

Magnetohydrodynamics (MHD) boundary layer flow and heat transfer over shrinking sheet with suction and stability analysis

ABSTRACT

This case study seeks to examine the fluid flow over shrinking sheet towards suction. This work also investigates the heat transfer in the presence of magnetic parameter, heat generation and Lewis number. The basic governing partial differential equations are reduced to a set of ordinary differential equations by using appropriate similarity transformation. To obtain the numerical results, we used MATLAB software. We notice that dual similarity solutions are available in a certain range of shrinking sheet parameter. Thus, these results make us continue further to perform the stability analysis by using the bvp4c solver in MATLAB software. As expected, our study proved that the solution is stable only for the first one and the second solution is not.

Keyword: Boundary layer; Dual solutions; MHD; Stability analysis