Abstract Submitted
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Observations and modeling of magnetized plasma jets and bubbles launched into a transverse B-field[1] DUSTIN M. FISHER, YUE ZHANG[2], BEN WALLACE, MARK GILMORE, University of New Mexico, WARD B. MANCHESTER IV, BART VAN DER HOLST, University of Michigan, BARRETT N. ROGERS, Dartmouth College, SCOTT C. HSU, Los Alamos National Laboratory — Hot, dense, plasma structures launched from a coaxial plasma gun on the HelCat dual-source plasma device at the University of New Mexico drag frozen-in magnetic flux into the chambers background magnetic field providing a rich set of dynamics to study magnetic turbulence, force-free magnetic spheromaks, shocks, as well as CME-like dynamics possibly relevant to the solar corona. Vector magnetic field data from an eleven-tipped B-dot rake probe and images from an ultra-fast camera will be presented in comparison with ongoing MHD modeling using the 3-D MHD BATS-R-US code developed at the University of Michigan. BATS-R-US employs an adaptive mesh refinement grid (AMR) that enables the capture and resolution of shock structures and current sheets and is uniquely suited for flux-rope expansion modeling. Recent experiments show a possible magnetic Rayleigh-Taylor (MRT) instability that appears asymmetrically at the interface between launched spheromaks (bubbles) and their entraining background magnetic field. Efforts to understand this instability using in situ measurements, new chamber boundary conditions, and ultra-fast camera data will be presented.

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