

Abstract Submitted
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Facility Dependent Issues Influencing the Experimental Characterization of a Laminar Separation Bubble¹ DAVID A. OLSON, AHMED M. NAGUIB, MANOOCH EHR M. KOCHESFAHANI, Michigan State University — There is a documented discrepancy in the characteristics of the laminar separation bubble on the steady SD7003 airfoil obtained from various experimental and computational studies. The influence of added freestream turbulence, among other factors, is studied for a range of Reynolds number ($2 \times 10^4 - 6 \times 10^4$), and angle of attack ($2^\circ - 12^\circ$). Both the baseline cases and those with added grid-generated turbulence utilize single-component Molecular Tagging Velocimetry with a cross-stream measurement spatial resolution of $52 \mu\text{m}$. The addition of freestream turbulence is shown to decrease the size of the separation bubble by both delaying separation and triggering an earlier reattachment. The measured separation location is shown to be also sensitive to the uncertainty of wall location and near-wall spatial resolution.

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