# Heliospheric-Relevant MHD Turbulence in Laboratory Plasma

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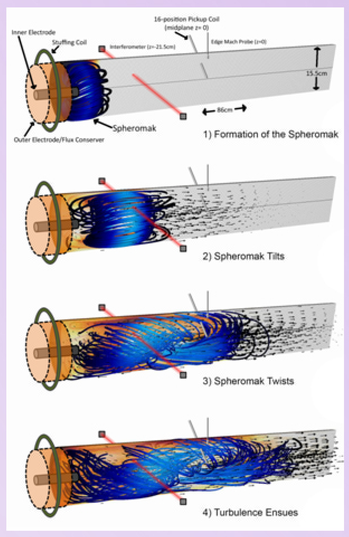
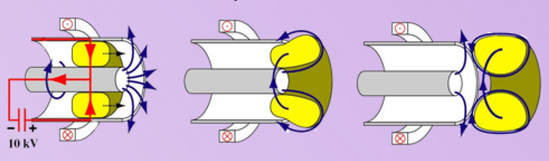
***Dynamic**** magnetic fields and flows are generated by a plasma gun to create a controllable MHD turbulent environment

*i.e.no rigid background field

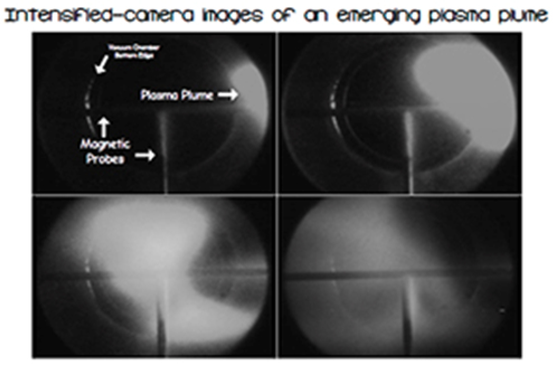
Simulated Spheromak Evolution (HiFi)




Spheromak Formation

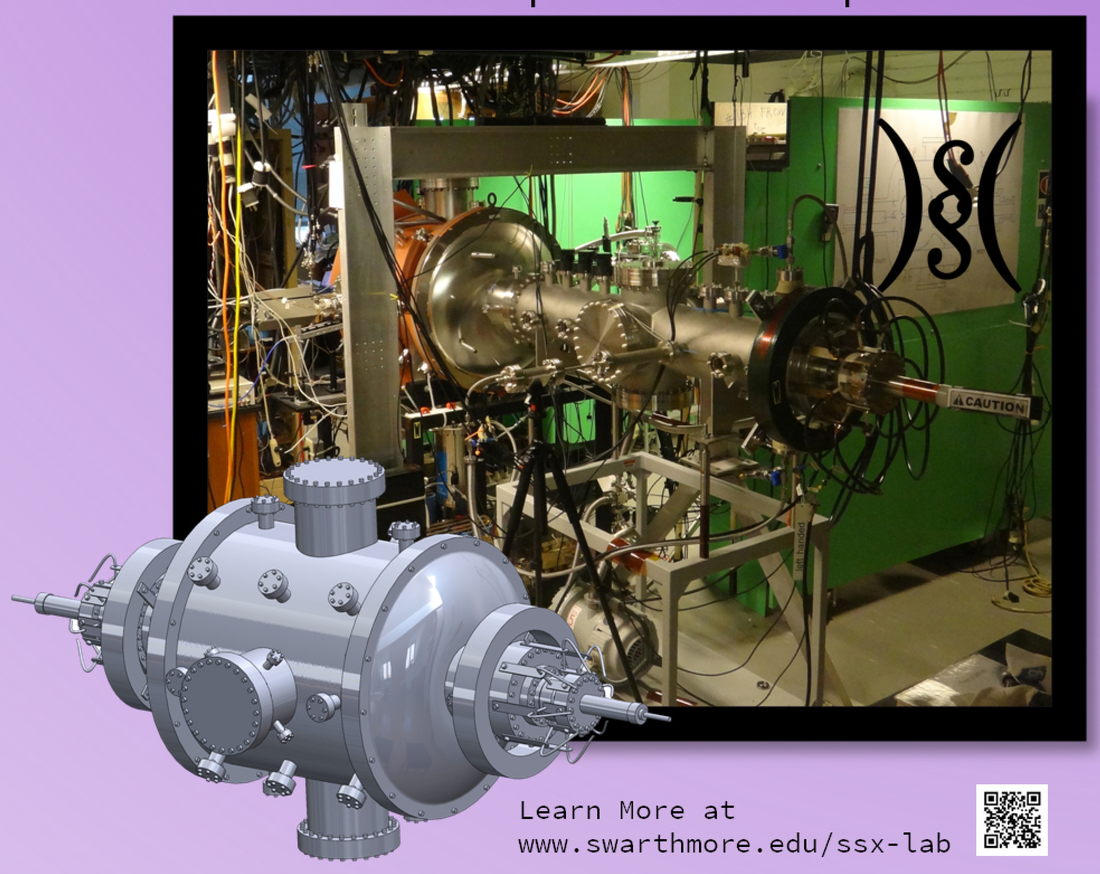



Intensified-camera images of an emerging plasma plume

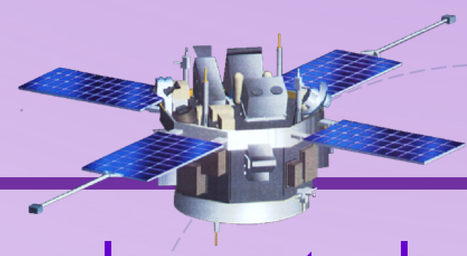



Schaffner PPCF 2014, Brown and Schaffner PSST 2014, Brown and Schaffner JPP 2015

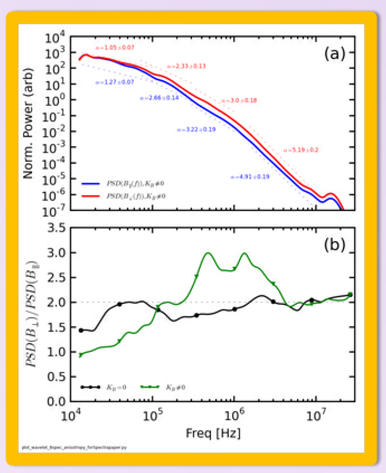
Swarthmore Spheromak Experiment



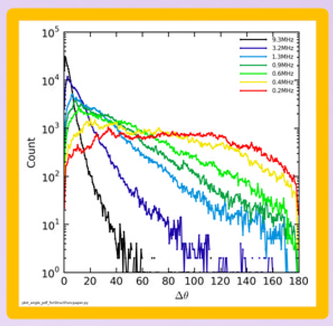

Learn More at
www.swarthmore.edu/ssx-lab



Various analyzes can be used to understand the laboratory plasma turbulence in order to begin making comparisons to heliospheric observations

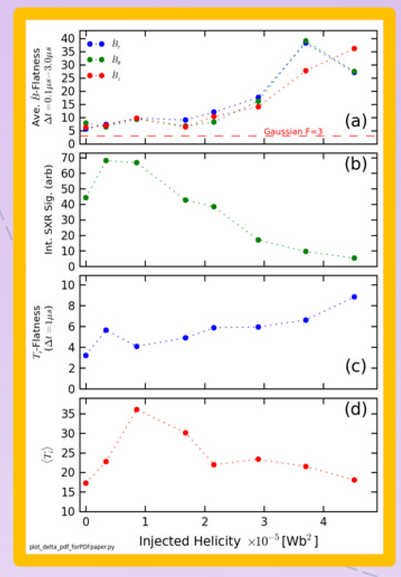



Magnetic compressibility observed at ion inertial length scales
*(Schaffner ApJ 2014)*

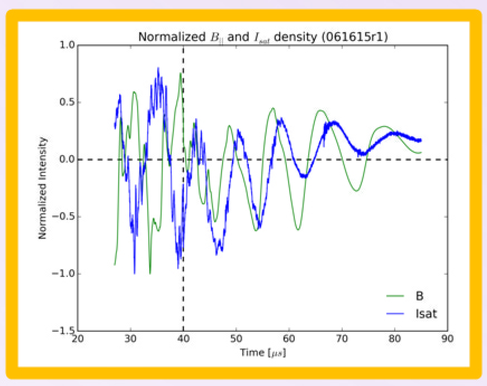



Distribution of magnetic vector angler jumps depends on temporal increment
*(Area of Current Research)*

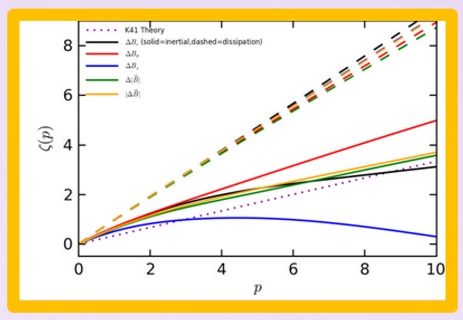
Increased intermittency observed with increasing injected magnetic helicity
*(Schaffner PRL 2014)*



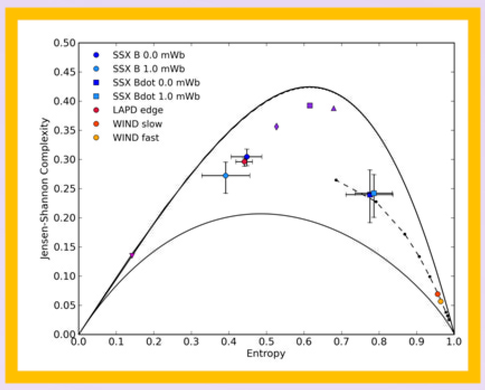

Turbulence




Correlation of Density and $B_{||}$ explored to determine mode nature of plasma
*(Area of Current Research)*




Multifractal scaling observed in inertial range, Monofractal scaling in dissipation range
*(Submitted to ApJ 2015)*




Laboratory fluctuations exhibit more statistical complexity, less permutation entropy than space plasmas
*(Weck PRE 2015)*