



Post-eruptive deformation on the eastern flank of Mt. Etna following the 2002-03 eruption

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Deformations accompanying major earthquakes and eruptions have been observed with a variety of geodetic techniques, such as GPS, InSAR, tilt, trilateration and leveling. In addition to static displacements, transient displacements have been observed in the weeks, months and years following large earthquakes or eruptions. Several studies have carried out on time-dependent displacements following recent large earthquakes using space geodetic techniques, whereas observations of time-dependent displacements due to magma intrusions and/or fissure eruptions are rare.

Here we discussed the ground deformation pattern following the 2002-03 Mt. Etna lateral eruption. In particular, data from several benchmarks located on the north-eastern flank of the volcano and permanently surveyed by GPS technique are analyzed. The data span the 26 October 2002 - 23 February 2003 time interval, about a month after the end of the eruption. Since the eruption onset along the North-East Rift area, several benchmarks, showed an exponential decaying of deformation, even after the end on the eruption. In order to evaluate which mechanism is involved into the post-eruptive deformation process, two time-dependent relaxation function were inverted by using GPS data. In addition, for each model we evaluated some parameters (e.g. viscosity, elastic shear modulus, layers-thickness, etc.) for the comparison with geologic and seismic information available for the investigated area. Finally, we discussed, our

finding, in the framework of geological and geophysical knowledge on Mt. Etna and in particular the 2002-03 eruptive period.