

SOME CHARACTERISTICS OF BINARY NEAR EARTH ASTEROIDS

N. V. Ivanenko, A. A. Bazyey

*Odessa National I.I. Mechnikov University, Odessa, Ukraine,
ivanenko.natali2012@yandex.ua*

We present some results of a study of double asteroids, near-Earth objects (NEA). During the summer of 2014, we completed three double coordinate surveillance NEA (88710) 2001 SL9, (137170) 1999 HF1, (162483) 2000 PJ5 to clarify the elements of their orbits. In addition, we used the parameters of double NEA. We chose the asteroid systems for which parameters are known with the smallest error. We have identified the biggest tidal acceleration by Venus, Mars, Earth and Jupiter. All of them were negligible in order to cause their destruction.

Search for commensurability of asteroidal systems with planets was performed, as a result, it was found that the asteroid (363599) 2004 FG11 moves in resonance with the Earth at a ratio of 1: 2 and the error is 0.041159 days. For a more strict definition of sustainability movement asteroidal systems, we used the three-body problem. We determine the radius of the Hill sphere for each system near perihelion points. The calculation results showed that all of the satellites in the asteroidal system are deep in Hill areas. For example, in a satellite system Heracles (5143) moves in an orbit semi-major axis with respect to 4 km main component, while Hill sphere radius is 348 km.

Next, we examined the motion of satellites in binary systems, for which the period of axial rotation is well known. Comparison of centrifugal and gravitational acceleration on the surface of these satellites, assuming a spherical shape showed that for most of its surface loose bodies cannot hold. We performed a numerical simulation of trajectories for particles leaving the surface of the satellite in the double asteroid system.