Thermal-Diffusion, Diffusion-Thermo Effects on MHD Mixed Convective Heat and Mass Transfer Inside Cone due to a Point Sink

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Abstract: *The present investigation elucidates the magnetohydrodynamic (MHD) mixed convection phenomena involving heat and mass transfer within a cone influenced by a point sink, taking into account thermal diffusion and diffusion-thermo effects. Through the application of an appropriate similarity transformation, the boundary layer equations governing momentum, heat, and mass transfer were transformed into a set of ordinary differential equations. Subsequently, the obtained ordinary differential equations were addressed using the Homotopy Analysis Method (HAM) implemented through the BVPh 2.0 software package. The graphical representation and detailed discussion of dimensionless velocity, temperature, and concentration profiles were conducted to explore the influence of various governing parameters. Furthermore, the numerical results for the skin friction coefficient were compared with corresponding findings from the existing literature, revealing a notable agreement between them.*

Keywords: Magnetohydrodynamic, heat and mass transfer, mixed convection, Soret-Dufour effect, chemical reaction

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