



IS42 Graciosa (Azores): A new IMS certified infrasound station in the North Atlantic

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After several years and attempts to establish an International Monitoring System (IMS) infrasound station in the Azores Islands, the cooperation between the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), the Azores Government, the Centre of Volcanology and Geological Risks Assessment (CVARG) and the Santa Cruz da Graciosa Municipality (CMSCG), allowed the construction, installation and certification of the IS42 Graciosa station during the year of 2010.

Graciosa is one of the nine volcanic islands that constitute the Azores archipelago, located in the middle of the North Atlantic Ocean where the North American, Eurasian and African lithospheric plates interact. Located in the Central Group of the Azores Islands, between 39°-39°06'N° and 27°56'-28°05'W, Graciosa has an area of 60.7 km² and a maximum altitude of 402 m *asl*. With an estimated population of 4938 (2009), it has a commercial harbour and an aerodrome for regional flights, which guarantee the connections to the main populated islands of the archipelago.

The station IS42 Graciosa was built a bit towards SE of the central part of the island, in a heavily forested area that grows over recent basaltic lava flows. The station array comprises eight data acquisition elements (H1 to H8) and one central recording facility (CRF). The spatial distribution of the elements in the array is arranged in two groups following a broad geometry of one pentagon and an internal triangle. The side's lengths of those two geometric figures vary from an average of about 1km on the first and around 200 m on the later. Each element array element has 230V independent power supply from the public grid and all the elements are linked to the CRF by optical fiber.

In each element a vault, four pipe rosettes are linked to a MARTEC CEA MB2005 microbarometer which signals are digitized in a Nanometrics Europa T and transmitted via a Telesto optical fiber modem to the CRF. Time synchronisation is performed by a GPS receiver. In H1 meteorological data acquired by a thermometer and an anemometer are digitized through a second Europa T. Data received in the CRF is processed by a PC running on Linux and transmitted by satellite to the International Data Centre (IDC) in Vienna.

The Centre of Volcanology and Geological Risks Assessment (CVARG) of the University of Azores will assure the operation and maintenance of the station. The access to the IMS data will allow improving its seismo-volcanic monitoring capabilities in order to enhance its response to the Azorean Civil Defence authorities and future developments in atmospheric studies.