

Abstract Submitted
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Multi-parametric studies of electrically-driven flyer plates

WILLIAM NEAL, MICHAEL BOWDEN, None, EXPLOSIVE TRAINS AND DEVICES COLLABORATION — Exploding foil initiator (EFI) detonators function by the acceleration of a flyer plate, by the electrical explosion of a metallic bridge, into an explosive pellet. The length, and therefore time, scales of this shock initiation process is dominated by the magnitude and duration of the imparted shock pulse. To predict the dynamics of this initiation, it is critical to further understand the velocity, shape and thickness of this flyer plate. This study uses multi-parametric diagnostics to investigate the geometry and velocity of the flyer plate upon impact including the imparted electrical energy: photon Doppler velocimetry (PDV), dual axis imaging, time-resolved impact imaging, voltage and current. The investigation challenges the validity of traditional assumptions about the state of the flyer plate at impact and discusses the improved understanding of the process.

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None

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