

Combine effect of non-uniform temperature gradient and magnetic field on Bénard Marangoni convection with a constant heat flux

ABSTRACT

This paper studied the problem of Bénard-Marangoni convection in a horizontal fluid layer heated from below with non-uniform temperature gradient under magnetic field. A linear stability analysis is performed to undertake a detail investigation. The eigenvalues are obtained for both adiabatic boundaries. The influence of various parameters on the onset of convection has been analyzed. Six non-uniform basic temperature profiles are considered and some general conclusions about their destabilizing effects are presented.

Keyword: Bénard-Marangoni convection; Magnetic field; Non-uniform temperature