

Abstract Submitted  
for the DPP16 Meeting of  
The American Physical Society

**Characterization and initial results from the upgraded MST interferometer-polarimeter** W.X. DING, E. PARKE, D.L. BROWER, University of California Los Angeles, J. DUFF, University of Wisconsin-Madison — The FIR interferometer-polarimeter diagnostic on MST is a high-bandwidth system with unique capabilities for measuring high-frequency density and internal magnetic fluctuations. Installation of new planar-diode mixers improves both the signal strength and the noise floor compared to the corner-cube mixers previously used. Measurements of density and Faraday rotation angle in standard reversed-field pinch (RFP) plasmas and plasmas with improved, tokamak-like confinement are presented. The noise floor in the Faraday rotation power spectrum is reduced by nearly an order of magnitude, with fluctuations observed up to 250 kHz. Cross-correlation between multiple mixers is an additional, novel technique for reducing the noise floor and improving the resolution of high-frequency, small-amplitude magnetic and density fluctuations. Correlation of signals from two independent mixers viewing the same chord reduces the noise floor by another order of magnitude. High wavenumber resolution may be possible when operating without focusing elements, using only the 2-3 mm aperture on the mixer to determine the sampled chord width. This configuration will provide better resolution of small-scale fluctuations observed in the RFP during periods of improved confinement. Work supported by U.S. D.O.E.

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Date submitted: 14 Jul 2016

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