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Deflagration of Energetic Materials Initiated by Electrostatic Discharges and Laser-Induced Plasmas ERIC COLLINS, JENNIFER GOTTFRIED, US Army Rsch Lab - Aberdeen — A laser-induced plasma and an electrostatic discharge were used for the ignition of small quantities (5-10 mg) of energetic materials. The laser-induced plasma was generated from a ns-pulsed Nd:YAG laser with energy output of 0.8 J per pulse and the electrostatic discharge was generated from a 0.035 μF capacitor that was charged to energy levels of up to 10 J. Although the durations and energy outputs of these two ignition mechanisms are very different, similarities in the initiation of the energetic materials include particle ejection from the target, heating of particles in the air from the plasma and spark, and a shockwave formation. The shock wave was measured and analyzed at various energy levels using schlieren imaging with a high speed camera. Diagnostics used to measure time-resolved temperatures, energy generation, and emission signatures of the deflagrations were high speed camera pyrometry, visible and infrared photo receivers, and a high-resolution spectrometer, respectively.

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