



The puzzle of Mt. Etna 2015 activity

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During 2015, Mt. Etna volcano activity consisted of a sequence of seismic and volcanic events indicative of a complex cause-effect relationship between volcanism and tectonics. Here we analyze in details all these events in order to figure out a possible and reliable causative mechanism able to explain the measured evidences by exploiting an extensive and multi-parametric dataset, including geochemical, volcanological, magnetic, seismic, and geodetic data. The integration of the different parameters allowed us to observe a long-lasting inflation episode abruptly interrupted by two vigorous short-term deflations and an intense dynamics of the northern sector of the volcano unstable flank. This last feature was characterized by two seismic swarms ($M_{max} = 3.6$) occurring along the central sector of the Pernicana Fault and aseismic slip with intense deformation affecting the north-eastern edge of the unstable flank. This is not the first time in which the interaction between volcanism and tectonics has been observed at Mt. Etna although poorly constrained. In our case, the used multidisciplinary approach suggested us that in 2015 the eruptive activity was mainly triggered by the tectonic framework of the volcano unstable flank.