



Gravity field at unrest caldera: an application to Campi Flegrei area

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Campi Flegrei is a well known volcanic caldera which is characterized by a slow sequence of uplifts and downlifts (bradyseism) superimposed to a sporadic but remarkable explosive activity. Last eruption occurred in 1538, while the most recent uplift episodes (1970-72 and 1982-84) produced about 3 m of cumulative displacement at the town of Pozzuoli. This behavior and the proximity of the densely urbanized town of Naples increases the volcanic hazard of the area.

The knowledge of the structural characteristics of the caldera is important to better understand and interpret measured data as well as the past volcanic history. In this frame, gravity data inversion can provide useful information. We collected and inverted about 1500 gravity data covering Campi Flegrei caldera and Ischia island, which is the other main volcanic center of the area, and was characterized in the past by several explosive eruptions (the last one in 1301), and presently by hydrothermal activity. The 3D inversion method was developed by us to deal with scattered data and the presence of topography, and is based on Tichonov regularization theory.

As to Campi Flegrei caldera, its shape and bordering structure is clearly singled out in agreement with seismic tomography results. Less marked borders are also present at shallow depth on the NE part of the area. As to Ischia island, our results show the presence of a central high density block and the border of a caldera roughly coinciding with the coastline of the island.