



Tectonic segmentation along the South Iberian Margin (Northern branch of the Gibraltar Arc System)

M.C. Comas and J.I. Soto

Instituto Andaluz de Ciencias de la Tierra, CSIC and University of Granada, Campus
Fuentenueva s/n 18002 Granada, Spain. (mcomas@ugr.es)

Crustal structures responsible of the shape, segmentation and evolution of the South Iberian Margin result from the aftermath of extensional and subsequent compressive tectonic processes occurred from the middle Miocene to nowadays. New seismic reflection profiles evidence a complex structural pattern in the margin, and provide further data to constrain the tectonic evolution of the marginal Alboran Basin and its neighboring Algero-Balearic ocean basin.

Significant deformation processes generate a tectonic segmentation throughout the South Iberian Margin from the Strait of Gibraltar to the Algero-Balearic Basin (at the Palos Cape). Abrupt changes in the orientation of the shoreline and of the sedimentary depocentres are controlled by long living to recent (in cases seismically active) fault systems. Four segments with different structural and physiographic characteristics are distinguished along the South Iberian Margin. From W to E we distinguish the Málaga and Almería margin-segments in the Alboran Basin, and the Palomares and Cartagena margin-segments in the northwestern Algero-Balearic Basin. These segments show different structural patterns and distinctive tectonic evolution since the latest Miocene. Miocene rifting heritage dominates the structural pattern in the western margins (Málaga and Almería segments), whereas in the eastern segments (Palomares and Cartagena margins) normal-to-reverse strike-slip faulting play a mayor role in shaping the margins and overprints, or possible obliterates, previous (Miocene) rifting structures. Variations in margin morphologies, source-to-sink pathways (turbidite systems) and shallow Plio-Quaternary structures in the four margin segments denote that post-Miocene active tectonics and uplift processes increase in magnitude and became younger from W to E.

We interpret the tectonic segmentation of the South Iberian Margin as derived from latest Miocene to Pliocene rotation of major crustal-blocks occurred within an dominant wrench-tectonic regimen developed in an oblique plate convergence setting. These results should be considerer to discriminate between the competing geodynamic models for the origin of the Gibraltar Arc System.