

## A reappraisal of the 1968 Belice valley seismic sequence: a case study of intensity assessment with cumulated damage effects

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In 1968 six shocks with magnitudes between 5.2 and 6.4 destroyed or heavily damaged several towns in the Belice Valley (western Sicily), causing some three hundred fatalities. Seismologists and geologists provided first reports on field observations mainly on macroseismic features (De Panfilis & Marcelli, 1968; Bosi et al., 1973). Later, Barbano et al. (1980) and Cosentino & Mulone (1985) carried out a-posteriori studies aimed at detailing main and minor shocks; more recently, Guidoboni et al. (2018) produced further analyses based on previous studies and archives' material, newspapers and magazines.

However, these studies show some discrepancies in intensity assessment, since the MCS scale was used as an estimation of shaking rather than a representation of the damage scenario at a given locality. We think that it is a nonsense to assign an intensity 9 after a destructive shock and then 7 for a minor aftershock. The recent survey of the 2016-17 seismic sequence in Central Italy proved the difficulty to estimate macroseismic intensities in localities repeatedly hit by strong shocks and consequently to derive macroseismic parameters (epicentre, magnitude), which result inconsistent with the instrumental locations.

For the 1968 shocks, the catalogue CPTI15 (Rovida et al., 2016) reports macroseismic epicentres, though aware of the bias in locations. Available instrumental data appear poorly constrained, since the inadequacy of the seismic network operating in the late 1960s; only magnitude values may be considered reliable.

Here we propose a reappraisal of the 1968 Belice earthquakes following a methodology tested during the 2016-17 seismic sequence in Central Italy. We re-analyse primary sources, including newspapers and archive documents, to reconstruct the evolution of damage scenario during the sequence and, finally, to assess intensity by using the European Macroseismic Scale.

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