

MHD mixed convective stagnation point flow with heat generation past a shrinking sheet

ABSTRACT

This paper investigates the influence of magnetohydrodynamics (MHD) mixed convective stagnation point flow over a shrinking sheet with the enhancement of heat generation/source. Using appropriate similarity transformations, the model are transformed into a system of nonlinear equations and then solved using `bvp4c` built-in-function in Matlab. Numerical results are presented graphically for the distributions of velocity, temperature as well as the skin friction coefficient and local Nusselt number. The findings revealed the dual solutions obtained within a particular range of the mixed convection parameter and shrinking parameter. It is found that the fluid velocity increases with the increasing values of the magnetic and mixed convection parameter while opposite results obtained for the fluid temperature. A stability analysis was performed and it is proven that the first solution is physically realizable and stable whereas the second solution is unstable.

Keyword: Dual solutions; Mixed convection; MHD; Stagnation flow; Shrinking sheet