Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Experimental study of fill-tube hydrodynamic effects on implosion N. IZUMI, D. CALLAHAN, R. COOK, J. EDWARDS, S. HAAN, J. KLINGMANN, J. KOCH, O. LANDEN, S. LANGER, S. LETTS, R. SEUGLING, B. SPEARS, C. SORCE, R. TURNER, R. WALLACE, Lawrence Livermore National Laboratory — Planned cryogenic ignition experiments at the National Ignition Facility (NIF) are expected to use a fill tube to introduce liquid DT into the capsule prior to solid layer formation. This fill tube is expected to form a hydrodynamic jet during the deceleration phase of the implosion. Numerical simulations indicate that a 10um tube with a 3um hole has an acceptable impact on the implosion. However, the hydrodynamic effects of the fill tube have not been explored by experiments. We have begun the first indirect-drive experiments to explore the hydrodynamic effects of fill tubes on implosion performance. In these experiments, we have concentrated on developing diagnostic techniques by replacing the fill tube with a bump on the outer shell surface. This bump is hydrodynamically similar to a fill tube but much easier to fabricate and simulate. We present experimental data obtained from temporally resolved, high spatial resolution x-ray emission imaging of Ti-doped shell material that has been swept into the core at times near peak compression. This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W- 7405-Eng-48.

Nobuhiko IZUMI
Lawrence Livermore National Laboratory

Date submitted: 24 Aug 2005 Electronic form version 1.4