

Abstract Submitted
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Overview of Recent Alcator C-Mod Results¹ S.J. WUKITCH, MIT PSFC, ALCATOR C-MOD TEAM — An emphasis of C-Mod research is to address physics and technological issues related to ITER and future burning plasma devices. Among the most critical is plasma facing materials. Recent experiments have indicated that RF sheaths localized to field lines connected to the antenna were responsible for the erosion of the boron layer and subsequent impurity generation on the outer divertor. To obtain broad current profiles, efficient off-axis current drive is required. Initial experiments with LH current drive have observed up to 200 kA of current can be driven for 0.6 MW coupled power. The H-mode transition, pedestal, and dynamics have significant impact on plasma performance. For discharges with high L->H mode threshold, a improvement in the thermal confinement is observed before improved particle confinement. Fast framing camera images of ELMs and intermittent turbulent structures show they travel coherently through the entire SOL. The radial velocity distribution peaks at about 1% of the ion sound speed. Massive gas-jet impurity puffing disruption mitigation has reduced disruption divertor surface heating and halo currents by $\sim 50\%$ at high plasma pressures and short disruption times. The measured evolution of Alfvén cascades agrees well with NOVA-K simulations and a number of additional modes have been observed and simulated during sawteeth and EDA H-mode.

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Stephen Wukitch
MIT PSFC

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