Seismic Vulnerability of Classical Monuments

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Abstract Classical monuments are articulated structures consisting of multi-drum columns made of discrete stone blocks that are placed one on top of the other without mortar. Despite the lack of any lateral load resisting mechanism except friction, classical monuments are, in general, earthquake resistant, as proven from the fact that they have survived several strong earthquakes over the centuries. However, in their current condition, they present many different types of damage that affect significantly their stability. This lecture presents the results of theoretical and experimental research on the earthquake resisting features and the assessment of the vulnerability of these structures, which is not straightforward due to the high nonlinearity and the sensitivity of the response. Recent trends towards a performance-based philosophy for their seismic risk assessment, based on conditional limit-state probabilities and seismic fragility surfaces, are also discussed.

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