



## **A new interpretation of the 1982-84 unrest at Campi Flegrei Caldera (Italy) by numerical inversion**

**E. Trasatti** (1), C. Giunchi (1), M. Bonafede (2) and G. Berrino (3)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy (trasatti@ingv.it), (2) Università degli Studi, Bologna, Italy, (3) Istituto Nazionale di Geofisica e Vulcanologia, Napoli, Italy

The 1982-84 unrest episode at Campi Flegrei was characterized by huge deformation (about 1.8 m uplift) located inside the caldera and significant gravity variations correlated with the elevation changes (about  $-213 \mu\text{Gal/m}$ ). Due to the bell shape of the uplift, the source is usually interpreted to have a fixed spherical shape. In the present study, we combine simple point source mechanisms (dipoles and double couples) to represent arbitrary sources such as sphere, ellipsoid or sill. The models are realized by Finite Element and the medium may be characterized by elastic heterogeneities. We study the deformation detected by leveling and EDM techniques by coupling the FE forward models with an inversion procedure. The potential point sources are contained in a volume of  $8 \times 8 \times 8 \text{ km}^3$  located beneath Pozzuoli, the site of maximum displacement. We calculate the displacement field at each data point for each basic mechanism and we compare the result with the observed value. From the inversion of geodetic data we retrieve the best-fitting source parameters, without fixing the shape a priori. The best-fitting source is located beneath Pozzuoli at about 4.8 km b.s.l. and undergoes to horizontal compression and vertical dilatation.