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Observing Magnetized Shocks Using the OMEGA Laser JOSEPH LEVESQUE, CAROLYN KURANZ, RACHEL YOUNG, SALLEE KLEIN, MATTHEW TRANTHAM, GENNADY FIKSEL, Univ of Michigan - Ann Arbor, PATRICK HARTIGAN, ANDY LIAO, Rice University, MARIO MANUEL, General Atomics, CHIKANG LI, ANDREW BIRKEL, Massachusetts Institute of Technology, JOSEPH KATZ, Laboratory for Laser Energetics — Results from a campaign to generate and study magnetized bow shocks using the OMEGA laser are presented in which optical imaging Thomson scattering and proton radiography diagnostics were used to make measurements of magnetized shocks in a sufficiently low β_{ram} regime. The system consisted of a slow, low-density plasma flow impinging on the azimuthal magnetic field produced by a current-carrying wire. Data collected at multiple times captured dynamical features of shock formation for two levels of the current in the wire. The proton images show regions of magnetic compression, and sharp increases in density and temperature are observed by the Thomson scattering diagnostic, all evidence of shock formation. Combining measurements from both diagnostics, some shock characteristics can be determined. This work is funded by the U.S. Department of Energy, through the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0002956, and the National Laser User Facility Program and William Marsh Rice University, grant number, R19071, and through the Laboratory for Laser Energetics, University of Rochester by the NNSA/OICF under Cooperative Agreement No. DE-NA0001944.

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