Session ID: GEO-3

Title
GEOTECHNICAL SEISMIC ISOLATION (GSI)

Convenors
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Description
Recent events in Turkey and Syria once again reminded us of the devastating power of earthquakes, especially if they occurred in impoverished regions of the world. New seismic design philosophies and approaches that can be conveniently, economically and universally adopted are desperately needed. Geotechnical Seismic Isolation (GSI) has been developed with this vision and purpose in mind.

Base isolation is a low-damage seismic design technology that can enhance the resilience of buildings and bridges. GSI is an emerging class of base isolation techniques that involve direct contact with geomaterials. This new research area has attracted global interest and gained momentum through a decade of research. It comes to a stage when a more systematic and collaborative global effort is required to take this technology to another level. This is one of the motivations behind this proposal of a technical session. A technical session on GSI of over two hours was successfully organised at the 3ECEES in Bucharest in 2022. There is also an ongoing special issue on GSI in the Bulletin of Earthquake Engineering, co-edited by H.-H. Tsang and K. Pitilakis.

Various reputable groups from all around the world have proposed different schemes of GSI based on the use of different materials (e.g. rubber-soil mixture, polyurethane, EPS geofoam, super absorbent polymers, metamaterials, geosynthetics, PVC, etc.), which reduce the seismic demand through dynamic soil-structure interaction, rocking or sliding between the structure and the foundation soil, or wave filtering/scattering using soil improvement techniques. Enabled by the recent advancement of relevant research techniques, such as analytical modelling, laboratory tests, or large-scale field testing of dynamic soil-structure interaction (e.g. the EuroSeistest-EuroProteas model structure), it is timely to exchange research ideas and consolidate the development of GSI.

Invited Speakers
A. Flora [4], S. Banerjee [5], A. Edincliler [6], J. Bernal-Sanchez [7], I. Banovic [8], Z. Cheng [9], G. Chiaro [10], G. Abate [11], V. Lentini [12], D. Forcellini [13]

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