Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Design and analysis of high-density laser-plasma interaction experiments[1] RICHARD LONDON, DUSTIN FROULA, RICHARD BERGER, LAURENT DIVOL, PAUL NEUMAYER, SIEGFRIED GLENZER, LAURENCE SUTER, Lawrence Livermore National Laboratory — Control of laser backscatter is required to achieve ignition with inertial confinement fusion. For indirect drive fusion at the National Ignition Facility (NIF), 351-nm laser beams must propagate through several mm of plasma at electron densities of 1–2x10^{21} $cm^{-3}$to deposit energy at the hohlraum walls. Experiments are being conducted at the Omega Laser Facility to study propagation in similar plasmas and to validate computer programs used to predict backscatter on NIF. Gas-filled hohlraums have recently been used to emulate low-density NIF plasmas (4-8x10^{21} cm^{-3}, Froula et al., Phys. Plasmas**, 14**, 044705, 2007 and Meezan, et al., ibid, 056304). At higher densities, laser heating of the gas creates density variations that compromise the plasma uniformity. A new hohlraum design that produces more uniform plasma conditions will be described. Predictions of the stimulated Raman and Brillouin backscatter from these targets will be presented and compared to experimental measurements.

[1]This work was prepared by LLNL under Contract DE-AC52-07NA27344.

Richard London
Lawrence Livermore National Laboratory

Date submitted: 19 Jul 2008 Electronic form version 1.4