

**Abstract Submitted for the Forty-Ninth Annual Meeting
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Category Number and Subject: 5.6.2. DIII-D Tokamak

Theory Experiment

Overview of DIII-D Experimental Results and Program Plans,* T.S. Taylor for the DIII-D Team, *General Atomics* – The DIII-D research program is addressing urgent ITER R&D issues, improving Advanced Tokamak operation, and using an expanding set of control tools and diagnostics to better understand the physics of high performance tokamaks. Resistive wall mode experiments with counter beam injection addressed stability and feedback control in slowly rotating ITER-relevant plasmas, providing new data to compare with code predictions. ELM-control experiments using internal and external coils point to a physics basis for design of similar coils for ITER, and new disruption mitigation results show promise for suppression of runaway electrons. Steadily increasing ECH and fast wave power (2.4 MW ECH and 3.1 MW FW) provides the means to heat electrons to vary collisionality and T_e/T_i to study turbulent transport with improved diagnostics to measure a broad spectrum of density and temperature fluctuations, and will improve current profile control in AT plasmas. In the near future, we anticipate increased long-pulse ECH power to extend noninductive high bootstrap fraction AT performance; longer-term plans include 10 s operation at full field.

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