



Heliospheric conditions resulting in magnetic storms: Statistic study

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Time behavior of the solar wind and interplanetary magnetic field parameters for 623 magnetic storms is investigated on the basis of the OMNI database for the period 1976–2000 (see preliminary version in paper by Yermolaev et al., *Cosmic Research*, N1, 2007). The analysis is carried out by the superposed epoch method (the magnetic storm onset time is taken as an epoch time) for five various categories of storms induced by various types of solar wind: CIR-induced (121 storms), Sheath-induced (22 storms), MC-induced (113 storms), and "uncertain type" (367 storms). In total, the analysis conducted for "all storms" included 623 storms. The obtained data, on the one hand, confirm the results obtained earlier without selecting the intervals according to the solar wind types, and, on the other hand, they indicate the existence of distinctions in the time variation of parameters for various types of solar wind. Though the lowest values of the Bz-component of IMF are observed in the MC, the lowest values of the Dst-index are achieved in the Sheath. Thus, the strongest magnetic storms are induced, on average, during the Sheath rather than during the MC body passage, probably owing to higher magnitudes and variability of density and pressure in the Sheath.