

**Session ID:** EXP-3

**Title**

EXPERIMENTAL MECHANICS FOR EARTHQUAKE ENGINEERING: NEW TRENDS, NEW CHALLENGES

**Convenors**

D. Seyedi <sup>1</sup>, I. Politopoulos <sup>1</sup>

**Description**

Experimental facilities are widely used in order to carry experiments in real situation, or close to reality, in order to better understand the behavior of structures during an earthquake and to develop solutions to make them more resistant. New challenges arise in this domain such as scaling down large structures and similitude laws, nonconventional and new materials, and testing under extreme and multihazard conditions. Experimental facilities such as shaking tables use high power hydraulic actuators to apply dynamics loads to structural specimens. However, controlling the hydraulic actuators of the tables is still a challenging task, requiring a close dialogue between model and measurements. Dynamics or pseudo dynamic Hybrid tests allow testing experimentally a structural component of interest, while the remaining parts of the structure, inertia and damping forces, are modeled numerically. An efficient experimental simulation coupling thus must be set up. When dealing with nonlinear models, the integration of experimental data requires robust techniques to detect the initiation and propagation of damage within the tested structures. Different monitoring techniques have been developed to this end using different kind of sensors or optical measurements. Another field of development concerns soil dynamics and soil structure interaction problems. Experimental investigation of such phenomena is facing various technical and theoretical difficulties. This technical session is dedicated to recent advances in experimental mechanics applied to earthquake engineering problems. Topics of interest for this technical session are: (i) Scaling down structures for shaking table tests, (ii) Control of shake tables and other experimental devices, (iii) Hybrid tests in earthquake engineering, (iv) Model updating techniques, (v) Use of digital image correlation techniques in earthquake engineering, (vi) Experimental studies of soil dynamics and soil structure interaction.

**Invited Speakers**

A. Sextos <sup>2</sup>, J. Hashemi <sup>3</sup>, S. Bousias <sup>4</sup>

**Affiliations**

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