

Documents

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Hydromagnetic flow of heat absorbing and radiating fluid over exponentially stretching sheet with partial slip and viscous and Joule dissipation
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Abstract

Purpose - The purpose of this paper is to investigate hydromagnetic two dimensional boundary layer flow with heat transfer of a viscous, incompressible, electrically conducting, heat absorbing and optically thick heat radiating fluid over a permeable exponentially stretching sheet considering the effects of viscous and Joule dissipations in the presence of velocity and thermal slip. **Design/methodology/approach** - Using similarity transform, governing differential equations representing mathematical model of the problem are solved with the help of fourth-order Runge-Kutta method along with shooting technique. Numerical solutions of fluid velocity and fluid temperature are depicted graphically for various values of pertinent flow parameters whereas numerical values of wall velocity gradient and wall temperature gradient are displayed graphically for various values of pertinent flow parameters. **Findings** - Numerical results obtained in this paper are compared with earlier published results and are found to be in excellent agreement. Magnetic field and suction tend to enhance the wall velocity gradient whereas dimensionless coordinate, injection and velocity slip factor have reverse effect on it. Suction and heat absorption tend to enhance wall temperature gradient whereas magnetic field, velocity slip factor, injection, thermal radiation, thermal slip factor and viscous dissipation have reverse effect on it. **Originality/value** - The investigation of this problem may have bearing in several engineering processes such as extrusion of plastic sheet, annealing and tinning of copper wire, paper production, crystal growing and glass blowing, continuous casting of metals and spinning of fibers. © Emerald Group Publishing Limited.

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