Abstract Submitted for the DPP10 Meeting of The American Physical Society

High Resolution Full Wave Modeling of Fast Waves in NSTX¹ C.K. PHILLIPS, L. BERK², J.C. HOSEA, B.P. LEBLANC, G. TAYLOR, E.J. VA-LEO, J.R. WILSON, PPPL, L.A. BERRY, E.F. JAEGER, P.M. RYAN, ORNL, P.T. BONOLI, J.C. WRIGHT, PSFC-MIT, AND THE NSTX TEAM — High Harmonic Fast Waves (HHFW) are being used in NSTX for plasma heating and noninductive current profile control. Numerical solutions for the wave fields obtained with the full wave TORIC and AORSA codes with ultrafine spatial resolution reveal the presence of a short wavelength feature that is predominantly polarized in the direction parallel to the equilibrium magnetic field and which is predicted by the codes to damp on electrons. A similar short wavelength mode also appears in simulations of the rf fields in C-Mod in the ICRF regime. Preliminary analysis indicates that the mode may be related to a slow mode that can propagate above the fundamental ion cyclotron frequency. The predicted power deposition profiles will be compared to those inferred from experimental measurements to see if the mode has a significant effect on the wave propagation and absorption. Possibilities for detecting the mode in NSTX and C-Mod will be discussed.

¹Work supported by DE-AC02-09CH11466. ²SULI intern from Yale University

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Date submitted: 15 Jul 2010

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