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Seismicity of the Terceira Island (Azores) recorded by a temporary seismic network

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The last eruption in the Azores archipelago occurred in 1998-2000 and took place offshore, broadly 10 km WNW of Terceira. Terceira Island comprises four central polygenetic active volcanoes, Santa Bárbara, Pico Alto, Cinco Picos-Serra do Cume, Caldeira Guilherme Moniz, and a Basaltic Fissural zone.

To study the seismicity at Terceira Island, we installed a dense seismic network with an average inter-station distance of 5 km. The total number of instruments in use were 31: 12 short-period (2 Hz) and five very short periods (4.5 Hz), both from Instituto Dom Luiz (IDL), eight broadband (30s) from the University of Evora (UEv). The very short period instruments were installed around the Pico Alto geothermal power plant to improve the detectability of the micro-seismicity of the zone. The temporary seismic network operated at full capacity for 11 months and later with instruments from UEv and IPMA until the end of 2020. The permanent stations operated by the Instituto Português do Mar e da Atmosfera (IPMA), namely two broadband (120s), two short period (5s) and two accelerometers, completed the temporary network.

This work presents the preliminary results obtained with the seismic network. We detected some volcano-tectonic earthquakes in this period, mostly related to the Santa Bárbara Volcano and calculated the focal mechanism to the most energetic events. Behind the regular seismicity around the island, we observe an abnormal number of earthquakes in the stations installed in Pico Alto and central part regions.

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