

Recent seismic volcanic activity at Deception Island volcano (Shetland Islands, Antarctica).

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SERRANO, Inmaculada<sup>1\*</sup>; CARMONA, Enrique<sup>1</sup>; TORCAL, Federico<sup>2</sup>; DIAZ, Alejandro<sup>1</sup>; JIMENEZ, Vanessa<sup>1</sup>; LORENZO, Francisco<sup>1</sup>; ALMENDROS, Francisco javier<sup>1</sup>  
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<sup>1</sup>Andalusian Institute of Geophysics, Granada University, Spain, <sup>2</sup>Pablo Olavide University, Seville, Spain

<sup>1</sup>Andalusian Institute of Geophysics, Granada University, Spain, <sup>2</sup>Pablo Olavide University, Seville, Spain

Deception Island is the most active volcano in the South Shetland Islands region, having erupted at least 6 times since it was first visited 160 years ago. The 15-km-diameter island is horseshoe-shaped and has a flooded caldera (Port Foster) measuring about 6 x 10 km and a maximum depth of 190 m. All historical eruptions have been relatively small in volume. Evidence for present-day volcanic activity at Deception Island includes fumaroles and hydrothermal activity, resurgence of the floor of Port Foster, and seismicity. Seismic monitoring has been going on since 1986 during austral summer surveys, in which volcano-tectonic earthquakes (VT), long-period events (LP) and volcanic tremors, among others, have been recorded with a local network and seismic arrays.

In this work we analyze the results of the last two Antarctic campaigns conducted by the Spanish research team (2013-2014 and 2014-2015). Although seismic volcanic activity remained at relatively low levels in the 2013-2014 campaign, a notable increase has been observed in the current campaign (the highest number of LP/VT events in one day is 1500/100). In this paper we will be discussing the initial results obtained from our analysis of the data, focusing our attention on particular periods of intense LP and VT activity.

These variations may be related to alterations in the shallow hydrothermal system of Deception Island. In some periods VT distributions are temporally and spatially homogeneous, with a generally low level of seismicity in certain specific particular areas. These patterns may be caused by different processes, involving regional stresses and local tectonic destabilization induced by volcanic activity. We investigated how these events may have influenced volcano dynamics. Overall, this study suggests that there has been a significant reactivation of the volcano since the 2013-2014 Antarctic campaign.

キーワード: seismic array, seismic network, volcano seismology, Shetland Islands, Antarctica

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