



Neotectonic of Dead Sea pull-apart basin. A new tectonic model for its northern closure

Mohammad Al-Awabdeh (1), J. Vicente Pérez-Peña (1), J. Miguel Azañón (1,2), Guillermo Booth-Rea (1,2)

(1) Departamento de Geodinámica, Universidad de Granada. Granada, España., (2) Instituto Andaluz de Ciencias de la Tierra (CSIC-UGR). Granada, España.

The Dead Sea is a pull-apart basin formed by the relative motion of two active fault segments of the southern Dead Sea Transform Fault system (DSTF); the Wadi Araba Fault (WAF) and the Jordan Valley Fault (JVF) in northwest Jordan. Both of them are sinistral strike slip faults, however, the WAF has slightly faster slip-rate than the JVF. The northern termination of the Dead Sea basin is not well constrained, without clear transverse structures closing the basin. However, geophysical data suggest an abrupt thinning in this northern termination. Based on fieldwork and observations of recent tectonic structures, we suggest that the northern closure of this pull-apart basin corresponds to an active NW-SE normal fault system to the north of the Kafraïn Dam (28 km southwest Amman; the capital of Jordan). These normal faults constitute a transtensional zone formed by the partial reactivation of two major structures; the Shueib and the Amman Hallabat structures (SHS and AHS). Normal faults dipping SW present low to moderate throws, lateral ramps coalescing in the SHS, and probably they merge into a low-dipping main plane. This fault system is also the responsible of the extension of the upper Cretaceous formations to the NE of Kafraïn Dam and has associated colluvial wedges of Holocene sediments, indicating a seismic component with related small to medium earthquakes. This work reveals the Quaternary reactivation of tectonic structures that thought inactive in the Neogene and how they accommodate part of the stress in the region alongside with the DSFT.