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Measurements of High Frequency Magnetic Fluctuations in MST[1] Y. REN, A.F. ALMAGRI, G. FIKSEL, S.C. PRAGER, J.S. SARFF, UW-Madison, CMSO — Reversed field pinch plasmas are rich in magnetic fluctuations, dominated by low frequency tearing modes (∼10-30 KHz) which play important roles in magnetic self-organization and transport. However, the origin of high frequency fluctuations (>100 KHz) remains unclear. The increase of high frequency fluctuation power during fast reconnection events (sawteeth) suggests that magnetic energy may cascade from the tearing modes to the high frequency fluctuations. Here we present detailed measurements of edge magnetic fluctuations in MST using an insertable magnetic probe, where the toroidal and poloidal mode numbers, n and m, were obtained using the two- point correlation method. The radial dependence of the fluctuation characteristics (power spectra, dispersion relations, etc.) was quantified. The time evolution of the fluctuations during the sawtooth cycle is also resolved. Interestingly, at the sawtooth crash the high frequency fluctuations (∼200-400 KHz) become almost parallel- propagating relative to the equilibrium field, and the phase velocity is close to the ion thermal velocity. This suggests that these high frequency fluctuations may be magnetosonic waves, expected to be strongly damped to produce strong ion heating.

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