SESSION 36- Advancing the Next Generation of Earthquake Hazard and Risk Assessment in Europe, the Middle East and Worldwide (EFEHR Session)

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Session Description

Assessing and managing earthquake hazard and risk is a central challenge in protecting societies, critical infrastructure, and the built environment. Probabilistic Seismic Hazard and Risk Assessment (PSHRA) provides the scientific framework that links earthquake processes with engineering practice and policy decisions. As new technologies, data, and computational methods reshape how earthquakes are modelled and their impacts quantified, the field is entering a new era of innovation and interdisciplinary collaboration.

The European Facilities for Earthquake Hazard and Risk (EFEHR) brings together leading institutions dedicated to advancing transparent, open, and reproducible methodologies for seismic hazard and risk modelling. This session will showcase ongoing and emerging efforts to modernise PSHRA, emphasising both methodological innovation and practical implementation.

We welcome submissions related to various topics in the field of probabilistic seismic hazard and risk assessment, including: advances in seismogenic source characterisation for time-independent and time-dependent models; integration of geological and geophysical datasets; insights from physics-based and multi-cycle earthquake simulators; developments in ground-motion modelling, including refined ergodic and non-ergodic formulations, site and path effects, and the use of physicsbased simulations. We also welcome submissions highlighting progress in modelling secondary

and cascading hazards in seismic risk assessment, such as liquefaction, landsliding, co-seismic fault displacement, and tsunami.

Further emphasis will be placed on improving the representation of the built environment within seismic risk models through new data sources and empirical and analytical methods that capture the evolving characteristics and performance of structures. The session will also consider innovative approaches for quantifying and communicating uncertainties, addressing both epistemic and aleatory components, and enhancing model validation and benchmarking.

This EFEHR session brings together researchers, engineers, and policymakers to define a shared vision for the next generation of PSHRA. It promotes scientific excellence, computational innovation, and practical implementation, aiming to support a safer and more earthquake-resilient society across the globe. We look forward to fruitful discussions that foster collaboration, inspire new research directions, and strengthen the collective capacity to advance earthquake hazard and risk assessment in the coming decade.