

UNSTEADY MHD AXISYMMETRIC BOUNDARY LAYER FLOW WITH SLOT SUCTION (INJECTION) AND VARIABLE VISCOSITY

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Abstract

An analysis of unsteady non-uniform slot suction (injection) into MHD axisymmetric boundary layer flow with variable viscosity is performed. The system of nonlinear partial differential equations governing the nonsimilar flow and heat transfer have been solved numerically by using an implicit finite difference scheme in combination with the quasilinearization technique and the solutions are obtained by overcoming the difficulties arising from the starting point of the streamwise co-ordinate to the exact point of separation. The influence of unsteadiness on the skin friction and heat transfer coefficients for various parameters is analyzed. It is found that skin friction and heat transfer coefficients get enhanced with the magnetic parameter while, the effect of variable viscosity is to decrease the skin friction and to increase the heat transfer. It is observed that boundary layer separation can be delayed due to time-dependent slot suction and also by moving the slot downstream, while the time-dependent slot injection does the opposite. In general, the unsteadiness has significant effect on both velocity and thermal fields.

Key Words : *Skin friction and Heat transfer, Magnetic field, Variable viscosity, Slot suction (Injection), Unsteady flow.*

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