Satellite FUV remote sensing and its impact to ionospheric modeling

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Far-ultraviolet (FUV: 100-200nm) observations from a satellite provide a unique way to monitor the conditions of the ionosphere, thermosphere and aurora on a global scale with high spatial resolution (better than 25km horizontally and 5 km vertically). The FUV data can be used to determine the physical parameters such as those that characterize the ionosphere and thermosphere as well as energy inputs and response. For example, (1) O+ and e recombination gives emissions of O 135.6 nm can be used to retrieve electron density profiles, (2) thermospheric composition changes (O/N2 and NO) control NmF2, TEC and NO+, and (3) energetic particle precipitation (electrons and protons) determine NmE and hmE in auroral region. The impact of the FUV observations on the ionospheric modeling will be discussed using data from TIMED/GUVI, DMSP/SSUSI and IMAGE/FUV instruments.