Rayleigh-Benard convection in micropolar fluid with feedback control effect

ABSTRACT

The effect of feedback control on the criterion for the onset of Rayleigh-Benard convection in a horizontal micropolar fluid layer is studied theoretically. The bounding surfaces of the liquid are considered to either rigid on the upper and lower boundaries or upper boundary free and lower boundary rigid. A linear stability analysis is used and the Galerkin method is employed to find the critical stability parameters numerically. It is found that the onset of instability can be delayed through the use of feedback control.

Keyword: Rayleigh-Benard convection; Micropolar fluid; Feedback control