

# Seshan VLBI Station Report for 2001

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## Abstract

We give a short report of the current status and future plans of Seshan VLBI station of Shanghai Astronomical Observatory as an IVS Network station.

## 1. Introduction

The Seshan 25 meter radio telescope is an alt-az antenna run by Shanghai Astronomical Observatory (SHAO), Chinese Academy of Sciences (CAS). The telescope is located about 30 km west of Shanghai.

Station Location: Longitude:  $121^{\circ} 11' 59''$  E; Latitude:  $31^{\circ} 05' 57''$  N.  
Height above sea level: 5 meters (ground).

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 MKIV data processor and an analysis center of IERS of various space geodetic observations in Shanghai observatory .

## 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)

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

Maximum slewing speed: Azimuth :  $0.55^{\circ}/\text{sec}$

Elevation:  $0.28^{\circ}/\text{sec}$

### 2.2. Receiver

Five bands of VLBI observations are available at Seshan Station. The parameters of the receivers are listed in Table 1.

The X-band receiver system has been upgraded to the wideband system since Dec. 2000. So, Seshan station has participated in the wideband experiments of geodynamics for all of 2001. But the correlated results showed the X-band G error codes due to sensitivity rolloff at high frequency end. It looks like we must attempt to improve the performance of the feed as soon as possible.

Table 1. VLBI Receivers of Seshan Satation

Band (cm)	Bandwidth (MHz)	Efficiency (%)	Type	$T_{system}$ (K)	Polarization
18	1620-1680	40	Room Temperature	$\sim 100$	LCP & RCP
13	2150-2350	45	Room Temperature	$\sim 100$	RCP
6	4700-5100	58	Cryogenic	45-50	LCP
3.6	8200-9000	48	Cryogenic	$\sim 50$	RCP
1.3	22100-22600	$\sim 20$	Cryogenic	$\sim 110$	RCP & LCP

### 2.3. Recording System

VLBA, MKIV and S2 recording systems are available now at Seshan VLBI station. MKIV upgrade of Seshan station was completed in 2000. Seshan station has participated in the two-head recording test with 512Mbit/s by EVN organization in Oct. 2001. Fringes were found at Seshan; both head-stacks were successful. The performance of the observing system of Shanghai station has been more advanced over the last few years.

### 2.4. Two-station FX Model Processor

The Chinese VLBI Network correlator is a two-station FX model correlator. It is located at Shanghai Astronomical Observatory, Chinese Academy of Sciences. It first got fringes at the end of 2000. Now the correlator can process Mark4, VLBA and Mark3 thin tapes. The bandwidth is 128 MHz. It has 8 IFs. The max resolution is 2048 channels/IF.

## 3. Personnel

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

Table 2 - The main staff in Seshan VLBI Station

Name	Position	Working area	email address
Xiaoyu Hong	Research Professor	Chief Scientist	xhong@center.shao.ac.cn
Shi-guang Liang	Research Professor	Chief Engineer	sgliang@center.shao.ac.cn
Zhihan Qian	Research Professor	Advisor	qzh@center.shao.ac.cn
Xinyong Huang	Senior Engineer	VLBI friend	xhuang@center.shao.ac.cn
Wenren Wei	Senior Engineer	Technical friend	wwr@center.shao.ac.cn
Zhuhe Xue	Senior Engineer	Terminal software	zhxue@center.shao.ac.cn
Jiazheng He	Senior Engineer	Antenna control hardware	jzhe@center.shao.ac.cn
Qing-yuan Fan	Senior Engineer	Antenna control software	qyfan@center.shao.ac.cn
Song-lin Chen	Engineer	Microwave	slchen@center.shao.ac.cn
Bin Li	Engineer	Microwave	bing@center.shao.ac.cn

#### **4. Current Status and Activities**

Sixteen geodetic experiments have been run by Seshan Station from February 2001 to December 2001, and 17 geodetic experiments will be operated during 2002. There is a new spectrum analyzer (model: 8560 E) purchased from America in 2001. It has been used in the VLBI observing system.

#### **5. Future Plans**

The designs for the improvement of a rapid frequency switching system for Seshan Station have been completed in 2001. The construction process is being made now. The C-band twin-polarization receiver is being made at ASTRON. Seshan station is planning to purchase a hydrogen clock from Datum for advancing the precision of the observation.