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Mapping Fault Creep along the North Anatolian Fault (Turkey) using InSAR

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We use Synthetic Aperture Radar Interferometry (InSAR) to detect fault creep along the North Anatolian Fault (NAF) at Ismetpasa (Turkey). Interferograms with temporal baselines ranging between 1.25 and 5 years show that creeping section is about 70 km of long with a creep rate of 10 mm/year in the middle (near Ismetpasa) that diminishes to zero towards the edges. InSAR data indicate 7.7 mm/year of creep rate at Ismetpasa consistent with that deduced from recent instrumental measurements (i.e. 9 mm/year). Our analysis combined with the previous studies suggests that creeping might have commenced following a large earthquake, and thus may be a long-lasting transient deformation. Modeling of the observed data using elastic dislocations suggests that creeping depth is 5-7 km in the middle, decreasing proportionally with creep rate towards the edges (˜E-W).