Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Ion Power Balance in NSTX P.W. ROSS, R.E. BELL, D.A. GATES, S. GERHARDT, S.M. KAYE, B.P. LEBLANC, S.S. MEDLEY, R.B. WHITE, PPPL, M. PODESTA, UCI, NSTX TEAM — Experiments and simulations have been performed to investigate power balance of thermal ions in NSTX discharges. The neutral beam sources were modulated to affect the input power into the plasma. The modulations occurred on two time scales. For some discharges, the modulations lasted 30 ms which is approximately than the thermalization time of beam ions. In other discharges, the modulations lasted for 60 ms, or slightly longer than the energy confinement time. The faster time scale was used to determine the deposition profile of the fast ions, and the slower time scale was used to study the effects of the beam ions on the thermal ions. Grad-Shafranov reconstructions of the plasma were performed using magnetic, temperature, and MSE measurements as constrains. The input power to the ions was calculated using the TRANSP code, which performs a time dependent transport analysis. For the longer modulation time, the inferred confinement in some cases appears to be better than neoclassical, while the shorter modulation time fit better with theoretical predictions. NPA measurements show almost no fast ions for some discharges but a very strong signal for other discharges. Comparison of the fast particle drive MHD spectrum is made between discharges with the longer and shorter modulation times. This work was supported by DoE contract No. DE-AC02-76CH03073.

P.W. Ross

Date submitted: 17 Jul 2008 Electronic form version 1.4