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# Determination of a physical reference frame for Deception Island (Antarctica)

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Deception Island is one of the two active volcanic areas in the Antarctica. Since 1988, with the first Spanish Antarctic Campaigns, it has been carried out systematically a vigilance of the volcanic and tectonic activities on the island by means of geodetic and geophysical techniques.

With this purpose, it has been designed and improved since 1992 a geodetic network of thirteen vertices, a levelling network formed by six independent levelling lines and a gravimetric network from this set of vertices and benchmarks.

In this work it is presented an experimental geoid model for Deception Island which has been computed from the height above the ellipsoid, obtained from GPS data, geometrical levelling and absolute gravimetric measurements. The last ones have been carried out in all the vertices of the previous networks as well as in other points to make the network denser.

This surface represents the physical reference frame of Deception Island. This frame is essential for the remarkable scientific researches that are being carried out in the island, as for example, the study of the sea currents; the research of the changes in sea level; the analysis of the water volume added by the glaciers thaw, as well its evolution along the time and its relation with the global changes; the establishment of volcanic vertical deformation models; the determination of more accurate digital terrain models; and the georeference of the images from remote sensors.