



Plio-quaternary shortening of the Algerian margin in the region of Boumerdes highlighted by multibeam bathymetry and seismic reflection (Maradja 1 and Samra cruises).

P. Strzeczynski (1), A. Cattaneo (2), A. Domzig (1), B. Mercier de Lépinay (3), J. Déverchère(1), K. Yelles (4), R. Bracène (5)

(1) Domaines Océaniques, I.U.E.M. Plouzané, France, (2) IFREMER, Plouzané, France, (3) Géoscience Azur, Valbonne, France, (4) CRAAG, Algiers, Algeria, (5) SONATRACH, Boumerdes, Algeria (pierre.strzeczynski@univ-brest.fr).

With the occurrence of earthquakes with magnitude up to 7, the northern limit of Algeria is one of the most seismically active region of the western Mediterranean sea. Focal mechanisms indicate mainly compressional events compatible with the NW-SE direction of convergence between Africa and Europe. Earthquakes are mainly located onshore; however, the recent Boumerdes earthquake of May ,2003, has pointed out the importance of the tectonic processes offshore. The aim of this note is to highlight the localization, the timing and the style of deformation offshore the Boumerdes area.

We provide the interpretation of bathymetric and seismic sections on the Algerian margin (Maradja 1 and Samra campaigns) acquired in 2003 and 2005. Processing of the bathymetry and multichannel seismic reflection lines provide respectively a 50 m spatial resolution DEM and an accurate picture of the structures at depth down to 5 twt from the sea level.

Sedimentary units of the Algerian margin are composed from top to bottom by (1) a plio-quaternary sequence (about 1 twt), (2) the Messinian deposits composed of upper evaporite unit and a salt layer (about 0.5 twt); near the slope's footwall, these deposits are replaced by chaotic units interpreted as a Messinian detritic fan. (3) under the

Messinian deposits, strong reflectors are interpreted as Miocene deposits.

From the mid-part of the continental slope up to about 30-40 km inside the deep basin, we observe five uplifted basins. Their depth progressively increases from 1400 to 2450 m. Each basin are limited by scarps that correspond to north-western flanks of Plio-quadernary anticlines. From sedimentary units analysis one can distinguish salt tectonic related structures from compressional structures as these two processes are diachronous. We also note that compressive structures affect the infra-Messinian layers. On the basis of the sedimentary records, the onset of the tectonic (s.s.) deformation took place during the Plio-quadernary times and progressively migrated from the slope to the deep basin. In absence of absolute geochronological constraints, the time of initiation of deformation could only be estimated.

The basin and the folding pattern strongly suggest the occurrence of a system of flat and blind thrust ramps. Because faults do not reach the surface, direct evidences of active tectonic are missing. In the deep basin, flats are located at the base or under the Miocene deposits. Heterogeneties inside the Miocene deposits can be related to deposition discontinuities in one hand and to the tips of blind thrust ramps on the other hand.

On the slope, uplifted basins are less developed, suggesting that the flat length decreases from the basin to the slope. We interpret this decrease as being directly related to crustal heterogeneity located at the boundary between continental and oceanic crust. We propose that the present day deformation near Boumerdes roots at this boundary.

The area located offshore the Bourmerdes area is affected by Plio-Quadernary to present shortening. The upper part of the crust is affected by a system of flat and blind thrust ramps that root at the foot wall of the continental slope. We propose that the deformation roots at the boundary between continental and oceanic crust.