

## **Electromagnetic imaging of the deep Campi Flegrei caldera structure (Southern Italy)**

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The Campi Flegrei caldera (CFc) is the most hazardous volcano in Europe. Enormous investigative efforts have been done aimed to share its inner structure and to understand its unrest dynamics, making the CFc one of the main subjects of interest of modern volcanology.

Due to the destructive potential and the active geothermal system, the CFc geological structures have been investigated through many different methodologies. A key role belongs to the applied geophysics that allows to gain knowledge about the volcanic setting and consequently to understand the dynamics of this active caldera system.

So far, the main CFc structures have been not yet clearly defined. The strong heterogeneity of the territory associated to the composite coastal morphology and the extreme urbanization represent a major obstacle to apply the geophysical techniques. Therefore the geometry and configuration of the CFc plumbing system are still largely undefined, although seismic surveys nowadays detected findings of melt-bearing rocks, at least locally.

Here a deep electromagnetic (EM) imaging the CFc is presented. A Magnetotelluric (MT) profile has been carried out across a 12 km-long transect, ideally intersecting the main recent volcano-tectonic structures. The peculiar sensitivity to subsurface fluids and melts, associated with huge electric conductivity contrasts, make the MT particularly well suited to be applied in active volcanic settings.

The obtained results highlight the buried structures down to 10 km of depth providing an interpretative key into the overall caldera dynamics. In particular, the deep magmatic source is revealed, as well as the main ascent pathway of magmatic fluids and the related structures which critically contributing to the shallower-level of deformation at CFc.