

Three dimensional tomography of ionosphere by combining observations from GPS-TEC and radio beacon TEC data

Gopi Seemala[1]; Mamoru Yamamoto[1]; Akinori Saito[2]; Chia-Hung Chen[3]; Susumu Saito[4]

[1] RISH, Kyoto Univ.; [2] Dept. of Geophysics, Kyoto Univ.; [3] Earth Science, NCKU; [4] NAV Department, ENRI

Ionospheric total electron content (TEC) measurements have re-gained importance in the recent years since there was an exponential usage and growth of navigation applications using GPS in various fields. Delay from the Ionospheric electron content and irregularities are among the major factors affecting the trans-ionospheric navigation and communication systems. Hence the study of three dimensional distribution of ionospheric electron density is very essential to measure the effect on radio wave propagation. Ionospheric Tomography technique is used to estimate the electron density distribution in the ionosphere.

In this presentation, the efforts are made to estimate tomography of ionosphere by combining GPS and beacon data. The GPS data is obtained from GPS Earth Observation Network (GEONET) operated by Geographical Survey Institute (GSI) and the radio beacon data recorded from chain of GNU Radio Beacon Receivers (GRBR) installed at Shionomisaki (33.45 N, 135.8 E), Shigaraki (34.8 N, 136.1 E) and Fukui (36 N, 136 E) by Research Institute for Sustainable Humanosphere (RISH), Kyoto University. This method is a successor to the GPS tomography method developed by Department of Geophysics, Kyoto University, which produces three dimensional tomography using GPS-TEC data alone. In this presentation, the initial results obtained from the combination of GPS data and beacon data in producing the three dimensional tomography of ionosphere will be presented and the improvements in will be discussed.