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function [YP,Y1,Y2,Y3,Y4,Y5,Y6,Y7,Y8] = regression_matrix.m(zz,xx,yy)
MP = [(z2d*cos(alpha) + alpha2d*z*sin(alpha))/cos(alpha)^3, 0, 0, 0
      (z*(z2d*sin(2*alpha) + 2*alpha2d*z))/(2*cos(alpha)^4), alpha2d*cos(beta)^2, 0, alpha2d*sin(beta)^2
      0, 0, beta2d, 0];
YCP = [(alpha1d*(2*alpha1d*z - 2*alpha1d*z*cos(alpha))^2 + 2*z1d*cos(alpha)*sin(alpha))/cos(alpha)^4,
      0, 0, 0
      (2*alpha1d*z*(z1d*cos(alpha) + alpha1d*z*sin(alpha)))/cos(alpha)^5, -alpha1d*beta1d*sin(2*beta), 0,
      alpha1d*beta1d*sin(2*beta)
      0, (alpha1d^2*sin(2*beta))/2, 0, -(alpha1d^2*sin(2*beta))/2];
YGP = [-ga, 0, 0, 0
      0, 0, 0, 0
      0, 0, 0, 0];
YP=YMP+YCP+YGP;
YM11=[ (e1^2*cos(alpha)*(ra - rb*cos(alpha))*(alpha2d*z^2 + ra*z2d*cos(alpha) - rb*z2d*cos(alpha)^2 +
alpha2d*ra^2*cos(alpha)^2 + alpha2d*ra*z*sin(alpha) - alpha2d*ra*rb*cos(alpha)^3))/(ra^4*cos(alpha)^4 +
rb^4*cos(alpha)^4 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 + 4*ra^2*rb^2*cos(alpha)^6 + 2*ra^2*z^2*cos(alpha)^2
+ 6*rb^2*z^2*cos(alpha)^2 - 4*rb^2*z^2*cos(alpha)^4 - 4*ra*rb^3*cos(alpha)^5 - 4*ra^3*rb*cos(alpha)^5 +
2*rb*z^3*sin(2*alpha) - 4*ra*rb*z^2*cos(alpha)^3 + 4*rb^3*z*cos(alpha)^3*sin(alpha) +
4*ra^2*rb*z*cos(alpha)^3*sin(alpha) - 8*ra*rb^2*z*cos(alpha)^4*sin(alpha)), 0,
(cos(alpha)*(ra - rb*cos(alpha))*(alpha2d*z^2 + ra*z2d*cos(alpha) - rb*z2d*cos(alpha)^2 +
alpha2d*ra^2*cos(alpha)^2 + alpha2d*ra*z*sin(alpha) - alpha2d*ra*rb*cos(alpha)^3))/(ra^4*cos(alpha)^4 +
rb^4*cos(alpha)^4 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 + 4*ra^2*rb^2*cos(alpha)^6 + 2*ra^2*z^2*cos(alpha)^2
+ 6*rb^2*z^2*cos(alpha)^2 - 4*rb^2*z^2*cos(alpha)^4 - 4*ra*rb^3*cos(alpha)^5 - 4*ra^3*rb*cos(alpha)^5 +
2*rb*z^3*sin(2*alpha) - 4*ra*rb*z^2*cos(alpha)^3 + 4*rb^3*z*cos(alpha)^3*sin(alpha) +
4*ra^2*rb*z*cos(alpha)^3*sin(alpha) - 8*ra*rb^2*z*cos(alpha)^4*sin(alpha)), 0
(e1^2*(alpha2d*z^4 + alpha2d*ra^2*z^2 + alpha2d*ra^4*cos(alpha)^4 + ra^3*z2d*cos(alpha)^3 -
2*alpha2d*ra^3*rb*cos(alpha)^5 - 2*ra^2*rb*z2d*cos(alpha)^4 + ra*rb^2*z2d*cos(alpha)^5 -
rb*z^2*z2d*cos(alpha)^2 + alpha2d*ra^2*rb^2*cos(alpha)^6 + alpha2d*ra^2*z^2*cos(alpha)^2 +
2*alpha2d*ra*z^3*sin(alpha) + ra*z^2*z2d*cos(alpha) + 2*alpha2d*ra^3*z*cos(alpha)^2*sin(alpha) -
2*alpha2d*ra*rb*z^2*cos(alpha)^3 + ra^2*z^2*z2d*cos(alpha)*sin(alpha) - ra*rb*z^2*z2d*cos(alpha)^2*sin(alpha) -
2*alpha2d*ra^2*rb*z*cos(alpha)^3*sin(alpha)))/(ra^4*cos(alpha)^4 + rb^4*cos(alpha)^4 + z^4 +
2*ra^2*rb^2*cos(alpha)^4 + 4*ra^2*rb^2*cos(alpha)^6 + 2*ra^2*z^2*cos(alpha)^2 + 6*rb^2*z^2*cos(alpha)^2
- 4*rb^2*z^2*cos(alpha)^4 - 4*ra*rb^3*cos(alpha)^5 - 4*ra^3*rb*cos(alpha)^5 + 2*rb*z^3*sin(2*alpha) -
4*ra*rb*z^2*cos(alpha)^3 + 4*rb^3*z*cos(alpha)^3*sin(alpha) + 4*ra^2*rb*z*cos(alpha)^3*sin(alpha) -
8*ra*rb^2*z*cos(alpha)^4*sin(alpha)), 0, (alpha2d*z^4 + alpha2d*ra^2*z^2 + alpha2d*ra^4*cos(alpha)^4 +
ra^3*z2d*cos(alpha)^3 - 2*alpha2d*ra^3*rb*cos(alpha)^5 - 2*ra^2*rb*z2d*cos(alpha)^4 +
ra*rb^2*z2d*cos(alpha)^5 - rb*z^2*z2d*cos(alpha)^2 + alpha2d*ra^2*rb^2*cos(alpha)^6 +
alpha2d*ra^2*z^2*cos(alpha)^2 + 2*alpha2d*ra*z^3*sin(alpha) + ra*z^2*z2d*cos(alpha) +
2*alpha2d*ra^3*z*cos(alpha)^2*sin(alpha) - 2*alpha2d*ra*rb*z^2*cos(alpha)^3 +
ra^2*z^2*z2d*cos(alpha)*sin(alpha) - ra*rb*z^2*z2d*cos(alpha)^2*sin(alpha) -
2*alpha2d*ra^2*rb*z*cos(alpha)^3*sin(alpha))/(ra^4*cos(alpha)^4 + rb^4*cos(alpha)^4 + z^4 +
2*ra^2*rb^2*cos(alpha)^4 + 4*ra^2*rb^2*cos(alpha)^6 + 2*ra^2*z^2*cos(alpha)^2 + 6*rb^2*z^2*cos(alpha)^2
- 4*rb^2*z^2*cos(alpha)^4 - 4*ra*rb^3*cos(alpha)^5 - 4*ra^3*rb*cos(alpha)^5 + 2*rb*z^3*sin(2*alpha) -
4*ra*rb*z^2*cos(alpha)^3 + 4*rb^3*z*cos(alpha)^3*sin(alpha) + 4*ra^2*rb*z*cos(alpha)^3*sin(alpha) -
8*ra*rb^2*z*cos(alpha)^4*sin(alpha)), 0
      0, 0,
      0, 0];

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$$\begin{aligned}
YC11 = & (e1^{2*\cos(\alpha)}*(ra - rb*\cos(\alpha))*(2*\alpha1d^{2*rb*z^3} + 2*rb^{2*z1d^{2*\cos(\alpha)^3*\sin(\alpha)} + \\
& \alpha1d^{2*ra*z^3*\cos(\alpha)} + 2*\alpha1d^{2*ra^3*z*\cos(\alpha)} + 2*rb*z*z1d^{2*\cos(\alpha)^2} - \\
& \alpha1d^{2*ra^3*z*\cos(\alpha)^3} - 4*\alpha1d^{2*rb*z^3*\cos(\alpha)^2} + 2*\alpha1d*ra^3*z1d*(\sin(\alpha) - \\
& \sin(\alpha)^3) - 2*ra*rb*z1d^{2*(\sin(\alpha) - \sin(\alpha)^3)} - 2*ra*z*z1d^{2*\cos(\alpha)} + \\
& \alpha1d^{2*rb^2*z^2*\sin(2*\alpha)} - 8*\alpha1d^{2*ra^2*rb*z*\cos(\alpha)^2} + \\
& 3*\alpha1d^{2*ra*rb^2*z*\cos(\alpha)^3} + 4*\alpha1d^{2*ra^2*rb*z*\cos(\alpha)^4} - \\
& 2*\alpha1d^{2*ra*rb^2*z*\cos(\alpha)^5} + 2*\alpha1d*ra*rb^2*z1d*(\sin(\alpha) - \sin(\alpha)^3) - \\
& 2*\alpha1d*ra*z^2*z1d*\sin(\alpha) + \alpha1d^{2*ra*rb^3*\cos(\alpha)^4*\sin(\alpha)} - \\
& \alpha1d^{2*ra^3*rb*\cos(\alpha)^4*\sin(\alpha)} + 2*\alpha1d^{2*ra*rb^2*z*\cos(\alpha)} - \\
& 5*\alpha1d^{2*ra*rb*z^2*(\sin(\alpha) - \sin(\alpha)^3)} + 4*\alpha1d*rb^2*z*z1d*\cos(\alpha)^2 + \\
& 2*\alpha1d^{2*ra*rb*z^2*\sin(\alpha)} + 2*\alpha1d*rb*z^2*z1d*\sin(2*\alpha) - \\
& 8*\alpha1d*ra^2*rb*z1d*\cos(\alpha)^3*\sin(\alpha) + 4*\alpha1d*ra*rb^2*z1d*\cos(\alpha)^4*\sin(\alpha) - \\
& 4*\alpha1d*ra*rb*z*z1d*\cos(\alpha)^3)/(ra^6*\cos(\alpha)^6 + rb^6*\cos(\alpha)^6 + z^6 + \\
& 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 - 12*ra^3*rb^3*\cos(\alpha)^7 + \\
& 12*ra^2*rb^4*\cos(\alpha)^8 + 12*ra^4*rb^2*\cos(\alpha)^8 - 8*ra^3*rb^3*\cos(\alpha)^9 + \\
& 3*ra^2*z^4*\cos(\alpha)^2 + 3*ra^4*z^2*\cos(\alpha)^4 + 15*rb^2*z^4*\cos(\alpha)^2 - 12*rb^2*z^4*\cos(\alpha)^4 \\
& + 15*rb^4*z^2*\cos(\alpha)^4 - 12*rb^4*z^2*\cos(\alpha)^6 - 6*ra*rb^5*\cos(\alpha)^7 - 6*ra^5*rb*\cos(\alpha)^7 + \\
& 3*rb*z^5*\sin(2*\alpha) + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 + 20*rb^3*z^3*\cos(\alpha)^3*\sin(\alpha) - \\
& 8*rb^3*z^3*\cos(\alpha)^5*\sin(\alpha) - 6*ra*rb*z^4*\cos(\alpha)^3 - 36*ra*rb^3*z^2*\cos(\alpha)^5 - \\
& 12*ra^3*rb*z^2*\cos(\alpha)^5 + 24*ra*rb^3*z^2*\cos(\alpha)^7 + 6*rb^5*z*\cos(\alpha)^5*\sin(\alpha) + \\
& 6*ra^4*rb*z*\cos(\alpha)^5*\sin(\alpha) - 24*ra*rb^4*z*\cos(\alpha)^6*\sin(\alpha) + \\
& 12*ra^2*rb*z^3*\cos(\alpha)^3*\sin(\alpha) - 24*ra*rb^2*z^3*\cos(\alpha)^4*\sin(\alpha) + \\
& 12*ra^2*rb^3*z*\cos(\alpha)^5*\sin(\alpha) - 24*ra^3*rb^2*z*\cos(\alpha)^6*\sin(\alpha) + \\
& 24*ra^2*rb^3*z*\cos(\alpha)^7*\sin(\alpha)), 0, (\cos(\alpha))*(ra - rb*\cos(\alpha))*(2*\alpha1d^{2*rb*z^3} + \\
& 2*rb^{2*z1d^{2*\cos(\alpha)^3*\sin(\alpha)} + \alpha1d^{2*ra*z^3*\cos(\alpha)} + 2*\alpha1d^{2*ra^3*z*\cos(\alpha)} + \\
& 2*rb*z*z1d^{2*\cos(\alpha)^2} - \alpha1d^{2*ra^3*z*\cos(\alpha)^3} - 4*\alpha1d^{2*rb*z^3*\cos(\alpha)^2} + \\
& 2*\alpha1d*ra^3*z1d*(\sin(\alpha) - \sin(\alpha)^3) - 2*ra*rb*z1d^{2*(\sin(\alpha) - \sin(\alpha)^3)} - \\
& 2*ra*z*z1d^{2*\cos(\alpha)} + \alpha1d^{2*rb^2*z^2*\sin(2*\alpha)} - 8*\alpha1d^{2*ra^2*rb*z*\cos(\alpha)^2} + \\
& 3*\alpha1d^{2*ra*rb^2*z*\cos(\alpha)^3} + 4*\alpha1d^{2*ra^2*rb*z*\cos(\alpha)^4} - \\
& 2*\alpha1d^{2*ra*rb^2*z*\cos(\alpha)^5} + 2*\alpha1d*ra*rb^2*z1d*(\sin(\alpha) - \sin(\alpha)^3) - \\
& 2*\alpha1d*ra*z^2*z1d*\sin(\alpha) + \alpha1d^{2*ra*rb^3*\cos(\alpha)^4*\sin(\alpha)} - \\
& \alpha1d^{2*ra^3*rb*\cos(\alpha)^4*\sin(\alpha)} + 2*\alpha1d^{2*ra*rb^2*z*\cos(\alpha)} - \\
& 5*\alpha1d^{2*ra*rb*z^2*(\sin(\alpha) - \sin(\alpha)^3)} + 4*\alpha1d*rb^2*z*z1d*\cos(\alpha)^2 + \\
& 2*\alpha1d^{2*ra*rb*z^2*\sin(\alpha)} + 2*\alpha1d*rb*z^2*z1d*\sin(2*\alpha) - \\
& 8*\alpha1d*ra^2*rb*z1d*\cos(\alpha)^3*\sin(\alpha) + 4*\alpha1d*ra*rb^2*z1d*\cos(\alpha)^4*\sin(\alpha) - \\
& 4*\alpha1d*ra*rb*z*z1d*\cos(\alpha)^3)/(ra^6*\cos(\alpha)^6 + rb^6*\cos(\alpha)^6 + z^6 + \\
& 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 - 12*ra^3*rb^3*\cos(\alpha)^7 + \\
& 12*ra^2*rb^4*\cos(\alpha)^8 + 12*ra^4*rb^2*\cos(\alpha)^8 - 8*ra^3*rb^3*\cos(\alpha)^9 + \\
& 3*ra^2*z^4*\cos(\alpha)^2 + 3*ra^4*z^2*\cos(\alpha)^4 + 15*rb^2*z^4*\cos(\alpha)^2 - 12*rb^2*z^4*\cos(\alpha)^4 \\
& + 15*rb^4*z^2*\cos(\alpha)^4 - 12*rb^4*z^2*\cos(\alpha)^6 - 6*ra*rb^5*\cos(\alpha)^7 - 6*ra^5*rb*\cos(\alpha)^7 + \\
& 3*rb*z^5*\sin(2*\alpha) + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 + 20*rb^3*z^3*\cos(\alpha)^3*\sin(\alpha) - \\
& 8*rb^3*z^3*\cos(\alpha)^5*\sin(\alpha) - 6*ra*rb*z^4*\cos(\alpha)^3 - 36*ra*rb^3*z^2*\cos(\alpha)^5 - \\
& 12*ra^3*rb*z^2*\cos(\alpha)^5 + 24*ra*rb^3*z^2*\cos(\alpha)^7 + 6*rb^5*z*\cos(\alpha)^5*\sin(\alpha) + \\
& 6*ra^4*rb*z*\cos(\alpha)^5*\sin(\alpha) - 24*ra*rb^4*z*\cos(\alpha)^6*\sin(\alpha) + \\
& 12*ra^2*rb*z^3*\cos(\alpha)^3*\sin(\alpha) - 24*ra*rb^2*z^3*\cos(\alpha)^4*\sin(\alpha) + \\
& 12*ra^2*rb^3*z*\cos(\alpha)^5*\sin(\alpha) - 24*ra^3*rb^2*z*\cos(\alpha)^6*\sin(\alpha) + \\
& 24*ra^2*rb^3*z*\cos(\alpha)^7*\sin(\alpha)), 0
\end{aligned}$$

$$\begin{aligned}
& (e^{1/2} (2\alpha^{1d} \alpha^{2rb} z^5 - r \alpha^{2z} z^{2z} 1d^{2\sin(2\alpha)} + \alpha^{1d} \alpha^{2ra} z^5 \cos(\alpha) + \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{2rb} z^3 - 2ra^z \alpha^{3z} 1d^{2\cos(\alpha)} + 2\alpha^{1d} \alpha^{2ra} \alpha^{3z} \cos(\alpha) + \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{5z} \cos(\alpha)^3 - \alpha^{1d} \alpha^{2ra} \alpha^{5z} \cos(\alpha)^5 - 4\alpha^{1d} \alpha^{2rb} z^5 \cos(\alpha)^2 - \\
& 2ra^z \alpha^{3z} 1d^{2\cos(\alpha)} \alpha^3 + 2rb^z \alpha^{3z} 1d^{2\cos(\alpha)} \alpha^2 - 2\alpha^{1d} \alpha^{2ra} \alpha^{3z} 1d + \\
& (\alpha^{1d} \alpha^{2ra} \alpha^{2z} \alpha^{4\sin(2\alpha)})/2 + \alpha^{1d} \alpha^{2ra} \alpha^{4z} \alpha^{2\sin(2\alpha)} + \alpha^{1d} \alpha^{2rb} \alpha^{2z} \alpha^{4\sin(2\alpha)} \\
& + 4\alpha^{1d} \alpha^{2ra} \alpha^{2z} \alpha^3 \cos(\alpha) - 11\alpha^{1d} \alpha^{2ra} \alpha^{4rb} z^* \cos(\alpha)^4 + \\
& 6\alpha^{1d} \alpha^{2ra} \alpha^{4rb} z^* \cos(\alpha)^6 + 2\alpha^{1d} \alpha^{2ra} \alpha^{5z} 1d^* \cos(\alpha)^4 \sin(\alpha) - \\
& 6\alpha^{1d} \alpha^{2ra} \alpha^{3rb} z^* \alpha^2 (\sin(\alpha) - \sin(\alpha)^3) + 2\alpha^{1d} \alpha^{2ra} \alpha^{3z} 1d^* \cos(\alpha)^2 + \\
& 4\alpha^{1d} \alpha^{2ra} \alpha^{3z} 1d^* \cos(\alpha)^2 - 2ra^z \alpha^{2rb} z^* 1d^{2\cos(\alpha)} \alpha^2 + 2ra^z \alpha^{2z} 1d^{2\cos(\alpha)} \alpha^3 + \\
& 6ra^z \alpha^{2rb} z^* 1d^{2\cos(\alpha)} \alpha^4 - 4ra^z \alpha^{2z} z^* 1d^{2\cos(\alpha)} \alpha^5 - 2\alpha^{1d} \alpha^{2ra} \alpha^{4z} 1d^* \sin(\alpha) - \\
& \alpha^{1d} \alpha^{2ra} \alpha^{5rb} \cos(\alpha)^6 \sin(\alpha) - 13\alpha^{1d} \alpha^{2ra} \alpha^{2rb} z^* \alpha^3 \cos(\alpha)^2 - \\
& \alpha^{1d} \alpha^{2ra} \alpha^{2z} \alpha^3 \cos(\alpha)^3 + 2\alpha^{1d} \alpha^{2ra} \alpha^{3rb} \alpha^{2z} \cos(\alpha)^3 + \\
& 4\alpha^{1d} \alpha^{2ra} \alpha^{2rb} z^* \alpha^3 \cos(\alpha)^4 - \alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^3 z^* \cos(\alpha)^4 + \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{2z} \alpha^3 \cos(\alpha)^5 + 11\alpha^{1d} \alpha^{2ra} \alpha^{3rb} \alpha^{2z} \cos(\alpha)^5 - \\
& 4\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^3 z^* \cos(\alpha)^6 - 6\alpha^{1d} \alpha^{2ra} \alpha^{3rb} \alpha^{2z} \cos(\alpha)^7 + \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^3 z^* \cos(\alpha)^8 - 2ra^z \alpha^{3rb} z^* 1d^{2\cos(\alpha)} \alpha^4 \sin(\alpha) - \\
& 2ra^z \alpha^{3z} 1d^{2\cos(\alpha)} \alpha^6 \sin(\alpha) - 9\alpha^{1d} \alpha^{2ra} \alpha^{rb} z^* \alpha^4 (\sin(\alpha) - \sin(\alpha)^3) + \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{4z} z^* 1d^* \cos(\alpha)^2 - 2\alpha^{1d} \alpha^{2ra} \alpha^{4z} z^* 1d^* \cos(\alpha)^4 + 4\alpha^{1d} \alpha^{2ra} \alpha^{rb} z^* \alpha^4 \sin(\alpha) \\
& + 2\alpha^{1d} \alpha^{2rb} z^* \alpha^4 z^* 1d^* \sin(2\alpha) + \alpha^{1d} \alpha^{2ra} \alpha^{3rb} \alpha^3 \cos(\alpha)^6 \sin(\alpha) - \\
& \alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^4 \cos(\alpha)^7 \sin(\alpha) + \alpha^{1d} \alpha^{2ra} \alpha^{4rb} \alpha^2 \cos(\alpha)^7 \sin(\alpha) - \\
& \alpha^{1d} \alpha^{2ra} \alpha^{4z} \alpha^2 \cos(\alpha)^3 \sin(\alpha) + \alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^{2z} \alpha^2 \sin(2\alpha) + \\
& 4ra^z \alpha^{2rb} \alpha^{2z} 1d^{2\cos(\alpha)} \alpha^5 \sin(\alpha) + 2rb^z \alpha^{2z} \alpha^2 1d^{2\cos(\alpha)} \alpha^3 \sin(\alpha) - \\
& 8\alpha^{1d} \alpha^{2ra} \alpha^{rb} z^* \alpha^3 z^* 1d^* \cos(\alpha)^3 - 8\alpha^{1d} \alpha^{2ra} \alpha^{3rb} z^* z^* 1d^* \cos(\alpha)^3 - \\
& 4\alpha^{1d} \alpha^{2ra} \alpha^{rb} \alpha^3 z^* z^* 1d^* \cos(\alpha)^5 + 4\alpha^{1d} \alpha^{2ra} \alpha^{3rb} z^* z^* 1d^* \cos(\alpha)^5 + \\
& 6\alpha^{1d} \alpha^{2ra} \alpha^{rb} \alpha^{2z} \alpha^2 z^* 1d^* (\sin(\alpha) - \sin(\alpha)^3) - \alpha^{1d} \alpha^{2ra} \alpha^{rb} \alpha^3 z^* \alpha^2 \cos(\alpha)^4 \sin(\alpha) - \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{3rb} z^* \alpha^2 \cos(\alpha)^4 \sin(\alpha) - 10\alpha^{1d} \alpha^{2ra} \alpha^{4rb} z^* 1d^* \cos(\alpha)^5 \sin(\alpha) + \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^{2z} z^* 1d^* \cos(\alpha)^2 + 6\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^{2z} z^* 1d^* \cos(\alpha)^4 + \\
& 3\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^{2z} \alpha^2 \cos(\alpha)^3 \sin(\alpha) + 3\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^{2z} \alpha^2 \cos(\alpha)^5 \sin(\alpha) + \\
& 4\alpha^{1d} \alpha^{2ra} \alpha^{rb} z^* \alpha^3 z^* 1d^* \cos(\alpha) + 2\alpha^{1d} \alpha^{2ra} \alpha^{3rb} \alpha^2 z^* 1d^* \cos(\alpha)^4 \sin(\alpha) - \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^3 z^* 1d^* \cos(\alpha)^5 \sin(\alpha) + 12\alpha^{1d} \alpha^{2ra} \alpha^{3rb} \alpha^2 z^* 1d^* \cos(\alpha)^6 \sin(\alpha) - \\
& 4\alpha^{1d} \alpha^{2ra} \alpha^{2rb} \alpha^3 z^* 1d^* \cos(\alpha)^7 \sin(\alpha) - \\
& 6\alpha^{1d} \alpha^{2ra} \alpha^{2rb} z^* \alpha^2 z^* 1d^* \cos(\alpha)^3 \sin(\alpha) / (ra^6 \cos(\alpha)^6 + rb^6 \cos(\alpha)^6 + z^6 + \\
& 3ra^z \alpha^{2rb} \alpha^4 \cos(\alpha)^6 + 3ra^z \alpha^{4rb} \alpha^2 \cos(\alpha)^6 - 12ra^z \alpha^{3rb} \alpha^3 \cos(\alpha)^7 + \\
& 12ra^z \alpha^{2rb} \alpha^4 \cos(\alpha)^8 + 12ra^z \alpha^{4rb} \alpha^2 \cos(\alpha)^8 - 8ra^z \alpha^{3rb} \alpha^3 \cos(\alpha)^9 + \\
& 3ra^z \alpha^{2z} \alpha^4 \cos(\alpha)^2 + 3ra^z \alpha^{4z} \alpha^2 \cos(\alpha)^4 + 15rb^z \alpha^{2z} \alpha^4 \cos(\alpha)^2 - 12rb^z \alpha^{2z} \alpha^4 \cos(\alpha)^4 \\
& + 15rb^z \alpha^{4z} \alpha^2 \cos(\alpha)^4 - 12rb^z \alpha^{4z} \alpha^2 \cos(\alpha)^6 - 6ra^z \alpha^{5rb} \cos(\alpha)^7 - 6ra^z \alpha^{5rb} \cos(\alpha)^7 + \\
& 3rb^z \alpha^5 \sin(2\alpha) + 18ra^z \alpha^{2rb} \alpha^{2z} \alpha^2 \cos(\alpha)^4 + 20rb^z \alpha^3 z^* \alpha^3 \cos(\alpha)^3 \sin(\alpha) - \\
& 8rb^z \alpha^3 z^* \alpha^3 \cos(\alpha)^5 \sin(\alpha) - 6ra^z \alpha^{rb} z^* \alpha^4 \cos(\alpha)^3 - 36ra^z \alpha^{3z} \alpha^2 \cos(\alpha)^5 - \\
& 12ra^z \alpha^{3rb} z^* \alpha^2 \cos(\alpha)^5 + 24ra^z \alpha^{3z} \alpha^2 \cos(\alpha)^7 + 6rb^z \alpha^5 z^* \cos(\alpha)^5 \sin(\alpha) + \\
& 6ra^z \alpha^{4rb} z^* \cos(\alpha)^5 \sin(\alpha) - 24ra^z \alpha^{4z} z^* \cos(\alpha)^6 \sin(\alpha) + \\
& 12ra^z \alpha^{2rb} z^* \alpha^3 \cos(\alpha)^3 \sin(\alpha) - 24ra^z \alpha^{rb} \alpha^{2z} \alpha^3 \cos(\alpha)^4 \sin(\alpha) + \\
& 12ra^z \alpha^{2rb} \alpha^3 z^* \cos(\alpha)^5 \sin(\alpha) - 24ra^z \alpha^{3rb} \alpha^{2z} z^* \cos(\alpha)^6 \sin(\alpha) + \\
& 24ra^z \alpha^{2rb} \alpha^3 z^* \cos(\alpha)^7 \sin(\alpha)), 0, \\
& ((\cos(\alpha)^2)^{(3/2)} (ra^z \alpha^{2\cos(\alpha)} \alpha^2 + z^2 + ra^z \sin(\alpha) - ra^z \alpha^{rb} \cos(\alpha)^3)^{(2\alpha^{1d} \alpha^{2rb} z^* \alpha^3 + \\
& 2rb^z \alpha^{2z} 1d^{2\cos(\alpha)} \alpha^3 \sin(\alpha) + \alpha^{1d} \alpha^{2ra} \alpha^3 \cos(\alpha) + 2\alpha^{1d} \alpha^{2ra} \alpha^3 z^* \cos(\alpha) + \\
& 2rb^z \alpha^{2z} 1d^{2\cos(\alpha)} \alpha^2 - \alpha^{1d} \alpha^{2ra} \alpha^3 z^* \cos(\alpha)^3 - 4\alpha^{1d} \alpha^{2rb} z^* \alpha^3 \cos(\alpha)^2 + \\
& 2\alpha^{1d} \alpha^{2ra} \alpha^3 z^* 1d^* (\sin(\alpha) - \sin(\alpha)^3) - 2ra^z \alpha^{rb} z^* 1d^{2\sin(\alpha) - \sin(\alpha)^3}) -
\end{aligned}$$

$$\begin{aligned}
& 2*ra*z^2d^2*cos(alpha) + alpha1d^2*rb^2*z^2*sin(2*alpha) - 8*alpha1d^2*ra^2*rb*z*cos(alpha)^2 + \\
& 3*alpha1d^2*ra*rb^2*z*cos(alpha)^3 + 4*alpha1d^2*ra^2*rb*z*cos(alpha)^4 - \\
& 2*alpha1d^2*ra*rb^2*z*cos(alpha)^5 + 2*alpha1d*ra*rb^2*z1d*(sin(alpha) - sin(alpha)^3) - \\
& 2*alpha1d*ra*z^2*z1d*sin(alpha) + alpha1d^2*ra*rb^3*cos(alpha)^4*sin(alpha) - \\
& alpha1d^2*ra^3*rb*cos(alpha)^4*sin(alpha) + 2*alpha1d^2*ra*rb^2*z*cos(alpha) - \\
& 5*alpha1d^2*ra*rb*z^2*(sin(alpha) - sin(alpha)^3) + 4*alpha1d*rb^2*z^2*cos(alpha)^2 + \\
& 2*alpha1d^2*ra*rb*z^2*sin(alpha) + 2*alpha1d*rb*z^2*z1d*sin(2*alpha) - \\
& 8*alpha1d*ra^2*rb*z1d*cos(alpha)^3*sin(alpha) + 4*alpha1d*ra*rb^2*z1d*cos(alpha)^4*sin(alpha) - \\
& 4*alpha1d*ra*rb*z^2*z1d*cos(alpha)^3)/(cos(alpha)^6*((rb - ra*cos(alpha) + z*tan(alpha))^2 + (z + \\
& ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 + sin(2*alpha)*rb*z + \\
& z^2)^(3/2)), 0
\end{aligned}$$

0, 0,
0, 0];

$$\begin{aligned}
YG11 = [& (e1*ga*(ra - rb*cos(alpha))*(rb - ra*cos(alpha) + \\
& z*tan(alpha)))/(cos(alpha)*((rb - ra*cos(alpha) + z*tan(alpha))^2 + (z + ra*sin(alpha))^2)^(3/2)), 0, 0, 0 \\
& (e1*ga*(rb - ra*cos(alpha) + z*tan(alpha))*(ra^2*cos(alpha)^2 + z^2 + ra*z*sin(alpha) - \\
& ra*rb*cos(alpha)^3))/(cos(alpha)^2*((rb - ra*cos(alpha) + z*tan(alpha))^2 + (z + ra*sin(alpha))^2)^(3/2)), 0, 0, 0 \\
& 0, 0, 0, 0];
\end{aligned}$$

Y1=YM11+YC11+YG11;

$$\begin{aligned}
YM12 = [& (e1^2*cos(alpha)*(rb - ra*cos(beta))*(beta2d*ra^2*cos(alpha)^2 - rb*z2d*cos(alpha) - \\
& alpha2d*rb*z*sin(alpha) + ra*z2d*cos(alpha)*cos(beta) + alpha2d*ra*z*cos(beta)*sin(alpha) + \\
& beta2d*ra*z*cos(alpha)*sin(beta) - beta2d*ra*rb*cos(alpha)^2*cos(beta))/(ra^4*cos(alpha)^4 + \\
& rb^4*cos(alpha)^4 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 + 6*ra^2*z^2*cos(alpha)^2 + 2*rb^2*z^2*cos(alpha)^2 \\
& + 4*ra*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 - \\
& 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 4*ra^3*z*cos(alpha)^3*sin(beta) - 4*ra*rb*z^2*cos(alpha)^2*cos(beta) + 4*ra*rb^2*z*cos(alpha)^3*sin(beta) - \\
& 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta)), \\
& (cos(alpha)*(rb - ra*cos(beta))*(rb*z2d*cos(alpha) - rb*z2d*cos(alpha)^3 - beta2d*ra^2*cos(alpha)^2 + \\
& beta2d*ra^2*cos(alpha)^4 + ra*z2d*cos(alpha)^3*cos(beta) + alpha2d*rb*z*sin(alpha) - \\
& ra*z2d*cos(alpha)*cos(beta) - alpha2d*ra*z*cos(beta)*sin(alpha) - beta2d*ra*z*cos(alpha)*sin(beta) + \\
& beta2d*ra*rb*cos(alpha)^2*cos(beta) - beta2d*ra*rb*cos(alpha)^4*cos(beta) + \\
& beta2d*ra*z*cos(alpha)^3*sin(beta) - alpha2d*ra^2*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) + \\
& alpha2d*ra*rb*cos(alpha)^3*sin(alpha)*sin(beta))/(ra^4*cos(alpha)^4 - ra^4*cos(alpha)^6 + rb^4*cos(alpha)^4 \\
& - z^4*cos(alpha)^2 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 - ra^2*rb^2*cos(alpha)^6 + 6*ra^2*z^2*cos(alpha)^2 - \\
& 6*ra^2*z^2*cos(alpha)^4 + 2*rb^2*z^2*cos(alpha)^2 - rb^2*z^2*cos(alpha)^4 + \\
& ra^4*cos(alpha)^6*cos(beta)^2 + 4*ra*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 + \\
& ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + \\
& 5*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 2*ra^3*rb*cos(alpha)^6*cos(beta) - 4*ra*z^3*cos(alpha)^3*sin(beta) + 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra^3*z*cos(alpha)^5*sin(beta) - 2*ra^3*rb*cos(alpha)^6*cos(beta)^3 - 4*ra*rb*z^2*cos(alpha)^2*cos(beta) + \\
& 2*ra*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^2*z*cos(alpha)^3*sin(beta) - 2*ra*rb^2*z*cos(alpha)^5*sin(beta) \\
& + 2*ra^3*z*cos(alpha)^5*cos(beta)^2*sin(beta) - 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 4*ra^2*rb*z*cos(alpha)^5*cos(beta)*sin(beta)), \\
& -(cos(alpha)^3*(rb - ra*cos(beta))^2*(alpha2d*z^3*sin(alpha) - rb^2*z2d*cos(alpha)^3 + \\
& beta2d*ra^2*rb*cos(alpha)^4 - beta2d*ra^3*cos(alpha)^4*cos(beta) - ra^2*z2d*cos(alpha)^3*cos(beta)^2 + \\
& 3*alpha2d*ra^2*z*cos(alpha)^2*sin(alpha) + beta2d*ra^2*rb*cos(alpha)^4*cos(beta)^2 + \\
& alpha2d*ra^3*cos(alpha)^3*sin(alpha)*sin(beta) + 2*ra*rb*z2d*cos(alpha)^3*cos(beta) -
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 r^2 r^b \cos^4(\alpha) \cos(\beta) + \beta^2 d^2 r^2 r^b z^2 \cos^3(\alpha) \sin(\beta) - \\
& 3 \alpha^2 d^2 r^2 r^2 z^2 \cos^2(\alpha) \cos^2(\beta) \sin(\alpha) + 3 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) - \\
& \beta^2 d^2 r^2 r^2 z^2 \cos^3(\alpha) \cos(\beta) \sin(\beta) + \alpha^2 d^2 r^2 r^b \cos^3(\alpha) \sin(\alpha) \sin(\beta) - \\
& 2 \alpha^2 d^2 r^2 r^2 r^b \cos^3(\alpha) \cos(\beta) \sin(\alpha) \sin(\beta) / (r^6 \cos^6(\alpha) - r^6 \cos^8(\alpha) + \\
& r^6 \cos^6(\alpha) - z^6 \cos^2(\alpha) + z^6 + 3 r^2 r^2 r^b \cos^6(\alpha) + 3 r^4 r^b \cos^6(\alpha) - \\
& r^2 r^2 r^b \cos^8(\alpha) - 2 r^4 r^2 r^b \cos^8(\alpha) + 15 r^2 r^2 z^4 \cos^2(\alpha) - 15 r^2 z^4 \cos^4(\alpha) + \\
& 15 r^4 z^2 \cos^4(\alpha) - 15 r^4 z^2 \cos^6(\alpha) + 3 r^2 z^4 \cos^2(\alpha) - \\
& 2 r^2 z^4 \cos^4(\alpha) + 3 r^2 z^4 \cos^6(\alpha) - r^4 z^2 \cos^6(\alpha) + \\
& r^6 \cos^8(\alpha) \cos^2(\beta) + 18 r^2 r^2 r^2 z^2 \cos^4(\alpha) - 12 r^2 r^2 r^2 z^2 \cos^6(\alpha) + \\
& 20 r^2 z^3 \cos^3(\alpha) \sin(\beta) - 20 r^2 z^3 \cos^5(\alpha) \sin(\beta) + 6 r^2 z^5 \cos(\alpha) \sin(\beta) + \\
& 12 r^2 r^2 r^b \cos^6(\alpha) \cos^2(\beta) + 12 r^2 r^4 r^b \cos^6(\alpha) \cos^2(\beta) - \\
& 8 r^2 r^3 r^b \cos^6(\alpha) \cos^3(\beta) + r^2 r^2 r^b \cos^8(\alpha) \cos^2(\beta) - \\
& 2 r^2 r^4 r^b \cos^8(\alpha) \cos^2(\beta) - 4 r^2 r^3 r^b \cos^8(\alpha) \cos^3(\beta) + \\
& 4 r^2 r^4 r^b \cos^8(\alpha) \cos^4(\beta) - 12 r^2 z^4 \cos^2(\alpha) \cos^2(\beta) + \\
& 13 r^2 z^4 \cos^4(\alpha) \cos^2(\beta) - 12 r^2 z^4 \cos^4(\alpha) \cos^4(\beta) + \\
& 18 r^2 z^4 \cos^6(\alpha) \cos^2(\beta) - 4 r^2 z^4 \cos^6(\alpha) \cos^4(\beta) - \\
& 6 r^2 r^b \cos^6(\alpha) \cos^6(\beta) - 6 r^2 r^5 r^b \cos^6(\alpha) \cos^6(\beta) + 4 r^2 r^5 r^b \cos^8(\alpha) \cos^6(\beta) - \\
& 6 r^2 z^5 \cos^3(\alpha) \sin(\beta) + 6 r^2 r^5 z^2 \cos^5(\alpha) \sin(\beta) - 6 r^2 r^5 z^2 \cos^7(\alpha) \sin(\beta) - \\
& 12 r^2 r^3 r^b \cos^6(\alpha) \cos^6(\beta) + 4 r^2 r^3 r^b \cos^8(\alpha) \cos^6(\beta) - \\
& 4 r^2 r^5 r^b \cos^8(\alpha) \cos^6(\beta) - 6 r^2 r^2 r^b z^4 \cos^2(\alpha) \cos^6(\beta) + 4 r^2 r^2 r^b z^4 \cos^4(\alpha) \cos^6(\beta) \\
& + 6 r^2 r^2 r^b \cos^5(\alpha) \sin(\beta) - 2 r^2 r^2 r^b \cos^7(\alpha) \sin(\beta) + \\
& 6 r^2 r^2 r^b z^2 \cos^6(\alpha) \cos^6(\beta) - 8 r^2 r^3 z^3 \cos^3(\alpha) \cos^3(\beta) \sin(\beta) + \\
& 12 r^2 r^3 z^3 \cos^5(\alpha) \cos^2(\beta) \sin(\beta) - 12 r^2 r^2 r^b z^3 \cos^4(\alpha) \cos^6(\beta) - \\
& 36 r^2 r^3 r^b z^2 \cos^4(\alpha) \cos^6(\beta) + 4 r^2 r^2 r^b z^3 \cos^6(\alpha) \cos^6(\beta) + \\
& 24 r^2 r^3 r^b z^2 \cos^6(\alpha) \cos^6(\beta) + 12 r^2 r^2 r^b z^2 \cos^3(\alpha) \sin(\beta) - \\
& 8 r^2 r^2 r^b z^3 \cos^5(\alpha) \sin(\beta) + 12 r^2 r^3 r^b z^2 \cos^5(\alpha) \sin(\beta) - \\
& 8 r^2 r^3 r^b z^2 \cos^7(\alpha) \sin(\beta) + 24 r^2 r^3 r^b z^2 \cos^4(\alpha) \cos^6(\beta) - \\
& 20 r^2 r^3 r^b z^2 \cos^6(\alpha) \cos^6(\beta) + 4 r^2 r^5 z^2 \cos^7(\alpha) \cos^2(\beta) \sin(\beta) - \\
& 24 r^2 r^2 r^b z^3 \cos^3(\alpha) \cos^3(\beta) \sin(\beta) + 16 r^2 r^2 r^b z^3 \cos^5(\alpha) \cos^5(\beta) \sin(\beta) - \\
& 24 r^2 r^2 r^b z^3 \cos^5(\alpha) \cos^5(\beta) \sin(\beta) + 8 r^2 r^2 r^b z^3 \cos^7(\alpha) \cos^5(\beta) \sin(\beta) - \\
& 8 r^2 r^4 r^b z^2 \cos^7(\alpha) \cos^3(\beta) \sin(\beta) + 24 r^2 r^3 r^b z^2 \cos^5(\alpha) \cos^2(\beta) \sin(\beta) - \\
& 4 r^2 r^3 r^b z^2 \cos^7(\alpha) \cos^2(\beta) \sin(\beta) - 24 r^2 r^4 r^b z^2 \cos^5(\alpha) \cos^5(\beta) \sin(\beta) + \\
& 16 r^2 r^4 r^b z^2 \cos^7(\alpha) \cos^5(\beta) \sin(\beta)), 0 \\
& (e^{1/2} (\alpha^2 d^2 z^4 + \alpha^2 d^2 r^b z^2 + \alpha^2 d^2 r^4 \cos^4(\alpha) + (r^2 z^2 d^2 \sin(2\alpha))/2 + \\
& \alpha^2 d^2 r^2 r^b \cos^4(\alpha) + 6 \alpha^2 d^2 r^2 z^2 \cos^2(\alpha) + \alpha^2 d^2 r^2 z^2 \cos^2(\beta) - \\
& \alpha^2 d^2 r^4 \cos^4(\alpha) \cos^2(\beta) + 4 \alpha^2 d^2 r^3 z^2 \cos^3(\alpha) \sin(\beta) - \\
& 2 \alpha^2 d^2 r^2 r^b z^2 \cos^2(\beta) - \beta^2 d^2 r^2 r^2 z^2 (\sin(\alpha) - \sin(\alpha)^3) + \\
& 2 \alpha^2 d^2 r^2 r^3 r^b \cos^4(\alpha) \cos^2(\beta) + 4 \alpha^2 d^2 r^2 r^2 z^3 \cos^3(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^2 r^2 r^b \cos^4(\alpha) \cos^2(\beta) - 6 \alpha^2 d^2 r^2 z^2 \cos^2(\alpha) \cos^2(\beta) - \\
& 2 \alpha^2 d^2 r^2 r^3 r^b \cos^4(\alpha) \cos^2(\beta) - 2 \alpha^2 d^2 r^2 r^3 z^2 \cos^3(\alpha) \cos^2(\beta) \sin(\beta) + \\
& 2 \alpha^2 d^2 r^2 r^2 r^b \cos^3(\alpha) \sin(\beta) + \beta^2 d^2 r^2 r^3 z^2 \cos^2(\alpha) \cos^2(\beta) \sin(\alpha) + \\
& r^2 z^2 d^2 \cos^2(\alpha) \cos^2(\beta) \sin(\alpha) + \beta^2 d^2 r^2 r^b z^2 \cos^2(\alpha) \cos^2(\beta) \sin(\alpha) - \\
& 4 \alpha^2 d^2 r^2 r^2 r^b z^2 \cos^3(\alpha) \cos^2(\beta) \sin(\beta) - 2 r^2 r^2 r^b z^2 d^2 \cos^2(\alpha) \cos^2(\beta) \sin(\alpha) - \\
& \beta^2 d^2 r^2 r^2 r^b z^2 \cos^2(\alpha) \cos^2(\beta) \sin(\alpha) + \\
& \beta^2 d^2 r^2 r^2 z^2 \cos^2(\alpha) \cos^2(\beta) \sin(\alpha) \sin(\beta) - \\
& \beta^2 d^2 r^2 r^2 r^b z^2 \cos^2(\alpha) \sin(\alpha) \sin(\beta) / (r^4 \cos^4(\alpha) + r^4 \cos^4(\alpha) + z^4 + \\
& 2 r^2 r^2 r^b \cos^4(\alpha) + 6 r^2 z^2 \cos^2(\alpha) + 2 r^2 z^2 \cos^2(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& 4*ra^z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 \\
& - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra*rb*z^2*cos(alpha)^2*cos(beta) + 4*ra*rb^2*z*cos(alpha)^3*sin(beta) - \\
& 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta)), \\
& -((rb - ra*cos(beta))*(alpha2d*ra^3*cos(alpha)^6*cos(beta) - alpha2d*ra^2*rb*cos(alpha)^6 - alpha2d*rb*z^2 + \\
& alpha2d*ra^z^2*cos(beta) - alpha2d*ra^3*cos(alpha)^6*cos(beta)^3 + beta2d*ra^2*z*cos(alpha)^2*sin(alpha) + \\
& beta2d*ra^2*z*cos(alpha)^4*sin(alpha) + alpha2d*ra^2*rb*cos(alpha)^6*cos(beta)^2 - \\
& rb*z^2d*cos(alpha)*sin(alpha) + beta2d*ra^3*cos(alpha)^5*sin(alpha)*sin(beta) - \\
& 2*alpha2d*ra*rb*z*cos(alpha)^3*sin(beta) + ra*z^2d*cos(alpha)*cos(beta)*sin(alpha) - \\
& beta2d*ra^2*z*cos(alpha)^4*cos(beta)^2*sin(alpha) + ra^2*z^2d*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& beta2d*ra^z^2*cos(alpha)*sin(alpha)*sin(beta) - ra*rb*z^2d*cos(alpha)^4*sin(alpha)*sin(beta) + \\
& 2*alpha2d*ra^2*z*cos(alpha)^3*cos(beta)*sin(beta) - \\
& beta2d*ra^2*rb*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& beta2d*ra*rb*z*cos(alpha)^2*cos(beta)*sin(alpha)))/(ra^4*cos(alpha)^4 - ra^4*cos(alpha)^6 + \\
& rb^4*cos(alpha)^4 - z^4*cos(alpha)^2 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 - ra^2*rb^2*cos(alpha)^6 + \\
& 6*ra^2*z^2*cos(alpha)^2 - 6*ra^2*z^2*cos(alpha)^4 + 2*rb^2*z^2*cos(alpha)^2 - rb^2*z^2*cos(alpha)^4 + \\
& ra^4*cos(alpha)^6*cos(beta)^2 + 4*ra^z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 + \\
& ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + \\
& 5*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 2*ra^3*rb*cos(alpha)^6*cos(beta) - 4*ra^z^3*cos(alpha)^3*sin(beta) + 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra^3*z*cos(alpha)^5*sin(beta) - 2*ra^3*rb*cos(alpha)^6*cos(beta)^3 - 4*ra*rb*z^2*cos(alpha)^2*cos(beta) + \\
& 2*ra*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^2*z*cos(alpha)^3*sin(beta) - 2*ra*rb^2*z*cos(alpha)^5*sin(beta) \\
& + 2*ra^3*z*cos(alpha)^5*cos(beta)^2*sin(beta) - 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 4*ra^2*rb*z*cos(alpha)^5*cos(beta)*sin(beta)), -(alpha2d*ra^6*cos(alpha)^8 - alpha2d*ra^6*cos(alpha)^6 - \\
& alpha2d*z^6 + alpha2d*z^6*cos(alpha)^2 - alpha2d*ra^2*rb^4*cos(alpha)^6 - \\
& 2*alpha2d*ra^4*rb^2*cos(alpha)^6 + alpha2d*ra^2*rb^4*cos(alpha)^8 + 2*alpha2d*ra^4*rb^2*cos(alpha)^8 - \\
& 15*alpha2d*ra^2*z^4*cos(alpha)^2 + 15*alpha2d*ra^2*z^4*cos(alpha)^4 - 15*alpha2d*ra^4*z^2*cos(alpha)^4 \\
& + 15*alpha2d*ra^4*z^2*cos(alpha)^6 + alpha2d*ra^6*cos(alpha)^6*cos(beta)^2 - \\
& alpha2d*ra^6*cos(alpha)^8*cos(beta)^2 + 6*alpha2d*ra*z^5*cos(alpha)^3*sin(beta) - \\
& 6*alpha2d*ra^5*z*cos(alpha)^5*sin(beta) + 6*alpha2d*ra^5*z*cos(alpha)^7*sin(beta) + \\
& 4*alpha2d*ra^3*rb^3*cos(alpha)^6*cos(beta) - 4*alpha2d*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*alpha2d*ra^5*rb*cos(alpha)^6*cos(beta)^3 + 4*alpha2d*ra^5*rb*cos(alpha)^8*cos(beta)^3 - \\
& 6*alpha2d*ra^2*rb^2*z^2*cos(alpha)^4 + 6*alpha2d*ra^2*rb^2*z^2*cos(alpha)^6 - \\
& 20*alpha2d*ra^3*z^3*cos(alpha)^3*sin(beta) + 20*alpha2d*ra^3*z^3*cos(alpha)^5*sin(beta) + \\
& rb^2*z^3z^2d*cos(alpha)^3*sin(alpha) - 6*alpha2d*ra^z^5*cos(alpha)*sin(beta) + \\
& alpha2d*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 - 2*alpha2d*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& 4*alpha2d*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 - alpha2d*ra^2*rb^4*cos(alpha)^8*cos(beta)^2 + \\
& 4*alpha2d*ra^4*rb^2*cos(alpha)^6*cos(beta)^4 + 2*alpha2d*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 + \\
& 4*alpha2d*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 - 4*alpha2d*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 + \\
& 15*alpha2d*ra^2*z^4*cos(alpha)^2*cos(beta)^2 - 15*alpha2d*ra^2*z^4*cos(alpha)^4*cos(beta)^2 + \\
& 24*alpha2d*ra^4*z^2*cos(alpha)^4*cos(beta)^2 - 9*alpha2d*ra^4*z^2*cos(alpha)^4*cos(beta)^4 - \\
& 24*alpha2d*ra^4*z^2*cos(alpha)^6*cos(beta)^2 + 9*alpha2d*ra^4*z^2*cos(alpha)^6*cos(beta)^4 + \\
& 4*alpha2d*ra^5*rb*cos(alpha)^6*cos(beta) - 4*alpha2d*ra^5*rb*cos(alpha)^8*cos(beta) - \\
& 12*alpha2d*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 + 12*alpha2d*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + \\
& beta2d*ra^6*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta) + \\
& 4*beta2d*ra^3*z^3*cos(alpha)^4*cos(beta)*sin(alpha) - 4*beta2d*ra^5*z*cos(alpha)^6*cos(beta)^3*sin(alpha) + \\
& 6*alpha2d*ra^5*z*cos(alpha)^5*cos(beta)^2*sin(beta) - 6*alpha2d*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 r^a \wedge^3 r^b \wedge^3 \cos(\alpha) \wedge^7 \sin(\alpha) \sin(\beta) + 3 r^a \wedge^4 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\alpha) - \\
& 3 r^a \wedge^4 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^4 \sin(\alpha) + r^a \wedge^3 r^b \wedge^2 z^2 d^2 \cos(\alpha) \wedge^6 \sin(\alpha) \sin(\beta) - \\
& 4 \beta^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^6 \sin(\alpha) + 6 \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 z^2 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^2 - \\
& 6 \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 - 3 \beta^2 d^2 r^a \wedge^3 z^3 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^3 \sin(\alpha) \\
& + 18 \alpha^2 d^2 r^a \wedge^3 z^3 \cos(\alpha) \wedge^3 \cos(\beta) \wedge^2 \sin(\beta) - \\
& 18 \alpha^2 d^2 r^a \wedge^3 z^3 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\beta) + \\
& r^a \wedge^5 z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + r^a \wedge^2 z^3 z^2 d^2 \cos(\alpha) \wedge^3 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& 12 \alpha^2 d^2 r^a \wedge^3 r^b z^2 \cos(\alpha) \wedge^4 \cos(\beta) - 12 \alpha^2 d^2 r^a \wedge^3 r^b z^2 \cos(\alpha) \wedge^6 \cos(\beta) + \\
& 4 \beta^2 d^2 r^a \wedge^5 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) - \beta^2 d^2 r^a \wedge^5 r^b \cos(\alpha) \wedge^7 \sin(\alpha) \sin(\beta) - \\
& 4 \beta^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^4 \sin(\alpha) - \beta^2 d^2 r^a \wedge^2 r^b \wedge^3 z^2 \cos(\alpha) \wedge^6 \sin(\alpha) - \\
& 2 \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 z^3 \cos(\alpha) \wedge^3 \sin(\beta) + 2 \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 z^3 \cos(\alpha) \wedge^5 \sin(\beta) - \\
& 6 \alpha^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^5 \sin(\beta) + 6 \alpha^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^7 \sin(\beta) + \\
& r^a \wedge^4 z^2 d^2 \cos(\alpha) \wedge^6 \sin(\alpha) \sin(\beta) + 3 r^a \wedge^2 r^b \wedge^2 z^2 d^2 \cos(\alpha) \wedge^5 \sin(\alpha) + \\
& \beta^2 d^2 r^a \wedge^2 z^4 \cos(\alpha) \wedge^3 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 6 \beta^2 d^2 r^a \wedge^4 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 4 r^a \wedge^2 r^b \wedge^3 z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 2 r^a \wedge^4 r^b z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^3 \sin(\alpha) \sin(\beta) - \\
& 3 r^a \wedge^2 r^b \wedge^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\beta) - \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^7 \cos(\beta) \sin(\beta) - \beta^2 d^2 r^a \wedge^2 r^b z^4 \cos(\alpha) \wedge^3 \sin(\alpha) \sin(\beta) - \\
& 2 r^a \wedge^2 r^b z^3 z^2 d^2 \cos(\alpha) \wedge^3 \cos(\beta) \sin(\alpha) - 6 r^a \wedge^3 r^b z^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\alpha) - \\
& 3 \beta^2 d^2 r^a \wedge^3 r^b \wedge^3 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + \\
& 2 \beta^2 d^2 r^a \wedge^4 r^b \wedge^2 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^3 \sin(\alpha) \sin(\beta) - \\
& 3 \beta^2 d^2 r^a \wedge^4 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^3 \sin(\alpha) \sin(\beta) + \\
& 5 r^a \wedge^3 r^b \wedge^2 z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + \\
& 3 r^a \wedge^3 z^2 z^2 d^2 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + \\
& \beta^2 d^2 r^a \wedge^2 z^3 \cos(\alpha) \wedge^4 \cos(\beta) \sin(\alpha) + \\
& 6 \beta^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) - \\
& \beta^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& 5 \beta^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^4 \sin(\alpha) + \\
& 4 \alpha^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^3 \cos(\beta) \sin(\beta) - \\
& 4 \alpha^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\beta) - \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^3 \sin(\beta) + \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^3 \sin(\beta) - \\
& 6 \beta^2 d^2 r^a \wedge^3 r^b z^2 \cos(\alpha) \wedge^5 \sin(\alpha) \sin(\beta) - \\
& 2 r^a \wedge^4 r^b z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 6 r^a \wedge^3 r^b z^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^3 \sin(\alpha) + 3 r^a \wedge^2 r^b \wedge^2 z^2 z^2 d^2 \cos(\alpha) \wedge^4 \sin(\alpha) \sin(\beta) + \\
& \beta^2 d^2 r^a \wedge^2 r^b \wedge^4 \cos(\alpha) \wedge^7 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 4 \beta^2 d^2 r^a \wedge^4 r^b \wedge^2 \cos(\alpha) \wedge^7 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 3 \beta^2 d^2 r^a \wedge^5 r^b \cos(\alpha) \wedge^7 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + \\
& 2 \beta^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& \beta^2 d^2 r^a \wedge^2 r^b \wedge^3 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) - \\
& 6 \beta^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^3 \sin(\alpha) + \\
& 6 \alpha^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\beta) - \\
& 6 \alpha^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^2 \sin(\beta) - \\
& 6 r^a \wedge^2 r^b z^2 z^2 d^2 \cos(\alpha) \wedge^4 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 3 \beta^2 d^2 r^a \wedge^2 r^b \wedge^2 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\alpha) \sin(\beta) / (r^a \wedge^6 \cos(\alpha) \wedge^6 - r^a \wedge^6 \cos(\alpha) \wedge^8
\end{aligned}$$

$$\begin{aligned}
& + rb^6 \cos(\alpha)^6 - z^6 \cos(\alpha)^2 + z^6 + 3ra^2 rb^4 \cos(\alpha)^6 + 3ra^4 rb^2 \cos(\alpha)^6 - \\
& ra^2 rb^4 \cos(\alpha)^8 - 2ra^4 rb^2 \cos(\alpha)^8 + 15ra^2 z^4 \cos(\alpha)^2 - 15ra^2 z^4 \cos(\alpha)^4 \\
& + 15ra^4 z^2 \cos(\alpha)^4 - 15ra^4 z^2 \cos(\alpha)^6 + 3rb^2 z^4 \cos(\alpha)^2 - \\
& 2rb^2 z^4 \cos(\alpha)^4 + 3rb^4 z^2 \cos(\alpha)^4 - rb^4 z^2 \cos(\alpha)^6 + \\
& ra^6 \cos(\alpha)^8 \cos(\beta)^2 + 18ra^2 rb^2 z^2 \cos(\alpha)^4 - 12ra^2 rb^2 z^2 \cos(\alpha)^6 + \\
& 20ra^3 z^3 \cos(\alpha)^3 \sin(\beta) - 20ra^3 z^3 \cos(\alpha)^5 \sin(\beta) + 6ra^5 z \cos(\alpha) \sin(\beta) + \\
& 12ra^2 rb^4 \cos(\alpha)^6 \cos(\beta)^2 + 12ra^4 rb^2 \cos(\alpha)^6 \cos(\beta)^2 - \\
& 8ra^3 rb^3 \cos(\alpha)^6 \cos(\beta)^3 + ra^2 rb^4 \cos(\alpha)^8 \cos(\beta)^2 - \\
& 2ra^4 rb^2 \cos(\alpha)^8 \cos(\beta)^2 - 4ra^3 rb^3 \cos(\alpha)^8 \cos(\beta)^3 + \\
& 4ra^4 rb^2 \cos(\alpha)^8 \cos(\beta)^4 - 12ra^2 z^4 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 13ra^2 z^4 \cos(\alpha)^4 \cos(\beta)^2 - 12ra^4 z^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& 18ra^4 z^2 \cos(\alpha)^6 \cos(\beta)^2 - 4ra^4 z^2 \cos(\alpha)^6 \cos(\beta)^4 - \\
& 6ra^5 rb^5 \cos(\alpha)^6 \cos(\beta) - 6ra^5 rb^5 \cos(\alpha)^6 \cos(\beta) + 4ra^5 rb^5 \cos(\alpha)^8 \cos(\beta) - \\
& 6ra^5 z^5 \cos(\alpha)^3 \sin(\beta) + 6ra^5 z^5 \cos(\alpha)^5 \sin(\beta) - 6ra^5 z^5 \cos(\alpha)^7 \sin(\beta) - \\
& 12ra^3 rb^3 \cos(\alpha)^6 \cos(\beta) + 4ra^3 rb^3 \cos(\alpha)^8 \cos(\beta) - \\
& 4ra^5 rb^5 \cos(\alpha)^8 \cos(\beta)^3 - 6ra^5 rb^5 z^4 \cos(\alpha)^2 \cos(\beta) + 4ra^5 rb^5 z^4 \cos(\alpha)^4 \cos(\beta) \\
& + 6ra^5 rb^5 z^4 \cos(\alpha)^5 \sin(\beta) - 2ra^5 rb^5 z^4 \cos(\alpha)^7 \sin(\beta) + \\
& 6ra^2 rb^2 z^2 \cos(\alpha)^6 \cos(\beta)^2 - 8ra^3 z^3 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) + \\
& 12ra^3 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - 12ra^3 z^3 \cos(\alpha)^4 \cos(\beta) - \\
& 36ra^3 z^3 \cos(\alpha)^4 \cos(\beta) + 4ra^3 z^3 \cos(\alpha)^6 \cos(\beta) + \\
& 24ra^3 z^3 \cos(\alpha)^6 \cos(\beta) + 12ra^3 z^3 \cos(\alpha)^3 \sin(\beta) - \\
& 8ra^3 z^3 \cos(\alpha)^5 \sin(\beta) + 12ra^3 z^3 \cos(\alpha)^5 \sin(\beta) - \\
& 8ra^3 z^3 \cos(\alpha)^7 \sin(\beta) + 24ra^3 z^3 \cos(\alpha)^4 \cos(\beta)^3 - \\
& 20ra^3 z^3 \cos(\alpha)^6 \cos(\beta)^3 + 4ra^5 z^5 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) - \\
& 24ra^2 z^3 \cos(\alpha)^3 \cos(\beta) \sin(\beta) + 16ra^2 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \\
& 24ra^2 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + 8ra^2 z^3 \cos(\alpha)^7 \cos(\beta) \sin(\beta) - \\
& 8ra^4 z^3 \cos(\alpha)^7 \cos(\beta)^3 \sin(\beta) + 24ra^3 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - \\
& 4ra^3 z^3 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) - 24ra^4 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \\
& 16ra^4 z^3 \cos(\alpha)^7 \cos(\beta) \sin(\beta)), 0 \\
& (e^{1/2} ra^2 (\beta^2 d^2 ra^3 \cos(\alpha)^4 + \beta^2 d^2 ra^2 \cos(\alpha)^2 + ra^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta) + \\
& rb^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta) - ra^2 z^2 d^2 \cos(\alpha)^3 + 2\beta^2 d^2 ra^2 z^2 \cos(\alpha)^3 \sin(\beta) - \\
& ra^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta)^2 + \beta^2 d^2 ra^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 - \\
& \beta^2 d^2 ra^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 - rb^2 z^2 d^2 \cos(\alpha)^2 \sin(\beta) - \\
& 2\beta^2 d^2 ra^2 z^2 \cos(\alpha)^4 \cos(\beta) - \alpha^2 d^2 ra^2 z^2 \cos(\alpha)^2 \sin(\alpha) - \\
& \alpha^2 d^2 z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) + ra^2 z^2 d^2 \cos(\alpha)^2 \cos(\beta) \sin(\beta) + \\
& \alpha^2 d^2 ra^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + \alpha^2 d^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) - \\
& \alpha^2 d^2 ra^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) + \alpha^2 d^2 ra^2 z^2 \cos(\alpha) \cos(\beta) \sin(\alpha) \sin(\beta) \\
& - 2\beta^2 d^2 ra^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta)) / (ra^4 \cos(\alpha)^4 + rb^4 \cos(\alpha)^4 + z^4 + \\
& 2ra^2 z^2 \cos(\alpha)^4 + 6ra^2 z^2 \cos(\alpha)^2 + 2rb^2 z^2 \cos(\alpha)^2 + \\
& 4ra^2 z^3 \cos(\alpha) \sin(\beta) + 4ra^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 - 4ra^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \\
& - 4ra^2 z^3 \cos(\alpha)^4 \cos(\beta) - 4ra^2 z^3 \cos(\alpha)^4 \cos(\beta) + 4ra^2 z^3 \cos(\alpha)^3 \sin(\beta) - \\
& 4ra^2 z^3 \cos(\alpha)^2 \cos(\beta) + 4ra^2 z^3 \cos(\alpha)^3 \sin(\beta) - \\
& 8ra^2 z^3 \cos(\alpha)^3 \cos(\beta) \sin(\beta)), (\beta^2 d^2 ra^4 \cos(\alpha)^4 - \beta^2 d^2 ra^4 \cos(\alpha)^6 - \\
& ra^2 z^2 d^2 \cos(\alpha)^3 + ra^2 z^2 d^2 \cos(\alpha)^5 + \beta^2 d^2 ra^2 z^2 \cos(\alpha)^2 - \\
& \beta^2 d^2 ra^2 z^2 \cos(\alpha)^4 + ra^3 z^2 d^2 \cos(\alpha)^3 \cos(\beta) - ra^3 z^2 d^2 \cos(\alpha)^5 \cos(\beta) + \\
& 2\beta^2 d^2 ra^3 z^2 \cos(\alpha)^3 \sin(\beta) - 2\beta^2 d^2 ra^3 z^2 \cos(\alpha)^5 \sin(\beta) + \\
& ra^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta) - ra^2 z^2 d^2 \cos(\alpha)^5 \cos(\beta) -
\end{aligned}$$

$$\begin{aligned}
& ra^2*rb^2z2d*cos(alpha)^3*cos(beta)^2 + ra^2*rb^2z2d*cos(alpha)^5*cos(beta)^2 + \\
& beta2d*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 - beta2d*ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& beta2d*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + beta2d*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - \\
& 2*beta2d*ra^3*rb*cos(alpha)^4*cos(beta) + 2*beta2d*ra^3*rb*cos(alpha)^6*cos(beta) + \\
& alpha2d*ra^4*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - alpha2d*ra^3*z*cos(alpha)^4*cos(beta)^3*sin(alpha) \\
& - ra*rb*z^2d*cos(alpha)^2*sin(beta) + ra*rb*z^2d*cos(alpha)^4*sin(beta) - \\
& alpha2d*ra^2*rb*z*cos(alpha)^2*sin(alpha) - alpha2d*ra^2*rb*z*cos(alpha)^4*sin(alpha) + \\
& alpha2d*ra^3*z*cos(alpha)^2*cos(beta)*sin(alpha) + alpha2d*ra^3*z*cos(alpha)^4*cos(beta)*sin(alpha) - \\
& alpha2d*ra^3*rb*cos(alpha)^5*sin(alpha)*sin(beta) + ra^2*z^2d*cos(alpha)^2*cos(beta)*sin(beta) - \\
& ra^2*z^2d*cos(alpha)^4*cos(beta)*sin(beta) + alpha2d*ra*rb^2*z*cos(alpha)^2*cos(beta)*sin(alpha) - \\
& 2*beta2d*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta) + 2*beta2d*ra^2*rb*z*cos(alpha)^5*cos(beta)*sin(beta) - \\
& alpha2d*ra^2*rb*z*cos(alpha)^2*cos(beta)^2*sin(alpha) + \\
& alpha2d*ra^2*rb*z*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& alpha2d*ra^2*z^2*cos(alpha)*cos(beta)*sin(alpha)*sin(beta) - alpha2d*ra*rb^2*z*cos(alpha)*sin(alpha)*sin(beta) \\
& + alpha2d*ra^2*rb^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& alpha2d*ra^3*rb*cos(alpha)^5*cos(beta)^2*sin(alpha)*sin(beta))/(ra^4*cos(alpha)^4 - ra^4*cos(alpha)^6 + \\
& rb^4*cos(alpha)^4 - z^4*cos(alpha)^2 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 - ra^2*rb^2*cos(alpha)^6 + \\
& 6*ra^2*z^2*cos(alpha)^2 - 6*ra^2*z^2*cos(alpha)^4 + 2*rb^2*z^2*cos(alpha)^2 - rb^2*z^2*cos(alpha)^4 + \\
& ra^4*cos(alpha)^6*cos(beta)^2 + 4*ra^2*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 + \\
& ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + \\
& 5*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 2*ra^3*rb*cos(alpha)^6*cos(beta) - 4*ra^2*z^3*cos(alpha)^3*sin(beta) + 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra^3*z*cos(alpha)^5*sin(beta) - 2*ra^3*rb*cos(alpha)^6*cos(beta)^3 - 4*ra*rb^2*z^2*cos(alpha)^2*cos(beta) + \\
& 2*ra*rb^2*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^2*z^2*cos(alpha)^3*sin(beta) - 2*ra*rb^2*z^2*cos(alpha)^5*sin(beta) \\
& + 2*ra^3*z*cos(alpha)^5*cos(beta)^2*sin(beta) - 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 4*ra^2*rb*z*cos(alpha)^5*cos(beta)*sin(beta)), \\
& -(ra*cos(alpha)^3*(rb - ra*cos(beta))*(ra*rb^2*z2d*cos(alpha)^4 - 2*alpha2d*ra^2*z^3*sin(2*alpha) - \\
& beta2d*ra^3*rb*cos(alpha)^5 - alpha2d*z^4*sin(alpha)*sin(beta) + beta2d*ra^4*cos(alpha)^5*cos(beta) - \\
& rb^3*z2d*cos(alpha)^4*cos(beta) + ra^3*z2d*cos(alpha)^4*cos(beta)^2 - \\
& 4*alpha2d*ra^3*z*cos(alpha)^3*sin(alpha) - 2*ra^2*rb^2z2d*cos(alpha)^4*cos(beta) + \\
& rb^2*z^2d*cos(alpha)^3*sin(beta) + 2*beta2d*ra^2*rb^2*cos(alpha)^5*cos(beta) - \\
& beta2d*ra*rb^3*cos(alpha)^5*cos(beta)^2 - 2*beta2d*ra^3*rb*cos(alpha)^5*cos(beta)^2 + \\
& beta2d*ra^2*z^2*cos(alpha)^3*cos(beta) - alpha2d*ra^4*cos(alpha)^4*sin(alpha)*sin(beta) + \\
& 2*ra*rb^2*z2d*cos(alpha)^4*cos(beta)^2 - ra^2*rb^2z2d*cos(alpha)^4*cos(beta)^3 - \\
& beta2d*ra*rb^2*z^2*cos(alpha)^3 + beta2d*ra^2*rb^2*cos(alpha)^5*cos(beta)^3 - \\
& beta2d*ra^2*z^2*cos(alpha)^3*cos(beta)^3 + 4*alpha2d*ra^3*z*cos(alpha)^3*cos(beta)^2*sin(alpha) - \\
& alpha2d*ra^2*rb^2*cos(alpha)^4*sin(alpha)*sin(beta) + ra^2*z^2d*cos(alpha)^3*cos(beta)^2*sin(beta) + \\
& alpha2d*rb^2*z^3*cos(alpha)*cos(beta)*sin(alpha) - alpha2d*ra*rb^2*z^2*cos(alpha)^3*sin(alpha) - \\
& 2*beta2d*ra^2*rb*z*cos(alpha)^4*sin(beta) + 6*alpha2d*ra^2*z^2*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) + \\
& beta2d*ra*rb^2*z^2*cos(alpha)^3*cos(beta)^2 + 3*alpha2d*ra^2*z^3*cos(alpha)*cos(beta)^2*sin(alpha) + \\
& 2*beta2d*ra^3*z*cos(alpha)^4*cos(beta)*sin(beta) + 5*alpha2d*ra^2*rb^2*cos(alpha)^3*cos(beta)*sin(alpha) + \\
& 2*beta2d*ra*rb^2*z^2*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 2*alpha2d*ra^2*rb^2*cos(alpha)^4*cos(beta)^2*sin(alpha)*sin(beta) + \\
& 3*alpha2d*ra^2*z^2*cos(alpha)^2*cos(beta)^2*sin(alpha)*sin(beta) + \\
& alpha2d*ra*rb^3*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& 3*alpha2d*ra^3*rb*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& alpha2d*ra*rb^2*z^2*cos(alpha)^3*cos(beta)^2*sin(alpha) -
\end{aligned}$$

$$\begin{aligned}
& 5*\alpha^2*d*ra^2*rb*z*cos(alpha)^3*cos(beta)^3*sin(alpha) - \\
& 2*beta^2*d*ra^2*rb*z*cos(alpha)^4*cos(beta)^2*sin(beta) - 2*ra*rb*z^2*d*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 3*\alpha^2*d*ra*rb*z^2*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta))/(ra^6*cos(alpha)^6 - ra^6*cos(alpha)^8 + \\
& rb^6*cos(alpha)^6 - z^6*cos(alpha)^2 + z^6 + 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 - \\
& ra^2*rb^4*cos(alpha)^8 - 2*ra^4*rb^2*cos(alpha)^8 + 15*ra^2*z^4*cos(alpha)^2 - 15*ra^2*z^4*cos(alpha)^4 \\
& + 15*ra^4*z^2*cos(alpha)^4 - 15*ra^4*z^2*cos(alpha)^6 + 3*rb^2*z^4*cos(alpha)^2 - \\
& 2*rb^2*z^4*cos(alpha)^4 + 3*rb^4*z^2*cos(alpha)^4 - rb^4*z^2*cos(alpha)^6 + \\
& ra^6*cos(alpha)^8*cos(beta)^2 + 18*ra^2*rb^2*z^2*cos(alpha)^4 - 12*ra^2*rb^2*z^2*cos(alpha)^6 + \\
& 20*ra^3*z^3*cos(alpha)^3*sin(beta) - 20*ra^3*z^3*cos(alpha)^5*sin(beta) + 6*ra*z^5*cos(alpha)*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 + ra^2*rb^4*cos(alpha)^8*cos(beta)^2 - \\
& 2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - 4*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 + \\
& 4*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 + \\
& 13*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 + \\
& 18*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 4*ra^4*z^2*cos(alpha)^6*cos(beta)^4 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 4*ra^5*rb*cos(alpha)^8*cos(beta) - \\
& 6*ra*z^5*cos(alpha)^3*sin(beta) + 6*ra^5*z*cos(alpha)^5*sin(beta) - 6*ra^5*z*cos(alpha)^7*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) + 4*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& + 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 2*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) + \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) - \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) + 12*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 8*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 8*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 8*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta)), 0]; \\
& YC1211 = -(e1^2*cos(alpha)*(rb - ra*cos(beta))*(alpha1d^2*ra^2*z^2*sin(2*beta) - \\
& 2*alpha1d^2*rb^3*z*cos(alpha) + 2*alpha1d^2*rb^3*z*cos(alpha)^3 - 2*alpha1d*rb^3*z1d*(sin(alpha) - \\
& sin(alpha)^3) + 2*rb*z^21d^2*cos(alpha) - 2*alpha1d*beta1d*ra^2*z^2*sin(2*alpha) + \\
& 4*alpha1d^2*ra^2*rb*z*cos(alpha)^3 - 2*beta1d*ra^3*z1d*cos(alpha)^3*sin(beta) + \\
& 2*ra*rb*z1d^2*cos(alpha)^2*sin(beta) - 2*alpha1d*ra^2*rb*z1d*(sin(alpha) - sin(alpha)^3) - \\
& 4*alpha1d^2*ra^3*z*cos(alpha)^3*cos(beta) - beta1d^2*ra^3*z*cos(alpha)^3*cos(beta) + \\
& 2*alpha1d*rb*z^2*z1d*sin(alpha) + alpha1d^2*ra*rb^3*cos(alpha)^4*sin(beta) + \\
& alpha1d^2*ra^3*rb*cos(alpha)^4*sin(beta) + beta1d^2*ra*rb^3*cos(alpha)^4*sin(beta) - \\
& beta1d^2*ra^3*rb*cos(alpha)^4*sin(beta) - 2*alpha1d^2*ra^2*rb*z*cos(alpha) - \\
& 4*beta1d*ra^2*z*z1d*cos(alpha)^2 - 2*ra*z*z1d^2*cos(alpha)*cos(beta) - \\
& alpha1d^2*ra^4*cos(alpha)^4*cos(beta)*sin(beta) - 2*alpha1d^2*ra*rb*z^2*sin(beta) + \\
& 2*alpha1d^2*ra^3*z*cos(alpha)^3*cos(beta)^3 - 2*ra^2*z1d^2*cos(alpha)^2*cos(beta)*sin(beta) + \\
& 2*alpha1d^2*ra^3*z*cos(alpha)*cos(beta) + beta1d^2*ra*z^3*cos(alpha)*cos(beta) - \\
& 2*alpha1d*beta1d*ra*z^3*sin(alpha)*sin(beta) - 2*alpha1d*ra*z^2*z1d*cos(beta)*sin(alpha) - \\
& 2*beta1d*ra*z^2*z1d*cos(alpha)*sin(beta) + 2*alpha1d^2*ra^2*rb*z*cos(alpha)^3*cos(beta)^2 +
\end{aligned}$$

$$\begin{aligned}
& 6*\alpha_1d^2*ra*rb^2*z*cos(alpha)*cos(beta) + 2*beta_1d*ra*rb^2*z^1d*cos(alpha)^3*sin(beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 2*\alpha_1d^2*ra^3*rb*cos(alpha)^4*cos(beta)^2*sin(beta) - \\
& 3*\alpha_1d^2*ra^2*z^2*cos(alpha)^2*cos(beta)*sin(beta) - 4*\alpha_1d^2*ra^2*rb*z*cos(alpha)*cos(beta)^2 - \\
& 6*\alpha_1d^2*ra*rb^2*z*cos(alpha)^3*cos(beta) + beta_1d^2*ra*rb^2*z*cos(alpha)^3*cos(beta) + \\
& 2*\alpha_1d*ra^3*z^1d*cos(alpha)^2*cos(beta)*sin(alpha) + 3*\alpha_1d^2*ra*rb*z^2*cos(alpha)^2*sin(beta) + \\
& beta_1d^2*ra*rb*z^2*cos(alpha)^2*sin(beta) + 6*\alpha_1d*ra*rb^2*z^1d*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& 4*beta_1d*ra*rb*z^1d*cos(alpha)^2*cos(beta) - 4*\alpha_1d*ra^2*rb*z^1d*cos(alpha)^2*cos(beta)^2*sin(alpha) + \\
& 2*\alpha_1d*beta_1d*ra^3*z*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) - \\
& 2*\alpha_1d*beta_1d*ra*rb^2*z*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) + \\
& 4*\alpha_1d*beta_1d*ra*rb*z^2*cos(alpha)*cos(beta)*sin(alpha))/(ra^6*cos(alpha)^6 + rb^6*cos(alpha)^6 + z^6 + \\
& 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 + 15*ra^2*z^4*cos(alpha)^2 + \\
& 15*ra^4*z^2*cos(alpha)^4 + 3*rb^2*z^4*cos(alpha)^2 + 3*rb^4*z^2*cos(alpha)^4 + \\
& 18*ra^2*rb^2*z^2*cos(alpha)^4 + 20*ra^3*z^3*cos(alpha)^3*sin(beta) + 6*ra*z^5*cos(alpha)*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 - \\
& 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 - 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) \\
& + 6*ra^5*z*cos(alpha)^5*sin(beta) - 12*ra^3*rb^3*cos(alpha)^6*cos(beta) - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) \\
& + 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + \\
& 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta)); \\
& YC1212 = (cos(alpha)*(rb - ra*cos(beta))*(2*\alpha_1d^2*rb^3*z*cos(alpha) + 2*rb*z^1d^2*cos(alpha)^3 - \\
& 2*\alpha_1d^2*rb^3*z*cos(alpha)^3 - 2*rb*z^1d^2*cos(alpha) - 6*\alpha_1d^2*ra^2*rb*z*cos(alpha)^3 + \\
& 4*\alpha_1d^2*ra^2*rb*z*cos(alpha)^5 + 2*\alpha_1d*rb^3*z^1d*cos(alpha)^2*sin(alpha) + \\
& 2*beta_1d*ra^3*z^1d*cos(alpha)^3*sin(beta) - 2*beta_1d*ra^3*z^1d*cos(alpha)^5*sin(beta) - \\
& 2*ra*z^1d^2*cos(alpha)^3*cos(beta) - 2*ra*rb*z^1d^2*cos(alpha)^2*sin(beta) + \\
& 2*ra*rb*z^1d^2*cos(alpha)^4*sin(beta) + 6*\alpha_1d^2*ra^3*z*cos(alpha)^3*cos(beta) - \\
& 4*\alpha_1d^2*ra^3*z*cos(alpha)^5*cos(beta) + beta_1d^2*ra*z^3*cos(alpha)^3*cos(beta) + \\
& beta_1d^2*ra^3*z*cos(alpha)^3*cos(beta) - beta_1d^2*ra^3*z*cos(alpha)^5*cos(beta) - \\
& 2*\alpha_1d*rb*z^2*z^1d*sin(alpha) - alpha_1d^2*ra*rb^3*cos(alpha)^4*sin(beta) - \\
& alpha_1d^2*ra^3*rb*cos(alpha)^4*sin(beta) + alpha_1d^2*ra*rb^3*cos(alpha)^6*sin(beta) + \\
& alpha_1d^2*ra^3*rb*cos(alpha)^6*sin(beta) - beta_1d^2*ra*rb^3*cos(alpha)^4*sin(beta) + \\
& beta_1d^2*ra^3*rb*cos(alpha)^4*sin(beta) + beta_1d^2*ra*rb^3*cos(alpha)^6*sin(beta) - \\
& beta_1d^2*ra^3*rb*cos(alpha)^6*sin(beta) - 2*\alpha_1d^2*ra^2*z^2*cos(beta)*sin(beta) + \\
& 2*\alpha_1d^2*ra^2*rb*z*cos(alpha) + 4*beta_1d*ra^2*z^1d*cos(alpha)^2 - 4*beta_1d*ra^2*z^1d*cos(alpha)^4 + \\
& 2*ra*z^1d^2*cos(alpha)*cos(beta) + alpha_1d^2*ra^4*cos(alpha)^4*cos(beta)*sin(beta) - \\
& alpha_1d^2*ra^4*cos(alpha)^6*cos(beta)*sin(beta) + 2*\alpha_1d^2*ra*rb*z^2*sin(beta) - \\
& 4*\alpha_1d^2*ra^3*z*cos(alpha)^3*cos(beta)^3 + 4*\alpha_1d^2*ra^3*z*cos(alpha)^5*cos(beta)^3 + \\
& 2*ra^2*z^1d^2*cos(alpha)^2*cos(beta)*sin(beta) - 2*ra^2*z^1d^2*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 2*\alpha_1d^2*ra^3*z*cos(alpha)*cos(beta) - beta_1d^2*ra*z^3*cos(alpha)*cos(beta) - \\
& 2*\alpha_1d*beta_1d*ra^4*cos(alpha)^5*cos(beta)^2*sin(alpha) + 2*\alpha_1d*beta_1d*ra*z^3*sin(alpha)*sin(beta) + \\
& 2*\alpha_1d*ra*z^2*z^1d*cos(beta)*sin(alpha) + 2*beta_1d*ra*z^2*z^1d*cos(alpha)*sin(beta) - \\
& 4*\alpha_1d^2*ra^2*rb*z*cos(alpha)^5*cos(beta)^2 - 2*\alpha_1d*ra^3*z^1d*cos(alpha)^4*cos(beta)^3*sin(alpha) + \\
& 4*\alpha_1d*beta_1d*ra^2*z^2*cos(alpha)*sin(alpha) - 6*\alpha_1d^2*ra*rb^2*z*cos(alpha)*cos(beta) +
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*ra^2*rb*z_1d*\cos(\alpha)^2*\sin(\alpha) - 2*\alpha_1d*ra^2*rb*z_1d*\cos(\alpha)^4*\sin(\alpha) - \\
& 2*\beta_1d*ra*rb^2*z_1d*\cos(\alpha)^3*\sin(\beta) + 2*\beta_1d*ra*rb^2*z_1d*\cos(\alpha)^5*\sin(\beta) + \\
& 2*\alpha_1d*rb^z^2*z_1d*\cos(\alpha)^2*\sin(\alpha) - 2*\beta_1d*ra^z^2*z_1d*\cos(\alpha)^3*\sin(\beta) + \\
& 3*\alpha_1d^2*ra^2*rb^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d^2*ra^3*rb*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^3*rb*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) + \\
& 5*\alpha_1d^2*ra^2*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - 2*\alpha_1d*\beta_1d*ra^2*rb^2*\cos(\alpha)^5*\sin(\alpha) \\
& - 4*\alpha_1d*\beta_1d*ra^2*z^2*\cos(\alpha)^3*\sin(\alpha) + 4*\alpha_1d^2*ra^2*rb^z*\cos(\alpha)*\cos(\beta)^2 + \\
& 6*\alpha_1d^2*ra*rb^2*z*\cos(\alpha)^3*\cos(\beta) - \beta_1d^2*ra*rb^2*z*\cos(\alpha)^3*\cos(\beta) + \\
& \beta_1d^2*ra*rb^2*z*\cos(\alpha)^5*\cos(\beta) - 2*\alpha_1d*ra^3*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d*ra^3*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - 5*\alpha_1d^2*ra*rb^z^2*\cos(\alpha)^2*\sin(\beta) + \\
& 3*\alpha_1d^2*ra*rb^z^2*\cos(\alpha)^4*\sin(\beta) - \beta_1d^2*ra*rb^z^2*\cos(\alpha)^2*\sin(\beta) + \\
& \beta_1d^2*ra*rb^z^2*\cos(\alpha)^4*\sin(\beta) + 2*\alpha_1d*\beta_1d*ra*rb^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^3*rb*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^z^3*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*z*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^3*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*ra*rb^2*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*ra^z^2*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) - 4*\beta_1d*ra*rb^z*z_1d*\cos(\alpha)^2*\cos(\beta) + \\
& 4*\beta_1d*ra*rb^z*z_1d*\cos(\alpha)^4*\cos(\beta) + 2*\alpha_1d*\beta_1d*ra^3*rb*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) \\
& + 4*\alpha_1d*ra^2*rb^z_1d*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*ra^2*rb^z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra*rb^z^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^3*z*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra*rb^z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra*rb^2*z*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta)))/(ra^6*\cos(\alpha)^6 - \\
& ra^6*\cos(\alpha)^8 + rb^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + \\
& 3*ra^4*rb^2*\cos(\alpha)^6 - ra^2*rb^4*\cos(\alpha)^8 - 2*ra^4*rb^2*\cos(\alpha)^8 + 15*ra^2*z^4*\cos(\alpha)^2 - \\
& 15*ra^2*z^4*\cos(\alpha)^4 + 15*ra^4*z^2*\cos(\alpha)^4 - 15*ra^4*z^2*\cos(\alpha)^6 + \\
& 3*rb^2*z^4*\cos(\alpha)^2 - 2*rb^2*z^4*\cos(\alpha)^4 + 3*rb^4*z^2*\cos(\alpha)^4 - rb^4*z^2*\cos(\alpha)^6 + \\
& ra^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 12*ra^2*rb^2*z^2*\cos(\alpha)^6 + \\
& 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) - 20*ra^3*z^3*\cos(\alpha)^5*\sin(\beta) + 6*ra^z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 + ra^2*rb^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*ra^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) + 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta) - \\
& 6*ra^z^5*\cos(\alpha)^3*\sin(\beta) + 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) - 6*ra^5*z*\cos(\alpha)^7*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) + 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta)^3 - 6*ra*rb^z^4*\cos(\alpha)^2*\cos(\beta) + 4*ra*rb^z^4*\cos(\alpha)^4*\cos(\beta) \\
& + 6*ra*rb^4*z*\cos(\alpha)^5*\sin(\beta) - 2*ra*rb^4*z*\cos(\alpha)^7*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) + \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) - \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) - \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + 16*ra^2*rb^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb^2*z*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb^2*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
YC1213 = & (cos(alpha)^4*(rb - ra*cos(beta))^3*(2*alpha1d^2*ra*z^3*cos(beta) - 2*alpha1d^2*rb*z^3 - \\
& 2*rb*z^3d^2*cos(alpha)^2 + 2*alpha1d^2*rb*z^3*cos(alpha)^2 - 2*alpha1d^2*ra^2*rb*z*cos(alpha)^4 + \\
& 2*beta1d*ra^3*z1d*cos(alpha)^4*sin(beta) + 2*ra*z^3d^2*cos(alpha)^2*cos(beta) - \\
& 2*ra*rb*z1d^2*cos(alpha)^3*sin(beta) - 2*alpha1d^2*ra*z^3*cos(alpha)^2*cos(beta) + \\
& 2*alpha1d^2*ra^3*z*cos(alpha)^4*cos(beta) - beta1d^2*ra*z^3*cos(alpha)^2*cos(beta) + \\
& beta1d^2*ra^3*z*cos(alpha)^4*cos(beta) - alpha1d^2*ra*rb^3*cos(alpha)^5*sin(beta) - \\
& alpha1d^2*ra^3*rb*cos(alpha)^5*sin(beta) - beta1d^2*ra*rb^3*cos(alpha)^5*sin(beta) + \\
& beta1d^2*ra^3*rb*cos(alpha)^5*sin(beta) + 10*alpha1d*beta1d*ra^2*z^2*(sin(alpha) - sin(alpha)^3) + \\
& 4*beta1d*ra^2*z^2d*cos(alpha)^3 + alpha1d^2*ra^4*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra^3*z*cos(alpha)^4*cos(beta)^3 - 2*alpha1d*rb*z^2*z1d*sin(2*alpha) + \\
& 2*ra^2*z1d^2*cos(alpha)^3*cos(beta)*sin(beta) + 2*alpha1d*beta1d*ra^4*cos(alpha)^4*sin(alpha) + \\
& 2*alpha1d^2*ra^2*rb*z*cos(alpha)^4*cos(beta)^2 + 2*alpha1d^2*ra^2*z^2*cos(alpha)*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra*rb*z^2*cos(alpha)*sin(beta) - 2*beta1d*ra*rb^2*z1d*cos(alpha)^4*sin(beta) + \\
& 2*beta1d*ra*z^2*z1d*cos(alpha)^2*sin(beta) + 3*alpha1d^2*ra^2*rb^2*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra^3*rb*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& alpha1d^2*ra^2*z^2*cos(alpha)^3*cos(beta)*sin(beta) + 2*alpha1d*beta1d*ra^2*rb^2*cos(alpha)^4*sin(alpha) \\
& - beta1d^2*ra*rb^2*z*cos(alpha)^4*cos(beta) + alpha1d^2*ra*rb^2*cos(alpha)^3*sin(beta) - \\
& beta1d^2*ra*rb^2*z^2*cos(alpha)^3*sin(beta) - 2*alpha1d*beta1d*ra*rb^3*cos(alpha)^4*cos(beta)*sin(alpha) - \\
& 6*alpha1d*beta1d*ra^3*rb*cos(alpha)^4*cos(beta)*sin(alpha) + \\
& 8*alpha1d*beta1d*ra^3*z*cos(alpha)^3*sin(alpha)*sin(beta) - 4*beta1d*ra*rb*z^2d*cos(alpha)^3*cos(beta) + \\
& 4*alpha1d*beta1d*ra^3*cos(alpha)*sin(alpha)*sin(beta) + \\
& 4*alpha1d*beta1d*ra^2*rb^2*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& 4*alpha1d*ra^2*z1d*cos(alpha)*cos(beta)*sin(alpha) - \\
& 4*alpha1d*beta1d*ra^2*z^2*cos(alpha)^2*cos(beta)^2*sin(alpha) + \\
& 4*alpha1d*ra^2*z^2d*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta) - \\
& 6*alpha1d*beta1d*ra*rb*z^2*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& 4*alpha1d*ra*rb*z^2d*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) - \\
& 8*alpha1d*beta1d*ra^2*rb^2*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta)))/(ra^8*cos(alpha)^8 - \\
& ra^8*cos(alpha)^10 + rb^8*cos(alpha)^8 - z^8*cos(alpha)^2 + z^8 + 4*ra^2*rb^6*cos(alpha)^8 + \\
& 6*ra^4*rb^4*cos(alpha)^8 + 4*ra^6*rb^2*cos(alpha)^8 - ra^2*rb^6*cos(alpha)^10 - \\
& 3*ra^4*rb^4*cos(alpha)^10 - 3*ra^6*rb^2*cos(alpha)^10 + 28*ra^2*z^6*cos(alpha)^2 - \\
& 28*ra^2*z^6*cos(alpha)^4 + 70*ra^4*z^4*cos(alpha)^4 - 70*ra^4*z^4*cos(alpha)^6 + \\
& 28*ra^6*z^2*cos(alpha)^6 - 28*ra^6*z^2*cos(alpha)^8 + 4*rb^2*z^6*cos(alpha)^2 - 3*rb^2*z^6*cos(alpha)^4 \\
& + 6*rb^4*z^4*cos(alpha)^4 - 3*rb^4*z^4*cos(alpha)^6 + 4*rb^6*z^2*cos(alpha)^6 - rb^6*z^2*cos(alpha)^8 + \\
& ra^8*cos(alpha)^10*cos(beta)^2 + 60*ra^2*rb^2*z^4*cos(alpha)^4 - 45*ra^2*rb^2*z^4*cos(alpha)^6 +
\end{aligned}$$

$$\begin{aligned}
& 36*ra^2*rb^4*z^2*cos(alpha)^6 + 60*ra^4*rb^2*z^2*cos(alpha)^6 - 18*ra^2*rb^4*z^2*cos(alpha)^8 - \\
& 45*ra^4*rb^2*z^2*cos(alpha)^8 + 56*ra^3*z^5*cos(alpha)^3*sin(beta) - 56*ra^3*z^5*cos(alpha)^5*sin(beta) + \\
& 56*ra^5*z^3*cos(alpha)^5*sin(beta) - 56*ra^5*z^3*cos(alpha)^7*sin(beta) + 8*ra*z^7*cos(alpha)*sin(beta) + \\
& 24*ra^2*rb^6*cos(alpha)^8*cos(beta)^2 + 48*ra^4*rb^4*cos(alpha)^8*cos(beta)^2 + \\
& 24*ra^6*rb^2*cos(alpha)^8*cos(beta)^2 - 32*ra^3*rb^5*cos(alpha)^8*cos(beta)^3 - \\
& 32*ra^5*rb^3*cos(alpha)^8*cos(beta)^3 + ra^2*rb^6*cos(alpha)^10*cos(beta)^2 + \\
& 16*ra^4*rb^4*cos(alpha)^8*cos(beta)^4 - 9*ra^4*rb^4*cos(alpha)^10*cos(beta)^2 - \\
& 9*ra^6*rb^2*cos(alpha)^10*cos(beta)^2 - 6*ra^3*rb^5*cos(alpha)^10*cos(beta)^3 - \\
& 4*ra^5*rb^3*cos(alpha)^10*cos(beta)^3 + 12*ra^4*rb^4*cos(alpha)^10*cos(beta)^4 + \\
& 12*ra^6*rb^2*cos(alpha)^10*cos(beta)^4 - 8*ra^5*rb^3*cos(alpha)^10*cos(beta)^5 - \\
& 24*ra^2*z^6*cos(alpha)^2*cos(beta)^2 + 25*ra^2*z^6*cos(alpha)^4*cos(beta)^2 - \\
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) - 8*ra*z^7*cos(alpha)^3*sin(beta) + 8*ra^7*z*cos(alpha)^7*sin(beta) - \\
& 8*ra^7*z*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb*z^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb*z^6*cos(alpha)^4*cos(beta) + 8*ra*rb^6*z*cos(alpha)^7*sin(beta) - 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 - \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) + 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb*z^2*cos(alpha)^8*cos(beta) + 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) - \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) + 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) - \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) + 24*ra^3*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) - \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 + \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) - 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) - 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) + 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) + \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) - 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& 96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) - \\
& 64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) - \\
& 36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) - 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) + 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta)); \\
YC1214=0; \\
YC1221=(e1^2*(rb - ra*cos(beta))*(alpha1d^2*rb*z^4*sin(2*alpha) - 2*alpha1d*rb*z^3*z1d - \\
rb*z^2*z1d^2*sin(2*alpha) + alpha1d^2*rb^3*z^2*sin(2*alpha) + 2*alpha1d*beta1d*ra*z^4*sin(beta) + \\
2*alpha1d*ra*z^3*z1d*cos(beta) + alpha1d^2*ra^2*rb*z^2*sin(2*alpha) + \\
4*alpha1d*beta1d*ra^2*z^3*cos(alpha) - 8*alpha1d*beta1d*ra^4*z*cos(alpha)^5 + \\
4*alpha1d*rb*z^3*z1d*cos(alpha)^2 + 2*alpha1d*rb^3*z^2*cos(alpha)^2 + \\
4*beta1d*ra^2*z^2*z1d*(sin(alpha) - sin(alpha)^3) - 2*alpha1d*beta1d*ra^5*cos(alpha)^6*sin(beta) - \\
12*alpha1d*beta1d*ra^2*z^3*cos(alpha)^3 + 6*alpha1d*beta1d*ra^2*z^3*cos(alpha)^3*cos(beta)^2 + \\
2*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^2 + 4*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^4 - \\
2*alpha1d^2*ra^3*z^2*cos(alpha)*cos(beta)*sin(alpha) + 2*alpha1d^2*ra^2*rb*z^2*cos(alpha)^3*sin(alpha) - \\
2*alpha1d^2*ra^2*z^3*cos(beta)*sin(alpha)*sin(beta) - 4*alpha1d*beta1d*ra^2*rb^2*z*cos(alpha)^5 - \\
4*alpha1d*beta1d*ra*z^4*cos(alpha)^2*sin(beta) - 4*alpha1d*ra*z^3*z1d*cos(alpha)^2*cos(beta) - \\
2*alpha1d*ra^3*z^2*z1d*cos(alpha)^2*cos(beta) - 4*alpha1d*ra^3*z^2*z1d*cos(alpha)^4*cos(beta) + \\
2*alpha1d*ra*rb^3*z1d*cos(alpha)^5*sin(beta) + 2*alpha1d*ra^3*rb*z1d*cos(alpha)^5*sin(beta) + \\
2*alpha1d^2*ra*rb*z^3*sin(alpha)*sin(beta) - 2*alpha1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)*sin(alpha) + \\
beta1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)*sin(alpha) + 6*alpha1d*beta1d*ra^4*z*cos(alpha)^5*cos(beta)^2 - \\
2*alpha1d*beta1d*ra^3*rb^2*cos(alpha)^6*sin(beta) + 2*alpha1d*beta1d*ra^3*z^2*cos(alpha)^2*sin(beta) - \\
14*alpha1d*beta1d*ra^3*z^2*cos(alpha)^4*sin(beta) - 2*alpha1d^2*ra*z^4*cos(alpha)*cos(beta)*sin(alpha) - \\
beta1d^2*ra*z^4*cos(alpha)*cos(beta)*sin(alpha) - 2*alpha1d*ra^4*z1d*cos(alpha)^5*cos(beta)*sin(beta) + \\
4*alpha1d*ra^3*z^2*z1d*cos(alpha)^4*cos(beta)^3 + 2*ra*z^2*z1d^2*cos(alpha)*cos(beta)*sin(alpha) + \\
2*alpha1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)^3*sin(alpha) - \\
alpha1d^2*ra^4*z*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
2*ra^2*z^2*z1d^2*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta) - \\
3*alpha1d^2*ra*rb*z^3*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) + \\
beta1d^2*ra*rb*z^3*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) + \\
6*alpha1d*beta1d*ra^4*rb*cos(alpha)^6*cos(beta)*sin(beta) - \\
8*alpha1d*beta1d*ra^3*rb*z*cos(alpha)^5*cos(beta)^3 - 2*alpha1d*beta1d*ra*rb^2*z^2*cos(alpha)^2*sin(beta) \\
+ 4*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^2*cos(beta)^2 - 4*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^4*cos(beta)^2 + \\
2*beta1d*ra^3*z^2*z1d*cos(alpha)^3*sin(alpha)*sin(beta) - \\
2*alpha1d^2*ra^2*rb*z^2*cos(alpha)^3*cos(beta)^2*sin(alpha) - \\
3*alpha1d^2*ra^2*z^3*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta) - \\
4*alpha1d*beta1d*ra*rb*z^3*cos(alpha)*cos(beta) + \\
2*alpha1d*beta1d*ra^2*rb^3*cos(alpha)^6*cos(beta)*sin(beta) - \\
2*alpha1d*beta1d*ra^2*rb^2*z*cos(alpha)^5*cos(beta)^2 - \\
6*alpha1d^2*ra*rb^2*z^2*cos(alpha)*cos(beta)*sin(alpha) - \\
6*alpha1d*ra^2*rb^2*z1d*cos(alpha)^5*cos(beta)*sin(beta) + \\
4*alpha1d*ra^3*rb*z1d*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
6*alpha1d*ra^2*z^2*z1d*cos(alpha)^3*cos(beta)*sin(beta) + \\
alpha1d^2*ra*rb^3*z*cos(alpha)^4*sin(alpha)*sin(beta) + \\
alpha1d^2*ra^3*rb*z*cos(alpha)^4*sin(alpha)*sin(beta) - beta1d^2*ra*rb^3*z*cos(alpha)^4*sin(alpha)*sin(beta) \\
+ beta1d^2*ra^3*rb*z*cos(alpha)^4*sin(alpha)*sin(beta) + 6*alpha1d*beta1d*ra*rb*z^3*cos(alpha)^3*cos(beta)
\end{aligned}$$

$$\begin{aligned}
& + 2*\alpha_1d*\beta_1d*ra*rb^3*z*cos(alpha)^5*cos(beta) + 14*\alpha_1d*\beta_1d*ra^3*rb*z*cos(alpha)^5*cos(beta) \\
& + 2*ra*rb*z^2*d^2*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) - 6*\alpha_1d*ra*rb^2*z^2*d*cos(alpha)^2*cos(beta) - \\
& 4*\alpha_1d*\beta_1d*ra^3*rb^2*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& 4*\alpha_1d*\beta_1d*ra^3*z^2*cos(alpha)^4*cos(beta)^2*sin(beta) + \\
& 6*\alpha_1d*ra*rb*z^2*z_1d*cos(alpha)^3*sin(beta) + 2*\beta_1d*ra*z^3*z_1d*cos(alpha)*sin(alpha)*sin(beta) + \\
& 4*\alpha_1d^2*ra^2*rb*z^2*cos(alpha)*cos(beta)^2*sin(alpha) - \\
& \beta_1d^2*ra*rb^2*z^2*cos(alpha)^3*cos(beta)*sin(alpha) + \\
& 10*\alpha_1d*\beta_1d*ra^2*rb*z^2*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 4*\beta_1d*ra*rb*z^2*z_1d*cos(alpha)^2*cos(beta)*sin(alpha) - \\
& 2*\beta_1d*ra*rb^2*z*z_1d*cos(alpha)^3*sin(alpha)*sin(beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2*z*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& 2*\alpha_1d^2*ra^3*rb*z*cos(alpha)^4*cos(beta)^2*sin(alpha)*sin(beta))/ra^6*cos(alpha)^6 + \\
& rb^6*cos(alpha)^6 + z^6 + 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 + \\
& 15*ra^2*z^4*cos(alpha)^2 + 15*ra^4*z^2*cos(alpha)^4 + 3*rb^2*z^4*cos(alpha)^2 + \\
& 3*rb^4*z^2*cos(alpha)^4 + 18*ra^2*rb^2*z^2*cos(alpha)^4 + 20*ra^3*z^3*cos(alpha)^3*sin(beta) + \\
& 6*ra*z^5*cos(alpha)*sin(beta) + 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + \\
& 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 - \\
& 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 6*ra^5*z*cos(alpha)^5*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + \\
& 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta)); \\
YC1222=&((rb - ra*cos(beta))*(alpha_1d^2*rb^3*z^2*sin(2*alpha) - rb*z^2*z_1d^2*sin(2*alpha) - \\
& 2*\alpha_1d*rb*z^3*z_1d + 2*\beta_1d*ra^4*z_1d*cos(alpha)^6*sin(alpha) - \\
& \alpha_1d^2*ra^5*cos(alpha)^7*cos(beta)^3*sin(alpha) - 2*ra^3*z_1d^2*cos(alpha)^5*cos(beta)^3*sin(alpha) + \\
& 2*\alpha_1d*\beta_1d*ra*z^4*sin(beta) + 2*\alpha_1d*ra*z^3*z_1d*cos(beta) - \\
& \alpha_1d^2*ra^4*rb*cos(alpha)^7*sin(alpha) + \beta_1d^2*ra^4*rb*cos(alpha)^7*sin(alpha) + \\
& \alpha_1d^2*ra^2*rb*z^2*sin(2*alpha) - 2*ra^2*rb*z_1d^2*cos(alpha)^5*sin(alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^2*z^3*cos(alpha) + 2*\alpha_1d*\beta_1d*ra^4*z*cos(alpha)^5 - \\
& 2*\alpha_1d*\beta_1d*ra^4*z*cos(alpha)^7 + 2*\alpha_1d*rb*z^3*z_1d*cos(alpha)^2 + \\
& 2*\alpha_1d*rb^3*z*z_1d*cos(alpha)^2 + 4*\beta_1d*ra^2*z^2*z_1d*(sin(alpha) - sin(alpha)^3) + \\
& \alpha_1d^2*ra^5*cos(alpha)^7*cos(beta)*sin(alpha) - \alpha_1d^2*ra^2*rb^3*cos(alpha)^7*sin(alpha) - \\
& \beta_1d^2*ra^2*rb^3*cos(alpha)^7*sin(alpha) + 2*ra^3*z_1d^2*cos(alpha)^5*cos(beta)*sin(alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^2*z^3*cos(alpha)^3 - 2*\alpha_1d*\beta_1d*ra^2*z^3*cos(alpha)^5 - \\
& 2*\alpha_1d*\beta_1d*ra^5*cos(alpha)^8*cos(beta)^2*sin(beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*z^3*cos(alpha)^3*cos(beta)^2 + \\
& 2*\alpha_1d*\beta_1d*ra^2*z^3*cos(alpha)^5*cos(beta)^2 + 2*\alpha_1d*ra^2*rb*z^2*cos(alpha)^2 - \\
& 2*\alpha_1d*ra^2*rb*z^2*z_1d*cos(alpha)^4 - 2*\alpha_1d^2*ra^3*z^2*cos(alpha)*cos(beta)*sin(alpha) - \\
& 2*\beta_1d*ra^4*z_1d*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& 2*\alpha_1d*ra^4*z_1d*cos(alpha)^7*cos(beta)^3*sin(beta) - 2*\alpha_1d^2*ra^2*rb*z^2*cos(alpha)^3*sin(alpha) - \\
& 3*\alpha_1d^2*ra^2*rb*z^2*cos(alpha)^5*sin(alpha) - \beta_1d^2*ra^2*rb*z^2*cos(alpha)^5*sin(alpha) - \\
& 2*\alpha_1d^2*ra^2*z^3*cos(beta)*sin(alpha)*sin(beta) - 4*\alpha_1d*\beta_1d*ra^2*rb^2*z*cos(alpha)^5 - \\
& 2*\alpha_1d*\beta_1d*ra*z^4*cos(alpha)^2*sin(beta) - 2*\alpha_1d*ra*z^3*z_1d*cos(alpha)^2*cos(beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^2*\cos(\beta) + 2*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^4*\cos(\beta) + \\
& 2*\alpha_1d*ra*rb^3*z_1d*\cos(\alpha)^5*\sin(\beta) + 2*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^5*\sin(\beta) - \\
& 2*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^7*\sin(\beta) + 3*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - \\
& \alpha_1d^2*ra^4*rb*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d^2*ra^4*rb*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha) - \\
& \beta_1d^2*ra^4*rb*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + 2*\alpha_1d^2*ra^2*rb*z^3*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& \beta_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) + 2*ra^2*rb*z_1d^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) \\
& - 4*\alpha_1d*\beta_1d*ra^4*z*\cos(\alpha)^5*\cos(\beta)^2 + 2*\alpha_1d*\beta_1d*ra^4*z*\cos(\alpha)^7*\cos(\beta)^4 - \\
& 2*\alpha_1d*\beta_1d*ra^3*rb^2*\cos(\alpha)^8*\sin(\beta) + 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^2*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^4*\sin(\beta) - 4*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^6*\sin(\beta) - \\
& \beta_1d^2*ra*z^4*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - 2*\alpha_1d*ra^4*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*ra^4*z_1d*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - 2*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^4*\cos(\beta)^3 - \\
& 2*\beta_1d*ra^2*rb^2*z_1d*\cos(\alpha)^6*\sin(\alpha) + 2*\beta_1d*ra^2*z^2*z_1d*\cos(\alpha)^4*\sin(\alpha) + \\
& \alpha_1d^2*ra^2*rb^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) - \\
& 3*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& \beta_1d^2*ra^2*rb^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + 2*ra*z^2*z_1d^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) - \\
& 3*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) - \\
& \alpha_1d^2*ra^4*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& \beta_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta_1d*ra^2*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 2*ra^2*z*z_1d^2*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*ra^2*z*z_1d^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 3*\alpha_1d^2*ra*rb*z^3*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) + \\
& \beta_1d^2*ra*rb*z^3*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) + \\
& 4*\alpha_1d*\beta_1d*ra^4*rb*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^5*\cos(\beta)^3 - \\
& 4*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^7*\cos(\beta)^3 - 2*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^2*\sin(\beta) \\
& + 4*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^2*\cos(\beta)^2 + 2*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 2*\beta_1d*ra^3*z*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta_1d*ra^3*z*z_1d*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& \beta_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^2*z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& \beta_1d^2*ra^2*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*ra*rb*z*z_1d^2*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - 4*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)*\cos(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^3*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^4*rb*\cos(\alpha)^8*\cos(\beta)^3*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^2 - \\
& 6*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha_1d*ra^2*rb^2*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha^{1d}*r^{3r}*z^{1d}*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha^{1d}*r^{2z}^2*z^{1d}*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha^{1d}*r^{2z}^2*z^{1d}*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& \alpha^{1d}^2*r^{3r}*z^3*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& \alpha^{1d}^2*r^{3r}*z^3*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha^{1d}^2*r^{3r}*z^3*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& \beta^{1d}^2*r^{3r}^3*z^3*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \beta^{1d}^2*r^{3r}^3*z^3*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) \\
& + 4*\alpha^{1d}*\beta^{1d}*r^{3r}*z^3*\cos(\alpha)^3*\cos(\beta) + 2*\alpha^{1d}*\beta^{1d}*r^{3r}^3*z^3*\cos(\alpha)^5*\cos(\beta) + \\
& 4*\alpha^{1d}*\beta^{1d}*r^{3r}^3*z^3*\cos(\alpha)^5*\cos(\beta) + 4*\alpha^{1d}*\beta^{1d}*r^{3r}^3*z^3*\cos(\alpha)^7*\cos(\beta) + \\
& 2*r^{3r}*z^{1d}^2*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) - 6*\alpha^{1d}*r^{2z}^2*z^{1d}*\cos(\alpha)^2*\cos(\beta) - \\
& 4*\alpha^{1d}*\beta^{1d}*r^{3r}^2*\cos(\alpha)^8*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha^{1d}*\beta^{1d}*r^{3z}^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha^{1d}*r^{3r}*z^2*z^{1d}*\cos(\alpha)^3*\sin(\beta) + 2*\alpha^{1d}*r^{3r}*z^2*z^{1d}*\cos(\alpha)^5*\sin(\beta) + \\
& 2*\beta^{1d}*r^{3z}^3*z^{1d}*\cos(\alpha)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha^{1d}^2*r^{2r}^2*z^2*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) - \\
& \beta^{1d}^2*r^{2r}^2*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta^{1d}*r^{2r}^2*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha^{1d}*\beta^{1d}*r^{2r}^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& 4*\beta^{1d}*r^{2r}^2*z^2*z^{1d}*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) - \\
& 2*\beta^{1d}*r^{2r}^2*z^2*z^{1d}*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 3*\alpha^{1d}^2*r^{2r}^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha^{1d}^2*r^{3r}^3*z^3*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha^{1d}^2*r^{3r}^3*z^3*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& \beta^{1d}^2*r^{2r}^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta^{1d}*r^{2r}^2*z^2*z^{1d}*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta))/((r^{6d}*\cos(\alpha)^6 - r^{6d}*\cos(\alpha)^8 \\
& + r^{6d}*\cos(\alpha)^6 - z^{6d} + 3*r^{2d}^2*r^{4d}*\cos(\alpha)^6 + 3*r^{4d}^2*r^{2d}*\cos(\alpha)^6 - \\
& r^{2d}^2*r^{4d}*\cos(\alpha)^8 - 2*r^{4d}^2*r^{2d}*\cos(\alpha)^8 + 15*r^{2d}^2*z^4*\cos(\alpha)^2 - 15*r^{2d}^2*z^4*\cos(\alpha)^4 \\
& + 15*r^{4d}^2*z^2*\cos(\alpha)^4 - 15*r^{4d}^2*z^2*\cos(\alpha)^6 + 3*r^{2d}^2*z^4*\cos(\alpha)^2 - \\
& 2*r^{2d}^2*z^4*\cos(\alpha)^4 + 3*r^{4d}^2*z^2*\cos(\alpha)^4 - r^{4d}^2*z^2*\cos(\alpha)^6 + \\
& r^{6d}*\cos(\alpha)^8*\cos(\beta)^2 + 18*r^{2d}^2*r^{2d}^2*z^2*\cos(\alpha)^4 - 12*r^{2d}^2*r^{2d}^2*z^2*\cos(\alpha)^6 + \\
& 20*r^{3d}^2*z^3*\cos(\alpha)^3*\sin(\beta) - 20*r^{3d}^2*z^3*\cos(\alpha)^5*\sin(\beta) + 6*r^{2d}^2*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*r^{2d}^2*r^{4d}^2*\cos(\alpha)^6*\cos(\beta)^2 + 12*r^{4d}^2*r^{2d}^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*r^{3d}^3*r^{3d}^3*\cos(\alpha)^6*\cos(\beta)^3 + r^{2d}^2*r^{4d}^2*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*r^{4d}^2*r^{2d}^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*r^{3d}^3*r^{3d}^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*r^{4d}^2*r^{2d}^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*r^{2d}^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*r^{2d}^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*r^{4d}^2*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*r^{4d}^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*r^{4d}^2*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*r^{3d}^3*r^{5d}*\cos(\alpha)^6*\cos(\beta) - 6*r^{5d}^3*r^{3d}*\cos(\alpha)^6*\cos(\beta) + 4*r^{5d}^3*r^{3d}*\cos(\alpha)^8*\cos(\beta) - \\
& 6*r^{2d}^2*z^5*\cos(\alpha)^3*\sin(\beta) + 6*r^{5d}^3*z^5*\cos(\alpha)^5*\sin(\beta) - 6*r^{5d}^3*z^5*\cos(\alpha)^7*\sin(\beta) - \\
& 12*r^{3d}^3*r^{3d}^3*\cos(\alpha)^6*\cos(\beta) + 4*r^{3d}^3*r^{3d}^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*r^{5d}^3*r^{3d}^3*\cos(\alpha)^8*\cos(\beta)^3 - 6*r^{3d}^3*r^{3d}^3*z^4*\cos(\alpha)^2*\cos(\beta) + 4*r^{3d}^3*r^{3d}^3*z^4*\cos(\alpha)^4*\cos(\beta) \\
& + 6*r^{3d}^3*r^{4d}^2*z^4*\cos(\alpha)^5*\sin(\beta) - 2*r^{3d}^3*r^{4d}^2*z^4*\cos(\alpha)^7*\sin(\beta) + \\
& 6*r^{2d}^2*r^{2d}^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 8*r^{3d}^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) + \\
& 12*r^{3d}^3*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - 12*r^{3d}^3*r^{3d}^3*z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 36*r^{3d}^3*r^{3d}^3*z^2*\cos(\alpha)^4*\cos(\beta) + 4*r^{3d}^3*r^{3d}^3*z^2*\cos(\alpha)^6*\cos(\beta) + \\
& 24*r^{3d}^3*r^{3d}^3*z^2*\cos(\alpha)^6*\cos(\beta) + 12*r^{3d}^3*r^{2d}^2*z^3*\cos(\alpha)^3*\sin(\beta) - \\
& 8*r^{3d}^3*r^{2d}^2*z^3*\cos(\alpha)^5*\sin(\beta) + 12*r^{3d}^3*r^{2d}^2*z^3*\cos(\alpha)^5*\sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
YC1223=& (cos(alpha)*(rb - ra*cos(beta))*(2*alpha1d^2*rb*z^6*sin(alpha) - \\
& 2*alpha1d^2*ra*z^6*cos(beta)*sin(alpha) - 2*beta1d*ra^6*z1d*cos(alpha)^7*sin(alpha) + \\
& alpha1d^2*ra^7*cos(alpha)^8*cos(beta)^3*sin(alpha) + 2*ra^5*z1d^2*cos(alpha)^6*cos(beta)^3*sin(alpha) + \\
& 4*alpha1d*rb*z^5*z1d*cos(alpha) + alpha1d^2*ra^6*rb*cos(alpha)^8*sin(alpha) - \\
& beta1d^2*ra^6*rb*cos(alpha)^8*sin(alpha) - 2*alpha1d^2*rb*z^6*cos(alpha)^2*sin(alpha) + \\
& 2*ra^4*rb*z1d^2*cos(alpha)^6*sin(alpha) + 2*rb*z^4*z1d^2*cos(alpha)^2*sin(alpha) - \\
& 14*alpha1d*beta1d*ra^6*z*cos(alpha)^6 + 14*alpha1d*beta1d*ra^6*z*cos(alpha)^8 - \\
& 4*alpha1d*rb*z^5*z1d*cos(alpha)^3 - alpha1d^2*ra^7*cos(alpha)^8*cos(beta)*sin(alpha) + \\
& alpha1d^2*ra^2*rb^5*cos(alpha)^8*sin(alpha) + 2*alpha1d^2*ra^4*rb^3*cos(alpha)^8*sin(alpha) + \\
& beta1d^2*ra^2*rb^5*cos(alpha)^8*sin(alpha) - 2*ra^5*z1d^2*cos(alpha)^6*cos(beta)*sin(alpha) + \\
& 2*ra^2*rb^3*z1d^2*cos(alpha)^6*sin(alpha) - 2*alpha1d*beta1d*ra^7*cos(alpha)^7*sin(beta) + \\
& 2*alpha1d*beta1d*ra^7*cos(alpha)^9*sin(beta) - 22*alpha1d*beta1d*ra^2*z^5*cos(alpha)^2 + \\
& 22*alpha1d*beta1d*ra^2*z^5*cos(alpha)^4 - 60*alpha1d*beta1d*ra^4*z^3*cos(alpha)^4 + \\
& 60*alpha1d*beta1d*ra^4*z^3*cos(alpha)^6 + 12*ra^3*z^2*z1d^2*cos(alpha)^4*cos(beta)^3*sin(alpha) - \\
& 4*alpha1d*beta1d*ra*z^6*cos(alpha)*sin(beta) - 4*alpha1d*ra*z^5*z1d*cos(alpha)*cos(beta) + \\
& 16*alpha1d*beta1d*ra^2*z^5*cos(alpha)^2*cos(beta)^2 - \\
& 16*alpha1d*beta1d*ra^2*z^5*cos(alpha)^4*cos(beta)^2 + \\
& 70*alpha1d*beta1d*ra^4*z^3*cos(alpha)^4*cos(beta)^2 - \\
& 12*alpha1d*beta1d*ra^4*z^3*cos(alpha)^4*cos(beta)^4 - \\
& 70*alpha1d*beta1d*ra^4*z^3*cos(alpha)^6*cos(beta)^2 + \\
& 12*alpha1d*beta1d*ra^4*z^3*cos(alpha)^6*cos(beta)^4 + 4*alpha1d*ra^4*rb*z*z1d*cos(alpha)^5 - \\
& 4*alpha1d*ra^4*rb*z*z1d*cos(alpha)^7 + 2*alpha1d^2*ra*z^6*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& beta1d^2*ra*z^6*cos(alpha)^2*cos(beta)*sin(alpha) + 2*beta1d*ra^6*z1d*cos(alpha)^7*cos(beta)^2*sin(alpha) \\
& + 24*alpha1d*ra^3*z^3*z1d*cos(alpha)^3*cos(beta)^3 - 24*alpha1d*ra^3*z^3*z1d*cos(alpha)^5*cos(beta)^3 + \\
& 12*alpha1d^2*ra^2*rb*z^4*cos(alpha)^2*sin(alpha) - 7*alpha1d^2*ra^2*rb*z^4*cos(alpha)^4*sin(alpha) + \\
& 2*alpha1d^2*ra^4*rb*z^2*cos(alpha)^4*sin(alpha) + 8*alpha1d^2*ra^4*rb*z^2*cos(alpha)^6*sin(alpha) + \\
& 3*beta1d^2*ra^2*rb*z^4*cos(alpha)^4*sin(alpha) - 2*beta1d^2*ra^4*rb*z^2*cos(alpha)^6*sin(alpha) - \\
& 2*ra*z^4*z1d^2*cos(alpha)^2*cos(beta)*sin(alpha) + 12*ra^2*rb*z^2*z1d^2*cos(alpha)^4*sin(alpha) - \\
& 14*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^6 + 14*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^8 + \\
& 4*alpha1d*beta1d*ra*z^6*cos(alpha)^3*sin(beta) + 4*alpha1d*ra*z^5*z1d*cos(alpha)^3*cos(beta) - \\
& 4*alpha1d*ra^5*z*z1d*cos(alpha)^5*cos(beta) + 4*alpha1d*ra^5*z*z1d*cos(alpha)^7*cos(beta) + \\
& 24*alpha1d*ra^2*rb*z^3*z1d*cos(alpha)^3 - 24*alpha1d*ra^2*rb*z^3*z1d*cos(alpha)^5 + \\
& 4*alpha1d*ra^2*rb^3*z*z1d*cos(alpha)^5 - 4*alpha1d*ra^2*rb^3*z*z1d*cos(alpha)^7 - \\
& 5*alpha1d^2*ra^3*rb^4*cos(alpha)^8*cos(beta)*sin(alpha) - \\
& 6*alpha1d^2*ra^5*rb^2*cos(alpha)^8*cos(beta)*sin(alpha) + \\
& 3*alpha1d^2*ra^6*rb*cos(alpha)^8*cos(beta)^2*sin(alpha) - \\
& 4*alpha1d^2*ra^6*rb*cos(alpha)^8*cos(beta)^4*sin(alpha) - \\
& 2*beta1d^2*ra^3*rb^4*cos(alpha)^8*cos(beta)*sin(alpha) + \\
& 2*beta1d^2*ra^5*rb^2*cos(alpha)^8*cos(beta)*sin(alpha) + \\
& beta1d^2*ra^6*rb*cos(alpha)^8*cos(beta)^2*sin(alpha) -
\end{aligned}$$

$$\begin{aligned}
& 12*\alpha d^2*ra^3*z^4*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 7*\alpha d^2*ra^3*z^4*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha d^2*ra^5*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 8*\alpha d^2*ra^5*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta d^2*ra^3*z^4*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 3*\beta d^2*ra^5*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha d^2*ra^2*rb^3*z^2*\cos(\alpha)^4*\sin(\alpha) + 2*\alpha d^2*ra^2*rb^3*z^2*\cos(\alpha)^6*\sin(\alpha) + \\
& 4*\beta d^2*ra^2*rb^3*z^2*\cos(\alpha)^6*\sin(\alpha) - 6*ra^3*rb^2*z d^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) + \\
& 2*ra^4*rb*z d^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) - 4*ra^4*rb*z d^2*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) \\
& - 12*ra^3*z^2*z d^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 14*\alpha d*\beta d*ra^6*z*\cos(\alpha)^6*\cos(\beta)^2 - 14*\alpha d*\beta d*ra^6*z*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*\alpha d*\beta d*ra^3*rb^4*\cos(\alpha)^7*\sin(\beta) - 4*\alpha d*\beta d*ra^5*rb^2*\cos(\alpha)^7*\sin(\beta) + \\
& 2*\alpha d*\beta d*ra^3*rb^4*\cos(\alpha)^9*\sin(\beta) + 4*\alpha d*\beta d*ra^5*rb^2*\cos(\alpha)^9*\sin(\beta) - \\
& 6*\alpha d*\beta d*ra^2*rb^2*z^3*\cos(\alpha)^4 + 6*\alpha d*\beta d*ra^2*rb^2*z^3*\cos(\alpha)^6 - \\
& 50*\alpha d*\beta d*ra^3*z^4*\cos(\alpha)^3*\sin(\beta) + 50*\alpha d*\beta d*ra^3*z^4*\cos(\alpha)^5*\sin(\beta) - \\
& 40*\alpha d*\beta d*ra^5*z^2*\cos(\alpha)^5*\sin(\beta) + 40*\alpha d*\beta d*ra^5*z^2*\cos(\alpha)^7*\sin(\beta) - \\
& 24*\alpha d*ra^3*z^3*z d*\cos(\alpha)^3*\cos(\beta) + 24*\alpha d*ra^3*z^3*z d*\cos(\alpha)^5*\cos(\beta) + \\
& 4*\alpha d*ra^5*z^2*z d*\cos(\alpha)^5*\cos(\beta)^3 - 4*\alpha d*ra^5*z^2*z d*\cos(\alpha)^7*\cos(\beta)^3 + \\
& 2*\beta d*ra^2*rb^4*z d*\cos(\alpha)^7*\sin(\alpha) - 10*\beta d*ra^2*z^4*z d*\cos(\alpha)^3*\sin(\alpha) - \\
& 20*\beta d*ra^4*z^2*z d*\cos(\alpha)^5*\sin(\alpha) - \alpha d^2*ra^2*rb^5*\cos(\alpha)^8*\cos(\beta)^2*\sin(\alpha) \\
& + 6*\alpha d^2*ra^4*rb^3*\cos(\alpha)^8*\cos(\beta)^2*\sin(\alpha) + \\
& 5*\alpha d^2*ra^3*rb^4*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha d^2*ra^5*rb^2*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) - \\
& 8*\alpha d^2*ra^4*rb^3*\cos(\alpha)^8*\cos(\beta)^4*\sin(\alpha) + \\
& 4*\alpha d^2*ra^5*rb^2*\cos(\alpha)^8*\cos(\beta)^5*\sin(\alpha) - \\
& \beta d^2*ra^2*rb^5*\cos(\alpha)^8*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\beta d^2*ra^3*rb^4*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) - \\
& 2*\beta d^2*ra^5*rb^2*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) + \\
& 12*\alpha d^2*ra^3*z^4*\cos(\alpha)^2*\cos(\beta)^3*\sin(\alpha) - \\
& 7*\alpha d^2*ra^3*z^4*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha d^2*ra^5*z^2*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 14*\alpha d^2*ra^5*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
& 6*\alpha d^2*ra^5*z^2*\cos(\alpha)^6*\cos(\beta)^5*\sin(\alpha) - \\
& 3*\beta d^2*ra^3*z^4*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 3*\beta d^2*ra^5*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
& 2*ra^2*rb^3*z d^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 6*ra^3*rb^2*z d^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
& 8*\alpha d^2*ra^2*z^5*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha d^2*ra^6*z*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& \beta d^2*ra^6*z*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\beta d*ra^2*z^4*z d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 20*\beta d*ra^4*z^2*z d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 12*\alpha d*ra^4*z^2*z d*\cos(\alpha)^4*\cos(\beta)^3*\sin(\beta) - \\
& 12*\alpha d*ra^4*z^2*z d*\cos(\alpha)^6*\cos(\beta)^3*\sin(\beta) + \\
& 2*\alpha d^2*ra*rb^3*z^3*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha d^2*ra^3*rb*z^3*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& \alpha d^2*ra*rb^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha^{1d} \wedge 2^{*ra} \wedge 3^{*rb} * z^3 * \cos(\alpha)^5 * \sin(\alpha) * \sin(\beta) + \\
& 5*\alpha^{1d} \wedge 2^{*ra} \wedge 3^{*rb} \wedge 3^{*z} * \cos(\alpha)^7 * \sin(\alpha) * \sin(\beta) + \\
& \beta^{1d} \wedge 2^{*ra} * r^b \wedge 3^{*z} \wedge 3 * \cos(\alpha)^5 * \sin(\alpha) * \sin(\beta) + \\
& 2*\beta^{1d} \wedge 2^{*ra} \wedge 3^{*rb} * z^3 * \cos(\alpha)^5 * \sin(\alpha) * \sin(\beta) + \\
& 3*\beta^{1d} \wedge 2^{*ra} \wedge 3^{*rb} \wedge 3^{*z} * \cos(\alpha)^7 * \sin(\alpha) * \sin(\beta) - \\
& 8^{*ra} \wedge 4^{*z} * z^{1d} \wedge 2 * \cos(\alpha)^5 * \cos(\beta) * \sin(\alpha) * \sin(\beta) + \\
& 10*\alpha^{1d} * \beta^{1d} * r^a \wedge 6^{*rb} * \cos(\alpha)^7 * \cos(\beta) * \sin(\beta) - \\
& 10*\alpha^{1d} * \beta^{1d} * r^a \wedge 6^{*rb} * \cos(\alpha)^9 * \cos(\beta) * \sin(\beta) + \\
& 2*\alpha^{1d} * \beta^{1d} * r^a * r^b \wedge 3^{*z} \wedge 3 * \cos(\alpha)^4 * \cos(\beta) + \\
& 56*\alpha^{1d} * \beta^{1d} * r^a \wedge 3^{*rb} * z^3 * \cos(\alpha)^4 * \cos(\beta) - \\
& 2*\alpha^{1d} * \beta^{1d} * r^a * r^b \wedge 3^{*z} \wedge 3 * \cos(\alpha)^6 * \cos(\beta) - \\
& 56*\alpha^{1d} * \beta^{1d} * r^a \wedge 3^{*rb} * z^3 * \cos(\alpha)^6 * \cos(\beta) + \\
& 14*\alpha^{1d} * \beta^{1d} * r^a \wedge 3^{*rb} \wedge 3^{*z} * \cos(\alpha)^6 * \cos(\beta) - \\
& 14*\alpha^{1d} * \beta^{1d} * r^a \wedge 3^{*rb} \wedge 3^{*z} * \cos(\alpha)^8 * \cos(\beta) - \\
& 42*\alpha^{1d} * \beta^{1d} * r^a \wedge 5^{*rb} * z^3 * \cos(\alpha)^6 * \cos(\beta)^3 + \\
& 42*\alpha^{1d} * \beta^{1d} * r^a \wedge 5^{*rb} * z^3 * \cos(\alpha)^8 * \cos(\beta)^3 + \\
& 4*\beta^{1d} * r^a \wedge 5^{*rb} * z^{1d} * \cos(\alpha)^7 * \cos(\beta) * \sin(\alpha) - 12*\alpha^{1d} * r^a \wedge 3^{*rb} \wedge 2^{*z} * z^{1d} * \cos(\alpha)^5 * \cos(\beta) \\
& + 4*\alpha^{1d} * r^a \wedge 4^{*rb} * z^2 * z^{1d} * \cos(\alpha)^5 * \cos(\beta)^2 + 12*\alpha^{1d} * r^a \wedge 3^{*rb} \wedge 2^{*z} * z^{1d} * \cos(\alpha)^7 * \cos(\beta) - \\
& 8*\alpha^{1d} * r^a \wedge 4^{*rb} * z^2 * z^{1d} * \cos(\alpha)^5 * \cos(\beta)^4 - 4*\alpha^{1d} * r^a \wedge 4^{*rb} * z^2 * z^{1d} * \cos(\alpha)^7 * \cos(\beta)^2 + \\
& 8*\alpha^{1d} * r^a \wedge 4^{*rb} * z^2 * z^{1d} * \cos(\alpha)^7 * \cos(\beta)^4 + 8*\alpha^{1d} \wedge 2^{*ra} * r^b * z^5 * \cos(\alpha) * \sin(\alpha) * \sin(\beta) + \\
& 4*\alpha^{1d} * r^a * r^b \wedge 3^{*z} \wedge 2^{*z^{1d}} * \cos(\alpha)^4 * \sin(\beta) + 16*\alpha^{1d} * r^a \wedge 3^{*rb} * z^2 * z^{1d} * \cos(\alpha)^4 * \sin(\beta) - \\
& 4*\alpha^{1d} * r^a * r^b \wedge 3^{*z} \wedge 2^{*z^{1d}} * \cos(\alpha)^6 * \sin(\beta) - 16*\alpha^{1d} * r^a \wedge 3^{*rb} * z^2 * z^{1d} * \cos(\alpha)^6 * \sin(\beta) - \\
& 2*\beta^{1d} * r^a * z^5 * z^{1d} * \cos(\alpha)^2 * \sin(\alpha) * \sin(\beta) - \\
& 10*\beta^{1d} * r^a \wedge 5^{*z} * z^{1d} * \cos(\alpha)^6 * \sin(\alpha) * \sin(\beta) - \\
& 12*\alpha^{1d} \wedge 2^{*ra} \wedge 2^{*rb} * z^4 * \cos(\alpha)^2 * \cos(\beta)^2 * \sin(\alpha) - \\
& 6*\alpha^{1d} \wedge 2^{*ra} \wedge 3^{*rb} \wedge 2^{*z} \wedge 2 * \cos(\alpha)^4 * \cos(\beta) * \sin(\alpha) + \\
& 7*\alpha^{1d} \wedge 2^{*ra} \wedge 2^{*rb} * z^4 * \cos(\alpha)^4 * \cos(\beta)^2 * \sin(\alpha) + \\
& 2*\alpha^{1d} \wedge 2^{*ra} \wedge 4^{*rb} * z^2 * \cos(\alpha)^4 * \cos(\beta)^2 * \sin(\alpha) - \\
& 6*\alpha^{1d} \wedge 2^{*ra} \wedge 3^{*rb} \wedge 2^{*z} \wedge 2 * \cos(\alpha)^6 * \cos(\beta) * \sin(\alpha) - \\
& 4*\alpha^{1d} \wedge 2^{*ra} \wedge 4^{*rb} * z^2 * \cos(\alpha)^4 * \cos(\beta)^4 * \sin(\alpha) - \\
& 10*\alpha^{1d} \wedge 2^{*ra} \wedge 4^{*rb} * z^2 * \cos(\alpha)^6 * \cos(\beta)^2 * \sin(\alpha) + \\
& 2*\alpha^{1d} \wedge 2^{*ra} \wedge 4^{*rb} * z^2 * \cos(\alpha)^6 * \cos(\beta)^4 * \sin(\alpha) - \\
& 3*\beta^{1d} \wedge 2^{*ra} \wedge 2^{*rb} * z^4 * \cos(\alpha)^4 * \cos(\beta)^2 * \sin(\alpha) + \\
& \beta^{1d} \wedge 2^{*ra} \wedge 3^{*rb} \wedge 2^{*z} \wedge 2 * \cos(\alpha)^6 * \cos(\beta) * \sin(\alpha) + \\
& 2*\beta^{1d} \wedge 2^{*ra} \wedge 4^{*rb} * z^2 * \cos(\alpha)^6 * \cos(\beta)^2 * \sin(\alpha) + \\
& 7*\alpha^{1d} \wedge 2^{*ra} \wedge 2^{*z} \wedge 5 * \cos(\alpha)^3 * \cos(\beta) * \sin(\alpha) * \sin(\beta) - \\
& 8*\alpha^{1d} \wedge 2^{*ra} \wedge 4^{*z} \wedge 3 * \cos(\alpha)^3 * \cos(\beta) * \sin(\alpha) * \sin(\beta) - \\
& 2*\alpha^{1d} \wedge 2^{*ra} \wedge 4^{*z} \wedge 3 * \cos(\alpha)^5 * \cos(\beta) * \sin(\alpha) * \sin(\beta) + \\
& 5*\alpha^{1d} \wedge 2^{*ra} \wedge 6^{*z} * \cos(\alpha)^7 * \cos(\beta)^3 * \sin(\alpha) * \sin(\beta) + \\
& 3*\beta^{1d} \wedge 2^{*ra} \wedge 2^{*z} \wedge 5 * \cos(\alpha)^3 * \cos(\beta) * \sin(\alpha) * \sin(\beta) - \\
& 2*\beta^{1d} \wedge 2^{*ra} \wedge 4^{*z} \wedge 3 * \cos(\alpha)^5 * \cos(\beta) * \sin(\alpha) * \sin(\beta) - \\
& 12^{*ra} \wedge 2^{*rb} * z^2 * z^{1d} \wedge 2 * \cos(\alpha)^4 * \cos(\beta)^2 * \sin(\alpha) - \\
& 8^{*ra} \wedge 2^{*z} \wedge 3^{*z^{1d}} \wedge 2 * \cos(\alpha)^3 * \cos(\beta) * \sin(\alpha) * \sin(\beta) + \\
& 6^{*ra} \wedge 4^{*z} * z^{1d} \wedge 2 * \cos(\alpha)^5 * \cos(\beta)^3 * \sin(\alpha) * \sin(\beta) + \\
& 2*\alpha^{1d} * \beta^{1d} * r^a \wedge 2^{*rb} \wedge 5 * \cos(\alpha)^7 * \cos(\beta) * \sin(\beta) + \\
& 12*\alpha^{1d} * \beta^{1d} * r^a \wedge 4^{*rb} \wedge 3 * \cos(\alpha)^7 * \cos(\beta) * \sin(\beta) - \\
& 2*\alpha^{1d} * \beta^{1d} * r^a \wedge 2^{*rb} \wedge 5 * \cos(\alpha)^9 * \cos(\beta) * \sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
&12*\alpha1d*\beta1d*ra^4*rb^3*\cos(\alpha)^9*\cos(\beta)*\sin(\beta) - \\
&50*\alpha1d*\beta1d*ra^3*rb*z^3*\cos(\alpha)^4*\cos(\beta)^3 - \\
&14*\alpha1d*\beta1d*ra^4*rb^2*z*\cos(\alpha)^6*\cos(\beta)^2 + \\
&50*\alpha1d*\beta1d*ra^3*rb*z^3*\cos(\alpha)^6*\cos(\beta)^3 - \\
&14*\alpha1d*\beta1d*ra^3*rb^3*z*\cos(\alpha)^6*\cos(\beta)^3 + \\
&28*\alpha1d*\beta1d*ra^4*rb^2*z*\cos(\alpha)^6*\cos(\beta)^4 + \\
&14*\alpha1d*\beta1d*ra^4*rb^2*z*\cos(\alpha)^8*\cos(\beta)^2 + \\
&14*\alpha1d*\beta1d*ra^3*rb^3*z*\cos(\alpha)^8*\cos(\beta)^3 - \\
&28*\alpha1d*\beta1d*ra^4*rb^2*z*\cos(\alpha)^8*\cos(\beta)^4 - \\
&16*\alpha1d*\beta1d*ra^3*rb^2*z^2*\cos(\alpha)^5*\sin(\beta) + \\
&16*\alpha1d*\beta1d*ra^3*rb^2*z^2*\cos(\alpha)^7*\sin(\beta) - \\
&4*\beta1d*ra^3*rb^3*z1d*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - \\
&4*\beta1d*ra^5*rb*z1d*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) - \\
&24*\alpha1d*ra^2*rb*z^3*z1d*\cos(\alpha)^3*\cos(\beta)^2 + \\
&24*\alpha1d*ra^2*rb*z^3*z1d*\cos(\alpha)^5*\cos(\beta)^2 - \\
&4*\alpha1d*ra^2*rb^3*z*z1d*\cos(\alpha)^5*\cos(\beta)^2 + \\
&12*\alpha1d*ra^3*rb^2*z*z1d*\cos(\alpha)^5*\cos(\beta)^3 + \\
&4*\alpha1d*ra^2*rb^3*z*z1d*\cos(\alpha)^7*\cos(\beta)^2 - \\
&12*\alpha1d*ra^3*rb^2*z*z1d*\cos(\alpha)^7*\cos(\beta)^3 - \\
&16*\alpha1d*ra^2*z^4*z1d*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + \\
&16*\alpha1d*ra^2*z^4*z1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
&16*\alpha1d*ra^4*z^2*z1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
&16*\alpha1d*ra^4*z^2*z1d*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
&7*\alpha1d^2*ra*rb*z^5*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
&5*\alpha1d^2*ra^5*rb*z*\cos(\alpha)^7*\sin(\alpha)*\sin(\beta) + \\
&\beta1d^2*ra*rb*z^5*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
&3*\beta1d^2*ra^5*rb*z*\cos(\alpha)^7*\sin(\alpha)*\sin(\beta) + \\
&4*\beta1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^5*\sin(\alpha) - \\
&20*\beta1d*ra^3*z^3*z1d*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
&2*\alpha1d^2*ra^2*rb^3*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
&6*\alpha1d^2*ra^3*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) - \\
&2*\alpha1d^2*ra^2*rb^3*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
&6*\alpha1d^2*ra^3*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
&4*\beta1d^2*ra^2*rb^3*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) - \\
&\beta1d^2*ra^3*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
&6*\alpha1d^2*ra^4*z^3*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
&3*\alpha1d^2*ra^4*z^3*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
&8*ra*rb*z^3*z1d^2*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + 2*ra*rb^3*z*z1d^2*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
&8*ra^3*rb*z*z1d^2*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + 6*\alpha1d*\beta1d*ra*rb*z^5*\cos(\alpha)^2*\cos(\beta) - \\
&6*\alpha1d*\beta1d*ra*rb*z^5*\cos(\alpha)^4*\cos(\beta) + 42*\alpha1d*\beta1d*ra^5*rb*z*\cos(\alpha)^6*\cos(\beta) - \\
&42*\alpha1d*\beta1d*ra^5*rb*z*\cos(\alpha)^8*\cos(\beta) - \\
&8*\alpha1d*\beta1d*ra^3*rb^4*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
&16*\alpha1d*\beta1d*ra^5*rb^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
&8*\alpha1d*\beta1d*ra^4*rb^3*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) + \\
&8*\alpha1d*\beta1d*ra^3*rb^4*\cos(\alpha)^9*\cos(\beta)^2*\sin(\beta) + \\
&16*\alpha1d*\beta1d*ra^5*rb^2*\cos(\alpha)^9*\cos(\beta)^2*\sin(\beta) - \\
&8*\alpha1d*\beta1d*ra^4*rb^3*\cos(\alpha)^9*\cos(\beta)^3*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 24*\alpha^1d*\beta^1d*ra^3*z^4*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) - \\
& 24*\alpha^1d*\beta^1d*ra^3*z^4*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 28*\alpha^1d*\beta^1d*ra^5*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - \\
& 28*\alpha^1d*\beta^1d*ra^5*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
& 16*\alpha^1d*ra*rb*z^4*z^1d*\cos(\alpha)^2*\sin(\beta) - 16*\alpha^1d*ra*rb*z^4*z^1d*\cos(\alpha)^4*\sin(\beta) + \\
& \beta^1d^2*ra*rb^2*z^4*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 2*\beta^1d*ra^2*rb^4*z^1d*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\beta^1d*ra^3*rb^3*z^1d*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& 26*\alpha^1d*\beta^1d*ra^2*rb*z^4*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 26*\alpha^1d*\beta^1d*ra^2*rb*z^4*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 68*\alpha^1d*\beta^1d*ra^4*rb*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 68*\alpha^1d*\beta^1d*ra^4*rb*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) + \\
& 16*\beta^1d*ra^3*rb*z^2*z^1d*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta^1d*ra*rb^2*z^3*z^1d*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 2*\beta^1d*ra^3*rb^2*z^3*z^1d*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha^1d^2*ra^2*rb^2*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha^1d^2*ra^3*rb*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 3*\alpha^1d^2*ra^2*rb^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha^1d^2*ra^3*rb*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha^1d^2*ra^3*rb^3*z^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 15*\alpha^1d^2*ra^4*rb^2*z^3*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta^1d^2*ra^2*rb^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\beta^1d^2*ra^3*rb*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 5*\beta^1d^2*ra^3*rb^3*z^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 12*\alpha^1d*\beta^1d*ra^2*rb^3*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 12*\alpha^1d*\beta^1d*ra^2*rb^3*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 32*\alpha^1d*\beta^1d*ra^4*rb*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\beta) + \\
& 32*\alpha^1d*\beta^1d*ra^4*rb*z^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) - \\
& 16*\beta^1d*ra^3*rb*z^2*z^1d*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) - \\
& 12*\alpha^1d*ra^2*rb^2*z^2*z^1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 4*\alpha^1d*ra^3*rb*z^2*z^1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) + \\
& 12*\alpha^1d*ra^2*rb^2*z^2*z^1d*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha^1d*ra^3*rb*z^2*z^1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) + \\
& 6*\beta^1d*ra^5*z^2*z^1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta^1d*ra*rb*z^4*z^1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 20*\alpha^1d*\beta^1d*ra^3*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 20*\alpha^1d*\beta^1d*ra^3*rb^2*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
& 15*\alpha^1d^2*ra^4*rb^2*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 5*\alpha^1d^2*ra^5*rb*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 10*\alpha^1d^2*ra^5*rb*z^2*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha)*\sin(\beta) + \\
& \beta^1d^2*ra^2*rb^4*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 5*\beta^1d^2*ra^5*rb*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta^1d*ra^2*rb^2*z^2*z^1d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 6*\beta^1d*ra^3*z^3*z^1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 6*ra^2*rb^2*z^2*z^1d^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*ra^3*rb*z^2*z^1d^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 14*\beta^1d*ra^3*rb^2*z^2*z^1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 12*\beta*1d*ra^4*rb^z*z*1d*cos(alpha)^6*cos(beta)*sin(alpha)*sin(beta) + \\
& 12*\beta*1d*ra^2*rb^z^3*z*1d*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& 4*\beta*1d*ra^2*rb^3*z^2*1d*cos(alpha)^6*cos(beta)*sin(alpha)*sin(beta)))/(ra^8*cos(alpha)^8 - \\
& ra^8*cos(alpha)^10 + rb^8*cos(alpha)^8 - z^8*cos(alpha)^2 + z^8 + 4*ra^2*rb^6*cos(alpha)^8 + \\
& 6*ra^4*rb^4*cos(alpha)^8 + 4*ra^6*rb^2*cos(alpha)^8 - ra^2*rb^6*cos(alpha)^10 - \\
& 3*ra^4*rb^4*cos(alpha)^10 - 3*ra^6*rb^2*cos(alpha)^10 + 28*ra^2*z^6*cos(alpha)^2 - \\
& 28*ra^2*z^6*cos(alpha)^4 + 70*ra^4*z^4*cos(alpha)^4 - 70*ra^4*z^4*cos(alpha)^6 + \\
& 28*ra^6*z^2*cos(alpha)^6 - 28*ra^6*z^2*cos(alpha)^8 + 4*rb^2*z^6*cos(alpha)^2 - 3*rb^2*z^6*cos(alpha)^4 \\
& + 6*rb^4*z^4*cos(alpha)^4 - 3*rb^4*z^4*cos(alpha)^6 + 4*rb^6*z^2*cos(alpha)^6 - rb^6*z^2*cos(alpha)^8 + \\
& ra^8*cos(alpha)^10*cos(beta)^2 + 60*ra^2*rb^2*z^4*cos(alpha)^4 - 45*ra^2*rb^2*z^4*cos(alpha)^6 + \\
& 36*ra^2*rb^4*z^2*cos(alpha)^6 + 60*ra^4*rb^2*z^2*cos(alpha)^6 - 18*ra^2*rb^4*z^2*cos(alpha)^8 - \\
& 45*ra^4*rb^2*z^2*cos(alpha)^8 + 56*ra^3*z^5*cos(alpha)^3*sin(beta) - 56*ra^3*z^5*cos(alpha)^5*sin(beta) + \\
& 56*ra^5*z^3*cos(alpha)^5*sin(beta) - 56*ra^5*z^3*cos(alpha)^7*sin(beta) + 8*ra^z^7*cos(alpha)*sin(beta) + \\
& 24*ra^2*rb^6*cos(alpha)^8*cos(beta)^2 + 48*ra^4*rb^4*cos(alpha)^8*cos(beta)^2 + \\
& 24*ra^6*rb^2*cos(alpha)^8*cos(beta)^2 - 32*ra^3*rb^5*cos(alpha)^8*cos(beta)^3 - \\
& 32*ra^5*rb^3*cos(alpha)^8*cos(beta)^3 + ra^2*rb^6*cos(alpha)^10*cos(beta)^2 + \\
& 16*ra^4*rb^4*cos(alpha)^8*cos(beta)^4 - 9*ra^4*rb^4*cos(alpha)^10*cos(beta)^2 - \\
& 9*ra^6*rb^2*cos(alpha)^10*cos(beta)^2 - 6*ra^3*rb^5*cos(alpha)^10*cos(beta)^3 - \\
& 4*ra^5*rb^3*cos(alpha)^10*cos(beta)^3 + 12*ra^4*rb^4*cos(alpha)^10*cos(beta)^4 + \\
& 12*ra^6*rb^2*cos(alpha)^10*cos(beta)^4 - 8*ra^5*rb^3*cos(alpha)^10*cos(beta)^5 - \\
& 24*ra^2*z^6*cos(alpha)^2*cos(beta)^2 + 25*ra^2*z^6*cos(alpha)^4*cos(beta)^2 - \\
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) - 8*ra^z^7*cos(alpha)^3*sin(beta) + 8*ra^7*z*cos(alpha)^7*sin(beta) - \\
& 8*ra^7*z*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb^z^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb^z^6*cos(alpha)^4*cos(beta) + 8*ra*rb^6*z*cos(alpha)^7*sin(beta) - 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 - \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) + 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb^z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb^z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb^z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb^z^2*cos(alpha)^8*cos(beta) + 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) - \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) + 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) - \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) + 24*ra^3*rb^4*z^3*cos(alpha)^7*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) - \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb^z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb^z^4*cos(alpha)^6*cos(beta)^3 +
\end{aligned}$$

$$\begin{aligned}
&72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
&108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 + \\
&6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
&60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) - 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) + \\
&36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) - 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
&48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) + 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
&96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) + \\
&48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) - 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
&96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
&64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
&96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) - \\
&64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) - \\
&36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
&24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) - 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
&36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) + 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
&12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta));
\end{aligned}$$

YC1224=0;

$$\begin{aligned}
YC1231=&(e1^2*ra*cos(alpha)*(2*alpha1d^2*ra^2*z^3*cos(beta) - 2*alpha1d^2*ra*rb*z^3 - \\
&2*alpha1d^2*ra^2*z^3*cos(beta)^3 + 3*alpha1d^2*ra*rb*z^3*cos(alpha)^2 - \\
&2*alpha1d^2*ra*rb^3*z*cos(alpha)^2 - 2*alpha1d^2*ra^3*rb*z*cos(alpha)^2 + \\
&3*alpha1d^2*ra*rb^3*z*cos(alpha)^4 + 5*alpha1d^2*ra^3*rb*z*cos(alpha)^4 + \\
&beta1d^2*ra*rb*z^3*cos(alpha)^2 + beta1d^2*ra*rb^3*z*cos(alpha)^4 - beta1d^2*ra^3*rb*z*cos(alpha)^4 + \\
&2*alpha1d^2*ra*rb*z^3*cos(beta)^2 - 2*beta1d*ra^4*z1d*cos(alpha)^4*sin(beta) + \\
&3*alpha1d^2*ra^2*z^3*cos(alpha)^2*cos(beta)^3 + 2*rb*z^2*z1d^2*cos(alpha)*sin(beta) - \\
&2*alpha1d*beta1d*ra*z^4*sin(alpha) - 2*beta1d*ra*z^3*z1d*cos(alpha) + \\
&2*alpha1d^2*ra^4*z*cos(alpha)^2*cos(beta) - 5*alpha1d^2*ra^4*z*cos(alpha)^4*cos(beta) + \\
&2*alpha1d^2*rb^4*z*cos(alpha)^2*cos(beta) - 2*alpha1d^2*rb^4*z*cos(alpha)^4*cos(beta) - \\
&beta1d^2*ra^4*z*cos(alpha)^4*cos(beta) + alpha1d^2*ra^4*rb*cos(alpha)^5*sin(beta) - \\
&beta1d^2*ra^4*rb*cos(alpha)^5*sin(beta) - 2*alpha1d^2*rb^3*z^2*cos(alpha)*sin(beta) - \\
&4*ra^2*z^2*z1d^2*cos(alpha)^2*cos(beta) - 2*rb^2*z^2*z1d^2*cos(alpha)^2*cos(beta) + \\
&2*ra^2*rb*z1d^2*cos(alpha)^3*sin(beta) - 6*beta1d*ra^3*z*z1d*cos(alpha)^3 - \\
&alpha1d^2*ra^5*cos(alpha)^5*cos(beta)*sin(beta) - 3*alpha1d^2*ra^2*z^3*cos(alpha)^2*cos(beta) + \\
&3*alpha1d^2*ra^4*z*cos(alpha)^4*cos(beta)^3 + beta1d^2*ra^2*z^3*cos(alpha)^2*cos(beta) + \\
&4*ra*rb*z*z1d^2*cos(alpha)^2 + alpha1d^2*ra^2*rb^3*cos(alpha)^5*sin(beta) + \\
&beta1d^2*ra^2*rb^3*cos(alpha)^5*sin(beta) + 2*alpha1d^2*rb^3*z^2*cos(alpha)^3*sin(beta) - \\
&2*ra^3*z1d^2*cos(alpha)^3*cos(beta)*sin(beta) + 2*ra^2*z^2*z1d^2*cos(alpha)^2*cos(beta)^3 + \\
&2*beta1d*ra*rb^2*z^2*z1d*cos(alpha)^3 - alpha1d^2*ra*rb^4*cos(alpha)^5*cos(beta)*sin(beta) - \\
&beta1d^2*ra*rb^4*cos(alpha)^5*cos(beta)*sin(beta) + 8*alpha1d^2*ra^2*rb^2*z*cos(alpha)^2*cos(beta) - \\
&3*alpha1d^2*ra*rb*z^3*cos(alpha)^2*cos(beta)^2 - 6*alpha1d^2*ra*rb^3*z*cos(alpha)^2*cos(beta)^2 - \\
&6*alpha1d^2*ra^3*rb*z*cos(alpha)^2*cos(beta)^2 - 13*alpha1d^2*ra^2*rb^2*z*cos(alpha)^4*cos(beta) + \\
&5*alpha1d^2*ra*rb^3*z*cos(alpha)^4*cos(beta)^2 + 7*alpha1d^2*ra^3*rb*z*cos(alpha)^4*cos(beta)^2 - \\
&4*alpha1d^2*ra^3*rb*z*cos(alpha)^4*cos(beta)^4 - 2*beta1d^2*ra*rb^3*z*cos(alpha)^2*cos(beta)^2 + \\
&beta1d^2*ra^2*rb^2*z*cos(alpha)^4*cos(beta) - 2*beta1d^2*ra*rb^3*z*cos(alpha)^4*cos(beta)^2 + \\
&2*beta1d^2*ra^3*rb*z*cos(alpha)^4*cos(beta)^2 + 4*alpha1d^2*ra^3*z^2*cos(alpha)*cos(beta)*sin(beta) + \\
&2*alpha1d*rb*z^3*z1d*sin(alpha)*sin(beta) + 7*alpha1d^2*ra^2*rb*z^2*cos(alpha)^3*sin(beta) + \\
&beta1d^2*ra^2*rb*z^2*cos(alpha)^3*sin(beta) - 2*ra*rb^2*z1d^2*cos(alpha)^3*cos(beta)*sin(beta) + \\
&2*alpha1d*beta1d*ra*z^4*cos(beta)^2*sin(alpha) + 2*beta1d*ra*z^3*z1d*cos(alpha)*cos(beta)^2 -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*ra*rb^3*z_1d*\cos(\alpha)^3*\sin(\alpha) - 2*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^3*\sin(\alpha) - \\
& 4*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 3*\alpha_1d^2*ra^4*rb*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& \beta_1d^2*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + 4*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^2*\cos(\beta)^3 \\
& + \alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^4*\cos(\beta)^3 - 7*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) \\
& - \beta_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + 2*ra^2*rb*z_1d^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) \\
& - 6*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^2*\sin(\alpha) + 2*\alpha_1d*ra^4*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) \\
& + 2*\alpha_1d*rb^4*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) + \beta_1d^2*ra^2*z^4*\cos(\alpha)*\cos(\beta)*\sin(\beta) + \\
& 2*\beta_1d*ra^3*z*z_1d*\cos(\alpha)^3*\cos(\beta)^2 - 4*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)*\sin(\beta) + \\
& 2*\beta_1d*ra^2*rb^2*z_1d*\cos(\alpha)^4*\sin(\beta) - 6*\beta_1d*ra^2*z^2*z_1d*\cos(\alpha)^2*\sin(\beta) + \\
& 3*\alpha_1d^2*ra^2*rb^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\beta) - 2*ra*z^2*z_1d^2*\cos(\alpha)*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)^3*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^2*\sin(\alpha) - \\
& 6*\alpha_1d*\beta_1d*ra^2*z^3*\cos(\alpha)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^4*z*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta_1d*ra*rb^3*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& 2*\beta_1d*ra^3*rb*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - 6*\beta_1d*ra*rb^2*z*z_1d*\cos(\alpha)^3*\cos(\beta)^2 - \\
& 2*\alpha_1d*ra^2*z^2*z_1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*rb^2*z^2*z_1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*rb^3*z*z_1d*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) + \\
& 5*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) + 2*\alpha_1d*ra*rb*z^2*z_1d*\cos(\alpha)*\sin(\alpha) \\
& + 8*\alpha_1d*ra^2*rb^2*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha_1d*ra*rb^3*z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 8*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)*\cos(\beta)*\sin(\beta) + 8*\beta_1d*ra^2*rb*z*z_1d*\cos(\alpha)^3*\cos(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*ra^z^3*z_1d*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^2*rb^2*z_1d*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) - \\
& 6*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)*\cos(\beta)^2*\sin(\beta) - \\
& 9*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*ra*rb*z^2*z_1d*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) + \\
& 6*\beta_1d*ra*rb*z^2*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha_1d*\beta_1d*ra^2*rb*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 6*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra*rb^3*z*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha_1d*ra*rb^2*z*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha)*\sin(\beta)))/(ra^6*\cos(\alpha)^6 + \\
& rb^6*\cos(\alpha)^6 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 + \\
& 15*ra^2*z^4*\cos(\alpha)^2 + 15*ra^4*z^2*\cos(\alpha)^4 + 3*rb^2*z^4*\cos(\alpha)^2 + \\
& 3*rb^4*z^2*\cos(\alpha)^4 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 + 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) + \\
& 6*ra^z^5*\cos(\alpha)*\sin(\beta) + 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 +
\end{aligned}$$

$$\begin{aligned}
& 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 - \\
& 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 6*ra^5*z*cos(alpha)^5*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + \\
& 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta)); \\
YC1232 = & (7*alpha1d^2*ra^4*rb*z*cos(alpha)^5 - 2*alpha1d^2*ra^2*rb*z^3*cos(alpha) - \\
& 2*alpha1d^2*ra^4*rb*z*cos(alpha)^3 - alpha1d*beta1d*ra^2*z^4*sin(2*alpha) - \\
& 5*alpha1d^2*ra^4*rb*z*cos(alpha)^7 - beta1d^2*ra^4*rb*z*cos(alpha)^5 + beta1d^2*ra^4*rb*z*cos(alpha)^7 - \\
& 2*beta1d*ra^5*z1d*cos(alpha)^5*sin(beta) + 2*beta1d*ra^5*z1d*cos(alpha)^7*sin(beta) - \\
& 2*beta1d*ra^2*z^3*z1d*cos(alpha)^2 + 2*beta1d*ra^2*z^3*z1d*cos(alpha)^4 + \\
& 5*alpha1d^2*ra^3*z^3*cos(alpha)^3*cos(beta)^3 - 3*alpha1d^2*ra^3*z^3*cos(alpha)^5*cos(beta)^3 + \\
& 4*ra^2*rb*z*z1d^2*cos(alpha)^3 - 4*ra^2*rb*z*z1d^2*cos(alpha)^5 + \\
& 2*alpha1d^2*ra^3*z^3*cos(alpha)*cos(beta) + 2*alpha1d^2*ra^5*z*cos(alpha)^3*cos(beta) - \\
& 7*alpha1d^2*ra^5*z*cos(alpha)^5*cos(beta) + 5*alpha1d^2*ra^5*z*cos(alpha)^7*cos(beta) - \\
& beta1d^2*ra^5*z*cos(alpha)^5*cos(beta) + beta1d^2*ra^5*z*cos(alpha)^7*cos(beta) + \\
& alpha1d^2*ra^5*rb*cos(alpha)^6*sin(beta) - alpha1d^2*ra^5*rb*cos(alpha)^8*sin(beta) - \\
& beta1d^2*ra^5*rb*cos(alpha)^6*sin(beta) + beta1d^2*ra^5*rb*cos(alpha)^8*sin(beta) + \\
& 5*alpha1d^2*ra^2*rb*z^3*cos(alpha)^3 - 2*alpha1d^2*ra^2*rb^3*z*cos(alpha)^3 - \\
& 3*alpha1d^2*ra^2*rb*z^3*cos(alpha)^5 + 3*alpha1d^2*ra^2*rb^3*z*cos(alpha)^5 - \\
& alpha1d^2*ra^2*rb^3*z*cos(alpha)^7 + beta1d^2*ra^2*rb*z^3*cos(alpha)^3 - \\
& beta1d^2*ra^2*rb^3*z*cos(alpha)^5 + beta1d^2*ra^2*rb^3*z*cos(alpha)^5 - \\
& beta1d^2*ra^2*rb^3*z*cos(alpha)^7 - 4*ra^3*z*z1d^2*cos(alpha)^3*cos(beta) + \\
& 4*ra^3*z*z1d^2*cos(alpha)^5*cos(beta) + 2*ra^3*rb*z1d^2*cos(alpha)^4*sin(beta) - \\
& 2*ra^3*rb*z1d^2*cos(alpha)^6*sin(beta) - 6*beta1d*ra^4*z*z1d*cos(alpha)^4 + \\
& 6*beta1d*ra^4*z*z1d*cos(alpha)^6 - alpha1d^2*ra^6*cos(alpha)^6*cos(beta)*sin(beta) + \\
& alpha1d^2*ra^6*cos(alpha)^8*cos(beta)*sin(beta) - 2*alpha1d^2*ra^3*z^3*cos(alpha)*cos(beta)^3 - \\
& 5*alpha1d^2*ra^3*z^3*cos(alpha)^3*cos(beta) + 3*alpha1d^2*ra^3*z^3*cos(alpha)^5*cos(beta) + \\
& 5*alpha1d^2*ra^5*z*cos(alpha)^5*cos(beta)^3 - 5*alpha1d^2*ra^5*z*cos(alpha)^7*cos(beta)^3 + \\
& beta1d^2*ra^3*z^3*cos(alpha)^3*cos(beta) - beta1d^2*ra^3*z^3*cos(alpha)^5*cos(beta) + \\
& alpha1d^2*ra^3*rb^3*cos(alpha)^6*sin(beta) - alpha1d^2*ra^3*rb^3*cos(alpha)^8*sin(beta) + \\
& beta1d^2*ra^3*rb^3*cos(alpha)^6*sin(beta) - beta1d^2*ra^3*rb^3*cos(alpha)^8*sin(beta) - \\
& 2*ra^4*z1d^2*cos(alpha)^4*cos(beta)*sin(beta) + 2*ra^4*z1d^2*cos(alpha)^6*cos(beta)*sin(beta) + \\
& 2*ra^3*z*z1d^2*cos(alpha)^3*cos(beta)^3 - 2*ra^3*z*z1d^2*cos(alpha)^5*cos(beta)^3 + \\
& 2*alpha1d*beta1d*ra^6*cos(alpha)^7*cos(beta)^2*sin(alpha) + 2*alpha1d*ra^2*rb*z^2*z1d*(sin(alpha) - \\
& sin(alpha)^3) + 2*alpha1d^2*ra^2*rb*z^3*cos(alpha)*cos(beta)^2 + \\
& 8*alpha1d^2*ra^3*rb^2*z*cos(alpha)^3*cos(beta) - 6*alpha1d^2*ra^4*rb*z*cos(alpha)^3*cos(beta)^2 - \\
& 15*alpha1d^2*ra^3*rb^2*z*cos(alpha)^5*cos(beta) + 7*alpha1d^2*ra^4*rb*z*cos(alpha)^5*cos(beta)^2 + \\
& 7*alpha1d^2*ra^3*rb^2*z*cos(alpha)^7*cos(beta) - 6*alpha1d^2*ra^4*rb*z*cos(alpha)^5*cos(beta)^4 - \\
& alpha1d^2*ra^4*rb*z*cos(alpha)^7*cos(beta)^2 + 6*alpha1d^2*ra^4*rb*z*cos(alpha)^7*cos(beta)^4 + \\
& beta1d^2*ra^3*rb^2*z*cos(alpha)^5*cos(beta) + 2*beta1d^2*ra^4*rb*z*cos(alpha)^5*cos(beta)^2 - \\
& beta1d^2*ra^3*rb^2*z*cos(alpha)^7*cos(beta) - 2*beta1d^2*ra^4*rb*z*cos(alpha)^7*cos(beta)^2 + \\
& 2*alpha1d*ra^5*z1d*cos(alpha)^6*cos(beta)^3*sin(alpha) + 2*beta1d*ra^2*z^3*z1d*cos(alpha)^2*cos(beta)^2
\end{aligned}$$

$$\begin{aligned}
& - 2*\beta_1d^2r^2z^3z_1d*\cos(\alpha)^4*\cos(\beta)^2 - 2*\alpha_1d^2r^2rb^3z^2*\cos(\alpha)^2*\sin(\beta) - \\
& 4*\alpha_1d^2r^2ra^3rb^z^2*\cos(\alpha)^2*\sin(\beta) + 2*\alpha_1d^2r^2ra^3rb^z^2*\cos(\alpha)^4*\sin(\beta) + \\
& 11*\alpha_1d^2r^2ra^3rb^z^2*\cos(\alpha)^4*\sin(\beta) - 7*\alpha_1d^2r^2ra^3rb^z^2*\cos(\alpha)^6*\sin(\beta) + \\
& \beta_1d^2r^2ra^3rb^z^2*\cos(\alpha)^4*\sin(\beta) - \beta_1d^2r^2ra^3rb^z^2*\cos(\alpha)^6*\sin(\beta) - \\
& 2*\alpha_1d^2r^2ra^4rb^z_1d*\cos(\alpha)^4*\sin(\alpha) + 2*\alpha_1d^2r^2ra^4rb^z_1d*\cos(\alpha)^6*\sin(\alpha) + \\
& 2*\beta_1d^2r^2r^2b^2z^2z_1d*\cos(\alpha)^4 - 2*\beta_1d^2r^2r^2b^2z^2z_1d*\cos(\alpha)^6 - \\
& \alpha_1d^2r^2r^2b^4*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& 4*\alpha_1d^2r^2r^4b^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\
& 3*\alpha_1d^2r^2r^5b*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) + \\
& \alpha_1d^2r^2r^2b^4*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha_1d^2r^2r^4b^2*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) - \\
& 3*\alpha_1d^2r^2r^5b*\cos(\alpha)^8*\cos(\beta)^2*\sin(\beta) - \\
& \beta_1d^2r^2r^2b^4*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \beta_1d^2r^2r^4b^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) \\
& + \beta_1d^2r^2r^2b^4*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) - \\
& \beta_1d^2r^2r^4b^2*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) - 5*\alpha_1d^2r^2r^2b^z^3*\cos(\alpha)^3*\cos(\beta)^2 - \\
& 6*\alpha_1d^2r^2r^2b^3z^*\cos(\alpha)^3*\cos(\beta)^2 + 4*\alpha_1d^2r^2r^3b^2z^*\cos(\alpha)^3*\cos(\beta)^3 + \\
& 3*\alpha_1d^2r^2r^2b^z^3*\cos(\alpha)^5*\cos(\beta)^2 + 5*\alpha_1d^2r^2r^2b^3z^*\cos(\alpha)^5*\cos(\beta)^2 + \\
& 3*\alpha_1d^2r^2r^3b^2z^*\cos(\alpha)^5*\cos(\beta)^3 + \alpha_1d^2r^2r^2b^3z^*\cos(\alpha)^7*\cos(\beta)^2 - \\
& 7*\alpha_1d^2r^2r^3b^2z^*\cos(\alpha)^7*\cos(\beta)^3 - 2*\beta_1d^2r^2r^2b^z^3*\cos(\alpha)^3*\cos(\beta)^2 + \\
& 2*\beta_1d^2r^2r^2b^z^3*\cos(\alpha)^5*\cos(\beta)^2 - 2*\beta_1d^2r^2r^2b^3z^*\cos(\alpha)^5*\cos(\beta)^2 + \\
& 2*\beta_1d^2r^2r^2b^3z^*\cos(\alpha)^7*\cos(\beta)^2 + 4*\alpha_1d^2r^2r^4z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) \\
& - 11*\alpha_1d^2r^2r^4z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& 7*\alpha_1d^2r^2r^4z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\
& \beta_1d^2r^2r^2z^4*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) - \beta_1d^2r^2r^2z^4*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& \beta_1d^2r^2r^4z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \beta_1d^2r^2r^4z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& 2*r^2r^2b^2z_1d^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + 2*r^2r^2b^2z_1d^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) + \\
& 2*r^2r^2b^2z_1d^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - 2*r^2r^2b^2z_1d^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) - \\
& 2*r^2r^2z^2z_1d^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + 2*r^2r^2z^2z_1d^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*r^4b^2*\cos(\alpha)^7*\sin(\alpha) + 2*\alpha_1d*\beta_1d*r^4z^4*\cos(\alpha)^3*\sin(\alpha) - \\
& 6*\alpha_1d*\beta_1d*r^4z^2*\cos(\alpha)^3*\sin(\alpha) + 6*\alpha_1d*\beta_1d*r^4z^2*\cos(\alpha)^5*\sin(\alpha) + \\
& 2*\alpha_1d^2r^2r^4b^2*\cos(\alpha)^3*\cos(\beta) - 2*\alpha_1d^2r^2r^4b^2*\cos(\alpha)^5*\cos(\beta) + \\
& 2*\alpha_1d^2r^2r^5z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - 2*\alpha_1d^2r^2r^5z_1d*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) \\
& + 2*\beta_1d^2r^2r^4z^2z_1d*\cos(\alpha)^4*\cos(\beta)^2 - 2*\beta_1d^2r^2r^4z^2z_1d*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 2*\alpha_1d^2r^2r^2b^3z_1d*\cos(\alpha)^4*\sin(\alpha) + 2*\beta_1d^2r^2r^2b^3z_1d*\cos(\alpha)^5*\sin(\beta) - \\
& 2*\beta_1d^2r^2r^3b^2z_1d*\cos(\alpha)^7*\sin(\beta) - 6*\beta_1d^2r^2r^3z^2z_1d*\cos(\alpha)^3*\sin(\beta) + \\
& 6*\beta_1d^2r^2r^3z^2z_1d*\cos(\alpha)^5*\sin(\beta) - 2*r^2r^2b^2z^2z_1d^2*\cos(\alpha)^3*\cos(\beta) + \\
& 2*r^2r^2b^2z^2z_1d^2*\cos(\alpha)^5*\cos(\beta) + 3*\alpha_1d^2r^2r^3b^3*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha_1d^2r^2r^4b^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\beta) - \\
& 3*\alpha_1d^2r^2r^3b^3*\cos(\alpha)^8*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha_1d^2r^2r^4b^2*\cos(\alpha)^8*\cos(\beta)^3*\sin(\beta) + \\
& 4*\alpha_1d^2r^2r^4z^2*\cos(\alpha)^4*\cos(\beta)^3*\sin(\beta) - \\
& 4*\alpha_1d^2r^2r^4z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\beta) + 2*r^2r^2b^z^2z_1d^2*\cos(\alpha)^2*\sin(\beta) - \\
& 2*r^2r^2b^z^2z_1d^2*\cos(\alpha)^4*\sin(\beta) + 6*\alpha_1d*\beta_1d*r^3z^3*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) \\
& - 4*\alpha_1d*\beta_1d*r^5b*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*r^5z^*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*r^5z^*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^2r^2r^4z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& 2*\beta_1d^*r_a^4*r_b*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 2*\beta_1d^*r_a^4*r_b*z_1d*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - 2*\alpha_1d^*r_a^2*r_b*z^2*z_1d*\cos(\alpha)^4*\sin(\alpha) \\
& + 8*\alpha_1d^2*r_a^2*r_b^2*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) - \\
& 6*\alpha_1d^2*r_a^3*r_b*z^2*\cos(\alpha)^2*\cos(\beta)^2*\sin(\beta) - \\
& 11*\alpha_1d^2*r_a^2*r_b^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& 5*\alpha_1d^2*r_a^3*r_b*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) + \\
& 3*\alpha_1d^2*r_a^2*r_b^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\
& \alpha_1d^2*r_a^3*r_b*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) - \\
& 4*\alpha_1d*\beta_1d^*r_a^3*r_b^3*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d^*r_a^5*r_b*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d^*r_a^2*z^4*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d^*r_a^2*r_b^2*z^2*\cos(\alpha)^3*\sin(\alpha) + \\
& 6*\alpha_1d*\beta_1d^*r_a^3*z^3*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha_1d^*r_a^3*r_b^2*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha_1d^*r_a^4*r_b*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d^*r_a^3*r_b^2*z_1d*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d^*r_a^4*r_b*z_1d*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) - \\
& 2*\beta_1d^*r_a^2*r_b^3*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\beta_1d^*r_a^2*r_b^3*z_1d*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 6*\beta_1d^*r_a^2*r_b^2*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)^2 + 6*\beta_1d^*r_a^2*r_b^2*z^2*z_1d*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 2*\alpha_1d^*r_a^3*z^2*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d^*r_a^3*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + 8*\beta_1d^*r_a^3*r_b*z^2*z_1d*\cos(\alpha)^4*\cos(\beta) - \\
& 8*\beta_1d^*r_a^3*r_b*z^2*z_1d*\cos(\alpha)^6*\cos(\beta) + \\
& 2*\alpha_1d*\beta_1d^*r_a^2*r_b^4*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + \\
& 8*\alpha_1d*\beta_1d^*r_a^4*r_b^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d^*r_a^3*r_b^3*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d^*r_a^4*r_b^2*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d^*r_a^2*z^4*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d^*r_a^4*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d^*r_a^4*z^2*\cos(\alpha)^5*\cos(\beta)^4*\sin(\alpha) - \\
& 6*\alpha_1d^*r_a^2*r_b^3*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d^*r_a^3*r_b^2*z_1d*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d^*r_a^3*r_b^2*z_1d*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d^*r_a^3*r_b^2*z^2*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d^*r_a^3*r_b^2*z^2*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d^*r_a*r_b^2*z^2*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d^*r_a*r_b^2*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 6*\beta_1d^*r_a^2*r_b*z^2*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 6*\beta_1d^*r_a^2*r_b*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d^*r_a^2*z^3*z_1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^*r_a^4*z^2*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d^*r_a^4*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d^*r_a^3*r_b*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d^*r_a^5*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^*r_a*r_b*z^3*z_1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^*r_a^2*r_b*z^2*z_1d*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d^*r_a^2*r_b*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*ra^2*z^3*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^4*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*ra*rb*z^3*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra*rb^3*z^2*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha_1d*\beta_1d*ra^3*rb*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 12*\alpha_1d*\beta_1d*ra^3*rb*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 8*\alpha_1d*\beta_1d*ra^3*rb^2*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^4*rb*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 10*\alpha_1d*\beta_1d*ra^4*rb*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha_1d*\beta_1d*ra^2*rb*z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*\beta_1d*ra^2*rb*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^3*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^3*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*\beta_1d*ra^4*rb*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha_1d*ra^2*rb^2*z^2*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta))/ (ra^6*\cos(\alpha)^6 - \\
& ra^6*\cos(\alpha)^8 + rb^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + \\
& 3*ra^4*rb^2*\cos(\alpha)^6 - ra^2*rb^4*\cos(\alpha)^8 - 2*ra^4*rb^2*\cos(\alpha)^8 + 15*ra^2*z^4*\cos(\alpha)^2 - \\
& 15*ra^2*z^4*\cos(\alpha)^4 + 15*ra^4*z^2*\cos(\alpha)^4 - 15*ra^4*z^2*\cos(\alpha)^6 + \\
& 3*rb^2*z^4*\cos(\alpha)^2 - 2*rb^2*z^4*\cos(\alpha)^4 + 3*rb^4*z^2*\cos(\alpha)^4 - rb^4*z^2*\cos(\alpha)^6 + \\
& ra^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 12*ra^2*rb^2*z^2*\cos(\alpha)^6 + \\
& 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) - 20*ra^3*z^3*\cos(\alpha)^5*\sin(\beta) + 6*ra*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 + ra^2*rb^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*ra^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) + 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta) - \\
& 6*ra*z^5*\cos(\alpha)^3*\sin(\beta) + 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) - 6*ra^5*z*\cos(\alpha)^7*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) + 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta)^3 - 6*ra*rb*z^4*\cos(\alpha)^2*\cos(\beta) + 4*ra*rb*z^4*\cos(\alpha)^4*\cos(\beta) \\
& + 6*ra*rb^4*z*\cos(\alpha)^5*\sin(\beta) - 2*ra*rb^4*z*\cos(\alpha)^7*\sin(\beta) + \\
& 6*ra^2*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) + \\
& 12*ra^3*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - 12*ra*rb^3*z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 36*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta) + 4*ra*rb^3*z^2*\cos(\alpha)^6*\cos(\beta) + \\
& 24*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta) + 12*ra*rb^2*z^3*\cos(\alpha)^3*\sin(\beta) - \\
& 8*ra*rb^2*z^3*\cos(\alpha)^5*\sin(\beta) + 12*ra^3*rb^2*z*\cos(\alpha)^5*\sin(\beta) - \\
& 8*ra^3*rb^2*z*\cos(\alpha)^7*\sin(\beta) + 24*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta)^3 - \\
& 20*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta)^3 + 4*ra^5*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
& 24*ra^2*rb*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + 16*ra^2*rb*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 24*ra^2*rb^3*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + 8*ra^2*rb^3*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
YC1233=& (ra*cos(alpha)^4*(rb - ra*cos(beta)))^2*(2*alpha1d^2*rb*z^4*sin(beta) - alpha1d^2*ra*z^4*sin(2*beta) - \\
& 3*alpha1d^2*ra*rb*z^3*cos(alpha)^3 + alpha1d^2*ra*rb^3*z*cos(alpha)^5 + \\
& 3*alpha1d^2*ra^3*rb*z*cos(alpha)^5 + beta1d^2*ra*rb^3*cos(alpha)^3 + beta1d^2*ra*rb^3*z*cos(alpha)^5 \\
& - beta1d^2*ra^3*rb*z*cos(alpha)^5 - 2*beta1d*ra^4*z1d*cos(alpha)^5*sin(beta) - \\
& alpha1d^2*ra^2*z^3*cos(alpha)^3*cos(beta)^3 - 4*alpha1d^2*ra^2*z^3*cos(alpha)*cos(beta) - \\
& 3*alpha1d^2*ra^4*z*cos(alpha)^5*cos(beta) - 2*alpha1d^2*rb^2*z^3*cos(alpha)*cos(beta) - \\
& beta1d^2*ra^4*z*cos(alpha)^5*cos(beta) + alpha1d^2*ra^4*rb*cos(alpha)^6*sin(beta) - \\
& beta1d^2*ra^4*rb*cos(alpha)^6*sin(beta) - 2*alpha1d^2*rb*z^4*cos(alpha)^2*sin(beta) - \\
& 4*ra^2*z^21d^2*cos(alpha)^3*cos(beta) - 2*rb^2*z^21d^2*cos(alpha)^3*cos(beta) + \\
& 2*ra^2*rb*z1d^2*cos(alpha)^4*sin(beta) + 2*rb*z^2*z1d^2*cos(alpha)^2*sin(beta) - \\
& 2*alpha1d*beta1d*ra*z^4*sin(2*alpha) + 4*alpha1d^2*ra*rb*z^3*cos(alpha) - \\
& 2*beta1d*ra*z^3*z1d*cos(alpha)^2 - 6*beta1d*ra^3*z*z1d*cos(alpha)^4 - \\
& alpha1d^2*ra^5*cos(alpha)^6*cos(beta)*sin(beta) + 2*alpha1d^2*ra^2*z^3*cos(alpha)*cos(beta)^3 + \\
& 3*alpha1d^2*ra^2*z^3*cos(alpha)^3*cos(beta) + 3*alpha1d^2*ra^4*z*cos(alpha)^5*cos(beta)^3 + \\
& 2*alpha1d^2*rb^2*z^3*cos(alpha)^3*cos(beta) + beta1d^2*ra^2*z^3*cos(alpha)^3*cos(beta) + \\
& 4*ra*rb*z^21d^2*cos(alpha)^3 + alpha1d^2*ra^2*rb^3*cos(alpha)^6*sin(beta) + \\
& beta1d^2*ra^2*rb^3*cos(alpha)^6*sin(beta) - 2*ra^3*z1d^2*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 2*ra^2*z^21d^2*cos(alpha)^3*cos(beta)^3 - 2*alpha1d*beta1d*ra^5*cos(alpha)^5*sin(alpha) + \\
& 2*beta1d*ra*rb^2*z^21d*cos(alpha)^4 - alpha1d^2*ra*rb^4*cos(alpha)^6*cos(beta)*sin(beta) - \\
& beta1d^2*ra*rb^4*cos(alpha)^6*cos(beta)*sin(beta) - alpha1d^2*ra*rb*z^3*cos(alpha)^3*cos(beta)^2 - \\
& 5*alpha1d^2*ra^2*rb^2*z*cos(alpha)^5*cos(beta) - alpha1d^2*ra*rb^3*z*cos(alpha)^5*cos(beta)^2 + \\
& alpha1d^2*ra^3*rb*z*cos(alpha)^5*cos(beta)^2 - 4*alpha1d^2*ra^3*rb*z*cos(alpha)^5*cos(beta)^4 - \\
& 2*beta1d^2*ra*rb*z^3*cos(alpha)^3*cos(beta)^2 + beta1d^2*ra^2*rb^2*z*cos(alpha)^5*cos(beta) - \\
& 2*beta1d^2*ra*rb^3*z*cos(alpha)^5*cos(beta)^2 + 2*beta1d^2*ra^3*rb*z*cos(alpha)^5*cos(beta)^2 + \\
& 2*alpha1d^2*ra*z^4*cos(alpha)^2*cos(beta)*sin(beta) + beta1d^2*ra*z^4*cos(alpha)^2*cos(beta)*sin(beta) + \\
& 2*alpha1d^2*ra^2*rb*z^2*cos(alpha)^2*sin(beta) + alpha1d^2*ra^2*rb*z^2*cos(alpha)^4*sin(beta) + \\
& beta1d^2*ra^2*rb*z^2*cos(alpha)^4*sin(beta) - 2*ra*rb^2*z1d^2*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 2*ra*z^2*z1d^2*cos(alpha)^2*cos(beta)*sin(beta) - 4*alpha1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)*sin(beta) + \\
& 3*alpha1d^2*ra^4*rb*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& beta1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)*sin(beta) + 5*alpha1d^2*ra^2*rb^2*z*cos(alpha)^5*cos(beta)^3 - \\
& 2*alpha1d^2*ra^3*z^2*cos(alpha)^2*cos(beta)*sin(beta) - \\
& alpha1d^2*ra^3*z^2*cos(alpha)^4*cos(beta)*sin(beta) - beta1d^2*ra^3*z^2*cos(alpha)^4*cos(beta)*sin(beta) \\
& + 2*ra^2*rb*z1d^2*cos(alpha)^4*cos(beta)^2*sin(beta) - 2*alpha1d*beta1d*ra^3*rb^2*cos(alpha)^5*sin(alpha) \\
& + 8*alpha1d*ra*rb*z^2*z1d*(sin(alpha) - sin(alpha)^3) - 18*alpha1d*beta1d*ra^3*z^2*cos(alpha)^3*sin(alpha) + \\
& 2*beta1d*ra*z^3*z1d*cos(alpha)^2*cos(beta)^2 + 2*beta1d*ra^3*z*z1d*cos(alpha)^4*cos(beta)^2 + \\
& 2*beta1d*ra^2*rb^2*z1d*cos(alpha)^5*sin(beta) - 6*beta1d*ra^2*z^2*z1d*cos(alpha)^3*sin(beta) + \\
& 3*alpha1d^2*ra^2*rb^3*cos(alpha)^6*cos(beta)^2*sin(beta) - \\
& 2*alpha1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)^3*sin(beta) + \\
& 2*alpha1d^2*ra^3*z^2*cos(alpha)^4*cos(beta)^3*sin(beta) + \\
& 4*alpha1d*ra^2*z^2*z1d*cos(alpha)^2*cos(beta)^3*sin(alpha) + \\
& 14*alpha1d*beta1d*ra^2*z^3*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) + \\
& 8*alpha1d*beta1d*ra^4*rb*cos(alpha)^5*cos(beta)*sin(alpha) + \\
& 4*alpha1d*beta1d*ra*z^4*cos(alpha)*cos(beta)^2*sin(alpha) - \\
& 10*alpha1d*beta1d*ra^4*z*cos(alpha)^4*sin(alpha)*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*\beta_1d*ra*rb^3z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\beta_1d*ra^3*rb*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - 6*\beta_1d*ra*rb^2z^2z_1d*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 2*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^2*\cos(\beta)^2*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra*rb^4*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) - \\
& 8*\alpha_1d*ra^2z^2z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) - \\
& 4*\alpha_1d*rb^2z^2z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + 8*\beta_1d*ra^2*rb*z^2z_1d*\cos(\alpha)^4*\cos(\beta) - \\
& 10*\alpha_1d*\beta_1d*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^3*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) + \\
& 12*\alpha_1d*\beta_1d*ra^3z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*rb*z^3z_1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d^2*ra*rb^2z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + \\
& \alpha_1d^2*ra*rb^2z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2z^2*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*ra^3z^2z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*\beta_1d*ra*rb^2z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 12*\alpha_1d*\beta_1d*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) + \\
& 6*\beta_1d*ra*rb*z^2z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 4*\alpha_1d*ra^3z^2z_1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^2z^3*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^2*rb*z^2z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 24*\alpha_1d*\beta_1d*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 12*\alpha_1d*\beta_1d*ra^2*rb^2z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 10*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra*rb^3z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 22*\alpha_1d*\beta_1d*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*ra*rb^2z^2z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^2*rb*z^2z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta)))/(ra^8*\cos(\alpha)^8 - \\
& ra^8*\cos(\alpha)^{10} + rb^8*\cos(\alpha)^8 - z^8*\cos(\alpha)^2 + z^8 + 4*ra^2*rb^6*\cos(\alpha)^8 + \\
& 6*ra^4*rb^4*\cos(\alpha)^8 + 4*ra^6*rb^2*\cos(\alpha)^8 - ra^2*rb^6*\cos(\alpha)^{10} - \\
& 3*ra^4*rb^4*\cos(\alpha)^{10} - 3*ra^6*rb^2*\cos(\alpha)^{10} + 28*ra^2z^6*\cos(\alpha)^2 - \\
& 28*ra^2z^6*\cos(\alpha)^4 + 70*ra^4z^4*\cos(\alpha)^4 - 70*ra^4z^4*\cos(\alpha)^6 + \\
& 28*ra^6z^2*\cos(\alpha)^6 - 28*ra^6z^2*\cos(\alpha)^8 + 4*rb^2z^6*\cos(\alpha)^2 - 3*rb^2z^6*\cos(\alpha)^4 \\
& + 6*rb^4z^4*\cos(\alpha)^4 - 3*rb^4z^4*\cos(\alpha)^6 + 4*rb^6z^2*\cos(\alpha)^6 - rb^6z^2*\cos(\alpha)^8 + \\
& ra^8*\cos(\alpha)^{10}*\cos(\beta)^2 + 60*ra^2*rb^2z^4*\cos(\alpha)^4 - 45*ra^2*rb^2z^4*\cos(\alpha)^6 + \\
& 36*ra^2*rb^4z^2*\cos(\alpha)^6 + 60*ra^4*rb^2z^2*\cos(\alpha)^6 - 18*ra^2*rb^4z^2*\cos(\alpha)^8 - \\
& 45*ra^4*rb^2z^2*\cos(\alpha)^8 + 56*ra^3z^5*\cos(\alpha)^3*\sin(\beta) - 56*ra^3z^5*\cos(\alpha)^5*\sin(\beta) + \\
& 56*ra^5z^3*\cos(\alpha)^5*\sin(\beta) - 56*ra^5z^3*\cos(\alpha)^7*\sin(\beta) + 8*ra^z^7*\cos(\alpha)*\sin(\beta) + \\
& 24*ra^2*rb^6*\cos(\alpha)^8*\cos(\beta)^2 + 48*ra^4*rb^4*\cos(\alpha)^8*\cos(\beta)^2 + \\
& 24*ra^6*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 32*ra^3*rb^5*\cos(\alpha)^8*\cos(\beta)^3 - \\
& 32*ra^5*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + ra^2*rb^6*\cos(\alpha)^{10}*\cos(\beta)^2 + \\
& 16*ra^4*rb^4*\cos(\alpha)^8*\cos(\beta)^4 - 9*ra^4*rb^4*\cos(\alpha)^{10}*\cos(\beta)^2 - \\
& 9*ra^6*rb^2*\cos(\alpha)^{10}*\cos(\beta)^2 - 6*ra^3*rb^5*\cos(\alpha)^{10}*\cos(\beta)^3 - \\
& 4*ra^5*rb^3*\cos(\alpha)^{10}*\cos(\beta)^3 + 12*ra^4*rb^4*\cos(\alpha)^{10}*\cos(\beta)^4 + \\
& 12*ra^6*rb^2*\cos(\alpha)^{10}*\cos(\beta)^4 - 8*ra^5*rb^3*\cos(\alpha)^{10}*\cos(\beta)^5 - \\
& 24*ra^2z^6*\cos(\alpha)^2*\cos(\beta)^2 + 25*ra^2z^6*\cos(\alpha)^4*\cos(\beta)^2 -
\end{aligned}$$

$$\begin{aligned}
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) - 8*ra^z^7*cos(alpha)^3*sin(beta) + 8*ra^7*z*cos(alpha)^7*sin(beta) - \\
& 8*ra^7*z*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb*z^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb*z^6*cos(alpha)^4*cos(beta) + 8*ra*rb^6*z*cos(alpha)^7*sin(beta) - 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 - \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) + 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb*z^2*cos(alpha)^8*cos(beta) + 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) - \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) + 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) - \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) + 24*ra^3*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) - \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 + \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) - 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) - 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) + 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) + \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) - 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) - \\
& 64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) - \\
& 36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) - 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) + 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta));
\end{aligned}$$

YC1234=0;

YC12=[YC1211 YC1212 YC1213 YC1214; YC1221 YC1222 YC1223 YC1224; YC1231 YC1232 YC1233 YC1234];

YG12

= [

$$-(e1*ga*(\cos(\alpha)^2)^{(3/2)}*(rb - ra*\cos(\beta))^2)/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}, 0, 0, 0$$

$$(e1*ga*\sin(\alpha)*(\cos(\alpha)^2)^{(3/2)}*(z^3 + ra^3*\cos(\alpha)^3*\sin(\beta) + 3*ra^2*z*\cos(\alpha)^2 + 3*ra*z^2*\cos(\alpha)*\sin(\beta) + ra*rb^2*\cos(\alpha)^3*\sin(\beta) - 3*ra^2*z*\cos(\alpha)^2*\cos(\beta)^2 - 2*ra^2*rb*\cos(\alpha)^3*\cos(\beta)*\sin(\beta)))/(\cos(\alpha)^3*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}), 0, 0, 0$$

$$(e1*ga*ra*\abs(\cos(\alpha))*\cos(\alpha)^2*(rb - ra*\cos(\beta))*(ra*\cos(\alpha) + z*\sin(\beta) - rb*\cos(\alpha)*\cos(\beta)))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}, 0, 0, 0];$$

Y2=YM12+YC12+YG12;

YM13

=[

$$-(e1^2*\cos(\alpha)*(ra - rb*\cos(\alpha))*(\alpha^2*d^z^2 - ra*z^2*d*\cos(\alpha) + rb*z^2*d*\cos(\alpha)^2 + \alpha^2*d^2*ra^2*\cos(\alpha)^2 - \alpha^2*d^2*ra*z*\sin(\alpha) - \alpha^2*d^2*ra*rb*\cos(\alpha)^3))/(ra^4*\cos(\alpha)^4 + rb^4*\cos(\alpha)^4 + z^4 + 2*ra^2*rb^2*\cos(\alpha)^4 + 4*ra^2*rb^2*\cos(\alpha)^6 + 2*ra^2*z^2*\cos(\alpha)^2 + 6*rb^2*z^2*\cos(\alpha)^2 - 4*rb^2*z^2*\cos(\alpha)^4 - 4*ra*rb^3*\cos(\alpha)^5 - 4*ra^3*rb*\cos(\alpha)^5 - 2*rb*z^3*\sin(2*\alpha) - 4*ra*rb*z^2*\cos(\alpha)^3 - 4*rb^3*z*\cos(\alpha)^3*\sin(\alpha) - 4*ra^2*rb*z*\cos(\alpha)^3*\sin(\alpha) + 8*ra*rb^2*z*\cos(\alpha)^4*\sin(\alpha)), 0,$$

$$-(\cos(\alpha)*(ra - rb*\cos(\alpha))*(\alpha^2*d^z^2 - ra*z^2*d*\cos(\alpha) + rb*z^2*d*\cos(\alpha)^2 + \alpha^2*d^2*ra^2*\cos(\alpha)^2 - \alpha^2*d^2*ra*z*\sin(\alpha) - \alpha^2*d^2*ra*rb*\cos(\alpha)^3))/(ra^4*\cos(\alpha)^4 + rb^4*\cos(\alpha)^4 + z^4 + 2*ra^2*rb^2*\cos(\alpha)^4 + 4*ra^2*rb^2*\cos(\alpha)^6 + 2*ra^2*z^2*\cos(\alpha)^2 + 6*rb^2*z^2*\cos(\alpha)^2 - 4*rb^2*z^2*\cos(\alpha)^4 - 4*ra*rb^3*\cos(\alpha)^5 - 4*ra^3*rb*\cos(\alpha)^5 - 2*rb*z^3*\sin(2*\alpha) - 4*ra*rb*z^2*\cos(\alpha)^3 - 4*rb^3*z*\cos(\alpha)^3*\sin(\alpha) - 4*ra^2*rb*z*\cos(\alpha)^3*\sin(\alpha) + 8*ra*rb^2*z*\cos(\alpha)^4*\sin(\alpha)), 0$$

$$(e1^2*(\alpha^2*d^z^4 + \alpha^2*d^2*ra^2*z^2 + \alpha^2*d^2*ra^4*\cos(\alpha)^4 - ra^3*z^2*d*\cos(\alpha)^3 - 2*\alpha^2*d^2*ra^3*rb*\cos(\alpha)^5 + 2*ra^2*rb*z^2*d*\cos(\alpha)^4 - ra*rb^2*z^2*d*\cos(\alpha)^5 + rb*z^2*z^2*d*\cos(\alpha)^2 + \alpha^2*d^2*ra^2*rb^2*\cos(\alpha)^6 + \alpha^2*d^2*ra^2*z^2*\cos(\alpha)^2 - 2*\alpha^2*d^2*ra*z^3*\sin(\alpha) - ra*z^2*z^2*d*\cos(\alpha) - 2*\alpha^2*d^2*ra^3*z*\cos(\alpha)^2*\sin(\alpha) - 2*\alpha^2*d^2*ra*rb*z^2*\cos(\alpha)^3 + ra^2*z^2*z^2*d*\cos(\alpha)*\sin(\alpha) - ra*rb*z^2*z^2*d*\cos(\alpha)^2*\sin(\alpha) + 2*\alpha^2*d^2*ra^2*rb*z*\cos(\alpha)^3*\sin(\alpha)))/(ra^4*\cos(\alpha)^4 + rb^4*\cos(\alpha)^4 + z^4 + 2*ra^2*rb^2*\cos(\alpha)^4 + 4*ra^2*rb^2*\cos(\alpha)^6 + 2*ra^2*z^2*\cos(\alpha)^2 + 6*rb^2*z^2*\cos(\alpha)^2 - 4*rb^2*z^2*\cos(\alpha)^4 - 4*ra*rb^3*\cos(\alpha)^5 - 4*ra^3*rb*\cos(\alpha)^5 - 2*rb*z^3*\sin(2*\alpha) - 4*ra*rb*z^2*\cos(\alpha)^3 - 4*rb^3*z*\cos(\alpha)^3*\sin(\alpha) - 4*ra^2*rb*z*\cos(\alpha)^3*\sin(\alpha) + 8*ra*rb^2*z*\cos(\alpha)^4*\sin(\alpha)), 0, (\alpha^2*d^z^4 + \alpha^2*d^2*ra^2*z^2 + \alpha^2*d^2*ra^4*\cos(\alpha)^4 - ra^3*z^2*d*\cos(\alpha)^3 - 2*\alpha^2*d^2*ra^3*rb*\cos(\alpha)^5 + 2*ra^2*rb*z^2*d*\cos(\alpha)^4 - ra*rb^2*z^2*d*\cos(\alpha)^5 + rb*z^2*z^2*d*\cos(\alpha)^2 + \alpha^2*d^2*ra^2*rb^2*\cos(\alpha)^6 + \alpha^2*d^2*ra^2*z^2*\cos(\alpha)^2 - 2*\alpha^2*d^2*ra^3*z*\sin(\alpha) - ra*z^2*z^2*d*\cos(\alpha) - 2*\alpha^2*d^2*ra^3*rb*\cos(\alpha)^2*\sin(\alpha) - 2*\alpha^2*d^2*ra*rb*z^2*\cos(\alpha)^3 + ra^2*z^2*z^2*d*\cos(\alpha)*\sin(\alpha) - ra*rb*z^2*z^2*d*\cos(\alpha)^2*\sin(\alpha) + 2*\alpha^2*d^2*ra^2*rb*z*\cos(\alpha)^3*\sin(\alpha)))/(ra^4*\cos(\alpha)^4 + rb^4*\cos(\alpha)^4 + z^4 + 2*ra^2*rb^2*\cos(\alpha)^4 + 4*ra^2*rb^2*\cos(\alpha)^6 + 2*ra^2*z^2*\cos(\alpha)^2 + 6*rb^2*z^2*\cos(\alpha)^2 - 4*rb^2*z^2*\cos(\alpha)^4 - 4*ra*rb^3*\cos(\alpha)^5 - 4*ra^3*rb*\cos(\alpha)^5 - 2*rb*z^3*\sin(2*\alpha) - 4*ra*rb*z^2*\cos(\alpha)^3 - 4*rb^3*z*\cos(\alpha)^3*\sin(\alpha) - 4*ra^2*rb*z*\cos(\alpha)^3*\sin(\alpha) + 8*ra*rb^2*z*\cos(\alpha)^4*\sin(\alpha)), 0$$

0, 0,

0, 0];

YC13

=[

$$\begin{aligned} & (e^{12\cos(\alpha)}(ra - rb\cos(\alpha))^{(2\alpha 1d^2rb^z^3 - 2rb^2z1d^2\cos(\alpha))^3\sin(\alpha) + \alpha 1d^2ra^z^3\cos(\alpha) + 2\alpha 1d^2ra^3z^2\cos(\alpha) + 2rb^z^2z1d^2\cos(\alpha)^2 - \alpha 1d^2ra^3z^2\cos(\alpha)^3 - 4\alpha 1d^2rb^z^3\cos(\alpha)^2 + 2\alpha 1d^2ra^3z1d^2(\sin(\alpha) - \sin(\alpha)^3) + 2ra^2rb^z1d^2(\sin(\alpha) - \sin(\alpha)^3) - 2ra^z^2z1d^2\cos(\alpha) - \alpha 1d^2rb^2z^2\sin(2\alpha) - 8\alpha 1d^2ra^2rb^z\cos(\alpha)^2 + 3\alpha 1d^2ra^2rb^2z^2\cos(\alpha)^3 + 4\alpha 1d^2ra^2rb^z\cos(\alpha)^4 - 2\alpha 1d^2ra^2rb^2z^2\cos(\alpha)^5 + 2\alpha 1d^2ra^2rb^2z1d^2(\sin(\alpha) - \sin(\alpha)^3) - 2\alpha 1d^2ra^z^2z1d^2\sin(\alpha) - \alpha 1d^2ra^2rb^3\cos(\alpha)^4\sin(\alpha) + \alpha 1d^2ra^3rb^2\cos(\alpha)^4\sin(\alpha) + 2\alpha 1d^2ra^2rb^2z^2\cos(\alpha) + 5\alpha 1d^2ra^2rb^z^2(\sin(\alpha) - \sin(\alpha)^3) - 4\alpha 1d^2rb^2z^2z1d^2\cos(\alpha)^2 - 2\alpha 1d^2ra^2rb^z^2\sin(\alpha) + 2\alpha 1d^2rb^z^2z1d^2\sin(2\alpha) - 8\alpha 1d^2ra^2rb^z1d^2\cos(\alpha)^3\sin(\alpha) + 4\alpha 1d^2ra^2rb^2z1d^2\cos(\alpha)^4\sin(\alpha) + 4\alpha 1d^2ra^2rb^z^2z1d^2\cos(\alpha)^3)/(ra^6\cos(\alpha)^6 + rb^6\cos(\alpha)^6 + z^6 + 3ra^2rb^4\cos(\alpha)^6 + 3ra^4rb^2\cos(\alpha)^6 - 12ra^3rb^3\cos(\alpha)^7 + 12ra^2rb^4\cos(\alpha)^8 + 12ra^4rb^2\cos(\alpha)^8 - 8ra^3rb^3\cos(\alpha)^9 + 3ra^2z^4\cos(\alpha)^2 + 3ra^4z^2\cos(\alpha)^4 + 15rb^2z^4\cos(\alpha)^2 - 12rb^2z^4\cos(\alpha)^4 + 15rb^4z^2\cos(\alpha)^4 - 12rb^4z^2\cos(\alpha)^6 - 6ra^2rb^5\cos(\alpha)^7 - 6ra^5rb^2\cos(\alpha)^7 - 3rb^z^5\sin(2\alpha) + 18ra^2rb^2z^2\cos(\alpha)^4 - 20rb^3z^3\cos(\alpha)^3\sin(\alpha) + 8rb^3z^3\cos(\alpha)^5\sin(\alpha) - 6ra^2rb^z^4\cos(\alpha)^3 - 36ra^2rb^3z^2\cos(\alpha)^5 - 12ra^3rb^z^2\cos(\alpha)^5 + 24ra^2rb^3z^2\cos(\alpha)^7 - 6rb^5z^2\cos(\alpha)^5\sin(\alpha) - 6ra^4rb^z^2\cos(\alpha)^5\sin(\alpha) + 24ra^2rb^4z^2\cos(\alpha)^6\sin(\alpha) - 12ra^2rb^z^3\cos(\alpha)^3\sin(\alpha) + 24ra^2rb^2z^3\cos(\alpha)^4\sin(\alpha) - 12ra^2rb^3z^2\cos(\alpha)^5\sin(\alpha) + 24ra^3rb^2z^2\cos(\alpha)^6\sin(\alpha) - 24ra^2rb^3z^2\cos(\alpha)^7\sin(\alpha)), 0, (\cos(\alpha))(ra - rb\cos(\alpha))^{(2\alpha 1d^2rb^z^3 - 2rb^2z1d^2\cos(\alpha))^3\sin(\alpha) + \alpha 1d^2ra^z^3\cos(\alpha) + 2\alpha 1d^2ra^3z^2\cos(\alpha) + 2rb^z^2z1d^2\cos(\alpha)^2 - \alpha 1d^2ra^3z^2\cos(\alpha)^3 - 4\alpha 1d^2rb^z^3\cos(\alpha)^2 + 2\alpha 1d^2ra^3z1d^2(\sin(\alpha) - \sin(\alpha)^3) + 2ra^2rb^z1d^2(\sin(\alpha) - \sin(\alpha)^3) - 2ra^z^2z1d^2\cos(\alpha) - \alpha 1d^2rb^2z^2\sin(2\alpha) - 8\alpha 1d^2ra^2rb^z\cos(\alpha)^2 + 3\alpha 1d^2ra^2rb^2z^2\cos(\alpha)^3 + 4\alpha 1d^2ra^2rb^z^2\cos(\alpha)^4 - 2\alpha 1d^2ra^2rb^2z^2\cos(\alpha)^5 + 2\alpha 1d^2ra^2rb^2z1d^2(\sin(\alpha) - \sin(\alpha)^3) - 2\alpha 1d^2ra^z^2z1d^2\sin(\alpha) - \alpha 1d^2ra^2rb^3\cos(\alpha)^4\sin(\alpha) + \alpha 1d^2ra^3rb^2\cos(\alpha)^4\sin(\alpha) + 2\alpha 1d^2ra^2rb^2z^2\cos(\alpha) + 5\alpha 1d^2ra^2rb^z^2(\sin(\alpha) - \sin(\alpha)^3) - 4\alpha 1d^2rb^2z^2z1d^2\cos(\alpha)^2 - 2\alpha 1d^2ra^2rb^z^2\sin(\alpha) + 2\alpha 1d^2rb^z^2z1d^2\sin(2\alpha) - 8\alpha 1d^2ra^2rb^z1d^2\cos(\alpha)^3\sin(\alpha) + 4\alpha 1d^2ra^2rb^2z1d^2\cos(\alpha)^4\sin(\alpha) + 4\alpha 1d^2ra^2rb^z^2z1d^2\cos(\alpha)^3)/(ra^6\cos(\alpha)^6 + rb^6\cos(\alpha)^6 + z^6 + 3ra^2rb^4\cos(\alpha)^6 + 3ra^4rb^2\cos(\alpha)^6 - 12ra^3rb^3\cos(\alpha)^7 + 12ra^2rb^4\cos(\alpha)^8 + 12ra^4rb^2\cos(\alpha)^8 - 8ra^3rb^3\cos(\alpha)^9 + 3ra^2z^4\cos(\alpha)^2 + 3ra^4z^2\cos(\alpha)^4 + 15rb^2z^4\cos(\alpha)^2 - 12rb^2z^4\cos(\alpha)^4 + 15rb^4z^2\cos(\alpha)^4 - 12rb^4z^2\cos(\alpha)^6 - 6ra^2rb^5\cos(\alpha)^7 - 6ra^5rb^2\cos(\alpha)^7 - 3rb^z^5\sin(2\alpha) + 18ra^2rb^2z^2\cos(\alpha)^4 - 20rb^3z^3\cos(\alpha)^3\sin(\alpha) + 8rb^3z^3\cos(\alpha)^5\sin(\alpha) - 6ra^2rb^z^4\cos(\alpha)^3 - 36ra^2rb^3z^2\cos(\alpha)^5 - 12ra^3rb^z^2\cos(\alpha)^5 + 24ra^2rb^3z^2\cos(\alpha)^7 - 6rb^5z^2\cos(\alpha)^5\sin(\alpha) - 6ra^4rb^z^2\cos(\alpha)^5\sin(\alpha) + 24ra^2rb^4z^2\cos(\alpha)^6\sin(\alpha) - \end{aligned}$$

$$\begin{aligned}
& 12*ra^2*rb*z^3*cos(alpha)^3*sin(alpha) + 24*ra*rb^2*z^3*cos(alpha)^4*sin(alpha) - \\
& 12*ra^2*rb^3*z*cos(alpha)^5*sin(alpha) + 24*ra^3*rb^2*z*cos(alpha)^6*sin(alpha) - \\
& 24*ra^2*rb^3*z*cos(alpha)^7*sin(alpha)), 0 \\
& -(e1^2*(2*alpha1d^2*rb*z^5 + ra^2*z^2*z1d^2*sin(2*alpha) + alpha1d^2*ra*z^5*cos(alpha) + \\
& 2*alpha1d^2*ra^2*rb*z^3 - 2*ra*z^3*z1d^2*cos(alpha) + 2*alpha1d^2*ra^3*z^3*cos(alpha) + \\
& 2*alpha1d^2*ra^5*z*cos(alpha)^3 - alpha1d^2*ra^5*z*cos(alpha)^5 - 4*alpha1d^2*rb*z^5*cos(alpha)^2 - \\
& 2*ra^3*z*z1d^2*cos(alpha)^3 + 2*rb*z^3*z1d^2*cos(alpha)^2 + 2*alpha1d*ra^2*z^3*z1d - \\
& (alpha1d^2*ra^2*z^4*sin(2*alpha))/2 - alpha1d^2*ra^4*z^2*sin(2*alpha) - alpha1d^2*rb^2*z^4*sin(2*alpha) + \\
& 4*alpha1d^2*ra*rb^2*z^3*cos(alpha) - 11*alpha1d^2*ra^4*rb*z*cos(alpha)^4 + \\
& 6*alpha1d^2*ra^4*rb*z*cos(alpha)^6 + 2*alpha1d*ra^5*z1d*cos(alpha)^4*sin(alpha) + \\
& 6*alpha1d^2*ra^3*rb*z^2*(sin(alpha) - sin(alpha)^3) - 2*alpha1d*ra^2*z^3*z1d*cos(alpha)^2 - \\
& 4*alpha1d*rb^2*z^3*z1d*cos(alpha)^2 - 2*ra^2*rb*z*z1d^2*cos(alpha)^2 + 2*ra*rb^2*z*z1d^2*cos(alpha)^3 + \\
& 6*ra^2*rb*z*z1d^2*cos(alpha)^4 - 4*ra*rb^2*z*z1d^2*cos(alpha)^5 - 2*alpha1d*ra*z^4*z1d*sin(alpha) + \\
& alpha1d^2*ra^5*rb*cos(alpha)^6*sin(alpha) - 13*alpha1d^2*ra^2*rb*z^3*cos(alpha)^2 - \\
& alpha1d^2*ra*rb^2*z^3*cos(alpha)^3 + 2*alpha1d^2*ra^3*rb^2*z*cos(alpha)^3 + \\
& 4*alpha1d^2*ra^2*rb*z^3*cos(alpha)^4 - alpha1d^2*ra^2*rb^3*z*cos(alpha)^4 + \\
& 2*alpha1d^2*ra*rb^2*z^3*cos(alpha)^5 + 11*alpha1d^2*ra^3*rb^2*z*cos(alpha)^5 - \\
& 4*alpha1d^2*ra^2*rb^3*z*cos(alpha)^6 - 6*alpha1d^2*ra^3*rb^2*z*cos(alpha)^7 + \\
& 2*alpha1d^2*ra^2*rb^3*z*cos(alpha)^8 + 2*ra^3*rb*z1d^2*cos(alpha)^4*sin(alpha) + \\
& 2*ra*rb^3*z1d^2*cos(alpha)^6*sin(alpha) + 9*alpha1d^2*ra*rb*z^4*(sin(alpha) - sin(alpha)^3) - \\
& 2*alpha1d*ra^4*z*z1d*cos(alpha)^2 + 2*alpha1d*ra^4*z*z1d*cos(alpha)^4 - 4*alpha1d^2*ra*rb*z^4*sin(alpha) \\
& + 2*alpha1d*rb*z^4*z1d*sin(2*alpha) - alpha1d^2*ra^3*rb^3*cos(alpha)^6*sin(alpha) + \\
& alpha1d^2*ra^2*rb^4*cos(alpha)^7*sin(alpha) - alpha1d^2*ra^4*rb^2*cos(alpha)^7*sin(alpha) + \\
& alpha1d^2*ra^4*z^2*cos(alpha)^3*sin(alpha) - alpha1d^2*ra^2*rb^2*z^2*sin(2*alpha) - \\
& 4*ra^2*rb^2*z1d^2*cos(alpha)^5*sin(alpha) - 2*rb^2*z^2*z1d^2*cos(alpha)^3*sin(alpha) + \\
& 8*alpha1d*ra*rb*z^3*z1d*cos(alpha)^3 + 8*alpha1d*ra^3*rb*z*z1d*cos(alpha)^3 + \\
& 4*alpha1d*ra*rb^3*z*z1d*cos(alpha)^5 - 4*alpha1d*ra^3*rb*z*z1d*cos(alpha)^5 + \\
& 6*alpha1d*ra*rb^2*z^2*z1d*(sin(alpha) - sin(alpha)^3) + alpha1d^2*ra*rb^3*z^2*cos(alpha)^4*sin(alpha) + \\
& 2*alpha1d^2*ra^3*rb*z^2*cos(alpha)^4*sin(alpha) - 10*alpha1d*ra^4*rb*z1d*cos(alpha)^5*sin(alpha) - \\
& 2*alpha1d*ra^2*rb^2*z*z1d*cos(alpha)^2 - 6*alpha1d*ra^2*rb^2*z*z1d*cos(alpha)^4 - \\
& 3*alpha1d^2*ra^2*rb^2*z^2*cos(alpha)^3*sin(alpha) - 3*alpha1d^2*ra^2*rb^2*z^2*cos(alpha)^5*sin(alpha) - \\
& 4*alpha1d*ra*rb*z^3*z1d*cos(alpha) + 2*alpha1d*ra^3*rb^2*z1d*cos(alpha)^4*sin(alpha) - \\
& 2*alpha1d*ra^2*rb^3*z1d*cos(alpha)^5*sin(alpha) + 12*alpha1d*ra^3*rb^2*z1d*cos(alpha)^6*sin(alpha) - \\
& 4*alpha1d*ra^2*rb^3*z1d*cos(alpha)^7*sin(alpha) - \\
& 6*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^3*sin(alpha))/(ra^6*cos(alpha)^6 + rb^6*cos(alpha)^6 + z^6 + \\
& 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 - 12*ra^3*rb^3*cos(alpha)^7 + \\
& 12*ra^2*rb^4*cos(alpha)^8 + 12*ra^4*rb^2*cos(alpha)^8 - 8*ra^3*rb^3*cos(alpha)^9 + \\
& 3*ra^2*z^4*cos(alpha)^2 + 3*ra^4*z^2*cos(alpha)^4 + 15*rb^2*z^4*cos(alpha)^2 - 12*rb^2*z^4*cos(alpha)^4 \\
& + 15*rb^4*z^2*cos(alpha)^4 - 12*rb^4*z^2*cos(alpha)^6 - 6*ra*rb^5*cos(alpha)^7 - 6*ra^5*rb*cos(alpha)^7 - \\
& 3*rb*z^5*sin(2*alpha) + 18*ra^2*rb^2*z^2*cos(alpha)^4 - 20*rb^3*z^3*cos(alpha)^3*sin(alpha) + \\
& 8*rb^3*z^3*cos(alpha)^5*sin(alpha) - 6*ra*rb*z^4*cos(alpha)^3 - 36*ra*rb^3*z^2*cos(alpha)^5 - \\
& 12*ra^3*rb*z^2*cos(alpha)^5 + 24*ra*rb^3*z^2*cos(alpha)^7 - 6*rb^5*z*cos(alpha)^5*sin(alpha) - \\
& 6*ra^4*rb*z*cos(alpha)^5*sin(alpha) + 24*ra*rb^4*z*cos(alpha)^6*sin(alpha) - \\
& 12*ra^2*rb*z^3*cos(alpha)^3*sin(alpha) + 24*ra*rb^2*z^3*cos(alpha)^4*sin(alpha) - \\
& 12*ra^2*rb^3*z*cos(alpha)^5*sin(alpha) + 24*ra^3*rb^2*z*cos(alpha)^6*sin(alpha) - \\
& 24*ra^2*rb^3*z*cos(alpha)^7*sin(alpha)), 0, \\
& -((cos(alpha)^2)^(3/2)*(ra^2*cos(alpha)^2 + z^2 - ra*z*sin(alpha) - ra*rb*cos(alpha)^3)*(2*alpha1d^2*rb*z^3 -
\end{aligned}$$

$$\begin{aligned}
&2*rb^2*z1d^2*cos(alpha)^3*sin(alpha) + alpha1d^2*ra*z^3*cos(alpha) + 2*alpha1d^2*ra^3*z*cos(alpha) + \\
&2*rb*z^2z1d^2*cos(alpha)^2 - alpha1d^2*ra^3*z*cos(alpha)^3 - 4*alpha1d^2*rb*z^3*cos(alpha)^2 + \\
&2*alpha1d*ra^3*z1d*(sin(alpha) - sin(alpha)^3) + 2*ra*rb*z1d^2*(sin(alpha) - sin(alpha)^3) - \\
&2*ra*z^2z1d^2*cos(alpha) - alpha1d^2*rb^2*z^2*sin(2*alpha) - 8*alpha1d^2*ra^2*rb*z*cos(alpha)^2 + \\
&3*alpha1d^2*ra*rb^2*z*cos(alpha)^3 + 4*alpha1d^2*ra^2*rb*z*cos(alpha)^4 - \\
&2*alpha1d^2*ra*rb^2*z*cos(alpha)^5 + 2*alpha1d*ra*rb^2*z1d*(sin(alpha) - sin(alpha)^3) - \\
&2*alpha1d*ra*z^2*z1d*sin(alpha) - alpha1d^2*ra*rb^3*cos(alpha)^4*sin(alpha) + \\
&alpha1d^2*ra^3*rb*cos(alpha)^4*sin(alpha) + 2*alpha1d^2*ra*rb^2*z*cos(alpha) + \\
&5*alpha1d^2*ra*rb*z^2*(sin(alpha) - sin(alpha)^3) - 4*alpha1d*rb^2*z^2z1d*cos(alpha)^2 - \\
&2*alpha1d^2*ra*rb*z^2*sin(alpha) + 2*alpha1d*rb*z^2*z1d*sin(2*alpha) - \\
&8*alpha1d*ra^2*rb*z1d*cos(alpha)^3*sin(alpha) + 4*alpha1d*ra*rb^2*z1d*cos(alpha)^4*sin(alpha) + \\
&4*alpha1d*ra*rb*z^2z1d*cos(alpha)^3)/(cos(alpha)^6*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
&ra*sin(alpha))^2)^(3/2))*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - sin(2*alpha)*rb*z + \\
&z^2)^(3/2)), 0
\end{aligned}$$

0, 0,

0, 0];

$$\begin{aligned}
YG13 = [& \hspace{15em} -(e1*ga*(ra - rb*cos(alpha))*(ra*cos(alpha) - rb + \\
& z*tan(alpha)))/(cos(alpha)*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(3/2)), 0, 0, 0 \\
& (e1*ga*(ra*cos(alpha) - rb + z*tan(alpha))*(ra^2*cos(alpha)^2 + z^2 - ra*z*sin(alpha) - \\
& ra*rb*cos(alpha)^3))/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(3/2)), 0, 0, 0 \\
& 0, 0, 0, 0];
\end{aligned}$$

Y3=YM13+YC13+YG13;

$$\begin{aligned}
YM14 = [& -(e1^2*cos(alpha)*(rb - ra*cos(beta))*(ra*z2d*cos(alpha)*cos(beta) - beta2d*ra^2*cos(alpha)^2 - \\
& alpha2d*rb*z*sin(alpha) - rb*z2d*cos(alpha) + alpha2d*ra*z*cos(beta)*sin(alpha) + \\
& beta2d*ra*z*cos(alpha)*sin(beta) + beta2d*ra*rb*cos(alpha)^2*cos(beta))/(ra^4*cos(alpha)^4 + \\
& rb^4*cos(alpha)^4 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 + 6*ra^2*z^2*cos(alpha)^2 + 2*rb^2*z^2*cos(alpha)^2 - \\
& 4*ra*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 \\
& - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) - 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra*rb*z^2*cos(alpha)^2*cos(beta) - 4*ra*rb^2*z*cos(alpha)^3*sin(beta) + \\
& 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta)), \\
& (cos(alpha)*(rb - ra*cos(beta))*(rb*z2d*cos(alpha) - rb*z2d*cos(alpha)^3 + beta2d*ra^2*cos(alpha)^2 - \\
& beta2d*ra^2*cos(alpha)^4 + ra*z2d*cos(alpha)^3*cos(beta) + alpha2d*rb*z*sin(alpha) - \\
& ra*z2d*cos(alpha)*cos(beta) - alpha2d*ra*z*cos(beta)*sin(alpha) - beta2d*ra*z*cos(alpha)*sin(beta) - \\
& beta2d*ra*rb*cos(alpha)^2*cos(beta) + beta2d*ra*rb*cos(alpha)^4*cos(beta) + \\
& beta2d*ra*z*cos(alpha)^3*sin(beta) + alpha2d*ra^2*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) - \\
& alpha2d*ra*rb*cos(alpha)^3*sin(alpha)*sin(beta))/(ra^4*cos(alpha)^4 - ra^4*cos(alpha)^6 + rb^4*cos(alpha)^4 \\
& - z^4*cos(alpha)^2 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 - ra^2*rb^2*cos(alpha)^6 + 6*ra^2*z^2*cos(alpha)^2 - \\
& 6*ra^2*z^2*cos(alpha)^4 + 2*rb^2*z^2*cos(alpha)^2 - rb^2*z^2*cos(alpha)^4 + \\
& ra^4*cos(alpha)^6*cos(beta)^2 - 4*ra*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 + \\
& ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + \\
& 5*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 2*ra^3*rb*cos(alpha)^6*cos(beta) + 4*ra*z^3*cos(alpha)^3*sin(beta) - 4*ra^3*z*cos(alpha)^3*sin(beta) + \\
& 4*ra^3*z*cos(alpha)^5*sin(beta) - 2*ra^3*rb*cos(alpha)^6*cos(beta)^3 - 4*ra*rb*z^2*cos(alpha)^2*cos(beta) + \\
& 2*ra*rb*z^2*cos(alpha)^4*cos(beta) - 4*ra*rb^2*z*cos(alpha)^3*sin(beta) + 2*ra*rb^2*z*cos(alpha)^5*sin(beta) \\
& - 2*ra^3*z*cos(alpha)^5*cos(beta)^2*sin(beta) + 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 4*ra^2*rb*z*cos(alpha)^5*cos(beta)*sin(beta)), \\
& (cos(alpha)^3*(rb - ra*cos(beta))^2*(rb^2*z2d*cos(alpha)^3 - alpha2d*z^3*sin(alpha) +
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 r^a \wedge^2 r^b \cos(\alpha)^4 - \beta^2 d^2 r^a \wedge^3 \cos(\alpha)^4 \cos(\beta) + r^a \wedge^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta)^2 - \\
& 3 \alpha^2 d^2 r^a \wedge^2 z^2 \cos(\alpha)^2 \sin(\alpha) + \beta^2 d^2 r^a \wedge^2 r^b \cos(\alpha)^4 \cos(\beta)^2 + \\
& \alpha^2 d^2 r^a \wedge^3 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) - 2 r^a r^b z^2 d^2 \cos(\alpha)^3 \cos(\beta) - \\
& \beta^2 d^2 r^a r^b \wedge^2 \cos(\alpha)^4 \cos(\beta) - \beta^2 d^2 r^a r^b z^2 \cos(\alpha)^3 \sin(\beta) + \\
& 3 \alpha^2 d^2 r^a \wedge^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) + 3 \alpha^2 d^2 r^a z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) + \\
& \beta^2 d^2 r^a \wedge^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) + \alpha^2 d^2 r^a r^b \wedge^2 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) - \\
& 2 \alpha^2 d^2 r^a \wedge^2 r^b \cos(\alpha)^3 \cos(\beta) \sin(\alpha) \sin(\beta) \Big/ (r^a \wedge^6 \cos(\alpha)^6 - r^a \wedge^6 \cos(\alpha)^8 + \\
& r^b \wedge^6 \cos(\alpha)^6 - z \wedge^6 \cos(\alpha)^2 + z \wedge^6 + 3 r^a \wedge^2 r^b \wedge^4 \cos(\alpha)^6 + 3 r^a \wedge^4 r^b \wedge^2 \cos(\alpha)^6 - \\
& r^a \wedge^2 r^b \wedge^4 \cos(\alpha)^8 - 2 r^a \wedge^4 r^b \wedge^2 \cos(\alpha)^8 + 15 r^a \wedge^2 z^2 \wedge^4 \cos(\alpha)^2 - 15 r^a \wedge^2 z^2 \wedge^4 \cos(\alpha)^4 \\
& + 15 r^a \wedge^4 z^2 \wedge^2 \cos(\alpha)^4 - 15 r^a \wedge^4 z^2 \wedge^2 \cos(\alpha)^6 + 3 r^b \wedge^2 z^2 \wedge^4 \cos(\alpha)^2 - \\
& 2 r^b \wedge^2 z^2 \wedge^4 \cos(\alpha)^4 + 3 r^b \wedge^4 z^2 \wedge^2 \cos(\alpha)^4 - r^b \wedge^4 z^2 \wedge^2 \cos(\alpha)^6 + \\
& r^a \wedge^6 \cos(\alpha)^8 \cos(\beta)^2 + 18 r^a \wedge^2 r^b \wedge^2 z^2 \wedge^2 \cos(\alpha)^4 - 12 r^a \wedge^2 r^b \wedge^2 z^2 \wedge^2 \cos(\alpha)^6 - \\
& 20 r^a \wedge^3 z^2 \wedge^3 \cos(\alpha)^3 \sin(\beta) + 20 r^a \wedge^3 z^2 \wedge^3 \cos(\alpha)^5 \sin(\beta) - 6 r^a z^2 \wedge^5 \cos(\alpha) \sin(\beta) + \\
& 12 r^a \wedge^2 r^b \wedge^4 \cos(\alpha)^6 \cos(\beta)^2 + 12 r^a \wedge^4 r^b \wedge^2 \cos(\alpha)^6 \cos(\beta)^2 - \\
& 8 r^a \wedge^3 r^b \wedge^3 \cos(\alpha)^6 \cos(\beta)^3 + r^a \wedge^2 r^b \wedge^4 \cos(\alpha)^8 \cos(\beta)^2 - \\
& 2 r^a \wedge^4 r^b \wedge^2 \cos(\alpha)^8 \cos(\beta)^2 - 4 r^a \wedge^3 r^b \wedge^3 \cos(\alpha)^8 \cos(\beta)^3 + \\
& 4 r^a \wedge^4 r^b \wedge^2 \cos(\alpha)^8 \cos(\beta)^4 - 12 r^a \wedge^2 z^2 \wedge^4 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 13 r^a \wedge^2 z^2 \wedge^4 \cos(\alpha)^4 \cos(\beta)^2 - 12 r^a \wedge^4 z^2 \wedge^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& 18 r^a \wedge^4 z^2 \wedge^2 \cos(\alpha)^6 \cos(\beta)^2 - 4 r^a \wedge^4 z^2 \wedge^2 \cos(\alpha)^6 \cos(\beta)^4 - \\
& 6 r^a r^b \wedge^5 \cos(\alpha)^6 \cos(\beta) - 6 r^a \wedge^5 r^b \cos(\alpha)^6 \cos(\beta) + 4 r^a \wedge^5 r^b \cos(\alpha)^8 \cos(\beta) + \\
& 6 r^a z^2 \wedge^5 \cos(\alpha)^3 \sin(\beta) - 6 r^a \wedge^5 z^2 \cos(\alpha)^5 \sin(\beta) + 6 r^a \wedge^5 z^2 \cos(\alpha)^7 \sin(\beta) - \\
& 12 r^a \wedge^3 r^b \wedge^3 \cos(\alpha)^6 \cos(\beta) + 4 r^a \wedge^3 r^b \wedge^3 \cos(\alpha)^8 \cos(\beta) - \\
& 4 r^a \wedge^5 r^b \cos(\alpha)^8 \cos(\beta)^3 - 6 r^a r^b z^2 \wedge^4 \cos(\alpha)^2 \cos(\beta) + 4 r^a r^b z^2 \wedge^4 \cos(\alpha)^4 \cos(\beta) \\
& - 6 r^a r^b \wedge^4 z^2 \cos(\alpha)^5 \sin(\beta) + 2 r^a r^b \wedge^4 z^2 \cos(\alpha)^7 \sin(\beta) + \\
& 6 r^a \wedge^2 r^b \wedge^2 z^2 \wedge^2 \cos(\alpha)^6 \cos(\beta)^2 + 8 r^a \wedge^3 z^2 \wedge^3 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) - \\
& 12 r^a \wedge^3 z^2 \wedge^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - 12 r^a r^b \wedge^3 z^2 \wedge^2 \cos(\alpha)^4 \cos(\beta) - \\
& 36 r^a \wedge^3 r^b z^2 \wedge^2 \cos(\alpha)^4 \cos(\beta) + 4 r^a r^b \wedge^3 z^2 \wedge^2 \cos(\alpha)^6 \cos(\beta) + \\
& 24 r^a \wedge^3 r^b z^2 \wedge^2 \cos(\alpha)^6 \cos(\beta) - 12 r^a r^b \wedge^2 z^2 \wedge^3 \cos(\alpha)^3 \sin(\beta) + \\
& 8 r^a r^b \wedge^2 z^2 \wedge^3 \cos(\alpha)^5 \sin(\beta) - 12 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha)^5 \sin(\beta) + \\
& 8 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha)^7 \sin(\beta) + 24 r^a \wedge^3 r^b z^2 \wedge^2 \cos(\alpha)^4 \cos(\beta)^3 - \\
& 20 r^a \wedge^3 r^b z^2 \wedge^2 \cos(\alpha)^6 \cos(\beta)^3 - 4 r^a \wedge^5 z^2 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + \\
& 24 r^a \wedge^2 r^b z^2 \wedge^3 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - 16 r^a \wedge^2 r^b z^2 \wedge^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \\
& 24 r^a \wedge^2 r^b \wedge^3 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - 8 r^a \wedge^2 r^b \wedge^3 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta) + \\
& 8 r^a \wedge^4 r^b z^2 \cos(\alpha)^7 \cos(\beta)^3 \sin(\beta) - 24 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + \\
& 4 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + 24 r^a \wedge^4 r^b z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \\
& 16 r^a \wedge^4 r^b z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta)), 0 \\
& (e^{\wedge^2 (\alpha^2 d^2 z^4 + \alpha^2 d^2 r^b \wedge^2 z^2 + \alpha^2 d^2 r^a \wedge^4 \cos(\alpha)^4 + (r^b \wedge^2 z^2 z^2 d^2 \sin(2 \alpha)) / 2 + \\
& \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^4 + 6 \alpha^2 d^2 r^a \wedge^2 z^2 \wedge^2 \cos(\alpha)^2 + \alpha^2 d^2 r^a \wedge^2 z^2 \wedge^2 \cos(\beta)^2 - \\
& \alpha^2 d^2 r^a \wedge^4 \cos(\alpha)^4 \cos(\beta)^2 - 4 \alpha^2 d^2 r^a \wedge^3 z^2 \cos(\alpha)^3 \sin(\beta) - \\
& 2 \alpha^2 d^2 r^a r^b z^2 \wedge^2 \cos(\beta) + \beta^2 d^2 r^a \wedge^2 r^b z^2 (\sin(\alpha) - \sin(\alpha)^3) + \\
& 2 \alpha^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^4 \cos(\beta)^3 - 4 \alpha^2 d^2 r^a z^2 \wedge^3 \cos(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^4 \cos(\beta)^2 - 6 \alpha^2 d^2 r^a \wedge^2 z^2 \wedge^2 \cos(\alpha)^2 \cos(\beta)^2 - \\
& 2 \alpha^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^4 \cos(\beta) + 2 \alpha^2 d^2 r^a \wedge^3 z^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) - \\
& 2 \alpha^2 d^2 r^a r^b \wedge^2 z^2 \cos(\alpha)^3 \sin(\beta) - \beta^2 d^2 r^a \wedge^3 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + \\
& r^a \wedge^2 z^2 z^2 d^2 \cos(\alpha) \cos(\beta)^2 \sin(\alpha) - \beta^2 d^2 r^a r^b \wedge^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + \\
& 4 \alpha^2 d^2 r^a \wedge^2 r^b z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - 2 r^a r^b z^2 z^2 d^2 \cos(\alpha) \cos(\beta) \sin(\alpha) + \\
& \beta^2 d^2 r^a \wedge^2 r^b z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 r^a z^2 \cos(\alpha) \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& \beta^2 d^2 r^a r^b z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) / (r^4 \cos(\alpha)^4 + r^b \cos(\alpha)^4 + z^4 + \\
& 2 r^a z^2 r^b \cos(\alpha)^4 + 6 r^a z^2 z^2 \cos(\alpha)^2 + 2 r^b z^2 z^2 \cos(\alpha)^2 - \\
& 4 r^a z^3 \cos(\alpha) \sin(\beta) + 4 r^a z^2 r^b \cos(\alpha)^4 \cos(\beta)^2 - 4 r^a z^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \\
& - 4 r^a r^b z^3 \cos(\alpha)^4 \cos(\beta) - 4 r^a z^3 r^b \cos(\alpha)^4 \cos(\beta) - 4 r^a z^3 z^2 \cos(\alpha)^3 \sin(\beta) - \\
& 4 r^a r^b z^2 \cos(\alpha)^2 \cos(\beta) - 4 r^a r^b z^2 z^2 \cos(\alpha)^3 \sin(\beta) + \\
& 8 r^a z^2 r^b z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta)), \\
& -((r^b - r^a \cos(\beta)) (\alpha^2 d^2 r^a z^3 \cos(\alpha)^6 \cos(\beta) - \alpha^2 d^2 r^a z^2 r^b \cos(\alpha)^6 - \alpha^2 d^2 r^b z^2 + \\
& \alpha^2 d^2 r^a z^2 z^2 \cos(\beta) - \alpha^2 d^2 r^a z^3 \cos(\alpha)^6 \cos(\beta)^3 - \beta^2 d^2 r^a z^2 z^2 \cos(\alpha)^2 \sin(\alpha) - \\
& \beta^2 d^2 r^a z^2 z^2 \cos(\alpha)^4 \sin(\alpha) + \alpha^2 d^2 r^a z^2 r^b \cos(\alpha)^6 \cos(\beta)^2 - \\
& r^b z^2 z^2 d^2 \cos(\alpha) \sin(\alpha) + \beta^2 d^2 r^a z^3 \cos(\alpha)^5 \sin(\alpha) \sin(\beta) + \\
& 2 \alpha^2 d^2 r^a r^b z^2 \cos(\alpha)^3 \sin(\beta) + r^a z^2 z^2 d^2 \cos(\alpha) \cos(\beta) \sin(\alpha) + \\
& \beta^2 d^2 r^a z^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) - r^a z^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& \beta^2 d^2 r^a z^2 z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) + r^a r^b z^2 d^2 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) - \\
& 2 \alpha^2 d^2 r^a z^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& \beta^2 d^2 r^a z^2 r^b \cos(\alpha)^5 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& \beta^2 d^2 r^a r^b z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) / (r^4 \cos(\alpha)^4 - r^a \cos(\alpha)^6 + \\
& r^b \cos(\alpha)^4 - z^4 \cos(\alpha)^2 + z^4 + 2 r^a z^2 r^b \cos(\alpha)^4 - r^a z^2 r^b \cos(\alpha)^6 + \\
& 6 r^a z^2 z^2 \cos(\alpha)^2 - 6 r^a z^2 z^2 \cos(\alpha)^4 + 2 r^b z^2 z^2 \cos(\alpha)^2 - r^b z^2 z^2 \cos(\alpha)^4 + \\
& r^a z^4 \cos(\alpha)^6 \cos(\beta)^2 - 4 r^a z^3 \cos(\alpha) \sin(\beta) + 4 r^a z^2 r^b \cos(\alpha)^4 \cos(\beta)^2 + \\
& r^a z^2 r^b \cos(\alpha)^6 \cos(\beta)^2 - 4 r^a z^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 5 r^a z^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 - 4 r^a r^b z^3 \cos(\alpha)^4 \cos(\beta) - 4 r^a z^3 r^b \cos(\alpha)^4 \cos(\beta) + \\
& 2 r^a z^3 r^b \cos(\alpha)^6 \cos(\beta) + 4 r^a z^3 \cos(\alpha)^3 \sin(\beta) - 4 r^a z^3 z^2 \cos(\alpha)^3 \sin(\beta) + \\
& 4 r^a z^3 z^2 \cos(\alpha)^5 \sin(\beta) - 2 r^a z^3 r^b \cos(\alpha)^6 \cos(\beta)^3 - 4 r^a r^b z^2 z^2 \cos(\alpha)^2 \cos(\beta) + \\
& 2 r^a r^b z^2 z^2 \cos(\alpha)^4 \cos(\beta) - 4 r^a r^b z^2 z^2 \cos(\alpha)^3 \sin(\beta) + 2 r^a r^b z^2 z^2 \cos(\alpha)^5 \sin(\beta) \\
& - 2 r^a z^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + 8 r^a z^2 r^b z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& 4 r^a z^2 r^b z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta)), (\alpha^2 d^2 z^6 + \alpha^2 d^2 r^a z^6 \cos(\alpha)^6 - \\
& \alpha^2 d^2 r^a z^6 \cos(\alpha)^8 - \alpha^2 d^2 z^6 \cos(\alpha)^2 + \alpha^2 d^2 r^a z^2 r^b \cos(\alpha)^6 + \\
& 2 \alpha^2 d^2 r^a z^4 r^b \cos(\alpha)^6 - \alpha^2 d^2 r^a z^2 r^b \cos(\alpha)^8 - 2 \alpha^2 d^2 r^a z^4 r^b \cos(\alpha)^8 + \\
& 15 \alpha^2 d^2 r^a z^2 z^4 \cos(\alpha)^2 - 15 \alpha^2 d^2 r^a z^2 z^4 \cos(\alpha)^4 + 15 \alpha^2 d^2 r^a z^4 z^2 \cos(\alpha)^4 \\
& - 15 \alpha^2 d^2 r^a z^4 z^2 \cos(\alpha)^6 - \alpha^2 d^2 r^a z^6 \cos(\alpha)^6 \cos(\beta)^2 + \\
& \alpha^2 d^2 r^a z^6 \cos(\alpha)^8 \cos(\beta)^2 + 6 \alpha^2 d^2 r^a z^5 \cos(\alpha)^3 \sin(\beta) - \\
& 6 \alpha^2 d^2 r^a z^5 z^2 \cos(\alpha)^5 \sin(\beta) + 6 \alpha^2 d^2 r^a z^5 z^2 \cos(\alpha)^7 \sin(\beta) - \\
& 4 \alpha^2 d^2 r^a z^3 r^b z^3 \cos(\alpha)^6 \cos(\beta) + 4 \alpha^2 d^2 r^a z^3 r^b z^3 \cos(\alpha)^8 \cos(\beta) + \\
& 4 \alpha^2 d^2 r^a z^5 r^b \cos(\alpha)^6 \cos(\beta)^3 - 4 \alpha^2 d^2 r^a z^5 r^b \cos(\alpha)^8 \cos(\beta)^3 + \\
& 6 \alpha^2 d^2 r^a z^2 r^b z^2 z^2 \cos(\alpha)^4 - 6 \alpha^2 d^2 r^a z^2 r^b z^2 z^2 \cos(\alpha)^6 - \\
& 20 \alpha^2 d^2 r^a z^3 z^3 \cos(\alpha)^3 \sin(\beta) + 20 \alpha^2 d^2 r^a z^3 z^3 \cos(\alpha)^5 \sin(\beta) - \\
& r^b z^2 z^3 z^2 d^2 \cos(\alpha)^3 \sin(\alpha) - 6 \alpha^2 d^2 r^a z^5 \cos(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^a z^2 r^b \cos(\alpha)^6 \cos(\beta)^2 + 2 \alpha^2 d^2 r^a z^4 r^b \cos(\alpha)^6 \cos(\beta)^2 + \\
& 4 \alpha^2 d^2 r^a z^3 r^b z^3 \cos(\alpha)^6 \cos(\beta)^3 + \alpha^2 d^2 r^a z^2 r^b \cos(\alpha)^8 \cos(\beta)^2 - \\
& 4 \alpha^2 d^2 r^a z^4 r^b z^2 \cos(\alpha)^6 \cos(\beta)^4 - 2 \alpha^2 d^2 r^a z^4 r^b z^2 \cos(\alpha)^8 \cos(\beta)^2 - \\
& 4 \alpha^2 d^2 r^a z^3 r^b z^3 \cos(\alpha)^8 \cos(\beta)^3 + 4 \alpha^2 d^2 r^a z^4 r^b z^2 \cos(\alpha)^8 \cos(\beta)^4 - \\
& 15 \alpha^2 d^2 r^a z^2 z^4 \cos(\alpha)^2 \cos(\beta)^2 + 15 \alpha^2 d^2 r^a z^2 z^4 \cos(\alpha)^4 \cos(\beta)^2 - \\
& 24 \alpha^2 d^2 r^a z^4 z^2 \cos(\alpha)^4 \cos(\beta)^2 + 9 \alpha^2 d^2 r^a z^4 z^2 \cos(\alpha)^4 \cos(\beta)^4 + \\
& 24 \alpha^2 d^2 r^a z^4 z^2 \cos(\alpha)^6 \cos(\beta)^2 - 9 \alpha^2 d^2 r^a z^4 z^2 \cos(\alpha)^6 \cos(\beta)^4 - \\
& 4 \alpha^2 d^2 r^a z^5 r^b \cos(\alpha)^6 \cos(\beta) + 4 \alpha^2 d^2 r^a z^5 r^b \cos(\alpha)^8 \cos(\beta) + \\
& 12 \alpha^2 d^2 r^a z^3 r^b z^2 z^2 \cos(\alpha)^4 \cos(\beta)^3 - 12 \alpha^2 d^2 r^a z^3 r^b z^2 z^2 \cos(\alpha)^6 \cos(\beta)^3 -
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 r^a \wedge^6 \cos(\alpha) \wedge^7 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 4 \beta^2 d^2 r^a \wedge^3 z^3 \cos(\alpha) \wedge^4 \cos(\beta) \sin(\alpha) - 4 \beta^2 d^2 r^a \wedge^5 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^3 \sin(\alpha) + \\
& 6 \alpha^2 d^2 r^a \wedge^5 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\beta) - 6 \alpha^2 d^2 r^a \wedge^5 z^2 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^2 \sin(\beta) + \\
& \beta^2 d^2 r^a \wedge^3 r^b \wedge^3 \cos(\alpha) \wedge^7 \sin(\alpha) \sin(\beta) - 3 r^a \wedge^4 z^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& 3 r^a \wedge^4 z^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^4 \sin(\alpha) + r^a \wedge^3 r^b \wedge^2 z^2 d^2 \cos(\alpha) \wedge^6 \sin(\alpha) \sin(\beta) - \\
& 4 \beta^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^6 \sin(\alpha) - 6 \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 z^2 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^2 + \\
& 6 \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 - 3 \beta^2 d^2 r^a \wedge^3 z^3 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^3 \sin(\alpha) \\
& + 18 \alpha^2 d^2 r^a \wedge^3 z^3 \cos(\alpha) \wedge^3 \cos(\beta) \wedge^2 \sin(\beta) - \\
& 18 \alpha^2 d^2 r^a \wedge^3 z^3 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\beta) + \\
& r^a \wedge^5 z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) - r^a \wedge^2 z^3 z^2 d^2 \cos(\alpha) \wedge^3 \cos(\beta) \wedge^2 \sin(\alpha) - \\
& 12 \alpha^2 d^2 r^a \wedge^3 r^b z^2 \cos(\alpha) \wedge^4 \cos(\beta) + 12 \alpha^2 d^2 r^a \wedge^3 r^b z^2 \cos(\alpha) \wedge^6 \cos(\beta) + \\
& 4 \beta^2 d^2 r^a \wedge^5 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) + \beta^2 d^2 r^a \wedge^5 r^b \cos(\alpha) \wedge^7 \sin(\alpha) \sin(\beta) - \\
& 4 \beta^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^4 \sin(\alpha) - \beta^2 d^2 r^a \wedge^2 r^b \wedge^3 z^2 \cos(\alpha) \wedge^6 \sin(\alpha) - \\
& 2 \alpha^2 d^2 r^a r^b \wedge^2 z^3 \cos(\alpha) \wedge^3 \sin(\beta) + 2 \alpha^2 d^2 r^a r^b \wedge^2 z^3 \cos(\alpha) \wedge^5 \sin(\beta) - \\
& 6 \alpha^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^5 \sin(\beta) + 6 \alpha^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^7 \sin(\beta) + \\
& r^a r^b \wedge^4 z^2 d^2 \cos(\alpha) \wedge^6 \sin(\alpha) \sin(\beta) - 3 r^a \wedge^2 r^b \wedge^2 z^2 z^2 d^2 \cos(\alpha) \wedge^5 \sin(\alpha) - \\
& \beta^2 d^2 r^a \wedge^2 z^4 \cos(\alpha) \wedge^3 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 6 \beta^2 d^2 r^a \wedge^4 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 4 r^a \wedge^2 r^b \wedge^3 z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 2 r^a \wedge^4 r^b z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^3 \sin(\alpha) \sin(\beta) + \\
& 3 r^a \wedge^2 r^b \wedge^2 z^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\beta) - \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^7 \cos(\beta) \sin(\beta) + \beta^2 d^2 r^a r^b z^4 \cos(\alpha) \wedge^3 \sin(\alpha) \sin(\beta) + \\
& 2 r^a r^b z^3 z^2 d^2 \cos(\alpha) \wedge^3 \cos(\beta) \sin(\alpha) + 6 r^a \wedge^3 r^b z^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\alpha) + \\
& 3 \beta^2 d^2 r^a \wedge^3 r^b \wedge^3 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) - \\
& 2 \beta^2 d^2 r^a \wedge^4 r^b \wedge^2 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^3 \sin(\alpha) \sin(\beta) + \\
& 3 \beta^2 d^2 r^a \wedge^4 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^3 \sin(\alpha) \sin(\beta) + \\
& 5 r^a \wedge^3 r^b \wedge^2 z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + \\
& 3 r^a \wedge^3 z^2 z^2 d^2 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + \\
& \beta^2 d^2 r^a r^b \wedge^2 z^3 \cos(\alpha) \wedge^4 \cos(\beta) \sin(\alpha) + \\
& 6 \beta^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) - \\
& \beta^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& 5 \beta^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^4 \sin(\alpha) + \\
& 4 \alpha^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^3 \cos(\beta) \sin(\beta) - \\
& 4 \alpha^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^5 \cos(\beta) \sin(\beta) - \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^3 \sin(\beta) + \\
& 12 \alpha^2 d^2 r^a \wedge^4 r^b z^2 \cos(\alpha) \wedge^7 \cos(\beta) \wedge^3 \sin(\beta) + \\
& 6 \beta^2 d^2 r^a \wedge^3 r^b z^2 \cos(\alpha) \wedge^5 \sin(\alpha) \sin(\beta) - \\
& 2 r^a \wedge^4 r^b z^2 d^2 \cos(\alpha) \wedge^6 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 6 r^a \wedge^3 r^b z^2 z^2 d^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^3 \sin(\alpha) + 3 r^a r^b \wedge^2 z^2 z^2 d^2 \cos(\alpha) \wedge^4 \sin(\alpha) \sin(\beta) - \\
& \beta^2 d^2 r^a \wedge^2 r^b \wedge^4 \cos(\alpha) \wedge^7 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& 4 \beta^2 d^2 r^a \wedge^4 r^b \wedge^2 \cos(\alpha) \wedge^7 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 3 \beta^2 d^2 r^a \wedge^5 r^b \cos(\alpha) \wedge^7 \cos(\beta) \wedge^2 \sin(\alpha) \sin(\beta) + \\
& 2 \beta^2 d^2 r^a \wedge^2 r^b z^3 \cos(\alpha) \wedge^4 \cos(\beta) \wedge^2 \sin(\alpha) + \\
& \beta^2 d^2 r^a \wedge^2 r^b \wedge^3 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^2 \sin(\alpha) - \\
& 6 \beta^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^6 \cos(\beta) \wedge^3 \sin(\alpha) + \\
& 6 \alpha^2 d^2 r^a \wedge^3 r^b \wedge^2 z^2 \cos(\alpha) \wedge^5 \cos(\beta) \wedge^2 \sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 6*\alpha 2d*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 6*ra^2*rb*z^2*z2d*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) - \\
& 3*beta2d*ra^2*rb^2*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta))/(ra^6*cos(alpha)^6 - ra^6*cos(alpha)^8 \\
& + rb^6*cos(alpha)^6 - z^6*cos(alpha)^2 + z^6 + 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 - \\
& ra^2*rb^4*cos(alpha)^8 - 2*ra^4*rb^2*cos(alpha)^8 + 15*ra^2*z^4*cos(alpha)^2 - 15*ra^2*z^4*cos(alpha)^4 \\
& + 15*ra^4*z^2*cos(alpha)^4 - 15*ra^4*z^2*cos(alpha)^6 + 3*rb^2*z^4*cos(alpha)^2 - \\
& 2*rb^2*z^4*cos(alpha)^4 + 3*rb^4*z^2*cos(alpha)^4 - rb^4*z^2*cos(alpha)^6 + \\
& ra^6*cos(alpha)^8*cos(beta)^2 + 18*ra^2*rb^2*z^2*cos(alpha)^4 - 12*ra^2*rb^2*z^2*cos(alpha)^6 - \\
& 20*ra^3*z^3*cos(alpha)^3*sin(beta) + 20*ra^3*z^3*cos(alpha)^5*sin(beta) - 6*ra*z^5*cos(alpha)*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 + ra^2*rb^4*cos(alpha)^8*cos(beta)^2 - \\
& 2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - 4*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 + \\
& 4*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 + \\
& 13*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 + \\
& 18*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 4*ra^4*z^2*cos(alpha)^6*cos(beta)^4 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 4*ra^5*rb*cos(alpha)^8*cos(beta) + \\
& 6*ra*z^5*cos(alpha)^3*sin(beta) - 6*ra^5*z*cos(alpha)^5*sin(beta) + 6*ra^5*z*cos(alpha)^7*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) + 4*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& - 6*ra*rb^4*z*cos(alpha)^5*sin(beta) + 2*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) - 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) - 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 - 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) - 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)), 0
\end{aligned}$$

$$\begin{aligned}
& (e1^2*ra*(beta2d*ra^3*cos(alpha)^4 + beta2d*ra*z^2*cos(alpha)^2 - ra^2*z2d*cos(alpha)^3*cos(beta) - \\
& rb^2*z2d*cos(alpha)^3*cos(beta) + ra*rb*z2d*cos(alpha)^3 - 2*beta2d*ra^2*z*cos(alpha)^3*sin(beta) + \\
& ra*rb*z2d*cos(alpha)^3*cos(beta)^2 + beta2d*ra*rb^2*cos(alpha)^4*cos(beta)^2 - \\
& beta2d*ra*z^2*cos(alpha)^2*cos(beta)^2 - rb*z^2d*cos(alpha)^2*sin(beta) - \\
& 2*beta2d*ra^2*rb*cos(alpha)^4*cos(beta) + alpha2d*ra*rb*z*cos(alpha)^2*sin(alpha) - \\
& alpha2d*rb*z^2*cos(alpha)*sin(alpha)*sin(beta) + ra*z^2d*cos(alpha)^2*cos(beta)*sin(beta) - \\
& alpha2d*ra^2*z*cos(alpha)^2*cos(beta)*sin(alpha) - alpha2d*rb^2*z*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& alpha2d*ra*rb*z*cos(alpha)^2*cos(beta)^2*sin(alpha) + alpha2d*ra*z^2*cos(alpha)*cos(beta)*sin(alpha)*sin(beta) \\
& + 2*beta2d*ra*rb*z*cos(alpha)^3*cos(beta)*sin(beta))/(ra^4*cos(alpha)^4 + rb^4*cos(alpha)^4 + z^4 + \\
& 2*ra^2*rb^2*cos(alpha)^4 + 6*ra^2*z^2*cos(alpha)^2 + 2*rb^2*z^2*cos(alpha)^2 - \\
& 4*ra*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 \\
& - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) - 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra*rb*z^2*cos(alpha)^2*cos(beta) - 4*ra*rb^2*z*cos(alpha)^3*sin(beta) + \\
& 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta)), (beta2d*ra^4*cos(alpha)^4 - beta2d*ra^4*cos(alpha)^6 + \\
& ra^2*rb*z2d*cos(alpha)^3 - ra^2*rb*z2d*cos(alpha)^5 + beta2d*ra^2*z^2*cos(alpha)^2 -
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 r^a z^2 \cos(\alpha)^4 - r^a z^2 d^2 \cos(\alpha)^3 \cos(\beta) + r^a z^2 d^2 \cos(\alpha)^5 \cos(\beta) - \\
& 2 \beta^2 d^2 r^a z^3 \cos(\alpha)^3 \sin(\beta) + 2 \beta^2 d^2 r^a z^3 \cos(\alpha)^5 \sin(\beta) - \\
& r^a r^b z^2 d^2 \cos(\alpha)^3 \cos(\beta) + r^a r^b z^2 d^2 \cos(\alpha)^5 \cos(\beta) + \\
& r^a z^2 r^b z^2 d^2 \cos(\alpha)^3 \cos(\beta)^2 - r^a z^2 r^b z^2 d^2 \cos(\alpha)^5 \cos(\beta)^2 + \\
& \beta^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^4 \cos(\beta)^2 - \beta^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^6 \cos(\beta)^2 - \\
& \beta^2 d^2 r^a z^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 + \beta^2 d^2 r^a z^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 - \\
& 2 \beta^2 d^2 r^a z^3 r^b \cos(\alpha)^4 \cos(\beta) + 2 \beta^2 d^2 r^a z^3 r^b \cos(\alpha)^6 \cos(\beta) + \\
& \alpha^2 d^2 r^a z^4 \cos(\alpha)^5 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& \alpha^2 d^2 r^a z^3 z^2 \cos(\alpha)^4 \cos(\beta)^3 \sin(\alpha) - r^a r^b z^2 z^2 d^2 \cos(\alpha)^2 \sin(\beta) + \\
& r^a r^b z^2 z^2 d^2 \cos(\alpha)^4 \sin(\beta) + \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^2 \sin(\alpha) + \\
& \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^4 \sin(\alpha) - \alpha^2 d^2 r^a z^3 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) - \\
& \alpha^2 d^2 r^a z^3 z^2 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \alpha^2 d^2 r^a z^3 r^b \cos(\alpha)^5 \sin(\alpha) \sin(\beta) + \\
& r^a z^2 z^2 z^2 d^2 \cos(\alpha)^2 \cos(\beta) \sin(\beta) - r^a z^2 z^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - \\
& \alpha^2 d^2 r^a r^b z^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + 2 \beta^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& 2 \beta^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) \\
& - \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) + \\
& \alpha^2 d^2 r^a z^2 z^2 \cos(\alpha) \cos(\beta) \sin(\alpha) \sin(\beta) - \alpha^2 d^2 r^a r^b z^2 z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) \\
& + \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^5 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^a z^3 r^b \cos(\alpha)^5 \cos(\beta)^2 \sin(\alpha) \sin(\beta) / (r^a z^4 \cos(\alpha)^4 - r^a z^4 \cos(\alpha)^6 + \\
& r^b z^4 \cos(\alpha)^4 - z^4 z^4 \cos(\alpha)^2 + z^4 z^4 + 2 r^a z^2 r^b z^2 \cos(\alpha)^4 - r^a z^2 r^b z^2 \cos(\alpha)^6 + \\
& 6 r^a z^2 z^2 \cos(\alpha)^2 - 6 r^a z^2 z^2 \cos(\alpha)^4 + 2 r^b z^2 z^2 \cos(\alpha)^2 - r^b z^2 z^2 \cos(\alpha)^4 + \\
& r^a z^4 \cos(\alpha)^6 \cos(\beta)^2 - 4 r^a z^3 \cos(\alpha) \sin(\beta) + 4 r^a z^2 r^b z^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& r^a z^2 r^b z^2 \cos(\alpha)^6 \cos(\beta)^2 - 4 r^a z^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 5 r^a z^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 - 4 r^a r^b z^3 \cos(\alpha)^4 \cos(\beta) - 4 r^a z^3 r^b \cos(\alpha)^4 \cos(\beta) + \\
& 2 r^a z^3 r^b \cos(\alpha)^6 \cos(\beta) + 4 r^a z^3 z^3 \cos(\alpha)^3 \sin(\beta) - 4 r^a z^3 z^3 \cos(\alpha)^3 \sin(\beta) + \\
& 4 r^a z^3 z^3 \cos(\alpha)^5 \sin(\beta) - 2 r^a z^3 r^b \cos(\alpha)^6 \cos(\beta)^3 - 4 r^a r^b z^2 z^2 \cos(\alpha)^2 \cos(\beta) + \\
& 2 r^a r^b z^2 z^2 \cos(\alpha)^4 \cos(\beta) - 4 r^a r^b z^2 z^2 \cos(\alpha)^3 \sin(\beta) + 2 r^a r^b z^2 z^2 \cos(\alpha)^5 \sin(\beta) \\
& - 2 r^a z^3 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + 8 r^a z^2 r^b z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& 4 r^a z^2 r^b z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta)), \\
& -(r^a \cos(\alpha)^3 (r^b - r^a \cos(\beta)) (2 \alpha^2 d^2 r^a z^3 \sin(2 \alpha) - \beta^2 d^2 r^a z^3 r^b \cos(\alpha)^5 - \\
& r^a r^b z^2 z^2 d^2 \cos(\alpha)^4 - \alpha^2 d^2 z^4 \sin(\alpha) \sin(\beta) + \beta^2 d^2 r^a z^4 \cos(\alpha)^5 \cos(\beta) + \\
& r^b z^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta) - r^a z^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& 4 \alpha^2 d^2 r^a z^3 z^2 \cos(\alpha)^3 \sin(\alpha) + 2 r^a z^2 r^b z^2 d^2 \cos(\alpha)^4 \cos(\beta) + \\
& r^b z^2 z^2 z^2 d^2 \cos(\alpha)^3 \sin(\beta) + 2 \beta^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^5 \cos(\beta) - \\
& \beta^2 d^2 r^a r^b z^3 \cos(\alpha)^5 \cos(\beta)^2 - 2 \beta^2 d^2 r^a z^3 r^b \cos(\alpha)^5 \cos(\beta)^2 + \\
& \beta^2 d^2 r^a z^2 z^2 \cos(\alpha)^3 \cos(\beta) - \alpha^2 d^2 r^a z^4 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) - \\
& 2 r^a r^b z^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^2 + r^a z^2 r^b z^2 d^2 \cos(\alpha)^4 \cos(\beta)^3 - \\
& \beta^2 d^2 r^a r^b z^2 z^2 \cos(\alpha)^3 + \beta^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^5 \cos(\beta)^3 - \\
& \beta^2 d^2 r^a z^2 z^2 \cos(\alpha)^3 \cos(\beta)^3 - 4 \alpha^2 d^2 r^a z^3 z^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) - \\
& \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) + r^a z^2 z^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) - \\
& \alpha^2 d^2 r^b z^2 z^3 \cos(\alpha) \cos(\beta) \sin(\alpha) + \alpha^2 d^2 r^a r^b z^2 z^2 \cos(\alpha)^3 \sin(\alpha) + \\
& 2 \beta^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^4 \sin(\beta) + 6 \alpha^2 d^2 r^a z^2 z^2 \sin(\alpha) \sin(\beta) (\sin(\alpha)^2 - 1) + \\
& \beta^2 d^2 r^a r^b z^2 z^2 \cos(\alpha)^3 \cos(\beta)^2 - 3 \alpha^2 d^2 r^a z^3 z^3 \cos(\alpha) \cos(\beta)^2 \sin(\alpha) - \\
& 2 \beta^2 d^2 r^a z^3 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - 5 \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^3 \cos(\beta) \sin(\alpha) - \\
& 2 \beta^2 d^2 r^a r^b z^2 z^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - \\
& 2 \alpha^2 d^2 r^a z^2 r^b z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) \sin(\beta) + \\
& 3 \alpha^2 d^2 r^a z^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) \sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& \alpha^2 d^2 r^2 r^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 3 \alpha^2 d^2 r^2 r^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) + \\
& 5 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) + \\
& 2 \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\beta) - 2 r^2 r^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) + \\
& 3 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) \sin(\beta) / (r^6 \cos(\alpha)^6 - r^6 \cos(\alpha)^8 + \\
& r^6 \cos(\alpha)^6 - z^6 \cos(\alpha)^2 + z^6 + 3 r^2 r^2 r^4 \cos(\alpha)^6 + 3 r^4 r^2 r^2 \cos(\alpha)^6 - \\
& r^2 r^2 r^4 \cos(\alpha)^8 - 2 r^4 r^2 r^2 \cos(\alpha)^8 + 15 r^2 r^2 z^4 \cos(\alpha)^2 - 15 r^4 z^4 \cos(\alpha)^4 \\
& + 15 r^4 z^2 \cos(\alpha)^4 - 15 r^4 z^2 \cos(\alpha)^6 + 3 r^2 z^4 \cos(\alpha)^2 - \\
& 2 r^2 z^4 \cos(\alpha)^4 + 3 r^2 z^4 \cos(\alpha)^4 - r^4 z^2 \cos(\alpha)^6 + \\
& r^6 \cos(\alpha)^8 \cos(\beta)^2 + 18 r^2 r^2 z^2 \cos(\alpha)^4 - 12 r^2 r^2 z^2 \cos(\alpha)^6 - \\
& 20 r^3 z^3 \cos(\alpha)^3 \sin(\beta) + 20 r^3 z^3 \cos(\alpha)^5 \sin(\beta) - 6 r^2 z^5 \cos(\alpha) \sin(\beta) + \\
& 12 r^2 r^2 r^4 \cos(\alpha)^6 \cos(\beta)^2 + 12 r^4 r^2 r^2 \cos(\alpha)^6 \cos(\beta)^2 - \\
& 8 r^3 r^2 r^3 \cos(\alpha)^6 \cos(\beta)^3 + r^2 r^2 r^4 \cos(\alpha)^8 \cos(\beta)^2 - \\
& 2 r^4 r^2 r^2 \cos(\alpha)^8 \cos(\beta)^2 - 4 r^3 r^2 r^3 \cos(\alpha)^8 \cos(\beta)^3 + \\
& 4 r^4 r^2 r^2 \cos(\alpha)^8 \cos(\beta)^4 - 12 r^2 z^4 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 13 r^2 z^4 \cos(\alpha)^4 \cos(\beta)^2 - 12 r^4 z^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& 18 r^4 z^2 \cos(\alpha)^6 \cos(\beta)^2 - 4 r^4 z^2 \cos(\alpha)^6 \cos(\beta)^4 - \\
& 6 r^2 r^2 z^5 \cos(\alpha)^6 \cos(\beta) - 6 r^4 z^5 \cos(\alpha)^6 \cos(\beta) + 4 r^4 z^5 \cos(\alpha)^8 \cos(\beta) + \\
& 6 r^2 z^5 \cos(\alpha)^3 \sin(\beta) - 6 r^4 z^5 \cos(\alpha)^5 \sin(\beta) + 6 r^4 z^5 \cos(\alpha)^7 \sin(\beta) - \\
& 12 r^2 r^2 r^3 \cos(\alpha)^6 \cos(\beta) + 4 r^3 r^2 r^3 \cos(\alpha)^8 \cos(\beta) - \\
& 4 r^4 z^5 \cos(\alpha)^8 \cos(\beta)^3 - 6 r^2 r^2 z^4 \cos(\alpha)^2 \cos(\beta) + 4 r^2 r^2 z^4 \cos(\alpha)^4 \cos(\beta) \\
& - 6 r^2 r^2 z^4 \cos(\alpha)^5 \sin(\beta) + 2 r^2 r^2 z^4 \cos(\alpha)^7 \sin(\beta) + \\
& 6 r^2 r^2 z^2 \cos(\alpha)^6 \cos(\beta)^2 + 8 r^3 z^3 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) - \\
& 12 r^2 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - 12 r^2 r^2 z^3 \cos(\alpha)^4 \cos(\beta) - \\
& 36 r^2 z^3 \cos(\alpha)^4 \cos(\beta) + 4 r^2 r^2 z^3 \cos(\alpha)^6 \cos(\beta) + \\
& 24 r^2 z^3 \cos(\alpha)^6 \cos(\beta) - 12 r^2 r^2 z^3 \cos(\alpha)^3 \sin(\beta) + \\
& 8 r^2 r^2 z^3 \cos(\alpha)^5 \sin(\beta) - 12 r^2 z^3 \cos(\alpha)^5 \sin(\beta) + \\
& 8 r^2 z^3 \cos(\alpha)^7 \sin(\beta) + 24 r^2 z^3 \cos(\alpha)^4 \cos(\beta)^3 - \\
& 20 r^2 z^3 \cos(\alpha)^6 \cos(\beta)^3 - 4 r^2 z^5 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + \\
& 24 r^2 z^3 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - 16 r^2 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \\
& 24 r^2 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - 8 r^2 z^3 \cos(\alpha)^7 \cos(\beta) \sin(\beta) + \\
& 8 r^2 z^4 \cos(\alpha)^7 \cos(\beta)^3 \sin(\beta) - 24 r^2 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + \\
& 4 r^2 z^3 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + 24 r^2 z^4 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \\
& 16 r^2 z^4 \cos(\alpha)^7 \cos(\beta) \sin(\beta), 0]; \\
\text{YC1411} = & (e^{1/2} \cos(\alpha) (r - r \cos(\beta))) (\alpha^2 d^2 r^2 z^2 \sin(2\beta) + \\
& 2 \alpha^2 d^2 r^2 r^3 z^2 \cos(\alpha) - 2 \alpha^2 d^2 r^2 r^3 z^2 \cos(\alpha)^3 + 2 \alpha^2 d^2 r^2 r^3 z^2 d^2 (\sin(\alpha) - \\
& \sin(\alpha)^3) - 2 r^2 z^2 d^2 \cos(\alpha) - 2 \alpha^2 d^2 r^2 r^3 z^2 \sin(2\alpha) - \\
& 4 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 + 2 \beta^2 d^2 r^2 r^3 z^2 \cos(\alpha)^3 \sin(\beta) + \\
& 2 r^2 r^2 z^2 d^2 \cos(\alpha)^2 \sin(\beta) + 2 \alpha^2 d^2 r^2 r^2 z^2 d^2 (\sin(\alpha) - \sin(\alpha)^3) + \\
& 4 \alpha^2 d^2 r^2 r^3 z^2 \cos(\alpha)^3 \cos(\beta) + \beta^2 d^2 r^2 r^3 z^2 \cos(\alpha)^3 \cos(\beta) - \\
& 2 \alpha^2 d^2 r^2 r^2 z^2 d^2 \sin(\alpha) + \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \sin(\beta) + \\
& \alpha^2 d^2 r^2 r^3 z^2 \cos(\alpha)^4 \sin(\beta) + \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \sin(\beta) - \\
& \beta^2 d^2 r^2 r^3 z^2 \cos(\alpha)^4 \sin(\beta) + 2 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha) - \\
& 4 \beta^2 d^2 r^2 z^2 d^2 \cos(\alpha)^2 + 2 r^2 z^2 d^2 \cos(\alpha) \cos(\beta) - \\
& \alpha^2 d^2 r^2 r^4 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - 2 \alpha^2 d^2 r^2 r^2 z^2 \sin(\beta) - \\
& 2 \alpha^2 d^2 r^2 r^3 z^2 \cos(\alpha)^3 \cos(\beta)^3 - 2 r^2 z^2 d^2 \cos(\alpha)^2 \cos(\beta) \sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d^2*ra^3*z*\cos(\alpha)*\cos(\beta) - \beta_1d^2*ra^3*z*\cos(\alpha)*\cos(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*z^3*\sin(\alpha)*\sin(\beta) + 2*\alpha_1d*ra^2*z^2d*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta_1d*ra^2*z^2d*\cos(\alpha)*\sin(\beta) - 2*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^3*\cos(\beta)^2 - \\
& 6*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)*\cos(\beta) - 2*\beta_1d^2*ra^2*rb^2*z^2d*\cos(\alpha)^3*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^3*rb*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + 4*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)*\cos(\beta)^2 + \\
& 6*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^3*\cos(\beta) - \beta_1d^2*ra^2*rb^2*z*\cos(\alpha)^3*\cos(\beta) - \\
& 2*\alpha_1d*ra^3*z^2d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + 3*\alpha_1d^2*ra^2*rb^2*z^2*\cos(\alpha)^2*\sin(\beta) + \\
& \beta_1d^2*ra^2*rb^2*z^2*\cos(\alpha)^2*\sin(\beta) - 6*\alpha_1d*ra^2*rb^2*z^2d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 4*\beta_1d*ra^2*rb^2*z^2d*\cos(\alpha)^2*\cos(\beta) + 4*\alpha_1d*ra^2*rb^2*z^2d*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^3*z^3*\sin(\alpha)*\sin(\beta)*(sin(\alpha)^2 - 1) + \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z^3*\sin(\alpha)*\sin(\beta)*(sin(\alpha)^2 - 1) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha))/((ra^6*\cos(\alpha)^6 + rb^6*\cos(\alpha)^6 + z^6 + \\
& 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 + 15*ra^2*z^4*\cos(\alpha)^2 + \\
& 15*ra^4*z^2*\cos(\alpha)^4 + 3*rb^2*z^4*\cos(\alpha)^2 + 3*rb^4*z^2*\cos(\alpha)^4 + \\
& 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) - 6*ra^2*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 - \\
& 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 - 6*ra^2*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) \\
& - 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) - 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) - 6*ra^2*rb^4*\cos(\alpha)^2*\cos(\beta) \\
& - 6*ra^2*rb^4*z*\cos(\alpha)^5*\sin(\beta) + 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) - \\
& 12*ra^2*rb^3*z^2*\cos(\alpha)^4*\cos(\beta) - 36*ra^3*rb^2*z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 12*ra^2*rb^2*z^3*\cos(\alpha)^3*\sin(\beta) - 12*ra^3*rb^2*z^2*\cos(\alpha)^5*\sin(\beta) + \\
& 24*ra^3*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)^3 + 24*ra^2*rb^2*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + \\
& 24*ra^2*rb^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - 24*ra^3*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 24*ra^4*rb^2*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta)); \\
& YC1412=(\cos(\alpha)*(rb - ra*\cos(\beta))*(2*\alpha_1d^2*ra^2*rb^3*z*\cos(\alpha) + 2*rb^2*z^2d^2*\cos(\alpha)^3 - \\
& 2*\alpha_1d^2*ra^2*rb^3*z*\cos(\alpha)^3 - 2*rb^2*z^2d^2*\cos(\alpha) - 6*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^3 + \\
& 4*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^5 + 2*\alpha_1d*rb^3*z^2d*\cos(\alpha)^2*\sin(\alpha) + \\
& 2*\beta_1d*ra^3*z^2d*\cos(\alpha)^3*\sin(\beta) - 2*\beta_1d*ra^3*z^2d*\cos(\alpha)^5*\sin(\beta) - \\
& 2*ra^2*z^2d^2*\cos(\alpha)^3*\cos(\beta) + 2*ra^2*rb^2*z^2d^2*\cos(\alpha)^2*\sin(\beta) - \\
& 2*ra^2*rb^2*z^2d^2*\cos(\alpha)^4*\sin(\beta) + 6*\alpha_1d^2*ra^3*z*\cos(\alpha)^3*\cos(\beta) - \\
& 4*\alpha_1d^2*ra^3*z*\cos(\alpha)^5*\cos(\beta) + \beta_1d^2*ra^2*z^3*\cos(\alpha)^3*\cos(\beta) + \\
& \beta_1d^2*ra^2*z^3*\cos(\alpha)^3*\cos(\beta) - \beta_1d^2*ra^2*z^3*\cos(\alpha)^5*\cos(\beta) - \\
& 2*\alpha_1d*rb^2*z^2*z^2d*\sin(\alpha) + \alpha_1d^2*ra^2*rb^3*\cos(\alpha)^4*\sin(\beta) + \\
& \alpha_1d^2*ra^3*rb*\cos(\alpha)^4*\sin(\beta) - \alpha_1d^2*ra^2*rb^3*\cos(\alpha)^6*\sin(\beta) - \\
& \alpha_1d^2*ra^3*rb*\cos(\alpha)^6*\sin(\beta) + \beta_1d^2*ra^2*rb^3*\cos(\alpha)^4*\sin(\beta) - \\
& \beta_1d^2*ra^3*rb*\cos(\alpha)^4*\sin(\beta) - \beta_1d^2*ra^2*rb^3*\cos(\alpha)^6*\sin(\beta) + \\
& \beta_1d^2*ra^3*rb*\cos(\alpha)^6*\sin(\beta) + 2*\alpha_1d^2*ra^2*z^2*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha) - 4*\beta_1d*ra^2*z^2d*\cos(\alpha)^2 + 4*\beta_1d*ra^2*z^2d*\cos(\alpha)^4 + \\
& 2*ra^2*z^2d^2*\cos(\alpha)*\cos(\beta) - \alpha_1d^2*ra^4*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& \alpha_1d^2*ra^4*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - 2*\alpha_1d^2*ra^2*rb^2*z^2*\sin(\beta) - \\
& 4*\alpha_1d^2*ra^3*z*\cos(\alpha)^3*\cos(\beta)^3 + 4*\alpha_1d^2*ra^3*z*\cos(\alpha)^5*\cos(\beta)^3 - \\
& 2*ra^2*z^2d^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + 2*ra^2*z^2d^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d^2*ra^2*z^3*\cos(\alpha)*\cos(\beta) - \beta_1d^2*ra^2*z^3*\cos(\alpha)*\cos(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^4*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + 2*\alpha_1d*\beta_1d*ra^2*z^3*\sin(\alpha)*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*ra*z^2*z1d*cos(beta)*sin(alpha) + 2*beta1d*ra*z^2*z1d*cos(alpha)*sin(beta) - \\
& 4*\alpha_1d^2*ra^2*rb*z*cos(alpha)^5*cos(beta)^2 - 2*\alpha_1d*ra^3*z1d*cos(alpha)^4*cos(beta)^3*sin(alpha) - \\
& 4*\alpha_1d*beta_1d*ra^2*z^2*cos(alpha)*sin(alpha) - 6*\alpha_1d^2*ra*rb^2*z*cos(alpha)*cos(beta) + \\
& 2*\alpha_1d*ra^2*rb*z1d*cos(alpha)^2*sin(alpha) - 2*\alpha_1d*ra^2*rb*z1d*cos(alpha)^4*sin(alpha) - \\
& 2*beta_1d*ra*rb^2*z1d*cos(alpha)^3*sin(beta) + 2*beta_1d*ra*rb^2*z1d*cos(alpha)^5*sin(beta) + \\
& 2*\alpha_1d*rb*z^2*z1d*cos(alpha)^2*sin(alpha) - 2*beta_1d*ra*z^2*z1d*cos(alpha)^3*sin(beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 2*\alpha_1d^2*ra^3*rb*cos(alpha)^4*cos(beta)^2*sin(beta) + \\
& 3*\alpha_1d^2*ra^2*rb^2*cos(alpha)^6*cos(beta)*sin(beta) - \\
& 2*\alpha_1d^2*ra^3*rb*cos(alpha)^6*cos(beta)^2*sin(beta) - \\
& 5*\alpha_1d^2*ra^2*z^2*cos(alpha)^2*cos(beta)*sin(beta) + \\
& 3*\alpha_1d^2*ra^2*z^2*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 2*\alpha_1d*beta_1d*ra^2*rb^2*cos(alpha)^5*sin(alpha) + 4*\alpha_1d*beta_1d*ra^2*z^2*cos(alpha)^3*sin(alpha) + \\
& 4*\alpha_1d^2*ra^2*rb*z*cos(alpha)*cos(beta)^2 + 6*\alpha_1d^2*ra*rb^2*z*cos(alpha)^3*cos(beta) - \\
& beta_1d^2*ra*rb^2*z*cos(alpha)^3*cos(beta) + beta_1d^2*ra*rb^2*z*cos(alpha)^5*cos(beta) - \\
& 2*\alpha_1d*ra^3*z1d*cos(alpha)^2*cos(beta)*sin(alpha) + 2*\alpha_1d*ra^3*z1d*cos(alpha)^4*cos(beta)*sin(alpha) \\
& + 5*\alpha_1d^2*ra*rb*z^2*cos(alpha)^2*sin(beta) - 3*\alpha_1d^2*ra*rb*z^2*cos(alpha)^4*sin(beta) + \\
& beta_1d^2*ra*rb*z^2*cos(alpha)^2*sin(beta) - beta_1d^2*ra*rb*z^2*cos(alpha)^4*sin(beta) - \\
& 2*\alpha_1d*beta_1d*ra*rb^3*cos(alpha)^5*cos(beta)*sin(alpha) - \\
& 4*\alpha_1d*beta_1d*ra^3*rb*cos(alpha)^5*cos(beta)*sin(alpha) - \\
& 2*\alpha_1d*beta_1d*ra*z^3*cos(alpha)^2*sin(alpha)*sin(beta) + \\
& 2*\alpha_1d*beta_1d*ra^3*z*cos(alpha)^2*sin(alpha)*sin(beta) - \\
& 2*\alpha_1d*beta_1d*ra^3*z*cos(alpha)^4*sin(alpha)*sin(beta) - \\
& 6*\alpha_1d*ra*rb^2*z1d*cos(alpha)^2*cos(beta)*sin(alpha) - \\
& 2*\alpha_1d*ra*z^2*z1d*cos(alpha)^2*cos(beta)*sin(alpha) + 4*beta_1d*ra*rb*z*z1d*cos(alpha)^2*cos(beta) - \\
& 4*beta_1d*ra*rb*z*z1d*cos(alpha)^4*cos(beta) - 2*\alpha_1d*beta_1d*ra^3*rb*cos(alpha)^5*cos(beta)^3*sin(alpha) \\
& + 4*\alpha_1d*ra^2*rb*z1d*cos(alpha)^2*cos(beta)^2*sin(alpha) + \\
& 2*\alpha_1d*ra^2*rb*z1d*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& 4*\alpha_1d*beta_1d*ra^2*rb^2*cos(alpha)^5*cos(beta)^2*sin(alpha) + \\
& 4*\alpha_1d*beta_1d*ra*rb*z^2*cos(alpha)*cos(beta)*sin(alpha) - \\
& 2*\alpha_1d*beta_1d*ra^3*z*cos(alpha)^4*cos(beta)^2*sin(alpha)*sin(beta) - \\
& 4*\alpha_1d*beta_1d*ra*rb*z^2*cos(alpha)^3*cos(beta)*sin(alpha) - \\
& 2*\alpha_1d*beta_1d*ra*rb^2*z*cos(alpha)^2*sin(alpha)*sin(beta) + \\
& 4*\alpha_1d*beta_1d*ra^2*rb*z*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta)))/(ra^6*cos(alpha)^6 - \\
& ra^6*cos(alpha)^8 + rb^6*cos(alpha)^6 - z^6*cos(alpha)^2 + z^6 + 3*ra^2*rb^4*cos(alpha)^6 + \\
& 3*ra^4*rb^2*cos(alpha)^6 - ra^2*rb^4*cos(alpha)^8 - 2*ra^4*rb^2*cos(alpha)^8 + 15*ra^2*z^4*cos(alpha)^2 - \\
& 15*ra^2*z^4*cos(alpha)^4 + 15*ra^4*z^2*cos(alpha)^4 - 15*ra^4*z^2*cos(alpha)^6 + \\
& 3*rb^2*z^4*cos(alpha)^2 - 2*rb^2*z^4*cos(alpha)^4 + 3*rb^4*z^2*cos(alpha)^4 - rb^4*z^2*cos(alpha)^6 + \\
& ra^6*cos(alpha)^8*cos(beta)^2 + 18*ra^2*rb^2*z^2*cos(alpha)^4 - 12*ra^2*rb^2*z^2*cos(alpha)^6 - \\
& 20*ra^3*z^3*cos(alpha)^3*sin(beta) + 20*ra^3*z^3*cos(alpha)^5*sin(beta) - 6*ra*z^5*cos(alpha)*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 + ra^2*rb^4*cos(alpha)^8*cos(beta)^2 - \\
& 2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - 4*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 + \\
& 4*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 + \\
& 13*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 + \\
& 18*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 4*ra^4*z^2*cos(alpha)^6*cos(beta)^4 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 4*ra^5*rb*cos(alpha)^8*cos(beta) +
\end{aligned}$$

$$\begin{aligned}
& 6*ra^5*cos(alpha)^3*sin(beta) - 6*ra^5*z*cos(alpha)^5*sin(beta) + 6*ra^5*z*cos(alpha)^7*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) + 4*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& - 6*ra*rb^4*z*cos(alpha)^5*sin(beta) + 2*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) - 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) - 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 - 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) - 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
YC1413 = & (cos(alpha)^4*(rb - ra*cos(beta))^3*(2*alpha1d^2*ra*z^3*cos(beta) - 2*alpha1d^2*rb*z^3 - \\
& 2*rb*z^3d^2*cos(alpha)^2 + 2*alpha1d^2*rb*z^3*cos(alpha)^2 - 2*alpha1d^2*ra^2*rb*z*cos(alpha)^4 + \\
& 2*beta1d*ra^3*z1d*cos(alpha)^4*sin(beta) + 2*ra*z^3d^2*cos(alpha)^2*cos(beta) + \\
& 2*ra*rb*z1d^2*cos(alpha)^3*sin(beta) - 2*alpha1d^2*ra*z^3*cos(alpha)^2*cos(beta) + \\
& 2*alpha1d^2*ra^3*z*cos(alpha)^4*cos(beta) - beta1d^2*ra*z^3*cos(alpha)^2*cos(beta) + \\
& beta1d^2*ra^3*z*cos(alpha)^4*cos(beta) + alpha1d^2*ra*rb^3*cos(alpha)^5*sin(beta) + \\
& alpha1d^2*ra^3*rb*cos(alpha)^5*sin(beta) + beta1d^2*ra*rb^3*cos(alpha)^5*sin(beta) - \\
& beta1d^2*ra^3*rb*cos(alpha)^5*sin(beta) - 10*alpha1d*beta1d*ra^2*z^2*(sin(alpha) - sin(alpha)^3) - \\
& 4*beta1d*ra^2*z^2d*cos(alpha)^3 - alpha1d^2*ra^4*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra^3*z*cos(alpha)^4*cos(beta)^3 - 2*alpha1d*rb*z^2*z1d*sin(2*alpha) - \\
& 2*ra^2*z1d^2*cos(alpha)^3*cos(beta)*sin(beta) - 2*alpha1d*beta1d*ra^4*cos(alpha)^4*sin(alpha) + \\
& 2*alpha1d^2*ra^2*rb*z*cos(alpha)^4*cos(beta)^2 - 2*alpha1d^2*ra^2*z^2*cos(alpha)*cos(beta)*sin(beta) + \\
& 2*alpha1d^2*ra*rb*z^2*cos(alpha)*sin(beta) - 2*beta1d*ra*rb^2*z1d*cos(alpha)^4*sin(beta) + \\
& 2*beta1d*ra*z^2*z1d*cos(alpha)^2*sin(beta) - 3*alpha1d^2*ra^2*rb^2*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 2*alpha1d^2*ra^3*rb*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& alpha1d^2*ra^2*z^2*cos(alpha)^3*cos(beta)*sin(beta) - 2*alpha1d*beta1d*ra^2*rb^2*cos(alpha)^4*sin(alpha) - \\
& beta1d^2*ra*rb^2*z*cos(alpha)^4*cos(beta) - alpha1d^2*ra*rb*z^2*cos(alpha)^3*sin(beta) + \\
& beta1d^2*ra*rb*z^2*cos(alpha)^3*sin(beta) + 2*alpha1d*beta1d*ra*rb^3*cos(alpha)^4*cos(beta)*sin(alpha) + \\
& 6*alpha1d*beta1d*ra^3*rb*cos(alpha)^4*cos(beta)*sin(alpha) + \\
& 8*alpha1d*beta1d*ra^3*z*cos(alpha)^3*sin(alpha)*sin(beta) + 4*beta1d*ra*rb*z^2d*cos(alpha)^3*cos(beta) + \\
& 4*alpha1d*beta1d*ra*z^3*cos(alpha)*sin(alpha)*sin(beta) - \\
& 4*alpha1d*beta1d*ra^2*rb^2*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& 4*alpha1d*ra*z^2*z1d*cos(alpha)*cos(beta)*sin(alpha) + \\
& 4*alpha1d*beta1d*ra^2*z^2*cos(alpha)^2*cos(beta)^2*sin(alpha) - \\
& 4*alpha1d*ra^2*z^2d*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta) + \\
& 6*alpha1d*beta1d*ra*rb*z^2*cos(alpha)^2*cos(beta)*sin(alpha) - \\
& 4*alpha1d*ra*rb*z^2d*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) - \\
& 8*alpha1d*beta1d*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta)))/(ra^8*cos(alpha)^8 - \\
& ra^8*cos(alpha)^10 + rb^8*cos(alpha)^8 - z^8*cos(alpha)^2 + z^8 + 4*ra^2*rb^6*cos(alpha)^8 + \\
& 6*ra^4*rb^4*cos(alpha)^8 + 4*ra^6*rb^2*cos(alpha)^8 - ra^2*rb^6*cos(alpha)^10 - \\
& 3*ra^4*rb^4*cos(alpha)^10 - 3*ra^6*rb^2*cos(alpha)^10 + 28*ra^2*z^6*cos(alpha)^2 -
\end{aligned}$$

$$\begin{aligned}
& 28*ra^2*z^6*cos(alpha)^4 + 70*ra^4*z^4*cos(alpha)^4 - 70*ra^4*z^4*cos(alpha)^6 + \\
& 28*ra^6*z^2*cos(alpha)^6 - 28*ra^6*z^2*cos(alpha)^8 + 4*rb^2*z^6*cos(alpha)^2 - 3*rb^2*z^6*cos(alpha)^4 \\
& + 6*rb^4*z^4*cos(alpha)^4 - 3*rb^4*z^4*cos(alpha)^6 + 4*rb^6*z^2*cos(alpha)^6 - rb^6*z^2*cos(alpha)^8 + \\
& ra^8*cos(alpha)^10*cos(beta)^2 + 60*ra^2*rb^2*z^4*cos(alpha)^4 - 45*ra^2*rb^2*z^4*cos(alpha)^6 + \\
& 36*ra^2*rb^4*z^2*cos(alpha)^6 + 60*ra^4*rb^2*z^2*cos(alpha)^6 - 18*ra^2*rb^4*z^2*cos(alpha)^8 - \\
& 45*ra^4*rb^2*z^2*cos(alpha)^8 - 56*ra^3*z^5*cos(alpha)^3*sin(beta) + 56*ra^3*z^5*cos(alpha)^5*sin(beta) - \\
& 56*ra^5*z^3*cos(alpha)^5*sin(beta) + 56*ra^5*z^3*cos(alpha)^7*sin(beta) - 8*ra^z^7*cos(alpha)*sin(beta) + \\
& 24*ra^2*rb^6*cos(alpha)^8*cos(beta)^2 + 48*ra^4*rb^4*cos(alpha)^8*cos(beta)^2 + \\
& 24*ra^6*rb^2*cos(alpha)^8*cos(beta)^2 - 32*ra^3*rb^5*cos(alpha)^8*cos(beta)^3 - \\
& 32*ra^5*rb^3*cos(alpha)^8*cos(beta)^3 + ra^2*rb^6*cos(alpha)^10*cos(beta)^2 + \\
& 16*ra^4*rb^4*cos(alpha)^8*cos(beta)^4 - 9*ra^4*rb^4*cos(alpha)^10*cos(beta)^2 - \\
& 9*ra^6*rb^2*cos(alpha)^10*cos(beta)^2 - 6*ra^3*rb^5*cos(alpha)^10*cos(beta)^3 - \\
& 4*ra^5*rb^3*cos(alpha)^10*cos(beta)^3 + 12*ra^4*rb^4*cos(alpha)^10*cos(beta)^4 + \\
& 12*ra^6*rb^2*cos(alpha)^10*cos(beta)^4 - 8*ra^5*rb^3*cos(alpha)^10*cos(beta)^5 - \\
& 24*ra^2*z^6*cos(alpha)^2*cos(beta)^2 + 25*ra^2*z^6*cos(alpha)^4*cos(beta)^2 - \\
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) + 8*ra^z^7*cos(alpha)^3*sin(beta) - 8*ra^7*z*cos(alpha)^7*sin(beta) + \\
& 8*ra^7*z*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb*z^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb*z^6*cos(alpha)^4*cos(beta) - 8*ra*rb^6*z*cos(alpha)^7*sin(beta) + 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 + \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) - 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb^3*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb^3*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb^3*z^2*cos(alpha)^8*cos(beta) - 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) + \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) - 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) + \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) - 24*ra^3*rb^4*z*cos(alpha)^7*sin(beta) - \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) + 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) + \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb^3*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb^3*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb^3*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb^3*z^2*cos(alpha)^8*cos(beta)^5 - \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) + \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) + 48*ra^2*rb^2*z^5*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 36*ra^2*rb^2*z^5*cos(alpha)^5*cos(beta)*sin(beta) + 160*ra^4*rb^2*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) - 120*ra^4*rb^2*z^3*cos(alpha)^7*cos(beta)*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) - \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) + 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) - 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) - 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) + \\
& 64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) + \\
& 36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
& 24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) + 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) - 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta));
\end{aligned}$$

$$YC1414=0;$$

$$\begin{aligned}
YC1421 = & -(e1^2*(rb - ra*cos(beta))*(2*alpha1d*rb*z^3*z1d - alpha1d^2*rb*z^4*sin(2*alpha) + \\
& rb*z^2*z1d^2*sin(2*alpha) - alpha1d^2*rb^3*z^2*sin(2*alpha) - 2*alpha1d*beta1d*ra*z^4*sin(beta) - \\
& 2*alpha1d*ra*z^3*z1d*cos(beta) - alpha1d^2*ra^2*rb*z^2*sin(2*alpha) + \\
& 4*alpha1d*beta1d*ra^2*z^3*cos(alpha) - 8*alpha1d*beta1d*ra^4*z*cos(alpha)^5 - \\
& 4*alpha1d*rb*z^3*z1d*cos(alpha)^2 - 2*alpha1d*rb^3*z^2*z1d*cos(alpha)^2 + 4*beta1d*ra^2*z^2*z1d*(sin(alpha) \\
& - sin(alpha)^3) + 2*alpha1d*beta1d*ra^5*cos(alpha)^6*sin(beta) - 12*alpha1d*beta1d*ra^2*z^3*cos(alpha)^3 + \\
& 6*alpha1d*beta1d*ra^2*z^3*cos(alpha)^3*cos(beta)^2 - 2*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^2 - \\
& 4*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^4 + 2*alpha1d^2*ra^3*z^2*cos(alpha)*cos(beta)*sin(alpha) - \\
& 2*alpha1d^2*ra^2*rb*z^2*cos(alpha)^3*sin(alpha) - 2*alpha1d^2*ra^2*z^3*cos(beta)*sin(alpha)*sin(beta) - \\
& 4*alpha1d*beta1d*ra^2*rb^2*z*cos(alpha)^5 + 4*alpha1d*beta1d*ra*z^4*cos(alpha)^2*sin(beta) + \\
& 4*alpha1d*ra*z^3*z1d*cos(alpha)^2*cos(beta) + 2*alpha1d*ra^3*z^2*z1d*cos(alpha)^2*cos(beta) + \\
& 4*alpha1d*ra^3*z^2*z1d*cos(alpha)^4*cos(beta) + 2*alpha1d*ra^3*z^2*z1d*cos(alpha)^5*sin(beta) + \\
& 2*alpha1d*ra^3*rb*z1d*cos(alpha)^5*sin(beta) + 2*alpha1d^2*ra*rb*z^3*sin(alpha)*sin(beta) + \\
& 2*alpha1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)*sin(alpha) - \\
& beta1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)*sin(alpha) + 6*alpha1d*beta1d*ra^4*z*cos(alpha)^5*cos(beta)^2 + \\
& 2*alpha1d*beta1d*ra^3*rb^2*cos(alpha)^6*sin(beta) - 2*alpha1d*beta1d*ra^3*z^2*cos(alpha)^2*sin(beta) + \\
& 14*alpha1d*beta1d*ra^3*z^2*cos(alpha)^4*sin(beta) + 2*alpha1d^2*ra*z^4*cos(alpha)*cos(beta)*sin(alpha) + \\
& beta1d^2*ra*z^4*cos(alpha)*cos(beta)*sin(alpha) - 2*alpha1d*ra^4*z1d*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 4*alpha1d*ra^3*z^2*z1d*cos(alpha)^4*cos(beta)^3 - 2*ra*z^2*z1d^2*cos(alpha)*cos(beta)*sin(alpha) - \\
& 2*alpha1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)^3*sin(alpha) - \\
& alpha1d^2*ra^4*z*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& 2*ra^2*z^2*z1d^2*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta) - \\
& 3*alpha1d^2*ra*rb*z^3*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) + \\
& beta1d^2*ra*rb*z^3*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) - \\
& 6*alpha1d*beta1d*ra^4*rb*cos(alpha)^6*cos(beta)*sin(beta) - \\
& 8*alpha1d*beta1d*ra^3*rb*z*cos(alpha)^5*cos(beta)^3 + \\
& 2*alpha1d*beta1d*ra*rb^2*z^2*cos(alpha)^2*sin(beta) - 4*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^2*cos(beta)^2 + \\
& 4*alpha1d*ra^2*rb*z^2*z1d*cos(alpha)^4*cos(beta)^2 - 2*beta1d*ra^3*z^2*z1d*cos(alpha)^3*sin(alpha)*sin(beta) + \\
& 2*alpha1d^2*ra^2*rb*z^2*cos(alpha)^3*cos(beta)^2*sin(alpha) - \\
& 3*alpha1d^2*ra^2*z^3*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta) - \\
& 4*alpha1d*beta1d*ra*rb*z^3*cos(alpha)*cos(beta) - \\
& 2*alpha1d*beta1d*ra^2*rb^3*cos(alpha)^6*cos(beta)*sin(beta) - \\
& 2*alpha1d*beta1d*ra^2*rb^2*z*cos(alpha)^5*cos(beta)^2 + \\
& 6*alpha1d^2*ra*rb^2*z^2*cos(alpha)*cos(beta)*sin(alpha) - \\
& 6*alpha1d*ra^2*rb^2*z^2*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 4*alpha1d*ra^3*rb*z1d*cos(alpha)^5*cos(beta)^2*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 6*\alpha 1d*ra^2*z^2*z1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + \\
& \alpha 1d^2*ra*rb^3*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& \alpha 1d^2*ra^3*rb*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \beta 1d^2*ra*rb^3*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) \\
& + \beta 1d^2*ra^3*rb*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + 6*\alpha 1d*\beta 1d*ra*rb^3*z*\cos(\alpha)^3*\cos(\beta) \\
& + 2*\alpha 1d*\beta 1d*ra*rb^3*z*\cos(\alpha)^5*\cos(\beta) + 14*\alpha 1d*\beta 1d*ra^3*rb*z*\cos(\alpha)^5*\cos(\beta) \\
& + 2*ra*rb^2*z1d^2*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) + 6*\alpha 1d*ra*rb^2*z^2*z1d*\cos(\alpha)^2*\cos(\beta) + \\
& 4*\alpha 1d*\beta 1d*ra^3*rb^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) - \\
& 4*\alpha 1d*\beta 1d*ra^3*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) + \\
& 6*\alpha 1d*ra*rb^2*z^2*z1d*\cos(\alpha)^3*\sin(\beta) - 2*\beta 1d*ra^2*z^3*z1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha 1d^2*ra^2*rb^2*z^2*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) + \\
& \beta 1d^2*ra*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 10*\alpha 1d*\beta 1d*ra^2*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 4*\beta 1d*ra*rb^2*z^2*z1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta 1d*ra*rb^2*z^2*z1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 3*\alpha 1d^2*ra^2*rb^2*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha 1d^2*ra^3*rb^2*z*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta)))/(ra^6*\cos(\alpha)^6 + \\
& rb^6*\cos(\alpha)^6 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 + \\
& 15*ra^2*z^4*\cos(\alpha)^2 + 15*ra^4*z^2*\cos(\alpha)^4 + 3*rb^2*z^4*\cos(\alpha)^2 + \\
& 3*rb^4*z^2*\cos(\alpha)^4 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) - \\
& 6*ra^z^5*\cos(\alpha)*\sin(\beta) + 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + \\
& 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 - \\
& 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) - 6*ra*rb^z^4*\cos(\alpha)^2*\cos(\beta) - \\
& 6*ra*rb^4*z*\cos(\alpha)^5*\sin(\beta) + 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) - \\
& 12*ra*rb^3*z^2*\cos(\alpha)^4*\cos(\beta) - 36*ra^3*rb^z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 12*ra*rb^2*z^3*\cos(\alpha)^3*\sin(\beta) - 12*ra^3*rb^2*z*\cos(\alpha)^5*\sin(\beta) + \\
& 24*ra^3*rb^z^2*\cos(\alpha)^4*\cos(\beta)^3 + 24*ra^2*rb^z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + \\
& 24*ra^2*rb^3*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - 24*ra^3*rb^2*z*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 24*ra^4*rb^z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta)); \\
\text{YC1422} = & -((rb - ra*\cos(\beta))*(2*\alpha 1d*rb^2*z^3*z1d + rb^2*z^2*z1d^2*\sin(2*\alpha) - \\
& \alpha 1d^2*rb^3*z^2*\sin(2*\alpha) + 2*\beta 1d*ra^4*z1d*\cos(\alpha)^6*\sin(\alpha) + \\
& \alpha 1d^2*ra^5*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + 2*ra^3*z1d^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) - \\
& 2*\alpha 1d*\beta 1d*ra^z^4*\sin(\beta) - 2*\alpha 1d*ra^z^3*z1d*\cos(\beta) + \\
& \alpha 1d^2*ra^4*rb*\cos(\alpha)^7*\sin(\alpha) - \beta 1d^2*ra^4*rb*\cos(\alpha)^7*\sin(\alpha) - \\
& \alpha 1d^2*ra^2*rb^z^2*\sin(2*\alpha) + 2*ra^2*rb^z1d^2*\cos(\alpha)^5*\sin(\alpha) + \\
& 4*\alpha 1d*\beta 1d*ra^2*z^3*\cos(\alpha) + 2*\alpha 1d*\beta 1d*ra^4*z*\cos(\alpha)^5 - \\
& 2*\alpha 1d*\beta 1d*ra^4*z*\cos(\alpha)^7 - 2*\alpha 1d*rb^z^3*z1d*\cos(\alpha)^2 - \\
& 2*\alpha 1d*rb^3*z^2*z1d*\cos(\alpha)^2 + 4*\beta 1d*ra^2*z^2*z1d*(\sin(\alpha) - \sin(\alpha)^3) - \\
& \alpha 1d^2*ra^5*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) + \alpha 1d^2*ra^2*rb^3*\cos(\alpha)^7*\sin(\alpha) + \\
& \beta 1d^2*ra^2*rb^3*\cos(\alpha)^7*\sin(\alpha) - 2*ra^3*z1d^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha 1d*\beta 1d*ra^2*z^3*\cos(\alpha)^3 - 2*\alpha 1d*\beta 1d*ra^2*z^3*\cos(\alpha)^5 + \\
& 2*\alpha 1d*\beta 1d*ra^5*\cos(\alpha)^8*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha 1d*\beta 1d*ra^2*z^3*\cos(\alpha)^3*\cos(\beta)^2 + \\
& 2*\alpha 1d*\beta 1d*ra^2*z^3*\cos(\alpha)^5*\cos(\beta)^2 - 2*\alpha 1d*ra^2*rb^z^2*z1d*\cos(\alpha)^2 + \\
& 2*\alpha 1d*ra^2*rb^z^2*z1d*\cos(\alpha)^4 + 2*\alpha 1d^2*ra^3*z^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\beta 1d*ra^4*z1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*ra^4*z_1d*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) + 2*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\sin(\alpha) + \beta_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\sin(\alpha) - \\
& 2*\alpha_1d^2*ra^2*z^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - 4*\alpha_1d*\beta_1d*ra^2*rb^2*z*\cos(\alpha)^5 + \\
& 2*\alpha_1d*\beta_1d*ra*z^4*\cos(\alpha)^2*\sin(\beta) + 2*\alpha_1d*ra*z^3*z_1d*\cos(\alpha)^2*\cos(\beta) + \\
& 2*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^2*\cos(\beta) - 2*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^4*\cos(\beta) + \\
& 2*\alpha_1d*ra*rb^3*z_1d*\cos(\alpha)^5*\sin(\beta) + 2*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^5*\sin(\beta) - \\
& 2*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^7*\sin(\beta) - 3*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) + \\
& \alpha_1d^2*ra^4*rb*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d^2*ra^4*rb*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha) + \\
& \beta_1d^2*ra^4*rb*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + 2*\alpha_1d^2*ra*rb*z^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 3*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) - \\
& \beta_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - 2*ra^2*rb*z_1d^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) \\
& - 4*\alpha_1d*\beta_1d*ra^4*z*\cos(\alpha)^5*\cos(\beta)^2 + 2*\alpha_1d*\beta_1d*ra^4*z*\cos(\alpha)^7*\cos(\beta)^4 + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb^2*\cos(\alpha)^8*\sin(\beta) - 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^2*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^4*\sin(\beta) + 4*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^6*\sin(\beta) + \\
& \beta_1d^2*ra*z^4*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - 2*\alpha_1d*ra^4*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*ra^4*z_1d*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) + 2*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^4*\cos(\beta)^3 - \\
& 2*\beta_1d*ra^2*rb^2*z_1d*\cos(\alpha)^6*\sin(\alpha) + 2*\beta_1d*ra^2*z^2*z_1d*\cos(\alpha)^4*\sin(\alpha) - \\
& \alpha_1d^2*ra^2*rb^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) - \\
& \beta_1d^2*ra^2*rb^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) - 2*ra*z^2*z_1d^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) - \\
& \alpha_1d^2*ra^4*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& \beta_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta_1d*ra^2*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 2*ra^2*z*z_1d^2*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*ra^2*z*z_1d^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 3*\alpha_1d^2*ra*rb*z^3*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) + \\
& \beta_1d^2*ra*rb*z^3*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) - \\
& 4*\alpha_1d*\beta_1d*ra^4*rb*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^5*\cos(\beta)^3 - \\
& 4*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^7*\cos(\beta)^3 + \\
& 2*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^2*\sin(\beta) - 4*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^2*\cos(\beta)^2 - \\
& 2*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^4*\cos(\beta)^2 - 2*\beta_1d*ra^3*z*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta_1d*ra^3*z*z_1d*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 3*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) - \\
& \beta_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^2*z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& \beta_1d^2*ra^2*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*ra*rb*z*z_1d^2*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - 4*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)*\cos(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^3*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^4*rb*\cos(\alpha)^8*\cos(\beta)^3*\sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z*\cos(\alpha)^5*\cos(\beta)^2 + \\
& 6*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha_1d*ra^2*rb^2*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha_1d*ra^3*rb*z1d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha_1d*ra^3*rb*z1d*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha_1d*ra^2*z^2*z1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*ra^2*z^2*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& \alpha_1d^2*ra*rb^3*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& \alpha_1d^2*ra^3*rb*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d^2*ra^3*rb*z*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& \beta_1d^2*ra*rb^3*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \beta_1d^2*ra^3*rb*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) \\
& + 4*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)^3*\cos(\beta) + 2*\alpha_1d*\beta_1d*ra*rb^3*z*\cos(\alpha)^5*\cos(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^5*\cos(\beta) + 4*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^7*\cos(\beta) + \\
& 2*ra*rb*z*z1d^2*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) + 6*\alpha_1d*ra*rb^2*z*z1d*\cos(\alpha)^2*\cos(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^3*rb^2*\cos(\alpha)^8*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha_1d*ra*rb*z^2*z1d*\cos(\alpha)^3*\sin(\beta) + 2*\alpha_1d*ra*rb*z^2*z1d*\cos(\alpha)^5*\sin(\beta) - \\
& 2*\beta_1d*ra*z^3*z1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) + \\
& \beta_1d^2*ra*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta_1d*ra^2*rb^2*z1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra^2*rb*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& 4*\beta_1d*ra*rb*z^2*z1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta_1d*ra*rb^2*z*z1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^3*rb*z*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d^2*ra^3*rb*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& \beta_1d^2*ra^2*rb^2*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta_1d*ra^2*rb*z*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta)))/(ra^6*\cos(\alpha)^6 - ra^6*\cos(\alpha)^8 \\
& + rb^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 - \\
& ra^2*rb^4*\cos(\alpha)^8 - 2*ra^4*rb^2*\cos(\alpha)^8 + 15*ra^2*z^4*\cos(\alpha)^2 - 15*ra^2*z^4*\cos(\alpha)^4 \\
& + 15*ra^4*z^2*\cos(\alpha)^4 - 15*ra^4*z^2*\cos(\alpha)^6 + 3*rb^2*z^4*\cos(\alpha)^2 - \\
& 2*rb^2*z^4*\cos(\alpha)^4 + 3*rb^4*z^2*\cos(\alpha)^4 - rb^4*z^2*\cos(\alpha)^6 + \\
& ra^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 12*ra^2*rb^2*z^2*\cos(\alpha)^6 - \\
& 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) + 20*ra^3*z^3*\cos(\alpha)^5*\sin(\beta) - 6*ra*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 + ra^2*rb^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*ra^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) + 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta) + \\
& 6*ra*z^5*\cos(\alpha)^3*\sin(\beta) - 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) + 6*ra^5*z*\cos(\alpha)^7*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) + 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta)^3 - 6*ra*rb*z^4*\cos(\alpha)^2*\cos(\beta) + 4*ra*rb*z^4*\cos(\alpha)^4*\cos(\beta) \\
& - 6*ra*rb^4*z*\cos(\alpha)^5*\sin(\beta) + 2*ra*rb^4*z*\cos(\alpha)^7*\sin(\beta) + \\
& 6*ra^2*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 + 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) - 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) - 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 - 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) - 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
YC1423=& (cos(alpha)*(rb - ra*cos(beta))*(2*alpha1d^2*rb*z^6*sin(alpha) - \\
& 2*alpha1d^2*ra*z^6*cos(beta)*sin(alpha) + 2*beta1d*ra^6*z1d*cos(alpha)^7*sin(alpha) + \\
& alpha1d^2*ra^7*cos(alpha)^8*cos(beta)^3*sin(alpha) + 2*ra^5*z1d^2*cos(alpha)^6*cos(beta)^3*sin(alpha) + \\
& 4*alpha1d*rb*z^5*z1d*cos(alpha) + alpha1d^2*ra^6*rb*cos(alpha)^8*sin(alpha) - \\
& beta1d^2*ra^6*rb*cos(alpha)^8*sin(alpha) - 2*alpha1d^2*rb*z^6*cos(alpha)^2*sin(alpha) + \\
& 2*ra^4*rb*z1d^2*cos(alpha)^6*sin(alpha) + 2*rb*z^4*z1d^2*cos(alpha)^2*sin(alpha) + \\
& 14*alpha1d*beta1d*ra^6*z*cos(alpha)^6 - 14*alpha1d*beta1d*ra^6*z*cos(alpha)^8 - \\
& 4*alpha1d*rb*z^5*z1d*cos(alpha)^3 - alpha1d^2*ra^7*cos(alpha)^8*cos(beta)*sin(alpha) + \\
& alpha1d^2*ra^2*rb^5*cos(alpha)^8*sin(alpha) + 2*alpha1d^2*ra^4*rb^3*cos(alpha)^8*sin(alpha) + \\
& beta1d^2*ra^2*rb^5*cos(alpha)^8*sin(alpha) - 2*ra^5*z1d^2*cos(alpha)^6*cos(beta)*sin(alpha) + \\
& 2*ra^2*rb^3*z1d^2*cos(alpha)^6*sin(alpha) - 2*alpha1d*beta1d*ra^7*cos(alpha)^7*sin(beta) + \\
& 2*alpha1d*beta1d*ra^7*cos(alpha)^9*sin(beta) + 22*alpha1d*beta1d*ra^2*z^5*cos(alpha)^2 - \\
& 22*alpha1d*beta1d*ra^2*z^5*cos(alpha)^4 + 60*alpha1d*beta1d*ra^4*z^3*cos(alpha)^4 - \\
& 60*alpha1d*beta1d*ra^4*z^3*cos(alpha)^6 + 12*ra^3*z^2*z1d^2*cos(alpha)^4*cos(beta)^3*sin(alpha) - \\
& 4*alpha1d*beta1d*ra*z^6*cos(alpha)*sin(beta) - 4*alpha1d*ra*z^5*z1d*cos(alpha)*cos(beta) - \\
& 16*alpha1d*beta1d*ra^2*z^5*cos(alpha)^2*cos(beta)^2 + \\
& 16*alpha1d*beta1d*ra^2*z^5*cos(alpha)^4*cos(beta)^2 - \\
& 70*alpha1d*beta1d*ra^4*z^3*cos(alpha)^4*cos(beta)^2 + \\
& 12*alpha1d*beta1d*ra^4*z^3*cos(alpha)^4*cos(beta)^4 + \\
& 70*alpha1d*beta1d*ra^4*z^3*cos(alpha)^6*cos(beta)^2 - \\
& 12*alpha1d*beta1d*ra^4*z^3*cos(alpha)^6*cos(beta)^4 + 4*alpha1d*ra^4*rb*z*z1d*cos(alpha)^5 - \\
& 4*alpha1d*ra^4*rb*z*z1d*cos(alpha)^7 + 2*alpha1d^2*ra*z^6*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& beta1d^2*ra*z^6*cos(alpha)^2*cos(beta)*sin(alpha) - 2*beta1d*ra^6*z1d*cos(alpha)^7*cos(beta)^2*sin(alpha) \\
& + 24*alpha1d*ra^3*z^3*z1d*cos(alpha)^3*cos(beta)^3 - 24*alpha1d*ra^3*z^3*z1d*cos(alpha)^5*cos(beta)^3 + \\
& 12*alpha1d^2*ra^2*rb*z^4*cos(alpha)^2*sin(alpha) - 7*alpha1d^2*ra^2*rb*z^4*cos(alpha)^4*sin(alpha) + \\
& 2*alpha1d^2*ra^4*rb*z^2*cos(alpha)^4*sin(alpha) + 8*alpha1d^2*ra^4*rb*z^2*cos(alpha)^6*sin(alpha) + \\
& 3*beta1d^2*ra^2*rb*z^4*cos(alpha)^4*sin(alpha) - 2*beta1d^2*ra^4*rb*z^2*cos(alpha)^6*sin(alpha) - \\
& 2*ra*z^4*z1d^2*cos(alpha)^2*cos(beta)*sin(alpha) + 12*ra^2*rb*z^2*z1d^2*cos(alpha)^4*sin(alpha) + \\
& 14*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^6 - 14*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^8 + \\
& 4*alpha1d*beta1d*ra*z^6*cos(alpha)^3*sin(beta) + 4*alpha1d*ra^5*z1d*cos(alpha)^3*cos(beta) - \\
& 4*alpha1d*ra^5*z*z1d*cos(alpha)^5*cos(beta) + 4*alpha1d*ra^5*z*z1d*cos(alpha)^7*cos(beta) + \\
& 24*alpha1d*ra^2*rb*z^3*z1d*cos(alpha)^3 - 24*alpha1d*ra^2*rb*z^3*z1d*cos(alpha)^5 + \\
& 4*alpha1d*ra^2*rb^3*z*z1d*cos(alpha)^5 - 4*alpha1d*ra^2*rb^3*z*z1d*cos(alpha)^7 - \\
& 5*alpha1d^2*ra^3*rb^4*cos(alpha)^8*cos(beta)*sin(alpha) - \\
& 6*alpha1d^2*ra^5*rb^2*cos(alpha)^8*cos(beta)*sin(alpha) + \\
& 3*alpha1d^2*ra^6*rb*cos(alpha)^8*cos(beta)^2*sin(alpha) -
\end{aligned}$$

$$\begin{aligned}
& 4*\alpha_1d^2*ra^6*rb*cos(\alpha)^8*cos(\beta)^4*sin(\alpha) - \\
& 2*\beta_1d^2*ra^3*rb^4*cos(\alpha)^8*cos(\beta)*sin(\alpha) + \\
& 2*\beta_1d^2*ra^5*rb^2*cos(\alpha)^8*cos(\beta)*sin(\alpha) + \\
& \beta_1d^2*ra^6*rb*cos(\alpha)^8*cos(\beta)^2*sin(\alpha) - \\
& 12*\alpha_1d^2*ra^3*z^4*cos(\alpha)^2*cos(\beta)*sin(\alpha) + \\
& 7*\alpha_1d^2*ra^3*z^4*cos(\alpha)^4*cos(\beta)*sin(\alpha) - \\
& 2*\alpha_1d^2*ra^5*z^2*cos(\alpha)^4*cos(\beta)*sin(\alpha) - \\
& 8*\alpha_1d^2*ra^5*z^2*cos(\alpha)^6*cos(\beta)*sin(\alpha) + \\
& 2*\beta_1d^2*ra^3*z^4*cos(\alpha)^4*cos(\beta)*sin(\alpha) - \\
& 3*\beta_1d^2*ra^5*z^2*cos(\alpha)^6*cos(\beta)*sin(\alpha) + \\
& 2*\alpha_1d^2*ra^2*rb^3*z^2*cos(\alpha)^4*sin(\alpha) + 2*\alpha_1d^2*ra^2*rb^3*z^2*cos(\alpha)^6*sin(\alpha) + \\
& 4*\beta_1d^2*ra^2*rb^3*z^2*cos(\alpha)^6*sin(\alpha) - 6*ra^3*rb^2*z^1d^2*cos(\alpha)^6*cos(\beta)*sin(\alpha) + \\
& 2*ra^4*rb*z^1d^2*cos(\alpha)^6*cos(\beta)^2*sin(\alpha) - 4*ra^4*rb*z^1d^2*cos(\alpha)^6*cos(\beta)^4*sin(\alpha) \\
& - 12*ra^3*z^2*z^1d^2*cos(\alpha)^4*cos(\beta)*sin(\alpha) - 14*\alpha_1d*\beta_1d*ra^6*z*cos(\alpha)^6*cos(\beta)^2 \\
& + 14*\alpha_1d*\beta_1d*ra^6*z*cos(\alpha)^8*cos(\beta)^2 - 2*\alpha_1d*\beta_1d*ra^3*rb^4*cos(\alpha)^7*sin(\beta) - \\
& 4*\alpha_1d*\beta_1d*ra^5*rb^2*cos(\alpha)^7*sin(\beta) + 2*\alpha_1d*\beta_1d*ra^3*rb^4*cos(\alpha)^9*sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^5*rb^2*cos(\alpha)^9*sin(\beta) + 6*\alpha_1d*\beta_1d*ra^2*rb^2*z^3*cos(\alpha)^4 - \\
& 6*\alpha_1d*\beta_1d*ra^2*rb^2*z^3*cos(\alpha)^6 - 50*\alpha_1d*\beta_1d*ra^3*z^4*cos(\alpha)^3*sin(\beta) + \\
& 50*\alpha_1d*\beta_1d*ra^3*z^4*cos(\alpha)^5*sin(\beta) - 40*\alpha_1d*\beta_1d*ra^5*z^2*cos(\alpha)^5*sin(\beta) + \\
& 40*\alpha_1d*\beta_1d*ra^5*z^2*cos(\alpha)^7*sin(\beta) - 24*\alpha_1d*ra^3*z^3*z^1d*cos(\alpha)^3*cos(\beta) + \\
& 24*\alpha_1d*ra^3*z^3*z^1d*cos(\alpha)^5*cos(\beta) + 4*\alpha_1d*ra^5*z^2*z^1d*cos(\alpha)^5*cos(\beta)^3 - \\
& 4*\alpha_1d*ra^5*z^2*z^1d*cos(\alpha)^7*cos(\beta)^3 - 2*\beta_1d*ra^2*rb^4*z^1d*cos(\alpha)^7*sin(\alpha) + \\
& 10*\beta_1d*ra^2*z^4*z^1d*cos(\alpha)^3*sin(\alpha) + 20*\beta_1d*ra^4*z^2*z^1d*cos(\alpha)^5*sin(\alpha) - \\
& \alpha_1d^2*ra^2*rb^5*cos(\alpha)^8*cos(\beta)^2*sin(\alpha) + \\
& 6*\alpha_1d^2*ra^4*rb^3*cos(\alpha)^8*cos(\beta)^2*sin(\alpha) + \\
& 5*\alpha_1d^2*ra^3*rb^4*cos(\alpha)^8*cos(\beta)^3*sin(\alpha) + \\
& 2*\alpha_1d^2*ra^5*rb^2*cos(\alpha)^8*cos(\beta)^3*sin(\alpha) - \\
& 8*\alpha_1d^2*ra^4*rb^3*cos(\alpha)^8*cos(\beta)^4*sin(\alpha) + \\
& 4*\alpha_1d^2*ra^5*rb^2*cos(\alpha)^8*cos(\beta)^5*sin(\alpha) - \\
& \beta_1d^2*ra^2*rb^5*cos(\alpha)^8*cos(\beta)^2*sin(\alpha) + \\
& 2*\beta_1d^2*ra^3*rb^4*cos(\alpha)^8*cos(\beta)^3*sin(\alpha) - \\
& 2*\beta_1d^2*ra^5*rb^2*cos(\alpha)^8*cos(\beta)^3*sin(\alpha) + \\
& 12*\alpha_1d^2*ra^3*z^4*cos(\alpha)^2*cos(\beta)^3*sin(\alpha) - \\
& 7*\alpha_1d^2*ra^3*z^4*cos(\alpha)^4*cos(\beta)^3*sin(\alpha) + \\
& 2*\alpha_1d^2*ra^5*z^2*cos(\alpha)^4*cos(\beta)^3*sin(\alpha) + \\
& 14*\alpha_1d^2*ra^5*z^2*cos(\alpha)^6*cos(\beta)^3*sin(\alpha) - \\
& 6*\alpha_1d^2*ra^5*z^2*cos(\alpha)^6*cos(\beta)^5*sin(\alpha) - \\
& 3*\beta_1d^2*ra^3*z^4*cos(\alpha)^4*cos(\beta)^3*sin(\alpha) + \\
& 3*\beta_1d^2*ra^5*z^2*cos(\alpha)^6*cos(\beta)^3*sin(\alpha) - \\
& 2*ra^2*rb^3*z^1d^2*cos(\alpha)^6*cos(\beta)^2*sin(\alpha) + \\
& 6*ra^3*rb^2*z^1d^2*cos(\alpha)^6*cos(\beta)^3*sin(\alpha) + \\
& 8*\alpha_1d^2*ra^2*z^5*cos(\alpha)*cos(\beta)*sin(\alpha)*sin(\beta) + \\
& 5*\alpha_1d^2*ra^6*z*cos(\alpha)^7*cos(\beta)*sin(\alpha)*sin(\beta) + \\
& \beta_1d^2*ra^6*z*cos(\alpha)^7*cos(\beta)*sin(\alpha)*sin(\beta) - \\
& 6*\beta_1d*ra^2*z^4*z^1d*cos(\alpha)^3*cos(\beta)^2*sin(\alpha) - \\
& 20*\beta_1d*ra^4*z^2*z^1d*cos(\alpha)^5*cos(\beta)^2*sin(\alpha) - \\
& 12*\alpha_1d*ra^4*z^2*z^1d*cos(\alpha)^4*cos(\beta)^3*sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 12*\alpha^4*d^2*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\beta) - \\
& 2*\alpha^4*d^2*r^3*b^3*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 8*\alpha^4*d^2*r^3*b^3*z^3*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& \alpha^4*d^2*r^3*b^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha^4*d^2*r^3*b^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha^4*d^2*r^3*b^3*z^3*\cos(\alpha)^7*\sin(\alpha)*\sin(\beta) - \\
& \beta^4*d^2*r^3*b^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta^4*d^2*r^3*b^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 3*\beta^4*d^2*r^3*b^3*z^3*\cos(\alpha)^7*\sin(\alpha)*\sin(\beta) + \\
& 8*r^4*z^2*d^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 10*\alpha^4*d*\beta^4*r^6*b*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 10*\alpha^4*d*\beta^4*r^6*b*\cos(\alpha)^9*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha^4*d*\beta^4*r^3*b^3*\cos(\alpha)^4*\cos(\beta) - \\
& 56*\alpha^4*d*\beta^4*r^3*b^3*z^3*\cos(\alpha)^4*\cos(\beta) + \\
& 2*\alpha^4*d*\beta^4*r^3*b^3*\cos(\alpha)^6*\cos(\beta) + \\
& 56*\alpha^4*d*\beta^4*r^3*b^3*\cos(\alpha)^6*\cos(\beta) - \\
& 14*\alpha^4*d*\beta^4*r^3*b^3*z^3*\cos(\alpha)^6*\cos(\beta) + \\
& 14*\alpha^4*d*\beta^4*r^3*b^3*z^3*\cos(\alpha)^8*\cos(\beta) + \\
& 42*\alpha^4*d*\beta^4*r^5*b^3*\cos(\alpha)^6*\cos(\beta)^3 - \\
& 42*\alpha^4*d*\beta^4*r^5*b^3*\cos(\alpha)^8*\cos(\beta)^3 - \\
& 4*\beta^4*d*r^5*b^3*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - 12*\alpha^4*d*r^3*b^2*z^2*\cos(\alpha)^5*\cos(\beta) \\
& + 4*\alpha^4*d*r^4*b^2*z^2*\cos(\alpha)^5*\cos(\beta)^2 + 12*\alpha^4*d*r^3*b^2*z^2*\cos(\alpha)^7*\cos(\beta) - \\
& 8*\alpha^4*d*r^4*b^2*z^2*\cos(\alpha)^5*\cos(\beta)^4 - 4*\alpha^4*d*r^4*b^2*z^2*\cos(\alpha)^7*\cos(\beta)^2 + \\
& 8*\alpha^4*d*r^4*b^2*z^2*\cos(\alpha)^7*\cos(\beta)^4 - 8*\alpha^4*d^2*r^3*b^2*z^5*\cos(\alpha)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha^4*d*r^3*b^2*z^2*\cos(\alpha)^4*\sin(\beta) - 16*\alpha^4*d*r^3*b^2*z^2*\cos(\alpha)^4*\sin(\beta) + \\
& 4*\alpha^4*d*r^3*b^2*z^2*\cos(\alpha)^6*\sin(\beta) + 16*\alpha^4*d*r^3*b^2*z^2*\cos(\alpha)^6*\sin(\beta) - \\
& 2*\beta^4*d*r^5*z^2*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) - \\
& 10*\beta^4*d*r^5*z^2*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& 12*\alpha^4*d^2*r^2*b^2*z^4*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\alpha^4*d^2*r^3*b^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 7*\alpha^4*d^2*r^2*b^2*z^4*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha^4*d^2*r^4*b^2*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\alpha^4*d^2*r^3*b^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& 4*\alpha^4*d^2*r^4*b^2*z^2*\cos(\alpha)^4*\cos(\beta)^4*\sin(\alpha) - \\
& 10*\alpha^4*d^2*r^4*b^2*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha^4*d^2*r^4*b^2*z^2*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) - \\
& 3*\beta^4*d^2*r^2*b^2*z^4*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& \beta^4*d^2*r^3*b^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta^4*d^2*r^4*b^2*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) - \\
& 7*\alpha^4*d^2*r^2*z^5*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha^4*d^2*r^4*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha^4*d^2*r^4*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha^4*d^2*r^6*z*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& 3*\beta^4*d^2*r^2*z^5*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\beta^4*d^2*r^4*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 12*r^2*b^2*z^2*d^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 8*r^2*b^2*z^3*d^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 6*ra^4*z^2*d^2*cos(alpha)^5*cos(beta)^3*sin(alpha)*sin(beta) + \\
& 2*alpha1d*beta1d*ra^2*rb^5*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 12*alpha1d*beta1d*ra^4*rb^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 2*alpha1d*beta1d*ra^2*rb^5*cos(alpha)^9*cos(beta)*sin(beta) - \\
& 12*alpha1d*beta1d*ra^4*rb^3*cos(alpha)^9*cos(beta)*sin(beta) + \\
& 50*alpha1d*beta1d*ra^3*rb*z^3*cos(alpha)^4*cos(beta)^3 + \\
& 14*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^6*cos(beta)^2 - \\
& 50*alpha1d*beta1d*ra^3*rb*z^3*cos(alpha)^6*cos(beta)^3 + \\
& 14*alpha1d*beta1d*ra^3*rb^3*z*cos(alpha)^6*cos(beta)^3 - \\
& 28*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^6*cos(beta)^4 - \\
& 14*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^8*cos(beta)^2 - \\
& 14*alpha1d*beta1d*ra^3*rb^3*z*cos(alpha)^8*cos(beta)^3 + \\
& 28*alpha1d*beta1d*ra^4*rb^2*z*cos(alpha)^8*cos(beta)^4 - \\
& 16*alpha1d*beta1d*ra^3*rb^2*z^2*cos(alpha)^5*sin(beta) + \\
& 16*alpha1d*beta1d*ra^3*rb^2*z^2*cos(alpha)^7*sin(beta) + \\
& 4*beta1d*ra^3*rb^3*z1d*cos(alpha)^7*cos(beta)*sin(alpha) + \\
& 4*beta1d*ra^5*rb*z1d*cos(alpha)^7*cos(beta)^3*sin(alpha) - \\
& 24*alpha1d*ra^2*rb*z^3*z1d*cos(alpha)^3*cos(beta)^2 + \\
& 24*alpha1d*ra^2*rb*z^3*z1d*cos(alpha)^5*cos(beta)^2 - \\
& 4*alpha1d*ra^2*rb^3*z^3*z1d*cos(alpha)^5*cos(beta)^2 + \\
& 12*alpha1d*ra^3*rb^2*z^3*z1d*cos(alpha)^5*cos(beta)^3 + \\
& 4*alpha1d*ra^2*rb^3*z^3*z1d*cos(alpha)^7*cos(beta)^2 - \\
& 12*alpha1d*ra^3*rb^2*z^3*z1d*cos(alpha)^7*cos(beta)^3 + \\
& 16*alpha1d*ra^2*z^4*z1d*cos(alpha)^2*cos(beta)*sin(beta) - \\
& 16*alpha1d*ra^2*z^4*z1d*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 16*alpha1d*ra^4*z^2*z1d*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 16*alpha1d*ra^4*z^2*z1d*cos(alpha)^6*cos(beta)*sin(beta) + \\
& 7*alpha1d^2*ra*rb*z^5*cos(alpha)^3*sin(alpha)*sin(beta) - \\
& 5*alpha1d^2*ra^5*rb*z*cos(alpha)^7*sin(alpha)*sin(beta) - \\
& beta1d^2*ra*rb*z^5*cos(alpha)^3*sin(alpha)*sin(beta) + \\
& 3*beta1d^2*ra^5*rb*z*cos(alpha)^7*sin(alpha)*sin(beta) - 4*beta1d*ra^2*rb^2*z^2*z1d*cos(alpha)^5*sin(alpha) \\
& - 20*beta1d*ra^3*z^3*z1d*cos(alpha)^4*sin(alpha)*sin(beta) - \\
& 2*alpha1d^2*ra^2*rb^3*z^2*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& 6*alpha1d^2*ra^3*rb^2*z^2*cos(alpha)^4*cos(beta)^3*sin(alpha) - \\
& 2*alpha1d^2*ra^2*rb^3*z^2*cos(alpha)^6*cos(beta)^2*sin(alpha) + \\
& 6*alpha1d^2*ra^3*rb^2*z^2*cos(alpha)^6*cos(beta)^3*sin(alpha) - \\
& 4*beta1d^2*ra^2*rb^3*z^2*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& beta1d^2*ra^3*rb^2*z^2*cos(alpha)^6*cos(beta)^3*sin(alpha) - \\
& 6*alpha1d^2*ra^4*z^3*cos(alpha)^3*cos(beta)^3*sin(alpha)*sin(beta) - \\
& 3*alpha1d^2*ra^4*z^3*cos(alpha)^5*cos(beta)^3*sin(alpha)*sin(beta) - \\
& 8*ra*rb*z^3*z1d^2*cos(alpha)^3*sin(alpha)*sin(beta) - 2*ra*rb^3*z^3*z1d^2*cos(alpha)^5*sin(alpha)*sin(beta) - \\
& 8*ra^3*rb*z^3*z1d^2*cos(alpha)^5*sin(alpha)*sin(beta) - 6*alpha1d*beta1d*ra*rb*z^5*cos(alpha)^2*cos(beta) + \\
& 6*alpha1d*beta1d*ra*rb*z^5*cos(alpha)^4*cos(beta) - 42*alpha1d*beta1d*ra^5*rb*z*cos(alpha)^6*cos(beta) + \\
& 42*alpha1d*beta1d*ra^5*rb*z*cos(alpha)^8*cos(beta) - \\
& 8*alpha1d*beta1d*ra^3*rb^4*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 16*alpha1d*beta1d*ra^5*rb^2*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 8*alpha1d*beta1d*ra^4*rb^3*cos(alpha)^7*cos(beta)^3*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& 8*\alpha^{1d}*\beta^{1d}*r^3*r^b^4*\cos(\alpha)^9*\cos(\beta)^2*\sin(\beta) + \\
& 16*\alpha^{1d}*\beta^{1d}*r^5*r^b^2*\cos(\alpha)^9*\cos(\beta)^2*\sin(\beta) - \\
& 8*\alpha^{1d}*\beta^{1d}*r^4*r^b^3*\cos(\alpha)^9*\cos(\beta)^3*\sin(\beta) + \\
& 24*\alpha^{1d}*\beta^{1d}*r^3*z^4*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) - \\
& 24*\alpha^{1d}*\beta^{1d}*r^3*z^4*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 28*\alpha^{1d}*\beta^{1d}*r^5*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - \\
& 28*\alpha^{1d}*\beta^{1d}*r^5*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
& 16*\alpha^{1d}*r^a*r^b*z^4*z^{1d}*\cos(\alpha)^2*\sin(\beta) + 16*\alpha^{1d}*r^a*r^b*z^4*z^{1d}*\cos(\alpha)^4*\sin(\beta) + \\
& \beta^{1d}^2*r^a*r^b^2*z^4*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta^{1d}*r^a^2*r^b^4*z^{1d}*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\beta^{1d}*r^a^3*r^b^3*z^{1d}*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& 26*\alpha^{1d}*\beta^{1d}*r^2*r^b^4*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 26*\alpha^{1d}*\beta^{1d}*r^2*r^b^4*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 68*\alpha^{1d}*\beta^{1d}*r^4*r^b^2*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 68*\alpha^{1d}*\beta^{1d}*r^4*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 16*\beta^{1d}*r^a^3*r^b^2*z^{1d}*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta^{1d}*r^a*r^b^2*z^3*z^{1d}*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 2*\beta^{1d}*r^a^3*r^b^2*z^3*z^{1d}*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha^{1d}^2*r^a^2*r^b^2*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha^{1d}^2*r^a^3*r^b^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 3*\alpha^{1d}^2*r^a^2*r^b^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 5*\alpha^{1d}^2*r^a^3*r^b^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 5*\alpha^{1d}^2*r^a^3*r^b^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 15*\alpha^{1d}^2*r^a^4*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta^{1d}^2*r^a^2*r^b^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 5*\beta^{1d}^2*r^a^3*r^b^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 5*\beta^{1d}^2*r^a^3*r^b^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 12*\alpha^{1d}*\beta^{1d}*r^2*r^b^3*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 12*\alpha^{1d}*\beta^{1d}*r^2*r^b^3*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 32*\alpha^{1d}*\beta^{1d}*r^4*r^b^2*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\beta) + \\
& 32*\alpha^{1d}*\beta^{1d}*r^4*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) + \\
& 16*\beta^{1d}*r^a^3*r^b^2*z^{1d}*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) + \\
& 12*\alpha^{1d}*r^a^2*r^b^2*z^2*z^{1d}*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha^{1d}*r^a^3*r^b^2*z^{1d}*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 12*\alpha^{1d}*r^a^2*r^b^2*z^2*z^{1d}*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& 4*\alpha^{1d}*r^a^3*r^b^2*z^{1d}*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) + \\
& 6*\beta^{1d}*r^a^5*z^2*z^{1d}*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta^{1d}*r^a*r^b^2*z^4*z^{1d}*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 20*\alpha^{1d}*\beta^{1d}*r^3*r^b^2*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 20*\alpha^{1d}*\beta^{1d}*r^3*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
& 15*\alpha^{1d}^2*r^a^4*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha^{1d}^2*r^a^5*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 10*\alpha^{1d}^2*r^a^5*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha)*\sin(\beta) - \\
& \beta^{1d}^2*r^a^2*r^b^4*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\beta^{1d}^2*r^a^5*r^b^2*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta^{1d}*r^a^2*r^b^2*z^2*z^{1d}*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 6*\beta^{1d}*r^a^3*z^3*z^{1d}*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 6*ra^2*rb^2*z^2*d^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) + \\
& 2*ra^3*rb^2*z^2*d^2*cos(alpha)^5*cos(beta)^2*sin(alpha)*sin(beta) - \\
& 14*beta1d*ra^3*rb^2*z^2*d*cos(alpha)^6*cos(beta)^2*sin(alpha)*sin(beta) + \\
& 12*beta1d*ra^4*rb^2*z^2*d*cos(alpha)^6*cos(beta)*sin(alpha)*sin(beta) + \\
& 12*beta1d*ra^2*rb^2*z^3*d*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& 4*beta1d*ra^2*rb^3*z^2*d*cos(alpha)^6*cos(beta)*sin(alpha)*sin(beta)))/(ra^8*cos(alpha)^8 - \\
& ra^8*cos(alpha)^10 + rb^8*cos(alpha)^8 - z^8*cos(alpha)^2 + z^8 + 4*ra^2*rb^6*cos(alpha)^8 + \\
& 6*ra^4*rb^4*cos(alpha)^8 + 4*ra^6*rb^2*cos(alpha)^8 - ra^2*rb^6*cos(alpha)^10 - \\
& 3*ra^4*rb^4*cos(alpha)^10 - 3*ra^6*rb^2*cos(alpha)^10 + 28*ra^2*z^6*cos(alpha)^2 - \\
& 28*ra^2*z^6*cos(alpha)^4 + 70*ra^4*z^4*cos(alpha)^4 - 70*ra^4*z^4*cos(alpha)^6 + \\
& 28*ra^6*z^2*cos(alpha)^6 - 28*ra^6*z^2*cos(alpha)^8 + 4*rb^2*z^6*cos(alpha)^2 - 3*rb^2*z^6*cos(alpha)^4 \\
& + 6*rb^4*z^4*cos(alpha)^4 - 3*rb^4*z^4*cos(alpha)^6 + 4*rb^6*z^2*cos(alpha)^6 - rb^6*z^2*cos(alpha)^8 + \\
& ra^8*cos(alpha)^10*cos(beta)^2 + 60*ra^2*rb^2*z^4*cos(alpha)^4 - 45*ra^2*rb^2*z^4*cos(alpha)^6 + \\
& 36*ra^2*rb^4*z^2*cos(alpha)^6 + 60*ra^4*rb^2*z^2*cos(alpha)^6 - 18*ra^2*rb^4*z^2*cos(alpha)^8 - \\
& 45*ra^4*rb^2*z^2*cos(alpha)^8 - 56*ra^3*z^5*cos(alpha)^3*sin(beta) + 56*ra^3*z^5*cos(alpha)^5*sin(beta) - \\
& 56*ra^5*z^3*cos(alpha)^5*sin(beta) + 56*ra^5*z^3*cos(alpha)^7*sin(beta) - 8*ra^z^7*cos(alpha)*sin(beta) + \\
& 24*ra^2*rb^6*cos(alpha)^8*cos(beta)^2 + 48*ra^4*rb^4*cos(alpha)^8*cos(beta)^2 + \\
& 24*ra^6*rb^2*cos(alpha)^8*cos(beta)^2 - 32*ra^3*rb^5*cos(alpha)^8*cos(beta)^3 - \\
& 32*ra^5*rb^3*cos(alpha)^8*cos(beta)^3 + ra^2*rb^6*cos(alpha)^10*cos(beta)^2 + \\
& 16*ra^4*rb^4*cos(alpha)^8*cos(beta)^4 - 9*ra^4*rb^4*cos(alpha)^10*cos(beta)^2 - \\
& 9*ra^6*rb^2*cos(alpha)^10*cos(beta)^2 - 6*ra^3*rb^5*cos(alpha)^10*cos(beta)^3 - \\
& 4*ra^5*rb^3*cos(alpha)^10*cos(beta)^3 + 12*ra^4*rb^4*cos(alpha)^10*cos(beta)^4 + \\
& 12*ra^6*rb^2*cos(alpha)^10*cos(beta)^4 - 8*ra^5*rb^3*cos(alpha)^10*cos(beta)^5 - \\
& 24*ra^2*z^6*cos(alpha)^2*cos(beta)^2 + 25*ra^2*z^6*cos(alpha)^4*cos(beta)^2 - \\
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) + 8*ra^z^7*cos(alpha)^3*sin(beta) - 8*ra^7*z^5*cos(alpha)^7*sin(beta) + \\
& 8*ra^7*z^5*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb^6*cos(alpha)^4*cos(beta) - 8*ra*rb^6*z^2*cos(alpha)^7*sin(beta) + 2*ra*rb^6*z^2*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 + \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) - 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb^2*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb^2*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb^2*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb^2*z^2*cos(alpha)^8*cos(beta) - 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) + \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) - 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) + \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) - 24*ra^3*rb^4*z^3*cos(alpha)^7*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) + 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) + \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 - \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) + \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) + 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) + 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) - 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) - \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) + 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) - 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) - 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) + \\
& 64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) + \\
& 36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
& 24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) + 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) - 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta));
\end{aligned}$$

YC1424=0;

$$\begin{aligned}
YC1431 = & -(e1^2*ra*cos(alpha)*(2*alpha1d^2*ra^2*z^3*cos(beta) - 2*alpha1d^2*ra*rb*z^3 - \\
& 2*alpha1d^2*ra^2*z^3*cos(beta)^3 + 3*alpha1d^2*ra*rb*z^3*cos(alpha)^2 - \\
& 2*alpha1d^2*ra*rb^3*z*cos(alpha)^2 - 2*alpha1d^2*ra^3*rb*z*cos(alpha)^2 + \\
& 3*alpha1d^2*ra*rb^3*z*cos(alpha)^4 + 5*alpha1d^2*ra^3*rb*z*cos(alpha)^4 + \\
& beta1d^2*ra*rb^3*cos(alpha)^2 + beta1d^2*ra*rb^3*z*cos(alpha)^4 - beta1d^2*ra^3*rb*z*cos(alpha)^4 + \\
& 2*alpha1d^2*ra*rb^3*cos(beta)^2 - 2*beta1d*ra^4*z1d*cos(alpha)^4*sin(beta) + \\
& 3*alpha1d^2*ra^2*z^3*cos(alpha)^2*cos(beta)^3 - 2*rb*z^2*z1d^2*cos(alpha)*sin(beta) + \\
& 2*alpha1d*beta1d*ra*z^4*sin(alpha) + 2*beta1d*ra*z^3*z1d*cos(alpha) + \\
& 2*alpha1d^2*ra^4*z*cos(alpha)^2*cos(beta) - 5*alpha1d^2*ra^4*z*cos(alpha)^4*cos(beta) + \\
& 2*alpha1d^2*rb^4*z*cos(alpha)^2*cos(beta) - 2*alpha1d^2*rb^4*z*cos(alpha)^4*cos(beta) - \\
& beta1d^2*ra^4*z*cos(alpha)^4*cos(beta) - alpha1d^2*ra^4*rb*cos(alpha)^5*sin(beta) + \\
& beta1d^2*ra^4*rb*cos(alpha)^5*sin(beta) + 2*alpha1d^2*rb^3*z^2*cos(alpha)*sin(beta) - \\
& 4*ra^2*z^2*z1d^2*cos(alpha)^2*cos(beta) - 2*rb^2*z^2*z1d^2*cos(alpha)^2*cos(beta) - \\
& 2*ra^2*rb*z1d^2*cos(alpha)^3*sin(beta) + 6*beta1d*ra^3*z*z1d*cos(alpha)^3 + \\
& alpha1d^2*ra^5*cos(alpha)^5*cos(beta)*sin(beta) - 3*alpha1d^2*ra^2*z^3*cos(alpha)^2*cos(beta) + \\
& 3*alpha1d^2*ra^4*z*cos(alpha)^4*cos(beta)^3 + beta1d^2*ra^2*z^3*cos(alpha)^2*cos(beta) + \\
& 4*ra*rb*z*z1d^2*cos(alpha)^2 - alpha1d^2*ra^2*rb^3*cos(alpha)^5*sin(beta) - \\
& beta1d^2*ra^2*rb^3*cos(alpha)^5*sin(beta) - 2*alpha1d^2*rb^3*z^2*cos(alpha)^3*sin(beta) + \\
& 2*ra^3*z1d^2*cos(alpha)^3*cos(beta)*sin(beta) + 2*ra^2*z^2*z1d^2*cos(alpha)^2*cos(beta)^3 - \\
& 2*beta1d*ra*rb^2*z^2*z1d*cos(alpha)^3 + alpha1d^2*ra*rb^4*cos(alpha)^5*cos(beta)*sin(beta) + \\
& beta1d^2*ra*rb^4*cos(alpha)^5*cos(beta)*sin(beta) + 8*alpha1d^2*ra^2*rb^2*z*cos(alpha)^2*cos(beta) - \\
& 3*alpha1d^2*ra*rb^3*cos(alpha)^2*cos(beta)^2 - 6*alpha1d^2*ra*rb^3*z*cos(alpha)^2*cos(beta)^2 - \\
& 6*alpha1d^2*ra^3*rb*z*cos(alpha)^2*cos(beta)^2 - 13*alpha1d^2*ra^2*rb^2*z*cos(alpha)^4*cos(beta) + \\
& 5*alpha1d^2*ra*rb^3*z*cos(alpha)^4*cos(beta)^2 + 7*alpha1d^2*ra^3*rb*z*cos(alpha)^4*cos(beta)^2 - \\
& 4*alpha1d^2*ra^3*rb*z*cos(alpha)^4*cos(beta)^4 - 2*beta1d^2*ra*rb^3*cos(alpha)^2*cos(beta)^2 + \\
& beta1d^2*ra^2*rb^2*z*cos(alpha)^4*cos(beta) - 2*beta1d^2*ra*rb^3*z*cos(alpha)^4*cos(beta)^2 + \\
& 2*beta1d^2*ra^3*rb*z*cos(alpha)^4*cos(beta)^2 - 4*alpha1d^2*ra^3*z^2*cos(alpha)*cos(beta)*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*rb*z^3z_1d*\sin(\alpha)*\sin(\beta) - 7*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\sin(\beta) - \\
& \beta_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\sin(\beta) + 2*ra*rb^2*z_1d^2*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra*z^4*\cos(\beta)^2*\sin(\alpha) - 2*\beta_1d*ra*z^3z_1d*\cos(\alpha)*\cos(\beta)^2 - \\
& 2*\alpha_1d*ra*rb^3*z_1d*\cos(\alpha)^3*\sin(\alpha) - 2*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^3*\sin(\alpha) + \\
& 4*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^4*rb*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - \\
& \beta_1d^2*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + 4*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^2*\cos(\beta)^3 \\
& + \alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^4*\cos(\beta)^3 + 7*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) \\
& + \beta_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - 2*ra^2*rb*z_1d^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) \\
& + 6*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^2*\sin(\alpha) + 2*\alpha_1d*ra^4*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) \\
& + 2*\alpha_1d*rb^4*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \beta_1d^2*ra^2*z^4*\cos(\alpha)*\cos(\beta)*\sin(\beta) - \\
& 2*\beta_1d*ra^3*z^2z_1d*\cos(\alpha)^3*\cos(\beta)^2 + 4*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)*\sin(\beta) + \\
& 2*\beta_1d*ra^2*rb^2*z_1d*\cos(\alpha)^4*\sin(\beta) - 6*\beta_1d*ra^2*z^2z_1d*\cos(\alpha)^2*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*rb^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\beta) + 2*ra*z^2z_1d^2*\cos(\alpha)*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)^3*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^2*\sin(\alpha) - \\
& 6*\alpha_1d*\beta_1d*ra^2*z^3*\cos(\alpha)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^4*z^2*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta_1d*ra*rb^3*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + \\
& 2*\beta_1d*ra^3*rb*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + 6*\beta_1d*ra*rb^2*z^2z_1d*\cos(\alpha)^3*\cos(\beta)^2 - \\
& 2*\alpha_1d*ra^2*z^2z_1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*rb^2*z^2z_1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d*rb^3*z^2z_1d*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) + 2*\alpha_1d*ra*rb*z^2z_1d*\cos(\alpha)*\sin(\alpha) \\
& + 8*\alpha_1d*ra^2*rb^2*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha_1d*ra*rb^3*z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\alpha_1d*ra^3*rb*z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 8*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)*\cos(\beta)*\sin(\beta) - 8*\beta_1d*ra^2*rb*z^2z_1d*\cos(\alpha)^3*\cos(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*ra*z^3z_1d*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^2*rb^2*z_1d*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) + \\
& 6*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)*\cos(\beta)^2*\sin(\beta) + \\
& 9*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra^3*z^2z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*ra*rb*z^2z_1d*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) + \\
& 6*\beta_1d*ra*rb*z^2z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*ra^2*rb*z^2z_1d*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) - \\
& 8*\alpha_1d*\beta_1d*ra^2*rb*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 6*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra*rb^3*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*ra*rb^2*z^2z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^2*rb*z^2z_1d*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha)*\sin(\beta)))/(ra^6*\cos(\alpha)^6 + \\
& rb^6*\cos(\alpha)^6 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 +
\end{aligned}$$

$$\begin{aligned}
& 15*ra^2*z^4*cos(alpha)^2 + 15*ra^4*z^2*cos(alpha)^4 + 3*rb^2*z^4*cos(alpha)^2 + \\
& 3*rb^4*z^2*cos(alpha)^4 + 18*ra^2*rb^2*z^2*cos(alpha)^4 - 20*ra^3*z^3*cos(alpha)^3*sin(beta) - \\
& 6*ra*z^5*cos(alpha)*sin(beta) + 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + \\
& 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 - \\
& 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) - 6*ra^5*z*cos(alpha)^5*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) - \\
& 6*ra*rb^4*z*cos(alpha)^5*sin(beta) + 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) - \\
& 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) - 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 + 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) - 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta)); \\
YC1432 = & -(alpha1d*beta1d*ra^2*z^4*sin(2*alpha) - 2*alpha1d^2*ra^2*rb*z^3*cos(alpha) - \\
& 2*alpha1d^2*ra^4*rb*z*cos(alpha)^3 + 7*alpha1d^2*ra^4*rb*z*cos(alpha)^5 - \\
& 5*alpha1d^2*ra^4*rb*z*cos(alpha)^7 - beta1d^2*ra^4*rb*z*cos(alpha)^5 + beta1d^2*ra^4*rb*z*cos(alpha)^7 - \\
& 2*beta1d*ra^5*z1d*cos(alpha)^5*sin(beta) + 2*beta1d*ra^5*z1d*cos(alpha)^7*sin(beta) + \\
& 2*beta1d*ra^2*z^3*z1d*cos(alpha)^2 - 2*beta1d*ra^2*z^3*z1d*cos(alpha)^4 + \\
& 5*alpha1d^2*ra^3*z^3*cos(alpha)^3*cos(beta)^3 - 3*alpha1d^2*ra^3*z^3*cos(alpha)^5*cos(beta)^3 + \\
& 4*ra^2*rb*z*z1d^2*cos(alpha)^3 - 4*ra^2*rb*z*z1d^2*cos(alpha)^5 + \\
& 2*alpha1d^2*ra^3*z^3*cos(alpha)*cos(beta) + 2*alpha1d^2*ra^5*z*cos(alpha)^3*cos(beta) - \\
& 7*alpha1d^2*ra^5*z*cos(alpha)^5*cos(beta) + 5*alpha1d^2*ra^5*z*cos(alpha)^7*cos(beta) - \\
& beta1d^2*ra^5*z*cos(alpha)^5*cos(beta) + beta1d^2*ra^5*z*cos(alpha)^7*cos(beta) - \\
& alpha1d^2*ra^5*rb*cos(alpha)^6*sin(beta) + alpha1d^2*ra^5*rb*cos(alpha)^8*sin(beta) + \\
& beta1d^2*ra^5*rb*cos(alpha)^6*sin(beta) - beta1d^2*ra^5*rb*cos(alpha)^8*sin(beta) + \\
& 5*alpha1d^2*ra^2*rb*z^3*cos(alpha)^3 - 2*alpha1d^2*ra^2*rb^3*z*cos(alpha)^3 - \\
& 3*alpha1d^2*ra^2*rb*z^3*cos(alpha)^5 + 3*alpha1d^2*ra^2*rb^3*z*cos(alpha)^5 - \\
& alpha1d^2*ra^2*rb^3*z*cos(alpha)^7 + beta1d^2*ra^2*rb*z^3*cos(alpha)^3 - \\
& beta1d^2*ra^2*rb^3*z*cos(alpha)^5 + beta1d^2*ra^2*rb^3*z*cos(alpha)^5 - \\
& beta1d^2*ra^2*rb^3*z*cos(alpha)^7 - 4*ra^3*z*z1d^2*cos(alpha)^3*cos(beta) + \\
& 4*ra^3*z*z1d^2*cos(alpha)^5*cos(beta) - 2*ra^3*rb*z1d^2*cos(alpha)^4*sin(beta) + \\
& 2*ra^3*rb*z1d^2*cos(alpha)^6*sin(beta) + 6*beta1d*ra^4*z*z1d*cos(alpha)^4 - \\
& 6*beta1d*ra^4*z*z1d*cos(alpha)^6 + alpha1d^2*ra^6*cos(alpha)^6*cos(beta)*sin(beta) - \\
& alpha1d^2*ra^6*cos(alpha)^8*cos(beta)*sin(beta) - 2*alpha1d^2*ra^3*z^3*cos(alpha)*cos(beta)^3 - \\
& 5*alpha1d^2*ra^3*z^3*cos(alpha)^3*cos(beta) + 3*alpha1d^2*ra^3*z^3*cos(alpha)^5*cos(beta) + \\
& 5*alpha1d^2*ra^5*z*cos(alpha)^5*cos(beta)^3 - 5*alpha1d^2*ra^5*z*cos(alpha)^7*cos(beta)^3 + \\
& beta1d^2*ra^3*z^3*cos(alpha)^3*cos(beta) - beta1d^2*ra^3*z^3*cos(alpha)^5*cos(beta) - \\
& alpha1d^2*ra^3*rb^3*cos(alpha)^6*sin(beta) + alpha1d^2*ra^3*rb^3*cos(alpha)^8*sin(beta) - \\
& beta1d^2*ra^3*rb^3*cos(alpha)^6*sin(beta) + beta1d^2*ra^3*rb^3*cos(alpha)^8*sin(beta) + \\
& 2*ra^4*z1d^2*cos(alpha)^4*cos(beta)*sin(beta) - 2*ra^4*z1d^2*cos(alpha)^6*cos(beta)*sin(beta) + \\
& 2*ra^3*z*z1d^2*cos(alpha)^3*cos(beta)^3 - 2*ra^3*z*z1d^2*cos(alpha)^5*cos(beta)^3 - \\
& 2*alpha1d*beta1d*ra^6*cos(alpha)^7*cos(beta)^2*sin(alpha) + 2*alpha1d*ra^2*rb*z^2*z1d*(sin(alpha) - \\
& sin(alpha)^3) + 2*alpha1d^2*ra^2*rb*z^3*cos(alpha)*cos(beta)^2 + \\
& 8*alpha1d^2*ra^3*rb^2*z*cos(alpha)^3*cos(beta) - 6*alpha1d^2*ra^4*rb*z*cos(alpha)^3*cos(beta)^2 - \\
& 15*alpha1d^2*ra^3*rb^2*z*cos(alpha)^5*cos(beta) + 7*alpha1d^2*ra^4*rb*z*cos(alpha)^5*cos(beta)^2 + \\
& 7*alpha1d^2*ra^3*rb^2*z*cos(alpha)^7*cos(beta) - 6*alpha1d^2*ra^4*rb*z*cos(alpha)^5*cos(beta)^4 - \\
& alpha1d^2*ra^4*rb*z*cos(alpha)^7*cos(beta)^2 + 6*alpha1d^2*ra^4*rb*z*cos(alpha)^7*cos(beta)^4 +
\end{aligned}$$

$$\begin{aligned}
& \beta_1 d^2 r^3 r^b z^2 \cos(\alpha)^5 \cos(\beta) + 2 \beta_1 d^2 r^4 r^b z^2 \cos(\alpha)^5 \cos(\beta)^2 - \\
& \beta_1 d^2 r^3 r^b z^2 \cos(\alpha)^7 \cos(\beta) - 2 \beta_1 d^2 r^4 r^b z^2 \cos(\alpha)^7 \cos(\beta)^2 + \\
& 2 \alpha_1 d r^5 z^1 d \cos(\alpha)^6 \cos(\beta)^3 \sin(\alpha) - 2 \beta_1 d r^5 z^3 z^1 d \cos(\alpha)^2 \cos(\beta)^2 + \\
& 2 \beta_1 d r^2 z^3 z^1 d \cos(\alpha)^4 \cos(\beta)^2 + 2 \alpha_1 d^2 r^2 r^b z^2 \cos(\alpha)^2 \sin(\beta) + \\
& 4 \alpha_1 d^2 r^3 r^b z^2 \cos(\alpha)^2 \sin(\beta) - 2 \alpha_1 d^2 r^2 r^b z^2 \cos(\alpha)^4 \sin(\beta) - \\
& 11 \alpha_1 d^2 r^3 r^b z^2 \cos(\alpha)^4 \sin(\beta) + 7 \alpha_1 d^2 r^3 r^b z^2 \cos(\alpha)^6 \sin(\beta) - \\
& \beta_1 d^2 r^3 r^b z^2 \cos(\alpha)^4 \sin(\beta) + \beta_1 d^2 r^3 r^b z^2 \cos(\alpha)^6 \sin(\beta) - \\
& 2 \alpha_1 d r^4 r^b z^1 d \cos(\alpha)^4 \sin(\alpha) + 2 \alpha_1 d r^4 r^b z^1 d \cos(\alpha)^6 \sin(\alpha) - \\
& 2 \beta_1 d r^2 r^b z^2 z^1 d \cos(\alpha)^4 + 2 \beta_1 d r^2 r^b z^2 z^1 d \cos(\alpha)^6 + \\
& \alpha_1 d^2 r^2 r^b z^4 \cos(\alpha)^6 \cos(\beta) \sin(\beta) + \\
& 4 \alpha_1 d^2 r^4 r^b z^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) - \\
& 3 \alpha_1 d^2 r^5 r^b z^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\beta) - \\
& \alpha_1 d^2 r^2 r^b z^4 \cos(\alpha)^8 \cos(\beta) \sin(\beta) - \\
& 4 \alpha_1 d^2 r^4 r^b z^2 \cos(\alpha)^8 \cos(\beta) \sin(\beta) + \\
& 3 \alpha_1 d^2 r^5 r^b z^2 \cos(\alpha)^8 \cos(\beta)^2 \sin(\beta) + \\
& \beta_1 d^2 r^2 r^b z^4 \cos(\alpha)^6 \cos(\beta) \sin(\beta) - \beta_1 d^2 r^4 r^b z^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) \\
& - \beta_1 d^2 r^2 r^b z^4 \cos(\alpha)^8 \cos(\beta) \sin(\beta) + \\
& \beta_1 d^2 r^4 r^b z^2 \cos(\alpha)^8 \cos(\beta) \sin(\beta) - 5 \alpha_1 d^2 r^2 r^b z^3 \cos(\alpha)^3 \cos(\beta)^2 - \\
& 6 \alpha_1 d^2 r^2 r^b z^3 z^2 \cos(\alpha)^3 \cos(\beta)^2 + 4 \alpha_1 d^2 r^3 r^b z^2 z^2 \cos(\alpha)^3 \cos(\beta)^3 + \\
& 3 \alpha_1 d^2 r^2 r^b z^3 z^3 \cos(\alpha)^5 \cos(\beta)^2 + 5 \alpha_1 d^2 r^2 r^b z^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 + \\
& 3 \alpha_1 d^2 r^3 r^b z^2 z^2 \cos(\alpha)^5 \cos(\beta)^3 + \alpha_1 d^2 r^2 r^b z^3 z^2 \cos(\alpha)^7 \cos(\beta)^2 - \\
& 7 \alpha_1 d^2 r^3 r^b z^2 z^2 \cos(\alpha)^7 \cos(\beta)^3 - 2 \beta_1 d^2 r^2 r^b z^3 z^2 \cos(\alpha)^3 \cos(\beta)^2 + \\
& 2 \beta_1 d^2 r^2 r^b z^3 z^3 \cos(\alpha)^5 \cos(\beta)^2 - 2 \beta_1 d^2 r^2 r^b z^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 + \\
& 2 \beta_1 d^2 r^2 r^b z^3 z^2 \cos(\alpha)^7 \cos(\beta)^2 - 4 \alpha_1 d^2 r^4 r^b z^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\beta) \\
& + 11 \alpha_1 d^2 r^4 r^b z^2 z^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - \\
& 7 \alpha_1 d^2 r^4 r^b z^2 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) - \beta_1 d^2 r^2 r^b z^4 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\beta) \\
& + \beta_1 d^2 r^2 r^b z^4 z^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) + \beta_1 d^2 r^4 r^b z^2 z^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) \\
& - \beta_1 d^2 r^4 r^b z^2 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) + 2 r^2 r^b z^2 z^1 d^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) \\
& - 2 r^2 r^3 r^b z^1 d^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\beta) - 2 r^2 r^2 r^b z^2 z^1 d^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) \\
& + 2 r^2 r^3 r^b z^1 d^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\beta) + 2 r^2 r^2 z^2 z^1 d^2 \cos(\alpha)^2 \cos(\beta) \sin(\beta) - \\
& 2 r^2 r^2 z^2 z^1 d^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - 2 \alpha_1 d \beta_1 d r^4 r^b z^2 \cos(\alpha)^7 \sin(\alpha) - \\
& 2 \alpha_1 d \beta_1 d r^2 r^b z^4 z^2 \cos(\alpha)^3 \sin(\alpha) + 6 \alpha_1 d \beta_1 d r^4 r^b z^2 z^2 \cos(\alpha)^3 \sin(\alpha) - \\
& 6 \alpha_1 d \beta_1 d r^2 r^b z^4 z^2 \cos(\alpha)^5 \sin(\alpha) + 2 \alpha_1 d^2 r^2 r^b z^4 z^2 \cos(\alpha)^3 \cos(\beta) - \\
& 2 \alpha_1 d^2 r^2 r^b z^4 z^2 \cos(\alpha)^5 \cos(\beta) + 2 \alpha_1 d r^5 z^1 d \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 2 \alpha_1 d r^5 z^1 d \cos(\alpha)^6 \cos(\beta) \sin(\alpha) - 2 \beta_1 d r^4 r^b z^2 z^1 d \cos(\alpha)^4 \cos(\beta)^2 + \\
& 2 \beta_1 d r^4 r^b z^2 z^1 d \cos(\alpha)^6 \cos(\beta)^2 - 2 \alpha_1 d r^2 r^b z^3 z^1 d \cos(\alpha)^4 \sin(\alpha) + \\
& 2 \beta_1 d r^3 r^b z^2 z^1 d \cos(\alpha)^5 \sin(\beta) - 2 \beta_1 d r^3 r^b z^2 z^1 d \cos(\alpha)^7 \sin(\beta) - \\
& 6 \beta_1 d r^3 r^b z^2 z^1 d \cos(\alpha)^3 \sin(\beta) + 6 \beta_1 d r^3 r^b z^2 z^1 d \cos(\alpha)^5 \sin(\beta) - \\
& 2 r^2 r^b z^2 z^1 d^2 \cos(\alpha)^3 \cos(\beta) + 2 r^2 r^b z^2 z^1 d^2 \cos(\alpha)^5 \cos(\beta) - \\
& 3 \alpha_1 d^2 r^3 r^b z^3 \cos(\alpha)^6 \cos(\beta)^2 \sin(\beta) + \\
& 2 \alpha_1 d^2 r^4 r^b z^2 \cos(\alpha)^6 \cos(\beta)^3 \sin(\beta) + \\
& 3 \alpha_1 d^2 r^3 r^b z^3 \cos(\alpha)^8 \cos(\beta)^2 \sin(\beta) - \\
& 2 \alpha_1 d^2 r^4 r^b z^2 \cos(\alpha)^8 \cos(\beta)^3 \sin(\beta) - \\
& 4 \alpha_1 d^2 r^4 r^b z^2 \cos(\alpha)^4 \cos(\beta)^3 \sin(\beta) + \\
& 4 \alpha_1 d^2 r^4 r^b z^2 \cos(\alpha)^6 \cos(\beta)^3 \sin(\beta) - 2 r^2 r^b z^2 z^1 d^2 \cos(\alpha)^2 \sin(\beta) + \\
& 2 r^2 r^b z^2 z^1 d^2 \cos(\alpha)^4 \sin(\beta) + 6 \alpha_1 d \beta_1 d r^3 r^b z^3 \sin(\alpha) \sin(\beta) (\sin(\alpha)^2 - 1) \\
& + 4 \alpha_1 d \beta_1 d r^5 r^b z^2 \cos(\alpha)^7 \cos(\beta) \sin(\alpha) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha1d*\beta1d*ra^5*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha1d*\beta1d*ra^5*z*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha1d*ra^4*rb^4*z1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta1d*ra^4*rb^4*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 2*\beta1d*ra^4*rb^4*z1d*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - 2*\alpha1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^4*\sin(\alpha) - \\
& 8*\alpha1d^2*ra^2*rb^2*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + \\
& 6*\alpha1d^2*ra^3*rb^2*z^2*\cos(\alpha)^2*\cos(\beta)^2*\sin(\beta) + \\
& 11*\alpha1d^2*ra^2*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 5*\alpha1d^2*ra^3*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 3*\alpha1d^2*ra^2*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& \alpha1d^2*ra^3*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) + \\
& 4*\alpha1d*\beta1d*ra^3*rb^3*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) + \\
& 4*\alpha1d*\beta1d*ra^5*rb*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) - \\
& 2*\alpha1d*\beta1d*ra^2*z^4*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha1d*\beta1d*ra^2*rb^2*z^2*\cos(\alpha)^3*\sin(\alpha) + \\
& 6*\alpha1d*\beta1d*ra^3*z^3*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha1d*ra^3*rb^2*z1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha1d*ra^4*rb^2*z1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha1d*ra^3*rb^2*z1d*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha1d*ra^4*rb^2*z1d*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) - \\
& 2*\beta1d*ra^2*rb^3*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\beta1d*ra^2*rb^3*z1d*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) + \\
& 6*\beta1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^4*\cos(\beta)^2 - 6*\beta1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 2*\alpha1d*ra^3*z^2*z1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha1d*ra^3*z^2*z1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - 8*\beta1d*ra^3*rb^2*z1d*\cos(\alpha)^4*\cos(\beta) + \\
& 8*\beta1d*ra^3*rb^2*z1d*\cos(\alpha)^6*\cos(\beta) - \\
& 2*\alpha1d*\beta1d*ra^2*rb^4*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) - \\
& 8*\alpha1d*\beta1d*ra^4*rb^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha1d*\beta1d*ra^3*rb^3*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) - \\
& 2*\alpha1d*\beta1d*ra^4*rb^2*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha) + \\
& 2*\alpha1d*\beta1d*ra^2*z^4*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha1d*\beta1d*ra^4*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha1d*\beta1d*ra^4*z^2*\cos(\alpha)^5*\cos(\beta)^4*\sin(\alpha) - \\
& 6*\alpha1d*ra^2*rb^3*z1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha1d*ra^3*rb^2*z1d*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha1d*ra^3*rb^2*z1d*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha1d*\beta1d*ra^3*rb^2*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha1d*\beta1d*ra^3*rb^2*z*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 6*\beta1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 6*\beta1d*ra^2*rb^2*z^2*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha1d*ra^2*z^3*z1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha1d*ra^4*z^2*z1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha1d*ra^4*z^2*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha1d*\beta1d*ra^3*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) + \\
& 4*\alpha1d*\beta1d*ra^5*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d*ra*rb*z^3*z_1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^2*rb*z^2*z_1d*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*ra^2*rb*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*ra^2*z^3*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra^4*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*ra*rb*z^3*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra*rb^3*z^2*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra^3*rb^2*z^2*z_1d*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 8*\alpha_1d*\beta_1d*ra^3*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) + \\
& 12*\alpha_1d*\beta_1d*ra^3*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 8*\alpha_1d*\beta_1d*ra^3*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^4*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 10*\alpha_1d*\beta_1d*ra^4*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha_1d*\beta_1d*ra^2*rb^2*z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*\beta_1d*ra^2*rb^2*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^3*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^3*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*\beta_1d*ra^4*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*ra^2*rb^2*z^2*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^3*rb^2*z^2*z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^3*rb^2*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta))/(ra^6*\cos(\alpha)^6 - \\
& ra^6*\cos(\alpha)^8 + rb^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + \\
& 3*ra^4*rb^2*\cos(\alpha)^6 - ra^2*rb^4*\cos(\alpha)^8 - 2*ra^4*rb^2*\cos(\alpha)^8 + 15*ra^2*z^4*\cos(\alpha)^2 - \\
& 15*ra^2*z^4*\cos(\alpha)^4 + 15*ra^4*z^2*\cos(\alpha)^4 - 15*ra^4*z^2*\cos(\alpha)^6 + \\
& 3*rb^2*z^4*\cos(\alpha)^2 - 2*rb^2*z^4*\cos(\alpha)^4 + 3*rb^4*z^2*\cos(\alpha)^4 - rb^4*z^2*\cos(\alpha)^6 + \\
& ra^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 12*ra^2*rb^2*z^2*\cos(\alpha)^6 - \\
& 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) + 20*ra^3*z^3*\cos(\alpha)^5*\sin(\beta) - 6*ra^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 + ra^2*rb^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*ra^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) + 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta) + \\
& 6*ra^5*z^5*\cos(\alpha)^3*\sin(\beta) - 6*ra^5*z^5*\cos(\alpha)^5*\sin(\beta) + 6*ra^5*z^5*\cos(\alpha)^7*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) + 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta)^3 - 6*ra*rb^2*z^4*\cos(\alpha)^2*\cos(\beta) + 4*ra*rb^2*z^4*\cos(\alpha)^4*\cos(\beta) \\
& - 6*ra*rb^4*z^2*\cos(\alpha)^5*\sin(\beta) + 2*ra*rb^4*z^2*\cos(\alpha)^7*\sin(\beta) + \\
& 6*ra^2*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 + 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) - \\
& 12*ra^3*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - 12*ra*rb^3*z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 36*ra^3*rb^2*z^2*\cos(\alpha)^4*\cos(\beta) + 4*ra*rb^3*z^2*\cos(\alpha)^6*\cos(\beta) + \\
& 24*ra^3*rb^2*z^2*\cos(\alpha)^6*\cos(\beta) - 12*ra*rb^2*z^3*\cos(\alpha)^3*\sin(\beta) + \\
& 8*ra*rb^2*z^3*\cos(\alpha)^5*\sin(\beta) - 12*ra^3*rb^2*z^3*\cos(\alpha)^5*\sin(\beta) + \\
& 8*ra^3*rb^2*z^3*\cos(\alpha)^7*\sin(\beta) + 24*ra^3*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)^3 -
\end{aligned}$$

$$\begin{aligned}
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 - 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) - 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
YC1433 = & -(ra*cos(alpha)^4*(rb - ra*cos(beta))^2*(alpha1d^2*ra*z^4*sin(2*beta) - 2*alpha1d^2*rb*z^4*sin(beta) \\
& - 3*alpha1d^2*ra*rb*z^3*cos(alpha)^3 + alpha1d^2*ra*rb^3*z*cos(alpha)^5 + \\
& 3*alpha1d^2*ra^3*rb*z*cos(alpha)^5 + beta1d^2*ra*rb^3*cos(alpha)^3 + beta1d^2*ra*rb^3*z*cos(alpha)^5 \\
& - beta1d^2*ra^3*rb*z*cos(alpha)^5 - 2*beta1d*ra^4*z1d*cos(alpha)^5*sin(beta) - \\
& alpha1d^2*ra^2*z^3*cos(alpha)^3*cos(beta)^3 - 4*alpha1d^2*ra^2*z^3*cos(alpha)*cos(beta) - \\
& 3*alpha1d^2*ra^4*z*cos(alpha)^5*cos(beta) - 2*alpha1d^2*rb^2*z^3*cos(alpha)*cos(beta) - \\
& beta1d^2*ra^4*z*cos(alpha)^5*cos(beta) - alpha1d^2*ra^4*rb*cos(alpha)^6*sin(beta) + \\
& beta1d^2*ra^4*rb*cos(alpha)^6*sin(beta) + 2*alpha1d^2*rb*z^4*cos(alpha)^2*sin(beta) - \\
& 4*ra^2*z^21d^2*cos(alpha)^3*cos(beta) - 2*rb^2*z^21d^2*cos(alpha)^3*cos(beta) - \\
& 2*ra^2*rb*z1d^2*cos(alpha)^4*sin(beta) - 2*rb*z^2*z1d^2*cos(alpha)^2*sin(beta) + \\
& 2*alpha1d*beta1d*ra*z^4*sin(2*alpha) + 4*alpha1d^2*ra*rb*z^3*cos(alpha) + \\
& 2*beta1d*ra*z^3*z1d*cos(alpha)^2 + 6*beta1d*ra^3*z^21d*cos(alpha)^4 + \\
& alpha1d^2*ra^5*cos(alpha)^6*cos(beta)*sin(beta) + 2*alpha1d^2*ra^2*z^3*cos(alpha)*cos(beta)^3 + \\
& 3*alpha1d^2*ra^2*z^3*cos(alpha)^3*cos(beta) + 3*alpha1d^2*ra^4*z*cos(alpha)^5*cos(beta)^3 + \\
& 2*alpha1d^2*rb^2*z^3*cos(alpha)^3*cos(beta) + beta1d^2*ra^2*z^3*cos(alpha)^3*cos(beta) + \\
& 4*ra*rb*z^21d^2*cos(alpha)^3 - alpha1d^2*ra^2*rb^3*cos(alpha)^6*sin(beta) - \\
& beta1d^2*ra^2*rb^3*cos(alpha)^6*sin(beta) + 2*ra^3*z1d^2*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 2*ra^2*z^21d^2*cos(alpha)^3*cos(beta)^3 + 2*alpha1d*beta1d*ra^5*cos(alpha)^5*sin(alpha) - \\
& 2*beta1d*ra*rb^2*z^21d*cos(alpha)^4 + alpha1d^2*ra*rb^4*cos(alpha)^6*cos(beta)*sin(beta) + \\
& beta1d^2*ra*rb^4*cos(alpha)^6*cos(beta)*sin(beta) - alpha1d^2*ra*rb*z^3*cos(alpha)^3*cos(beta)^2 - \\
& 5*alpha1d^2*ra^2*rb^2*z*cos(alpha)^5*cos(beta) - alpha1d^2*ra*rb^3*z*cos(alpha)^5*cos(beta)^2 + \\
& alpha1d^2*ra^3*rb*z*cos(alpha)^5*cos(beta)^2 - 4*alpha1d^2*ra^3*rb*z*cos(alpha)^5*cos(beta)^4 - \\
& 2*beta1d^2*ra*rb^2*z^3*cos(alpha)^3*cos(beta)^2 + beta1d^2*ra^2*rb^2*z*cos(alpha)^5*cos(beta) - \\
& 2*beta1d^2*ra*rb^3*z*cos(alpha)^5*cos(beta)^2 + 2*beta1d^2*ra^3*rb*z*cos(alpha)^5*cos(beta)^2 - \\
& 2*alpha1d^2*ra*z^4*cos(alpha)^2*cos(beta)*sin(beta) - beta1d^2*ra*z^4*cos(alpha)^2*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra^2*rb*z^2*cos(alpha)^2*sin(beta) - alpha1d^2*ra^2*rb*z^2*cos(alpha)^4*sin(beta) - \\
& beta1d^2*ra^2*rb*z^2*cos(alpha)^4*sin(beta) + 2*ra*rb^2*z1d^2*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 2*ra*z^2*z1d^2*cos(alpha)^2*cos(beta)*sin(beta) + 4*alpha1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)*sin(beta) - \\
& 3*alpha1d^2*ra^4*rb*cos(alpha)^6*cos(beta)^2*sin(beta) - \\
& beta1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)*sin(beta) + 5*alpha1d^2*ra^2*rb^2*z*cos(alpha)^5*cos(beta)^3 \\
& + 2*alpha1d^2*ra^3*z^2*cos(alpha)^2*cos(beta)*sin(beta) + \\
& alpha1d^2*ra^3*z^2*cos(alpha)^4*cos(beta)*sin(beta) + beta1d^2*ra^3*z^2*cos(alpha)^4*cos(beta)*sin(beta) \\
& - 2*ra^2*rb*z1d^2*cos(alpha)^4*cos(beta)^2*sin(beta) + 2*alpha1d*beta1d*ra^3*rb^2*cos(alpha)^5*sin(alpha) \\
& + 8*alpha1d*ra*rb*z^2*z1d*(sin(alpha) - sin(alpha)^3) + 18*alpha1d*beta1d*ra^3*z^2*cos(alpha)^3*sin(alpha) - \\
& 2*beta1d*ra*z^3*z1d*cos(alpha)^2*cos(beta)^2 - 2*beta1d*ra^3*z^21d*cos(alpha)^4*cos(beta)^2 + \\
& 2*beta1d*ra^2*rb^2*z1d*cos(alpha)^5*sin(beta) - 6*beta1d*ra^2*z^2*z1d*cos(alpha)^3*sin(beta) - \\
& 3*alpha1d^2*ra^2*rb^3*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& 2*alpha1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)^3*sin(beta) - \\
& 2*alpha1d^2*ra^3*z^2*cos(alpha)^4*cos(beta)^3*sin(beta) + \\
& 4*alpha1d*ra^2*z^2*z1d*cos(alpha)^2*cos(beta)^3*sin(alpha) + \\
& 14*alpha1d*beta1d*ra^2*z^3*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) -
\end{aligned}$$

$$\begin{aligned}
& 8*\alpha^{1d}*\beta^{1d}*r^{4*rb}*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) - \\
& 4*\alpha^{1d}*\beta^{1d}*r^{4z}*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) - \\
& 10*\alpha^{1d}*\beta^{1d}*r^{4z}*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta^{1d}*r^{3z}*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\beta^{1d}*r^{3z}*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + 6*\beta^{1d}*r^{2z}*\cos(\alpha)^4*\cos(\beta)^2 - \\
& 2*\alpha^{1d}^{2*ra}^{2*rb}*\cos(\alpha)^2*\cos(\beta)^2*\sin(\beta) + \\
& 3*\alpha^{1d}^{2*ra}^{2*rb}*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 4*\alpha^{1d}*\beta^{1d}*r^{2*rb}^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha^{1d}*\beta^{1d}*r^{4z}*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) - \\
& 8*\alpha^{1d}*r^{2z}^{2z}*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) - \\
& 4*\alpha^{1d}*r^{2z}^{2z}*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) - 8*\beta^{1d}*r^{2*rb}^{2z}*\cos(\alpha)^4*\cos(\beta) + \\
& 10*\alpha^{1d}*\beta^{1d}*r^{3*rb}^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha^{1d}*\beta^{1d}*r^{2*rb}^3*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) - \\
& 12*\alpha^{1d}*\beta^{1d}*r^{3z}^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha^{1d}*r^{3z}^3*\cos(\alpha)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha^{1d}^{2*ra}^{2*rb}^{2z}*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) - \\
& \alpha^{1d}^{2*ra}^{2*rb}^{2z}*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha^{1d}*\beta^{1d}*r^{2*rb}^{2z}*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha^{1d}*r^{3z}^{2z}*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha^{1d}*\beta^{1d}*r^{2z}^{2z}*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 12*\alpha^{1d}*\beta^{1d}*r^{2*rb}^{2z}*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) + \\
& 6*\beta^{1d}*r^{2z}^{2z}*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha^{1d}*r^{3z}^3*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha^{1d}*\beta^{1d}*r^{2z}^3*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha^{1d}*r^{2*rb}^{2z}*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 24*\alpha^{1d}*\beta^{1d}*r^{2*rb}^{2z}*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 12*\alpha^{1d}*\beta^{1d}*r^{2*rb}^{2z}*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 10*\alpha^{1d}*\beta^{1d}*r^{3*rb}^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha^{1d}*\beta^{1d}*r^{3z}^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 22*\alpha^{1d}*\beta^{1d}*r^{3*rb}^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha^{1d}*r^{2z}^{2z}*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha^{1d}*r^{2*rb}^{2z}*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta)))/(r^{8*\cos(\alpha)^8} - \\
& r^{8*\cos(\alpha)^{10}} + r^{8*\cos(\alpha)^8} - z^{8*\cos(\alpha)^2} + z^8 + 4*r^{2*rb}^6*\cos(\alpha)^8 + \\
& 6*r^{4*rb}^4*\cos(\alpha)^8 + 4*r^{6*rb}^2*\cos(\alpha)^8 - r^{2*rb}^6*\cos(\alpha)^{10} - \\
& 3*r^{4*rb}^4*\cos(\alpha)^{10} - 3*r^{6*rb}^2*\cos(\alpha)^{10} + 28*r^{2z}^6*\cos(\alpha)^2 - \\
& 28*r^{2z}^6*\cos(\alpha)^4 + 70*r^{4z}^4*\cos(\alpha)^4 - 70*r^{4z}^4*\cos(\alpha)^6 + \\
& 28*r^{6z}^2*\cos(\alpha)^6 - 28*r^{6z}^2*\cos(\alpha)^8 + 4*rb^{2z}^6*\cos(\alpha)^2 - 3*rb^{2z}^6*\cos(\alpha)^4 \\
& + 6*rb^{4z}^4*\cos(\alpha)^4 - 3*rb^{4z}^4*\cos(\alpha)^6 + 4*rb^{6z}^2*\cos(\alpha)^6 - rb^{6z}^2*\cos(\alpha)^8 + \\
& r^{8*\cos(\alpha)^{10}*\cos(\beta)^2} + 60*r^{2*rb}^2*z^4*\cos(\alpha)^4 - 45*r^{2*rb}^2*z^4*\cos(\alpha)^6 + \\
& 36*r^{2*rb}^4*z^2*\cos(\alpha)^6 + 60*r^{4*rb}^2*z^2*\cos(\alpha)^6 - 18*r^{2*rb}^4*z^2*\cos(\alpha)^8 - \\
& 45*r^{4*rb}^2*z^2*\cos(\alpha)^8 - 56*r^{3z}^5*\cos(\alpha)^3*\sin(\beta) + 56*r^{3z}^5*\cos(\alpha)^5*\sin(\beta) - \\
& 56*r^{5z}^3*\cos(\alpha)^5*\sin(\beta) + 56*r^{5z}^3*\cos(\alpha)^7*\sin(\beta) - 8*r^{z}^7*\cos(\alpha)*\sin(\beta) + \\
& 24*r^{2*rb}^6*\cos(\alpha)^8*\cos(\beta)^2 + 48*r^{4*rb}^4*\cos(\alpha)^8*\cos(\beta)^2 + \\
& 24*r^{6*rb}^2*\cos(\alpha)^8*\cos(\beta)^2 - 32*r^{3*rb}^5*\cos(\alpha)^8*\cos(\beta)^3 - \\
& 32*r^{5*rb}^3*\cos(\alpha)^8*\cos(\beta)^3 + r^{2*rb}^6*\cos(\alpha)^{10}*\cos(\beta)^2 + \\
& 16*r^{4*rb}^4*\cos(\alpha)^8*\cos(\beta)^4 - 9*r^{4*rb}^4*\cos(\alpha)^{10}*\cos(\beta)^2 - \\
& 9*r^{6*rb}^2*\cos(\alpha)^{10}*\cos(\beta)^2 - 6*r^{3*rb}^5*\cos(\alpha)^{10}*\cos(\beta)^3 -
\end{aligned}$$

$$\begin{aligned}
& 4*ra^5*rb^3*cos(alpha)^10*cos(beta)^3 + 12*ra^4*rb^4*cos(alpha)^10*cos(beta)^4 + \\
& 12*ra^6*rb^2*cos(alpha)^10*cos(beta)^4 - 8*ra^5*rb^3*cos(alpha)^10*cos(beta)^5 - \\
& 24*ra^2*z^6*cos(alpha)^2*cos(beta)^2 + 25*ra^2*z^6*cos(alpha)^4*cos(beta)^2 - \\
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) + 8*ra*z^7*cos(alpha)^3*sin(beta) - 8*ra^7*z*cos(alpha)^7*sin(beta) + \\
& 8*ra^7*z*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb*z^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb*z^6*cos(alpha)^4*cos(beta) - 8*ra*rb^6*z*cos(alpha)^7*sin(beta) + 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 + \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) - 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb*z^2*cos(alpha)^8*cos(beta) - 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) + \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) - 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) + \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) - 24*ra^3*rb^4*z*cos(alpha)^7*sin(beta) - \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) + 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) + \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 - \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) + \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) + 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) + 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) - 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) - \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) + 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) - 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) - 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) + \\
& 64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) + \\
& 36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
& 24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) + 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) - 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta));
\end{aligned}$$

YC1434=0;

YC14=[YC1411,YC1412,YC1413,YC1414;YC1421,YC1422,YC1423,YC1424;YC1431,YC1432,YC1433,YC1434];

YG14

=[

$$\begin{aligned}
 &-(e^{1*ga}(\cos(\alpha)^2)^{(3/2)}(rb - ra\cos(\beta))^2)/(ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - \\
 &2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}, 0, 0, 0 \\
 &\quad -(e^{1*ga}\sin(\alpha)(\cos(\alpha)^2)^{(3/2)}(ra^3\cos(\alpha)^3*\sin(\beta) - z^3 - 3*ra^2*z*\cos(\alpha)^2 + \\
 &3*ra*z^2*\cos(\alpha)*\sin(\beta) + ra*rb^2*\cos(\alpha)^3*\sin(\beta) + 3*ra^2*z*\cos(\alpha)^2*\cos(\beta)^2 - \\
 &2*ra^2*rb*\cos(\alpha)^3*\cos(\beta)*\sin(\beta)))/(\cos(\alpha)^3(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
 &2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}), 0, 0, 0 \\
 &\quad (e^{1*ga}*ra*\cos(\alpha))^2*(rb - ra\cos(\beta))(z*\sin(\beta) - ra\cos(\alpha) + \\
 &rb*\cos(\alpha)*\cos(\beta))/((ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
 &2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}), 0, 0, 0];
 \end{aligned}$$

Y4=YM14+YC14+YG14;

$$\begin{aligned}
 YM21 = &[\alpha 2d * ((ra^2(z^2\sin(\alpha) + 2*rb*z*\cos(\alpha) + rb^2*\cos(\alpha)^2*\sin(\alpha) - ra*z*\cos(\alpha)^2 - \\
 &rb*z*\cos(\alpha)^3 - ra*rb*\cos(\alpha)^3*\sin(\alpha)))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
 &2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha)) + (z*(rb - ra*\cos(\alpha) + z*\tan(\alpha))^2)/(\cos(\alpha)^2*((rb - \\
 &ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)) - ((e^2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + \\
 &ra*\sin(\alpha))^2)^{(1/2)}*(z + ra*\sin(\alpha))^(ra^2*\cos(\alpha)^2 + z^2 + ra*z*\sin(\alpha) - \\
 &ra*rb*\cos(\alpha)^3))/(\cos(\alpha)^2*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(3/2))}*((z + \\
 &ra*\sin(\alpha))^(rb - ra*\cos(\alpha) + z*\tan(\alpha)))/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) + \\
 &(\tan(\alpha)*(rb - ra*\cos(\alpha) + z*\tan(\alpha))^2)/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) - \\
 &((e^2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(1/2)}*(ra - rb*\cos(\alpha))*(z + \\
 &ra*\sin(\alpha)))/(\cos(\alpha)*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(3/2))}) + \\
 &((ra*\cos(\alpha))^2*(z^2 + ra*rb*\cos(\alpha) + ra*z*\sin(\alpha) - ra*rb*\cos(\alpha)^3 + \\
 &rb*z*\cos(\alpha)*\sin(\alpha)))/((ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^3 + \\
 &rb*z*\sin(2*\alpha)) + ((e^2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(1/2)}*(rb - ra*\cos(\alpha) \\
 &+ z*\tan(\alpha))^(ra^2*\cos(\alpha)^2 + z^2 + ra*z*\sin(\alpha) - ra*rb*\cos(\alpha)^3))/(\cos(\alpha)^2*((rb - \\
 &ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(3/2))}) + (z*(z + ra*\sin(\alpha))*(rb - ra*\cos(\alpha) + \\
 &z*\tan(\alpha)))/(\cos(\alpha)^2*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)))*(z + \\
 &ra*\sin(\alpha))^2/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) + (\tan(\alpha)*(z + \\
 &ra*\sin(\alpha))*(rb - ra*\cos(\alpha) + z*\tan(\alpha)))/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) + \\
 &((e^2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(1/2)}*(ra - rb*\cos(\alpha))*(rb - ra*\cos(\alpha) \\
 &+ z*\tan(\alpha)))/(\cos(\alpha)*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(3/2))}) + z2d*((z + \\
 &ra*\sin(\alpha))^2/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) + (\tan(\alpha)*(z + \\
 &ra*\sin(\alpha))*(rb - ra*\cos(\alpha) + z*\tan(\alpha)))/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) + \\
 &((e^2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(1/2)}*(ra - rb*\cos(\alpha))*(rb - ra*\cos(\alpha) \\
 &+ z*\tan(\alpha)))/(\cos(\alpha)*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(3/2))})^2 + (((z + \\
 &ra*\sin(\alpha))*(rb - ra*\cos(\alpha) + z*\tan(\alpha)))/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) + \\
 &(\tan(\alpha)*(rb - ra*\cos(\alpha) + z*\tan(\alpha))^2)/((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2) - \\
 &((e^2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(1/2)}*(ra - rb*\cos(\alpha))*(z + \\
 &ra*\sin(\alpha)))/(\cos(\alpha)*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^{(3/2))})^2), 0, \\
 &(\cos(\alpha)*(ra - rb*\cos(\alpha))*(\alpha 2d*z^2 + ra*z2d*\cos(\alpha) - rb*z2d*\cos(\alpha)^2 + \\
 &\alpha 2d*ra^2*\cos(\alpha)^2 + \alpha 2d*ra*z*\sin(\alpha) - \alpha 2d*ra*rb*\cos(\alpha)^3))/((ra^4*\cos(\alpha)^4 + \\
 &rb^4*\cos(\alpha)^4 + z^4 + 2*ra^2*rb^2*\cos(\alpha)^4 + 4*ra^2*rb^2*\cos(\alpha)^6 + 2*ra^2*z^2*\cos(\alpha)^2 \\
 &+ 6*rb^2*z^2*\cos(\alpha)^2 - 4*rb^2*z^2*\cos(\alpha)^4 - 4*ra*rb^3*\cos(\alpha)^5 - 4*ra^3*rb*\cos(\alpha)^5 + \\
 &2*rb*z^3*\sin(2*\alpha) - 4*ra*rb*z^2*\cos(\alpha)^3 + 4*rb^3*z*\cos(\alpha)^3*\sin(\alpha) + \\
 &4*ra^2*rb*z*\cos(\alpha)^3*\sin(\alpha) - 8*ra*rb^2*z*\cos(\alpha)^4*\sin(\alpha)), 0
 \end{aligned}$$

$$\begin{aligned}
& z^2 d^*(((ra^*(z^2 \sin(\alpha) + 2*rb*z \cos(\alpha) + rb^2 \cos(\alpha))^2 \sin(\alpha) - ra^*z \cos(\alpha))^2 - \\
& rb^*z \cos(\alpha)^3 - ra^*rb \cos(\alpha)^3 \sin(\alpha)))/(ra^2 \cos(\alpha)^2 + rb^2 \cos(\alpha)^2 + z^2 - \\
& 2*ra^*rb \cos(\alpha)^3 + rb^*z \sin(2*\alpha)) + (z*(rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2)/(cos(\alpha)^2*((rb - \\
& ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)) - ((e^2 - ((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + \\
& ra^* \sin(\alpha))^2)^{(1/2)}*(z + ra^* \sin(\alpha))*(ra^2 \cos(\alpha)^2 + z^2 + ra^*z \sin(\alpha) - \\
& ra^*rb \cos(\alpha)^3))/(cos(\alpha)^2*((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(3/2)}))*(((z + \\
& ra^* \sin(\alpha))*(rb - ra^* \cos(\alpha) + z*\tan(\alpha)))/(rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2) + \\
& (\tan(\alpha)*(rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2)/(rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2) - \\
& ((e^2 - ((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(1/2)}*(ra - rb^* \cos(\alpha))*(z + \\
& ra^* \sin(\alpha)))/(cos(\alpha)*((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(3/2)})) + \\
& ((ra^* \cos(\alpha))^*(z^2 + ra^*rb \cos(\alpha) + ra^*z \sin(\alpha) - ra^*rb \cos(\alpha)^3 + \\
& rb^*z \cos(\alpha)*\sin(\alpha)))/(ra^2 \cos(\alpha)^2 + rb^2 \cos(\alpha)^2 + z^2 - 2*ra^*rb \cos(\alpha)^3 + \\
& rb^*z \sin(2*\alpha)) + ((e^2 - ((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(1/2)}*(rb - ra^* \cos(\alpha) \\
& + z*\tan(\alpha))*(ra^2 \cos(\alpha)^2 + z^2 + ra^*z \sin(\alpha) - ra^*rb \cos(\alpha)^3))/(cos(\alpha)^2*((rb - \\
& ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(3/2)})) + (z*(z + ra^* \sin(\alpha))*(rb - ra^* \cos(\alpha) + \\
& z*\tan(\alpha)))/(cos(\alpha)^2*((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2))*((z + \\
& ra^* \sin(\alpha))^2/((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2) + (\tan(\alpha)*(z + \\
& ra^* \sin(\alpha))*(rb - ra^* \cos(\alpha) + z*\tan(\alpha)))/(rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2) + \\
& ((e^2 - ((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(1/2)}*(ra - rb^* \cos(\alpha))*(rb - ra^* \cos(\alpha) \\
& + z*\tan(\alpha)))/(cos(\alpha)*((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(3/2)})) + \\
& \alpha^2 d^*(((ra^*(z^2 \sin(\alpha) + 2*rb*z \cos(\alpha) + rb^2 \cos(\alpha))^2 \sin(\alpha) - ra^*z \cos(\alpha))^2 - \\
& rb^*z \cos(\alpha)^3 - ra^*rb \cos(\alpha)^3 \sin(\alpha)))/(ra^2 \cos(\alpha)^2 + rb^2 \cos(\alpha)^2 + z^2 - \\
& 2*ra^*rb \cos(\alpha)^3 + rb^*z \sin(2*\alpha)) + (z*(rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2)/(cos(\alpha)^2*((rb - \\
& ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)) - ((e^2 - ((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + \\
& ra^* \sin(\alpha))^2)^{(1/2)}*(z + ra^* \sin(\alpha))*(ra^2 \cos(\alpha)^2 + z^2 + ra^*z \sin(\alpha) - \\
& ra^*rb \cos(\alpha)^3))/(cos(\alpha)^2*((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(3/2)}))^2 + \\
& ((ra^* \cos(\alpha))^*(z^2 + ra^*rb \cos(\alpha) + ra^*z \sin(\alpha) - ra^*rb \cos(\alpha)^3 + \\
& rb^*z \cos(\alpha)*\sin(\alpha)))/(ra^2 \cos(\alpha)^2 + rb^2 \cos(\alpha)^2 + z^2 - 2*ra^*rb \cos(\alpha)^3 + \\
& rb^*z \sin(2*\alpha)) + ((e^2 - ((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(1/2)}*(rb - ra^* \cos(\alpha) \\
& + z*\tan(\alpha))*(ra^2 \cos(\alpha)^2 + z^2 + ra^*z \sin(\alpha) - ra^*rb \cos(\alpha)^3))/(cos(\alpha)^2*((rb - \\
& ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2)^{(3/2)})) + (z*(z + ra^* \sin(\alpha))*(rb - ra^* \cos(\alpha) + \\
& z*\tan(\alpha)))/(cos(\alpha)^2*((rb - ra^* \cos(\alpha) + z*\tan(\alpha))^2 + (z + ra^* \sin(\alpha))^2))^2, 0, (\alpha^2 d^*z^4 \\
& + \alpha^2 d^*ra^2 z^2 + \alpha^2 d^*ra^4 \cos(\alpha)^4 + ra^3 z^2 d^* \cos(\alpha)^3 - 2*\alpha^2 d^*ra^3 rb^* \cos(\alpha)^5 \\
& - 2*ra^2 rb^* z^2 d^* \cos(\alpha)^4 + ra^*rb^2 z^2 d^* \cos(\alpha)^5 - rb^*z^2 z^2 d^* \cos(\alpha)^2 + \\
& \alpha^2 d^*ra^2 rb^2 \cos(\alpha)^6 + \alpha^2 d^*ra^2 z^2 \cos(\alpha)^2 + 2*\alpha^2 d^*ra^*z^3 \sin(\alpha) + \\
& ra^*z^2 z^2 d^* \cos(\alpha) + 2*\alpha^2 d^*ra^3 z^* \cos(\alpha)^2 \sin(\alpha) - 2*\alpha^2 d^*ra^*rb^*z^2 \cos(\alpha)^3 + \\
& ra^2 z^* z^2 d^* \cos(\alpha) \sin(\alpha) - ra^*rb^*z^* z^2 d^* \cos(\alpha)^2 \sin(\alpha) - \\
& 2*\alpha^2 d^*ra^2 rb^*z^* \cos(\alpha)^3 \sin(\alpha))/(ra^4 \cos(\alpha)^4 + rb^4 \cos(\alpha)^4 + z^4 + \\
& 2*ra^2 rb^2 \cos(\alpha)^4 + 4*ra^2 rb^2 \cos(\alpha)^6 + 2*ra^2 z^2 \cos(\alpha)^2 + 6*rb^2 z^2 \cos(\alpha)^2 \\
& - 4*rb^2 z^2 \cos(\alpha)^4 - 4*ra^*rb^3 \cos(\alpha)^5 - 4*ra^3 rb^* \cos(\alpha)^5 + 2*rb^*z^3 \sin(2*\alpha) - \\
& 4*ra^*rb^*z^2 \cos(\alpha)^3 + 4*rb^3 z^* \cos(\alpha)^3 \sin(\alpha) + 4*ra^2 rb^*z^* \cos(\alpha)^3 \sin(\alpha) - \\
& 8*ra^*rb^2 z^* \cos(\alpha)^4 \sin(\alpha)), 0
\end{aligned}$$

0, 0,
0, 0];

$$\begin{aligned}
YC2111 = & (2*\alpha^1 d^*z^7 - 2*\alpha^1 d^*z^7 \cos(\alpha)^2 + \alpha^1 d^*z^6 z^1 d^* \sin(2*\alpha) + \\
& 2*\alpha^1 d^*ra^6 z^* \cos(\alpha)^6 - 2*\alpha^1 d^*ra^6 z^* \cos(\alpha)^8 + 2*\alpha^1 d^*rb^6 z^* \cos(\alpha)^6 - \\
& 2*\alpha^1 d^*rb^6 z^* \cos(\alpha)^8 + 6*\alpha^1 d^*rb^*z^6 \sin(2*\alpha) + 6*\alpha^1 d^*ra^2 z^5 \cos(\alpha)^2 -
\end{aligned}$$

$$\begin{aligned}
& 6*\alpha^{1d^2}r^{a^2}z^5*\cos(\alpha)^4 + 6*\alpha^{1d^2}r^{a^4}z^3*\cos(\alpha)^4 - \\
& 6*\alpha^{1d^2}r^{a^4}z^3*\cos(\alpha)^6 + 30*\alpha^{1d^2}r^{b^2}z^5*\cos(\alpha)^2 - \\
& 54*\alpha^{1d^2}r^{b^2}z^5*\cos(\alpha)^4 + 30*\alpha^{1d^2}r^{b^4}z^3*\cos(\alpha)^4 + \\
& 24*\alpha^{1d^2}r^{b^2}z^5*\cos(\alpha)^6 - 54*\alpha^{1d^2}r^{b^4}z^3*\cos(\alpha)^6 + \\
& 24*\alpha^{1d^2}r^{b^4}z^3*\cos(\alpha)^8 - 12*\alpha^{1d^2}r^{a^2}r^{b^2}z^5*\cos(\alpha)^3 + \\
& 12*\alpha^{1d^2}r^{a^2}r^{b^2}z^5*\cos(\alpha)^5 - 12*\alpha^{1d^2}r^{a^2}r^{b^5}z^5*\cos(\alpha)^7 - \\
& 12*\alpha^{1d^2}r^{a^5}r^{b^2}z^5*\cos(\alpha)^7 + 12*\alpha^{1d^2}r^{a^2}r^{b^5}z^5*\cos(\alpha)^9 + \\
& 12*\alpha^{1d^2}r^{a^5}r^{b^2}z^5*\cos(\alpha)^9 + 2*\alpha^{1d^2}r^{a^6}z^{1d}*\cos(\alpha)^7*\sin(\alpha) + \\
& 2*\alpha^{1d^2}r^{b^6}z^{1d}*\cos(\alpha)^7*\sin(\alpha) + 40*\alpha^{1d^2}r^{b^3}z^3z^{1d}*\cos(\alpha)^4 - \\
& 56*\alpha^{1d^2}r^{b^3}z^3z^{1d}*\cos(\alpha)^6 + 16*\alpha^{1d^2}r^{b^3}z^3z^{1d}*\cos(\alpha)^8 + \\
& 2*\alpha^{1d^2}e^{2^2}r^{a^4}z^3*\cos(\alpha)^6 - \alpha^{1d^2}e^{2^2}r^{a^4}z^3*\cos(\alpha)^8 - \\
& 72*\alpha^{1d^2}r^{a^2}r^{b^3}z^3z^3*\cos(\alpha)^5 - 24*\alpha^{1d^2}r^{a^3}r^{b^2}z^3z^3*\cos(\alpha)^5 + \\
& 6*\alpha^{1d^2}r^{a^2}r^{b^4}z^3*\cos(\alpha)^6 + 6*\alpha^{1d^2}r^{a^4}r^{b^2}z^3*\cos(\alpha)^6 + \\
& 120*\alpha^{1d^2}r^{a^2}r^{b^3}z^3z^3*\cos(\alpha)^7 + 24*\alpha^{1d^2}r^{a^3}r^{b^2}z^3z^3*\cos(\alpha)^7 - \\
& 24*\alpha^{1d^2}r^{a^3}r^{b^3}z^3z^3*\cos(\alpha)^7 + 18*\alpha^{1d^2}r^{a^2}r^{b^4}z^3z^3*\cos(\alpha)^8 + \\
& 18*\alpha^{1d^2}r^{a^4}r^{b^2}z^3z^3*\cos(\alpha)^8 - 48*\alpha^{1d^2}r^{a^2}r^{b^3}z^3z^3*\cos(\alpha)^9 + \\
& 8*\alpha^{1d^2}r^{a^3}r^{b^3}z^3z^3*\cos(\alpha)^9 - 24*\alpha^{1d^2}r^{a^2}r^{b^4}z^3z^3*\cos(\alpha)^{10} - \\
& 24*\alpha^{1d^2}r^{a^4}r^{b^2}z^3z^3*\cos(\alpha)^{10} + 16*\alpha^{1d^2}r^{a^3}r^{b^3}z^3z^3*\cos(\alpha)^{11} - \\
& 12*\alpha^{1d^2}r^{b^2}z^6*\cos(\alpha)^3*\sin(\alpha) - 2*e^{2^2}r^{a^2}z^2z^{1d}*\cos(\alpha)^6 - \\
& 2*e^{2^2}r^{b^2}z^2z^{1d}*\cos(\alpha)^8 + 12*\alpha^{1d^2}r^{b^2}z^5z^{1d}*\cos(\alpha)^2 - \\
& 12*\alpha^{1d^2}r^{b^2}z^5z^{1d}*\cos(\alpha)^4 + 12*\alpha^{1d^2}r^{b^5}z^5z^{1d}*\cos(\alpha)^6 - \\
& 12*\alpha^{1d^2}r^{b^5}z^5z^{1d}*\cos(\alpha)^8 + \alpha^{1d^2}e^{2^2}r^{a^2}z^3*\cos(\alpha)^6 - \\
& 2*\alpha^{1d^2}e^{2^2}r^{b^2}z^3z^3*\cos(\alpha)^6 + 4*\alpha^{1d^2}e^{2^2}r^{b^2}z^3z^3*\cos(\alpha)^8 + \\
& 36*\alpha^{1d^2}r^{a^2}r^{b^2}z^3z^3*\cos(\alpha)^4 - 36*\alpha^{1d^2}r^{a^2}r^{b^2}z^3z^3*\cos(\alpha)^6 + \\
& 40*\alpha^{1d^2}r^{b^3}z^4z^4*\cos(\alpha)^3*\sin(\alpha) - 56*\alpha^{1d^2}r^{b^3}z^4z^4*\cos(\alpha)^5*\sin(\alpha) + \\
& 12*\alpha^{1d^2}r^{b^5}z^4z^2*\cos(\alpha)^5*\sin(\alpha) + 16*\alpha^{1d^2}r^{b^3}z^4z^4*\cos(\alpha)^7*\sin(\alpha) - \\
& 12*\alpha^{1d^2}r^{b^5}z^4z^2*\cos(\alpha)^7*\sin(\alpha) - 2*e^{2^2}r^{b^3}z^{1d}*\cos(\alpha)^9*\sin(\alpha) + \\
& 12*\alpha^{1d^2}r^{a^4}r^{b^2}z^2z^{1d}*\cos(\alpha)^6 - 48*\alpha^{1d^2}r^{a^2}r^{b^4}z^2z^{1d}*\cos(\alpha)^7 - \\
& 12*\alpha^{1d^2}r^{a^4}r^{b^2}z^2z^{1d}*\cos(\alpha)^8 + 48*\alpha^{1d^2}r^{a^2}r^{b^4}z^2z^{1d}*\cos(\alpha)^9 - \\
& \alpha^{1d^2}e^{2^2}r^{a^4}r^{b^2}z^2z^{1d}*\cos(\alpha)^9*\sin(\alpha) - \alpha^{1d^2}e^{2^2}r^{a^2}r^{b^4}z^2z^{1d}*\cos(\alpha)^{10}*\sin(\alpha) + \\
& 2*\alpha^{1d^2}e^{2^2}r^{a^2}r^{b^2}z^2z^2*\cos(\alpha)^6 + 11*\alpha^{1d^2}e^{2^2}r^{a^2}r^{b^2}z^2z^2*\cos(\alpha)^8 - \\
& 6*\alpha^{1d^2}e^{2^2}r^{a^2}r^{b^2}z^2z^2*\cos(\alpha)^{10} + (\alpha^{1d^2}e^{2^2}z^5*\cos(\alpha)^4*(r^{a^2}z^2*\cos(\alpha)^2 + \\
& r^{b^2}z^2*\cos(\alpha)^2 + z^2 - 2*r^{a^2}r^{b^2}z^2*\cos(\alpha)^3 + r^{b^2}z^2*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& 24*\alpha^{1d^2}r^{a^2}r^{b^2}z^4z^4*\cos(\alpha)^3*\sin(\alpha) - 48*\alpha^{1d^2}r^{a^2}r^{b^2}z^4z^4*\cos(\alpha)^4*\sin(\alpha) - \\
& 24*\alpha^{1d^2}r^{a^2}r^{b^2}z^4z^4*\cos(\alpha)^5*\sin(\alpha) + 12*\alpha^{1d^2}r^{a^4}r^{b^2}z^2z^2*\cos(\alpha)^5*\sin(\alpha) + \\
& 48*\alpha^{1d^2}r^{a^2}r^{b^2}z^4z^4*\cos(\alpha)^6*\sin(\alpha) - 48*\alpha^{1d^2}r^{a^2}r^{b^4}z^4z^2*\cos(\alpha)^6*\sin(\alpha) - \\
& 12*\alpha^{1d^2}r^{a^4}r^{b^2}z^2z^2*\cos(\alpha)^7*\sin(\alpha) + 48*\alpha^{1d^2}r^{a^2}r^{b^4}z^4z^2*\cos(\alpha)^8*\sin(\alpha) - \\
& 2*e^{2^2}r^{a^2}r^{b^2}z^{1d}*\cos(\alpha)^7*\sin(\alpha) + 4*e^{2^2}r^{a^2}r^{b^2}z^{1d}*\cos(\alpha)^8*\sin(\alpha) - \\
& 4*\alpha^{1d^2}e^{2^2}r^{b^3}z^3z^{1d}*\cos(\alpha)^8 - 12*\alpha^{1d^2}r^{a^2}r^{b^5}z^{1d}*\cos(\alpha)^8*\sin(\alpha) - \\
& 12*\alpha^{1d^2}r^{a^5}r^{b^2}z^{1d}*\cos(\alpha)^8*\sin(\alpha) + 24*\alpha^{1d^2}r^{a^2}r^{b^2}z^3z^{1d}*\cos(\alpha)^4 - \\
& 48*\alpha^{1d^2}r^{a^2}r^{b^2}z^3z^{1d}*\cos(\alpha)^5 - 24*\alpha^{1d^2}r^{a^2}r^{b^2}z^3z^{1d}*\cos(\alpha)^6 + \\
& 24*\alpha^{1d^2}r^{a^2}r^{b^3}z^3z^{1d}*\cos(\alpha)^6 + 48*\alpha^{1d^2}r^{a^2}r^{b^2}z^3z^{1d}*\cos(\alpha)^7 - \\
& 48*\alpha^{1d^2}r^{a^3}r^{b^2}z^3z^{1d}*\cos(\alpha)^7 + 24*\alpha^{1d^2}r^{a^2}r^{b^3}z^3z^{1d}*\cos(\alpha)^8 + \\
& 48*\alpha^{1d^2}r^{a^3}r^{b^2}z^3z^{1d}*\cos(\alpha)^9 - 48*\alpha^{1d^2}r^{a^2}r^{b^3}z^3z^{1d}*\cos(\alpha)^{10} + \\
& 4*e^{2^2}r^{a^2}r^{b^2}z^2z^{1d}*\cos(\alpha)^7 + \alpha^{1d^2}e^{2^2}r^{a^2}r^{b^3}z^3*\cos(\alpha)^9*\sin(\alpha) + \\
& \alpha^{1d^2}e^{2^2}r^{a^3}r^{b^2}z^2z^2*\cos(\alpha)^{10}*\sin(\alpha) - 2*\alpha^{1d^2}e^{2^2}r^{b^3}z^2z^2*\cos(\alpha)^7*\sin(\alpha) + \\
& 24*\alpha^{1d^2}r^{a^2}r^{b^3}z^2z^2*\cos(\alpha)^5*\sin(\alpha) - 48*\alpha^{1d^2}r^{a^3}r^{b^2}z^2z^2*\cos(\alpha)^6*\sin(\alpha)
\end{aligned}$$

$$\begin{aligned}
& + 24*\alpha^2*r^2*r^3*z^2*\cos(\alpha)^7*\sin(\alpha) + \\
& 48*\alpha^2*r^3*r^2*z^2*\cos(\alpha)^8*\sin(\alpha) - 48*\alpha^2*r^2*r^3*z^2*\cos(\alpha)^9*\sin(\alpha) \\
& + 2*\alpha^2*e^2*r^2*r^3*z^3*\cos(\alpha)^5 - 5*\alpha^2*e^2*r^2*r^3*z^3*\cos(\alpha)^7 - \\
& 2*\alpha^2*e^2*r^2*r^3*z^3*\cos(\alpha)^9 - 10*\alpha^2*e^2*r^2*r^3*z^3*\cos(\alpha)^7 - \\
& 3*\alpha^2*e^2*r^2*r^3*z^3*\cos(\alpha)^9 + 5*\alpha^2*e^2*r^2*r^3*z^3*\cos(\alpha)^9 + \\
& 2*\alpha^2*e^2*r^2*r^3*z^3*\cos(\alpha)^11 + 2*\alpha^2*e^2*r^4*z^1*\cos(\alpha)^7*\sin(\alpha) + \\
& 6*\alpha^2*r^2*r^4*z^1*\cos(\alpha)^7*\sin(\alpha) + 6*\alpha^2*r^4*r^2*z^1*\cos(\alpha)^7*\sin(\alpha) - \\
& 24*\alpha^2*r^3*r^3*z^1*\cos(\alpha)^8*\sin(\alpha) + 24*\alpha^2*r^2*r^4*z^1*\cos(\alpha)^9*\sin(\alpha) + \\
& 24*\alpha^2*r^4*r^2*z^1*\cos(\alpha)^9*\sin(\alpha) - 16*\alpha^2*r^3*r^3*z^1*\cos(\alpha)^10*\sin(\alpha) + \\
& 6*\alpha^2*r^2*z^4*z^1*\cos(\alpha)^3*\sin(\alpha) + 6*\alpha^2*r^4*z^2*z^1*\cos(\alpha)^5*\sin(\alpha) + \\
& 30*\alpha^2*r^2*z^4*z^1*\cos(\alpha)^3*\sin(\alpha) - 24*\alpha^2*r^2*z^4*z^1*\cos(\alpha)^5*\sin(\alpha) + \\
& 30*\alpha^2*r^4*z^2*z^1*\cos(\alpha)^5*\sin(\alpha) - 24*\alpha^2*r^4*z^2*z^1*\cos(\alpha)^7*\sin(\alpha) + \\
& (3*\alpha^2*e^2*r^2*z^3*\cos(\alpha)^4*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - 2*r^2*\cos(\alpha)^3 \\
& + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - (\alpha^2*e^2*r^2*z^3*\cos(\alpha)^6*(r^2*\cos(\alpha)^2 + \\
& r^2*\cos(\alpha)^2 + z^2 - 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& (2*\alpha^2*e^2*r^2*z^3*\cos(\alpha)^6*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + \\
& (3*e^2*r^3*z^1*\cos(\alpha)^9*\sin(\alpha)*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& 2*\alpha^2*e^2*r^2*r^3*z^1*\cos(\alpha)^8*\sin(\alpha) - 10*\alpha^2*e^2*r^2*r^3*z^1*\cos(\alpha)^8*\sin(\alpha) \\
& - 4*\alpha^2*e^2*r^2*r^3*z^1*\cos(\alpha)^10*\sin(\alpha) - 72*\alpha^2*r^2*r^3*z^1*\cos(\alpha)^6*\sin(\alpha) \\
& - 24*\alpha^2*r^3*r^2*z^1*\cos(\alpha)^6*\sin(\alpha) + 48*\alpha^2*r^2*r^3*z^1*\cos(\alpha)^8*\sin(\alpha) \\
& + 2*\alpha^2*e^2*r^2*r^2*z^1*\cos(\alpha)^7*\sin(\alpha) + \\
& 12*\alpha^2*e^2*r^2*r^2*z^1*\cos(\alpha)^9*\sin(\alpha) - \\
& 2*\alpha^2*e^2*r^2*z^2*z^1*\cos(\alpha)^5*\sin(\alpha) - \\
& 4*\alpha^2*e^2*r^2*z^2*z^1*\cos(\alpha)^7*\sin(\alpha) - \\
& (4*\alpha^2*e^2*r^2*z^2*\cos(\alpha)^6*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - 2*r^2*\cos(\alpha)^3 + \\
& r^2*z*\sin(2*\alpha))^(3/2))/(\cos(\alpha)^2)^(3/2) + (2*\alpha^2*e^2*r^2*z^2*\cos(\alpha)^8*(r^2*\cos(\alpha)^2 + \\
& r^2*\cos(\alpha)^2 + z^2 - 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(3/2))/(\cos(\alpha)^2)^(3/2) + \\
& (\alpha^2*e^2*r^4*z^2*\cos(\alpha)^8*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - 2*r^2*\cos(\alpha)^3 + \\
& r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + 36*\alpha^2*r^2*r^2*z^2*z^1*\cos(\alpha)^5*\sin(\alpha) + \\
& (3*e^2*r^2*z^2*z^1*\cos(\alpha)^6*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - 2*r^2*\cos(\alpha)^3 + \\
& r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + (3*e^2*r^2*z^2*z^1*\cos(\alpha)^8*(r^2*\cos(\alpha)^2 + \\
& r^2*\cos(\alpha)^2 + z^2 - 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + \\
& 4*\alpha^2*e^2*r^2*r^2*z^1*\cos(\alpha)^7 - 4*\alpha^2*e^2*r^2*r^2*z^1*\cos(\alpha)^8 + \\
& 4*\alpha^2*e^2*r^2*r^2*z^1*\cos(\alpha)^9 - 12*\alpha^2*r^2*r^2*z^1*\cos(\alpha)^4*\sin(\alpha) + \\
& 2*\alpha^2*e^2*r^2*r^2*z^2*\cos(\alpha)^5*\sin(\alpha) - \\
& 5*\alpha^2*e^2*r^2*r^2*z^2*\cos(\alpha)^7*\sin(\alpha) + \\
& 5*\alpha^2*e^2*r^2*r^2*z^2*\cos(\alpha)^8*\sin(\alpha) + \\
& (2*\alpha^2*e^2*r^2*r^2*z^3*\cos(\alpha)^5*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& (2*\alpha^2*e^2*r^2*r^2*z^3*\cos(\alpha)^7*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + \\
& (6*\alpha^2*e^2*r^2*r^2*z^3*\cos(\alpha)^7*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + \\
& (2*\alpha^2*e^2*r^2*r^2*z^3*\cos(\alpha)^9*(r^2*\cos(\alpha)^2 + r^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^2*\cos(\alpha)^3 + r^2*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) -
\end{aligned}$$

$$\begin{aligned}
& (4*\alpha d^2*e^2*ra*rb*z^2*\cos(\alpha)^8*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} + \\
& (6*\alpha d^2*e^2*ra^2*rb*z^2*\cos(\alpha)^6*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (8*\alpha d^2*e^2*ra*rb^2*z^2*\cos(\alpha)^7*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (12*\alpha d^2*e^2*ra^2*rb*z^2*\cos(\alpha)^8*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& (8*\alpha d^2*e^2*ra*rb^2*z^2*\cos(\alpha)^9*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& (3*\alpha d^2*e^2*ra^2*rb*z^2*\cos(\alpha)^5*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (2*\alpha d^2*e^2*ra*rb^2*z^2*\cos(\alpha)^6*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (3*\alpha d^2*e^2*ra^2*rb*z^2*\cos(\alpha)^7*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (2*\alpha d^2*e^2*ra*rb^2*z^2*\cos(\alpha)^8*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& (6*\alpha d^2*e^2*ra^3*rb*z^2*\cos(\alpha)^8*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& (6*\alpha d^2*e^2*ra*rb^3*z^2*\cos(\alpha)^10*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (12*\alpha d^2*e^2*ra^2*rb^2*z^2*\cos(\alpha)^9*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& (6*\alpha d^2*e^2*ra^2*z^2*z^2*\cos(\alpha)^5*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (2*\alpha d^2*e^2*rb^2*z^2*z^2*\cos(\alpha)^7*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (4*\alpha d^2*e^2*ra*rb*z^2*z^2*\cos(\alpha)^6*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^3 + rb*z*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)))/(\text{ra}^6*\cos(\alpha)^{10} + \text{rb}^6*\cos(\alpha)^{10} + \\
& z^6*\cos(\alpha)^4 + 3*ra^2*rb^4*\cos(\alpha)^{10} + 3*ra^4*rb^2*\cos(\alpha)^{10} - 12*ra^3*rb^3*\cos(\alpha)^{11} + \\
& 12*ra^2*rb^4*\cos(\alpha)^{12} + 12*ra^4*rb^2*\cos(\alpha)^{12} - 8*ra^3*rb^3*\cos(\alpha)^{13} + \\
& 3*ra^2*z^4*\cos(\alpha)^6 + 3*ra^4*z^2*\cos(\alpha)^8 + 15*rb^2*z^4*\cos(\alpha)^6 - 12*rb^2*z^4*\cos(\alpha)^8 \\
& + 15*rb^4*z^2*\cos(\alpha)^8 - 12*rb^4*z^2*\cos(\alpha)^{10} - 6*ra*rb^5*\cos(\alpha)^{11} - \\
& 6*ra^5*rb*\cos(\alpha)^{11} + 18*ra^2*rb^2*z^2*\cos(\alpha)^8 + 20*rb^3*z^3*\cos(\alpha)^7*\sin(\alpha) - \\
& 8*rb^3*z^3*\cos(\alpha)^9*\sin(\alpha) - 6*ra*rb*z^4*\cos(\alpha)^7 - 36*ra*rb^3*z^2*\cos(\alpha)^9 - \\
& 12*ra^3*rb*z^2*\cos(\alpha)^9 + 24*ra*rb^3*z^2*\cos(\alpha)^{11} + 6*rb*z^5*\cos(\alpha)^5*\sin(\alpha) + \\
& 6*rb^5*z*\cos(\alpha)^9*\sin(\alpha) + 6*ra^4*rb*z*\cos(\alpha)^9*\sin(\alpha) - \\
& 24*ra*rb^4*z*\cos(\alpha)^{10}*\sin(\alpha) + 12*ra^2*rb*z^3*\cos(\alpha)^7*\sin(\alpha) - \\
& 24*ra*rb^2*z^3*\cos(\alpha)^8*\sin(\alpha) + 12*ra^2*rb^3*z*\cos(\alpha)^9*\sin(\alpha) - \\
& 24*ra^3*rb^2*z*\cos(\alpha)^{10}*\sin(\alpha) + 24*ra^2*rb^3*z*\cos(\alpha)^{11}*\sin(\alpha)); \\
& YC2112=0; \\
& YC2113=(\cos(\alpha)*(ra - rb*\cos(\alpha))*(2*\alpha d^2*rb*z^3 + 2*rb^2*z^2*d^2*\cos(\alpha)^3*\sin(\alpha) + \\
& \alpha d^2*ra^2*z^3*\cos(\alpha) + 2*\alpha d^2*ra^3*z*\cos(\alpha) + 2*rb*z^2*d^2*\cos(\alpha)^2 - \\
& \alpha d^2*ra^2*ra^3*z*\cos(\alpha)^3 - 4*\alpha d^2*rb*z^3*\cos(\alpha)^2 + 2*\alpha d^2*ra^3*z^2*(\sin(\alpha) - \\
& \sin(\alpha)^3) - 2*ra*rb*z^2*(\sin(\alpha) - \sin(\alpha)^3) - 2*ra*z^2*d^2*\cos(\alpha) + \\
& \alpha d^2*rb^2*z^2*\sin(2*\alpha) - 8*\alpha d^2*ra^2*rb*z*\cos(\alpha)^2 +
\end{aligned}$$

$$\begin{aligned}
& 3*\alpha1d^2*ra*rb^2*z*cos(\alpha)^3 + 4*\alpha1d^2*ra^2*rb*z*cos(\alpha)^4 - \\
& 2*\alpha1d^2*ra*rb^2*z*cos(\alpha)^5 + 2*\alpha1d*ra*rb^2*z1d*(\sin(\alpha) - \sin(\alpha)^3) - \\
& 2*\alpha1d*ra*z^2*z1d*\sin(\alpha) + \alpha1d^2*ra*rb^3*cos(\alpha)^4*\sin(\alpha) - \\
& \alpha1d^2*ra^3*rb*cos(\alpha)^4*\sin(\alpha) + 2*\alpha1d^2*ra*rb^2*z*cos(\alpha) - \\
& 5*\alpha1d^2*ra*rb*z^2*(\sin(\alpha) - \sin(\alpha)^3) + 4*\alpha1d*rb^2*z^2*cos(\alpha)^2 + \\
& 2*\alpha1d^2*ra*rb*z^2*\sin(\alpha) + 2*\alpha1d*rb*z^2*z1d*\sin(2*\alpha) - \\
& 8*\alpha1d*ra^2*rb*z1d*cos(\alpha)^3*\sin(\alpha) + 4*\alpha1d*ra*rb^2*z1d*cos(\alpha)^4*\sin(\alpha) - \\
& 4*\alpha1d*ra*rb*z^2*z1d*cos(\alpha)^3)/(\alpha^6*cos(\alpha)^6 + rb^6*cos(\alpha)^6 + z^6 + \\
& 3*ra^2*rb^4*cos(\alpha)^6 + 3*ra^4*rb^2*cos(\alpha)^6 - 12*ra^3*rb^3*cos(\alpha)^7 + \\
& 12*ra^2*rb^4*cos(\alpha)^8 + 12*ra^4*rb^2*cos(\alpha)^8 - 8*ra^3*rb^3*cos(\alpha)^9 + \\
& 3*ra^2*z^4*cos(\alpha)^2 + 3*ra^4*z^2*cos(\alpha)^4 + 15*rb^2*z^4*cos(\alpha)^2 - 12*rb^2*z^4*cos(\alpha)^4 \\
& + 15*rb^4*z^2*cos(\alpha)^4 - 12*rb^4*z^2*cos(\alpha)^6 - 6*ra*rb^5*cos(\alpha)^7 - 6*ra^5*rb*cos(\alpha)^7 + \\
& 3*rb*z^5*\sin(2*\alpha) + 18*ra^2*rb^2*z^2*cos(\alpha)^4 + 20*rb^3*z^3*cos(\alpha)^3*\sin(\alpha) - \\
& 8*rb^3*z^3*cos(\alpha)^5*\sin(\alpha) - 6*ra*rb*z^4*cos(\alpha)^3 - 36*ra*rb^3*z^2*cos(\alpha)^5 - \\
& 12*ra^3*rb*z^2*cos(\alpha)^5 + 24*ra*rb^3*z^2*cos(\alpha)^7 + 6*rb^5*z*cos(\alpha)^5*\sin(\alpha) + \\
& 6*ra^4*rb*z*cos(\alpha)^5*\sin(\alpha) - 24*ra*rb^4*z*cos(\alpha)^6*\sin(\alpha) + \\
& 12*ra^2*rb*z^3*cos(\alpha)^3*\sin(\alpha) - 24*ra*rb^2*z^3*cos(\alpha)^4*\sin(\alpha) + \\
& 12*ra^2*rb^3*z*cos(\alpha)^5*\sin(\alpha) - 24*ra^3*rb^2*z*cos(\alpha)^6*\sin(\alpha) + \\
& 24*ra^2*rb^3*z*cos(\alpha)^7*\sin(\alpha));
\end{aligned}$$

YC2114= 0;

$$\begin{aligned}
& YC2121=z1d*(((ra*(\sin(\alpha)*rb^2*cos(\alpha)^2 - rb*z*cos(\alpha)^3 + 2*rb*z*cos(\alpha) - \\
& ra*\sin(\alpha)*rb*cos(\alpha)^3 + \sin(\alpha)*z^2 - ra*z*cos(\alpha)^2))/(\alpha^2*cos(\alpha)^2 - 2*ra*rb*cos(\alpha)^3 \\
& + rb^2*cos(\alpha)^2 + \sin(2*\alpha)*rb*z + z^2) + (z*(rb - ra*cos(\alpha) + z*tan(\alpha))^2)/(\cos(\alpha)^2*((rb - \\
& ra*cos(\alpha) + z*tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)) - ((e2 - ((rb - ra*cos(\alpha) + z*tan(\alpha))^2 + (z + \\
& ra*\sin(\alpha))^2)^(1/2))*(z + ra*\sin(\alpha))*(\alpha^2*cos(\alpha)^2 + \sin(\alpha)*ra*z - rb*ra*cos(\alpha)^3 + \\
& z^2))/(\cos(\alpha)^2*((rb - ra*cos(\alpha) + z*tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^(3/2)))*((- \\
& \alpha1d*ra^3*rb*cos(\alpha)^5 - 2*\alpha1d*\sin(\alpha)*ra^3*z*cos(\alpha)^4 - z1d*ra^3*cos(\alpha)^5 - \\
& \alpha1d*ra^2*rb^2*cos(\alpha)^8 + 3*\alpha1d*ra^2*rb^2*cos(\alpha)^6 + \alpha1d*ra^2*rb^2*cos(\alpha)^4 + \\
& 5*\alpha1d*\sin(\alpha)*ra^2*rb*z*cos(\alpha)^5 + 3*\alpha1d*\sin(\alpha)*ra^2*rb*z*cos(\alpha)^3 + \\
& 2*z1d*ra^2*rb*cos(\alpha)^6 + z1d*ra^2*rb*cos(\alpha)^4 - 2*\alpha1d*ra^2*z^2*cos(\alpha)^4 + \\
& 2*\alpha1d*ra^2*z^2*cos(\alpha)^2 + z1d*\sin(\alpha)*ra^2*z*cos(\alpha)^3 + \alpha1d*ra*rb^3*cos(\alpha)^7 - \\
& 4*\alpha1d*ra*rb^3*cos(\alpha)^5 + \alpha1d*\sin(\alpha)*ra*rb^2*z*cos(\alpha)^6 - \\
& 11*\alpha1d*\sin(\alpha)*ra*rb^2*z*cos(\alpha)^4 - z1d*ra*rb^2*cos(\alpha)^7 - 2*z1d*ra*rb^2*cos(\alpha)^5 + \\
& 8*\alpha1d*ra*rb*z^2*cos(\alpha)^5 - 8*\alpha1d*ra*rb*z^2*cos(\alpha)^3 - 2*z1d*\sin(\alpha)*ra*rb*z*cos(\alpha)^4 \\
& - \alpha1d*(\sin(\alpha) - \sin(\alpha)^3)*ra*z^3 + \alpha1d*rb^4*cos(\alpha)^4 + \\
& 4*\alpha1d*\sin(\alpha)*rb^3*z*cos(\alpha)^3 + z1d*rb^3*cos(\alpha)^6 - 6*\alpha1d*rb^2*z^2*cos(\alpha)^4 + \\
& 6*\alpha1d*rb^2*z^2*cos(\alpha)^2 + z1d*\sin(\alpha)*rb^2*z*cos(\alpha)^5 - \\
& 3*\alpha1d*\sin(\alpha)*rb*z^3*cos(\alpha)^3 + 2*\alpha1d*\sin(2*\alpha)*rb*z^3 - \alpha1d*z^4*cos(\alpha)^2 + \\
& \alpha1d*z^4)/(\alpha^4*cos(\alpha)^6 - 4*ra^3*rb*cos(\alpha)^7 + 4*ra^2*rb^2*cos(\alpha)^8 + \\
& 2*ra^2*rb^2*cos(\alpha)^6 + 4*\sin(\alpha)*ra^2*rb*z*cos(\alpha)^5 + 2*ra^2*z^2*cos(\alpha)^4 - \\
& 4*ra*rb^3*cos(\alpha)^7 - 8*\sin(\alpha)*ra*rb^2*z*cos(\alpha)^6 - 4*ra*rb*z^2*cos(\alpha)^5 + rb^4*cos(\alpha)^6 \\
& + 4*\sin(\alpha)*rb^3*z*cos(\alpha)^5 - 4*rb^2*z^2*cos(\alpha)^6 + 6*rb^2*z^2*cos(\alpha)^4 + \\
& 4*\sin(\alpha)*rb*z^3*cos(\alpha)^3 + z^4*cos(\alpha)^2) - (e2 - ((rb - ra*cos(\alpha) + z*tan(\alpha))^2 + (z + \\
& ra*\sin(\alpha))^2)^(1/2))*(((\cos(\alpha)^2)^(3/2)*(z + ra*\sin(\alpha))*(\alpha1d*\sin(\alpha)*ra^3*cos(\alpha)^2 - \\
& 4*\alpha1d*\sin(\alpha)*ra^2*rb*cos(\alpha)^3 + \alpha1d*ra^2*z*cos(\alpha)^2 + \\
& 2*\alpha1d*\sin(\alpha)*ra*rb^2*cos(\alpha)^4 + \alpha1d*\sin(\alpha)*ra*rb^2*cos(\alpha)^2 - \\
& 4*\alpha1d*ra*rb*z*cos(\alpha)^3 - 2*z1d*\sin(\alpha)*ra*rb*cos(\alpha)^2 - \alpha1d*\sin(\alpha)*ra*z^2 -
\end{aligned}$$

$$\begin{aligned}
& 2^2z1d^*ra^*z^*cos(alpha) + 3^*alpha1d^*rb^2z^*cos(alpha)^2 + 2^2z1d^*sin(alpha)^*rb^2z^*cos(alpha)^3 + \\
& 4^*alpha1d^*sin(alpha)^*rb^*z^2^*cos(alpha) + 2^2z1d^*rb^*z^*cos(alpha)^2 + alpha1d^*z^3)/((cos(alpha))^4*((rb - \\
& ra^*cos(alpha) + z^*tan(alpha))^2 + (z + ra^*sin(alpha))^2)*(ra^2^*cos(alpha)^2 - 2^*ra^*rb^*cos(alpha)^3 + \\
& rb^2^*cos(alpha)^2 + sin(2^*alpha)^*rb^*z + z^2)^{(3/2)}) - ((ra - rb^*cos(alpha))*(rb - ra^*cos(alpha) + \\
& z^*tan(alpha))*(alpha1d^*ra^2^*cos(alpha)^2 + alpha1d^*sin(alpha)^*ra^*z - alpha1d^*rb^*ra^*cos(alpha)^3 + \\
& z1d^*ra^*cos(alpha) + alpha1d^*z^2 - rb^*z1d^*cos(alpha)^2))/((cos(alpha))*((rb - ra^*cos(alpha) + z^*tan(alpha))^2 + (z \\
& + ra^*sin(alpha))^2)^{(3/2)}*(ra^2^*cos(alpha)^2 - 2^*ra^*rb^*cos(alpha)^3 + rb^2^*cos(alpha)^2 + sin(2^*alpha)^*rb^*z + \\
& z^2))) + (abs(cos(alpha))*(ra - rb^*cos(alpha))*(z + ra^*sin(alpha))*(2^2z^2z1d^*cos(alpha) + 2^*alpha1d^*z^2^*sin(alpha) \\
& + 2^*rb^*z1d^*cos(alpha)^2^*sin(alpha) + 2^*alpha1d^*rb^*z^*cos(alpha) + \\
& 2^*alpha1d^*ra^*rb^*cos(alpha)^3^*sin(alpha)))/((cos(alpha))^4*((rb - ra^*cos(alpha) + z^*tan(alpha))^2 + (z + \\
& ra^*sin(alpha))^2)^{(3/2)}*(ra^2^*cos(alpha)^2 - 2^*ra^*rb^*cos(alpha)^3 + rb^2^*cos(alpha)^2 + sin(2^*alpha)^*rb^*z + \\
& z^2)^{(1/2)})) + (e2^*cos(alpha))*((rb - ra^*cos(alpha) + z^*tan(alpha))^2 + (z + \\
& ra^*sin(alpha))^2)^{(1/2)}*((ra^*cos(alpha))^2 + rb^*sin(alpha)^*z^*cos(alpha) + ra^*sin(alpha)^*z - ra^*rb^*cos(alpha)^3 + \\
& ra^*rb^*cos(alpha)))/(ra^2^*cos(alpha)^2 - 2^*ra^*rb^*cos(alpha)^3 + rb^2^*cos(alpha)^2 + sin(2^*alpha)^*rb^*z + z^2) + \\
& ((e2 - ((rb - ra^*cos(alpha) + z^*tan(alpha))^2 + (z + ra^*sin(alpha))^2)^{(1/2)})*(rb - ra^*cos(alpha) + \\
& z^*tan(alpha))*(ra^2^*cos(alpha)^2 + sin(alpha)^*ra^*z - rb^*ra^*cos(alpha)^3 + z^2))/((cos(alpha))^2*((rb - ra^*cos(alpha) \\
& + z^*tan(alpha))^2 + (z + ra^*sin(alpha))^2)^{(3/2)}) + (z*(z + ra^*sin(alpha))*(rb - ra^*cos(alpha) + \\
& z^*tan(alpha)))/((cos(alpha))^2*((rb - ra^*cos(alpha) + z^*tan(alpha))^2 + (z + \\
& ra^*sin(alpha))^2)))*(2^*alpha1d^*sin(alpha)^*ra^3^*rb^*cos(alpha)^5 + alpha1d^*sin(alpha)^*ra^3^*rb^*cos(alpha)^3 - \\
& 2^*alpha1d^*ra^3^*z^*cos(alpha)^4 + 2^*alpha1d^*ra^3^*z^*cos(alpha)^2 + z1d^*sin(alpha)^*ra^3^*cos(alpha)^3 - \\
& alpha1d^*sin(alpha)^*ra^2^*rb^2^*cos(alpha)^6 - 5^*alpha1d^*sin(alpha)^*ra^2^*rb^2^*cos(alpha)^4 + \\
& 7^*alpha1d^*ra^2^*rb^*z^*cos(alpha)^5 - 4^*alpha1d^*ra^2^*rb^*z^*cos(alpha)^3 + 4^*alpha1d^*(sin(alpha) - \\
& sin(alpha)^3)^*ra^2^*z^2 + 3^2z1d^*ra^2^*z^*cos(alpha)^3 + 2^*alpha1d^*sin(alpha)^*ra^*rb^3^*cos(alpha)^5 + \\
& alpha1d^*sin(alpha)^*ra^*rb^3^*cos(alpha)^3 - alpha1d^*ra^*rb^2^*z^*cos(alpha)^6 - \\
& 6^*alpha1d^*ra^*rb^2^*z^*cos(alpha)^4 + alpha1d^*ra^*rb^2^*z^*cos(alpha)^2 - z1d^*sin(alpha)^*ra^*rb^2^*cos(alpha)^5 - \\
& 2^2z1d^*sin(alpha)^*ra^*rb^2^*cos(alpha)^3 - 10^*alpha1d^*sin(alpha)^*ra^*rb^*z^2^*cos(alpha)^3 - \\
& (alpha1d^*sin(2^*alpha)^*ra^*rb^*z^2)/2 - 2^2z1d^*ra^*rb^*z^*cos(alpha)^4 - 4^2z1d^*ra^*rb^*z^*cos(alpha)^2 + \\
& alpha1d^*ra^*z^3^*cos(alpha)^2 - alpha1d^*ra^*z^3 - z1d^*sin(2^*alpha)^*ra^*z^2 + 3^*alpha1d^*rb^3^*z^*cos(alpha)^3 + \\
& 2^2z1d^*sin(alpha)^*rb^3^*cos(alpha)^4 + 7^*alpha1d^*(sin(alpha) - sin(alpha)^3)^*rb^2^*z^2 - \\
& z1d^*rb^2^*z^*cos(alpha)^5 + 4^2z1d^*rb^2^*z^*cos(alpha)^3 - 5^*alpha1d^*rb^*z^3^*cos(alpha)^3 + \\
& 5^*alpha1d^*rb^*z^3^*cos(alpha) + 2^2z1d^*(sin(alpha) - sin(alpha)^3)^*rb^*z^2 + \\
& alpha1d^*sin(alpha)^*z^4)/((ra^2^*cos(alpha)^2 - 2^*ra^*rb^*cos(alpha)^3 + rb^2^*cos(alpha)^2 + sin(2^*alpha)^*rb^*z + \\
& z^2)^3) + alpha1d^*((e2 - ((rb - ra^*cos(alpha) + z^*tan(alpha))^2 + (z + \\
& ra^*sin(alpha))^2)^{(1/2)})*((cos(alpha)^2)^{(3/2)}*(rb - ra^*cos(alpha) + z^*tan(alpha))*(- \\
& alpha1d^*sin(alpha)^*ra^3^*rb^*cos(alpha)^4 - alpha1d^*ra^3^*z^*cos(alpha)^3 + 2^*alpha1d^*ra^3^*z^*cos(alpha) + \\
& z1d^*sin(alpha)^*ra^3^*cos(alpha)^2 + 4^*alpha1d^*ra^2^*rb^*z^*cos(alpha)^4 - 8^*alpha1d^*ra^2^*rb^*z^*cos(alpha)^2 - \\
& 4^2z1d^*sin(alpha)^*ra^2^*rb^*cos(alpha)^3 - z1d^*ra^2^*z^*cos(alpha)^2 + alpha1d^*sin(alpha)^*ra^*rb^3^*cos(alpha)^4 - \\
& 2^*alpha1d^*ra^*rb^2^*z^*cos(alpha)^5 + 3^*alpha1d^*ra^*rb^2^*z^*cos(alpha)^3 + 2^*alpha1d^*ra^*rb^2^*z^*cos(alpha) + \\
& 2^2z1d^*sin(alpha)^*ra^*rb^2^*cos(alpha)^4 + z1d^*sin(alpha)^*ra^*rb^2^*cos(alpha)^2 - \\
& 5^*alpha1d^*sin(alpha)^*ra^*rb^*z^2^*cos(alpha)^2 + 2^*alpha1d^*sin(alpha)^*ra^*rb^*z^2 + alpha1d^*ra^*z^3^*cos(alpha) - \\
& z1d^*sin(alpha)^*ra^*z^2 + 2^*alpha1d^*sin(alpha)^*rb^2^*z^2^*cos(alpha) + z1d^*rb^2^*z^*cos(alpha)^2 - \\
& 4^*alpha1d^*rb^*z^3^*cos(alpha)^2 + 2^*alpha1d^*rb^*z^3 - z1d^*z^3))/((cos(alpha))^4*((rb - ra^*cos(alpha) + \\
& z^*tan(alpha))^2 + (z + ra^*sin(alpha))^2)*(ra^2^*cos(alpha)^2 - 2^*ra^*rb^*cos(alpha)^3 + rb^2^*cos(alpha)^2 + \\
& sin(2^*alpha)^*rb^*z + z^2)^{(3/2)}) + ((z + ra^*sin(alpha))*(ra^2^*cos(alpha)^2 + sin(alpha)^*ra^*z - rb^*ra^*cos(alpha)^3 + \\
& z^2)*(alpha1d^*ra^2^*cos(alpha)^2 + alpha1d^*sin(alpha)^*ra^*z - alpha1d^*rb^*ra^*cos(alpha)^3 + z1d^*ra^*cos(alpha) + \\
& alpha1d^*z^2 - rb^*z1d^*cos(alpha)^2))/((cos(alpha))^2*((rb - ra^*cos(alpha) + z^*tan(alpha))^2 + (z + \\
& ra^*sin(alpha))^2)^{(3/2)}*(ra^2^*cos(alpha)^2 - 2^*ra^*rb^*cos(alpha)^3 + rb^2^*cos(alpha)^2 + sin(2^*alpha)^*rb^*z +
\end{aligned}$$

$$\begin{aligned}
& z^2)) + (2*\alpha 1d*z^5 - \alpha 1d*z^5*\cos(\alpha)^2 + (z^4*z1d*\sin(2*\alpha))/2 + \\
& 3*\alpha 1d*ra^3*z^2*(\sin(\alpha) - \sin(\alpha)^3) + 3*\alpha 1d*rb*z^4*\sin(2*\alpha) - ra*z^3*z1d*\cos(\alpha)^3 + \\
& 2*ra^3*z*z1d*\cos(\alpha)^3 - 2*ra^3*z*z1d*\cos(\alpha)^5 + 3*rb*z^3*z1d*\cos(\alpha)^2 - \\
& 3*rb*z^3*z1d*\cos(\alpha)^4 + rb^3*z*z1d*\cos(\alpha)^4 + 3*\alpha 1d*ra^2*z^3*\cos(\alpha)^2 - \\
& 2*\alpha 1d*ra^2*z^3*\cos(\alpha)^4 + 6*\alpha 1d*rb^2*z^3*\cos(\alpha)^2 - 6*\alpha 1d*rb^2*z^3*\cos(\alpha)^4 - \\
& \alpha 1d*ra^2*z^4*(\sin(\alpha) - \sin(\alpha)^3) + 2*\alpha 1d*ra^2*z^4*\sin(\alpha) + ra*z^3*z1d*\cos(\alpha)^4 - \\
& 6*\alpha 1d*ra^2*rb^2*z*\cos(\alpha)^4 + 7*\alpha 1d*ra^2*rb^2*z*\cos(\alpha)^6 - \\
& 3*\alpha 1d*ra^2*rb^2*z*\cos(\alpha)^8 - 4*\alpha 1d*rb^2*z^4*\cos(\alpha)^3*\sin(\alpha) + \\
& ra*rb^3*z1d*\cos(\alpha)^4*\sin(\alpha) + ra^3*rb*z1d*\cos(\alpha)^4*\sin(\alpha) + 6*\alpha 1d*ra*rb^2*z^3*\cos(\alpha) - \\
& \alpha 1d*ra^3*rb^2*\cos(\alpha)^6*\sin(\alpha) + \alpha 1d*ra^2*rb^3*\cos(\alpha)^7*\sin(\alpha) - \\
& \alpha 1d*ra^3*rb^2*\cos(\alpha)^8*\sin(\alpha) + 3*ra*rb^2*z^2*z1d*(\sin(\alpha) - \sin(\alpha)^3) - \\
& 2*\alpha 1d*ra^3*z^2*\cos(\alpha)^4*\sin(\alpha) + 2*\alpha 1d*rb^3*z^2*\cos(\alpha)^3*\sin(\alpha) - \\
& 3*ra^2*rb^2*z1d*\cos(\alpha)^5*\sin(\alpha) + ra^2*rb^2*z1d*\cos(\alpha)^7*\sin(\alpha) + \\
& 2*ra^2*z^2*z1d*\cos(\alpha)^3*\sin(\alpha) + 3*rb^2*z^2*z1d*\cos(\alpha)^3*\sin(\alpha) - \\
& 18*\alpha 1d*ra*rb^2*z^3*\cos(\alpha)^3 + 2*\alpha 1d*ra*rb^3*z^3*\cos(\alpha)^3 + 2*\alpha 1d*ra^3*rb^2*z^3*\cos(\alpha)^3 \\
& + 11*\alpha 1d*ra*rb^2*z^3*\cos(\alpha)^5 - 2*\alpha 1d*ra*rb^3*z^3*\cos(\alpha)^5 - 2*\alpha 1d*ra^3*rb^2*z^3*\cos(\alpha)^5 \\
& + \alpha 1d*ra*rb^3*z^3*\cos(\alpha)^7 + \alpha 1d*ra^3*rb^2*z^3*\cos(\alpha)^7 + 6*\alpha 1d*ra*rb^2*z^2*(\sin(\alpha) - \\
& \sin(\alpha)^3) + 3*ra*rb^2*z^2*z1d*\cos(\alpha)^3 - 4*ra^2*rb^2*z^2*z1d*\cos(\alpha)^4 - 6*ra*rb^2*z^2*z1d*\cos(\alpha)^5 \\
& + 5*ra^2*rb^2*z^2*z1d*\cos(\alpha)^6 + ra*rb^2*z^2*z1d*\cos(\alpha)^7 + \alpha 1d*ra^4*rb*\cos(\alpha)^7*\sin(\alpha) - \\
& 8*ra*rb^2*z^2*z1d*\cos(\alpha)^4*\sin(\alpha) - 6*\alpha 1d*ra^2*rb^2*z^2*\cos(\alpha)^3*\sin(\alpha) - \\
& 12*\alpha 1d*ra*rb^2*z^2*\cos(\alpha)^4*\sin(\alpha) + 7*\alpha 1d*ra^2*rb^2*z^2*\cos(\alpha)^5*\sin(\alpha) + \\
& 2*\alpha 1d*ra*rb^2*z^2*\cos(\alpha)^6*\sin(\alpha))/(ra^4*\cos(\alpha)^6 - 4*ra^3*rb*\cos(\alpha)^7 + \\
& 4*ra^2*rb^2*\cos(\alpha)^8 + 2*ra^2*rb^2*\cos(\alpha)^6 + 4*\sin(\alpha)*ra^2*rb^2*\cos(\alpha)^5 + \\
& 2*ra^2*z^2*\cos(\alpha)^4 - 4*ra*rb^3*\cos(\alpha)^7 - 8*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^6 - \\
& 4*ra*rb^2*z^2*\cos(\alpha)^5 + rb^4*\cos(\alpha)^6 + 4*\sin(\alpha)*rb^3*z*\cos(\alpha)^5 - 4*rb^2*z^2*\cos(\alpha)^6 \\
& + 6*rb^2*z^2*\cos(\alpha)^4 + 4*\sin(\alpha)*rb^2*z^3*\cos(\alpha)^3 + z^4*\cos(\alpha)^2) - (\text{abs}(\cos(\alpha))*(rb - \\
& ra*\cos(\alpha) + z*\tan(\alpha))*(ra^2*\cos(\alpha)^2 + \sin(\alpha)*ra*z - rb*ra*\cos(\alpha)^3 + \\
& z^2)*(2*z*z1d*\cos(\alpha) + 2*\alpha 1d*z^2*\sin(\alpha) + 2*rb*z1d*\cos(\alpha)^2*\sin(\alpha) + \\
& 2*\alpha 1d*rb^2*z*\cos(\alpha) + 2*\alpha 1d*ra*rb*\cos(\alpha)^3*\sin(\alpha)))/(\cos(\alpha)^5*((rb - ra*\cos(\alpha) + \\
& z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^(3/2))*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 + \\
& \sin(2*\alpha)*rb*z + z^2)^(1/2))*((ra*\cos(\alpha)*(z^2 + rb*\sin(\alpha)*z*\cos(\alpha) + ra*\sin(\alpha)*z - \\
& ra*rb*\cos(\alpha)^3 + ra*rb*\cos(\alpha)))/(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 + \\
& \sin(2*\alpha)*rb*z + z^2) + ((e2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^(1/2))*(rb - \\
& ra*\cos(\alpha) + z*\tan(\alpha))*(ra^2*\cos(\alpha)^2 + \sin(\alpha)*ra*z - rb*ra*\cos(\alpha)^3 + \\
& z^2))/(\cos(\alpha)^2*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^(3/2)) + (z*(z + \\
& ra*\sin(\alpha))*(rb - ra*\cos(\alpha) + z*\tan(\alpha)))/(\cos(\alpha)^2*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + \\
& ra*\sin(\alpha))^2))) + ((ra*(\sin(\alpha)*rb^2*\cos(\alpha)^2 - rb^2*\cos(\alpha)^3 + 2*rb^2*z*\cos(\alpha) - \\
& ra*\sin(\alpha)*rb*\cos(\alpha)^3 + \sin(\alpha)*z^2 - ra^2*\cos(\alpha)^2))/(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 \\
& + rb^2*\cos(\alpha)^2 + \sin(2*\alpha)*rb*z + z^2) + (z*(rb - ra*\cos(\alpha) + z*\tan(\alpha))^2)/(\cos(\alpha)^2*((rb - \\
& ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)) - ((e2 - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + \\
& ra*\sin(\alpha))^2)^(1/2))*z + ra*\sin(\alpha))*(ra^2*\cos(\alpha)^2 + \sin(\alpha)*ra*z - rb*ra*\cos(\alpha)^3 + \\
& z^2))/(\cos(\alpha)^2*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^(3/2))*((- \\
& \alpha 1d*ra^4*rb*\cos(\alpha)^9 + \alpha 1d*ra^3*rb^2*\cos(\alpha)^10 + 2*\alpha 1d*ra^3*rb^2*\cos(\alpha)^8 + \\
& \alpha 1d*\sin(\alpha)*ra^3*rb^2*\cos(\alpha)^7 - 2*\alpha 1d*\sin(\alpha)*ra^3*rb^2*\cos(\alpha)^5 - \\
& z1d*ra^3*rb*\cos(\alpha)^6 + 2*\alpha 1d*ra^3*z^2*\cos(\alpha)^6 - 3*\alpha 1d*ra^3*z^2*\cos(\alpha)^4 - \\
& 2*z1d*\sin(\alpha)*ra^3*z^2*\cos(\alpha)^5 - 2*\alpha 1d*ra^2*rb^3*\cos(\alpha)^9 - \alpha 1d*ra^2*rb^3*\cos(\alpha)^7 - \\
& 3*\alpha 1d*\sin(\alpha)*ra^2*rb^2*z*\cos(\alpha)^8 + 5*\alpha 1d*\sin(\alpha)*ra^2*rb^2*z*\cos(\alpha)^6 +
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha 1d*\sin(\alpha)*ra^2*rb^2*z*\cos(\alpha)^4 - z1d*ra^2*rb^2*\cos(\alpha)^9 + \\
& 3*z1d*ra^2*rb^2*\cos(\alpha)^7 + z1d*ra^2*rb^2*\cos(\alpha)^5 - 7*\alpha 1d*ra^2*rb^2*z^2*\cos(\alpha)^7 + \\
& 4*\alpha 1d*ra^2*rb^2*z^2*\cos(\alpha)^5 + 5*\alpha 1d*ra^2*rb^2*z^2*\cos(\alpha)^3 + \\
& 5*z1d*\sin(\alpha)*ra^2*rb^2*\cos(\alpha)^6 + 3*z1d*\sin(\alpha)*ra^2*rb^2*\cos(\alpha)^4 - \\
& 2*\alpha 1d*\sin(\alpha)*ra^2*z^3*\cos(\alpha)^4 + 3*\alpha 1d*\sin(\alpha)*ra^2*z^3*\cos(\alpha)^2 - \\
& 2*z1d*ra^2*z^2*\cos(\alpha)^5 + 2*z1d*ra^2*z^2*\cos(\alpha)^3 + \alpha 1d*ra*rb^4*\cos(\alpha)^8 + \\
& 3*\alpha 1d*\sin(\alpha)*ra*rb^3*z*\cos(\alpha)^7 - 8*\alpha 1d*\sin(\alpha)*ra*rb^3*z*\cos(\alpha)^5 + \\
& z1d*ra*rb^3*\cos(\alpha)^8 - 4*z1d*ra*rb^3*\cos(\alpha)^6 - 2*\alpha 1d*ra*rb^2*z^2*\cos(\alpha)^8 + \\
& 21*\alpha 1d*ra*rb^2*z^2*\cos(\alpha)^6 - 20*\alpha 1d*ra*rb^2*z^2*\cos(\alpha)^4 + \\
& z1d*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^7 - 11*z1d*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^5 + \\
& 11*\alpha 1d*\sin(\alpha)*ra*rb^2*z^3*\cos(\alpha)^5 - 14*\alpha 1d*\sin(\alpha)*ra*rb^2*z^3*\cos(\alpha)^3 + \\
& 8*z1d*ra*rb^2*z^2*\cos(\alpha)^6 - 8*z1d*ra*rb^2*z^2*\cos(\alpha)^4 + \alpha 1d*ra*z^4*\cos(\alpha)^4 - \\
& 2*\alpha 1d*ra*z^4*\cos(\alpha)^2 - z1d*\sin(\alpha)*ra*z^3*\cos(\alpha)^3 + \\
& 2*\alpha 1d*\sin(\alpha)*rb^4*z*\cos(\alpha)^4 + z1d*rb^4*\cos(\alpha)^5 - 8*\alpha 1d*rb^3*z^2*\cos(\alpha)^5 + \\
& 8*\alpha 1d*rb^3*z^2*\cos(\alpha)^3 + 4*z1d*\sin(\alpha)*rb^3*z*\cos(\alpha)^4 - \\
& 10*\alpha 1d*\sin(\alpha)*rb^2*z^3*\cos(\alpha)^4 + 12*\alpha 1d*\sin(\alpha)*rb^2*z^3*\cos(\alpha)^2 - \\
& 6*z1d*rb^2*z^2*\cos(\alpha)^5 + 6*z1d*rb^2*z^2*\cos(\alpha)^3 + 4*\alpha 1d*rb^2*z^4*\cos(\alpha)^5 - \\
& 11*\alpha 1d*rb^2*z^4*\cos(\alpha)^3 + 8*\alpha 1d*rb^2*z^4*\cos(\alpha) - 3*z1d*\sin(\alpha)*rb^2*z^3*\cos(\alpha)^4 + \\
& 4*z1d*\sin(\alpha)*rb^2*z^3*\cos(\alpha)^2 - \alpha 1d*\sin(\alpha)*z^5*\cos(\alpha)^2 + 2*\alpha 1d*\sin(\alpha)*z^5 - \\
& z1d*z^4*\cos(\alpha)^3 + z1d*z^4*\cos(\alpha))/(ra^4*\cos(\alpha)^7 - 4*ra^3*rb*\cos(\alpha)^8 + \\
& 4*ra^2*rb^2*\cos(\alpha)^9 + 2*ra^2*rb^2*\cos(\alpha)^7 + 4*\sin(\alpha)*ra^2*rb^2*z*\cos(\alpha)^6 + \\
& 2*ra^2*z^2*\cos(\alpha)^5 - 4*ra*rb^3*\cos(\alpha)^8 - 8*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^7 - \\
& 4*ra*rb^2*z^2*\cos(\alpha)^6 + rb^4*\cos(\alpha)^7 + 4*\sin(\alpha)*rb^3*z*\cos(\alpha)^6 - 4*rb^2*z^2*\cos(\alpha)^7 + \\
& 6*rb^2*z^2*\cos(\alpha)^5 + 4*\sin(\alpha)*rb^2*z^3*\cos(\alpha)^4 + z^4*\cos(\alpha)^3) - (e2 - ((rb - ra*\cos(\alpha) \\
& + z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^(1/2))(((\cos(\alpha)^2)^(3/2)*(z + ra*\sin(\alpha))^(\\
& \alpha 1d*\sin(\alpha)*ra^3*rb*\cos(\alpha)^4 - \alpha 1d*ra^3*z*\cos(\alpha)^3 + 2*\alpha 1d*ra^3*z*\cos(\alpha) + \\
& z1d*\sin(\alpha)*ra^3*\cos(\alpha)^2 + 4*\alpha 1d*ra^2*rb^2*z*\cos(\alpha)^4 - 8*\alpha 1d*ra^2*rb^2*z*\cos(\alpha)^2 - \\
& 4*z1d*\sin(\alpha)*ra^2*rb^2*\cos(\alpha)^3 - z1d*ra^2*z^2*\cos(\alpha)^2 + \alpha 1d*\sin(\alpha)*ra*rb^3*\cos(\alpha)^4 - \\
& 2*\alpha 1d*ra*rb^2*z^2*\cos(\alpha)^5 + 3*\alpha 1d*ra*rb^2*z^2*\cos(\alpha)^3 + 2*\alpha 1d*ra*rb^2*z^2*\cos(\alpha) + \\
& 2*z1d*\sin(\alpha)*ra*rb^2*\cos(\alpha)^4 + z1d*\sin(\alpha)*ra*rb^2*\cos(\alpha)^2 - \\
& 5*\alpha 1d*\sin(\alpha)*ra*rb^2*z^2*\cos(\alpha)^2 + 2*\alpha 1d*\sin(\alpha)*ra*rb^2*z^2 + \alpha 1d*ra*z^3*\cos(\alpha) - \\
& z1d*\sin(\alpha)*ra*z^2 + 2*\alpha 1d*\sin(\alpha)*rb^2*z^2*\cos(\alpha) + z1d*rb^2*z^2*\cos(\alpha)^2 - \\
& 4*\alpha 1d*rb^2*z^3*\cos(\alpha)^2 + 2*\alpha 1d*rb^2*z^3 - z1d*z^3))/(\cos(\alpha)^4*((rb - ra*\cos(\alpha) + \\
& z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 + \\
& \sin(2*\alpha)*rb^2*z + z^2)^(3/2)) - ((rb - ra*\cos(\alpha) + z*\tan(\alpha))*(ra^2*\cos(\alpha)^2 + \sin(\alpha)*ra*z - \\
& rb*ra*\cos(\alpha)^3 + z^2)*(alpha 1d*ra^2*\cos(\alpha)^2 + alpha 1d*\sin(\alpha)*ra*z - alpha 1d*rb*ra*\cos(\alpha)^3 \\
& + z1d*ra*\cos(\alpha) + alpha 1d*z^2 - rb*z1d*\cos(\alpha)^2))/(\cos(\alpha)^2*((rb - ra*\cos(\alpha) + z*\tan(\alpha))^2 \\
& + (z + ra*\sin(\alpha))^2)^(3/2)*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 + \\
& \sin(2*\alpha)*rb^2*z + z^2))) + (abs(\cos(\alpha))*(z + ra*\sin(\alpha))*(ra^2*\cos(\alpha)^2 + \sin(\alpha)*ra*z - \\
& rb*ra*\cos(\alpha)^3 + z^2)*(2*z*z1d*\cos(\alpha) + 2*\alpha 1d*z^2*\sin(\alpha) + 2*rb*z1d*\cos(\alpha)^2*\sin(\alpha) \\
& + 2*\alpha 1d*rb^2*z*\cos(\alpha) + 2*\alpha 1d*ra*rb^2*\cos(\alpha)^3*\sin(\alpha)))/(\cos(\alpha)^5*((rb - ra*\cos(\alpha) + \\
& z*\tan(\alpha))^2 + (z + ra*\sin(\alpha))^2)^(3/2)*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 + \\
& \sin(2*\alpha)*rb^2*z + z^2)^(1/2)));
\end{aligned}$$

YC2122=0;

$$\begin{aligned}
YC2123 &= ((\cos(\alpha)^2)^(3/2)*(ra^2*\cos(\alpha)^2 + z^2 + ra*z*\sin(\alpha) - \\
& ra*rb*\cos(\alpha)^3)*(2*\alpha 1d^2*rb^2*z^3 + 2*rb^2*z1d^2*\cos(\alpha)^3*\sin(\alpha) + \\
& \alpha 1d^2*ra*z^3*\cos(\alpha) + 2*\alpha 1d^2*ra^3*z*\cos(\alpha) + 2*rb^2*z1d^2*\cos(\alpha)^2 -
\end{aligned}$$

$$\begin{aligned} & \alpha^2 r^3 z \cos(\alpha)^3 - 4 \alpha^2 r^2 b z^3 \cos(\alpha)^2 + 2 \alpha^2 r^3 z^2 d (\sin(\alpha) - \sin(\alpha)^3) - 2 r^2 b z^2 d^2 (\sin(\alpha) - \sin(\alpha)^3) - 2 r^2 z^2 d^2 \cos(\alpha) + \\ & \alpha^2 r^2 b^2 z^2 \sin(2\alpha) - 8 \alpha^2 r^2 z^2 \cos(\alpha)^2 + 3 \alpha^2 r^2 z^2 \cos(\alpha)^3 + 4 \alpha^2 r^2 b z^2 \cos(\alpha)^4 - \\ & 2 \alpha^2 r^2 z^2 \cos(\alpha)^5 + 2 \alpha^2 r^2 b z^2 d (\sin(\alpha) - \sin(\alpha)^3) - 2 \alpha^2 r^2 z^2 d \sin(\alpha) + \alpha^2 r^2 b^3 \cos(\alpha)^4 \sin(\alpha) - \\ & \alpha^2 r^2 z^3 b \cos(\alpha)^4 \sin(\alpha) + 2 \alpha^2 r^2 b^2 z^2 \cos(\alpha) - 5 \alpha^2 r^2 z^2 \cos(\alpha)^2 (\sin(\alpha) - \sin(\alpha)^3) + 4 \alpha^2 r^2 b z^2 d \cos(\alpha)^2 + \\ & 2 \alpha^2 r^2 b z^2 \sin(\alpha) + 2 \alpha^2 r^2 b z^2 d \sin(2\alpha) - 8 \alpha^2 r^2 b z^2 d \cos(\alpha)^3 \sin(\alpha) + 4 \alpha^2 r^2 b z^2 d \cos(\alpha)^4 \sin(\alpha) - \\ & 4 \alpha^2 r^2 b z^2 d \cos(\alpha)^3) / (\cos(\alpha)^6 ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2)^{3/2}) (r^2 \cos(\alpha)^2 - 2 r^2 b \cos(\alpha)^3 + r^2 \cos(\alpha)^2 + \sin(2\alpha) r b z + \\ & z^2)^{3/2}); \\ & YC2124=0; \\ & YC2131=0; \\ & YC2132=0; \\ & YC2133=0; \\ & YC2134=0; \\ & YC21=[YC2111,YC2112,YC2113,YC2114;YC2121,YC2122,YC2123,YC2124;YC2131,YC2132,YC2133,YC2134]; \\ & YG21 \\ & =[\\ & \qquad \qquad \qquad -ga*((z + r \sin(\alpha))^2 / ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2) + (\tan(\alpha) * (z + r \sin(\alpha)) * (r - r \cos(\alpha) + z \tan(\alpha))) / ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2) + ((e^2 - ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2)^{1/2}) * (r - r \cos(\alpha)) * (r - r \cos(\alpha) + z \tan(\alpha))) / (\cos(\alpha) * ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2)^{3/2})), 0, 0, 0 \\ & \qquad -ga*((r^2 \cos(\alpha) * (z^2 + r^2 b \cos(\alpha) + r^2 z \sin(\alpha) - r^2 b \cos(\alpha)^3 + r^2 z^2 \cos(\alpha) * \sin(\alpha))) / (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - 2 r^2 b \cos(\alpha)^3 + r^2 z^2 \sin(2\alpha)) + ((e^2 - ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2)^{1/2}) * (r - r \cos(\alpha) + z \tan(\alpha)) * (r^2 \cos(\alpha)^2 + z^2 + r^2 z \sin(\alpha) - r^2 b \cos(\alpha)^3)) / (\cos(\alpha)^2 * ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2)^{3/2})) + (z * (z + r \sin(\alpha)) * (r - r \cos(\alpha) + z \tan(\alpha))) / (\cos(\alpha)^2 * ((r - r \cos(\alpha) + z \tan(\alpha))^2 + (z + r \sin(\alpha))^2))), 0, 0, 0]; \\ & Y5=YM21+YC21+YG21; \\ & YM2211=(\alpha^2 z^7 \sin(\alpha) + z^6 z^2 d \cos(\alpha) + r^6 z^2 d \cos(\alpha)^7 + r^6 z^2 d \cos(\alpha)^7 + 15 \alpha^2 d r^2 z^5 (\sin(\alpha) - \sin(\alpha)^3) + 3 \alpha^2 d r^2 z^5 (\sin(\alpha) - \sin(\alpha)^3) + \beta^2 d r^7 \cos(\alpha)^8 \cos(\beta) + e^2 r^2 b^4 z^2 d \cos(\alpha)^7 + 3 r^2 r^2 b^4 z^2 d \cos(\alpha)^7 + 3 r^2 r^2 b^2 z^2 d \cos(\alpha)^7 + 15 r^2 z^4 z^2 d \cos(\alpha)^3 + 15 r^2 z^4 z^2 d \cos(\alpha)^5 + \alpha^2 d r^6 z^2 \cos(\alpha)^6 \sin(\alpha) + \alpha^2 d r^6 z^2 \cos(\alpha)^6 \sin(\alpha) - 6 r^2 r^2 b^5 z^2 d \cos(\alpha)^7 \cos(\beta) - 6 r^2 r^2 b^5 z^2 d \cos(\alpha)^7 \cos(\beta) + 6 r^2 z^5 z^2 d \cos(\alpha)^2 \sin(\beta) + 6 r^2 z^5 z^2 d \cos(\alpha)^6 \sin(\beta) + \beta^2 d e^2 r^2 r^5 \cos(\alpha)^8 \cos(\beta) - \beta^2 d e^2 r^2 r^2 b^3 \cos(\alpha)^8 + 3 \beta^2 d r^2 r^3 b^4 \cos(\alpha)^8 \cos(\beta) + 3 \beta^2 d r^2 r^5 b^2 \cos(\alpha)^8 \cos(\beta) - 6 \beta^2 d r^2 r^6 b \cos(\alpha)^8 \cos(\beta)^2 + 15 \beta^2 d r^2 r^3 z^4 \cos(\alpha)^4 \cos(\beta) + 15 \beta^2 d r^2 r^5 z^2 \cos(\alpha)^6 \cos(\beta) + 15 \alpha^2 d r^4 z^3 \cos(\alpha)^4 \sin(\alpha) + 3 \alpha^2 d r^2 r^4 z^3 \cos(\alpha)^4 \sin(\alpha) + e^2 r^2 r^2 b^2 z^2 d \cos(\alpha)^7 - 12 r^2 r^3 b^3 z^2 d \cos(\alpha)^7 \cos(\beta) +
\end{aligned}$$

$$\begin{aligned}
& e2^2*rb^2*z^2*z2d*cos(alpha)^5 + 18*ra^2*rb^2*z^2*z2d*cos(alpha)^5 + \\
& 20*ra^3*z^3*z2d*cos(alpha)^4*sin(beta) - 6*beta2d*ra^2*rb^5*cos(alpha)^8*cos(beta)^2 - \\
& 12*beta2d*ra^4*rb^3*cos(alpha)^8*cos(beta)^2 + 12*beta2d*ra^3*rb^4*cos(alpha)^8*cos(beta)^3 + \\
& 12*beta2d*ra^5*rb^2*cos(alpha)^8*cos(beta)^3 - 8*beta2d*ra^4*rb^3*cos(alpha)^8*cos(beta)^4 - \\
& 12*beta2d*ra^3*z^4*cos(alpha)^4*cos(beta)^3 - 12*beta2d*ra^5*z^2*cos(alpha)^6*cos(beta)^3 + \\
& e2^2*ra^4*z2d*cos(alpha)^7*cos(beta)^2 + 12*ra^2*rb^4*z2d*cos(alpha)^7*cos(beta)^2 + \\
& 12*ra^4*rb^2*z2d*cos(alpha)^7*cos(beta)^2 - 8*ra^3*rb^3*z2d*cos(alpha)^7*cos(beta)^3 - \\
& 12*ra^2*z^4*z2d*cos(alpha)^3*cos(beta)^2 - 12*ra^4*z^2*z2d*cos(alpha)^5*cos(beta)^2 - \\
& beta2d*e2^2*ra^4*rb*cos(alpha)^8 + beta2d*ra*rb^6*cos(alpha)^8*cos(beta) + \\
& beta2d*ra*z^6*cos(alpha)^2*cos(beta) - (2*e2*rb^4*z2d*cos(alpha)^7*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 \\
& + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& 4*beta2d*e2^2*ra^3*rb^2*cos(alpha)^8*cos(beta) - 3*beta2d*e2^2*ra^4*rb*cos(alpha)^8*cos(beta)^2 + \\
& 3*beta2d*e2^2*ra^3*z^2*cos(alpha)^6*cos(beta) - 6*beta2d*ra^2*rb*z^4*cos(alpha)^4*cos(beta)^2 + \\
& 18*beta2d*ra^3*rb^2*z^2*cos(alpha)^6*cos(beta) - 36*beta2d*ra^4*rb*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 24*beta2d*ra^4*rb*z^2*cos(alpha)^6*cos(beta)^4 + alpha2d*e2^2*rb^2*z^3*cos(alpha)^4*sin(alpha) - \\
& 2*e2^2*ra^3*rb*z2d*cos(alpha)^7*cos(beta)^3 + 6*beta2d*ra^2*z^5*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 20*beta2d*ra^4*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 18*alpha2d*ra^2*rb^2*z^3*cos(alpha)^4*sin(alpha) + \\
& 20*alpha2d*ra^3*z^4*cos(alpha)^3*sin(alpha)*sin(beta) + \\
& 6*alpha2d*ra^5*z^2*cos(alpha)^5*sin(alpha)*sin(beta) + 24*ra^3*rb*z^2*z2d*cos(alpha)^5*cos(beta)^3 - \\
& 3*beta2d*e2^2*ra^2*rb^3*cos(alpha)^8*cos(beta)^2 + 2*beta2d*e2^2*ra^3*rb^2*cos(alpha)^8*cos(beta)^3 - \\
& 2*beta2d*e2^2*ra^3*z^2*cos(alpha)^6*cos(beta)^3 + 6*alpha2d*ra*z^6*cos(alpha)*sin(alpha)*sin(beta) - \\
& 6*ra*rb*z^4*z2d*cos(alpha)^3*cos(beta) - 12*beta2d*ra^2*rb^3*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 12*alpha2d*ra^2*z^5*cos(alpha)^2*cos(beta)^2*sin(alpha) - \\
& 12*alpha2d*ra^4*z^3*cos(alpha)^4*cos(beta)^2*sin(alpha) + 5*e2^2*ra^2*rb^2*z2d*cos(alpha)^7*cos(beta)^2 \\
& - 8*beta2d*ra^4*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 6*ra*rb^4*z^2*z2d*cos(alpha)^6*sin(beta) + \\
& e2^2*ra^2*z^2*z2d*cos(alpha)^5*cos(beta)^2 - 8*ra^3*z^3*z2d*cos(alpha)^4*cos(beta)^2*sin(beta) + \\
& beta2d*e2^2*ra*rb^4*cos(alpha)^8*cos(beta) - 3*beta2d*e2^2*ra^2*rb*z^2*cos(alpha)^6 + \\
& 3*beta2d*ra*rb^2*z^4*cos(alpha)^4*cos(beta) + 3*beta2d*ra*rb^4*z^2*cos(alpha)^6*cos(beta) + \\
& alpha2d*e2^2*rb^4*z*cos(alpha)^6*sin(alpha) - 4*e2^2*ra*rb^3*z2d*cos(alpha)^7*cos(beta) - \\
& 2*e2^2*ra^3*rb*z2d*cos(alpha)^7*cos(beta) + 6*beta2d*ra^6*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 3*alpha2d*ra^2*rb^4*z*cos(alpha)^6*sin(alpha) + 3*alpha2d*ra^4*rb^2*z*cos(alpha)^6*sin(alpha) - \\
& 12*ra*rb^3*z^2*z2d*cos(alpha)^5*cos(beta) - 36*ra^3*rb*z^2*z2d*cos(alpha)^5*cos(beta) + \\
& 12*ra*rb^2*z^3*z2d*cos(alpha)^4*sin(beta) + 12*ra^3*rb^2*z^2*z2d*cos(alpha)^6*sin(beta) + \\
& 2*e2^2*ra^3*z^2*z2d*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& 12*alpha2d*ra^3*rb^2*z^2*cos(alpha)^5*sin(alpha)*sin(beta) + \\
& 24*ra^3*rb^2*z^2*z2d*cos(alpha)^6*cos(beta)^2*sin(beta) - \\
& (2*e2*ra^4*z2d*cos(alpha)^7*cos(beta)^2*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& 6*alpha2d*ra*rb*z^5*cos(alpha)^2*cos(beta)*sin(alpha) - 6*alpha2d*ra*rb^5*z*cos(alpha)^6*cos(beta)*sin(alpha) \\
& - 6*alpha2d*ra^5*rb*z*cos(alpha)^6*cos(beta)*sin(alpha) - beta2d*e2^2*ra*rb*z^3*cos(alpha)^5*sin(beta) - \\
& beta2d*e2^2*ra*rb^3*z*cos(alpha)^7*sin(beta) - 3*beta2d*e2^2*ra^3*rb*z*cos(alpha)^7*sin(beta) - \\
& 2*e2^2*ra*rb*z^2*z2d*cos(alpha)^5*cos(beta) + alpha2d*e2^2*ra^2*z^3*cos(alpha)^4*cos(beta)^2*sin(alpha) \\
& + 2*e2^2*ra*rb^2*z^2*z2d*cos(alpha)^6*sin(beta) - 24*ra^4*rb*z^2*z2d*cos(alpha)^6*cos(beta)*sin(beta) - \\
& 8*alpha2d*ra^3*z^4*cos(alpha)^3*cos(beta)^2*sin(alpha)*sin(beta) + \\
& (2*beta2d*e2*ra^2*rb*cos(alpha)^8*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& beta2d*e2^2*ra*rb^2*z^2*cos(alpha)^6*cos(beta) + 3*beta2d*e2^2*ra^4*z*cos(alpha)^7*cos(beta)*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& \alpha^2 d^2 e^2 r^2 r^2 b^2 z^2 \cos(\alpha)^6 \sin(\alpha) - \\
& 12 \alpha^2 d^2 r^3 r^3 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 36 \alpha^2 d^2 r^3 r^3 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 12 \alpha^2 d^2 r^3 r^3 z^3 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) + \\
& 6 \beta^2 d^2 r^2 r^2 b^4 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta) + \\
& 12 \beta^2 d^2 r^4 r^4 b^2 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta) - \\
& 24 \beta^2 d^2 r^5 r^5 b^2 z^2 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + \\
& 12 \alpha^2 d^2 r^2 r^2 b^2 z^4 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) + \\
& 6 \alpha^2 d^2 r^4 r^4 z^2 \cos(\alpha)^5 \sin(\alpha) \sin(\beta) - \\
& 24 r^2 r^2 b^2 z^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - 24 r^2 r^2 b^3 z^2 z^2 d^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) - \\
& (2 \beta^2 d^2 e^2 r^3 \cos(\alpha)^8 \cos(\beta) (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(3/2)}) / (\cos(\alpha)^2)^{(3/2)} - \\
& (2 e^2 r^2 r^2 b^2 z^2 d^2 \cos(\alpha)^7 (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(1/2)}) / \text{abs}(\cos(\alpha)) - \\
& (2 e^2 r^2 r^2 z^2 z^2 d^2 \cos(\alpha)^5 (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(1/2)}) / \text{abs}(\cos(\alpha)) + \\
& \beta^2 d^2 e^2 r^2 r^2 b^2 z^2 \cos(\alpha)^6 \cos(\beta)^2 + \\
& \alpha^2 d^2 e^2 r^4 z^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) + \\
& \beta^2 d^2 e^2 r^2 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \\
& 24 \alpha^2 d^2 r^3 r^3 z^3 \cos(\alpha)^4 \cos(\beta)^3 \sin(\alpha) + \\
& 12 \alpha^2 d^2 r^2 r^2 b^4 z^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) + \\
& 12 \alpha^2 d^2 r^4 r^4 b^2 z^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) - \\
& 8 \alpha^2 d^2 r^3 r^3 z^3 \cos(\alpha)^6 \cos(\beta)^3 \sin(\alpha) + \\
& 12 \beta^2 d^2 r^2 r^2 b^2 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \\
& 24 \beta^2 d^2 r^3 r^3 b^2 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - \\
& 24 \beta^2 d^2 r^3 r^3 z^3 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + \\
& 24 \beta^2 d^2 r^4 r^4 b^2 z^2 \cos(\alpha)^7 \cos(\beta)^3 \sin(\beta) - \\
& 2 \alpha^2 d^2 e^2 r^2 r^2 b^2 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 4 \alpha^2 d^2 e^2 r^2 r^2 b^3 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) - \\
& 2 \alpha^2 d^2 e^2 r^3 r^3 b^2 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) - \\
& (10 e^2 r^2 r^2 b^2 z^2 d^2 \cos(\alpha)^7 \cos(\beta)^2 (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(1/2)}) / \text{abs}(\cos(\alpha)) - \\
& (2 e^2 r^2 r^2 z^2 z^2 d^2 \cos(\alpha)^5 \cos(\beta)^2 (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(1/2)}) / \text{abs}(\cos(\alpha)) - \\
& 4 e^2 r^2 r^2 b^2 z^2 z^2 d^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) + \\
& 2 \alpha^2 d^2 e^2 r^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\alpha) \sin(\beta) - \\
& (2 \beta^2 d^2 e^2 r^2 r^2 b^2 \cos(\alpha)^8 \cos(\beta) (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(3/2)}) / (\cos(\alpha)^2)^{(3/2)} + \\
& 24 \alpha^2 d^2 r^3 r^3 b^2 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\alpha) \sin(\beta) - \\
& (2 \alpha^2 d^2 e^2 r^2 z^2 \cos(\alpha)^6 \sin(\alpha) (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(3/2)}) / (\cos(\alpha)^2)^{(3/2)} + \\
& (8 e^2 r^2 r^2 b^3 z^2 d^2 \cos(\alpha)^7 \cos(\beta) (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(1/2)}) / \text{abs}(\cos(\alpha)) + \\
& (4 e^2 r^2 r^3 r^3 z^2 d^2 \cos(\alpha)^7 \cos(\beta) (r^2 \cos(\alpha)^2 + r b^2 \cos(\alpha)^2 + z^2 - \\
& 2 r^2 r^2 b^2 \cos(\alpha)^2 \cos(\beta) + 2 r^2 z^2 \cos(\alpha) \sin(\beta))^{(1/2)}) / \text{abs}(\cos(\alpha)) - \\
& 2 \alpha^2 d^2 e^2 r^3 r^3 b^2 z^2 \cos(\alpha)^6 \cos(\beta)^3 \sin(\alpha) + \\
& 5 \beta^2 d^2 e^2 r^2 r^2 b^2 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& (8*\alpha^2*d^2*e^2*ra^3*rb*z*cos(alpha)^8*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (8*e^2*ra^2*rb*z^2*d*cos(alpha)^6*cos(beta)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (10*\alpha^2*d^2*e^2*ra^3*rb^2*cos(alpha)^9*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) \\
& + (2*\alpha^2*d^2*e^2*ra^3*z^2*cos(alpha)^7*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) \\
& + (4*\alpha^2*d^2*e^2*ra^2*rb*cos(alpha)^9*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 \\
& + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (4*\alpha^2*d^2*e^2*ra^4*rb*cos(alpha)^9*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + \\
& z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (8*\alpha^2*d^2*e^2*ra^3*rb*z*cos(alpha)^8*cos(beta)^3*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*\alpha^2*d^2*e^2*ra*rb^2*z^2*cos(alpha)^7*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*\alpha^2*d^2*e^2*ra^2*rb*z^2*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)))/(ra^6*cos(alpha)^9 + rb^6*cos(alpha)^9 + \\
& z^6*cos(alpha)^3 + 3*ra^2*rb^4*cos(alpha)^9 + 3*ra^4*rb^2*cos(alpha)^9 + 15*ra^2*z^4*cos(alpha)^5 + \\
& 15*ra^4*z^2*cos(alpha)^7 + 3*rb^2*z^4*cos(alpha)^5 + 3*rb^4*z^2*cos(alpha)^7 + \\
& 18*ra^2*rb^2*z^2*cos(alpha)^7 + 20*ra^3*z^3*cos(alpha)^6*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^9*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^9*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^9*cos(beta)^3 - 12*ra^2*z^4*cos(alpha)^5*cos(beta)^2 - \\
& 12*ra^4*z^2*cos(alpha)^7*cos(beta)^2 - 6*ra*rb^5*cos(alpha)^9*cos(beta) - 6*ra^5*rb*cos(alpha)^9*cos(beta) \\
& + 6*ra*z^5*cos(alpha)^4*sin(beta) + 6*ra^5*z*cos(alpha)^8*sin(beta) - 12*ra^3*rb^3*cos(alpha)^9*cos(beta) - \\
& 6*ra*rb*z^4*cos(alpha)^5*cos(beta) + 6*ra*rb^4*z*cos(alpha)^8*sin(beta) - \\
& 8*ra^3*z^3*cos(alpha)^6*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^7*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^7*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^6*sin(beta) + \\
& 12*ra^3*rb^2*z*cos(alpha)^8*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^7*cos(beta)^3 - \\
& 24*ra^2*rb*z^3*cos(alpha)^6*cos(beta)*sin(beta) - 24*ra^2*rb^3*z*cos(alpha)^8*cos(beta)*sin(beta) + \\
& 24*ra^3*rb^2*z*cos(alpha)^8*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^8*cos(beta)*sin(beta)); \\
& YM2212 = (cos(alpha)*(rb - ra*cos(beta))*(rb^2*d*cos(alpha) - rb*z^2*d*cos(alpha)^3 - beta^2*d*ra^2*cos(alpha)^2 + \\
& beta^2*d*ra^2*cos(alpha)^4 + ra*z^2*d*cos(alpha)^3*cos(beta) + alpha^2*d*rb*z*sin(alpha) - \\
& ra*z^2*d*cos(alpha)*cos(beta) - alpha^2*d*ra*z*cos(beta)*sin(alpha) - beta^2*d*ra*z*cos(alpha)*sin(beta) + \\
& beta^2*d*ra*rb*cos(alpha)^2*cos(beta) - beta^2*d*ra*rb*cos(alpha)^4*cos(beta) + \\
& beta^2*d*ra*z*cos(alpha)^3*sin(beta) - alpha^2*d*ra^2*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) + \\
& alpha^2*d*ra*rb*cos(alpha)^3*sin(alpha)*sin(beta))/(ra^4*cos(alpha)^4 - ra^4*cos(alpha)^6 + rb^4*cos(alpha)^4 \\
& - z^4*cos(alpha)^2 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 - ra^2*rb^2*cos(alpha)^6 + 6*ra^2*z^2*cos(alpha)^2 - \\
& 6*ra^2*z^2*cos(alpha)^4 + 2*rb^2*z^2*cos(alpha)^2 - rb^2*z^2*cos(alpha)^4 + \\
& ra^4*cos(alpha)^6*cos(beta)^2 + 4*ra*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 + \\
& ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + \\
& 5*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 2*ra^3*rb*cos(alpha)^6*cos(beta) - 4*ra*z^3*cos(alpha)^3*sin(beta) + 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra^3*z*cos(alpha)^5*sin(beta) - 2*ra^3*rb*cos(alpha)^6*cos(beta)^3 - 4*ra*rb*z^2*cos(alpha)^2*cos(beta) + \\
& 2*ra*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^2*z^2*cos(alpha)^3*sin(beta) - 2*ra*rb^2*z^2*cos(alpha)^5*sin(beta) \\
& + 2*ra^3*z*cos(alpha)^5*cos(beta)^2*sin(beta) - 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& 4*ra^2*rb*z*cos(alpha)^5*cos(beta)*sin(beta)); \\
YM2213 = & -(cos(alpha)^3*(rb - ra*cos(beta))^2*(alpha2d*z^3*sin(alpha) - rb^2*z2d*cos(alpha)^3 + \\
& beta2d*ra^2*rb*cos(alpha)^4 - beta2d*ra^3*cos(alpha)^4*cos(beta) - ra^2*z2d*cos(alpha)^3*cos(beta)^2 + \\
& 3*alpha2d*ra^2*z*cos(alpha)^2*sin(alpha) + beta2d*ra^2*rb*cos(alpha)^4*cos(beta)^2 + \\
& alpha2d*ra^3*cos(alpha)^3*sin(alpha)*sin(beta) + 2*ra*rb*z2d*cos(alpha)^3*cos(beta) - \\
& beta2d*ra*rb^2*cos(alpha)^4*cos(beta) + beta2d*ra*rb*z*cos(alpha)^3*sin(beta) - \\
& 3*alpha2d*ra^2*z*cos(alpha)^2*cos(beta)^2*sin(alpha) + 3*alpha2d*ra*z^2*cos(alpha)*sin(alpha)*sin(beta) - \\
& beta2d*ra^2*z*cos(alpha)^3*cos(beta)*sin(beta) + alpha2d*ra*rb^2*cos(alpha)^3*sin(alpha)*sin(beta) - \\
& 2*alpha2d*ra^2*rb*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta)))/(ra^6*cos(alpha)^6 - ra^6*cos(alpha)^8 + \\
& rb^6*cos(alpha)^6 - z^6*cos(alpha)^2 + z^6 + 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 - \\
& ra^2*rb^4*cos(alpha)^8 - 2*ra^4*rb^2*cos(alpha)^8 + 15*ra^2*z^4*cos(alpha)^2 - 15*ra^2*z^4*cos(alpha)^4 \\
& + 15*ra^4*z^2*cos(alpha)^4 - 15*ra^4*z^2*cos(alpha)^6 + 3*rb^2*z^4*cos(alpha)^2 - \\
& 2*rb^2*z^4*cos(alpha)^4 + 3*rb^4*z^2*cos(alpha)^4 - rb^4*z^2*cos(alpha)^6 + \\
& ra^6*cos(alpha)^8*cos(beta)^2 + 18*ra^2*rb^2*z^2*cos(alpha)^4 - 12*ra^2*rb^2*z^2*cos(alpha)^6 + \\
& 20*ra^3*z^3*cos(alpha)^3*sin(beta) - 20*ra^3*z^3*cos(alpha)^5*sin(beta) + 6*ra*z^5*cos(alpha)*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 + ra^2*rb^4*cos(alpha)^8*cos(beta)^2 - \\
& 2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - 4*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 + \\
& 4*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 + \\
& 13*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 + \\
& 18*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 4*ra^4*z^2*cos(alpha)^6*cos(beta)^4 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 4*ra^5*rb*cos(alpha)^8*cos(beta) - \\
& 6*ra*z^5*cos(alpha)^3*sin(beta) + 6*ra^5*z*cos(alpha)^5*sin(beta) - 6*ra^5*z*cos(alpha)^7*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) + 4*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& + 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 2*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) + \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) - \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) - \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta));
\end{aligned}$$

$$YM2214=0;$$

$$\begin{aligned}
YM2221 = & beta2d*((- (ra*cos(alpha)^3*(z^2*cos(beta) + ra*rb*cos(alpha)^2 - ra*rb*cos(alpha)^2*cos(beta)^2 + \\
& rb*z*cos(alpha)*sin(beta) + ra*z*cos(alpha)*cos(beta)*sin(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 \\
& - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta) + (ra*cos(alpha)*(cos(alpha)^2 - 1)*(z^2*cos(beta) \\
& + ra*rb*cos(alpha)^2 - ra*rb*cos(alpha)^2*cos(beta)^2 + rb*z*cos(alpha)*sin(beta) + \\
& ra*z*cos(alpha)*cos(beta)*sin(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta) + (ra*cos(alpha)^2*(rb - \\
& ra*cos(beta))*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta))^(1/2) - e2*abs(cos(alpha)))*(ra*cos(alpha) + z*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*ra*z*cos(alpha)*sin(beta))^(1/2) - e2*abs(cos(alpha))*(ra^2*cos(alpha)^2 + z^2 - \\
& ra^2*cos(alpha)^2*cos(beta)^2 + 2*ra*z*cos(alpha)*sin(beta)))/(ra^2*cos(alpha)^2 - \\
& 2*cos(beta)*ra*rb*cos(alpha)^2 + 2*sin(beta)*ra*z*cos(alpha) + rb^2*cos(alpha)^2 + z^2)^(3/2) + \\
& (ra*sin(alpha)*sin(beta)*(cos(alpha)^2)^(3/2)*(rb - ra*cos(beta))^2*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + \\
& z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2) - \\
& e2*abs(cos(alpha)))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 - 2*cos(beta)*ra*rb*cos(alpha)^2 + \\
& 2*sin(beta)*ra*z*cos(alpha) + rb^2*cos(alpha)^2 + z^2)^(3/2))*((cos(alpha)^2*(z + \\
& ra*cos(alpha)*sin(beta))^2)/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta)) + (sin(alpha)^2*(z + ra*cos(alpha)*sin(beta))^2)/(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta)) + \\
& ((cos(alpha)^2)^(3/2)*(rb - ra*cos(beta))^2*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2) - \\
& e2*abs(cos(alpha)))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 - 2*cos(beta)*ra*rb*cos(alpha)^2 + \\
& 2*sin(beta)*ra*z*cos(alpha) + rb^2*cos(alpha)^2 + z^2)^(3/2))) + ((z*(rb - ra*cos(beta))*(z*tan(alpha) + \\
& ra*sin(alpha)*sin(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta)) - ((rb - ra*cos(beta))*(z*tan(alpha) + ra*sin(alpha)*sin(beta))*((ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2) - \\
& e2*abs(cos(alpha)))*(z + ra*cos(alpha)^3*sin(beta)))/(ra^2*cos(alpha)^2 - 2*cos(beta)*ra*rb*cos(alpha)^2 + \\
& 2*sin(beta)*ra*z*cos(alpha) + rb^2*cos(alpha)^2 + z^2)^(3/2) + (ra*sin(alpha)*sin(beta)*(cos(alpha)^2)^(3/2)*(z \\
& + ra*cos(alpha)*sin(beta))*(rb - ra*cos(beta))*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2) - \\
& e2*abs(cos(alpha)))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 - 2*cos(beta)*ra*rb*cos(alpha)^2 + \\
& 2*sin(beta)*ra*z*cos(alpha) + rb^2*cos(alpha)^2 + z^2)^(3/2))*((cos(alpha)^2*(z + ra*cos(alpha)*sin(beta))*(rb - \\
& ra*cos(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta)) + (cos(alpha)^2*tan(alpha)*(rb - ra*cos(beta))*(z*tan(alpha) + \\
& ra*sin(alpha)*sin(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta)) - ((cos(alpha)^2)^(3/2)*(z + ra*cos(alpha)*sin(beta))*(rb - \\
& ra*cos(beta))*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta))^(1/2) - e2*abs(cos(alpha)))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 - \\
& 2*cos(beta)*ra*rb*cos(alpha)^2 + 2*sin(beta)*ra*z*cos(alpha) + rb^2*cos(alpha)^2 + z^2)^(3/2)) - \\
& (tan(alpha)*(cos(alpha)^2)^(3/2)*(rb - ra*cos(beta))*(z*tan(alpha) + ra*sin(alpha)*sin(beta))*((ra^2*cos(alpha)^2 \\
& + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2) - \\
& e2*abs(cos(alpha)))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 - 2*cos(beta)*ra*rb*cos(alpha)^2 + \\
& 2*sin(beta)*ra*z*cos(alpha) + rb^2*cos(alpha)^2 + z^2)^(3/2))); \\
& YM2222=-((rb - ra*cos(beta))*(alpha2d*ra^3*cos(alpha)^6*cos(beta) - alpha2d*ra^2*rb*cos(alpha)^6 - \\
& alpha2d*rb*z^2 + alpha2d*ra*z^2*cos(beta) - alpha2d*ra^3*cos(alpha)^6*cos(beta)^3 + \\
& beta2d*ra^2*z*cos(alpha)^2*sin(alpha) + beta2d*ra^2*z*cos(alpha)^4*sin(alpha) + \\
& alpha2d*ra^2*rb*cos(alpha)^6*cos(beta)^2 - rb*z*z2d*cos(alpha)*sin(alpha) + \\
& beta2d*ra^3*cos(alpha)^5*sin(alpha)*sin(beta) - 2*alpha2d*ra*rb*z*cos(alpha)^3*sin(beta) + \\
& ra*z*z2d*cos(alpha)*cos(beta)*sin(alpha) - beta2d*ra^2*z*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& ra^2*z2d*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + beta2d*ra*z^2*cos(alpha)*sin(alpha)*sin(beta) - \\
& ra*rb*z2d*cos(alpha)^4*sin(alpha)*sin(beta) + 2*alpha2d*ra^2*z*cos(alpha)^3*cos(beta)*sin(beta) - \\
& beta2d*ra^2*rb*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& beta2d*ra*rb*z*cos(alpha)^2*cos(beta)*sin(alpha))/(ra^4*cos(alpha)^4 - ra^4*cos(alpha)^6 + \\
& rb^4*cos(alpha)^4 - z^4*cos(alpha)^2 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 - ra^2*rb^2*cos(alpha)^6 + \\
& 6*ra^2*z^2*cos(alpha)^2 - 6*ra^2*z^2*cos(alpha)^4 + 2*rb^2*z^2*cos(alpha)^2 - rb^2*z^2*cos(alpha)^4 + \\
& ra^4*cos(alpha)^6*cos(beta)^2 + 4*ra*z^3*cos(alpha)*sin(beta) + 4*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 +
\end{aligned}$$

$$\begin{aligned}
& ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - 4*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + \\
& 5*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - 4*ra*rb^3*cos(alpha)^4*cos(beta) - 4*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 2*ra^3*rb*cos(alpha)^6*cos(beta) - 4*ra*z^3*cos(alpha)^3*sin(beta) + 4*ra^3*z*cos(alpha)^3*sin(beta) - \\
& 4*ra^3*z*cos(alpha)^5*sin(beta) - 2*ra^3*rb*cos(alpha)^6*cos(beta)^3 - 4*ra*rb*z^2*cos(alpha)^2*cos(beta) + \\
& 2*ra*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^2*z*cos(alpha)^3*sin(beta) - 2*ra*rb^2*z*cos(alpha)^5*sin(beta) \\
& + 2*ra^3*z*cos(alpha)^5*cos(beta)^2*sin(beta) - 8*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 4*ra^2*rb*z*cos(alpha)^5*cos(beta)*sin(beta)); \\
YM2223 = & -(alpha2d*ra^6*cos(alpha)^8 - alpha2d*ra^6*cos(alpha)^6 - alpha2d*z^6 + alpha2d*z^6*cos(alpha)^2 \\
& - alpha2d*ra^2*rb^4*cos(alpha)^6 - 2*alpha2d*ra^4*rb^2*cos(alpha)^6 + alpha2d*ra^2*rb^4*cos(alpha)^8 + \\
& 2*alpha2d*ra^4*rb^2*cos(alpha)^8 - 15*alpha2d*ra^2*z^4*cos(alpha)^2 + 15*alpha2d*ra^2*z^4*cos(alpha)^4 \\
& - 15*alpha2d*ra^4*z^2*cos(alpha)^4 + 15*alpha2d*ra^4*z^2*cos(alpha)^6 + \\
& alpha2d*ra^6*cos(alpha)^6*cos(beta)^2 - alpha2d*ra^6*cos(alpha)^8*cos(beta)^2 + \\
& 6*alpha2d*ra^5*z*cos(alpha)^3*sin(beta) - 6*alpha2d*ra^5*z*cos(alpha)^5*sin(beta) + \\
& 6*alpha2d*ra^5*z*cos(alpha)^7*sin(beta) + 4*alpha2d*ra^3*rb^3*cos(alpha)^6*cos(beta) - \\
& 4*alpha2d*ra^3*rb^3*cos(alpha)^8*cos(beta) - 4*alpha2d*ra^5*rb*cos(alpha)^6*cos(beta)^3 + \\
& 4*alpha2d*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*alpha2d*ra^2*rb^2*z^2*cos(alpha)^4 + \\
& 6*alpha2d*ra^2*rb^2*z^2*cos(alpha)^6 - 20*alpha2d*ra^3*z^3*cos(alpha)^3*sin(beta) + \\
& 20*alpha2d*ra^3*z^3*cos(alpha)^5*sin(beta) + rb^2*z^3*z2d*cos(alpha)^3*sin(alpha) - \\
& 6*alpha2d*ra^5*cos(alpha)*sin(beta) + alpha2d*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 - \\
& 2*alpha2d*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - 4*alpha2d*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 - \\
& alpha2d*ra^2*rb^4*cos(alpha)^8*cos(beta)^2 + 4*alpha2d*ra^4*rb^2*cos(alpha)^6*cos(beta)^4 + \\
& 2*alpha2d*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 + 4*alpha2d*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 - \\
& 4*alpha2d*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 + 15*alpha2d*ra^2*z^4*cos(alpha)^2*cos(beta)^2 - \\
& 15*alpha2d*ra^2*z^4*cos(alpha)^4*cos(beta)^2 + 24*alpha2d*ra^4*z^2*cos(alpha)^4*cos(beta)^2 - \\
& 9*alpha2d*ra^4*z^2*cos(alpha)^4*cos(beta)^4 - 24*alpha2d*ra^4*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 9*alpha2d*ra^4*z^2*cos(alpha)^6*cos(beta)^4 + 4*alpha2d*ra^5*rb*cos(alpha)^6*cos(beta) - \\
& 4*alpha2d*ra^5*rb*cos(alpha)^8*cos(beta) - 12*alpha2d*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 + \\
& 12*alpha2d*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + beta2d*ra^6*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta) \\
& + 4*beta2d*ra^3*z^3*cos(alpha)^4*cos(beta)*sin(alpha) - 4*beta2d*ra^5*z*cos(alpha)^6*cos(beta)^3*sin(alpha) \\
& + 6*alpha2d*ra^5*z*cos(alpha)^5*cos(beta)^2*sin(beta) - 6*alpha2d*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) \\
& - beta2d*ra^3*rb^3*cos(alpha)^7*sin(alpha)*sin(beta) + 3*ra^4*z*z2d*cos(alpha)^5*cos(beta)^2*sin(alpha) - \\
& 3*ra^4*z*z2d*cos(alpha)^5*cos(beta)^4*sin(alpha) + ra^3*rb^2*z2d*cos(alpha)^6*sin(alpha)*sin(beta) - \\
& 4*beta2d*ra^4*rb*z*cos(alpha)^6*sin(alpha) + 6*alpha2d*ra^2*rb^2*z^2*cos(alpha)^4*cos(beta)^2 - \\
& 6*alpha2d*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 - 3*beta2d*ra^3*z^3*cos(alpha)^4*cos(beta)^3*sin(alpha) \\
& + 18*alpha2d*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 18*alpha2d*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& ra^5*z2d*cos(alpha)^6*cos(beta)^2*sin(alpha)*sin(beta) + ra^2*z^3*z2d*cos(alpha)^3*cos(beta)^2*sin(alpha) + \\
& 12*alpha2d*ra^3*rb*z^2*cos(alpha)^4*cos(beta) - 12*alpha2d*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + \\
& 4*beta2d*ra^5*z*cos(alpha)^6*cos(beta)*sin(alpha) - beta2d*ra^5*rb*cos(alpha)^7*sin(alpha)*sin(beta) - \\
& 4*beta2d*ra^2*rb*z^3*cos(alpha)^4*sin(alpha) - beta2d*ra^2*rb^3*z*cos(alpha)^6*sin(alpha) - \\
& 2*alpha2d*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + 2*alpha2d*ra*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 6*alpha2d*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + 6*alpha2d*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + \\
& ra*rb^4*z2d*cos(alpha)^6*sin(alpha)*sin(beta) + 3*ra^2*rb^2*z*z2d*cos(alpha)^5*sin(alpha) + \\
& beta2d*ra^2*z^4*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) + \\
& 6*beta2d*ra^4*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& 4*ra^2*rb^3*z2d*cos(alpha)^6*cos(beta)*sin(alpha)*sin(beta) - \\
& 2*ra^4*rb*z2d*cos(alpha)^6*cos(beta)^3*sin(alpha)*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 3*ra^2*rb^2*z^2d*cos(alpha)^5*cos(beta)^2*sin(alpha) + \\
& 12*alpha2d*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 12*alpha2d*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta) - beta2d*ra*rb*z^4*cos(alpha)^3*sin(alpha)*sin(beta) - \\
& 2*ra*rb*z^3*z^2d*cos(alpha)^3*cos(beta)*sin(alpha) - 6*ra^3*rb*z^2d*cos(alpha)^5*cos(beta)*sin(alpha) - \\
& 3*beta2d*ra^3*rb^3*cos(alpha)^7*cos(beta)^2*sin(alpha)*sin(beta) + \\
& 2*beta2d*ra^4*rb^2*cos(alpha)^7*cos(beta)^3*sin(alpha)*sin(beta) - \\
& 3*beta2d*ra^4*z^2*cos(alpha)^5*cos(beta)^3*sin(alpha)*sin(beta) + \\
& 5*ra^3*rb^2*z^2d*cos(alpha)^6*cos(beta)^2*sin(alpha)*sin(beta) + \\
& 3*ra^3*z^2*z^2d*cos(alpha)^4*cos(beta)^2*sin(alpha)*sin(beta) + \\
& beta2d*ra*rb^2*z^3*cos(alpha)^4*cos(beta)*sin(alpha) + \\
& 6*beta2d*ra^3*rb^2*z*cos(alpha)^6*cos(beta)*sin(alpha) - \\
& beta2d*ra^4*rb*z*cos(alpha)^6*cos(beta)^2*sin(alpha) + \\
& 5*beta2d*ra^4*rb*z*cos(alpha)^6*cos(beta)^4*sin(alpha) + \\
& 4*alpha2d*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 4*alpha2d*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 12*alpha2d*ra^4*rb*z*cos(alpha)^5*cos(beta)^3*sin(beta) + \\
& 12*alpha2d*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) - \\
& 6*beta2d*ra^3*rb*z^2*cos(alpha)^5*sin(alpha)*sin(beta) - \\
& 2*ra^4*rb*z^2d*cos(alpha)^6*cos(beta)*sin(alpha)*sin(beta) + \\
& 6*ra^3*rb*z^2d*cos(alpha)^5*cos(beta)^3*sin(alpha) + 3*ra*rb^2*z^2*z^2d*cos(alpha)^4*sin(alpha)*sin(beta) + \\
& beta2d*ra^2*rb^4*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta) + \\
& 4*beta2d*ra^4*rb^2*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta) - \\
& 3*beta2d*ra^5*rb*cos(alpha)^7*cos(beta)^2*sin(alpha)*sin(beta) + \\
& 2*beta2d*ra^2*rb*z^3*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& beta2d*ra^2*rb^3*z*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& 6*beta2d*ra^3*rb^2*z*cos(alpha)^6*cos(beta)^3*sin(alpha) + \\
& 6*alpha2d*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 6*alpha2d*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 6*ra^2*rb*z^2*z^2d*cos(alpha)^4*cos(beta)*sin(alpha)*sin(beta) + \\
& 3*beta2d*ra^2*rb^2*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta))/(ra^6*cos(alpha)^6 - ra^6*cos(alpha)^8 \\
& + rb^6*cos(alpha)^6 - z^6*cos(alpha)^2 + z^6 + 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 - \\
& ra^2*rb^4*cos(alpha)^8 - 2*ra^4*rb^2*cos(alpha)^8 + 15*ra^2*z^4*cos(alpha)^2 - 15*ra^2*z^4*cos(alpha)^4 \\
& + 15*ra^4*z^2*cos(alpha)^4 - 15*ra^4*z^2*cos(alpha)^6 + 3*rb^2*z^4*cos(alpha)^2 - \\
& 2*rb^2*z^4*cos(alpha)^4 + 3*rb^4*z^2*cos(alpha)^4 - rb^4*z^2*cos(alpha)^6 + \\
& ra^6*cos(alpha)^8*cos(beta)^2 + 18*ra^2*rb^2*z^2*cos(alpha)^4 - 12*ra^2*rb^2*z^2*cos(alpha)^6 + \\
& 20*ra^3*z^3*cos(alpha)^3*sin(beta) - 20*ra^3*z^3*cos(alpha)^5*sin(beta) + 6*ra*z^5*cos(alpha)*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^6*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^6*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 + ra^2*rb^4*cos(alpha)^8*cos(beta)^2 - \\
& 2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - 4*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 + \\
& 4*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 + \\
& 13*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 + \\
& 18*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 4*ra^4*z^2*cos(alpha)^6*cos(beta)^4 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 4*ra^5*rb*cos(alpha)^8*cos(beta) - \\
& 6*ra*z^5*cos(alpha)^3*sin(beta) + 6*ra^5*z*cos(alpha)^5*sin(beta) - 6*ra^5*z*cos(alpha)^7*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) + 4*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& + 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 2*ra*rb^4*z*cos(alpha)^7*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) + \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) - \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) - \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + 16*ra^2*rb^2*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta);
\end{aligned}$$

$$YM2224=0;$$

$$\begin{aligned}
YM2231 = & (beta2d*ra^8*cos(alpha)^8 + beta2d*e2^2*ra^6*cos(alpha)^8 + beta2d*ra^2*rb^6*cos(alpha)^8 + \\
& 3*beta2d*ra^4*rb^4*cos(alpha)^8 + 3*beta2d*ra^6*rb^2*cos(alpha)^8 + beta2d*ra^2*z^6*cos(alpha)^2 + \\
& 15*beta2d*ra^4*z^4*cos(alpha)^4 + 15*beta2d*ra^6*z^2*cos(alpha)^6 + ra^7*z2d*cos(alpha)^7*cos(beta) - \\
& e2^2*ra^4*rb*z2d*cos(alpha)^7 + 6*beta2d*ra^7*z*cos(alpha)^7*sin(beta) + \\
& ra*rb^6*z2d*cos(alpha)^7*cos(beta) + beta2d*e2^2*ra^4*rb^2*cos(alpha)^8 - \\
& 6*beta2d*ra^3*rb^5*cos(alpha)^8*cos(beta) - 12*beta2d*ra^5*rb^3*cos(alpha)^8*cos(beta) + \\
& beta2d*e2^2*ra^2*z^4*cos(alpha)^4 + 6*beta2d*e2^2*ra^4*z^2*cos(alpha)^6 + \\
& e2^2*ra^5*z2d*cos(alpha)^7*cos(beta) + 3*beta2d*ra^2*rb^2*z^4*cos(alpha)^4 + \\
& 3*beta2d*ra^2*rb^4*z^2*cos(alpha)^6 + 18*beta2d*ra^4*rb^2*z^2*cos(alpha)^6 - \\
& e2^2*ra^2*rb^3*z2d*cos(alpha)^7 + 6*beta2d*ra^3*z^5*cos(alpha)^3*sin(beta) + \\
& 20*beta2d*ra^5*z^3*cos(alpha)^5*sin(beta) + 3*ra^3*rb^4*z2d*cos(alpha)^7*cos(beta) + \\
& 3*ra^5*rb^2*z2d*cos(alpha)^7*cos(beta) - 6*ra^6*rb*z2d*cos(alpha)^7*cos(beta)^2 + \\
& 15*ra^3*z^4*z2d*cos(alpha)^3*cos(beta) + 15*ra^5*z^2*z2d*cos(alpha)^5*cos(beta) + \\
& alpha2d*ra*z^7*cos(beta)*sin(alpha) + 12*beta2d*ra^4*rb^4*cos(alpha)^8*cos(beta)^2 + \\
& 12*beta2d*ra^6*rb^2*cos(alpha)^8*cos(beta)^2 - 8*beta2d*ra^5*rb^3*cos(alpha)^8*cos(beta)^3 + \\
& ra*z^6*z2d*cos(alpha)*cos(beta) - 12*beta2d*ra^4*z^4*cos(alpha)^4*cos(beta)^2 - \\
& 12*beta2d*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - 6*ra^2*rb^5*z2d*cos(alpha)^7*cos(beta)^2 - \\
& 12*ra^4*rb^3*z2d*cos(alpha)^7*cos(beta)^2 + 12*ra^3*rb^4*z2d*cos(alpha)^7*cos(beta)^3 + \\
& 12*ra^5*rb^2*z2d*cos(alpha)^7*cos(beta)^3 - 8*ra^4*rb^3*z2d*cos(alpha)^7*cos(beta)^4 - \\
& 12*ra^3*z^4*z2d*cos(alpha)^3*cos(beta)^3 - 12*ra^5*z^2*z2d*cos(alpha)^5*cos(beta)^3 - \\
& 6*beta2d*ra^7*rb*cos(alpha)^8*cos(beta) - 2*beta2d*e2^2*ra^3*rb^3*cos(alpha)^8*cos(beta) + \\
& beta2d*e2^2*ra^2*rb^2*z^2*cos(alpha)^6 - 12*beta2d*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*beta2d*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 + 15*alpha2d*ra^3*z^5*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& 15*alpha2d*ra^5*z^3*cos(alpha)^4*cos(beta)*sin(alpha) + 4*beta2d*e2^2*ra^3*z^3*cos(alpha)^5*sin(beta) + \\
& 4*e2^2*ra^3*rb^2*z2d*cos(alpha)^7*cos(beta) - 3*e2^2*ra^4*rb*z2d*cos(alpha)^7*cos(beta)^2 + \\
& 3*e2^2*ra^3*z^2*z2d*cos(alpha)^5*cos(beta) + 12*beta2d*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 6*ra^2*rb^4*z2d*cos(alpha)^3*cos(beta)^2 + 18*ra^3*rb^2*z^2*z2d*cos(alpha)^5*cos(beta) - \\
& 36*ra^4*rb*z^2*z2d*cos(alpha)^5*cos(beta)^2 + 24*ra^4*rb*z^2*z2d*cos(alpha)^5*cos(beta)^4 + \\
& 6*ra^2*z^5*z2d*cos(alpha)^2*cos(beta)*sin(beta) + 20*ra^4*z^3*z2d*cos(alpha)^4*cos(beta)*sin(beta) + \\
& beta2d*e2^2*ra^2*rb^4*cos(alpha)^8*cos(beta)^2 + 5*beta2d*e2^2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - \\
& 2*beta2d*e2^2*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 - beta2d*e2^2*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - \\
& 5*beta2d*e2^2*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 12*alpha2d*ra^3*z^5*cos(alpha)^2*cos(beta)^3*sin(alpha) - \\
& 12*alpha2d*ra^5*z^3*cos(alpha)^4*cos(beta)^3*sin(alpha) - 3*e2^2*ra^2*rb^3*z2d*cos(alpha)^7*cos(beta)^2
\end{aligned}$$

$$\begin{aligned}
& + 2 * e^{2 * r_a^3 * r_b^2 * z^2} * \cos(\alpha)^7 * \cos(\beta)^3 - 8 * \beta^2 d^2 * r_a^5 * z^3 * \cos(\alpha)^5 * \cos(\beta)^2 * \sin(\beta) - \\
& 2 * e^{2 * r_a^3 * z^2} * z^2 d^2 * \cos(\alpha)^5 * \cos(\beta)^3 - 12 * r_a^2 * r_b^3 * z^2 * z^2 d^2 * \cos(\alpha)^5 * \cos(\beta)^2 - \\
& 8 * r_a^4 * z^3 * z^2 d^2 * \cos(\alpha)^4 * \cos(\beta)^3 * \sin(\beta) - 4 * \beta^2 d^2 * e^{2 * r_a^5 * r_b} * \cos(\alpha)^8 * \cos(\beta) - \\
& 6 * \beta^2 d^2 * r_a^3 * r_b * z^4 * \cos(\alpha)^4 * \cos(\beta) - 36 * \beta^2 d^2 * r_a^5 * r_b * z^2 * \cos(\alpha)^6 * \cos(\beta) + \\
& \alpha^2 d^2 * r_a^7 * z * \cos(\alpha)^6 * \cos(\beta) * \sin(\alpha) + 4 * \beta^2 d^2 * e^{2 * r_a^5 * z} * \cos(\alpha)^7 * \sin(\beta) + \\
& e^{2 * r_a * r_b^4 * z^2} * \cos(\alpha)^7 * \cos(\beta) + 6 * \beta^2 d^2 * r_a^3 * r_b^4 * z * \cos(\alpha)^7 * \sin(\beta) + \\
& 12 * \beta^2 d^2 * r_a^5 * r_b^2 * z * \cos(\alpha)^7 * \sin(\beta) - 3 * e^{2 * r_a^2 * r_b * z^2} * z^2 d^2 * \cos(\alpha)^5 + \\
& 3 * r_a * r_b^2 * z^4 * z^2 d^2 * \cos(\alpha)^3 * \cos(\beta) + 3 * r_a * r_b^4 * z^2 * z^2 d^2 * \cos(\alpha)^5 * \cos(\beta) + \\
& 6 * r_a^6 * z^2 * z^2 d^2 * \cos(\alpha)^6 * \cos(\beta) * \sin(\beta) - (2 * \beta^2 d^2 * e^{2 * r_a^4} * \cos(\alpha)^8 * (r_a^2 * \cos(\alpha))^2 + \\
& r_b^2 * \cos(\alpha)^2 + z^2 - 2 * r_a * r_b * \cos(\alpha)^2 * \cos(\beta) + \\
& 2 * r_a * z * \cos(\alpha) * \sin(\beta))^{(3/2)} / (\cos(\alpha)^2)^{(3/2)} + \\
& 20 * \alpha^2 d^2 * r_a^4 * z^4 * \cos(\alpha)^3 * \cos(\beta) * \sin(\alpha) * \sin(\beta) + \\
& 6 * \alpha^2 d^2 * r_a^6 * z^2 * \cos(\alpha)^5 * \cos(\beta) * \sin(\alpha) * \sin(\beta) + \\
& e^{2 * r_a^2 * r_b * z^2} * z^2 * z^2 d^2 * \cos(\alpha)^5 * \cos(\beta)^2 + e^{2 * r_a^2 * z^3} * z^2 d^2 * \cos(\alpha)^4 * \cos(\beta) * \sin(\beta) + \\
& 12 * r_a^2 * r_b^2 * z^3 * z^2 d^2 * \cos(\alpha)^4 * \cos(\beta) * \sin(\beta) - \\
& 24 * r_a^3 * r_b * z^3 * z^2 d^2 * \cos(\alpha)^4 * \cos(\beta)^2 * \sin(\beta) - \\
& 24 * r_a^3 * r_b^3 * z^2 * z^2 d^2 * \cos(\alpha)^6 * \cos(\beta)^2 * \sin(\beta) + \\
& 24 * r_a^4 * r_b^2 * z^2 * z^2 d^2 * \cos(\alpha)^6 * \cos(\beta)^3 * \sin(\beta) - \alpha^2 d^2 * e^{2 * r_a^4 * r_b} * z * \cos(\alpha)^6 * \sin(\alpha) + \\
& \alpha^2 d^2 * r_a * r_b^6 * z * \cos(\alpha)^6 * \cos(\beta) * \sin(\alpha) - 24 * \beta^2 d^2 * r_a^6 * r_b * z * \cos(\alpha)^7 * \cos(\beta) * \sin(\beta) - \\
& 2 * \alpha^2 d^2 * e^{2 * r_a^3 * z^3} * \cos(\alpha)^4 * \cos(\beta)^3 * \sin(\alpha) - \\
& 2 * \beta^2 d^2 * e^{2 * r_a^3 * z^3} * \cos(\alpha)^5 * \cos(\beta)^2 * \sin(\beta) - e^{2 * r_a * r_b * z^3} * z^2 d^2 * \cos(\alpha)^4 * \sin(\beta) - \\
& e^{2 * r_a * r_b^3 * z^2} * z^2 d^2 * \cos(\alpha)^6 * \sin(\beta) - 3 * e^{2 * r_a^3 * r_b * z^2} * z^2 d^2 * \cos(\alpha)^6 * \sin(\beta) - \\
& 12 * \alpha^2 d^2 * r_a^2 * r_b^3 * z^3 * \cos(\alpha)^4 * \cos(\beta)^2 * \sin(\alpha) - \\
& 8 * \alpha^2 d^2 * r_a^4 * z^4 * \cos(\alpha)^3 * \cos(\beta)^3 * \sin(\alpha) * \sin(\beta) + \\
& (2 * e^{2 * r_a^4 * r_b} * z^2 d^2 * \cos(\alpha)^7 * (r_a^2 * \cos(\alpha))^2 + r_b^2 * \cos(\alpha)^2 + z^2 - \\
& 2 * r_a * r_b * \cos(\alpha)^2 * \cos(\beta) + 2 * r_a * z * \cos(\alpha) * \sin(\beta))^{(1/2)} / \text{abs}(\cos(\alpha)) - \\
& 8 * \beta^2 d^2 * e^{2 * r_a^3 * r_b * z^2} * \cos(\alpha)^6 * \cos(\beta) + \alpha^2 d^2 * e^{2 * r_a^5 * z} * \cos(\alpha)^6 * \cos(\beta) * \sin(\alpha) \\
& - 3 * \alpha^2 d^2 * e^{2 * r_a^2 * r_b * z^3} * \cos(\alpha)^4 * \sin(\alpha) - \alpha^2 d^2 * e^{2 * r_a^2 * r_b^3 * z} * \cos(\alpha)^6 * \sin(\alpha) + \\
& 3 * \alpha^2 d^2 * r_a * r_b^2 * z^5 * \cos(\alpha)^2 * \cos(\beta) * \sin(\alpha) + \\
& 3 * \alpha^2 d^2 * r_a * r_b^4 * z^3 * \cos(\alpha)^4 * \cos(\beta) * \sin(\alpha) + \\
& 3 * \alpha^2 d^2 * r_a^3 * r_b^4 * z * \cos(\alpha)^6 * \cos(\beta) * \sin(\alpha) + \\
& 3 * \alpha^2 d^2 * r_a^5 * r_b^2 * z * \cos(\alpha)^6 * \cos(\beta) * \sin(\alpha) - \\
& 6 * \alpha^2 d^2 * r_a^6 * r_b * z * \cos(\alpha)^6 * \cos(\beta)^2 * \sin(\alpha) + 2 * \beta^2 d^2 * e^{2 * r_a^3 * r_b^2} * z * \cos(\alpha)^7 * \sin(\beta) \\
& - 24 * \beta^2 d^2 * r_a^4 * r_b * z^3 * \cos(\alpha)^5 * \cos(\beta) * \sin(\beta) - \\
& 24 * \beta^2 d^2 * r_a^4 * r_b^3 * z * \cos(\alpha)^7 * \cos(\beta) * \sin(\beta) + \\
& 6 * \alpha^2 d^2 * r_a^2 * z^6 * \cos(\alpha) * \cos(\beta) * \sin(\alpha) * \sin(\beta) + e^{2 * r_a * r_b^2} * z^2 * z^2 d^2 * \cos(\alpha)^5 * \cos(\beta) \\
& + 3 * e^{2 * r_a^4 * z^2} * z^2 d^2 * \cos(\alpha)^6 * \cos(\beta) * \sin(\beta) + 6 * r_a^2 * r_b^4 * z^2 * z^2 d^2 * \cos(\alpha)^6 * \cos(\beta) * \sin(\beta) \\
& + 12 * r_a^4 * r_b^2 * z^2 * z^2 d^2 * \cos(\alpha)^6 * \cos(\beta) * \sin(\beta) - 24 * r_a^5 * r_b * z^2 * z^2 d^2 * \cos(\alpha)^6 * \cos(\beta)^2 * \sin(\beta) \\
& - (2 * \beta^2 d^2 * e^{2 * r_a^2 * z^2} * \cos(\alpha)^6 * (r_a^2 * \cos(\alpha))^2 + r_b^2 * \cos(\alpha)^2 + z^2 - \\
& 2 * r_a * r_b * \cos(\alpha)^2 * \cos(\beta) + 2 * r_a * z * \cos(\alpha) * \sin(\beta))^{(3/2)} / (\cos(\alpha)^2)^{(3/2)} - \\
& (2 * e^{2 * r_a^5 * z^2} * z^2 d^2 * \cos(\alpha)^7 * \cos(\beta) * (r_a^2 * \cos(\alpha))^2 + r_b^2 * \cos(\alpha)^2 + z^2 - \\
& 2 * r_a * r_b * \cos(\alpha)^2 * \cos(\beta) + 2 * r_a * z * \cos(\alpha) * \sin(\beta))^{(1/2)} / \text{abs}(\cos(\alpha)) + \\
& (2 * e^{2 * r_a^2 * r_b^3} * z^2 d^2 * \cos(\alpha)^7 * (r_a^2 * \cos(\alpha))^2 + r_b^2 * \cos(\alpha)^2 + z^2 - \\
& 2 * r_a * r_b * \cos(\alpha)^2 * \cos(\beta) + 2 * r_a * z * \cos(\alpha) * \sin(\beta))^{(1/2)} / \text{abs}(\cos(\alpha)) + \\
& 6 * \beta^2 d^2 * e^{2 * r_a^3 * r_b * z^2} * \cos(\alpha)^6 * \cos(\beta)^3 + \\
& 3 * \alpha^2 d^2 * e^{2 * r_a^3 * z^3} * \cos(\alpha)^4 * \cos(\beta) * \sin(\alpha) - \\
& 6 * \alpha^2 d^2 * r_a^2 * r_b * z^5 * \cos(\alpha)^2 * \cos(\beta)^2 * \sin(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& 18*\alpha^2*d^*r^3*r^b^2*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 36*\alpha^2*d^*r^4*r^b*z^3*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\alpha^2*d^*r^2*r^b^5*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 24*\alpha^2*d^*r^4*r^b*z^3*\cos(\alpha)^4*\cos(\beta)^4*\sin(\alpha) - \\
& 12*\alpha^2*d^*r^4*r^b^3*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 12*\alpha^2*d^*r^3*r^b^4*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
& 12*\alpha^2*d^*r^5*r^b^2*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
& 8*\alpha^2*d^*r^4*r^b^3*z*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) + \\
& 24*\beta^2*d^*r^5*r^b^2*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
& \alpha^2*d^2*r^2*r^b^4*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& 10*\beta^2*d^2*r^4*r^b*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) + \\
& (6*e^2*r^2*r^b^3*z^2*d*\cos(\alpha)^7*\cos(\beta)^2*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) - \\
& (4*e^2*r^3*r^b^2*z^2*d*\cos(\alpha)^7*\cos(\beta)^3*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) + \\
& (4*e^2*r^3*z^2*z^2*d*\cos(\alpha)^5*\cos(\beta)^3*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) - \\
& \alpha^2*d^2*r^2*r^b*z^4*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& (4*\beta^2*d^2*r^3*r^b*\cos(\alpha)^8*\cos(\beta)*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(3/2))/(\cos(\alpha)^2)^(3/2) - \\
& 24*\alpha^2*d^*r^3*r^b^3*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 24*\alpha^2*d^*r^4*r^b^2*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& (4*\beta^2*d^2*r^3*z*\cos(\alpha)^7*\sin(\beta)*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(3/2))/(\cos(\alpha)^2)^(3/2) - \\
& (2*e^2*r^4*r^b^4*z^2*d*\cos(\alpha)^7*\cos(\beta)*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) + \\
& (6*e^2*r^2*r^b^2*z^2*z^2*d*\cos(\alpha)^5*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) + \\
& \alpha^2*d^2*r^2*r^b^2*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 4*\alpha^2*d^2*r^2*r^3*r^b^2*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& 3*\alpha^2*d^2*r^2*r^4*r^b*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\beta^2*d^2*r^2*r^2*r^b*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 2*\beta^2*d^2*r^2*r^2*r^b^3*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& \alpha^2*d^2*r^2*r^b^3*z^2*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 3*\alpha^2*d^2*r^2*r^3*r^b*z^2*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 5*e^2*r^2*r^2*r^b^2*z^2*d*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& 4*e^2*r^2*r^3*r^b*z^2*d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) - \\
& (8*e^2*r^3*r^b^2*z^2*d*\cos(\alpha)^7*\cos(\beta)*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) + \\
& (6*e^2*r^4*r^b^2*d*\cos(\alpha)^7*\cos(\beta)^2*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) - \\
& (6*e^2*r^3*z^2*z^2*d*\cos(\alpha)^5*\cos(\beta)*(r^2*\cos(\alpha)^2 + r^b^2*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha)^2*\cos(\beta) + 2*r^a*z*\cos(\alpha)*\sin(\beta))^(1/2))/\text{abs}(\cos(\alpha)) + \\
& \alpha^2*d^2*r^2*r^2*r^b*z^3*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 3*\alpha^2*d^2*r^2*r^2*r^b^3*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha^2*d^2*r^2*r^3*r^b^2*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
& 6*\beta^2*d^2*r^2*r^3*r^b^2*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (2*alpha2d*e2*ra^2*rb*z*cos(alpha)^8*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (10*alpha2d*e2*ra^3*rb^2*z*cos(alpha)^8*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 \\
& - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (2*alpha2d*e2*ra^4*rb*z*cos(alpha)^8*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (8*alpha2d*e2*ra^4*rb*z*cos(alpha)^8*cos(beta)^4*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (6*alpha2d*e2*ra^3*rb*z^2*cos(alpha)^7*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (10*e2*ra^2*rb^2*z^2d*cos(alpha)^6*cos(beta)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (8*e2*ra^3*rb*z^2d*cos(alpha)^6*cos(beta)^2*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^2*rb^2*z^2*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) \\
& + (2*alpha2d*e2*ra^3*rb*z^2*cos(alpha)^7*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)))/(ra^6*cos(alpha)^8 + rb^6*cos(alpha)^8 + \\
& z^6*cos(alpha)^2 + 3*ra^2*rb^4*cos(alpha)^8 + 3*ra^4*rb^2*cos(alpha)^8 + 15*ra^2*z^4*cos(alpha)^4 + \\
& 15*ra^4*z^2*cos(alpha)^6 + 3*rb^2*z^4*cos(alpha)^4 + 3*rb^4*z^2*cos(alpha)^6 + \\
& 18*ra^2*rb^2*z^2*cos(alpha)^6 + 20*ra^3*z^3*cos(alpha)^5*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^8*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 - 12*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - \\
& 12*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 6*ra*rb^5*cos(alpha)^8*cos(beta) - 6*ra^5*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra*z^5*cos(alpha)^3*sin(beta) + 6*ra^5*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 6*ra*rb*z^4*cos(alpha)^4*cos(beta) + 6*ra*rb^4*z*cos(alpha)^7*sin(beta) - \\
& 8*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^6*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^5*sin(beta) + \\
& 12*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 24*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - 24*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 24*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
& YM2232=(beta2d*ra^4*cos(alpha)^4 - beta2d*ra^4*cos(alpha)^6 - ra^2*rb*z2d*cos(alpha)^3 + \\
& ra^2*rb*z2d*cos(alpha)^5 + beta2d*ra^2*z^2*cos(alpha)^2 - beta2d*ra^2*z^2*cos(alpha)^4 + \\
& ra^3*z2d*cos(alpha)^3*cos(beta) - ra^3*z2d*cos(alpha)^5*cos(beta) + 2*beta2d*ra^3*z*cos(alpha)^3*sin(beta) \\
& - 2*beta2d*ra^3*z*cos(alpha)^5*sin(beta) + ra*rb^2*z2d*cos(alpha)^3*cos(beta) - \\
& ra*rb^2*z2d*cos(alpha)^5*cos(beta) - ra^2*rb*z2d*cos(alpha)^3*cos(beta)^2 + \\
& ra^2*rb*z2d*cos(alpha)^5*cos(beta)^2 + beta2d*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 - \\
& beta2d*ra^2*rb^2*cos(alpha)^6*cos(beta)^2 - beta2d*ra^2*z^2*cos(alpha)^2*cos(beta)^2 + \\
& beta2d*ra^2*z^2*cos(alpha)^4*cos(beta)^2 - 2*beta2d*ra^3*rb*cos(alpha)^4*cos(beta) + \\
& 2*beta2d*ra^3*rb*cos(alpha)^6*cos(beta) + alpha2d*ra^4*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& alpha2d*ra^3*z*cos(alpha)^4*cos(beta)^3*sin(alpha) - ra*rb*z^2d*cos(alpha)^2*sin(beta) + \\
& ra*rb*z^2d*cos(alpha)^4*sin(beta) - alpha2d*ra^2*rb*z*cos(alpha)^2*sin(alpha) - \\
& alpha2d*ra^2*rb*z*cos(alpha)^4*sin(alpha) + alpha2d*ra^3*z*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& alpha2d*ra^3*z*cos(alpha)^4*cos(beta)*sin(alpha) - alpha2d*ra^3*rb*cos(alpha)^5*sin(alpha)*sin(beta) + \\
& ra^2*z^2d*cos(alpha)^2*cos(beta)*sin(beta) - ra^2*z^2d*cos(alpha)^4*cos(beta)*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) - 2 \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) + \\
& 2 \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) \\
& + \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) + \\
& \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha) \cos(\beta) \sin(\alpha) \sin(\beta) - \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) \\
& + \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\alpha) \sin(\beta) / (r^4 \cos(\alpha)^4 - r^4 \cos(\alpha)^6 + \\
& r^4 \cos(\alpha)^4 - z^4 \cos(\alpha)^2 + z^4 + 2 r^2 r^2 z^2 \cos(\alpha)^4 - r^2 r^2 z^2 \cos(\alpha)^6 + \\
& 6 r^2 r^2 z^2 \cos(\alpha)^2 - 6 r^2 r^2 z^2 \cos(\alpha)^4 + 2 r^2 r^2 z^2 \cos(\alpha)^2 - r^2 r^2 z^2 \cos(\alpha)^4 + \\
& r^4 \cos(\alpha)^6 \cos(\beta)^2 + 4 r^2 r^2 z^3 \cos(\alpha) \sin(\beta) + 4 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& r^2 r^2 z^2 \cos(\alpha)^6 \cos(\beta)^2 - 4 r^2 r^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 5 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 - 4 r^2 r^2 z^3 \cos(\alpha)^4 \cos(\beta) - 4 r^2 r^2 z^3 \cos(\alpha)^4 \cos(\beta) + \\
& 2 r^2 r^2 z^3 \cos(\alpha)^6 \cos(\beta) - 4 r^2 r^2 z^3 \cos(\alpha)^3 \sin(\beta) + 4 r^2 r^2 z^3 \cos(\alpha)^3 \sin(\beta) - \\
& 4 r^2 r^2 z^3 \cos(\alpha)^5 \sin(\beta) - 2 r^2 r^2 z^3 \cos(\alpha)^6 \cos(\beta)^3 - 4 r^2 r^2 z^2 \cos(\alpha)^2 \cos(\beta) + \\
& 2 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta) + 4 r^2 r^2 z^2 \cos(\alpha)^3 \sin(\beta) - 2 r^2 r^2 z^2 \cos(\alpha)^5 \sin(\beta) \\
& + 2 r^2 r^2 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - 8 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) + \\
& 4 r^2 r^2 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta)); \\
\text{YM2233} = & -(r^3 \cos(\alpha)^3 (r - r \cos(\beta)) (r^2 r^2 z^2 \cos(\alpha)^4 - 2 \alpha^2 d^2 r^2 r^2 z^3 \sin(2 \alpha) - \\
& \beta^2 d^2 r^2 r^2 z^3 \cos(\alpha)^5 - \alpha^2 d^2 r^2 r^2 z^4 \sin(\alpha) \sin(\beta) + \beta^2 d^2 r^2 r^2 z^4 \cos(\alpha)^5 \cos(\beta) - \\
& r^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta) + r^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^2 - \\
& 4 \alpha^2 d^2 r^2 r^2 z^3 \cos(\alpha)^3 \sin(\alpha) - 2 r^2 r^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta) + \\
& r^2 z^2 z^2 d^2 \cos(\alpha)^3 \sin(\beta) + 2 \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^5 \cos(\beta) - \\
& \beta^2 d^2 r^2 r^2 z^3 \cos(\alpha)^5 \cos(\beta)^2 - 2 \beta^2 d^2 r^2 r^2 z^3 \cos(\alpha)^5 \cos(\beta)^2 + \\
& \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta) - \alpha^2 d^2 r^2 r^2 z^4 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) + \\
& 2 r^2 r^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^2 - r^2 r^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^3 - \\
& \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 + \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^5 \cos(\beta)^3 - \\
& \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta)^3 + 4 \alpha^2 d^2 r^2 r^2 z^3 \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) - \\
& \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) + r^2 z^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) + \\
& \alpha^2 d^2 r^2 r^2 z^3 \cos(\alpha) \cos(\beta) \sin(\alpha) - \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \sin(\alpha) - \\
& 2 \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \sin(\beta) + 6 \alpha^2 d^2 r^2 r^2 z^2 \sin(\alpha) \sin(\beta) (\sin(\alpha)^2 - 1) + \\
& \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta)^2 + 3 \alpha^2 d^2 r^2 r^2 z^3 \cos(\alpha) \cos(\beta)^2 \sin(\alpha) + \\
& 2 \beta^2 d^2 r^2 r^2 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\beta) + 5 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\alpha) + \\
& 2 \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - \\
& 2 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) \sin(\beta) + \\
& 3 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) \sin(\beta) + \\
& \alpha^2 d^2 r^2 r^2 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 3 \alpha^2 d^2 r^2 r^2 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) - \\
& 5 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^3 \cos(\beta)^3 \sin(\alpha) - \\
& 2 \beta^2 d^2 r^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\beta) - 2 r^2 r^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) + \\
& 3 \alpha^2 d^2 r^2 r^2 z^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) \sin(\beta) / (r^6 \cos(\alpha)^6 - r^6 \cos(\alpha)^8 + \\
& r^6 \cos(\alpha)^6 - z^6 \cos(\alpha)^2 + z^6 + 3 r^2 r^2 z^4 \cos(\alpha)^6 + 3 r^2 r^2 z^4 \cos(\alpha)^6 - \\
& r^2 r^2 z^4 \cos(\alpha)^8 - 2 r^2 r^2 z^4 \cos(\alpha)^8 + 15 r^2 r^2 z^4 \cos(\alpha)^2 - 15 r^2 r^2 z^4 \cos(\alpha)^4 + \\
& 15 r^2 r^2 z^4 \cos(\alpha)^4 - 15 r^2 r^2 z^4 \cos(\alpha)^6 + 3 r^2 r^2 z^4 \cos(\alpha)^2 - \\
& 2 r^2 r^2 z^4 \cos(\alpha)^4 + 3 r^2 r^2 z^4 \cos(\alpha)^4 - r^2 r^2 z^4 \cos(\alpha)^6 + \\
& r^2 r^2 z^4 \cos(\alpha)^8 \cos(\beta)^2 + 18 r^2 r^2 z^2 \cos(\alpha)^4 - 12 r^2 r^2 z^2 \cos(\alpha)^6 + \\
& 20 r^2 r^2 z^3 \cos(\alpha)^3 \sin(\beta) - 20 r^2 r^2 z^3 \cos(\alpha)^5 \sin(\beta) + 6 r^2 r^2 z^5 \cos(\alpha) \sin(\beta) + \\
& 12 r^2 r^2 z^4 \cos(\alpha)^6 \cos(\beta)^2 + 12 r^2 r^2 z^4 \cos(\alpha)^6 \cos(\beta)^2 -
\end{aligned}$$

$$\begin{aligned}
& 8*ra^3*rb^3*cos(alpha)^6*cos(beta)^3 + ra^2*rb^4*cos(alpha)^8*cos(beta)^2 - \\
& 2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - 4*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 + \\
& 4*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 + \\
& 13*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 + \\
& 18*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 4*ra^4*z^2*cos(alpha)^6*cos(beta)^4 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 4*ra^5*rb*cos(alpha)^8*cos(beta) - \\
& 6*ra*z^5*cos(alpha)^3*sin(beta) + 6*ra^5*z*cos(alpha)^5*sin(beta) - 6*ra^5*z*cos(alpha)^7*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) + 4*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& + 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 2*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) + \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) - \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) - \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta);
\end{aligned}$$

YM2234=0;

YM22=[YM2211 YM2212 YM2213 YM2214 ;YM2221 YM2222 YM2223 YM2224 ;YM2231 YM2232
YM2233 YM2234];

YC2211=0;

$$\begin{aligned}
& YC2212=(cos(alpha)*(rb - ra*cos(beta))*(2*alpha1d^2*rb^3*z*cos(alpha) + 2*rb*z*z1d^2*cos(alpha)^3 - \\
& 2*alpha1d^2*rb^3*z*cos(alpha)^3 - 2*rb*z*z1d^2*cos(alpha) - 6*alpha1d^2*ra^2*rb*z*cos(alpha)^3 + \\
& 4*alpha1d^2*ra^2*rb*z*cos(alpha)^5 + 2*alpha1d*rb^3*z1d*cos(alpha)^2*sin(alpha) + \\
& 2*beta1d*ra^3*z1d*cos(alpha)^3*sin(beta) - 2*beta1d*ra^3*z1d*cos(alpha)^5*sin(beta) - \\
& 2*ra*z*z1d^2*cos(alpha)^3*cos(beta) - 2*ra*rb*z1d^2*cos(alpha)^2*sin(beta) + \\
& 2*ra*rb*z1d^2*cos(alpha)^4*sin(beta) + 6*alpha1d^2*ra^3*z*cos(alpha)^3*cos(beta) - \\
& 4*alpha1d^2*ra^3*z*cos(alpha)^5*cos(beta) + beta1d^2*ra^3*z*cos(alpha)^3*cos(beta) + \\
& beta1d^2*ra^3*z*cos(alpha)^3*cos(beta) - beta1d^2*ra^3*z*cos(alpha)^5*cos(beta) - \\
& 2*alpha1d*rb*z^2*z1d*sin(alpha) - alpha1d^2*ra*rb^3*cos(alpha)^4*sin(beta) - \\
& alpha1d^2*ra^3*rb*cos(alpha)^4*sin(beta) + alpha1d^2*ra*rb^3*cos(alpha)^6*sin(beta) + \\
& alpha1d^2*ra^3*rb*cos(alpha)^6*sin(beta) - beta1d^2*ra*rb^3*cos(alpha)^4*sin(beta) + \\
& beta1d^2*ra^3*rb*cos(alpha)^4*sin(beta) + beta1d^2*ra*rb^3*cos(alpha)^6*sin(beta) - \\
& beta1d^2*ra^3*rb*cos(alpha)^6*sin(beta) - 2*alpha1d^2*ra^2*z^2*cos(beta)*sin(beta) + \\
& 2*alpha1d^2*ra^2*rb*z*cos(alpha) + 4*beta1d*ra^2*z*z1d*cos(alpha)^2 - 4*beta1d*ra^2*z*z1d*cos(alpha)^4 + \\
& 2*ra*z*z1d^2*cos(alpha)*cos(beta) + alpha1d^2*ra^4*cos(alpha)^4*cos(beta)*sin(beta) - \\
& alpha1d^2*ra^4*cos(alpha)^6*cos(beta)*sin(beta) + 2*alpha1d^2*ra*rb*z^2*sin(beta) - \\
& 4*alpha1d^2*ra^3*z*cos(alpha)^3*cos(beta)^3 + 4*alpha1d^2*ra^3*z*cos(alpha)^5*cos(beta)^3 + \\
& 2*ra^2*z1d^2*cos(alpha)^2*cos(beta)*sin(beta) - 2*ra^2*z1d^2*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra^3*z*cos(alpha)*cos(beta) - beta1d^2*ra^z^3*cos(alpha)*cos(beta) - \\
& 2*alpha1d*beta1d*ra^4*cos(alpha)^5*cos(beta)^2*sin(alpha) + 2*alpha1d*beta1d*ra^z^3*sin(alpha)*sin(beta) + \\
& 2*alpha1d*ra^z^2*z1d*cos(beta)*sin(alpha) + 2*beta1d*ra^z^2*z1d*cos(alpha)*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 4*\alpha_1d^{\wedge}2*ra^{\wedge}2*rb*z*\cos(\alpha)^{\wedge}5*\cos(\beta)^{\wedge}2 - 2*\alpha_1d*ra^{\wedge}3*z1d*\cos(\alpha)^{\wedge}4*\cos(\beta)^{\wedge}3*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^{\wedge}2*z^{\wedge}2*\cos(\alpha)*\sin(\alpha) - 6*\alpha_1d^{\wedge}2*ra*rb^{\wedge}2*z*\cos(\alpha)*\cos(\beta) + \\
& 2*\alpha_1d*ra^{\wedge}2*rb*z1d*\cos(\alpha)^{\wedge}2*\sin(\alpha) - 2*\alpha_1d*ra^{\wedge}2*rb*z1d*\cos(\alpha)^{\wedge}4*\sin(\alpha) - \\
& 2*\beta_1d*ra*rb^{\wedge}2*z1d*\cos(\alpha)^{\wedge}3*\sin(\beta) + 2*\beta_1d*ra*rb^{\wedge}2*z1d*\cos(\alpha)^{\wedge}5*\sin(\beta) + \\
& 2*\alpha_1d*rb*z^{\wedge}2*z1d*\cos(\alpha)^{\wedge}2*\sin(\alpha) - 2*\beta_1d*ra*z^{\wedge}2*z1d*\cos(\alpha)^{\wedge}3*\sin(\beta) + \\
& 3*\alpha_1d^{\wedge}2*ra^{\wedge}2*rb^{\wedge}2*\cos(\alpha)^{\wedge}4*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d^{\wedge}2*ra^{\wedge}3*rb*\cos(\alpha)^{\wedge}4*\cos(\beta)^{\wedge}2*\sin(\beta) - \\
& 3*\alpha_1d^{\wedge}2*ra^{\wedge}2*rb^{\wedge}2*\cos(\alpha)^{\wedge}6*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d^{\wedge}2*ra^{\wedge}3*rb*\cos(\alpha)^{\wedge}6*\cos(\beta)^{\wedge}2*\sin(\beta) + \\
& 5*\alpha_1d^{\wedge}2*ra^{\wedge}2*z^{\wedge}2*\cos(\alpha)^{\wedge}2*\cos(\beta)*\sin(\beta) - \\
& 3*\alpha_1d^{\wedge}2*ra^{\wedge}2*z^{\wedge}2*\cos(\alpha)^{\wedge}4*\cos(\beta)*\sin(\beta) - 2*\alpha_1d*\beta_1d*ra^{\wedge}2*rb^{\wedge}2*\cos(\alpha)^{\wedge}5*\sin(\alpha) \\
& - 4*\alpha_1d*\beta_1d*ra^{\wedge}2*z^{\wedge}2*\cos(\alpha)^{\wedge}3*\sin(\alpha) + 4*\alpha_1d^{\wedge}2*ra^{\wedge}2*rb*z*\cos(\alpha)*\cos(\beta)^{\wedge}2 + \\
& 6*\alpha_1d^{\wedge}2*ra*rb^{\wedge}2*z*\cos(\alpha)^{\wedge}3*\cos(\beta) - \beta_1d^{\wedge}2*ra*rb^{\wedge}2*z*\cos(\alpha)^{\wedge}3*\cos(\beta) + \\
& \beta_1d^{\wedge}2*ra*rb^{\wedge}2*z*\cos(\alpha)^{\wedge}5*\cos(\beta) - 2*\alpha_1d*ra^{\wedge}3*z1d*\cos(\alpha)^{\wedge}2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d*ra^{\wedge}3*z1d*\cos(\alpha)^{\wedge}4*\cos(\beta)*\sin(\alpha) - 5*\alpha_1d^{\wedge}2*ra*rb*z^{\wedge}2*\cos(\alpha)^{\wedge}2*\sin(\beta) + \\
& 3*\alpha_1d^{\wedge}2*ra*rb*z^{\wedge}2*\cos(\alpha)^{\wedge}4*\sin(\beta) - \beta_1d^{\wedge}2*ra*rb*z^{\wedge}2*\cos(\alpha)^{\wedge}2*\sin(\beta) + \\
& \beta_1d^{\wedge}2*ra*rb*z^{\wedge}2*\cos(\alpha)^{\wedge}4*\sin(\beta) + 2*\alpha_1d*\beta_1d*ra*rb^{\wedge}3*\cos(\alpha)^{\wedge}5*\cos(\beta)*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^{\wedge}3*rb*\cos(\alpha)^{\wedge}5*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra*z^{\wedge}3*\cos(\alpha)^{\wedge}2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^{\wedge}3*z*\cos(\alpha)^{\wedge}2*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^{\wedge}3*z*\cos(\alpha)^{\wedge}4*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*ra*rb^{\wedge}2*z1d*\cos(\alpha)^{\wedge}2*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*ra*z^{\wedge}2*z1d*\cos(\alpha)^{\wedge}2*\cos(\beta)*\sin(\alpha) - 4*\beta_1d*ra*rb*z^{\wedge}2*z1d*\cos(\alpha)^{\wedge}2*\cos(\beta) + \\
& 4*\beta_1d*ra*rb*z^{\wedge}2*z1d*\cos(\alpha)^{\wedge}4*\cos(\beta) + 2*\alpha_1d*\beta_1d*ra^{\wedge}3*rb*\cos(\alpha)^{\wedge}5*\cos(\beta)^{\wedge}3*\sin(\alpha) \\
& + 4*\alpha_1d*ra^{\wedge}2*rb*z1d*\cos(\alpha)^{\wedge}2*\cos(\beta)^{\wedge}2*\sin(\alpha) + \\
& 2*\alpha_1d*ra^{\wedge}2*rb*z1d*\cos(\alpha)^{\wedge}4*\cos(\beta)^{\wedge}2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra^{\wedge}2*rb^{\wedge}2*\cos(\alpha)^{\wedge}5*\cos(\beta)^{\wedge}2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra*rb*z^{\wedge}2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^{\wedge}3*z*\cos(\alpha)^{\wedge}4*\cos(\beta)^{\wedge}2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra*rb*z^{\wedge}2*\cos(\alpha)^{\wedge}3*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra*rb^{\wedge}2*z*\cos(\alpha)^{\wedge}2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^{\wedge}2*rb*z*\cos(\alpha)^{\wedge}4*\cos(\beta)*\sin(\alpha)*\sin(\beta)))/(ra^{\wedge}6*\cos(\alpha)^{\wedge}6 - \\
& ra^{\wedge}6*\cos(\alpha)^{\wedge}8 + rb^{\wedge}6*\cos(\alpha)^{\wedge}6 - z^{\wedge}6*\cos(\alpha)^{\wedge}2 + z^{\wedge}6 + 3*ra^{\wedge}2*rb^{\wedge}4*\cos(\alpha)^{\wedge}6 + \\
& 3*ra^{\wedge}4*rb^{\wedge}2*\cos(\alpha)^{\wedge}6 - ra^{\wedge}2*rb^{\wedge}4*\cos(\alpha)^{\wedge}8 - 2*ra^{\wedge}4*rb^{\wedge}2*\cos(\alpha)^{\wedge}8 + 15*ra^{\wedge}2*z^{\wedge}4*\cos(\alpha)^{\wedge}2 - \\
& 15*ra^{\wedge}2*z^{\wedge}4*\cos(\alpha)^{\wedge}4 + 15*ra^{\wedge}4*z^{\wedge}2*\cos(\alpha)^{\wedge}4 - 15*ra^{\wedge}4*z^{\wedge}2*\cos(\alpha)^{\wedge}6 + \\
& 3*rb^{\wedge}2*z^{\wedge}4*\cos(\alpha)^{\wedge}2 - 2*rb^{\wedge}2*z^{\wedge}4*\cos(\alpha)^{\wedge}4 + 3*rb^{\wedge}4*z^{\wedge}2*\cos(\alpha)^{\wedge}4 - rb^{\wedge}4*z^{\wedge}2*\cos(\alpha)^{\wedge}6 + \\
& ra^{\wedge}6*\cos(\alpha)^{\wedge}8*\cos(\beta)^{\wedge}2 + 18*ra^{\wedge}2*rb^{\wedge}2*z^{\wedge}2*\cos(\alpha)^{\wedge}4 - 12*ra^{\wedge}2*rb^{\wedge}2*z^{\wedge}2*\cos(\alpha)^{\wedge}6 + \\
& 20*ra^{\wedge}3*z^{\wedge}3*\cos(\alpha)^{\wedge}3*\sin(\beta) - 20*ra^{\wedge}3*z^{\wedge}3*\cos(\alpha)^{\wedge}5*\sin(\beta) + 6*ra*z^{\wedge}5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^{\wedge}2*rb^{\wedge}4*\cos(\alpha)^{\wedge}6*\cos(\beta)^{\wedge}2 + 12*ra^{\wedge}4*rb^{\wedge}2*\cos(\alpha)^{\wedge}6*\cos(\beta)^{\wedge}2 - \\
& 8*ra^{\wedge}3*rb^{\wedge}3*\cos(\alpha)^{\wedge}6*\cos(\beta)^{\wedge}3 + ra^{\wedge}2*rb^{\wedge}4*\cos(\alpha)^{\wedge}8*\cos(\beta)^{\wedge}2 - \\
& 2*ra^{\wedge}4*rb^{\wedge}2*\cos(\alpha)^{\wedge}8*\cos(\beta)^{\wedge}2 - 4*ra^{\wedge}3*rb^{\wedge}3*\cos(\alpha)^{\wedge}8*\cos(\beta)^{\wedge}3 + \\
& 4*ra^{\wedge}4*rb^{\wedge}2*\cos(\alpha)^{\wedge}8*\cos(\beta)^{\wedge}4 - 12*ra^{\wedge}2*z^{\wedge}4*\cos(\alpha)^{\wedge}2*\cos(\beta)^{\wedge}2 + \\
& 13*ra^{\wedge}2*z^{\wedge}4*\cos(\alpha)^{\wedge}4*\cos(\beta)^{\wedge}2 - 12*ra^{\wedge}4*z^{\wedge}2*\cos(\alpha)^{\wedge}4*\cos(\beta)^{\wedge}2 + \\
& 18*ra^{\wedge}4*z^{\wedge}2*\cos(\alpha)^{\wedge}6*\cos(\beta)^{\wedge}2 - 4*ra^{\wedge}4*z^{\wedge}2*\cos(\alpha)^{\wedge}6*\cos(\beta)^{\wedge}4 - \\
& 6*ra*rb^{\wedge}5*\cos(\alpha)^{\wedge}6*\cos(\beta) - 6*ra^{\wedge}5*rb*\cos(\alpha)^{\wedge}6*\cos(\beta) + 4*ra^{\wedge}5*rb*\cos(\alpha)^{\wedge}8*\cos(\beta) - \\
& 6*ra*z^{\wedge}5*\cos(\alpha)^{\wedge}3*\sin(\beta) + 6*ra^{\wedge}5*z*\cos(\alpha)^{\wedge}5*\sin(\beta) - 6*ra^{\wedge}5*z*\cos(\alpha)^{\wedge}7*\sin(\beta) - \\
& 12*ra^{\wedge}3*rb^{\wedge}3*\cos(\alpha)^{\wedge}6*\cos(\beta) + 4*ra^{\wedge}3*rb^{\wedge}3*\cos(\alpha)^{\wedge}8*\cos(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& + 6*ra*rb^4*z*cos(alpha)^5*sin(beta) - 2*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 - 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) + \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) + 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) - \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) + 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) - \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) + 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) + 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) + 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
YC2213=& (cos(alpha)^4*(rb - ra*cos(beta))^3*(2*alpha1d^2*ra*z^3*cos(beta) - 2*alpha1d^2*rb*z^3 - \\
& 2*rb*z*z1d^2*cos(alpha)^2 + 2*alpha1d^2*rb*z^3*cos(alpha)^2 - 2*alpha1d^2*ra^2*rb*z*cos(alpha)^4 + \\
& 2*beta1d*ra^3*z1d*cos(alpha)^4*sin(beta) + 2*ra*z*z1d^2*cos(alpha)^2*cos(beta) - \\
& 2*ra*rb*z1d^2*cos(alpha)^3*sin(beta) - 2*alpha1d^2*ra*z^3*cos(alpha)^2*cos(beta) + \\
& 2*alpha1d^2*ra^3*z*cos(alpha)^4*cos(beta) - beta1d^2*ra*z^3*cos(alpha)^2*cos(beta) + \\
& beta1d^2*ra^3*z*cos(alpha)^4*cos(beta) - alpha1d^2*ra*rb^3*cos(alpha)^5*sin(beta) - \\
& alpha1d^2*ra^3*rb*cos(alpha)^5*sin(beta) - beta1d^2*ra*rb^3*cos(alpha)^5*sin(beta) + \\
& beta1d^2*ra^3*rb*cos(alpha)^5*sin(beta) + 10*alpha1d*beta1d*ra^2*z^2*(sin(alpha) - sin(alpha)^3) + \\
& 4*beta1d*ra^2*z*z1d*cos(alpha)^3 + alpha1d^2*ra^4*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra^3*z*cos(alpha)^4*cos(beta)^3 - 2*alpha1d*rb*z^2*z1d*sin(2*alpha) + \\
& 2*ra^2*z1d^2*cos(alpha)^3*cos(beta)*sin(beta) + 2*alpha1d*beta1d*ra^4*cos(alpha)^4*sin(alpha) + \\
& 2*alpha1d^2*ra^2*rb*z*cos(alpha)^4*cos(beta)^2 + 2*alpha1d^2*ra^2*z^2*cos(alpha)*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra*rb*z^2*cos(alpha)*sin(beta) - 2*beta1d*ra*rb^2*z1d*cos(alpha)^4*sin(beta) + \\
& 2*beta1d*ra*z^2*z1d*cos(alpha)^2*sin(beta) + 3*alpha1d^2*ra^2*rb^2*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 2*alpha1d^2*ra^3*rb*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& alpha1d^2*ra^2*z^2*cos(alpha)^3*cos(beta)*sin(beta) + 2*alpha1d*beta1d*ra^2*rb^2*cos(alpha)^4*sin(alpha) \\
& - beta1d^2*ra*rb^2*z*cos(alpha)^4*cos(beta) + alpha1d^2*ra*rb*z^2*cos(alpha)^3*sin(beta) - \\
& beta1d^2*ra*rb*z^2*cos(alpha)^3*sin(beta) - 2*alpha1d*beta1d*ra*rb^3*cos(alpha)^4*cos(beta)*sin(alpha) - \\
& 6*alpha1d*beta1d*ra^3*rb*cos(alpha)^4*cos(beta)*sin(alpha) + \\
& 8*alpha1d*beta1d*ra^3*z*cos(alpha)^3*sin(alpha)*sin(beta) - 4*beta1d*ra*rb*z*z1d*cos(alpha)^3*cos(beta) + \\
& 4*alpha1d*beta1d*ra*z^3*cos(alpha)*sin(alpha)*sin(beta) + \\
& 4*alpha1d*beta1d*ra^2*rb^2*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& 4*alpha1d*ra*z^2*z1d*cos(alpha)*cos(beta)*sin(alpha) - \\
& 4*alpha1d*beta1d*ra^2*z^2*cos(alpha)^2*cos(beta)^2*sin(alpha) + \\
& 4*alpha1d*ra^2*z*z1d*cos(alpha)^2*cos(beta)*sin(alpha)*sin(beta) - \\
& 6*alpha1d*beta1d*ra*rb*z^2*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& 4*alpha1d*ra*rb*z*z1d*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) - \\
& 8*alpha1d*beta1d*ra^2*rb*z*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta))/(ra^8*cos(alpha)^8 - \\
& ra^8*cos(alpha)^10 + rb^8*cos(alpha)^8 - z^8*cos(alpha)^2 + z^8 + 4*ra^2*rb^6*cos(alpha)^8 + \\
& 6*ra^4*rb^4*cos(alpha)^8 + 4*ra^6*rb^2*cos(alpha)^8 - ra^2*rb^6*cos(alpha)^10 - \\
& 3*ra^4*rb^4*cos(alpha)^10 - 3*ra^6*rb^2*cos(alpha)^10 + 28*ra^2*z^6*cos(alpha)^2 - \\
& 28*ra^2*z^6*cos(alpha)^4 + 70*ra^4*z^4*cos(alpha)^4 - 70*ra^4*z^4*cos(alpha)^6 + \\
& 28*ra^6*z^2*cos(alpha)^6 - 28*ra^6*z^2*cos(alpha)^8 + 4*rb^2*z^6*cos(alpha)^2 - 3*rb^2*z^6*cos(alpha)^4
\end{aligned}$$

$$\begin{aligned}
& + 6*rb^4*z^4*cos(alpha)^4 - 3*rb^4*z^4*cos(alpha)^6 + 4*rb^6*z^2*cos(alpha)^6 - rb^6*z^2*cos(alpha)^8 + \\
& ra^8*cos(alpha)^10*cos(beta)^2 + 60*ra^2*rb^2*z^4*cos(alpha)^4 - 45*ra^2*rb^2*z^4*cos(alpha)^6 + \\
& 36*ra^2*rb^4*z^2*cos(alpha)^6 + 60*ra^4*rb^2*z^2*cos(alpha)^6 - 18*ra^2*rb^4*z^2*cos(alpha)^8 - \\
& 45*ra^4*rb^2*z^2*cos(alpha)^8 + 56*ra^3*z^5*cos(alpha)^3*sin(beta) - 56*ra^3*z^5*cos(alpha)^5*sin(beta) + \\
& 56*ra^5*z^3*cos(alpha)^5*sin(beta) - 56*ra^5*z^3*cos(alpha)^7*sin(beta) + 8*ra*z^7*cos(alpha)*sin(beta) + \\
& 24*ra^2*rb^6*cos(alpha)^8*cos(beta)^2 + 48*ra^4*rb^4*cos(alpha)^8*cos(beta)^2 + \\
& 24*ra^6*rb^2*cos(alpha)^8*cos(beta)^2 - 32*ra^3*rb^5*cos(alpha)^8*cos(beta)^3 - \\
& 32*ra^5*rb^3*cos(alpha)^8*cos(beta)^3 + ra^2*rb^6*cos(alpha)^10*cos(beta)^2 + \\
& 16*ra^4*rb^4*cos(alpha)^8*cos(beta)^4 - 9*ra^4*rb^4*cos(alpha)^10*cos(beta)^2 - \\
& 9*ra^6*rb^2*cos(alpha)^10*cos(beta)^2 - 6*ra^3*rb^5*cos(alpha)^10*cos(beta)^3 - \\
& 4*ra^5*rb^3*cos(alpha)^10*cos(beta)^3 + 12*ra^4*rb^4*cos(alpha)^10*cos(beta)^4 + \\
& 12*ra^6*rb^2*cos(alpha)^10*cos(beta)^4 - 8*ra^5*rb^3*cos(alpha)^10*cos(beta)^5 - \\
& 24*ra^2*z^6*cos(alpha)^2*cos(beta)^2 + 25*ra^2*z^6*cos(alpha)^4*cos(beta)^2 - \\
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) - 8*ra*z^7*cos(alpha)^3*sin(beta) + 8*ra^7*z*cos(alpha)^7*sin(beta) - \\
& 8*ra^7*z*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb*z^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb*z^6*cos(alpha)^4*cos(beta) + 8*ra*rb^6*z*cos(alpha)^7*sin(beta) - 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 - \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) + 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb*z^2*cos(alpha)^8*cos(beta) + 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) - \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) + 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) - \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) + 24*ra^3*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) - \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 + \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) - 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) - 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) + 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) + \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) - 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) -
\end{aligned}$$

$$\begin{aligned}
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 64*ra^4*rb^z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 96*ra^3*rb^4*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 96*ra^5*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - 72*ra^4*rb^z^3*cos(alpha)^7*cos(beta)^3*sin(beta) - \\
& 64*ra^4*rb^3*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) - 18*ra^3*rb^4*z^3*cos(alpha)^9*cos(beta)^2*sin(beta) - \\
& 36*ra^5*rb^2*z^3*cos(alpha)^9*cos(beta)^2*sin(beta) - 8*ra^4*rb^3*z^3*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 24*ra^5*rb^2*z^3*cos(alpha)^9*cos(beta)^4*sin(beta) - 48*ra^6*rb^z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 36*ra^6*rb^z*cos(alpha)^9*cos(beta)*sin(beta) + 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta);
\end{aligned}$$

$$YC2214=0;$$

$$YC2221=0;$$

$$\begin{aligned}
YC2222=& ((rb - ra*cos(beta))*(alpha1d^2*rb^3*z^2*sin(2*alpha) - rb*z^2*z1d^2*sin(2*alpha) - \\
& 2*alpha1d*rb^z^3*z1d + 2*beta1d*ra^4*z1d*cos(alpha)^6*sin(alpha) - \\
& alpha1d^2*ra^5*cos(alpha)^7*cos(beta)^3*sin(alpha) - 2*ra^3*z1d^2*cos(alpha)^5*cos(beta)^3*sin(alpha) + \\
& 2*alpha1d*beta1d*ra^z^4*sin(beta) + 2*alpha1d*ra^z^3*z1d*cos(beta) - \\
& alpha1d^2*ra^4*rb*cos(alpha)^7*sin(alpha) + beta1d^2*ra^4*rb*cos(alpha)^7*sin(alpha) + \\
& alpha1d^2*ra^2*rb^z^2*sin(2*alpha) - 2*ra^2*rb*z1d^2*cos(alpha)^5*sin(alpha) + \\
& 4*alpha1d*beta1d*ra^2*z^3*cos(alpha) + 2*alpha1d*beta1d*ra^4*z*cos(alpha)^5 - \\
& 2*alpha1d*beta1d*ra^4*z^3*cos(alpha)^7 + 2*alpha1d*rb^z^3*z1d*cos(alpha)^2 + \\
& 2*alpha1d*rb^3*z^3*z1d*cos(alpha)^2 + 4*beta1d*ra^2*z^2*z1d*(sin(alpha) - sin(alpha)^3) + \\
& alpha1d^2*ra^5*cos(alpha)^7*cos(beta)*sin(alpha) - alpha1d^2*ra^2*rb^3*cos(alpha)^7*sin(alpha) - \\
& beta1d^2*ra^2*rb^3*cos(alpha)^7*sin(alpha) + 2*ra^3*z1d^2*cos(alpha)^5*cos(beta)*sin(alpha) - \\
& 2*alpha1d*beta1d*ra^2*z^3*cos(alpha)^3 - 2*alpha1d*beta1d*ra^2*z^3*cos(alpha)^5 - \\
& 2*alpha1d*beta1d*ra^5*cos(alpha)^8*cos(beta)^2*sin(beta) - \\
& 2*alpha1d*beta1d*ra^2*z^3*cos(alpha)^3*cos(beta)^2 + \\
& 2*alpha1d*beta1d*ra^2*z^3*cos(alpha)^5*cos(beta)^2 + 2*alpha1d*ra^2*rb^z*z1d*cos(alpha)^2 - \\
& 2*alpha1d*ra^2*rb^z*z1d*cos(alpha)^4 - 2*alpha1d^2*ra^3*z^2*cos(alpha)*cos(beta)*sin(alpha) - \\
& 2*beta1d*ra^4*z1d*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& 2*alpha1d*ra^4*z1d*cos(alpha)^7*cos(beta)^3*sin(beta) - 2*alpha1d^2*ra^2*rb^z^2*cos(alpha)^3*sin(alpha) - \\
& 3*alpha1d^2*ra^2*rb^z^2*cos(alpha)^5*sin(alpha) - beta1d^2*ra^2*rb^z^2*cos(alpha)^5*sin(alpha) - \\
& 2*alpha1d^2*ra^2*z^3*cos(beta)*sin(alpha)*sin(beta) - 4*alpha1d*beta1d*ra^2*rb^2*z^3*cos(alpha)^5 - \\
& 2*alpha1d*beta1d*ra^z^4*cos(alpha)^2*sin(beta) - 2*alpha1d*ra^z^3*z1d*cos(alpha)^2*cos(beta) - \\
& 2*alpha1d*ra^3*z^3*z1d*cos(alpha)^2*cos(beta) + 2*alpha1d*ra^3*z^3*z1d*cos(alpha)^4*cos(beta) + \\
& 2*alpha1d*ra^rb^3*z1d*cos(alpha)^5*sin(beta) + 2*alpha1d*ra^3*rb^z1d*cos(alpha)^5*sin(beta) - \\
& 2*alpha1d*ra^3*rb^z1d*cos(alpha)^7*sin(beta) + 3*alpha1d^2*ra^3*rb^2*cos(alpha)^7*cos(beta)*sin(alpha) - \\
& alpha1d^2*ra^4*rb*cos(alpha)^7*cos(beta)^2*sin(alpha) + \\
& 2*alpha1d^2*ra^4*rb*cos(alpha)^7*cos(beta)^4*sin(alpha) - \\
& beta1d^2*ra^4*rb*cos(alpha)^7*cos(beta)^2*sin(alpha) + 2*alpha1d^2*ra*rb^z^3*sin(alpha)*sin(beta) + \\
& 2*alpha1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)*sin(alpha) + \\
& 3*alpha1d^2*ra^3*z^2*cos(alpha)^5*cos(beta)*sin(alpha) + \\
& beta1d^2*ra^3*z^2*cos(alpha)^3*cos(beta)*sin(alpha) + 2*ra^2*rb*z1d^2*cos(alpha)^5*cos(beta)^2*sin(alpha) \\
& - 4*alpha1d*beta1d*ra^4*z^3*cos(alpha)^5*cos(beta)^2 + 2*alpha1d*beta1d*ra^4*z^3*cos(alpha)^7*cos(beta)^4 - \\
& 2*alpha1d*beta1d*ra^3*rb^2*cos(alpha)^8*sin(beta) + 2*alpha1d*beta1d*ra^3*z^2*cos(alpha)^2*sin(beta) + \\
& 2*alpha1d*beta1d*ra^3*z^2*cos(alpha)^4*sin(beta) - 4*alpha1d*beta1d*ra^3*z^2*cos(alpha)^6*sin(beta) - \\
& beta1d^2*ra^z^4*cos(alpha)*cos(beta)*sin(alpha) - 2*alpha1d*ra^4*z1d*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 2*alpha1d*ra^4*z1d*cos(alpha)^7*cos(beta)*sin(beta) - 2*alpha1d*ra^3*z^3*z1d*cos(alpha)^4*cos(beta)^3 - \\
& 2*beta1d*ra^2*rb^2*z1d*cos(alpha)^6*sin(alpha) + 2*beta1d*ra^2*z^2*z1d*cos(alpha)^4*sin(alpha) + \\
& alpha1d^2*ra^2*rb^3*cos(alpha)^7*cos(beta)^2*sin(alpha) -
\end{aligned}$$

$$\begin{aligned}
& 3*\alpha_1d^2*ra^3*rb^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& \beta_1d^2*ra^2*rb^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + 2*ra*z^2*z1d^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) - \\
& 3*\alpha_1d^2*ra^3*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) - \\
& \alpha_1d^2*ra^4*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& \beta_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta_1d*ra^2*z^2*z1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 2*ra^2*z^2*z1d^2*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*ra^2*z^2*z1d^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 3*\alpha_1d^2*ra*rb*z^3*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) + \\
& \beta_1d^2*ra*rb*z^3*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) + \\
& 4*\alpha_1d*\beta_1d*ra^4*rb*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^5*\cos(\beta)^3 - \\
& 4*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^7*\cos(\beta)^3 - 2*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^2*\sin(\beta) \\
& + 4*\alpha_1d*ra^2*rb*z*z1d*\cos(\alpha)^2*\cos(\beta)^2 + 2*\alpha_1d*ra^2*rb*z*z1d*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 2*\beta_1d*ra^3*z*z1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta_1d*ra^3*z*z1d*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& \beta_1d^2*ra^2*rb*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 3*\alpha_1d^2*ra^2*z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d^2*ra^4*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& \beta_1d^2*ra^2*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*ra*rb*z*z1d^2*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - 4*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)*\cos(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^3*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^4*rb*\cos(\alpha)^8*\cos(\beta)^3*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z*\cos(\alpha)^5*\cos(\beta)^2 - \\
& 6*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha_1d*ra^2*rb^2*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha_1d*ra^3*rb*z1d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha_1d*ra^3*rb*z1d*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
& 2*\alpha_1d*ra^2*z^2*z1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*ra^2*z^2*z1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& \alpha_1d^2*ra*rb^3*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& \alpha_1d^2*ra^3*rb*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d^2*ra^3*rb*z*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& \beta_1d^2*ra*rb^3*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \beta_1d^2*ra^3*rb*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) \\
& + 4*\alpha_1d*\beta_1d*ra*rb*z^3*\cos(\alpha)^3*\cos(\beta) + 2*\alpha_1d*\beta_1d*ra*rb^3*z*\cos(\alpha)^5*\cos(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^5*\cos(\beta) + 4*\alpha_1d*\beta_1d*ra^3*rb*z*\cos(\alpha)^7*\cos(\beta) + \\
& 2*ra*rb*z*z1d^2*\sin(\alpha)*\sin(\beta)*(\sin(\alpha)^2 - 1) - 6*\alpha_1d*ra*rb^2*z*z1d*\cos(\alpha)^2*\cos(\beta) - \\
& 4*\alpha_1d*\beta_1d*ra^3*rb^2*\cos(\alpha)^8*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) - \\
& 2*\alpha_1d*ra*rb*z^2*z1d*\cos(\alpha)^3*\sin(\beta) + 2*\alpha_1d*ra*rb*z^2*z1d*\cos(\alpha)^5*\sin(\beta) + \\
& 2*\beta_1d*ra*z^3*z1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d^2*ra^2*rb*z^2*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) - \\
& \beta_1d^2*ra*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& 2*\beta_1d*ra^2*rb^2*z_1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\
& 4*\beta_1d*ra*rb*z^2*z_1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) - \\
& 2*\beta_1d*ra*rb^2*z*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d^2*ra^3*rb*z*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d^2*ra^3*rb*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& \beta_1d^2*ra^2*rb^2*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta_1d*ra^2*rb*z*z_1d*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta)))/(ra^6*\cos(\alpha)^6 - ra^6*\cos(\alpha)^8 \\
& + rb^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 - \\
& ra^2*rb^4*\cos(\alpha)^8 - 2*ra^4*rb^2*\cos(\alpha)^8 + 15*ra^2*z^4*\cos(\alpha)^2 - 15*ra^2*z^4*\cos(\alpha)^4 \\
& + 15*ra^4*z^2*\cos(\alpha)^4 - 15*ra^4*z^2*\cos(\alpha)^6 + 3*rb^2*z^4*\cos(\alpha)^2 - \\
& 2*rb^2*z^4*\cos(\alpha)^4 + 3*rb^4*z^2*\cos(\alpha)^4 - rb^4*z^2*\cos(\alpha)^6 + \\
& ra^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 12*ra^2*rb^2*z^2*\cos(\alpha)^6 + \\
& 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) - 20*ra^3*z^3*\cos(\alpha)^5*\sin(\beta) + 6*ra*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 + ra^2*rb^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*ra^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) + 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta) - \\
& 6*ra*z^5*\cos(\alpha)^3*\sin(\beta) + 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) - 6*ra^5*z*\cos(\alpha)^7*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) + 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta)^3 - 6*ra*rb*z^4*\cos(\alpha)^2*\cos(\beta) + 4*ra*rb*z^4*\cos(\alpha)^4*\cos(\beta) \\
& + 6*ra*rb^4*z*\cos(\alpha)^5*\sin(\beta) - 2*ra*rb^4*z*\cos(\alpha)^7*\sin(\beta) + \\
& 6*ra^2*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) + \\
& 12*ra^3*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - 12*ra*rb^3*z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 36*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta) + 4*ra*rb^3*z^2*\cos(\alpha)^6*\cos(\beta) + \\
& 24*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta) + 12*ra*rb^2*z^3*\cos(\alpha)^3*\sin(\beta) - \\
& 8*ra*rb^2*z^3*\cos(\alpha)^5*\sin(\beta) + 12*ra^3*rb^2*z*\cos(\alpha)^5*\sin(\beta) - \\
& 8*ra^3*rb^2*z*\cos(\alpha)^7*\sin(\beta) + 24*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta)^3 - \\
& 20*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta)^3 + 4*ra^5*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
& 24*ra^2*rb*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + 16*ra^2*rb*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 24*ra^2*rb^3*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + 8*ra^2*rb^3*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 8*ra^4*rb*z*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) + 24*ra^3*rb^2*z*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - \\
& 4*ra^3*rb^2*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - 24*ra^4*rb*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 16*ra^4*rb*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta)); \\
& YC2223=(\cos(\alpha)*(rb - ra*\cos(\beta)))*(2*\alpha_1d^2*rb*z^6*\sin(\alpha) - \\
& 2*\alpha_1d^2*ra*z^6*\cos(\beta)*\sin(\alpha) - 2*\beta_1d*ra^6*z_1d*\cos(\alpha)^7*\sin(\alpha) + \\
& \alpha_1d^2*ra^7*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) + 2*ra^5*z_1d^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
& 4*\alpha_1d*rb*z^5*z_1d*\cos(\alpha) + \alpha_1d^2*ra^6*rb*\cos(\alpha)^8*\sin(\alpha) - \\
& \beta_1d^2*ra^6*rb*\cos(\alpha)^8*\sin(\alpha) - 2*\alpha_1d^2*rb*z^6*\cos(\alpha)^2*\sin(\alpha) + \\
& 2*ra^4*rb*z_1d^2*\cos(\alpha)^6*\sin(\alpha) + 2*rb*z^4*z_1d^2*\cos(\alpha)^2*\sin(\alpha) - \\
& 14*\alpha_1d*\beta_1d*ra^6*z*\cos(\alpha)^6 + 14*\alpha_1d*\beta_1d*ra^6*z*\cos(\alpha)^8 - \\
& 4*\alpha_1d*rb*z^5*z_1d*\cos(\alpha)^3 - \alpha_1d^2*ra^7*\cos(\alpha)^8*\cos(\beta)*\sin(\alpha) + \\
& \alpha_1d^2*ra^2*rb^5*\cos(\alpha)^8*\sin(\alpha) + 2*\alpha_1d^2*ra^4*rb^3*\cos(\alpha)^8*\sin(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& \beta^2 r^2 r^b^5 \cos(\alpha)^8 \sin(\alpha) - 2 r^5 z^2 d^2 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) + \\
& 2 r^2 r^b^3 z^2 d^2 \cos(\alpha)^6 \sin(\alpha) - 2 \alpha^1 d \beta^1 r^7 \cos(\alpha)^7 \sin(\beta) + \\
& 2 \alpha^1 d \beta^1 r^7 \cos(\alpha)^9 \sin(\beta) - 22 \alpha^1 d \beta^1 r^2 z^5 \cos(\alpha)^2 + \\
& 22 \alpha^1 d \beta^1 r^2 z^5 \cos(\alpha)^4 - 60 \alpha^1 d \beta^1 r^4 z^3 \cos(\alpha)^4 + \\
& 60 \alpha^1 d \beta^1 r^4 z^3 \cos(\alpha)^6 + 12 r^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^3 \sin(\alpha) - \\
& 4 \alpha^1 d \beta^1 r^2 z^6 \cos(\alpha) \sin(\beta) - 4 \alpha^1 d r^2 z^5 d \cos(\alpha) \cos(\beta) + \\
& 16 \alpha^1 d \beta^1 r^2 z^5 \cos(\alpha)^2 \cos(\beta)^2 - \\
& 16 \alpha^1 d \beta^1 r^2 z^5 \cos(\alpha)^4 \cos(\beta)^2 + \\
& 70 \alpha^1 d \beta^1 r^4 z^3 \cos(\alpha)^4 \cos(\beta)^2 - \\
& 12 \alpha^1 d \beta^1 r^4 z^3 \cos(\alpha)^4 \cos(\beta)^4 - \\
& 70 \alpha^1 d \beta^1 r^4 z^3 \cos(\alpha)^6 \cos(\beta)^2 + \\
& 12 \alpha^1 d \beta^1 r^4 z^3 \cos(\alpha)^6 \cos(\beta)^4 + 4 \alpha^1 r^4 r^b z^2 d \cos(\alpha)^5 - \\
& 4 \alpha^1 r^4 r^b z^2 d \cos(\alpha)^7 + 2 \alpha^1 d^2 r^2 z^6 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + \\
& \beta^2 r^2 z^6 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + 2 \beta^2 r^2 z^6 d \cos(\alpha)^7 \cos(\beta)^2 \sin(\alpha) \\
& + 24 \alpha^1 r^3 z^3 z^2 d \cos(\alpha)^3 \cos(\beta)^3 - 24 \alpha^1 r^3 z^3 z^2 d \cos(\alpha)^5 \cos(\beta)^3 + \\
& 12 \alpha^1 d^2 r^2 r^b z^4 \cos(\alpha)^2 \sin(\alpha) - 7 \alpha^1 d^2 r^2 r^b z^4 \cos(\alpha)^4 \sin(\alpha) + \\
& 2 \alpha^1 d^2 r^4 r^b z^2 \cos(\alpha)^4 \sin(\alpha) + 8 \alpha^1 d^2 r^4 r^b z^2 \cos(\alpha)^6 \sin(\alpha) + \\
& 3 \beta^2 d^2 r^2 r^b z^4 \cos(\alpha)^4 \sin(\alpha) - 2 \beta^2 d^2 r^4 r^b z^2 \cos(\alpha)^6 \sin(\alpha) - \\
& 2 r^2 z^4 z^2 d^2 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + 12 r^2 r^b z^2 z^2 d^2 \cos(\alpha)^4 \sin(\alpha) - \\
& 14 \alpha^1 d \beta^1 r^4 r^b^2 z^2 \cos(\alpha)^6 + 14 \alpha^1 d \beta^1 r^4 r^b^2 z^2 \cos(\alpha)^8 + \\
& 4 \alpha^1 d \beta^1 r^2 z^6 \cos(\alpha)^3 \sin(\beta) + 4 \alpha^1 d r^2 z^5 d \cos(\alpha)^3 \cos(\beta) - \\
& 4 \alpha^1 r^5 z^2 d \cos(\alpha)^5 \cos(\beta) + 4 \alpha^1 r^5 z^2 d \cos(\alpha)^7 \cos(\beta) + \\
& 24 \alpha^1 r^2 r^b z^3 z^2 d \cos(\alpha)^3 - 24 \alpha^1 r^2 r^b z^3 z^2 d \cos(\alpha)^5 + \\
& 4 \alpha^1 r^2 r^b^3 z^2 d \cos(\alpha)^5 - 4 \alpha^1 r^2 r^b^3 z^2 d \cos(\alpha)^7 - \\
& 5 \alpha^1 d^2 r^3 r^b^4 \cos(\alpha)^8 \cos(\beta) \sin(\alpha) - \\
& 6 \alpha^1 d^2 r^5 r^b^2 \cos(\alpha)^8 \cos(\beta) \sin(\alpha) + \\
& 3 \alpha^1 d^2 r^6 r^b \cos(\alpha)^8 \cos(\beta)^2 \sin(\alpha) - \\
& 4 \alpha^1 d^2 r^6 r^b \cos(\alpha)^8 \cos(\beta)^4 \sin(\alpha) - \\
& 2 \beta^2 d^2 r^3 r^b^4 \cos(\alpha)^8 \cos(\beta) \sin(\alpha) + \\
& 2 \beta^2 d^2 r^5 r^b^2 \cos(\alpha)^8 \cos(\beta) \sin(\alpha) + \\
& \beta^2 d^2 r^6 r^b \cos(\alpha)^8 \cos(\beta)^2 \sin(\alpha) - \\
& 12 \alpha^1 d^2 r^3 z^4 \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + \\
& 7 \alpha^1 d^2 r^3 z^4 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 2 \alpha^1 d^2 r^5 z^2 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 8 \alpha^1 d^2 r^5 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) + \\
& 2 \beta^2 d^2 r^3 z^4 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 3 \beta^2 d^2 r^5 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) + \\
& 2 \alpha^1 d^2 r^2 r^b^3 z^2 \cos(\alpha)^4 \sin(\alpha) + 2 \alpha^1 d^2 r^2 r^b^3 z^2 \cos(\alpha)^6 \sin(\alpha) + \\
& 4 \beta^2 d^2 r^2 r^b^3 z^2 \cos(\alpha)^6 \sin(\alpha) - 6 r^3 r^b^2 z^2 d^2 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) + \\
& 2 r^4 r^b z^2 d^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) - 4 r^4 r^b z^2 d^2 \cos(\alpha)^6 \cos(\beta)^4 \sin(\alpha) \\
& - 12 r^3 z^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) + \\
& 14 \alpha^1 d \beta^1 r^6 z^2 \cos(\alpha)^6 \cos(\beta)^2 - 14 \alpha^1 d \beta^1 r^6 z^2 \cos(\alpha)^8 \cos(\beta)^2 - \\
& 2 \alpha^1 d \beta^1 r^3 r^b^4 \cos(\alpha)^7 \sin(\beta) - 4 \alpha^1 d \beta^1 r^5 r^b^2 \cos(\alpha)^7 \sin(\beta) + \\
& 2 \alpha^1 d \beta^1 r^3 r^b^4 \cos(\alpha)^9 \sin(\beta) + 4 \alpha^1 d \beta^1 r^5 r^b^2 \cos(\alpha)^9 \sin(\beta) - \\
& 6 \alpha^1 d \beta^1 r^2 r^b^2 z^3 \cos(\alpha)^4 + 6 \alpha^1 d \beta^1 r^2 r^b^2 z^3 \cos(\alpha)^6 - \\
& 50 \alpha^1 d \beta^1 r^3 z^4 \cos(\alpha)^3 \sin(\beta) + 50 \alpha^1 d \beta^1 r^3 z^4 \cos(\alpha)^5 \sin(\beta) - \\
& 40 \alpha^1 d \beta^1 r^5 z^2 \cos(\alpha)^5 \sin(\beta) + 40 \alpha^1 d \beta^1 r^5 z^2 \cos(\alpha)^7 \sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 24*\alpha^3*d^3*z^3*\cos(\alpha)^3*\cos(\beta) + 24*\alpha^3*d^3*z^3*\cos(\alpha)^5*\cos(\beta) + \\
& 4*\alpha^5*d^5*z^5*\cos(\alpha)^5*\cos(\beta)^3 - 4*\alpha^5*d^5*z^5*\cos(\alpha)^7*\cos(\beta)^3 + \\
& 2*\beta^2*d^2*r^4*z^4*\cos(\alpha)^7*\sin(\alpha) - 10*\beta^2*d^2*r^4*z^4*\cos(\alpha)^3*\sin(\alpha) - \\
& 20*\beta^4*d^4*z^4*\cos(\alpha)^5*\sin(\alpha) - \alpha^2*d^2*r^2*\beta^5*\cos(\alpha)^8*\cos(\beta)^2*\sin(\alpha) \\
& + 6*\alpha^2*d^2*r^4*\beta^3*\cos(\alpha)^8*\cos(\beta)^2*\sin(\alpha) + \\
& 5*\alpha^2*d^2*r^3*\beta^4*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha^2*d^2*r^5*\beta^2*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) - \\
& 8*\alpha^2*d^2*r^4*\beta^3*\cos(\alpha)^8*\cos(\beta)^4*\sin(\alpha) + \\
& 4*\alpha^2*d^2*r^5*\beta^2*\cos(\alpha)^8*\cos(\beta)^5*\sin(\alpha) - \\
& \beta^2*d^2*r^2*\beta^5*\cos(\alpha)^8*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\beta^2*d^2*r^3*\beta^4*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) - \\
& 2*\beta^2*d^2*r^5*\beta^2*\cos(\alpha)^8*\cos(\beta)^3*\sin(\alpha) + \\
& 12*\alpha^2*d^2*r^3*z^4*\cos(\alpha)^2*\cos(\beta)^3*\sin(\alpha) - \\
& 7*\alpha^2*d^2*r^3*z^4*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha^2*d^2*r^5*z^2*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 14*\alpha^2*d^2*r^5*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
& 6*\alpha^2*d^2*r^5*z^2*\cos(\alpha)^6*\cos(\beta)^5*\sin(\alpha) - \\
& 3*\beta^2*d^2*r^3*z^4*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 3*\beta^2*d^2*r^5*z^2*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
& 2*r^2*\beta^3*z^4*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 6*r^3*\beta^2*z^4*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) - \\
& 8*\alpha^2*d^2*r^2*z^5*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha^2*d^2*r^6*z*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& \beta^2*d^2*r^6*z*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\beta^2*d^2*r^2*z^4*z^4*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 20*\beta^4*d^4*z^4*z^4*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 12*\alpha^4*d^4*z^2*z^4*\cos(\alpha)^4*\cos(\beta)^3*\sin(\beta) - \\
& 12*\alpha^4*d^4*z^2*z^4*\cos(\alpha)^6*\cos(\beta)^3*\sin(\beta) + \\
& 2*\alpha^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& \alpha^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 5*\alpha^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^7*\sin(\alpha)*\sin(\beta) + \\
& \beta^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 2*\beta^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + \\
& 3*\beta^2*d^2*r^3*\beta^3*z^3*\cos(\alpha)^7*\sin(\alpha)*\sin(\beta) - \\
& 8*r^4*z^4*z^4*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 10*\alpha^4*d^4*\beta^6*r^6*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 10*\alpha^4*d^4*\beta^6*r^6*\cos(\alpha)^9*\cos(\beta)*\sin(\beta) + \\
& 2*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^4*\cos(\beta) + \\
& 56*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^4*\cos(\beta) - \\
& 2*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^6*\cos(\beta) - \\
& 56*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^6*\cos(\beta) + \\
& 14*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^6*\cos(\beta) - \\
& 14*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^8*\cos(\beta) - \\
& 42*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^6*\cos(\beta)^3 + \\
& 42*\alpha^4*d^4*\beta^6*r^6*\beta^3*z^3*\cos(\alpha)^8*\cos(\beta)^3 +
\end{aligned}$$

$$\begin{aligned}
& 4*\beta_1d^*r^a^5*rb^*z_1d*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - 12*\alpha_1d^*r^a^3*rb^2*z^2_1d*\cos(\alpha)^5*\cos(\beta) \\
& + 4*\alpha_1d^*r^a^4*rb^*z^2_1d*\cos(\alpha)^5*\cos(\beta)^2 + 12*\alpha_1d^*r^a^3*rb^2*z^2_1d*\cos(\alpha)^7*\cos(\beta) - \\
& 8*\alpha_1d^*r^a^4*rb^*z^2_1d*\cos(\alpha)^5*\cos(\beta)^4 - 4*\alpha_1d^*r^a^4*rb^*z^2_1d*\cos(\alpha)^7*\cos(\beta)^2 + \\
& 8*\alpha_1d^*r^a^4*rb^*z^2_1d*\cos(\alpha)^7*\cos(\beta)^4 + 8*\alpha_1d^2*r^a*rb^*z^5*\cos(\alpha)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d^*r^a*rb^3*z^2_1d*\cos(\alpha)^4*\sin(\beta) + 16*\alpha_1d^*r^a^3*rb^*z^2_1d*\cos(\alpha)^4*\sin(\beta) - \\
& 4*\alpha_1d^*r^a*rb^3*z^2_1d*\cos(\alpha)^6*\sin(\beta) - 16*\alpha_1d^*r^a^3*rb^*z^2_1d*\cos(\alpha)^6*\sin(\beta) - \\
& 2*\beta_1d^*r^a^5*z^2_1d*\cos(\alpha)^2*\sin(\alpha)*\sin(\beta) - \\
& 10*\beta_1d^*r^a^5*z^2_1d*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& 12*\alpha_1d^2*r^a^2*rb^*z^4*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\alpha_1d^2*r^a^3*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 7*\alpha_1d^2*r^a^2*rb^*z^4*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d^2*r^a^4*rb^*z^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\alpha_1d^2*r^a^3*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& 4*\alpha_1d^2*r^a^4*rb^*z^2*\cos(\alpha)^4*\cos(\beta)^4*\sin(\alpha) - \\
& 10*\alpha_1d^2*r^a^4*rb^*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d^2*r^a^4*rb^*z^2*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) - \\
& 3*\beta_1d^2*r^a^2*rb^*z^4*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& \beta_1d^2*r^a^3*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) + \\
& 2*\beta_1d^2*r^a^4*rb^*z^2*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 7*\alpha_1d^2*r^a^2*z^5*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 8*\alpha_1d^2*r^a^4*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d^2*r^a^4*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 5*\alpha_1d^2*r^a^6*z*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 3*\beta_1d^2*r^a^2*z^5*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta_1d^2*r^a^4*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 12*r^a^2*rb^*z^2*z_1d^2*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 8*r^a^2*z^3*z_1d^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*r^a^4*z^2_1d^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d^*r^a^2*rb^5*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) + \\
& 12*\alpha_1d*\beta_1d^*r^a^4*rb^3*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d^*r^a^2*rb^5*\cos(\alpha)^9*\cos(\beta)*\sin(\beta) - \\
& 12*\alpha_1d*\beta_1d^*r^a^4*rb^3*\cos(\alpha)^9*\cos(\beta)*\sin(\beta) - \\
& 50*\alpha_1d*\beta_1d^*r^a^3*rb^*z^3*\cos(\alpha)^4*\cos(\beta)^3 - \\
& 14*\alpha_1d*\beta_1d^*r^a^4*rb^2*z*\cos(\alpha)^6*\cos(\beta)^2 + \\
& 50*\alpha_1d*\beta_1d^*r^a^3*rb^*z^3*\cos(\alpha)^6*\cos(\beta)^3 - \\
& 14*\alpha_1d*\beta_1d^*r^a^3*rb^3*z*\cos(\alpha)^6*\cos(\beta)^3 + \\
& 28*\alpha_1d*\beta_1d^*r^a^4*rb^2*z*\cos(\alpha)^6*\cos(\beta)^4 + \\
& 14*\alpha_1d*\beta_1d^*r^a^4*rb^2*z*\cos(\alpha)^8*\cos(\beta)^2 + \\
& 14*\alpha_1d*\beta_1d^*r^a^3*rb^3*z*\cos(\alpha)^8*\cos(\beta)^3 - \\
& 28*\alpha_1d*\beta_1d^*r^a^4*rb^2*z*\cos(\alpha)^8*\cos(\beta)^4 - \\
& 16*\alpha_1d*\beta_1d^*r^a^3*rb^2*z^2*\cos(\alpha)^5*\sin(\beta) + \\
& 16*\alpha_1d*\beta_1d^*r^a^3*rb^2*z^2*\cos(\alpha)^7*\sin(\beta) - \\
& 4*\beta_1d^*r^a^3*rb^3*z_1d*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - \\
& 4*\beta_1d^*r^a^5*rb^*z_1d*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) - \\
& 24*\alpha_1d^*r^a^2*rb^*z^3*z_1d*\cos(\alpha)^3*\cos(\beta)^2 + \\
& 24*\alpha_1d^*r^a^2*rb^*z^3*z_1d*\cos(\alpha)^5*\cos(\beta)^2 - \\
& 4*\alpha_1d^*r^a^2*rb^3*z^2_1d*\cos(\alpha)^5*\cos(\beta)^2 +
\end{aligned}$$

$$\begin{aligned}
& 12\alpha^3 r^2 z \cos(\alpha)^5 \cos(\beta)^3 + \\
& 4\alpha^2 r^3 z \cos(\alpha)^7 \cos(\beta)^2 - \\
& 12\alpha^3 r^2 z \cos(\alpha)^7 \cos(\beta)^3 - \\
& 16\alpha^2 r^4 z \cos(\alpha)^2 \cos(\beta) \sin(\beta) + \\
& 16\alpha^2 r^4 z \cos(\alpha)^4 \cos(\beta) \sin(\beta) - \\
& 16\alpha^4 r^2 z \cos(\alpha)^4 \cos(\beta) \sin(\beta) + \\
& 16\alpha^4 r^2 z \cos(\alpha)^6 \cos(\beta) \sin(\beta) - \\
& 7\alpha^2 r^3 z^5 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) + \\
& 5\alpha^2 r^5 z^5 \cos(\alpha)^7 \sin(\alpha) \sin(\beta) + \\
& \beta^2 r^3 z^5 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) - \\
& 3\beta^2 r^5 z^5 \cos(\alpha)^7 \sin(\alpha) \sin(\beta) + \\
& 4\beta^2 r^2 z^2 \cos(\alpha)^5 \sin(\alpha) - \\
& 20\beta^3 r^3 z \cos(\alpha)^4 \sin(\alpha) \sin(\beta) - \\
& 2\alpha^2 r^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) + \\
& 6\alpha^2 r^3 z^2 \cos(\alpha)^4 \cos(\beta)^3 \sin(\alpha) - \\
& 2\alpha^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) + \\
& 6\alpha^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta)^3 \sin(\alpha) - \\
& 4\beta^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) - \\
& \beta^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta)^3 \sin(\alpha) + \\
& 6\alpha^4 r^3 z^3 \cos(\alpha)^3 \cos(\beta)^3 \sin(\alpha) \sin(\beta) + \\
& 3\alpha^4 r^3 z^3 \cos(\alpha)^5 \cos(\beta)^3 \sin(\alpha) \sin(\beta) + \\
& 8r^3 z^3 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) + 2r^3 z^3 \cos(\alpha)^5 \sin(\alpha) \sin(\beta) + \\
& 8r^3 z^3 \cos(\alpha)^5 \sin(\alpha) \sin(\beta) + 6\alpha \beta r^3 z^5 \cos(\alpha)^2 \cos(\beta) - \\
& 6\alpha \beta r^3 z^5 \cos(\alpha)^4 \cos(\beta) + 42\alpha \beta r^5 z^5 \cos(\alpha)^6 \cos(\beta) - \\
& 42\alpha \beta r^5 z^5 \cos(\alpha)^8 \cos(\beta) - \\
& 8\alpha \beta r^3 z^4 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) - \\
& 16\alpha \beta r^5 z^2 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + \\
& 8\alpha \beta r^4 z^3 \cos(\alpha)^7 \cos(\beta)^3 \sin(\beta) + \\
& 8\alpha \beta r^4 z^3 \cos(\alpha)^9 \cos(\beta)^2 \sin(\beta) + \\
& 16\alpha \beta r^5 z^2 \cos(\alpha)^9 \cos(\beta)^2 \sin(\beta) - \\
& 8\alpha \beta r^4 z^3 \cos(\alpha)^9 \cos(\beta)^3 \sin(\beta) + \\
& 24\alpha \beta r^3 z^4 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) - \\
& 24\alpha \beta r^3 z^4 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + \\
& 28\alpha \beta r^5 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - \\
& 28\alpha \beta r^5 z^2 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + \\
& 16\alpha^2 r^3 z^4 \cos(\alpha)^2 \sin(\beta) - 16\alpha^2 r^3 z^4 \cos(\alpha)^4 \sin(\beta) + \\
& \beta^2 r^2 z^4 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \\
& 2\beta^2 r^4 z \cos(\alpha)^7 \cos(\beta)^2 \sin(\alpha) + \\
& 4\beta^2 r^3 z \cos(\alpha)^7 \cos(\beta)^3 \sin(\alpha) + \\
& 26\alpha \beta r^2 z^4 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& 26\alpha \beta r^2 z^4 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \\
& 68\alpha \beta r^4 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \\
& 68\alpha \beta r^4 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta) + \\
& 16\beta^2 r^3 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\alpha) + \\
& 2\beta^2 r^3 z^3 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) + \\
& 2\beta^2 r^3 z^3 \cos(\alpha)^6 \sin(\alpha) \sin(\beta) - \\
& 6\alpha \beta r^2 z^3 \cos(\alpha)^3 \cos(\beta) \sin(\alpha) \sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 2*\alpha_1d^2*ra^3*rb*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 3*\alpha_1d^2*ra^2*rb^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha_1d^2*ra^3*rb*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 5*\alpha_1d^2*ra^3*rb^3*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 15*\alpha_1d^2*ra^4*rb^2*z*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta_1d^2*ra^2*rb^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 5*\beta_1d^2*ra^3*rb*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 5*\beta_1d^2*ra^3*rb^3*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 12*\alpha_1d*\beta_1d*ra^2*rb^3*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 12*\alpha_1d*\beta_1d*ra^2*rb^3*z^2*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 32*\alpha_1d*\beta_1d*ra^4*rb*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\beta) + \\
& 32*\alpha_1d*\beta_1d*ra^4*rb*z^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) - \\
& 16*\beta_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) - \\
& 12*\alpha_1d*ra^2*rb^2*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 4*\alpha_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\beta) + \\
& 12*\alpha_1d*ra^2*rb^2*z^2*z_1d*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\
& 4*\alpha_1d*ra^3*rb*z^2*z_1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\beta) + \\
& 6*\beta_1d*ra^5*z*z_1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta_1d*ra*rb*z^4*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 20*\alpha_1d*\beta_1d*ra^3*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 20*\alpha_1d*\beta_1d*ra^3*rb^2*z^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
& 15*\alpha_1d^2*ra^4*rb^2*z*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 5*\alpha_1d^2*ra^5*rb*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 10*\alpha_1d^2*ra^5*rb*z*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha)*\sin(\beta) + \\
& \beta_1d^2*ra^2*rb^4*z*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 5*\beta_1d^2*ra^5*rb*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta_1d*ra^2*rb^2*z^2*z_1d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 6*\beta_1d*ra^3*z^3*z_1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 6*ra^2*rb^2*z^2*z_1d^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*ra^3*rb*z^2*z_1d^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 14*\beta_1d*ra^3*rb^2*z^2*z_1d*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 12*\beta_1d*ra^4*rb*z^2*z_1d*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 12*\beta_1d*ra^2*rb*z^3*z_1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\beta_1d*ra^2*rb^3*z^2*z_1d*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta)))/(ra^8*\cos(\alpha)^8 - \\
& ra^8*\cos(\alpha)^{10} + rb^8*\cos(\alpha)^8 - z^8*\cos(\alpha)^2 + z^8 + 4*ra^2*rb^6*\cos(\alpha)^8 + \\
& 6*ra^4*rb^4*\cos(\alpha)^8 + 4*ra^6*rb^2*\cos(\alpha)^8 - ra^2*rb^6*\cos(\alpha)^{10} - \\
& 3*ra^4*rb^4*\cos(\alpha)^{10} - 3*ra^6*rb^2*\cos(\alpha)^{10} + 28*ra^2*z^6*\cos(\alpha)^2 - \\
& 28*ra^2*z^6*\cos(\alpha)^4 + 70*ra^4*z^4*\cos(\alpha)^4 - 70*ra^4*z^4*\cos(\alpha)^6 + \\
& 28*ra^6*z^2*\cos(\alpha)^6 - 28*ra^6*z^2*\cos(\alpha)^8 + 4*rb^2*z^6*\cos(\alpha)^2 - 3*rb^2*z^6*\cos(\alpha)^4 \\
& + 6*rb^4*z^4*\cos(\alpha)^4 - 3*rb^4*z^4*\cos(\alpha)^6 + 4*rb^6*z^2*\cos(\alpha)^6 - rb^6*z^2*\cos(\alpha)^8 + \\
& ra^8*\cos(\alpha)^{10}*\cos(\beta)^2 + 60*ra^2*rb^2*z^4*\cos(\alpha)^4 - 45*ra^2*rb^2*z^4*\cos(\alpha)^6 + \\
& 36*ra^2*rb^4*z^2*\cos(\alpha)^6 + 60*ra^4*rb^2*z^2*\cos(\alpha)^6 - 18*ra^2*rb^4*z^2*\cos(\alpha)^8 - \\
& 45*ra^4*rb^2*z^2*\cos(\alpha)^8 + 56*ra^3*z^5*\cos(\alpha)^3*\sin(\beta) - 56*ra^3*z^5*\cos(\alpha)^5*\sin(\beta) + \\
& 56*ra^5*z^3*\cos(\alpha)^5*\sin(\beta) - 56*ra^5*z^3*\cos(\alpha)^7*\sin(\beta) + 8*ra^z^7*\cos(\alpha)*\sin(\beta) + \\
& 24*ra^2*rb^6*\cos(\alpha)^8*\cos(\beta)^2 + 48*ra^4*rb^4*\cos(\alpha)^8*\cos(\beta)^2 + \\
& 24*ra^6*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 32*ra^3*rb^5*\cos(\alpha)^8*\cos(\beta)^3 - \\
& 32*ra^5*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + ra^2*rb^6*\cos(\alpha)^{10}*\cos(\beta)^2 +
\end{aligned}$$

$$\begin{aligned}
& 16*ra^4*rb^4*cos(alpha)^8*cos(beta)^4 - 9*ra^4*rb^4*cos(alpha)^10*cos(beta)^2 - \\
& 9*ra^6*rb^2*cos(alpha)^10*cos(beta)^2 - 6*ra^3*rb^5*cos(alpha)^10*cos(beta)^3 - \\
& 4*ra^5*rb^3*cos(alpha)^10*cos(beta)^3 + 12*ra^4*rb^4*cos(alpha)^10*cos(beta)^4 + \\
& 12*ra^6*rb^2*cos(alpha)^10*cos(beta)^4 - 8*ra^5*rb^3*cos(alpha)^10*cos(beta)^5 - \\
& 24*ra^2*z^6*cos(alpha)^2*cos(beta)^2 + 25*ra^2*z^6*cos(alpha)^4*cos(beta)^2 - \\
& 80*ra^4*z^4*cos(alpha)^4*cos(beta)^2 + 16*ra^4*z^4*cos(alpha)^4*cos(beta)^4 + \\
& 95*ra^4*z^4*cos(alpha)^6*cos(beta)^2 - 24*ra^6*z^2*cos(alpha)^6*cos(beta)^2 - \\
& 28*ra^4*z^4*cos(alpha)^6*cos(beta)^4 + 39*ra^6*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 12*ra^6*z^2*cos(alpha)^8*cos(beta)^4 - 8*ra*rb^7*cos(alpha)^8*cos(beta) - 8*ra^7*rb*cos(alpha)^8*cos(beta) \\
& + 6*ra^7*rb*cos(alpha)^10*cos(beta) - 8*ra*z^7*cos(alpha)^3*sin(beta) + 8*ra^7*z*cos(alpha)^7*sin(beta) - \\
& 8*ra^7*z*cos(alpha)^9*sin(beta) - 24*ra^3*rb^5*cos(alpha)^8*cos(beta) - 24*ra^5*rb^3*cos(alpha)^8*cos(beta) \\
& + 6*ra^3*rb^5*cos(alpha)^10*cos(beta) + 12*ra^5*rb^3*cos(alpha)^10*cos(beta) - \\
& 6*ra^7*rb*cos(alpha)^10*cos(beta)^3 - 8*ra*rb*z^6*cos(alpha)^2*cos(beta) + \\
& 6*ra*rb*z^6*cos(alpha)^4*cos(beta) + 8*ra*rb^6*z*cos(alpha)^7*sin(beta) - 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 - \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) + 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb*z^2*cos(alpha)^8*cos(beta) + 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) - \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) + 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) - \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) + 24*ra^3*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) - \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 + \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) - 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) - 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) + 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) + \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) - 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) - \\
& 64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) - \\
& 36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) - 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) + 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta));
\end{aligned}$$

YC2224=0;

YC2231=0;

$$\begin{aligned} YC2232 = & (7*\alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^5 - 2*\alpha^{1d^2}r^{2*}b^*z^3*\cos(\alpha) - \\ & 2*\alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^3 - \alpha^{1d^2}b^{1d}r^{2*}z^4*\sin(2*\alpha) - \\ & 5*\alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^7 - b^{1d^2}r^{4*}b^*z*\cos(\alpha)^5 + b^{1d^2}r^{4*}b^*z*\cos(\alpha)^7 - \\ & 2*b^{1d^2}r^{5*}z^{1d}*\cos(\alpha)^5*\sin(\beta) + 2*b^{1d^2}r^{5*}z^{1d}*\cos(\alpha)^7*\sin(\beta) - \\ & 2*b^{1d^2}r^{2*}z^3z^{1d}*\cos(\alpha)^2 + 2*b^{1d^2}r^{2*}z^3z^{1d}*\cos(\alpha)^4 + \\ & 5*\alpha^{1d^2}r^{3*}z^3*\cos(\alpha)^3*\cos(\beta)^3 - 3*\alpha^{1d^2}r^{3*}z^3*\cos(\alpha)^5*\cos(\beta)^3 + \\ & 4*r^{2*}b^*z^z^{1d^2}*\cos(\alpha)^3 - 4*r^{2*}b^*z^z^{1d^2}*\cos(\alpha)^5 + \\ & 2*\alpha^{1d^2}r^{3*}z^3*\cos(\alpha)*\cos(\beta) + 2*\alpha^{1d^2}r^{5*}z*\cos(\alpha)^3*\cos(\beta) - \\ & 7*\alpha^{1d^2}r^{5*}z*\cos(\alpha)^5*\cos(\beta) + 5*\alpha^{1d^2}r^{5*}z*\cos(\alpha)^7*\cos(\beta) - \\ & b^{1d^2}r^{5*}z*\cos(\alpha)^5*\cos(\beta) + b^{1d^2}r^{5*}z*\cos(\alpha)^7*\cos(\beta) + \\ & \alpha^{1d^2}r^{5*}b^*z*\cos(\alpha)^6*\sin(\beta) - \alpha^{1d^2}r^{5*}b^*z*\cos(\alpha)^8*\sin(\beta) - \\ & b^{1d^2}r^{5*}b^*z*\cos(\alpha)^6*\sin(\beta) + b^{1d^2}r^{5*}b^*z*\cos(\alpha)^8*\sin(\beta) + \\ & 5*\alpha^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^3 - 2*\alpha^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^3 - \\ & 3*\alpha^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^5 + 3*\alpha^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^5 - \\ & \alpha^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^7 + b^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^3 - \\ & b^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^5 + b^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^5 - \\ & b^{1d^2}r^{2*}b^*z^3*\cos(\alpha)^7 - 4*r^{3*}z^z^{1d^2}*\cos(\alpha)^3*\cos(\beta) + \\ & 4*r^{3*}z^z^{1d^2}*\cos(\alpha)^5*\cos(\beta) + 2*r^{3*}b^*z^{1d^2}*\cos(\alpha)^4*\sin(\beta) - \\ & 2*r^{3*}b^*z^{1d^2}*\cos(\alpha)^6*\sin(\beta) - 6*b^{1d^2}r^{4*}z^z^{1d}*\cos(\alpha)^4 + \\ & 6*b^{1d^2}r^{4*}z^z^{1d}*\cos(\alpha)^6 - \alpha^{1d^2}r^{6*}z*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\ & \alpha^{1d^2}r^{6*}z*\cos(\alpha)^8*\cos(\beta)*\sin(\beta) - 2*\alpha^{1d^2}r^{3*}z^3*\cos(\alpha)*\cos(\beta)^3 - \\ & 5*\alpha^{1d^2}r^{3*}z^3*\cos(\alpha)^3*\cos(\beta) + 3*\alpha^{1d^2}r^{3*}z^3*\cos(\alpha)^5*\cos(\beta) + \\ & 5*\alpha^{1d^2}r^{5*}z*\cos(\alpha)^5*\cos(\beta)^3 - 5*\alpha^{1d^2}r^{5*}z*\cos(\alpha)^7*\cos(\beta)^3 + \\ & b^{1d^2}r^{3*}z^3*\cos(\alpha)^3*\cos(\beta) - b^{1d^2}r^{3*}z^3*\cos(\alpha)^5*\cos(\beta) + \\ & \alpha^{1d^2}r^{3*}b^*z^3*\cos(\alpha)^6*\sin(\beta) - \alpha^{1d^2}r^{3*}b^*z^3*\cos(\alpha)^8*\sin(\beta) + \\ & b^{1d^2}r^{3*}b^*z^3*\cos(\alpha)^6*\sin(\beta) - b^{1d^2}r^{3*}b^*z^3*\cos(\alpha)^8*\sin(\beta) - \\ & 2*r^{4*}z^{1d^2}*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) + 2*r^{4*}z^{1d^2}*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \\ & 2*r^{3*}z^z^{1d^2}*\cos(\alpha)^3*\cos(\beta)^3 - 2*r^{3*}z^z^{1d^2}*\cos(\alpha)^5*\cos(\beta)^3 + \\ & 2*\alpha^{1d^2}b^{1d}r^{6*}z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + 2*\alpha^{1d^2}r^{2*}b^*z^2z^{1d}*(\sin(\alpha) - \\ & \sin(\alpha)^3) + 2*\alpha^{1d^2}r^{2*}b^*z^3*\cos(\alpha)*\cos(\beta)^2 + \\ & 8*\alpha^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^3*\cos(\beta) - 6*\alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^3*\cos(\beta)^2 - \\ & 15*\alpha^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^5*\cos(\beta) + 7*\alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^5*\cos(\beta)^2 + \\ & 7*\alpha^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^7*\cos(\beta) - 6*\alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^5*\cos(\beta)^4 - \\ & \alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^7*\cos(\beta)^2 + 6*\alpha^{1d^2}r^{4*}b^*z*\cos(\alpha)^7*\cos(\beta)^4 + \\ & b^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^5*\cos(\beta) + 2*b^{1d^2}r^{4*}b^*z*\cos(\alpha)^5*\cos(\beta)^2 - \\ & b^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^7*\cos(\beta) - 2*b^{1d^2}r^{4*}b^*z*\cos(\alpha)^7*\cos(\beta)^2 + \\ & 2*\alpha^{1d^2}r^{5*}z^{1d}*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + 2*b^{1d^2}r^{2*}z^3z^{1d}*\cos(\alpha)^2*\cos(\beta)^2 \\ & - 2*b^{1d^2}r^{2*}z^3z^{1d}*\cos(\alpha)^4*\cos(\beta)^2 - 2*\alpha^{1d^2}r^{2*}b^*z^3z^2*\cos(\alpha)^2*\sin(\beta) - \\ & 4*\alpha^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^2*\sin(\beta) + 2*\alpha^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^4*\sin(\beta) + \\ & 11*\alpha^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^4*\sin(\beta) - 7*\alpha^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^6*\sin(\beta) + \\ & b^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^4*\sin(\beta) - b^{1d^2}r^{3*}b^*z^2z*\cos(\alpha)^6*\sin(\beta) - \\ & 2*\alpha^{1d^2}r^{4*}b^*z^{1d}*\cos(\alpha)^4*\sin(\alpha) + 2*\alpha^{1d^2}r^{4*}b^*z^{1d}*\cos(\alpha)^6*\sin(\alpha) + \\ & 2*b^{1d^2}r^{2*}b^*z^2z^{1d}*\cos(\alpha)^4 - 2*b^{1d^2}r^{2*}b^*z^2z^{1d}*\cos(\alpha)^6 - \\ & \alpha^{1d^2}r^{2*}b^*z^4*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) - \\ & 4*\alpha^{1d^2}r^{4*}b^*z^2z*\cos(\alpha)^6*\cos(\beta)*\sin(\beta) + \end{aligned}$$

$$\begin{aligned}
& 3*\alpha_1d^2*ra^5*rb*cos(\alpha)^6*cos(\beta)^2*sin(\beta) + \\
& \alpha_1d^2*ra^2*rb^4*cos(\alpha)^8*cos(\beta)*sin(\beta) + \\
& 4*\alpha_1d^2*ra^4*rb^2*cos(\alpha)^8*cos(\beta)*sin(\beta) - \\
& 3*\alpha_1d^2*ra^5*rb*cos(\alpha)^8*cos(\beta)^2*sin(\beta) - \\
& \beta_1d^2*ra^2*rb^4*cos(\alpha)^6*cos(\beta)*sin(\beta) + \beta_1d^2*ra^4*rb^2*cos(\alpha)^6*cos(\beta)*sin(\beta) \\
& + \beta_1d^2*ra^2*rb^4*cos(\alpha)^8*cos(\beta)*sin(\beta) - \\
& \beta_1d^2*ra^4*rb^2*cos(\alpha)^8*cos(\beta)*sin(\beta) - 5*\alpha_1d^2*ra^2*rb^z^3*cos(\alpha)^3*cos(\beta)^2 - \\
& 6*\alpha_1d^2*ra^2*rb^3*z*cos(\alpha)^3*cos(\beta)^2 + 4*\alpha_1d^2*ra^3*rb^2*z*cos(\alpha)^3*cos(\beta)^3 + \\
& 3*\alpha_1d^2*ra^2*rb^z^3*cos(\alpha)^5*cos(\beta)^2 + 5*\alpha_1d^2*ra^2*rb^3*z*cos(\alpha)^5*cos(\beta)^2 + \\
& 3*\alpha_1d^2*ra^3*rb^2*z*cos(\alpha)^5*cos(\beta)^3 + \alpha_1d^2*ra^2*rb^3*z*cos(\alpha)^7*cos(\beta)^2 - \\
& 7*\alpha_1d^2*ra^3*rb^2*z*cos(\alpha)^7*cos(\beta)^3 - 2*\beta_1d^2*ra^2*rb^z^3*cos(\alpha)^3*cos(\beta)^2 + \\
& 2*\beta_1d^2*ra^2*rb^z^3*cos(\alpha)^5*cos(\beta)^2 - 2*\beta_1d^2*ra^2*rb^3*z*cos(\alpha)^5*cos(\beta)^2 + \\
& 2*\beta_1d^2*ra^2*rb^3*z*cos(\alpha)^7*cos(\beta)^2 + 4*\alpha_1d^2*ra^4*z^2*cos(\alpha)^2*cos(\beta)*sin(\beta) \\
& - 11*\alpha_1d^2*ra^4*z^2*cos(\alpha)^4*cos(\beta)*sin(\beta) + \\
& 7*\alpha_1d^2*ra^4*z^2*cos(\alpha)^6*cos(\beta)*sin(\beta) + \\
& \beta_1d^2*ra^2*z^4*cos(\alpha)^2*cos(\beta)*sin(\beta) - \beta_1d^2*ra^2*z^4*cos(\alpha)^4*cos(\beta)*sin(\beta) - \\
& \beta_1d^2*ra^4*z^2*cos(\alpha)^4*cos(\beta)*sin(\beta) + \beta_1d^2*ra^4*z^2*cos(\alpha)^6*cos(\beta)*sin(\beta) - \\
& 2*ra^2*rb^2*z^1d^2*cos(\alpha)^4*cos(\beta)*sin(\beta) + 2*ra^3*rb^z^1d^2*cos(\alpha)^4*cos(\beta)^2*sin(\beta) + \\
& 2*ra^2*rb^2*z^1d^2*cos(\alpha)^6*cos(\beta)*sin(\beta) - 2*ra^3*rb^z^1d^2*cos(\alpha)^6*cos(\beta)^2*sin(\beta) - \\
& 2*ra^2*z^2z^1d^2*cos(\alpha)^2*cos(\beta)*sin(\beta) + 2*ra^2*z^2z^1d^2*cos(\alpha)^4*cos(\beta)*sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^4*rb^2*cos(\alpha)^7*sin(\alpha) + 2*\alpha_1d*\beta_1d*ra^2*z^4*cos(\alpha)^3*sin(\alpha) - \\
& 6*\alpha_1d*\beta_1d*ra^4*z^2*cos(\alpha)^3*sin(\alpha) + 6*\alpha_1d*\beta_1d*ra^4*z^2*cos(\alpha)^5*sin(\alpha) + \\
& 2*\alpha_1d^2*ra*rb^4*z*cos(\alpha)^3*cos(\beta) - 2*\alpha_1d^2*ra*rb^4*z*cos(\alpha)^5*cos(\beta) + \\
& 2*\alpha_1d*ra^5*z^1d*cos(\alpha)^4*cos(\beta)*sin(\alpha) - 2*\alpha_1d*ra^5*z^1d*cos(\alpha)^6*cos(\beta)*sin(\alpha) \\
& + 2*\beta_1d*ra^4*z^z^1d*cos(\alpha)^4*cos(\beta)^2 - 2*\beta_1d*ra^4*z^z^1d*cos(\alpha)^6*cos(\beta)^2 - \\
& 2*\alpha_1d*ra^2*rb^3*z^1d*cos(\alpha)^4*sin(\alpha) + 2*\beta_1d*ra^3*rb^2*z^1d*cos(\alpha)^5*sin(\beta) - \\
& 2*\beta_1d*ra^3*rb^2*z^1d*cos(\alpha)^7*sin(\beta) - 6*\beta_1d*ra^3*z^2z^1d*cos(\alpha)^3*sin(\beta) + \\
& 6*\beta_1d*ra^3*z^2z^1d*cos(\alpha)^5*sin(\beta) - 2*ra*rb^2*z^z^1d^2*cos(\alpha)^3*cos(\beta) + \\
& 2*ra*rb^2*z^z^1d^2*cos(\alpha)^5*cos(\beta) + 3*\alpha_1d^2*ra^3*rb^3*cos(\alpha)^6*cos(\beta)^2*sin(\beta) - \\
& 2*\alpha_1d^2*ra^4*rb^2*cos(\alpha)^6*cos(\beta)^3*sin(\beta) - \\
& 3*\alpha_1d^2*ra^3*rb^3*cos(\alpha)^8*cos(\beta)^2*sin(\beta) + \\
& 2*\alpha_1d^2*ra^4*rb^2*cos(\alpha)^8*cos(\beta)^3*sin(\beta) + \\
& 4*\alpha_1d^2*ra^4*z^2*cos(\alpha)^4*cos(\beta)^3*sin(\beta) - \\
& 4*\alpha_1d^2*ra^4*z^2*cos(\alpha)^6*cos(\beta)^3*sin(\beta) + 2*ra*rb^z^2z^1d^2*cos(\alpha)^2*sin(\beta) - \\
& 2*ra*rb^z^2z^1d^2*cos(\alpha)^4*sin(\beta) + 6*\alpha_1d*\beta_1d*ra^3*z^3*sin(\alpha)*sin(\beta)*(sin(\alpha)^2 - 1) \\
& - 4*\alpha_1d*\beta_1d*ra^5*rb*cos(\alpha)^7*cos(\beta)*sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^5*z*cos(\alpha)^4*sin(\alpha)*sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^5*z*cos(\alpha)^6*sin(\alpha)*sin(\beta) + \\
& 2*\alpha_1d*ra*rb^4*z^1d*cos(\alpha)^4*cos(\beta)*sin(\alpha) + \\
& 2*\beta_1d*ra^4*rb^z^1d*cos(\alpha)^5*cos(\beta)*sin(\beta) - \\
& 2*\beta_1d*ra^4*rb^z^1d*cos(\alpha)^7*cos(\beta)*sin(\beta) - 2*\alpha_1d*ra^2*rb^z^2z^1d*cos(\alpha)^4*sin(\alpha) \\
& + 8*\alpha_1d^2*ra^2*rb^2*z^2*cos(\alpha)^2*cos(\beta)*sin(\beta) - \\
& 6*\alpha_1d^2*ra^3*rb^z^2*cos(\alpha)^2*cos(\beta)^2*sin(\beta) - \\
& 11*\alpha_1d^2*ra^2*rb^2*z^2*cos(\alpha)^4*cos(\beta)*sin(\beta) + \\
& 5*\alpha_1d^2*ra^3*rb^z^2*cos(\alpha)^4*cos(\beta)^2*sin(\beta) + \\
& 3*\alpha_1d^2*ra^2*rb^2*z^2*cos(\alpha)^6*cos(\beta)*sin(\beta) + \\
& \alpha_1d^2*ra^3*rb^z^2*cos(\alpha)^6*cos(\beta)^2*sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 4*\alpha_1d*\beta_1d*ra^3*rb^3*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra^5*rb*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d*ra^2*z^4*\cos(\alpha)*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^3*\sin(\alpha) + \\
& 6*\alpha_1d*\beta_1d*ra^3*z^3*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 8*\alpha_1d*ra^3*rb^2*z^1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) - \\
& 6*\alpha_1d*ra^4*rb*z^1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*ra^3*rb^2*z^1d*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& 2*\alpha_1d*ra^4*rb*z^1d*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) - \\
& 2*\beta_1d*ra^2*rb^3*z^1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 2*\beta_1d*ra^2*rb^3*z^1d*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 6*\beta_1d*ra^2*rb^2*z^2z^1d*\cos(\alpha)^4*\cos(\beta)^2 + 6*\beta_1d*ra^2*rb^2*z^2z^1d*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 2*\alpha_1d*ra^3*z^2z^1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d*ra^3*z^2z^1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + 8*\beta_1d*ra^3*rb*z^2z^1d*\cos(\alpha)^4*\cos(\beta) - \\
& 8*\beta_1d*ra^3*rb*z^2z^1d*\cos(\alpha)^6*\cos(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^4*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) + \\
& 8*\alpha_1d*\beta_1d*ra^4*rb^2*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha) - \\
& 4*\alpha_1d*\beta_1d*ra^3*rb^3*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d*ra^4*rb^2*\cos(\alpha)^7*\cos(\beta)^4*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^2*z^4*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d*ra^4*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*\beta_1d*ra^4*z^2*\cos(\alpha)^5*\cos(\beta)^4*\sin(\alpha) - \\
& 6*\alpha_1d*ra^2*rb^3*z^1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*ra^3*rb^2*z^1d*\cos(\alpha)^4*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d*ra^3*rb^2*z^1d*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb^2*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra^3*rb^2*z*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra*rb^2*z^2z^1d*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha) + \\
& 2*\alpha_1d*ra*rb^2*z^2z^1d*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 6*\beta_1d*ra^2*rb*z^2z^1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 6*\beta_1d*ra^2*rb*z^2z^1d*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*ra^2*z^3z^1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^4*z^2z^1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra^4*z^2z^1d*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^3*rb*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^5*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra*rb*z^3z^1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^2*rb*z^2z^1d*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*ra^2*rb*z^2z^1d*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& 2*\alpha_1d*ra^2*z^3z^1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^4*z^2z^1d*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^2*z^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) - \\
& 2*\alpha_1d*ra*rb*z^3z^1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra*rb^3z^2z^1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d*ra^3*rb*z^2z^1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*ra^3*rb*z^2z^1d*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 8*\alpha1d*\beta1d*ra^3*rb*z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 12*\alpha1d*\beta1d*ra^3*rb*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 8*\alpha1d*\beta1d*ra^3*rb^2*z*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha1d*\beta1d*ra^4*rb*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 10*\alpha1d*\beta1d*ra^4*rb*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha1d*\beta1d*ra^2*rb*z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha1d*\beta1d*ra^2*rb*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha1d*\beta1d*ra^2*rb^3*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha1d*\beta1d*ra^2*rb^3*z*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha1d*\beta1d*ra^4*rb*z*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 6*\alpha1d*ra^2*rb^2*z^2d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha1d*ra^3*rb*z^2d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha1d*ra^3*rb*z^2d*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha)*\sin(\beta))/(ra^6*\cos(\alpha)^6 - \\
& ra^6*\cos(\alpha)^8 + rb^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + \\
& 3*ra^4*rb^2*\cos(\alpha)^6 - ra^2*rb^4*\cos(\alpha)^8 - 2*ra^4*rb^2*\cos(\alpha)^8 + 15*ra^2*z^4*\cos(\alpha)^2 - \\
& 15*ra^2*z^4*\cos(\alpha)^4 + 15*ra^4*z^2*\cos(\alpha)^4 - 15*ra^4*z^2*\cos(\alpha)^6 + \\
& 3*rb^2*z^4*\cos(\alpha)^2 - 2*rb^2*z^4*\cos(\alpha)^4 + 3*rb^4*z^2*\cos(\alpha)^4 - rb^4*z^2*\cos(\alpha)^6 + \\
& ra^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 12*ra^2*rb^2*z^2*\cos(\alpha)^6 + \\
& 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) - 20*ra^3*z^3*\cos(\alpha)^5*\sin(\beta) + 6*ra*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 + ra^2*rb^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*ra^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) + 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta) - \\
& 6*ra*z^5*\cos(\alpha)^3*\sin(\beta) + 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) - 6*ra^5*z*\cos(\alpha)^7*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) + 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta)^3 - 6*ra*rb*z^4*\cos(\alpha)^2*\cos(\beta) + 4*ra*rb*z^4*\cos(\alpha)^4*\cos(\beta) \\
& + 6*ra*rb^4*z*\cos(\alpha)^5*\sin(\beta) - 2*ra*rb^4*z*\cos(\alpha)^7*\sin(\beta) + \\
& 6*ra^2*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) + \\
& 12*ra^3*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - 12*ra*rb^3*z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 36*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta) + 4*ra*rb^3*z^2*\cos(\alpha)^6*\cos(\beta) + \\
& 24*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta) + 12*ra*rb^2*z^3*\cos(\alpha)^3*\sin(\beta) - \\
& 8*ra*rb^2*z^3*\cos(\alpha)^5*\sin(\beta) + 12*ra^3*rb^2*z*\cos(\alpha)^5*\sin(\beta) - \\
& 8*ra^3*rb^2*z*\cos(\alpha)^7*\sin(\beta) + 24*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta)^3 - \\
& 20*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta)^3 + 4*ra^5*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
& 24*ra^2*rb*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) + 16*ra^2*rb*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 24*ra^2*rb^3*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + 8*ra^2*rb^3*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) - \\
& 8*ra^4*rb*z*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) + 24*ra^3*rb^2*z*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - \\
& 4*ra^3*rb^2*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - 24*ra^4*rb*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 16*ra^4*rb*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta)); \\
& YC2233=(ra*\cos(\alpha)^4*(rb - ra*\cos(\beta))^2*(2*\alpha1d^2*rb*z^4*\sin(\beta) - \alpha1d^2*ra*z^4*\sin(2*\beta) - \\
& 3*\alpha1d^2*ra*rb*z^3*\cos(\alpha)^3 + \alpha1d^2*ra*rb^3*z*\cos(\alpha)^5 + \\
& 3*\alpha1d^2*ra^3*rb*z*\cos(\alpha)^5 + \beta1d^2*ra*rb^3*z*\cos(\alpha)^3 + \beta1d^2*ra*rb^3*z*\cos(\alpha)^5 \\
& - \beta1d^2*ra^3*rb*z*\cos(\alpha)^5 - 2*\beta1d*ra^4*z^2d*\cos(\alpha)^5*\sin(\beta) - \\
& \alpha1d^2*ra^2*z^3*\cos(\alpha)^3*\cos(\beta)^3 - 4*\alpha1d^2*ra^2*z^3*\cos(\alpha)*\cos(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 3*\alpha_1d^2*ra^4*z*cos(alpha)^5*cos(beta) - 2*\alpha_1d^2*rb^2*z^3*cos(alpha)*cos(beta) - \\
& \beta_1d^2*ra^4*z*cos(alpha)^5*cos(beta) + \alpha_1d^2*ra^4*rb*cos(alpha)^6*sin(beta) - \\
& \beta_1d^2*ra^4*rb*cos(alpha)^6*sin(beta) - 2*\alpha_1d^2*rb^2*z^4*cos(alpha)^2*sin(beta) - \\
& 4*ra^2*z^2d^2*cos(alpha)^3*cos(beta) - 2*rb^2*z^2z1d^2*cos(alpha)^3*cos(beta) + \\
& 2*ra^2*rb^2z1d^2*cos(alpha)^4*sin(beta) + 2*rb^2z^2z1d^2*cos(alpha)^2*sin(beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*z^4*sin(2*alpha) + 4*\alpha_1d^2*ra*rb^2z^3*cos(alpha) - \\
& 2*\beta_1d*ra^2z^3z1d*cos(alpha)^2 - 6*\beta_1d*ra^3z^2z1d*cos(alpha)^4 - \\
& \alpha_1d^2*ra^5*cos(alpha)^6*cos(beta)*sin(beta) + 2*\alpha_1d^2*ra^2z^3*cos(alpha)*cos(beta)^3 + \\
& 3*\alpha_1d^2*ra^2z^3*cos(alpha)^3*cos(beta) + 3*\alpha_1d^2*ra^4z*cos(alpha)^5*cos(beta)^3 + \\
& 2*\alpha_1d^2*rb^2z^3*cos(alpha)^3*cos(beta) + \beta_1d^2*ra^2z^3*cos(alpha)^3*cos(beta) + \\
& 4*ra*rb^2z^2z1d^2*cos(alpha)^3 + \alpha_1d^2*ra^2*rb^3*cos(alpha)^6*sin(beta) + \\
& \beta_1d^2*ra^2*rb^3*cos(alpha)^6*sin(beta) - 2*ra^3z1d^2*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 2*ra^2z^2z1d^2*cos(alpha)^3*cos(beta)^3 - 2*\alpha_1d*\beta_1d*ra^5*cos(alpha)^5*sin(alpha) + \\
& 2*\beta_1d*ra*rb^2z^2z1d*cos(alpha)^4 - \alpha_1d^2*ra*rb^4*cos(alpha)^6*cos(beta)*sin(beta) - \\
& \beta_1d^2*ra*rb^4*cos(alpha)^6*cos(beta)*sin(beta) - \alpha_1d^2*ra*rb^2z^3*cos(alpha)^3*cos(beta)^2 - \\
& 5*\alpha_1d^2*ra^2*rb^2z^2*cos(alpha)^5*cos(beta) - \alpha_1d^2*ra*rb^3z*cos(alpha)^5*cos(beta)^2 + \\
& \alpha_1d^2*ra^3*rb^2z*cos(alpha)^5*cos(beta)^2 - 4*\alpha_1d^2*ra^3*rb^2z*cos(alpha)^5*cos(beta)^4 - \\
& 2*\beta_1d^2*ra*rb^2z^3*cos(alpha)^3*cos(beta)^2 + \beta_1d^2*ra^2*rb^2z^2*cos(alpha)^5*cos(beta) - \\
& 2*\beta_1d^2*ra*rb^3z^2*cos(alpha)^5*cos(beta)^2 + 2*\beta_1d^2*ra^3*rb^2z*cos(alpha)^5*cos(beta)^2 + \\
& 2*\alpha_1d^2*ra^2z^4*cos(alpha)^2*cos(beta)*sin(beta) + \beta_1d^2*ra^2z^4*cos(alpha)^2*cos(beta)*sin(beta) + \\
& 2*\alpha_1d^2*ra^2*rb^2z^2*cos(alpha)^2*sin(beta) + \alpha_1d^2*ra^2*rb^2z^2*cos(alpha)^4*sin(beta) + \\
& \beta_1d^2*ra^2*rb^2z^2*cos(alpha)^4*sin(beta) - 2*ra*rb^2z1d^2*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 2*ra^2z^2z1d^2*cos(alpha)^2*cos(beta)*sin(beta) - 4*\alpha_1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)*sin(beta) + \\
& 3*\alpha_1d^2*ra^4*rb*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& \beta_1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)*sin(beta) + 5*\alpha_1d^2*ra^2*rb^2z^2*cos(alpha)^5*cos(beta)^3 - \\
& 2*\alpha_1d^2*ra^3z^2*cos(alpha)^2*cos(beta)*sin(beta) - \\
& \alpha_1d^2*ra^3z^2*cos(alpha)^4*cos(beta)*sin(beta) - \beta_1d^2*ra^3z^2*cos(alpha)^4*cos(beta)*sin(beta) \\
& + 2*ra^2*rb^2z1d^2*cos(alpha)^4*cos(beta)^2*sin(beta) - 2*\alpha_1d*\beta_1d*ra^3*rb^2*cos(alpha)^5*sin(alpha) \\
& + 8*\alpha_1d*ra*rb^2z^2z1d*(sin(alpha) - sin(alpha)^3) - 18*\alpha_1d*\beta_1d*ra^3z^2*cos(alpha)^3*sin(alpha) + \\
& 2*\beta_1d*ra^2z^3z1d*cos(alpha)^2*cos(beta)^2 + 2*\beta_1d*ra^3z^2z1d*cos(alpha)^4*cos(beta)^2 + \\
& 2*\beta_1d*ra^2*rb^2z1d*cos(alpha)^5*sin(beta) - 6*\beta_1d*ra^2z^2z1d*cos(alpha)^3*sin(beta) + \\
& 3*\alpha_1d^2*ra^2*rb^3*cos(alpha)^6*cos(beta)^2*sin(beta) - \\
& 2*\alpha_1d^2*ra^3*rb^2*cos(alpha)^6*cos(beta)^3*sin(beta) + \\
& 2*\alpha_1d^2*ra^3z^2*cos(alpha)^4*cos(beta)^3*sin(beta) + \\
& 4*\alpha_1d*ra^2z^2z1d*cos(alpha)^2*cos(beta)^3*sin(alpha) + \\
& 14*\alpha_1d*\beta_1d*ra^2z^3*sin(alpha)*sin(beta)*(sin(alpha)^2 - 1) + \\
& 8*\alpha_1d*\beta_1d*ra^4*rb*cos(alpha)^5*cos(beta)*sin(alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^2z^4*cos(alpha)*cos(beta)^2*sin(alpha) - \\
& 10*\alpha_1d*\beta_1d*ra^4z*cos(alpha)^4*sin(alpha)*sin(beta) - \\
& 2*\beta_1d*ra*rb^3z1d*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 2*\beta_1d*ra^3*rb^2z1d*cos(alpha)^5*cos(beta)*sin(beta) - 6*\beta_1d*ra*rb^2z^2z1d*cos(alpha)^4*cos(beta)^2 + \\
& 2*\alpha_1d^2*ra^2*rb^2z^2*cos(alpha)^2*cos(beta)^2*sin(beta) - \\
& 3*\alpha_1d^2*ra^2*rb^2z^2*cos(alpha)^4*cos(beta)^2*sin(beta) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^3*cos(alpha)^5*cos(beta)*sin(alpha) - \\
& 2*\alpha_1d*\beta_1d*ra*rb^4*cos(alpha)^5*cos(beta)^2*sin(alpha) - \\
& 8*\alpha_1d*ra^2z^2z1d*cos(alpha)^2*cos(beta)*sin(alpha) - \\
& 4*\alpha_1d*rb^2z^2z1d*cos(alpha)^2*cos(beta)*sin(alpha) + 8*\beta_1d*ra^2*rb^2z^2z1d*cos(alpha)^4*cos(beta) -
\end{aligned}$$

$$\begin{aligned}
& 10*\alpha_1d*\beta_1d*ra^3*rb^2*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*\beta_1d*ra^2*rb^3*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) + \\
& 12*\alpha_1d*\beta_1d*ra^3*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) + \\
& 4*\alpha_1d*rb^z^3*z_1d*\cos(\alpha)*\sin(\alpha)*\sin(\beta) - \\
& 2*\alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\beta) + \\
& \alpha_1d^2*ra*rb^2*z^2*\cos(\alpha)^4*\cos(\beta)*\sin(\beta) - \\
& 2*\alpha_1d*\beta_1d*ra^2*rb^2*z*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*ra^3*z*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\alpha_1d*\beta_1d*ra*rb^2*z^2*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha) - \\
& 12*\alpha_1d*\beta_1d*ra^2*rb*z^2*\cos(\alpha)^3*\cos(\beta)^3*\sin(\alpha) + \\
& 6*\beta_1d*ra*rb*z^2*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 4*\alpha_1d*ra^z^3*z_1d*\cos(\alpha)*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*\beta_1d*ra^2*z^3*\cos(\alpha)^2*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 24*\alpha_1d*\beta_1d*ra^2*rb^z^2*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) - \\
& 12*\alpha_1d*\beta_1d*ra^2*rb^2*z*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 10*\alpha_1d*\beta_1d*ra*rb^z^3*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 2*\alpha_1d*\beta_1d*ra*rb^3*z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 22*\alpha_1d*\beta_1d*ra^3*rb^z*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\alpha_1d*ra*rb^2*z*z_1d*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 4*\alpha_1d*ra^2*rb*z*z_1d*\cos(\alpha)^3*\cos(\beta)^2*\sin(\alpha)*\sin(\beta))) / (ra^8*\cos(\alpha)^8 - \\
& ra^8*\cos(\alpha)^{10} + rb^8*\cos(\alpha)^8 - z^8*\cos(\alpha)^2 + z^8 + 4*ra^2*rb^6*\cos(\alpha)^8 + \\
& 6*ra^4*rb^4*\cos(\alpha)^8 + 4*ra^6*rb^2*\cos(\alpha)^8 - ra^2*rb^6*\cos(\alpha)^{10} - \\
& 3*ra^4*rb^4*\cos(\alpha)^{10} - 3*ra^6*rb^2*\cos(\alpha)^{10} + 28*ra^2*z^6*\cos(\alpha)^2 - \\
& 28*ra^2*z^6*\cos(\alpha)^4 + 70*ra^4*z^4*\cos(\alpha)^4 - 70*ra^4*z^4*\cos(\alpha)^6 + \\
& 28*ra^6*z^2*\cos(\alpha)^6 - 28*ra^6*z^2*\cos(\alpha)^8 + 4*rb^2*z^6*\cos(\alpha)^2 - 3*rb^2*z^6*\cos(\alpha)^4 \\
& + 6*rb^4*z^4*\cos(\alpha)^4 - 3*rb^4*z^4*\cos(\alpha)^6 + 4*rb^6*z^2*\cos(\alpha)^6 - rb^6*z^2*\cos(\alpha)^8 + \\
& ra^8*\cos(\alpha)^{10}*\cos(\beta)^2 + 60*ra^2*rb^2*z^4*\cos(\alpha)^4 - 45*ra^2*rb^2*z^4*\cos(\alpha)^6 + \\
& 36*ra^2*rb^4*z^2*\cos(\alpha)^6 + 60*ra^4*rb^2*z^2*\cos(\alpha)^6 - 18*ra^2*rb^4*z^2*\cos(\alpha)^8 - \\
& 45*ra^4*rb^2*z^2*\cos(\alpha)^8 + 56*ra^3*z^5*\cos(\alpha)^3*\sin(\beta) - 56*ra^3*z^5*\cos(\alpha)^5*\sin(\beta) + \\
& 56*ra^5*z^3*\cos(\alpha)^5*\sin(\beta) - 56*ra^5*z^3*\cos(\alpha)^7*\sin(\beta) + 8*ra^z^7*\cos(\alpha)*\sin(\beta) + \\
& 24*ra^2*rb^6*\cos(\alpha)^8*\cos(\beta)^2 + 48*ra^4*rb^4*\cos(\alpha)^8*\cos(\beta)^2 + \\
& 24*ra^6*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 32*ra^3*rb^5*\cos(\alpha)^8*\cos(\beta)^3 - \\
& 32*ra^5*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + ra^2*rb^6*\cos(\alpha)^{10}*\cos(\beta)^2 + \\
& 16*ra^4*rb^4*\cos(\alpha)^8*\cos(\beta)^4 - 9*ra^4*rb^4*\cos(\alpha)^{10}*\cos(\beta)^2 - \\
& 9*ra^6*rb^2*\cos(\alpha)^{10}*\cos(\beta)^2 - 6*ra^3*rb^5*\cos(\alpha)^{10}*\cos(\beta)^3 - \\
& 4*ra^5*rb^3*\cos(\alpha)^{10}*\cos(\beta)^3 + 12*ra^4*rb^4*\cos(\alpha)^{10}*\cos(\beta)^4 + \\
& 12*ra^6*rb^2*\cos(\alpha)^{10}*\cos(\beta)^4 - 8*ra^5*rb^3*\cos(\alpha)^{10}*\cos(\beta)^5 - \\
& 24*ra^2*z^6*\cos(\alpha)^2*\cos(\beta)^2 + 25*ra^2*z^6*\cos(\alpha)^4*\cos(\beta)^2 - \\
& 80*ra^4*z^4*\cos(\alpha)^4*\cos(\beta)^2 + 16*ra^4*z^4*\cos(\alpha)^4*\cos(\beta)^4 + \\
& 95*ra^4*z^4*\cos(\alpha)^6*\cos(\beta)^2 - 24*ra^6*z^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 28*ra^4*z^4*\cos(\alpha)^6*\cos(\beta)^4 + 39*ra^6*z^2*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 12*ra^6*z^2*\cos(\alpha)^8*\cos(\beta)^4 - 8*ra*rb^7*\cos(\alpha)^8*\cos(\beta) - 8*ra^7*rb*\cos(\alpha)^8*\cos(\beta) \\
& + 6*ra^7*rb*\cos(\alpha)^{10}*\cos(\beta) - 8*ra^z^7*\cos(\alpha)^3*\sin(\beta) + 8*ra^7*z*\cos(\alpha)^7*\sin(\beta) - \\
& 8*ra^7*z*\cos(\alpha)^9*\sin(\beta) - 24*ra^3*rb^5*\cos(\alpha)^8*\cos(\beta) - 24*ra^5*rb^3*\cos(\alpha)^8*\cos(\beta) \\
& + 6*ra^3*rb^5*\cos(\alpha)^{10}*\cos(\beta) + 12*ra^5*rb^3*\cos(\alpha)^{10}*\cos(\beta) - \\
& 6*ra^7*rb*\cos(\alpha)^{10}*\cos(\beta)^3 - 8*ra*rb^z^6*\cos(\alpha)^2*\cos(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 6*ra*rb*z^6*cos(alpha)^4*cos(beta) + 8*ra*rb^6*z*cos(alpha)^7*sin(beta) - 2*ra*rb^6*z*cos(alpha)^9*sin(beta) \\
& - 24*ra^2*rb^2*z^4*cos(alpha)^4*cos(beta)^2 + 27*ra^2*rb^2*z^4*cos(alpha)^6*cos(beta)^2 + \\
& 24*ra^2*rb^4*z^2*cos(alpha)^6*cos(beta)^2 + 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 64*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta)^3 + 3*ra^2*rb^4*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 96*ra^4*rb^2*z^2*cos(alpha)^6*cos(beta)^4 - 18*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^2 - \\
& 52*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta)^3 + 48*ra^4*rb^2*z^2*cos(alpha)^8*cos(beta)^4 - \\
& 32*ra^3*z^5*cos(alpha)^3*cos(beta)^2*sin(beta) + 38*ra^3*z^5*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 32*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + 52*ra^5*z^3*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& 8*ra^5*z^3*cos(alpha)^7*cos(beta)^4*sin(beta) - 24*ra*rb^3*z^4*cos(alpha)^4*cos(beta) - \\
& 120*ra^3*rb*z^4*cos(alpha)^4*cos(beta) + 12*ra*rb^3*z^4*cos(alpha)^6*cos(beta) - \\
& 24*ra*rb^5*z^2*cos(alpha)^6*cos(beta) + 90*ra^3*rb*z^4*cos(alpha)^6*cos(beta) - \\
& 120*ra^5*rb*z^2*cos(alpha)^6*cos(beta) + 6*ra*rb^5*z^2*cos(alpha)^8*cos(beta) + \\
& 90*ra^5*rb*z^2*cos(alpha)^8*cos(beta) + 24*ra*rb^2*z^5*cos(alpha)^3*sin(beta) - \\
& 18*ra*rb^2*z^5*cos(alpha)^5*sin(beta) + 24*ra*rb^4*z^3*cos(alpha)^5*sin(beta) - \\
& 12*ra*rb^4*z^3*cos(alpha)^7*sin(beta) + 24*ra^3*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^4*z*cos(alpha)^9*sin(beta) - \\
& 18*ra^5*rb^2*z*cos(alpha)^9*sin(beta) + 96*ra^3*rb*z^4*cos(alpha)^4*cos(beta)^3 - \\
& 144*ra^3*rb^3*z^2*cos(alpha)^6*cos(beta) - 78*ra^3*rb*z^4*cos(alpha)^6*cos(beta)^3 + \\
& 72*ra^3*rb^3*z^2*cos(alpha)^8*cos(beta) + 96*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 108*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^3 + 24*ra^5*rb*z^2*cos(alpha)^8*cos(beta)^5 + \\
& 6*ra^7*z*cos(alpha)^9*cos(beta)^2*sin(beta) + 80*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 60*ra^3*rb^2*z^3*cos(alpha)^7*sin(beta) - 48*ra^2*rb*z^5*cos(alpha)^3*cos(beta)*sin(beta) + \\
& 36*ra^2*rb*z^5*cos(alpha)^5*cos(beta)*sin(beta) - 160*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 48*ra^2*rb^5*z*cos(alpha)^7*cos(beta)*sin(beta) + 120*ra^4*rb*z^3*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 96*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + 12*ra^2*rb^5*z*cos(alpha)^9*cos(beta)*sin(beta) + \\
& 48*ra^4*rb^3*z*cos(alpha)^9*cos(beta)*sin(beta) - 24*ra^6*rb*z*cos(alpha)^9*cos(beta)^3*sin(beta) - \\
& 96*ra^2*rb^3*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 48*ra^2*rb^3*z^3*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 64*ra^4*rb*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 96*ra^3*rb^4*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 96*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - 72*ra^4*rb*z^3*cos(alpha)^7*cos(beta)^3*sin(beta) - \\
& 64*ra^4*rb^3*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 18*ra^3*rb^4*z*cos(alpha)^9*cos(beta)^2*sin(beta) - \\
& 36*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^2*sin(beta) - 8*ra^4*rb^3*z*cos(alpha)^9*cos(beta)^3*sin(beta) + \\
& 24*ra^5*rb^2*z*cos(alpha)^9*cos(beta)^4*sin(beta) - 48*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 36*ra^6*rb*z*cos(alpha)^9*cos(beta)*sin(beta) + 64*ra^3*rb^2*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - \\
& 12*ra^3*rb^2*z^3*cos(alpha)^7*cos(beta)^2*sin(beta));
\end{aligned}$$

YC2234=0;

YC22=[YC2211 YC2212 YC2213 YC2214; YC2221 YC2222 YC2223 YC2224; YC2231 YC2232 YC2233 YC2234];

$$\begin{aligned}
YG22 = & [-ga*((cos(alpha)^2*(z + ra*cos(alpha)*sin(beta))^2)/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta)) + (sin(alpha)^2*(z + \\
& ra*cos(alpha)*sin(beta))^2)/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + \\
& 2*ra*z*cos(alpha)*sin(beta)) + ((cos(alpha)^2)^(3/2)*(rb - ra*cos(beta))^2*((ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2) - \\
& e2*abs(cos(alpha))))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(3/2))], 0, 0, 0
\end{aligned}$$

$$\begin{aligned}
& ga*((z*tan(alpha) + ra*sin(alpha)*sin(beta))*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(1/2) - e2*abs(cos(alpha))))*(ra^2*cos(alpha)^2 + \\
& z^2 - ra^2*cos(alpha)^2*cos(beta)^2 + 2*ra*z*cos(alpha)*sin(beta))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + \\
& z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) + 2*ra*z*cos(alpha)*sin(beta))^(3/2) - (z*(z +
\end{aligned}$$

$$\begin{aligned}
& ra*\cos(\alpha)*\sin(\beta))*(z*\tan(\alpha) + ra*\sin(\alpha)*\sin(\beta))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 \\
& - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta)) + \\
& (ra*\sin(\alpha)*\sin(\beta)*(\cos(\alpha)^2)^{(3/2)}*(rb - ra*\cos(\beta))^2*((ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + \\
& z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta))^{(1/2)} - \\
& e2*abs(\cos(\alpha))))/(abs(\cos(\alpha))*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}), 0, 0, 0
\end{aligned}$$

$$\begin{aligned}
& ga*((ra*\cos(\alpha)*(\cos(\alpha)^2 - 1)*(z^2*\cos(\beta) + ra*rb*\cos(\alpha)^2 - ra*rb*\cos(\alpha)^2*\cos(\beta)^2 \\
& + rb*z*\cos(\alpha)*\sin(\beta) + ra*z*\cos(\alpha)*\cos(\beta)*\sin(\beta)))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + \\
& z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta) - (ra*\cos(\alpha)^3*(z^2*\cos(\beta) + \\
& ra*rb*\cos(\alpha)^2 - ra*rb*\cos(\alpha)^2*\cos(\beta)^2 + rb*z*\cos(\alpha)*\sin(\beta) + \\
& ra*z*\cos(\alpha)*\cos(\beta)*\sin(\beta)))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + 2*ra*z*\cos(\alpha)*\sin(\beta) + (ra*\cos(\alpha)^2*(rb - \\
& ra*\cos(\beta))*((ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + \\
& 2*ra*z*\cos(\alpha)*\sin(\beta))^{(1/2)} - e2*abs(\cos(\alpha)))*(ra*\cos(\alpha) + z*\sin(\beta) - \\
& rb*\cos(\alpha)*\cos(\beta)))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) + \\
& 2*ra*z*\cos(\alpha)*\sin(\beta))^{(3/2)}), 0, 0, 0];
\end{aligned}$$

$$Y6=YM22+YC22+YG22;$$

$$\begin{aligned}
YM23 = & [z2d*((\tan(\alpha)*(ra*\cos(\alpha) - rb + z*\tan(\alpha))^2)/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2) + ((z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + \\
& (z - ra*\sin(\alpha))^2) + ((ra - rb*\cos(\alpha))*(z - ra*\sin(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(1/2)}))/(\cos(\alpha)*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(3/2)}))^2 + ((z - \\
& ra*\sin(\alpha))^2)/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2) + (\tan(\alpha)*(z - \\
& ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2) - \\
& ((ra - rb*\cos(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)})*(ra*\cos(\alpha) - rb \\
& + z*\tan(\alpha)))/(\cos(\alpha)*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(3/2)}))^2 - \\
& alpha2d*((\tan(\alpha)*(ra*\cos(\alpha) - rb + z*\tan(\alpha))^2)/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2) + ((z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + \\
& (z - ra*\sin(\alpha))^2) + ((ra - rb*\cos(\alpha))*(z - ra*\sin(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(1/2)}))/(\cos(\alpha)*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(3/2)}))*((ra*(z^2*\sin(\alpha) - 2*rb*z*\cos(\alpha) + rb^2*\cos(\alpha)^2*\sin(\alpha) + \\
& ra*z*\cos(\alpha)^2 + rb*z*\cos(\alpha)^3 - ra*rb*\cos(\alpha)^3*\sin(\alpha)))/(ra^2*\cos(\alpha)^2 + \\
& rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^3 - rb*z*\sin(2*\alpha) - (z*(ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2)/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2) + ((z - \\
& ra*\sin(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)})*(ra^2*\cos(\alpha)^2 + z^2 \\
& - ra*z*\sin(\alpha) - ra*rb*\cos(\alpha)^3))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(3/2)}) - ((z - ra*\sin(\alpha))^2)/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2) + \\
& (\tan(\alpha)*(z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2) - ((ra - rb*\cos(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(1/2)})*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/(\cos(\alpha)*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(3/2)}))*((ra*\cos(\alpha)*(ra*z*\sin(\alpha) - ra*rb*\cos(\alpha) - z^2 + ra*rb*\cos(\alpha)^3 + \\
& rb*z*\cos(\alpha)*\sin(\alpha)))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^3 - \\
& rb*z*\sin(2*\alpha) + ((e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)})*(ra*\cos(\alpha) - rb \\
& + z*\tan(\alpha))*(ra^2*\cos(\alpha)^2 + z^2 - ra*z*\sin(\alpha) - ra*rb*\cos(\alpha)^3))/(\cos(\alpha)^2*((ra*\cos(\alpha) - \\
& rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(3/2)}) + (z*(z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha)))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2))), 0, \\
& -(\cos(\alpha)*(ra - rb*\cos(\alpha))*(alpha2d*z^2 - ra*z2d*\cos(\alpha) + rb*z2d*\cos(\alpha))^2 + \\
& alpha2d*ra^2*\cos(\alpha)^2 - alpha2d*ra*z*\sin(\alpha) - alpha2d*ra*rb*\cos(\alpha)^3)/(ra^4*\cos(\alpha)^4 +
\end{aligned}$$

$$\begin{aligned}
& rb^4 \cos(\alpha)^4 + z^4 + 2ra^2 rb^2 \cos(\alpha)^4 + 4ra^2 rb^2 \cos(\alpha)^6 + 2ra^2 z^2 \cos(\alpha)^2 \\
& + 6rb^2 z^2 \cos(\alpha)^2 - 4rb^2 z^2 \cos(\alpha)^4 - 4ra^3 rb^3 \cos(\alpha)^5 - 4ra^3 rb^3 \cos(\alpha)^5 - \\
& 2rb^2 z^3 \sin(2\alpha) - 4ra^2 rb^2 z^2 \cos(\alpha)^3 - 4rb^3 z^3 \cos(\alpha)^3 \sin(\alpha) - \\
& 4ra^2 rb^2 z^2 \cos(\alpha)^3 \sin(\alpha) + 8ra^2 rb^2 z^2 \cos(\alpha)^4 \sin(\alpha), 0 \\
& \alpha 2d^*(((ra^2 \cos(\alpha) * (ra^2 z^2 \sin(\alpha) - ra^2 rb^2 \cos(\alpha) - z^2 + ra^2 rb^2 \cos(\alpha))^3 + \\
& rb^2 z^2 \cos(\alpha) * \sin(\alpha)) / (ra^2 \cos(\alpha)^2 + rb^2 \cos(\alpha)^2 + z^2 - 2ra^2 rb^2 \cos(\alpha))^3 - \\
& rb^2 z^2 \sin(2\alpha)) + ((e^2 - ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2)^{1/2}) * (ra^2 \cos(\alpha) - rb \\
& + z \tan(\alpha)) * (ra^2 \cos(\alpha)^2 + z^2 - ra^2 z^2 \sin(\alpha) - ra^2 rb^2 \cos(\alpha)^3)) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - \\
& rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2)^{3/2}) + (z * (z - ra^2 \sin(\alpha)) * (ra^2 \cos(\alpha) - rb + \\
& z \tan(\alpha))) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2))^{1/2} + \\
& ((ra^2 (z^2 \sin(\alpha) - 2rb^2 z^2 \cos(\alpha) + rb^2 \cos(\alpha)^2 \sin(\alpha) + ra^2 z^2 \cos(\alpha)^2 + rb^2 z^2 \cos(\alpha)^3 \\
& - ra^2 rb^2 \cos(\alpha)^3 \sin(\alpha)) / (ra^2 \cos(\alpha)^2 + rb^2 \cos(\alpha)^2 + z^2 - 2ra^2 rb^2 \cos(\alpha)^3 - \\
& rb^2 z^2 \sin(2\alpha)) - (z * (ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + \\
& (z - ra^2 \sin(\alpha))^2)) + ((z - ra^2 \sin(\alpha)) * (e^2 - ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2)^{1/2}) * (ra^2 \cos(\alpha)^2 + z^2 - ra^2 z^2 \sin(\alpha) - \\
& ra^2 rb^2 \cos(\alpha)^3)) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2)^{3/2}))^{1/2} - \\
& z 2d^*(((\tan(\alpha) * (ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2) / ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2) + ((z - ra^2 \sin(\alpha)) * (ra^2 \cos(\alpha) - rb + z \tan(\alpha))) / ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + \\
& (z - ra^2 \sin(\alpha))^2) + ((ra - rb \cos(\alpha)) * (z - ra^2 \sin(\alpha)) * (e^2 - ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2)^{1/2})) / (\cos(\alpha) * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2)^{3/2})) * ((ra^2 (z^2 \sin(\alpha) - 2rb^2 z^2 \cos(\alpha) + rb^2 \cos(\alpha)^2 \sin(\alpha) + \\
& ra^2 z^2 \cos(\alpha)^2 + rb^2 z^2 \cos(\alpha)^3 - ra^2 rb^2 \cos(\alpha)^3 \sin(\alpha)) / (ra^2 \cos(\alpha)^2 + \\
& rb^2 \cos(\alpha)^2 + z^2 - 2ra^2 rb^2 \cos(\alpha)^3 - rb^2 z^2 \sin(2\alpha)) - (z * (ra^2 \cos(\alpha) - rb + \\
& z \tan(\alpha))^2) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2)) + ((z - \\
& ra^2 \sin(\alpha)) * (e^2 - ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2)^{1/2})) * (ra^2 \cos(\alpha)^2 + z^2 \\
& - ra^2 z^2 \sin(\alpha) - ra^2 rb^2 \cos(\alpha)^3)) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2)^{3/2})) - ((z - ra^2 \sin(\alpha))^2) / ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2) + \\
& (\tan(\alpha) * (z - ra^2 \sin(\alpha)) * (ra^2 \cos(\alpha) - rb + z \tan(\alpha))) / ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2) - ((ra - rb \cos(\alpha)) * (e^2 - ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2)^{1/2}) * (ra^2 \cos(\alpha) - rb + z \tan(\alpha))) / (\cos(\alpha) * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - \\
& ra^2 \sin(\alpha))^2)^{3/2})) * ((ra^2 \cos(\alpha) * (ra^2 z^2 \sin(\alpha) - ra^2 rb^2 \cos(\alpha) - z^2 + ra^2 rb^2 \cos(\alpha)^3 + \\
& rb^2 z^2 \cos(\alpha) * \sin(\alpha)) / (ra^2 \cos(\alpha)^2 + rb^2 \cos(\alpha)^2 + z^2 - 2ra^2 rb^2 \cos(\alpha)^3 - \\
& rb^2 z^2 \sin(2\alpha)) + ((e^2 - ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2)^{1/2}) * (ra^2 \cos(\alpha) - rb \\
& + z \tan(\alpha)) * (ra^2 \cos(\alpha)^2 + z^2 - ra^2 z^2 \sin(\alpha) - ra^2 rb^2 \cos(\alpha)^3)) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - \\
& rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2)^{3/2}) + (z * (z - ra^2 \sin(\alpha)) * (ra^2 \cos(\alpha) - rb + \\
& z \tan(\alpha))) / (\cos(\alpha)^2 * ((ra^2 \cos(\alpha) - rb + z \tan(\alpha))^2 + (z - ra^2 \sin(\alpha))^2))), 0, (\alpha 2d^* z^4 + \\
& \alpha 2d^* ra^2 z^2 + \alpha 2d^* ra^4 \cos(\alpha)^4 - ra^3 z 2d^* \cos(\alpha)^3 - 2\alpha 2d^* ra^3 rb^3 \cos(\alpha)^5 + \\
& 2ra^2 rb^2 z 2d^* \cos(\alpha)^4 - ra^2 rb^2 z 2d^* \cos(\alpha)^5 + rb^2 z^2 z 2d^* \cos(\alpha)^2 + \\
& \alpha 2d^* ra^2 rb^2 \cos(\alpha)^6 + \alpha 2d^* ra^2 z^2 \cos(\alpha)^2 - 2\alpha 2d^* ra^2 z^3 \sin(\alpha) - \\
& ra^2 z^2 z 2d^* \cos(\alpha) - 2\alpha 2d^* ra^3 z^2 \cos(\alpha)^2 \sin(\alpha) - 2\alpha 2d^* ra^2 rb^2 z^2 \cos(\alpha)^3 + \\
& ra^2 z^2 z 2d^* \cos(\alpha) * \sin(\alpha) - ra^2 rb^2 z^2 z 2d^* \cos(\alpha)^2 \sin(\alpha) + \\
& 2\alpha 2d^* ra^2 rb^2 z^2 \cos(\alpha)^3 \sin(\alpha)) / (ra^4 \cos(\alpha)^4 + rb^4 \cos(\alpha)^4 + z^4 + \\
& 2ra^2 rb^2 \cos(\alpha)^4 + 4ra^2 rb^2 \cos(\alpha)^6 + 2ra^2 z^2 \cos(\alpha)^2 + 6rb^2 z^2 \cos(\alpha)^2 \\
& - 4rb^2 z^2 \cos(\alpha)^4 - 4ra^3 rb^3 \cos(\alpha)^5 - 4ra^3 rb^3 \cos(\alpha)^5 - 2rb^2 z^3 \sin(2\alpha) - \\
& 4ra^2 rb^2 z^2 \cos(\alpha)^3 - 4rb^3 z^2 \cos(\alpha)^3 \sin(\alpha) - 4ra^2 rb^2 z^2 \cos(\alpha)^3 \sin(\alpha) + \\
& 8ra^2 rb^2 z^2 \cos(\alpha)^4 \sin(\alpha)), 0 \\
& 0, 0,
\end{aligned}$$

0, 0];

$$\begin{aligned} YC2311 = & (2*\alpha1d^2*z^7 - 2*\alpha1d^2*z^7*\cos(\alpha))^2 + \alpha1d*z^6*z1d*\sin(2*\alpha) + \\ & 2*\alpha1d^2*ra^6*z*\cos(\alpha)^6 - 2*\alpha1d^2*ra^6*z*\cos(\alpha)^8 + 2*\alpha1d^2*rb^6*z*\cos(\alpha)^6 - \\ & 2*\alpha1d^2*rb^6*z*\cos(\alpha)^8 - 6*\alpha1d^2*rb*z^6*\sin(2*\alpha) + 6*\alpha1d^2*ra^2*z^5*\cos(\alpha)^2 - \\ & 6*\alpha1d^2*ra^2*z^5*\cos(\alpha)^4 + 6*\alpha1d^2*ra^4*z^3*\cos(\alpha)^4 - \\ & 6*\alpha1d^2*ra^4*z^3*\cos(\alpha)^6 + 30*\alpha1d^2*rb^2*z^5*\cos(\alpha)^2 - \\ & 54*\alpha1d^2*rb^2*z^5*\cos(\alpha)^4 + 30*\alpha1d^2*rb^4*z^3*\cos(\alpha)^4 + \\ & 24*\alpha1d^2*rb^2*z^5*\cos(\alpha)^6 - 54*\alpha1d^2*rb^4*z^3*\cos(\alpha)^6 + \\ & 24*\alpha1d^2*rb^4*z^3*\cos(\alpha)^8 - 12*\alpha1d^2*ra*rb*z^5*\cos(\alpha)^3 + \\ & 12*\alpha1d^2*ra*rb*z^5*\cos(\alpha)^5 - 12*\alpha1d^2*ra*rb^5*z*\cos(\alpha)^7 - \\ & 12*\alpha1d^2*ra^5*rb*z*\cos(\alpha)^7 + 12*\alpha1d^2*ra*rb^5*z*\cos(\alpha)^9 + \\ & 12*\alpha1d^2*ra^5*rb*z*\cos(\alpha)^9 + 2*\alpha1d*ra^6*z1d*\cos(\alpha)^7*\sin(\alpha) + \\ & 2*\alpha1d*rb^6*z1d*\cos(\alpha)^7*\sin(\alpha) - 40*\alpha1d*rb^3*z^3*z1d*\cos(\alpha)^4 + \\ & 56*\alpha1d*rb^3*z^3*z1d*\cos(\alpha)^6 - 16*\alpha1d*rb^3*z^3*z1d*\cos(\alpha)^8 + \\ & 2*\alpha1d^2*e2^2*ra^4*z*\cos(\alpha)^6 - \alpha1d^2*e2^2*ra^4*z*\cos(\alpha)^8 - \\ & 72*\alpha1d^2*ra*rb^3*z^3*\cos(\alpha)^5 - 24*\alpha1d^2*ra^3*rb*z^3*\cos(\alpha)^5 + \\ & 6*\alpha1d^2*ra^2*rb^4*z*\cos(\alpha)^6 + 6*\alpha1d^2*ra^4*rb^2*z*\cos(\alpha)^6 + \\ & 120*\alpha1d^2*ra*rb^3*z^3*\cos(\alpha)^7 + 24*\alpha1d^2*ra^3*rb*z^3*\cos(\alpha)^7 - \\ & 24*\alpha1d^2*ra^3*rb^3*z^3*\cos(\alpha)^7 + 18*\alpha1d^2*ra^2*rb^4*z*\cos(\alpha)^8 + \\ & 18*\alpha1d^2*ra^4*rb^2*z*\cos(\alpha)^8 - 48*\alpha1d^2*ra*rb^3*z^3*\cos(\alpha)^9 + \\ & 8*\alpha1d^2*ra^3*rb^3*z*\cos(\alpha)^9 - 24*\alpha1d^2*ra^2*rb^4*z*\cos(\alpha)^10 - \\ & 24*\alpha1d^2*ra^4*rb^2*z*\cos(\alpha)^10 + 16*\alpha1d^2*ra^3*rb^3*z*\cos(\alpha)^11 + \\ & 12*\alpha1d^2*rb*z^6*\cos(\alpha)^3*\sin(\alpha) - 2*e2^2*ra^2*z*z1d^2*\cos(\alpha)^6 - \\ & 2*e2^2*rb^2*z*z1d^2*\cos(\alpha)^8 - 12*\alpha1d*rb*z^5*z1d*\cos(\alpha)^2 + \\ & 12*\alpha1d*rb*z^5*z1d*\cos(\alpha)^4 - 12*\alpha1d*rb^5*z*z1d*\cos(\alpha)^6 + \\ & 12*\alpha1d*rb^5*z*z1d*\cos(\alpha)^8 + \alpha1d^2*e2^2*ra^2*z^3*\cos(\alpha)^6 - \\ & 2*\alpha1d^2*e2^2*rb^2*z^3*\cos(\alpha)^6 + 4*\alpha1d^2*e2^2*rb^2*z^3*\cos(\alpha)^8 + \\ & 36*\alpha1d^2*ra^2*rb^2*z^3*\cos(\alpha)^4 - 36*\alpha1d^2*ra^2*rb^2*z^3*\cos(\alpha)^6 - \\ & 40*\alpha1d^2*rb^3*z^4*\cos(\alpha)^3*\sin(\alpha) + 56*\alpha1d^2*rb^3*z^4*\cos(\alpha)^5*\sin(\alpha) - \\ & 12*\alpha1d^2*rb^5*z^2*\cos(\alpha)^5*\sin(\alpha) - 16*\alpha1d^2*rb^3*z^4*\cos(\alpha)^7*\sin(\alpha) + \\ & 12*\alpha1d^2*rb^5*z^2*\cos(\alpha)^7*\sin(\alpha) + 2*e2^2*rb^3*z1d^2*\cos(\alpha)^9*\sin(\alpha) - \\ & 12*\alpha1d*ra^4*rb*z*z1d*\cos(\alpha)^6 + 48*\alpha1d*ra*rb^4*z*z1d*\cos(\alpha)^7 + \\ & 12*\alpha1d*ra^4*rb*z*z1d*\cos(\alpha)^8 - 48*\alpha1d*ra*rb^4*z*z1d*\cos(\alpha)^9 + \\ & \alpha1d^2*e2^2*ra^4*rb*\cos(\alpha)^9*\sin(\alpha) + \alpha1d^2*e2^2*ra*rb^4*\cos(\alpha)^10*\sin(\alpha) + \\ & 2*\alpha1d^2*e2^2*ra^2*rb^2*z*\cos(\alpha)^6 + 11*\alpha1d^2*e2^2*ra^2*rb^2*z*\cos(\alpha)^8 - \\ & 6*\alpha1d^2*e2^2*ra^2*rb^2*z*\cos(\alpha)^10 + (\alpha1d^2*e2^2*z^5*\cos(\alpha)^4*(ra^2*\cos(\alpha)^2 + \\ & rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^3 - rb*z*\sin(2*\alpha))^(1/2))/\text{abs}(\cos(\alpha)) - \\ & 24*\alpha1d^2*ra^2*rb*z^4*\cos(\alpha)^3*\sin(\alpha) + 48*\alpha1d^2*ra*rb^2*z^4*\cos(\alpha)^4*\sin(\alpha) + \\ & 24*\alpha1d^2*ra^2*rb*z^4*\cos(\alpha)^5*\sin(\alpha) - 12*\alpha1d^2*ra^4*rb*z^2*\cos(\alpha)^5*\sin(\alpha) - \\ & 48*\alpha1d^2*ra*rb^2*z^4*\cos(\alpha)^6*\sin(\alpha) + 48*\alpha1d^2*ra*rb^4*z^2*\cos(\alpha)^6*\sin(\alpha) + \\ & 12*\alpha1d^2*ra^4*rb*z^2*\cos(\alpha)^7*\sin(\alpha) - 48*\alpha1d^2*ra*rb^4*z^2*\cos(\alpha)^8*\sin(\alpha) + \\ & 2*e2^2*ra^2*rb*z1d^2*\cos(\alpha)^7*\sin(\alpha) - 4*e2^2*ra*rb^2*z1d^2*\cos(\alpha)^8*\sin(\alpha) + \\ & 4*\alpha1d*e2^2*rb^3*z*z1d*\cos(\alpha)^8 - 12*\alpha1d*ra*rb^5*z1d*\cos(\alpha)^8*\sin(\alpha) - \\ & 12*\alpha1d*ra^5*rb*z1d*\cos(\alpha)^8*\sin(\alpha) - 24*\alpha1d*ra^2*rb*z^3*z1d*\cos(\alpha)^4 + \\ & 48*\alpha1d*ra*rb^2*z^3*z1d*\cos(\alpha)^5 + 24*\alpha1d*ra^2*rb*z^3*z1d*\cos(\alpha)^6 - \\ & 24*\alpha1d*ra^2*rb^3*z^3*z1d*\cos(\alpha)^6 - 48*\alpha1d*ra*rb^2*z^3*z1d*\cos(\alpha)^7 + \\ & 48*\alpha1d*ra^3*rb^2*z^3*z1d*\cos(\alpha)^7 - 24*\alpha1d*ra^2*rb^3*z^3*z1d*\cos(\alpha)^8 - \end{aligned}$$

$$\begin{aligned}
& 48*\alpha^3*ra^3*rb^2*z^2*\cos(\alpha)^9 + 48*\alpha^3*ra^2*rb^3*z^2*\cos(\alpha)^10 + \\
& 4*e^2*2*ra^2*rb^3*z^2*\cos(\alpha)^7 - \alpha^2*e^2*2*ra^2*rb^3*\cos(\alpha)^9*\sin(\alpha) - \\
& \alpha^2*e^2*2*ra^3*rb^2*\cos(\alpha)^10*\sin(\alpha) + 2*\alpha^2*e^2*2*rb^3*z^2*\cos(\alpha)^7*\sin(\alpha) - \\
& 24*\alpha^2*ra^2*rb^3*z^2*\cos(\alpha)^5*\sin(\alpha) + 48*\alpha^2*ra^2*rb^2*z^2*\cos(\alpha)^6*\sin(\alpha) \\
& - 24*\alpha^2*ra^2*rb^3*z^2*\cos(\alpha)^7*\sin(\alpha) - \\
& 48*\alpha^2*ra^3*rb^2*z^2*\cos(\alpha)^8*\sin(\alpha) + 48*\alpha^2*ra^2*rb^3*z^2*\cos(\alpha)^9*\sin(\alpha) \\
& + 2*\alpha^2*e^2*2*ra^2*rb^3*\cos(\alpha)^5 - 5*\alpha^2*e^2*2*ra^2*rb^3*\cos(\alpha)^7 - \\
& 2*\alpha^2*e^2*2*ra^2*rb^3*\cos(\alpha)^7 - 10*\alpha^2*e^2*2*ra^3*rb^2*\cos(\alpha)^7 - \\
& 3*\alpha^2*e^2*2*ra^2*rb^3*\cos(\alpha)^9 + 5*\alpha^2*e^2*2*ra^3*rb^2*\cos(\alpha)^9 + \\
& 2*\alpha^2*e^2*2*ra^2*rb^3*\cos(\alpha)^11 + 2*\alpha^2*e^2*2*ra^4*z^2*\cos(\alpha)^7*\sin(\alpha) + \\
& 6*\alpha^2*ra^2*rb^4*z^2*\cos(\alpha)^7*\sin(\alpha) + 6*\alpha^2*ra^4*rb^2*z^2*\cos(\alpha)^7*\sin(\alpha) - \\
& 24*\alpha^2*ra^3*rb^3*z^2*\cos(\alpha)^8*\sin(\alpha) + 24*\alpha^2*ra^2*rb^4*z^2*\cos(\alpha)^9*\sin(\alpha) + \\
& 24*\alpha^2*ra^4*rb^2*z^2*\cos(\alpha)^9*\sin(\alpha) - 16*\alpha^2*ra^3*rb^3*z^2*\cos(\alpha)^10*\sin(\alpha) + \\
& 6*\alpha^2*ra^2*z^4*z^2*\cos(\alpha)^3*\sin(\alpha) + 6*\alpha^2*ra^4*z^2*z^2*\cos(\alpha)^5*\sin(\alpha) + \\
& 30*\alpha^2*rb^2*z^4*z^2*\cos(\alpha)^3*\sin(\alpha) - 24*\alpha^2*rb^2*z^4*z^2*\cos(\alpha)^5*\sin(\alpha) + \\
& 30*\alpha^2*rb^4*z^2*z^2*\cos(\alpha)^5*\sin(\alpha) - 24*\alpha^2*rb^4*z^2*z^2*\cos(\alpha)^7*\sin(\alpha) + \\
& (3*\alpha^2*e^2*ra^2*z^3*\cos(\alpha)^4*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha))^3 \\
& - rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - (\alpha^2*e^2*ra^2*z^3*\cos(\alpha)^6*(ra^2*\cos(\alpha)^2 + \\
& rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha))^3 - rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& (2*\alpha^2*e^2*rb^2*z^3*\cos(\alpha)^6*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha))^3 - rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& (3*e^2*rb^3*z^2*\cos(\alpha)^9*\sin(\alpha)*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha))^3 - rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& 2*\alpha^2*e^2*2*ra^2*rb^3*z^2*\cos(\alpha)^8*\sin(\alpha) - 10*\alpha^2*e^2*2*ra^3*rb^2*z^2*\cos(\alpha)^8*\sin(\alpha) \\
& - 4*\alpha^2*e^2*2*ra^2*rb^3*z^2*\cos(\alpha)^10*\sin(\alpha) - 72*\alpha^2*ra^2*rb^3*z^2*z^2*\cos(\alpha)^6*\sin(\alpha) \\
& - 24*\alpha^2*ra^3*rb^2*z^2*z^2*\cos(\alpha)^6*\sin(\alpha) + 48*\alpha^2*ra^2*rb^3*z^2*z^2*\cos(\alpha)^8*\sin(\alpha) \\
& + 2*\alpha^2*e^2*2*ra^2*rb^2*z^2*\cos(\alpha)^7*\sin(\alpha) + \\
& 12*\alpha^2*e^2*2*ra^2*rb^2*z^2*\cos(\alpha)^9*\sin(\alpha) - \\
& 2*\alpha^2*e^2*2*ra^2*z^2*z^2*\cos(\alpha)^5*\sin(\alpha) - \\
& 4*\alpha^2*e^2*2*rb^2*z^2*z^2*\cos(\alpha)^7*\sin(\alpha) - \\
& (4*\alpha^2*e^2*ra^2*z^2*\cos(\alpha)^6*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha))^3 - \\
& rb*z*\sin(2*\alpha))^(3/2))/(\cos(\alpha)^2)^(3/2) + (2*\alpha^2*e^2*ra^2*z^2*\cos(\alpha)^8*(ra^2*\cos(\alpha)^2 + \\
& rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha))^3 - rb*z*\sin(2*\alpha))^(3/2))/(\cos(\alpha)^2)^(3/2) + \\
& (\alpha^2*e^2*ra^4*z^2*\cos(\alpha)^8*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha))^3 - \\
& rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + 36*\alpha^2*ra^2*rb^2*z^2*z^2*\cos(\alpha)^5*\sin(\alpha) + \\
& (3*e^2*ra^2*z^2*z^2*\cos(\alpha)^6*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha))^3 - \\
& rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) + (3*e^2*rb^2*z^2*z^2*\cos(\alpha)^8*(ra^2*\cos(\alpha)^2 + \\
& rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha))^3 - rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& 4*\alpha^2*e^2*2*ra^2*rb^2*z^2*z^2*\cos(\alpha)^7 + 4*\alpha^2*e^2*2*ra^2*rb^2*z^2*z^2*\cos(\alpha)^8 - \\
& 4*\alpha^2*e^2*2*ra^2*rb^2*z^2*z^2*\cos(\alpha)^9 - 12*\alpha^2*ra^2*rb^2*z^4*z^2*\cos(\alpha)^4*\sin(\alpha) - \\
& 2*\alpha^2*e^2*2*ra^2*rb^2*z^2*\cos(\alpha)^5*\sin(\alpha) + \\
& 5*\alpha^2*e^2*2*ra^2*rb^2*z^2*\cos(\alpha)^7*\sin(\alpha) - \\
& 5*\alpha^2*e^2*2*ra^2*rb^2*z^2*\cos(\alpha)^8*\sin(\alpha) + \\
& (2*\alpha^2*e^2*ra^2*rb^2*z^3*\cos(\alpha)^5*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha))^3 - rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
& (2*\alpha^2*e^2*ra^2*rb^2*z^3*\cos(\alpha)^7*(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha))^3 - rb*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) +
\end{aligned}$$

$$\begin{aligned}
& \alpha^2 r^2 z^3 \cos(\alpha) + 2 \alpha^2 r^2 z^3 \cos(\alpha) + 2 r^2 z^2 d^2 \cos(\alpha)^2 - \\
& \alpha^2 r^2 z^3 \cos(\alpha)^3 - 4 \alpha^2 r^2 z^3 \cos(\alpha)^2 + 2 \alpha^2 r^2 z^3 d^2 (\sin(\alpha) - \\
& \sin(\alpha)^3) + 2 r^2 z^2 d^2 (\sin(\alpha) - \sin(\alpha)^3) - 2 r^2 z^2 d^2 \cos(\alpha) - \\
& \alpha^2 r^2 z^2 \sin(2\alpha) - 8 \alpha^2 r^2 z^2 \cos(\alpha)^2 + \\
& 3 \alpha^2 r^2 z^2 \cos(\alpha)^3 + 4 \alpha^2 r^2 z^2 \cos(\alpha)^4 - \\
& 2 \alpha^2 r^2 z^2 \cos(\alpha)^5 + 2 \alpha^2 r^2 z^2 d^2 (\sin(\alpha) - \sin(\alpha)^3) - \\
& 2 \alpha^2 r^2 z^2 d^2 \sin(\alpha) - \alpha^2 r^2 z^2 \cos(\alpha)^4 \sin(\alpha) + \\
& \alpha^2 r^2 z^2 \cos(\alpha)^4 \sin(\alpha) + 2 \alpha^2 r^2 z^2 \cos(\alpha) + \\
& 5 \alpha^2 r^2 z^2 (\sin(\alpha) - \sin(\alpha)^3) - 4 \alpha^2 r^2 z^2 d^2 \cos(\alpha)^2 - \\
& 2 \alpha^2 r^2 z^2 \sin(\alpha) + 2 \alpha^2 r^2 z^2 d^2 \sin(2\alpha) - \\
& 8 \alpha^2 r^2 z^2 d^2 \cos(\alpha)^3 \sin(\alpha) + 4 \alpha^2 r^2 z^2 d^2 \cos(\alpha)^4 \sin(\alpha) + \\
& 4 \alpha^2 r^2 z^2 d^2 \cos(\alpha)^3) / (r^6 \cos(\alpha)^6 + r^6 \cos(\alpha)^6 + z^6 + \\
& 3 r^4 z^4 \cos(\alpha)^6 + 3 r^4 z^4 r^2 \cos(\alpha)^6 - 12 r^3 z^3 \cos(\alpha)^7 + \\
& 12 r^2 z^2 r^4 \cos(\alpha)^8 + 12 r^2 z^2 r^4 \cos(\alpha)^8 - 8 r^3 z^3 \cos(\alpha)^9 + \\
& 3 r^2 z^2 z^4 \cos(\alpha)^2 + 3 r^2 z^2 z^4 \cos(\alpha)^4 + 15 r^2 z^2 z^4 \cos(\alpha)^2 - 12 r^2 z^2 z^4 \cos(\alpha)^4 \\
& + 15 r^2 z^2 z^4 \cos(\alpha)^4 - 12 r^2 z^2 z^4 \cos(\alpha)^6 - 6 r^2 z^2 z^4 \cos(\alpha)^7 - 6 r^2 z^2 z^4 \cos(\alpha)^7 - \\
& 3 r^2 z^2 z^5 \sin(2\alpha) + 18 r^2 z^2 z^2 \cos(\alpha)^4 - 20 r^2 z^2 z^3 \cos(\alpha)^3 \sin(\alpha) + \\
& 8 r^2 z^2 z^3 \cos(\alpha)^5 \sin(\alpha) - 6 r^2 z^2 z^4 \cos(\alpha)^3 - 36 r^2 z^2 z^2 \cos(\alpha)^5 - \\
& 12 r^2 z^2 z^3 \cos(\alpha)^5 + 24 r^2 z^2 z^3 \cos(\alpha)^7 - 6 r^2 z^2 z^5 \cos(\alpha)^5 \sin(\alpha) - \\
& 6 r^2 z^2 z^4 \cos(\alpha)^5 \sin(\alpha) + 24 r^2 z^2 z^4 \cos(\alpha)^6 \sin(\alpha) - \\
& 12 r^2 z^2 z^3 \cos(\alpha)^3 \sin(\alpha) + 24 r^2 z^2 z^3 \cos(\alpha)^4 \sin(\alpha) - \\
& 12 r^2 z^2 z^3 \cos(\alpha)^5 \sin(\alpha) + 24 r^2 z^2 z^3 \cos(\alpha)^6 \sin(\alpha) - \\
& 24 r^2 z^2 z^3 \cos(\alpha)^7 \sin(\alpha));
\end{aligned}$$

YC2314=0;

$$\begin{aligned}
& \text{YC2321} = z^2 d^2 ((r^2 \sin(\alpha) r^2 \cos(\alpha)^2 + r^2 z^2 \cos(\alpha)^3 - 2 r^2 z^2 \cos(\alpha) - \\
& r^2 \sin(\alpha) r^2 \cos(\alpha)^3 + \sin(\alpha) z^2 + r^2 z^2 \cos(\alpha)^2)) / (r^2 \cos(\alpha)^2 - 2 r^2 r^2 \cos(\alpha)^3 \\
& + r^2 z^2 \cos(\alpha)^2 - \sin(2\alpha) r^2 z + z^2) - (z^2 (r^2 \cos(\alpha) - r^2 + \\
& z^2 \tan(\alpha))^2) / (\cos(\alpha)^2 ((r^2 \cos(\alpha) - r^2 + z^2 \tan(\alpha))^2 + (z - r^2 \sin(\alpha))^2)) + ((z - \\
& r^2 \sin(\alpha))^2 (e^2 - ((r^2 \cos(\alpha) - r^2 + z^2 \tan(\alpha))^2 + (z - r^2 \sin(\alpha))^2)^{1/2})) (r^2 \cos(\alpha)^2 - \\
& \sin(\alpha) r^2 z - r^2 r^2 \cos(\alpha)^3 + z^2) / (\cos(\alpha)^2 ((r^2 \cos(\alpha) - r^2 + z^2 \tan(\alpha))^2 + (z - \\
& r^2 \sin(\alpha))^2)^{3/2}) * (((r^2 \cos(\alpha) - r^2 + z^2 \tan(\alpha)) (r^2 \cos(\alpha)^2 - \sin(\alpha) r^2 z - \\
& \alpha^2 d^2 \sin(\alpha) r^2 z - \alpha^2 d^2 r^2 r^2 \cos(\alpha)^3 - z^2 d^2 r^2 \cos(\alpha) + \alpha^2 d^2 z^2 + \\
& r^2 z^2 d^2 \cos(\alpha)^2)) / (\cos(\alpha)^2 ((r^2 \cos(\alpha) - r^2 + z^2 \tan(\alpha))^2 + (z - \\
& r^2 \sin(\alpha))^2)^{3/2}) (r^2 \cos(\alpha)^2 - 2 r^2 r^2 \cos(\alpha)^3 + r^2 z^2 \cos(\alpha)^2 - \sin(2\alpha) r^2 z + \\
& z^2) + ((\cos(\alpha)^2)^{3/2} (z - r^2 \sin(\alpha)) (-\alpha^2 d^2 \sin(\alpha) r^2 z^3 \cos(\alpha)^2 + \\
& 4 \alpha^2 d^2 \sin(\alpha) r^2 z^2 \cos(\alpha)^3 + \alpha^2 d^2 r^2 z^2 \cos(\alpha)^2 - \\
& 2 \alpha^2 d^2 \sin(\alpha) r^2 z^2 \cos(\alpha)^4 - \alpha^2 d^2 \sin(\alpha) r^2 z^2 \cos(\alpha)^2 - \\
& 4 \alpha^2 d^2 r^2 z^2 \cos(\alpha)^3 - 2 z^2 d^2 \sin(\alpha) r^2 z^2 \cos(\alpha)^2 + \alpha^2 d^2 \sin(\alpha) r^2 z^2 + \\
& 2 z^2 d^2 r^2 z^2 \cos(\alpha) + 3 \alpha^2 d^2 r^2 z^2 \cos(\alpha)^2 + 2 z^2 d^2 \sin(\alpha) r^2 z^2 \cos(\alpha)^3 - \\
& 4 \alpha^2 d^2 \sin(\alpha) r^2 z^2 \cos(\alpha) - 2 z^2 d^2 r^2 z^2 \cos(\alpha)^2 + \alpha^2 d^2 z^3)) / (\cos(\alpha)^4 ((r^2 \cos(\alpha) \\
& - r^2 + z^2 \tan(\alpha))^2 + (z - r^2 \sin(\alpha))^2) (r^2 \cos(\alpha)^2 - 2 r^2 r^2 \cos(\alpha)^3 + r^2 z^2 \cos(\alpha)^2 - \\
& \sin(2\alpha) r^2 z + z^2)^{3/2}) * (e^2 - ((r^2 \cos(\alpha) - r^2 + z^2 \tan(\alpha))^2 + (z - r^2 \sin(\alpha))^2)^{1/2}) - (- \\
& \alpha^2 d^2 r^2 z^3 \cos(\alpha)^5 + 2 \alpha^2 d^2 \sin(\alpha) r^2 z^3 \cos(\alpha)^4 + z^2 d^2 r^2 z^3 \cos(\alpha)^5 - \\
& \alpha^2 d^2 r^2 z^2 r^2 \cos(\alpha)^8 + 3 \alpha^2 d^2 r^2 z^2 r^2 \cos(\alpha)^6 + \alpha^2 d^2 r^2 z^2 r^2 \cos(\alpha)^4 - \\
& 5 \alpha^2 d^2 \sin(\alpha) r^2 z^2 r^2 \cos(\alpha)^5 - 3 \alpha^2 d^2 \sin(\alpha) r^2 z^2 r^2 \cos(\alpha)^3 - \\
& 2 z^2 d^2 r^2 z^2 r^2 \cos(\alpha)^6 - z^2 d^2 r^2 z^2 r^2 \cos(\alpha)^4 - 2 \alpha^2 d^2 r^2 z^2 z^2 \cos(\alpha)^4 + \\
& 2 \alpha^2 d^2 r^2 z^2 z^2 \cos(\alpha)^2 + z^2 d^2 \sin(\alpha) r^2 z^2 z^2 \cos(\alpha)^3 + \alpha^2 d^2 r^2 z^2 r^2 z^3 \cos(\alpha)^7 -
\end{aligned}$$

$$\begin{aligned}
& 4*\alpha^1d*ra*rb^3*\cos(\alpha)^5 - \alpha^1d*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^6 + \\
& 11*\alpha^1d*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^4 + z^1d*ra*rb^2*\cos(\alpha)^7 + 2*z^1d*ra*rb^2*\cos(\alpha)^5 + \\
& 8*\alpha^1d*ra*rb*z^2*\cos(\alpha)^5 - 8*\alpha^1d*ra*rb*z^2*\cos(\alpha)^3 - 2*z^1d*\sin(\alpha)*ra*rb*z*\cos(\alpha)^4 \\
& + \alpha^1d*(\sin(\alpha) - \sin(\alpha)^3)*ra*z^3 + \alpha^1d*rb^4*\cos(\alpha)^4 - \\
& 4*\alpha^1d*\sin(\alpha)*rb^3*z*\cos(\alpha)^3 - z^1d*rb^3*\cos(\alpha)^6 - 6*\alpha^1d*rb^2*z^2*\cos(\alpha)^4 + \\
& 6*\alpha^1d*rb^2*z^2*\cos(\alpha)^2 + z^1d*\sin(\alpha)*rb^2*z*\cos(\alpha)^5 + \\
& 3*\alpha^1d*\sin(\alpha)*rb*z^3*\cos(\alpha)^3 - 2*\alpha^1d*\sin(2*\alpha)*rb*z^3 - \alpha^1d*z^4*\cos(\alpha)^2 + \\
& \alpha^1d*z^4)/(ra^4*\cos(\alpha)^6 - 4*ra^3*rb*\cos(\alpha)^7 + 4*ra^2*rb^2*\cos(\alpha)^8 + \\
& 2*ra^2*rb^2*\cos(\alpha)^6 - 4*\sin(\alpha)*ra^2*rb*z*\cos(\alpha)^5 + 2*ra^2*z^2*\cos(\alpha)^4 - \\
& 4*ra*rb^3*\cos(\alpha)^7 + 8*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^6 - 4*ra*rb*z^2*\cos(\alpha)^5 + rb^4*\cos(\alpha)^6 \\
& - 4*\sin(\alpha)*rb^3*z*\cos(\alpha)^5 - 4*rb^2*z^2*\cos(\alpha)^6 + 6*rb^2*z^2*\cos(\alpha)^4 - \\
& 4*\sin(\alpha)*rb*z^3*\cos(\alpha)^3 + z^4*\cos(\alpha)^2) + (\text{abs}(\cos(\alpha))*(ra - rb*\cos(\alpha))*(z - \\
& ra*\sin(\alpha))*(2*z*z^1d*\cos(\alpha) + 2*\alpha^1d*z^2*\sin(\alpha) - 2*rb*z^1d*\cos(\alpha)^2*\sin(\alpha) - \\
& 2*\alpha^1d*rb*z*\cos(\alpha) + 2*\alpha^1d*ra*rb*\cos(\alpha)^3*\sin(\alpha)))/(\cos(\alpha)^4*((ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^(3/2))*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 - \\
& \sin(2*\alpha)*rb*z + z^2)^(1/2))) + (e^2*\cos(\alpha)*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^(1/2))*((ra*\cos(\alpha)*(-z^2 + rb*\sin(\alpha)*z*\cos(\alpha) + ra*\sin(\alpha)*z + ra*rb*\cos(\alpha)^3 \\
& - ra*rb*\cos(\alpha)))/(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 - \sin(2*\alpha)*rb*z + z^2) + \\
& ((e^2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^(1/2))*(ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))*(ra^2*\cos(\alpha)^2 - \sin(\alpha)*ra*z - rb*ra*\cos(\alpha)^3 + z^2))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^(3/2)) + (z*(z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha)))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)))*(2*\alpha^1d*\sin(\alpha)*ra^3*rb*\cos(\alpha)^5 + \alpha^1d*\sin(\alpha)*ra^3*rb*\cos(\alpha)^3 + \\
& 2*\alpha^1d*ra^3*z*\cos(\alpha)^4 - 2*\alpha^1d*ra^3*z*\cos(\alpha)^2 - z^1d*\sin(\alpha)*ra^3*\cos(\alpha)^3 - \\
& \alpha^1d*\sin(\alpha)*ra^2*rb^2*\cos(\alpha)^6 - 5*\alpha^1d*\sin(\alpha)*ra^2*rb^2*\cos(\alpha)^4 - \\
& 7*\alpha^1d*ra^2*rb*z*\cos(\alpha)^5 + 4*\alpha^1d*ra^2*rb*z*\cos(\alpha)^3 + 4*\alpha^1d*(\sin(\alpha) - \\
& \sin(\alpha)^3)*ra^2*z^2 + 3*z^1d*ra^2*z*\cos(\alpha)^3 + 2*\alpha^1d*\sin(\alpha)*ra*rb^3*\cos(\alpha)^5 + \\
& \alpha^1d*\sin(\alpha)*ra*rb^3*\cos(\alpha)^3 + \alpha^1d*ra*rb^2*z*\cos(\alpha)^6 + \\
& 6*\alpha^1d*ra*rb^2*z*\cos(\alpha)^4 - \alpha^1d*ra*rb^2*z*\cos(\alpha)^2 + z^1d*\sin(\alpha)*ra*rb^2*\cos(\alpha)^5 + \\
& 2*z^1d*\sin(\alpha)*ra*rb^2*\cos(\alpha)^3 - 10*\alpha^1d*\sin(\alpha)*ra*rb*z^2*\cos(\alpha)^3 - \\
& (\alpha^1d*\sin(2*\alpha)*ra*rb*z^2)/2 - 2*z^1d*ra*rb*z*\cos(\alpha)^4 - 4*z^1d*ra*rb*z*\cos(\alpha)^2 - \\
& \alpha^1d*ra*z^3*\cos(\alpha)^2 + \alpha^1d*ra*z^3 + z^1d*\sin(2*\alpha)*ra*z^2 - 3*\alpha^1d*rb^3*z*\cos(\alpha)^3 - \\
& 2*z^1d*\sin(\alpha)*rb^3*\cos(\alpha)^4 + 7*\alpha^1d*(\sin(\alpha) - \sin(\alpha)^3)*rb^2*z^2 - \\
& z^1d*rb^2*z*\cos(\alpha)^5 + 4*z^1d*rb^2*z*\cos(\alpha)^3 + 5*\alpha^1d*rb^2*z^3*\cos(\alpha)^3 - \\
& 5*\alpha^1d*rb^2*z^3*\cos(\alpha) - 2*z^1d*(\sin(\alpha) - \sin(\alpha)^3)*rb*z^2 + \\
& \alpha^1d*\sin(\alpha)*z^4)/(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 - \sin(2*\alpha)*rb*z + \\
& z^2)^3) - \alpha^1d*((\alpha^1d*ra^4*rb*\cos(\alpha)^9 - \alpha^1d*ra^3*rb^2*\cos(\alpha)^10 - \\
& 2*\alpha^1d*ra^3*rb^2*\cos(\alpha)^8 + \alpha^1d*\sin(\alpha)*ra^3*rb*z*\cos(\alpha)^7 - \\
& 2*\alpha^1d*\sin(\alpha)*ra^3*rb*z*\cos(\alpha)^5 - z^1d*ra^3*rb*\cos(\alpha)^6 - 2*\alpha^1d*ra^3*z^2*\cos(\alpha)^6 + \\
& 3*\alpha^1d*ra^3*z^2*\cos(\alpha)^4 + 2*z^1d*\sin(\alpha)*ra^3*z*\cos(\alpha)^5 + \\
& 2*\alpha^1d*ra^2*rb^3*\cos(\alpha)^9 + \alpha^1d*ra^2*rb^3*\cos(\alpha)^7 - \\
& 3*\alpha^1d*\sin(\alpha)*ra^2*rb^2*z*\cos(\alpha)^8 + 5*\alpha^1d*\sin(\alpha)*ra^2*rb^2*z*\cos(\alpha)^6 + \\
& 2*\alpha^1d*\sin(\alpha)*ra^2*rb^2*z*\cos(\alpha)^4 - z^1d*ra^2*rb^2*\cos(\alpha)^9 + \\
& 3*z^1d*ra^2*rb^2*\cos(\alpha)^7 + z^1d*ra^2*rb^2*\cos(\alpha)^5 + 7*\alpha^1d*ra^2*rb*z^2*\cos(\alpha)^7 - \\
& 4*\alpha^1d*ra^2*rb*z^2*\cos(\alpha)^5 - 5*\alpha^1d*ra^2*rb*z^2*\cos(\alpha)^3 - \\
& 5*z^1d*\sin(\alpha)*ra^2*rb*z*\cos(\alpha)^6 - 3*z^1d*\sin(\alpha)*ra^2*rb*z*\cos(\alpha)^4 - \\
& 2*\alpha^1d*\sin(\alpha)*ra^2*z^3*\cos(\alpha)^4 + 3*\alpha^1d*\sin(\alpha)*ra^2*z^3*\cos(\alpha)^2 -
\end{aligned}$$

$$\begin{aligned}
& 2^2z1d*ra^{2z}z^{2*}\cos(\alpha)^5 + 2^2z1d*ra^{2z}z^{2*}\cos(\alpha)^3 - \alpha1d*ra^{*}rb^{4*}\cos(\alpha)^8 + \\
& 3*\alpha1d*\sin(\alpha)*ra^{*}rb^{3*}z*\cos(\alpha)^7 - 8*\alpha1d*\sin(\alpha)*ra^{*}rb^{3*}z*\cos(\alpha)^5 + \\
& z1d*ra^{*}rb^{3*}\cos(\alpha)^8 - 4^2z1d*ra^{*}rb^{3*}\cos(\alpha)^6 + 2*\alpha1d*ra^{*}rb^{2*}z^{2*}\cos(\alpha)^8 - \\
& 21*\alpha1d*ra^{*}rb^{2*}z^{2*}\cos(\alpha)^6 + 20*\alpha1d*ra^{*}rb^{2*}z^{2*}\cos(\alpha)^4 - \\
& z1d*\sin(\alpha)*ra^{*}rb^{2*}z*\cos(\alpha)^7 + 11*z1d*\sin(\alpha)*ra^{*}rb^{2*}z*\cos(\alpha)^5 + \\
& 11*\alpha1d*\sin(\alpha)*ra^{*}rb^{z^3}\cos(\alpha)^5 - 14*\alpha1d*\sin(\alpha)*ra^{*}rb^{z^3}\cos(\alpha)^3 + \\
& 8^2z1d*ra^{*}rb^{z^2}\cos(\alpha)^6 - 8^2z1d*ra^{*}rb^{z^2}\cos(\alpha)^4 - \alpha1d*ra^{*}z^4*\cos(\alpha)^4 + \\
& 2*\alpha1d*ra^{*}z^4*\cos(\alpha)^2 + z1d*\sin(\alpha)*ra^{*}z^3*\cos(\alpha)^3 + \\
& 2*\alpha1d*\sin(\alpha)*rb^{4*}z*\cos(\alpha)^4 + z1d*rb^{4*}\cos(\alpha)^5 + 8*\alpha1d*rb^{3*}z^2*\cos(\alpha)^5 - \\
& 8*\alpha1d*rb^{3*}z^2*\cos(\alpha)^3 - 4^2z1d*\sin(\alpha)*rb^{3*}z*\cos(\alpha)^4 - \\
& 10*\alpha1d*\sin(\alpha)*rb^{2*}z^3*\cos(\alpha)^4 + 12*\alpha1d*\sin(\alpha)*rb^{2*}z^3*\cos(\alpha)^2 - \\
& 6^2z1d*rb^{2*}z^2*\cos(\alpha)^5 + 6^2z1d*rb^{2*}z^2*\cos(\alpha)^3 - 4*\alpha1d*rb^{z^4}\cos(\alpha)^5 + \\
& 11*\alpha1d*rb^{z^4}\cos(\alpha)^3 - 8*\alpha1d*rb^{z^4}\cos(\alpha) + 3^2z1d*\sin(\alpha)*rb^{z^3}\cos(\alpha)^4 - \\
& 4^2z1d*\sin(\alpha)*rb^{z^3}\cos(\alpha)^2 - \alpha1d*\sin(\alpha)*z^5*\cos(\alpha)^2 + 2*\alpha1d*\sin(\alpha)*z^5 - \\
& z1d*z^4*\cos(\alpha)^3 + z1d*z^4*\cos(\alpha))/(ra^{4*}\cos(\alpha)^7 - 4*ra^{3*}rb*\cos(\alpha)^8 + \\
& 4*ra^{2*}rb^{2*}\cos(\alpha)^9 + 2*ra^{2*}rb^{2*}\cos(\alpha)^7 - 4*\sin(\alpha)*ra^{2*}rb^{z*\cos(\alpha)^6 + \\
& 2*ra^{2*}z^{2*}\cos(\alpha)^5 - 4*ra^{*}rb^{3*}\cos(\alpha)^8 + 8*\sin(\alpha)*ra^{*}rb^{2*}z*\cos(\alpha)^7 - \\
& 4*ra^{*}rb^{z^2}\cos(\alpha)^6 + rb^{4*}\cos(\alpha)^7 - 4*\sin(\alpha)*rb^{3*}z*\cos(\alpha)^6 - 4*rb^{2*}z^2*\cos(\alpha)^7 + \\
& 6*rb^{2*}z^2*\cos(\alpha)^5 - 4*\sin(\alpha)*rb^{z^3}\cos(\alpha)^4 + z^4*\cos(\alpha)^3) + (e2 - ((ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)})*((ra*\cos(\alpha) - rb + z*\tan(\alpha))*(ra^{2*}\cos(\alpha)^2 - \\
& \sin(\alpha)*ra^z - rb*ra*\cos(\alpha)^3 + z^2)*(alpha1d*ra^{2*}\cos(\alpha)^2 - alpha1d*\sin(\alpha)*ra^z - \\
& alpha1d*rb*ra*\cos(\alpha)^3 - z1d*ra*\cos(\alpha) + alpha1d*z^2 + \\
& rb*z1d*\cos(\alpha)^2))/(cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(3/2)}*(ra^{2*}\cos(\alpha)^2 - 2*ra^{*}rb*\cos(\alpha)^3 + rb^{2*}\cos(\alpha)^2 - \sin(2*\alpha)*rb^z + \\
& z^2)) + ((cos(\alpha)^2)^{(3/2)}*(z - ra*\sin(\alpha))*(alpha1d*\sin(\alpha)*ra^{3*}rb*\cos(\alpha)^4 - \\
& alpha1d*ra^{3*}z*\cos(\alpha)^3 + 2*\alpha1d*ra^{3*}z*\cos(\alpha) + z1d*\sin(\alpha)*ra^{3*}\cos(\alpha)^2 + \\
& 4*\alpha1d*ra^{2*}rb^z*\cos(\alpha)^4 - 8*\alpha1d*ra^{2*}rb^z*\cos(\alpha)^2 - \\
& 4^2z1d*\sin(\alpha)*ra^{2*}rb*\cos(\alpha)^3 + z1d*ra^{2*}z*\cos(\alpha)^2 - alpha1d*\sin(\alpha)*ra^{*}rb^{3*}\cos(\alpha)^4 - \\
& 2*\alpha1d*ra^{*}rb^{2*}z*\cos(\alpha)^5 + 3*\alpha1d*ra^{*}rb^{2*}z*\cos(\alpha)^3 + 2*\alpha1d*ra^{*}rb^{2*}z*\cos(\alpha) + \\
& 2^2z1d*\sin(\alpha)*ra^{*}rb^{2*}\cos(\alpha)^4 + z1d*\sin(\alpha)*ra^{*}rb^{2*}\cos(\alpha)^2 + \\
& 5*\alpha1d*\sin(\alpha)*ra^{*}rb^{z^2}\cos(\alpha)^2 - 2*\alpha1d*\sin(\alpha)*ra^{*}rb^{z^2} + alpha1d*ra^{z^3}\cos(\alpha) - \\
& z1d*\sin(\alpha)*ra^{z^2} - 2*\alpha1d*\sin(\alpha)*rb^{2*}z^2*\cos(\alpha) - z1d*rb^{2*}z*\cos(\alpha)^2 - \\
& 4*\alpha1d*rb^{z^3}\cos(\alpha)^2 + 2*\alpha1d*rb^{z^3} + z1d*z^3))/(cos(\alpha)^4*((ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)*(ra^{2*}\cos(\alpha)^2 - 2*ra^{*}rb*\cos(\alpha)^3 + rb^{2*}\cos(\alpha)^2 - \\
& \sin(2*\alpha)*rb^z + z^2)^{(3/2)}) + (abs(cos(\alpha))*(z - ra*\sin(\alpha))*(ra^{2*}\cos(\alpha)^2 - \sin(\alpha)*ra^z - \\
& rb*ra*\cos(\alpha)^3 + z^2)*(2^2z1d*\cos(\alpha) + 2*\alpha1d*z^2*\sin(\alpha) - 2*rb^z1d*\cos(\alpha)^2*\sin(\alpha) - \\
& 2*\alpha1d*rb^z*\cos(\alpha) + 2*\alpha1d*ra^{*}rb*\cos(\alpha)^3*\sin(\alpha)))/(cos(\alpha)^5*((ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(3/2)}*(ra^{2*}\cos(\alpha)^2 - 2*ra^{*}rb*\cos(\alpha)^3 + rb^{2*}\cos(\alpha)^2 - \\
& \sin(2*\alpha)*rb^z + z^2)^{(1/2)})*((ra*(\sin(\alpha)*rb^{2*}\cos(\alpha)^2 + rb^z*\cos(\alpha)^3 - 2*rb^z*\cos(\alpha) - \\
& ra*\sin(\alpha)*rb*\cos(\alpha)^3 + \sin(\alpha)*z^2 + ra^z*\cos(\alpha)^2))/(ra^{2*}\cos(\alpha)^2 - 2*ra^{*}rb*\cos(\alpha)^3 \\
& + rb^{2*}\cos(\alpha)^2 - \sin(2*\alpha)*rb^z + z^2) - (z*(ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2)/(cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)) + ((z - \\
& ra*\sin(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)}*(ra^{2*}\cos(\alpha)^2 - \\
& \sin(\alpha)*ra^z - rb*ra*\cos(\alpha)^3 + z^2))/(cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^{(3/2)}) - ((e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)})*((z - \\
& ra*\sin(\alpha))*(ra^{2*}\cos(\alpha)^2 - \sin(\alpha)*ra^z - rb*ra*\cos(\alpha)^3 + z^2)*(alpha1d*ra^{2*}\cos(\alpha)^2 - \\
& alpha1d*\sin(\alpha)*ra^z - alpha1d*rb*ra*\cos(\alpha)^3 - z1d*ra*\cos(\alpha) + alpha1d*z^2 +
\end{aligned}$$

$$\begin{aligned}
& rb*z1d*cos(alpha)^2)/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
& ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - sin(2*alpha)*rb*z + \\
& z^2)) - ((cos(alpha)^2)^(3/2)*(ra*cos(alpha) - rb + z*tan(alpha))*(alpha1d*sin(alpha)*ra^3*rb*cos(alpha)^4 - \\
& alpha1d*ra^3*z*cos(alpha)^3 + 2*alpha1d*ra^3*z*cos(alpha) + z1d*sin(alpha)*ra^3*cos(alpha)^2 + \\
& 4*alpha1d*ra^2*rb*z*cos(alpha)^4 - 8*alpha1d*ra^2*rb*z*cos(alpha)^2 - \\
& 4*z1d*sin(alpha)*ra^2*rb*cos(alpha)^3 + z1d*ra^2*z*cos(alpha)^2 - alpha1d*sin(alpha)*ra*rb^3*cos(alpha)^4 - \\
& 2*alpha1d*ra*rb^2*z*cos(alpha)^5 + 3*alpha1d*ra*rb^2*z*cos(alpha)^3 + 2*alpha1d*ra*rb^2*z*cos(alpha) + \\
& 2*z1d*sin(alpha)*ra*rb^2*cos(alpha)^4 + z1d*sin(alpha)*ra*rb^2*cos(alpha)^2 + \\
& 5*alpha1d*sin(alpha)*ra*rb*z^2*cos(alpha)^2 - 2*alpha1d*sin(alpha)*ra*rb*z^2 + alpha1d*ra*z^3*cos(alpha) - \\
& z1d*sin(alpha)*ra*z^2 - 2*alpha1d*sin(alpha)*rb^2*z^2*cos(alpha) - z1d*rb^2*z*cos(alpha)^2 - \\
& 4*alpha1d*rb^2*z^3*cos(alpha)^2 + 2*alpha1d*rb^2*z^3 + z1d*z^3))/(cos(alpha)^4*((ra*cos(alpha) - rb + \\
& z*tan(alpha))^2 + (z - ra*sin(alpha))^2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb*z + z^2)^(3/2))) + (2*alpha1d*z^5 - alpha1d*z^5*cos(alpha)^2 + (z^4*z1d*sin(2*alpha))/2 - \\
& 3*alpha1d*ra^3*z^2*(sin(alpha) - sin(alpha)^3) - 3*alpha1d*rb*z^4*sin(2*alpha) + ra*z^3*z1d*cos(alpha)^3 - \\
& 2*ra^3*z*z1d*cos(alpha)^3 + 2*ra^3*z*z1d*cos(alpha)^5 - 3*rb*z^3*z1d*cos(alpha)^2 + \\
& 3*rb*z^3*z1d*cos(alpha)^4 - rb^3*z*z1d*cos(alpha)^4 + 3*alpha1d*ra^2*z^3*cos(alpha)^2 - \\
& 2*alpha1d*ra^2*z^3*cos(alpha)^4 + 6*alpha1d*rb^2*z^3*cos(alpha)^2 - 6*alpha1d*rb^2*z^3*cos(alpha)^4 + \\
& alpha1d*ra*z^4*(sin(alpha) - sin(alpha)^3) - 2*alpha1d*ra*z^4*sin(alpha) - ra*z^3*z1d*cos(alpha) - \\
& 6*alpha1d*ra^2*rb^2*z*cos(alpha)^4 + 7*alpha1d*ra^2*rb^2*z*cos(alpha)^6 - \\
& 3*alpha1d*ra^2*rb^2*z*cos(alpha)^8 + 4*alpha1d*rb*z^4*cos(alpha)^3*sin(alpha) + \\
& ra*rb^3*z1d*cos(alpha)^4*sin(alpha) + ra^3*rb*z1d*cos(alpha)^4*sin(alpha) + 6*alpha1d*ra*rb*z^3*cos(alpha) \\
& + alpha1d*ra^3*rb^2*cos(alpha)^6*sin(alpha) - alpha1d*ra^2*rb^3*cos(alpha)^7*sin(alpha) + \\
& alpha1d*ra^3*rb^2*cos(alpha)^8*sin(alpha) + 3*ra*rb*z^2*z1d*(sin(alpha) - sin(alpha)^3) + \\
& 2*alpha1d*ra^3*z^2*cos(alpha)^4*sin(alpha) - 2*alpha1d*rb^3*z^2*cos(alpha)^3*sin(alpha) - \\
& 3*ra^2*rb^2*z1d*cos(alpha)^5*sin(alpha) + ra^2*rb^2*z1d*cos(alpha)^7*sin(alpha) + \\
& 2*ra^2*z^2*z1d*cos(alpha)^3*sin(alpha) + 3*rb^2*z^2*z1d*cos(alpha)^3*sin(alpha) - \\
& 18*alpha1d*ra*rb*z^3*cos(alpha)^3 + 2*alpha1d*ra*rb^3*z*cos(alpha)^3 + 2*alpha1d*ra^3*rb*z*cos(alpha)^3 \\
& + 11*alpha1d*ra*rb*z^3*cos(alpha)^5 - 2*alpha1d*ra*rb^3*z*cos(alpha)^5 - 2*alpha1d*ra^3*rb*z*cos(alpha)^5 \\
& + alpha1d*ra*rb^3*z*cos(alpha)^7 + alpha1d*ra^3*rb*z*cos(alpha)^7 - 6*alpha1d*ra*rb^2*z^2*(sin(alpha) - \\
& sin(alpha)^3) - 3*ra*rb^2*z*z1d*cos(alpha)^3 + 4*ra^2*rb*z*z1d*cos(alpha)^4 + 6*ra*rb^2*z*z1d*cos(alpha)^5 \\
& - 5*ra^2*rb*z*z1d*cos(alpha)^6 - ra*rb^2*z*z1d*cos(alpha)^7 - alpha1d*ra^4*rb*cos(alpha)^7*sin(alpha) - \\
& 8*ra*rb*z^2*z1d*cos(alpha)^4*sin(alpha) + 6*alpha1d*ra^2*rb*z^2*cos(alpha)^3*sin(alpha) + \\
& 12*alpha1d*ra*rb^2*z^2*cos(alpha)^4*sin(alpha) - 7*alpha1d*ra^2*rb*z^2*cos(alpha)^5*sin(alpha) - \\
& 2*alpha1d*ra*rb^2*z^2*cos(alpha)^6*sin(alpha))/(ra^4*cos(alpha)^6 - 4*ra^3*rb*cos(alpha)^7 + \\
& 4*ra^2*rb^2*cos(alpha)^8 + 2*ra^2*rb^2*cos(alpha)^6 - 4*sin(alpha)*ra^2*rb*z*cos(alpha)^5 + \\
& 2*ra^2*z^2*cos(alpha)^4 - 4*ra*rb^3*cos(alpha)^7 + 8*sin(alpha)*ra*rb^2*z*cos(alpha)^6 - \\
& 4*ra*rb*z^2*cos(alpha)^5 + rb^4*cos(alpha)^6 - 4*sin(alpha)*rb^3*z*cos(alpha)^5 - 4*rb^2*z^2*cos(alpha)^6 + \\
& 6*rb^2*z^2*cos(alpha)^4 - 4*sin(alpha)*rb*z^3*cos(alpha)^3 + z^4*cos(alpha)^2) - \\
& (abs(cos(alpha))*(ra*cos(alpha) - rb + z*tan(alpha))*(ra^2*cos(alpha)^2 - sin(alpha)*ra*z - rb*ra*cos(alpha)^3 + \\
& z^2)*(2*z*z1d*cos(alpha) + 2*alpha1d*z^2*sin(alpha) - 2*rb*z1d*cos(alpha)^2*sin(alpha) - \\
& 2*alpha1d*rb*z*cos(alpha) + 2*alpha1d*ra*rb*cos(alpha)^3*sin(alpha)))/(cos(alpha)^5*((ra*cos(alpha) - rb + \\
& z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb*z + z^2)^(1/2)))*((ra*cos(alpha)*(-z^2 + rb*sin(alpha)*z*cos(alpha) + ra*sin(alpha)*z + \\
& ra*rb*cos(alpha)^3 - ra*rb*cos(alpha)))/(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb*z + z^2) + ((e2 - ((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
& ra*sin(alpha))^2)^(1/2))*(ra*cos(alpha) - rb + z*tan(alpha))*(ra^2*cos(alpha)^2 - sin(alpha)*ra*z - \\
& rb*ra*cos(alpha)^3 + z^2))/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(3/2)) +
\end{aligned}$$

$$(z*(z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2));$$

$$YC2322=0;$$

$$YC2323=-((\cos(\alpha)^2)^{(3/2)}*(ra^2*\cos(\alpha)^2 + z^2 - ra*z*\sin(\alpha) - ra*rb*\cos(\alpha)^3)*(2*\alpha1d^2*rb*z^3 - 2*rb^2*z1d^2*\cos(\alpha)^3*\sin(\alpha) + \alpha1d^2*ra*z^3*\cos(\alpha) + 2*\alpha1d^2*ra^3*z*\cos(\alpha) + 2*rb*z*z1d^2*\cos(\alpha)^2 - \alpha1d^2*ra^3*z*\cos(\alpha)^3 - 4*\alpha1d^2*rb*z^3*\cos(\alpha)^2 + 2*\alpha1d*ra^3*z1d*(\sin(\alpha) - \sin(\alpha)^3) + 2*ra*rb*z1d^2*(\sin(\alpha) - \sin(\alpha)^3) - 2*ra*z*z1d^2*\cos(\alpha) - \alpha1d^2*rb^2*z^2*\sin(2*\alpha) - 8*\alpha1d^2*ra^2*rb*z*\cos(\alpha)^2 + 3*\alpha1d^2*ra*rb^2*z*\cos(\alpha)^3 + 4*\alpha1d^2*ra^2*rb*z*\cos(\alpha)^4 - 2*\alpha1d^2*ra*rb^2*z*\cos(\alpha)^5 + 2*\alpha1d*ra*rb^2*z1d*(\sin(\alpha) - \sin(\alpha)^3) - 2*\alpha1d*ra*z^2*z1d*\sin(\alpha) - \alpha1d^2*ra*rb^3*\cos(\alpha)^4*\sin(\alpha) + \alpha1d^2*ra^3*rb*\cos(\alpha)^4*\sin(\alpha) + 2*\alpha1d^2*ra*rb^2*z*\cos(\alpha) + 5*\alpha1d^2*ra*rb*z^2*(\sin(\alpha) - \sin(\alpha)^3) - 4*\alpha1d*rb^2*z*z1d*\cos(\alpha)^2 - 2*\alpha1d^2*ra*rb*z^2*\sin(\alpha) + 2*\alpha1d*rb*z^2*z1d*\sin(2*\alpha) - 8*\alpha1d*ra^2*rb*z1d*\cos(\alpha)^3*\sin(\alpha) + 4*\alpha1d*ra*rb^2*z1d*\cos(\alpha)^4*\sin(\alpha) + 4*\alpha1d*ra*rb*z*z1d*\cos(\alpha)^3)/(\cos(\alpha)^6*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(3/2)}*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 - \sin(2*\alpha)*rb*z + z^2)^{(3/2)});$$

$$YC2324=0;$$

$$YC2331=0;$$

$$YC2332=0;$$

$$YC2333=0;$$

$$YC2334=0;$$

$$YC23=[YC2311 YC2312 YC2313 YC2314; YC2321 YC2322 YC2323 YC2324; YC2331 YC2332 YC2333 YC2334];$$

$$YG23$$

$$=[$$

$$-ga*((z - ra*\sin(\alpha))^2)/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2) + (\tan(\alpha)*(z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2) - ((ra - rb*\cos(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)}*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/(\cos(\alpha)*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(3/2)}), 0, 0, 0$$

$$-ga*((ra*\cos(\alpha)*(ra*z*\sin(\alpha) - ra*rb*\cos(\alpha) - z^2 + ra*rb*\cos(\alpha)^3 + rb*z*\cos(\alpha)*\sin(\alpha)))/(ra^2*\cos(\alpha)^2 + rb^2*\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^3 - rb*z*\sin(2*\alpha)) + ((e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(1/2)}*(ra*\cos(\alpha) - rb + z*\tan(\alpha))*(ra^2*\cos(\alpha)^2 + z^2 - ra*z*\sin(\alpha) - ra*rb*\cos(\alpha)^3))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^{(3/2)} + (z*(z - ra*\sin(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha)))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2))), 0, 0, 0,$$

$$0, 0, 0, 0];$$

$$Y7=YM23+YC23+YG23;$$

$$YM2411=-(\beta2d*ra^7*\cos(\alpha)^8*\cos(\beta) - z^6*z2d*\cos(\alpha) - ra^6*z2d*\cos(\alpha)^7 - rb^6*z2d*\cos(\alpha)^7 - 15*\alpha2d*ra^2*z^5*(\sin(\alpha) - \sin(\alpha)^3) - 3*\alpha2d*rb^2*z^5*(\sin(\alpha) - \sin(\alpha)^3) - \alpha2d*z^7*\sin(\alpha) - e2^2*rb^4*z2d*\cos(\alpha)^7 - 3*ra^2*rb^4*z2d*\cos(\alpha)^7 - 3*ra^4*rb^2*z2d*\cos(\alpha)^7 - 15*ra^2*z^4*z2d*\cos(\alpha)^3 - 15*ra^4*z^2*z2d*\cos(\alpha)^5 - 3*rb^2*z^4*z2d*\cos(\alpha)^3 - 3*rb^4*z^2*z2d*\cos(\alpha)^5 - \alpha2d*ra^6*z*\cos(\alpha)^6*\sin(\alpha) - \alpha2d*rb^6*z*\cos(\alpha)^6*\sin(\alpha) + 6*ra*rb^5*z2d*\cos(\alpha)^7*\cos(\beta) + 6*ra^5*rb*z2d*\cos(\alpha)^7*\cos(\beta) + 6*ra*z^5*z2d*\cos(\alpha)^2*\sin(\beta) +$$

$$\begin{aligned}
& 6*ra^5*z^2d*cos(alpha)^6*sin(beta) + beta2d*e2^2*ra^5*cos(alpha)^8*cos(beta) - \\
& beta2d*e2^2*ra^2*rb^3*cos(alpha)^8 + 3*beta2d*ra^3*rb^4*cos(alpha)^8*cos(beta) + \\
& 3*beta2d*ra^5*rb^2*cos(alpha)^8*cos(beta) - 6*beta2d*ra^6*rb*cos(alpha)^8*cos(beta)^2 + \\
& 15*beta2d*ra^3*z^4*cos(alpha)^4*cos(beta) + 15*beta2d*ra^5*z^2*cos(alpha)^6*cos(beta) - \\
& 15*alpha2d*ra^4*z^3*cos(alpha)^4*sin(alpha) - 3*alpha2d*rb^4*z^3*cos(alpha)^4*sin(alpha) - \\
& e2^2*ra^2*rb^2*z^2d*cos(alpha)^7 + 12*ra^3*rb^3*z^2d*cos(alpha)^7*cos(beta) - \\
& e2^2*rb^2*z^2*z^2d*cos(alpha)^5 - 18*ra^2*rb^2*z^2*z^2d*cos(alpha)^5 + \\
& 20*ra^3*z^3*z^2d*cos(alpha)^4*sin(beta) - 6*beta2d*ra^2*rb^5*cos(alpha)^8*cos(beta)^2 - \\
& 12*beta2d*ra^4*rb^3*cos(alpha)^8*cos(beta)^2 + 12*beta2d*ra^3*rb^4*cos(alpha)^8*cos(beta)^3 + \\
& 12*beta2d*ra^5*rb^2*cos(alpha)^8*cos(beta)^3 - 8*beta2d*ra^4*rb^3*cos(alpha)^8*cos(beta)^4 - \\
& 12*beta2d*ra^3*z^4*cos(alpha)^4*cos(beta)^3 - 12*beta2d*ra^5*z^2*cos(alpha)^6*cos(beta)^3 - \\
& e2^2*ra^4*z^2d*cos(alpha)^7*cos(beta)^2 - 12*ra^2*rb^4*z^2d*cos(alpha)^7*cos(beta)^2 - \\
& 12*ra^4*rb^2*z^2d*cos(alpha)^7*cos(beta)^2 + 8*ra^3*rb^3*z^2d*cos(alpha)^7*cos(beta)^3 + \\
& 12*ra^2*z^4*z^2d*cos(alpha)^3*cos(beta)^2 + 12*ra^4*z^2*z^2d*cos(alpha)^5*cos(beta)^2 - \\
& beta2d*e2^2*ra^4*rb*cos(alpha)^8 + beta2d*ra*rb^6*cos(alpha)^8*cos(beta) + \\
& beta2d*ra*z^6*cos(alpha)^2*cos(beta) + (2*e2*rb^4*z^2d*cos(alpha)^7*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 \\
& + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2)/abs(cos(alpha)) + \\
& 4*beta2d*e2^2*ra^3*rb^2*cos(alpha)^8*cos(beta) - 3*beta2d*e2^2*ra^4*rb*cos(alpha)^8*cos(beta)^2 + \\
& 3*beta2d*e2^2*ra^3*z^2*cos(alpha)^6*cos(beta) - 6*beta2d*ra^2*rb*z^4*cos(alpha)^4*cos(beta)^2 + \\
& 18*beta2d*ra^3*rb^2*z^2*cos(alpha)^6*cos(beta) - 36*beta2d*ra^4*rb*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 24*beta2d*ra^4*rb*z^2*cos(alpha)^6*cos(beta)^4 - alpha2d*e2^2*rb^2*z^3*cos(alpha)^4*sin(alpha) + \\
& 2*e2^2*ra^3*rb*z^2d*cos(alpha)^7*cos(beta)^3 - 6*beta2d*ra^2*z^5*cos(alpha)^3*cos(beta)*sin(beta) - \\
& 20*beta2d*ra^4*z^3*cos(alpha)^5*cos(beta)*sin(beta) - 18*alpha2d*ra^2*rb^2*z^3*cos(alpha)^4*sin(alpha) + \\
& 20*alpha2d*ra^3*z^4*cos(alpha)^3*sin(alpha)*sin(beta) + \\
& 6*alpha2d*ra^5*z^2*cos(alpha)^5*sin(alpha)*sin(beta) - 24*ra^3*rb*z^2*z^2d*cos(alpha)^5*cos(beta)^3 - \\
& 3*beta2d*e2^2*ra^2*rb^3*cos(alpha)^8*cos(beta)^2 + 2*beta2d*e2^2*ra^3*rb^2*cos(alpha)^8*cos(beta)^3 - \\
& 2*beta2d*e2^2*ra^3*z^2*cos(alpha)^6*cos(beta)^3 + 6*alpha2d*ra*z^6*cos(alpha)*sin(alpha)*sin(beta) + \\
& 6*ra*rb*z^4*z^2d*cos(alpha)^3*cos(beta) - 12*beta2d*ra^2*rb^3*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 12*alpha2d*ra^2*z^5*cos(alpha)^2*cos(beta)^2*sin(alpha) + \\
& 12*alpha2d*ra^4*z^3*cos(alpha)^4*cos(beta)^2*sin(alpha) - 5*e2^2*ra^2*rb^2*z^2d*cos(alpha)^7*cos(beta)^2 \\
& + 8*beta2d*ra^4*z^3*cos(alpha)^5*cos(beta)^3*sin(beta) + 6*ra*rb^4*z^2d*cos(alpha)^6*sin(beta) - \\
& e2^2*ra^2*z^2*z^2d*cos(alpha)^5*cos(beta)^2 - 8*ra^3*z^3*z^2d*cos(alpha)^4*cos(beta)^2*sin(beta) + \\
& beta2d*e2^2*ra*rb^4*cos(alpha)^8*cos(beta) - 3*beta2d*e2^2*ra^2*rb*z^2*cos(alpha)^6 + \\
& 3*beta2d*ra*rb^2*z^4*cos(alpha)^4*cos(beta) + 3*beta2d*ra*rb^4*z^2*cos(alpha)^6*cos(beta) - \\
& alpha2d*e2^2*rb^4*z*cos(alpha)^6*sin(alpha) + 4*e2^2*ra*rb^3*z^2d*cos(alpha)^7*cos(beta) + \\
& 2*e2^2*ra^3*rb*z^2d*cos(alpha)^7*cos(beta) - 6*beta2d*ra^6*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 3*alpha2d*ra^2*rb^4*z*cos(alpha)^6*sin(alpha) - 3*alpha2d*ra^4*rb^2*z*cos(alpha)^6*sin(alpha) + \\
& 12*ra*rb^3*z^2*z^2d*cos(alpha)^5*cos(beta) + 36*ra^3*rb*z^2*z^2d*cos(alpha)^5*cos(beta) + \\
& 12*ra*rb^2*z^3*z^2d*cos(alpha)^4*sin(beta) + 12*ra^3*rb^2*z^2d*cos(alpha)^6*sin(beta) + \\
& 2*e2^2*ra^3*z^2d*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& 12*alpha2d*ra^3*rb^2*z^2*cos(alpha)^5*sin(alpha)*sin(beta) + \\
& 24*ra^3*rb^2*z^2d*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& (2*e2*ra^4*z^2d*cos(alpha)^7*cos(beta)^2*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2)/abs(cos(alpha)) + \\
& 6*alpha2d*ra*rb*z^5*cos(alpha)^2*cos(beta)*sin(alpha) + \\
& 6*alpha2d*ra*rb^5*z*cos(alpha)^6*cos(beta)*sin(alpha) + \\
& 6*alpha2d*ra^5*rb*z*cos(alpha)^6*cos(beta)*sin(alpha) + beta2d*e2^2*ra*rb*z^3*cos(alpha)^5*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^7 \sin(\beta) + 3 \beta^2 d^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^7 \sin(\beta) + \\
& 2^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^5 \cos(\beta) - \alpha^2 d^2 e^2 \alpha^2 r^2 z^3 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) \\
& + 2^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^6 \sin(\beta) - 24^2 r^4 r^3 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) - \\
& 8^2 \alpha^2 d^2 r^2 r^3 z^4 \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) \sin(\beta) + \\
& (2^2 \beta^2 d^2 e^2 r^2 r^3 \cos(\alpha)^8 (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - \\
& 2^2 r^2 r^3 \cos(\alpha)^2 \cos(\beta) - 2^2 r^2 z^2 \cos(\alpha) \sin(\beta))^{3/2}) / (\cos(\alpha)^2)^{3/2} + \\
& \beta^2 d^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta) - 3^2 \beta^2 d^2 e^2 \alpha^2 r^4 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta) - \\
& \alpha^2 d^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^6 \sin(\alpha) + \\
& 12^2 \alpha^2 d^2 r^2 r^3 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) + \\
& 36^2 \alpha^2 d^2 r^2 r^3 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) + \\
& 12^2 \alpha^2 d^2 r^2 r^3 z^3 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) - \\
& 6^2 \beta^2 d^2 r^2 r^3 z^4 \cos(\alpha)^7 \cos(\beta) \sin(\beta) - \\
& 12^2 \beta^2 d^2 r^2 r^3 z^4 \cos(\alpha)^7 \cos(\beta) \sin(\beta) + \\
& 24^2 \beta^2 d^2 r^2 r^3 z^4 \cos(\alpha)^7 \cos(\beta) \sin(\beta) + \\
& 12^2 \alpha^2 d^2 r^2 r^3 z^4 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) + \\
& 6^2 \alpha^2 d^2 r^2 r^3 z^4 \cos(\alpha)^5 \sin(\alpha) \sin(\beta) - \\
& 24^2 r^2 r^3 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - 24^2 r^2 r^3 z^3 \cos(\alpha)^6 \cos(\beta) \sin(\beta) - \\
& (2^2 \beta^2 d^2 e^2 r^2 r^3 \cos(\alpha)^8 \cos(\beta) (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - \\
& 2^2 r^2 r^3 \cos(\alpha)^2 \cos(\beta) - 2^2 r^2 z^2 \cos(\alpha) \sin(\beta))^{3/2}) / (\cos(\alpha)^2)^{3/2} + \\
& (2^2 e^2 r^2 r^3 z^2 \cos(\alpha)^7 (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - \\
& 2^2 r^2 r^3 \cos(\alpha)^2 \cos(\beta) - 2^2 r^2 z^2 \cos(\alpha) \sin(\beta))^{1/2}) / \text{abs}(\cos(\alpha)) + \\
& (2^2 e^2 r^2 r^3 z^2 \cos(\alpha)^5 (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - \\
& 2^2 r^2 r^3 \cos(\alpha)^2 \cos(\beta) - 2^2 r^2 z^2 \cos(\alpha) \sin(\beta))^{1/2}) / \text{abs}(\cos(\alpha)) + \\
& \beta^2 d^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta)^2 - \\
& \alpha^2 d^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) - \\
& \beta^2 d^2 e^2 \alpha^2 r^2 r^3 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \\
& 24^2 \alpha^2 d^2 r^2 r^3 z^3 \cos(\alpha)^4 \cos(\beta)^3 \sin(\alpha) - \\
& 12^2 \alpha^2 d^2 r^2 r^3 z^4 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) - \\
& 12^2 \alpha^2 d^2 r^2 r^3 z^4 \cos(\alpha)^6 \cos(\beta)^2 \sin(\alpha) + \\
& 8^2 \alpha^2 d^2 r^2 r^3 z^3 \cos(\alpha)^6 \cos(\beta)^3 \sin(\alpha) - \\
& 12^2 \beta^2 d^2 r^2 r^3 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \\
& 24^2 \beta^2 d^2 r^2 r^3 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + \\
& 24^2 \beta^2 d^2 r^2 r^3 z^3 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) - \\
& 24^2 \beta^2 d^2 r^2 r^3 z^4 \cos(\alpha)^7 \cos(\beta)^3 \sin(\beta) + \\
& 2^2 \alpha^2 d^2 e^2 \alpha^2 r^2 r^3 z^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) + \\
& 4^2 \alpha^2 d^2 e^2 \alpha^2 r^2 r^3 z^3 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) + \\
& 2^2 \alpha^2 d^2 e^2 \alpha^2 r^2 r^3 z^3 \cos(\alpha)^6 \cos(\beta) \sin(\alpha) + \\
& (10^2 e^2 r^2 r^3 z^2 \cos(\alpha)^7 \cos(\beta)^2 (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - \\
& 2^2 r^2 r^3 \cos(\alpha)^2 \cos(\beta) - 2^2 r^2 z^2 \cos(\alpha) \sin(\beta))^{1/2}) / \text{abs}(\cos(\alpha)) + \\
& (2^2 e^2 r^2 r^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - \\
& 2^2 r^2 r^3 \cos(\alpha)^2 \cos(\beta) - 2^2 r^2 z^2 \cos(\alpha) \sin(\beta))^{1/2}) / \text{abs}(\cos(\alpha)) - \\
& 4^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^6 \cos(\beta) \sin(\beta) + \\
& 2^2 \alpha^2 d^2 e^2 \alpha^2 r^2 r^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\alpha) \sin(\beta) - \\
& (2^2 \beta^2 d^2 e^2 r^2 r^3 \cos(\alpha)^8 \cos(\beta) (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 - \\
& 2^2 r^2 r^3 \cos(\alpha)^2 \cos(\beta) - 2^2 r^2 z^2 \cos(\alpha) \sin(\beta))^{3/2}) / (\cos(\alpha)^2)^{3/2} + \\
& 24^2 \alpha^2 d^2 r^2 r^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\alpha) \sin(\beta) + \\
& (2^2 \alpha^2 d^2 e^2 r^2 r^3 z^2 \cos(\alpha)^6 \sin(\alpha) (r^2 \cos(\alpha)^2 + r^2 \cos(\alpha)^2 + z^2 -
\end{aligned}$$

$$\begin{aligned}
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (8*e2*ra*rb^3*z2d*cos(alpha)^7*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*e2*ra^3*rb*z2d*cos(alpha)^7*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& 2*alpha2d*e2^2*ra^3*rb*z*cos(alpha)^6*cos(beta)^3*sin(alpha) - \\
& 5*beta2d*e2^2*ra^2*rb^2*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 4*beta2d*e2^2*ra^3*rb*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 2*alpha2d*e2^2*ra*rb^2*z^2*cos(alpha)^5*sin(alpha)*sin(beta) - \\
& 24*alpha2d*ra^2*rb*z^4*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) - \\
& 24*alpha2d*ra^4*rb*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) + \\
& (2*beta2d*e2*ra^2*rb*cos(alpha)^8*cos(beta)^2*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (4*e2*ra^3*rb*z2d*cos(alpha)^7*cos(beta)^3*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& 5*alpha2d*e2^2*ra^2*rb^2*z*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& 24*alpha2d*ra^2*rb^3*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) + \\
& (2*beta2d*e2*ra^2*z*cos(alpha)^7*cos(beta)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (2*alpha2d*e2*ra*rb^2*cos(alpha)^9*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*alpha2d*e2*ra*rb^4*cos(alpha)^9*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*alpha2d*e2*ra^2*rb^2*z*cos(alpha)^8*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& 4*alpha2d*e2^2*ra^2*rb*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& (2*beta2d*e2*ra*rb*z*cos(alpha)^7*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*alpha2d*e2*ra^2*z*cos(alpha)^6*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (4*alpha2d*e2*ra^4*z*cos(alpha)^8*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (4*alpha2d*e2*ra^4*z*cos(alpha)^8*cos(beta)^4*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^3*rb^2*cos(alpha)^9*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*e2*ra^3*z^2d*cos(alpha)^6*cos(beta)^2*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*e2*ra*rb*z^2z2d*cos(alpha)^5*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (2*alpha2d*e2*ra^3*cos(alpha)^9*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + \\
& z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*alpha2d*e2*ra^5*cos(alpha)^9*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + \\
& z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*e2*ra*rb^2*z^2z2d*cos(alpha)^6*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*alpha2d*e2*ra*rb*z*cos(alpha)^6*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 -
\end{aligned}$$

$$\begin{aligned}
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (8*alpha2d*e2*ra^2*rb^3*cos(alpha)^9*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 \\
& + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*alpha2d*e2*ra^4*rb*cos(alpha)^9*cos(beta)^3*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 \\
& + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (4*alpha2d*e2*ra^2*rb^2*z*cos(alpha)^8*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + \\
& z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (8*alpha2d*e2*ra^3*rb*z*cos(alpha)^8*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (8*e2*ra^2*rb*z^2d*cos(alpha)^6*cos(beta)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (10*alpha2d*e2*ra^3*rb^2*cos(alpha)^9*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) \\
& + (2*alpha2d*e2*ra^3*z^2*cos(alpha)^7*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) \\
& + (4*alpha2d*e2*ra^2*rb*cos(alpha)^9*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 \\
& + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (4*alpha2d*e2*ra^4*rb*cos(alpha)^9*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + \\
& z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (8*alpha2d*e2*ra^3*rb*z*cos(alpha)^8*cos(beta)^3*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra*rb^2*z^2*cos(alpha)^7*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*alpha2d*e2*ra^2*rb*z^2*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - \\
& 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)))/(ra^6*cos(alpha)^9 + rb^6*cos(alpha)^9 + \\
& z^6*cos(alpha)^3 + 3*ra^2*rb^4*cos(alpha)^9 + 3*ra^4*rb^2*cos(alpha)^9 + 15*ra^2*z^4*cos(alpha)^5 + \\
& 15*ra^4*z^2*cos(alpha)^7 + 3*rb^2*z^4*cos(alpha)^5 + 3*rb^4*z^2*cos(alpha)^7 + \\
& 18*ra^2*rb^2*z^2*cos(alpha)^7 - 20*ra^3*z^3*cos(alpha)^6*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^9*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^9*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^9*cos(beta)^3 - 12*ra^2*z^4*cos(alpha)^5*cos(beta)^2 - \\
& 12*ra^4*z^2*cos(alpha)^7*cos(beta)^2 - 6*ra*rb^5*cos(alpha)^9*cos(beta) - 6*ra^5*rb*cos(alpha)^9*cos(beta) \\
& - 6*ra*z^5*cos(alpha)^4*sin(beta) - 6*ra^5*z*cos(alpha)^8*sin(beta) - 12*ra^3*rb^3*cos(alpha)^9*cos(beta) - \\
& 6*ra*rb*z^4*cos(alpha)^5*cos(beta) - 6*ra*rb^4*z*cos(alpha)^8*sin(beta) + \\
& 8*ra^3*z^3*cos(alpha)^6*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^7*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^7*cos(beta) - 12*ra*rb^2*z^3*cos(alpha)^6*sin(beta) - \\
& 12*ra^3*rb^2*z*cos(alpha)^8*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^7*cos(beta)^3 + \\
& 24*ra^2*rb*z^3*cos(alpha)^6*cos(beta)*sin(beta) + 24*ra^2*rb^3*z*cos(alpha)^8*cos(beta)*sin(beta) - \\
& 24*ra^3*rb^2*z*cos(alpha)^8*cos(beta)^2*sin(beta) + 24*ra^4*rb*z*cos(alpha)^8*cos(beta)*sin(beta)); \\
& YM2412=(cos(alpha)*(rb - ra*cos(beta))*(rb*z2d*cos(alpha) - rb*z2d*cos(alpha)^3 + beta2d*ra^2*cos(alpha)^2 - \\
& beta2d*ra^2*cos(alpha)^4 + ra*z2d*cos(alpha)^3*cos(beta) + alpha2d*rb*z*sin(alpha) - \\
& ra*z2d*cos(alpha)*cos(beta) - alpha2d*ra*z*cos(beta)*sin(alpha) - beta2d*ra*z*cos(alpha)*sin(beta) - \\
& beta2d*ra*rb*cos(alpha)^2*cos(beta) + beta2d*ra*rb*cos(alpha)^4*cos(beta) + \\
& beta2d*ra*z*cos(alpha)^3*sin(beta) + alpha2d*ra^2*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) - \\
& alpha2d*ra*rb*cos(alpha)^3*sin(alpha)*sin(beta))/(ra^4*cos(alpha)^4 - ra^4*cos(alpha)^6 + rb^4*cos(alpha)^4 \\
& - z^4*cos(alpha)^2 + z^4 + 2*ra^2*rb^2*cos(alpha)^4 - ra^2*rb^2*cos(alpha)^6 + 6*ra^2*z^2*cos(alpha)^2 - \\
& 6*ra^2*z^2*cos(alpha)^4 + 2*rb^2*z^2*cos(alpha)^2 - rb^2*z^2*cos(alpha)^4 +
\end{aligned}$$

$$\begin{aligned}
& ra^4 \cos(\alpha)^6 \cos(\beta)^2 - 4*ra^2 z^3 \cos(\alpha) \sin(\beta) + 4*ra^2 rb^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& ra^2 rb^2 \cos(\alpha)^6 \cos(\beta)^2 - 4*ra^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 5*ra^2 z^2 \cos(\alpha)^4 \cos(\beta)^2 - 4*ra^2 rb^3 \cos(\alpha)^4 \cos(\beta) - 4*ra^3 rb \cos(\alpha)^4 \cos(\beta) + \\
& 2*ra^3 rb \cos(\alpha)^6 \cos(\beta) + 4*ra^2 z^3 \cos(\alpha)^3 \sin(\beta) - 4*ra^3 z^2 \cos(\alpha)^3 \sin(\beta) + \\
& 4*ra^3 z^2 \cos(\alpha)^5 \sin(\beta) - 2*ra^3 rb \cos(\alpha)^6 \cos(\beta)^3 - 4*ra^2 rb z^2 \cos(\alpha)^2 \cos(\beta) + \\
& 2*ra^2 rb z^2 \cos(\alpha)^4 \cos(\beta) - 4*ra^2 rb^2 z^2 \cos(\alpha)^3 \sin(\beta) + 2*ra^2 rb^2 z^2 \cos(\alpha)^5 \sin(\beta) \\
& - 2*ra^3 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + 8*ra^2 rb^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& 4*ra^2 rb^2 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta));
\end{aligned}$$

$$\begin{aligned}
YM2413 = & (\cos(\alpha)^3 (rb - ra \cos(\beta))^2 (rb^2 z^2 d^2 \cos(\alpha)^3 - \alpha d^2 z^3 \sin(\alpha) + \\
& \beta d^2 ra^2 rb \cos(\alpha)^4 - \beta d^2 ra^3 \cos(\alpha)^4 \cos(\beta) + ra^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta)^2 - \\
& 3 \alpha d^2 ra^2 z^2 \cos(\alpha)^2 \sin(\alpha) + \beta d^2 ra^2 rb \cos(\alpha)^4 \cos(\beta)^2 + \\
& \alpha d^2 ra^3 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) - 2 ra^2 rb z^2 d^2 \cos(\alpha)^3 \cos(\beta) - \\
& \beta d^2 ra^2 rb^2 \cos(\alpha)^4 \cos(\beta) - \beta d^2 ra^2 rb^2 z^2 \cos(\alpha)^3 \sin(\beta) + \\
& 3 \alpha d^2 ra^2 z^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) + 3 \alpha d^2 ra^2 z^2 \cos(\alpha) \sin(\alpha) \sin(\beta) + \\
& \beta d^2 ra^2 z^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) + \alpha d^2 ra^2 rb^2 \cos(\alpha)^3 \sin(\alpha) \sin(\beta) - \\
& 2 \alpha d^2 ra^2 rb \cos(\alpha)^3 \cos(\beta) \sin(\alpha) \sin(\beta)) / (ra^6 \cos(\alpha)^6 - ra^6 \cos(\alpha)^8 + \\
& rb^6 \cos(\alpha)^6 - z^6 \cos(\alpha)^2 + z^6 + 3 ra^2 rb^4 \cos(\alpha)^6 + 3 ra^4 rb^2 \cos(\alpha)^6 - \\
& ra^2 rb^4 \cos(\alpha)^8 - 2 ra^4 rb^2 \cos(\alpha)^8 + 15 ra^2 z^4 \cos(\alpha)^2 - 15 ra^2 z^4 \cos(\alpha)^4 \\
& + 15 ra^4 z^2 \cos(\alpha)^4 - 15 ra^4 z^2 \cos(\alpha)^6 + 3 rb^2 z^4 \cos(\alpha)^2 - \\
& 2 rb^2 z^4 \cos(\alpha)^4 + 3 rb^4 z^2 \cos(\alpha)^4 - rb^4 z^2 \cos(\alpha)^6 + \\
& ra^6 \cos(\alpha)^8 \cos(\beta)^2 + 18 ra^2 rb^2 z^2 \cos(\alpha)^4 - 12 ra^2 rb^2 z^2 \cos(\alpha)^6 - \\
& 20 ra^3 z^3 \cos(\alpha)^3 \sin(\beta) + 20 ra^3 z^3 \cos(\alpha)^5 \sin(\beta) - 6 ra^2 z^5 \cos(\alpha) \sin(\beta) + \\
& 12 ra^2 rb^4 \cos(\alpha)^6 \cos(\beta)^2 + 12 ra^4 rb^2 \cos(\alpha)^6 \cos(\beta)^2 - \\
& 8 ra^3 rb^3 \cos(\alpha)^6 \cos(\beta)^3 + ra^2 rb^4 \cos(\alpha)^8 \cos(\beta)^2 - \\
& 2 ra^4 rb^2 \cos(\alpha)^8 \cos(\beta)^2 - 4 ra^3 rb^3 \cos(\alpha)^8 \cos(\beta)^3 + \\
& 4 ra^4 rb^2 \cos(\alpha)^8 \cos(\beta)^4 - 12 ra^2 z^4 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 13 ra^2 z^4 \cos(\alpha)^4 \cos(\beta)^2 - 12 ra^4 z^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& 18 ra^4 z^2 \cos(\alpha)^6 \cos(\beta)^2 - 4 ra^4 z^2 \cos(\alpha)^6 \cos(\beta)^4 - \\
& 6 ra^2 rb^5 \cos(\alpha)^6 \cos(\beta) - 6 ra^5 rb \cos(\alpha)^6 \cos(\beta) + 4 ra^5 rb \cos(\alpha)^8 \cos(\beta) + \\
& 6 ra^2 z^5 \cos(\alpha)^3 \sin(\beta) - 6 ra^5 z^2 \cos(\alpha)^5 \sin(\beta) + 6 ra^5 z^2 \cos(\alpha)^7 \sin(\beta) - \\
& 12 ra^3 rb^3 \cos(\alpha)^6 \cos(\beta) + 4 ra^3 rb^3 \cos(\alpha)^8 \cos(\beta) - \\
& 4 ra^5 rb \cos(\alpha)^8 \cos(\beta)^3 - 6 ra^2 rb^2 z^4 \cos(\alpha)^2 \cos(\beta) + 4 ra^2 rb^2 z^4 \cos(\alpha)^4 \cos(\beta) \\
& - 6 ra^2 rb^4 z^2 \cos(\alpha)^5 \sin(\beta) + 2 ra^2 rb^4 z^2 \cos(\alpha)^7 \sin(\beta) + \\
& 6 ra^2 rb^2 z^2 \cos(\alpha)^6 \cos(\beta)^2 + 8 ra^3 z^3 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) - \\
& 12 ra^3 z^3 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) - 12 ra^2 rb^3 z^2 \cos(\alpha)^4 \cos(\beta) - \\
& 36 ra^3 rb^2 z^2 \cos(\alpha)^4 \cos(\beta) + 4 ra^2 rb^3 z^2 \cos(\alpha)^6 \cos(\beta) + \\
& 24 ra^3 rb^2 z^2 \cos(\alpha)^6 \cos(\beta) - 12 ra^2 rb^2 z^3 \cos(\alpha)^3 \sin(\beta) + \\
& 8 ra^2 rb^2 z^3 \cos(\alpha)^5 \sin(\beta) - 12 ra^3 rb^2 z^2 \cos(\alpha)^5 \sin(\beta) + \\
& 8 ra^3 rb^2 z^2 \cos(\alpha)^7 \sin(\beta) + 24 ra^3 rb^2 z^2 \cos(\alpha)^4 \cos(\beta)^3 - \\
& 20 ra^3 rb^2 z^2 \cos(\alpha)^6 \cos(\beta)^3 - 4 ra^5 z^2 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + \\
& 24 ra^2 rb^2 z^3 \cos(\alpha)^3 \cos(\beta) \sin(\beta) - 16 ra^2 rb^2 z^3 \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \\
& 24 ra^2 rb^3 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - 8 ra^2 rb^3 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta) + \\
& 8 ra^4 rb^2 z^2 \cos(\alpha)^7 \cos(\beta)^3 \sin(\beta) - 24 ra^3 rb^2 z^2 \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + \\
& 4 ra^3 rb^2 z^2 \cos(\alpha)^7 \cos(\beta)^2 \sin(\beta) + 24 ra^4 rb^2 z^2 \cos(\alpha)^5 \cos(\beta) \sin(\beta) - \\
& 16 ra^4 rb^2 z^2 \cos(\alpha)^7 \cos(\beta) \sin(\beta));
\end{aligned}$$

$$YM2414=0;$$

$$YM2421 = -\beta d^2 ((-ra \cos(\alpha))^3 (-z^2 \cos(\beta) - ra^2 rb \cos(\alpha)^2 + ra^2 rb \cos(\alpha)^2 \cos(\beta))^2$$

$$\begin{aligned}
& (\cos(\alpha)\sin(\alpha)(z - ra\cos(\alpha)\sin(\beta))^2)/(ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta)) + (\tan(\alpha)*(\cos(\alpha)^2)^{(3/2)}*(rb - \\
& ra*\cos(\beta))^2*((ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
& 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - e^{2*abs(\cos(\alpha))})/(abs(\cos(\alpha))*(ra^2\cos(\alpha)^2 - \\
& 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)})) + ((z*(z - \\
& ra*\cos(\alpha)\sin(\beta))*(z*\tan(\alpha) - ra*\sin(\alpha)\sin(\beta)))/(ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta)) - ((z*\tan(\alpha) - \\
& ra*\sin(\alpha)\sin(\beta))*((ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
& 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - e^{2*abs(\cos(\alpha))})*(ra^2\cos(\alpha)^2 + z^2 - \\
& ra^2\cos(\alpha)^2*\cos(\beta)^2 - 2*ra*z*\cos(\alpha)\sin(\beta)))/(ra^2\cos(\alpha)^2 - \\
& 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)} + \\
& (ra*\sin(\alpha)\sin(\beta)*(\cos(\alpha)^2)^{(3/2)}*(rb - ra*\cos(\beta))^2*((ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + \\
& z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - \\
& e^{2*abs(\cos(\alpha))})/(abs(\cos(\alpha))*(ra^2\cos(\alpha)^2 - 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - \\
& 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)}))*((\cos(\alpha)^2*(z - \\
& ra*\cos(\alpha)\sin(\beta))^2)/(ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
& 2*ra*z*\cos(\alpha)\sin(\beta)) + (\sin(\alpha)^2*(z - ra*\cos(\alpha)\sin(\beta))^2)/(ra^2\cos(\alpha)^2 + \\
& rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta)) + \\
& ((\cos(\alpha)^2)^{(3/2)}*(rb - ra*\cos(\beta))^2*((ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - \\
& e^{2*abs(\cos(\alpha))})/(abs(\cos(\alpha))*(ra^2\cos(\alpha)^2 - 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - \\
& 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)})) - ((z*(rb - ra*\cos(\beta))*(z*\tan(\alpha) - \\
& ra*\sin(\alpha)\sin(\beta)))/(ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
& 2*ra*z*\cos(\alpha)\sin(\beta)) + ((rb - ra*\cos(\beta))*(z*\tan(\alpha) - ra*\sin(\alpha)\sin(\beta))*((ra^2\cos(\alpha)^2 + \\
& rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - \\
& e^{2*abs(\cos(\alpha))})*(z - ra*\cos(\alpha)\sin(\beta)))/(ra^2\cos(\alpha)^2 - 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - \\
& 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)} + (ra*\sin(\alpha)\sin(\beta)*(\cos(\alpha)^2)^{(3/2)}*(z \\
& - ra*\cos(\alpha)\sin(\beta))*(rb - ra*\cos(\beta))*((ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - \\
& 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - \\
& e^{2*abs(\cos(\alpha))})/(abs(\cos(\alpha))*(ra^2\cos(\alpha)^2 - 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - \\
& 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)}))*((\cos(\alpha)^2*(z - ra*\cos(\alpha)\sin(\beta))*(rb - \\
& ra*\cos(\beta)))/(ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
& 2*ra*z*\cos(\alpha)\sin(\beta)) + (\cos(\alpha)^2*\tan(\alpha)*(rb - ra*\cos(\beta))*(z*\tan(\alpha) - \\
& ra*\sin(\alpha)\sin(\beta)))/(ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
& 2*ra*z*\cos(\alpha)\sin(\beta)) - ((\cos(\alpha)^2)^{(3/2)}*(z - ra*\cos(\alpha)\sin(\beta))*(rb - \\
& ra*\cos(\beta))*((ra^2\cos(\alpha)^2 + rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - \\
& 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - e^{2*abs(\cos(\alpha))})/(abs(\cos(\alpha))*(ra^2\cos(\alpha)^2 - \\
& 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)})) - \\
& (\tan(\alpha)*(\cos(\alpha)^2)^{(3/2)}*(rb - ra*\cos(\beta))*(z*\tan(\alpha) - ra*\sin(\alpha)\sin(\beta))*((ra^2\cos(\alpha)^2 + \\
& rb^2\cos(\alpha)^2 + z^2 - 2*ra*rb*\cos(\alpha)^2*\cos(\beta) - 2*ra*z*\cos(\alpha)\sin(\beta))^{(1/2)} - \\
& e^{2*abs(\cos(\alpha))})/(abs(\cos(\alpha))*(ra^2\cos(\alpha)^2 - 2*\cos(\beta)*ra*rb*\cos(\alpha)^2 - \\
& 2*\sin(\beta)*ra*z*\cos(\alpha) + rb^2\cos(\alpha)^2 + z^2)^{(3/2)})); \\
& YM2422 = -((rb - ra*\cos(\beta))*(alpha2d*ra^3*\cos(\alpha)^6*\cos(\beta) - alpha2d*ra^2*rb*\cos(\alpha)^6 - \\
& alpha2d*rb*z^2 + alpha2d*ra*z^2*\cos(\beta) - alpha2d*ra^3*\cos(\alpha)^6*\cos(\beta)^3 - \\
& beta2d*ra^2*z*\cos(\alpha)^2*\sin(\alpha) - beta2d*ra^2*z*\cos(\alpha)^4*\sin(\alpha) + \\
& alpha2d*ra^2*rb*\cos(\alpha)^6*\cos(\beta)^2 - rb*z^2d*\cos(\alpha)*\sin(\alpha) + \\
& beta2d*ra^3*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) + 2*alpha2d*ra*rb*z*\cos(\alpha)^3*\sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& ra^2z^2d^2\cos(\alpha)\cos(\beta)\sin(\alpha) + \beta^2d^2ra^2z^2\cos(\alpha)^4\cos(\beta)^2\sin(\alpha) - \\
& ra^2z^2d^2\cos(\alpha)^4\cos(\beta)\sin(\alpha)\sin(\beta) + \beta^2d^2ra^2z^2\cos(\alpha)\sin(\alpha)\sin(\beta) + \\
& ra^2rb^2z^2d^2\cos(\alpha)^4\sin(\alpha)\sin(\beta) - 2\alpha^2d^2ra^2z^2\cos(\alpha)^3\cos(\beta)\sin(\beta) - \\
& \beta^2d^2ra^2z^2rb^2\cos(\alpha)^5\cos(\beta)\sin(\alpha)\sin(\beta) + \\
& \beta^2d^2ra^2rb^2z^2\cos(\alpha)^2\cos(\beta)\sin(\alpha)\sin(\beta))/((ra^4\cos(\alpha)^4 - ra^4\cos(\alpha)^6 + \\
& rb^4\cos(\alpha)^4 - z^4\cos(\alpha)^2 + z^4 + 2ra^2rb^2\cos(\alpha)^4 - ra^2rb^2\cos(\alpha)^6 + \\
& 6ra^2z^2\cos(\alpha)^2 - 6ra^2z^2\cos(\alpha)^4 + 2rb^2z^2\cos(\alpha)^2 - rb^2z^2\cos(\alpha)^4 + \\
& ra^4\cos(\alpha)^6\cos(\beta)^2 - 4ra^2z^3\cos(\alpha)\sin(\beta) + 4ra^2rb^2\cos(\alpha)^4\cos(\beta)^2 + \\
& ra^2rb^2\cos(\alpha)^6\cos(\beta)^2 - 4ra^2z^2\cos(\alpha)^2\cos(\beta)^2 + \\
& 5ra^2z^2\cos(\alpha)^4\cos(\beta)^2 - 4ra^2rb^3\cos(\alpha)^4\cos(\beta) - 4ra^3rb^2\cos(\alpha)^4\cos(\beta) + \\
& 2ra^3rb^2\cos(\alpha)^6\cos(\beta) + 4ra^2z^3\cos(\alpha)^3\sin(\beta) - 4ra^3z^2\cos(\alpha)^3\sin(\beta) + \\
& 4ra^3z^2\cos(\alpha)^5\sin(\beta) - 2ra^3rb^2\cos(\alpha)^6\cos(\beta)^3 - 4ra^2rb^2z^2\cos(\alpha)^2\cos(\beta) + \\
& 2ra^2rb^2z^2\cos(\alpha)^4\cos(\beta) - 4ra^2rb^2z^2\cos(\alpha)^3\sin(\beta) + 2ra^2rb^2z^2\cos(\alpha)^5\sin(\beta) \\
& - 2ra^3z^2\cos(\alpha)^5\cos(\beta)^2\sin(\beta) + 8ra^2rb^2z^2\cos(\alpha)^3\cos(\beta)\sin(\beta) - \\
& 4ra^2rb^2z^2\cos(\alpha)^5\cos(\beta)\sin(\beta)); \\
YM2423 = & (\alpha^2d^2z^6 + \alpha^2d^2ra^6\cos(\alpha)^6 - \alpha^2d^2ra^6\cos(\alpha)^8 - \alpha^2d^2z^6\cos(\alpha)^8 \\
& + \alpha^2d^2ra^2rb^4\cos(\alpha)^6 + 2\alpha^2d^2ra^4rb^2\cos(\alpha)^6 - \alpha^2d^2ra^2rb^4\cos(\alpha)^8 - \\
& 2\alpha^2d^2ra^4rb^2\cos(\alpha)^8 + 15\alpha^2d^2ra^2z^4\cos(\alpha)^2 - 15\alpha^2d^2ra^2z^4\cos(\alpha)^4 \\
& + 15\alpha^2d^2ra^4z^2\cos(\alpha)^4 - 15\alpha^2d^2ra^4z^2\cos(\alpha)^6 - \\
& \alpha^2d^2ra^6\cos(\alpha)^6\cos(\beta)^2 + \alpha^2d^2ra^6\cos(\alpha)^8\cos(\beta)^2 + \\
& 6\alpha^2d^2ra^2z^5\cos(\alpha)^3\sin(\beta) - 6\alpha^2d^2ra^5z^2\cos(\alpha)^5\sin(\beta) + \\
& 6\alpha^2d^2ra^5z^2\cos(\alpha)^7\sin(\beta) - 4\alpha^2d^2ra^3rb^3\cos(\alpha)^6\cos(\beta) + \\
& 4\alpha^2d^2ra^3rb^3\cos(\alpha)^8\cos(\beta) + 4\alpha^2d^2ra^5rb^2\cos(\alpha)^6\cos(\beta)^3 - \\
& 4\alpha^2d^2ra^5rb^2\cos(\alpha)^8\cos(\beta)^3 + 6\alpha^2d^2ra^2rb^2z^2\cos(\alpha)^4 - \\
& 6\alpha^2d^2ra^2rb^2z^2\cos(\alpha)^6 - 20\alpha^2d^2ra^3z^3\cos(\alpha)^3\sin(\beta) + \\
& 20\alpha^2d^2ra^3z^3\cos(\alpha)^5\sin(\beta) - rb^2z^3z^2d^2\cos(\alpha)^3\sin(\alpha) - \\
& 6\alpha^2d^2ra^2z^5\cos(\alpha)\sin(\beta) - \alpha^2d^2ra^2rb^4\cos(\alpha)^6\cos(\beta)^2 + \\
& 2\alpha^2d^2ra^4rb^2\cos(\alpha)^6\cos(\beta)^2 + 4\alpha^2d^2ra^3rb^3\cos(\alpha)^6\cos(\beta)^3 + \\
& \alpha^2d^2ra^2rb^4\cos(\alpha)^8\cos(\beta)^2 - 4\alpha^2d^2ra^4rb^2\cos(\alpha)^6\cos(\beta)^4 - \\
& 2\alpha^2d^2ra^4rb^2\cos(\alpha)^8\cos(\beta)^2 - 4\alpha^2d^2ra^3rb^3\cos(\alpha)^8\cos(\beta)^3 + \\
& 4\alpha^2d^2ra^4rb^2\cos(\alpha)^8\cos(\beta)^4 - 15\alpha^2d^2ra^2z^4\cos(\alpha)^2\cos(\beta)^2 + \\
& 15\alpha^2d^2ra^2z^4\cos(\alpha)^4\cos(\beta)^2 - 24\alpha^2d^2ra^4z^2\cos(\alpha)^4\cos(\beta)^2 + \\
& 9\alpha^2d^2ra^4z^2\cos(\alpha)^4\cos(\beta)^4 + 24\alpha^2d^2ra^4z^2\cos(\alpha)^6\cos(\beta)^2 - \\
& 9\alpha^2d^2ra^4z^2\cos(\alpha)^6\cos(\beta)^4 - 4\alpha^2d^2ra^5rb^2\cos(\alpha)^6\cos(\beta) + \\
& 4\alpha^2d^2ra^5rb^2\cos(\alpha)^8\cos(\beta) + 12\alpha^2d^2ra^3rb^2z^2\cos(\alpha)^4\cos(\beta)^3 - \\
& 12\alpha^2d^2ra^3rb^2z^2\cos(\alpha)^6\cos(\beta)^3 - \beta^2d^2ra^6\cos(\alpha)^7\cos(\beta)\sin(\alpha)\sin(\beta) \\
& + 4\beta^2d^2ra^3z^3\cos(\alpha)^4\cos(\beta)\sin(\alpha) - 4\beta^2d^2ra^5z^2\cos(\alpha)^6\cos(\beta)^3\sin(\alpha) \\
& + 6\alpha^2d^2ra^5z^2\cos(\alpha)^5\cos(\beta)^2\sin(\beta) - 6\alpha^2d^2ra^5z^2\cos(\alpha)^7\cos(\beta)^2\sin(\beta) \\
& + \beta^2d^2ra^3rb^3\cos(\alpha)^7\sin(\alpha)\sin(\beta) - 3ra^4z^2z^2d^2\cos(\alpha)^5\cos(\beta)^2\sin(\alpha) + \\
& 3ra^4z^2z^2d^2\cos(\alpha)^5\cos(\beta)^4\sin(\alpha) + ra^3rb^2z^2d^2\cos(\alpha)^6\sin(\alpha)\sin(\beta) - \\
& 4\beta^2d^2ra^4rb^2z^2\cos(\alpha)^6\sin(\alpha) - 6\alpha^2d^2ra^2rb^2z^2\cos(\alpha)^4\cos(\beta)^2 + \\
& 6\alpha^2d^2ra^2rb^2z^2\cos(\alpha)^6\cos(\beta)^2 - 3\beta^2d^2ra^3z^3\cos(\alpha)^4\cos(\beta)^3\sin(\alpha) \\
& + 18\alpha^2d^2ra^3z^3\cos(\alpha)^3\cos(\beta)^2\sin(\beta) - \\
& 18\alpha^2d^2ra^3z^3\cos(\alpha)^5\cos(\beta)^2\sin(\beta) + \\
& ra^5z^2d^2\cos(\alpha)^6\cos(\beta)^2\sin(\alpha)\sin(\beta) - ra^2z^3z^2d^2\cos(\alpha)^3\cos(\beta)^2\sin(\alpha) - \\
& 12\alpha^2d^2ra^3rb^2z^2\cos(\alpha)^4\cos(\beta) + 12\alpha^2d^2ra^3rb^2z^2\cos(\alpha)^6\cos(\beta) + \\
& 4\beta^2d^2ra^5z^2\cos(\alpha)^6\cos(\beta)\sin(\alpha) + \beta^2d^2ra^5rb^2\cos(\alpha)^7\sin(\alpha)\sin(\beta) -
\end{aligned}$$

$$\begin{aligned}
& 4*\beta^2*d^r*a^2*r*b*z^3*\cos(\alpha)^4*\sin(\alpha) - \beta^2*d^r*a^2*r*b^3*z^3*\cos(\alpha)^6*\sin(\alpha) - \\
& 2*\alpha^2*d^r*a^r*b^2*z^3*\cos(\alpha)^3*\sin(\beta) + 2*\alpha^2*d^r*a^r*b^2*z^3*\cos(\alpha)^5*\sin(\beta) - \\
& 6*\alpha^2*d^r*a^3*r*b^2*z^3*\cos(\alpha)^5*\sin(\beta) + 6*\alpha^2*d^r*a^3*r*b^2*z^3*\cos(\alpha)^7*\sin(\beta) + \\
& r*a^r*b^4*z^2*d^r*\cos(\alpha)^6*\sin(\alpha)*\sin(\beta) - 3*r*a^2*r*b^2*z^2*d^r*\cos(\alpha)^5*\sin(\alpha) - \\
& \beta^2*d^r*a^2*z^4*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*\beta^2*d^r*a^4*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*r*a^2*r*b^3*z^2*d^r*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 2*r*a^4*r*b^2*z^2*d^r*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 3*r*a^2*r*b^2*z^2*d^r*\cos(\alpha)^5*\cos(\beta)^2*\sin(\alpha) + \\
& 12*\alpha^2*d^r*a^4*r*b*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 12*\alpha^2*d^r*a^4*r*b*z^3*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) + \beta^2*d^r*a^r*b^3*z^4*\cos(\alpha)^3*\sin(\alpha)*\sin(\beta) + \\
& 2*r*a^r*b^3*z^2*d^r*\cos(\alpha)^3*\cos(\beta)*\sin(\alpha) + 6*r*a^3*r*b^2*z^2*d^r*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha) + \\
& 3*\beta^2*d^r*a^3*r*b^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) - \\
& 2*\beta^2*d^r*a^4*r*b^2*\cos(\alpha)^7*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 3*\beta^2*d^r*a^4*z^2*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha)*\sin(\beta) + \\
& 5*r*a^3*r*b^2*z^2*d^r*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 3*r*a^3*z^2*z^2*d^r*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& \beta^2*d^r*a^r*b^2*z^3*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha) + \\
& 6*\beta^2*d^r*a^3*r*b^2*z^3*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha) - \\
& \beta^2*d^r*a^4*r*b^2*z^3*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) + \\
& 5*\beta^2*d^r*a^4*r*b^2*z^3*\cos(\alpha)^6*\cos(\beta)^4*\sin(\alpha) + \\
& 4*\alpha^2*d^r*a^2*r*b^2*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - \\
& 4*\alpha^2*d^r*a^2*r*b^2*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 12*\alpha^2*d^r*a^4*r*b^2*z^3*\cos(\alpha)^5*\cos(\beta)^3*\sin(\beta) + \\
& 12*\alpha^2*d^r*a^4*r*b^2*z^3*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) + \\
& 6*\beta^2*d^r*a^3*r*b^2*z^2*\cos(\alpha)^5*\sin(\alpha)*\sin(\beta) - \\
& 2*r*a^4*r*b^2*z^2*d^r*\cos(\alpha)^6*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 6*r*a^3*r*b^2*z^2*d^r*\cos(\alpha)^5*\cos(\beta)^3*\sin(\alpha) + 3*r*a^r*b^2*z^2*z^2*d^r*\cos(\alpha)^4*\sin(\alpha)*\sin(\beta) - \\
& \beta^2*d^r*a^2*r*b^4*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 4*\beta^2*d^r*a^4*r*b^2*\cos(\alpha)^7*\cos(\beta)*\sin(\alpha)*\sin(\beta) + \\
& 3*\beta^2*d^r*a^5*r*b*\cos(\alpha)^7*\cos(\beta)^2*\sin(\alpha)*\sin(\beta) + \\
& 2*\beta^2*d^r*a^2*r*b^2*z^3*\cos(\alpha)^4*\cos(\beta)^2*\sin(\alpha) + \\
& \beta^2*d^r*a^2*r*b^3*z^3*\cos(\alpha)^6*\cos(\beta)^2*\sin(\alpha) - \\
& 6*\beta^2*d^r*a^3*r*b^2*z^3*\cos(\alpha)^6*\cos(\beta)^3*\sin(\alpha) + \\
& 6*\alpha^2*d^r*a^3*r*b^2*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - \\
& 6*\alpha^2*d^r*a^3*r*b^2*z^3*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) - \\
& 6*r*a^2*r*b^2*z^2*z^2*d^r*\cos(\alpha)^4*\cos(\beta)*\sin(\alpha)*\sin(\beta) - \\
& 3*\beta^2*d^r*a^2*r*b^2*z^2*\cos(\alpha)^5*\cos(\beta)*\sin(\alpha)*\sin(\beta))/(r^6*\cos(\alpha)^6 - r^6*\cos(\alpha)^8 \\
& + r^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*r^2*r^2*r^4*\cos(\alpha)^6 + 3*r^4*r^2*r^2*\cos(\alpha)^6 - \\
& r^2*r^2*r^4*\cos(\alpha)^8 - 2*r^4*r^2*r^2*\cos(\alpha)^8 + 15*r^2*z^4*\cos(\alpha)^2 - 15*r^2*z^4*\cos(\alpha)^4 \\
& + 15*r^4*z^2*\cos(\alpha)^4 - 15*r^4*z^2*\cos(\alpha)^6 + 3*r^2*z^4*\cos(\alpha)^2 - \\
& 2*r^2*z^4*\cos(\alpha)^4 + 3*r^4*z^2*\cos(\alpha)^4 - r^4*z^2*\cos(\alpha)^6 + \\
& r^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*r^2*r^2*r^2*z^2*\cos(\alpha)^4 - 12*r^2*r^2*r^2*z^2*\cos(\alpha)^6 - \\
& 20*r^3*z^3*\cos(\alpha)^3*\sin(\beta) + 20*r^3*z^3*\cos(\alpha)^5*\sin(\beta) - 6*r^3*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*r^2*r^2*r^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*r^4*r^2*r^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*r^3*r^3*\cos(\alpha)^6*\cos(\beta)^3 + r^2*r^2*r^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*r^4*r^2*r^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*r^4*r^3*r^3*\cos(\alpha)^8*\cos(\beta)^3 +
\end{aligned}$$

$$\begin{aligned}
& 4*ra^4*rb^2*cos(alpha)^8*cos(beta)^4 - 12*ra^2*z^4*cos(alpha)^2*cos(beta)^2 + \\
& 13*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - 12*ra^4*z^2*cos(alpha)^4*cos(beta)^2 + \\
& 18*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 4*ra^4*z^2*cos(alpha)^6*cos(beta)^4 - \\
& 6*ra*rb^5*cos(alpha)^6*cos(beta) - 6*ra^5*rb*cos(alpha)^6*cos(beta) + 4*ra^5*rb*cos(alpha)^8*cos(beta) + \\
& 6*ra*z^5*cos(alpha)^3*sin(beta) - 6*ra^5*z*cos(alpha)^5*sin(beta) + 6*ra^5*z*cos(alpha)^7*sin(beta) - \\
& 12*ra^3*rb^3*cos(alpha)^6*cos(beta) + 4*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 4*ra^5*rb*cos(alpha)^8*cos(beta)^3 - 6*ra*rb*z^4*cos(alpha)^2*cos(beta) + 4*ra*rb*z^4*cos(alpha)^4*cos(beta) \\
& - 6*ra*rb^4*z*cos(alpha)^5*sin(beta) + 2*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 6*ra^2*rb^2*z^2*cos(alpha)^6*cos(beta)^2 + 8*ra^3*z^3*cos(alpha)^3*cos(beta)^2*sin(beta) - \\
& 12*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^4*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^4*cos(beta) + 4*ra*rb^3*z^2*cos(alpha)^6*cos(beta) + \\
& 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta) - 12*ra*rb^2*z^3*cos(alpha)^3*sin(beta) + \\
& 8*ra*rb^2*z^3*cos(alpha)^5*sin(beta) - 12*ra^3*rb^2*z*cos(alpha)^5*sin(beta) + \\
& 8*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^4*cos(beta)^3 - \\
& 20*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 - 4*ra^5*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& 24*ra^2*rb*z^3*cos(alpha)^3*cos(beta)*sin(beta) - 16*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 24*ra^2*rb^3*z*cos(alpha)^5*cos(beta)*sin(beta) - 8*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 8*ra^4*rb*z*cos(alpha)^7*cos(beta)^3*sin(beta) - 24*ra^3*rb^2*z*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 4*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 24*ra^4*rb*z*cos(alpha)^5*cos(beta)*sin(beta) - \\
& 16*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta);
\end{aligned}$$

$$YM2424=0;$$

$$\begin{aligned}
YM2431= & (beta2d*ra^8*cos(alpha)^8 + beta2d*e2^2*ra^6*cos(alpha)^8 + beta2d*ra^2*rb^6*cos(alpha)^8 + \\
& 3*beta2d*ra^4*rb^4*cos(alpha)^8 + 3*beta2d*ra^6*rb^2*cos(alpha)^8 + beta2d*ra^2*z^6*cos(alpha)^2 + \\
& 15*beta2d*ra^4*z^4*cos(alpha)^4 + 15*beta2d*ra^6*z^2*cos(alpha)^6 - ra^7*z2d*cos(alpha)^7*cos(beta) + \\
& e2^2*ra^4*rb^2z2d*cos(alpha)^7 - 6*beta2d*ra^7*z*cos(alpha)^7*sin(beta) - ra*rb^6*z2d*cos(alpha)^7*cos(beta) \\
& + beta2d*e2^2*ra^4*rb^2*cos(alpha)^8 - 6*beta2d*ra^3*rb^5*cos(alpha)^8*cos(beta) - \\
& 12*beta2d*ra^5*rb^3*cos(alpha)^8*cos(beta) + beta2d*e2^2*ra^2*z^4*cos(alpha)^4 + \\
& 6*beta2d*e2^2*ra^4*z^2*cos(alpha)^6 - e2^2*ra^5*z2d*cos(alpha)^7*cos(beta) + \\
& 3*beta2d*ra^2*rb^2*z^4*cos(alpha)^4 + 3*beta2d*ra^2*rb^4*z^2*cos(alpha)^6 + \\
& 18*beta2d*ra^4*rb^2*z^2*cos(alpha)^6 + e2^2*ra^2*rb^3z2d*cos(alpha)^7 - \\
& 6*beta2d*ra^3*z^5*cos(alpha)^3*sin(beta) - 20*beta2d*ra^5*z^3*cos(alpha)^5*sin(beta) - \\
& 3*ra^3*rb^4*z2d*cos(alpha)^7*cos(beta) - 3*ra^5*rb^2*z2d*cos(alpha)^7*cos(beta) + \\
& 6*ra^6*rb^2z2d*cos(alpha)^7*cos(beta)^2 - 15*ra^3*z^4z2d*cos(alpha)^3*cos(beta) - \\
& 15*ra^5*z^2z2d*cos(alpha)^5*cos(beta) - alpha2d*ra*z^7*cos(beta)*sin(alpha) + \\
& 12*beta2d*ra^4*rb^4*cos(alpha)^8*cos(beta)^2 + 12*beta2d*ra^6*rb^2*cos(alpha)^8*cos(beta)^2 - \\
& 8*beta2d*ra^5*rb^3*cos(alpha)^8*cos(beta)^3 - ra*z^6z2d*cos(alpha)*cos(beta) - \\
& 12*beta2d*ra^4*z^4*cos(alpha)^4*cos(beta)^2 - 12*beta2d*ra^6*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 6*ra^2*rb^5z2d*cos(alpha)^7*cos(beta)^2 + 12*ra^4*rb^3z2d*cos(alpha)^7*cos(beta)^2 - \\
& 12*ra^3*rb^4z2d*cos(alpha)^7*cos(beta)^3 - 12*ra^5*rb^2z2d*cos(alpha)^7*cos(beta)^3 + \\
& 8*ra^4*rb^3z2d*cos(alpha)^7*cos(beta)^4 + 12*ra^3*z^4z2d*cos(alpha)^3*cos(beta)^3 + \\
& 12*ra^5*z^2z2d*cos(alpha)^5*cos(beta)^3 - 6*beta2d*ra^7*rb*cos(alpha)^8*cos(beta) - \\
& 2*beta2d*e2^2*ra^3*rb^3*cos(alpha)^8*cos(beta) + beta2d*e2^2*ra^2*rb^2*z^2*cos(alpha)^6 - \\
& 12*beta2d*ra^3*rb^3z^2*cos(alpha)^6*cos(beta) + 24*beta2d*ra^5*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 15*alpha2d*ra^3*z^5*cos(alpha)^2*cos(beta)*sin(alpha) - \\
& 15*alpha2d*ra^5*z^3*cos(alpha)^4*cos(beta)*sin(alpha) - 4*beta2d*e2^2*ra^3*z^3*cos(alpha)^5*sin(beta) - \\
& 4*e2^2*ra^3*rb^2z2d*cos(alpha)^7*cos(beta) + 3*e2^2*ra^4*rb^2z2d*cos(alpha)^7*cos(beta)^2 - \\
& 3*e2^2*ra^3*z^2z2d*cos(alpha)^5*cos(beta) - 12*beta2d*ra^3*rb^2*z^3*cos(alpha)^5*sin(beta) +
\end{aligned}$$

$$\begin{aligned}
& 6*ra^2*rb*z^4*z2d*cos(alpha)^3*cos(beta)^2 - 18*ra^3*rb^2*z^2*z2d*cos(alpha)^5*cos(beta) + \\
& 36*ra^4*rb*z^2*z2d*cos(alpha)^5*cos(beta)^2 - 24*ra^4*rb*z^2*z2d*cos(alpha)^5*cos(beta)^4 + \\
& 6*ra^2*z^5*z2d*cos(alpha)^2*cos(beta)*sin(beta) + 20*ra^4*z^3*z2d*cos(alpha)^4*cos(beta)*sin(beta) + \\
& beta2d*e2^2*ra^2*rb^4*cos(alpha)^8*cos(beta)^2 + 5*beta2d*e2^2*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - \\
& 2*beta2d*e2^2*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 - beta2d*e2^2*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - \\
& 5*beta2d*e2^2*ra^4*z^2*cos(alpha)^6*cos(beta)^2 + \\
& 12*alpha2d*ra^3*z^5*cos(alpha)^2*cos(beta)^3*sin(alpha) + \\
& 12*alpha2d*ra^5*z^3*cos(alpha)^4*cos(beta)^3*sin(alpha) + 3*e2^2*ra^2*rb^3*z2d*cos(alpha)^7*cos(beta)^2 \\
& - 2*e2^2*ra^3*rb^2*z2d*cos(alpha)^7*cos(beta)^3 + 8*beta2d*ra^5*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) + \\
& 2*e2^2*ra^3*z^2*z2d*cos(alpha)^5*cos(beta)^3 + 12*ra^2*rb^3*z^2*z2d*cos(alpha)^5*cos(beta)^2 - \\
& 8*ra^4*z^3*z2d*cos(alpha)^4*cos(beta)^3*sin(beta) - 4*beta2d*e2^2*ra^5*rb*cos(alpha)^8*cos(beta) - \\
& 6*beta2d*ra^3*rb*z^4*cos(alpha)^4*cos(beta) - 36*beta2d*ra^5*rb*z^2*cos(alpha)^6*cos(beta) - \\
& alpha2d*ra^7*z*cos(alpha)^6*cos(beta)*sin(alpha) - 4*beta2d*e2^2*ra^5*z*cos(alpha)^7*sin(beta) - \\
& e2^2*ra*rb^4*z2d*cos(alpha)^7*cos(beta) - 6*beta2d*ra^3*rb^4*z*cos(alpha)^7*sin(beta) - \\
& 12*beta2d*ra^5*rb^2*z*cos(alpha)^7*sin(beta) + 3*e2^2*ra^2*rb*z^2*z2d*cos(alpha)^5 - \\
& 3*ra*rb^2*z^4*z2d*cos(alpha)^3*cos(beta) - 3*ra*rb^4*z^2*z2d*cos(alpha)^5*cos(beta) + \\
& 6*ra^6*z^2d*cos(alpha)^6*cos(beta)*sin(beta) - (2*beta2d*e2*ra^4*cos(alpha)^8*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - \\
& 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& 20*alpha2d*ra^4*z^4*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) + \\
& 6*alpha2d*ra^6*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& e2^2*ra^2*rb*z^2*z2d*cos(alpha)^5*cos(beta)^2 + e2^2*ra^2*z^3*z2d*cos(alpha)^4*cos(beta)*sin(beta) + \\
& 12*ra^2*rb^2*z^3*z2d*cos(alpha)^4*cos(beta)*sin(beta) - \\
& 24*ra^3*rb*z^3*z2d*cos(alpha)^4*cos(beta)^2*sin(beta) - \\
& 24*ra^3*rb^3*z^2d*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& 24*ra^4*rb^2*z^2d*cos(alpha)^6*cos(beta)^3*sin(beta) + alpha2d*e2^2*ra^4*rb*z*cos(alpha)^6*sin(alpha) - \\
& alpha2d*ra*rb^6*z*cos(alpha)^6*cos(beta)*sin(alpha) + 24*beta2d*ra^6*rb*z*cos(alpha)^7*cos(beta)*sin(beta) \\
& + 2*alpha2d*e2^2*ra^3*z^3*cos(alpha)^4*cos(beta)^3*sin(alpha) + \\
& 2*beta2d*e2^2*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - e2^2*ra*rb*z^3*z2d*cos(alpha)^4*sin(beta) - \\
& e2^2*ra*rb^3*z^2d*cos(alpha)^6*sin(beta) - 3*e2^2*ra^3*rb*z^2d*cos(alpha)^6*sin(beta) + \\
& 12*alpha2d*ra^2*rb^3*z^3*cos(alpha)^4*cos(beta)^2*sin(alpha) - \\
& 8*alpha2d*ra^4*z^4*cos(alpha)^3*cos(beta)^3*sin(alpha)*sin(beta) - \\
& (2*e2*ra^4*rb*z2d*cos(alpha)^7*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& 8*beta2d*e2^2*ra^3*rb*z^2*cos(alpha)^6*cos(beta) - alpha2d*e2^2*ra^5*z*cos(alpha)^6*cos(beta)*sin(alpha) \\
& + 3*alpha2d*e2^2*ra^2*rb*z^3*cos(alpha)^4*sin(alpha) + alpha2d*e2^2*ra^2*rb^3*z*cos(alpha)^6*sin(alpha) \\
& - 3*alpha2d*ra*rb^2*z^5*cos(alpha)^2*cos(beta)*sin(alpha) - \\
& 3*alpha2d*ra*rb^4*z^3*cos(alpha)^4*cos(beta)*sin(alpha) - \\
& 3*alpha2d*ra^3*rb^4*z*cos(alpha)^6*cos(beta)*sin(alpha) - \\
& 3*alpha2d*ra^5*rb^2*z*cos(alpha)^6*cos(beta)*sin(alpha) + \\
& 6*alpha2d*ra^6*rb*z*cos(alpha)^6*cos(beta)^2*sin(alpha) - 2*beta2d*e2^2*ra^3*rb^2*z*cos(alpha)^7*sin(beta) \\
& + 24*beta2d*ra^4*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 24*beta2d*ra^4*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) + \\
& 6*alpha2d*ra^2*z^6*cos(alpha)*cos(beta)*sin(alpha)*sin(beta) - e2^2*ra*rb^2*z^2*z2d*cos(alpha)^5*cos(beta) \\
& + 3*e2^2*ra^4*z^2d*cos(alpha)^6*cos(beta)*sin(beta) + 6*ra^2*rb^4*z^2d*cos(alpha)^6*cos(beta)*sin(beta) \\
& + 12*ra^4*rb^2*z^2d*cos(alpha)^6*cos(beta)*sin(beta) - 24*ra^5*rb*z^2d*cos(alpha)^6*cos(beta)^2*sin(beta) \\
& - (2*beta2d*e2*ra^2*z^2*cos(alpha)^6*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 -
\end{aligned}$$

$$\begin{aligned}
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*e2*ra^5*z2d*cos(alpha)^7*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (2*e2*ra^2*rb^3*z2d*cos(alpha)^7*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& 6*beta2d*e2^2*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 - \\
& 3*alpha2d*e2^2*ra^3*z^3*cos(alpha)^4*cos(beta)*sin(alpha) + \\
& 6*alpha2d*ra^2*rb*z^5*cos(alpha)^2*cos(beta)^2*sin(alpha) - \\
& 18*alpha2d*ra^3*rb^2*z^3*cos(alpha)^4*cos(beta)*sin(alpha) + \\
& 36*alpha2d*ra^4*rb*z^3*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& 6*alpha2d*ra^2*rb^5*z*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& 24*alpha2d*ra^4*rb*z^3*cos(alpha)^4*cos(beta)^4*sin(alpha) + \\
& 12*alpha2d*ra^4*rb^3*z*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& 12*alpha2d*ra^3*rb^4*z*cos(alpha)^6*cos(beta)^3*sin(alpha) - \\
& 12*alpha2d*ra^5*rb^2*z*cos(alpha)^6*cos(beta)^3*sin(alpha) + \\
& 8*alpha2d*ra^4*rb^3*z*cos(alpha)^6*cos(beta)^4*sin(alpha) - \\
& 24*beta2d*ra^5*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) - \\
& alpha2d*e2^2*ra*rb^4*z*cos(alpha)^6*cos(beta)*sin(alpha) + \\
& 10*beta2d*e2^2*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& (6*e2*ra^2*rb^3*z2d*cos(alpha)^7*cos(beta)^2*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (4*e2*ra^3*rb^2*z2d*cos(alpha)^7*cos(beta)^3*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*e2*ra^3*z^2*z2d*cos(alpha)^5*cos(beta)^3*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& alpha2d*e2^2*ra*rb*z^4*cos(alpha)^3*sin(alpha)*sin(beta) + \\
& (4*beta2d*e2*ra^3*rb*cos(alpha)^8*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& 24*alpha2d*ra^3*rb^3*z^2*cos(alpha)^5*cos(beta)^2*sin(alpha)*sin(beta) + \\
& 24*alpha2d*ra^4*rb^2*z^2*cos(alpha)^5*cos(beta)^3*sin(alpha)*sin(beta) + \\
& (4*beta2d*e2*ra^3*z*cos(alpha)^7*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*e2*ra*rb^4*z2d*cos(alpha)^7*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (6*e2*ra^2*rb*z^2*z2d*cos(alpha)^5*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& alpha2d*e2^2*ra*rb^2*z^3*cos(alpha)^4*cos(beta)*sin(alpha) - \\
& 4*alpha2d*e2^2*ra^3*rb^2*z*cos(alpha)^6*cos(beta)*sin(alpha) + \\
& 3*alpha2d*e2^2*ra^4*rb*z*cos(alpha)^6*cos(beta)^2*sin(alpha) + \\
& 2*beta2d*e2^2*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + \\
& 2*beta2d*e2^2*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& alpha2d*e2^2*ra*rb^3*z^2*cos(alpha)^5*sin(alpha)*sin(beta) - \\
& 3*alpha2d*e2^2*ra^3*rb*z^2*cos(alpha)^5*sin(alpha)*sin(beta) + \\
& 5*e2^2*ra^2*rb^2*z^2z2d*cos(alpha)^6*cos(beta)*sin(beta) - \\
& 4*e2^2*ra^3*rb*z^2z2d*cos(alpha)^6*cos(beta)^2*sin(beta) + \\
& (8*e2*ra^3*rb^2*z2d*cos(alpha)^7*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) -
\end{aligned}$$

$$\begin{aligned}
& (6e2*ra^4*rb*z2d*cos(alpha)^7*cos(beta)^2*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (6e2*ra^3*z^2*z2d*cos(alpha)^5*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& alpha2d*e2^2*ra^2*rb*z^3*cos(alpha)^4*cos(beta)^2*sin(alpha) + \\
& 3*alpha2d*e2^2*ra^2*rb^3*z*cos(alpha)^6*cos(beta)^2*sin(alpha) - \\
& 2*alpha2d*e2^2*ra^3*rb^2*z*cos(alpha)^6*cos(beta)^3*sin(alpha) - \\
& 6*beta2d*e2^2*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + \\
& alpha2d*e2^2*ra^2*z^4*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) + \\
& 3*alpha2d*e2^2*ra^4*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) + \\
& 12*alpha2d*ra^2*rb^2*z^4*cos(alpha)^3*cos(beta)*sin(alpha)*sin(beta) - \\
& 24*alpha2d*ra^3*rb*z^4*cos(alpha)^3*cos(beta)^2*sin(alpha)*sin(beta) + \\
& 6*alpha2d*ra^2*rb^4*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) + \\
& 12*alpha2d*ra^4*rb^2*z^2*cos(alpha)^5*cos(beta)*sin(alpha)*sin(beta) - \\
& 24*alpha2d*ra^5*rb*z^2*cos(alpha)^5*cos(beta)^2*sin(alpha)*sin(beta) - \\
& (2*beta2d*e2*ra^2*rb^2*cos(alpha)^8*cos(beta)^2*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*beta2d*e2*ra^2*z^2*cos(alpha)^6*cos(beta)^2*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*alpha2d*e2*ra^3*z*cos(alpha)^6*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*alpha2d*e2*ra^3*z*cos(alpha)^8*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (6*alpha2d*e2*ra^5*z*cos(alpha)^8*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^3*rb*cos(alpha)^9*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (2*alpha2d*e2*ra^5*rb*cos(alpha)^9*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^2*rb*z^3*cos(alpha)^6*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^2*rb^3*z*cos(alpha)^8*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2e2*ra*rb^2*z^2*z2d*cos(alpha)^5*cos(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (6e2*ra^4*z^2d*cos(alpha)^6*cos(beta)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (2*alpha2d*e2*ra^4*cos(alpha)^9*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*alpha2d*e2*ra^6*cos(alpha)^9*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (2*alpha2d*e2*ra^3*z*cos(alpha)^8*cos(beta)^3*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (2*alpha2d*e2*ra^3*z^3*cos(alpha)^6*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (6*alpha2d*e2*ra^5*z*cos(alpha)^8*cos(beta)^3*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) -
\end{aligned}$$

$$\begin{aligned}
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (6*alpha2d*e2*ra^3*rb^3*cos(alpha)^9*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) \\
& + (4*alpha2d*e2*ra^4*rb^2*cos(alpha)^9*cos(beta)^3*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (4*alpha2d*e2*ra^4*z^2*cos(alpha)^7*cos(beta)^3*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (2*alpha2d*e2*ra^2*rb*z*cos(alpha)^6*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) + \\
& (2*alpha2d*e2*ra^4*z^2*cos(alpha)^7*cos(beta)^3*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^2*rb*z*cos(alpha)^8*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (10*alpha2d*e2*ra^3*rb^2*z*cos(alpha)^8*cos(beta)*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^4*rb*z*cos(alpha)^8*cos(beta)^2*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (8*alpha2d*e2*ra^4*rb*z*cos(alpha)^8*cos(beta)^4*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (6*alpha2d*e2*ra^3*rb*z^2*cos(alpha)^7*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) - \\
& (10*e2*ra^2*rb^2*z^2d*cos(alpha)^6*cos(beta)*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (8*e2*ra^3*rb*z^2d*cos(alpha)^6*cos(beta)^2*sin(beta)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha2d*e2*ra^2*rb^2*z^2*cos(alpha)^7*cos(beta)*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)) \\
& + (2*alpha2d*e2*ra^3*rb*z^2*cos(alpha)^7*cos(beta)^2*sin(alpha)*sin(beta)*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - \\
& 2*ra*z*cos(alpha)*sin(beta))^(1/2))/abs(cos(alpha)))/(ra^6*cos(alpha)^8 + rb^6*cos(alpha)^8 + \\
& z^6*cos(alpha)^2 + 3*ra^2*rb^4*cos(alpha)^8 + 3*ra^4*rb^2*cos(alpha)^8 + 15*ra^2*z^4*cos(alpha)^4 + \\
& 15*ra^4*z^2*cos(alpha)^6 + 3*rb^2*z^4*cos(alpha)^4 + 3*rb^4*z^2*cos(alpha)^6 + \\
& 18*ra^2*rb^2*z^2*cos(alpha)^6 - 20*ra^3*z^3*cos(alpha)^5*sin(beta) + \\
& 12*ra^2*rb^4*cos(alpha)^8*cos(beta)^2 + 12*ra^4*rb^2*cos(alpha)^8*cos(beta)^2 - \\
& 8*ra^3*rb^3*cos(alpha)^8*cos(beta)^3 - 12*ra^2*z^4*cos(alpha)^4*cos(beta)^2 - \\
& 12*ra^4*z^2*cos(alpha)^6*cos(beta)^2 - 6*ra*rb^5*cos(alpha)^8*cos(beta) - 6*ra^5*rb*cos(alpha)^8*cos(beta) \\
& - 6*ra*z^5*cos(alpha)^3*sin(beta) - 6*ra^5*z*cos(alpha)^7*sin(beta) - 12*ra^3*rb^3*cos(alpha)^8*cos(beta) - \\
& 6*ra*rb*z^4*cos(alpha)^4*cos(beta) - 6*ra*rb^4*z*cos(alpha)^7*sin(beta) + \\
& 8*ra^3*z^3*cos(alpha)^5*cos(beta)^2*sin(beta) - 12*ra*rb^3*z^2*cos(alpha)^6*cos(beta) - \\
& 36*ra^3*rb*z^2*cos(alpha)^6*cos(beta) - 12*ra*rb^2*z^3*cos(alpha)^5*sin(beta) - \\
& 12*ra^3*rb^2*z*cos(alpha)^7*sin(beta) + 24*ra^3*rb*z^2*cos(alpha)^6*cos(beta)^3 + \\
& 24*ra^2*rb*z^3*cos(alpha)^5*cos(beta)*sin(beta) + 24*ra^2*rb^3*z*cos(alpha)^7*cos(beta)*sin(beta) - \\
& 24*ra^3*rb^2*z*cos(alpha)^7*cos(beta)^2*sin(beta) + 24*ra^4*rb*z*cos(alpha)^7*cos(beta)*sin(beta)); \\
& YM2432=(beta2d*ra^4*cos(alpha)^4 - beta2d*ra^4*cos(alpha)^6 + ra^2*rb^2z2d*cos(alpha)^3 - \\
& ra^2*rb^2z2d*cos(alpha)^5 + beta2d*ra^2*z^2*cos(alpha)^2 - beta2d*ra^2*z^2*cos(alpha)^4 - \\
& ra^3z2d*cos(alpha)^3*cos(beta) + ra^3z2d*cos(alpha)^5*cos(beta) - 2*beta2d*ra^3z*cos(alpha)^3*sin(beta) \\
& + 2*beta2d*ra^3z*cos(alpha)^5*sin(beta) - ra*rb^2z2d*cos(alpha)^3*cos(beta) + \\
& ra*rb^2z2d*cos(alpha)^5*cos(beta) + ra^2*rb^2z2d*cos(alpha)^3*cos(beta)^2 - \\
& ra^2*rb^2z2d*cos(alpha)^5*cos(beta)^2 + beta2d*ra^2*rb^2*cos(alpha)^4*cos(beta)^2 -
\end{aligned}$$

$$\begin{aligned}
& \beta^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^6 \cos(\beta)^2 - \beta^2 d^2 r^a \wedge^2 z \wedge^2 \cos(\alpha)^2 \cos(\beta)^2 + \\
& \beta^2 d^2 r^a \wedge^2 z \wedge^2 \cos(\alpha)^4 \cos(\beta)^2 - 2^* \beta^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^4 \cos(\beta) + \\
& 2^* \beta^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^6 \cos(\beta) + \alpha^2 d^2 r^a \wedge^4 \cos(\alpha)^5 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& \alpha^2 d^2 r^a \wedge^3 z \cos(\alpha)^4 \cos(\beta)^3 \sin(\alpha) - r^a r^b z^2 d^2 \cos(\alpha)^2 \sin(\beta) + \\
& r^a r^b z^2 d^2 \cos(\alpha)^4 \sin(\beta) + \alpha^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^2 \sin(\alpha) + \\
& \alpha^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^4 \sin(\alpha) - \alpha^2 d^2 r^a \wedge^3 z \cos(\alpha)^2 \cos(\beta) \sin(\alpha) - \\
& \alpha^2 d^2 r^a \wedge^3 z \cos(\alpha)^4 \cos(\beta) \sin(\alpha) - \alpha^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^5 \sin(\alpha) \sin(\beta) + \\
& r^a \wedge^2 z^2 d^2 \cos(\alpha)^2 \cos(\beta) \sin(\beta) - r^a \wedge^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta) \sin(\beta) - \\
& \alpha^2 d^2 r^a r^b \wedge^2 z \cos(\alpha)^2 \cos(\beta) \sin(\alpha) + 2^* \beta^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& 2^* \beta^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^5 \cos(\beta) \sin(\beta) + \alpha^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) \\
& - \alpha^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) + \\
& \alpha^2 d^2 r^a \wedge^2 z \wedge^2 \cos(\alpha) \cos(\beta) \sin(\alpha) \sin(\beta) - \alpha^2 d^2 r^a r^b z \wedge^2 \cos(\alpha) \sin(\alpha) \sin(\beta) \\
& + \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^5 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^5 \cos(\beta)^2 \sin(\alpha) \sin(\beta) / (r^a \wedge^4 \cos(\alpha)^4 - r^a \wedge^4 \cos(\alpha)^6 + \\
& r^b \wedge^4 \cos(\alpha)^4 - z \wedge^4 \cos(\alpha)^2 + z \wedge^4 + 2^* r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^4 - r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^6 + \\
& 6^* r^a \wedge^2 z \wedge^2 \cos(\alpha)^2 - 6^* r^a \wedge^2 z \wedge^2 \cos(\alpha)^4 + 2^* r^b \wedge^2 z \wedge^2 \cos(\alpha)^2 - r^b \wedge^2 z \wedge^2 \cos(\alpha)^4 + \\
& r^a \wedge^4 \cos(\alpha)^6 \cos(\beta)^2 - 4^* r^a z \wedge^3 \cos(\alpha) \sin(\beta) + 4^* r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^6 \cos(\beta)^2 - 4^* r^a \wedge^2 z \wedge^2 \cos(\alpha)^2 \cos(\beta)^2 + \\
& 5^* r^a \wedge^2 z \wedge^2 \cos(\alpha)^4 \cos(\beta)^2 - 4^* r^a r^b \wedge^3 \cos(\alpha)^4 \cos(\beta) - 4^* r^a \wedge^3 r^b \cos(\alpha)^4 \cos(\beta) + \\
& 2^* r^a \wedge^3 r^b \cos(\alpha)^6 \cos(\beta) + 4^* r^a z \wedge^3 \cos(\alpha)^3 \sin(\beta) - 4^* r^a \wedge^3 z \cos(\alpha)^3 \sin(\beta) + \\
& 4^* r^a \wedge^3 z \cos(\alpha)^5 \sin(\beta) - 2^* r^a \wedge^3 r^b \cos(\alpha)^6 \cos(\beta)^3 - 4^* r^a r^b z \wedge^2 \cos(\alpha)^2 \cos(\beta) + \\
& 2^* r^a r^b z \wedge^2 \cos(\alpha)^4 \cos(\beta) - 4^* r^a r^b \wedge^2 z \cos(\alpha)^3 \sin(\beta) + 2^* r^a r^b \wedge^2 z \cos(\alpha)^5 \sin(\beta) \\
& - 2^* r^a \wedge^3 z \cos(\alpha)^5 \cos(\beta)^2 \sin(\beta) + 8^* r^a \wedge^2 r^b z \cos(\alpha)^3 \cos(\beta) \sin(\beta) - \\
& 4^* r^a \wedge^2 r^b z \cos(\alpha)^5 \cos(\beta) \sin(\beta)); \\
\text{YM2433} = & -(r^a \cos(\alpha)^3 (r^b - r^a \cos(\beta))) (2^* \alpha^2 d^2 r^a z \wedge^3 \sin(2^* \alpha) - \beta^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^5 - \\
& r^a r^b \wedge^2 z^2 d^2 \cos(\alpha)^4 - \alpha^2 d^2 z \wedge^4 \sin(\alpha) \sin(\beta) + \beta^2 d^2 r^a \wedge^4 \cos(\alpha)^5 \cos(\beta) + \\
& r^b \wedge^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta) - r^a \wedge^3 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^2 + \\
& 4^* \alpha^2 d^2 r^a \wedge^3 z \cos(\alpha)^3 \sin(\alpha) + 2^* r^a \wedge^2 r^b z^2 d^2 \cos(\alpha)^4 \cos(\beta) + \\
& r^b \wedge^2 z^2 d^2 \cos(\alpha)^3 \sin(\beta) + 2^* \beta^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^5 \cos(\beta) - \\
& \beta^2 d^2 r^a r^b \wedge^3 \cos(\alpha)^5 \cos(\beta)^2 - 2^* \beta^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^5 \cos(\beta)^2 + \\
& \beta^2 d^2 r^a \wedge^2 z \wedge^2 \cos(\alpha)^3 \cos(\beta) - \alpha^2 d^2 r^a \wedge^4 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) - \\
& 2^* r^a r^b \wedge^2 z^2 d^2 \cos(\alpha)^4 \cos(\beta)^2 + r^a \wedge^2 r^b z^2 d^2 \cos(\alpha)^4 \cos(\beta)^3 - \\
& \beta^2 d^2 r^a r^b z \wedge^2 \cos(\alpha)^3 + \beta^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^5 \cos(\beta)^3 - \\
& \beta^2 d^2 r^a \wedge^2 z \wedge^2 \cos(\alpha)^3 \cos(\beta)^3 - 4^* \alpha^2 d^2 r^a \wedge^3 z \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) - \\
& \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^4 \sin(\alpha) \sin(\beta) + r^a \wedge^2 z^2 d^2 \cos(\alpha)^3 \cos(\beta)^2 \sin(\beta) - \\
& \alpha^2 d^2 r^b z \wedge^3 \cos(\alpha) \cos(\beta) \sin(\alpha) + \alpha^2 d^2 r^a r^b \wedge^2 z \cos(\alpha)^3 \sin(\alpha) + \\
& 2^* \beta^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^4 \sin(\beta) + 6^* \alpha^2 d^2 r^a \wedge^2 z \wedge^2 \sin(\alpha) \sin(\beta) (\sin(\alpha)^2 - 1) + \\
& \beta^2 d^2 r^a r^b z \wedge^2 \cos(\alpha)^3 \cos(\beta)^2 - 3^* \alpha^2 d^2 r^a z \wedge^3 \cos(\alpha) \cos(\beta)^2 \sin(\alpha) - \\
& 2^* \beta^2 d^2 r^a \wedge^3 z \cos(\alpha)^4 \cos(\beta) \sin(\beta) - 5^* \alpha^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^3 \cos(\beta) \sin(\alpha) - \\
& 2^* \beta^2 d^2 r^a r^b \wedge^2 z \cos(\alpha)^4 \cos(\beta) \sin(\beta) - \\
& 2^* \alpha^2 d^2 r^a \wedge^2 r^b \wedge^2 \cos(\alpha)^4 \cos(\beta)^2 \sin(\alpha) \sin(\beta) + \\
& 3^* \alpha^2 d^2 r^a \wedge^2 z \wedge^2 \cos(\alpha)^2 \cos(\beta)^2 \sin(\alpha) \sin(\beta) + \\
& \alpha^2 d^2 r^a r^b \wedge^3 \cos(\alpha)^4 \cos(\beta) \sin(\alpha) \sin(\beta) + \\
& 3^* \alpha^2 d^2 r^a \wedge^3 r^b \cos(\alpha)^4 \cos(\beta) \sin(\alpha) \sin(\beta) - \\
& \alpha^2 d^2 r^a r^b \wedge^2 z \cos(\alpha)^3 \cos(\beta)^2 \sin(\alpha) + \\
& 5^* \alpha^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^3 \cos(\beta)^3 \sin(\alpha) + \\
& 2^* \beta^2 d^2 r^a \wedge^2 r^b z \cos(\alpha)^4 \cos(\beta)^2 \sin(\beta) - 2^* r^a r^b z^2 d^2 \cos(\alpha)^3 \cos(\beta) \sin(\beta) +
\end{aligned}$$

$$\begin{aligned}
& 3*\alpha 2d*ra*rb*z^2*\cos(\alpha)^2*\cos(\beta)*\sin(\alpha)*\sin(\beta)))/(ra^6*\cos(\alpha)^6 - ra^6*\cos(\alpha)^8 + \\
& rb^6*\cos(\alpha)^6 - z^6*\cos(\alpha)^2 + z^6 + 3*ra^2*rb^4*\cos(\alpha)^6 + 3*ra^4*rb^2*\cos(\alpha)^6 - \\
& ra^2*rb^4*\cos(\alpha)^8 - 2*ra^4*rb^2*\cos(\alpha)^8 + 15*ra^2*z^4*\cos(\alpha)^2 - 15*ra^2*z^4*\cos(\alpha)^4 \\
& + 15*ra^4*z^2*\cos(\alpha)^4 - 15*ra^4*z^2*\cos(\alpha)^6 + 3*rb^2*z^4*\cos(\alpha)^2 - \\
& 2*rb^2*z^4*\cos(\alpha)^4 + 3*rb^4*z^2*\cos(\alpha)^4 - rb^4*z^2*\cos(\alpha)^6 + \\
& ra^6*\cos(\alpha)^8*\cos(\beta)^2 + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 12*ra^2*rb^2*z^2*\cos(\alpha)^6 - \\
& 20*ra^3*z^3*\cos(\alpha)^3*\sin(\beta) + 20*ra^3*z^3*\cos(\alpha)^5*\sin(\beta) - 6*ra*z^5*\cos(\alpha)*\sin(\beta) + \\
& 12*ra^2*rb^4*\cos(\alpha)^6*\cos(\beta)^2 + 12*ra^4*rb^2*\cos(\alpha)^6*\cos(\beta)^2 - \\
& 8*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta)^3 + ra^2*rb^4*\cos(\alpha)^8*\cos(\beta)^2 - \\
& 2*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^2 - 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta)^3 + \\
& 4*ra^4*rb^2*\cos(\alpha)^8*\cos(\beta)^4 - 12*ra^2*z^4*\cos(\alpha)^2*\cos(\beta)^2 + \\
& 13*ra^2*z^4*\cos(\alpha)^4*\cos(\beta)^2 - 12*ra^4*z^2*\cos(\alpha)^4*\cos(\beta)^2 + \\
& 18*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^2 - 4*ra^4*z^2*\cos(\alpha)^6*\cos(\beta)^4 - \\
& 6*ra*rb^5*\cos(\alpha)^6*\cos(\beta) - 6*ra^5*rb*\cos(\alpha)^6*\cos(\beta) + 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta) + \\
& 6*ra*z^5*\cos(\alpha)^3*\sin(\beta) - 6*ra^5*z*\cos(\alpha)^5*\sin(\beta) + 6*ra^5*z*\cos(\alpha)^7*\sin(\beta) - \\
& 12*ra^3*rb^3*\cos(\alpha)^6*\cos(\beta) + 4*ra^3*rb^3*\cos(\alpha)^8*\cos(\beta) - \\
& 4*ra^5*rb*\cos(\alpha)^8*\cos(\beta)^3 - 6*ra*rb*z^4*\cos(\alpha)^2*\cos(\beta) + 4*ra*rb*z^4*\cos(\alpha)^4*\cos(\beta) \\
& - 6*ra*rb^4*z*\cos(\alpha)^5*\sin(\beta) + 2*ra*rb^4*z*\cos(\alpha)^7*\sin(\beta) + \\
& 6*ra^2*rb^2*z^2*\cos(\alpha)^6*\cos(\beta)^2 + 8*ra^3*z^3*\cos(\alpha)^3*\cos(\beta)^2*\sin(\beta) - \\
& 12*ra^3*z^3*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) - 12*ra*rb^3*z^2*\cos(\alpha)^4*\cos(\beta) - \\
& 36*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta) + 4*ra*rb^3*z^2*\cos(\alpha)^6*\cos(\beta) + \\
& 24*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta) - 12*ra*rb^2*z^3*\cos(\alpha)^3*\sin(\beta) + \\
& 8*ra*rb^2*z^3*\cos(\alpha)^5*\sin(\beta) - 12*ra^3*rb^2*z*\cos(\alpha)^5*\sin(\beta) + \\
& 8*ra^3*rb^2*z*\cos(\alpha)^7*\sin(\beta) + 24*ra^3*rb*z^2*\cos(\alpha)^4*\cos(\beta)^3 - \\
& 20*ra^3*rb*z^2*\cos(\alpha)^6*\cos(\beta)^3 - 4*ra^5*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + \\
& 24*ra^2*rb^3*z^3*\cos(\alpha)^3*\cos(\beta)*\sin(\beta) - 16*ra^2*rb^3*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) + \\
& 24*ra^2*rb^3*z^3*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - 8*ra^2*rb^3*z^3*\cos(\alpha)^7*\cos(\beta)*\sin(\beta) + \\
& 8*ra^4*rb*z*\cos(\alpha)^7*\cos(\beta)^3*\sin(\beta) - 24*ra^3*rb^2*z*\cos(\alpha)^5*\cos(\beta)^2*\sin(\beta) + \\
& 4*ra^3*rb^2*z*\cos(\alpha)^7*\cos(\beta)^2*\sin(\beta) + 24*ra^4*rb*z*\cos(\alpha)^5*\cos(\beta)*\sin(\beta) - \\
& 16*ra^4*rb*z*\cos(\alpha)^7*\cos(\beta)*\sin(\beta));
\end{aligned}$$

YM2434 =0;

YM24=[YM2411 YM2412 YM2413 YM2414; YM2421 YM2422 YM2423 YM2424;YM2431 YM2432 YM2433
YM2434];

$$\begin{aligned}
YC2411 = & (2*\alpha 1d^2*z^7 - 2*\alpha 1d^2*z^7*\cos(\alpha)^2 + \alpha 1d*z^6*z1d*\sin(2*\alpha) + \\
& 2*\alpha 1d^2*ra^6*z*\cos(\alpha)^6 - 2*\alpha 1d^2*ra^6*z*\cos(\alpha)^8 + 2*\alpha 1d^2*rb^6*z*\cos(\alpha)^6 - \\
& 2*\alpha 1d^2*rb^6*z*\cos(\alpha)^8 - 6*\alpha 1d^2*rb^2*z^6*\sin(2*\alpha) + 6*\alpha 1d^2*ra^2*z^5*\cos(\alpha)^2 - \\
& 6*\alpha 1d^2*ra^2*z^5*\cos(\alpha)^4 + 6*\alpha 1d^2*ra^4*z^3*\cos(\alpha)^4 - \\
& 6*\alpha 1d^2*ra^4*z^3*\cos(\alpha)^6 + 30*\alpha 1d^2*rb^2*z^5*\cos(\alpha)^2 - \\
& 54*\alpha 1d^2*rb^2*z^5*\cos(\alpha)^4 + 30*\alpha 1d^2*rb^4*z^3*\cos(\alpha)^4 + \\
& 24*\alpha 1d^2*rb^2*z^5*\cos(\alpha)^6 - 54*\alpha 1d^2*rb^4*z^3*\cos(\alpha)^6 + \\
& 24*\alpha 1d^2*rb^4*z^3*\cos(\alpha)^8 - 12*\alpha 1d^2*ra*rb^2*z^5*\cos(\alpha)^3 + \\
& 12*\alpha 1d^2*ra*rb^2*z^5*\cos(\alpha)^5 - 12*\alpha 1d^2*ra*rb^5*z*\cos(\alpha)^7 - \\
& 12*\alpha 1d^2*ra^5*rb*z*\cos(\alpha)^7 + 12*\alpha 1d^2*ra*rb^5*z*\cos(\alpha)^9 + \\
& 12*\alpha 1d^2*ra^5*rb*z*\cos(\alpha)^9 + 2*\alpha 1d*ra^6*z1d*\cos(\alpha)^7*\sin(\alpha) + \\
& 2*\alpha 1d*rb^6*z1d*\cos(\alpha)^7*\sin(\alpha) - 40*\alpha 1d*rb^3*z^3*z1d*\cos(\alpha)^4 + \\
& 56*\alpha 1d*rb^3*z^3*z1d*\cos(\alpha)^6 - 16*\alpha 1d*rb^3*z^3*z1d*\cos(\alpha)^8 + \\
& 2*\alpha 1d^2*e^2*ra^4*z*\cos(\alpha)^6 - \alpha 1d^2*e^2*ra^4*z*\cos(\alpha)^8 -
\end{aligned}$$

$$\begin{aligned}
&72*\alpha d^2*r^b^3*z^3*\cos(\alpha)^5 - 24*\alpha d^2*r^b^3*z^3*\cos(\alpha)^5 + \\
&6*\alpha d^2*r^b^4*z^3*\cos(\alpha)^6 + 6*\alpha d^2*r^b^4*z^3*\cos(\alpha)^6 + \\
&120*\alpha d^2*r^b^3*z^3*\cos(\alpha)^7 + 24*\alpha d^2*r^b^3*z^3*\cos(\alpha)^7 - \\
&24*\alpha d^2*r^b^3*z^3*\cos(\alpha)^7 + 18*\alpha d^2*r^b^4*z^3*\cos(\alpha)^8 + \\
&18*\alpha d^2*r^b^4*z^3*\cos(\alpha)^8 - 48*\alpha d^2*r^b^3*z^3*\cos(\alpha)^9 + \\
&8*\alpha d^2*r^b^3*z^3*\cos(\alpha)^9 - 24*\alpha d^2*r^b^4*z^3*\cos(\alpha)^10 - \\
&24*\alpha d^2*r^b^4*z^3*\cos(\alpha)^10 + 16*\alpha d^2*r^b^3*z^3*\cos(\alpha)^11 + \\
&12*\alpha d^2*r^b^3*z^3*\cos(\alpha)^3*\sin(\alpha) - 2*e^2^2*r^b^2*z^1d^2*\cos(\alpha)^6 - \\
&2*e^2^2*r^b^2*z^1d^2*\cos(\alpha)^8 - 12*\alpha d*r^b^5*z^1d*\cos(\alpha)^2 + \\
&12*\alpha d*r^b^5*z^1d*\cos(\alpha)^4 - 12*\alpha d*r^b^5*z^1d*\cos(\alpha)^6 + \\
&12*\alpha d*r^b^5*z^1d*\cos(\alpha)^8 + \alpha d^2*e^2^2*r^b^2*z^3*\cos(\alpha)^6 - \\
&2*\alpha d^2*e^2^2*r^b^2*z^3*\cos(\alpha)^6 + 4*\alpha d^2*e^2^2*r^b^2*z^3*\cos(\alpha)^8 + \\
&36*\alpha d^2*r^b^2*z^3*\cos(\alpha)^4 - 36*\alpha d^2*r^b^2*z^3*\cos(\alpha)^6 - \\
&40*\alpha d^2*r^b^3*z^4*\cos(\alpha)^3*\sin(\alpha) + 56*\alpha d^2*r^b^3*z^4*\cos(\alpha)^5*\sin(\alpha) - \\
&12*\alpha d^2*r^b^5*z^2*\cos(\alpha)^5*\sin(\alpha) - 16*\alpha d^2*r^b^3*z^4*\cos(\alpha)^7*\sin(\alpha) + \\
&12*\alpha d^2*r^b^5*z^2*\cos(\alpha)^7*\sin(\alpha) + 2*e^2^2*r^b^3*z^1d^2*\cos(\alpha)^9*\sin(\alpha) - \\
&12*\alpha d*r^b^4*r^b^z^1d*\cos(\alpha)^6 + 48*\alpha d*r^b^4*r^b^z^1d*\cos(\alpha)^7 + \\
&12*\alpha d*r^b^4*r^b^z^1d*\cos(\alpha)^8 - 48*\alpha d*r^b^4*r^b^z^1d*\cos(\alpha)^9 + \\
&\alpha d^2*e^2^2*r^b^4*r^b^z^1d*\cos(\alpha)^9*\sin(\alpha) + \alpha d^2*e^2^2*r^b^4*r^b^z^1d*\cos(\alpha)^10*\sin(\alpha) + \\
&2*\alpha d^2*e^2^2*r^b^2*z^3*\cos(\alpha)^6 + 11*\alpha d^2*e^2^2*r^b^2*z^3*\cos(\alpha)^8 - \\
&6*\alpha d^2*e^2^2*r^b^2*z^3*\cos(\alpha)^10 + (\alpha d^2*e^2^2*z^5*\cos(\alpha)^4*(r^b^2*\cos(\alpha)^2 + \\
&r^b^2*\cos(\alpha)^2 + z^2 - 2*r^b*\cos(\alpha)^3 - r^b*z*\sin(2*\alpha))^(1/2))/\abs(\cos(\alpha)) - \\
&24*\alpha d^2*r^b^2*z^4*\cos(\alpha)^3*\sin(\alpha) + 48*\alpha d^2*r^b^2*z^4*\cos(\alpha)^4*\sin(\alpha) + \\
&24*\alpha d^2*r^b^2*z^4*\cos(\alpha)^5*\sin(\alpha) - 12*\alpha d^2*r^b^4*r^b^z^2*\cos(\alpha)^5*\sin(\alpha) - \\
&48*\alpha d^2*r^b^2*z^4*\cos(\alpha)^6*\sin(\alpha) + 48*\alpha d^2*r^b^4*r^b^z^2*\cos(\alpha)^6*\sin(\alpha) + \\
&12*\alpha d^2*r^b^4*r^b^z^2*\cos(\alpha)^7*\sin(\alpha) - 48*\alpha d^2*r^b^4*r^b^z^2*\cos(\alpha)^8*\sin(\alpha) + \\
&2*e^2^2*r^b^2*z^1d^2*\cos(\alpha)^7*\sin(\alpha) - 4*e^2^2*r^b^2*z^1d^2*\cos(\alpha)^8*\sin(\alpha) + \\
&4*\alpha d^2*e^2^2*r^b^3*z^1d^2*\cos(\alpha)^8 - 12*\alpha d*r^b^5*z^1d*\cos(\alpha)^8*\sin(\alpha) - \\
&12*\alpha d*r^b^5*z^1d*\cos(\alpha)^8*\sin(\alpha) - 24*\alpha d*r^b^2*r^b^z^3*z^1d*\cos(\alpha)^4 + \\
&48*\alpha d*r^b^2*r^b^z^3*z^1d*\cos(\alpha)^5 + 24*\alpha d*r^b^2*r^b^z^3*z^1d*\cos(\alpha)^6 - \\
&24*\alpha d*r^b^2*r^b^z^3*z^1d*\cos(\alpha)^6 - 48*\alpha d*r^b^2*r^b^z^3*z^1d*\cos(\alpha)^7 + \\
&48*\alpha d*r^b^3*r^b^z^2*z^1d*\cos(\alpha)^7 - 24*\alpha d*r^b^3*r^b^z^2*z^1d*\cos(\alpha)^8 - \\
&48*\alpha d*r^b^3*r^b^z^2*z^1d*\cos(\alpha)^9 + 48*\alpha d*r^b^2*r^b^z^3*z^1d*\cos(\alpha)^10 + \\
&4*e^2^2*r^b^2*z^1d^2*\cos(\alpha)^7 - \alpha d^2*e^2^2*r^b^2*r^b^3*\cos(\alpha)^9*\sin(\alpha) - \\
&\alpha d^2*e^2^2*r^b^3*r^b^2*\cos(\alpha)^10*\sin(\alpha) + 2*\alpha d^2*e^2^2*r^b^3*z^2*\cos(\alpha)^7*\sin(\alpha) - \\
&24*\alpha d^2*r^b^2*r^b^3*z^2*\cos(\alpha)^5*\sin(\alpha) + 48*\alpha d^2*r^b^2*r^b^3*z^2*\cos(\alpha)^6*\sin(\alpha) \\
&- 24*\alpha d^2*r^b^2*r^b^3*z^2*\cos(\alpha)^7*\sin(\alpha) - \\
&48*\alpha d^2*r^b^3*r^b^z^2*\cos(\alpha)^8*\sin(\alpha) + 48*\alpha d^2*r^b^2*r^b^3*z^2*\cos(\alpha)^9*\sin(\alpha) \\
&+ 2*\alpha d^2*e^2^2*r^b^2*r^b^z^3*\cos(\alpha)^5 - 5*\alpha d^2*e^2^2*r^b^2*r^b^z^3*\cos(\alpha)^7 - \\
&2*\alpha d^2*e^2^2*r^b^2*r^b^z^3*\cos(\alpha)^7 - 10*\alpha d^2*e^2^2*r^b^3*r^b^z*\cos(\alpha)^7 - \\
&3*\alpha d^2*e^2^2*r^b^3*r^b^z*\cos(\alpha)^9 + 5*\alpha d^2*e^2^2*r^b^3*r^b^z*\cos(\alpha)^9 + \\
&2*\alpha d^2*e^2^2*r^b^3*r^b^z*\cos(\alpha)^11 + 2*\alpha d^2*e^2^2*r^b^4*z^1d*\cos(\alpha)^7*\sin(\alpha) + \\
&6*\alpha d*r^b^2*r^b^4*z^1d*\cos(\alpha)^7*\sin(\alpha) + 6*\alpha d*r^b^4*r^b^2*z^1d*\cos(\alpha)^7*\sin(\alpha) - \\
&24*\alpha d*r^b^3*r^b^3*z^1d*\cos(\alpha)^8*\sin(\alpha) + 24*\alpha d*r^b^2*r^b^4*z^1d*\cos(\alpha)^9*\sin(\alpha) + \\
&24*\alpha d*r^b^4*r^b^2*z^1d*\cos(\alpha)^9*\sin(\alpha) - 16*\alpha d*r^b^3*r^b^3*z^1d*\cos(\alpha)^10*\sin(\alpha) + \\
&6*\alpha d*r^b^2*z^4*z^1d*\cos(\alpha)^3*\sin(\alpha) + 6*\alpha d*r^b^4*z^2*z^1d*\cos(\alpha)^5*\sin(\alpha) + \\
&30*\alpha d*r^b^2*z^4*z^1d*\cos(\alpha)^3*\sin(\alpha) - 24*\alpha d*r^b^2*z^4*z^1d*\cos(\alpha)^5*\sin(\alpha) +
\end{aligned}$$

$$\begin{aligned}
& 30*\alpha^{1d}*r^{b^4}*z^{2z^2d}*\cos(\alpha)^5*\sin(\alpha) - 24*\alpha^{1d}*r^{b^4}*z^{2z^2d}*\cos(\alpha)^7*\sin(\alpha) + \\
& (3*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^4*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 \\
& - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - (\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^6*(r^{a^2}*\cos(\alpha)^2 + \\
& r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^6*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (3*e^{2r^b^3z^2d}*\cos(\alpha)^9*\sin(\alpha)*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& 2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^8*\sin(\alpha) - 10*\alpha^{1d}^2*e^{2r^a^3r^b^2z^2d}*\cos(\alpha)^8*\sin(\alpha) \\
& - 4*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^10*\sin(\alpha) - 72*\alpha^{1d}^2*r^a*r^b^3*z^2z^2d*\cos(\alpha)^6*\sin(\alpha) \\
& - 24*\alpha^{1d}^2*r^a^3*r^b^2z^2z^2d*\cos(\alpha)^6*\sin(\alpha) + 48*\alpha^{1d}^2*r^a*r^b^3*z^2z^2d*\cos(\alpha)^8*\sin(\alpha) \\
& + 2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^7*\sin(\alpha) + \\
& 12*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^9*\sin(\alpha) - \\
& 2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^5*\sin(\alpha) - \\
& 4*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^7*\sin(\alpha) - \\
& (4*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^6*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - \\
& r^{b^2}*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} + (2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^8*(r^{a^2}*\cos(\alpha)^2 + \\
& r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} + \\
& (\alpha^{1d}^2*e^{2r^a^4z^2}*\cos(\alpha)^8*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - \\
& r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + 36*\alpha^{1d}^2*r^a^2*r^b^2z^2z^2d*\cos(\alpha)^5*\sin(\alpha) + \\
& (3*e^{2r^a^2z^2z^2d}*\cos(\alpha)^6*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - \\
& r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + (3*e^{2r^b^2z^2z^2d}*\cos(\alpha)^8*(r^{a^2}*\cos(\alpha)^2 + \\
& r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& 4*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^7 + 4*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^8 - \\
& 4*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^9 - 12*\alpha^{1d}^2*r^a*r^b^2z^4z^2d*\cos(\alpha)^4*\sin(\alpha) - \\
& 2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^5*\sin(\alpha) + \\
& 5*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^7*\sin(\alpha) - \\
& 5*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^8*\sin(\alpha) + \\
& (2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^5*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^7*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& (6*\alpha^{1d}^2*e^{2r^a^3r^b^2z^2}*\cos(\alpha)^7*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) + \\
& (2*\alpha^{1d}^2*e^{2r^a^2z^3}*\cos(\alpha)^9*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (6*\alpha^{1d}^2*e^{2r^a^3r^b^2z^2}*\cos(\alpha)^9*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(1/2)}/\text{abs}(\cos(\alpha)) - \\
& (4*\alpha^{1d}^2*e^{2r^a^2z^2d}*\cos(\alpha)^7*\sin(\alpha)*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} + \\
& (4*\alpha^{1d}^2*e^{2r^a^2z^2d}*\cos(\alpha)^7*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - \\
& r^{b^2}*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} - (4*\alpha^{1d}^2*e^{2r^a^2z^2d}*\cos(\alpha)^8*(r^{a^2}*\cos(\alpha)^2 + \\
& r^{b^2}*\cos(\alpha)^2 + z^2 - 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} + \\
& (2*\alpha^{1d}^2*e^{2r^a^2z^2}*\cos(\alpha)^9*\sin(\alpha)*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} - \\
& (2*\alpha^{1d}^2*e^{2r^a^2z^2}*\cos(\alpha)^10*\sin(\alpha)*(r^{a^2}*\cos(\alpha)^2 + r^{b^2}*\cos(\alpha)^2 + z^2 - \\
& 2*r^a*r^b*\cos(\alpha))^3 - r^{b^2}*\sin(2*\alpha))^{(3/2)}/(\cos(\alpha)^2)^{(3/2)} -
\end{aligned}$$

$$\begin{aligned}
& (3*\alpha1d^2*e2*ra^4*rb*cos(alpha)^9*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (8*\alpha1d^2*e2*ra^2*rb^2*z*cos(alpha)^8*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (5*\alpha1d^2*e2*ra^2*rb^2*z*cos(alpha)^10*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (4*\alpha1d^2*e2*ra^z^2*cos(alpha)^6*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (4*\alpha1d^2*e2*rb^z^2*cos(alpha)^7*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (4*\alpha1d^2*e2*ra^z^4*cos(alpha)^4*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (\alpha1d^2*e2*rb^z^4*cos(alpha)^5*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (3*e2*ra^2*rb^z1d^2*cos(alpha)^7*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (6*e2*ra*rb^2*z1d^2*cos(alpha)^8*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& 6*\alpha1d^2*e2*ra*rb^z^2*z1d*cos(alpha)^6*sin(alpha) + \\
& (4*\alpha1d^2*e2*ra*rb^z*cos(alpha)^7*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^3 - \\
& rb*z*sin(2*alpha))^(3/2))/(cos(alpha)^2)^(3/2) - (2*\alpha1d^2*e2*ra*rb^z*cos(alpha)^9*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (4*\alpha1d^2*e2*ra^z^3*z1d*cos(alpha)^5*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^3 \\
& - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - (4*\alpha1d^2*e2*ra^3*z^z1d*cos(alpha)^7*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (4*\alpha1d^2*e2*rb^z^3*z1d*cos(alpha)^6*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^3 \\
& - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - (2*\alpha1d^2*e2*rb^3*z^z1d*cos(alpha)^8*(ra^2*cos(alpha)^2 + \\
& rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (6*e2*ra*rb^z^z1d^2*cos(alpha)^7*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^3 - \\
& rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (6*\alpha1d^2*e2*ra^3*rb^2*cos(alpha)^10*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (3*\alpha1d^2*e2*ra^2*rb^3*cos(alpha)^11*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (4*\alpha1d^2*e2*ra^3*z^2*cos(alpha)^6*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (4*\alpha1d^2*e2*ra*rb^z1d*cos(alpha)^8*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(3/2))/(cos(alpha)^2)^(3/2) - \\
& (6*\alpha1d^2*e2*ra^2*rb^z^z1d*cos(alpha)^6*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (8*\alpha1d^2*e2*ra*rb^2*z^z1d*cos(alpha)^7*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (12*\alpha1d^2*e2*ra^2*rb^z^z1d*cos(alpha)^8*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (8*\alpha1d^2*e2*ra*rb^2*z^z1d*cos(alpha)^9*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (3*\alpha1d^2*e2*ra^2*rb^z^2*cos(alpha)^5*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 -
\end{aligned}$$

$$\begin{aligned}
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha1d^2*e2*ra*rb^2*z^2*cos(alpha)^6*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (3*alpha1d^2*e2*ra^2*rb*z^2*cos(alpha)^7*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (2*alpha1d^2*e2*ra*rb^2*z^2*cos(alpha)^8*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (6*alpha1d^2*e2*ra^3*rb*z1d*cos(alpha)^8*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (6*alpha1d^2*e2*ra*rb^3*z1d*cos(alpha)^10*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (12*alpha1d^2*e2*ra^2*rb^2*z1d*cos(alpha)^9*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) + \\
& (6*alpha1d^2*e2*ra^2*z^2*z1d*cos(alpha)^5*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (2*alpha1d^2*e2*rb^2*z^2*z1d*cos(alpha)^7*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)) - \\
& (4*alpha1d^2*e2*ra*rb*z^2*z1d*cos(alpha)^6*sin(alpha)*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - \\
& 2*ra*rb*cos(alpha)^3 - rb*z*sin(2*alpha))^(1/2))/abs(cos(alpha)))/(ra^6*cos(alpha)^10 + rb^6*cos(alpha)^10 + \\
& z^6*cos(alpha)^4 + 3*ra^2*rb^4*cos(alpha)^10 + 3*ra^4*rb^2*cos(alpha)^10 - 12*ra^3*rb^3*cos(alpha)^11 + \\
& 12*ra^2*rb^4*cos(alpha)^12 + 12*ra^4*rb^2*cos(alpha)^12 - 8*ra^3*rb^3*cos(alpha)^13 + \\
& 3*ra^2*z^4*cos(alpha)^6 + 3*ra^4*z^2*cos(alpha)^8 + 15*rb^2*z^4*cos(alpha)^6 - 12*rb^2*z^4*cos(alpha)^8 \\
& + 15*rb^4*z^2*cos(alpha)^8 - 12*rb^4*z^2*cos(alpha)^10 - 6*ra*rb^5*cos(alpha)^11 - \\
& 6*ra^5*rb*cos(alpha)^11 + 18*ra^2*rb^2*z^2*cos(alpha)^8 - 20*rb^3*z^3*cos(alpha)^7*sin(alpha) + \\
& 8*rb^3*z^3*cos(alpha)^9*sin(alpha) - 6*ra*rb*z^4*cos(alpha)^7 - 36*ra*rb^3*z^2*cos(alpha)^9 - \\
& 12*ra^3*rb*z^2*cos(alpha)^9 + 24*ra*rb^3*z^2*cos(alpha)^11 - 6*rb*z^5*cos(alpha)^5*sin(alpha) - \\
& 6*rb^5*z*cos(alpha)^9*sin(alpha) - 6*ra^4*rb*z*cos(alpha)^9*sin(alpha) + \\
& 24*ra*rb^4*z*cos(alpha)^10*sin(alpha) - 12*ra^2*rb*z^3*cos(alpha)^7*sin(alpha) + \\
& 24*ra*rb^2*z^3*cos(alpha)^8*sin(alpha) - 12*ra^2*rb^3*z*cos(alpha)^9*sin(alpha) + \\
& 24*ra^3*rb^2*z*cos(alpha)^10*sin(alpha) - 24*ra^2*rb^3*z*cos(alpha)^11*sin(alpha));
\end{aligned}$$

YC2412=0;

$$\begin{aligned}
& YC2413=(cos(alpha)*(ra - rb*cos(alpha))*(2*alpha1d^2*rb*z^3 - 2*rb^2*z1d^2*cos(alpha)^3*sin(alpha) + \\
& alpha1d^2*ra*z^3*cos(alpha) + 2*alpha1d^2*ra^3*z*cos(alpha) + 2*rb*z*z1d^2*cos(alpha)^2 - \\
& alpha1d^2*ra^3*z*cos(alpha)^3 - 4*alpha1d^2*rb*z^3*cos(alpha)^2 + 2*alpha1d*ra^3*z1d*(sin(alpha) - \\
& sin(alpha)^3) + 2*ra*rb*z1d^2*(sin(alpha) - sin(alpha)^3) - 2*ra*z*z1d^2*cos(alpha) - \\
& alpha1d^2*rb^2*z^2*sin(2*alpha) - 8*alpha1d^2*ra^2*rb*z*cos(alpha)^2 + \\
& 3*alpha1d^2*ra*rb^2*z*cos(alpha)^3 + 4*alpha1d^2*ra^2*rb*z*cos(alpha)^4 - \\
& 2*alpha1d^2*ra*rb^2*z*cos(alpha)^5 + 2*alpha1d*ra*rb^2*z1d*(sin(alpha) - sin(alpha)^3) - \\
& 2*alpha1d*ra*z^2*z1d*sin(alpha) - alpha1d^2*ra*rb^3*cos(alpha)^4*sin(alpha) + \\
& alpha1d^2*ra^3*rb*cos(alpha)^4*sin(alpha) + 2*alpha1d^2*ra*rb^2*z*cos(alpha) + \\
& 5*alpha1d^2*ra*rb*z^2*(sin(alpha) - sin(alpha)^3) - 4*alpha1d*rb^2*z*z1d*cos(alpha)^2 - \\
& 2*alpha1d^2*ra*rb*z^2*sin(alpha) + 2*alpha1d*rb*z^2*z1d*sin(2*alpha) - \\
& 8*alpha1d*ra^2*rb*z1d*cos(alpha)^3*sin(alpha) + 4*alpha1d*ra*rb^2*z1d*cos(alpha)^4*sin(alpha) + \\
& 4*alpha1d*ra*rb*z*z1d*cos(alpha)^3))/(ra^6*cos(alpha)^6 + rb^6*cos(alpha)^6 + z^6 + \\
& 3*ra^2*rb^4*cos(alpha)^6 + 3*ra^4*rb^2*cos(alpha)^6 - 12*ra^3*rb^3*cos(alpha)^7 + \\
& 12*ra^2*rb^4*cos(alpha)^8 + 12*ra^4*rb^2*cos(alpha)^8 - 8*ra^3*rb^3*cos(alpha)^9 + \\
& 3*ra^2*z^4*cos(alpha)^2 + 3*ra^4*z^2*cos(alpha)^4 + 15*rb^2*z^4*cos(alpha)^2 - 12*rb^2*z^4*cos(alpha)^4
\end{aligned}$$

$$\begin{aligned}
& + 15*rb^4*z^2*\cos(\alpha)^4 - 12*rb^4*z^2*\cos(\alpha)^6 - 6*ra*rb^5*\cos(\alpha)^7 - 6*ra^5*rb*\cos(\alpha)^7 - \\
& 3*rb*z^5*\sin(2*\alpha) + 18*ra^2*rb^2*z^2*\cos(\alpha)^4 - 20*rb^3*z^3*\cos(\alpha)^3*\sin(\alpha) + \\
& 8*rb^3*z^3*\cos(\alpha)^5*\sin(\alpha) - 6*ra*rb*z^4*\cos(\alpha)^3 - 36*ra*rb^3*z^2*\cos(\alpha)^5 - \\
& 12*ra^3*rb*z^2*\cos(\alpha)^5 + 24*ra*rb^3*z^2*\cos(\alpha)^7 - 6*rb^5*z*\cos(\alpha)^5*\sin(\alpha) - \\
& 6*ra^4*rb*z*\cos(\alpha)^5*\sin(\alpha) + 24*ra*rb^4*z*\cos(\alpha)^6*\sin(\alpha) - \\
& 12*ra^2*rb*z^3*\cos(\alpha)^3*\sin(\alpha) + 24*ra*rb^2*z^3*\cos(\alpha)^4*\sin(\alpha) - \\
& 12*ra^2*rb^3*z*\cos(\alpha)^5*\sin(\alpha) + 24*ra^3*rb^2*z*\cos(\alpha)^6*\sin(\alpha) - \\
& 24*ra^2*rb^3*z*\cos(\alpha)^7*\sin(\alpha));
\end{aligned}$$

YC2414=0;

$$\begin{aligned}
YC2421=& z1d*(((ra*(\sin(\alpha)*rb^2*\cos(\alpha)^2 + rb*z*\cos(\alpha)^3 - 2*rb*z*\cos(\alpha) - \\
& ra*\sin(\alpha)*rb*\cos(\alpha)^3 + \sin(\alpha)*z^2 + ra*z*\cos(\alpha)^2))/(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 \\
& + rb^2*\cos(\alpha)^2 - \sin(2*\alpha)*rb*z + z^2) - (z*(ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2)/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)) + ((z - \\
& ra*\sin(\alpha))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^(1/2))*(ra^2*\cos(\alpha)^2 - \\
& \sin(\alpha)*ra*z - rb*ra*\cos(\alpha)^3 + z^2))/(\cos(\alpha)^2*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^(3/2)))*(((ra - rb*\cos(\alpha))*(ra*\cos(\alpha) - rb + z*\tan(\alpha))*(\alpha1d*ra^2*\cos(\alpha)^2 - \\
& \alpha1d*\sin(\alpha)*ra*z - \alpha1d*rb*ra*\cos(\alpha)^3 - z1d*ra*\cos(\alpha) + \alpha1d*z^2 + \\
& rb*z1d*\cos(\alpha)^2))/(\cos(\alpha)*((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - \\
& ra*\sin(\alpha))^2)^(3/2))*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 - \sin(2*\alpha)*rb*z + \\
& z^2)) + ((\cos(\alpha)^2)^(3/2)*(z - ra*\sin(\alpha))*(-\alpha1d*\sin(\alpha)*ra^3*\cos(\alpha)^2 + \\
& 4*\alpha1d*\sin(\alpha)*ra^2*rb*\cos(\alpha)^3 + \alpha1d*ra^2*z*\cos(\alpha)^2 - \\
& 2*\alpha1d*\sin(\alpha)*ra*rb^2*\cos(\alpha)^4 - \alpha1d*\sin(\alpha)*ra*rb^2*\cos(\alpha)^2 - \\
& 4*\alpha1d*ra*rb*z*\cos(\alpha)^3 - 2*z1d*\sin(\alpha)*ra*rb*\cos(\alpha)^2 + \alpha1d*\sin(\alpha)*ra*z^2 + \\
& 2*z1d*ra*z*\cos(\alpha) + 3*\alpha1d*rb^2*z*\cos(\alpha)^2 + 2*z1d*\sin(\alpha)*rb^2*\cos(\alpha)^3 - \\
& 4*\alpha1d*\sin(\alpha)*rb*z^2*\cos(\alpha) - 2*z1d*rb*z*\cos(\alpha)^2 + \alpha1d*z^3))/(\cos(\alpha)^4*((ra*\cos(\alpha) \\
& - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 - \\
& \sin(2*\alpha)*rb*z + z^2)^(3/2))*(e2 - ((ra*\cos(\alpha) - rb + z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^(1/2)) - (- \\
& \alpha1d*ra^3*rb*\cos(\alpha)^5 + 2*\alpha1d*\sin(\alpha)*ra^3*z*\cos(\alpha)^4 + z1d*ra^3*\cos(\alpha)^5 - \\
& \alpha1d*ra^2*rb^2*\cos(\alpha)^8 + 3*\alpha1d*ra^2*rb^2*\cos(\alpha)^6 + \alpha1d*ra^2*rb^2*\cos(\alpha)^4 - \\
& 5*\alpha1d*\sin(\alpha)*ra^2*rb*z*\cos(\alpha)^5 - 3*\alpha1d*\sin(\alpha)*ra^2*rb*z*\cos(\alpha)^3 - \\
& 2*z1d*ra^2*rb*\cos(\alpha)^6 - z1d*ra^2*rb*\cos(\alpha)^4 - 2*\alpha1d*ra^2*z^2*\cos(\alpha)^4 + \\
& 2*\alpha1d*ra^2*z^2*\cos(\alpha)^2 + z1d*\sin(\alpha)*ra^2*z*\cos(\alpha)^3 + \alpha1d*ra*rb^3*\cos(\alpha)^7 - \\
& 4*\alpha1d*ra*rb^3*\cos(\alpha)^5 - \alpha1d*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^6 + \\
& 11*\alpha1d*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^4 + z1d*ra*rb^2*\cos(\alpha)^7 + 2*z1d*ra*rb^2*\cos(\alpha)^5 + \\
& 8*\alpha1d*ra*rb*z^2*\cos(\alpha)^5 - 8*\alpha1d*ra*rb*z^2*\cos(\alpha)^3 - 2*z1d*\sin(\alpha)*ra*rb*z*\cos(\alpha)^4 \\
& + \alpha1d*(\sin(\alpha) - \sin(\alpha)^3)*ra*z^3 + \alpha1d*rb^4*\cos(\alpha)^4 - \\
& 4*\alpha1d*\sin(\alpha)*rb^3*z*\cos(\alpha)^3 - z1d*rb^3*\cos(\alpha)^6 - 6*\alpha1d*rb^2*z^2*\cos(\alpha)^4 + \\
& 6*\alpha1d*rb^2*z^2*\cos(\alpha)^2 + z1d*\sin(\alpha)*rb^2*z*\cos(\alpha)^5 + \\
& 3*\alpha1d*\sin(\alpha)*rb*z^3*\cos(\alpha)^3 - 2*\alpha1d*\sin(2*\alpha)*rb*z^3 - \alpha1d*z^4*\cos(\alpha)^2 + \\
& \alpha1d*z^4)/(\ra^4*\cos(\alpha)^6 - 4*ra^3*rb*\cos(\alpha)^7 + 4*ra^2*rb^2*\cos(\alpha)^8 + \\
& 2*ra^2*rb^2*\cos(\alpha)^6 - 4*\sin(\alpha)*ra^2*rb*z*\cos(\alpha)^5 + 2*ra^2*z^2*\cos(\alpha)^4 - \\
& 4*ra*rb^3*\cos(\alpha)^7 + 8*\sin(\alpha)*ra*rb^2*z*\cos(\alpha)^6 - 4*ra*rb*z^2*\cos(\alpha)^5 + rb^4*\cos(\alpha)^6 \\
& - 4*\sin(\alpha)*rb^3*z*\cos(\alpha)^5 - 4*rb^2*z^2*\cos(\alpha)^6 + 6*rb^2*z^2*\cos(\alpha)^4 - \\
& 4*\sin(\alpha)*rb*z^3*\cos(\alpha)^3 + z^4*\cos(\alpha)^2) + (\text{abs}(\cos(\alpha))*(ra - rb*\cos(\alpha))*(z - \\
& ra*\sin(\alpha))*(2*z*z1d*\cos(\alpha) + 2*\alpha1d*z^2*\sin(\alpha) - 2*rb*z1d*\cos(\alpha)^2*\sin(\alpha) - \\
& 2*\alpha1d*rb*z*\cos(\alpha) + 2*\alpha1d*ra*rb*\cos(\alpha)^3*\sin(\alpha)))/(\cos(\alpha)^4*((ra*\cos(\alpha) - rb + \\
& z*\tan(\alpha))^2 + (z - ra*\sin(\alpha))^2)^(3/2))*(ra^2*\cos(\alpha)^2 - 2*ra*rb*\cos(\alpha)^3 + rb^2*\cos(\alpha)^2 -
\end{aligned}$$

$$\begin{aligned}
& \sin(2\alpha)rbz + z^2)^{1/2}) + (e^{2\cos(\alpha)}((r\cos(\alpha) - rb + z\tan(\alpha))^2 + (z - \\
& r\sin(\alpha))^2)^{1/2})(r\cos(\alpha)(-z^2 + rb\sin(\alpha)z\cos(\alpha) + r\sin(\alpha)z + rrb\cos(\alpha)^3 \\
& - rrb\cos(\alpha)))/(r^2\cos(\alpha)^2 - 2r\cos(\alpha)^3 + rb^2\cos(\alpha)^2 - \sin(2\alpha)rbz + z^2) + \\
& ((e^{2\cos(\alpha)} - (r\cos(\alpha) - rb + z\tan(\alpha))^2 + (z - r\sin(\alpha))^2)^{1/2})(r\cos(\alpha) - rb + \\
& z\tan(\alpha))(r^2\cos(\alpha)^2 - \sin(\alpha)ra^2z - rrb\cos(\alpha)^3 + z^2)/(\cos(\alpha)^2((r\cos(\alpha) - rb \\
& + z\tan(\alpha))^2 + (z - r\sin(\alpha))^2)^{3/2}) + (z(z - r\sin(\alpha))(r\cos(\alpha) - rb + \\
& z\tan(\alpha)))/(\cos(\alpha)^2((r\cos(\alpha) - rb + z\tan(\alpha))^2 + (z - \\
& r\sin(\alpha))^2)))(2\alpha\sin(\alpha)ra^3rb\cos(\alpha)^5 + \alpha\sin(\alpha)ra^3rb\cos(\alpha)^3 + \\
& 2\alpha\sin(\alpha)ra^3z\cos(\alpha)^4 - 2\alpha\sin(\alpha)ra^3z\cos(\alpha)^2 - z\sin(\alpha)ra^3\cos(\alpha)^3 - \\
& \alpha\sin(\alpha)ra^2rb^2\cos(\alpha)^6 - 5\alpha\sin(\alpha)ra^2rb^2\cos(\alpha)^4 - \\
& 7\alpha\sin(\alpha)ra^2rb^2\cos(\alpha)^5 + 4\alpha\sin(\alpha)ra^2rb^2\cos(\alpha)^3 + 4\alpha\sin(\alpha) - \\
& \sin(\alpha)^3ra^2z^2 + 3z\sin(\alpha)ra^2z\cos(\alpha)^3 + 2\alpha\sin(\alpha)ra^3rb^3\cos(\alpha)^5 + \\
& \alpha\sin(\alpha)ra^3rb^3\cos(\alpha)^3 + \alpha\sin(\alpha)ra^3rb^2z\cos(\alpha)^6 + \\
& 6\alpha\sin(\alpha)ra^3rb^2z\cos(\alpha)^4 - \alpha\sin(\alpha)ra^3rb^2z\cos(\alpha)^2 + z\sin(\alpha)ra^3rb^2\cos(\alpha)^5 + \\
& 2z\sin(\alpha)ra^3rb^2\cos(\alpha)^3 - 10\alpha\sin(\alpha)ra^3rb^2z\cos(\alpha)^3 - \\
& (\alpha\sin(2\alpha)ra^3rbz^2)/2 - 2z\sin(\alpha)ra^3rbz\cos(\alpha)^4 - 4z\sin(\alpha)ra^3rbz\cos(\alpha)^2 - \\
& \alpha\sin(\alpha)ra^3z\cos(\alpha)^2 + \alpha\sin(\alpha)ra^3z^3 + z\sin(2\alpha)ra^3z^2 - 3\alpha\sin(\alpha)ra^3z\cos(\alpha)^3 - \\
& 2z\sin(\alpha)ra^3z\cos(\alpha)^4 + 7\alpha\sin(\alpha) - \sin(\alpha)^3rb^2z^2 - \\
& z\sin(\alpha)ra^3z\cos(\alpha)^5 + 4z\sin(\alpha)ra^3z\cos(\alpha)^3 + 5\alpha\sin(\alpha)ra^3z\cos(\alpha)^3 - \\
& 5\alpha\sin(\alpha)ra^3z\cos(\alpha) - 2z\sin(\alpha) - \sin(\alpha)^3rbz^2 + \\
& \alpha\sin(\alpha)z^4)/(r^2\cos(\alpha)^2 - 2r\cos(\alpha)^3 + rb^2\cos(\alpha)^2 - \sin(2\alpha)rbz + \\
& z^2)^3 - \alpha\sin(\alpha)((\alpha\sin(\alpha)ra^4rb\cos(\alpha)^9 - \alpha\sin(\alpha)ra^3rb^2\cos(\alpha)^{10} - \\
& 2\alpha\sin(\alpha)ra^3rb^2\cos(\alpha)^8 + \alpha\sin(\alpha)ra^3rbz\cos(\alpha)^7 - \\
& 2\alpha\sin(\alpha)ra^3rbz\cos(\alpha)^5 - z\sin(\alpha)ra^3rb\cos(\alpha)^6 - 2\alpha\sin(\alpha)ra^3z^2\cos(\alpha)^6 + \\
& 3\alpha\sin(\alpha)ra^3z^2\cos(\alpha)^4 + 2z\sin(\alpha)ra^3z\cos(\alpha)^5 + \\
& 2\alpha\sin(\alpha)ra^3rb^3\cos(\alpha)^9 + \alpha\sin(\alpha)ra^2rb^3\cos(\alpha)^7 - \\
& 3\alpha\sin(\alpha)ra^2rb^2z\cos(\alpha)^8 + 5\alpha\sin(\alpha)ra^2rb^2z\cos(\alpha)^6 + \\
& 2\alpha\sin(\alpha)ra^2rb^2z\cos(\alpha)^4 - z\sin(\alpha)ra^2rb^2\cos(\alpha)^9 + \\
& 3z\sin(\alpha)ra^2rb^2\cos(\alpha)^7 + z\sin(\alpha)ra^2rb^2\cos(\alpha)^5 + 7\alpha\sin(\alpha)ra^2rbz^2\cos(\alpha)^7 - \\
& 4\alpha\sin(\alpha)ra^2rbz^2\cos(\alpha)^5 - 5\alpha\sin(\alpha)ra^2rbz^2\cos(\alpha)^3 - \\
& 5z\sin(\alpha)ra^2rbz\cos(\alpha)^6 - 3z\sin(\alpha)ra^2rbz\cos(\alpha)^4 - \\
& 2\alpha\sin(\alpha)ra^2z^3\cos(\alpha)^4 + 3\alpha\sin(\alpha)ra^2z^3\cos(\alpha)^2 - \\
& 2z\sin(\alpha)ra^2z^2\cos(\alpha)^5 + 2z\sin(\alpha)ra^2z^2\cos(\alpha)^3 - \alpha\sin(\alpha)ra^4rb^4\cos(\alpha)^8 + \\
& 3\alpha\sin(\alpha)ra^3rb^3z\cos(\alpha)^7 - 8\alpha\sin(\alpha)ra^3rb^3z\cos(\alpha)^5 + \\
& z\sin(\alpha)ra^3rb^3\cos(\alpha)^8 - 4z\sin(\alpha)ra^3rb^3\cos(\alpha)^6 + 2\alpha\sin(\alpha)ra^3rb^2z^2\cos(\alpha)^8 - \\
& 21\alpha\sin(\alpha)ra^3rb^2z^2\cos(\alpha)^6 + 20\alpha\sin(\alpha)ra^3rb^2z^2\cos(\alpha)^4 - \\
& z\sin(\alpha)ra^3rb^2z\cos(\alpha)^7 + 11z\sin(\alpha)ra^3rb^2z\cos(\alpha)^5 + \\
& 11\alpha\sin(\alpha)ra^3rbz^3\cos(\alpha)^5 - 14\alpha\sin(\alpha)ra^3rbz^3\cos(\alpha)^3 + \\
& 8z\sin(\alpha)ra^3rbz^2\cos(\alpha)^6 - 8z\sin(\alpha)ra^3rbz^2\cos(\alpha)^4 - \alpha\sin(\alpha)ra^4z^4\cos(\alpha)^4 + \\
& 2\alpha\sin(\alpha)ra^4z^4\cos(\alpha)^2 + z\sin(\alpha)ra^4z^3\cos(\alpha)^3 + \\
& 2\alpha\sin(\alpha)ra^4z^3\cos(\alpha)^4 + z\sin(\alpha)ra^4z^3\cos(\alpha)^5 + 8\alpha\sin(\alpha)ra^4z^2\cos(\alpha)^5 - \\
& 8\alpha\sin(\alpha)ra^4z^2\cos(\alpha)^3 - 4z\sin(\alpha)ra^4z^2\cos(\alpha)^4 - \\
& 10\alpha\sin(\alpha)ra^4z^2\cos(\alpha)^4 + 12\alpha\sin(\alpha)ra^4z^2\cos(\alpha)^2 - \\
& 6z\sin(\alpha)ra^4z^2\cos(\alpha)^5 + 6z\sin(\alpha)ra^4z^2\cos(\alpha)^3 - 4\alpha\sin(\alpha)ra^4z^4\cos(\alpha)^5 + \\
& 11\alpha\sin(\alpha)ra^4z^4\cos(\alpha)^3 - 8\alpha\sin(\alpha)ra^4z^4\cos(\alpha) + 3z\sin(\alpha)ra^4z^3\cos(\alpha)^4 - \\
& 4z\sin(\alpha)ra^4z^3\cos(\alpha)^2 - \alpha\sin(\alpha)ra^4z^5\cos(\alpha)^2 + 2\alpha\sin(\alpha)ra^4z^5\cos(\alpha) - \\
& z\sin(\alpha)ra^4z^4\cos(\alpha)^3 + z\sin(\alpha)ra^4z^4\cos(\alpha))/(r^4\cos(\alpha)^7 - 4ra^3rb\cos(\alpha)^8 +
\end{aligned}$$

$$\begin{aligned}
& 4*ra^2*rb^2*cos(alpha)^9 + 2*ra^2*rb^2*cos(alpha)^7 - 4*sin(alpha)*ra^2*rb*z*cos(alpha)^6 + \\
& 2*ra^2*z^2*cos(alpha)^5 - 4*ra*rb^3*cos(alpha)^8 + 8*sin(alpha)*ra*rb^2*z*cos(alpha)^7 - \\
& 4*ra*rb*z^2*cos(alpha)^6 + rb^4*cos(alpha)^7 - 4*sin(alpha)*rb^3*z*cos(alpha)^6 - 4*rb^2*z^2*cos(alpha)^7 + \\
& 6*rb^2*z^2*cos(alpha)^5 - 4*sin(alpha)*rb*z^3*cos(alpha)^4 + z^4*cos(alpha)^3 + (e2 - ((ra*cos(alpha) - rb + \\
& z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(1/2))*(((ra*cos(alpha) - rb + z*tan(alpha))*(ra^2*cos(alpha)^2 - \\
& sin(alpha)*ra*z - rb*ra*cos(alpha)^3 + z^2)*(alpha1d*ra^2*cos(alpha)^2 - alpha1d*sin(alpha)*ra*z - \\
& alpha1d*rb*ra*cos(alpha)^3 - z1d*ra*cos(alpha) + alpha1d*z^2 + \\
& rb*z1d*cos(alpha)^2))/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
& ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - sin(2*alpha)*rb*z + \\
& z^2)) + ((cos(alpha)^2)^(3/2)*(z - ra*sin(alpha))*(alpha1d*sin(alpha)*ra^3*rb*cos(alpha)^4 - \\
& alpha1d*ra^3*z*cos(alpha)^3 + 2*alpha1d*ra^3*z*cos(alpha) + z1d*sin(alpha)*ra^3*cos(alpha)^2 + \\
& 4*alpha1d*ra^2*rb*z*cos(alpha)^4 - 8*alpha1d*ra^2*rb*z*cos(alpha)^2 - \\
& 4*z1d*sin(alpha)*ra^2*rb*cos(alpha)^3 + z1d*ra^2*z*cos(alpha)^2 - alpha1d*sin(alpha)*ra*rb^3*cos(alpha)^4 - \\
& 2*alpha1d*ra*rb^2*z*cos(alpha)^5 + 3*alpha1d*ra*rb^2*z*cos(alpha)^3 + 2*alpha1d*ra*rb^2*z*cos(alpha) + \\
& 2*z1d*sin(alpha)*ra*rb^2*cos(alpha)^4 + z1d*sin(alpha)*ra*rb^2*cos(alpha)^2 + \\
& 5*alpha1d*sin(alpha)*ra*rb*z^2*cos(alpha)^2 - 2*alpha1d*sin(alpha)*ra*rb*z^2 + alpha1d*ra*z^3*cos(alpha) - \\
& z1d*sin(alpha)*ra*z^2 - 2*alpha1d*sin(alpha)*rb^2*z^2*cos(alpha) - z1d*rb^2*z*cos(alpha)^2 - \\
& 4*alpha1d*rb*z^3*cos(alpha)^2 + 2*alpha1d*rb*z^3 + z1d*z^3))/(cos(alpha)^4*((ra*cos(alpha) - rb + \\
& z*tan(alpha))^2 + (z - ra*sin(alpha))^2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb*z + z^2)^(3/2))) + (abs(cos(alpha))*(z - ra*sin(alpha))*(ra^2*cos(alpha)^2 - sin(alpha)*ra*z - \\
& rb*ra*cos(alpha)^3 + z^2)*(2*z*z1d*cos(alpha) + 2*alpha1d*z^2*sin(alpha) - 2*rb*z1d*cos(alpha)^2*sin(alpha) - \\
& 2*alpha1d*rb*z*cos(alpha) + 2*alpha1d*ra*rb*cos(alpha)^3*sin(alpha)))/(cos(alpha)^5*((ra*cos(alpha) - rb + \\
& z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb*z + z^2)^(1/2))*((ra*(sin(alpha)*rb^2*cos(alpha)^2 + rb*z*cos(alpha)^3 - 2*rb*z*cos(alpha) - \\
& ra*sin(alpha)*rb*cos(alpha)^3 + sin(alpha)*z^2 + ra*z*cos(alpha)^2))/(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 \\
& + rb^2*cos(alpha)^2 - sin(2*alpha)*rb*z + z^2) - (z*(ra*cos(alpha) - rb + \\
& z*tan(alpha))^2)/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - ra*sin(alpha))^2)) + ((z - \\
& ra*sin(alpha))*(e2 - ((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(1/2))*(ra^2*cos(alpha)^2 - \\
& sin(alpha)*ra*z - rb*ra*cos(alpha)^3 + z^2))/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
& ra*sin(alpha))^2)^(3/2)) - ((e2 - ((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(1/2))*((z - \\
& ra*sin(alpha))*(ra^2*cos(alpha)^2 - sin(alpha)*ra*z - rb*ra*cos(alpha)^3 + z^2)*(alpha1d*ra^2*cos(alpha)^2 - \\
& alpha1d*sin(alpha)*ra*z - alpha1d*rb*ra*cos(alpha)^3 - z1d*ra*cos(alpha) + alpha1d*z^2 + \\
& rb*z1d*cos(alpha)^2))/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
& ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - sin(2*alpha)*rb*z + \\
& z^2)) - (((cos(alpha)^2)^(3/2)*(ra*cos(alpha) - rb + z*tan(alpha))*(alpha1d*sin(alpha)*ra^3*rb*cos(alpha)^4 - \\
& alpha1d*ra^3*z*cos(alpha)^3 + 2*alpha1d*ra^3*z*cos(alpha) + z1d*sin(alpha)*ra^3*cos(alpha)^2 + \\
& 4*alpha1d*ra^2*rb*z*cos(alpha)^4 - 8*alpha1d*ra^2*rb*z*cos(alpha)^2 - \\
& 4*z1d*sin(alpha)*ra^2*rb*cos(alpha)^3 + z1d*ra^2*z*cos(alpha)^2 - alpha1d*sin(alpha)*ra*rb^3*cos(alpha)^4 - \\
& 2*alpha1d*ra*rb^2*z*cos(alpha)^5 + 3*alpha1d*ra*rb^2*z*cos(alpha)^3 + 2*alpha1d*ra*rb^2*z*cos(alpha) + \\
& 2*z1d*sin(alpha)*ra*rb^2*cos(alpha)^4 + z1d*sin(alpha)*ra*rb^2*cos(alpha)^2 + \\
& 5*alpha1d*sin(alpha)*ra*rb*z^2*cos(alpha)^2 - 2*alpha1d*sin(alpha)*ra*rb*z^2 + alpha1d*ra*z^3*cos(alpha) - \\
& z1d*sin(alpha)*ra*z^2 - 2*alpha1d*sin(alpha)*rb^2*z^2*cos(alpha) - z1d*rb^2*z*cos(alpha)^2 - \\
& 4*alpha1d*rb*z^3*cos(alpha)^2 + 2*alpha1d*rb*z^3 + z1d*z^3))/(cos(alpha)^4*((ra*cos(alpha) - rb + \\
& z*tan(alpha))^2 + (z - ra*sin(alpha))^2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb*z + z^2)^(3/2))) + (2*alpha1d*z^5 - alpha1d*z^5*cos(alpha)^2 + (z^4*z1d*sin(2*alpha))/2 - \\
& 3*alpha1d*ra^3*z^2*(sin(alpha) - sin(alpha)^3) - 3*alpha1d*rb*z^4*sin(2*alpha) + ra*z^3*z1d*cos(alpha)^3 - \\
& 2*ra^3*z*z1d*cos(alpha)^3 + 2*ra^3*z*z1d*cos(alpha)^5 - 3*rb*z^3*z1d*cos(alpha)^2 +
\end{aligned}$$

$$\begin{aligned}
& 3*rb^3*z^3*d*cos(alpha)^4 - rb^3*z^3*d*cos(alpha)^4 + 3*alpha1d*ra^2*z^3*cos(alpha)^2 - \\
& 2*alpha1d*ra^2*z^3*cos(alpha)^4 + 6*alpha1d*rb^2*z^3*cos(alpha)^2 - 6*alpha1d*rb^2*z^3*cos(alpha)^4 + \\
& alpha1d*ra^2*z^4*(sin(alpha) - sin(alpha)^3) - 2*alpha1d*ra^2*z^4*sin(alpha) - ra^2*z^3*d*cos(alpha) - \\
& 6*alpha1d*ra^2*rb^2*z^2*cos(alpha)^4 + 7*alpha1d*ra^2*rb^2*z^2*cos(alpha)^6 - \\
& 3*alpha1d*ra^2*rb^2*z^2*cos(alpha)^8 + 4*alpha1d*rb^2*z^4*cos(alpha)^3*sin(alpha) + \\
& ra^2*rb^3*z^1*d*cos(alpha)^4*sin(alpha) + ra^3*rb^2*z^1*d*cos(alpha)^4*sin(alpha) + 6*alpha1d*ra*rb^2*z^3*cos(alpha) \\
& + alpha1d*ra^3*rb^2*cos(alpha)^6*sin(alpha) - alpha1d*ra^2*rb^3*cos(alpha)^7*sin(alpha) + \\
& alpha1d*ra^3*rb^2*cos(alpha)^8*sin(alpha) + 3*ra^2*rb^2*z^1*d*(sin(alpha) - sin(alpha)^3) + \\
& 2*alpha1d*ra^3*z^2*cos(alpha)^4*sin(alpha) - 2*alpha1d*rb^3*z^2*cos(alpha)^3*sin(alpha) - \\
& 3*ra^2*rb^2*z^1*d*cos(alpha)^5*sin(alpha) + ra^2*rb^2*z^1*d*cos(alpha)^7*sin(alpha) + \\
& 2*ra^2*z^2*z^1*d*cos(alpha)^3*sin(alpha) + 3*rb^2*z^2*z^1*d*cos(alpha)^3*sin(alpha) - \\
& 18*alpha1d*ra*rb^2*z^3*cos(alpha)^3 + 2*alpha1d*ra*rb^3*z*cos(alpha)^3 + 2*alpha1d*ra^3*rb^2*cos(alpha)^3 \\
& + 11*alpha1d*ra*rb^2*z^3*cos(alpha)^5 - 2*alpha1d*ra*rb^3*z*cos(alpha)^5 - 2*alpha1d*ra^3*rb^2*cos(alpha)^5 \\
& + alpha1d*ra*rb^3*z*cos(alpha)^7 + alpha1d*ra^3*rb^2*cos(alpha)^7 - 6*alpha1d*ra*rb^2*z^2*(sin(alpha) - \\
& sin(alpha)^3) - 3*ra^2*rb^2*z^1*d*cos(alpha)^3 + 4*ra^2*rb^2*z^1*d*cos(alpha)^4 + 6*ra^2*rb^2*z^1*d*cos(alpha)^5 \\
& - 5*ra^2*rb^2*z^1*d*cos(alpha)^6 - ra^2*rb^2*z^1*d*cos(alpha)^7 - alpha1d*ra^4*rb*cos(alpha)^7*sin(alpha) - \\
& 8*ra^2*rb^2*z^1*d*cos(alpha)^4*sin(alpha) + 6*alpha1d*ra^2*rb^2*cos(alpha)^3*sin(alpha) + \\
& 12*alpha1d*ra*rb^2*z^2*cos(alpha)^4*sin(alpha) - 7*alpha1d*ra^2*rb^2*z^2*cos(alpha)^5*sin(alpha) - \\
& 2*alpha1d*ra*rb^2*z^2*cos(alpha)^6*sin(alpha))/(ra^4*cos(alpha)^6 - 4*ra^3*rb*cos(alpha)^7 + \\
& 4*ra^2*rb^2*cos(alpha)^8 + 2*ra^2*rb^2*cos(alpha)^6 - 4*sin(alpha)*ra^2*rb^2*cos(alpha)^5 + \\
& 2*ra^2*z^2*cos(alpha)^4 - 4*ra^2*rb^3*cos(alpha)^7 + 8*sin(alpha)*ra^2*rb^2*cos(alpha)^6 - \\
& 4*ra^2*rb^2*z^2*cos(alpha)^5 + rb^4*cos(alpha)^6 - 4*sin(alpha)*rb^3*z*cos(alpha)^5 - 4*rb^2*z^2*cos(alpha)^6 + \\
& 6*rb^2*z^2*cos(alpha)^4 - 4*sin(alpha)*rb^2*z^3*cos(alpha)^3 + z^4*cos(alpha)^2) - \\
& (abs(cos(alpha))*(ra*cos(alpha) - rb + z*tan(alpha))*(ra^2*cos(alpha)^2 - sin(alpha)*ra*z - rb*ra*cos(alpha)^3 + \\
& z^2)*(2*z^2*d*cos(alpha) + 2*alpha1d*z^2*sin(alpha) - 2*rb^2*d*cos(alpha)^2*sin(alpha) - \\
& 2*alpha1d*rb^2*cos(alpha) + 2*alpha1d*ra*rb*cos(alpha)^3*sin(alpha)))/(cos(alpha)^5*((ra*cos(alpha) - rb + \\
& z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb^2*z + z^2)^(1/2))*((ra*cos(alpha)*(-z^2 + rb*sin(alpha)*z*cos(alpha) + ra*sin(alpha)*z + \\
& ra*rb*cos(alpha)^3 - ra*rb*cos(alpha)))/(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - \\
& sin(2*alpha)*rb^2*z + z^2) + ((e2 - ((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
& ra*sin(alpha))^2)^(1/2))*(ra*cos(alpha) - rb + z*tan(alpha))*(ra^2*cos(alpha)^2 - sin(alpha)*ra*z - \\
& rb*ra*cos(alpha)^3 + z^2))/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - ra*sin(alpha))^2)^(3/2)) + \\
& (z*(z - ra*sin(alpha))*(ra*cos(alpha) - rb + z*tan(alpha)))/(cos(alpha)^2*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z - \\
& ra*sin(alpha))^2)));
\end{aligned}$$

YC2422=0;

$$\begin{aligned}
YC2423 = & -((cos(alpha)^2)^(3/2)*(ra^2*cos(alpha)^2 + z^2 - ra*z*sin(alpha) - \\
& ra*rb*cos(alpha)^3)*(2*alpha1d^2*rb^2*z^3 - 2*rb^2*z^1*d^2*cos(alpha)^3*sin(alpha) + \\
& alpha1d^2*ra^2*z^3*cos(alpha) + 2*alpha1d^2*ra^3*z*cos(alpha) + 2*rb^2*z^1*d^2*cos(alpha)^2 - \\
& alpha1d^2*ra^3*z*cos(alpha)^3 - 4*alpha1d^2*rb^2*z^3*cos(alpha)^2 + 2*alpha1d*ra^3*z^1*d*(sin(alpha) - \\
& sin(alpha)^3) + 2*ra*rb^2*z^1*d^2*(sin(alpha) - sin(alpha)^3) - 2*ra^2*z^1*d^2*cos(alpha) - \\
& alpha1d^2*rb^2*z^2*sin(2*alpha) - 8*alpha1d^2*ra^2*rb^2*cos(alpha)^2 + \\
& 3*alpha1d^2*ra*rb^2*cos(alpha)^3 + 4*alpha1d^2*ra^2*rb^2*cos(alpha)^4 - \\
& 2*alpha1d^2*ra*rb^2*cos(alpha)^5 + 2*alpha1d*ra*rb^2*z^1*d*(sin(alpha) - sin(alpha)^3) - \\
& 2*alpha1d*ra^2*z^1*d^2*sin(alpha) - alpha1d^2*ra*rb^3*cos(alpha)^4*sin(alpha) + \\
& alpha1d^2*ra^3*rb*cos(alpha)^4*sin(alpha) + 2*alpha1d^2*ra*rb^2*cos(alpha) + \\
& 5*alpha1d^2*ra*rb^2*z^2*(sin(alpha) - sin(alpha)^3) - 4*alpha1d*rb^2*z^2*d*cos(alpha)^2 - \\
& 2*alpha1d^2*ra*rb^2*z^2*sin(alpha) + 2*alpha1d*rb^2*z^1*d^2*sin(2*alpha) -
\end{aligned}$$

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8*alpha1d*ra^2*rb*z1d*cos(alpha)^3*sin(alpha) + 4*alpha1d*ra*rb^2*z1d*cos(alpha)^4*sin(alpha) +
4*alpha1d*ra*rb*z^2*z1d*cos(alpha)^3)/(cos(alpha)^6*((ra*cos(alpha) - rb + z*tan(alpha))^2 + (z -
ra*sin(alpha))^2)^(3/2)*(ra^2*cos(alpha)^2 - 2*ra*rb*cos(alpha)^3 + rb^2*cos(alpha)^2 - sin(2*alpha)*rb*z +
z^2)^(3/2));
YC2424=0;
YC2431=0;
YC2432=0;
YC2433=0;
YC2434=0;
YC24=[YC2411 YC2412 YC2413 YC2414; YC2421 YC2422 YC2423 YC2424; YC2431 YC2432 YC2433 YC2434] ;
YG24=[ga*((cos(alpha)^2*(z - ra*cos(alpha)*sin(beta))^2)/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 -
2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta)) + (sin(alpha)^2*(z -
ra*cos(alpha)*sin(beta))^2)/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) -
2*ra*z*cos(alpha)*sin(beta)) + ((cos(alpha)^2)^(3/2)*(rb - ra*cos(beta))^2*((ra^2*cos(alpha)^2 +
rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2) -
e2*abs(cos(alpha))))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 -
2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))), 0, 0, 0
-ga*((z*(z - ra*cos(alpha)*sin(beta))*(z*tan(alpha) - ra*sin(alpha)*sin(beta)))/(ra^2*cos(alpha)^2 +
rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta)) - ((z*tan(alpha) -
ra*sin(alpha)*sin(beta))*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) -
2*ra*z*cos(alpha)*sin(beta))^(1/2) - e2*abs(cos(alpha))))*(ra^2*cos(alpha)^2 + z^2 -
ra^2*cos(alpha)^2*cos(beta)^2 - 2*ra*z*cos(alpha)*sin(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 -
2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2) +
(ra*sin(alpha)*sin(beta)*(cos(alpha)^2)^(3/2)*(rb - ra*cos(beta))^2*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 +
z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(1/2) -
e2*abs(cos(alpha))))/(abs(cos(alpha))*(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 -
2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta))^(3/2))), 0, 0, 0
ga*((ra*cos(alpha)*(cos(alpha)^2 - 1)*(ra*rb*cos(alpha)^2*cos(beta)^2 - ra*rb*cos(alpha)^2 - z^2*cos(beta) +
rb*z*cos(alpha)*sin(beta) + ra*z*cos(alpha)*cos(beta)*sin(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2
- 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta)) -
(ra*cos(alpha)^3*(ra*rb*cos(alpha)^2*cos(beta)^2 - ra*rb*cos(alpha)^2 - z^2*cos(beta) +
rb*z*cos(alpha)*sin(beta) + ra*z*cos(alpha)*cos(beta)*sin(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2
- 2*ra*rb*cos(alpha)^2*cos(beta) - 2*ra*z*cos(alpha)*sin(beta)) + (ra*cos(alpha)^2*(rb -
ra*cos(beta))*((ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) -
2*ra*z*cos(alpha)*sin(beta))^(1/2) - e2*abs(cos(alpha))))*(z*sin(beta) - ra*cos(alpha) +
rb*cos(alpha)*cos(beta)))/(ra^2*cos(alpha)^2 + rb^2*cos(alpha)^2 + z^2 - 2*ra*rb*cos(alpha)^2*cos(beta) -
2*ra*z*cos(alpha)*sin(beta))^(3/2)), 0, 0, 0];
Y8=YM24+YC24+YG24;
Y=[YP Y1 Y2 Y3 Y4 Y5 Y6 Y7 Y8];
end

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