Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Preliminary Measurements with the Ultra-Fast Charge Exchange Recombination Spectrometer (UF-CHERS) on DIII-D[1] I.U. UZUN-KAYMAK, R.J. FONCK, G.R. MCKEE, N.L. SCHOENBECK, D.R. SMITH, Z. YAN, U. Wisconsin-Madison — A dual-channel, high throughput (1 mm^2-ster), high efficiency, customized spectrometer (UF-CHERS) has been deployed at DIII-D to measure ion temperature and parallel velocity fluctuations through detection of the beam-excited CVI charge exchange line near 529 nm at 0.25 nm resolution. Turbulence-relevant time resolution of 1 μs is achieved with cooled avalanched photodiode detectors (APDs). Initial measurements obtained during the 2010 DIII-D experimental run campaign demonstrate detection of the charge exchange and edge emission at near photon-noise-limited performance, although signal levels are lower than estimated. The Doppler broadened spectrum, time evolution, radial variation, and cross correlation with BES-measured density fluctuations from L-mode discharges are presented to assess signal levels and noise characteristics. Hints of GAM-induced temperature fluctuations are observed. Upgrades to the optics and detectors for improved signal-to-noise are evaluated.

[1]Supported by the US Department of Energy under DE-FC02-04ER54698, DE-FG02-89ER53296, DE-FG02-08ER54999.

I.U. Uzun-Kaymak
U. Wisconsin-Madison

Date submitted: 17 Jul 2010 Electronic form version 1.4