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Experimental Investigation of Cross-Beam Energy Transfer Mitigation via Wavelength Detuning in Directly Driven Implosions at the National Ignition Facility M. HOHENBERGER, J.A. MAROZAS, P.W. MCKENTY, M.J. ROSENBERG, P.B. RADHA, D. CAO, J.P. KNAUER, S.P. REGAN, Laboratory for Laser Energetics, U. of Rochester — Cross-beam energy transfer (CBET) affects directly driven, inertial confinement fusion implosions by reducing the absorbed light and the coupling of driver energy to the target. A mitigation strategy is to detune the laser wavelength of interacting beams ($\Delta\lambda \neq 0$) to reduce the CBET interaction volume. In polar-direct-drive (PDD) experiments at the National Ignition Facility (NIF) the CBET-imposed energy losses occur predominantly in the equatorial region. The NIF does not support a hemispheric wavelength detuning but does have $\Delta\lambda$ capabilities between inner and outer quads. Using a north–south asymmetric beam pointing, it is therefore possible to introduce a hemispheric wavelength difference of up to $\Delta\lambda = 4.6\,\AA$ in the UV. We report on experiments to test this CBET mitigation scheme in PDD experiments on the NIF. Using this asymmetric beam pointing, we have completed experiments with both $\Delta\lambda = 0$ and 4.6 Å. The effect of CBET on the driver–target coupling is diagnosed via implosion velocities, implosion shape, and scattered-light spectra and by comparing experimental data to 2-D *DRACO* simulations. 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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