



## **Sensor technologies and non-destructive monitoring for dampness diagnosis in cultural heritage**

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This work presents a case study based on results of monitoring campaigns developed in San Juan Bautista church in Talamanca de Jarama (Madrid, Spain). This Church was built in the twelfth-thirteenth centuries (Romanesque style) with dolostone ashlar. It was reconstructed in the sixteenth century (Renaissance style) with rubble stone and mortar, brick and an earth fill.

Different sections on walls and floors (north and south oriented) have been selected based on a preliminary study of moisture distribution on stone and masonry wall. The behavior of different materials has been studied according to the influence of indoor (microclimatic conditions) and outdoor conditions (weather conditions) and taking into account constructive facts.

Several sensing technologies as dataloggers and wireless sensor networks (WSN) together to other non invasive techniques as thermal imaging, portable moisture meter, electrical resistivity tomography (ERT) and ground-penetrating radar (GPR) have been conducted.

By means of this study it has been possible to establish an analysis methodology to determine the dampness origin in each case. Conclusions related to the each technique according to its effectiveness in the detection of decay problems have been established.

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