Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

High-Harmonic Fast Wave (HHFW) Heating Results on NSTX[1]

G. TAYLOR, J.C. HOSEA, B.P. LEBLANC, C.K. PHILLIPS, M. PODESTA, E.J. VALEO, J.R. WILSON, Princeton Plasma Physics Laboratory, P.T. BONOLI, MIT Plasma Science and Fusion Center, R.W. HARVEY, CompX, E.F. JAEGER, P.M. RYAN, Oak Ridge National Laboratory, AND THE NSTX TEAM — This talk will present recent experimental and modeling results from NSTX HHFW research. HHFW heating of low current (200 - 400 kA) plasmas has resulted in a transition to a high bootstrap current fraction, H-mode regime needed for solenoid-free ramp-up. Coupling of HHFW power to NBI H-mode plasmas has been improved with lithium wall conditioning [1], although significant rf power is measured to flow to the divertor, particularly at longer launch wavelengths. Modeling results for H-mode discharges that use a combination of HHFW and NBI heating predict a strong competition between direct electron heating and fast-ion acceleration. A double-feed upgrade of the HHFW antenna in 2009 did not improve the stand off voltage by as much as predicted and appears to be limited by RF currents induced on the antenna surface. However, the stand off voltage limit can be increased with sufficient antenna conditioning. [1] G. Taylor, et al., Phys. Plasmas 17, 056114 (2010).

[1]Work supported by USDOE Contract No. DE-AC02-09CH11466 and DE-AC05-00OR2272.

Gary Taylor
Princeton Plasma Physics Laboratory

Date submitted: 12 Jul 2010 Electronic form version 1.4