Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Upgrade of the NSTX Plasma Control System* D. MUELLER, D. GATES, M. ISAACS, J. LAWSON, C. LUDESCHER-FURTH, R. MARSALA, D. MATROVITO, P. SICHTA, Princeton University — The plasma control system for the National Spherical Torus Experiment (NSTX) has been upgraded to replace the obsolete SKY computer system. The three main improvements with the new system are 1) higher computer speed, 2) lower latency and 3) a recordable absolute time during the discharge. The eight 333 MHz G4 processors in the Sky system were replaced with four dual core AMD Opteron 880 2.4 GHz processors. This provides approximately 7 times the speed for computationally intensive parts of the control system. The data acquisition and control were previously shared between VME and front panel dataport (FPDP) hardware. Two PCI FPDP cards, one each for data input and output made elimination of the VME hardware possible. Presently, the input data is read directly from the FIFO, this results in a loss of speed compared to the full potential of the vmetro FPDP DPIO2 boards using DMA, nevertheless, the present latency is about 2/3 that of the old system. In the old system, time was computed relative to a start trigger and was calculated based on input data frequency and the real-time cpu clock frequency. A digital input and time stamp module (DITS) was developed to provide a 48 bit absolute timestamp for each input data sample. *This work supported by U.S. DOE Contract # DE-AC02-76CH03073.

D. Mueller
Princeton University

Date submitted: 18 Jul 2007 Electronic form version 1.4