

# Sheshan VLBI Station Report for 2004

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## Abstract

The Sheshan (also called Seshan) 25-meter radio telescope is an alt-az antenna run by Shanghai Astronomical Observatory (SHAO), Chinese Academy of Sciences (CAS). It is one of the six main astronomical facilities of Chinese National Astronomical Observatories. The VLBI station is a member of the EVN, IVS, and APT. We give a short report about the current status and future plans of Sheshan VLBI station of Shanghai Astronomical Observatory as an IVS Network station.

## 1. Introduction

The telescope is located about 30 km west of Shanghai. Station located at longitude  $121^{\circ} 11' 59''$  E, latitude  $31^{\circ} 05' 57''$  N, and height 5 meters above sea level (ground).

The radio telescope started its operation in 1987. It is one of the five main astronomical facilities of Chinese National Astronomical Observatories. The VLBI station is a member of the EVN, APT and IVS. There is a two-station Mark IV data processor and an analysis center of IERS of various space geodetic observations in Shanghai Astronomical Observatory.

Sheshan station participates in the EVN sessions for astrophysics, IVS sessions and APSG observations for the geodetic purpose.

## 2. Facilities

### 2.1. Antenna

Diameter : 25 meters

Antenna type: Cassegrain beam wave-guide

Seat-rack type: Azimuth-pitching ring

Main surface precision: 0.65 mm (rms)

Point precision:  $20''$  (rms)

Rolling range: Azimuth :  $-86^{\circ} - 425^{\circ}$ ; Elevation:  $5^{\circ} - 88^{\circ}$

Maximum rolling speed: Azimuth :  $0.55^{\circ}/\text{sec}$ ; Elevation:  $0.28^{\circ}/\text{sec}$

The control system of the telescope is being upgraded. We expect to have maximum rolling speed in azimuth ( $1.0^{\circ}/\text{sec}$ ) and elevation ( $0.5^{\circ}/\text{sec}$ ) after the upgrade.

### 2.2. Receiver

Five bands for VLBI observations are available at Sheshan VLBI station: L band (18 cm), C band (6 cm), K band (1.3 cm), and S/X band (13/3.6 cm). The parameters of the receivers are listed in Table 1. Column 1 gives the observation band. The frequency range is listed in column 2, followed by the efficiency of each band in column 3. The receiver type, system temperature, and polarization model are listed in columns 4, 5 and 6, respectively.

The L, C, and K bands are used for astrophysics and S/X double frequencies are used for geodesy. X band is also used for astrophysical observations sometimes.

A new C-band receiver with double polarizations has been used since Oct. 2004.

Table 1. VLBI Receivers of Sheshan Station

<b>Band</b> (cm) (1)	<b>Bandwidth</b> (MHz) (2)	<b>Efficiency</b> (%) (3)	<b>Type</b> (4)	$T_{system}$ (K) (5)	Polarization (6)
18	1620-1680	40	Room Temperature	~ 100	LCP & RCP
13	2150-2350	45	Room Temperature	~ 100	RCP
6	4700-5100	58	Cryogenic	~45-50	RCP & LCP
3.6	8200-9000	50	Cryogenic	~ 50	RCP
1.3	22100-22600	~20	Cryogenic	~110	RCP & LCP

### 2.3. Recording System

VLBA, Mark IV, Mark 5 and S2 recording systems are available now at Sheshan VLBI station. The performance of the observing system of Shanghai station has been more advanced over the last few years.

The Field System has been upgraded to 9.7.0 version and it worked well for Sheshan station in 2004.

The recording system has been upgraded to Mark 5A system in May 2004 and it works well for IVS and EVN observations. So the tape recorder has not been used then.

A new Hydrogen Maser MHM2010A has been installed and used since July 2004 and it works well.

### 2.4. Correlator

A new correlator with 5 stations is being built in Shanghai Astronomical Observatory. We expect to have our new correlator in 2006.

## 3. Personnel

There are some changes of the staff in Sheshan station. The main staff members at Sheshan VLBI Station are listed in Table 2.

Our senior engineer Xinyong Hunag retired in Oct. of 2004. She is still working with us after her retirement.

## 4. Current Status & Activities and Future Plans

The antenna control system will be finished in second half of 2005.

A new L band receiver with double polarization will be available in second half of 2005

A new S/X band receiver has been designed and it will be available by the end of 2005.

Table 2 - The main staff in Sheshan VLBI Station

<b>Name</b>	<b>Position</b>	<b>Working area</b>	<b>email address</b>
Xiaoyu Hong	Professor	Head of station	xhong@shao.ac.cn
Wenren Wei	Professor	Chief Engineer	wwr@shao.ac.cn
Shiguang Liang	Professor	Microware	sgliang@shao.ac.cn
Xinyong Huang	Senior Engineer	VLBI friend	xhuang@shao.ac.cn
Zhuhe Xue	Senior Engineer	Terminal software	zhxue@shao.ac.cn
Qingyuan Fan	Senior Engineer	Antenna control	qyfan@shao.ac.cn
Tao An	VLBI friend	Astrophysics	antao@shao.ac.cn
Songlin Chen	Engineer	Microware	slchen@shao.ac.cn
Bin Li	Engineer	Microware	bing@shao.ac.cn
Jinqing Wang	Engineer	Observation et al	jqwang@shao.ac.cn
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