

Constructing the Secular System in the Three–Axial Moon’s Rotation Theory in the Trigonometric Form

Tamara Ivanova.

The combined secular system for the evolution parameters of the orbits of the eight major planets and the Moon and the rigid–body rotation of the three–axial Moon is constructed by the method of the General Planetary Theory (GPT) [1] in the trigonometric form without secular and mixed terms. For that the techniques of the GPT and the Poisson Series Processor (PSP) [2] are used. The GPT is based on the ideas of separating the short–period and long–period terms variables and the Birkhoff’ normalizing transformation of the dynamical system. This method allows to reduce the equations of the translatory motion of the major planets and the Moon and the equations of the Earth’s rotation in Euler parameters to the secular system describing the evolution of the planetary and lunar orbits (independent of the Moon’s rotation) and the evolution of the Moon’s rotation (depending on the planetary and lunar evolution) and containing only the long–periodic terms. Therefore, the Moon’s rotation parameters are represented in the form of the GPT coordinates, i.e. in the form of the series in powers of the evolutionary variables with quazi–periodic coefficients with respect to the planetary-lunar mean longitudes.

References

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- [2] Ivanova, T.V.: 1995, “PSP: A New Poisson Series Processor”. In: *Dynamics, Ephemerides and Astrometry of the Solar System* (IAU Symposium 172, Paris, 1995, eds. S. Ferraz-Mello, B. Morando and J. -E. Arlot), 283, Kluwer

Tamara Ivanova.
Institute of Applied Astronomy of the Russian Academy of Sciences
Saint-Petersburg, Russian Federation
e-mail: itv@iaaras.ru