Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Early time hot electron generation and deposition at the capsule in indirect drive ICF implosions on the National Ignition Facility[1] EDUARD DEWALD, ARTHUR PAK, JOSE MILOVICH, BENJAMIN BACHMANN, Lawrence Livermore National Laboratory, MATTHIAS HOHENBERGER, Laboratory of Laser Energetics, University of Rochester, FELICIE ALBERT, HARRY ROBEY, CLIFF THOMAS, LAURENT DIVOL, TILO DOEPPNER, ANDREW MACKINNON, NATHAN MEEZAN, DEBBIE CALLAHAN, DENISE HINKEL, OMAR HURRICANE, OTTO LANDEN, JOHN EDWARDS, Lawrence Livermore National Laboratory — In indirect drive ICF experiments [1] on the National Ignition Facility (NIF), hot electrons generated by laser plasma instabilities can preheat the deuterium-tritium (DT) capsule, compromising ignition. While below detection limit, the early time (picket) allowable hot electrons in low adiabat implosions [1] are $\sim$ 1J in electrons with >170 keV energy compared to 1000 J during the late time peak laser power [2]. At the same time, High Foot implosions [3] that demonstrated fuel-ablator mix mitigation and improved yield, have also shown picket hot electrons that can be comparable to allowable threshold. High Foot Re-emit experiments for tuning the picket radiation symmetry also infer the fraction and uniformity of hot electrons reaching the capsule by hard x-ray (50 keV) imaging combined with 40-300 keV spectra [2]. Their scalings with laser and plasma conditions are discussed.

[1] M. J. Edwards et al, *Phys. Plasmas* **20**, 070501 (2013).
[2] E.L. Dewald, *et. al., Rev. Sci. Instrum.* **81**, 10D938 (2010).
[3] O. Hurricane, *et. al, Nature* **506,** 343 (2014).

[1]This work performed under the auspices of the U.S. DOE by LLNL under Contract DE-AC52-07NA27344.

Eduard Dewald
Lawrence Livermore National Laboratory

Date submitted: 11 Jul 2014 Electronic form version 1.4