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Improved inline model for Raman backscatter in HYDRA[1] M.M. MARINAK, G.D. KERBEL, P. MICHEL, D.J. STROZZI, S.M. SEPKE, Lawrence Livermore National Laboratory — Backscatter of laser light due to laser plasma instabilities has a pronounced impact on the flow of energy in a National Ignition Facility (NIF) hohlraum. We have implemented a new inline model for stimulated Raman scattering (SRS) in HYDRA. The model integrates the coupled-mode equations for SRS gain and inverse bremsstrahlung absorption along the rays, including pump depletion and energetic electron production by Langmuir waves. This enables more precise resolution of the spatial variation of the backscattered intensity along the beam path. The SRS escaping power and wavelength are constrained to match the experimentally measured history for each beam cone. Run in conjunction with the inline model for energy transfer between crossed laser beams, the new model enables more accurate treatment of energy and momentum deposition in hohlraum simulations. We examine the impact of the model on an integrated HYDRA simulation of a NIF hohlraum.

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