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Exploring the combined influence of thermal radiation and slip condition on Casson ternary hybrid nanofluid flow past a stretching sheet

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ABSTRACT

This article emphasizes the analysis of heat transfer properties in a 2-dimensional slip flow of magnetohydrodynamic (MHD) Casson ternary hybrid nanofluid past a stretching sheet. The effect of thermal radiation is considered in the study to better understand the heat transfer phenomena. By employing suitable similarity variables, the governing equations are transformed into a dimensionless form. The numerical solution is obtained using the Runge-Kutta-based shooting technique. The uniqueness of this paper stems from employing a Casson ternary hybrid nanofluid. Additionally, the introduction of slip flow and the implementation of a magnetic field further augment the intricacy of the problem. The analysis aims to grasp the heat transfer behavior and the influence of various parameters on fluid flow and temperature distribution. Furthermore, a thorough comparison of the acquired outcomes with prior literature is conducted to validate the conclusions. The findings derived from this study offer valuable insights applicable to a range of engineering and industrial processes.

Keywords: Heat transfer; slip flow; MHD; Casson ternary hybrid nanofluid; Stretching sheet, thermal radiation.

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