

Stabilization of convective instability in micropolar fluid model by feedback control strategy subjected to internal heat source

ABSTRACT

This investigation reports on a stability analysis of Rayleigh-Benard convection in a horizontal of micropolar fluid layer heated from below. The effect of a feedback control strategy on the onset of steady convection in the presence of internal heat source is investigated theoretically using Galerkin technique. The eigenvalues are obtained for free-free, rigid-rigid, free-rigid boundary combination with isothermal temperature boundary condition. The influence of various micropolar parameters on the onset of convection has also been analyzed. The onset of motion is found to depend on the feedback control parameter, K and internal heat source, Q and the micropolar parameter N_i .

Keyword: Convection; Feedback control; Internal heat source; Micropolar fluid model