ID: Type: **Oral**

waves as means to monitor tropospheric weather and crater morphology changes

We use infrasound waves generated by volcanic eruptions at Volcan Tungurahua to study both changing atmospheric conditions and source characteristics. Analyzed infrasound data were recorded for a 32 month period at Volcan Tungurahua by a five-station network (within 6.5 km from the vent). We use cross-network correlation to quantify the cyclic eruptive behavior of Tungurahua and results are corroborated by reports from the Ecuadorian monitoring agency. Cross-network correlation lag times are used to compute ~6.75 m resolution infrasound source positions, which take into account coarse NOAA atmospheric models for local winds and temperatures. Variable infrasound-derived source locations suggest source migration during the 32 months of analyzed data. Such source position variability is expected following energetic eruptions that destructively altered the crater/vent morphology as confirmed by imagery obtained during regular overflights. We also observe variations in cross-network lag times over short time periods (seconds to days) when vent location is stable and attribute these variations to changes in atmospheric structure. Assuming a fixed source location we invert for average air temperatures and winds in Tungurahua's vicinity (<6.5 km) and find evidence for diurnal and semidurnal tropospheric tides.

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Track Classification: 5. Analysis of Sources and Scientific Applications