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(57) Abstract :
This work examines the characteristics of a three-dimensional magnetohydrodynamic (MHD) flow of Maxwell nanofluid, considering the thermal radiation, cross-diffusion, and heat source effects along a stretched sheet. The investigation of chemical reactions, thermophoresis, and Brownian motion is also undertaken. Appropriate similarity variables have been employed to convert the controlling boundary layer equations into a set of non-linear ordinary differential equations. The current issue is resolved by the utilization of the Runge-Kutta based shooting approach in a numerical manner. The graphical representation and comprehensive analysis of the velocity, temperature, and concentration profiles are presented. The tabulated data displays the numerical outcomes of the skin friction coefficient, Nusselt number, and Sherwood number across various physical factors. The observation reveals that the thermal radiation parameter has been effect of reducing the temperature field. The increasing values of the Deborah number and magnetic field lead to a decrease in the friction factors, Nusselt number, and Sherwood number. Additionally, it has been observed that theNusselt number is decreased and the Sherwood number is increased by variations in heat source and chemical reaction conditions. The resultsobtained in this exploration upkeep substantial applications of biomedical, engineering and industrial sectors such as food processing, polymer manufacturing, glass and fiber production, improving oil recovery, material processing.

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