Proposal Submission for NSTX Research Forum 2001

Title	EBW Research on NSTX: Status and Near-Term Plans
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Choose only one topical session by inserting X (Please use separate forms for individual proposals)	**2001 Research Program** (esynakowski@pppl.gov) __ET1: Macroscopic Stability __ET2: Transport & Turbulence X ET3: High Harmonic Fast Wave & Electron Bernstein Wave __ET4: Coaxial Helicity Injection __ET5: Boundary Physics **2002-2005 Research Opportunities** (mpeng@pppl.gov) __TG1: Noninductive Startup __ TG2: Heating, Current Drive & Fueling __TG3: Macroscopic Stability __TG4: Transport & Turbulence __TG5: Energetic Particle Physics __TG6: Multiphase Interface __TG7: General Plasma Science Research **Fluctuations Measurement** (esynakowski@pppl.gov) __Fluctuations Measurement proposals

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During the NSTX experimental campaign in 2000 we began measuring fundamental and second harmonic mode-converted EBW with a fast frequency scanning, 11-18 GHz, heterodyne radiometer viewing the plasma on a dedicated re-entrant midplane port. The mode-converted EBW emission was observed to increase by up to a factor of three during

NBI-heated H-mode plasmas with steep edge density gradients. Preliminary analysis of the EBW data shows that the observed radiation temperature is consistent with the EBW mode conversion efficiencies calculated using measured density profiles, which reach 10-20% during the H-Mode. Mode conversion calculations have so far had to use density measurements from multi-point Thomson scattering. A more accurate determination of the edge density profile will hopefully be provided by the ORNL and UCLA reflectometers in 2001. During HHFW heating we observed several peaks in the EBW emission spectrum, some with satellites, which often persisted throughout the HHFW heating pulse. The cause for these emission peaks is presently not understood although they often, but not always, appear to coincide with the radial location of the ion cyclotron harmonics. The addition of a fast frequency scanning, 8-12 GHz, radiometer is planned for March 2001 to increase the effective radial coverage of the EBW emission diagnostic. Experiments planned for the 2001 campaign include the study of EBW source localization and radial transport using neon puffs and an investigation of EBW heating utilizing the existing ORNL 18 GHz ECH system.

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