

Abstract Submitted
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OMEGA Laser-Driven Hydrodynamic Plasma Jet Experiments with Relevance to Astrophysics S.L. SUBLETT, J.P. KNAUER, D.D. MEYERHOFER, T.J.B. COLLINS, A. FRANK, Laboratory for Laser Energetics, U. of Rochester — Using the University of Rochester’s OMEGA laser, experimental techniques have been developed to study plasma jets. A charge-coupled-device (CCD) detector was configured to measure the jet evolution with a high signal-to-noise ratio compared with previous film detectors. The evolution of experimental supersonic plasma jets was observed over many dynamical times. Double-pulsed jets looked similar to single-pulsed jets at times long compared to the pulse separation. The bow-shock profiles of the experimental jets matched the predictions of an astrophysical energy-driven jet model. These jet experiments extend the applicable regime of impulsive, energy-driven jet simulations to density contrasts greater than 1. The experimental jets were observed under controlled conditions during earlier stages of development than astrophysical jets can be observed. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement DE-FC52-92SF19460.

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