Scopus

Documents

Ganesh, N.V., Al-Mdallal, Q.M., Chamkha, A.J.

A numerical investigation of Newtonian fluid flow with buoyancy, thermal slip of order two and entropy generation
(2019) *Case Studies in Thermal Engineering*, 13, art. no. 100376, . Cited 7 times.

Abstract
In the present article, the Newtonian fluid flow problem with buoyancy and thermal radiation in non-linear form is investigated by considering the entropy generation. The boundary is mathematically modeled with slip conditions (velocity and thermal) of order two. The parameters for the slip conditions of order two are calculated from the slip parameters of order one. The governing PDE's and the corresponding BC's are derived and transformed into ODE's by suitable transformation. Fourth order RK with shooting method is utilized to solve the transformed non-dimensional governing equations along with the boundary conditions. The efficiency of the present type of thermal fluidic system can be increased by reducing the generation of entropy. In view of these, the influences of slip conditions of order two on the entropy generation number are discussed. It is found that the increase of second order velocity and thermal slip effects reduces the entropy generation. Furthermore, the significant results are discussed with buoyancy effects. The present research work suggests to increase the second order slip factors in order to achieve the higher efficiency in the present type of thermal fluidic system. © 2018 The Authors.

2-s2.0-85059306825
Document Type: Article
Publication Stage: Final
Source: Scopus
Access Type: Open Access