

Soret and Dufour's Effects on Mixed Convection Unsteady MHD Boundary Layer Flow over a Stretching Sheet Embedded in a Porous Medium with Chemically Reactive Spices

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Abstract : An investigation is made to carry out to study the thermal-diffusion and diffusion thermo-effects in hydro-magnetic unsteady flow by a mixed convection boundary layer past an impermeable vertical stretching sheet embedded in a conducting fluid-saturated porous medium in the presence of a chemical reaction effect. The velocity of stretching surface, the surface temperature and the concentration are assumed to vary linearly with the distance along the surface. The governing partial differential equations are transformed in to self similar unsteady equations using similarity transformations and solved numerically by the Runge kutta fourth order scheme in association with the shooting method for the whole transient domain from the initial state to the final steady state flow. Numerical results for the velocity, temperature, the concentration, the skin friction , and the Nusselt and Sherwood numbers are shown graphically for various flow parameters. The results reveal that there is a smooth transition of flow from unsteady state to the final steady state. A special case of our results is in good agreement with an earlier published work.

Keywords : heat and mass transfer, boundary layer flow, porous media, magnetic field, Soret number, Dufour's number

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