

Abstract Submitted  
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**Experimental Study of Synchronization and Phase Dynamics in Flapping Wing Propulsion** CYNDEE FINKEL, KARL VON ELLENRIEDER, Florida Atlantic University — Experiments are conducted on a two dimensional heaving airfoil to determine whether or not natural flight can be modeled as a limit cycle process as well as the degree to which the wing motion, any vortices shed from upstream bodies and the fluid force response act as dynamically coupled oscillators. The heaving airfoil mechanism is constructed to permit the experimental simulation of a freely flying system in which the forward speed of the system is determined by the Strouhal number and reduced frequency of the motion. Also examined is how the structure of the flow behind a freely flying system differs from that of a strongly forced system, where the position of a flapping airfoil mechanism is fixed and the forward velocity is imposed.

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