Abstract Submitted
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Inline Modeling of Cross-Beam Energy Transfer and Raman Scattering in NIF Hohlraums[1] DAVID STROZZI, D.S. BAILEY, C.A. THOMAS, S.M. SEPKE, G.D. KERBEL, P. MICHEL, L. DIVOL, O.S. JONES, LLNL — Inline models of cross-beam energy transfer (CBET) and stimulated Raman Scattering (SRS) have been added to the radiation-hydrodynamics codes Hydra and Lasnex. Both processes are important in hohlraums with high gas fill density, particularly for implosion symmetry. Coupled-mode equations are solved along laser ray paths for both models. The inline model shows the SRS gain rate exceeds that of SRS light absorption along most of the laser ray path, and most SRS light escapes the target. Most SRS-driven Langmuir wave power is deposited slightly inside the laser entrance hole (LEH), which reduces how much inner-beam power reaches the equator. This also makes the LEH hotter, which affects CBET. Compared to removing SRS power from the incident laser, the inline SRS model does not change total x-ray drive but makes the drive stronger from the poles than the equatorial waist. This reduces the need to artificially clamp CBET in order to match implosion shape data, which has historically been needed for high gas fill hohlraums. We are applying the models to a set of NIF shots with varying gas fill densities.

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