

SESSION 33- Design and Analysis of Passive Control Systems from the Lens of Earthquake Engineering and Seismology

Conveners

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Session Description

The use of innovative technologies plays a significant role in reducing earthquake risk. Today, seismic isolation technology and energy dissipation devices have many applications. They are used in designing structural systems within infrastructure and in the built environment, as well as strengthening existing structures. Since passive control systems often have low redundancy, selecting, analyzing, and optimizing the best system requires a holistic approach. This process begins with site-specific studies, followed by careful record selection and scaling to comply with the seismic hazard analysis of the site of interest. Recent advances in computer technology and materials science provide seismologists, earthquake engineers, and stakeholders with a wide range of solutions towards earthquake resiliency. This special session aims to gather academics, researchers, practitioners, and suppliers. The goal is to share cutting-edge technologies, collaborate, and discuss innovations in structural control strategies and hazard analysis for critical components of the built environment.

Topics of interest:

- Seismic hazard analysis of critical facilities for passive control systems
- Earthquake record selecting and scaling for passive control systems
- Case-studies of active and passive structural control systems in practice.
- Advances in numerical modelling and simulation of passive control systems.
- Development of new devices for practice-oriented approaches
- Code-based approaches and critical perspective of standards and guidelines.
- Insights from comprehensive collaborations between suppliers and designers.



- Experimental activities in seismic control strategies (e.g., prototype testing, qualification tests, shake-table tests, structural health monitoring)
- Design procedures and seismic retrofitting through passive control systems
- Structural Health Monitoring of Seismically Isolated Structures
- *Influence of Near-Fault Ground Motions on the Design*
- *Cost-effective earthquake protection systems*

