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Evaluating the Effects of Imperfections in Laser Illumination and Target Geometry on Direct-Drive Cryogenic DT Implosions on OMEGA CHRISTIAN STOECK, TIMOTHY COLLINS, REUBEN EPSTEIN, CHAD FOR-REST, VLADIMIR GLEBOV, VALERI GONCHAROV, ROBERT JUNGQUIST, CHAD MILEHAM, RADHA BAHUKUTUMBI, SEAN REGAN, CRAIG SANG-STER, RAHUL SHAH, WOLFGANG THEOBALD, University of Rochester — Laser-direct-drive experiments with layered cryogenic DT targets on OMEGA are used to evaluate the impact of imperfections in laser illumination and target geometry on the implosion performance. Some effects do not disturb the observable spherical symmetry of the implosion, like shock timing, preheat, and imprint, while others, like laser irradiation and ice layer nonuniformities, will show signatures in spatially resolved observables. A comprehensive set of diagnostics including neutron detectors, x-ray self-emission, and x-ray backlighting techniques is used to distinguish between different causes for the observed performance degradation. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

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