

Abstract of Contribution 2257**ID: 2257 / P6: 132****Solid Earth/Geodesy**

Poster presentation

Topics: ENVISAT, ERS

Keywords: Volcanoes, Interferometry, SAR, Earthquakes/Tectonics, Geodynamics

Creeping faults on the flanks of Mount Etna volcano (Italy) monitored by means of ERS and ENVISAT interferometry in the period 1992-2010.**Konstantinos Derdelakos^{1,2}, Sofia Mitoulaki², Francesco Guglielmino³, Panagiotis Elias⁴, Alessandro Bonforte³, Giuseppe Puglisi³, Issaak Parcharidis², Pierre Briole¹**¹Ecole normale supérieure, Paris, France; ²Harokopio University of Athens, Greece; ³Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Etneo, Catania, Italy; ⁴National Observatory of Athens, Greece

SAR interferometry and GPS, used at Mount Etna since more than twenty years, show that the volcano is characterized by a relatively stable western domain and a mobile eastern flank. The boundary between both is well defined to the north with a unique discontinuity, the Pernicana left lateral fault. The south boundary is more complex with several right lateral faults, e.g. the Mascalucia, Trecastagni, S.Leonardello, and Timpe faults. Some of them produce a well visible topography, e.g. the Pernicana, while others do not, e.g. the Mascalucia fault. Their motion, as shown by the data and discussed in several articles, combines creep activity and episodic co-seismic slips. The seismicity on those faults is known not to be steady with time, and the geodetic data also suggest the existence of temporal changes. The depth of those faults is not well established. They might cut only the volcanic products and not the sedimentary basement, and therefore allow the eastward motion of the recent (<300kyr) volcanic products pushed away from the volcano axis by the episodic injection of dykes feeding the eruptions.

In this work, we study the spatio-temporal variability of the motion along those faults in the period 1992-2010. We produced a series of ascending and descending interferograms using the AMI/ERS and ASAR/ENVISAT archive, with maximum baseline of 250 m and maximum time span of 4 years. Using published fault maps and our interferograms, we refine the location of the fault and we discuss the status of the transitions between faults. We calculate accurately the average slip velocities and temporal changes and compare with those published, and with the available GPS constraints.

In a second step we analyze the time series derived from PS and SBAS interferometry. For the Pernicana and both Mascalucia/Trecastagni fault, a specific PS processing method for non-urban areas is used separately, starting from a multi-reference stack of interferograms, a technique that is suitable for areas affected by non-uniform motion, fast line of sight (LOS) deformation rate and high decorrelation resulting in coherence loss over long time intervals.