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Systems and Efficient Algorithms). The tsunami model shows the influence of the seafloor morphology in the wave propagation, the Spanish coast being the most affected margin by wave heights up to 2.5 m.

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THE AL HOCEIMA SEISMIC ZONE (SW PROLONGATION OF THE EBSZ IN THE RIF): GPS EVIDENCES OF DEEP TECTONIC DISPLACEMENTS ON A MAIN ACTIVE BLIND SINISTRAL FAULT

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The Al Hoceima seismic zone is located at the southwestward prolongation of the Eastern Betic Shear Zone that crosses the Alboran Sea and reaches up to the Rif. This region was affected by the 1994, 2004 and 2016 onshore and offshore seismic crisis and constitutes one of the most active areas of the westernmost Mediterranean. The January 24, 2004 (M=6.4, depth 7 to 10 km) earthquake was related to a NNE-SSW sinistral or a WNW-ESE dextral vertical fault, but in spite of its shallow origin, no tectonic field ruptures were recognized. Anyway, the epicentral region evidences NE-SW to E-W brittle extensional structures: Quaternary fractured pebbles, conjugate normal faults and open joints. The main normal and transtensional faults in the region are located eastwards of the zone affected by seismicity, onshore and offshore of the Nekor bay. A non-permanent GPS network composed by 6 sites and measured since June 2007 evidence very moderate or absent activity of the main outcropping faults surrounding the Nekor Basin. However, very high rates (up to 2-3 mm/yr) of ENE-WSW extension have been detected in the epicentral zone. These field data are in agreement with those obtained on the analysis of the 2016 seismic series in the Alboran Sea, that evidence a westward migration of the deformation in the region. While the main sinistral EBSZ propagates southwestward up to the Rif affecting the basement, shallow tectonics units probably are detached and only being affected by the extensional deformation above the deeper main crustal fault. This complex setting may constitute a key area to advance in paleoseismological and seismic hazard assessment studies because the main recent outcropping faults have become inactive and the new main active structures are blind strike-slip faults.

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FIRST PALEOSEISMIC EVIDENCE OF THE FRONTAL BRANCH OF ALHAMA DE MURCIA FAULT ZONE (EASTERN BETICS, SE SPAIN) AND ITS HOLOCENE ACTIVITY

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The Alhama de Murcia fault system (AMF) is a left-lateral strike-slip structure within the Eastern Betics Shear Zone (EBSZ) which absorbs an important part of the shortening resulting from the convergence between the African and Nubian plates. In the Lorca-Totana section, the fault system is divided in three main branches: NW, central and SE or frontal. Most of the paleoseismic studies developed in this fault have focused on the central branch, because it is the one with most surface expression (e.g. geomorphological lineaments, deflected drainages, wind gaps, pressure ridges etc.). Conversely, no research to date has focused on characterizing the paleoseismic activity of the other branches in the section. In this study we present the first paleoseismic evidence of the frontal branch of AMF. We excavated 5 paleoseismic trenches in La Hoya site (Lorca, Spain) that exposed fault related deformation in at least two different generations of alluvial fan sediments. In the trenches dug in the oldest deposits, probably Late Pliocene-Early Quaternary in age, we observed strong deformation (tilting, folding and minor faulting), although no robust evidence of recent faulting was clearly recognized. Late Quaternary faulting was only observed in a trench dug within the deposits of el Colmenar creek, where it appears as a low angle reverse fault. Lower sedimentary units are offset up to 40 cm in the dip slip sense while upper units are offset only about 4 cm, proving recurrent activity of this fault branch during the Late Quaternary. A channelized unconsolidated gravel unit seals the fault at around 1 m from the actual surface of the creek. Radiocarbon dating was carried out in the most recent affected deposits, yielding ages from 8456 to 9743 cal BP. This demonstrates the occurrence of a young earthquake rupture posterior to these dates. No age data is currently available from the unaffected deposits (upper ~ 1 m of the stratigraphic sequence) and therefore, the upper bracket of this last event remains