

Abstract Submitted
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Cross-beam energy transfer to a single f-20 beam: simulations of previous and upcoming experiments THOMAS CHAPMAN, LLNL, DAVID TURNBULL, LLE, ROBERT KIRKWOOD, PIERRE MICHEL, SCOTT WILKS, RICHARD BERGER, DENISE HINKEL, JOHN MOODY, STEVE LANGER, BRUCE LANGDON, DAVID STROZZI, LLNL — Motivated by materials research applications, cross-beam energy transfer can be used to transfer energy from one or more quads of beamlets at the NIF, which have an effective f -number of 8, to a single f -20 beam. Using plasma comprised of a preheated C_5H_{12} gasbag, a preliminary experiment at the NIF demonstrated amplification of a 750 J f -20 beam by a factor of 2 in both power and energy. A witness plate providing gated x-ray images was used to obtain total energies and transmitted spot intensities for the pump quad, seed beamlet, and a calibration quad. These experimental diagnostics offer the opportunity to perform quantitative comparisons with simulations. We use the laser-plasma interaction code pF3D to simulate the energy transfer process, using plasma conditions obtained from the plasma hydrodynamics code HYDRA. Our simulations of the completed single-pump quad experiment recover the measured seed amplification and transmitted spot power distributions. We also show simulation results for the upcoming two-pump quad experiment.

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