Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Physics and Engineering Design of the ITER Electron Cyclotron Emission Diagnostic[1] W.L. ROWAN, M.E. AUSTIN, S. HOUSHMANDYAR, P.E. PHILLIPS, IFS, The University of Texas at Austin, J.H. BENO, A. OUROUA, D.A. WEEKS, CEM, The University of Texas at Austin, A.E. HUBBARD, J.A. STILLERMAN, MIT-PSFC, R.E. FEDER, A. KHODAK, G. TAYLOR, PPPL, H.K. PANDYA, S. DANANI, R. KUMAR, IPR, ITER India — Electron temperature (T_e) measurements and consequent electron thermal transport inferences will be critical to the non-active phases of ITER operation and will take on added importance during the alpha heating phase. Here, we describe our design for the diagnostic that will measure spatial and temporal profiles of T_e using electron cyclotron emission (ECE). Other measurement capability includes high frequency instabilities (e.g. ELMs, NTMs, and TAEs). Since results from TFTR and JET suggest that Thomson Scattering and ECE differ at high T_e due to driven non-Maxwellian distributions, non-thermal features of the ITER electron distribution must be documented. The ITER environment presents other challenges including space limitations, vacuum requirements, and very high-neutron-fluence. Plasma control in ITER will require real-time T_e. The diagnosic design that evolved from these sometimes-conflicting needs and requirements will be described component by component with special emphasis on the integration to form a single effective diagnostic system.

[1]Supported by PPPL/US-DA via subcontract S013464-C to UT Austin.

William Rowan
IFS, The University of Texas at Austin

Date submitted: 24 Jul 2015 Electronic form version 1.4