Analysis of the long and short-term effects of temperature and humidity on the structural properties of adobe buildings using continuous monitoring

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The analysis of the evolution of modal properties and its relationship with changes in environmental properties (i.e. ambient temperature and relative humidity) is of high importance since their effects along time can mask the influence of structural damage. While structural monitoring studies to assess the relationship between modal parameters and environmental conditions are abundantly available for modern materials constructions (i.e. concrete or steel), very few studies are reported for adobe buildings. The present paper focuses on the study of the short and long-term structural behavior of existing adobe buildings through the long-term monitoring of ambient vibration and environmental conditions. With this purpose, the paper describes in detail the case study of the San Pedro Apostol Church of Andahuaylillas located in Cusco, inside the Andean region of Peru, a 16th-century church considered as a masterpiece of South American baroque architecture. The paper star