



Fast characterization of Italian seismogenic sources by the analysis of macroseismic intensities

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We analyse the intensity data collected just after three strong earthquakes ($M_w \geq 6$) that occurred in Italy in the last decade to infer location, orientation and size of the relevant seismogenic faults using the Boxer method. We show that, starting from a couple of days after the earthquake, such analysis could provide a characterization of the seismogenic source with accuracy comparable or even better than instrumental methods that usually require much more time to give stable result. In particular for the 6 April 2009 earthquake, the analysis of macroseismic survey data would have been able to accurately constrain the location, the orientation and the size of the area of maximum coseismic displacement, related to the activation of the Paganica Fault, just starting from the early afternoon of the day of the earthquake. For the 20 May 2012 Emilia earthquake the orientation of the fault is correctly detected although the size is underestimated, due to the underestimation of the assessed MCS intensities, while for the 24 August 2016 Amatrice earthquake both the orientation and the size are correctly assessed.

The analysis of the cumulate intensities observed after the occurrences north of Amatrice of the strong shocks of 26 and 30 November 2016 indicates an overall $M_w=6.8$ that is comparable with that of the largest earthquake reported by the Italian catalogue for the same section of the Apennine chain: the 14 January 1703 Norcia earthquake ($M_w=6.9$).