

Abstract Submitted
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Investigation of density and potential fluctuations measured in the interior of improved confinement RFP plasmas¹ P.J. FIMOGNARI, D.R. DEMERS, Xantho Technologies, LLC, Madison, WI, D. CARMODY, P.W. TERRY, University of Wisconsin, Madison, WI — The Heavy Ion Beam Probe (HIBP) is uniquely capable of simultaneously measuring density and potential fluctuations in the plasma core. Characterizing the amplitudes, wavelengths, and cross phases of these quantities is necessary for validation efforts. During improved confinement (IC) periods in the Madison Symmetric Torus (MST) Reversed Field Pinch (RFP), HIBP measurements indicate density and potential fluctuations are broadband with most power below 100 kHz; the cross phase varies with radius and frequency. Gyrokinetic simulations of MST experimental discharges, focusing on microinstabilities during IC periods, suggest ITG and TEM are the predominant linear instabilities; profiles of various parameters are key to the growth or stability of these modes. Comparison of these simulations to interior fluctuation profiles is made possible by using the HIBP along with equilibrium temperature and density gradients. Measurements of fluctuations have been acquired with the HIBP at multiple radial locations inside the MST reversal surface; analysis of these and other relevant experimentally measured quantities will be presented.

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