Abstract Submitted
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**I-mode Plasmas with Combined ICRF Mode Conversion Flow Drive and Minority Heating on Alcator C-Mod**[1] Y. LIN, M.L. REINKE, J.E. RICE, S.J. WUKITCH, R. GRANETZ, M. GREENWALD, A.E. HUBBARD, E.S. MARMAR, Y.A. PODPALY, M. PORKOLAB, N. TSUJII, S. WOLFE, ALCATOR C-MOD TEAM — High performance I-mode plasmas have been obtained via ICRF mode conversion heating and flow drive, plus ICRF minority heating. The plasmas have reversed magnetic field ($B_{t0}$ ~5.1 T) and lower-single-null shape. External $^3$He is puffed to have $n_{He3}/n_e$ ~0.1 and the residual H level $n_H/n_e$ is about 0.05. We use 50 MHz RF power (≤2.5 MW) for D($^3$He) mode conversion flow drive and heating, and 80 MHz RF power (≤2.5 MW) for D(H) minority heating. The obtained I-mode plasmas have high $T_e$ (≤8 keV) and large rotation (≤100 km/s). The rotation profile has a large shear at r/a ∼ 0.9, which may help further enhance the plasma confinement. Because of the long slowdown time at high $T_e$ and relatively low density, a high energy H tail is generated. The tail also affects the sawtooth oscillation and produces large sawtooth crashes, which also trigger neoclassical tearing modes. The appearance of the NTMs often coincides with a slowdown of plasma rotation. The onset condition of these NTMs is at the low collisionality regime within the criterion established by studies on other tokamaks.

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