International J. of Math. Sci. & Engg. Appls. (IJMSEA)
ISSN 0973-9424, Vol. 5 No. V (September, 2011), pp. 105-122

ANALYTICAL SOLUTION TO THE PROBLEM OF MHD FLOW BETWEEN INCLINED POROUS PLATES

K. ELANGOVAN AND NIRMALA P. RATCHAGAR

Abstract

An unsteady viscous incompressible free convective flow of an electrically conducting fluid between two inclined parallel porous plates is considered under the action of a magnetic field applied transversely to the flow. The pressure gradient is taken as constant quantity and the case of steady flow is obtained by taking the time since the start of the motion to be infinite. Analytical solution for the velocity and temperature distribution are obtained. The skin friction and coefficient of heat transfer on both the plates are obtained and plotted. Graphical results for the velocity distribution of the fluid and the temperature distribution are illustrated and discuss for various values of non dimensional physical parameter m (Hall parameter), M (Magnetic Parameter), R_m (Reynolds number), θ (Inclination of angle $0 < \theta < \frac{\pi}{2}$) and P. E (Product of prandtl and Eckert number). Velocity distribution when the pressure gradient (i) Varies linearly with time and (ii) Decreases exponentially with time has also been evaluated.

Key Words : *Incompressible conducting fluid, Magnetic field, Heat transfer.*

AMS Subject Classification : 76V05.