Abstract Submitted
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Experimental Investigations of Broadband Magnetic Turbulence in the Madison Symmetric Torus Reversed Field Pinch[1] A.F. ALMAGRI, D. CRAIG, J.S. SARFF, UW-Masison, CMSO, L. MARRELLI, P. MARTIN, P. PIOVESAN, Consorzio RFX, Padova, Italy — Reversed field pinch plasmas are well documented to exhibit long wavelength magnetic fluctuations, a few percent of the mean field, due to MHD tearing instability. However, the origin of fluctuations observed at the smaller scales is not understood. The wave number and frequency spectra exhibit power decay suggestive of turbulent cascade physics, but the inertial range and dissipation range are not well separated in scale, if the spectrum is cascade in origin. The amplitude of fluctuations at all scales increases and decreases with the amplitude of the unstable tearing modes, controlled by varying plasma conditions, also suggestive of cascade physics at work. Other statistical properties also depend on the tearing amplitude, with increased intermittency observed when the tearing fluctuations are large. Studies to date have been limited to measurements at the plasma surface. A multi-coil movable probe with a 5mm coil separation is developed to investigate the radial dependence of the magnetic spectrum, important since the radial correlation lengths are very short at high frequency. The frequency bandwidth of the measurements is also extended to several MHz, which is at or above ion gyro frequencies.

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