Numerical solutions of boundary layer flow over an exponentially stretching/shrinking sheet with generalized slip velocity

ABSTRACT

In this paper, the problem of steady laminar boundary layer flow and heat transfer over a permeable exponentially stretching/shrinking sheet with generalized slip velocity is considered. The similarity transformations are used to transform the governing nonlinear partial differential equations to a system of nonlinear ordinary differential equations. The transformed equations are then solved numerically using the bvp4c function in MATLAB. Dual solutions are found for a certain range of the suction and stretching/shrinking parameters. The effects of the suction parameter, stretching/shrinking parameter, velocity slip parameter, critical shear rate and Prandtl number on the skin friction and heat transfer coefficients as well as the velocity and temperature profiles are presented and discussed.

Keyword: Heat transfer; Numerical solutions; Boundary layer; Generalized slip; Exponentially stretching/shrinking sheet