

Abstract Submitted
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High resolution velocimetry near the trailing edge of rigid and flexible airfoils undergoing unsteady motion¹ DAVID OLSON, AHMED NAGUIB, MANOOCHEHR KOOCHEFAHANI, Michigan State University — The advantages of Molecular Tagging Velocimetry (MTV) are exploited in performing highly resolved measurements within the boundary layer, and downstream of the trailing edge of rigid and flexible NACA0012 airfoils undergoing canonical unsteady motions. Experiments are performed over a range of motion and flow parameters in an effort to establish the connections between airfoil motion trajectory, trailing edge flexure, and the time history of vorticity flux at the trailing edge. Specifically, multi-line MTV measurements, which are phase averaged relative to the airfoil motion, are used to examine the formation, evolution and characteristics of the wake vortices near the trailing edge and the concurrent behavior of the boundary layer immediately upstream. Results are used to gain insight into the effect of the trailing edge flexibility on the pattern of vorticity shed from, and the flow details around the trailing edge.

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