Abstract Submitted
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Surface Visualization of Low Re Flow over Low Aspect Ratio Flat Plate Wings[1] BLAIR FARLEY, University of Alabama-Birmingham, JAMES HUBNER, University of Alabama — Unmanned air vehicles are an increasingly important focus of the military. Micro air vehicles (MAVs) are a subset of these for which the size is limited to 15 cm. MAVs generally fly at low speeds, 5-20 m/s, and Reynolds numbers less than 200,000. For designs to be compact while maintaining high lift, low aspect ratio wings are generally employed, creating larger tip vortices. This study investigates the extent of flow separation and reattachment as well as the effect of the tip vortex over the lee-side of low-aspect ratio wings. Surface visualization methods, such as powder tracking, are discussed, and the results for the flow over Zimmerman and rectangular rigid, flat plate wings of aspect ratio 1.27, 3, and 5 will be presented for Re near 50,000.

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