



## Session 36

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### Advances in strong ground motion simulation for urban hazard/risk assessment and risk reduction

**Conveners:**

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Dense population and urbanization in regions prone to high seismic activity bring the realistic estimation of future large earthquakes into prominence to mitigate the seismic risk by predicting the seismic hazard better. Seismic hazard assessment (SHA) studies can be conducted using a variety of approaches that vary in terms of sophistication of methodology. Although the empirical methods are the most popular, those methodologies may fail to capture the effects of complex mechanisms associated with the source, path, and site on the ground motion (GM). GM simulation techniques provide a robust tool to produce realistic synthetics that can be observed over a region, especially for regions where a limited number of recordings are available. The 3D physics-based GM simulation techniques are powerful in generating realistic synthetics at any arbitrary spatial location for earthquakes with varying magnitudes considering the irregularities at the source, within the earth medium and on the surface. The methodology can provide near-fault recordings of large earthquakes, which are scarcely collected by digital instruments. Additionally, the variation in the intensity measures and/or GMs due to phenomena such as the basin effect, directivity effect, spatial correlation, and topographical effects can be studied in detail using the simulated GMs.

The overarching aim of this session is to discuss the potential of Strong Ground Motion Simulation Techniques (stochastic, physics-based, hybrid, and holistic methods which include elements at risk) to better predict Seismic Hazard and Seismic Risk of Urban Areas, as well as recent developments and applications of these methodologies.