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The northwestern boundary of the Nubia (Africa) Plate.

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We present a study of the North Africa margin from Gibraltar to Sicily. Before the Miocene the internal blocks (Betics, Kabylies and Calabria) formed the southern margin of the Eurasia plate and were adjacent to the Balearic and Sardinia blocks. After the drift to the south and the collision of the Kabylies with the Nubia (Africa) plate in the early Miocene, the Algerian Basin opened behind the Gibraltar Arc and the Alboran Block that moved towards the west between the Langhian (16 Ma) and the late Tortonian (8 Ma). Consequently the Algerian margin was a left-lateral transform margin during this period and the contact between the young oceanic crust of the Algerian basin and the North African continent was probably narrow. After 8 Ma the convergence between the Nubia (Africa) plate and Eurasia is evidenced in Spain and North Africa. The pole of rotation of Nubia relative to Eurasia was located near Canary Islands in the Atlantic Ocean then it moved to the south at 3 Ma. Consequently the motion is transpressional with a strong component of right-lateral motion in the Alboran Sea, (0.4 cm/year) and mainly compressional in Sicily (0.6 cm/year) although the main motion is presently more oblique than in the past and the average velocity (0.6 cm/year) is the same for the Mediterranean region (Calais et al., 2003).

In the Alboran Sea, Spain and Morocco the compression is evidenced by strike-slip faulting with a component of compression. The most prominent feature is the Alboran Ridge where a shortening (more than 10 km) as a well as a strike-slip component are observed. In the Alboran area the structures related to the convergence are not only localized in Morocco and the south margin but are also evident in Spain.

Off western Algeria the convergent motion occurs along strike-slip fault with a component of compression. The fold and reverse faults are north verging whereas the onland thrusts are mainly south verging in particularly in the El Asnam area. Therefore,

the boundary between Nubia (Africa) and Eurasia (Algerian basin) shows a double vergence and may be a positive flower structure at crustal scale. E-W trending folds and reverse faults and strike-slip faults are identified in the large margin between Alicante and Ibiza Island. The oceanic crust that extends in the Algerian Basin therefore transmits the compression.

Off central Algeria (Algiers) the Boumerdes earthquake (May 21 2003) is located offshore along a 50 km long reverse fault dipping south (Ayadi et al., 2003; Yelles et al., 2004) that trends NE-SW. A multibeam survey performed after the earthquake (Deverchère et al. 2003) suggests that the reverse fault is a blind thrust beneath a flexure affecting the sea floor and the salt layer. The multibeam survey and our seismic profiles show several flexures as far as 50 km from the coast. The TRANSMED lithospheric section (Roca et al., 2003), that crosses this area, suggests that the oceanic crust of the Algerian Basin is involved in the deformation with a shortening of 30 km and a beginning of underthrusting beneath the Kabylian Massif. This massif and the 2.3 km high Djurdjura are affected by thrusts and reverse faulting dipping to the north and a shortening of about 15 km can be estimated.

After a right-lateral transfer fault off Bejaïa, the deformation front is located closer to the coast (30 km) than in the Algiers area and located at the base of the slope. A prominent erosional surface cuts (0.8 km) pre Messinian anticlines and synclines. However, the recent sediments and the seafloor are also affected by the compression. On land some reverse faults are dipping to the north and E-W and NE-SW strike-slip faults are evidenced in the Constantine region.

Off Tunisia the south dipping front strikes NE-SW and bounds la Galite block. This block and several banks are active folds with reverse faults dipping to the north. Therefore the double vergence can be seen off Tunisia. The deformed zone can be followed up to the north of Sicily.