

Coriolis force in a nanofluid layer in the presence of Soret effect

ABSTRACT

The influence of coriolis force on the onset of steady Rayleigh-Benard convection subjected to Soret parameter in a horizontal nanofluid layer is considered analytically. The confined lower and upper boundary conditions of the nanofluid layer are considered to be free-free, rigid-free and rigid-rigid respectively. The model used for the nanofluid incorporates the effects of Brownian motion and thermophoresis diffusion. Following the usual linear stability theory, the eigenvalue solution is obtained numerically by using Galerkin technique. From the investigation, the presence of coriolis force due to the rotation inhibits the onset of convection in nanofluid layer and have a stabilizing effect. Further, the instability of the system get advanced with the increased values of the Soret parameter.

Keyword: Coriolis force; Nanofluid layer; Soret parameter