



## **Automatic geochemical network for volcanic surveillance of the island of Vulcano**

M. Camarda, S. De Gregorio, G. Capasso, S. Cappuzzo, I.S. Diliberto, G. Giudice, R. Guida, S. Gurrieri, and G. Riccobono

Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Palermo - V. Ugo La Malfa, 153 – 90146 Palermo, Italy

Numerous studies highlight as the CO<sub>2</sub> flux and groundwater geochemical parameters changes are well correlated with seismic and volcanic activity of an area (Capasso et al., 2001; Federico et al., 2004; De Gregorio et al., 2007; Gurrieri et al., 2008). According to these studies, in the framework of volcanic and seismic surveillance program, the monitoring of these parameters contributes to the valuation of level of volcanic activity. For real time assessment is needed to measure geochemical parameters continuously. An automatic network of geochemical stations has been installed on the island of Vulcano (Aeolian Archipelagos, Italy). The island is an active volcano which last erupted in 1888-1890. At present the volcanic activity is characterized by the presence of fumarole field in the northern part of La Fossa crater, by intense soil CO<sub>2</sub> degassing and thermal groundwater. The network is composed by 8 stations for soil CO<sub>2</sub> flux monitoring and 4 stations for measuring the physico-chemical parameters of the groundwater. Some stations are also equipped with sensors to measure the air temperature and humidity, atmospheric pressure, wind speed and direction, and rainfall. The data are acquired with an hour frequency and daily transmitted to INGV-Pa. The CO<sub>2</sub> flux is measured in situ using the method of dynamic concentration (Gurrieri and Valenza, 1988; Camarda et al., 2006). The main physico-chemical parameters of thermal water are monitored by using a special probe, entirely worked out by INGV-Pa. The probe is fitted out with sensors for measuring the water temperature, electrical conductivity, piezometric level and a tailor-made sensor for measuring the total dissolved gas pressure (TDGP) (De Gregorio et al., 2005). The stations are located at the base of La Fossa cone and in the Vulcano Porto village. A special station, which acquired soil CO<sub>2</sub> flux and temperature gradient in the soil is located on the southern rim of the La Fossa crater, close to the fumarolic field. The monitored sites were selected on the basis of field monthly geochemical surveys (investigations) performed since 1984 in the island. During the monitored period (2008) no relevant anomaly in the time variation of the acquired data was recorded.