Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Simulations of super-ellipse hohlraum targets as a path to high neutron yields[1] JOSE MILOVICH, PETER AMENDT, ERIK STORM, HARRY ROBEY, STEVE HAAN, OTTO LANDEN, NATHAN MEEZAN, JOHN LINDL, LLNL — Recently neutron yields in excess of 10^{16} have been achieved at the National Ignition Facility (NIF) using a low-density gas fill hohlraum and a subscale high-density-carbon capsule[1]. The laser power used was near the current maximum level allowed on the inner cones of the NIF laser. While more energy can be extracted from the laser to provide additional improvement on the neutron yield, a more efficient design is desired. A new effort has begun to investigate alternatives to the current cylinder-shaped hohlraum for driving larger capsules (1.1 mm outer radius). If these new hohlraums can preserve the implosion symmetry, the additional absorbed energy is expected to provide a path to high neutron yield and potential ignition. Super-ellipse hohlraums, a generalization of an earlier rugby hohlraum design[2], have the advantage of a larger waist diameter and reduced parasitic energy losses from the corners of cylindrical hohlraums while still being able to produce the required capsule drive at the current energy and power limits available at the NIF. We will present plausible designs of these hohlraums based on the Lam mathematical construction, and discuss their prospects to reach high neutron gains. [1] NIF shot N170601 [2] P. Amendt et al Phys of Plasmas 22, 040703 (2015)

[1]Prepared by LLNL under Contract DE-AC52-07NA27344

Jose Milovich
LLNL

Date submitted: 14 Jul 2017 Electronic form version 1.4