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Dynamical approach to study and interpret geodynamical and geophysical effects

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It was proved by satellite and terrestrial observation that the hydrostatics, which operates by the outer forces, is not able to ensure correct description and interpretation of geodynamical and geophysical effects. In order to find solution of the problem, we applied to dynamics. For this purpose the outer force field of the Earth was replaced by its inner (volumetric) force pressure. Doing so we introduced new physical basis for study dynamics of the planet in its own force field. The analytics for that is as follows. The body is considered as a system of n elementary particles ($n \to \infty$) of masses mi and many degrees of freedom. The volumetric moment of a particle pi is written as pi = midri/dt. Then the moment of momentum M of the system is found to be derivative from the moment of inertia I in the form: M = $\sum$piri = $\sum$miridri/dt = d/dt($\sum$½ miri2) = ½ dI/dt. Then derivative on time from M gives the energy of the system as second derivative from I: M' = $\sum$pidri/dt + $\sum$ridpi/dt = ½I" where $\sum$pidri/dt = 2T is the kinetic energy and $\sum$ridpi/dt = U is the potential energy of the oscillating moment of inertia (interacting particles). So, equation of dynamical equilibrium (equation of state) of a body, where the interacted particles are presented by nonlinear oscillators, is ½I" = 2T + U. We used this for study and interpretation of oscillation and rotation parameters of the Earth. Note that the center of mass of the Earth is presented here by a surface of asymmetric spheroid. For more information see our works: Ferronsky V.I. and S.V.Ferronsky (2007). Dynamics of the Earth, Scientific World, Moscow; Ferronsky V.I. (2008) Non-averaged virial theorem for natural systems: http://zhurnal.ape.relarn.ru/articles/2008/066e.pdf