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Diagnosing 3D asymmetries in indirect drive implosions at the National Ignition Facility[1] D. CASEY, O. LANDEN, B. MACGOWAN, C. YOUNG, J. MILOVICH, R. NORA, M. HOHENBERGER, D. HINKEL, R. TOMMASINI, D. CLARK, P. PATEL, E. HARTOUNI, R. BIONTA, K. HAHN, D. SCHLOSSBERG, A. MOORE, R. HATARIK, Lawrence Livermore Natl Lab, H. RINDERKNECHT, Laboratory for Laser Energetics — To achieve hotspot ignition, inertial confinement fusion (ICF) implosions must achieve high hotspot pressures that are inertially confined by a dense shell of DT fuel. This requires high inflight shell velocity, good energy coupling between the hotspot and imploding shell, and high areal-density at peak compression. Three-dimensional (3D) asymmetries seeded by the drive and/or target can grow during an implosion and damage both the coupling of energy to the hotspot and confinement of that energy. Low mode ($l \leq 2$) 3D asymmetries have been present to some extent in nearly every campaign and target design type fielded at the National Ignition Facility (NIF). To demonstrate that these asymmetries are real and significant we have cross-compared independent experimental measurements. To better understand their cause and impact, we are combining the available experimental data, simplified models, and 3D radiation hydrodynamic simulations, while also proposing new efforts. This presentation will briefly overview some of these efforts and present the status of our understanding of the origin and impact of 3D asymmetry in ignition experiments at the NIF as well as plans for how they may be mitigated.

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