

Meteotsunamis in Japan associated with the Tonga Eruption in January 2022

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Large-amplitude meteotsunamis were observed in many areas in Japan, following the arrival of barometric Lamb waves emitted by an underwater volcanic eruption of Hunga Tonga-Hunga Ha 'apai in January 2022. We modeled the power spectra of the tidal level data obtained from 12 tide stations of the Geospatial Information Authority of Japan, based on a method of transfer function which converts the barometric pressure pulse spectra into the meteotsunami spectra. The obtained transfer functions are similar at 12 stations. The pressure pulse spectra are obtained from the ensemble average of ~1500 Soratena weather sensors of Weathernews Inc. distributed over Japan. The observed meteotsunami spectra can be characterized by the enhanced seiche eigenmodes at each station excited by the mesoscale pressure pulse within the amplitude error of 50%, which contributes for accumulating the necessary knowledge to understand the potential dangers in various different areas over Japan.