



## **Modeling and forecast at Campi Flegrei caldera: new perspectives from ground deformation interpretation**

C. Troise and G. De Natale

Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Vesuviano, Naples, Italy (pino@ov.ingv.it, +39-081-6108521)

Campi Flegrei caldera is affected, since about 40 years, by volcanic unrests which occasionally attains very large and spectacular levels, particularly for ground deformation which reached, in the period 1982-1984, peak rates up to 1m/year. The extremely high level of ground deformation in this area, for both uplift and subsidence, poses the question if it is possible to discriminate precursory patterns which may likely indicate magma rising and impending eruptions. We show here that the most critical parameter to put in evidence the shape and depth of the pressure source is the ratio between vertical and horizontal displacements which, if continuously monitored, is a very sensitive indicator of changes in depth, position and shape of the pressure source. Monitoring displacement ratios is hence a very effective way to detect, for instance, rising dykes, moving magma sources, activation of shallow sources, etc., to forecast impending eruptions and, more generally, to build refined models of activity at complex caldera areas. We will show theoretical tests and some applications to ground deformation episodes at Campi Flegrei.