GEOMETRICAL AND STATISTICAL METHODS OF ANALYSIS OF STAR CONFIGURATIONS. DATING PTOLEMY'S ALMAGEST

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The book presents an unusual application of statistical and geometrical methods to dating ancient astronomical documents. An exciting result of the book consists of placing the date of Ptolemy's principal work "Almagest" in the Middle Ages instead of its traditional date (second century A.D.). The main body of the book contains statistical analysis of Ptolemy's star catalogue (systematic errors, accuracy, inclination of the ecliptic, dating the star catalogue). The elaborated method is tested on some medieval star catalogs (T. Brahe, Ulugh Beg, Hevelius, Al Sufi). In addition, the results are confirmed by other dating based on coverings of stars and lunar eclipses. The book contains necessary notions and concepts of astronomy and history and an addendum discussing historical problems and hypotheses related to dating the Almagest.