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Visualization of hot spot formation in energetic materials under periodic mechanical excitation using phosphor thermography[1] ALEX CASEY, GABRIEL FENOGLIO, Purdue University, HUMBERTO DETRINIDAD, Brigham Young University — Under mechanical excitation, energy is known to localize within an energetic material resulting in 'hot spot' formation. While many formation mechanisms have been proposed, additional insight to heat generation mechanisms, the effect of binder/crystal interfaces, and predication capabilities can be gained by quantifying the initiation and growth of the hot spots. Phosphor thermography is a well established temperature sensing technique wherein an object's temperature is obtained by collecting the temperature dependent luminescence of an optically excited phosphor. Herein, the phosphor thermography technique has been applied to Dow Corning Sylgard® 184/octahydro 1,3,5,7tetranitro1,3,5,7tetrazocine (HMX) composite materials under mechanical excitation in order to visualize the evolution of the temperature field, and thus hot spot formation, within the binder.

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