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A new ignition scheme using hybrid indirect-direct drive for ICF ZHENGFENG FAN, MO CHEN, ZHENSHENG DAI, HONG-BO CAI, SHAO-PING ZHU, W.Y. ZHANG, X.T. HE, Institute of Applied Physics and Computational Mathematics, Beijing, China — A new hybrid indirect-direct-drive ignition scheme is proposed: the fuel capsule encased in a hohlraum is compressed first by indirect-drive x rays, and then accelerated and ignited by both direct-drive lasers and x rays. In this scheme, between the radiation and electron ablation fronts separately formed by indirect-drive x rays and direct-drive lasers there can appear a high-density plateau that suppresses the rarefaction wave at the radiation ablation front ahead of the imploding capsule. It is shown by numerical simulations that the drive pressure is significantly enhanced and multiple shock reflections off the main fuel/hot spot interface during the deceleration phase of the compression are prevented, leading to rapid compression and heating of the fuel to reach hot-spot ignition condition there before stagnation. Practically, the hybrid drive can implode the capsule to a high velocity (430 km/s) at a low convergence ratio (25), and the hydrodynamic instability and drive asymmetry are significant suppressed, especially, at the main fuel/hot spot interface the hydrodynamic instability is decreased by several times as compared with the conventional indirect drive.

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