



Moment tensor inversion of volcanic tremor at Mount Etna: the case study of 05 August 2011 lava fountaining.

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During 2011-12, twenty-five episodes of short-temporal lava fountains at Mount Etna were occurred. The events took place in the summit area of the volcano, at the New South-East Crater (NSEC). In order to investigate the features of the volcanic tremor source during these events and to understand the dynamics of the volcano, we examined the event occurred on 5 August 2011, the ninth in chronological order of the series of events considered as well as one of the most vigorous episodes. For this purpose, we first investigated the main features of the seismic signal recorded by the broadband seismic network and we carried out the localization of the volcanic tremor source using the amplitude decay method. Subsequently, we proceeded with the study of the source mechanism through full-waveform inversion of the seismic moment tensor. In order to focus attention of the analysis on the volcanic tremor, the contribute of microseism was also considered. For the considered lava fountain episode, the results obtained allowed us to hypothesize that the volcanic tremor could have been generated by a shallow source near NSEC, probably with a crack-shaped body. The inversion of the volcanic tremor moment tensor represents a novelty for Mt. Etna, therefore further tests are necessary in order to optimally evaluate the stability and robustness of our inversion. However, the reliability of the results obtained from the study of the single event allow us to undertake a new path in order to improve our knowledge on the physical processes concerning the shallow plumbing system of the volcano.