



Reappraisal of the Galicia Interior Basin structure from new seismic images: Implications for the formation of the West Iberia margin

Alejandra L. Cameselle (1), César R. Ranero (2), Marta Pérez-Gussinyé (3), and Luis M. Pinheiro (4)

(1) Universidade de Aveiro, Departamento de Geociencias, Aveiro, Portugal (acameselle@uvigo.es), (2) Barcelona Center for Subsurface Imaging, ICREA at CSIC, Institut de Cieñcies del Mar, Barcelona, Spain (cranero@cmima.csic.es), (3) MARUM – Center for Marine Environmental Sciences, University of Bremen, Germany (mpgussinye@marum.de), (4) Departamento de Geociencias and CESAM, Universidade de Aveiro, Aveiro, Portugal

The Galicia Interior Basin (GIB) is a ~ 3 km deep bathymetric trough located at the non-volcanic margin off West Iberia. The GIB extends in a N-S trend along more than 100 km between the NW Iberian continental shelf and the Galicia Bank. The GIB is considered as an aborted rift in the context of the opening of the North Atlantic rift system. Even though the West Iberia is one of the best studied non-volcanic margins, most of the works have focused on the Deep Galicia Margin and Iberian Abyssal Plain segments, where breakup finally occurred. However, the extensional models of West Iberia cannot be understood if the opening of the GIB is not integrated into a regional geodynamic framework. In this sense, GIB represents the necessary link to understand the mechanisms of extension from the little extended shelf to the areas where continental breakup finally occurs.

We present a series of reprocessed multichannel seismic profiles collected across the GIB. The lines are of different vintages by re-processing is far superior to original processing. Using state-of-the-art techniques, we have been improved the entire crustal structure. To increase the signal to noise ratio, including Tau-P and Wiener predictive deconvolution, multiple attenuation by both radon filtering and wave-equation-based surface-related multiple elimination (SRME). We processed these lines up to post-stack time migration to improve the image of the complex basement structure and deep sedimentary units, which was unclear in previous publications.

The selected reprocessed seismic lines run perpendicular to the margin's trend from the continental shelf across the GIB to the Galicia Bank, providing the opportunity to study the 3D tectonic structure of the GIB. The new high-quality images display syn - and post -rift sediment, tilted fault blocks, clear top-of-the-basement reflections, and also intra-basement and Moho reflections that provide new information about the tectonic structural style during rifting. The data display variation in the amount and distribution of crustal extension along the basin that permits to speculate on the reasons for the rift failure at the GIB in the context of the opening of the West Iberia margin.