



Composite ground deformation pattern forerunning the current (2004 - 2005) Mt. Etna Eruption

M. Aloisi, A. Bonaccorso, A. Bonforte, F. Guglielmino, M. Mattia, M. Palano, G. Puglisi

Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Catania, P.zza Roma, 2, 95123 Catania (Italy)

After the end of the 2002-2003 eruption, Mt. Etna activity was characterized only by gentle degassing at the summit craters and some earthquake swarms. Suddenly, an eruption started on September 7, 2004 with total absence of summit crater volcanic activity, seismicity or seismic tremor, and ground deformation. This is the very first time that magma poured out passively without associated volcanic and/or geophysical phenomena. The primary key to understanding this event is represented by the ground deformation pattern recorded through continuous and periodical GPS measurements during the year before the eruption, that are also visible with the SAR ENVISAT data. The ground deformation show an inflation superimposed by a major eastward movement of the eastern sector at a rate never observed before in a non-eruptive period. This pattern well shows the maximum tension in the eastern sector of the volcano that caused the silent opening of the eruptive fracture along this upper flank, where the SAR showed a graben-like structure in the month before the eruption onset.