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Ramdane Younsi

COMPUTATIONAL ANALYSIS OF MHD FLOW, HEAT AND MASS TRANSFER IN TRAPEZOIDAL POROUS CAVITY

ABSTRACT

Numerical simulations are conducted for two-dimensional steady-state double diffusive flow in a trapezoidal porous cavity, submitted to axial magnetic field. The Darcy equation, including Brinkmamn and Forchheimer terms account for viscous and inertia effects, respectively is used for the momentum equation, and a SIMPLER algorithm, based on finite volume approach is used to solve the pressure-velocity coupling. An extensive series of numerical simulations is conducted in the range: 103 £ Ra £ 106, 1 £ Ha £ 102, Da =10^{-5}, N = 1, and Le = 10. It is shown that the application of a transverse magnetic field normal to the flow direction decreases the Nusselt number and Sherwood number. Illustrative graphs are presented.

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