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The forecast of Dst dynamic under the established characteristics of Solar wind magnetic cloud

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Geoeffective properties of magnetic clouds are determined by its parameters, in particular, an inclination angel of its axis to ecliptic plane, value of a magnetic field on an axis and a trajectory of passage through the Earth (aim parameter). The establishment of these key cloud parameters before its interaction with magnetosphere allows short-term forecasts of intensity and duration of expected magnetic storms is carried out.

In the present work the establishment technique of magnetic cloud parameters on initial measurements on spacecraft (SC) magnetic field components and Solar wind parameters in a cloud is submitted. The task of magnetic storm intensity forecast expected at interaction of such cloud with Earth magnetosphere is solved.

The establishment technique of cloud parameters in comparison magnetic field components, measured inside a cloud, with magnetic field components of modelling clouds from preliminary created base is consisted. The estimation of conformity modelling and real magnetic field component by calculation of correlation factor and minimization of a root-mean-square deviation between them was made. The greatest correlation factors for all three magnetic field components and the minimum root-mean-square deviation on these to components closest modelling cloud to real ejecta is corresponded. The base of modelling clouds which includes about 2 000 000 combinations is created. Each combination to concrete set of cloud parameters corresponds. The developed technique on the real events determined in the literature as magnetic clouds was fulfilled. In result it has been established that for definition of magnetic cloud parameters, with the help of the given base of modelling clouds, there is enough passage through SC 1/3 parts of magnetic cloud.

For each of analyzed magnetic clouds comparison of geomagnetic storm intensity classes caused by real ejecta and expected from the modelling cloud constructed on few initial measurements on SC has been carried out. Conformity of real classes and expected geomagnetic storms in 80% of cases is marked. The high conformity testifies that the developed technique can be used for the short-term forecast of geomagnetic storm intensity expected at interaction of magnetic clouds with Earth's magnetosphere when we 1/3 cloud information is used.

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