



Studying of Coronal Mass Ejections Geoeffectiveness

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A study of geoeffectiveness of the Coronal Mass Ejections (CMEs) is carried out, using different approaches to the analysis of phenomena.

In the first case geoeffectiveness of CMEs events is determined by the nature of a change in the three-hour values of Kp- index during 1-2 days after CMEs registration on the coronagraphs. The analyzed events are examined in following time intervals: 1980 and 1984-1988 (time of coronagraph SMM operation), 1998 and 1999 (LASCO operation). The increase of Kp- index per 2 units within the period indicated is used as the criterion of CMEs geoeffectiveness. It was considered that CMEs events are not geoeffective in the absence of this increase. Such characteristics of CMEs as their angular width, condition on the solar disk and type of morphological description are examined. It is shown that the average angular dimension of CMEs events with established geoeffectiveness exceeds average size of the CMEs events, which do not find reflection in changes of Kp- index up to $\sim 20\%$. The study indicated gives the steady results for all given above independent samples of the data. At the stage of geoeffective CMEs formation (in 2-hour interval to their registration) wide-band precursors in the microwave emission are observed for events 1980, 1984-1988.

With other approach by the methods of correlation analysis the most geoeffective CMEs parameters, registered in January- June, 1996 and February- April, 1999 were studied. In this case the manifestation of CMEs in the disturbances of the parameters of the near-earth outer space and terrestrial ionosphere was examined. Among the CMEs parameters the initial and final speeds of ejection, angular width of CMEs were selected. As the parameters of solar wind (SW) and interplanetary magnetic field (IMF) we used concentration, proton velocity of SW, value of Bz-components of IMF. Correlation coefficient for all events in question was calculated between different pairs

of the parameters. It was shown according to the results of studies that the information about the solar sources of the proceeding disturbances remains.

Thus, there were established the geoeffective parameters of CMEs and the possibility of evaluating their geoeffectiveness according to the characteristics measured on the coronagraphs. The fact of the estimation of possible CMEs geoeffectiveness according to the characteristics of sporadic radio emission at the stage of their formation was established, as well.

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