

Volcanic tremor at Mt. Vesuvius

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We show a quantitative analysis of volcanic tremor observed in recent years at Vesuvius volcano, identified through the analysis of seismic data with array methods. Data are provided by a seismic array, named VAS, composed of 10 short period stations operating since 2012 on the south flank of the volcano. After careful analysis of low amplitude signals characterized by coherence higher than the background noise, more than 20 events have been classified as volcanic tremor. They are characterized by low frequency (corner frequency between 3 Hz and 6 Hz), duration of a few minutes, and the strongest episodes are recorded at distance up to 90 km from the volcano. In many cases we could identify P-S wave pairs in the seismograms that allowed for a precise location of the source depth in the range between 5 km and 6.5 km bsl beneath the crater. In the same depth range we observe very little VT seismicity, and those VT earthquakes are characterized by corner frequency in the same range of the tremor. Waveform features, spectral analysis, and comparison with VT earthquakes located at the same depth indicate that the source mechanism of the Vesuvius tremor is a sequence of low frequency shear failures. No relations with magmatic activity are inferred from the observed signals and their source properties.