

AGU Fall Meeting 2018 <https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/436584>

G23B-0588: Geodetic interpretation of InSAR time series for the M_w 6.1 Iran Earthquake, April 5, 2017

Tuesday, 11 December 2018 13:40 - 18:00 *Walter E Washington Convention Center- Hall A-C (Poster Hall)*

On April 5, 2017, a M 6.1 earthquake occurred about 90 km southeast of Mashhad, Iran. This event was well captured by w interferograms generated from the Sentinel-1A satellite using InSAR (Interferometric Synthetic Aperture Radar). Co-seismic deformation presents a “bulls-eye pattern” of 4 - 5 fringes (corresponding to 11.2 - 14.0 cm line-of-sight deformation) without discontinuity, reflecting the lack of surface rupture at the time of the main shock. Inversion of the InSAR data suggests two possible orientations of the fault plane – southwest dipping or northeast dipping. The ambiguity is resolved by considering aftershocks relocated using seismic data, suggesting the fault plane dips to the northeast.

The 12-day repeat orbit of the Sentinel-1A satellite allows us to generate time-series deformation maps of the study area starting several days before the main shock to about one year after its occurrence. The InSAR observations are compared with available GPS data for accuracy assessment. Total afterslip is calculated and compared to co-seismic slip. We calculate the time-varying moment release based on the temporally and spatially variable slip derived from the InSAR time-series observations. The goal of this research is to improve our understanding of the relationship between co-seismic slip and afterslip, their contribution to total moment, as well as to gain a better understanding of regional tectonics, for improved seismic hazard assessment in the area.

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