



3D gravity inversion and deformation field at Campi Flegrei (Italy)

G. Russo (1), P. Capuano (2) and G. Giberti (1)

(1) University of Naples "Federico II", Italy, (2) University of Molise, Italy

We used a recent developed techniques (Zhdanov 2000) to reconstruct a 3D image of Campi Flegrei caldera structure based on gravity data collected during previous surveys. The knowledge of the present structural state of a caldera is important because it may clarify its evolution and the associated eruptive dynamic. This is the case of Campi Flegrei caldera, a densely inhabited area near the town of Naples, Southern Italy. Preliminary studies on synthetic models have been carried on calibrating the inversion procedure which will then be applied to real data. Data have been accurately checked for inconsistencies and validate. Seismic data collected during a tomography survey (Serapis) have been used to constrain the inversion procedure and to have a preliminary constrain on the carbonate basement. A regularized inversion of free air anomalies have been performed. The main characteristic structure we find is a caldera the location and shape of which is fairly consistent with the results of SERAPIS experiment. The average density contrast respect to the filling rocks is between 300 and 400 kg/m³. By means of a commercial finite element models, a 3D simulation of the elastic deformation field has been realized using axis-symmetric model to reproduce elastic heterogeneities of Campi Flegrei structure as inferred by Serapis results. As a first step, we characterize the response of this axis-symmetric model to overpressure generated by different sources, comparing the vertical and horizontal displacements obtained with the measured ones.