Historical reconstruction and in-situ inspections of a cultural heritage masonry building

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ABSTRACT

Recent seismic events that hit the Centre Italy have highlighted the high vulnerability of the historical and architectonical heritage of Italy. The monumental buildings such as churches or historical palaces, even if they are characterized by a better quality of masonry (square stone blocks or solid bricks arranged according to a regular wall texture) than traditional masonry, have suffered heavy damage during earthquake, mainly due to their inherent vulnerability for the horizontal actions. The knowledge of the building is an indispensable process to understand the seismic behaviour and the structural analyses provide a reliable and objective seismic vulnerability assessment. Currently, the usage of numerical models to assess the seismic safety of historical structures is gaining increasing interest. However, these models need a significant amount of information for their preparation. In the present paper the historical reconstruction is developed for an important nineteenth century astronomical observatory, constructed between 1816 and 1819. Moreover, the building, located in Naples, the southern part of Italy classified by the Italian code as an area of medium seismic hazard, is analysed by the use of integrated investigation activities such as coring, flat jack tests, thermography to obtain all the desirable information due to the variability of the materials and the influence of previous alterations and repairs.

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