

# Homework 5: AE550, Viscous Fluid Flow

October. 9 2008

Due: October 16, 2008 (beginning of class)

## Problem 1.

Consider the decelerating inviscid flow:

$$U(x) = U_0 (1 - x/L)$$

- Comment on the pressure gradient in this flow and its effect on the boundary layer.
- Use Pohlhausen's method to estimate the separation point  $x_{sep}$ .
- Plot at least five velocity profiles up to the separation point and based on them comment on the boundary layer development in terms of skin friction, boundary layer thickness and displacement thickness.
- Use Twaites method to estimate the separation point,  $x_{sep}$ .