

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

A Platform for X-Ray Thomson Scattering Measurements of Radiation Hydrodynamics Experiments on the NIF HEATH LEFEVRE, KEVIN MA, PATRICK BELANCOURT, Univ of Michigan - Ann Arbor, MICHAEL MACDONALD, University of California - Berkeley, TILO DOEPPNER, Lawrence Livermore National Laboratory, PAUL KEITER, CAROLYN KURANZ, Univ of Michigan - Ann Arbor — A recent experiment on the National Ignition Facility(NIF) radiographed the evolution of the Rayleigh-Taylor(RT) instability under high and low drive cases. This experiment showed that under a high drive the growth rate of the RT instability is reduced relative to the low drive case. The high drive launches a radiative shock, increases the temperature of the post-shock region, and ablates the spikes, which reduces the RT growth rate. The plasma parameters must be measured to validate this claim. We present a target design for making X-Ray Thomson Scattering(XRTS) measurements on radiation hydrodynamics experiments on NIF to measure the electron temperature of the shocked region in the above cases. Specifically, we show that a previously fielded NIF radiation hydrodynamics platform can be modified to allow sufficient signal and temperature resolution for XRTS measurements. This work is funded by the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0002956 and the National Science Foundation through the Basic Plasma Science and Engineering program.

Heath LeFevre
Univ of Michigan - Ann Arbor

Date submitted: 14 Jul 2017

Electronic form version 1.4