

A mathematical study on magnetohydrodynamic permeable channel flow

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Abstract

The nonlinear differential equations governing the inherent irreversibility in a steady hydromagnetic permeable channel flow of a conducting fluid with variable electrical conductivity and asymmetric Navier slip at the channel walls in the presence of induced electrical field is solved. An approximate analytical solution for dimensionless velocity and dimensionless temperature are derived using Homotopy Analysis Method. The current density, the entropy generation number and the Bejan number are also derived analytically. The results obtained are discussed graphically and analytically.

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