Flow and heat transfer in a Maxwell liquid sheet over a stretching surface with thermal radiation and viscous dissipation

ABSTRACT

The fluid flow and heat transfer behavior in a Maxwell liquid film over a stretching surface with thermal radiation and viscous dissipation is presented in this paper. The governing nonlinear thermal boundary layer that covers the physical problem is formulated and transformed into a system of higher order nonlinear ordinary differential equations using similarity transformation. The resultant systems of equations are solved numerically using Explicit Runge-Kutta scheme technique along with shooting technique. The effects of various thermophysical interesting parameters on the velocity profile, thermal energy and nanoparticle concentration, skin friction, Nusselt number and Sherwood number are discussed and analyzed graphically and numerically. Favorable comparisons with previous published papers have been done with an excellent agreement.

Keyword: Boundary layer flow; Heat transfer; Maxwell fluid, Thermal radiation; Viscous dissipation