

Nanshan VLBI Station Report 2013

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Abstract Urumqi Nanshan station is a key node of the Chinese VLBI Network (CVN). It participates in global VLBI observations for the IVS, EVN, and EAVN networks. This report provides an overview of geodetic and astronomical activities and technical development at XAO during 2013.

1 Introduction



Fig. 1 The 25-m antenna at Nanshan station.

The Nanshan VLBI station is located 70 km south of Urumqi, the capital city of the Xinjiang Uyghur Autonomous Region of China. The station is affiliated with the Xinjiang Astronomical Observatory of the National Astronomical Observatories of CAS. In 2013, we have participated in geodetic observations for IVS

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as well as in astronomical observations for EVN, CVN and EAVN.

2 Current Status

2.1 Antenna

- **Coordinates:** Longitude: $87^{\circ}10'41''$ E; Latitude: $43^{\circ}28'17''$ N; Altitude: 2080 m
- **Diameters:** Primary: 25 m; Secondary: 7 m
- **Antenna type:** Modified Cassegrain
- **Seat-rack type:** Azimuth-pitching ring
- **Main surface precision:** 0.40 mm (rms)
- **Pointing precision:** $15''$ (rms)
- **Turning angle:** Azimuth: $\pm 270^{\circ}$; Elevation: 5° - 88°
- **Slew speed:** Azimuth: $0.9^{\circ}/\text{sec}$; Elevation: $0.5^{\circ}/\text{sec}$

2.2 Receivers

The receiver parameters of the 25-m antenna are shown in Table 1.

2.3 Recording System

The recording systems available at the Nanshan VLBI station are Mark 5B+, Mark IV, Mark II, and K5. The Mark 5 StreamStor SDK has been upgraded from version 8.1 to 9.2. The Field System now is being upgraded from version 9.10.4 to 9.11.4. The analog BBC

Table 1 The receiver parameters of the 25-m antenna.

Band	Wave (cm)	Freq (MHz)	BW (MHz)	LO (MHz)	Pol
L	18	1400-1720	320	1300	dual
S	13	2150-2450	300	2000	dual
C	6	4750-5150	400	4620	dual
X	3.6	8200-9100	500	8100/8600	dual
K	1.3	22100-24200	500	22000-23700	dual
Band	Type	T_rec (K)	T_sys (K)	Eff (%)	SEFD (Jy)
L	room	10	24	52	300
S	room	50	70	48	560
C	room	9	22	55	250
X	cryo	20	50	50	350
K	cryo	17	40	35	850

used here is old but still able to record at a maximum rate of 2,048 Mbps with a maximum channel width of 16 MHz and a maximum of 16 channels. The digital backend system we have here is a Chinese Data Acquisition System (CDAS), which was developed by Shanghai Astronomical Observatory.

3 IVS Observations

We have observed 12 scheduled IVS sessions in 2013. All of them were observed normally.

Table 2 The observed IVS sessions.

Session	Date	Remarks
R4569	JAN 24	Normal
R4579	APR 04	Normal
APSG32	APR 17	Normal
R4582	APR 25	Normal
APSG33	MAY 20	Normal
R4595	JUL 25	Normal
R1604	SEP 24	Normal
R1612	NOV 18	Normal
T2093	NOV 19	Normal
R1613	NOV 25	Normal
R1617	DEC 23	Normal
R1618	DEC 30	Normal

4 Personnel

See Table 3 for Urumqi personnel.

5 Future Plans

A planned reconstruction of the 25-m antenna will take place in March 2014 and will be completed in October 2014. A digital backend RDBE and a DBBC are both in our purchase plan.

Table 3 The staff supporting the 25-m antenna.

Name	Position	Field	E-mail
Na Wang	Director	Astrophysics	na.wang@xao.ac.cn
Ali Yusup	Chief Engineer	Antenna	aliyu@xao.ac.cn
Maozheng Chen	Senior Engineer	Receiver	mzchen@xao.ac.cn
Jun Ma	Senior Engineer	Receiver	majun@xao.ac.cn
Wenjun Yang	Senior Engineer	Terminal	yangwj@xao.ac.cn
Hua Zhang	Senior Engineer	Terminal	zhangh@xao.ac.cn
Shiqiang Wang	Senior Engineer	Antenna	wangshq@xao.ac.cn
Jun Nie	Senior Engineer	Computing	niejun@xao.ac.cn
Guanghai Li	Engineer	Computing	ligh@xao.ac.cn
Chenyu Chen	Engineer	Antenna	chency@xao.ac.cn
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Ming Zhang	Scientist	Astronomy	zhang.ming@xao.ac.cn