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Comparison of electron temperature fluctuations with gyrokinetic sumulations across the ohmic energy confinement transition in Alcator C-Mod[1] C. SUNG, A. WHITE, N. HOWARD, Plasma Science and Fusion Center, MIT, D. MIKKELSEN, Princeton Plasma Physics Laboratory, J. RICE, M. REINKE, C. GAO, P. ENNEVER, M. PORKOLAB, R. CHURCHILL, C. THEILER, A. HUBBARD, M. GREENWALD, Plasma Science and Fusion Center, MIT — Long wavelength electron temperature fluctuations ($k_y\rho_s < 0.3$) near the edge ($r/a \sim 0.85$) are reduced across the ohmic confinement transition from Linear Ohmic Confinement(LOC) regime to Saturated Ohmic Confinement(SOC) regime in Alcator C-Mod. Linear stability analysis shows that the dominant mode of long wavelength turbulence near the edge is changed from Trapped Electron Mode(TEM) to Ion Temperature Gradient(ITG) mode while the dominant mode is not changed deeper in the core ($r/a \sim 0.5$). This indicates that local turbulence changes near the edge might be responsible for the change of global energy confinement in ohmic plasmas. Further study using nonlinear gyrokinetic simulations is being performed to clarify the relation between the change of local turbulence and global ohmic energy confinement. Through nonlinear gyrokinetic simulation (GYRO), we will investigate the change of fluctuating quantities ($\tilde{T}, \tilde{n}, \tilde{\phi}$) and their phase relations across ohmic confinement transitions, and relate them to the change of energy transport. A synthetic CECE diagnostic for C-Mod has been developed, and it will be used to validate the gyrokinetic simulations.

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