Lab #7: Wind Tunnel

MAE 107
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Objectives and Tasks

- Understand how to use the Bernoulli’s Equation to determine flow speed.
- Plot the velocity profile in the wind tunnel.
- Plot the velocity profile with different wake conditions.
Before you begin...

- Calibrate the manometer so that it reads 0 when the wind tunnel is off.
- Calibrate the height measurement tool so that it reads 0 when the pipe is at the bottom.
Procedure 1: Bernoulli’s Equation

- Measure Pitot vs. Wall Tap pressure
- Measure Open vs. Wall Tap pressure
- Are they the same?

Fig 3 from Lab Instructions
Procedure 2: Velocity Profile

- Connect tubes to the Pitot and wall static.
- Starting at the bottom, move the Pitot tube up through the entire wind tunnel flow to measure the velocity profile.
- You do not have to take measurements in increments. You should take many measurements in places with large changes in the velocity.

Rotate to vertically Move Pitot tube

Record the $\Delta H$
Procedure 3: Cylinder Wake

- Take a cylinder from the box and place into the flow. Note the diameter of the cylinder.
- As in part 2, take the velocity profile. Repeat with the cylinder at two different positions.