Abstract Submitted
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Overview of the Alcator C-Mod Research Program[1] E. MARMAR, MIT PSFC, ALCATOR TEAM — Alcator C-Mod has compared plasma performance with all-metal plasma facing components (PFCs) to PFCs coated with boron. Low-Z coatings reduce metallic impurity influx leading to higher H-mode pedestal pressure that increases temperature and pressure globally. Profile measurements in L-mode Ohmic plasmas suggest that the controlling mechanism regulating pressure in the near scrape-off (SOL) layer is a critical gradient phenomenon, similar to the scaling of edge pressure gradient in H-mode. Cross-field transport decreases markedly as Ip is increased, corresponding to both higher pedestal density and gradient. Disruption mitigation through massive gas-jet impurity puffing has been extended to significantly higher plasma pressures and shorter disruption times. Using mixed gases (He + Ar) yields the fastest mitigation with high radiated energy fraction. Halo currents are reduced by ∼50% and divertor surface heating is substantially decreased. Fast framing camera images of intermittent turbulent structures show they travel coherently through the entire SOL. The peak of the radial velocity distribution is about 1% of the ion sound speed.The 'chirping' evolution of Alfven cascades during current ramps with intense ICRF heating measured by PCI agrees well with calculations of the NOVA-K code that includes geodesic deformation of the Alfven continuum.

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