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Double-HE-Layer Detonation-Confinement Sandwich Tests: The Effect of Slow-Layer Density LARRY HILL, Los Alamos National Laboratory — Over a period of several years, we have explored the phenomenon in which slabs of high explosives (HEs) with differing detonation speeds are joined along one of their faces. Both are initiated (usually by a line-wave generator) at one edge. If there were no coupling between the layers, the detonation in the fast HE would outrun that in the slow HE. In reality, the detonation in the fast HE transmits an oblique shock into the slow HE, the phase speed of which is equal to the speed of the fast HE. This has one of two effects depending on the particulars. First, the oblique shock transmitted to the slow HE can pre-shock and deaden it, extinguishing the detonation in the slow HE. Second, the oblique shock can transversely initiate the slow layer, pulling its detonation along at the fast HE speed. When the second occurs, it does so at the"penalty" of a nominally dead layer, which forms in the slow HE adjacent to the material interface. We present the results of tests in which the fast layer was 3-mm-thick PBX 9501 (95 wt% HMX), and the slow layer was 8-mm-thick PBX 9502 (95 wt% TATB). The purpose was to observe the effect of slow layer density on the "dead" layer thickness. Very little effect was observed across the nominal PBX 9502 density range, 1.885-1.895 g/cc.

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