Geophysical Research Abstracts
Vol. 18, EGU2016-3739, 2016
EGU General Assembly 2016

Seismotectonics of the Antalya Basin and surrounding regions in eastern Mediterranean from 8-28 December 2013 Mw 5.0-5.8 earthquake sequence

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The 8-28 December 2013 Mw 5.0-5.8 Antalya Basin earthquake sequence in eastern Mediterranean is examined. Centroid moment tensors for 16 earthquakes with moment magnitudes (Mw) between 3.6 and 5.8 are determined by applying a waveform inversion method. Both earthquakes are shallow focus thrust events at a depth of 40-45 km. The seismic moments (Mo) of the earthquakes are estimated as 4.10 $\times$ 1016 – 5.54 $\times$ 1017 Nm and rupture durations of the mainshocks are 20-22 s. The focal mechanisms of the aftershocks are mainly thrust faulting with a strike-slip component. The geometry of the focal mechanisms reveals a thrust faulting regime with NW-SE trending direction of T-axis in the entire activated region. According to high-resolution hypocenter relocation of the Antalya earthquake sequence, seven main clusters are revealed. The aftershock activity in the observation period between 1 December 2013 and 23 January 2015 extends from N to S direction. Seismic cross-section indicates that a complex pattern of the hypocenter distribution with the activation of seven segments. The westernmost cluster (cluster 1) are associated with a fault plane trending mainly WNW-ESE and dipping vertical, while the cluster 5 is related to a fault plane trending NNE-SSW and dipping towards SSE. The best constrained focal depths indicate that the aftershock sequence is mainly confined in the upper crust (depth $\leq$ 60 km) and are operating in the approximate depth range from 3 to 110 km. A stress tensor inversion of focal mechanism data is performed to obtain a more precise picture of the Antalya Basin stress field. The stress tensor inversion results indicate a predominant thrust stress regime with a NE-SW oriented maximum horizontal compressive stress (SH). According to variance of the stress tensor inversion, to first order, the Antalya Basin is characterized by a homogeneous interplate stress field. The Coulomb stress change associated with two mainshocks are also investigated to evaluate any significant enhancement of stresses along the Antalya Basin and surrounding regions. Positive lobes with stress more than 0.4 bars are obtained for two mainshocks, indicating that these values are large enough to increase the Coulomb stress failure towards NE-SW and NW-SE directions, respectively.