



Relationships between evaporation and moisture content in historical masonry

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The “material’s evaporative behaviour” describe how on site materials evaporate in real conditions, not only due to indoor conditions (air temperature and humidity ratio, etc), but also because it is influenced by multiple factors (building systems, materials, environmental conditions, etc), some of which can difficult the evaporation process, such as as hygroscopic salts presence. This evaporative behaviour may or may not have a direct relation to the actual moisture within the walls. This paper presents thermohygrometric data and a electrical resistivity survey from a half-buried wall of the Hermit of Humilladero (Ávila, Spain 16th century), a building that displays intense moisture-related decay in that wall. Thermohygrometric data allowed characterising the evaporative behaviour while the resistivity survey allowed inferring the moisture in the masonry. Salt’s presence was also mapped. These sets of data were statistically analysed to observe the significance of the correlation, if any and characterise the evaporative behaviour by discerning the different information obtained from each technique. The different measurements obtained by these techniques were combined using GIS software. This allowed obtaining maps that combine evaporation and moisture data represented by “factors” (i.e. a global value obtained as a sum of different properties). The combination of these tests allowed a better characterization and understanding of wetting and drying cycles aiming to develop a correct diagnosis system.

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