

Abstract Submitted  
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**Soft X-ray Analysis of HBT-EP Plasmas** J.P. LEVESQUE, B. DEBONO, J.M. HANSON, R. JAMES, M.E. MAUEL, D.A. MAURER, G.A. NAVRATIL, T.S. PEDERSEN, D. SHIRAKI, Columbia University — Measuring soft x-ray emission is a useful and non-invasive diagnostic for studying internal plasma properties and MHD mode structure and dynamics. The HBT-EP tokamak is equipped with two multi-chord soft x-ray systems to study internal profile and fluctuation behavior. A 32-channel soft x-ray tomography system composed of discrete diodes with a thin film filter of Titanium, Zirconium, and Carbon coated directly on to the diode face is used to reconstruct 2-D plasma emissivity profiles at a single toroidal location. Resolution of the system is sufficient to measure the structure and evolution of edge  $(m,n) = (2,1)$  tearing modes. In addition, a 16-channel “fan-array” assembly based upon a linear diode array and a 400 nanometer Beryllium filter measures emission predominantly from the plasma core. Fan-array measurements of internal sawtooth and  $(m,n)=(1,1)$  mode activity will be presented. A planned upgrade to the fan-array for measuring temperature profiles using a multiple set of filters and additional diode arrays will be discussed.

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