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Background-Oriented Schlieren Characterization of Explosions CYNTHIA ROMO, MICHAEL HARGATHER, New Mexico Tech — Characterizing the energy release from large explosions is a difficult process using traditional point-pressure gages. The background oriented schlieren technique is used here to provide large-field-of-view visualization of the shock wave propagation from large-scale explosions. This technique is used to allow field-measurements of blast wave properties instead of traditional point-wise measurements. By analyzing the shock wave propagation Mach number the peak overpressure and overpressure duration are estimated for different explosions. The technique is applied to the visualization of encased explosions, including car bombs, to estimate the amount of shock energy lost to the fragmentation and acceleration of the casing. Comparisons are made to un-encased explosions. The optically measured data is compared to experimental data recorded using piezoelectric pressure transducers. Scaling relationships are examined to determine scalability of encased explosions.

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