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Monitoring the Dead Sea Region by Multi-Parameter Stations

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The Dead Sea Transform (DST) has accommodated left-lateral transform motion of 105 km between the African and Arabian plates since early Miocene. The DST strikes in a north-northeast direction and extends over some 1000 km from the active spreading center of the Red Sea, to the continental collision zone in the Taurus-Zagros mountain belt.

The Dead Sea Region is an exceptional ecosystem whose seismic activity has influenced all facets of the development, from ground water availability to human evolution. Israelis, Palestinians and Jordanians living in the Dead Sea region are exposed to severe earthquake hazard. Repeatedly large earthquakes (e.g. 1927, magnitude 6.0; (Ambraseys, 2009)) shook the whole Dead Sea region proving that earthquake hazard knows no borders and damaging seismic events can strike anytime. Combined with the high vulnerability of cities in the region and with the enormous concentration of historical values this natural hazard results in an extreme earthquake risk. Thus, an integration of earthquake parameters at all scales (size and time) and their combination with data of infrastructure are needed with the specific aim of providing a state-of-the-art seismic hazard assessment for the Dead Sea region as well as a first quantitative estimate of vulnerability and risk.

A strong motivation for our research is the lack of reliable multi-parameter ground-based geophysical information on earthquakes in the Dead Sea region. The proposed set up of a number of observatories with on-line data access will enable to derive the present-day seismicity and deformation pattern in the Dead Sea region.

The first multi-parameter stations were installed in Jordan, Israel and Palestine for long-time monitoring. All partners will jointly use these locations. All stations will have an open data policy, with the Deutsches Geo Forschungs Zentrum (GFZ, Potsdam, Germany) providing the hard and software for real-time data transmission via satellite to Germany, where all partners can access the data via standard data protocols.