Geophysical Research Abstracts, Vol. 9, 03511, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-03511

The magmatic plumbing system of the Campi Flegrei caldera.

L. Civetta (1,2), I.Arienzo (3), M. D'Antonio (3), V. Di Renzo (1,2) M. A. Di Vito (2), and G. Orsi (2)

(1) Dipartimento di Scienze Fisiche, Università Federico II, Napoli, Italy,(2) I.N.G.V., Osservatorio Vesuviano, Napoli, Italy,(3) Dipartimento di Scienze della Terra, Università Federico II, Napoli, Italy (civetta@ov.ingv.it)

The Campi Flegrei caldera is a nested and resurgent structure generated by at least two major collapses. Large sectors of the structural boundary of both calderas resulted from partial reactivation of pre-existing faults generated by regional tectonism. Its magmatic system is still active with the last eruption occurring in 1538 A.D. (Monte Nuovo), widespread fumaroles and hot springs activity, and the unrest episodes in the last 35 years, with a maximum net uplift of about 3.5 m in the Pozzuoli area.

The definition of the history of the magmatic feeding system of this caldera, in terms of magmatic component, time-scale and depth of crystallization, relation between composition of the erupted magma and structural position of the vent, and magma chamber processes, is of extreme importance for a better understanding of the dynamic conditions of the present day magma chamber and for evaluating of the extent to which the behavior of the magmatic system can be predicted.

The Campi Flegrei caldera magmatic plumbing system is characterized by deep and shallow reservoirs. Campi Flegrei magmas originated in a subduction modified mantle source, stagnate at mid crustal level, where they differentiated and are contaminated with the continental crust. From the "deep reservoir" shoshonitic to latitic magmas rise towards the surface along the NE aligned regional fault reactivated during the caldera collapse, whereas trachytic magmas rise mostly along faults and fractures bordering the resurgent block and the southern part of the Campi Flegrei caldera. Repeated arrival of trachytic to phonolitic magmas form shallow reservoirs at 4-3 km depth, in which differentiation, contamination and mixing processes occur before and during

the eruption.