Geophysical Research Abstracts
Vol. 15, EGU2013-4662, 2013
EGU General Assembly 2013

Toward a new probabilistic model selection and merging for ground motion equations: preliminary results for the Italian region

Roselli Pamela and Marzocchi Warner
Istituto Nazionale di Geofisica e Vulcanologia, Roma (Italy)

The ground motion prediction equation (GMPE) is a basic component for probabilistic seismic hazard assessment (PSHA). There is a wide variety of GMPEs that are usually obtained by means of inversion techniques of datasets containing ground motion recorded at different stations. Basically, the GMPEs differ in terms of the functional relationship used in the inversion, and in the kind of database used. To date, there is not a commonly accepted procedure to select the 'best' GMPE for a specific case; usually, a set of GMPEs is implemented, more or less arbitrary, in a logic tree structure, where each GMPE is weighted by experts according to gut feeling. Here, we investigate on more objective procedures to score GMPEs taking into account their forecasting performances; these procedures may be also used to create a sort of 'ensemble' GMPE. In particular, information theory and statistical procedures (e.g. Kullback-Leibler distance, Bayesian Model Averaging, etc) provide a general framework to define a consistent and objective model selection process. Here, we apply this processing to the Italian territory. At this stage of the analysis, we use only a limited number of GMPEs, but we aim at incrementing significantly this number in the next future. For the ground motion observation, we use the ITalian ACcelerometric Archive - ITACA. This analysis and the comparison of the results with similar analyses carried out by other groups allow us to test different scientific hypotheses: (i) the importance of the focal mechanism; (ii) the importance of regionalization; (iii) the generalizability of GMPEs in a European context; (iv) the sensitivity of different GMPEs to different site conditions. The final purpose is to get objective scores for each GMPE and to realize an ensemble model for the region of interest.