



Crustal deformation and fault model of the 2017 Gulpinar-Babakale earthquake sequence (Biga peninsula, NE Aegean region): seismological and InSAR evidence

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We study the shallow earthquake sequence onshore Biga Peninsula (NW Turkey, NE Aegean region) that occurred during February-April of 2017 near the villages of Gulpinar-Babakale. We use seismological data (parametric data and Moment Tensor solutions from NOA and KOERI catalogues) and InSAR interferograms (Sentinel-1 satellites) to identify the east-west striking seismic fault and to refine its geometry and kinematics using inversion techniques. The catalog earthquakes were relocated with the HypoDD software and the use of a local velocity model. A south-dipping fault is not retrievable from InSAR but it is clear from seismology and the aftershocks distribution. The spatial distribution of relocated events shows the activation of one fault with a total length of about 12 km. Despite the moderate magnitudes of the main events ($5.0 < M < 5.2$) there is clear surface deformation (maximum 8 cm along descending LOS), which is well visible with InSAR because of the shallow depth of the four main events (6-8 km) and the good coherence of the signal phase. A stress inversion using 20 focal mechanisms ($M > 3.6$; NOA solutions) indicates that faulting accommodates a $N196^\circ E$ crustal extension