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Physics Based Reaction Burn Model Prediction of Reaction Initiation and Growth in RDX for Thin and Thick Impactor SUNIL DWIVEDI, University of Florida REEF, 1350 N. Poquito Rd., Shalimar, FL 32579, YASUYUKI HORIE, Munitions Directorate, Air Force Research Laboratory, Eglin AFB, FL 32542 — PBRB model for reactive composites simulates the reaction initiation and growth leading to detonation with built-in models for multiple individual as well as coupled phenomena: pre-existing statistical pore distribution, energy dissipation during shock loading and hot spot formations, surface temperature increase of the planar pore surfaces, surface reaction by sublimation, gas phase reaction, gas phase temperature rise and reverse heat flow to the pore surface aiding the surface reaction, solid phase heat conduction, etc. 1D idealized hot spot cell (1DHSC) version of the 3D PBRB model has been converted to a vectorized EOS form for the first time. Results validating the model with the pop plot of RDX in agreement with data through simulation of an assumed plate impact experiment will be presented. In addition, the effect of the surface sublimation model parameters on the rate of reaction, detonation shock pressure, and von-Neumann's peak for thin and thick inert impactor will be presented. We acknowledge Dr. Betsy Rice (ARL), Dr. Suhithi Peiris (DTRA) and Dr. John Brennan (ARL) for their support and discussion. This work is supported by Eglin AFB contract FA8651-08-0108/027 and in part by DTRA contract HDTRA-1-10-1-0035.

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