

Abstract Submitted  
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**NPS Gas Gun for Planar Impact Studies** CHIEN CHEONG HO<sup>1</sup>, NA, ROBERT HIXSON, NPS — The Naval Postgraduate School (NPS) commissioned a Gas Gun for shock wave studies on 9<sup>th</sup> October 2009, by performing the first experiment. The Gas Gun is the key element of NPS Shock Wave Research Program within the Physics Department, where well-characterized planar impacts are essential for obtaining high quality data, to characterize a solid material. This first experiment was very successful, and returned key data on the quality of the impact conditions created. The Gas Gun is designed by SANDIA NATIONAL LABORATORIES, and the NPS spent twelve months fabricating the components of the Gas Gun and six months assembling the Gas Gun. Three inch projectile are launched at velocities up to 0.5 km/s, creating high pressure and temperature states that can be used to characterize the fundamental response of relevant materials to dynamic loading. The projectile is launched from a ‘wrap around’ gas breech where helium gas is pressurized to relatively low pressure. This gas is used to accelerate the projectile down a 3m barrel. Upon impact, the speed of the projectile and the flatness of the impact is measured, via a stepped circular pin array circuit. The next stage of development for the Gas Gun is to integrate a Velocity Interferometer System for Any Reflector (VISAR). The VISAR sees all the waves that flow through the target plate as a result of the impact. This is a key diagnostic for determining material properties under dynamic loading conditions.

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