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Detonation Shock Radius Experiments. DAVID LAMBERT, Air Force Research Laboratory/Munitions Directorate, JOSHUA DEBES, Air Force Research Laboratory, SCOTT STEWART, SUNHEE YOO, University of Illinois, Urbana-Champaign — A previous passover experiment [1] was designed to create a complex detonation transient used in validating a reduced, asymptotically derived description of detonation shock dynamics (DSD). An underlying question remained on determining the location of the initial detonation shock radius to start the DSD simulation with respect to the dynamical response of the initiation system coupling's to the main charge. This paper concentrates on determining the initial shock radius required of such DSD governed problems. 'Cut-back' experiments of PBX-9501 were conducted using an initiation system that sought to optimize the transferred detonation to the desired constant radius, hemispherical shape. Streak camera techniques captured the breakout on three of the prism's surfaces for time-of-arrival data. The paper includes comparisons to simulations using constant volume explosion and high pressure hot spots. The results of the experiments and simulation efforts provide fundamental design considerations for actual explosive systems and verify necessary conditions from which the asymptotic theory of DSD may apply. [1] Lambert, D., Stewart, D. Scott and Yoo, S. and Wescott, B., "Experimental Validation of Detonation Shock Dynamics in Condensed Explosives. *J. of Fluid Mechs.*, Vol. 546, pp.227-253 (2006).

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