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Category Number and Subject:

[ ] Theory [**x**] Experiment

Electron Temperature Fluctuation and Heat Flux Measurements in the Edge of the DIII–D Tokamak,* R.D. Lehmer,† R.A. Moyer,† J.A. Boedo,† K.H. Burrell, J.G. Watkins,‡, *General Atomics* — Electrostatic plasma turbulence is thought to be one of the primary mechanisms that drive anomalous transport in the edge of tokamaks. The turbulently driven electron heat transport is made up of convective and conductive terms. While the convective term can be determined from the turbulent particle transport, the conductive term requires phase-correlated measurements of fluctuations in the electron temperature $\tilde{T}_e$ with the density $\tilde{n}$ and electric field $\tilde{E}_\theta$. The midplane reciprocating probe on the DIII–D tokamak is equipped with a probe array capable of making measurements of $\tilde{n}$ and $\tilde{E}_\theta$ with $f_{BW} > 2.5$ MHz. By employing a second harmonic detection scheme, $\tilde{T}_e$ can also be determined simultaneously with $f_{BW} > 200$ kHz, which is sufficient to estimate the heat flux, as previous measurements have shown that most of the particle transport in the DIII–D edge plasma occurs below 200 kHz. Initial measurements of edge electron temperature fluctuations are reported. The technical challenges of making high bandwidth measurements of $\tilde{T}_e$ with reciprocating probes in a high heat flux environment are discussed.

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[**x**] Prefer Poster Session

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