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Distribution of Interseismic Coupling Along the North and East Anatolian Faults Inferred From InSAR and GPS Data

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The North Anatolian Fault (NAF) has produced numerous major earthquakes. After decades of quiescence, the Mw 6.8 Elazığ earthquake (24 January 2020) has recently reminded us that the East Anatolian Fault (EAF) is also capable of producing significant earthquakes. To better estimate the seismic hazard associated with these two faults, we jointly invert interferometric synthetic aperture radar (InSAR) and GPS data to image the spatial distribution of interseismic coupling along the eastern part of both the NAF and EAF. We perform the inversion in a Bayesian framework, enabling to estimate uncertainties on both long-term relative plate motion and coupling. We find that coupling is high and deep (0–20 km) on the NAF and heterogeneous and superficial (0–5 km) on the EAF. Our model predicts that the Elazığ earthquake released between 200 and 250 years of accumulated moment, suggesting a bicentennial recurrence time.