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Interseismic strain accumulation along the East Anatolian Fault (Turkey) mapped with Sentinel-1 TOPS data using persistent scatterers InSAR technique

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Forming the boundary between the Anatolian and Arabian plates in Turkey, the East Anatolian fault (EAF) is one of the most important tectonic structures in the Eastern Mediterranean region. Together with its conjugate, the North Anatolian Fault (NAF), it accommodates the westward motion of the Anatolian plate at a rate of $\sim$10 mm/y (Reilinger et al., 2006). We study the interseismic deformation along the eastern section of the EAF using Sentinel-1 (2014-2017) IW (interferometric wide scan) SAR data. Images on one descending (T123) and one ascending (T43) tracks are used to calculate interferograms using GMT5SAR software (Sandwell et al., 2011). The interferograms are then used to map the velocity field with the Stanford Method for Persistent Scatterers technique (STAMPS; Hooper et al., 2012). The results confirm the GPS observations (Reilinger et al., 2006) that the average slip rate of the EAF is about 10 mm/yr. The results also reveal that the 100-km-long Palu segment in the Elazıg-Bingöl seismic gap is exhibiting aseismic creep at the surface. The creep rate varies along the fault reaching, at some places, to the far field plate velocity (i.e. 10 mm/y), implying that significant portion of the elastic strain has been released aseismically. Preliminary modelling with elastic dislocations suggests that some sections of the fault may be creeping from surface down to the entire seismogenic crust.