

AME 538
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Due: December 5, 1994

Consider the Blasius problem, flow over a flat plate.

- Plot the dimensionless velocity u_* as a function of the similarity variable η_* .
- For $Pr = 1$, plot the dimensionless temperature T_* as a function of the similarity variable η_* for $Ec = 0, 1/4, 1/2, 3/4, 1$. Put all of the temperature profiles on a single plot.
- If the fluid is air, initially at atmospheric conditions, and the freestream velocity is 50m/s generate dimensional plots of $u(x, y)$ and $T(x, y)$. Assume the thermal conductivity k is such that $Pr = 1$. Take the ordinate to be y and the abscissa to be either u or T ; plot the profiles at various x . Choose the range of y and x such that a meaningful variation is displayed.