

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

[P-EM14]Recent Advances in Ionosphere Observation and Modeling for Monitoring and Forecast

convener: Charles Lin (Department of Earth Sciences, National Cheng Kung University), Yang-Yi Sun (China University of Geosciences, Institute of Geophysics and Geomatics)

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Increasing number of observation opportunities in the Earth's ionosphere and upper atmosphere advances the research of the ionosphere weather in the recent two decades. In the ground segment, global deployment of ground-based GNSS receivers, newly planned radars and airglow instruments greatly extend the observation coverages. In the space segment, a number of upcoming new satellite missions with capabilities of airglow, neutral winds and electron density observations will provide a variety of observation worldwide. With the large amount and diversity of datasets, sophisticated theoretical and empirical models can be validated, and implemented for inclusion of new thermosphere and ionosphere phenomena. Additionally, advances in applications of data assimilation technique on the ionosphere monitoring and forecast system are developing in progress. These recent advances in observations and models are important to move forward the status of the ionospheric space weather monitoring and forecast. It is the purpose of this session to solicit studies providing observations, theoretical and empirical modeling and data assimilation on the multiple scales of ionosphere structures, from global morphology to small scale irregularities and traveling ionospheric disturbances. Studies on magnetically quiescent and disturbed conditions will both be addressed.

[PEM14-P06] Ionospheric responses to the 21 Aug 2017 total solar eclipse observed by Digisondes

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The photoionization processes in the ionosphere are triggered by solar radiation and hence the ionosphere could be influenced by a solar eclipse. In the present study, ionospheric parameters sounding by Digisonde are employed to study the ionospheric responses to the 21 Aug 2017 total solar eclipse, over the three stations of Boulder (40.0°N, 105.3°W, with a maximum obscuration of 1.00), Alpena (45.1°N, 83.6°W, 0.717), and Millstone Hill (42.6°N, 71.5°W, 0.631) in the United States. All the records over these stations show significant decreases in F2 layer critical frequency (foF2) during the eclipse. Meanwhile, the F2 layer peak heights (hmF2s) are also varied during the eclipse. Further wavelet analyses reveal that hmF2s are oscillated over these three stations during the eclipse, with wave periods around 60 to 80 minutes. However, no correlated oscillation is found in foF2. The results indicate that the ionosphere are vertically oscillated, which may be attributed to longitudinal waves causing by the solar eclipse.