

Abstract Submitted
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WITHDRAWN—Gains Optimization Algorithm for NSTX Power Supply Control System¹ JOHN SMITH, RONALD HATCHER, PPPL — A time-saving procedure for optimizing the gains of a power supply control system is described for the NSTX toroidal field (TF) coil. An algorithm is implemented for determination of the optimal gains for prescribed levels of convergence to the reference current over various intervals. We use Simulink to simulate feedback control behavior and plant response while imposing realistic constraints on the power supply and control system models. A MATLAB routine containing the algorithm rates convergence based on weighted considerations of rise-time, steady-state error and overshoot in user-specified regions, adjusting the proportional and integral gains accordingly. NSTX test shot data files provide reference currents for benchmarking the algorithm. Iterative methods of gains optimization have been explored for best convergence efficiency and have yielded excellent agreement with hand-checked gains for simple reference current behavior. Eventual application may include adaptive gain optimization and setting for the NSTX power supply control system.

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