

# **A METHOD TO DETERMINE SHOCK ADIABAT PARAMETERS WITH HIGH PRECISION**

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The paper presents an advanced method of projectile deceleration on the LiF window which helps determine Hugoniot parameters with much higher accuracy. With the PDV technique by a signal from one registration channel we can simultaneously measure two quantities: the velocity of the projectile free surface just before the impact and the velocity of the contact surface at a time of  $\sim 200$  ns after the impact. Extrapolation helps reliably recover the values of these velocities exactly at the time of impact. So, it has become possible to simultaneously measure two velocities at a unique space-time point which excludes errors associated with averaging over area and time.

The method we propose was verified through four experiments with a 12X18H10T projectile that was accelerated to velocities from 1500 to 4500 m/s and then decelerated on a LiF window. It has been shown that the method helps obtain data accurately to 0.5% even in explosive experiments thus opening ample opportunities for research into material behavior under dynamic loads.

Another essential factor for attaining high accuracy is the use of an approximation of the linear dependence between the two velocities being measured instead of the zero-order approximation where the velocities were assumed to be constant, as it was done earlier. In this case we can eliminate errors associated with different projectile dynamics and use multichannel measurements for statistical processing.

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