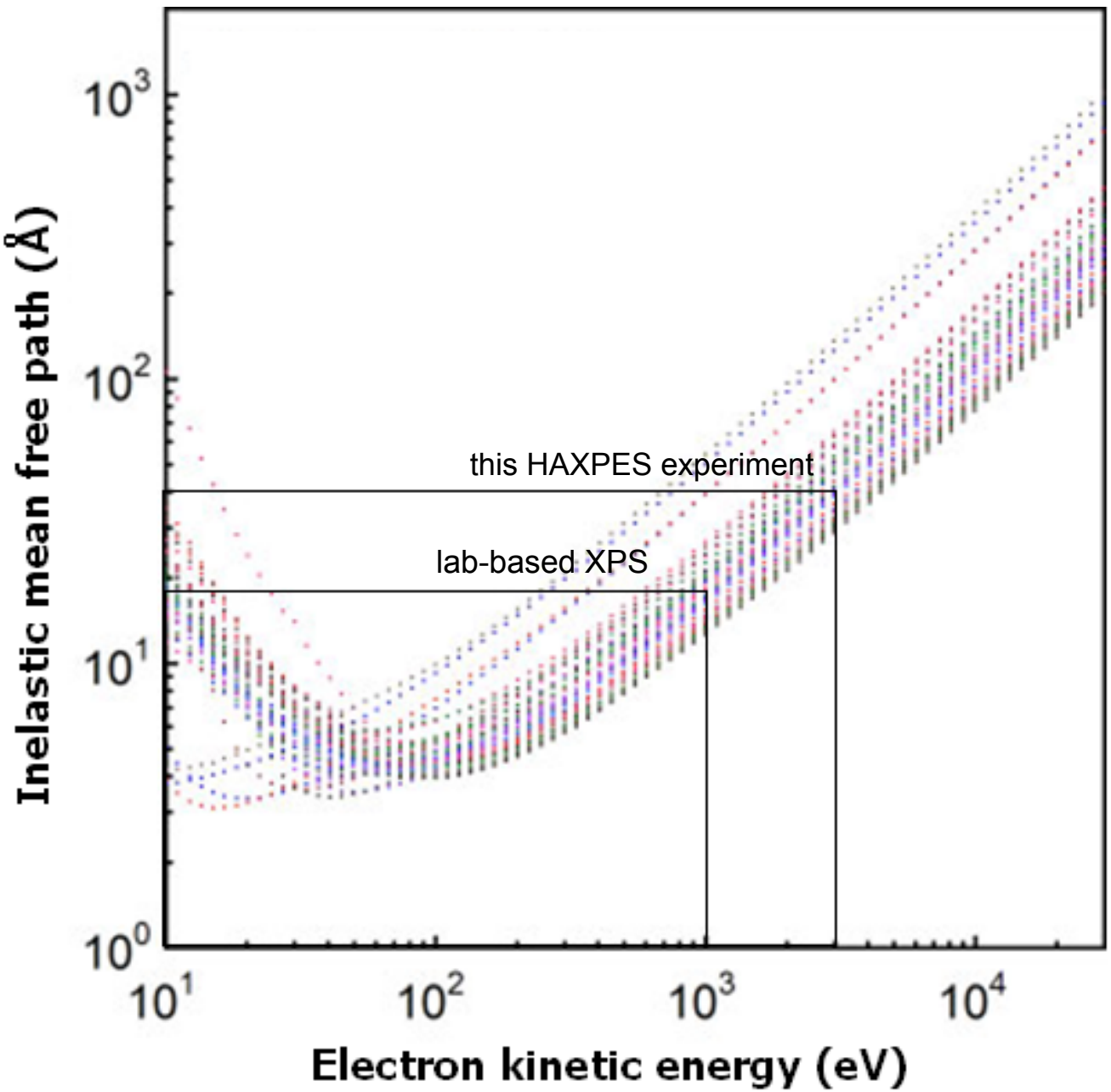

The HAXPES Advantage

$$KE_{max} = h\nu - BE - \phi$$

IMFP vs. electron KE for 41 elemental solids

S. Tanuma, et al., *Surf. Interface Anal.* **43** 689-713 (2010).

Cross sections from reference 42 (barns)									
photon energy	P 1s	Si 1s	F 1s	O 1s	C 1s	Si 2s	P 2p	Si 2p	Li 1s
4000	24639	19410	3720	2323.9	706.57	1159.1	581.5	380.3	32.264

IMFP equation (Å) from fit to data in reference 40, independent variable is the electron kinetic energy			
polynomial order	0	1	2
leading factor	6.90213	0.0253556	-3.64E-07

Transmission Function (relative luminosity) from fit to data in reference 41, independent variable is electron kinetic energy											
polynomial order	0	1	2	3	4	5	6	7	8	9	10
leading factor	-0.40688	0.0181553	-4.552E-05	5.88E-08	-4.626E-11	2.36E-14	-7.956E-18	1.7617E-21	-2.462E-25	1.97E-29	-6.858E-34

Core	IMFP(Å) @hv=1487eV	IMFP(Å) @hv=4000eV
Li1s	42	101
Si2p	41	100
P2p	40	99
C1s	37	95
O1s	30	89
F1s	26	85
Si1s	N/A	56
P1s	N/A	48

period	LixSi fit area	LixSi fit dA	LixSiOy fit area	LixSiOy fit dA	bkgd	dbkgd	lambda (Å)	LixSi relative thickness (Å)	LixSiOy relative thickness (Å)
1	370140	15557	1207100	68295	1068270	5	59.9978972	0	0
2	392210	15878	1304900	58638	1043400	5	59.9978972	-4.88814893	-6.08747825
3	414630	17386	1360300	57252	1022020	5	59.9978972	-9.465550273	-9.824291566
4	411640	17024	1375800	53352	1000750	5	59.9978972	-10.29315928	-11.76591103
5	415220	16269	1395500	50362	976604	5	59.9978972	-12.27807389	-14.08429844
6	419270	17247	1394500	52380	994564	5	59.9978972	-11.76709585	-12.94793535
7	427320	17139	1402400	51134	1006800	5	59.9978972	-12.17449538	-12.55322799
8	420580	16390	1376100	50677	981265	5	59.9978972	-12.76195109	-12.95869764
9	435300	19452	1414000	58711	1012920	5	59.9978972	-12.92099144	-12.68385831
10	427590	19828	1360300	61475	991133	5	59.9978972	-13.15337161	-11.66548345