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Entropy optimized MHD fluid flow over a vertical stretching sheet in presence of radiation

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Abstract

The present article describes the influence of radiation on two-dimensional laminar magnetohydrodynamic fluid flow passing over a convective surface. The behavior of the thermal equation is explored through Joule heating, heat generation/absorption, and viscous dissipation. The aim of this study is to examine the physical behavior of the entropy optimization rate. The Cartesian coordinates system is used to model the flow equations. Using similarity variables, a system of partial differential equations is converted into a system of ordinary differential equations. The problem is solved using HAM. The influence of various pertinent parameters on fluid characteristics is graphically explored. Velocity decreases for an increased amount of magnetic parameter, suction parameter, and velocity slip parameter, while behaves the opposite for Grashof number. Temperature increases for a large amount for Brinkman number, magnetic parameter, and radiation parameter, while decreases for Prandtl number. Entropy generation rate increases for Brinkman number, magnetic parameter, and temperature difference parameter. Bejan number decreases for Brinkman number while behaves the opposite for magnetic parameter and temperature difference parameter. Skin friction decreases for large

