



## **Development and construction of a 12-channel seismic array for permanent deployment in S. Miguel, Azores.**

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Emergent seismic signals in volcanic environments such as volcanic tremor and long period events can not be located using classical arrival time schemes. Their source location and process can only be unveiled by an implementation of specialized monitoring techniques, e.g. the seismic arrays.

Between April and July 2003, this monitoring technique was successfully implemented on Sao Miguel Island (Azores archipelago) on the area of Fogo and Furnas volcanoes, in collaboration with Instituto Andaluz de Geofísica (IAG), from Spain, during a seismic campaign of the *e-Ruption* project. However, the three 12-channel short-period seismic arrays prototypes, deployed in the surveyed area, presented several reliability problems due to the severe weather conditions and youth of the project.

As the result of these previous experimental developments, a new project was developed to deploy a permanent seismic array in the same area in order to monitor the ongoing seismovolcanic activity. Two major tasks were then performed: (1) the improvement of the seismic instrumentation; and (2) the implementation of a permanent infrastructure to deploy the instruments. In this work we describe the results achieved in the first task, while the other will be the subject of another work.

The improvement of the instrumentation was related with: (1) a new layout for the digital acquisition system (DAS) and for the seismic sensors, which were integrated in hermetic containers, (2) a new printed circuit board for the power supply and electronic response extension for seismometers circuits; and (3) a deep revision of the digital acquisition routines, with a new version developed in 2004 by IAG, in order to optimize hardware resources and to facilitate the data gathering procedures. For its construction, the electronic modules and computer routines were integrated with a

group of commercial devices for processing, storage and time synchronization of the seismic signal.