



The western Algerian margin: an example of a Miocene STEP (Subduction-Transform Edge Propagator)? New constraints for the geodynamic evolution of the Alboran region

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The Western Mediterranean underwent a complex Cenozoic history in response to Europe (Eurasia)-Africa convergence. Since 30 Ma, the trench of the subduction of the Tethys Ocean retreated, leading to opening of back-arc basins, among which the Algerian basin. During the Oligo-Miocene, the subduction roll-back to the south led to the collision of the Kabylies into the African plate, but subduction continued towards the west, causing the Alboran slab to migrate towards the Gibraltar Arc. In western Algeria, slab roll-back towards west is likely to have been accompanied by lithospheric tearing (STEP fault, as it has been modelled at a regional scale by Govers and Wortel, 2005). The way this may have happened, however, is as yet unclear. Northern Africa is at the southern border of this system and is therefore a key area to study the records of these past geodynamic processes.

This work based on the MARADJA'03 cruise data (multibeam bathymetry and seismic-reflection essentially) aims at showing the geological inheritance of the margin. By analysing and further interpreting the marine geophysical data, we aim at determining the morphological signature of these final stages of the slab roll-back phase. The novel constraints on the crustal and lithospheric structures (through tomographic data) that were inherited from the preceding geodynamic evolution offer stepping stones towards a better understanding of the geodynamics of this region and unravel

links between surface/shallow structure and processes and deep lithospheric/mantle structures and dynamics. Structural information combined with geological (geology of the margin and magmatism) and geophysical (heat flow, tomography, paleomagnetism) data provides evidence for the presence of a STEP fault offshore Algeria, and therefore leads us to propose a new evolution scenario for the Alboran region.