Geophysical Research Abstracts
Vol. 19, EGU2017-9286, 2017
EGU General Assembly 2017

Fault model of the 2014 Cephalonia seismic sequence - Evidence of spatiotemporal fault segmentation along the NW edge of Aegean Arc

Vasso Saltogianni, Fanis Moschas, and Stathis Stiros
Department of Civil Engineering, University of Patras, Patras, Greece

Finite fault models (FFM) are presented for the two main shocks of the 2014 Cephalonia (Ionian Sea, Greece) seismic sequence (M∼6.0) which produced extreme peak ground accelerations (∼0.7g) in the west edge of the Aegean Arc, an area in which the poor coverage by seismological and GPS/INSAR data makes FFM a real challenge.
Modeling was based on co-seismic GPS data and on the recently introduced TOPological INVersion algorithm. The latter is a novel uniform grid search-based technique in n-dimensional spaces, is based on the concept of stochastic variables and which can identify multiple unconstrained (“free”) solutions in a specified search space. Derived FFMs for the 2014 earthquakes correspond to an essentially strike slip fault and of part of a shallow thrust, the surface projection of both of which run roughly along the west coast of Cephalonia. Both faults correlate with pre-existing faults.
The 2014 faults, in combination with the faults of the 2003 and 2015 Leucas earthquakes farther NE, form a string of oblique slip, partly overlapping fault segments with variable geometric and kinematic characteristics along the NW edge of the Aegean Arc. This composite fault, usually regarded as the Cephalonia Transform Fault, accommodates shear along this part of the Arc. Because of the highly fragmented crust, dominated by major thrusts in this area, fault activity is associated with ∼20km long segments and magnitude 6.0-6.5 earthquakes recurring in intervals of a few seconds to ∼10 years.