



## **Ground-motion simulations for the Gulf of Aqaba region using pseudo dynamic rupture models.**

Luca Passone and P. Martin Mai

King Abdullah University of Science and Technology, Physical Science and Engineering, Earth Science and Engineering, Thuwal, Saudi Arabia (luca.passone@kaust.edu.sa)

Since the 1995 Mw 7.3 Gulf of Aqaba seismic sequence, the cities surrounding the Gulf of Aqaba have seen a considerable expansion, mostly thanks to the growing population, tourism and investments in national projects. Ongoing and planned large infrastructural investments require detailed seismic hazard assessment for adequate planning and risk assessment. However, the sparse seismic network and corresponding lack of data present engineers with a severe knowledge gap. We attempt to close this gap by computing synthetic earthquake scenarios to study the consequences of various combinations of seismic events. To this end, we conduct kinematic rupture simulations that mimic dynamic source behaviour for computing the 3D seismic wave-field with a maximum frequency of 1Hz. To assess the intensity and variability of ground-shaking we construct a four-segment fault geometry; we then simulate (1) single ruptures along each of the four segments, and (2) multi-segment ruptures. For the simulation domain, we include the latest data available for the area: (1) a 10 km-resolution 3D seismic velocity model, (2) the 120 m-resolution topographic data and (3) 900 m-resolution bathymetric data. Our findings contribute to quantifying the region's seismic hazard, and help decision makers and planners for further infrastructural development of the area.