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Magnetic field effect on hybrid nanofluid flow over a porous stretching/shrinking sheet with Brinkman model

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Abstract

Nanofluids have been an intriguing subject for academics and researchers in the modern technological era due to their thermophysical features and the desire to boost heat transfer rates. Nanofluids with stretching sheet applications. This article presents the study findings on heat transfer and flow over non-Newtonian hybrid nanofluid on a stretching/shrinking surface under the influence of viscous dissipation, thermal radiation, an inclined magnetic field, and a porous medium in the presence of suction/injection. By using the proper similarity transformations, the model equations were reduced from partial to ordinary differential equations. Using a new variable, the linear ODE with a variable coefficient is transformed into a confluent hypergeometric differential equation. After that, a graphic representation of the analytical results is presented. Additionally, a graphical representation of the impact of the other physical factors included in the model, such as the Brinkmann number, inclined magnetic field, porous medium, and radiation, on the velocity and temperature distribution is studied. It is seen that increasing the magnetic field raises the skin friction whereas the radiation promotes heat transfer rates.

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