

Abstract Submitted  
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**Dispersed Pressure Sensing for Flow Field Estimation**<sup>1</sup> AMRI-TAVARSHINI MAYAVARAM, PETER RENN, MORTEZA GHARIB, Caltech — Fan array wind tunnels offer an ideal test environment for small unmanned aerial vehicles (UAV) due to their high configurability and ability to simulate a multitude of different flows. However, flows currently must be manually measured and adjusted to achieve desired conditions. Measurements have to be taken by sweeping across which can be inaccurate and does not provide a temporally synchronized reading of the entire field. The development of an array of pitot-static tubes can provide accurate pressure and velocity data across an entire flow field at a single instance, giving a better picture of the entire field. This measurement technique has significant potential for machine learning applications on fan arrays, particularly as a feedback system to generate and maintain desired flows. This pitot-static tube array was implemented on a small fan array in Caltech's Center for Autonomous Systems and Technology (CAST) with the primary design conditions of minimizing interference with the flow produced by maintaining a small profile and structural integrity and stability.

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