Geophysical Research Abstracts
Vol. 17, EGU2015-4744, 2015
EGU General Assembly 2015


# Source Parameters of Major Earthquakes in the Aegean during 2013-2014: Implications on Recent Tectonics and Deformations

Tuncay Taymaz and Seda Yolsal-Çevikbilen

Istanbul Technical University (İTÜ), The Faculty of Mines, Depatment of Geophysical Engineering, Maslak, TR-34469, Istanbul, Turkey (taymaz@itu.edu.tr; yolsalse@itu.edu.tr)

Intense earthquake activity and volcanism are essentially responsible for complex geological structures in the Aegean and the Eastern Mediterranean Sea regions. During 2013-2014 many moderate earthquakes occurred along the Hellenic subduction zone, the North Aegean Trough (NAT), and the broader Aegean region. In this study, we examined source mechanism parameters and slip distributions of 15 earthquakes, Mw $\geq$ 5.0; 2013-2014, occurred in the region. We retrieve the geometry of active faulting, source characteristics, kinematic and dynamic source parameters and current deformations of the region by using teleseismic body-waveform inversion of long-period P- and SH-waves, and broad-band P-waveforms recorded by GDSN and FDSN stations. In addition, several uncertainty tests were applied to investigate the error limits of minimum misfit solutions. Inversion results exhibit that present-day deformation is mainly driven by convergence between the African and the Aegean plates. Most of our observations are concerned with the southern part of the Aegean and Eastern Mediterranean Sea regions where intense earthquake activity is mainly concentrated along the Hellenic subduction zone. However, there are several significant earthquakes occurred in the northern part of the Aegean Sea. The topography and bathymetry clearly reflect observed deformation styles. For example, source parameters of earthquakes related to the convergence of African and Aegean plates (h < 45 km) show that the outer part of the Hellenic Subduction Zone, especially the south of Crete, is deforming by thrust faulting mechanisms with strike slip components. Earthquakes occurred in the North Aegean Trough (NAT) show mostly right-lateral strike-slip faulting mechanisms consistent with the tectonic characteristics of the North Anatolian Fault (NAF) which extends to the region.