Mixed convection boundary layer flow near the stagnation point on a vertical surface embedded in a porous medium with anisotropy effect.

ABSTRACT

The steady boundary-layer flow near the stagnation point on a vertical flat plate embedded in a fluid-saturated porous medium characterized by an anisotropic permeability is investigated. Using appropriate similarity transformation, the governing system of partial differential equations is transformed into a system of ordinary differential equations. This system is then solved numerically. The features of the flow and the heat transfer characteristics for different values of the governing parameters, namely, the modified mixed convection parameter Λ, and the anisotropy parameter A are analyzed and discussed. It is found that dual solutions exist for both assisting and opposing flows. Moreover, the range of Λ for which the solution exists increases with A.

Keyword: Mixed convection; Stagnation point flow; Porous medium Dual solutions; Anisotropy.