



Correlation between submerged and continental infill at Campi Flegrei caldera: insights on the volcano-tectonic events of the last 15 kyr

Jacopo Natale¹, Stefano Vitale^{1,2}, Roberto Isaia², Francesco D'Assisi Tramparulo², Luigi Ferranti¹, Camilla Marino¹, Lena Steinmann³, Volkhard Spiess³, and Marco Sacchi⁴

¹Department of Earth, Environmental and Resources Sciences - University of Naples Federico II

²Istituto Nazionale di Geofisica e Vulcanologia - Osservatorio Vesuviano

³Faculty of Geosciences, University of Bremen

⁴Istituto di Scienze Marine (ISMAR), Consiglio Nazionale delle Ricerche (CNR), Sezione di Napoli

The Campi Flegrei caldera (southern Italy) is characterized by over one-third of its extension lying below the sea. In the last 15 ka the caldera floor has suffered hundreds of meters of ground deformation alternating uplift and subsidence episodes in response to the activity of the volcanic system. The evidence of significant uplifts is witnessed by the occurrence of marine sequences exposed on land, both along a 30 m high La Starza cliff and in numerous well logs. However, most of these sediments are currently hidden below the sea. This work aims to reconstruct the marine counterpart of the infill by using large multiscale reflection seismic data (>100 profiles) and an accurate seismic facies analysis. The latter consisted in the study and comparison of seismic attributes, scaled to the resolution of the different datasets, to their geological analogs on land. Furthermore, by observing the changes in the pattern of on-lap terminations, thickness, amplitude, and distribution of erosive features of different horizons, we tentatively ascribed these sequences to the well-known continental deposits. The study of the whole sequence above the Neapolitan Yellow Tuff (15 ka) allowed us to gather relevant information about the relationships between stratigraphic record, ground deformation and sea-level changes. In particular, the reconstruction of buried surfaces gave us hints on the evolution of the volcanic system including the role of faults in terms of estimation of displacement and relationships with the different epoch of major eruptive activity.