

Abstract Submitted  
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**Low Parallax High Brightness Imaging at High Laser Repetition Rates** KEVIN MCNESBY, BARRIE HOMAN, Army Research Laboratory — A new laser illuminator has been used to image detonations of chemical explosions at rates exceeding 200 kHz. The new laser illuminator is a hybrid fiber/Nd:YAG laser and is part of a Low Parallax High Brightness Imaging (LP-HBI) facility used to study shock wave formation and energy release during testing of chemical explosives up to a net explosive weight of 10 kg. The laser provides pulses of monochromatic radiation (wavelength 532 nanometers) that produces a shadowgraph of an explosive event, captured using a high speed camera (Photron SA-z) filtered and time-synchronized to the laser output. Using this technique, shock formation following energy release, shock detachment from explosive products, and shock reflection may be visualized in real time. The new laser replaces a copper vapor laser used at the facility since 2004. The new laser enables increases in temporal resolution up to a factor of 10 (from 50 microseconds between images to 5 microsecond between images). The discussion will include a description of the ways the new system is being used to investigate time to metal participation in energy release for real-scale explosive charges.

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