

Abstract Submitted  
for the DFD15 Meeting of  
The American Physical Society

**The effect of acceleration on the growth and shedding of laminar separation bubbles** SAMIK BHATTACHARYA, DAVID RIVAL, Queen's University — It has been observed that when a laminar boundary layer separates, the shear layer undergoes transition to turbulence and subsequently reattaches to form a laminar separation bubble (LSB). In this work, a SD7003 airfoil, held at an angle of attack of 8 degree, is towed with different acceleration profiles starting from rest. The separation region is then analyzed with time-resolved, planar PIV at short convective times during the initial acceleration phase. The aim of this work is to characterize the variation in size and shedding frequency of the laminar separation bubble with increasing acceleration. We show that the formation and shedding process in the LSB depends on the rate of vorticity-containing mass transported by the separated shear layer. Consequently, any changes in the structure of the shear layer affect the formation of the LSB downstream. Finally, attempts are also made to characterize the shedding frequency of the bubble with increasing acceleration. Here the unsteadiness of the LSB is found to be closely linked to the degree of boundary-layer acceleration on the airfoil surface.

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Date submitted: 01 Aug 2015

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