CLASSIFICATION OF GALAXY CLUSTERS. REALIZATION OF THE ALGORITHMS OF CLASSIFICATIONS AND CAPABILITIES OF THE CLUSTER CARTOGRAPHY SET

S.I. Yemelianov

Theoretical Physics and Astronomy Department,
I. I. Mechnikov Odessa National University, Odessa, Ukraine
sviatoslavem@gmail.com

For detail classification of galaxy clusters taking into account numerical criteria we create the cluster Cartography (CC) tool. We realized the developed algorithms in the Cluster Cartography tool for detecting various kinds of regular substructures in this objects. The input data are the Catalogue of Galaxy Clusters and Groups, E. Panko & P. Flin (2006), and list of galaxies of Munster Red Sky Survey (MRSS), R. Ungruhe, W. C. Seitter, and H. W. Duerbeck (2003). At the first step the MRSS information of galaxies is transformed to CC format. Equatorial coordinates are recalculated into 2D standard rectangular tangent coordinates in *arcseconds* by usual way. Real sizes of galaxies are very small relatively to size of cluster field and we used another approach for visualization. Galaxies in the CC maps are presented as ellipses. The square of the ellipse corresponds to galaxy' magnitude (calculated by a special equation). The axes and positional angle of major axe of symbol corresponds to the data for galaxy in MRSS.

CC allows one to determine the standard morphological types of cluster (the level of concentration to the center or/and straight line automatically – comparing the weighted densities in corresponding areas. The cross-type peculiarities we detect using a rotating pencil-beam area. CC also demonstrates corresponding histograms for visual control.

The possibilities of CC tools are demonstrated and discussed.