



Influence of Solar Wind Parameters and Interplanetary Magnetic Field on Global and Polar Indices of Geomagnetic Activity during Geomagnetic Storms

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The research of correlation connections between the indices, describing intensity of global (SYM, ASYM) and polar current systems (AU, AL), with concentration and velocity of solar wind (PSW), and interplanetary magnetic field (IMF) components Bz, By (1 minute averaged data from ACE) has been executed. Correlation was calculated with 0-2 hour shifts between PSW, IMF components and indices of current systems activity that has allowed to estimate average time of magnetosphere reaction on changes in PSW and Bz component. It takes about 30-40 minutes for PSW in case of geomagnetic storms high and middle intensities ($Dst < -100$ nT) and always is absent for Bz component.

The analysis of correlation connections has shown that velocity of solar wind and its concentration have the greater influence on indices SYM, ASYM, than on indices of auroral electrojets intensity. Bz component has influence on a ring current with a smaller time delay, than others PSW and IMF. These parameters correlate with index SYM more often than with ASYM.

The greatest influence on indices AU and AL have By and Bz components during magnetic storms of all intensity. Further on a level of influence follows concentration, and then velocity of solar wind. Influence of Bz component on these indices, as well as for indices of a ring current, becomes apparent with a smaller delay then with other parameters. By results of executed correlation research the primary influence of PSW and IMF on eastward or westward electrojets has not established.

It has been executed the research of dependence of intensity and durations of geomagnetic storms from PSW, IMF, a pulse and dynamic pressure of a solar wind which were observed for one hour up to storm beginning (hourly average values). Storm duration in the best way correlates with concentration ($R = 0.59$), with a pulse of a solar wind ($R = 0.42$) and with Bz component ($R = 0.47$). Storms intensity correlates only with Bz component ($R = 0.44$).

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