Geophysical Research Abstracts
Vol. 20, EGU2018-7883, 2018
EGU General Assembly 2018

Midlatitude ionospheric F2-layer response to the three largest geomagnetic disturbances over Hungary during the maximum of the solar cycle 24: a case study

Kitti Alexandra Berényi (1,2), Veronika Barta (2), and Árpád Kis (2)

(1) Eötvös Loránd University, Budapest, Hungary (berenyik@ggki.hu), (2) Geodetic and Geophysical Institute, RCAES HAS, Sopron, Hungary

In our study we analyze and compare the response and behavior of the ionospheric F2 and of the sporadic E-layer during the three strongest (i.e. Dst <-100nT) individual geomagnetic storms from the maximum period of the solar cycle 24. All three event occurred in winter. The data was provided by the state-of the art digital ionosonde of the Széchenyi István Geophysical Observatory located at midlatitude, Nagycenk, Hungary (IAGA code: NCK, geomagnetic lat.: 46,17° geomagnetic long.: 98,85°). The ionospheric foF2, h'F2 and the foEs parameter were used for the investigation. The local time of the sudden commencement (SC) was used to characterize the type of the ionospheric storm (after Mendillo and Narvaez, 2010). This way two regular positive phase (RPP) ionospheric storms and one no-positive phase (NPP) storm have been analyzed. In all three cases a significant increase in electron density of the foF2 layer can be observed at dawn/early morning (around 6:00 UT, 07:00 LT). Also we can observe the fade-out of the ionospheric layers at night during the geomagnetically disturbed time periods. The fade-out of the ionospheric layers were detected in the main phase of the analyzed winter time geomagnetic storms in the following cases: in the storm 2012 when the ionospheric storm phase was negative and the Dstmin < - 100 nT, in the storm 2015, when a positive ionospheric storm was generated and the Dstmin < - 200 nT. The analysis suggests that the effect is more common at midlatitude during negative ionospheric phases at night at the main phase of the geomagnetic storm. We can conclude form the results also that the fade-out effect is not connected to the occurrence of the sporadic E-layers.