MHD mixed convection flow near the stagnation-point on a vertical permeable surface.

ABSTRACT

The steady magnetohydrodynamic (MHD) mixed convection boundary layer flow of a viscous and electrically conducting fluid near the stagnation-point on a vertical permeable surface is investigated in this study. The velocity of the external flow and the temperature of the plate surface are assumed to vary linearly with the distance from the stagnation-point. The governing partial differential equations are first transformed into ordinary differential equations, before being solved numerically by a finite-difference method. The features of the flow and heat transfer characteristics for different values of the governing parameters are analyzed and discussed. Both assisting and opposing flows are considered. It is found that dual solutions exist for both cases, and the range of the mixed convection parameter for which the solution exists increases with suction.