Abstract Submitted
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Advanced target configurations for gigabar equation of state experiments at the National Ignition Facility[1] K.T. SULLIVAN, J. KUNTZ, D.C. SWIFT, J.A. HAWRELIAK, A. KRITCHER, T. DOEPPNER, Lawrence Livermore National Laboratory — The initial version of the converging-shock equation of state (EOS) platform demonstrated at NIF used a configuration based as closely as possible on inertial confinement fusion (ICF) targets. The success of this platform and the accuracy of the design simulations gives confidence that future experiments can be more flexible in both the hohlraum and target configurations. Changes in the target will enable significant improvements in EOS measurements. The first targets used a proven ICF ablator design, and the sample was a uniform sphere of CH-based plastic. As well as optimizing designs for other sample compositions, we are developing methods of fabricating samples with buried radiographic marker layers–a narrow layer with a high-Z dopant–using direct ink writing and electrophoretic deposition. The incorporation of multiple marker layers is an important step forward in converging shock experiments. The particle speed can be measured directly as the shock passes, and an average compression and opacity can be determined directly from the separation between markers and local x-ray attenuation. The markers can also be used to improve the precision of the radiographic unfold used to reconstruct the spatial dependence of the compression and opacity profiles.

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