

Infrasound array study at Popocatépetl

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Popocatépetl is an active 5,452-m-high glacier-clad andesitic stratovolcano located in the central region of the Mexican Volcanic Belt. Popocatépetl's eruptive activity is dominated by hydrothermal processes and magmatic degassing, characterized by periodic emissions of gas and ash, occasional vulcanian explosions, episodic passive effusions of lava, and the extrusion and destruction of lava domes. All of these eruptive dynamics result in abundant seismicity, including long-period (LP) and very-long period (VLP) events, tremor, and explosion signals, which have persisted since Popocatépetl's reawakening in 1994. The persistent occurrence of degassing bursts (from a few events per day to hundreds of events per day) make Popocatépetl an ideal target to combine seismic and infrasound investigations. In September 2017, we deployed a 4-element infrasound array collocated with a broadband seismometer at a site \sim 15.8 km to the east-southeast of Popocatépetl's summit. This site was chosen considering its orientation with respect to the crater shape and is in a location where local people report hearing sounds associated with visual observations of Popocatépetl's emissions. Popocatépetl's activity also presents logistical challenges, and we seek to investigate the capability of arrays at distances greater than 5 km to monitor the volcano without exposing people or instrumentation. The array (ATLI) consists of 4 broadband Hyperion IFS-3111 infrasound sensors and 2 channels (vertical and radial) of a 120-s Trillium Compact posthole seismometer. The continuous waveform data are sampled at 200 Hz and recorded locally on a 6-channel REF TEK 130S 24-bit digitizer. We plan to operate the array through summer 2018. We present preliminary results from this unique dataset.