Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Measurements of growth and saturation of the Ion Weibel instability using Thomson scattering[1] COLIN BRUULSEMA, University of Alberta, SEIGFRIED GLENZER, Stanford Linear Accelerator Complex, WOJCIECH ROZMUS, University of Alberta, GEORGE SWADLING, Lawrence Livermore National Lab, FREDERICO FIUZA, Stanford Linear Accelerator Complex — The growth and saturation of the ion Weibel instability is typically described in a homogeneous plasma with isotropic electrons, growing due to the streaming velocity of the ions. The resulting saturation levels have compared well to experimental measurements. However, the saturation levels and growth rates observed in PIC simulations of truly homogeneous plasma do not agree with these predictions. We analyze these discrepancies in growth rate and saturation to determine the applicability of the PIC simulations. We also simulate the effects of inhomogeneous experimental plasmas on the growth and saturation of the Weibel instability. These effects inform a strategy to measure the growth rates of the Weibel instability in experimental plasma. Using Thomson scattering, we determine the ion and electron currents growing within the plasma produced at the OMEGA laser facility. This measures the resulting growth of the field and the filamentation of the plasma. This work was performed under the auspices of the Lawrence Livermore National Security, LLC, (LLNS) under Contract No. DE-AC52-07NA27344

[1]I would like to acknowledge support from MITACS, as well as support and collaboration at LLNL and SLAC.

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Date submitted: 03 Jul 2019 Electronic form version 1.4