Stagnation point flow and heat transfer over a stretching/shrinking sheet in a porous medium

ABSTRACT

The steady stagnation point flow and heat transfer over a shrinking sheet in a porous medium is studied. A similarity transformation is used to reduce the governing system of partial differential equations to a set of nonlinear ordinary differential equations which are then solved numerically using the Keller-box method. The behavior of the flow and heat transfer characteristics for different values of the governing parameters are analyzed and discussed. Results for the skin friction coefficient, local Nusselt number, velocity profiles as well as temperature profiles are presented for different values of the governing parameters. The results indicate that dual solutions exist for the shrinking case.

Keyword: Stagnation point flow; Shrinking/stretching sheet; Porous medium; Forced convection; Heat transfer