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# Slip deficit and location of seismic gaps along the Dead Sea Fault

Mustapha Meghraoui (1), Renaud Toussaint (1), Matthieu Ferry (2), and Parfait Nguema-Edzang (1)
(1) CNRS -UMR7516, Institut de Physique du Globe, Geodynamics and Active Deformation, Strasbourg, France (m.meghraoui@unistra.fr), (2) Equipe Risques, Geoscience Montpellier, France

The Dead Sea Fault (DSF), a $\sim$ 1000-km-long North-South trending transform fault presents structural discontinuities and includes segments that experienced large earthquakes (Mw>7) in historical times. The Wadi Araba and Jordan Valley, the Lebanese restraining bend, the Missyaf and Ghab fault segments in Syria and the Ziyaret Fault segment in Turkey display geometrical complexities made of step overs, restraining and releasing bends that may constitute major obstacles to earthquake rupture propagation. Using active tectonics, GPS measurements and paleoseismology we investigate the kinematics and long-term/short-term slip rates along the Dead Sea fault. Tectonic geomorphology with paleoseismic trenching and archeoseismic investigations indicate repeated faulting events and left-lateral slip rate ranging from 4 mm/yr in the southern fault section to 6 mm/yr in the northern fault section. Except for the northernmost DSF section, these long-term estimates of fault slip rate are consistent with GPS measurements that show 4 to 5 mm/yr deformation rate across the plate boundary. Indeed, recent GPS results showing 3 +-0.5 mm/yr velocity rate of the northern DSF appear to be in contradiction with the $\sim$6 mm/yr paleoseismic slip rate.
The kinematic modeling that combines GPS and seismotectonic results implies a complex geodynamic pattern with the DSF transforms the Cyprus arc subduction zone into transpressive tectonics on the East Anatolian fault. The timing of past earthquake ruptures shows the occurrence of seismic sequences and a southward migration of large earthquakes, with the existence of major seismic gaps along strike. In this contribution, we present the calculated seismic slip deficit along the fault segments and discuss the identification of seismic gaps and the implication for the seismic hazard assessment.