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Theory Experiment

Finding Evidence for Scattering of ECRH Power by Density Blobs,* M.W. Brookman, M.E. Austin, K.W. Gentle, W.L. Rowan, *University of Texas* – Thermal transport studies using electron cyclotron heating (ECH) have measured anomalous effects inconsistent with narrow deposition profiles expected for the DIII-D gyrotrons. Recent theoretical work suggests that density blobs in the edge are capable of scattering and frequency shifting ECH power and broadening the deposition [1]. Knowledge of the heating profile is necessary for understanding thermal transport and mode suppression, as well as searching for density blob. Deposition profiles of modulated ECH (MECH) pulses from DIII-D gyrotrons are derived from 2nd harmonic X-mode electron cyclotron emission (ECE) measurements using the University of Texas 40 channel heterodyne radiometer. The uncertainties and resolution limits of this measurement are explored in both time and frequency domain analysis. The ability of the ECE system to resolve broadening effects from density bubbles is examined and measured deposition profiles are compared to previous derivations.

[1] A.K. Ram et al., *Phys. Plasmas* **20**, 056110 (2013).

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