[EE] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

[S-SS05]Effective usage of PSHA

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Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Seismic hazard models, including national seismic hazard models (NSHM) of most seismically active countries around the world are used by society for a wide range of applications, such as: optimising insurance rates, foundation of building design standards, large engineering projects and portfolio loss assessments. As such, these models need to be able to meet a wide range of end-user requirements. A crucial part of meeting those needs is to include a realistic assessment in the uncertainty in seismic hazard knowledge, and to translate that in a useful way to end-users and decision makers.

In this session we welcome presentations that address fundamental work in the development of seismic hazard models, particularly those that consider key uncertainties in the modeling and how these uncertainties can be modeled in a useful way for end-users. We have identified the following six dominant themes, but welcome topics from across the hazard and risk spectrum: 1) subduction-zone hazard is poorly understood but is significant source of uncertainty in many regions; 2) a focus on quantifying and including epistemic uncertainty is necessary, including uncertainty in fault and earthquake catalogue source models (and uncertainty due to data quality issues), as well as those in ground-motion prediction; 3) ground-motion simulations are becoming increasingly relevant for the NSHMs and require NSHM specific focus; 4) understanding how to include earthquake clustering and triggering will improve hazard forecasts; and 5) a focus on testing of hazard and model components will lead to improved NSHMs; 6) new approaches to seismic hazard and risk that will improve our understanding and the usefulness of hazard and risk models

[SSS05-P03]How well constrained are earthquake rates in low-seismicity areas?

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Long-term earthquake-catalogue based rates are a necessary and applied ingredient for PSHA in most parts of the world. Even when geological data is available, catalogue-based data is used to supplement this to provide an assessment about the average frequency of events. These types of estimates rely on multiple assumptions including, at least, the following: 1) earthquake occurrence is constant and stationary in time; 2) the time-length of the catalogue used is the best representation of the time-period of interest; 3) the rates are Poissonian; and 4) the earthquakes used to estimate the rates are completely recorded. We show that the uncertainties in long-term rate assessment can be significantly higher than typically considered and are an important contributor to epistemic uncertainty in PSHA calculations. Particularly, special care needs to be taken when using long-term rates in low seismicity areas. In this study we look at the variability in earthquake rate as the sample size decreases and investigate how this uncertainty impacts PSHA calculations.