Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Experimental demonstration of optical mitigation techniques for stimulated Brillouin Scattering in ignition relevant plasmas[1] DUSTIN FROULA, LAURENT DIVOL, NATHAN MEEZAN, RICHARD LONDON, RICHARD BERGER, SHAM DIXIT, JAMES ROSS, PAUL NEUMAYER, RUSSEL WALLACE, LARRY SUTER, SIEGFRIED GLENZER, Lawrence Livermore National Laboratory — Inertial confinement fusion (ICF) and high energy density physics experiments require intense and energetic laser beams to propagate efficiently through long plasmas. A series of experiments performed at Omega will be presented that study the effects of SSD, polarization smoothing, and laser beam defocusing on mitigating stimulated backscatter, filamentation, and beam spray. We measure a factor of 1.8 reduction in the stimulated Brillouin scattering (SBS) when polarization smoothing is applied; no effect on the SBS is observed when up to 3 angstroms of smoothing by spectral dispersion (SSD) is applied. Furthermore, we show that the SBS reflectivity is controlled by either reducing the laser beam intensity or defocusing. The results from these experiments compare well to linear theory as modeled in 3 dimensions by pf3D.

[1]This work was performed under the auspices of the U.S. Department of Energy by University of California Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

Dustin Froula
LLNL

Date submitted: 29 Aug 2007 Electronic form version 1.4