Geophysical Research Abstracts
Vol. 21, EGU2019-1194, 2019
EGU General Assembly 2019

Structural frame and volcano-tectonic evolution of the Campi Flegrei collapse caldera-resurgent dome system in the Pozzuoli bay based on multiscale seismic profiles analysis

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The present study aims at contributing to the structural framework and volcano-tectonic evolution of the Campi Flegrei caldera with a joint analysis of multi-scale seismic profiles in the Pozzuoli Bay, providing additional insights into the last ∼15 ky of ground deformation.
Only in recent years the submerged part of the caldera has been explored using marine geophysical data (Sacchi et al., 2014; Steinmann et al., 2016, 2018). Seismo-stratigraphic interpretation of the marine geophysical data revealed that, after the NYT eruption, rejuvenation of the activity occurred mainly along the ring faults while a resurgent central dome system was gradually developing.
The shallowest seismo-stratigraphic interval has been calibrated by marine gravity cores which allowed to identify key horizons between the AD 1538 Monte Nuovo tephra to Nisida tephra ∼3.9 ky. Chronostratigraphy of the deeper part of the caldera infill sequence has been inferred through tentative correlation with the most significant eruptions known on-land taking into account vent location, VEI, distribution of pyroclastic deposits and hiatuses developed during periods of relative volcanic rest (Smith et al., 2011; Steinmann et al., 2018). In addition to the volcano-tectonic events, the depositional environment has been affected by post-glacial sea-level rise as reconstructed by Lambeck et al. (2011).
This work provides a first detailed map of faults developed on top of the resurgent dome and an improved characterization of the ring faults, on the southern side of the caldera. The apical faults of the dome have a complex pattern with NNE-SSW dominating trend. Since ∼12 ky a total uplift of ∼130 m is estimated between the post collapse un-deformed and dome-deformed markers.
On the eastern side of the gulf has been defined timing and extension of a laccolite intrusion. On the western side, the Punta Pennata structure has been mapped and interpreted as a localized structure linked to magma migration in the footwall of the collapse ring fault.

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