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Demonstration of counter beam fast heating scheme by using a spherical CD shell target Y. MORI, Y. NISHIMURA, R. HANAYAMA, S. NAKAYAMA, K. ISHII, Y. KITAGAWA, The Graduate School for the Creation of New photonics Industries, T. SEKINE, Y. TAKEUCHI, T. KURITA, Y. KATO, N. SATO, N. KURITA, T. KAWASHIMA, Hamamatsu Photonics, K. K., T. HIOKI, T. MOTOHIRO, GREMO, Nagoyga Univ., A. SUNAHARA, Institute for Laser Technology, Y. SENTOKU, ILE, Osaka Univ., E. MIURA, AIST, A. IWAMOTO, H. SAKAGAMI, NIFS — We report fast heating of a shock-imploded core under counter beam configuration that published in recent [Y. MORI et al., Phys. Rev. Lett. 117, 055001 (2016)]. Experiments are performed by using a repetitive IFE driver HAMA [Y. MORI et al., Nucl. Fusion 53, 073011 (2013)]. Experiments results show that (i) a shock-imploded core with 70 micron diameter, originally deuterated polystyrene (CD) spherical shell of 500 micron diameter, is flashed by counter irradiating 110 fs, 7 TW laser pulses. The coupling efficiency from the laser to the core emission was inferred 13%. A collisional Particle-In-Cell simulation code PICLS2D indicates a possibility that counter hot electron currents generate magnetic filaments in the imploded core. (ii) Fast electrons with energy bellow a few MeV might be trapped by these filaments in the core region supposed to be contributing to the observed X-ray flash and the high coupling efficiency. These results indicate a possibility that counter irradiating fast heating scheme can improve the energy coupling into the core by hot electrons those are limited to less 10% for one-side irradiation fast heating conducted so far.

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