

**Session ID:** CHH-4

**Title**

MODELLING STRATEGIES FOR RELIGIOUS BUILDINGS: SEISMIC ANALYSES AND EVALUATION OF INTERVENTIONS

**Convenors**

F. Da Porto <sup>1</sup>, E. Vintzileou <sup>2</sup>

**Description**

As proved by recent earthquakes worldwide, seismic vulnerability of religious buildings is higher than that of ordinary buildings. The source of vulnerability lies in the peculiar architectural and structural layout, characterized by i) limited in number, perimeter load-bearing walls (façade, side walls, etc); ii) interior open spaces, frequently without shear walls or bracing systems; iii) curved thrusting elements at their top (e.g. arches, vaults), iv) forming a flexible horizontal diaphragm, usually not ensuring redistribution of seismic actions. These weaknesses are in many cases paired with very slender load-bearing walls, as well as with masonry of poor quality.

These aspects highlight not only the need to mitigate the intrinsic vulnerability of religious buildings, but also the complexity connected to the analysis phase. Indeed, wide-spread and well-established modelling and analysis methods, used for evaluating the seismic vulnerability of buildings, rely on hypotheses that do not account for the aforementioned characteristics in a reliable way. Thus, various modelling approaches have been developed with the purpose of providing a better understanding of the seismic behaviour of those specific structures. In this TS, issues covering recent advances in modelling and analysis of religious buildings, including the use and comparison of various modelling strategies, their implementation to select and evaluate possible interventions, and the significance of the preliminary knowledge phase, will be discussed.

This session is also based on the experience of the EAEE WG10 dealing with 'Seismic Aspects of Historical Monument Preservations', and on the intense work that has been carried out in Italy after the recent earthquakes by the ReLUI consortium, within the WP5.3 'Interventions on religious buildings' task. The TS will try to give a contribution to the definition of more effective procedures to analyse such buildings type, and to mitigate its seismic risk.

**Invited Speakers**

A. Turer <sup>3</sup>, A. Miltiadou-Fezans <sup>4</sup>, L. Pelà <sup>5</sup>

**Affiliations**

<sup>1</sup> University of Padova, Padova, Italy, <sup>2</sup> National Technical University of Athens, Athens, Greece, <sup>3</sup> Middle East Technical University, Ankara, Turkey, <sup>4</sup> National Technical University of Athens, Athens, Greece, <sup>5</sup> Universitat Politècnica de Catalunya, Barcelona, Spain