THE INFLUENCE OF POROSITY ON THERMAL COMFORT IN AN ISOLATED HABITAT OF THE ROOF BY A POROUS MEDIUM

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ABSTRACT

The large share of energy consumed for the heating or cooling of buildings has led researchers to address the issue of heat exchange between the premises and the environment.

Since much of the heat loss occurs through the roof, insulating materials slow down heat transfer through the building envelope. The quality of the insulation required depends on the climate, the exposure of the roofs and also the materials used for the construction. The choice of a material used as insulation depends naturally on its availability and cost. In this study, we propose to analyze the heat transfer in a ceiling-insulated building by a porous medium (glass wool), based on the effect of porosity on the heat exchange of the building and the external environment. For this purpose, Multiphysics-based Comsol software based on the finite element method was used to solve the equations governing heat transfer in the fluid medium as well as the porous medium. The results will be in the form of current lines, isotherms, temperature profiles and Nuselt numbers

KEYWORDS: **Darcy**-Brinkman, finite elements, inclined roof, porous medium, thermal insulation