

THERMAL STRATIFICATION EFFECTS ON NONLINEAR HYDROMAGNETIC FLOW OVER A VERTICAL STRETCHING SURFACE WITH A POWER – LAW VELOCITY

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An analysis has been carried out to obtain the nonlinear MHD flow with heat transfer characteristics of an incompressible, viscous and Boussinesq fluid on a vertical stretching surface with power-law velocity. An approximate numerical solution for the flow problem has been obtained by solving the governing equations using a numerical technique. A magnetic field is applied transversely to the direction of the flow. Adopting the similarity transformation, governing nonlinear partial differential equations of the problem are transformed to nonlinear ordinary differential equations. Then the numerical solution of the problem is drawn using the Runge Kutta Gill method. Numerical calculations are carried out for different values of the dimensionless parameters in the problem and an analysis of the results obtained show that the flow field is influenced appreciably by the presence of the magnetic field and thermal stratification effect.

Key words: magnetic field, Runge Kutta Gill method, Boussinesq approximation, heat transfer and thermal stratification effect.

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