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Theory Experiment

Enhancing Physics Operations and Increasing Physics Productivity at DIII-D,* A.W. Hyatt, D.A. Humphreys, R.D. Johnson, M.L. Walker, J.R. Ferron, J.T. Scoville, M.R. Wade, *General Atomics* – Having begun operation in 1986, DIII-D is a mature tokamak with highly effective physics operations procedures to plan and execute discharges, monitor machine status, and train personnel. A desire to maximize physics productivity per discharge has driven an ongoing process to enhance physics operations. Developments in modeling and simulation software and data-driven improved fault monitoring allow continuing improvement. Productivity enhancements include use of control design and simulation tools to reduce machine time needed to develop new algorithms, ongoing training programs for physics operators, improved physics and control-related trouble reporting, and deployment of new status reporting displays in the DIII-D Control Room. Use of the DIII-D Plasma Control System at other devices such as NSTX, EAST, and KSTAR have provided solutions for use at DIII-D as well. Results of this ongoing process and lessons learned for next generation devices such as ITER will be discussed.

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