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Geometry effects on detonation in vapor-deposited hexanitroazobenzene (HNAB) ALEXANDER S. TAPPAN, RYAN R. WIXOM, ROBERT KNEPPER, Sandia National Laboratories — Physical vapor deposition is a technique that can be used to produce explosive films with controlled geometry and microstructure. Films of the high explosive hexanitroazobenzene (HNAB) were deposited by vacuum thermal evaporation. HNAB deposits in an amorphous state that crystallizes over time into a polycrystalline material with high density and a consistent porosity distribution. In previous work, we have evaluated detonation critical thickness in HNAB films in an effectively infinite slab geometry with insignificant side losses. In this work, the effect of geometry on detonation failure was investigated by performing experiments on films with different thicknesses, while also changing dimensions such that side losses became significant. Films were characterized with surface profilometry and scanning electron microscopy. The results of these experiments will be discussed in the context of small sample geometry, deposited film microstructure, and density.

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