Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Shell asymmetry-driven hot-spot generation issues in high convergence ratio implosions on the National Ignition Facility[1] OMAR HURRICANE, PAUL SPRINGER, DEBBIE CALLAHAN, DANIEL CASEY, EDUARD DEWALD, THOMAS DITTRICH, TILO DOEPPNER, DENISE HINKEL, LAURA BERZAK HOPKINS, ANDREA KRITCHER, TAMMY MA, ANDREW MACPHEE, JOSE MILOVICH, HYE-SOOK PARK, PRAV PATEL, JOSEPH RALPH, HARRY ROBEY, J. STEVEN ROSS, JAY SALMONSON, BRIAN SPEARS, VLADIMIR SMALYUK, RICCARDO TOMMASINI, CHARLES YEAMANS, Lawrence Livermore National Laboratory — Much of the conceptual understanding, theory, and design of ICF implosions has been developed assuming a one-dimensional (1D) implosion [e.g. Lindl, J., Phys. Plasmas, **2**, 3933-4024 (1995); Betti, R., et al., 17, 058102 (2010)]. But what if the typical ICF implosion is not 1D? In this talk we present an overview of data and simulation results from recent high performance implosions on NIF that imply highly distorted implosions and an associated non-ideal hot-spot generation issue, *even in cases where the bang-time emission (in x-rays and neutrons) from the implosion appears 1D.* We present a simple extension of a semi-analytic dynamic implosion model that captures the key effect of localized thin-regions in an implosions shell (fuel+remaining ablator), via a leaking hot-spot picture, and discuss what the model implies about the physics we can't directly diagnose in our suite of implosions.

[1]This work performed under the auspices of U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Omar Hurricane
Lawrence Livermore National Laboratory

Date submitted: 24 Jul 2015 Electronic form version 1.4