

Double diffusive convection in a horizontal porous layer with non-uniform thermal gradient and internal heat source

Anjanna Matta and Gautam Kumar

Department of Mathematics, Faculty of Science and Technology,
ICFAI Foundation for Higher Education, Hyderabad - 501203,
Telangana, India

Corresponding author: anjireddyiiith@ifheindia.org

Abstract

The present study deals with the effects of non-uniform inclined thermal gradients and internal heat source on the stability of buoyant flows in a fluid saturated horizontal porous layer. The main aim of this study is to analyse the double diffusive convection with non-uniform inclined thermal gradients for various parameters. The physical problem is solved by numerically with linear theory. The corresponding eigenvalue problem is solved numerically by shooting and Runge Kutta methods. The linear instability analysis give the possible maximum thresholds. In this study also analyse the effect of internal heat source sub-critical instabilities.

Keywords: Instability analysis, Non Uniform heating, Convection, heat source.