Geophysical Research Abstracts
Vol. 20, EGU2018-14824-1, 2018
EGU General Assembly 2018

Continuing Postseismic Deformation of the Mw 7.1, October 23, 2011 Van (Turkey) Earthquake from GPS and InSAR Observations: Evidence for Complex Faulting on the Turkish-Iranian Plateau

Ahmet M. Akoğlu (1), Ziyadin Çakır (1), Sigurjón Jónsson (2), Semih Ergintav (3), Uğur Doğan (4), Deniz Öz Demir (4), and Seda Çetin (4)

(1) Istanbul Technical University, Department of Geology, Istanbul, Turkey (akoglua@outlook.com), (2) King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia, (3) Boğaziçi University, Kandilli Observatory, Geodesy Department, Istanbul, Turkey, (4) Yıldız Technical University, Department of Geomatics, Istanbul, Turkey

The October 23rd, 2011, Mw 7.1, Van earthquake is the largest instrumentally recorded thrust faulting event in Turkey making it one of the key events towards improving our understanding of the tectonics of the Turkish-Iranian Plateau and the accommodation of the convergence between the Eurasian and Arabian Plates. In addition the coseismic shallow slip deficit on the main fault signifies the importance of postseismic studies from a seismic hazard perspective. Here we will be presenting a new analysis of the postseismic deformation by complementing the data from previous near-field GPS campaigns with >3 years of InSAR measurements between October 2014 and December 2017. Persistent scatterer InSAR method is used to calculate the surface deformation maps from both the descending and ascending orbits of the Sentinel-1 satellites to reveal the extent and the nature of the post-seismic movement. The observations clearly indicate the presence of shallow afterslip along a NE-SW extending sharp discontinuity which is different than the up-dip trace of the causative coseismic fault that lies between Lake Van to the west and Lake Erçek to the east. While the westernmost part of the discontinuity coincides with the earlier recognized aseismic slip on the Bostaniçi (Beyüzümü) Fault, the remaining part of the discontinuity extends towards northeast and reaches the Kozluca Fault on the western coast of Lake Erçek, confirming our earlier coseismic study where that fault was proposed as being part of the main coseismic rupture and bounding it to the east.