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Overview of Recent DIII-D Experimental Results¹ D.N. HILL, Lawrence Livermore National Laboratory, DIII-D NATIONAL TEAM — DIII-D experiments have demonstrated the effectiveness of recent upgrades in assessing key fusion science and ITER physics issues. These upgrades include: 1) the reorientation of a neutral beam to allow co-, counter-, and balanced injection, 2) the modification of the lower divertor to allow particle exhaust in high triangularity, double-null (DN) configurations, 3) modification of the current feeds for the toroidal field and 4) high-bandwidth power supplies for controlling the internal asymmetric coil set. Using these tools, experiments have demonstrated the capability to maintain near zero toroidal rotation, density control in a wide range of plasma shapes, and a reduction in both the intrinsic and corrected error fields. H-mode confinement is observed to decrease slightly as toroidal rotation decreases, yet the best cases with near-zero rotation is better than the scaled confinement needed for ITER ($H_{98/2} = 1.2$). Advanced Tokamak experiments have shown the benefit of DN operation in achieving high $\beta$, and edge localized mode suppression in the ITER shape at low collisionality using resonant magnetic perturbations was demonstrated.

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