



Infrasound of lava fountains at Etna (Italy): implications for early warning eruption onset

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Volcano ash-eruptions produce devastating consequences for local communities and the air transport. Here we present the results of the real-time monitoring of the 2011-2012 sequences of lava fountains eruptions at Etna volcano (Italy) by means of small-aperture (250 m) infrasonic array located at 5 km of distance from the active vents. Most of the episodes generated sustained ash columns up to 10 km height with significant fallout of lapilli and ash up to 30 km of distance from summit craters causing problems at the Fontanarossa airport. The infrasonic activity before lava fountain episodes shows a clear acoustic trend and a distinctive waveform and frequency content of the recorded signals, reflecting the ongoing increasing of explosive level. Infrasound reveals that lava fountains are characterized by a sustained, low frequency, oscillations that are preceded by a violent and rhythmic strombolian activity. These characteristics allow the definition of infrasonic-based thresholds, which could be used as early warning system. The infrasonic array at Etna revealed to be a robust and efficient monitoring tool for real-time alert also in hostile weather conditions.