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Effects of Boundary Layer Transition on Shock Wave Boundary Layer Interactions ZACHARY MURPHREE, NOEL CLEMENS, DAVID DOLLING, Center for Aeromechanics Research, The University of Texas at Austin, TX 78712 — Shock wave boundary layer interactions generated with a cylinder on a flat plate were visualized in a Mach 5 flow. High-speed (10-20 kHz) planar laser scattering (PLS) was used to obtain images of the interactions. An emphasis was placed on how the interactions varied with respect to where the interaction occurred within the streamwise length of the transition process. These variations were looked at in terms of overall shape, unsteadiness, and frequency and range of motion. When the interactions occurred towards the laminar side of transition they were found to be more unsteady and to have a broader range of motion in the streamwise direction than the interactions occurring at the aft end of transition. These differences are explained in terms of the evolution of flow structures through the transition process, in particular, the finger-like structures that protrude through the upstream edge of the interaction and turbulent spots.

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