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The effects of variable properties and hall current on steady MHD laminar convective fluid flow due to a porous rotating disk

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Abstract

The present investigation is concerned with the effects of variable properties [density (*ρ*), viscosity (*μ*) and thermal conductivity (*κ*)], Hall current (*m*), magnetic field (*M*) and suction/injection (*W*s) on steady MHD laminar flow of an electrically conducting fluid on a porous rotating disk in presence of a uniform magnetic field. The fluid properties are taken to be strong functions of temperature. The induced magnetic field is neglected while the electron–atom collision frequency is assumed to be relatively high, so that the Hall effect is assumed to exist. The dimensionless steady governing equations are then solved numerically by using Runge–Kutta and Shooting method, and the effects of the relative parameters are examined.