

Abstract Submitted
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3D Hemispherical Test Development to Evaluate Detonation Wave Breakout¹ ELIZABETH FRANCOIS, JOHN MORRIS, MARK LIEBER, LARRY HILL, Los Alamos National Lab — The onionskin test has been the standard test to evaluate detonation wave breakout over a hemispherical surface for decades. It is not without its shortfalls however. It only images a small portion of the explosive and requires very precise alignment and camera requirements to make sense of the results. Asymmetry in explosive behavior cannot be pinpointed or evaluated effectively. We have developed a new diagnostic using fiber optics covering the surface of the explosive to yield a 3D representation of the detonation wave behavior. Precise timing mapping of the detonation over the hemispherical surface is generated which can be converted to detonation wave breakout behavior using Huygens's wave reconstruction. This presentation and paper will include the results of a recent suite of tests. The results of these tests will describe the effects on detonation wave breakout symmetry when inert materials are placed between the detonator and booster. The value of this test in visual representation of dynamic behavior will be presented and discussed. Statistical analysis of the test as compared to the onionskin test will be outlined. Test limitations and future improvements will be discussed.

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