

Abstract Submitted
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Modeling of NIF Laser-Plasma Interaction Experiments with Single and Multiple Beams¹ D.J. STROZZI, J.D. MOODY, H.F. ROBEY, L. DIVOL, P. MICHEL, R.L. BERGER, E.A. WILLIAMS, D.E. HINKEL, D.C. EDER, LLNL — We discuss modeling of recent NIF ignition hohlraum experiments, in which selected beams were toggled on or off, in order to study laser-plasma interactions. Backscattered light, namely Raman scattering from the inner cones and Brillouin scattering from the outers, was the main diagnostic. One pair of experiments determined the effect of turning off the outer cones on inner-cone Raman. This revealed cross-beam energy transfer levels ($\sim 35\%$ of outer-cone power) roughly in accord with radiation-hydrodynamic modeling and capsule symmetry measurements. A modest upper bound was also placed on inner-cone Raman backscatter re-amplification by the outers (total gain < 1). We find decent agreement between the measured and calculated (gain) Raman spectra, and minor changes in the spectrum when the outers are turned off. These experiments provide an effective power scaling of inner-beam SRS, which indicates via a simple Tang model of pump depletion that SRS is in a partly saturated regime. More recent experiments will be discussed, including those which examined the effect of toggling off the inner cones on outer-cone Brillouin.

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