

Effect of Radiation on MHD Mixed Convection Stagnation Point Flow towards a Vertical Plate in a Porous Medium with Convective Boundary Condition

Authors : H. Niranjana, S. Sivasankaran, Zailan Siri

Abstract : This study investigates mixed convection heat transfer about a thin vertical plate in the presence of magnetohydrodynamic (MHD) and heat transfer effects in the porous medium. The fluid is assumed to be steady, laminar, incompressible and in two-dimensional flow. The nonlinear coupled parabolic partial differential equations governing the flow are transformed into the non-similar boundary layer equations, which are then solved numerically using the shooting method. The effects of the conjugate heat transfer parameter, the porous medium parameter, the permeability parameter, the mixed convection parameter, the magnetic parameter, and the thermal radiation on the velocity and temperature profiles as well as on the local skin friction and local heat transfer are presented and analyzed. The validity of the methodology and analysis is checked by comparing the results obtained for some specific cases with those available in the literature. The various parameters on local skin friction, heat and mass transfer rates are presented in tabular form.

Keywords : MHD, porous medium, sores/dufour, stagnation-point

Conference Title : ICFMT 2015 : International Conference on Fluid Mechanics and Thermodynamics

Conference Location : Penang, Malaysia

Conference Dates : December 03-04, 2015