Session ID: GEO-8

Title
THE INFLUENCE OF SEISMIC INPUT, SITE EFFECTS, AND SOIL-STRUCTURE-INTERACTION ON FRAGILITY CURVES

Convenors
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Description
Fragility curves are a vital component in the methodological framework for seismic risk assessment by providing the probability of exceedance of a specific damage state conditioned on a selected ground motion intensity measure (IM). State-of-the-art approaches to derive fragility curves subdivide into: (1) empirical, based on the statistical processing of post-earthquake damage surveys, (2) analytical, relying on non-linear dynamic numerical analysis on selected building typologies, and (3) hybrid.

Despite the numerous approaches proposed, there are still unresolved methodological issues and uncertainties surrounding seismic fragility analysis. These include questions regarding the seismic input characterization, the impact of soil-structure interaction and site conditions on fragility, and how simulated earthquake ground shaking can be used to improve fragility curves. The availability of post-earthquake damage data from recent significant events, advancements in numerical algorithms for accurately modeling non-linear structural responses, and the use of physics-based simulations to generate simulated ground motions in areas where records are scarce have contributed to partially addressing these questions. Significant efforts have been done in this direction in Italy, especially after the earthquakes of the last two decades, by the ReLUIS university consortium, which led some of the conveners to propose this Technical Session.

We encourage the submission of abstracts on the following aspects:
- Development of innovative methodologies to derive seismic fragility curves, with particular reference to multi-risk assessment frameworks;
- Evaluation of the efficiency and sufficiency of several ground motion IMs;
- Dependence of seismic fragility on local site conditions;
- Incorporation of SSI effects in seismic fragility curves;
- Utilization of simulated ground motions and shaking scenarios for site-specific seismic fragility studies.

Invited Speakers
E. Saez [4], A. Penna [5], F. Jalayer [6], S. Lagomarsino [7], C. Galasso [6], B. Borzi [8]

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