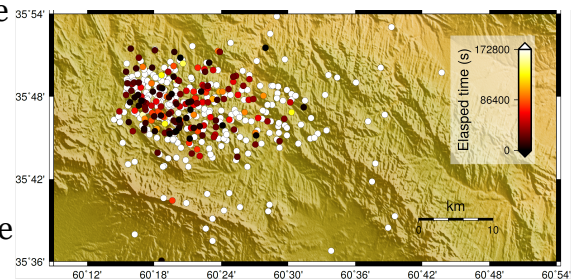
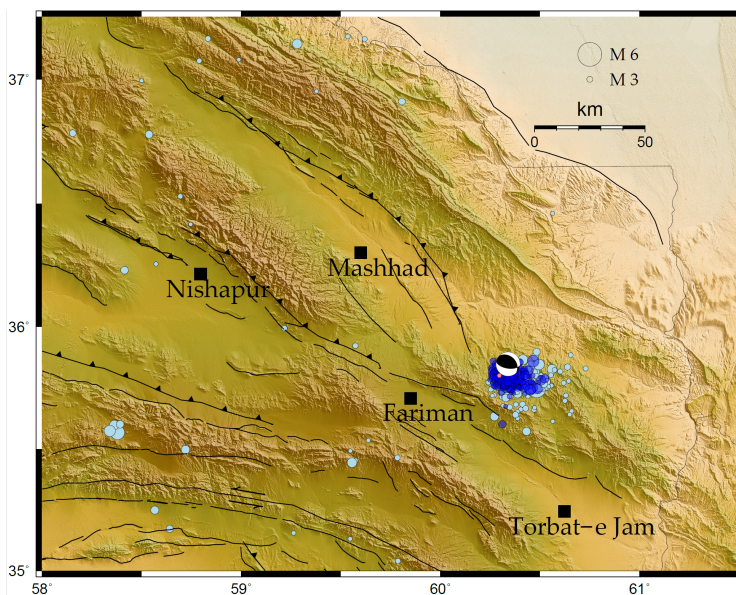
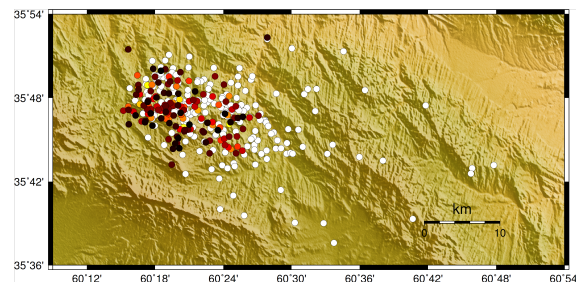
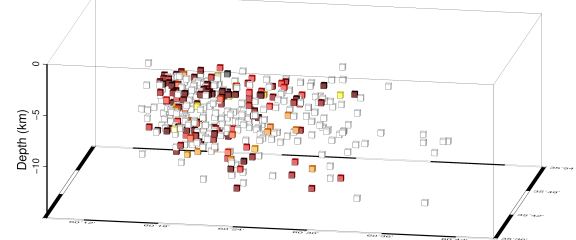


Finding the source fault of the April 2017 Fariman earthquake sequence

Iran, located at the center of the Arabia-Eurasia continental collision, is tectonically complex and high in seismic activity, with five earthquakes of magnitude M_w 6 or larger in the country in 2017 alone. In the region from Nishapur to Fariman in northeastern Iran, there has been only one $M > 6$ earthquake since seismic instrumentation began. In the time span from 1209 to 1405, four M 7 earthquakes occurred on the faults between Nisphapur and Mashhad. Given this history, it is important to understand the fault activity that began with a foreshock on 4 April 2017, followed the next day by a M_w 6.1 mainshock that shook all the way to Mashhad, collapsed numerous houses, injured 40 people, and killed one. As part of a regional moment tensor catalog for $M_w \geq 4.0$ earthquakes in Iran, seismic data from the mainshock and 21 aftershocks were examined. Seven well-constrained moment tensors and centroid depths were resolved; these show shallow, principally reverse faulting in the upper ~ 10 km of the crust with NNE-oriented P-axes consistent with the direction and low rates inferred from GPS data. We combine these moment tensors with aftershock relocations and known faults to better constrain the source fault of the earthquake sequence and understand the seismic hazard implications for the region.



Original hypocenters



Relocated hypocenters

