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Free convective 3D stretched radiative flow of nanofluid in presence of variable magnetic field and internal heating
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Abstract
The current paper investigated in detail the effects of variable magnetic field and thermal radiation on free convective flow of an electrical conducting incompressible nanofluid over an exponential stretching sheet with internal heating. In the present study, a micro-convection model (Patel model) is introduced. The present model has great influence on heat transfer mechanism in the sense that it significantly enriches the thermal conductivity and hence more heat transfer capability of nanofluids. The governing boundary layer partial differential equations are transformed into a set of ordinary non-linear differential equations by using suitable similarity transformation. The transformed equations are then solved numerically using fourth-order Runge-Kutta method along with shooting technique. The major outcome of the present study is that the presence of a magnetic field under the influence of thermal buoyancy and thermal radiation impedes the fluid motion associated with a diminution of axial and radial velocity gradients at the wall. It experiences an enhancement in the thermal resistance leading to a deterioration in the rate of heat transfer from the stretching sheet within the boundary layer.

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