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**First absolutely calibrated on-axis ion flow measurements in MST.** B. SCHOTT, M. BALTZER, D. CRAIG, Wheaton College, Wheaton, IL USA, D.J. DEN HARTOG, T. NISHIZAWA, M.D. NORNBERG, University of Wisconsin - Madison, WI USA — Improvements in absolute calibration techniques allow for the first direct measurements of the flow profile in the core of MST. We use both active charge exchange recombination spectroscopy and passive emission near 343 nm to measure ion temperature and flow. It is generally assumed that O VI is the brightest passive emission source. However, we show that there are cases, such as high temperature, pulsed poloidal current drive (PPCD) plasmas where the passive emission is dominated by C VI. Differences in the fine structure for O VI and C VI result in a systematic velocity error of about 12 km/s if the wrong model is assumed. Active measurements, however, are relatively insensitive to background model choice. The dominant source of error in active velocity measurements remains the systematic errors in calibration. The first absolutely calibrated, localized toroidal velocity measurements were obtained using an updated calibration technique. During PPCD, the on-axis ion flow is up to 40 km/s larger than both the n = 6 mode velocity and the line-averaged ion velocity. These measurements provide the first direct look at the flow profile in the core of MST. This work has been supported by the US DOE and the Wheaton College summer research program.

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