

Abstract Submitted
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Mechanism of pre-formed plasma electrons heating in relativistic laser-solid interactions¹ BHOOSHAN PARADKAR, SERGEI KRASHENINNIKOV, FARHAT BEG, University of California-San Diego, USA, UNIVERSITY OF CALIFORNIA-SAN DIEGO, USA TEAM — Recent experiments have shown that fast electron generation is significantly modified due to long pre-formed plasma in front of a target. In particular, electrons with significantly greater than laser ponderomotive energy are observed in presence of pre-formed plasma. In our recent work [1], we have demonstrated the influence of large electrostatic potential well, produced self consistently inside pre-formed plasma on electron heating. The synergistic effects of potential well and laser radiation are found to be responsible for the generation of high energy tail of the electron energy distribution. In present work, we have studied in detail this heating mechanism by analyzing, both analytically and numerically, the stochastic motion of an electron in presence of electrostatic field and laser radiation. Results of electron dynamics and stochastic heating in presence of such fields will be presented in this paper.

[1] B. S. Paradkar *et al.*, Phys. Rev. E **83** 046401(2011)

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