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Plans for Double Shell Experiments on NIF[1] D.S. MONTGOMERY, W.S. DAUGHTON, M.A. GUNDERSON, A.N. SIMAKOV, D.C. WILSON, R.G. WATT, J.L. KLINE, A.C. HAYES, H.W. HERRMANN, M. BOSWELL, C.R. DANLY, F.E. MERRILL, S.H. BATHA, Los Alamos National Laboratory, P.A. AMENDT, J.L. MILOVICH, H.F. ROBEY, Lawrence Livermore National Laboratory — Double-shells are an alternative approach to achieving indirect drive ignition. 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 present preliminary double-shell capsule designs for NIF using a cryogenic gas DT fill which are optimized for yield and minimized for fall-line mix. Challenges will be discussed, as well as uncertainties and trade-offs in the physics issues compared to single-shells. A development path for double-shell experiments on NIF will be presented.

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