Tsukuba VLBI Center

Misao Ishihara, Keizou Nemoto, Masao Iwata, Kousei Shiba, Kazuhiro Takashima, Shigeru Matsuzaka

Abstract

This report summarizes the technical parameters and the technical staff of the Geographical Survey Institute (GSI) VLBI section. We present our history of VLBI activities and the status. In 1998 GSI opened Tsukuba VLBI Center as an operation, correlation and analysis center. GSI installed a new correlator system for three stations - three baselines. The correlator unit and the software which controls the each unit have been developed as a KSP correlator in Communication Research Laboratory (CRL).

1. GSI VLBI Correlators

GSI has two different correlator systems. One is OKIVLBC-9100 (NAOCO) which was installed in March 1993. The correlator was developed in National Astronomical Observatory (NAO) and was made by Oki Corp. Ltd. The strong points of the correlator are the equipment for K4 system, 128Mbps maximum process speed, maximum 8192 lag windows and portable equipment. GSI installed it as one baseline correlator.

Another is the CRC-9403 which was installed in March 1997 for multiple baseline to cope with the expansion of the domestic VLBI network. GSI was also equipped with the latest hardware and software for automatic correlation from the point of labor saving.

Figure 1. The K4 correlater at Tsukuba VLBI center

2. Specification of GSI K4 Correlator

GSI has a K4 correlator for multi-baseline correlation. The specification of GSI's K4 correlator are presented.

1. The equipment of correlation process : CRC-9403-CR2
   - 3 stations and 3 baselines
   - process maximum speed at 512 Mbps
2. The equipment of data input : CRC-9403-DT2, Sony-DFC-2200
   - Devidable for CRC-9403-CR2 from K4 Digital Recorder
   - Automatic synchronization with each channel data
3. System controller : CRC-9511-CNT1
   - Function of automatic correlation process
4. Computer : HP9000/D370
   - OS : HP-UX10.2
   - CPU : PA-RISC, PA-8000
   - main memory : 1,024 MB
   - cash memory : 256 MB
   - internal HDD : 10 GB
   - external HDD : 400 GB RAID5
5. Application : Kety KUS880419
   - Support "automatic control" mode
6. Monitor for recording data : CRC-9703-MON1
   - Fourier transform for output data by FFT
   - number of FFT point : 128 - 16,384 points
   - calculation accuracy : 8 bits fixed-point

3. Technical Staff of the VLBI group at GSI

Table 1 lists the VLBI staff at GSI.

4. Status of GSI Correlator

We process the geodetic observation data which are recorded in the domestic permanent sites (Tsukuba, Kashima, Shintotsukawa, Aira and Chichijima) using the GSI correlator. We also process the antarctic observation data of Syowa station for the detection of fringe.

Table 1. Staff working at VLBI section at GSI

Name	Position	Jobs
Shigeru MATSUZAKA	IVS Networks Representative	
Misao ISHIHARA	VLBI leader	
Keizo NEMOTO	Colocation chief	H-meser, operation
Masao IWATA	Correlation chief	Correlation, operation
Kousei SHIBA	Operation chief	Coordination Experiments, operation
Kazuhiro TAKASHIMA	Analysis chief	Baseline Analysis, operation
Shinobu KURIHARA	Operator	Baseline Analysis, operation
Michiko ONOGAKI	Operator	antenna maint., operation
Kyoko KOBAYASHI	Assistant	correlation, operation

Figure 2. GSI VLBI Center is located on the second floor in the building

5. Outlook

GSI has a plan to analyze the five domestic permanent station data and the mobile station data for geodesy. GSI also will process the data for the Syowa station. In 1999, Tsukuba VLBI station will participate in Tsukuba-Wettzell Intensive experiments for UT1. These data will be correlated by GSI K4 correlator because K4 recording system will be used for the experiments.

References

[1] Ogi, S.,: Status Report of Geographical Survey Institute Japan, In: Proceedings of the 13th Working Meeting on European VLBI for Geodesy and Astrometry, held at Viechtach, February 12-13, 1999, edited by W. Schlüter and H. Hase, Bundesamt für Kartographie und Geodäsie, Wettzell, 1999

[2] Ogi, S., Y. Fukuzaki, M. Iwata, K. Shiba, M. Yazawa, K. Takashima, and K. Nagata: Comparison of the time variation with GSI VLBI Domestic Experiments and Daily GPS Measurements, held at the Communications Research Laboratory, Koganei, Tokyo, January 25-28, 1999