



## **Plio-Quaternary tectonic evolution off Al Hoceima, Moroccan Margin of the Alboran Basin.**

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We use data from a compilation of industrial and academic 2D surveys and recent data from MARLBORO-1 (2011), MARLBORO-2 (2012), and SARAS (2012) surveys, which provide high resolution bathymetry and 2D seismic reflexion data. We focus on the key area located south of the Alboran Ridge and the Tofiño Bank, and encompassing the Nekor and Boudinar onshore-offshore basins on the Moroccan side of the Alboran Sea. The Nekor basin is a present pull-apart basin in relay between inherited N050° sinistral strike-slip faults. We consider that these faults define the Principal Displacement Zones (PDZ). The northern PDZ marks the position of the crustal Bokkoya fault, which is connected to the Al-Idrissi Fault Zone en relais with the Adra and Carboneras Fault Zones. On the seabed, right-stepping non-coalescent faults characterize the sinistral kinematics of the northern PDZ and give a general N050° azimuth for the crustal discontinuity. The southern PDZ corresponds to the Nekor fault Zone, a Miocene sinistral strike-slip fault acting as the structural limit of the External Rif. On its eastern edge, the Nekor basin is bounded by the N-S onshore-offshore Trougout fault, connecting the northern and the southern PDZ. The western boundary of the Nekor basin is marked by the Rouadi and El-Hammam Quaternary active N-S normal faults. In the offshore Nekor basin, recent N155° conjugated normal faults affect the seabed. Further east, the Boudinar basin is a Plio-Quaternary uplifted Neogene basin. The northeastern segment of the Nekor fault bounds this basin to the south but is inactive in the Quaternary. Normal east-dipping N150° faults are visible offshore in the continuity of the Boudinar fault. From our perspective, the orientation of major tectonic structures (Bokkoya, Nekor and Carboneras faults and the Alboran ridge) under the present compressive regime due to the Europe/Africa convergence is not compatible with a strike-slip motion. The orientation of the most recent Plio-Quaternary structures (NW-SE normal faults in the Nekor basin, the Al-Idrissi fault zone) suggests a Plio-quaternary change in boundary conditions and the rotation of faults. In the Nekor and Boudinar basins, recent faulting, the abandonment of the Boudinar fault and the uplift of the basin can be interpreted as the effect of the slab rollback under the Rif, as well as the propagation of the deformation toward the southwest.