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[ ] Theory [X] Experiment

Radial Correlation Length of Turbulent Density Fluctuations in DIII-D Plasmas,* G. Wang, W.A. Peebles, T.L. Rhodes, J.C. Hillesheim, E.J. Doyle, L. Schmitz, A.E. White, L. Zeng, *UCLA* – The radial correlation length (L_r) of turbulent density fluctuations is an important quantity for understanding turbulent transport in tokamak plasmas. In DIII-D, a correlation reflectometer and a tunable multi-channel reflectometer system allow L_r measurement with both high time and spatial resolutions. In this presentation, results will be reported from two recent areas of study: (1) Measurements of L_r in Ohmic, ECH, and NBI heated L-mode plasmas, and comparisons to predictions from nonlinear gyrokinetic codes; and (2) Measurements of fast changes in L_r during the L- to H-mode transition. Preliminary results show that: (1) in general, L_r increases from the edge to core and scales as (5-10) ρ_s (ρ_s is the ion gyroradius using T_e); (2) L_r decreases with ECH in otherwise Ohmic plasmas; and (3) at the L-H transition, cross-correlations between reflectometer channels close to separatrix increase simultaneously as divertor D_α signal starts to decrease, while in the bulk plasma, they begin decreasing after a propagation delay.

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