



Seismic Evidence of multiple intrusion episodes within the shallow subsurface of Campi Flegrei and Ischia Island

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The reprocessing of old seismic reflection profiles represents an useful and cost-effective tool to constrain the geologic structure of a complex tectonic area such as the inner shelf of Bay of Naples. BRUNO et al., 2002 reprocessed a seismic dataset collected by OGS (Osservatorio Geofisico Sperimentale – Trieste) during 1973, reducing some of the limiting effects of the acquisition phase to gain more informations on the deep part of Bay of Naples and Campi Flegrei structure. In this study, the interpretation concerned 13 seismic lines reprocessed by BRUNO et al., 2002 that spread over an area of about 2000 Km² extending from the northern coast of Ischia and Procida Island up Sorrento Peninsula. The interpretation of seismic profiles allowed the delineation of a broad geo-volcanological and structural framework of the Campi Flegrei area. This region is well-known for its active volcanism but the crustal structure beneath the Campi Flegrei – Ischia ridge is still debated.

Our study confirms previous investigations (FINETTI et al., 1974; PESCATORE et al., 1984; FLORIO et al., 1999; BRUNO, 2003; AIELLO et al., 2005) on the structure of the Gulf of Naples basin, but bring new insights into the way magma is stored within the crust.

In particular, we found evidence of multiple episodes of sill emplacement at different levels within the crust. Igneous sills are extraordinarily well imaged on these seismic data because of a significant contrast in acoustic properties (velocity and density) between the intruding magma and the sedimentary host-rock. From the stratigraphic relationships between sedimentary and intruded rock, we define two episodes of magma emplacement occurring during Upper Pliocene and Late Pleistocene, respectively.

Intrusive processes, particularly well imaged below Ischia Island, could have ultimately be responsible for the rapid uplift of Ischia resurgent structure. Eventually, we show that volcanism in the Neapolitan area is a long process operating episodically from the Upper Pliocene onwards.