



Geophysical interpretation of the magnetic anomalies of the Gulf of Cagliari in the Southern Sardinian Margin (Western Mediterranean).

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This paper presents an integrated geophysical study of the Gulf of Cagliari in Southern Sardinian Margin (Western Mediterranean). The study area represents the southern part of the main branch of the Sardinian Rift (SR) that is the most eastern branch of the Oligo-Miocene Rift system of the Western Mediterranean. In its southern part the SR is made up of a basin bounded by approximately NW faults. Knowledge of the tectonic and volcanic processes that involved this basin is important to recognize the tectonic movements propagated within the SR from the continental margin of Southern Sardinia and from the Western Mediterranean. The study is aimed mainly at explaining the presence of a very strong elongated magnetic anomaly that has never been interpreted quantitatively. In the geological context of the investigated area, the anomaly was interpreted by 2D and 3D Analytical Signal and Euler deconvolution techniques and by a delineation technique based on the maxima of the radial horizontal derivative of the total magnetic field, which proved to be very effective. The magnetic interpretation was integrated by the interpretation of the ES 328, 319, and 321 reflection seismic lines, which were acquired by Western Geophysical on behalf of AGIP in 1970. The results of the seismic interpretation calibrated by the AGIP Marcella well, together with the geological knowledge of the area contributed to give a petrographical-geological meaning to the magnetic body. The integrated analysis of magnetic, seismic, and geological data gives a fundamental contribution to understanding the geological and structural evolution of the investigated area.