

Abstract Submitted  
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**Implementation of the Pegasus Digital Plasma Control System**<sup>1</sup> 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.

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