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# Gravity and magnetic modeling of granitic bodies in Central Portugal

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A better understanding of the subsurface geometry of the granitic bodies in Central Portugal is the main goal of this work. The results are also relevant for the assessment of the geothermal potential of the same region.
The study area is located in the Central Iberian Zone where the Beiras granite batholith outcrops. These variscan granitoids were emplaced into the “Complexo Xisto-Grauváquico” (CXG), a thick and monotonous megasequences of metapelites and metagreywackes. This metasedimentary sequence is affected by the Variscan deformation phases and a late Proterozoic to Cambrian age has been generally assumed for this rocks. The granitoids in the region are attributed to the magmatic activity associated to the post-collisional stages of the Variscan orogeny during the D3 stage. The granitic bodies in the study area are considered syn-D3 and late to post-D3.
To achieve the goal of the research, magnetic and gravimetric surveys where performed in order to obtain the Bouguer and magnetic anomalies. All the standard corrections were applied to the gravimetric and magnetic data. Considering and integrating all the available geological data and physical proprieties (density and magnetic susceptibility) the mentioned potential fields were simultaneously modeled. In this way it was possible to characterize the subsurface geometry of the granitic bodies in the studied region.
The modeling results show that the regional tectonic setting controls the geometry of the granitic bodies as well as the structure of the host CXG metasedimentary sequence. Through the modeling of the potential field the overall geometry, average and maximum depths of the granitic bodies in the study area was obtained. Some late to post-D3 plutons outcrop in spatial continuity and as they have similar ages, a common feeding zone is assumed as the most likely scenario. The sin-D3 pluton is more abrupt and vertical, suggesting the presence of a fault contact with the late-D3 pluton.
According to the developed study the areas with higher geothermal potential for EGS applications are located over the sectors where the granitic bodies have the greater thickness.