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Implosion of indirect-drive fast ignition targets with CH coated reentrant cone WEIMIN ZHOU, LIANQIANG SHAN, YUQIU GU, BAOHAN ZHANG, Research Center of Laser Fusion, China Academy of Engineering Physics, FAST IGNITION TEAM — 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 implosion of indirect-drive fast ignition targets with CH coated reentrant cone was experimentally researched on SHENGUANG (SG) II laser facility. The small scale cone-in-shell target fast ignition was pre-compressed by the SG II eight 260J/1ns/3ω laser beams indirectly since beam smoothing was not available currently. The maximum density of the compressed cone-in-shell target 1.37 ns after the lasers' irradiation on the inside wall of hohlraum is about 8.7 g/cm3, and the areal density is close to 8.9 mg/cm2, which are well consistent with the simulation results with two-dimensional radiation hydrodynamic code. 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. 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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