

## 3-D structure analysis of ionospheric anomalies associated with the 2011 Off the Pacific Coast of Tohoku Earthquake

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The ionospheric anomalies possibly associated with large earthquakes have been reported by many researchers. However, a physical mechanism of pre-earthquake ionospheric anomalies has not been clarified. To understand the mechanism, monitoring of three-dimensional distributions of ionospheric electron density is considered to be effective.

In this study, to investigate the three-dimensional structure of ionospheric electron density associated with the 2011 Off the Pacific Coast of Tohoku Earthquake (Mw9.0), the Neural Network based tomographic approach is adopted to GEONET and ionosonde data.

At first, we investigate the Total Electron Content (TEC) anomaly associated with the earthquake using the Global Ionosphere Maps (GIM) published by the Center for Orbit Determination in Europe (CODE). To detect the anomalous TEC change, the normalized GIM-TEC, which is computed based on 15 days backward running mean of GIM-TEC, have been investigated. Then, in order to investigate the structure of electron density in ionosphere, tomographic method is performed.

As for the 2011 Off the Pacific Coast of Tohoku earthquake, the significant enhancements are found in GIM-TEC investigation, 3 days prior to the earthquake. As a result, the reconstructed distribution of electron density was enhanced around F-layer and lower ionosphere. In our presentation, not only the electron density distribution of before the earthquake but also those on the other periods will be shown.