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Poster
Earth’s ionization component in the upper atmosphere was studied using theoretical model with scattering ground-based and solo-satellite observations. It is until the launch of COSMIC mission in 2006 that scientists are able to monitor or reconstruct the global ionospheric plasma structure in the three-dimensional viewing aspect using both ground-based and space-borne GNSS observations. New plasma structures are discovered with unprecedented details and physical mechanisms of previous observed ionospheric phenomena are renewed. With the availability of global observation, theoretical ionosphere-thermosphere models are evolved to data assimilation models providing sophisticated global three-dimensional coverage in the day-to-day basis, which is capable of studying the ionosphere weather. In this presentation, we highlight the new findings in the ionosphere studies using COSMIC observations, followed by introduction of the ionosphere-thermosphere data assimilation model with nowcast and forecast capability. It is expected that increasing observation numbers provided by COSMIC-2 will further elevate the exploration of ionosphere science, especially at low-latitude and equatorial regions where the GNSS signals are more frequently disrupted by evening plasma irregularities. We also present the model forecast of the plasma bubble growth rate and validation with observation during March 2015.
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