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Study of Electron Heat Transport in Positive and Negative Triangularity Shaped Discharges in DIII-D using Perturbative Experiments[1]
RUIFENG XIE, UT-Austin, MAX AUSTIN, University of Texas at Austin, ALESSANDRO MARINONI, MIT, DIII-D TEAM — Plasma shaping, in particular triangularity (δ), has been shown to influence turbulence levels and energy confinement in experimental tokamak plasmas. The effects of triangularity on electron heat transport in DIII-D have been studied using modulated electron cyclotron heating (ECH) deposited at $\rho \approx 0.35$. The experimental electron temperature data from electron cyclotron emission (ECE) diagnostics are Fourier analyzed. The resulting phase and amplitude from multiple harmonics are compared with an analytical model to infer diffusive and convective transport coefficients. The results are then compared with global transport calculations from ONETWO. It has been observed that, in matched L-mode negative (NT) and positive (PT) trangularity experiments, NT plasmas have on average slower heat pulse propagation and reduced electron thermal energy transport. Consequently, this analysis clearly demonstrates the improved confinement obtained in L-mode NT discharges.

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Ruifeng Xie
UT-Austin

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