Abstract Submitted
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Laboratory Measurements of Astrophysical Magnetic Fields C.D. MURPHY, University of Oxford, F. MINIATI, ETH Zurich, M. EDWARDS, J. MITHEN, A.R. BELL, University of Oxford, C. CONSTANTIN, E. EVERSON, D. SCHAEFFER, C. NIEMANN, UCLA, A. RAVASIO, E. BRAMBRINK, A. BENUZZI-MOUNAIX, M. KOENIG, LULI-Ecole Polytechnique, C. GREGORY, N. WOOLSEY, University of York, H.-S. PARK, B. REMINGTON, D. RYUTOV, LLNL, R. BINGHAM, STFC-RAL, L. GARGATE, IST, Lisbon, A. SPITKOVSKY, Princeton University, G. GREGORI, University of Oxford — It has been proposed that high Mach number collisionless shocks propagating in an initially unmagnetized plasma play a major role in the magnetization of large scale structures in the Universe. A detailed study of the experimental configuration necessary to scale such environments down to laboratory dimensions will be presented. We will show initial results from preliminary experiments conducted at the Phoenix laser (UCLA) and the LULI laser (Ecole Polytechnique) where collisionless shocks are generated by the expansion of exploding foils driven by energetic laser beams. The time evolution of the magnetic field is probed with induction coils placed at 10 cm from the laser focus. We will discuss various mechanisms of magnetic field generation and compare them with the experimental results.

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