

## Documents

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**Soret and dufour effects on unsteady MHD heat and mass transfer from a permeable stretching sheet with thermophoresis and non-uniform heat generation/absorption**

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**Abstract**

This paper is focused on the study of heat and mass transfer characteristics of an unsteady MHD boundary layer flow through porous medium over a stretching sheet in the presence of thermo-diffusion and diffusionthermo effects with thermophoresis, thermal radiation and non-uniform heat source/sink. The transformed conservation equations are solved numerically subject to the boundary conditions using an optimized, extensively validated, variational finite element analysis. The numerical code is validated with previous studies on special cases of the problem. The influence of important non-dimensional parameters, namely suction parameter ( $f_w$ ), magnetic parameter ( $M$ ), unsteadiness parameter ( $\alpha$ ), Soret parameter ( $Sr$ ), Dufour parameter ( $Du$ ) thermophoretic parameter ( $\tau$ ), space dependent ( $A_1$ ) and temperature dependent parameters ( $B_1$ ) and radiation parameter ( $A_n$ ) on the velocity, temperature and concentration fields as well as the skinfriction coefficient, Nusselt number and Sherwood number are examined in detail and the results are shown graphically and in tabular form to know the physical importance of the problem. It is found that the imposition of wall fluid suction ( $f_w > 0$ ) in the flow problem has the effect of depreciating the velocity, temperature and concentration boundary layer thicknesses at every finite value of  $\eta$ . This deceleration in momentum, thermal and concentration profiles is because of the fact that suction is taken away the warm fluid from the surface of the stretching sheet.

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