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Design of a two shock, high yield high-density carbon NIF target<sup>1</sup> L. BERZAK HOPKINS, D. CALLAHAN, L. DIVOL, J. EDWARDS, S. HAAN, D. HO, S. LE PAPE, J. LINDL, A. MACKINNON, N. MEEZAN, J. MILOVICH, S. ROSS, H. ROBEY, M. ROSEN, E. STORM, LLNL — In 2013, the first indirect drive exploding pusher (IDEP) targets were fielded on the NIF. These targets utilized a near-vacuum hohlraum (16 torr of helium) and thin (120  $\mu$ m) GDP capsule with a short (4.5 ns) single shock drive. With long pulses, a hohlraum gas fill is typically needed to achieve symmetry. The short pulse of the IDEP permitted the usage of a near-vacuum hohlraum, which served to minimize laser-plasma interactions, such as cross beam transfer and backscatter, and achieved 99% laser-hohlraum coupling. Both deuterium-deuterium and deuterium-tritium filled capsules produced high yields (approximately 5 x  $10^{12}$  and 5 x  $10^{14}$  neutrons, respectively) and were predicted well by HYDRA simulations with un-degraded laser drive. In addition, new experiments fielding high-density carbon (HDC) capsules in standard, gas-filled hohlraums have achieved the highest NIF neutron yields to-date. Combining and building upon these results, a two shock drive in a near-vacuum hohlraum with an HDC capsule has been developed. Challenges of the near-vacuum hohlraum, design of the two shock system, and first results will be discussed.

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