

Abstract Submitted
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A Data Mining Approach to Modeling of Fusion Plasmas¹

R.D. DERANIAN, K.H. BURRELL, C.E. EGGERS, R.J. GROEBNER, D.A. HUMPHREYS, M.L. WALKER, GA, C.A. PETERS, SDSU, A.N. VILLANO, RPI, A. TRUNOV, Intelligent Optical Systems, L.H. RODKOFF, S. STAROBINETS, L.T. WILLE, Digital FineTec — Traditional analysis approaches cannot fully use the large amount of fusion plasma data obtained in DIII-D experiments. Data mining techniques can be used to analyze these large datasets and potentially identify important state parameters and their role in physical models. These techniques have been or are currently being used to investigate 4 different plasma physics phenomena: L-mode to H-mode transition [1], edge harmonic oscillations [2], diagnostics of 3/2 neoclassical tearing mode [3] island locations, and ℓ_i dependence of ideal no-wall stability thresholds [4]. The overall approach and some details of these investigations are described.

[1] R.D. Deranian, *et al.*, Phys. Plasmas **9**, 2667 (2002).

[2] K.H. Burrell, *et al.*, Phys. Plasmas **8**, 2153, (2001).

[3] H. Zohm, *et al.*, Phys. Plasmas **8**, 2009 (2001).

[4] A.M. Garofalo, *et al.*, Nucl. Fusion **41**, 1171 (2001).

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