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Overview of Recent Results from Alcator C-Mod[1] EARL MARMAR, MIT, ALCATOR C-MOD TEAM — We have extended the I-mode regime to high power and plasma performance. I-mode yields strong edge ion and electron temperature barriers, excellent energy confinement, and low collisionality, with no need for ELMs to maintain particle control. Detailed studies of ICRF-induced flow drive on C-Mod reveal that the efficiency depends strongly on He3 concentration in the D(He^3) mode conversion regime, with driven core toroidal rotation up to 110 km/s. Studies of intrinsic rotation show that central toroidal rotation, observed in the absence of external momentum input, scales with edge temperature gradient, and the relationship to fluctuation-induced residual stress is under investigation. For n_e >1x10^{20} m^{-3} LHCD efficiency drops off more rapidly than expected theoretically, and mechanisms of anomalous absorption in the edge plasma are under investigation. Results from a new, advanced Lower Hybrid launcher, aimed at low-loss and high power density (∼100 MW/m^2) will be reported. Detailed studies of SOL heat footprints reveal a two zone structure: a narrow channel at the strike point locations, and a tail feature that extends into the far scrape-off layer.

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