Abstract Submitted
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First measurements of core electron temperature fluctuations in Alcator C-Mod via Correlation ECE[1] C. SUNG, A. WHITE, N. HOWARD, C. OI, J. RICE, C. GAO, P. ENNEVER, M. PORKOLAB, A. HUBBARD, M. GREENWALD, Plasma Science and Fusion Center, MIT — A new Correlation Electron Cyclotron Emission (CECE) diagnostic has been installed at Alcator C-Mod to measure broadband, turbulent electron temperature fluctuations in the core region ($\rho < 0.9$). This diagnostic has high poloidal resolution ($\omega_0 < 0.5cm$), and can measure long wavelength turbulence ($k_\theta \rho_s < 0.4$). We obtained the first electron temperature fluctuation data in Ohmic and ICRH plasmas. It was observed that the core ($\rho \sim 0.8$) electron temperature fluctuation level decreases as the Ohmic confinement regime transitions from Linear Ohmic Confinement (LOC) to Saturated Ohmic Confinement (SOC), while edge fluctuation levels ($\rho > 0.9$) stay similar in amplitude. These first quantitative, local electron temperature fluctuation measurements in C-Mod demonstrate that core turbulence characteristics change between LOC and SOC. In order to interpret the data, linear stability analysis is being performed, and the relation between fluctuation level and other plasma parameters is being investigated. This talk will describe the new CECE diagnostic, the SOC/LOC measurements, and associated gyrokinetic analyses.

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