

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Demonstration of beam propagation through hohlraum plasmas at NIF like temperatures CHRISTOPH NIEMANN, LAURENT DIVOL, DUSTIN FROULA, GIANLUCA GREGORI, OGDEN JONES, ROBERT KIRKWOOD, JOHN MOODY, JAMES ROSS, CHARLES SOURCE, LAURENCE SUTER, SIEGFRIED GLENZER, Lawrence Livermore National Laboratory — We have measured the propagation and backscatter of a 2ω (527 nm) high intensity ($\sim 5 \times 10^{14}$ W/cm²) interaction beam through large-scale length plasmas at NIF like temperatures of up to 4 keV. The plasma is created by heating 2 mm x 1.6 mm diam. hohlraum targets with 37 defocused heater beams at 3ω , delivering a total energy of 16 kJ in a 1 ns square pulse. A dedicated 2ω interaction beam probes the preformed plasma along the hohlraum axis. We have measured beam propagation and backscatter both in gas-filled and in foam-filled targets at 2ω NIF design densities around $n_e/n_c=5\%$ (at 3ω). We observe a beam transmission as high as 80% with negligible SRS reflectivity and modest levels of SBS. Both 2ω and 3ω SBS spectra and Thomson scattering measurements are consistent with a plasma temperature above 3.5 keV, which is a factor of two higher than the temperatures in gasbag-plasmas that were studied previously.

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Date submitted: 01 Aug 2005

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