

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Implementation of the Pegasus Digital Plasma Control System¹

M.W. BONGARD, D.J. BATTAGLIA, R.J. FONCK, G.D. GARSTKA, B.T. LEWICKI, B.J. SQUIRES, E.A. UNTERBERG, University of Wisconsin-Madison — A primary goal of the Phase II Pegasus ST experiment is to achieve high normalized current I_N at low toroidal field. Active feedback control is required to adequately guide the plasma evolution and attain stable high I_N operation at near-unity aspect ratio. To that end, the control of our programmable power supplies is transitioning to a digital Plasma Control System (PCS) based on the software framework currently in use on DIII-D. This architecture allows for implementation of arbitrary control algorithms. A near-term goal is to provide feedback control of $R(t)$, $Z(t)$, and $I_p(t)$ via in-shot analysis of magnetics measurements and adjustment to appropriate power supply demands. New hardware and software has been developed to support the PCS, including improved signal processing electronics and the creation of a cross-platform MDSplus compatibility layer for the LabVIEW 8.0 and Igor Pro programming environments. Control algorithm development is assisted by coupling improved power supply, vacuum vessel, and rigid plasma displacement response models into a comprehensive Pegasus simserver simulator.

¹Supported by U.S. D.O.E. Grant DE-FG02-96ER54375

Gregory Garstka
University of Wisconsin-Madison

Date submitted: 21 Jul 2006

Electronic form version 1.4