Unsteady stagnation point flow and heat transfer over a stretching/shrinking sheet with suction or injection

Abstract

The unsteady stagnation point flow and heat transfer over a stretching/shrinking sheet with suction/injection is studied. The governing partial differential equations are converted into nonlinear ordinary differential equations using a similarity transformation and solved numerically. Both stretching and shrinking cases are considered. Results for the skin friction coefficient, local Nusselt number, velocity and temperature profiles are presented for different values of the governing parameters. It is found that the dual solutions exist for the shrinking case, whereas the solution is unique for the stretching case. Numerical results show that the range of dual solutions increases with mass suction and decreases with mass injection.