

NUMERICAL SOLUTION
FOR THE EFFECT OF VARIABLE
FLUID PROPERTIES ON THE FLOW
AND HEAT TRANSFER IN A NON-NEWTONIAN
MAXWELL FLUID OVER AN UNSTEADY
STRETCHING SHEET WITH INTERNAL
HEAT GENERATION

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S u m m a r y

This article looks at the flow and heat transfer in the unsteady two-dimensional boundary layer of a non-Newtonian Maxwell fluid over a stretching sheet in the presence of variable fluid properties and internal heat generation. The governing differential equations are transformed into a set of coupled non-linear ordinary differential equations and then solved numerically, by using the appropriate boundary conditions for various physical parameters. The numerical solution for the governing non-linear boundary-value problem is based on applying the Chebyshev spectral method over the entire range of physical parameters. The effects of various parameters like the viscosity parameter, thermal conductivity parameter, unsteadiness parameter, heat generation parameter, Maxwell parameter, and Prandtl number on the flow and temperature profiles, as well as on the local skin-friction coefficient and the local Nusselt number, are presented and discussed. Comparison of numerical results is made with the earlier published results in limiting cases. A special attention is given to the effect of the viscosity parameter, thermal conductivity parameter, and heat generation parameter on the velocity and temperature fields above the sheet.