

Abstract Submitted
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A Simple Model for the Dependence on Local Detonation Speed (D) of the Product Entropy (S) DAVID HETHERINGTON, AWE — The generation of a burn time field as a pre-processing step ahead of a hydrocode calculation has been mostly upgraded in the explosives modelling community from the historical model of single-speed programmed burn to DSD. However, with this advance has come the problem that the previously conventional approach to the hydrodynamic stage of the model results in S having the wrong correlation with D. Instead of being higher where the detonation speed is lower, i.e. where reaction occurs at lower compression, the conventional method leads to S being lower where D is lower, resulting in a completely fictitious enhancement of available energy where the burn is degraded! A technique is described which removes this deficiency of the historical model when used with a DSD-generated burn time field. By treating the conventional JWL equation as a semi-empirical expression for the local expansion isentrope, and constraining the local parameter set for consistency with D, it is possible to obtain the two desirable outcomes that the model of the detonation wave is internally consistent, and S is realistically correlated with D.

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