Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Slow Wave Excitation due to warm electrons in NSTX-U and tokamaks[1] C.K. PHILLIPS, PPPL, E.F. JAEGER, XCEL Engineering, L.A. BERRY, ORNL, P.T. BONOLI, MIT, E.J. VALEO, N. BERTELLI, J.C. HOSEA, R. PERKINS, PPPL, P.M. RYAN, ORNL, G. TAYLOR, J.R. WILSON, PPPL, J.C. WRIGHT, MIT, NSTX-U TEAM, RF SCIDAC TEAM — Recent theoretical studies and high spatial resolution numerical simulations of high harmonic fast wave heating (HHFW) in spherical toruses (ST) and of ICRF heating in tokamaks indicate that the launched fast waves may excite a short wavelength slow mode inside of the plasma discharge due to the presence of hot electrons that satisfy the condition $\omega < k_{//} v_{te}$, where ω is the launched wave frequency, $k_{//}$ is the local parallel component of the wave vector, and v_{te} is the local electron thermal speed [1]. The 3D structure of the wave fields in ST's and tokamaks will be presented for the HHFW and ICRF regimes as well as for the related kinetic Alfven waves [2] with $\omega < \omega_{ci}$. Difficulties with resolving these short wavelength slow modes will be discussed. This slow wave may provide another path for rf power absorption in tokamaks and ST devices.

[1] C.K. Phillips et al, AIP Conf. Proc. 1406, AIP, 2011, pg. 341
[2] T.H. Stix, Waves in Plasmas, [AIP, 1992], pg. 357

[1]Work supported by the US DOE contract DE-AC02-09CH11466.

C.K. Phillips
PPPL

Date submitted: 12 Jul 2013 Electronic form version 1.4