BLOOD CONVEYING FERROPARTICLE FLOW ON A STAGNATION POINT OVER A STRETCHING SHEET: WILLIAMSON HYBRID FERROFLUID

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ABSTRACT

Non-Newtonian hybrid ferrofluid has become an interesting topic among the researchers due to various application in many sectors such as chemical industry and medical sectors. The purpose of this research is to stagnation point flow of the non-Newtonian Williamson hybrid ferrofluid point over a stretching sheet. In order to reduce the complexity of governing equations, the similarity transformation variable are used to transform the partial differential equation (PDEs) into ordinary differential equation (ODEs). The obtained ODEs are tackled numerically by using Runge-Kutta Fehlberg Fourth Fifth (RKF45) method. The result for the skin friction coefficient against volume fraction are validated by comparing with existing study to see the accurate of this study. The flow characteristic and heat transfer of the non-Newtonian Williamson hybrid nanofluid are investigated over various parameters such as volume fraction, magnetic parameter, non-Newtonian fluid parameter, Prandtl number and stretching parameter. The result reveal that velocity profiles increases when magnetic and stretching parameter are increased and decreases when the Williamson and volume fraction parameter are increased. The temperature profile increases when the stretching and volume fraction parameter are increased and decreases when the magnetic, stretching and Prandtl number parameter are increased. The velocity profile shows no significant changes over increasing Prandtl number due to decouple boundary layer equation.

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