



The Italy's D.P.C. - I.N.G.V. Project UNREST: Realization of an integrated method for the definition of the unrest phases at Campi Flegrei.

Lucia Civetta (1,2) and Edoardo Del Pezzo (1)

(1) I.N.G.V. Osservatorio Vesuviano, Napoli, Italy, (2) University Federico II of Napoli , Italy

In this poster we present the framework of the Project “UNREST” and the preliminary results obtained in the first 18 months of activity.

The Campi Flegrei resurgent caldera, where several hundred thousands people live, have been characterized during last decades by several bradiseismic crises which determined the partial evacuation of the population, as for the crises in 1969-72 and 1982-84. Recent studies have revealed a process of unrest which continues since the fifties, and which presents characteristics similar to the several centuries-decades long unrest period which led to the last eruption in AD 1538. In the frame of last INGV-DPC Agreement a method has been developed, which allows accounting of any information and associated uncertainty coming from historical, field, and modelling studies, and from the monitoring network, providing a probability on the state of the volcano and on the occurrence of an eruption. In the present project this method is explored and developed, particularly through the experimentation of methods for the definition of reference parameters and thresholds, and of criteria and procedures to make it an operational tool useful for volcano surveillance and crisis management.

The research in the project include the following points:

- a) Definition of the reference database for the validation of models of pre-eruptive dynamics. The database will include geologic, geophysic, geochemical, hydrological and hystorical data.
- b) Quantitative analysis of measured signals, and formulation of hypotheses on source mechanisms.
- c) Definition of a general conceptual model for the magma-rocks-geothermal system at Campi Flegrei.
- d) Physico-mathematical modelling and numerical simulation of the magmatic and geothermal process dynamics, and of the space-time relationships between such dynamics and the geophysical and geochemical signals measured at the surface.
- e) Definition of the critical parameters for the definition of the different unrest phases, and development of possible new methods for their determination.
- f) Realization of a prototype of an integrated multidisciplinary system for short term volcano hazard evaluation. This system should integrate the information coming from the monitoring network, the models and simulations, and any other kind of information source in the project, within a simple and efficient scheme like the Event Tree one. This should be useful in real time during emergencies, either real or simulated.
- g) Study of the methods for the operational use of the prototype above, and of the modalities for interfacing it with the DPC Functional Center.