

Documents

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MHD mixed convection stagnation-point flow of a viscoelastic fluid towards a stretching sheet in a porous medium with heat generation and radiation
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Abstract

An analysis was carried out to study the effect of thermal radiation on magnetohydrodynamic boundary layer flow and heat transfer characteristics of a non-Newtonian viscoelastic fluid near the stagnation point of a vertical stretching sheet in a porous medium with internal heat generation-absorption. The flow is generated because of linear stretching of the sheet and influenced by the uniform magnetic field that is applied horizontally in the flow region. Using a similarity variable, the governing nonlinear partial differential equations have been transformed into a set of coupled nonlinear ordinary differential equations, which are solved numerically using an accurate implicit finite difference scheme. A comparison of the obtained results with previously published numerical results is done and the results are found to be in good agreement. The effects of the viscoelastic fluid parameter, magnetic field parameter, nonuniform heat source-sink, and the thermal radiation parameter on the heat transfer characteristics are presented graphically and discussed. The values of the skin friction coefficient and the local Nusselt number are tabulated for both cases of assisting and opposing flows. © 2015 Published by NRC Research Press.

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