

Abstract Submitted  
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**Alternate Methods to Experimentally Investigate Shock Initiation Properties of Explosives** FORREST SVINGALA, RICHARD LEE, NSWC Indian Head EODTD, GERRIT SUTHERLAND, ARL Aberdeen Proving Ground, PHILIP SAMUELS, ARDEC — Reactive flow models are desired for many new explosives early in the formulation development stage. Traditionally, these models are parameterized by carefully-controlled 1-D shock experiments, including gas-gun testing with embedded gauges and wedge testing with explosive plane wave lenses (PWL). These experiments are easy to interpret, due to their 1-D nature, but are generally expensive to perform, and cannot be performed at all explosive test facilities. We investigate alternative methods to probe shock-initiation behavior of new explosives using widely-available pentolite gap test donors and simple time-of-arrival type diagnostics. These methods can be performed at a low cost at virtually any explosives testing facility, which allows experimental data to parameterize reactive flow models to be collected much earlier in the development of an explosive formulation. However, the fundamentally 2-D nature of these tests may increase the modeling burden in parameterizing these models, and reduce general applicability. Several variations of the so-called modified gap test were investigated and evaluated for suitability as an alternative to established 1-D gas gun and PWL techniques. At least partial agreement with 1-D test methods was observed for the explosives tested, and future work is planned to scope the applicability and limitations of these experimental techniques.

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