SnT 2025 8 SEPTEMBER ONLINE DAY 9 TO 12 SEPTEMBER AT HOFBURG PALACE, VIENNA & ONLINE
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

Azores infrasound network: Towards a better monitoring of seismo-volcanic activity

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INTRODUCTION AND MAIN RESULTS

Since the IMS IS42 station certification in 2011, the Azores have become an infrasound monitoring reference in the North Atlantic. Two portable arrays were later deployed on São Jorge and Terceira islands to respond to a volcanic unrest and a seismo-volcanic crisis on those islands.

The results obtained so far led to establishing, by planning, the deployment of a low-cost portable array on Faial Island and to projecting a larger aperture array on Santa Maria Island.

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Introduction

In December 2010, the Azores Islands (Fig. 1), were integrated into the infrasound global community with the certification of the IMS infrasound station IS42 (Fig. 2).

A volcanic unrest in São Jorge Island (Fig. 3), in March 2022, and a later seismo-volcanic crisis in Terceira Island (Fig. 4), led us to install a portable array from the University of Florence in São Jorge (SJ1), in April 2022, and to design and assemble a low-cost, small aperture, portable array that was installed in Terceira Island (TER) in April 2024.

Fig. 1 - Current Azores infrasound network.

Fig. 2 – Location of IS42 and array geometry.

Fig. 3 – Location of SJ1 and array geometry.

Fig. 4 – Location of TER and array geometry.

Data and results

The results obtained by the new arrays so far, namely the detection and location of a bolide and the seismoacoustic detection of a local low magnitude (M 2.1) earthquake, emphasised the importance of a regional infrasound network with better coverage.

A roadmap to design, assemble, and deploy a third array, similar to TER (Figs. 5 and 6) on Faial Island (FAY) (Figs. 6 and 7), has already started and is planned to be finished in 2026.

Fig. 5 – Infrasound sensors deployed in TER array

Fig. 6 – Details of TER portable array.

Fig. 7 – Location of the future FAY portable array.

Fig. 8 – Layout details of future FAY portable array.

Conclusion and future developments

In addition to the plan for Faial Island (Fig. 9a), a project is being prepared to deploy an array in Santa Maria Island (Fig. 9b) with four absolute pressure sensors, with a bigger and adjustable aperture to monitor future launches of small rockets, and also São Miguel Island.

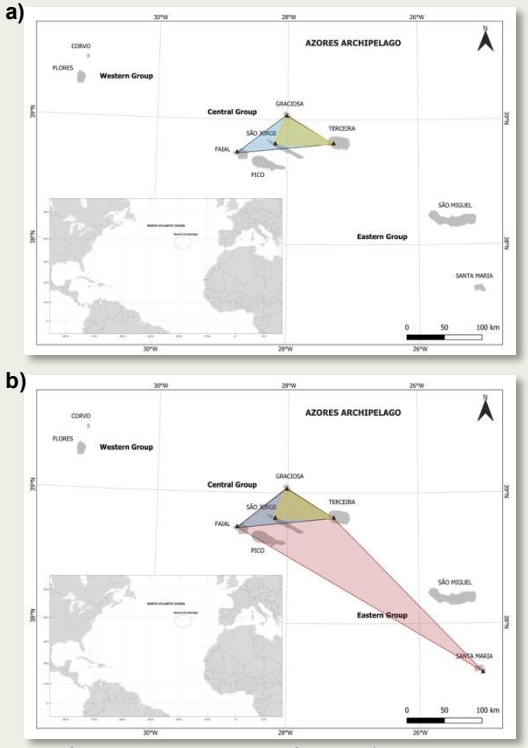

Fig. 9 – a) Azores infrasound network planned for 2026 (yellow triangle - current network and blue triangle - inclusion of the FAY portable array) and b) Azores infrasound network with inclusion of the array on Santa Maria Island (red shape).

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