

Abstract Submitted
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Deflagration to Detonation Transition (DDT) Simulations of HMX Powder Using the HERMES Model BRADLEY WHITE, LLNL, 7000 East Avenue, L-282, Livermore, CA 94550, USA, JOHN REAUGH, LLNL, 7000 East Avenue, L-288, Livermore, CA 94550, USA, JOSEPH TRINGE, LLNL, 7000 East Avenue, L-333, Livermore, CA 94550, USA — We performed computer simulations of DDT experiments [1] with Class I HMX powder using the HERMES model (High Explosive Response to MEchanical Stimulus) in ALE3D. Parameters for the model were fitted to the limited available mechanical property data of the low-density powder, and to the Shock to Detonation Transition (SDT) test results [2]. The DDT tests were carried out in steel-capped polycarbonate tubes. This arrangement permits direct observation of the event using both flash X-ray radiography and high speed camera imaging, and provides a stringent test of the model. We found the calculated detonation transition to be qualitatively similar to experiment. Through simulation we also explored the effects of confinement strength, the HMX particle size distribution and porosity on the computed detonation transition location. [1] Tringe J W, *et al.*, *AIP Conf. Proc.*, **1793**, 060024 (2017); doi: 10.1063/1.4971580 [2] Garcia F, *et al.*, *J. Phys. Conf. Ser.*, **500** (2014) 052048. This work was performed under the auspices of the US DOE by LLNL under Contract DE-AC52-07NA27344.

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