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Regional and telesonic propagation of volcano-acoustic signals

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Volcanic explosions are reliable sources for studying infrasonic propagation. Large amplitude acoustic explosions with known locations and onset times provide useful constraints for the signal changes induced by atmospheric variability. As part of the Acoustic Surveillance of Hazardous Eruptions (ASHE) project, two 4 element infrasound arrays with collocated seismometers have been deployed 37 and 251 km from Tungurahua Volcano, Ecuador since February 2006. During this period Tungurahua has been in near-constant eruption, with energetic tremor signals and a multitude of energetic explosions. A combination of array processing and energy threshold detectors have been used to identify over 12,000 explosions at the nearby array (RIOE, 37 km), with the peak pressure of the largest explosion around 24 Pa. Many of the larger explosions are recorded at the more distant LITE (251 km) array as well. To further supplement the dataset, select data from infrasonic sensors at distances of 3-5 km from the crater will be used. State-of-the-art wave propagation and atmospheric models will be used to assess the influence of long-range propagation on the volcanic signals. By selecting a data subset with high signal to noise ratios, it should be possible to infer statistically significant atmospheric propagation effects.