



EGU23-11137, updated on 16 Jan 2025

<https://doi.org/10.5194/egusphere-egu23-11137>

EGU General Assembly 2023

© Author(s) 2025. This work is distributed under the Creative Commons Attribution 4.0 License.



New Late Cretaceous and Central Atlantic Magmatic Province magmatic sources off West Iberia revealed by from high-resolution magnetic surveys on the continental shelf

Pedro Terrinha et al. ▶

This work investigates the existence and tectonic control of magmatic bodies in the continental shelf of the SW Iberia margin. Magnetic data were densely acquired for a total area of ~4400 km² and carefully processed. Our new maps reveal a complex magnetic anomaly field, where distinct zones are defined based on the anomaly distribution. A wide number and variety of magmatic bodies are interpreted, from >10 km-scale deeply intruded plutons to small plug-like and dike-like intrusions. Interpretation of magnetic results together with bathymetry and seismic reflection data allows discussing the geometry, extension, and age of the magmatic sources and inferring the faults of fault systems related to their intrusion. The Cabo Raso complex is a densely intruded zone related to the Late Cretaceous alkaline event. The Sines complex comprises the known offshore prolongation of the on-land Sines magmatic rocks but also the newly mapped Covo and Milfontes anomalies. Covo is the largest magmatic intrusion recognized in West Iberia. Milfontes intrudes the non-rifted Paleozoic crust and is the first known evidence of a plutonic source of the Central Atlantic Magmatic Province (CAMP) in Iberia. The geographical distribution and geometry of the magmatic bodies are mostly controlled by the crustal tectonic fabric inherited from the Paleozoic Variscan orogeny, which was re-worked during the Mesozoic rifting and the Cenozoic Alpine collision. The magmatic bodies modify the rheological structure of the crust and may affect the strain localization during the Alpine collision and recent tectonics.

This work allowed for mapping not only unknown plutons of Mesozoic age but also to define the eastern limit of the West Iberia Late Cretaceous Alkaline Province (WILCAP), which together with the Madeira-Tore Rise north of the Africa-Eurasia plate boundary cover an area equivalent to a Large Igneous Province (LIP).

This work was funded by the Portuguese Fundação para a Ciência e a Tecnologia (FCT) I.P./MCTES through national funds (PIDDAC) – UIDB/50019/2020- IDL

How to cite: Terrinha, P., Neres, M., Noiva, J., Brito, P., Rosa, M., Batista, L., and Ribeiro, C.: New Late Cretaceous and Central Atlantic Magmatic Province magmatic sources off West Iberia revealed by from high-resolution magnetic surveys on the continental shelf, EGU General Assembly 2023, Vienna, Austria, 23–28 Apr 2023, EGU23-11137, <https://doi.org/10.5194/egusphere-egu23-11137>, 2023.

Supplementary materials

[Supplementary material file](#)