

Abstract Submitted
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Laser-Accelerated Flyer System for Investigating Reactions in Ni-Al Mixtures SEAN C. KELLY, Georgia Institute of Technology, SARA BARON, Johns Hopkins University, NARESH THADHANI, Georgia Institute of Technology, TIMOTHY P. WEIHS, Johns Hopkins University — Experiments using a laser-accelerated flyer system were conducted on various forms of nickel-aluminum over a range of velocities in attempt to characterize the processes leading to complete reaction. The laser-accelerated flyer system consists of an Nd:YAG, 3-Joule, 1064-nm seeded laser, beam shaping optics, recovery experiment chamber, and velocity interferometry diagnostics. Using various flyer materials, impact velocities up to 1.5 km/sec have been measured using less than 50% of the maximum laser energy. The laser-accelerated flyer system is used to conduct impact experiments on Ni-Al powder compacts, Ni-Al vapor-deposited foils, and single Ni-Al interface configurations. Subsequently, characterization using LOM, SEM, and XRD techniques is used to identify the reaction products and isolate the processes that lead to reaction initiation and products formed in the various Ni-Al configurations.

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