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Diagnosing Cross-Beam Energy Transfer Using Beamlets of Unabsorbed Light from Direct-Drive Implosions D.H. EDGELL, R.K. FOLLETT, V.N. GONCHAROV, I.V. IGUMENSHCHEV, J. KATZ, J.F. MYATT, W. SEKA, D.H. FROULA, Laboratory for Laser Energetics, U. of Rochester — A new diagnostic is now being fielded to record the unabsorbed laser light from implosions on OMEGA. Unabsorbed light from each OMEGA beam is imaged as a distinct "spot" in time-integrated images. Each spot is, in essence, the end point of a beamlet of light that originates from a specific region of a beam profile and follows a path determined by refraction. The intensity of light in the beamlet varies along that path because of absorption and cross-beam energy transfer (CBET) with other beamlets. This diagnostic allows for the detailed investigation of the effects of CBET on specific locations of the beam profile. A pinhole can be used to isolate specific spots, allowing the time-resolved spectrum of the beamlet to be measured. A fully 3-D CBET hydrodynamics code postprocessor is used to model the intensity and wavelength of each beamlet as it traverses the coronal plasma to the diagnostic. The model predicts that if a single beam in a symmetric implosion is turned off, the recorded intensity of nearby spots will decrease by $\sim 15\%$ as a result of loss of CBET from the dropped beam. 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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