Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

**High-resolution 3D simulations of NIF ignition targets performed on Sequoia with HYDRA*** M.M. MARINAK, D.S. CLARK, O.S. JONES, G.D. KERBEL, S. SEPKE, M.V. PATEL, J.M. KONING, C.R. SCHROEDER, Lawrence Livermore National Laboratory — Developments in the multiphysics ICF code HYDRA enable it to perform large-scale simulations on the Sequoia machine at LLNL. With an aggregate computing power of 20 Petaflops, Sequoia offers an unprecedented capability to resolve the physical processes in NIF ignition targets for a more complete, consistent treatment of the sources of asymmetry. We describe modifications to HYDRA that enable it to scale to over one million processes on Sequoia. These include new options for replicating parts of the mesh over a subset of the processes, to avoid strong scaling limits. We consider results from a 3D full ignition capsule-only simulation performed using over one billion zones run on 262,000 processors which resolves surface perturbations through modes l = 200. We also report progress towards a high-resolution 3D integrated hohlraum simulation performed using 262,000 processors which resolves surface perturbations on the ignition capsule through modes l = 70. These aim for the most complete calculations yet of the interactions and overall impact of the various sources of asymmetry for NIF ignition targets. *This work was performed under the auspices of the Lawrence Livermore National Security, LLC, (LLNS) under Contract No. DE-AC52-07NA27344.

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Date submitted: 22 Jul 2015 Electronic form version 1.4