

GPS RADIO OCCULTATION MEASUREMENTS ON IONOSPHERIC ELECTRON DENSITY AND VTEC FROM LOW EARTH ORBIT

L.-C. Tsai*(1 2), C. H. Liu (3), J Y Huang (1), and K. Kevin Cheng (4)

(1) Center for Space and Remote Sensing Research, National Central University, Chung-Li, Taiwan; (2) Graduate Institute of Space Science, National Central University, Chung-Li, Taiwan; (3) Academia Sinica, Taipei, Taiwan; (4) Earth and Environmental Sciences, National Chung Cheng University, Chia-Yi, Taiwan.

In this study, we present a three-dimensional complementary electron density (Ne) inversion technique including the effects of large-scale horizontal gradients and/or inhomogeneous ionospheric Ne obtained from a near real-time phenomenological model of the TaiWan Ionospheric Model (TWIM). It is possible to apply qualified ionospheric models to determine compensated total electron content (TEC) values and then Ne profiles, and more realistic ionospheric model should provide better profiling results. To evaluate the TWIM, we define a TEC ratio (TR) profile between the limb-viewing calibrated path TEC and the simulated modeling path TEC from each radio occultation observation. The Ne profiling and TWIM modeling results have also been evaluated by the ionosonde and JASON data and shown improvement on retrieved foF2, foE and vertical TEC (vTEC) values, while the obtained hmF2s give better agreement with ionosonde observations.