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Studies of Millimeter Scale Magnetic Turbulence in Madison Symmetric Torus RFP Plasmas JAMES B. TITUS, EPHREM D. MEZONLIN, Florida A&M University, ABDULGADER F. ALMAGRI, PAUL W. TERRY, JOHN S. SARFF, University of Wisconsin-Madison — Work has been done to understand the cascade of turbulent magnetic field fluctuations and how the dissipation process is connected to particle heating and energization. Madison Symmetric Torus (MST) reversed-field pinch plasmas experience a quasiperiodic sawtooth relaxation cycle, where fluctuation levels increase due to tearing-mode driven magnetic reconnection bursts. These fluctuations that are anisotropic with respect to the equilibrium field may be related to powerful non-collisional ion heating, where the inferred scale for onset of strong dissipation is larger than classical dissipation. Previous measurements were done with a magnetic probe with 5 mm coil separation between 2 coils in each direction, but could only resolve k-spectra out to +/- 1.5 cm^{-1}. Measurements have recently been done with five times the spatial resolution, by decreasing the distance between coils (1 mm) and increasing the amount of coils (7) in each direction. These upgrades provide more resolution to areas of the spectrum that were previously too noisy to make any significant analysis. Initial analysis shows similar anisotropic behavior for larger values of k without deviation from the modeled spectrum, though it is unclear if the spectrum is exactly the same for k greater than 1.5 cm^{-1}. The dissipation range models well as a produced of a power law and exponential falloff.

James B. Titus
Florida A&M University

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