

Effects of Cattaneo-Christov Heat Flux on 3D Magnetohydrodynamic Viscoelastic Fluid Flow with Variable Thermal Conductivity

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Abstract : A mathematical model has been envisaged to discuss three-dimensional Viscoelastic fluid flow with an effect of Cattaneo-Christov heat flux in attendance of magnetohydrodynamic (MHD). Variable thermal conductivity with the impact of homogeneous-heterogeneous reactions and convective boundary condition is also taken into account. Homotopy analysis method is engaged to obtain series solutions. Graphical illustrations depicting behaviour of sundry parameters on skin friction coefficient and all involved distributions are also given. It is observed that velocity components are decreasing functions of Viscoelastic fluid parameter. Furthermore, strength of homogeneous and heterogeneous reactions have opposite effects on concentration distribution. A comparison with a published paper has also been established and an excellent agreement is obtained; hence reliable results are being presented.

Keywords : Cattaneo Christov heat flux, homogenous-heterogeneous reactions, magnetic field, variable thermal conductivity

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