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(57) Abstract :

This work describes the MHD convective flow of Maxwell nanofluid past a porous stretching sheet with Cattaneo-Christov heat flux. Consideration is given to the impacts of heat radiation, viscosity dissipation, suction/injection, and higher-order chemical reaction effects. The study's governing equations are reduced to a system of ordinary differential equations by similarity transformations, which may then be solved numerically with the help of the BVP5C MATLAB tool. Using graphs and tables, the effects of dimensionless parameters on the current study are discussed. It is discovered that the temperature field decreases with an increase in the thermal radiation, and thermal relaxation time parameter. The rate of heat transmission decreases as the heat source, Brownian motion, and thermophoresis parameters are increased. It has also been noted that when the value of the chemical reaction rises, the concentration field shrinks. A strong agreement is discovered when the numerically computed values of the Sherwood and Nusselt numbers are compared to the body of existing research. The findings of this investigation support significant uses in the biomedical, engineering, and industrial domains in areas are including food processing, polymer synthesis, glass and fibre manufacture, enhancing oil recovery, and material processing.

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