Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Direct, Non-Invasive Measurement of the Electric Field near an ICRH Antenna[1] C.C. KLEPPER, T.M. BIEWER, R.C. ISLER, D.L. HILLIS, J.H. HARRIS, ORNL, L. COLAS, PH. LOTTE, N. FEDORCZAK, M. GONICHE, CEA/IRFM — Characterization the Stark effect on the D I Balmer-series spectral profiles is a promising approach for the measurement of the rectified, dc electric field in the tokamak scrape-off layer plasma near an ICRH antenna. However, the strong magnetic field-induced Zeeman effect on these same profiles greatly complicates this approach. Furthermore, unperturbed, background D I emission can obscure the Stark effect features. A high-resolution, optical spectrometer has been set-up on Tore Supra to view one of the 3 ICRH antennas and to explore the feasibility of this measurement. Spectral profile modeling has been carried out, including combined Stark and Zeeman perturbations, the geometry of the viewing chord with respect to antenna surfaces and the directions of the fields. First spectra will be presented and techniques to overcome background emission will be discussed. This work is being pursued in connection with mapping studies of the plasma potential, and its gradient, near an antenna using Langmuir probes, which provide indirect measurements of the electric field [L. Colas et al., J.Nucl.Mater. 363-365 (2007) 555].

[1]Oak Ridge National Laboratory is managed by UT-Battelle, LLC, for the U.S. Dept. of Energy under contract DE-AC05-00OR22725.

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Date submitted: 19 Jul 2010 Electronic form version 1.4