Geophysical Research Abstracts,
Vol. 11, EGU2009-5564-1, 2009
EGU General Assembly 2009

Infrasound investigation as a tool to recognise active vent and volcanic activity: Mt. Etna, September-November 2007

P. Montalto (1,2), A. Cannata (1), E. Privitera (1), G. Nunnari (2), and G. Russo (3)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Catania, Piazza Roma 2, 95123 Catania, Italy (privitera@ct.ingv.it), (2) Dipartimento di Ingegneria Elettrica, Elettronica e dei Sistemi, Università di Catania, Viale Andrea Doria 6, 95125 Catania, Italy, (3) Consorzio Cometa, via Santa Sofia, 64, 95100 Catania, Italy

The time period September-November 2007 was characterised at Mt. Etna by explosive activity and intense degassing. During this time interval infrasonic signals were recorded by an infrasonic network, composed of 4 sensors azimuthally distributed around the summit area. By a triggering procedure, about 1000 infrasonic events were found and grouped into nine families on the basis of the waveform. Successively, the spectral analysis, performed by Fourier transform and Sompi method, allowed subdividing these nine families into three clusters based on the peak frequency and the quality factor of the events. Finally, by the location analysis, carried out by a grid searching procedure, a cluster (called cluster 1) was related to the degassing activity of the North East Crater (NEC), while the other two (called clusters 2 and 3) to the explosive activity of the South East Crater (SEC). The comparison between the stacked infrasonic waveforms, interpreted as generated by the vibration of large gas bubbles, and the synthetic ones permitted to calculate the source parameters, namely radius, length of the bubble and initial overpressure, by a genetic algorithm method. The higher overpressure values of the cluster 3 than the cluster 2 (both related to the explosive activity at SEC) were in good agreement with the stronger intensity of the explosions accompanying the infrasonic events of the cluster 3. The variation of both intensities and waveforms is tentatively attributed to the occasional accumulation of lithic clasts (due to moderate landslide) on the explosive vent. In fact with the end of the landslides, events belonging to the cluster 3 were no more observed. Finally, the daily emitted gas volume, related to the active degassing, was estimated for NEC and SEC by using the infrasonic data.