Correlated temperature and magnetic structures have been seen in MST. A new soft x-ray $T_e$ and tomography diagnostic offers a chance to study the phenomenology and evolution of these structures. Of special interest are plasmas with a dominant magnetic mode structure. The new diagnostic uses the double-foil technique and features:

- individual photo-diodes and fully differential adjustable gain transimpedance amplifiers
- pairs of diodes with shared chordal views to provide direct-brightness $T_e$ profiles in addition to tomographic reconstruction

**Background: The Diagnostic**

**Techniques: Tomographic Emissivity And Electron Temperature**

**Motivation and Introduction**

**Results: SXR Electron Temperature and Magnetic Structure**

SXR tomographic reconstruction shows an emissive island consistent with the magnetic structure from a dominant $(m,n)=(1,6)$ magnetic mode in a high-current improved confinement discharge.

**Impurity Continuum Contribution to the SXR Spectrum**

**New Evidence of Molybdenum Impurity**

**Summary And Future Work**

- The complete 40-chord SXR provides 2D tomographic emissivity as well as direct-brightness $T_e$ using the double-foil technique
- SXR $T_e$ agrees well with Thomson Scattering in the absence of molybdenum
- $\delta T_e$ island has been measured with amplitude $\sim12\% T_e(0)$ and correlated with dominant magnetic mode
- FIR and TS measurements can be leveraged with SXR to study $Z_{\text{Mo}}$ distribution
- Evidence of Mo impurity contamination from limiter installation in January 2013