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Category Number and Subject:

[ ] Theory [**x**] Experiment

Wavelength Calibration of the Charge Exchange Recombination Spectroscopy System on the DIII–D Tokamak,* P. Gohil, K.H. Burrell, R.J. Groebner, T. Hodapp, D.H. Kaplan, *General Atomics* — The charge exchange recombination spectroscopy (CER) system is the prime diagnostic for measurements of the ion temperature, plasma rotation and impurity density in the DIII–D tokamak. Precise knowledge of these plasma quantities, particularly the plasma rotation, is needed for accurate determination of the radial electric field, especially at the plasma edge. Accurate measurements of the Doppler shifted line-center wavelength of the C VI 5290.5 Å line are facilitated by performing a calibration of the spectral response of the complete CER detection system between every plasma discharge on DIII–D. The reference spectra for the calibration are obtained from the output of neon capillary discharge lamps contained within specifically designed labspheres. The Ne I lines at 3520.4720 Å, 5274.0393 Å, 5280.0853 Å, 5298.1891 Å and 5304.7580 Å are used in both 1st and 2nd order spectrometer settings for the C VI 5290.5 Å wavelength. The use of these lines also provides the spectral dispersion of the detection system. The emission from five different neon lamp and labsphere combinations is needed to cover all the 40 CER spatial channels. The pixel resolution achieved across the detectors is 0.1 pixel which corresponds to a plasma rotation resolution of about 1.2 km s^{-1} and 0.7 km s^{-1} for the central and edge rotation measurements respectively. Details will be presented on the hardware, the operational requirements and the analysis of the measured spectra.

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[**x**] Prefer Poster Session

[ ] Prefer Oral Session

[ ] No Preference

[ ] This poster/oral should be placed in the following grouping: (specify order)

[ ] Special Facilities Requested (e.g., movie projector)
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