

Abstract Submitted  
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**Detonation Propagation in Slabs and Axisymmetric Rate Sticks<sup>1</sup>**

CHRISTOPHER ROMICK, None, TARIQ ASLAM, Los Alamos National Laboratory — Insensitive high explosives (IHE) have many benefits; however, these IHEs exhibit longer reaction zones than more conventional high explosives (HE). This makes IHEs less ideal explosives and more susceptible to edge effects as well as other performance degradation issues. Thus, there is a resulting reduction in the detonation speed within the explosive. Many HE computational models, e. g. WSD, SURF, CREST, have shock-dependent reaction rates. This dependency places a high value on having an accurate shock speed. In the common practice of shock-capturing, there is ambiguity in the shock-state due to smoothing of the shock-front. Moreover, obtaining an accurate shock speed with shock-capturing becomes prohibitively computationally expensive in multiple dimensions. The use of shock-fitting removes the ambiguity of the shock-state as it is one of the boundaries. As such, the required resolution for a given error in the detonation speed is less than with shock-capturing. This allows for further insight into performance degradation. A two-dimensional shock-fitting scheme has been developed for unconfined slabs and rate sticks of HE. The HE modeling is accomplished by Euler equations utilizing several models with single-step irreversible kinetics in slab and rate stick geometries.

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