

## Tectonic and Sedimentation in the Southern Alboran Sea

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The Alboran Sea is divided into two parts; an eastern part where the acoustic basement is mainly formed by late Miocene volcanic rocks and a western part where a more than 10 km thick basin is infilled by early Miocene to Quaternary sediments. The eastern province belongs to a volcanic arc that forms a large stripe from the Cabo de Gata in Spain to the Trois Fourches Cape and Ras Tarf in Morocco. This arc, that trends NE-SW, traveled from the East and collided with the Africa and Eurasia plates during the Late Miocene (Late Tortonian and Messinian). During its motion the arc was separated from the northern and southern plates by strike-slip tear faults. The southern boundary is limited by left-lateral E-W to NE-SW faults. One deep late Miocene fault, trending E-W is probably located beneath the Gourougou-Chafarines volcanic structure as shown by a prominent E-W magnetic anomaly. The Nekor F. Z. is the superficial expression of the southern left-lateral boundary. The Nekor F. Z. is a crustal structure with a probable flower shape, and it is not a linear and straight fault but formed by several short segments. In the offshore region of the Trois Fourches Cape three basins that trend NE-SW show a dextral offset and the main faults are normal and have opposite throw from one basin to another. The onshore geology shows that the Boudinar basin has been formed along the Nekor fault first in a strike-slip setting during the lower Tortonian then with a normal component during the late Tortonian and the early Messinian. The same geological history is illustrated by the seismic profiles in the two other basins. The seismicity demonstrates that the Nekor F. Z. is not active at the Present, and the eastern region is now governed by the right-lateral transpressional motion of the Eurasia Plate relative to the Nubia (Africa) Plate. The Yusuf Fault and its pull-apart basin is the main expression of this motion. The deep fault beneath the Gourougou-Chafarines volcanic structure may change its motion from left-lateral to right-lateral and an intra-Pliocene sill of large extension has been identified off Chafarines Island. All the region west off the Trois Fourches Cape is affected by a prominent tilting that suggests an uplift of the adjacent continent that can be evaluated to 800-1000 m. Off Ras Tarf –Al Hoceima the Al Idrissi F. Z. forms the western boundary of the eastern province. This deep fracture has several superficial structural expression. Several normal faults are identified in the Al Hoceima region where a prominent seismicity is related to this normal faulting. The Tofino and the Xauen banks are folded and offset from the Alboran Ridge that is a complex transpressional feature with a volcanic core. The western part of the Alboran Sea is occupied by the Western Alboran Basin that was formed in the early Miocene south of the Balearic Islands in a fore arc position the primitive arc being located north of the Balearic Islands. Two rifting episodes can be identified. The first one, late Oligocene to early Miocene is coeval to the opening of the Provençal basin and the rotation of the Corso sard block. During this extensional event the deeply metamorphosed Alpujarride and Sebitides terranes have been exhumed and formed the basement of the West Alboran Basin. The second rifting event occurred during the middle (16 Ma) to the late Miocene (8-6 Ma) during the drift towards the west of the volcanic arc. The seismic profiles show clearly these two rifting and a tilting related to a recent uplift of the adjacent land along the western Mediterranean coast of Morocco.