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Simulations of Hot-Spot Initiation with Reactive Kinetics for Shocked TATB[1] F.M. NAJJAR, Lawrence Livermore National Laboratory, M.W. HOWARD, Lawrence Livemore National Laboratory, L.E. FRIED, Lawrence Livermore National Laboratory — Under mechanical or thermal insults, micron-sized pores created due to defects or impurities are embedded in high-energetic material and might collapse generating high-temperature regions, leading to ignition. A multiphysics computational study is undertaken to understand the formation, ignition and growth of these hot spots. Two-dimensional high-resolution simulations are performed on an axisymmetric pore configuration in a shocked TATB material using ALE3D. ALE3D is a massively parallel multiphysics framework using an arbitrary Lagrangian-Eulerian (ALE) approach and includes thermal transfer, hydrodynamics, and chemistry along with an extensive suite of advanced EOS models. Further, a reactive kinetics model has been used to capture the chemical processes occuring in TATB. We will present results obtained from these large-scale simulations and discuss key thermo-hydro-chemical processes leading to hot-spot initiation.

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