A NON-GRAVITATIONAL EFFECT AND SPIN ORIENTATION OF KILOMETRE-SIZED MAIN BELT ASTEROIDS

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Determining spin directions of asteroids - a rather difficult task Today, only about 200 asteroids have identified spin orientations. For some asteroids it can determine the spin directions by precise calculations of the evolution of the orbits.

Numerical calculations of the orbital evolution of the MBA asteroids from 2005 to 2016 were carried out. The calculation results analysis leads to the conclusion that in our days an influence of non-gravitational effects (NGE) of cometary nature becomes apparent in motion of a significant portion (at least 5%) of the main belt asteroids up to 40 km. Such NGE causes the increase of the semi-major axes of orbits of the low-albedo asteroids with respect to the semi-major axes of orbits of bodies with the large albedos.

Change an asteroid semi-major axis should depend on the spin direction. Therefore the calculations may indicate on the spin direction (prograde or retrograde) for several tens of asteroids.

PROBLEMS BY ASSESSMENT OF ACCURACY AT PROCESSING JOINT ROWS OF DIGITIZED ASTRONOMICAL IMAGES OBTAINED WITH DIFFERENT INSTRUMENTS

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Current methods for determining the astrometry positions of digitized photographic plates have difficulty for correctly using data from different telescopes. Factors such as scale of a plate, exposure duration, size of the plate and its quality, affect the accuracy of the results. Scanner options add their mistakes. Often, it is important to get results in prolonged time period.

In such cases, we use observational data that were obtained using different telescopes. Then there is the need to balance the various data accuracy. The report provides a methodical approach. The method has been tested for some standard star fields.