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Dynamic Compaction of Yttria-Stabilized Zirconia with the addition of Carbon Nanotubes PETER SABLE, JOHN BORG, JEFF LAJEUNESSE, MERIT SCHUMAKER, Marquette University, GREG KENNEDY, NARESH THADHANI, Georgia Institute of Technology — Yttria-stabilized zirconia (YSZ) is a versatile ceramic utilized for its hardness as well as thermal stability. In these experiments, carbon nanotubes (3% and 5% by weight) were added to powdered YSZ before it was statically compacted. These compacted samples were then dynamically compressed and monitored using a Photon Doppler Velocimetry (PDV) system. The objective was to better develop an understanding of how CNT affects the initial shock response of the powder system. Experiments indicate the CNT both steepen the rise and increase the Hugoniot state of the YSZ-CNT system as compared to YSZ alone. Additionally, the PDV data is in good agreement with simple hydrocode simulations. The results of experiments and simulations are discussed.

Peter Sable
Marquette University

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