Abstract Submitted
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Parametric Dependence of Initial LEV Behavior on Maneuvering Wings[1] RANDALL BERDON, KEVIN WABICK, JAMES BUCHHOLZ, University of Iowa, KYLE JOHNSON, BRIAN THUROW, Auburn University, UNIVERSITY OF IOWA TEAM, AUBURN UNIVERSITY TEAM — A maneuvering rectangular wing of aspect ratio 2 is examined experimentally using dye visualization and PIV to characterize the initial development of the leading-edge vortex (LEV) during a rolling maneuver in a uniform free stream. Understanding the underlying physics during the early evolution of the vortex is important for developing strategies to manipulate vortex evolution. Varying the dimensionless radius of gyration of the wing (R_g/c, where Rg is the radius of gyration and c is the chord) and the advance ratio (J=U/ΩR_g, where U is the free-stream velocity and Ω is the roll rate) affects the structure of the vortex and its propensity to remain attached. The influence of these parameters will be discussed, toward identification of similarity parameters governing vortex development.

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