

**Stokes problem of a Convective Flow Past a Vertical Infinite Plate in a Rotating System in  
Presence of Variable Magnetic Field**

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## ABSTRACT

In this study, stokes problem of a convective flow past a vertical infinite plate in a rotating system in presence of variable magnetic field is considered. The fluid flow is unsteady and a variable magnetic field is transversely applied to the plate. Evaluation of velocity gradients and temperature gradients across the plate is done. Observations and discussions of the effects of various parameters on flow variables is done. The non-dimensional parameters observed and discussed are Hall parameter,  $m$ ; Magnetic number,  $M^2$ ; Eckert number,  $Ec$  and Rotational parameter,  $Er$ . The velocity profiles and temperature profiles are presented graphically for both free convectonal heating and free convectonal cooling of the plate. The skin friction and rate of heat transfer values are obtained and presented in tables. For free convectonal heating and cooling of the plate, the Grashof number is taken as constants  $-0.5$  and  $0.5$  respectively. Prandtl number is  $0.71$  which corresponds to air. The variation of the parameters mentioned above is noted to increase or decrease or had no effect on the skin friction, rate of heat transfer, the velocity profiles and temperature profiles.