

Traveling Ionospheric Disturbance Triggered by Tsunami of the 11 March 2011 Tohoku Earthquake

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An earthquake of magnitude 9.0 occurred near the east coast of Honshu (Tohoku area) generates a serve tsunami and disturbed the total electron content (TEC) within the ionosphere, which is called the tsunami-traveling ionospheric disturbances (TTIDs). Measurements of ground-based GPS receivers in Japan and Hawaii are employed to study TTIDs in the Pacific Ocean area. It is found that the TTID periods are of about 10-20 minutes. In the Japan region, the TTIDs initially lags tsunami wave by about 9.6 minutes, which is comparable to the estimated upward propagating time of acoustic gravity waves in the atmosphere, while in the Hawaii region, the TTID leads the underneath tsunami waves by about 1 hour, which might result from the oblique propagation of traveling atmospheric disturbances induced by tsunami waves.

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