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Control of the Shock-Induced Flow Separation over Convex Surfaces ABRAHAM N. GISSEN, BOJAN VUKASINOVIC, ARI GLEZER, Georgia Tech — The present experimental investigation focuses on shock-induced flow separation off a convex surface geometry under subsonic upstream channel flow. In particular, the emphasis is placed on the narrow pre-chocked regime ($M \approx 0.6$) with a signature localized shock that induces the flow separation off the surface. Both uncontrolled and controlled flows are studied by characterization of both the shock dynamics and the resulting separated flow over the convex surfaces of varying curvatures. The diagnostics tools include static and dynamic surface pressure measurements, assisted by qualitative and quantitative characterizations of the separated flow. Alteration of the shock wave dynamics and its coupling to the boundary layer separation and shear layer dynamics is achieved by active generation of streamwise vorticity. The active control is aimed at direct manipulation of either the shock dynamics or the flow separation. The former demonstrates control authority on the shock dynamics and its coupling to the shear layer, while the latter assesses both upstream and downstream coupling of the flow separation delay with the shock and shear layer, respectively.

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