

Abstract Submitted
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Plasma formation and target preheating by prepulse of PW laser light¹ YASUHIKO SENTOKU, NATSUMI IWATA, ILE, Osaka University, JAMES KOGA, NICHOLAS DOVER, MAMIKO NISHIUCHI, National Institutes for Quantum and Radiological Science and Technology (QST) — An intense short pulse laser with intensity over 10^{21} W/cm² has become available, i.e. J-KAREN-P at QST. Although the contrast of the short pulse is improved to be of the order of 10^{-11} , there is an unavoidable prepulse, which has multiple spikes (ps) on top of an exponential profile with intensity greater than 10^{14} W/cm² about 50 ps in front of the main pulse. The prepulse preheats the target and also produces tenuous plasmas in front of a target before the main pulse arrives. It is critical to understand such preheating of the target, where the nonlocal heat transport is essential at intensity $> 10^{14}$ W/cm², since the target condition might totally change before the interaction with the main pulse. Using a hydro code, FLASH, and a collisional particle-in-cell code, PICLS, we study the preplasma formation and target preheating over tens of picoseconds timescale, and discuss the prepulse effects on the main pulse interaction.

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