Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Low Reynolds Number Low Aspect Ratio Leading Edge Separation Dynamics[1] DANIEL MORSE, JAMES LIBURDY, Oregon State University — The low Reynolds number flow conditions for a low aspect ratio wing are investigated using time resolved PIV with specific emphasis on the leading edge vortex generation at high angles of attack. The flow is highly three dimensional and the flow visualization shows very strong tip vortices which extend over a major portion of the wing. The separation bubble consists of a triangular shaped region extending back to about one third of the chord length. Three component velocity data are obtained at the centerline, one half span and at the wing tip. The time variation of the leading edge vortex shedding is studied in each of these regions using a swirl detection algorithm. The frequency of shedding is shown to be an order of magnitude higher than the dominant frequency within the recirculation region. The tip vortex flow dominate near the edge of the wing.

[1]Support from AFOSR is gratefully acknowledged.

James Liburdy
Oregon State University

Date submitted: 02 Aug 2008 Electronic form version 1.4