

Computational Analysis of Third-Grade Liquid Flow with Cross Diffusion Effects: Application to Entropy Modeling

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Abstract

The key goal of this current study is to analyze the entropy generation with cross diffusion effects. The third-grade type non-Newtonian fluid model is used in this study. The current flow problem is modelled with stretching plate. Modified Fourier heat flux is replaced the classical heat flux. The appropriate transformation is availed to convert the basic boundary layers equations into ODEs and then verified by homotopy algorithm. The consequences of various physical quantities on temperature, velocity, entropy and concentration profile are illustrated graphically.

Keywords: Third grade fluid; Linear stretching sheet; Homotopy Analysis Method (HAM); Soret and Dufour effects; Entropy generation