



Quantifying Sensitivities of PSHA to seismic source characterization in the Central Apennines, Italy

A. AKINCI (1), A.M. LOMBARDI (1), and D. PERKINS (2)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata, 605, 00143 Rome-Italy (akinci@ingv.it), (2) U. S. Geological Survey, MS 966 Box 25046, Denver, CO 80225 USA (dperkins@usgs.gov)

In this study, we discuss the seismic hazard variability of peak ground acceleration (PGA) and 1-Hz spectral acceleration (SA) in the Central Apennines, Italy. The uncertainty and parametric sensitivity are presented to quantify the impact of different models on ground-motion predictions for 10% exceedance in 50-year hazard. A Monte Carlo approach, based on the random balanced sampling by logic tree, is used in order to capture the uncertainty in seismic hazard calculations. The results are synthesized in different maps: the overall uncertainty maps provide a confidence interval for the PGA and 1Hz SA values and the parameter uncertainty maps determine the sensitivity of hazard assessment to variability of every logic tree branch. The overall variability of seismic source characterization parameters (such as b-value, correlation distance, maximum magnitude, slip rates) is determined by varying them simultaneously in the hazard calculations. We also determined the sensitivity of each parameter to overall variability for a certain annual probability, varying each of those parameters while fixing the others. Distribution of possible seismic hazard results is illustrated by 95% confidence factor (95% C.F.) map, which indicates the dispersion about mean value, and coefficient of variation (COV) map, which shows percent variability.