



Analysis of thermospheric infrasound returns

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As part of the Acoustic Surveillance for Hazardous Eruptions (ASHE) project, two infrasound arrays have been installed in Ecuador. The locations of the arrays are well-suited to study the propagation of various infrasonic signals from the Tungurahua volcano. Array RIOE is situated close by the volcano at 37 km distance, array LITE is in the far field at 251 km to the north. Depending on atmospheric conditions, stratospheric and thermospheric signals can be observed at LITE.

This study continues our investigations of the observed waveforms and their associated spectra. It is observed that thermospheric signals observed at the LITE array often have low-frequency features that are not observed at the RIOE array. Such low frequency generation is taken as an indication of non-linear effects during the propagation. This low frequency generation is not, however, observed in all thermospheric arrivals. In our study, we simulate the thermospheric propagation with full-wave models and state-of-the-art atmospheric specifications to determine under which conditions the low frequency generation is observed.