

Abstract Submitted
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Validation of spectral MSE for Alcator C-Mod and ITER¹ I.O. BESPAMYATNOV, W.L. ROWAN, IFS, The University of Texas at Austin, R.T. MUMGAARD, R.S. GRANETZ, MIT-PSFC, S.D. SCOTT, PPPL, F. LEVINTON, H. YUH, Nova Photonics, Inc. — The MSE spectrum was measured on C-Mod with sufficient accuracy to infer the spectral shifts and relative spectral intensities of the MSE full-energy pi and sigma components. The results were successfully used to benchmark new predictions. (I. O. Bepamyatnov, Nucl. Fusion 53 (12), 123010 (2013)). MSE optics, spectrometer, beam timing, plasma/gas density and magnetic field were optimized. Spectral resolution was improved by 50% over 2012 results by decreasing the spectrometer slits and the aperture of the MSE optics. Spectral fitting analysis was developed and optimized for local diagnostic equipment and plasma conditions. The spectral MSE approaches, one based on line ratios and the other based on line shifts, can be compared to MSE polarimetry which provides reliable pitch angle measurement for C-Mod. The results of these experiments are reported here and applicability both to C-Mod and ITER is discussed. Based on these results, additional hardware improvements are proposed.

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