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Heat and mass transfer on MHD free convective flow over an infinite nonconducting vertical flat porous plate
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Abstract
In this paper, we consider the unsteady magnetohydrodynamic free convection flow of an electrically conducting viscous incompressible and heat-absorbing fluid through a porous medium over an infinite vertical flat plate under the influence of uniform transverse magnetic field. The flow is induced by a general time-dependent movement of a vertical plate. The flow through the porous medium is governed by Brinkman's model for the momentum equation. The exact solutions for the velocity, temperature, and concentration are obtained making use of the Laplace transform technique. The influence of various governing flow parameters on the velocity, temperature, and concentration is analyzed graphically, and numerical solutions for the skin friction, Nusselt number, and Sherwood number are also obtained in tabular forms for both ramped temperature and isothermal plates. Some important applications of practical interest are also discussed for different types of plate motions. © 2019 Begell House, Inc.

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