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Moments of Inertia and Period of the Chandler Wobble for Two and Three Layers Models of Galilean Satellite Io

V.N.Zharkov, A.L.Sobisevich

Schmidt Institute of Physics of the Earth, Russian Academy of Sciences, zharkov@ifz.ru

There are considered the two (Fe-FeS core + silicate mantle) and three (Fe-FeS core + silicate mantle + crust) layers models of Galilean satellite Io. Two parameters: ρ_0 - average density and the Love number k_2 for equilibrium figure of satellite are known. For calculation the mean moment of inertia in (Anderson et al., 2001) it was used the Radau-Darwin formula. With help of theory of figure formulas the principle moment of inertia A, B , C and the mean moment of inertia I for two and three layers models of Io were calculated using only ρ_0 and k_2 as boundary conditions. It has been shown that for modeling the internal structure of Io it is better to use the observed value k_2 rather than perform a transition from k_2 to I with regard to the Radau-Darwin formula. We calculated the period of the Chandler wobble for every considered model. This period is equal approximately to 460 days for the three layers model. Using of the general theory of equilibrium figure to calculate the value of the dimensionless polar moment of inertia leads to the changing of the value by several thousandth in comparison with the value obtained by Radau-Darwin formula. The same calculations for the satellite Europe show that this correction to the value of the dimensionless polar moment of inertia obtained by Radau-Darwin formula is three times smaller than in the case of Io. The ratio of these corrections is proportional to the ratio of the small parameters for Io and Europe.