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**High Energy Density Plasma Jet Studies in the ZaP-HD Experiment**[1] E. G. FORBES, U. SHUMLAK, B. A. NELSON, E. L. CLAVEAU, R. P. GOLINGO, M. C. HUGHES, M. P. ROSS, University of Washington — The ZaP-HD Flow Z-Pinch device produces high energy density plasma jets that are magnetically confined in a Z-pinch configuration with a 50 cm length and 0.5 cm diameter. Conditions in the pinch exceed temperatures of 800 eV and densities of 2e17 $cm^{-3}$. Plasma properties are characterized with a suite of diagnostics including magnetic field probes, digital holographic interferometry, Doppler spectroscopy, and fast-framing photography. Magnetic field probes indicate an extended quiescent period. Recent investigations include impingement of the high-speed, high-energy-density plasma jet onto a solid body. A 0.3 cm diameter boron nitride rod is inserted into the Z-pinch plasma to study plasma-material interactions. Digital holographic interferometry produces a two-dimensional map of the plasma density around the tripping probe. Fast framing photography images laminar and turbulent boundary layer behavior. Spectroscopic data indicate subsonic flow speeds throughout the pulse. A time-resolved ion Doppler spectrometer is developed to produce velocity contours for the entire plasma pulse.

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