Development of the Numerical Theory of the Rigid Earth Rotation.

V. V. Pashkevich[1]

[1]*Central Astronomical Observatory at Pulkovo of RAS,*
Pulkovskoe Shosse 65, St. Petersburg, 196140, Russia. E-mail: apeks@gao.spb.ru

Development of the numerical theory of the rigid Earth's rotation is carried out in the Rodrigues-Hamilton parameters, which define a position of the principle axes of inertia of the Earth with respect to the fixed ecliptic plane and equinox J2000.0. The rigid Earth rotation is a result of the gravitational interaction of the Earth's body with the point mass disturbing bodies (the Sun, Moon and major planets). The geocentric motions of the disturbing bodies are provided by the ephemeris DE403/LE403. The numerical integration of the rotational motion equations of the rigid Earth is carried out over a 600 yr time interval. The results of the numerical solution of the problem are compared with the semi-analytical solution of the Earth's rotation SMART97 (Bretagnon et al., 1998). The dependence of the results of the numerical integration on the errors of DE403/LE403 ephemeris is investigated.