

UC SANTA BARBARA
Department of Earth Science

Speakers Club

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Listening to volcanoes: constraining eruption properties from infrasound observations

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Volcanic activity at all scales generates sound waves in the atmosphere. These sound waves are primarily at low frequencies below human hearing (< 20 Hz) and hence are termed infrasound. By studying the observed infrasound signals we can learn about the properties of volcanoes and eruptions. In this talk I will provide an overview of the volcano infrasound and its utility for volcano monitoring before discussing two modeling projects that attempt to relate infrasound observations to eruption properties.

The first project is focused on observations of harmonic infrasound signals from open-vent volcanoes. I will demonstrate that these signals can be explained by resonance of the crater and show how infrasound observations can be inverted to provide constraints on crater geometry.

In the second part of the talk I will discuss how infrasound observations can be used to estimate erupted volume fluxes. Much of the work on volcano infrasound assumes linear wave propagation. I will argue that nonlinear propagation effects such as shock waves can strongly bias estimates of eruption properties.