
PHYSICAL MODEL OF MOVEMENT OF JUPITER SATELLITE ANANKE

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In Solar system exists a number of the phenomena's, which can be not described with use of the Newton equation of world-wide gravity, which strictly corresponds to gravitational interaction of two body only. With its use it is impossible to explain, for example, moving the Moon around the Earth, since Moon inheres in sphere of Sun gravity. Cognate situation there is in the event of external satellites of Jupiter – Pasiphe, Sinope, Karme and Ananke.

In given work is used offered by author [1] original **generalised equation of gravitational interactions**, applying to systems, consisting of many body. In a system of n bodies the directivity of total gravity force, acting upon body 1, is determined values of m_i/r_{i1}^3 , where: r_{i1} – distance between body 1 and body i . As a result we have equation, in which numeral 2 noted body with most value of m_i/r_{i1}^3 :

$$\vec{F}_{12} = Gm_1r_{i1} \sum_{i=2}^n m_i \vec{r}_{i1} / r_{i1}^4$$

For system of two bodies it is converted in the Newton equation:

The Influence of total force decomposes on two components: normal and tangential. The normal component "provides" attraction of body 1 to the centre of gravitation. The tangential component influences on direction of vector of total gravity power.

For checking the given approach is built a dynamic model, including incremental calculation the bound orbital parameters in system a Sun-Planet-Satellite and taking into account referencing the planet around the Sun and satellite around planet.

In previous work [2] was considered a system Sun-Jupiter-Karme. This work repeats main sections of previous and demonstrates on new example a reproducing of used approaches. New aspect is consideration of satellite orbit plane as gyroscope and estimation of influence of tangential component on orientation of satellite orbit plane in space.

Use of the generalised equation of gravitational interaction allows:

To explain character of interaction in system of three bodies Sun – Jupiter - Ananke.

To construct dynamic model, including the movement of the Jupiter around the Sun and movement of the Ananke around the Jupiter.

To explain osculating of orbits of the external satellites of the Jupiter.

To explain displacement perigee and rotation of units line of the satellites at the expense of influence of the Sun.

References:

1. *Ostrovskiy N.V.* Decision of a problem of three bodies on an example of system Sun-Earth-Moon.//The collection of materials of All-Russia conference "Science, Manufacture, Technology and Ecology". Kirov: Vyatka state university, 2003, v. 4, p. 74-75 (in Russian).
2. *Nikolay V. Ostrovskiy.* Physical model of the orbital movement of the Jupiter satellite Karme. Electronic conference "Computer Applications in fundamental and applied Physics and Mathematics". 31.03.06. URL: http://www.ivtn.ru/2006/physmath/enter/t_pdf/dp06_33.pdf.