Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Laser Absorption and Particle Acceleration at the Critical Surface[1] J. MAY, J. TONGE, W.B. MORI, UCLA, F. FIUZA, LLNL, R. FONSECA, L.O. SILVA, IST — Using high intensity lasers ($I \geq 5 \times 10^{19} W/cm^2$) to accelerate particles at the critical surface offers the potential to deliver high fluence particle beams into dense matter. Potential applications include Fast Ignition Inertial Confinement Fusion, Radiation Pressure Acceleration, and probing high-density matter for basic plasma research. In order to tailor the beam characteristics of laser conversion efficiency, energy spectrum, beam divergence, and accelerated species (ions or electrons) to the given application – and of course to interpret the results of experiments – it is key to have an understanding of the underlying absorption and acceleration mechanisms. Much theoretical and simulation work has been done on this regime in recent years, and although it has become clear that mechanisms often invoked at lower intensities (i.e. JxB and Bruenel heating) are less or unimportant in these systems, debate still exists as to exactly what mechanisms will play the dominant role in laboratory relevant scenarios. We present recent results of simulations with the Particle-in-Cell code OSIRIS which sheds light on these issues.

[1]The authors acknowledge the support of the DOE Fusion Science Center for Extreme States of Matter and Fast Ignition Physics under DOE contract no. FC02-04ER54789 and DOE contracts DE-NA0001833 and DE-SC-0008316, and NSF grant ACI-13398893.

J. May
UCLA

Date submitted: 11 Jul 2014 Electronic form version 1.4