

Abstract Submitted
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Investigation of microtearing instability in NSTX with X-ray diagnostics¹ K.L. WONG, K. TRITZ², D.R. SMITH, K. HILL, S. KAYE, A.L. ROQUEMORE, PPPL, Princeton University, PPPL/JOHNS HOPKINS COLLABORATION — Microtearing instabilities can quantitatively explain the experimentally determined electron thermal conductivity in some NSTX discharges,³ and this motivates the search for experimental evidence of these modes. The 46-chord soft X-ray camera⁴ can, in principle, see the modes during their initial growth phase before neighboring island chains overlap. The singular value decomposition⁵ technique is employed to get information on their mode structures and evolution dynamics. When stochastic magnetic field caused by overlapping islands becomes the dominant electron loss mechanism, the loss rate is expected to increase with the electron parallel velocity, and this should distort the electron velocity distribution function to deviate from local Maxwellian distribution. Such evidence may appear in the X-ray energy spectrum. An X-ray spectrometer is built specifically for this purpose. Preliminary result from this investigation will be presented.

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