



Geocenter oscillations with hour periods and observed variations of the natural processes

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One of the basic mechanisms of observed displacements of the centre of mass of the Earth in the system of coordinates connected to a unchangeable crust, is the mechanism of perturbed swing and small relative translational displacements of the main shells of the Earth under gravitational attraction of external celestial bodies (Barkin, 2001). The outer liquid core and the elastic mantle test various gravitational influences on the part of the Moon and the Sun and cyclically influence against each other. In result the mantle and the core are deformed, the form of them varies, tensor of inertia of the Earth is changed, relative positions of their centers of mass also vary. It is naturally, that similar displacements cause variations of the tension state of the mantle layers and lead to synchronous variations of many planetary geodynamic and geophysical processes. The core-mantle system oscillations are reflected in displacements of the centre of mass of the Earth, in variations of a gravity, in variations of magnetic field and another physical fields. Alongside with the forced oscillations the core-mantle system (of the Earth and others celestial bodies) can execute free oscillations. The periods of free translational oscillations of the outer core and elastic mantle of the Earth are evaluated as 3.47 h, 4.06 h and 4.89 h (Barkin, 2005). These values were obtained on a basis of the simple model of unchangeable spherical core and the elastic mantle. In the undeformed state these bodies are considered as spherical and homogeneous bodies. In variations of rotation of the Earth (as in axial rotation, and in pole motion) and in many other geodynamic, geophysical, biophysical and physical processes the mentioned periods are observed actually. Also variations with frequencies which are some linear combinations with integer coefficients of angular velocity of the Earth rotation and frequency of free polar oscillation of the core (with corresponding period 4.06 h) are observed. Relatives on values the periods were found out

in the series of precision observations on superconducting gravimeters: 3.58 h, 3.77 h and 4.02 h which were attributed to own oscillations of the rigid core of the Earth (Smylie, 1992). In report (Barkin, 2005) the hypothesis about existence of variations with the interhour periods (**H**): 23.92, 11.95, 8.27, 7.98, 6.14, 5.985, 4.788, 4.89, 4.06, 3.99, 3.42, 3.47, 3.03, 2.66, 2.394, 2.176, 1.995, 1.842, 1.71 (hours) has been formulated. In accordance with this hypothesis variations with mentioned periods must be observed in all planetary natural processes, including the geocenter motion. The more general statement about an unity of spectrums of variations of all natural processes has been made, illustrated and confirmed for more wide diapason of periods (from days to decadal periods) (Barkin, 2001; Barkin, Ferrandiz, 2004). Variations of natural processes with the hour periods have rather complex spatial display. It is possible to expect also, that these variations will have property of inversion, when in one hemisphere of the Earth the changes (for example, activity of processes) are increased and in opposite hemisphere they are decreased. The predicted variations of a magnetic field with hour periods (**H**) (Barkin, 2005) have already obtained confirmations in preliminary spectral studies (Garcia, Barkin, 2006). Hour variations of the gravity and of geopotential coefficients with the mentioned periods (**H**) will be found out in the near future.

Referenses

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