



## **Four years of joint GPS and geochemical data analysis: a lesson from eruptions at Mt. Etna volcano (2002-2006)**

Francesco Zuccarello (1), Mimmo Palano (2), Stefano Gresta (1), Marco Viccaro (2,1)

(1) Università degli Studi di Catania, Dipartimento di Scienze Biologiche, Geologiche e Ambientali, Sezione di Scienze della Terra, Catania, Italy, (2) Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Etneo - Sezione di Catania, Catania, Italy (mimmo.palano@ingv.it)

Since October 2002 to December 2006, some eruptions took place at Mt. Etna. They were distributed along various slopes of the volcano: 1) the October 26, 2002 – January 28, 2003 eruption with vents located both on the north-eastern and on the southern upper flanks; 2) the September 7, 2004 - March 8, 2005 eruption, developed from two fissures opened in the north-western sector of the Valle del Bove and connected with the Southeast Crater; 3) the July 14, 2006 - December 15, 2006 eruptive episodes at various vents in the summit area (chiefly South East Crater and Bocca Nuova).

The availability of continuous GPS data allowed us to detecting at least ten different ground deformation stages, well capturing deflationary (I1, I4, I6, I7, I9) and inflationary (I3, I5, I8, I10) episodes as well as the occurrence of a shallow dike intrusion (I2). These data have been coupled with a large dataset of petrological and geochemical data obtained on both whole rocks and crystals included in them (olivine, clinopyroxene and plagioclase). Modeling of the surface deformation for each detected stage joined to kinetics resulting from textural and micro-analytical data on crystals have led to the detailed reconstruction of the magma movement within the plumbing system of the volcano during the investigated time interval.