Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Advanced Scenario and Plasma Control Development on NSTX[1]

DAVID GATES, S.P. GERHARDT, E. KOLEMEN, Princeton Plasma Physics Laboratory, AND THE NSTX TEAM — The NSTX extreme shaping regime ($\kappa \sim 3$, $\delta \sim 0.8$) and $\beta_N \sim 6$, has been extended to include lower q95 plasmas at high $< \beta_t > \sim 25\%$. These plasmas aim at the operating regime required for future ST reactors such as ARIES-ST. Additionally, record low sustained surface voltages have been sustained at higher q95 ~ 13. The non-inductive current drive fraction is calculated to be $f_{BS} \sim 65\%$, however actual values may be higher as the sum of the calculated inductive and non-inductive currents is less than the measured plasma currents. Possible causes of this discrepancy will be discussed. These plasmas aim at the regime envisioned for proposed future spherical torus devices, such as NHTX and ST-CTF which plan to operate in this strongly shaped regime but at lower β_t. These plasmas utilized n=1 RFA/RWM suppression and n=3 error field correction. Lithium evaporation was used to improve plasma confinement. Divertor strike point control experiments in support of the planned liquid lithium divertor upgrade will also be described.

[1]This work was supported by DoE contract No. DE-AC02-09CH11466

D. A. Gates
Princeton Plasma Physics Laboratory

Date submitted: 20 Jul 2009 Electronic form version 1.4