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Demonstrating Control of Symmetry Capsule Implosions in Omega Experiments using NIF 0.7-Scale Hohlräume¹ NELSON HOFFMAN, ROBERT GOLDMAN, GEORGE KYRALA, ACHIM SEIFTER, LANL — We have demonstrated the ability to detect the weak x-ray emission from, and control the imploded core shape of, large weakly-driven plastic capsules in NIF 0.7-scale hohlraums at the Omega laser. The capsules are similar to those that can be used to diagnose hohlraum radiation drive symmetry during the early stages (“foot”) of the drive in eventual NIF ignition experiments. Because the foot drive temperature is so low (~ 90 eV), it had been doubtful that capsule x-ray emission would be detectable. Because the capsule shells must be thin, making them hydrodynamically unstable and subject to complete ionization (“burnthrough”) before peak compression, it had been doubtful that their shape would respond to variations in laser beam pointing. We have now put those doubts to rest. These experiments used 1400- μm diameter CH shells, of thickness 15-20 μm , filled with 1 atm D_2 , in 6.38 mm x 3.56 mm gold hohlraums. No higher-Z dopant was necessary to make the x-ray emission detectable.

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