SESSION 25- Addressing challenges in seismic source characterisation for seismic hazard analysis

Conveners
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Session Description

PSHA continues to be one of the primary methods for converting earthquake and tectonic research into a form useful for decision making against seismic risks. As such, model developers have been tasked with incorporating new modelling approaches based on the learnings of the underlying scientific disciplines that affect PSHA: statistical and observational seismology, geodesy, geology, ground motions and attenuation, physical modelling of deformation, etc. More and more often, this leads to challenges in the model building process, such as difficulties in developing testable model components that match both theory and data, and characterising epistemic uncertainties that result in very large logic trees and intractable calculations. This session calls for contributions addressing the current challenges in PSHA with a focus on seismic source characterisation, including:

- Innovations in the fundamental steps for computing earthquake rates from seismicity catalogues: declustering, completeness analysis, tectonic classification, derivation of occurrence rates.
- Approaches for modelling distributed seismicity, especially in low- to moderate-seismicity regions with data-sparsity
- Fault sources: treatment of faults as individual sources or systems, describing geological uncertainties, incorporating physics into rüptüre generation, handling large slip rate uncertainties (e.g., from different measurement types), relaxing segmentation restrictions and allowing complex multi-rupture scenarios.
- Subduction zones: identifying and considering whether to impose segmentation, incorporating spatially variable convergence and a self-consistent coupling of information (e.g., geodetic, seismicity, slow-slip) into source models, modelling

subduction sources for both seismic and tsunami hazard modelling

- Uncertainty propagation: maintaining correlation among uncertainties, handling large logic trees, sensitivity analysis, testing both components and the full epistemic uncertainty of a model
- Time dependence: advancements on traditional methods, time-explicit or-implicit description of clustering in hazard models, cases where sources may not be “characteristic”, source interaction (e.g., static-stress transfer)

We are especially interested in contributions that focus on individual model components or methods, and that show the implications on seismic hazard results, but presentations of complete PSHA models are also welcome.