

## Relationship Between Granitic Intrusions and Hydrothermal Veins in the Argemela Tin and Lithium Mine

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The Argemela Tin and Lithium mine is located in Central Portugal, within the Central Iberian Zone (CIZ). The quartz-rich hydrothermal veins are mainly subvertical and are hosted in metasedimentary country rocks. The main lithium-bearing mineral is montebrasite, which is associated with cassiterite (Sn-bearing mineral). The genesis of this lithium mineralization is still debated. Authors say that this mineralization is related to non-outcropped granite, as happens in other lithium-rich quartz vein mineralization in the CIZ. In the late 70's, three drill holes were made by the Serviços de Formento Mineiro in order to understand the mineralizations. At the end of drill hole 1, granitic rocks were found, and at the end of drill hole 3, spotted schist was found that can be related to a non-outcropped granitic intrusion.

To study this genetic origin, we performed a gravimetric campaign in the Argemela area. A complete Bouguer anomaly (CBA) was obtained, to which were applied four filters highlighting different anomalies: tilt, analytic signal, and vertical and horizontal derivatives. An inversion was also performed in order to delimit the anomalies at depth.

On the CBA map, it is possible to observe that the mineralization occurrences are related to a zone of transition of higher to lower values, from SE to NW. Similar to CBA, the tilt and the vertical derivative are also associated with a transition between higher (SE) to lower values (NW). The analytic signal and the horizontal derivative are correlated with higher values. The inversion shows low-density values at depth on the W side of the Argemela mine.

The gravimetric results in conjunction with the drillholes, made in the past, indicate that at the West of the Argemela Mine, there is a non-outcropping granitic body that could be the source of the hydrothermal fluids that originated this mineralization.