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Improved Wavelength Detuning Cross-Beam Energy Transfer Mitigation Strategy for Polar Direct Drive at the National Ignition Facility J.A. MAROZAS, T.J.B. COLLINS, P.W. MCKENTY, J.D. ZUEGEL, Laboratory for Laser Energetics, U. of Rochester — Cross-beam energy transfer (CBET) reduces absorbed light and implosion velocity, alters time-resolved scattered-light spectra, and redistributes absorbed and scattered light. These effects reduce target performance in both symmetric direct-drive and polar-direct-drive (PDD) experiments on the OMEGA Laser System and the National Ignition Facility (NIF). The CBET package (*Adaawam*) incorporated into the 2-D hydrodynamics code *DRACO* is an integral part of the 3-D ray-trace package (*Mazinisin*). The CBET exchange occurs primarily over the equatorial region in PDD, where successful mitigation strategies concentrate. Detuning the initial laser wavelength ($d\lambda_0$) reduces the CBET interaction volume, which can be combined with other mitigation domains (e.g., spatial and temporal). By judiciously selecting the ring and/or port $\pm d\lambda_0$ in each hemisphere, using new *DRACO* diagnostic abilities, improved wavelength detuning strategies trade-off overall energy absorption for improved hemispherical energy balance control. These balanced-wavelength detuning strategies improve performance for high-convergence implosions. Simulations (2-D *DRACO*) predict improved implosion performance and control in both the shell trajectory and morphology for planned intermediate PDD experiments on the NIF. 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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