Investigation on coupled convection with internal heating in micropolar fluid

ABSTRACT

The effect of uniform distribution of internal heat generation on the linear stability analysis of the Benard-Marangoni convection (coupled driven convection) in micropolar fluid is investigated theoretically. The upper free surface is assumed to be non-deformable and the lower boundary is taken to be rigid and isothermal with fixed temperature and span-vanishing boundaries. The eigenvalue problem is solved numerically using the Galerkin method. The influence of the internal heat generation in micropolar fluid with various parameters on the onset of stationary convection has been analyzed and also comparison has been made with the Newtonian fluid. We found that the effect of internal heating is to destabilize the micropolar fluid system.