

NEAR-EARTH ASTEROIDS CLOSE TO MEAN MOTION RESONANCES: THE ORBITAL EVOLUTION

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The movement of asteroids near mean motion resonances is considered in the paper. Results of study of orbital evolution of NEAs 3838 Epona, 1996 DH, 1996 AJ1, 1994 RB, 2608 Seneca are presented.

Equations of the motion of asteroids have been integrated numerically. In process of numerical integration perturbations from planets (except Pluto) and Moon have been taken into account. The interval of time is ranging from -3000 years to 3000 years. Initial elements of orbits of asteroids have been taken from catalogue of E. Bowell, with date of 22.01.99 (<ftp://ftp.lowell.edu/pub/elgb/astorb.dat>). The motion of each object has been considered in two coordinate frame: 1) heliocentric frame related to ecliptic and equinox 2000.0; 2) heliocentric frame rotating with angular velocity of the planet with which the object is in a resonance.

Evolution of ensembles of 100 test particles with orbital elements nearby those of nominal orbits has been considered for each object. The initial set of orbits has been generated on the basis of probable variations of their initial orbital elements received from the least square analysis of observations. Numerical estimates of the average rate of deviation of initially nearby trajectories have been computed.

Investigations were carried out with the help of the specially developed software package, which allows to predict the motion of asteroids with high-accuracy. There is opportunity to using various forms of the differential equations and various coordinate frames in this package. The package has convenient interface and allows to represent the motion of asteroids and planets graphically. The package is created by using developing tool Delphi.