

Abstract Submitted  
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**Electron Bernstein Wave Physics in NSTX**<sup>1</sup> G. TAYLOR, S. DIEM, P.C. EFTHIMION, R.A. ELLIS, E. FREDD, J. HOSEA, J.R. WILSON, Princeton University, T.S. BIGELOW, M.D. CARTER, J.B. CAUGHMAN, F. JAEGER, D.A. RASMUSSEN, J.B. WILGEN, Oak Ridge National Laboratory, R.W. HARVEY, CompX, A.P. SMIRNOV, N.M. ERSHOV, Moscow State University, J. URBAN, J. PREINHAEALTER, Czech Institute of Plasma Physics, A. BERS, J. DECKER, A.K. RAM, MIT Plasma Science & Fusion Center — Numerical modeling [1] and emission diagnostics [2] are used to study electron Bernstein wave (EBW) coupling, propagation and damping physics in NSTX. This research supports both the design of a 1 MW, 28 GHz EBW current drive (EBWCD) system and the development of an EBW Te(R) diagnostic. Off-axis EBWCD may be critical to sustaining solenoid-free high  $\beta$  plasmas in NSTX. Modeling and emission measurements support efficient EBW coupling via obliquely launched O-mode polarized electromagnetic waves. Off-axis 28 GHz EBWCD appears viable on NSTX, however intrinsic Doppler broadening of EBWs in the plasma, combined with significant cyclotron harmonic overlap, may preclude core access for 28 GHz EBWs. [1] R.W. Harvey and G. Taylor, Phys. Plasmas 12, 051509 (2005) [2] G. Taylor, et al., Phys. Plasmas 12, 052511 (2005)

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