

DETERMINATION OF THE OPEN CLUSTERS 3D STRUCTURE FROM GAIA EDR3 CATALOG

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Catalogs with an unprecedented level of accuracy were obtained as a result of the Gaia space mission. The use of data from these catalogs for the open clusters research allows clarifying of their star population and obtaining more accurate estimates of their parameters. The software, developed by the MAO Research Institute, uses astrometric data (proper motions and parallaxes) to determine the size, mean parallaxes, and mean proper motions of the open clusters and their populations. The software can work with any modern catalogs which contain the necessary astrometric parameters. The ultimate goal of the software is to refine the population and study the 3D structure of open star clusters.

This report presents the results of processing of the selected 129 clusters from the open clusters catalog (Dias +, 2002, CDS VII / 229) with current updates according to the catalogs GAIA EDR3. Most of the selected clusters are at distances not exceeding 1 kPs. The algorithm for calculating and separating background and cluster stars in the selected sky areas is based on the assumption that the clusters stars have similar values of their proper motions and parallaxes. The calculation is performed by the method of confidence intervals by successive iterations. Comparison with the data of the catalog (Cantat-Gaudin +, 2020, J / A+A / 633 / A99) mostly showed good consistency in distances and proper motions, but the population differs significantly in some cases. For some clusters, distance has big differences to the same in the Dias catalog but similar to the Cantat-Gaudin catalog. The probable reasons for such discrepancies and a detailed analysis of the selected clusters are given.