

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Dependence of the unsteady behavior of shock wave boundary layer interactions on the Reynolds number and on the state of separation¹ PIERRE DUPONT, LOUIS SOUVEREIN, JEAN-PAUL DUS-
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The mean spatial organization and the unsteady behavior of a plane shock wave impinging on a turbulent boundary layer is investigated experimentally. Several parameters are considered: flow deviation, Mach and Reynolds numbers. Particular attention is paid to the incipient separation cases obtained at two Reynolds numbers with an order of magnitude of difference, obtained in different wind tunnels. The measurement technique is two component planar particle image velocimetry. The low frequency unsteadiness of the reflected shock is deduced by means of conditional statistics based on the existence of reverse flow. Upstream as well as downstream influences are considered. The results indicate that common mechanisms with the separated cases exist in the incipient cases, but with more or less importance, depending on the probability to observe reverse flow in the interaction. The effect of the Reynolds number will be shown to be negligible.

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Date submitted: 28 Jul 2009

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