



GROUND DISPLACEMENTS ACROSS THE PERNICANA FAULT (MT. ETNA, ITALY): A TECTONIC STRUCTURE LINKED TO VOLCANIC ACTIVITY

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The Pernicana fault is a tectonic fault located on Mt. Etna (Sicily). Movements along this structure have been monitored by a levelling network of the Osservatorio Vesuviano for the last 22 years. The last measurements date back October 2002, few days after a magnitude 3.7 earthquake (September 22) occurred on this fault. Interestingly, the last eruption of Mt. Etna (October 27 – still continuing) started shortly after the earthquake, suggesting, once more, a close relationship between seismic activity along this structure and eruptive events of the volcano. This work presents a detailed study and modelling of vertical ground deformations occurred on this fault during the whole period of monitoring (1980-2002) paying particular attention to the modelling of co-seismic displacements. In the long term, displacements across this fault are well interpreted by dislocation on a single rectangular normal fault with almost homogeneous slip, causing a maximum total subsidence of about 0.71 m. Looking at the individual co-seismic displacement episodes, however, it appears that only small patches of the whole fault are broken during each episode. In particular, the analysis of the 2002 co-seismic data allows to hypothesise a strict link between magma intrusion in the NE sector of the volcano and the activation of the Pernicana fault, which can be then view as an interesting precursor of volcanic eruptions at Mt. Etna.