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Wake Properties of an Oscillating Airfoil Undergoing Asymmetric Oscillation[1] COLIN STUTZ, DOUGLAS BOHL, Clarkson University, MELISSA GREEN, Syracuse University — The flow field around a NACA0012 airfoil undergoing small amplitude, high frequency asymmetric sinusoidal pitching is investigated using Particle Image Velocimetry (PIV). The airfoil is pitched about the quarter chord point with an amplitude of 4at reduced frequencies of k =2.6-5.8 for $\mathrm{Re_c}$ =12000. Pitching symmetries of 50/50, 60/40 and 70/30, where the symmetry is defined as the fraction of the cycle spent in the pitch down and pitch up motion. Wake characteristics (i.e. vortex size, peak vorticity, vortex orientation, vortex convection speed) are investigated by tracking the vortices in the wake over the first chord length of development. Mean thrust/drag are calculated using a control volume approach including fluctuating terms.

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