

Analysis of Spatial Distributions of Total Electron Content Variations Associated with Earthquakes

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It has been reported that ionospheric disturbances occur by giant earthquakes. This is because the acoustic wave and atmospheric gravity wave excited by ground perturbations or tsunami propagate into the ionosphere. Now that large-scale earthquake such as Tokai earthquake is predicted to occur, it is important to study ionospheric disturbances caused by the earthquake for revealing the mechanism of the earthquake.

In the previous studies, the variations of TEC associated with earthquakes have been confirmed by the frequency analysis of time-series data of total electron content (TEC) observed in Japanese GPS receiver net-work (GEONET). In this study, we have analyzed the spatial distribution of TEC variations in each directions of latitude and longitude by gaussian fitting. We examined the correlations of both spatial distributions of TEC variations and the magnitude. Ionospheric pierce points are assumed to be located at the height of the 350 km are determined. We calculated the spectral intensity in each frequency bands by the fast Fourier transform processing. We analyzed the 5 earthquakes of more than M6.8 that occurred around Japan since 2000.

As a result of the analysis, it is confirmed that the latitudinal distribution of TEC variations is highly correlated with the magnitude, while longitudinal one is not.

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