



The contribution of attenuation tomography to the understanding Campi Flegrei unrest

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The recent high resolution attenuation tomography of Campi Flegrei, performed on the basis of the data recorded during the 1983-1984 crisis, is a strong clue for the prediction the future behavior of this caldera. A joint study of the velocity and attenuation features of the first 4 km of the crust, correlated with various observations coming from different fields (electromagnetism, boreholes, etc.) allowed an unprecedented view of several features of the medium during the crisis.

The point of maximum uplift during the crisis is in good spatial correlation with evident low Qp anomalies. The attenuation and velocity features were also able to discriminate fluid bearing from gas bearing rocks on surface, as evidenced by boreholes measures. The top of the carbonate basement, located around 3 km depth below the whole area has been evidenced both by Qs, V and reflection tomography; anyway, the joint interpretation of the velocity and attenuation tomograms at this depth does not exclude the presence of melt in the volumes south-west of Pozzuoli, near the zone of maximum uplift.

The most important result, however, is the image of the upper part of high Qs, high Qp and low Vp/Vs gas bearing conduits connecting all the high attenuation volumes in the first 3 km of the crust with the magma sill revealed at about 7 km in depth by passive travel-time tomography under the whole caldera. This conduits are probably the paths for the magmatic gases measured in the fumaroles fields on surface, and could be related to melt inclusions located in zones presently not imaged by tomography.