

M. A. M. Abdeen, H. A. Attia, W. Abbas, W. Abd El-Meged , “Effectiveness of porosity on transient generalized Couette flow with Hall effect and variable properties under exponential decaying pressure gradient”, Indian Journal of Physics, Vol. 87, No. 8, pp. 767–775, August 2013.

Abstract:

The transient generalized Couette flow with heat transfer through a porous medium between two infinite parallel porous plates is studied considering the Hall effect and temperature dependent physical properties. The upper plate is moving with a uniform velocity while the lower plate is kept stationary. An exponential decaying pressure gradient is imposed in the axial direction and an external uniform magnetic field as well as a uniform suction and injection are applied perpendicular to the horizontal plates. A numerical solution for the governing non-linear coupled set of equations of motion and the energy equation including the viscous and Joule dissipations is adopted. The effect of the porosity of the medium, the Hall current and the temperature dependent viscosity and thermal conductivity on both the velocity and temperature distributions is investigated.