

Abstract Submitted
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Performance of High Non-Inductive Current Fraction H-Modes Generated by HHFW Heating in NSTX¹ G. TAYLOR, N. BERTELLI, J.C. HOSEA, B.P. LEBLANC, R. PERKINS, C.K. PHILLIPS, M. PODESTA, E.J. VALEO, J.R. WILSON, Princeton Plasma Physics Laboratory, P.T. BONOLI, J.C. WRIGHT, MIT Plasma Science and Fusion Center, R.W. HARVEY, CompX, E.F. JAEGER, P.M. RYAN, Oak Ridge National Laboratory, AND THE NSTX TEAM — High-harmonic fast wave (HHFW) heating in the National Spherical Torus Experiment (NSTX) has generated H-mode plasmas that have a significant non-inductive current fraction (f_{NI}). These experiments are part of a long-term strategy on NSTX to develop H-mode plasmas that are fully non-inductive ($f_{NI} \geq 1$) and that do not use the central solenoid. Initial experiments in 2010 achieved $f_{NI} \sim 0.65$ in a $I_p = 300kA$, $B_T(0) = 0.55T$ deuterium H-mode plasma with only 1.4 MW of HHFW power [1]. HHFW power could not be increased above 1.4 MW in 2010 due to poor antenna conditioning. Experiments are planned this year that will use 3-4 MW of HHFW power, with the goal of achieving $f_{NI} \geq 1$. This paper will present results for these recent high f_{NI} experiments.

[1] G. Taylor, *et al.*, 38th EPS Conf. on Plasma Physics, Strasbourg, France (2011) Paper P5.095.

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