

# Nanshan VLBI Station Report for 2010

*Aili Yusup, Xiang Liu*

## Abstract

The Nanshan 25-meter radio telescope is operated by Urumqi Observatory. This report describes the activities and the status of Nanshan VLBI station as an IVS network station in 2010.

## 1. Introduction

The Nanshan VLBI station is located 70 km south of Urumqi, the capital city of the Xinjiang Uygur Autonomous Region of China. The station is affiliated with the Urumqi Observatory of the National Astronomical Observatories of CAS. In 2010, we participated in a total of 153 domestic and international VLBI sessions and contributed to IVS in geodetic VLBI observations. Nanshan VLBI station has participated in domestic VLBI experiments as one of the VLBI ground stations tracking the Chinese Chang'E satellite. In addition, a GPS station, as a part of the IGS network, is located near the VLBI telescope.



Figure 1. Urumqi Observatory of the National Astronomical Observatories of CAS is located at the foothills of the Tianshan mountain range. Within the IVS the site is also known as Nanshan VLBI Station.

## 2. Telescope Status

### 2.1. Antenna

- Diameter: 25 meter
- Antenna type: Modified Cassegrain
- Seat-rack type: Azimuth-pitching ring
- Main surface precision: 0.40 mm (rms)
- Pointing precision: 15'' (rms)
- Rolling range: Azimuth:  $-270^\circ$  to  $270^\circ$ ; Elevation:  $5^\circ$  to  $88^\circ$
- Maximum rolling speed: Azimuth:  $1.0^\circ/\text{sec}$ ; Elevation:  $0.5^\circ/\text{sec}$



Figure 2. The 25-m, modified Cassegrain radio telescope of Urumqi Observatory was built in 1993.

### 2.2. Receivers

The basic specifications of the receivers and the antenna sensitivity are given in Table 1. In 2010, the S/X-band feed horn was replaced with a new one.

Table 1. Specifications of receivers.

Parameters			Freq. Range (MHz)
1.3 cm	dual	under construction	22100–24000
3.6 cm	RCP	Tsys= 50K DPFU=0.093	8100–8900
6 cm	dual	Tsys= 22K DPFU=0.11	4700–5110
13 cm	RCP	Tsys= 70K DPFU=0.096	2150–2450
18 cm	dual	Tsys= 24K DPFU=0.088	1400–1720
30 cm	LCP	Tsys=160K DPFU=0.06	800–1200
49 cm	dual	under construction	560–660
92 cm	dual	under construction	305–345

### 2.3. Recording System

The recording systems available at the Nanshan VLBI station are Mark 5B, Mark IV, Mark II, and K5. The performance of the observing system was improved in the report year. A new FS computer was installed, the Field System was upgraded to version 9.10.4, and it works well. The DBBC System, which was built at Shanghai Observatory (SHAO), was installed at Urumqi for domestic VLBI observations with the Mark 5B recorder. The analog BBC system is still being used for international VLBI observations together with the Mark 5B recorder.

### 2.4. Time and Frequency System

There are three H-masers at Nanshan Station: an MHM2010 imported from Symmetricom company of the U. S. plus the No. 13 and No. 90 H-masers made in Shanghai. The time and frequency comparison system operates continuously.

## 3. IVS Observations in 2010

Nine IVS sessions were scheduled for Nanshan VLBI station in 2010. We participated in six of these sessions and had to cancel three sessions due to a conflict with tracking the Chinese Chang'E-2 satellite from September to November 2010; the details for five of these sessions are listed in Table 2. There is a pretty strong but narrow 3G cellphone signal at S-band, which led to a total loss of signal in SR2U as documented in the IVS session reports.

Table 2. IVS sessions of Nanshan VLBI station in 2010.

Experiment	Date	Remarks (problems)
T2067	02.02	Observed, no signal in SR2U
T2068	04.13	Observed, no signal in SR2U
T2069	05.18	Observed, no signal in SR2U
T2070	07.20	Observed, no signal in SR2U
APSG27	12.15	Observed, no known problems

#### 4. Personnel

The main staff of Nanshan VLBI Station is compiled in Table 3.

Table 3. The main staff of Nanshan VLBI Station.

Name	Position	Working area	e-mail
Na Wang	Professor	Station chief	na.wang@uao.ac.cn
Aili Yusup	Professor	Chief engineer	aliyu@uao.ac.cn
Xiang Liu	Professor	VLBI friend	liux@uao.ac.cn
Maozheng Chen	Senior engineer	Receiver	mzchen@uao.ac.cn
Minghui Shao	Senior engineer	Time and Freq., Terminal	shaomh@uao.ac.cn
Wenjun Yang	Engineer	Terminal	yangwj@uao.ac.cn
Shiqiang Wang	Engineer	Antenna	Wangshq@uao.ac.cn
Hua Zhang	Engineer	Terminal, Time and Freq.	zhangh@uao.ac.cn
Guanghai Li	Engineer	Network, Computer	ligh@uao.ac.cn
Jun Ma	Engineer	Receiver	majun@uao.ac.cn
Chenyu Chen	Engineer	Antenna	chency@uao.ac.cn
Jun Nie	Scientist	Network, Computer	niejun@uao.ac.cn
Ming Zhang	Scientist	Astronomy	zhangming@uao.ac.cn