

Earth Science Colloquium

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Using Acoustic Waveform Inversion to Quantify Volcanic Emissions

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Volcanic eruptions can produce large amounts of acoustic energy, particularly in the infrasound band (below 20 Hz). Acoustic waveform inversion shows promise for improved eruption characterization by providing robust estimates of erupted volume and mass. While traditional infrasound sensor deployments are often constrained to Earth's surface, recent studies that include infrasound sensors suspended from a tethered aerostat have shown that portions of the radiated acoustic wavefield may be missing from traditional ground-based infrasound observations. Therefore, the simple assumption of infrasound from a volcanic explosion radiating equally in all directions may not be sufficient in some cases. Ongoing work aims to quantify the directional acoustic radiation pattern using optimal station configurations, which may also provide insight into proximal volcanic hazards such as ballistic directionality.