



The trace of the Dead Sea Transform in the northern Gulf of Aqaba (Elat). Evidence for the decoupling of the sediments from the basement

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A set of new multichannel seismic and hydroacoustic data reveal the Plio-Quaternary evolution of the northern Gulf of Aqaba and the trace of the Dead Sea Transform (DST) within the sediments. The step over of the DST from the SE-margin of the Elat Deep to the NW flank of the northernmost part of the Gulf, the Gulf's Head, was mapped for the first time. It runs more smoothly than previously suggested, building a continuous strike-slip fault from the Elat Deep to the Arava Valley. The step over is located at the northern termination of the Elat Deep, linking the Deep with the Gulf's Head, the transition zone to the onshore Arava Valley. The sedimentary record within the northern Gulf of Aqaba comprises two main sedimentary sequences. The lower sequence seems to be unaffected by the strike-slip displacement along the DST, thus pointing to a tectonic quiescence. The upper unit reveals growth faults and divergent reflections patterns indicating syntectonic sedimentation. The unconformity that separates both units could be correlated with a major change in the tectonic regime that is described by several authors for the entire Red Sea Rift system. The shape of the DST and the mapped sedimentary pattern in the Gulf's Head and the Elat Deep do not fit with the existing model of the Elat Deep as a classical pull-apart basin. A through-going strike-slip fault and continuous sedimentary beds that dip below the Elat Deep indicate another model for its development that is based on the decoupling of the sediments from the crystalline basement. This model suggests a pull-apart basin within the crystalline basement due to the left step over of the DST and to basin formation in the overlying decoupled sediments. The sediment basins do not reflect the shape of the crystalline basin, but build a series of elongated basins that exceeds the terminations of

the crystalline pull-apart basin. Following this approach, the Elat Deep and the Arava Valley are conjugate basins that belong to the same pull-apart basin within the crust.