



## **Inherited segmentation of the Iberian-African margins and tectonic reconstruction of a diffuse plate boundary.**

Manel Fernández, Montserrat Torne, Jaume Vergés, and Emilio Casciello

Institute Earth Sciences Jaume Almera CSIC, Earth's Structure and Dynamics, Barcelona, Spain (mfernandez@ictja.csic.es)

Diffuse plate-boundary regions are characterized by non-well defined contacts between tectonic plates thus making difficult their reconstruction through time. The Western Mediterranean is one of these regions, where the convergence between the African and Iberian plates since Late Cretaceous resulted in the Betic-Rif arcuate orogen, the Gulf of Cadiz imbricate wedge, and the Alboran back-arc basin. Whereas the Iberia-Africa plate boundary is well defined west to the Gorringe Bank and along the Gloria Fault, it becomes much more diffuse eastwards with seismicity spreading over both the south-Iberian and north-African margins. Gravity data, when filtered for short wavelengths, show conspicuous positive Bouguer anomalies associated with the Gorringe Bank, the Gulf of Cadiz High and the Ronda/Beni-Boussera peridotitic massifs reflecting an inherited Jurassic margin segmentation. The subsequent Alpine convergence between Africa and Iberia reactivated these domains, producing crustal-scale thrusting in the Atlantic segments and eventually subduction in the proto-Mediterranean segments. The Jurassic segmentation of the Iberia-Africa margins substantiates the double-polarity subduction model proposed for the region characterized by a change from SE-dipping polarity in the Gorringe, Gulf of Cadiz and Betic-Rif domains, to NW-dipping polarity in the proto-Algerian domain. Therefore, the Algerian and Tyrrhenian basins in the east and the Alboran basin in the west are the result of SSE-E and NW-W retreating slabs of oceanic and/or hyper-extended Tethyan domains, respectively.