Research on architectural form and structural performance of the brick-vault hall heritage in China- A case study of Yongzuo Temple

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ABSTRACT

Brick-vault hall heritage is a special type of architectural heritage in China, which is very different from western masonry vault heritages. Most of these brick-vault halls were built in the Ming dynasty (1368-1644), and they all have some damages in different degree. In order to study the architectural form and the structural performance of this special type of architectural heritage, the brick-vault hall of Yongzuo Temple was taken as an example to study. The accurate geometrics dimension of this building was first obtained by the survey of three dimensional laser scanner. Then, with the comparative analysis of some relevant historical literatures, the architectural form of this building was studied. Furthermore, the material strength was achieved with the non-destructive testing method, the finite element model of this building was built up to analyze its structural performance based on the accurate geometric dimension and the accurate material strength. The results can provide the basis and reference for the conservation strategy of this type of architectural heritage.

Keywords: Brick-vault hall; Yongzuo Temple; architectural form; Structural performance; Finite element method

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