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Measurements of broadband electrostatic and magnetic turbulence in the MST reversed-field pinch D.J. THUECKS, A.F. ALMAGRI, Univ. of Wisconsin-Madison, Y. REN, PPPL, J.S. SARFF, P.W. TERRY, Univ. of Wisconsin-Madison — The dominant fluctuations in the reversed field pinch arise from large scale tearing instabilities, but a broadband spectrum is observed. Recent measurements in MST suggest that the shorter wavelength magnetic fluctuations (spatially resolved to the ion gyro-radius scale) arise via a nonlinear cascade driven by the tearing modes. This turbulence is highly anisotropic, with fluctuation power being spread broadly in the direction perpendicular to the background magnetic field. Additionally, the scaling of the wavenumber spectrum reveals both inertial and dissipation ranges consistent with strong MHD turbulence expectations. Here we report measurements of broadband electrostatic fluctuations covering a similar range of physical scales. The wavenumber spectra for $\mathbf{E}$ and n_e fluctuations exhibit a clear power-law scaling suggestive of an inertial range, but there is no clear exponential fall-off indicative of dissipation. The electrostatic fluctuations are also anisotropic and appear to be consistent with the predicted relation $k_{||} = k_{\perp}^{2/3}$. Cross-correlation measurements are underway to determine if the electrostatic and magnetic fluctuations are related, for example as would be expected for an Alfvénic cascade. NSF and DOE support this work.

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