



## Detailed seismicity analysis of the southern Dead Sea area

Benjamin Braeuer (1), Guenter Asch (1), Rami Hofstetter (2), Christian Haberland (1), Darwish Jaser (3),  
Radwan El-Kelani (4), Michael Weber (1,5)

(1) GeoForschungsZentrum Potsdam, Potsdam, Germany (ben@gfz-potsdam.de), (2) Geophysical Institute of Israel (GII),  
P.O. Box 182, Lod 71100, Israel, (3) Natural Resources Authority (NRA), Eight circle, P.O. Box 7, Amman, Jordan, (4)  
An-Najah National University, P.O. Box 7, Nablus, West Bank, Palestine, (5) Institute of Earth and Environmental Science,  
Karl-Liebknecht-Str. 24-25, 14476 Potsdam, University of Potsdam, Germany

While the Dead Sea basin has been studied for a long time, the available knowledge about the micro-seismicity, its distribution and characteristics is limited. Therefore, within the framework of the international DESIRE (DEad Sea Integrated REsearch) project, a dense temporary local seismological network was operated in the southern Dead Sea area. Within 18 month of recording 650 events were detected. Based on an already published tomography study clustering, focal mechanisms, statistics and the distribution of the micro-seismicity in relation to the velocity models from the tomography are analyzed. The determined b-value of 0.7 indicates a relatively high risk of large earthquakes compared to the moderate microseismic activity. The distribution of the seismicity suggests an asymmetric basin with a vertical strike slip fault forming the eastern boundary of the basin, and an inclined western boundary, made up of strike-slip and normal faults. Furthermore, significant differences between the area North and South of the Boqeq fault were observed. South of the Boqeq fault the western boundary is inactive while the entire seismicity occurs at the eastern boundary and below the basin-fill sediments. The largest events occurred here, their focal mechanisms represent the northwards transform motion of the Arabian plate along the Dead Sea Transform. The vertical extension of the the spatial and temporal cluster from February 2007 is interpreted as being related to the locking of the region around the Boqeq fault. North of the Boqeq fault similar seismic activity occurs at both boundaries most notably within the basin-fill sediments, displaying mainly small events with strike-slip mechanism and normal faulting in EW direction. Therefore, we suggest that the Boqeq fault forms the border between the “single” transform fault and the pull-apart basin with two active border faults.