

**Abstract Submitted for the 50th Annual Meeting  
Division of Plasma Physics  
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Category Number and Subject:

Theory     Experiment

**Real-Time Plasma Control During KSTAR First Plasma,\***  
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A.W. Hyatt, J.A. Leuer, M.L. Walker, *General Atomics* – Real-time  
control of Korea Superconducting Tokamak Advanced Research  
(KSTAR) discharges was successfully demonstrated during the  
KSTAR coil commissioning and first plasma period of May-June  
2008. KSTAR, located at the National Fusion Research Institute  
(NFRI) in Daejeon, South Korea, is designed to explore steady-state,  
high-performance tokamak plasmas. The KSTAR plasma control  
system (PCS) was developed in a collaboration between General  
Atomics and NFRI, and derives from the PCS originally developed  
for DIII-D and currently in use at NSTX, MAST, EAST, Pegasus,  
and MST. A suite of electromagnetic analysis and plasma control  
design tools, closely integrated with the KSTAR PCS, were used  
extensively to support the startup campaign. Initial coil  
commissioning was completed successfully, utilizing the power  
supply voltage and current feedback algorithms. Plasma current,  
density, and rudimentary control of major radius was demonstrated  
during startup discharges.

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