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Heat and Mass Transfer in MHD Flow of Nanofluids through a Porous Media Due to a Permeable Stretching Sheet with Viscous Dissipation and Chemical Reaction Effects

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Abstract : The convective heat and mass transfer in nanofluid flow through a porous media due to a permeable stretching sheet with magnetic field, viscous dissipation, and chemical reaction and Soret effects are numerically investigated. Two types of nanofluids, namely Cu-water and Ag-water were studied. The governing boundary layer equations are formulated and reduced to a set of ordinary differential equations using similarity transformations and then solved numerically using the Keller box method. Numerical results are obtained for the skin friction coefficient, Nusselt number and Sherwood number as well as for the velocity, temperature and concentration profiles for selected values of the governing parameters. Excellent validation of the present numerical results has been achieved with the earlier linearly stretching sheet problems in the literature.

Keywords : heat and mass transfer, magnetohydrodynamics, nanofluid, fluid dynamics
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