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Transport Mechanisms Governing initial Leading-Edge Vortex Development on a Pitching Wing[1] KEVIN WABICK, RANDALL BERDON, JAMES BUCHHOLZ, University of Iowa, KYLE JOHNSON, BRIAN THUROW, Auburn University — The formation and evolution of Leading Edge Vortices (LEVs) are ubiquitous in natural fliers and maneuvering wings, and have a profound impact on aerodynamic loads. The formation of an LEV is experimentally investigated on a pitching flat-plate wing of aspect-ratio 2, and dimensionless pitch rates of $k = \Omega c/2U$ of 0.1, 0.2, and 0.5, at a Reynolds number of 10^4. The sources and sinks of vorticity that contribute to the growth and evolution of the LEV are investigated at spanwise regions of interest, and their relative balance is compared to other wing kinematics, and the case of a two-dimensional pitching wing.

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