UNSTEADY MHD MIXED CONVECTION OF A VISCOUS DOUBLE DIFFUSIVE FLUID OVER A VERTICAL PLATE IN POROUS MEDIUM WITH CHEMICAL REACTION, THERMAL RADIATION AND JOULE HEATING

B. MADHUSUDHANA RAO[1], G. VISWANATHA REDDY[2] & M. C. RAJU[3]

[1]Department of Mathematics, R.M.K. Engineering College, Chennai, Tamil Nadu, India

[2]Department of Mathematics, S.V. University, Tirupati, Andhra Pradesh, India

[3]Department of Mathematics, Annamacharya Institute of Technology and Sciences (Autonomous), Rajampet, Andhra Pradesh, India

ABSTRACT

The problem of 2-dimensional unsteady boundary layer MHD mixed double diffusive flow of a viscous incompressible, electrically conducting fluid along a semi-infinite vertical permeable moving plate in presence of a transverse magnetic field, chemical reaction, heat absorption and thermal radiation is considered. The dimensionless governing partial differential equations for this study are solved analytically by using 2-term harmonic and non-harmonic functions. Furthermore, the plate is assumed to move with a constant velocity in fluid flow direction while the free stream velocity is assumed to follow the perturbation rule. Numerical evaluation of the analytical results are performed and few graphical results for the velocity, temperature and concentration distributions and tabulated results for Skin friction, Nusselt number and Sherwood numbers are discussed and presented.

KEYWORDS: MHD, Mixed Convection, Heat and Mass Transfer, Thermal Radiation, Heat Absorption, Thermal Diffusivity, Permeability and Chemical Reaction