

On influence of the magnetosphere's disturbance onto the rotational regime of the Earth

Belashov V.Y., Nasyrov I.A.

Kazan (Volga Region) Federal University, Kazan, Russia

e-mail: vybelashov@yahoo.com

The hypothesis stated earlier, about solar control (through changes of global magnetic disturbance in magnetosphere) of a rotational regime of the Earth is confirmed on the basis of the analysis of heliogeophysical data for the period of 1927 to 2017. It is shown, that the variable on its characteristics stream of solar plasma (solar wind), interacting with magnetosphere, transfers it a part of its energy which, together with the energy accumulated in the magnetosphere tail by means of the phenomenon of a unipolar induction, and the energy released from time to time, causes the changes of an angular velocity of rotation of the Earth by means of effect of the inverted MHD-generator of an alternating current. It is confirmed, that the offered earlier mechanism of interaction of an external magnetic field with the constant field rigidly connected with the Earth, is energetically significant. Fluctuations of duration of day well correlate with changes of solar activity and global magnetosphere's disturbance both in 11-years, and in annual and semiannual cycles; the steady negative correlation of changes of duration of day with the monthly sums of polarities of the sectors of the interplanetary magnetic field is observed, as a whole.

Changes of the fields of atmospheric pressure and circulation, and also processes of strain of an Earth's crust (of a global character) and redistribution of density in a body of the Earth, offered by some of researchers, in view of observed correlation of these phenomena, as the reasons of fluctuations of an angular velocity of rotation of the Earth, are consequence of non-uniform rotation of a planet.

Possible ways of experimental confirmation of the obtained results are discussed.

So, measurements of the magnetic field at heights of a plasmasphere for rather long period including (in an ideal) a 22-years cycle of solar activity are necessary for finding-out of the real contribution of changes magnetosphere's disturbance in fluctuations of duration of day by means of tension of a magnetic field. For definition of value of the contribution of the energy accumulated in the magnetosphere voided by the trigger mechanism, experimental measurements of a vector of a magnetic induction in a tail of magnetosphere for the period including at least of some "operations" of the trigger mechanism are necessary.

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.