

Abstract Submitted  
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**Simultaneous analysis of wake structure and force measurements of unsteady hydrofoils** TIMOTHY JETER, JR., MELISSA GREEN, Syracuse University — In the field of bio-inspired hydrodynamics, comparison of simultaneous wake structure analysis and force measurement on the body itself are relatively unexplored. Hydrofoil technology in an experimental setup seeks to bridge this gap, with water tunnel experiments that utilize a pitching and heaving low-aspect-ratio airfoil mounted vertically. The actuation is accomplished by employing a two-axis motion controller. Vortical wake structure will be analyzed using particle image velocimetry (PIV), and hydrodynamic forces will be measured using a six-component force balance installed within the actuation system. The simultaneous measurements will allow for correlation of wake structure to propulsive power and efficiency and evaluate their relationship with variations in Strouhal number and Reynolds number.

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