Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Investigation of Weibel-filament growth in the nonlinear regime using laser-irradiated foils of different materials[1] MARIO MANUEL, General Atomics - San Diego — M.J.-E. MANUEL *GENERAL ATOMICS*, C.M. HUNTINGTON, D.P. HIGGINSON, B.B. POLLOCK, B.A. REMINGTON, H. RINDERKNECHT, J.S. ROSS, D. RYUTOV, G. SWADLING, S. WILKS, A.B. ZYLSTRA, H.-S. PARK *LLNL*, F. FIUZA, S. TOTORICA *SLAC*, G. GREGORI *OXFORD*, J. PARK, A. SPITKOVSKY *PRINCETON*, Y. SAKAWA, H. TAKABE *OSAKA*, H. SIO *MIT*, A.B. ZYLSTRA *LANL*. The Weibel instability is presently the leading mechanism proposed to amplify magnetic fields necessary to form 'collisionless' shocks in weakly magnetized astrophysical systems, including young supernova remnants and gamma-ray bursts. These systems rely on the presence of strong self-generated magnetic fields to mediate shock formation since the typical collisional mean-free-path is much larger than the system size. The work presented here investigates the development of the Weibel instability in the nonlinear regime through experimental variation of plasma parameters using different ion species and separation distances. Our goal is to investigate the underlying physical mechanism that may allow the formation of collisionless shocks in astrophysical objects. Recent experimental and computational results will be presented and discussed.

[1]This work is funded by the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0002956 and in collaboration with LLNL under contract DE-AC52-07NA27344.

Mario Manuel
General Atomics - San Diego

Date submitted: 14 Jul 2017 Electronic form version 1.4