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Characterization of Laser-Ablated, Magnetized Carbon Plasmas Relevant to Magnetized Collisionless Shocks D.B. SCHAEFFER, A.S. BONDARENKO, E.T. EVERSON, E.S. CLARK, C.G. CONSTANTIN, C. NIEMANN, University of California, Los Angeles, D. WINSKE, Los Alamos National Laboratory — We present experiments on laser-ablated, magnetized carbon plasmas performed at the University of California, Los Angeles (UCLA). A graphite target placed inside a static magnetic field ($\lesssim$ 1 kG) created by a 50 cm-diameter Helmholtz coil was ablated by laser pulses at 1053 nm with energies between $10 - 100$ J. Magnetic flux probes measured the magnetic field compression and expulsion of the resulting blow-off plasma and diamagnetic bubble. A separate laser at 527 nm was used for Thomson scattering to characterize the electron temperature and density up to several cm from the target and several microseconds after the initial laser ablation. The carbon ionization states and blow-off velocities were further measured with emission spectroscopy. The data was used to inform 2D hybrid simulations of a laser-ablated plasma expanding into an ambient plasma, relevant to upcoming magnetized collisionless shock experiments on the Large Plasma Device at UCLA.

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