

GPS ionospheric tomography with the constrained least-squares method (2)

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The developed algorithm of GPS Ionospheric tomography can estimate the electron density distribution in the ionosphere with high spatial and temporal resolution. The developed algorithm uses the constraint condition that the gradient of electron density tends to be smooth in the horizontal direction and steep in the vicinity of the F2 peak. Ground-based observation data by the MU radar is also included in the algorithm in order to increase the vertical resolution.

The accuracy of the retrieval is evaluated with some simulations using IRI model and indicates that the electron density distribution inside the traveling ionospheric disturbances and plasma bubbles can be reconstructed using the developed algorithm.

Results of several simulations using pseudo-observation data and a result of simulation using real GPS observation data with the algorithm of GPS ionospheric tomography will be discussed in the presentation.