ID: **P1.4-487** Type: **E-poster**

# Precision Characterization of Seismicity from the 2022 Hunga Tonga-Hunga Ha'apai Volcanic Eruption

*Tuesday, 20 June 2023 09:20 (1 minute)*

The earthquake swarm accompanying the January 2022 Hunga Tonga-Hunga Ha'apai (HTHH) volcanic eruption includes many post-eruptive moderate magnitude seismic events and presents the unique opportunity to use remote monitoring methods to characterize and compare seismic activity to other historical caldera-forming eruptions. We compute improved epicentroid locations, magnitudes, and regional moment tensors of seismic events from this earthquake swarm using regional to teleseismic surface wave cross correlation and waveform modeling. Precise relative locations of 91 seismic events derived from 59047 intermediate period Rayleigh and Love wave cross correlation measurements collapse into a small area surrounding the volcano and exhibit a southeastern time dependent migration. Regional moment tensors and observed waveforms suggest that these events are a similar mechanism and exhibit a strong positive CLVD component. Precise relative magnitudes agree with regional moment tensor MW estimates, while also showing that event sizes and frequency increase during the days after the eruption, followed by a period of several weeks of less frequent seismicity of a similar size. Our analysis of the HTHH eruption sequence demonstrates the value of potentially utilizing teleseismic surface wave cross correlation and waveform modeling methods to assist in the detailed analysis of remote volcanic eruption sequences.

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## Promotional text

This analysis of the Hunga Tonga-Hunga Ha'apai eruption sequence demonstrates the value of potentially utilizing teleseismic surface wave cross-correlation and waveform modeling methods to assist in the detailed analysis of remote volcanic eruption. sequences.

## Oral preference format

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**Session Classification:** Lightning talks: P1.3, P1.4, P5.2

**Track Classification:** Theme 1. The Earth as a Complex System: T1.4 Multi-Discipline Studies of the Earth's Subsystems