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NW Africa post-rift tectonics: fieldwork constraints from an “unfitting” anticline in west Morocco

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The evolution of the Moroccan Atlantic rifted margin is marked by a period of abnormal and excessive early post-rift subsidence during the Late Jurassic-Early Cretaceous affecting the proximal coastal basins, the continental shelf and the distal deep basins, which acted coevally to km-scale uplift and erosion of large domains to the east. The tectonics of the uplift event are still unclear, as it took place 30 to 50 Myr after lithospheric breakup between Morocco and Nova Scotia and prior to the Atlas/Alpine contraction, which gave rise to the Atlas and the Rif mountain belts. The Essaouira-Haha basin, located on the coastal plain of the Atlantic rifted margin of Morocco, and bounded by two uplifted Paleozoic basement highs (i.e. the Massif Ancien of Marrakech, to the east, and the Jebilet, to the northeast), is an ideal location to investigate the tectonic processes that might have triggered these vertical movements. Although most of the deformation observed in the basin is classically attributed to Upper Cretaceous halokinesis and Neogene Atlas contraction, recent works have shown the existence of contractional structures. We carry out a structural analysis of the Jbel Amsittene Anticline, located in the middle of the Essaouira-Haha basin to investigate the tectonics of its formation and its relationship with the above-mentioned exhumation. We show structural field data along several cross-sections transecting the anticline, and characterize a salt-cored fault propagation fold verging north, with a Triassic salt acting as a detachment plane. Regional kinematic indicators and structures show overall NNW-SSE to NNE-SSW shortening and active tectonics during the postrift phase, as indicated by syn-tectonic wedges seen for the Late Jurassic to Early Cretaceous period. These facts discard the "salt-drives-tectonics" theory to let "tectonic-drives-salt" one to rise, and point to factors other than small-cell mantle convection acting during the evolution of the Moroccan Atlantic rifted margin.