

Abstract Submitted
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Generalized Pseudo-Reaction Zone Model for Non-Ideal Explosives BRADLEY WESCOTT, Los Alamos National Laboratory — The pseudo-reaction zone model was proposed to improve engineering scale simulations when using Detonation Shock Dynamics with high explosives that have a slow reaction component. In this work an extension of the pseudo-reaction zone model is developed for non-ideal explosives that propagate well below their steady-planar Chapman-Jouguet velocity. A programmed burn method utilizing Detonation Shock Dynamics and a detonation velocity dependent pseudo-reaction rate has been developed for non-ideal explosives and applied to the explosive mixture of ammonium nitrate and fuel oil (ANFO). The pseudo-reaction rate is calibrated to the experimentally obtained normal detonation velocity—shock curvature relation. The generalized pseudo-reaction zone model proposed here predicts the cylinder expansion to within 1% by accounting for the slow reaction in ANFO.

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