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STRUCTURAL FEATURES OF ST. MICHELE ARCANGELO CATHEDRAL IN CASERTAVECCHIA, ITALY: A PRELIMINARY INVESTIGATION

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Abstract.

Historical masonry monuments, among which churches and religious buildings represent a conspicuous part in Europe, are prone to severe damage and even destruction in case of exceptional loadings as earthquakes. Seismic assessment and protection of such structures has thus become a high-priority goal as well as an exceptional challenge given the complex and interdisciplinary nature of the activities needed and the constraints represented by the safeguard of their outstanding cultural and historical values. In this paper, the majestic cathedral of St. Michael Arcangelo in the medieval village of Casertavecchia, Italy, is investigated from both historical and structural points of view. The church is the result of successive constructions, modifications and restorations, as well as transformations that occurred over the centuries. The construction of the cathedral started under the Norman domination in 1113, and the works were completed in 1153. The present study is addressed to the enhancement of the knowledge of this monument, through an in-depth historical analysis and a preliminary structural assessment by means of numerical modelling. Hence, documental research has been firstly performed to obtain information about its primary construction as well as any subsequent interventions occurring over time. An accurate geometric survey of the actual configuration has been carried out to detect the complex three-dimensional geometry of the structure. Furthermore, the structural constructive details and the degradation state of the structural elements have been surveyed and documented. Thanks to the collected data, a preliminary Finite Element model has been developed, with the aim of identifying the most vulnerable areas of the church and investigating its seismic response.