

Abstract Submitted
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Simulation of the time development of EBW emission from NSTX

J. PREINHAELTER, J. URBAN, Czech Academy of Sciences, G. TAYLOR, S. DIEM, PPPL, L. VAHALA, Old Dominion Univ., G. VAHALA, William & Mary — Time evolution of ECE spectra in 20-40GHz range were simulated for NSTX plasmas. The code is based on the full wave solution of the cold plasma wave propagation used for determination of EBW-X-O and EBW-X mode conversion efficiencies and on the determination of the effective radiation temperature from simultaneous solution of EBW ray evolution and integration of the radiative transfer equation. The method was successfully used for determination of the central temperature in NSTX from detected EBW signal at 16.5GHz [1]. The time development of the frequency spectra of EBW emission from the new NSTX antenna is simulated. For the shots (#117970-#117982), the most intense radiation occurs at $f = 25\text{GHz}$. In this case EBW starts at the plasma center and is radiated mainly from the second harmonic [2]. We obtained detailed information how the ECE intensity is connected with the plasma parameters so the simulations allow determination of the EBW usability for plasma diagnostics and proposal of parameters for ECCD application. [1] J. Preinhaelter et al, 16th Topical Conf. on RF Power in Plasmas, Park City, Utah, B-05, AIP Conference Proceedings 787,ed. Stephen J. Wukitch, Paul T. Bonoli,(2005), 349-352. [2] J. Urban, J. Preinhaelter, G. Taylor, L. Vahala, G. Vahala: *Simulation of ECE frequency spectra for NSTX and comparison with new radiometer results*. 47th APS-DPP, October, 2005. Denver, Colorado *Work supported by U.S. Dept. of Energy.

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