Abstract Submitted
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Properties of the dead zone due to the gas cushion effect in PBX 9502[1] WILLIAM ANDERSON, Los Alamos National Laboratory — The gas cushion effect is a well-known phenomenon in which gas trapped between an impactor and an explosive precompresses and deadens a layer of the explosive. We have conducted a series of impact experiments, with and without a trapped gas layer, on the plastic bonded explosive PBX 9502 (95% TATB and 5% Kel-F 800). In each experiment, a 100-oriented LiF window was glued, with an intervening Al foil (a reflector for VISAR), to the surface of a thin (2.5-3.3 mm) PBX 9502 sample and the opposite surface impacted by an impactor at a velocity sufficient to produce an overdriven detonation. VISAR was used to observe arrival of the resulting shock wave and reverberations between the LiF window and the impactor. In three experiments, a gap of 25-38 mm, filled with He gas at a pressure of 0.79 bar, existed between the impactor and the sample at the beginning of the experiment. In these three experiments, a low-amplitude wave reflected from the interface between the reacted explosive and the dead zone was observed to precede the reflection from the impactor. We have used the observed wave amplitudes and arrival times to quantify the properties of the dead zone and, by comparison to existing EOS data for reacted and unreacted PBX 9502, estimate the extent of reaction in the dead zone.

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