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Hydrodynamic Instability Growth Measurements at the Ablator-Fuel Interface in Layered ICF Capsule Implosions[1] TILO DOEPPNER, CHRIS WEBER, DAN CASEY, TOM BUNN, Lawrence Livermore National Laboratory, LANE CARLSON, General Atomics, REBECCA DYLLA-SPEARS, BERNIE KOZIOZIEMSKI, ANDY MACPHEE, JIM SATER, HARRY ROBEY, VLADIMIR SMALYUK, Lawrence Livermore National Laboratory — Based on the well-established Hydro-growth Radiography (HGR) concept [1-3] we have successfully developed and fielded a new target platform to measure instability growth at the ablator-fuel interface in layered capsule implosions on the NIF. We present the results of a proof-of-principle experiment for which mode 60 perturbations with an amplitude of 4.4 μm peak-to-valley were laser-machined at the inside of a 0.8-scale plastic ablator capsule. A 55 μm thick, polycrystalline DT ice layer was grown on top of these perturbations. High quality radiography data were recorded at 4 times, showing the growth of these perturbations in both the linear and non-linear stage. We find good agreement with preliminary HYDRA simulations that include small-scale perturbations introduced by the laser machining. Future directions will be discussed.

[1] V.A. Smalyuk et al., Phys. Rev. Lett. **112**, 185003 (2014).
[2] D.T. Casey et al., Phys. Rev. E **90**, 011102 (2014).
[3] K.S. Raman et al., Phys. Plasmas **21**, 072710 (2014).

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