Abstract Submitted
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High-Density Carbon (HDC) Ablator for Ignition Capsules[1] D. HO, S. HAAN, J. MILOVICH, J. SALMONSON, G. ZIMMERMAN, L. BENEDICT, J. BIENER, C. CERJAN, D. CLARK, E. DEWALDS, J. EDWARDS, L. BERZAK HOPKINS, A. MACKINNON, M. MARINAK, J. MCNANEY, N. MEEZAN, S. ROSS, R. TOMMASINI, Lawrence Livermore National Laboratory — HDC ablators show high performance based on simulations and experiments. HDC capsules have good 1-D performance because HDC has high density (3.5 g/cc), which results in a thinner ablator that absorbs more radiation, and have good 2-D performance because the ablator surface is substantially smoother than plastic ablators. A 25 um thick layer doped with 0.26 at.% of W is sufficient to block the M-band radiation. W can be doped very uniformly in HDC. Simulations using NLTE model for W shows that the capsule can tolerate close to 300 ng of W-doped ablator material in the hot spot. If W is replaced with Si, the entire ablator has to be uniformly doped with 3 at.% of Si. Surprisingly, the hot spot can tolerate about the same amount of ablator mass for the 3 at.% Si-doped HDC as it can for W-doped. The main reason is that Si radiates less and consequently raises the hot spot temperature which in term increases the electron heat conduction. 4, 3, and 2-shock designs and their stabilites will be presented. An undoped HDC Symcap with DT fill reached a record neutron yield of 1.7e15. W-doped HDC Symcap and DT-layered shots will be conducted in Fall. Comparison of simulations with measured data will be presented.

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