

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Design of Symmetry Capsules for the National Ignition Facility¹

S.V. WEBER, N. IZUMI, M.J. EDWARDS, D.H. KALANTAR, LLNL, N.M. HOFFMAN, D.C. WILSON, LANL — Symmetry capsules (SymCaps) will be used to tune the symmetry of the hohlraum x-ray drive for the National Ignition Facility (NIF). Stringent symmetry requirements are specified for the drive from each of four steps of the laser pulse powering the NIF indirect drive ignition capsule. SymCaps are gas-filled surrogates used to tune the high-power 4th step of the pulse. The first three pulse steps will be tuned in earlier experiments. X-ray emission from the capsule core near peak compression will be observed with a gated x-ray imager. Round images, indicating symmetric drive, may be achieved by adjusting the hohlraum length, beam pointing, and power ratio of the laser beam cones. The full thickness SymCap design replaces the frozen DT layer of the ignition capsule with equivalent $\rho\Delta R$ of Be. This SymCap is predictive of the core shape at ignition of the cryogenic capsule. Time-dependent drive symmetry will be optimized using thinner SymCaps having temporal sensitivity weighted earlier. We will present a simulated tuning campaign and demonstrate that SymCaps facilitate achieving adequate symmetry to drive the cryogenic capsule to ignition.

¹This work was performed under the auspices of the U.S. DOE by the Univ. of California, LLNL under contract No. W-7405-Eng-48.

Stephen Weber
Lawrence Livermore National Laboratory

Date submitted: 19 Jul 2007

Electronic form version 1.4