

Abstract Submitted
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The role of plasma density scale length on the laser pulse propagation and scattering in relativistic regime MASOUD PISHDAST, SEYED ABOLFAZL GHASEMI, JAMAL ALDIN YAZDANPANAHI, Plasma and Fusion Research School, NSTRI, Tehran, Iran — The role of plasma density scale length on two short and long laser pulse propagation and scattering in under dense plasma have been investigated in relativistic regime using $1D$ PIC simulation. In our simulation, different density scale lengths and also two short and long pulse lengths with temporal pulse duration $\tau_L = 60 fs$ and $\tau_L = 300 fs$, respectively have been used. It is found that laser pulse length and density scale length have considerable effects on the energetic electron generation. The analysis of total radiation spectrum reveals that, for short laser pulses and with reducing density scale length, more unstable electromagnetic modes grow and strong longitudinal electric field generates which leads to the generation of more energetic plasma particles. Meanwhile, the dominant scattering mechanism is Raman scattering and tends to Thomson scattering for longer laser pulse.

Seyed Abolfazl Ghasemi
Plasma and Fusion Research School, NSTRI, Tehran, Iran

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