

ON BOUNDARY LAYER FLOW PAST A STRETCHED AND STRETCHING PLATE AND HEAT TRANSFER WITH VARIABLE CONDUCTIVITY

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The present thesis entitled "On Boundary Layer Flow Past a Stretched and Stretching Plate and Heat Transfer with Variable Conductivity" has been spread over five chapters.

In Chapter-1, which is introductory, a brief resume is given about the developments in the field of fluid dynamics and the differential equations governing the problems of flow and heat transfer.

Crane [15] investigated the boundary layer flow past a stretching sheet whose velocity is proportional to the distance of the slit. Carragher [11] reconsidered the problem of Crane [15] to study heat transfer and calculated Nusselt number for the entire range of Prandtl number. Pr. Chen [12] considered the heat transfer with variable conductivity in stagnation point flow towards a stretching sheet and solved the problem first by perturbation method and then numerically, Ahmad and Khan [2] studied the viscous incompressible flow past a stretching plate and the heat transfer with variable conductivity obtaining the temperature field as well as Nusselt number. We generalize the result of Ahmad and Khan [2] for visco-elastic fluid (Walters Liquid B model), numerically for the heat transfer and we look for the influence of visco-elastic parameter as well as the variable conductivity parameter on the temperature field as Chapter-2 of this thesis.

In Chapter-3, we consider "Visco-elastic boundary layer flow past a stretching plate with suction and heat transfer with variable conductivity". Here, we apply the uniform suction on the surface of stretching plate. A closed form solution is analysed utilizing the value of r . Further, we solve the problem for temperature distribution for variable conductivity by Runge-Kutta method of fourth order through shooting method.

As Chapter-4, we consider Walter's Liquid B model to analyse the flow over a stretched surface, while in previous two chapters we have carried out work for stretching plate. The stretched character of sheet is managed through boundary conditions. We derive the expression for velocity components by similarity transformation method for small stretched factor u . Further, we study heat transfer with variable conductivity of plate and the related results have been discussed.

Chapter-5, the last chapter of this thesis presents a detailed analysis of "Boundary layer flow past a stretched plate with suction and heat transfer with variable

conductivity". Here, we read the influence of suction parameter and thermal variable parameter on temperature field for small stretched parameter u through calculated numerical values of temperature field for different values of suction parameter and thermal variability parameter. We also see the pattern through graphical presentation