

Abstract Submitted  
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**Shock wave boundary layer interaction in jet injection into supersonic crossflow** NITHIYARAJ MUNUSWAMY, RAGHURAMAN N GOVARDHAN, Indian Institute of Science — Jet injection into supersonic crossflow results in a bow shock forming upstream of the injected jet. In the present work, we study the unsteady interactions of this shock with the structures in the incoming boundary layer. The studies are done with a sonic air jet injected into a supersonic air crossflow at a Mach number of 2.5 with jet momentum ratios from 1.5 to 3. The interactions of the shock and the incoming boundary layer are measured using PIV in two perpendicular planes, one perpendicular to the wall from which the jet is injected and the other parallel to the wall and within the boundary layer. These measurements enable determination of both structures within the boundary layer, such as low and high speed streaks, and the instantaneous location of the bow shock, in addition to the jet penetration at that instant. The detailed analysis of instantaneous and mean flow quantities for different momentum flux ratios obtained from a large set of instantaneous PIV fields will be presented at the conference.

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