

Magnetoconvection in a Soret driven binary fluid mixture induced by temperature dependent viscosity

ABSTRACT

Thermosolutal Rayleigh-Benard convection in a binary fluid heated from the below is studied numerically. Soret effects are imposed to analyze the thermo-diffusion effects on the flow. We study the onset of convection in a horizontal binary fluid layer with the effect of temperature dependent viscosity together with vertical magnetic field. The confined boundaries of the binary fluid layer are considered to be free-free, rigid-free and rigid-rigid which described the lower and upper surfaces respectively. The Galerkin method is implemented through the numerical computations in order to observe the stability of the binary liquid mixture and the effect of magnetic field, temperature dependent viscosity and Soret effect to the critical Rayleigh number is also reported.

Keyword: Magnetoconvection; Soret driven binary; Temperature; Thermo-diffusion; Dependent viscosity