



## **The effect of the dynamics of sources of the main geomagnetic field on the spatial-time structure of secular variations of the main geomagnetic field**

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The authors suggest the dynamic model of sources of the main geomagnetic field. The model consists of the set of dipoles, most completely covering the spatial distribution of the main geomagnetic field for each epoch within the 100-year interval (from 1900 to 2000) with the 5-year time step. Dipoles obtained differ in magnitude within three orders and are located at different distance from the Earth's center. The least powerful of them coincide at the core-mantle boundary. The local anomalies of secular variations are considered as a result of the changes of the parameters of the 3rd order of magnitude sources in time. The comparative research was carried out for these dipoles to compare the time changes of the geomagnetic field components observed in a number of magnetic observatories and calculated using the model including or not the least powerful dipoles. We attempted to select for each potential source such a magnetic observatory that the local anomalies of secular variation were essentially affected by this dipole at the point of the observatory. It was found out that some local anomalies of secular variations recorded in observatories can not be explained without taking into account the dynamics of sources of the 3rd order. Besides, the formation and the decay of the same foci of the secular variation (for example, the Caspian and the Eurasian) can be completely explained by the dynamics of only one or two dipoles of the 3rd order of magnitude. We also compared the spatial structure of secular variations obtained with IGRF model and calculated using the models including the different sets of dipoles. It was shown that the main parameter affecting on spatial structure of SV is different for dipoles of different order. For the dipoles of the 1st order of magnitude it is the variation of the angle of inclination of the vector of magnetic moment and

for the dipoles of the 2nd and 3rd order of magnitude it is the variation of the magnitude of this vector. This work is supported by the RFFI grant 05-05-64181 and grant MK-2618.2007.5.