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FLOW, HEAT AND MASS TRANSFER DUE TO INDIRECT NATURAL CONVECTION

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ABSTRACT

In the present paper we have studied the flow, heat transfer and the effect of temperature gradient on mass transfer of a thermally conducting incompressible viscous fluid which is at rest over a semi infinite uniformly heated horizontal plate facing upward due to indirect natural convection. The problem of flow, heat and mass transfer is studied by taking into consideration of Soret and Dufour effects. The governing equations of continuity, momentum, energy and concentration are transformed into non-linear ordinary differential equations and numerical solutions are obtained on the basis of boundary layer approximation by using Matlab built in solver bvp4c and presented graphically. The skin friction, Nusselt number and Sherwood number are also derived and discussed numerically.

KEYWORDS: Indirect Natural Convection, Horizontal Plate, Heat Transfer, Mass Transfer, Soret and Dufour Effect, Prandtl Number, Schmidt Number, Skin Friction, Nusselt Number, Sherwood Number