

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Reduction of backscatter in long plasma with beam smoothing in the moderate gain regime LAURENT DIVOL, E.A. WILLIAMS, R.L. BERGER, D. HINKEL, LLNL — In typical NIF ignition targets, the laser beams propagate through underdense regions many millimeters long. In large regions of these hot underdense plasmas, stimulated Brillouin and Raman scattering instabilities are in a strongly damped regime with linear amplification gains usually below 20 (for intensity). Under these conditions of long plasmas with moderate gains, phase conjugation can greatly enhance the simulated scattering processes by doubling the effective gain. We'll show that polarization smoothing and smoothing by spectral dispersion, as they reduce the beam contrast and coherence, can strongly reduce phase conjugation and thus lower the reflectivity. We'll quantitatively assess the effect for NIF parameters using an analytical approach (with a variational method) and fluid simulations of the backscattering using the laser plasma interaction code pF3d. This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48. UCRL-ABS-213869

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Date submitted: 02 Aug 2005

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