

Urumqi Astronomical Observatory

Liu Xiang, Zhang Jin

Abstract

This report summarises the technical parameters and the technical staff of the VLBI station of Urumqi Astronomical Observatory. It also gives an overview about the VLBI activities during last year at Urumqi.

1. The VLBI station of UAO

Urumqi Astronomical Observatory (UAO) consists of a radio telescope for VLBI, an optical telescope, a GPS station and a telescope for solar observing. UAO is located at the site of the Capital of Xinjiang Province of China, while the 2- m radio telescope is located at Nanshan Mt. Since the beginning of 1999, UAO has been affiliated with National Astronomical Observatories, Chinese Academy of Sciences.



Figure 1. 25m telescope at Nanshan Mt.

2. Technical Parameters of the VLBI station of UAO

The largest instrument of UAO is the radio telescope for VLBI. Tables 1 and 2 list the parameters for the antenna and receivers.

Table 1. UAO Antenna Parameters

Diameter	25m
Working range	AZ $\pm 270^\circ$, EL 4 – 89°
Maximum speed	1°/second for AZ, 0.5 for EL
Maximum acceleration	0.5°/second for AZ, 0.25 for EL
Pointing error	15" (rms)
RFI	There are interferences at 92cm and 18cm bands.
Location	The antenna is sited about 60 km away from the host unit in Urumqi.

Table 2. UAO Receiver Parameters

Band	Frequency range	LO	Pol.	Tsys	SEFD
1.3 cm	22100-24000 MHz	22000MHz	LCP	170K	2580Jy
3.6 cm	8200-8600	8080	RCP	35	290
6 cm	4750-5150	4620	LCP	30	276
13 cm	2150-2450	2020	RCP	180	2440
18 cm	1450-1750	1500	LCP+RCP	85	1394
30 cm	underconstruction				
92 cm	317-337	0	LCP+RCP	90	1265

Back-end systems include Mark IIIA, Mark II, K4.

Timing system: two H-masers with stability 10^{-14} . A GPS (TAC) receiver is installed.

3. Technical Staff of the VLBI station of UAO

Table 3 lists the UAO staff members.

4. Status of the VLBI station

The station is a formal member of EVN, a member of NASA CORE project and China APSG project. It is also a member of APT and Russia LFN.

For S/X band, the system has contributed much observing time to NASA these years. The performance sounds good, except for the phase-cals and the delay measuring system. Another problem is that the FS has not been connected to control the antenna.

The observations were made for CB307-CB312 of NASA, total time is 144 hours, and 48 hours observation for APSG-3 and APSG-4 project of China (S/X band).

The observations were made for 15 projects of EVN at L-band, C-band and K-band, total time is 121 hours. The observations were made for LFN project of Russia, the sum of time is 144 hours (at 92 cm and 18 cm, Mark II mode). Four hours observation was made for Shanghai correlator test. CORE-B501 of NASA was observed in Jan. 1999. EVN session-1 also was conducted in February this year.

VLBI technical activity: a new head of the tape recorder was installed. Aili Yusup worked in Haystack three months for a new S/X band receiver. Zhang Hongbo worked in Jodrell Bank three

Table 3. UAO Technical Staff

Prof. Zhang Jin	chief scientist and general engineer
Zhang Hongbo	vice general engineer
Liu Xiang	the head of vlbi operation group.
Wang Na	responsible for single dish observation.
Aili, Yusup	engineer, vice general engineer.
Shao Minhui	engineer, responsible for H-maser.
Wang Weixia	engineer, responsible for receivers.
Dong Yousuo	engineer, responsible for operation.
Zen Yong	engineer, responsible for the antenna.
Rizwan Mamat	engineer, responsible for Mark IIIA, Mark II and K4.
Aili. E	staff of the operation group.
Jarken. Y	staff of the operation group.
Bao Xinming	staff of the operation group.
Wang Huaxiang	staff of the operation group.
Ma Xuelian	staff of the operation group.
Chen Maozheng	staff of the operation group.
Yang Wenjun	staff of the operation group.

months for Urumqi Mark IV upgrade. A team of 39th institute of China worked at the station half month for the antenna adjustment including main reflector, sub-reflector and pointing. The efficiency of the antenna has raised about 10%. The K-and and L-band are also adjusted.

The plate motion parameters of Urumqi station can be found in NASA Web. Astrophysical VLBI results which the station used can be seen in literature. The single dish observing facilities are undergoing to be established for pulsar timing and H₂O maser observing.

5. Outlook

Mark IV upgrade will be done at the end of 1999 or early 2000. A new S/X band receiver could be installed in this year. A new FS computer will arrive at the station and a connection will be made so as to control the antenna by FS in 1999. It is planed that 30 cm band system could be founded in 1999 according to TOG proposal of EVN. A dual polarized cooling receiver system of L-band is planed to be built in this year in order to fit pulsar timing and VLBI request.