

Seismoacoustic Observations of the Remarkable Atmospheric Waves from the January 2022 Hunga Tonga-Hunga Ha'apai Volcanic Eruption

Wednesday 21 June 2023 16:30 (30 minutes)

The 15 January 2022 volcanic eruption of Hunga, Tonga produced atmospheric waves that astonished both scientists and the general public. These waves were observed globally by a multitude of instruments and technologies and were nearly ubiquitous across the IMS infrasound network. The most notable atmospheric wave was the Lamb-wave, which is an acoustic-gravity wave that is associated with extremely large atmospheric explosions. The Lamb wave was detected on barometers, infrasound sensors, seismometers, and satellites. This Lamb wave propagated around the globe numerous times and contributed to fast-arriving, hazardous tsunamis that were not forecasted. The Hunga Lamb wave resembled the Lamb wave produced by the 1883 Krakatau eruption, but it was observed by a much denser instrument network. Notably, infrasound waves also propagated around the globe numerous times, and audible acoustic waves were heard out to an unprecedented 9000 km. Current wave propagation models do not sufficiently explain these observations. Here we present some notable observations of the atmospheric waves from the Hunga eruption. We focus on the Lamb, infrasound, and acoustic waves, including those on the IMS and dense geophysical network in Alaska. The atmospheric waves from this eruption provide a landmark dataset for scientists to study for many years.

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Promotional text

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Oral preference format

in-person

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Session Classification: Panel discussion on large seismoacoustic events

Track Classification: Invited talks