

## Study of turbulence changes associated with ELM suppression by RMP in DIII-D

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Using correlation electron cyclotron emission (CECE) measurements near the top of the H-mode pedestal ( $\rho=0.9 - 0.96$ ), we investigated the changes in broadband electron temperature fluctuations ( $\tilde{T}_e$ ) in low wavenumbers ( $k_{\theta}\rho_s < 0.5$ ) associated with ELM suppression with resonant magnetic perturbations (RMP), and also studied the nature of the  $\tilde{T}_e$  through profile analysis and linear stability analysis using gyro-Landau fluid model (TGLF) [1]. In addition, the correlation between turbulence changes and heat transport is also explored via power balance analysis. We first found that  $\tilde{T}_e$  increased significantly ( $\geq 40\%$ ) when ELMs were suppressed by RMP, rather than being due to the increase of RMP itself. A previous study in DIII-D showed that  $\tilde{n}_e$  measured by beam emission spectroscopy (BES) increased after ELMs were suppressed by RMP, consistent with  $\tilde{T}_e$  changes. However, we found that the changes in  $\tilde{T}_e$  with ELM phase with RMP are not always consistent with the  $\tilde{n}_e$  changes, which suggests the mechanism of  $\tilde{T}_e$  changes can be different from  $\tilde{n}_e$  changes. Details of fluctuation measurements and relevant analyses will be presented.

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