

Magnetic and Gravimetric model of Panarea (Aeolian islands)

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We show the results of the gravimetric and magnetometric surveys of the Island of Panarea and its archipelago. These geophysical surveys belong to a major multiparametric project for the evaluation of the volcanic and seismic hazard of the island. Panarea is considered a volcanic active area as demonstrated by gas eruption of November 2002.

In May 2006 we have performed the gravimetric and magnetometric survey of the volcanic cone and its islets (Basiluzzo, Bottaro and Lisca Bianca). We have evaluated the magnetic anomaly field of the offshore portion of Panarea by marine survey (magnetometer Geometrics G880), covering a 4x4 km area located a east of the island. The marine magnetometric survey has been integrated to the onland one for a complete magnetic cover of the study area. The gravimetric campaign has been performed by using a pair of micro-gravimeters (LaCoste & Romberg D model). The island cone has been sampled every 250 meter along the local paths. The gravimetric dataset has been processed by using the standard method. The complete Bouguer reduction has been performed by the Parker method after the evaluation of the optimal bouguer density using a cross-plot bouguer anomaly vs topography data. Starting from the Bouguer anomaly, we have obtained a density map of the Island by a 2D inversion using a Tikonov regularization. The magnetic data of the global study area have been inverted performed a bidimensional map of the magnetic susceptibility. The recovered model has been superimposed to the geological features of the area evaluating the possible sources of the anomalous magnetic field.