

THE SOFTWARE IDA FOR INVESTIGATION OF ASTEROID DYNAMICS AND ITS USE FOR STUDY OF SOME ASTEROID MOTION

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This work is devoted to description of the application suite IDA that is designed for investigation of dynamics and probability orbital evolution of asteroids. IDA allows to predict asteroid motion, to reveal close encounters, possible collisions and orbital resonance with planets, to estimate impact probability, to demonstrate asteroid and planets motion on a computer screen and to solve some additional problems. The features of the suite are multifunctionality, high efficiency and a convenient interface. The application suite IDA consists of following subsystems: subsystem “Assol” which allows to study orbital evolution of the nominal orbit and to demonstrate the asteroid and planets motion on a computer screen; subsystem “Observations” which intended to asteroid orbit fitting to positional observations and construction of initial probability domain with non-linear methods; subsystem “Distribution” which developed for the visualization of distribution of observations along an asteroid orbit; subsystem “Clones ensemble” which allows to construct an initial probability domain with the linear method; subsystem “Evolution” which designed for the study of the orbital evolution of an ensemble of asteroid clones; subsystem “Megno” which intended to estimate of predictability time of asteroid motion by means of average MEGNO parameter. The results of the motion investigation of the asteroid 2012 MF7 are given to demonstrate use of the application suite. This object has nonzero collision probability with the Earth in 2046.