A study of a hydro magnetic fluid flow in a rotating system bounded by two parallel plates

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ABSTRACT

An electrically conducting fluid flowing between two parallel plates has been considered in this study. The fluid flow is unsteady and a magnetic field is applied perpendicular to the plates. Various configurations have been considered for the plates with either one plate moving or both plates moving in opposite directions relative to each other. The whole system is then rotated in a direction normal to the plates with a constant angular velocity Ω. Temperature and concentration gradients have been considered across the plates. The Hall current effect has also been put into consideration when studying the fluid flow. The effects of changing various parameters on the velocity, temperature and concentration profiles has been discussed. These parameters include the rotation parameter Er, the Schmidt number Sc, the Hall parameter m, the suction parameter S, the Eckert number Ec, the pressure gradient $\frac{dP}{dx}$ and time t. The results that are obtained are then presented on graphs and the observations are discussed. Later the effect of changing these parameters on the skin friction, the rate of heat transfer and the rate of mass transfer are studied. The results that are obtained are presented in tables and then discussed.

The effect of changing the parameters mentioned above is observed either to increase, to decrease or to have no effect on the velocity profiles, the temperature profiles, the concentration profiles, the skin friction and the rates of heat and mass transfer