

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Shock Wave–Boundary Layer Interaction in Reflecting Detonations J. DAMAZO, J. ZEIGLER, J. KARNESKY, J.E. SHEPHERD, California Institute of Technology — The interaction of a reflecting shock wave with the boundary layer induced by the incident shock wave results in a unique flow field that has been examined in shock tubes. Our recent experiments studying reflecting detonations examine an incident detonation impinging on a normal, planar wall to create a reflected shock wave. We have observed that the pressure records taken near the location of reflection show that the measured speed of the reflected shock wave is inconsistent with the measured wall pressures. We present new experimental results of high-speed video taken of the reflecting detonation and highly-resolved two-dimensional numerical simulations of compressible viscous flow. These results show that the interaction of the reflected shock wave with the boundary layer can result in a three-dimensional shock front structure with an oblique front in the boundary layer similar to that observed in non-reacting shock tubes.

Joseph Shepherd
California Institute of Technology

Date submitted: 11 Aug 2010

Electronic form version 1.4