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Effect of Coriolis Force on Magnetoconvection in an Anisotropic Porous Medium

Authors : N. F. M. Mokhtar, N. Z. A. Hamid

Abstract : This paper reports an analytical investigation of the stability and thermal convection in a horizontal anisotropic porous medium in the presence of Coriolis force and magnetic field. The Darcy model is used in the momentum equation and Boussinesq approximation is considered for the density variation of the porous medium. The upper and lower boundaries of the porous medium are assumed to be conducting to temperature perturbation and we used first order Chebyshev polynomial Tau method to solve the resulting eigenvalue problem. Analytical solution is obtained for the case of stationary convection. It is found that the porous layer system becomes unstable when the mechanical anisotropy parameter elevated and increasing the Coriolis force and magnetic field help to stabilize the anisotropy porous medium.

Keywords : anisotropic, Chebyshev tau method, Coriolis force, Magnetic field
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