

Abstract Submitted
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Novel Uses of Detonator Diagnostics JOHN GIBSON, Los Alamos National Laboratory — A novel combination of diagnostics is being used to research the physics of detonator initiation. Rogowski coils are being used to obtain the time derivatives of electrical currents in the detonators in combination with polyvinylidene difluoride (PVDF) stress sensors to monitor shock propagation. PVDF is commonly used in contact with the detonator output to detect breakout time of the detonation wave; however, in this experiment PVDF foils are separated from the PETN and re-oriented to observe various shock events from the time of bridge burst until the breakout time of the detonation wave. The goal of these experiments is to use these diagnostics to study the response of detonators using specific explosive particle sizes. The new diagnostics were used to determine the timing of bridge burst, flyer impact, wave propagation and detonator breakout. Custom designed fixtures were loaded with the explosive PETN, which was pressed to a density of 1.55 g/cc. The results of testing various detonators with these new techniques will be presented. The data are compared to those of currently used diagnostics in order to validate the accuracy of these new methods. Future experiments will incorporate other methods of validation including dynamic radiography.

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