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Inline model for energy transfer between crossing laser beams in HYDRA[1] M.M. MARINAK, G.D. KERBEL, P. MICHEL, L. DIVOL — Energy transfer between laser beams crossing in National Ignition Facility (NIF) hohlraums has an important effect on the symmetry of a capsule implosion. Previous calculations using a linear model[2] applied through post-processing HYDRA simulations allowed fast assessment of the effect and provided a useful correspondence to experiments. That technique does not couple the effects of energy transfer between beams, or the associated momentum deposition, back to the plasma in a fully self-consistent manner. We have implemented the model in HYDRA through the 3D laser ray tracing package. We have also implemented empirical models for stimulated Raman scattering and stimulated Brillouin scattering. Together these allow for the energy flow and coupling to the plasma to be handled in a self-consistent manner. The inline models also enable a faster turnaround time to simulate an experiment. To achieve consistency the ray tracing is iterated, recomputing the beam resolved intensity in every cell for each iteration. We examine the importance of self-consistent treatment of energy and momentum deposition for a NIF ignition target.

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[2]P. Michel et. al, Phys. Plasmas 17, 056305 (2010).

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