[EE] Evening Poster | P (Space and Planetary Sciences) | P-EM Solar-Terrestrial Sciences, Space Electromagnetism & Space Environment

[P-EM11]Effects of recurrent storms: from the heliosphere to the atmosphere

convener:ALEXEI DMITRIEV(Institute of Space Science, National Central University, Jungli City, Taiwan), Yoshizumi Miyoshi(Institute for Space-Earth Environmental Research, Nagoya University)
Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Time intervals of declining solar activity are dominated by so-called recurrent storms. They are produced mainly by high speed streams (HSS) of the solar wind coming from coronal holes. A HSS is preceded by a co-rotating interaction region (CIR), where the fast stream interacts with slow solar wind. Recurrent magnetic storms are weak but they cause intense chorus activity, which leads to the acceleration of the magnetospheric electrons up to relativistic energies. These effects are comprehensively investigated now by the Van Allen and ERG space missions. Strong variations of interplanetary electric field in HSSs and precipitation of magnetospheric particles at middle and high latitudes disturb the ionosphere, thermosphere and atmosphere for several days or even weeks. This results in significant energy deposition, which is even greater than strong but short transient storms produced by CMEs. The role of recurrent storms in disturbances of the ionosphere, thermosphere and atmosphere has been under intense investigation during the last several years. Presentation of recent experimental results from space missions, such as modern Van Allen Probes, ERG, COSMIC, Swarm etc., ground-based networks as well as prediction of models on these subjects are encouraged.

[PEM11-P01]Recurrent ionospheric storms

*ALEXEI DMITRIEV[1] (1.Institute of Space Science, National Central University, Jungli City, Taiwan)
Keywords:ionospheric storms, recurrent magnetic storms, spatial and temporal scaling

Recurrent magnetic storms are produced by fast solar wind streams from coronal holes, which co-rotate with the Sun with ~27-day periodicity. The storms accompanied by various ionospheric disturbances with amplitudes of 20 TECU of various temporal and spatial scales. The analysis of these so-called recurrent ionospheric storms was based on global ionospheric maps of vertical total electron content derived from the ground based GPS network. It was found that positive ionospheric storms were developed predominantly in the noon and postnoon sector and they have very large latitudinal and longitudinal extensions of up to 70 and 180 degrees, respectively. Negative ionospheric storms occur mainly in the evening sector and they have ~2 time smaller latitudinal and latitudinal extensions. The different location and spatial scales can be explained by different origin of the ionospheric storms. The large-scale positive ionospheric storms are generated by the mechanism of prompt penetration electric field, operating on the dayside. The negative storms can be related to the mechanism of disturbance dynamo electric field, operating in the evening sector, and to the changing of the thermospheric neutral composition, operating on sunlight side.