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Tsunami driven internal gravity waves after Great Japan Earthquake

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The earthquake that occurred on March 11, 2011, east of the Japanese island of Honshu (with the coordinates of the epicenter in the ocean 38.32º N, 142.37º E), had a magnitude of 9.0. This earthquake caused a destructive tsunami. The tsunami was recorded by the Tsunami Warning Center.

The purpose of the present studies was to determine the ionospheric response to a tsunami. The initial data used were the results of radio frequency sounding using GPS at the Hawaii stations.

During the processing and analysis of data obtained via GPS, it was found that 1) wave disturbances in total electronic content precede tsunamis arrival by approximately 1 hour, 2) the detected ionospheric variations range from 10 to 20 minutes, which correspond to the internal gravity waves (IGWs) frequencies, 3) the low-frequency part of the disturbance arrives earlier as it should be for IGWs generated by tsunami.

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