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Mitigation of multi-beam CBET with broadband lasers[1] JASON BATES, United States Naval Research Laboratory, RUSSELL FOLLETT, JOHN SHAW, University of Rochester, STEPHEN OBENSCHAIN, ROBERT LEHMBERG, JAMES WEAVER, DAVID KEHNE, MATTHEW WOLFORD, MATTHEW MYERS, JUDE KESSLER, United States Naval Research Laboratory, JASON MYATT, University of Alberta — Cross-beam energy transfer (CBET) is an undesirable energy-loss mechanism in directly-driven inertial-confinement-fusion (ICF) implosions. An earlier study [J.W. Bates et al., High Energy Density Phys. 36, 100772 (2020)] using a 2D version of the code LPSE [J.F. Myatt et al., J. Comp. Phys. 399, 108919 (2019)] demonstrated that for two, crossed, frequency-tripled, Nd:glass laser beams modeled with random speckle patterns, distributed phase plates and polarization smoothing, Gaussian bandwidths of about 1% (8 THz) are effective at eliminating CBET in a plasma under ICF-relevant conditions. Here, we report on 2D and 3D LPSE simulations that examine CBET suppression in the multiple-laser-beam configuration used in direct-drive implosion on the OMEGA laser. In addition to Gaussian bandwidth, we also model the effects of laser "detuning" and smoothing by spectral dispersion and compare the efficacy of all three approaches for suppressing CBET between multiple, overlapped laser beams. Additionally, we will discuss in this presentation two possible techniques for CBET suppression in direct-drive ICF: i.) stimulated rotational Raman scattering; and ii.) excimer laser drivers.

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