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Supersonic jet experiments on Sandia National Laboratories' Z accelerator¹ G.R. BENNETT, D.B. SINARS, M.E. CUNEO, D.K. LOBLEY (KTECH CORP.), T.A. MEHLHORN, J.L. PORTER, D.G. SCHROEN (SCHAFER CORP.), R.A. VESEY, D.F. WENGER, SNL, B.H. WILDE, R.F. COKER, LANL, P.A. ROSEN, J.M. FOSTER, AWE, T.S. PERRY, LLNL — An x-ray-driven supersonic jet experiment has been performed on Sandia National Laboratories' Z accelerator. The 130-140 eV drive of a z-pinch-driven hohlraum ablates a cylindrical Al pin (300-micron-length, 600-micron-diameter) that is embedded half way into a 150-micron-thick Au washer. A strong convergent shock is formed on axis, and the dense Al plasma propagates into a 300 mg/cc RF foam, on the opposite side, and a jet is formed. The jet evolution is imaged by a 6.151 keV curved-crystal imaging system with 10-11 micron spatial resolution. This allows the bow shock, Kelvin-Helmholtz roll-up, and other jet features to be studied in detail and then compared with various radiation hydrodynamics codes. Radiographs can be reduced to running integral "1-T" plots (T=6.151 keV transmission) through various sections (of chosen width) of the jet along the direction parallel to the foam's z-axis, to provide metrics for direct comparison with simulations. Results are presented in this and the following paper.

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