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Generalized probabilistic seimsic hazard estimates in terms of macroseismic intensity as a tool for risk assessment in urban areas

Dario Albarello (1), Vera D'Amico (2), Renata Rotondi (3), Elsa Varini (3), and Gaetano Zonno (2)

(1) Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente, Università di Siena, Siena, Italy (dario.albarello@unisi.it), (2) Istituto Nazionale di Geofisica e Vulcanaologia, Pisa, Italy, (3) C.N.R. - Istituto di Matematica Applicata e Tecnologie Informatiche, Milano, Italy

The use of 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. This is why the use of the computational code SASHA (Site Approach to Seismic Hazard Assessment), on purpose developed for a coherent probabilistic analysis of intensity data locally available (site seismic histories) to provided 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.), resulted of specific interest in the frame of the EU research project UPStratMAFA "Urban Disaster Prevention Strategies Using MAcroseismic Fields and FAult 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 physical/stochastic simulations from data concerning 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. Results of some applications of the new release of the SASHA code will be described.