Geophysical Research Abstracts
Vol. 20, EGU2018-7375, 2018
EGU General Assembly 2018

Magnetotelluric data acquisition and processing on the volcanic island of Gran Canaria (Canary Islands, Spain)

Hugo Larnier (1), Katrina Dorosh (3), Ross Mowbray (4), Hannah Rodger (5), Ian Tourney (6), Juanjo Ledo (1,2), Katarzyna Ślęzak (1), Marta Garcia Merino (1), Alejandro Marcuello (2), Estefania Gorriz (2), and Nemesio Perez (1)

(1) Instituto Volcanológico de Canarias , Spain (hlarnier@iter.es), (2) Departament de Geodinàmica i Geofísica, Universitat de Barcelona, C/Marti Franquès s/n, 08028 Barcelona, Spain, (3) Department of Geological Sciences, University of Saskatchewan, S7N 5E2, Canada, (4) School of Geographical and Earth Sciences, University of Glasgow, G12 8QQ, United Kingdom, (5) School of Earth Sciences, University of Bristol, BS8 1RJ, United Kingdom, (6) School of Geosciences, University of Aberdeen, AB24 3UE, United Kingdom

Heat flux originating at depths from volcanic islands are a matter of great interest, in the aim of producing energy from a geothermal system. The island of Gran Canaria is currently studied to infer if such geothermal system exists and if it could be used for industrial purposes. In geothermal exploration, magnetotelluric soundings constitute a crucial knowledge to infer the major conductive structures related to fluid flux. However, acquiring such data in volcanic environments can be a challenging task due to the steepness of the topography.
In this work, a dataset of 100 new magnetotelluric soundings distributed around the island has been acquired from July 2017 to September 2017. Instrumentation consisted of three Metronix ADU-07 and two ADU-06, along with EPF06 electrodes and MFS06/07 magnetic coils. Only horizontal electric and magnetic fields were recorded, acquired in magnetic directions. No remote station was installed, as the aim was to use local stations acquired simultaneously as reference stations.
We used standard remote reference processing methodology based on Fourier transform and wavelet based methodology for high frequencies. We obtained the magnetotelluric response functions for frequencies between 2 kHz and 0.001 Hz, depending on the stations quality. A dimensional analysis was performed based on the phase tensor and the WALDIM decomposition, showing a 3D behaviour of the resistivity distribution over the island.