

Analysis of Heat and Mass Transport in Extended Brinkman Darcy Porous Medium: Triple Diffusive Convection

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ABSTRACT

The simultaneous action of the rotational modulation and the third diffusive component on the onset of Rayleigh Benard convection in an extended Brinkman-Darcy porous layer is studied by analytical method using Weakly non-linear theory. The rotational speed of fluid is assumed to be modulated by small parameter ϵ^2 and the two concentrations are assumed on lower and upper plate. The value of critical Rayleigh number is obtained for the three different cases. Moreover, weakly non-linear theory and the method of perturbation is applied to obtain an autonomous differential equation known as Ginzburg Landau's equation. The solution of the Ginzburg Landau equation and the graphs are plotted by the software MATHEMATICA.

Keywords: Rotational Modulation, Porosity; Brinkman Darcy Porous medium; Ginzburg Landau Equation; Rayleigh-Benard Convection.

