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Applications of Radiation-Driven Blast Waves at Z[1] T.E. TIERNEY, R.G. WATT, G.C. IDZOREK, C.L. FRYER, D.L. PETERSON, R.R. PETERSON, H.E. TIERNEY, Los Alamos National Laboratory — Radiation-driven blast waves (BWs) occur when the wave speed of an initially diffusive, supersonic radiation wave becomes subsonic and forms a radiographically-visible, hydrodynamic shock wave. BWs have been shown to be extremely energy sensitive, a fact we exploit as a calorimetry diagnostic. Experiments that use Sandia's Z-dynamic hohlraum as a quasi-Planckian radiation source often require accurate source energy measurements. We have used BWs as a principal diagnostic in experiments of hohlraum energy loss through diagnostic and entrance holes. We also intend to use BWs as a code validation technique for simulating the interaction between radiation-driven BWs sourced by a supernova with a companion star. We discuss experimental designs that use BWs as a diagnostic, and describe the computational and experimental uncertainties associated with BWs. This work was performed under the auspices of the Los Alamos National Laboratory for the U.S. Department of Energy.

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