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Progress in Laser-Driven Dynamic Hohlraum Implosions[1] S.G. GLENDINNING, J.F. HANSEN, R.P.J. TOWN, Lawrence Livermore National Lab, J. FRENJE, R. PETRASSO, MIT — We have been studying the use of laser driven dynamic hohlraums[2] (LDDH) to drive implosions of an inner D_2 filled glass capsule. In the LDDH, a radiatively collapsed shock driven in a Xenon-filled capsule confines radiation in a spherically convergent geometry, leading to a small, hot hohlraum. In contrast, a radiatively collapsed shock is not produced when a lower-Z gas fill such as neopentane (C_5H_{12}) replaces the Xenon, and the implosion is driven by the collision of the outer shell and the inner shell. While the neutron yields of the two contrasting systems are predicted to be very similar, the x-ray signatures are predicted to be quite different, as are the fuel and shell areal densities. We have fielded both systems in experiments on the Omega laser at the University of Rochester. In these experiments the inner capsules are 0.23 mm diameter and the outer capsules, 0.97 mm diameter, are irradiated with ~ 21 TW of 3ω for ~ 1 ns. We will report on results from the two kinds of experiments and compare the results with simulations.

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[2]Herrmann, M.C. et al., BAPS, DPP Nov. 2003.

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