Abstract Submitted
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High energy density plasma experiments using radial foils P.-A. GOURDAIN, I.C. BLESENER, J.B. GREENLY, D.A. HAMMER, P.F. KNAPP, B.R. KUSSE, P.C. SCHRAFEL, Cornell University — A novel technique involving radial foil explosions can produce high energy density plasmas (HEDP). A current flows radially inward in a 5-micron thick aluminum foil from a circular anode, which contacts the foil on its outer rim, to the cathode, which connects to the foil at its geometrical center. JxB forces lift the foil upward, forming a plasma shell, with electron density above $5\text{x}10^{19}$ cm^{-3}, around a central plasma column, carrying most of the current. When using very small "pin" cathodes ($\sim$ 1 mm in diameter) on a medium size pulsed-current generator such as the COrnell Beam Research Accelerator (COBRA), central magnetic fields approach 2 Mgauss and local JxB force densities are on the order of a mega-newton per cubic millimeter. Combining well-established diagnostics, such as laser backlighting, interferometry and fast camera imaging, with new measurements techniques, such as micro B-dot probes, we will present the magneto-hydrodynamics properties of such plasmas. Particular attention will be given to flow and magnetic field measurements.

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