The effect of pre-pulse on x-ray emission from nano-structured target irradiated by high power pulsed laser

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Abstract
In this paper, the enhanced continuum x-ray emission from nano-targets irradiated by long laser pulses is investigated numerically. The calculations are performed under different prepulse conditions, and the x-ray emissions from solid and nano-structured target are compared. The results show that x-ray yield can be enhanced significantly using a nano-layer with appropriate density. In addition, x-ray enhancement can be improved using a laser pre-pulse with appropriate intensity and delay time. The results also show that the enhancement can be reduced for prepulse intensities greater than the specific value (i.e. \(10^{13}\) W/cm\(^2\)). The effects of delay time between the main pulse and prepulse are also investigated.

Keywords: x-ray, nano-structured target, prepulse, laser plasma, high power pulsed laser

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