

Heat and Mass Transfer in a Saturated Porous Medium Confined in Cylindrical Annular Geometry

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Abstract : This paper reports the numerical simulation of double diffusive natural convection flows within a horizontal annular filled with a saturated porous medium. The analysis concerns the influence of the different parameters governing the problem, namely, the Rayleigh number Ra , the Lewis number Le and the buoyancy ratio N , on the heat and mass transfer and on the flow structure, in the case of a fixed radius ratio $R = 2$. The numerical model used for the discretization of the dimensionless equations governing the problem is based on the finite difference method, using the ADI scheme. The study is focused on steady-state solutions in the cooperation situation.

Keywords : natural convection, double-diffusion, porous medium, annular geometry, finite differences

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