MHD stagnation-point flow and heat transfer over a permeable stretching/shrinking sheet

ABSTRACT

The steady magnetohydrodynamic (MHD) two-dimensional stagnation-point boundary layer flow and heat transfer of a viscous, incompressible and electrically conducting fluid over a permeable flat stretching/shrinking sheet in the presence of an externally applied magnetic field of constant strength is studied. The governing partial differential equations are first transformed into a system of ordinary differential equations, which is then been solved numerically using a shooting method built in Maple software. It is found that the heat transfer rate at the surface reduces with the Eckert number and it is also found that dual solutions exist for certain values of the mass flux parameter and the stretching/shrinking parameter.

Keyword: Boundary layer; Dual solutions; Heat transfer; MHD; Stagnation-point; Stretching/shrinking sheet