Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Cross Comparison on DIII-D of Experimental Techniques for Measuring $\mathbf{n_e}$ and $\mathbf{T_e}$ in Detached Divertor Plasmas[1] N.H. BROOKS, A.W. LEONARD, GA, S. LISGO, E. OKS, D. VOLODKO, Auburn U. — Spectroscopy of high-n, Balmer line transitions provides a means of measuring n_e and T_e in recombining plasmas [1]. The relative intensities of Rydberg series lines near the ionization limit are a sensitive diagnostic of T_e for $T_e < 1$ eV. Stark broadening of these same lines provides a measure of local n_e and with less accuracy of T_e. Predictions from Balmer line spectroscopy are compared with those from divertor Thomson scattering to evaluate the accuracy of different theoretical models of line broadening [2,3]. In particular, the detailed dependence of line width on principal quantum number is used to distinguish which line-broadenign model best accords with experiment.

[1] J. Terry, Phys. Plasmas **5**, 3373 (1998).
[2] H. Griem Spectral Line Broadening by Plasmas, Academic Press, New York (1974).
[3] E. Oks Stark Broadening of Hydrogen and Hydrogenlike Spectral Lines in Plasmas: The Physical Insight, Alpha Science International, Oxford, UK (2006).

[1]Work supported by US DOE under DE-FC02-04ER54698.

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Date submitted: 21 Jul 2006 Electronic form version 1.4