Geophysical Research Abstracts
Vol. 20, EGU2018-9262, 2018
EGU General Assembly 2018

The July 20, 2017 M6.6 Kos-Bodrum earthquake: seismic and geodetic evidence for a north-dipping, normal fault at the western end of the Gulf of Gökova, SE Aegean Sea

Athanassios Ganas (1), Panagiotis Elias (2), Vassilis Kapetanidis (3), Sotirios Valkaniotis (4), Pierre Briole (5), Ioannis Kassaras (3), Panagiotis Argyrakis (1), Aggeliki Barberopoulou (6), and Alexandra Moshou (1)

(1) National Observatory of Athens, Institute of Geodynamics, Athens, Greece (aganas@gein.noa.gr, pargyrak@noa.gr, amoshou@noa.gr), (2) National Observatory of Athens, Institute of Astronomy, Astrophysics, Space Applications and Remote Sensing, Vas. Pavlou & I. Metaxa, GR-15 236 Penteli, Greece (pelias@noa.gr) , (3) National and Kapodistrian University of Athens, Faculty of Geology and Geoenvironment, University Campus- Zografou, Athens GR 157 84, Greece (vkapetan@geol.uoa.gr, kassaras@geol.uoa.gr), (4) Koronidos Str., 42131, Trikala, Greece (valkaniotis@yahoo.com), (5) Ecole Normale Supérieure, PSL research University, Laboratoire de Géologie - UMR CNRS 8538, Paris, France (briole@ens.fr), (6) AIR Worldwide, Research Department, 131 Dartmouth St, Boston MA 02116, USA (abarberopoulou@air-worldwide.com)

On July 20, 2017 22:31 UTC, a strong Mw = 6.6 earthquake occurred at shallow depth between Kos (Greece) and Bodrum (Turkey). We derive a co-seismic fault model from joint inversion of geodetic data (GNSS and InSAR). We assume that the earthquake can be modelled by the slip on a rectangular fault buried in an elastic and homogenous half-space. The GNSS observations constrain well most of the model parameters but do not permit to discriminate between south- and north-dipping planes. The interferograms, produced from C-band ESA Sentinel 1 synthetic aperture radar data, give a clear preference to the north-dipping plane. The orientation of the GNSS vectors and the absence of InSAR fringes onshore Kos constrain the fault's length. We also mapped surface motion away from the satellite along the Turkish coast (from Bodrum towards east) which reached about 20 cm onshore islet Karaada. The best-fit model was obtained with a 37° north-dipping normal fault, in agreement with the published moment tensor solutions. The slip vector is dominantly normal in a ESE-WNW direction with a component of left-lateral motion (5°). The surface projection of the seismic fault outcrops in the Gökova ridge area, a well-developed bathymetric feature inside the western Gulf of Gökova (SE Aegean Sea). The seismic fault plane extends 14 km along strike by 12.5 km wide. Our geodetic model is in agreement with relocated seismicity distribution (about 1160 events) from regional networks, which indicates an aftershock occurrence towards both ends of the rupture.