

Abstract Submitted
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Overview of Recent DIII-D Experimental Results¹ M.E. FENSTERMACHER, LLNL, DIII-D TEAM — 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.

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Max Fenstermacher
Lawrence Livermore National Laboratory

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