Abstract Submitted
for the DPP02 Meeting of
The American Physical Society

Sorting Category: 5.6.2 (Experimental)

Effect of the Electron Temperature Fluctuations on the Turbulent Flux Measurements in the Edge of DIII-D[1] D.L. RUDAKOV, J.A. BOEDO, R.A. MOYER, S. KRASHENINNIKOV, UCSD, D.M. THOMAS, W.P. WEST, GA, J.G. WATKINS, SNL — We report first cross-field fluctuation-driven flux measurements in the edge of DIII-D corrected for the poloidal variation of the electron temperature (T_e) fluctuations. Turbulent fluxes are commonly inferred from the Langmuir probe data using the fluctuating poloidal electric field (E_θ) estimated from the floating potential (V_f) measurements at two poloidally separated locations. In this approach the effect of the (T_e) fluctuations is neglected. A proper estimate of E_θ would require using two poloidally separated measurements of the plasma potential $V_p = V_f + \alpha T_e$, where $\alpha \sim$1-3 for the typical edge plasma parameters. The midplane reciprocating probe array on DIII-D has recently been upgraded to include two poloidally separated tips connected to a fast (100 kHz bandwidth) (T_e) diagnostic and aligned with two tips measuring V_f, allowing a more accurate estimate of E_θ. Results indicate that properly accounting for the effect of T_e fluctuations and their poloidal variation can not only affect the measured amplitudes of the cross-field particle and heat fluxes, but correct apparent (often unphysical) reversals of the flux direction.

[1]Supported by US DOE Grants DE-FG03-95ER54294, Contracts DE-AC04-94AL85000 and DE-AC03-99ER54463.

D.L. Rudakov
rudakov@fusion.gat.com
University of California, San Diego

[X] Prefer Oral Session
[ ] Prefer Poster Session

Date submitted: July 19, 2002 Electronic form version 1.4