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Aluminum X-ray Mass Ablation Rates Relevant to Inertial Confinement Fusion JONATHAN HAGER, JOHN KLINE, DAVID MONTGOMERY, DEREK SCHMIDT, IGOR USOV, Los Alamos National Laboratory, RICHARD OLSON, Sandia National Laboratory — In indirect-drive inertial confinement fusion (ICF), a spherical target is imploded as a response to x-ray mass ablation of the target's shell. Typical ICF ablator materials include plastic, doped plastic, high density carbon, and beryllium. The equation of state of many ICF ablators are commonly measured using an impedance matching technique where a relative measurement is made compared to a standard material. Aluminum's shocked equation of state has been studied through many absolute and relative measurements making it an excellent and common choice as a standard in these types of experiments. This work proposes to use aluminum as a surrogate ablator material to aid in the benchmarking of the hydrodynamics codes used to design experiments for indirect-drive thermonuclear ignition at the National Ignition Facility (NIF). X-ray mass ablation rates have been measured in aluminum at conditions relevant to indirect-drive inertial confinement fusion (ICF) as a first step in developing this platform. The measurements used the same technique as Olson et al. for typical ablator materials allowing a comprehensive comparison.

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