Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

**Experimental framework to study tip vortex interactions in multirotor wakes** RONGNAN YAO, DANIEL ARAYA, University of Houston — We present an experimental study to compare the dynamic characteristics of tip vortices shed from a propeller in a crossflow to similar characteristics of an isolated vortex column generated in a closed system. Our aim is to evaluate the feasibility of using this simple isolated system to study the more complicated three-dimensional vortex interactions inherent to multirotor wakes, where the local unsteadiness generated by one rotor can strongly impact the performance of nearby rotors. Time-resolved particle image velocimetry is used to measure the velocity field of the propeller wake flow in a wind tunnel and the vortex column in a water tank. Specific attention is placed on analyzing the observed vortex core precession in the isolated system and comparing this to characteristic tip-vortex wandering phenomenon.

Rongnan Yao
Univ of Houston

Date submitted: 01 Aug 2017 Electronic form version 1.4