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Comparison of Intermittency Detection Algorithms in a Transitional Boundary Layer JORDAN NULL, MARK MCQUILLING, Saint Louis University — Intermittency algorithms evaluate the maturity of the laminar-to-turbulent transition process by assessing how often a flow is turbulent. This work compares four different intermittency algorithms using thermal anemometry data sets. These data were acquired above the suction surface of a transitional low-pressure turbine airfoil at three chord Reynolds numbers of $2.5\text{x}10^4$, $5.0\text{x}10^4$, and $7.5\text{x}10^4$. Comparisons between the Hedley-Keffer, Volino-Hultgren, Clark, and MTERA algorithms show that using one algorithm over another could lead to an improper interpretation of the transition physics occurring throughout the flowfield. Algorithms appear to signal the onset of transition in similar locations, although the surface-normal and surface-tangential extents and magnitudes of intermittency can vary considerably throughout the transitional region. Comparisons of the anemometry data to Coles' Law of the Wake turbulent similarity velocity profiles also provide insight into the degree of correlation between algorithm intermittencies and accepted turbulent velocity profiles.

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