



Modelling of Ionospheric Response to Solar EUV Variability

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Modelling of ionospheric variations is very important for satellite communication and navigation applications. Solar activity plays a significant role in controlling the variations in the thermosphere/ionosphere (T/I) system, through interaction of solar EUV and UV radiation with the T/I, and their variability at different timescales. An experiment with the physics-based global 3-D Coupled Thermosphere/Ionosphere Plasmasphere electrodynamics (CTIpe) numerical model was performed to reproduce the so-called ionospheric delay, which represents the delayed response of the ionosphere to solar variation in particular at the solar rotation time scale, and which might be due to vertical transport processes. A delay of about 19 hours, as observed in satellite and radiosonde observations, is successfully reproduced by the model simulation. We also analyse the behaviour of the T/I system and the ionospheric delay during extremely low (2008) and high (2013) solar activity by using global International Global Navigation Satellite System total electron content (IGS-TEC) datasets, COSMIC (Constellation Observing System for Meteorology, Ionosphere, and Climate) satellite radio occultation measurements, and CTIpe model simulations.