



PROBABILISTIC SEISMIC HAZARD ESTIMATES FROM LOCAL SEISMIC HISTORY: A TOOL FOR RISK ASSESSMENT IN URBAN AREAS

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Using macroseismic intensity to parameterize earthquakes effects allows a direct link of hazard assessment with risk estimates in urban areas. This is particularly true in most of European countries where long lasting documentary history is available about the effects of past earthquakes. The computational code SASHA (Site Approach to Seismic Hazard Assessment), was developed to allow a coherent probabilistic analysis of intensity data locally available (site seismic histories) to provide hazard estimates in terms of intensity by taking into account the specific nature of intensity (ordinal, discrete, finite in range, site-dependent) and relevant uncertainty (completeness, ill-definition of the oldest earthquakes, etc.). Thus, it resulted of specific interest in the frame of the EU research project UPStratMAFA “Urban Disaster Prevention **Str**ategies Using **MA**croseismic Fields and **FA**ult Sources” (*Grant Agreement n. 230301/2011/613486/SUB/A5*). In order to extend the application of this approach to sites and countries where local seismic histories are relatively poor, a new implementation of the code was provided, allowing to include in the hazard assessment information coming from different branches (historical studies, seismological instrumental information and numerical simulations). In particular, macroseismic information related to the seismic history locally documented, that represents the bulk of the considered information, can be integrated with “virtual” intensities deduced from epicentral data (via earthquake-specific probabilistic attenuation relationships) and “simulated” intensities deduced via physically constrained stochastic simulations from data on seismogenic faults activated during past earthquakes. This allows a more complete reconstruction of local seismic history and also reducing uncertainty affecting macroseismic data relative to older earthquakes. Some applications of the new SASHA code in different European countries will be described.

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