



The northern end of the Dead Sea pull-apart basin : shape and relation to Dead Sea Transform

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Position and shape of the Dead Sea Basin's northern end in the southernmost Jordan Valley have been long-standing open questions. We use old reflection seismic lines from East of the river Jordan which are interpreted with the aid of partly unpublished borehole data and linked to outcrop geology. For the first time, these Eastbank lines are combined with the published reflection seismic lines from the western side of the Jordan Valley. Two complete E-W-trending cross sections show an inner deep basin that is strongly asymmetric and dips into the Jericho Fault. Thus the Jericho segment of the Jordan Valley Fault is concluded to be the long-lived and presently active part of the Dead Sea Transform. There is no indication for a shift of the depocenter towards a hypothetical eastern major fault with time as suggested recently. Rather, the north-eastern margin of the deep basin is resembling a large flexure, modestly faulted. The NNW-trending Al-Kharrar Monocline is a part of this margin. In N-S-section along its depocenters, the floor of the basin's northern end appears to deepen continuously by roughly 0.5 km over 10 km distance, without evidence for transverse faults. Yet, in comparison to published analogue models of pull-apart basins such Riedel-type oblique cross-faults are to be expected. Possibly the earthquake of February 2004 originating at mid-crustal depths is indicating this type by a NW-trending cluster of epicenters just South of the Jordan River delta. However, the general flexural shape of the basin's termination shown by our study conforms to published finite element models which predict a monocline geometry just outside the overlap of the main transcurrent border faults of a narrow pull-apart basin.