NATURAL OSCILLATIONS OF THE EARTH MAGNETOSPHERE ASSOCIATED WITH SOLAR WIND SUDDEN IMPULSES

A.V. Agapitov[1,2], *O.K. Cheremnykh*[1]

[1]Space Research Institute, NAS and NSA of Ukraine
(*40, Academician Glushkov Ave., Kyiv 03680, Ukraine*),
[2]Taras Shevchenko Kyiv National University
(*6, Academician Glushkov Ave., Kyiv 03680, Ukraine*)

S u m m a r y

We have studied Pc-5 magnetic pulsations using data from ACE, Wind, Polar Cluster, Geotail, and Goes10 spacecrafts and Earth-based magnetic field measurements from the Intermagnet archive. The solar wind on the Earth's orbit is a quasistationary formation with tangential discontinuous, fast and slow shock waves. We accentuate our study on the geomagnetic pulsations associated with Sudden Storm Commencements (SSC) and Sudden Impulses (SI). Disturbances of the magnetopause surface produce the fast MHD wave front which penetrates into the magnetosphere. Pulsations associated with fast waves were detected on spacecrafts and on the Earth surface with the same frequency. The excitation of pulsations can be considered as one of the energy transport mechanisms from the solar wind to the ionosphere. The polarization and frequency characteristic of observed waves are discussed in dependence on the geometry of the interaction of a solar-wind shock wave with the magnetosphere. Pulsations with different frequencies were observed simultaneously on different magnetic latitudes. The appearance of spectral maxima after the wideband fast MHD wave propagation testifies to the magnetosphere property to select particular spectral peaks and to produce ULF pulsations with expressed periodicities. The Earth magnetosphere is assumed to be a resonance system for hydromagnetic waves excited due to the shocks outside the magnetosphere.