Article Abstract

Title:	Hall effects on hydromagnetic Couette flow of Class-II in a rotating system in the presence of an inclined magnetic field with asymmetric heating/cooling of the walls
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Abstract:	Hall effects on steady hydromagnetic Couette flow of class-II of a viscous, incompressible and electrically conducting fluid with non-conducting walls in a rotating system in the presence of an inclined magnetic field is investigated. Exact solution of the governing equations is obtained in closed form. Expressions for the shear stress at the moving plate due to primary and secondary flows and mass flow rates in the primary and secondary flow directions are also derived. Asymptotic behavior of the solution for velocity and induced magnetic field is analyzed, for small and large values of rotation parameter K^2 and magnetic parameter M^2 to gain some physical insight into the flow pattern. Heat transfer characteristics of the fluid are considered taking viscous and Joule dissipations into account when walls of the channel are asymmetrically heated or cooled. Numerical solution of energy equation and numerical values of rate of heat transfer at the stationary and moving plates are computed with the help of MATLAB software. The numerical values of velocity, induced magnetic field and fluid temperature are displayed graphically versus channel width variable η for various values of Hall current parameter m and angle of inclination of magnetic field θ whereas numerical values of shear stress at the moving plate due to primary and secondary flows, mass flow rates in the primary and secondary flow directions and rate of heat transfer at the stationary and moving plates are presented in tabular form for various values of m and θ.
Keywords:	Inclined Magnetic field, Coriolis force, Hall current, Viscous and Joule Dissipations.