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Effect of Non-uniform Suction or Injection on Mixed Convection Flow Over a Vertical Cylinder Embedded in a Porous Medium

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ABSTRACT

The effect of steady non-uniform suction or injection on mixed convection boundary layer flow over a vertical heated or cooled permeable cylinder, which is embedded in a fluid-saturated porous medium, is studied numerically using the Darcy law approximation. Both assisting and opposing flow cases are considered. Using suitable transformations, the coupled governing boundary layer equations are transformed into a form suitable for a numerical solution. The effects of the suction or injection, transverse curvature and mixed convection parameters on the local Nusselt number and temperature profiles are studied. The obtain results are presented graphically and discussed in details.

Keywords: Boundary layer, heat transfer, mixed convection, porous medium, suction/ injection, vertical cylinder