Geophysical Research Abstracts
Vol. 16, EGU2014-1296, 2014
EGU General Assembly 2014

Tidal-Amplitude Delta-Factors and Their Dependence on Latitude

Evgeny Spiridonov
Schmidt Institute of Physics of the Earth, RAS, Moscow, Russian Federation (sp287@mail.ru)

The system of the sixth-order ordinary differential equations describing the strained state of incompressible elastic gravitating spherical layer with latitude-dependent geopotential, density, and Lame parameters is written out and integrated. The elliptical envelope of the Earth is modeled by the spherical layers. The latitudinal variations in density and elastic parameters across the spherical surface are proportional to the mean radii of the ellipsiods, which intersect this surface and on which these parameters are constant. Allowance for dissipation is introduced via the logarithmic creep function. When integrating the obtained equations, application of the approximate methods is avoided.
As a result, latitudinal dependences are obtained for the amplitude delta-factors of the second-order tidal waves. It is established that, irrespective of the wave frequency, the amplitude delta-factors of tidal waves experience a characteristic growth by about 0.12% from the equator to the pole.
After additional allowance for the effects associated with the action of inertia forces and dynamical resonant factors according to the data of the other authors, the resulting dependences were compared with the SG-measurements. This comparison demonstrated good agreement between our calculations and empirical data.
The average values of the amplitude delta-factors calculated in our analysis fall strictly between the predictions by the DDW/H and DDW/NH models (Dehant et al., 1999).