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Large-scale implosions for Frustraum using green and blue light[1]

D. D.-M. HO, P. A. AMENDT, J. D. LINDL, LLNL — A diamond-shaped hohlraum (Frustraum) proposed by Amendt[1] may provide adequate radiation symmetry for large capsules (1.5 mm radius) while requiring only about 1.8 MJ (460 TW) of laser energy (power). The advantages of large-scale capsules (LS) were earlier reported.[2] Here we present additional advantages of using LS. The high ignition margin of the LS allows: (1) high-yield implosions using shorter pulse than nominal-scales since LS can tolerate higher fuel adiabat resulted from steeper rise in Tr; (2) the use of liquid-DT foam as a viable option for high yield. The variation of YoC (yield over clean) with initial gas fill will be discussed. LS also allows DT-gas only capsules to achieve high neutron yield of 5e16. If green light is used, the capsule radius can be increased to 1.9 mm. Although the ablation front growth factor (GF) increases with capsule size, the performance is still acceptable because of the high ignition margin. To reduce the GF, we can use lower-Z ablator, e.g., Boron, to reduce the growth factor for capsule with radius larger than 1.9 mm. 1. Amendt et al., PoP 2019 accepted for publication. 2. Ho et al., APS-DPP 2018 GO6.10

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