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Critical Detonation Thickness in Vapor-Deposited Pentaerythritol Tetranitrate (PETN) Films ALEXANDER S. TAPPAN, ROBERT KNEPPER, RYAN R. WIXOM, MICHAEL P. MARQUEZ, J. PATRICK BALL, JILL C. MILLER, Sandia National Laboratories — Films of the high explosive PETN (pentaerythritol tetranitrate) have been deposited through physical vapor deposition. PETN films were characterized with surface profilometry, and scanning electron microscopy. This work is an extension of previous work (Tappan et al., 14th International Detonation Symposium), in which critical detonation thickness for PETN was determined to be less than 200 microns in a configuration where charge width was similar to film thickness, and thus side losses played a role in detonation propagation. In this work, experiments will be presented where charge width was large compared to film thickness (“infinite width”). The results of these experiments will be discussed in the context of small sample geometry, deposited film morphology, and density.

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