Abstract Submitted
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Overview of Recent DIII-D Experimental Results[1] MAX FENSTERMACHER, LLNL, DIII-D TEAM — Recent DIII-D experiments contributed to the ITER physics basis and to physics understanding for extrapolation to future devices. A predict-first analysis showed how shape can enhance access to RMP ELM suppression. 3D equilibrium changes from ELM control RMPs, were linked to density pumpout. Ion velocity imaging in the SOL showed 3D C_2^+ flow perturbations near RMP induced n=1 islands. Correlation ECE reveals a 40% increase in Te turbulence during QH-mode and 70% during RMP ELM suppression vs. ELMing H-mode. A long-lived predator-prey oscillation replaces edge MHD in recent low-torque QH-mode plasmas. Spatio-temporally resolved runaway electron measurements validate the importance of synchrotron and collisional damping on RE dissipation. A new small angle slot divertor achieves strong plasma cooling and facilitates detachment access. Fast ion confinement was improved in high q_min scenarios using variable beam energy optimization. First reproducible, stable ITER baseline scenarios were established. Studies have validated a model for edge momentum transport that predicts the pedestal main-ion intrinsic velocity value and direction.

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