§6. A Data Acquisition System of ECE Group

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The ECE measurement system on LHD consists of an diagnostic system, which is constituted by a radiometer, a Michelson interferometer and GPC, and a data acquisition system from these instruments. In this report, We show our data acquisition system which is used in our ECE measurement.

The total of ECE data is 49 M bytes per one shot. We have to collect and analyze these data and then serve analyzed data to other members in the LHD experiment sequence. On that account, We have constructured a data acquisition system, which costs very low and is easy to make up and operate. Fig.1 shows the schematic draw of our system. The data from each measurement devices are collected by every Personal Computers (Windows NT) through the ADC (Camac Aurora14, 12bit, 1Msps, 512kWord/Ch). Three PCs and a Workstation (Digital Unix) constitute a local network through a 100Base switching HUB, and files are shared with those computers by means of a free software named SAMBA. Our data taken into each PCs is sent to the Hard disk of the Workstation. The acquisition time for total 49 Mbytes data is 80 sec from each measurement devices to the ADC, and it takes 10 sec to forward to the Workstation. And after finishing data acquisition, collected data are analyzed on the Workstation and served to the LHD network through the SAMBA.

The Workstation is used as a monitor for the ECE signal in addition to a role of the data server, and the intensity profile and time evolution of ECE signal is showed on this Workstation. On the other hand, each PC as a client is availed to calibrate ECE data with Thomson scattering data and to monitor other signal data of LHD discharge besides the data acquisition.

The feature of this data acquisition is that the total time for the data acquisition and forwarding depends on the data acquisition time for the radiometer, which has a maximum amount of ECE data in our measurement devices, because our ECE network is a local one, and the data acquisition of each devices is decentralized.

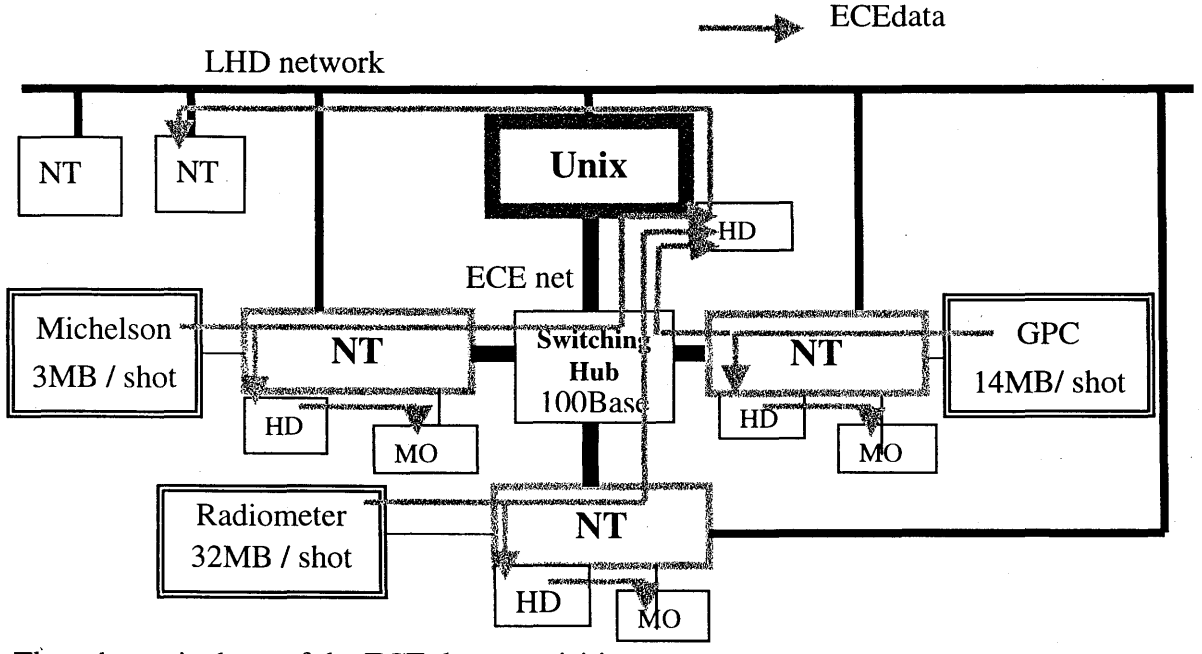

Fig.1 The schematic draw of the ECE data acquisition system .