Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Synergistic effects of deep electrostatic potential well and relativistic laser beam on electron acceleration[1] SITA SUNDAR, BIN QIAO, SERGEI KRASHENINNIKOV, FARHAT BEG, UCSD — Electron dynamics in intense laser waves has been the foundation of many early investigations on nonlinear laser plasma interactions. However, recently it was shown that the synergistic effects of deep ($\sim$ few MeVs) electrostatic potential well formed in pre-plasma and laser beam result in a strong increase of electron energy in comparison to a standard ponderomotive scaling. Here we use employ a simple box-like potential well and study numerically the energy gain by electron in the presence of two counter-propagating laser beams. We compare our numerical results with i) the case of electron interaction with single laser beam and box-like potential well and ii) with simplified analytic estimates for the case of electron interactions with two laser beams and box-like potential well. We discuss the physics of synergistic effects of electron interactions with potential well and two laser beams.

[1]Work is supported by DoE Grant DE-NA0001858 at UCSD.

Sergei Krasheninnikov
UCSD

Date submitted: 12 Jun 2013 Electronic form version 1.4