



## **Geophysical monitoring of the submerged area of the Campi Flegrei caldera (Southern Italy): experiences and perspectives**

Giovanni Iannaccone (1), Sergio Guardato (1), Prospero De Martino (1), Gian Paolo Donnarumma (2), Antonella Bobbio (1), Francesco Chierici (3), Luca Pignagnoli (3), and Laura Beranzoli (4)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Napoli Osservatorio Vesuviano, Napoli, Italy (giovanni.iannaccone@ingv.it), (2) Stazione Zoologica Anton Dohrn, Napoli, Italy, (3) Istituto Nazionale di Astrofisica - Istituto di Radioastronomia, Bologna, Italy, (4) Istituto Nazionale di Geofisica e Vulcanologia, Sezione Roma2, Roma, Italy

The monitoring system of the Campi Flegrei caldera is made up of a dense geophysical network of seismological and geodetic instruments with data acquired and processed at the Monitoring Center of INGV in Naples. As one third of the caldera is covered by the sea, a marine monitoring system has been operating since 2008 in the center of the gulf of Pozzuoli, where the sea depth is about 100 m at  $\sim 2.5$  km from the coast. The main component of the monitoring system is CUMAS (Cabled Underwater Multidisciplinary Acquisition System), which consists of a sea floor module equipped with geophysical and oceanographic sensors (broad band seismometer, accelerometer, hydrophone, bottom pressure recorder and single point three component water-current meter) and status and control sensors. CUMAS is connected by cable to the top of an elastic beacon buoy equipped with the power supply and data transmission devices. The buoy consists of a float placed below sea level, surrounding and holding a steel pole that supports a turret structure above sea level. The pole, turret and float system are rigidly connected to the ballast on the sea bottom. Thus a GPS installed on the turret can record the vertical sea floor displacement related to the volcanic activity of the area. The GPS has operated since January 2012 with continuous acquisition lasting more than three years and has recorded a cumulative seafloor uplift of about 7-8 cm. The comparison of the pattern of the GPS buoy data with those of the land stations confirms a quasi-symmetrical vertical displacement field of the caldera area. Measurement of vertical sea floor displacement has also been obtained by the analysis of bottom pressure recorder data. These results, in conjunction with the analysis of seismic and hydrophone data, have encouraged us to extend the marine monitoring system with the deployment in the Gulf of Pozzuoli of three new similar systems. We also present preliminary results of the first few months of activity of these new systems.