

The 1995 Grevena (Northern Greece) Earthquake: Fault model constrained with tectonic observations and SAR interferometry

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Abstract

After the 1995 Grevena $M_s=6.6$ event in northern Greece, we mapped the earthquake fault break in detail. The surface break is small (8-12 km long, 4 cm slip) compared to the moment release of the event. However, the morphologic and tectonic study of the active faults, in the field and using the SPOT satellite imagery, suggests that the earthquake ruptured part of a much larger fault system including interconnecting segments. We used SAR interferometry with ERS1 satellite images to characterize the coseismic displacement field. This shows a kidney-shaped zone of subsidence reaching 34 cm flanked by an uplift zone reaching 6 cm. We reproduce this field using dislocations in a halfspace consistent with our observations of the fault system. This requires 1 m slip from 4 to 15 km depth on a main normal fault segment dipping NNW. Our preliminary model include significant NE dipping tear faulting at the eastern end of the rupture, clearly seen in the interferograms.

Keywords: earthquake, active faults, SAR interferogram, modeling