

AerE344 Pre-Lab Assignment - Experiment Design Component

Lab # 11: PIV measurements of the unsteady vortices in the wake of an airfoil

DUE: At lab time for Lab Experiment # 11

You will need to finish this pre-lab assignment before you come to the wind tunnel laboratory to do the experiments.

What you will be given for your experiment:

- A low-speed wind tunnel
- A GA(w)-1 airfoil model
- A 2-D PIV system

What you need to know before you came to the lab:

- You should review and understand the concepts of flow patterns around an airfoil: attached flow, separation flow, airfoil stall, wake vortex flow.
- You should review and understand the concepts of Particle Image Velocimetry (PIV) technique and setup of a PIV system.

What your experiment needs to produce:

- You are required to prepare a formal lab report with the following results:
 - 1) Instantaneous PIV measurement results.
 - 2) Ensemble-averaged PIV measurement results based on 100 frames of instantaneous PIV measurements results.
- You are also required to discuss the results and their relationship.