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High lift generation of low-aspect-ratio wings ADAM DEVORIA, KAMRAN MOHSENI, Univ of Florida - Gainesville — The time-averaged flow field in the center-span of low-aspect-ratio rectangular wings is experimentally measured. It is shown that lift stall is preceded by shedding of strong trailing-edge vorticity. The induced downwash of the tip vortices delays the growth of the attached boundary layer as well as leading-edge separation. Reattached flow occurs for sufficiently low aspect ratios and results in a smooth merging of the flow at the trailing edge thus assisting in satisfying a Kutta condition there. As a consequence, the strength of vorticity shed from the trailing edge is decreased and allows for continued lift generation at high angles of attack. When the reattachment point passes beyond the trailing edge, a strong shear layer is generated there and represents negative lift, leading to stall with a slight increase in angle of attack or aspect ratio.

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