Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Analysis of ICF Capsule Surfaces Using Modal Growth Factors JOSEPH RALPH, M.J. EDWARDS, J.L. MILOVICH, S.V. WEBER, N.B. MEEZAN, S.W. HAAN, M.A. JOHNSON, P.T. SPRINGER, B.A. HAMMEL, S.H. GLENZER, Lawrence Livermore National Laboratory — Perturbations on an ICF capsule ablator surface can seed Rayleigh-Taylor instability, which can lead to ablator material being injected into the hot spot, cooling it by radiation. If sufficient mass is injected, the radiative energy loss can be sufficient to quench ignition. Modal growth factors derived from hydrodynamic simulations applied directly to the metrologized surfaces of CH capsules has proven to be a valuable tool for predicting the amount of ablator mass that would be injected into the hot spot, as well as providing a visualization the overall shell integrity during the implosion in 3D. The results of the application of this technique to Symcap and THD NIF implosion targets with comparison to gated x-ray shot data will be presented. The pulse shapes for different drive conditions have resulted, from hydrodynamic simulations, in vastly different modal growth factors. The application of these modal growth factors will be shown to help in optimizing the pulse shapes and minimize Rayleigh-Taylor growth. Comparison with hydrodynamic simulations will be shown. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Joseph Ralph
Lawrence Livermore National Laboratory

Date submitted: 20 Jul 2010 Electronic form version 1.4