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Design Options for Polar-Direct-Drive Targets: From Alpha Heating to Ignition T.J.B. COLLINS, J.A. MAROZAS, P.W. MCKENTY, S. SKUPSKY, Laboratory for Laser Energetics, U. of Rochester — Polar direct drive (PDD)[1] makes it possible to perform direct-drive–ignition experiments at the National Ignition Facility while the facility is configured for x-ray drive. We present the first PDD ignition-relevant target designs to include the physical effects of cross-beam energy transfer (CBET) and nonlocal heat transport, both of which substantially affect the target drive. These effects are complementary: CBET reduces target drive, while nonlocal heat transport increases the drive (relative to flux-limited models). Previous ignition designs[2] incorporated these processes in only an approximate way through use of an *ad-hoc* flux limiter applied to the classical expression for heat conduction. In the PDD configuration, a multiwavelength detuning strategy was found to be effective in mitigating the loss of coupling caused by CBET, allowing for implosion speeds comparable to those of previous designs. Target designs are found that span the region from alpha-particle heating to ignition. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]S. Skupsky *et al.*, Phys. Plasmas **11**, 2763 (2004).
[2]T. J. B. Collins *et al.*, Phys. Plasmas **19**, 056308 (2012).

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