

Abstract

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Symmetry analysis for MHD viscous flow and heat transfer over a stretching sheet

This work deals with the boundary layer flow and heat transfer of an electrically conducting viscous fluid over a stretching sheet. Lie-group method is applied for determining the symmetry reductions for the governing equations by reducing the number of independent variables in the given system of partial differential equations by one, leading to a system of non-linear ordinary differential equation. The resulting system is then solved numerically using shooting method coupled with Runge-Kutta scheme. Effects of various values of physical parameters on the horizontal and vertical velocities, temperature profiles, wall heat transfer and the wall shear stress (skin friction), have been studied and the results are plotted. Furthermore, a comparison between the present results with existing numerical and homotopy methods has been reported and we found that they are in a good agreement.