



Combining indoors thermo-hygric survey, thermal imaging and Electrical Resistivity Tomography through GIS for the characterization of moisture in historic buildings

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This paper presents the results of the combination, through a GIS, of environmental indoors thermo-hygric parameters and Electrical Resistivity Tomography in the hermit of “Humilladero”, a small historic building in the city of Avila (Spain). The Hermit of “humilladero” was built 1548 – 1550 and it underwent several refurbishment works throughout its history until the present day. The hermit is formed by two rooms and a basement: The hermit per se, a sacristy which was added at a later stage towards the east of the hermit and the basement excavated under the sacristy in 1990. The south wall is nowadays half buried by the adjacent street pavement and a staircase attached to the east wall. The walls are built with granite ashlar and the whole building displays severe moisture-related damage, including granular disaggregation of mortars and some ashlar. The most affected areas are the ones buried under the street towards the south and the staircase towards the east where liquid water appears from time to time due to infiltrations through the ground.

A mesh of thermo-hygric measurements of the indoors environment of the hermit was carried out to detect the humidity focal points, in addition to Electrical Resistivity Tomography and Infrared thermography on the walls. All these data was uploaded to a GIS (ArcGIS) together with a photogrammetric model of the decayed areas. The combination of the information in the GIS improved decay maps and allowed a better diagnosis of the building moisture distribution and causes.

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