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Studying Magnetic-Pressure-Driven Bow Shocks at OMEGA[1]
JOSEPH LEVESQUE, CAROLYN KURANZ, RACHEL YOUNG, WILLIAM GRAY, MATTHEW TRANTHAM, SALLEE KLEIN, GENNADY FIKSEL, University of Michigan, Ann Arbor, ANDY LIAO, Los Alamos National Laboratory, PATRICK HARTIGAN, William Marsh Rice University, MARIO MANUEL, General Atomics, JOSEPH KATZ, Laboratory for Laser Energetics, CHIKANG LI, ANDREW BIRKEL, Massachusetts Institute of Technology, PETROS TZEFERACOS, University of Chicago — We present data and analysis from a campaign to study astrophysically relevant, magnetic-pressure-driven bow shocks at the OMEGA laser facility. The system consists of a slow, low-density plasma flow impinging on the external azimuthal magnetic field around a current-carrying wire. The spatially resolved optical Imaging Thomson Scattering diagnostic provides quantitative measurements of electron number density and temperature across a shock. Proton images also indicate the formation of an MHD shock at a standoff distance from the wire. We simulate the experiment using the FLASH code and compare these results to the data.

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