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Optimized Polar-Direct-Drive Experiments on OMEGA F.J. MARSHALL, R.S. CRAXTON, M.J. BONINO, R. EPSTEIN, V.YU. GLEBOV, D. JACOBS-PERKINS, J.P. KNAUER, J.A. MAROZAS, P.W. MCKENTY, S.G. NOYES, P.B. RADHA, W. SEKA, S. SKUPSKY, V.A. SMALYUK, Laboratory for Laser Energetics, U. of Rochester — Polar-direct-drive experiments on OMEGA are being performed with 40 beams arranged similarly to the 48-beam, indirect-drive configuration on the NIF. The beams are re-aimed toward the target equator to compensate for the nonuniform illumination. Additionally, a "Saturn-like," toroidally shaped ring placed around the target equator is used to refract light toward the equator, further enhancing target-implosion symmetry. The latest experiments have succeeded in minimizing the lowest ℓ-mode distortions of the implosions (ℓ = 1 to 6), and resulted in fusion yields approaching that achieved with 60-beam symmetrically illuminated targets. The symmetry of the implosions is diagnosed with framed x-ray backlighting using additional beams of OMEGA. The implosions have been optimized by systematically varying the beam pointing and, in the case of Saturn targets, by varying the ring diameter. The beneficial effects of 1-THz SSD available on OMEGA are investigated by comparing target performance with and without the high-frequency component of SSD. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

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