Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Modeling the cold side expansion of directly driven CH foils, driven by radiative preheat[1] MORDECAI ROSEN, Lawrence Livermore Natl Lab — A recent PRL [D. Haberberger et al PRL 123, 235001 (2019)] measured the expansion of a CH hemi-sphere directly driven on the inside out by the Omega laser at the URLLE and found that for any given time, the URLLE simulation disagreed with the measured electron density profile on the cold side. That paper reported that including an ad-hoc several microns of pre-shock-break-out cold-side plasma would lead to agreement with the data. We report here that simulations done at LLNL agree with the data without any ad hoc assumptions. The 2 keV photons from the hot side radiatively preheat the cold side to ˜0.5 eV. This pre-shock, pre-heated plasma then blows out of the cold side to a distance of several microns. Then the shock breaks out and further heats and accelerates this cold side plasma. Agreement with the data ensues for all subsequent times. The ability of the codes to numerically deal with the EOS of this low temperature, high density situation is key to obviating the need for ad hoc assumptions. We thank the PRL authors for illuminating and collegial discussions regarding this work.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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Date submitted: 01 Jul 2020 Electronic form version 1.4