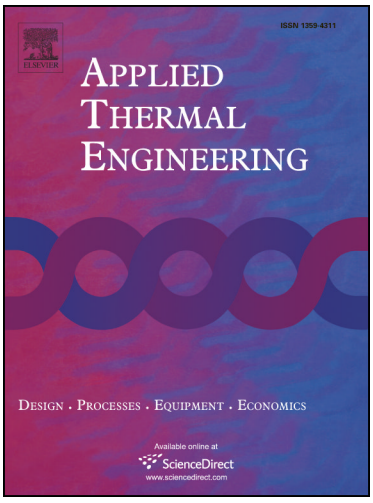


Research Paper

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# Improvement of thermal comfort and energy efficiency in historical and monumental buildings by means of localized heating based on non-invasive electric radiant panels

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## ABSTRACT

Energy efficiency and thermal comfort in historic buildings are very often hampered by preservation needs. This issue is particularly relevant for historical and monumental buildings, which currently represent a large part of the historic buildings stock in Europe. For such protected buildings most of the available retrofitting solutions are not feasible and alternatives have to be investigated to guarantee their usability potential. The purpose of this study is therefore to present a methodology to evaluate the potential of electric radiant panels as retrofitting solutions for historical and monumental buildings, focusing on thermal comfort and energy saving potential when compared with conventional fossil-fuel-based heating systems. In fact, the non-invasiveness and flexibility of electrical panels make them one of the few feasible solutions for protected buildings.

An original methodology is developed to evaluate the performance of such localized heating systems; the methodology is based on a dynamic simulation model, calibrated with

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