Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Impact of self-generated magnetic fields on High Energy Density experiments[1] DANIEL BARNAK, Los Alamos National Laboratory, ANDREW BIRKEL, Massachusetts Institute of Technology, KIRK FLIPPO, CODIE KAWAGUCHI, KWYNTERO KELSO, Los Alamos National Laboratory, BRANDON LAHMANN, CHIKANG LI, Massachusetts Institute of Technology, HUI LI, SHENGTAI LI, ERIC LOOMIS, YINGCHAO LU, NOMITA VAZIRANI, Los Alamos National Laboratory — Mixing has been discussed among the inertial confinement fusion community as an explanation for decreased capsule performance. Understanding where and how mix occurs and accurately modeling mix is quintessential to developing future mix mitigation strategies and designing better performing implosions. Strong magnetic fields can be generated when plasma flows shear and go Kelvin-Helmholtz unstable. Strong magnetic fields can affect electron thermal transport and ion transport, and can have energy densities on the order of the turbulent energy, which could affect the mixing behavior. An experiment was conducted to study strong magnetic field generation as a result of shear flow from counter propagating shocks separated by a thin foil. Magnetic field location and strength was determined using proton radiography through the central sheared region. The location and morphology of the shock/shear region were measured using point projection backlighting x-ray radiography on the axis perpendicular to the protons. The presence of strong magnetic fields in a shock-shear platform may lead to a paradigm shift in the need for including extended magnetohydrodynamics effects to accurately model aspects of mix. (LA-UR-19-26166)

[1]Research presented in this [article/presentation/report] was supported by the Laboratory Directed Research and Development program of Los Alamos National Laboratory under project number XWPJ00

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Date submitted: 02 Jul 2019 Electronic form version 1.4