LCS analysis of a biologically inspired wake\textsuperscript{1} MELISSA GREEN, ALEXANDER SMITS, Princeton University — Particle Image Velocimetry (PIV) was used to investigate the wakes of rigid pitching panels with a trapezoidal panel geometry, chosen to model idealized fish caudal fins. Experiments were performed for Strouhal numbers from 0.23 to 0.65. The three dimensional flow field around the panel is reconstructed by integrating two-dimensional PIV results across the volume surrounding the panel. A Lagrangian coherent structure (LCS) analysis is employed to investigate the formation and evolution of the panel wake. A classic reverse von Kármán vortex street pattern was observed along the mid-span of the near wake, but the complexity and three-dimensionality of the wake increases away from the mid-span as streamwise vortices interact with the swept edges of the panel.

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