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Indirect-drive pre-compression of CH coated cone-in-shell target with guiding wire for fast ignition WEIMIN ZHOU, YUQIU GU, LIANQIANG SHAN, BAOHAN ZHANG, Research Center of Laser Fusion, China Academy of Engineering Physics — Compared with central ignition of laser fusion, fast ignition separates compression and ignition thus it can relax the requirements on the implosion symmetry and the driven energy. The Research Center of Laser Fusion has begun the related experimental researches on fast ignition based on SHENGUANG II laser facility. The small scale cone-in-shell target with guiding wire for fast ignition was pre-compressed by the SHENGUANG II eight 260J/2ns/3ω laser beams indirectly since beam smoothing was not available currently. To minimize the mixing of the compressed fuel and high-Z vapor produced by the M-line emission from the gold holhraum, a 3μm CH foil was coated on the full outer surface of the cone and guiding wire. The maximum density of the compressed cone-in-shell target 1.3 ns after the lasers' irradiation on the inside wall of hohlraum is about 5.0 g/cm3, and the implosion velocity is close to 1.9*10^7 cm/s, which are well consistent with the simulation results with two-dimensional radiation hydrodynamic code. Experimental results and simulation results also demonstrated the coated CH foil could minimize the mixing effectively. By the appropriate design, target can remain robust before the maximum compression, that is, the time while the hot electrons produced by ignition laser pulse deposit energy in the compressed fuel.

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