Probabilistic procedure to estimate the macroseismic intensity attenuation in the Italian volcanic districts

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In Italian volcanic areas, we apply a probabilistic procedure for Macroseismic Intensity Attenuation estimates. The procedure, following the Bayesian approach, allows to exploit additional information on historical earthquakes.

The method, given the epicentral intensity and the site-epicenter distance, begins from selected earthquakes intensity data points and ends at the assessment of the intensity (I₀) probability distribution at a site.

Our probabilistic method provides a probability function matrix that can be directly applied for the computation of probabilistic seismic hazard at the site.

The decay trends produced by the clustering algorithm match well the ones published in the past (Azzaro et al., 2006). This suggests that the method could be successfully applied to other cases.

Open questions:
- Most of the earthquakes considered have epicentral intensity VII or VIII (MCS); this makes the probability functions of I₀ conditioned on the other I₀ (VI and IX) not reliable.
- The method should be validated using earthquakes not included in our dataset of Table 1, on the basis of probabilistic measures of the degree to which the model predicts the decay in the data points of a macroseismic field (Rotondi and Zonno, 2004).

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For the Etna region the CMTE local earthquake catalogue has been used.

For the remaining Italian volcanic districts (Aeolian Islands, Vesuvius-Loch, and Alban Hills) the CPTI04 Italian seismic catalogue and the DBMI04 associated database have been considered.

Data
Probabilistic Results
Deterministic Results

References


