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Toward the Experimental Characterization of an Unmanned Air System Flow Field JOHN-MICHAEL VELARDE, JACOB CONNORS, MARK GLAUSER, Syracuse Univ — The velocity flow field around a small unmanned air system (sUAS) is investigated in a series of experiments at Syracuse University. Experiments are conducted in the 2'x2' sub-sonic wind tunnel at Syracuse University and the Indoor Flow Lab. The goal of these experiments is to gain a better understanding of the rich, turbulent flow field that a sUAS creates. Comparison to large, multi-rotor manned vehicles is done to gain a better understanding of the flow physics that could be occurring with the sUAS. Regions of investigation include the downwash, above the vehicle, and far downstream. Characterization of the flow is performed using hotwire anemometry. Investigation of several locations around the sUAS show that dominant frequencies exist within the flow field. Analysis of the flow field using power spectral density will be presented as well as looking at which parameters have an effect on these dominant frequencies.

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