



The geometry of Mt. Etna shallow central feeding system

D. Patanè (1), G. Di Grazia (1), F. Ferrari (1), P. Montalto (1) and E. Boschi (1)

(1) Istituto Nazionale di Geofisica e Vulcanologia - Sezione di Catania (digrazia@ct.ingv.it)

At Mt. Etna volcano, several intense episodes of tremor activity were recorded during the 2007, in association with strong strombolian activity and/or energetic lava fountains occurring from the South East summit crater. The locations of the most energetic tremor episodes and of the low-frequency signals were used to constrain both the area and the depth range of magma degassing, allowing to obtain the geometry of the Mt. Etna's shallow central feeding system. Locations clustered in a narrow NNW-SSE oriented resonating sub-vertical dyke located beneath the summit craters, which is ca. 2 km elongated and extending from ca. 2000 m to the sea level. Moreover, during the investigated period, a continuous refilling and slow pressurising of this dyke and/or of the shallow magmatic reservoir seems to play a significant role in triggering summit eruptions, as evidenced by the significant relationships between geodetic measurements, low-frequency signals and the onset of lava fountains. Thus, the time evolution of seismo-volcanic signals together with their precise locations, can highlight shallow conduit geometries, allowing to improve our understanding of processes that control magma transport towards the surface and to better constrain future numerical models of conduit flow and eruption at Mt. Etna.