Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

An Overview of NSTX 2008 Results[1] M.G. BELL, PPPL, NSTX TEAM — Lithium, applied between discharges to the entire lower divertor, has suppressed ELMs in H-mode plasmas and produced a reduction of the density, a broadening of the temperature profiles, and an improvement in energy confinement by up to 25% in NBI-heated H-mode plasmas. With lithium, the efficiency of high-harmonic fast-wave heating also improved and electron heating occurred with a directed wave spectrum peaked at $k_{||} \approx 3m^{-1}$. Partial detachment of the divertor and flux expansion have mitigated the divertor heat flux. Deleterious MHD instabilities with low mode numbers were avoided by using non-axisymmetric coils to apply both n = 3 error field correction to maintain plasma rotation, and n = 1 feedback control to suppress resonant error field amplification and to stabilize the resistive-wall mode. The transport of toroidal momentum and effects of plasma rotation on confinement have been investigated. Coaxial helicity injection was used to generate initial plasma currents which were ramped by induction to 0.7MA and achieved H-mode with NBI. Plasmas with substantial beam-driven and bootstrap current have been maintained for up 1.8s with a very low loop voltage through field error correction and increased elongation.

[1]Supported by USDOE Contract DE-AC02-76CH03073

Michael G. Bell
PPPL

Date submitted: 18 Jul 2008 Electronic form version 1.4