Stagnation Point Flow And Heat Transfer Over A Stretching/Shrinking Sheet In A Viscoelastic Fluid With Convective Boundary Condition And Partial Slip Velocity

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ABSTRACT
In this study, the mathematical modeling for the stagnation point flow and heat transfer over a stretching/shrinking surface in a viscoelastic fluid (Walter's liquid-B model) with partial slip velocity is considered. The non-linear partial differential equations are transformed into a system of ordinary differential equations by a similarity transformation before being solved numerically using the Runge-Kutta-Fehlberg method. Numerical solutions are obtained for the surface temperature, temperature gradient at the surface and the skin friction coefficient. The features of the flow and heat transfer characteristics for various values of Prandtl number, the dimensionless viscoelastic parameter, stretching parameter, constant velocity slip parameter and conjugate parameter are analyzed and discussed. It is found that the heat transfer rate is higher for Walter's fluid compared to the classical viscous fluid and the presence of the velocity slip reduces the effects of the viscoelastic parameter on the skin friction coefficient.

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