

Abstract Submitted
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Simulation Study of Pre-Plasma Effects on Core Heating in FIREX-I TOMOYUKI JOHZAKI, HIDEO NAGATOMO, Institute of Laser Engineering, Osaka University, ATSUSHI SUNAHARA, Institute for Laser Technology, H.-B. CAI, IAPCM, China, HITOSHI SAKAGAMI, National Institute for Fusion Science, KUNIOKI MIMA, 1 Institute of Laser Engineering, Osaka University, HIROYUKI SHIRAGA, HIROSHI AZECHI, Institute of Laser Engineering, Osaka University, FIREX PROJECT TEAM — In ILE, Osaka University, using a 4-beam bundled new ultra-intense laser LFEX, the FIREX project has been started. About 30-fold enhancement in neutron yields was achieved by the heating laser irradiation at the first integrated experiments where the LFEX laser was operated with one-beam and low-energy mode. This enhancement is quite smaller than that in the previous experiments using PW laser (~ 1000 -fold enhancement). One reason for the low neutron yields is existence of relatively high-level pre-pulse. The pre-pulse generates the long-scale pre-formed plasma, which results in leading the fast electron generation point away from the core and in generating very energetic fast electrons not contributing the core heating. As the results of 2D PIC simulations, we showed the reduction of core heating efficiency due to the pre-plasma. The double cone effects for the case with pre-plasma are also discussed. In addition, we proposed use of thin foil, which is located at the entrance of the cone as absorber of pre-pulse, to reduce the pre-pulse level. We also discuss the thin foil effects.

Tomoyuki Johzaki
Institute of Laser Engineering, Osaka University

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