

DeFelipe, Irene<sup>1</sup>; Santamaría Barragán, Alberto<sup>2</sup>; Pérez-Cáceres, Irene<sup>3</sup>; Palomeras, Imma<sup>1</sup>; Yenes, Mariano<sup>1</sup>; Prieto, Raúl<sup>1</sup>; Rivero-Montero, Mercedes<sup>1,4</sup>; Sánchez-Sánchez, Yolanda<sup>1</sup>; Ayarza, Puy<sup>1</sup>; Gómez Barreiro, Juan<sup>1</sup>

## Characterizing gravimetric and magnetic anomalies in the South of Salamanca (Spain): implications on the tectonic structure and Sn-W mineralizations

<sup>1</sup>Departamento de Geología, Universidad de Salamanca, Salamanca, Spain;

<sup>2</sup>Centro Nacional de Investigación sobre la Evolución Humana (CENIEH), Burgos, Spain;

<sup>3</sup>Cámara Oficial Mineira de Galicia, A Coruña, Spain;

<sup>4</sup>Departamento de Física de la Tierra y Astrofísica, Facultad de Ciencias Físicas, Universidad Complutense de Madrid, Madrid, Spain;

[idefelipe@usal.es](mailto:idefelipe@usal.es)

In the Central Iberian Zone, located in the Iberian Massif (the westernmost outcrop of the Variscan orogen in Europe), several aeromagnetic anomalies stand out, and many of them are related to late-Variscan thermal domes. Nevertheless, some of these anomalies are not fully understood due to: 1) the lack of a clear relationship between extensional structures with the thermal domes, 2) the general low magnetic susceptibility of the outcropping rocks, and/or 3) the low resolution of the aeromagnetic map to correlate the anomalies with the local geology. For instance, the Salamanca Magnetic Anomaly (SAMA), in the central-western part of Spain, is a conspicuous reverse polarity magnetic anomaly with a maximum amplitude of 56.1 nT. However, the SAMA does not show any relationship with the magnetic properties of outcropping rocks. Previous studies showed that the outcropping Ordovician slates present randomly reverse polarity Natural Remanent Magnetization which is compatible with that of the SAMA but with very low intensity. To shed some light on the origin and to constrain the source of the SAMA, we have undertaken a large magnetic and gravimetric survey of this anomaly and its continuation to the south. The study area extends to the south of the city of Salamanca covering 1160 km<sup>2</sup> and geologically it comprises the contact between the Neoproterozoic and Paleozoic rocks of the Iberian Massif with the Duero Cenozoic basin along the Alpine Alba-Villoria NE-SW oriented fault. In addition, in the central part of the study area the Salamanca Detachment Zone, is a late-Variscan extensional structure that allowed deep rocks and crustal melt products to reach shallow crustal levels, probably easing Sn-W mineralization in the area. Our high-resolution magnetic and Bouguer anomaly maps depict a straightforward correlation between gravity and magnetic maxima, which are also related to the Alba-Villoria fault. Both gravity and magnetic maxima are aligned in an E-W orientation following the Ordovician slates cropping out west of Salamanca and its prolongation towards the east under the Cenozoic sedimentary rocks. Relatively high values are found towards the SW part of the map, where Neoproterozoic rocks hosting mineralizations are present. Although the magnetic maxima could be the potential field response of dense and magnetic slates common in the area, the ones previously measured do not present high magnetic susceptibility. Accordingly, this new data might indicate that late-Variscan extension triggered the intrusion of dense and magnetic basic rocks in a process that could have contributed to Sn-W mineralization.

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