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Predicting Run Distances for a Modified Wedge Test¹ ROBERT DORGAN, Air Force Research Laboratory, RICHARD LEE, Naval Surface Warfare Center, Indian Head Division, GERRIT SUTHERLAND, Army Research Laboratory — Simulations were used to aid in the development of a modified wedge test (MWT). This explosive sensitivity experiment allows the shockwave curvature to be defined in order to investigate the effect of combined shock-shear loading on sensitivity. Various widths of PBXN-110 donor slabs were used to define the shockwave curvature introduced to wedge samples of the same explosive. The donor slabs were initiated with a linewave generator and a Detasheet booster, and the shock wave was attenuated using a slab of PMMA. In developing simulations for these three material experiments, calibrations of the PBXN-110 ignition and growth model and of the PMMA constitutive model were investigated in order to choose between several models found in the literature. A calibration shot from the MWT was also used to demonstrate the appropriateness of the models selected. Experimental results were compared to CTH calculations to indicate if there were effects associated with highly curved shock fronts that could not be adequately predicted. The run distances predicted in CTH for the thicker donor slab compare very favorably with the actual experiments; however, for thinner donor slabs, the actual experimental results seem to suggest a more sensitive behavior than the simulations are able to capture.

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