Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Upgrade of the Edge Charge Exchange Diagnostic on Alcator C-Mod[1] RACHAEL MCDERMOTT, BRUCE LIPSCHULTZ, KENNETH MARR, MIT, PSFC — The current edge Charge Exchange Spectroscopy system is being upgraded to include both a beam viewing and a background viewing toroidal periscope. The beam viewing periscope will be focused on the center of the DNB and will cover a 4cm radial region at the edge of the plasma starting a few centimeters in from and extending up to 1centimeter outside of the last closed flux surface. The background periscope will view the same radial region but will be displaced toroidally by 36 degrees. Each periscope has 20 chordal views with a radial resolution of 2.5-3mm. The presence of a background periscope obviates the need for a chopped DNB by providing time synchronized background B^{+4} spectral data that can be subtracted directly from the active beam-derived B^{+4} line-shapes. This system has been designed to work in conjunction with the current poloidal Charge Exchange periscope which has 25 fibers focused in the same region with equivalent radial resolution. The new toroidal system will enable concurrent measurements of the poloidal and toroidal velocity as well as the temperature and density of the B^{+5} ions in the edge pedestal region; a measurement that currently does not exist on C-Mod. This information will then be used to calculate radial electric field profiles and study edge physics phenomena.

[1]Work supported by USDOE Coop. Agree. No. DE-FC02-99-ER54512 to MIT.

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Date submitted: 23 Jul 2006 Electronic form version 1.4