

NA1 Exchange Program Report

Basic Information

Title:

Visit the ionospheric research group of Institute of Atmospheric Physics, participation at the Solar variability and coupling effects in the Earth's atmosphere workshop

Visitor:

Kitti Alexandra Berényi

Host:

Petra Koucká Knížová

Dates of Visit:

2017.11.12-2017.11.16

Number of the Call:

CALL5

Home Institute/Laboratory/Company Information

Short Name: GGI, RCAES, HAS

Country: Hungary

Host Institute/Laboratory/Company Information

Short Name: UFA CAS

Country: Prague

(1) [see list of participants](#)

The period of the visit was timed to the workshop in the host institute, which is addressed to the variability and coupling phenomena in the atmosphere and ionosphere and the solar influence on the system. The purpose of the workshop was to meet and work in a small group. The participants of the seminar were mainly from Central and East Europe.

I had a lecture on Tuesday about my PhD research. In my first study we analyzed and compared the response and behavior of the ionospheric F2 and of the sporadic E-layer during three strong (i.e., $Dst < -100nT$) individual geomagnetic storms from years 2012, 2013 and 2015, winter time period. 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). 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). Also we observed the fade-out of the ionospheric layers at night during the geomagnetically disturbed time periods. Our results suggest that the fade-out effect is not connected to the occurrence of the sporadic E-layers. Besides the foF2 parameters of a meridional ionosonde station chain were examined in order to confirm the aforementioned suggestions. In the next study I analyzed the differences between the effect of CME-related (SSC events) and of HSS/CIR-related (GSC events) geomagnetic storms in the ionospheric F2-layer during the maximum of the recent #24 solar cycle (2012-2015). These effects were investigated by taking into consideration the seasonal and daytime variations. We used the ionospheric foF2 parameter from the midlatitude ionosonde of Széchenyi István Geophysical Observatory (IAGA code: NCK) in this work. A total number of 62 geomagnetic storm periods were analyzed: 21 from summer and 41 from winter time periods. In the main phase of the storms we compared the variation of the foF2 parameter with the global geomagnetic Dst-, Kp- and AE-index.

This workshop was great because several researcher attended from my field, and after my lecture I could discuss my results with them and they gave me also advices. Also we could share data, results, and speak about a future cooperation.

The main purpose of my visit was to meet outstanding researches from my research field, in order to improve my knowledge and build new and fruitful connections with them. This purpose materialized during the visit. I could speak with many outstanding professor from my field.

The host institute has an excellent background in space physics, aeronomy, processes of the upper atmosphere (e.g. ionosphere). We spoke about a future collaboration, they can help us improve our knowledge about digisonde measurement and data analysis. This will help us to reach their scientific level in some years. Also we can share our data, results and concepts. This will be a fruitful relationship for both institute.