INSTALLATION AND COMMISIONNING OF THE EU TEST FACILITY FOR ITER GYROTRON

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In the frame of the EU program on the ITER electron cyclotron wave (ECW) system, the development of a 170 GHz, 2 MW CW coaxial gyrotron with depressed collector has been launched in the European Technology Workplan, during the 6th Framework Program (2003-2006). Such development relies on the availability of a Test Facility (TF) capable of providing both the energy sources and sinks required by this new electron tube (electrical energy, cooling capacity), and allowing the control and acquisition of a large range of signals used to understand and improve the gyrotron behaviour. The TF will be used, in a later stage, for the component test of the ITER ECW system.
This paper will report on the design, installation and commissioning of the TF in Lausanne.

The electrical system fulfilling the gyrotron requirements will be presented. Details will be given on the supply structure implemented in light of the replies to the Call for Tenders: the Main HV Power Supply (MHVPS) feeding the gyrotron cathode at -55kV, 80A, and the Body Power Supply (BPS) polarizing the body and coaxial insert at 35 kV, 150 mA (steady state current value). Preliminary test results will be described. On the basis of the experience drawn from the TF design, a proposal for an alternate supply structure compared to the present ITER reference design will be described.
The cooling system is an important part of the TF design. The efficiency of the depressed collector gyrotron being about 50%, this implies that more than 4 MW power will be continuously dissipated and evacuated by the cooling equipment. The specifications, the design and the commissioning results of the cooling system will be reported.
The diagnostics, as others auxiliaries (vacuum, cryogenics), required for the gyrotron operation and testing, will be briefly described.
The second part of this paper will review the COntrol and DAta acQuisition (CODAQ) implemented in the TF. The control hardware and software developed for the gyrotron and auxiliaries will be described (PLD, Data Base, Graphical Interface Unit), focusing on the particular requirements relative to the gyrotron development phase. The design and the commissioning of the acquisition system will be reported.
Finally, the operation rules for a safe and secured gyrotron prototype testing at the Lausanne EU gyrotron TF will be reported.