

Abstract Submitted  
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**Planar Reflection of Detonations Waves<sup>1</sup>** JASON DAMAZO,  
JOSEPH SHEPHERD, California Institute of Technology — An experimental study  
examining normally reflected gaseous detonation waves is undertaken so that the  
physics of reflected detonations may be understood. Focused schlieren visualization  
is used to describe the boundary layer development behind the incident detonation  
wave and the nature of the reflected shock wave. Reflected shock wave bifurcation—  
which has received extensive study as it pertains to shock tube performance—is pre-  
dicted by classical bifurcation theory, but is not observed in the present study for  
undiluted hydrogen–oxygen and ethylene–oxygen detonation waves. Pressure and  
thermocouple gauges are installed in the floor of the detonation tube so as to examine  
both the wall pressure and heat flux. From the pressure results, we observe an in-  
consistency between the measured reflected shock speed and the measured reflected  
shock strength with one dimensional flow predictions confirming earlier experiments  
performed in our laboratory.

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