Astrometry of the OGLE-III data

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Abstract

The thesis presents the astrometric analysis of the data collected during the third phase of the Optical Gravitational Lensing Experiment. The area of 54 square degrees towards the Magellanic Clouds was analyzed. The clean and complete sample of the stars with proper motions higher than 0.1 arcsecond per year was prepared and analyzed. A catalog of over 6.2 million stellar proper motions is presented and discussed. For over 110 000 stars also the parallaxes are presented. Separate analysis was performed in four fields towards the Galactic bulge, in which a double red clump is observed. The double red clump is caused by an X-shaped structure. The proper motions of the stars in the two arms of this structure were compared. Significant differences in mean longitudinal proper motions were found. The dispersions of the proper motions in both arms of the structure were derived for the first time.

Keywords: astrometry — catalogs — galaxy: bulge — galaxy: kinematics and dynamics — globular clusters: 47 Tuc — Magellanic Clouds — parallaxes — proper motions