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Electron temperature fluctuations correlated with the dominant m = 0 tearing mode in the Madison Symmetric Torus CALE KASTEN, DANIEL DEN HARTOG, HILLARY STEPHENS, University of Wisconsin-Madison — Electron temperature fluctuations become correlated with the dominant m = 0, n = 1 edge tearing mode during sawtooth events in the Madison Symmetric Torus RFP. Using a Thomson scattering diagnostic, 5 bursts of 6 electron temperature measurements are taken at 25 kHz, allowing use of Bayesian analysis techniques to ensemble and correlate data with magnetic tearing modes. Between sawtooth events the fluctuations are correlated with dominant m = 1 mode remnant island structures and after events they are correlated to the m = 1, n = 5 mode that comes into resonance. However, during sawtooth events the m = 1 magnetic islands grow and overlap and the correlations disappear as the field becomes stochastic. Electron temperature fluctuations instead become correlated with the dominant m = 0, n = 1 mode, forming a coherent structure that is only observed 100 μs after the sawtooth crash. The fluctuation amplitudes have the same sign across the entire plasma radius with magnitudes of 4 – 30% of the background electron temperature.

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