



Fast Solar Wind and Geomagnetic Variability during the 24th Solar Cycle (2009 - 2013)

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Solar activity and its extensions in the heliosphere govern and perturb the geo-space. The response of the terrestrial magnetosphere displayed as geomagnetic disturbances is measured by several geomagnetic indices. This paper analyses the geomagnetic variability during 2009 - 2013 under the influence of the fast solar wind. A preliminary catalogue of the high speed streams in the solar wind was set up using OMNI Data Base for the first five years of the 24th solar cycle. Our catalogue lists the basic parameters of the fast streams: the time of start (calendar date by year, month, and day as well as the corresponding day of Bartels Rotation), the initial and maximum speeds (in km/sec), the maximum gradient of the plasma speed, the duration (in days) and the solar source (coronal holes or solar eruptive phenomena). The correlation between the geomagnetic indices and the high speed stream parameters during the analysed interval is examined in detail. Some individual pairs of events 'high speed stream - geomagnetic disturbance' (cause - effect) are analysed to reveal the peculiarities of the geomagnetic disturbance as a function of the stream parameters and the nature of its solar source. The most powerful geomagnetic disturbances were registered as a consequence of some complex external perturbation.