

Geochemical and geophysical approach to the Tenerife (Canary Islands) anomalous seismic swarm on the 2nd October 2016

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On the 2nd October 2016, anomalous seismic activity took place in the volcanic island of Tenerife. During 5 hours, 96 low magnitude earthquakes ($<1\text{mbLg}$) were located in the SW zone of the island with an average depth of 10 km, close to the area where a seismic crisis took place in 2004.

Seismic analysis of the swarm reveals more than 800 events manually detected showing a high correlation between their waveforms. Relocation by double differences shows all hypocenters situated in a small cluster with a radius of a few hundred meters. Magnitudes ranged between 0 and 0.9 but the time evolution shows a variation in narrow bands of ± 0.2 magnitudes.

In order to better understand the origin and main causes of such anomalous behavior in the volcanic island, data obtained from different volcano monitoring techniques were analyzed. GPS deformation data did not show anomalous changes related to the studied phenomena. In the aim of this interdisciplinary interpretation, available geochemical data from the IGN volcano monitoring network were also revised. Values of several geochemical parameters previous to the seismic swarm have been studied.

Chemical and isotopic analysis from fumaroles and soil gases, groundwater physicochemical parameters, CO₂ diffuse emissions from the soil, Rn and CO₂ concentrations inside a gallery and soil temperature in the summit of Teide volcano did not revealed significant geochemical changes clearly related to the seismic activity on the 2th October 2016. However, this conclusion could be reconsidered in the future since upcoming events may show new insights into past circumstances.