

Abstract Submitted
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Evaluation of the use of two-photon polymerization printed structures in multi-shell ICF targets¹ BRETT SCHEINER, MARK SCHMITT, DEREK SCHMIDT, LYNNE GOODWIN, Los Alamos National Laboratory, FREDERIC MARSHALL, PHILIP NILSON, Laboratory for Laser Energetics, University of Rochester — Recent interest in the fielding direct drive multi-shell targets on the NIF[1,2] has highlighted the need for a low density support structure to support the inner shell inside of the ablator and to avoid energy loss in the acceleration and collision process. We evaluate the use of low density (5 mg/cc) two-photon polymerization printed lattices for this purpose. Simulations of 1D thin shells are used as a surrogate for the lattice struts and are used to illustrate qualitative behavior of the lattice under radiation driven heating by x-rays from the corona. Sufficiently fine lattices are shown to isotropize before the shell collision. High resolution Fresnel zone plate images from experiments on OMEGA are used to evaluate the uniformity of the post-collision inner shell. [1] Kim Molvig et al. Phys. Rev. Lett. 116, 255003 (2016) [2] S. X. Hu et al. Phys. Rev. E 100, 063204 (2019)

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