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Seismic Vulnerability Assessment of Historic Masonry Buildings through Fragility Curves Approach

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The assessment of the seismic vulnerability of built heritage is still an open issue. Regarding this topic, in recent years many researchers have worked in the development of refined numerical models to simulate the behaviour of different building typologies subjected to seismic action. To be reliable, these models require in-depth knowledge of the building object of study.

In many countries, such as Italy, where the widespread historical heritage is widely present, there is the need to define quick, but reliable, evaluation procedures, which allow, in advance, to assess the vulnerability of the historical heritage of an entire area using databases already present without necessarily proceeding with detailed investigations on each building. This procedure has already been adopted in some case studies to compute a vulnerability index [1] or a safety factor for the structures examined [2].

Based on procedures in the literature, the authors have developed a forecasting methodology focused on the construction of fragility curves, safety factor vs PGA and vulnerability index, which allows to formulate hypotheses on the probable behavior of a specific type of building, to any similar actions and the probable expected damage. In the view of proceeding to the safety of a small historic village in an area with a high seismic propensity, this procedure could be useful for prioritizing interventions in probabilistic terms.

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