Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Laser Plasma Interactions in Cone Targets with Focusing Geometry[1] SCOTT WILKS, A. KEMP, G. COCHRAN, J. WILLIAMS, S. KERR, A. MACKINNON, A. MACPHEE, D. RUSBY, F. ALBERT, A. PAK, J. BUDE, C. SIDERS, W. KELLER, H. CHEN, T. LANIER, N. LEMOS, Lawrence Livermore Natl Lab, K. MILLER, W. MORI, UCLA — Compound Parabolic Concentrator targets[1] have proven to be effective at generating relativistic electron energies well in excess of those observed when the same high energy, low intensity, long focal length laser pulses are shot onto foils. Details of the laser-plasma interaction are complex and change during these long ($\approx$ 10 picosecond) pulses, making it difficult to optimize coupling the laser energy to the electrons in a systematic and predictable way. Plasma physics issues associated with this target and results of 3D PIC and radiation hydrodynamics simulations will be presented with an emphasis on determining how the laser energy couples to hot electrons. Specifically, we examine how the relative contributions of the laser plasma interaction in the underdense plasma and the laser intensity enhancement due to the focusing geometry of the cone contribute to the observed hot electron energy distributions. [1] MacPhee, et al., Optica Vol. 7, Issue 2, pp. 129-130 (2020)

[1]This work was completed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344 with funding support from the Laboratory Directed Research and Development Program under tracking code 19-SI-002. LLNL-ABS-812060

Scott Wilks
Lawrence Livermore Natl Lab

Date submitted: 29 Jun 2020 Electronic form version 1.4