Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Electron Temperature Measurements of PPCD and Non-reversed Plasmas on MST Using SXR Double-foil Brightness[1] J.A. GOETZ, M.B. MCGARRY, University of Wisconsin - Madison, P. FRANZ, Consorzio RFX - Padova, Italy, D.J. DEN HARTOG, M.A. THOMAS, University of Wisconsin - Madison — A new diagnostic has been developed that uses soft-x-ray (SXR) emission to provide tomographically reconstructed x-ray emissivity, double-foil electron temperature from either brightness or tomographic emissivity, and bulk plasma electron energy spectra on MST. Full, double-foil, radial profiles of electron temperature have been compared with Thomson scattering measurements, confirming that plasmas typically reach electron temperatures of ∼1keV in 600kA non-reversed (F=0) conditions and ∼1.2-1.4keV during non-crash-heated high current pulsed parallel current drive (PPCD). The diagnostic has also confirmed, during F=0 plasmas, enhanced SXR emission from a helical structure whose spatial location is consistent with that determined by external magnetic measurements. Additionally, rotating SXR emissivity structures correlated to remnant magnetic islands during PPCD have been identified. Ongoing work will determine whether or not there are also temperature structures that correspond to these remnant islands. Investigation of potential temperature structures during F=0 plasmas will also be pursued as the limits of the double-foil diagnostic are quantified.

[1]Work supported by US DoE

John Goetz
University of Wisconsin - Madison

Date submitted: 12 Jul 2012 Electronic form version 1.4