Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Radiative shock properties using x-ray Thomson scattering and self-emission measurements on the National Ignition Facility[1] HEATH LEFEVRE, KEVIN MA, Univ of Michigan - Ann Arbor, MICHAEL MACDONALD, TILO DOEPPNER, MARIUS MILLOT, CHANNING HUNTINGTON, Lawrence Livermore National Laboratory, PAUL KEITER, Los Alamos National Laboratory, ERIC JOHNSEN, CAROLYN KURANZ, Univ of Michigan - Ann Arbor — Radiative shocks are relevant to a variety of astrophysical phenomena, such as supernova remnants and accretion shocks. Experiments to understand the structure and radiation transport in radiative shocks inform the interpretation of observational data and improve simulation codes. A recent Discovery Science campaign measured radiative shocks using x-ray Thomson scattering and streaked self-emission from the heated material to extract quantitative information about the temperature profile and radiation transport. The experiment uses a halfraum to drive a radiative shock into a 20 mg cm^{-3} CH foam and a Zn probe foil to produce 9 keV emission for the scattering measurement. The self-emission diagnostic determined the average shock velocity is 130 μm ns^{-1}. This presentation will present the analysis of the scattering and self-emission data collected during the recent discovery science campaign.

[1]This work is funded by the U.S. DOE NNSA Center of Excellence under cooperative agreement number DE-NA0003869 and the NSF through the Basic Plasma Science and Engineering program NSF 16-564, grant number 1707260. The work of M.J.M., T.D., M.M and C.M.H. was performed under the auspices of the U.S. DOE by LLNL under Contract DE-AC52-07NA27344.

Heath LeFevre
Univ of Michigan - Ann Arbor

Date submitted: 23 Jun 2020 Electronic form version 1.4