The use of macro element approach for the seismic risk assessment of brick masonry buildings

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**ABSTRACT**

Unreinforced masonry [URM] is the dominant structural type for low to moderate-rise buildings in many Balkan countries including Albania. Its dynamic response is highly inelastic, and generally shows high vulnerability to earthquake loading. In literature, there a number of methods available to evaluate the seismic performance of these buildings. The choice of the proper model to use is a matter of paramount importance, as many aspects must be taken into account in order to reach a good approximation of the structural behavior. Within this context, this paper aims to make seismic risk assessment by following the equivalent frame approach based on macro-element modeling. Due to the resource and time efficient computations, this approach is becoming more popular among the practitioners and field experts in this area and allows simulating the non-linear behavior of masonry buildings. This method will be applied to two old masonry buildings from the Albanian construction practice that are representatives of low- and mid-size residential buildings. Capacity curves of the investigated building will be determined to assess the most probable seismic response of the investigated housing construction in the region under selected ground motions. Finally, estimated results will be used to evaluate the seismic risk of the tested structures.

**Keywords:** Macro-element approach, seismic vulnerability, TREMURI software, unreinforced masonry buildings.