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First shock tuning and backscatter measurements for large case-to-capsule ratio beryllium targets. ERIC LOOMIS, AUSTIN YI, JOHN KLINE, GEORGE KYRALA, ANDREI SIMAKOV, DOUG WILSON, Los Alamos Natl Lab, JOE RALPH, EDUARD DEWALD, DAVID STROZZI, PETER CELLIERS, MARIUS MILLOT, RICCARDO TOMMASINI, Lawrence Livermore National Lab — The current under performance of target implosions on the National Ignition Facility (NIF) has necessitated scaling back from high convergence ratio to access regimes of reduced physics uncertainties. These regimes, we expect, are more predictable by existing radiation hydrodynamics codes giving us a better starting point for isolating key physics questions. One key question is the lack of predictable in-flight and hot spot shape due to a complex hohlraum radiation environment. To achieve more predictable, shape tunable implosions we have designed and fielded a large 4.2 case-to-capsule ratio (CCR) target at the NIF using 6.72 mm diameter Au hohlraums and 1.6 mm diameter Cu-doped Be capsules. Simulations show that at these dimensions during a 10 ns 3-shock laser pulse reaching 270 eV hohlraum temperatures, the interaction between hohlraum and capsule plasma, which at lower CCR lead to beam propagation impedance by artificial plasma stagnation, are reduced. In this talk we will present measurements of early time drive symmetry using two-axis line-imaging velocimetry (VISAR) and streaked radiography measuring velocity of the imploding shell and their comparisons to post-shot calculations using the code HYDRA (Lawrence Livermore National Laboratory).

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