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Three-Dimensional Modeling of Polarization Effects on Cross-Beam Energy Transfer in OMEGA Implosions D.H. EDGELL, R.K. FOLLETT, J. KATZ, J.F. MYATT, J. SHAW, D.H. FROULA, Laboratory for Laser Energetics, U. of Rochester — Beamlet spot images are used to diagnose cross-beam energy transfer (CBET) during OMEGA direct-drive implosions. The spots are, in essence, the end point of beamlets of light originating from different regions of each beam profile and following paths determined by refraction. The intensity of each spot varies because of absorption and CBET along that path. When each beam is linearly polarized, the image is asymmetric in terms of spot intensities. A 3-D CBET postprocessor for hydrodynamics codes is used to model the intensity, wavelength, and polarization of light from each beam. Rotation of polarization caused by CBET is tracked. The model is benchmarked using a 3-D wave-based solver for simplified CBET geometries. For linearly polarized beams in OMEGA implosions, the model predicts that polarization effects will result in asymmetric polarization and unabsorbed light profiles that are different for each beam. An asymmetric beamlet spot image similar to that recorded is predicted by the CBET model for linearly polarized beams. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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