Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Three-dimensional simulations of the angular and polarization dependence of stimulated Brillouin backscattering from NIF hohlraums[1]
RICHARD BERGER, A. B. LANGDON, C. A. THOMAS, K. L. BAKER, C. S. GOYON, D. P. TURNBULL, Lawrence Livermore National Lab — The National Ignition Facility (NIF) groups its 192 beams in 48 quads, 2/3 of which are 'outer' beams and 1/3 'inner' beams. Half of the outer quads are focused at the laser entrance hole (LEH) at an mean angle of 44° and the other half at 50° with respect to the hohlraum axis. The majority of the stimulated Brillouin scatter (SBS) is reflected into the 50° quads, and most of that into the 52° beams. That observation we reproduce with our simulations that use the wave propagation code, pF3D.[*Berger et al., Phys.Plasmas* **5**, *4337 (1998)*] Simulations considered a number of different pulse shapes, wall materials, capsule materials, and initial fill gas density with the plasma properties taken from 2D cylindrically-symmetric, radiation-hydrodynamic simulations of the hohlraum, capsule included. The simulations predict that different hohlraum designs have different fractions, between 20% and 50%, of the total SBS reflected into the backscattered light collection optics (the so-called FABS). The amount of light backscattered outside of FABS is not currently measured but is assumed to be 70% of the light backscattered. That assumption is a reasonable but not accurate estimate.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344

Richard Berger
Lawrence Livermore National Lab

Date submitted: 13 Jul 2016 Electronic form version 1.4