

Structural Styles in the Western Alboran Basin (Morocco and Spain)

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The Western Alboran Basin is a narrow arcuate basin located in the westernmost part of the Mediterranean Sea lying between the southeastern corner of the Iberia peninsula and northern Morocco. The basin is filled by a thick Neogene sedimentary section deposited above igneous-metamorphic rocks correlated with the Alboran Allochthonous Complex. In the eastern part, the basin is bounded by the Carboneras – El Jebha active left-lateral fault system.

During Late Oligocene to Early Miocene time the basin was affected by regional extension (“rifting”) giving place to a very important depocenter up to 10 Km thick (Moroccan sector).

In the northern area, (Iberian side) two gravity driven thin-skinned fold-belts have been recognized based on 2D and 3D seismic interpretation. The oldest folded belt has Early Miocene age, while the youngest one has Middle Miocene age. Both detached systems would indicate a gravitational transport towards the depocenter, as is inferred from “extensional” and “toe thrust” features.

Normal faulting episodes in the Moroccan sector have been dated as Early- Middle Miocene and Late Miocene age and have been probably inverted during the Pliocene.

The West Alboran Basin is strongly affected by Pliocene to Quaternary mud-diapirism triggered from the early Miocene shales during the current compressive phase associated to European and African plates convergent displacements; mud-diapirs run parallel to Early Miocene depocenter and some active mud volcanoes have been mapped along the seafloor.

Potential exploratory “plays” from Early Miocene to Quaternary are related to the different stages of structural evolution along the western Alboran basin.