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Burn Front and Reflected Shocks Beyond the Shadow Region in PBX-9502: Experiment and Simulation

Guillermo Terrones, Adam M. Montoya, and Christopher Morris

Abstract

Proton radiography was used to investigate the spatiotemporal evolution of the burn front and associated reflected shocks on a PBX-9502 charge confined between an outer cylindrical steel liner and an inner elliptical tin liner. The charge was initiated with a line wave generator at 30 degrees from the major axis of the ellipse. This configuration provides a large region where the HE is not within the line of sight of the detonation line and thus offers a suitable experimental platform to test various burn models and EOS formulations. In addition, the off axis initiation allows for the burn fronts to travel around the charge through different confining paths. Simulations were performed to assess the accuracy of standard burn methodologies in production hydrocodes. Experimental data from initiation through HE shock collision will be presented and simulation comparison results will be discussed.