

Geophysical Research Abstracts, Vol. 9, 00976, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00976
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Experimental approach to study the influence of topology and dynamics of solar magnetic field on the

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Text of Abstract

- Relationships between the photospheric magnetic field, interplanetary field, solar wind characteristics near the Earth orbit and

geomagnetic perturbations was studied using WSO observations of large scale magnetic field of the Sun (SMF) and OMNI data taken since 1976 to 2005. Connection between SMF and interplanetary magnetic field (IMF) was analyzed on a short time scale (day-to-day comparison) for several years during minimum and maximum of solar activity and after the polarity change at high latitudes) to reveal the efficient delay between the processes on the Sun and on the Earth orbit.

The correlation between the temporal behavior of SMF and IMF, solar wind characteristics and geomagnetic perturbations was calculated for data sets of 29-year long and for the short subsets to reveal the heliolatitudes where the solar wind is originated from and how they depend on the phase of the activity.

Such complex approach to the problem of SOLAR-TERRESTRIAL relations helps to find physical connections between the processes on the way from the Sun to the Earth.

These results are useful for the understanding of the heliospheric structure and for the prediction of the magnetospheric perturbations.