

Realtime 3D tomography of the ionosphere based on GEONET GPS-TEC

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Measurement of ionospheric total electron content (TEC) by using the ground-based GPS receivers is now widely used. We refer to it as GPS-TEC. As there are always several GPS satellites available for the measurement, it is a very good tool for constant monitoring of the ionosphere. One of the most dense and wide network of the GPS network is GEONET operated by Geospatial Information Authority of Japan (GSI). This is the network of more than 1200 points over Japan. We have been developing 3D tomography of the ionospheric plasma density from the GEONET data. This tomography technique uses a constrained least squares fit to reconstruct the electron density distributions. Recently we further develop the software system to conduct the GPS-TEC analysis in the realtime basis. In this system we collect "every second" GPS data from GEONET, estimate satellite and receiver biases for true TEC measurement, and obtain 3D tomography reconstruction of the ionosphere every 15 minutes with 10 minutes latency. We will show current status of the 3D tomography analysis and the realtime system.

Keywords: 3D tomography, GPS TEC, GEONET, Realtime ionosphere monitoring