

NICT Data Center Biennial Report for 2015–2016

Mamoru Sekido

Abstract The Data Center at the National Institute of Information and Communications Technology (NICT) archives and releases the databases and analysis results processed at NICT. Regular VLBI sessions of the Key Stone Project VLBI Network were the primary objective of the Data Center. These regular sessions continued until the end of November 2001. In addition to the Key Stone Project VLBI sessions, NICT has been conducting geodetic VLBI sessions for various purposes, and these data are also archived and released by the Data Center.

1 General Information

The IVS Data Center at National Institute of Information and Communications Technology (NICT) archives and releases the databases and analysis results processed at NICT. Major parts of the data are from the Key Stone Project (KSP) VLBI sessions [1], but other regional and international VLBI sessions conducted by NICT are also archived and released. Since routine observations of the KSP network terminated at the end of November 2001, there have been no additional data from the KSP regular sessions since 2002.

The analysis results in SINEX (Solution INdependent EXchange) format, as well as in other formats, are available on the WWW server. Database files of non-KSP sessions, i.e., other domestic and international geodetic VLBI sessions, are also available on the

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WWW server. Table 1 lists the WWW server locations maintained by the NICT Data Center.

2 Activities during the Past Two Years

2.1 KSP VLBI Sessions

The KSP sessions had been performed with four VLBI Stations at Kashima, Koganei, Miura, and Tateyama on a daily or bi-daily basis until May 1999. The high-speed ATM (Asynchronous Transfer Mode) network line to the Miura station became unavailable in May 1999, and real-time VLBI observations with the Miura station became impossible. Thereafter, the real-time VLBI sessions were performed with the three other stations. Once every six days (every third session), the observed data was recorded to the K4 data recorders at the three stations, and the Miura station participated in the sessions with the tape-based VLBI technique. In this case, the observed data at the three stations other than the Miura station were processed in real-time, and the analysis results were released promptly after the observations were completed. A day later, the observed tapes were transported from the Kashima, Miura, and Tateyama stations to the Koganei station for tape-based correlation processing with all six baselines. After the tape-based correlation processing was completed, the data set produced with the real-time VLBI data processing was replaced by the new data set.

In July 2000, unusual site motion of the Tateyama station was detected from the KSP VLBI data series, and the frequency of the sessions was increased from once every two days to daily on July 22. The daily sessions were continued until November 11, 2000, and the

Table 1 URLs of the WWW server systems. The last two URLs have slightly changed.

Service	URL
KSP WWW pages	http://ksp.nict.go.jp/
IVS WWW mirror pages	http://ivs.nict.go.jp/mirror/
Database files	http://www2.nict.go.jp/sts/stmg/www3/database/
e-VLBI UT1 Exp.	http://www2.nict.go.jp/sts/stmg/research/e-VLBI/UT1/

site motions of the Tateyama and Miura stations were monitored in detail. During the period, it was found that Tateyama station moved about 5 cm to the north-east direction. The Miura station also moved about 3 cm to the north. The unusual site motions of these two stations gradually settled, and the current site velocities seem to be almost the same as those before June 2000. According to investigation of the time series of the site positions, the unusual site motion started sometime between the end of June 2000 and the beginning of July 2000. At the same time, volcanic and seismic activities near the Miyakejima and Kozushima Islands began. These activities have been finally found to be the cause of the regional crustal deformation in the area.

2.2 UT1 e-VLBI Sessions

In the period from 2007 to 2008, experimental e-VLBI sessions for rapid UT1 determination were conducted in collaboration with NICT, GSI, the Onsala Space Observatory, and the Metsähovi VLBI station. Observed VLBI data were transferred to Kashima (NICT) or Tsukuba (GSI) via a high-speed Internet network, and then succeeding correlation and bandwidth synthesis processes were applied in a pipeline scheme to make quick estimation of UT1-UTC. The VLBI data from these experiments are saved in Mark III database format and are available from this Data Center.

3 Current Status

The VLBI project of our group is currently focused on development of a broadband system and its application to frequency transfer. Two sets of small diameter VLBI stations are placed at NICT Headquarters in Tokyo and at the National Metrology Institute of Japan in Tsukuba city. The Kashima 34-m VLBI station has been upgraded to enable broadband observing. In addition to these three stations, the Ishioka 13-m VGOS station (GSI) has been used for domestic broadband R&D experiments [2]. These data are also saved in Mark III databases and analyzed by the CALC/SOLVE system. These data will be placed in the NICT Data Center in the near future.

References

1. Special issue for the Key Stone Project, J. Commun. Res. Lab., Vol. 46, No. 1, March 1999.
2. Mamoru Sekido, “NICT VLBI Analysis Center Report for 2015–2016”, International VLBI Service for Geodesy and Astrometry 2015+2016 Biennial Report, edited by K. D. Baver, D. Behrend, and K. L. Armstrong, this volume.