

Abstract Submitted  
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**An Upgraded Soft X-Ray Tomography Diagnostic to Measure Electron Temperature on MST** MEGHAN MCGARRY, University of Wisconsin - Madison, PAOLO FRANZ, Consorzio RFX - Padova, Italy, JOHN GOETZ, DANIEL DEN HARTOG, University of Wisconsin - Madison — The upgraded soft x-ray (SXR) diagnostic will measure electron temperature on MST using two complementary methods. Both methods are based on the two-color technique, which calculates temperature based on the ratio of SXR bremsstrahlung emission from the plasma in two different energy ranges. Improvements over the previous diagnostic include individual detection diodes to reduce noise, a new geometry that improves tomographic reconstructions, and a new filter design that provides direct two-color measurements for each line-of-sight. The new diagnostic retains the ability to measure temperature from tomographically reconstructed emissivity. Additionally, shared lines-of-sight also enable the two-color technique to be applied directly to the measured brightness. Extensive modeling demonstrates advantages and limitations in both techniques. For example, the direct brightness technique provides a robust radial profile of temperature, while the tomographic technique provides a 2D temperature map but is sensitive to mathematical artifacts. This work supported by U.S. D.O.E.

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