

SESSION 35- Operational Seismology: Developing Tools for Urban Environment Characterisation, Seismic Risk Reduction, Disaster Management, and Rapid Disaster Response

Conveners

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Session Description

Understanding and managing seismic risk in urban environments requires a comprehensive perspective on how the built environment, critical infrastructure, underlying soils, and societal exposure interact before, during, and after earthquakes. Rapid urbanization, increasing infrastructural complexity, and the demand for actionable seismic information underscore the need for approaches that connect detailed physical characterization with operational, real-time decision-support tools.

This session welcomes contributions focused on the characterization of the urban subsoils, buildings, infrastructure, and cultural heritage; the dynamics of soil–structure and site–city interaction; and assessments of exposure, vulnerability, damage, and losses. We encourage studies employing empirical measurements—such as earthquake and noise recordings—and the use of emerging observational technologies, including dense seismic arrays, DAS, remote sensing, and AI-powered tools.

In parallel, the session invites research on operational seismology applications that support emergency response and disaster risk management. Topics may include real-time ground-motion analysis, empirical or physics-based earthquake scenario modelling, structural response monitoring, rapid impact estimation, automated structural assessments, dynamic vulnerability models, and integration with early-warning systems. Case studies, methodological advances, and interdisciplinary



frameworks that demonstrate how seismic data and models can improve emergency management, guide response actions, and cross-border emergency exercises are particularly encouraged.

