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Entropy Generation in Casson Nanofluid Flow Past an Electromagnetic Stretching Riga Plate

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Abstract

This paper investigates entropy generation in a Casson nanofluid flow past an electromagnetic stretching Riga plate. Entropy generation is a measure of irreversibility factors in thermodynamic processes. It is a common feature in heat transfer studies, and as such, the study includes the effect of viscous dissipation. We solve the model equations using the spectral local linearization method. The study considers the impact of some other physical parameters like the Casson, velocity ratio, and electromagnetic parameters. A good correlation is achieved when the present results are compared with published literature. The results indicate that the velocity ratio parameter significantly influences the fluid flow, temperature, and concentration profiles. The entropy generation increases with an increase in concentration and Brinkmann number, whereas an opposite behavior is observed for increasing the value of the modified Hartmann number. Again, increasing the Casson parameter increases the temperature and concentration profiles, whereas the velocity profile reduces.

Keywords: entropy generation; Riga plate; Casson nanofluid; spectral local linearization method.