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Measurements of Reduced Hydrodynamic Instability Growth in Adiabat Shaped Implosions at the NIF[1] DANIEL CASEY, ANDREW MACPHEE, JOSE MILOVICH, VLADIMIR SMALYUK, DAN CLARK, HARRY ROBEY, LUC PETERSON, KEVIN BAKER, CHRIS WEBER, Lawrence Livermore Natl Lab — Hydrodynamic instabilities can cause capsule defects and other perturbations to grow and degrade implosion performance in ignition experiments at the National Ignition Facility (NIF). Radiographic measurements of ablation front perturbation growth were performed using adiabat-shaped drives which are shown to have lower ablation front growth than the low foot drive. This is partly due to faster Richtmyer-Meshkov (RM) oscillations during the shock transit phase of the implosion moving the node in the growth factor spectrum to lower mode numbers reducing the peak growth amplitude. This is demonstrated experimentally by a reversal of the perturbation phase at higher mode numbers (120-160). These results show that the ablation front growth and fuel adiabat can be controlled somewhat-independently and are providing insight into new, more stable, ignition designs.

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