



TSUNAMI IN THE OPEN OCEAN DETECTED FROM SPACE

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We present the detection of a tsunami wave in the open ocean through the imaging of the associated atmospheric-ionospheric disturbance. The coupling of the tsunami waves with the atmosphere is very efficient and leads to the onset of atmospheric gravity waves propagating upward with a significant amplification. We used Global Positioning System data from the GEONET network in Japan to image the ionospheric response to this gravity wave. We observed a short-scale ionospheric perturbation that presents the theoretically expected characteristics of a coupled tsunami-gravity wave occurring after the March 28, 2000 M 7.6 earthquake in the Volcano Islands region. We present observations performed as well as theoretical understanding of the phenomena. As this detection is the first of this kind, and was performed for a small tsunami wave before it reaches the coast of Japan, it opens exciting perspectives for the application of ionospheric imaging to early detection of tsunamis.