

**Abstract Submitted for the 51st Annual Meeting
Division of Plasma Physics
November 2–6, 2009, Atlanta, Georgia**

Overview of Recent DIII-D Experimental Results,* M.E. Fenstermacher for the DIII-D Team, *LLNL* — DIII-D experiments in 2009 addressed critical ITER issues and physics understanding needed for extrapolation to future devices. Multiple schemes for rapid plasma shutdown were demonstrated including massive gas injection, large shattered D₂ pellets and impurity filled shell pellets. Detailed particle balance experiments show dramatically reduced wall uptake in ITER relevant H-mode compared with L-mode. Joint DIII-D/JET experiments showed no dependence of pedestal pressure width on ρ^* , indicating a favorable scaling to ITER. Torque from non-resonant magnetic perturbations improved access to QH-mode at low rotation. DIII-D demonstrated low voltage startup with ECH assist and low l_i plasma rampdown, as well as solenoidless startup. Progress on qualifying Hybrid scenario plasmas for Q=10 in ITER included $\beta_N=2.5$ with ELM suppression by RMPs. Advances in physics understanding included 1) systematic q_{\min} , q_{95} scans showing the dependence of n_e and T_e profiles on $q(r)$, 2) plasma response to non-axisymmetric fields, 3) validation of core turbulence and thermal transport models and 4) intrinsic rotation studies.

*Work supported by the US DOE under DE-AC52-07NA27344 and DE-FC02-04ER54698.