

# **Dynamics of the upper SE flank of Mt. Etna: a synoptic view from the characteristics of the seismic signals between November 2005 and January 2006**

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The July – December 2006 eruptive activity at Mt. Etna was preceded by changes in volcanic tremor characteristics. The amplitude of volcanic tremor peaked in December 2005 after a restless, even though slow increase, starting from July 2005, during which no visible change was reported in the visible activity of the volcano by volcanologists and alpine guides.

In this study we focus on a three-month long time period, i.e., from November 1 2005 to January 31 2006, which was characterized by strong changes in amplitude and frequency content of volcanic tremor. In so doing, we analyze records from permanent stations run by INGV as well as a few broadband seismic sensors of a temporary array, deployed from July 2005 to January 2006. Pattern classification analysis based on Self Organizing Maps and Fuzzy Cluster Analysis highlights variations in volcanic tremor data we interpret as evidence for magma ascent, representing a stage of recharging of the volcanic feeder at depth. This hypothesis is supported by VT seismicity, which was intense in the time span investigated. In particular, earthquakes recorded on January 8, 2006 (with foci between 10 and 15 km) were the major indicators to sketch out the modality of transfer of magma within the volcano during this recharging phase [Cocina et al., Geophysical Research Abstracts, Vol. 12, EGU2010-9267, 2010]. Finally, differences in the characteristics of the seismic signal at reference stations are also analyzed in the light of a recently published seismic tomography [Patanè et al., Science, Vol. 313, 821-823, 2006].