

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Studies of Electron Temperature Fluctuations in the Core of Alcator C-Mod Plasmas via Correlation ECE¹ C. OI, C. SUNG, N. HOWARD, A.E. WHITE, J. IRBY, R. LECCACORVI, R. VIEIRA, J. RICE, C. GAO, Plasma Science and Fusion Center, MIT — A correlation electron cyclotron emission (CECE) diagnostic has been designed and installed at the Alcator C-Mod tokamak to measure long wavelength fluctuations in electron temperature [C. Sung, this conference, C-Mod oral session]. It is important to characterize turbulent fluctuations in the plasma in order to better understand and predict transport, since the cross-magnetic field transport of particles and energy in fusion plasmas exceeds the values predicted by neoclassical theory. The first electron temperature fluctuation data collected from Alcator C-Mod ohmic plasmas has shown that as the ohmic confinement regime transitions from Linear Ohmic Confinement (LOC) to Saturated Ohmic Confinement (SOC) there is a decrease in the core electron temperature fluctuation level. The edge electron temperature fluctuations are similar between the two modes, suggesting that mainly the core turbulence characteristics change when there is a shift between LOC and SOC regimes. In both ohmic and ICRH plasmas, the measured spectrum is seen to broaden in response to increases in plasma rotation; and fluctuation level increases with radius. A description of the C-Mod CECE diagnostic will be presented, along with the initial measurements of turbulent electron temperature fluctuations.

¹Research supported by USDoE awards DE-SC0006419, DE-FC02-99ER54512.

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Date submitted: 13 Jul 2012

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