Article

MHD CASSON FLUID STAGNATION POINT FLOW AND HEAT TRANSFER OVER AN EXPONENTIALLY STRETCHING SURFACE IN PRESENCE OF UNIFORM HEAT SOURCE AND SINK WITH SUCTION EFFECT

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Abstract

The present study reveals the analysis of steady mixed convection MHD stagnation point flow of Casson fluid of non-Newtonian nature and Heat transfer over an exponentially stretching surface where the consequence of uniform heat source and sink are taken in to consideration. The presiding Non-linear Partial differential equations and the corresponding boundary conditions are formulated and thus transformed into pair of non-linear ordinary differential equations. The equations thus obtained are deciphered using Runge-Kutta fourth - order method with the help of MATLAB software. The results obtained for Skin friction coefficient and heat transfer rate for the case of Newtonian fluid are determined, which are in good harmony with the previously proclaimed results of other researchers.The impact of physical quantities such as Casson parameter, buoyancy parameter, Hartmann number, Prandtl number, heat source and sink, Suction parameter, on the fluid velocity and temperature are discussed through graphs for both assisting and opposing flow. The variation in Skin friction coefficient and Nusselt number are tabulated for various values of Hartmann number. Divergence in the velocity profile is observed for increase in Suction for two different values of Velocity ratio parameter. As Skin friction coefficient escalates with suction parameter indicating the exertion of drag force by

the surface on the fluid flow. Also, the study reveals that the impact of Hartmann number is to minimize the boundary layer separation.

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