Modeling Regional Ionospheric TEC over China for S/C Radio Tracking and Orbiting

J.S. Ping, Y.D. Huang, G.L. Wang, H.P. Zhang, L. Han and the CE-1 VLBI team

(1)Shanghai Astronomical Observatory, CAS, Nandan Road, 80, Shanghai, 200030, China,
(2)Graduate School of the Chinese Academy of Sciences, Beijing 100039, China
(pjs@shao.ac.cn/0086-21-64384618)

One of the very active inter-disciplines in space geodesy and space science is to model the global and regional TEC GNSS technique. Ionospheric TEC along the track from detector to target radio source can be obtained accurately from the simultaneous observable at two different frequencies for these quickly developing space geodetic techniques, i.e., GPS, Satellite altimetry, integrated Doppler, VLBI. In China, we use the continue observation of a regional GPS network and a Shanghai local network to estimate 2D TEC distribution, After removing the instrumental effects successfully. The obtained model is validated by using IGS GIM TEC model and by using other independent observation. Systematic biases between them have been noticed, for example, the seasonal and annual periodical difference in temporal variation; the zonal like difference in spatial distribution. The reliability and effectiveness of the model has been proven by a recent space tracking experiments of VLBI. The regional RIM is developed for precise tracking of Chinese and Japanese lunar missions, as well as for the future deep space missions.