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**Separated Flow over finite span, cantilevered wings at a moderate Reynolds number**[1] JACOB NEAL, MICHAEL AMITAY, Rensselaer Polytechnic Institute — Separated flows over airfoils are known to exhibit cellular separation patterns known as stall cells (SCs). A series of wind tunnel experiments explored SC formation over a finite span, square tipped NACA 0015 with aspect ratio 4. For all experiments the Reynolds number was 330,000 and the angle of attack was 22 degrees. Oil flow visualizations (OFV) were performed to qualitatively ascertain the surface topology of the mean flow. The counter-rotating foci of a mushroom shaped SC were clearly seen near the midspan. SPIV measurements were taken of the mean flow volume. Three-dimensional streamlines were calculated through this volume, showing a focus which originated and terminated at the surface foci identified in the OFV, and extended into a U shape into the wake. To investigate the unsteadiness of the flowfield, time-resolved SPIV measurements were performed at two spanwise locations across the wing. One spanwise location at the center of the SC, and the other bisected the outboard surface focus of the SC. At the SC center location, the dominant frequencies and DMD mode shapes were consistent with von Karman shedding. At the focus center location, a range of frequencies was present and coherent mode shapes were fleeting.

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Michael Amitay
Rensselaer Polytechnic Institute

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