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Polar Direct Drive on the National Ignition Facility S. SKUPSKY, R.S. CRAXTON, F.J. MARSHALL, R. BETTI, T.J.B. COLLINS, R. EPSTEIN, V.N. GONCHAROV, I.V. IGUMENSHCHEV, J.D. KELLER, J.A. MAROZAS, P.W. MCKENTY, P.B. RADHA, J.D. KILKENNY, D.D. MEYERHOFER, T.C. SANGSTER, R.L. MCCRORY, Laboratory for Laser Energetics, U. of Rochester —
Target designs to achieve direct-drive ignition on the NIF using the x-ray-drive beam configuration are examined. This approach, known as polar direct drive (PDD), achieves the required irradiation uniformity by repointing some of the beams toward the target equator, and by increasing the laser intensity at the equator to compensate for the reduced laser coupling from oblique irradiation.[1,2] Techniques to increase the equatorial intensity can include using phase plates that produce elliptical spot shapes, increasing the power in beams directed toward the equator, and using a ring offset from the equator to redirect rays toward the target normal. The requirements for beam pointing and power balance are examined. The simulations use the 2-D hydrocode *DRACO* with a 3-D ray trace to model the laser irradiation and Monte Carlo alpha-particle transport to model the thermonuclear burn. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

[1]S. Skupsky *et al.*, Phys. Plasmas **11**, 2763 (2004).
[2]R. S. Craxton and D. W. Jacobs-Perkins, Phys. Rev. Lett. **94**, 095002 (2005); R. S. Craxton *et al.*, Phys. Plasmas **12**, 056304 (2004).

P.W. McKenty
Laboratory for Laser Energetics, U. of Rochester

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