Abstract Submitted
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Achieving Symmetry with Polar Direct Drive[1] N. KRASHENINNIKOVA, T. MURPHY, J. COBBLE, I. TREGILLIS, P. BRADLEY, P. HAKEL, S. HSU, G. KYRALA, K. OBREY, M. SCHMITT, R. KANZLEITER, J. BAUMGAERTEL, S. BATHA, Los Alamos Natl Lab — Direct Drive, widely used on Omega, provides high coupling energy and core temperatures per drive. NIF's much higher power offers a prospect for attaining hotter, larger cores enabling higher fidelity burn experiments. To use Omega's knowledge on NIF involves understanding the differences between PDD and SDD. Achieving symmetric implosions in PDD is essential for attaining high temperatures and neutron yields. LANL team tested laser cone-power tuning designs done with rad-hydro code HYDRA utilizing a flux-limited heat conduction (FLHC) model on NIF and Omega. Both campaigns produced symmetric implosions in PDD configuration. Omega campaign confirmed P_2 tunability that was in agreement with the simulations, while in experiments on NIF $|P_2|<3\%$ was sustained for 100's ps at NBT (similar to indirect drive and SDD). However, we need to recognize the role of LPI effects which are often left out in simulations. We found that when $I>10^{15}\mathrm{W/cm^2}$ on NIF, FLHC model in HYDRA was insufficient to accurately predict symmetry, bright equatorial self-emission band, and enhanced hot electron population. We were able to account for these effects by including CBET and non-local heat transfer models. Here we present out analysis of PDD symmetry data. We report on hot electron and CBET effects and assess our ability to model them with rad-hydro codes. We will also discuss laser intensity limits in PDD.

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