Abstract Submitted
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Double Shell Plans and First Results from Outer Shell Keyhole Experiments[1] D.S. MONTGOMERY, E.C. MERRITT, W.S. DAUGHTON, E.N. LOOMIS, D.C. WILSON, E.S. DODD, J.L. KLINE, S.H. BATHA, Los Alamos National Laboratory, H.F. ROBEY, Lawrence Livermore National Laboratory — Double-shells are an alternative approach to achieving indirect drive ignition on NIF. These targets consist of a low-Z ablatively-driven outer shell that impacts a high-Z inner shell filled with DT fuel. In contrast to single-shell designs, double-shell targets burn the fuel via volume ignition, albeit with a lower gain. While double-shell capsules are complicated to fabricate, their design includes several beneficial metrics such as a low convergence pusher (C.R. < 10), low implosion speed (250 km/s), a simple few-ns laser drive in a vacuum hohlraum, less sensitivity to hohlraum asymmetries, and low expected laser-plasma instabilities. We describe plans for developing double shell capsule implosions on NIF, and discuss challenges as well as uncertainties and trade-offs in the physics issues compared to single-shells, such as sensitivity to hard x-ray preheat of the inner shell. First experimental results measuring hard x-ray preheat, shock breakout and shock symmetry from outer-shell experiments using the NIF Keyhole platform will be presented.

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David Montgomery
Los Alamos National Laboratory

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