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The Effect of Nonuniformity Growth on Direct-Drive Plastic-Shell Implosions on the OMEGA Laser P.B. RADHA, C. STOECKL, J.P. KNAUER, V.N. GONCHAROV, I.V. IGUMENSHCHEV, R.L. MCCRORY, D.D. MEYERHOFER, T.C. SANGSTER, S. SKUPSKY, Laboratory for Laser Energetics, U. of Rochester, J.A. FRENJE, R.D. PETRASSO, PSFC, MIT — The in-flight aspect ratio (IFAR)—the ratio of the shell radius to its thickness—is an important implosion parameter that defines the minimum energy required for ignition and characterizes nonuniformity growth. Target performance is systematically studied in deuterium-filled warm plastic-shell implosions using triple-picket laser pulses on the OMEGA Laser. Picket energies and the timing between the pickets are systematically varied to obtain IFAR's between 30 and 60. Observed yields increase by nearly a factor of 3 when the IFAR is reduced to 30 from 60. A nearly 1-D value of areal density, $\langle \rho R \rangle \sim 170$ mg/cm^2, is observed for IFAR ~ 30. Observed $\langle \rho R \rangle$ is significantly reduced from 1-D values for IFAR ~ 60, with a value $\sim$140 mg/cm^2. These observations demonstrate the scaling of direct-drive target performance with IFAR. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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