Thermosolutal convection of a Casson fluid in a porous layer with internal heat source

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Abstract

The present study investigates the thermosolutal convection of a Casson fluid with internal heat source in a horizontal porous layer with through flow. The porous layer is heated and salted from below. The normal mode method is used to study the non-dimensionalized governing equations. Using linear stability analysis, the influence of internal heat source and through flow in a horizontal flow is studied. Linear instability analysis is analyzed by using shooting with the RK method. This theoretical and numerical analysis is made to understand the effect of heat source in a casson fluid flow passing through a porous layer. Thermosolutal convection of a Casson fluid with internal heat source in a horizontal porous layer with through flow has been studied to understand the mechanism of cross-diffusive effects on thermal and solutal transport.

Keywords: Casson fluid, internal heat source,porous medium,thermosolutal convection.