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Experimental and Numerical Analysis of a Historical Bell Tower

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Abstract : In this paper, a procedure for the evaluation of seismic behavior of slender masonry structures (towers, bell towers, chimneys, minarets, etc.) is presented. The presented procedure is based on a full three-dimensional modal analyses and frequency measurements. As well-known, masonry is a composite material formed by bricks, or stone blocks, and mortar arranged more or less regularly and adopted for many centuries as structural material. Dynamic actions may represent the major risk of collapse of brickworks, and despite the progress achieved so far in science and mechanics; the assessment of their seismic performance remains a challenging task. Then, reliable physical and numerical models are worthy of recommendation. In this paper, attention is paid to the historical bell tower of the Basilica of Santa Maria Gloriosa dei Frari - usually called Frari - one of the greatest churches in Venice, Italy.

Keywords : bell tower, FEM, masonry, modal analysis, non-destructive testing
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