

The effects of suction and injection on a moving flat plate in a parallel stream with prescribed surface heat flux.

ABSTRACT

The effect of surface mass flux on a moving flat plate in a moving fluid with prescribed surface heat flux is studied. The governing partial differential boundary layer 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. It is found that dual solutions exist when the plate and the free stream move in the opposite directions. The results indicate that the range of known dual solutions increases with suction and decreases with injection and the rate of heat transfer increases with increasing heat flux exponent parameter.

Keyword: Heat transfer; Moving plate; Moving fluid; Boundary layer; Heat flux; Suction/injection; Dual solutions.