



Session 06

Physics-based fault-to-site ground motion modelling for seismic hazard and risk assessment

Conveners:

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Recent progress in understanding earthquake physics, coupled with advances in scientific computing, has opened up stimulating opportunities for physics-based, fault-to-site earthquake simulations. Realistic regional-scale earthquake simulations capable of exploring different earthquake rupture scenarios have a tremendous impact on the estimation of the regional distribution and site-specific intensity of ground motions and related uncertainties for future major earthquakes. They are being used in developing a deep understanding of the underlying physics of earthquake processes and factors controlling earthquake risk. The development of computationally efficient methodologies for large-scale simulations and validation strategies will provide powerful new tool-sets for earthquake hazard and risk assessment.

This session focuses on the methods and applications of physics-based earthquake ground motion simulations capable of handling wave propagation at frequencies of engineering interest. We invite contributions drawing on advances in knowledge of earthquake rupture characterization, including kinematic and dynamic rupture modeling, wave path and site effects representations using velocity models with multi-scale variability, with linear and non-linear material properties. We also welcome presentations on evaluating the performance and applicability of these simulation methodologies in the framework of seismic hazard and risk assessment of urban areas. Additionally, we seek contributions to the development of non-ergodic ground-motion models using both recorded and simulated data and their implication for probabilistic seismic hazard models in different regions of the world.

