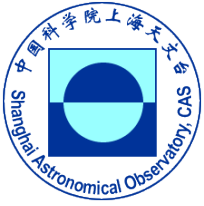




The 3rd General Meeting of the AOV is held in Canberra, Nov 9 –10, 2018.



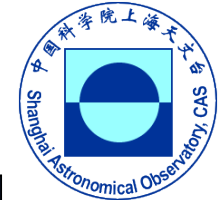
Status report of SHAO

Shanghai Astronomical Observatory

Bo Xia



Contents



1. Stations
 2. Observations
 3. Geodetic data correlation
 4. VGOS development
-



1.1 Sheshan25m



- 1. S/X - Dual polarization

Waveband	S	X
Freq. (GHz)	2.2-2.4	8.2-9
LO (GHz)	2.0	8.1
Type	room temp.	cryogenic

- 2. CDAS:

4IFs * 512MHz

Bandwidth 0.5\1\2\4\8\16\32 MHz



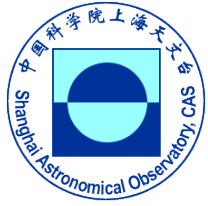
1.2 Antenna maintenance for sheshan25m



1. occurred on Sep.3
2. maintenance by CETC-39
3. first stage (done)
 - make maintenance plan
 - procurement chain
4. plan to start maintenance in the middle of Nov.



1.2 Tianma65m



- **1. S/X - Dual polarization**

Waveband	S	X
Freq. (GHz)	2.2-2.4	8.2-9
LO (GHz)	2.0	8.1
Type	cryogenic	cryogenic

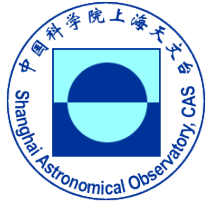
- **2. DBBC2:**

$4\text{IFs} * 512\text{MHz}$

Bandwidth $0.5\backslash 1\backslash 2\backslash 4\backslash 8\backslash 16\backslash 32\text{ MHz}$



1.2 Tianma65m

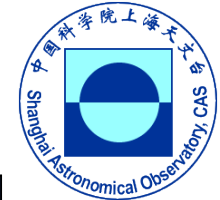


3. Mark5B+ -- mk5b
Flexbuff -- vdif



30 * 8TB

Total: 240 TB



2. Sessions observed status in 2018

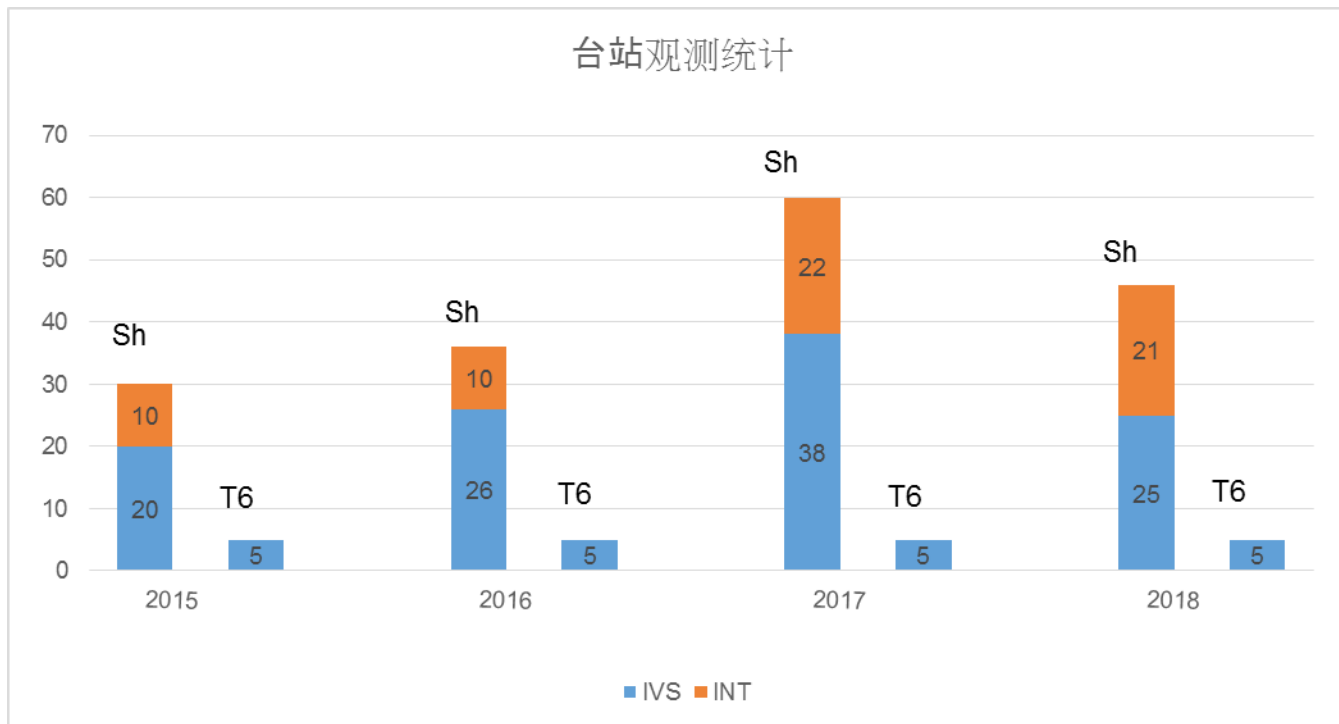
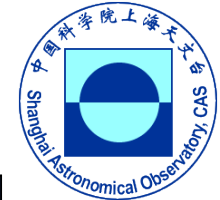
CODE	DATE	STATIONS	DUR (hr)	CORR
AOV019	2018.1.23	Sh & T6	24	SHAO
AOV021	2018.3.20	Sh	24	SHAO
AOV022	2018.5.1	Sh	24	SHAO
AOV025	2018.7.24	Sh & T6	24	SHAO
AOV029	2018.11.22	T6	24	SHAO

AOV021 – t6 cancelled due to antenna maintenance
(Mar. 20. 2018)

AOV026 & AOV029 – sh cancelled due to antenna maintenance
(Sep. 18. 2018 & Nov. 22 .2018)

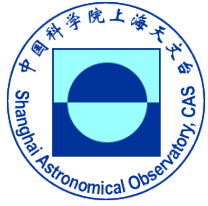


statistics on observing sessions





3. Shanghai VLBI correlator



- CVN correlator
 - VLBI tracking of spacecraft in China's Lunar Exploration Project
- DiFX correlator
 - geodesy and astrometry
 - radio imaging

VLE





Features of the DiFX cluster system

Software

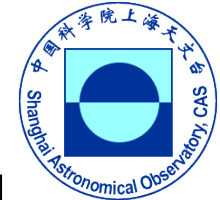
DiFX, HOPS, PIMA

Hardware

Head nodes	2 head nodes , 20 CPU, each head node manages 10 computing nodes
Computing nodes	400 cores , 20 computing nodes, 20 CPU each node, Intel Xeon E5-2660 v3 2.6GHz, 64GB RAM.
Networks	56Gb infiniband network for cluster and RAID, 10Gb/1Gb Ethernet for cluster, RAID and Mark5.
Storage system	800 TB , RAID 6 and parallel file system.
Mark5	6 units , 2 Mark5A, 2 Mark5B, 2Mark5B+

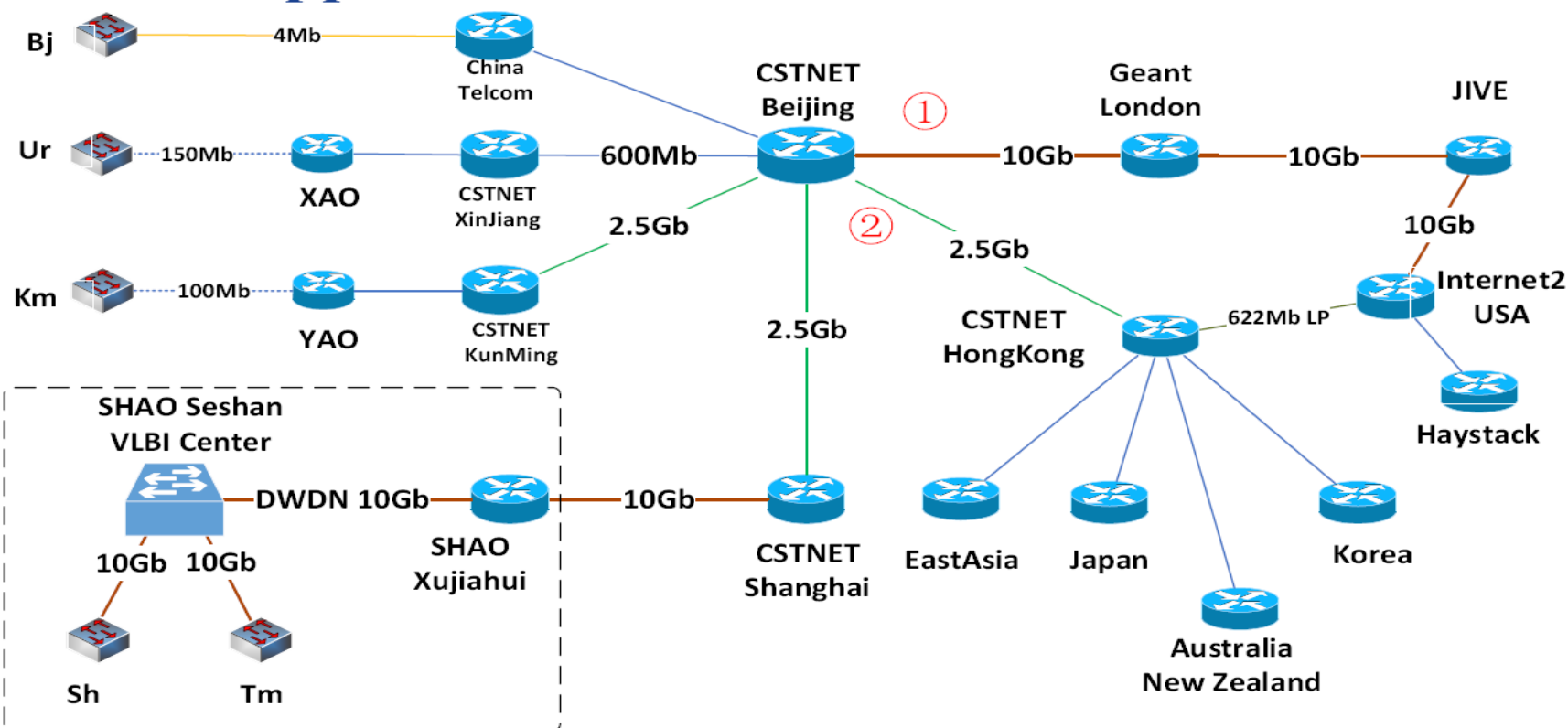


E-VLBI connection



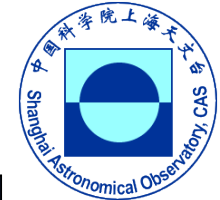
❖ Via CSTNET(Chinese Science&Technology Network, CAS)

❖ IPv6 supported in CVN

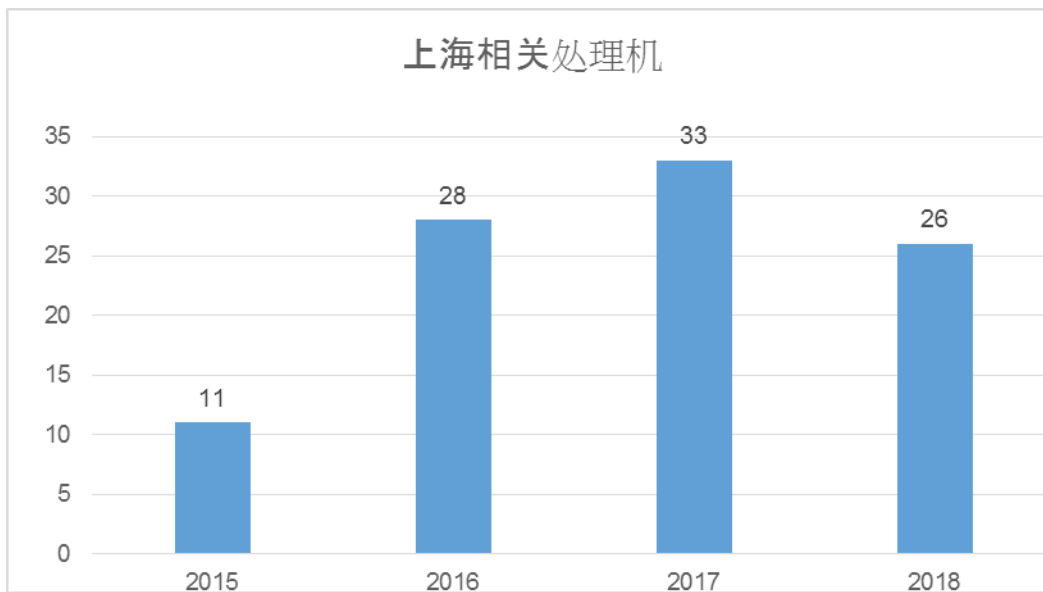




IVS sessions correlated at Shanghai

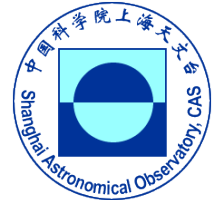


- many sessions are observed at 1Gbps





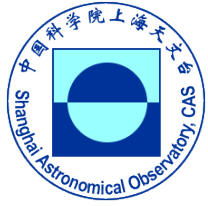
Geodetic data correlation at SHAO



- IVS observing sessions
 - R&D, AOV, APSG, CRF, CRDS, AUSTRAL
- Domestic sessions
 - CN-GEO
- geodetic sessions correlated
 - 2015: 11(IVS)+5(domestic) sessions
 - 2016: 28(IVS)+4(domestic) sessions
 - 2017: 33(IVS)+4(domestic) sessions
 - 2018: 26(IVS)+1(domestic) sessions



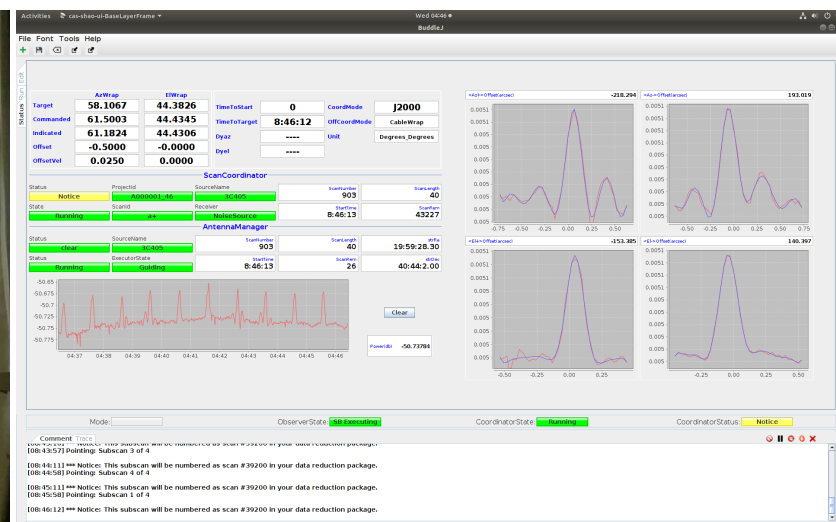
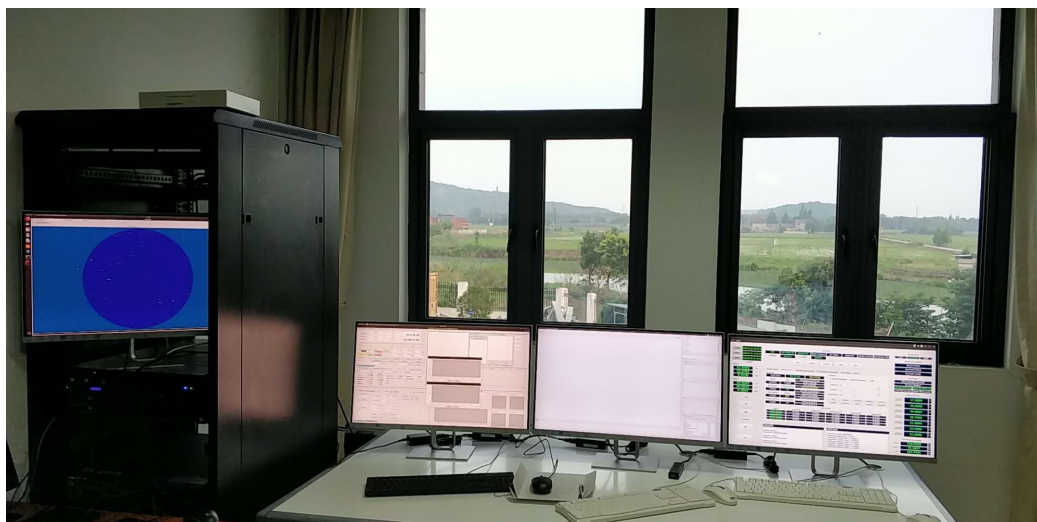
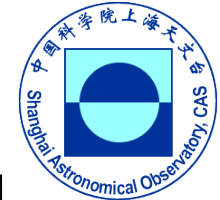
4.1 Tianma VGOS station



VGOS (VLBI Global Observing System)



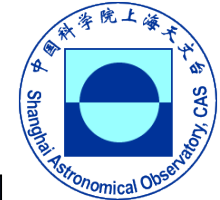
4.2 Control room



Remote full automatic operation control, automatic calibration measurement



4.3 System outline



Receiver

- wide-band receiver 3-14 GHz
(Installing)
- room temperature 7-9 GHz

Backend

- CDAS2 (4*1G bandwidth)
- DBBC3 (8IF, 16GHz bandwidth)

Recorder

- Mark6 *2
(32 Gbps at the maximum speed)

IF

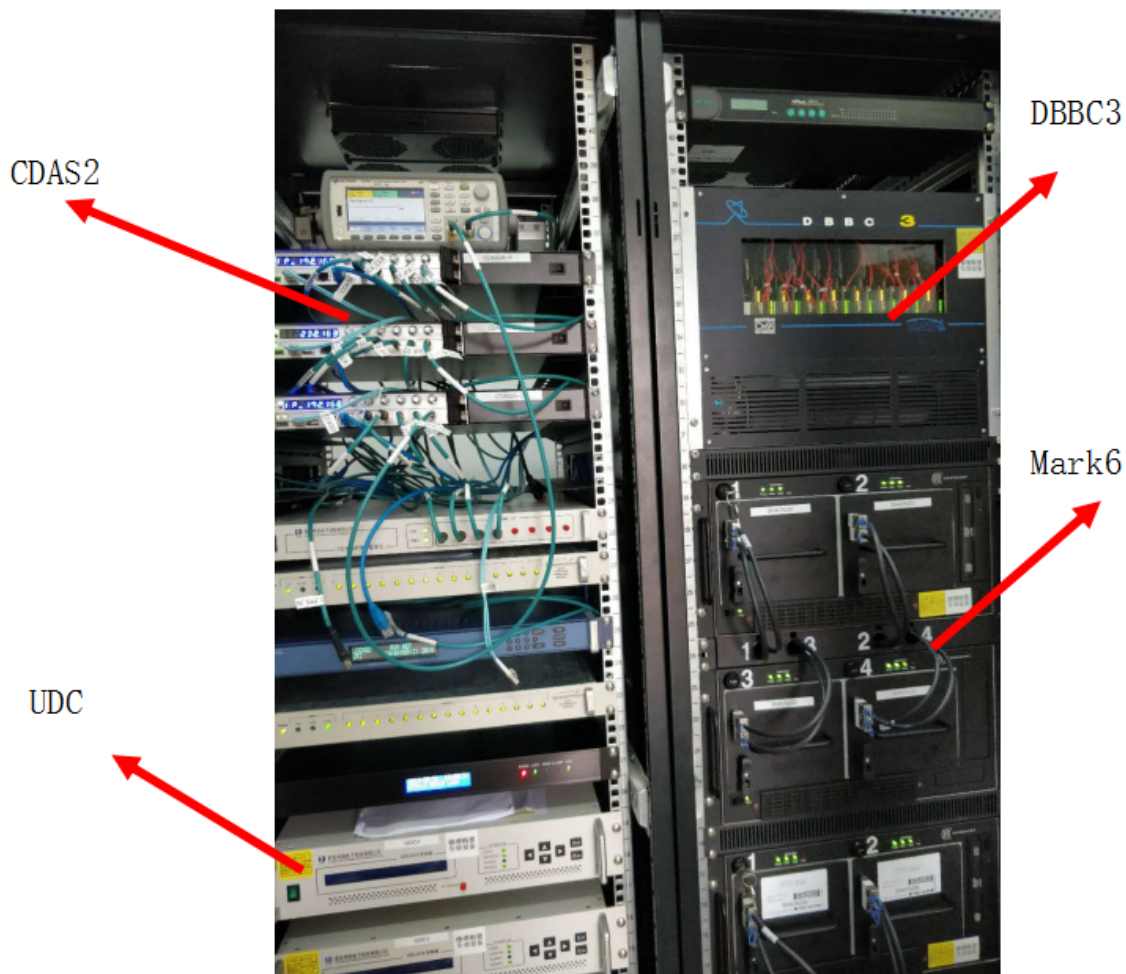
- UDC *4

Time/Frequency

- Maser (Made in Russia)
- Frequency Clock, counter etc.

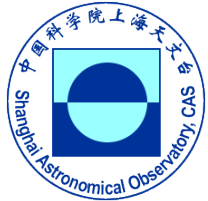
Pcal unit

Cable delay calibration





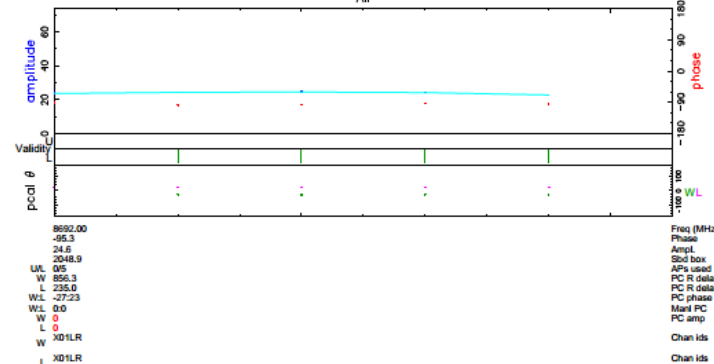
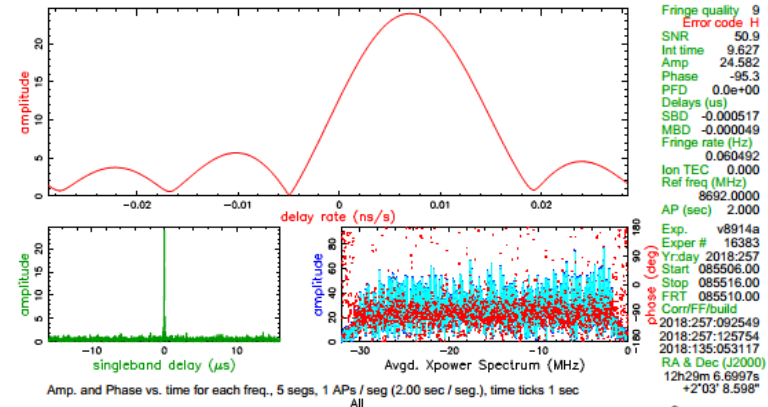
4.4 Fringe test observation



- 2018.9.14
- 8GHz
(nomal receiver)
- CDAS2

Mk4/DiFX fourfit 3.18 rev 2251

3C273.0A9VSB, No0016, WL
SESHAN13 - TIANMA13, fgroup X, pol RR



8692.00
-95.3
24.6
2048.9
UL 05
W 856.3
L 235.0
WL -37.23
Wt. 0.0
W 0
L 0
XD1LR
W
XD1LR
L

Group delay (usec)/(model) -2.1387240943E+02
Stand delay (usec) -2.13873409349E+02
Phase delay (usec) -2.13872922299E+02
Delay rate (u/s) -5.99831784204E-04
Total phase (deg) -158.6

Apriori delay (usec) 24.582 $\pm$ 0.483
Apriori clock (usec) 23.971
Apriori clockrate (u/s) 0.0000000E+00
Apriori rate (u/s) -0.00791287195E-04
Apriori accel (u/s/s) 9.62354446536E-08

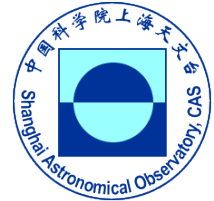
RMS Theor. Amplitude 24.582 $\pm$ 0.483
phfseg (deg) 2.5 2.5 Search (16X8) 23.971
amplseg (%) 2.7 4.4 Interp. 0.000
phfseg (deg) 0.0 1.1 Inc. seg. avg. 24.573
amplseg (%) 0.0 2.0 Inc. freq. avg. 24.568

PCal mode: MULTITONE, MULTITONE PC period (AP's) 5, 5
PCal rate: 0.000E+00, 0.000E+00 (u/s)
Strk/samp: 2x2 SampCnfrorm: disabled
Sample rate(MSamps): 64
Data rate(Mb/s): 128

Resid mod delay (usec) -4.30848E-05
Resid sb delay (usec) -5.17500E-04
Resid ph delay (usec) -3.04502E-05
Resid rate (u/s) 6.95950E-08
Resid phase (deg) -95.3

sb window (us) -1.000 1.000
mb window (us) -0.000 0.000
dr window (u/s) -0.029 0.029
ion window (TEC) 0.00 0.00

W: az 255.5 of 26.1 pa 56.1 L: az 255.4 of 26.1 pa 56.1 u/v (f/dec) 0.355 0.141
Control file: default Input file: /Exps/v8914a/001/No0016/3C273.0A9VSB Output file: Suppressed by test mode



**Thank you for your
attention!**
谢谢!