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Improvements in electron temperature measurements from soft x-rays in MST plasmas L.M. REUSCH, University of Wisconsin - Madison, P. FRANZ, Consorzio RFX, EURATOM-ENEA Association, M.E. GALANTE, J. GOETZ, D.J. DEN HARTOG, M.B. MCGARRY, University of Wisconsin - Madison, H.D. STEPHENS, Pierce College Fort Steilacoom — The MST is equipped with a two-color soft x-ray tomography (SXT) diagnostic that is capable of making electron temperature measurements via the double-foil technique. Discrepancies between the double-foil temperature and Thomson scattering (TS) have been confirmed to be due to impurities present in the Be filters used to block visible light and select the energy range for soft x-ray detection. Namely, contamination from Zr led to a larger effective thickness for all filters. Furthermore, the distribution of Zr particles was highly non-uniform, making accurate accounting of the contaminated filters impossible and leading to different effective thicknesses between different probes in the SXT system. We have installed new confirmed 99.9% purity Be filters and assessed their effect on the brightness profiles and on the two-foil temperature measurements. Results show consistent amplitudes for brightness profiles from all four probes, and the double-foil temperature measurement from SXT matches TS within uncertainty, both spatially and temporally. In addition, empirical measurements of the transmission function versus energy for the Be filters contaminated with Zr will allow us to accurately characterize data using the contaminated Be filters. This work was supported by the US DOE.

Lisa Reusch
University of Wisconsin - Madison

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