Considering the ranges of uncertainties in the New Probabilistic Seismic Hazard Assessment of Germany – Version 2016

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The seismic load parameters for the upcoming National Annex to the Eurocode 8 result from the reassessment of the seismic hazard supported by the German Institution for Civil Engineering . This 2016 version of hazard assessment for Germany as target area was based on a comprehensive involvement of all accessible uncertainties in models and parameters into the approach and the provision of a rational framework for facilitating the uncertainties in a transparent way. The developed seismic hazard model represents significant improvements; i.e. it is based on updated and extended databases, comprehensive ranges of models, robust methods and a selection of a set of ground motion prediction equations of their latest generation. The output specifications were designed according to the user oriented needs as suggested by two review teams supervising the entire project. In particular, seismic load parameters were calculated for rock conditions with a vS30 of 800 ms-1 for three hazard levels (10%, 5% and 2% probability of occurrence or exceedance within 50 years) in form of, e.g., uniform hazard spectra (UHS) based on 19 sprectral periods in the range of 0.01 – 3s, seismic hazard maps for spectral response accelerations for different spectral periods or for macroseismic intensities. The developed hazard model consists of a logic tree with 4040 end branches and essential innovations employed to capture epistemic uncertainties and aleatory variabilities. The computation scheme enables the sound calculation of the mean and any quantile of required seismic load parameters. Mean, median and 84th percentiles of load parameters were provided together with the full calculation model to clearly illustrate the uncertainties of such a probabilistic assessment for a region of a low-to-moderate level of seismicity. The regional variations of these uncertainties (e.g. ratios between the mean and median hazard estimations) were analyzed and discussed.