

Abstract Submitted  
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**Effects of pre-plasma scale-length on fast electron generation in laser-matter interactions**<sup>1</sup> BHOOSHAN PARADKAR, MINGSHENG WEI, TOSHINORI YABUUCHI, UCSD, RICH STEPHENS, General Atomics, CA, SERGEI KRADSHENINNIKOV, FARHAT BEG, UCSD — The effect of pre-plasma scale-length on fast electron generation in laser-matter interaction is studied with 1-D PIC simulations using hybrid/PIC code LSP. The simulations are performed for various pre-plasma scale-lengths (1 m, 5 m, 15 m) at the laser intensities ranging from  $1 \cdot 10^{19} \text{W/cm}^2$  to  $1 \cdot 10^{21} \text{W/cm}^2$ . Increase in both, the mean and maximum energy of the fast electrons with increasing pre-plasma scale-length and laser intensity is observed. The charge separation longitudinal electric field in the underdense plasma is found to be responsible for increase in maximum energy of fast electrons with pre-plasma scale-length whereas the stochastic heating by counter propagating Electromagnetic waves seems to be the dominant fast electron heating mechanism. The dynamics of fast electron generation will be discussed in detail at the meeting.

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