EFFECTS OF POROUS MEDIUM AND VARIABLE THERMAL CONDUCTIVITY ON HEAT TRANSFER OF NON-NEWTONIAN FLUIDS WITH ENERGY DISSIPATION AND THERMAL RADIATION UNDER THE EFFECT OF MAGNETIC FIELD

V. SINGH, GEETU SINGH AND SHWETA AGARWAL

Abstract

The problem of MHD flow and heat transfer of an electrically conducting, non-Newtonian fluids (second grade fluid and Walters' liquid B fluid) past a heated porous stretching sheet in the presence of variable thermal conductivity, thermal radiation, joule and viscous dissipation, internal heat generation/absorption and work done due to deformation is analyzed. The resulting governing equations are transformed into nonlinear ordinary equations using appropriate transformation and solved numerically by fourth order Runge-Kutta method with shooting technique is used to find the solution of boundary value problem. The effect of various physical parameters such as magnetic parameter, viscoelastic parameter, heat source/sink parameter, Prandtl number, Eckert number and variable thermal conductivity on the dynamics is analyzed. The heat transfer coefficients are tabulated for a range of values of said parameters.