Geophysical Research Abstracts
Vol. 14, EGU2012-10341, 2012
EGU General Assembly 2012

Interhemispheric asymmetry of the amplitudes of Pc3 geomagnetic pulsations

B. Heilig (1), V. Pilipenko (2), and P. Sutcliffe (3)

(1) Eotvos Lorand Geophysical Institute, Budapest, Hungary (heilig@elgi.hu), (2) Institute of the Physics of the Earth, Russian Academy of Sciences, Moscow, Russia, (3) SANSA Space Science, Hermanus, South Africa

The interhemispheric asymmetry between the amplitude of geomagnetic pulsations was realised already in the 1960s'. Most of the observers (Yumoto et al., 1988; Saito et al., 1989; Takahashi et al., 1994; Obana et al., 2005) reported that the energy of Pc3 (Pc4) pulsations were found to be significantly larger on the winter hemisphere (i.e. in December on the Northern hemisphere and in June in the Southern hemisphere) when comparing conjugate observations. The authors linked this behaviour to the seasonal conductivity changes of the ionosphere, however, no modelling effort were made to explain the observed behaviour. In the presented paper we make an attempt to model the seasonal asymmetry based on the model of Pilipenko et al (2008).
Using data recorded at geomagnetically conjugate stations, Tihany (THY, Hungary) and Hermanus (HER, South Africa) between 2002 and 2007 we present a case where an anomalous seasonal variation can be observed. The observed amplitudes were significantly larger in local summer than in local winter, but only in years near the sunspot maximum. This is exactly the opposite what was found for other station pairs. It was also observed that the range of the seasonal variation of the HER/THY ratio diminishes with the decrease of the solar index F10.7. The phenomenon was first realised by Vero (1965) who linked the anomalous winter attenuation of pulsations to the anomalously high F2 region electron density of the ionosphere. A clear physical interpretation of these results is still missing.