

Abstract Submitted
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Highlights of Recent Alcator C-Mod Research¹ EARL MARMAR, Mass. Institute of Technology, AND ALCATOR TEAM — Alcator C-Mod focuses on broad scientific issues with particular emphasis on ITER needs and requests. First results from a high power, magnetic field-aligned ICRF antenna show significant reduction of high Z impurity contamination under various plasma conditions. Detailed comparisons of core and edge fluctuations in L-mode and I-mode reveal that core turbulence is reduced in I-mode before the reduction of edge turbulence and the onset of the WCM, in stark contrast to the usual turbulence changes observed in H-mode on other tokamaks. The connection among rotation reversals, non-local heat transport, energy confinement saturation (the transition between the linear Ohmic confinement, and saturated Ohmic confinement, regimes) and changes in underlying turbulence has been demonstrated. Joint pedestal studies among C-Mod, DIII-D and NSTX reveal common features, including an upper limit on pedestal pressure in ELMy H-mode determined by peeling-ballooning modes (PBMs), and pedestal width scaling approximately as $\beta_{pol}^{1/2}$. A novel stochastic model for intermittent SOL plasma fluctuations has been constructed, is in excellent agreement with experiment, and reveals important details on the underlying physics. Design of the first actively heated tokamak tungsten divertor is described.

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