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Hydrodynamic Mixing of Ablator Material into the Compressed Fuel and Hot Spot of Direct-Drive DT Cryogenic Implosions S.P. REGAN, V.N. GONCHAROV, R. EPSTEIN, R. BETTI, M.J. BONINO, D. CAO, T.J.B. COLLINS, E.M. CAMPBELL, C.J. FORREST, V.YU. GLEBOV, D.R. HARDING, J.A. MAROZAS, F.J. MARSHALL, P.W. MCKENTY, T.C. SANGSTER, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester, R.W. LUO, M.E. SCHOFF, M. FARRELL, General Atomics — Hydrodynamic mixing of ablator material into the compressed fuel and hot spot[1] of direct-drive DT cryogenic implosions is diagnosed using time-integrated, spatially resolved xray spectroscopy. The laser drive ablates most of the 8-μm-thick CH ablator, which is doped with trace amounts of Ge ($\sim 0.5\,\text{at.}\,\%$) and surrounds the cryogenic DT layer. A small fraction of the ablator material is mixed into the compressed shell and the hot spot by the ablation-front Rayleigh–Taylor hydrodynamic instability seeded by laser imprint, the target mounting stalk, and surface debris. The amount of mix mass inferred from spectroscopic analysis of the Ge K-shell emission will be presented. This material is based upon work supported by the Department Of Energy National Nuclear Security Administration under Award Number DENA0001944. Part of this work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DEAC5207NA27344.

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