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Hot-Spot Flow Dynamics and Residual Kinetic Energy in NIF ICF Implosions DAVID SCHLOSSBERG, MARK ECKART, GARY GRIM, EDWARD HARTOUNI, ROBERT HATARIK, ALASTAIR MOORE, PRAV PATEL, Lawrence Livermore National Laboratory — Inertial confinement fusion relies on converting kinetic energy imparted during an implosion into thermal energy of the deuterium-tritium fuel. Non-radial motion in the fusing volume ("hot-spot") indicates residual kinetic energy and hence inefficient conversion. We present velocities internal to the hot-spot measured by 2D particle velocimetry of x-ray images. These are quantitatively compared to 2D hydrodynamic simulations for several magnitudes of low-mode asymmetric drive. Effects on burn-averaged ion temperatures are shown in observations, simulations and theory. Measurements of burn-averaged electron temperatures appear independent of residual motion and remain several hundred keV below minimum T_{ion} for all cases of asymmetric drive. This discrepancy will be discussed in terms of fuel velocity-variance artificially increasing apparent ion temperatures. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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