

§23. CHS Data Acquisition and Analysis System

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I. In this fiscal year, the CHS data acquisition system (DAS) acquired the experiment data of 4Mbytes/shot (480Mbytes/day). This is because of constructing and modifying the new diagnostic system. In the Higashiyama-site, DAS acquired the experiment data every five minutes. However, at the Toki-site, CHS is operated every three, four, five and six minutes, therefore we have adjusted the data acquisition time to the shortest 3 minutes mode. The modified program can take data of 10Mbytes in 2 minutes.

We have two big data acquisition systems, which are DAS and CHS Integrated architecture with No Operating System (CINOS). CINOS is composed of VME Sub system, and the high-speed collection of the experiment data is possible. Therefore, CINOS will be a base trunk system from now on, and it will make cut down DAS.

The main work of the experimental signal processing of this fiscal year is shown below.

- (1) Build up new data acquisition and analysis system. See section II.
- (2) Build up new data management system of MDSplus. See section III.

II. One model system of CINOS started operation last year, and four CINOSs came this fiscal year. Refer to figure 1. Each CINOS has four computer modules which are 2 units of 68060 MPU, alpha computer and DSP chip. And two computers in CINOS have OS which are OS-9 and UNIX. We installed two AD/c modules which are CAMAC AD/c (12bit, 1MHz, 128Kmemory) and VME AD/c (16bit, 100KHz, 128Kmemory). We developed the system which could take and draw the data simultaneously with the sample time of 100KHz with VME AD/c in the process of this installation. This technique is possible up to 100Hz in CAMAC. Next, we measured the fluctuation time of DAS and CINOS from the acquisition start to the end by the above-mentioned CAMAC AD/c. It has several tens μ second fluctuation time in the case of CINOS, on the other hand, DAS has several milliseconds which depend on the process number. Fewer fluctuation time of CINOS is because the system itself has a self-watch function. Figure 2 shows measurement results. The DAS fluctuation time of several hundreds μ seconds is due to process numbers.

III. We introduced MDSplus as a data management system in this fiscal year. This was developed by MIT, LANL, IGI-Padova. They are composed of the experimental data acquisition part, the analysis part and the part of the storage. CHS is in use of the analysis part and the part of the storage

of MDSplus, while CINOS is in charge of the data acquisition part. Because CINOS can acquire the experimental data at high-speed sampling with linearity it can be guaranteed to send data on the fixed quantity in the fixed time.

The reason why MDSplus is selected is as follows.

- 1) To be used under the UNIX/VMS 64bit system.
- 2) To read the DMG of CHS old data management system.
- 3) To be installed to CINOS.

Though we have begun employment tentatively at present, we will employ this rank from the next year.

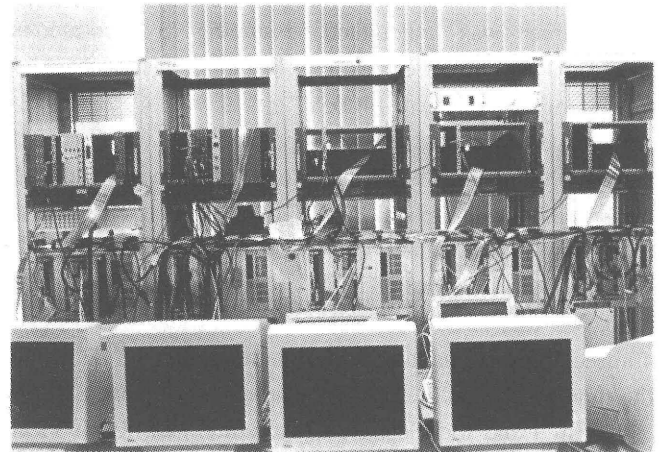


Figure 1. Five units of CINOS in the CHS control room.

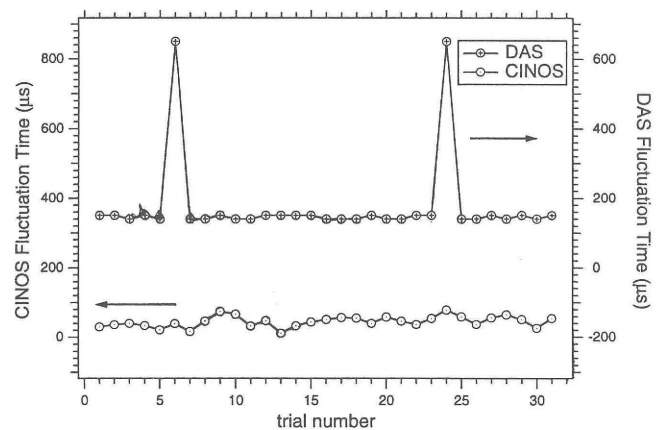


Figure 2. Comparison of fluctuation times of between DAS and CINOS.