Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

**The Effect of Flexible Membrane Scalloping on the Lift and Drag of Flat Plates in Low Re Flow**[1] MELISSA CONWAY, JAMES HUBNER, University of Alabama — Micro Air Vehicles (MAVs) have the potential to be used for surveillance and assessment of dangerous environments. Promising applications for MAVs encourage researchers to find effective designs for the most adept flying. Previous wake analysis research conducted at the University of Alabama suggested trailing-edge scalloping of the membrane reduces drag. The present study, drawing from the previous research, tests various geometries involving scalloped and nonscalloped trailing-edges on a three-component force balance. Flat plates were tested to mimic fixed MAV wings at low Reynolds number flow and varying angles-of-attack in a low-speed wind tunnel. Thin aluminum plates with repeated cell geometries were covered with a flexible latex membrane. Cell aspect ratios of 1 and 2 (80% and 40%, respectively, of the chordwise length) were tested along with a solid flat plate and a solid scalloped plate. The presentation will discuss results and explore the impact of changing geometries on lift, drag and aerodynamic efficiency.

[1]Work performed under REU site, NSF grant EEC 0754117.

Amy Lang
University of Alabama

Date submitted: 06 Aug 2009 Electronic form version 1.4