

عنوان مقاله:

Effects of Thermal Radiation and Rotation on Unsteady Hydromagnetic Free Convection Flow past an Impulsively Moving Vertical Plate with Ramped Temperature in a Porous Medium

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خلاصه مقاله:

The effects of radiation and rotation on unsteady hydromagnetic free convection flow of a viscous incompressible electrically conducting fluid past an impulsively moving infinite vertical plate with ramped temperature in a porous medium are investigated. Exact solution of momentum and energy equations, under Boussinesq approximation, is obtained in closed form by Laplace transform technique. To compare the results obtained in this case with that of isothermal plate, exact solution of the governing equations is also obtained for isothermal plate. The expressions for the primary and secondary skin frictions and Nusselt number are also derived. It is noticed that, for both ramped temperature and isothermal plates, rotation retards fluid flow in the primary flow direction whereas it accelerates fluid flow in the secondary flow direction in the boundary layer region while radiation exerts accelerating influence on the fluid flow in both the primary and secondary flow directions. For ramped temperature plate radiation reduces primary skin friction whereas it tends to increase secondary skin friction. For isothermal plate radiation has tendency to reduce secondary skin friction. Radiation tends to increase fluid temperature for both ramped temperature and isothermal plates. With the increase in time the rate of heat transfer at the plate is reduced for isothermal plate while it is increased for ramped temperature plate.

کلمات کلیدی:

Hydromagnetic free convection, Thermal radiation, Rotation, Ramped temperature, Porous medium

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