

Seismic observation of resonant oscillations generated by the Hunga Tonga volcanic eruption: Atmosphere - solid earth coupling oscillations and amplification of seiche after the passage of atmospheric Lamb waves

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Spectrograms of gravimeter and seismometer data recorded after the Hunga Tonga volcanic eruption revealed features different from those of ordinary earthquakes and tsunamis. One is the large amplitude excitation of an oscillatory mode with a frequency of 3.7 mHz, a signal known as atmosphere - solid earth coupling mode that has been observed in other volcanic eruptions in the past, and recorded at most seismic station in Japan. The other is the seawater loading effects observed at oceanic islands and coastal stations, and in this event, the seiche was clearly visible in the broadband seismometer horizontal records, which is generated (amplified) immediately after the atmospheric Lamb wave passes before the tsunami arrives. In the Sea of Japan, where the tsunami did not directly reach, there was a station where seiche excited by the Lamb waves were observed for several days.