



Quantification of tectonic uplift along the Dead Sea fault in Gulf of Aqaba

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Gulf of Aqaba is located at the southern end of the Dead Sea fault, which forms the boundary between the Arabian plate to the East and the Sinai micro-plate to the West. The Dead Sea fault accommodates mainly left-lateral strike-slip motion at a rate of about 5 ± 1 mm/yr. The 1995 MW=7.3 and the 1993 ML=5.8 earthquakes, both of which occurred in Gulf of Aqaba, reveal that in addition to strike-slip, a significant component of vertical motion is accommodated by the Dead Sea fault in the gulf. The long-term character of the vertical component is demonstrated by the presence of several levels of coral terraces uplifted above sea level all along the eastern flank of Gulf of Aqaba and in the Strait of Tiran area. Today the elevation of the different terrace levels ranges from a few meters to almost one hundred meters above the current sea level.

High-resolution Pleiades satellite images were used to build a digital surface model (DSM) at the metric scale along the eastern coast of Gulf of Aqaba to map in details the different levels of coral terraces and to correlate these levels along strike along the coast. In addition, U-Th analyses of uplifted corals were conducted to date the different levels of terraces. These analyses reveal that some samples show signs of significant diagenesis (recrystallization of the corals aragonite skeleton into calcite). However, XRD analysis and initial isotopic uranium signature have allowed us to discriminate pristine and unaltered corals. At this stage, our preliminary mapping and dating allows us to discriminate two groups of unaltered corals around 5 kyrs and 120 kyrs and to propose uplift-rates for the terraces that have been sampled. These rates will be compared with rates proposed in the literature.