

The stability of soret induced convection in doubly diffusive fluid layer with feedback control

ABSTRACT

Linear stability analysis is performed to study the Soret induced convection in a doubly diffusive fluid layer heated from below. The effect of a feedback control on the onset of steady convection is investigated theoretically using Galerkin technique. The eigenvalues are obtained for Free-Free, Rigid-Rigid, Rigid-Free boundaries combined with isothermal temperature boundary condition. The influence of various doubly diffusive parameters on the onset of convection has also been analyzed. It is found that the onset of motion can be stabilized by using the feedback control in all cases.

Keyword: Double-diffusive; Feedback control; Stability analysis