

Magnetohydrodynamic (MHD) Flow of Cu-Water Nanofluid Due to a Rotating Disk with Partial Slip

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Abstract : This problem is about the study of flow of viscous fluid due to rotating disk in nanofluid. Effects of magnetic field, slip boundary conditions and thermal radiations are encountered. An incompressible fluid soaked the porous medium. In this model, nanoparticles of Cu is considered with water as the base fluid. For Copper-water nanofluid, graphical results are presented to describe the influences of nanoparticles volume fraction (ϕ) on velocity and temperature fields for the slip boundary conditions. The governing differential equations are transformed to a system of nonlinear ordinary differential equations by suitable transformations. Convergent solution of the nonlinear system is developed. The obtained results are analyzed through graphical illustrations for different parameters. Moreover, the features of the flow and heat transfer characteristics are analyzed. It is found that the skin friction coefficient and heat transfer rate at the surface are highest in copper-water nanofluid.

Keywords : MHD nanofluid, porous medium, rotating disk, slip effect

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