EFFECTS OF VARIABLE FLUID PROPERTIES ON UNSTEADY HEAT TRANSFER OVER A STRETCHINGSURFACE IN THE PRESENCE OF THERMAL RADIATION

M.F. Dimian[1], *A.M. Megahed*[2]

[1]Department of Mathematics,
Ain Shams University, Faculty of Science
(*Cairo, Egypt; e-mail: mouradfadl@yahoo.com, ah_mg_sh@yahoo.com*),
[2]Department of Mathematics, Faculty of Science
(*Benha University (13518), Egypt*)

S u m m a r y

The effect of radiation on the unsteady flow over a stretching surface with variable viscosity and variable thermal conductivity is analyzed. Similar governing equations are obtained by using suitable transformations and are then solved by applying the Chebyshev spectral method. Numerical results for the dimensionless velocity profiles and the dimensionless temperature are graphically presented for various values of the radiation parameter, viscosity, thermal conductivity, space and time indices, Prandtl number, and unsteadiness parameter. It is shown that both the skin friction and the rate of heat transfer decrease, as the Prandtl number and the unsteadiness parameter decrease. But both decrease, as the radiation parameter increases. The dimensionless temperature increases with the radiation parameter and the viscosity, but it decreases as the space and time indices increase.