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Abstract

An analysis is made on the unsteady MHD flow and heat transfer of a viscous incompressible electrically conducting viscous fluid bounded by an infinite porous flat plate. The plate is oscillating in its own plane with a velocity , being the frequency of the oscillations. A uniform magnetic field of strength is imposed perpendicular to the plate. The governing equations

along with the boundary conditions are solved analytically. It is found that with an increase in either magnetic parameter or suction parameter the primary velocity and the magnitude of secondary velocity decrease. The primary velocity and the magnitude of the secondary velocity increase with an increase in either accelerated parameter or frequency parameter or time. It is found that the solution also exists for the blowing at the plate. The temperature distribution is obtained on taking viscous and joule dissipation into account. The mean wall temperature as well as the rate of heat transfer are also obtained. It is found that with an increase of magnetic field intensity, the mean temperature increases.

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Index Terms

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Key words

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Prandtl number and frequency parameter