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Status of JAXA VLBI stations.

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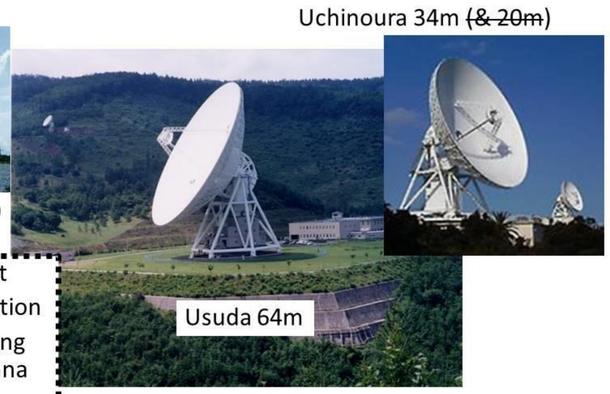
We will present the current status of JAXA antenna for VLBI (Mainly about Usuda 64m). Currently, we can use Usuda 64m and Uchinoura 34m for VLBI. Recently we made upgrade of the X band receiver and hope to be

We also consider the single dish use of VLBI and discuss about the upgrade plan. Uchinoura 34m used to use for VLBI, and we also considering the possibility to use Usuda-10m as a 22 GHz VLBI station, which used to use for VSOP-1 (HALCA). mission.

JAXA VLBI Antennas

Uchinoura 34m ~~(& 20m)~~

(Usuda10m)



Next Generation Tracking Antenna

Usuda 64m

Uchinoura 34m

- Tracking Suzaku (X-ray), Hinode (Solar telescope)
- Observation Bands : S, X
- Backends
  - VSOP terminal
  - K5/VSSP 16ch (for geodesy)
  - K5/VSI + ADS3000+（Wide band observation, Navigation）
- Joinned IVS observation in 2013 Feb.
  Try to find next session

Usuda 10m Antenna

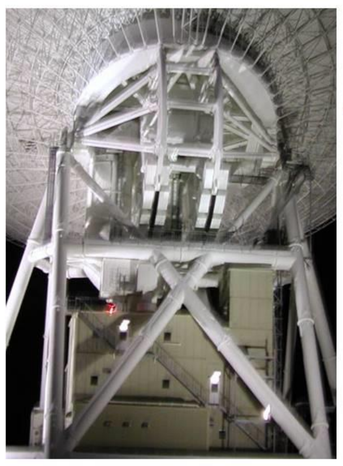
Current Status

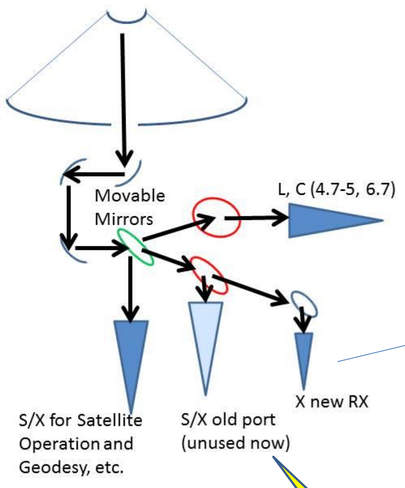
- 22 GHz room temperature RX installed
- Surface accuracy of 0.4 mm rms in 20 years ago
- No need to ask operator and can be controlled from Sagamihara
- Investigating whether it is useful for astronomy or stop operation.
- VLBI could be possible.

Status of Usuda 64m

- Tracking Akatsuki (Vinus), IKAROS (Solar Sail), GEOTAIL
- Observing band C（4.7-5.0, 6.7 GHz）,
  L(1.4, 1.6 GHz, S(2.2), X(8.4))
- Backends (Recorders)
  - VSOP terminal（will stop operation soon）
  - K5/VSSP 16ch (IP-VLBI for geodesy）
  - K5/VSI + ADS3000+ (Wideband observation)
- Current observation
  - Japanese VLBI network (JVN)
  - Radioastron
  - Single dish observation (Pulsars, Molecular/Atomic Lines)
  - Observation of Atmosphere of Solar system objects.
  - Geodesy (Usuda, Uchinoura (IVS))

Beam wave guide of Usuda 64m

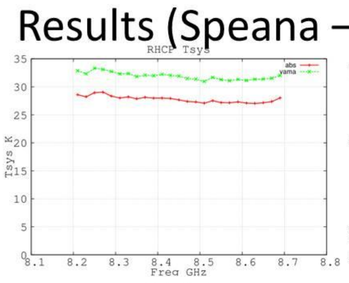




Installed new X-band receiver

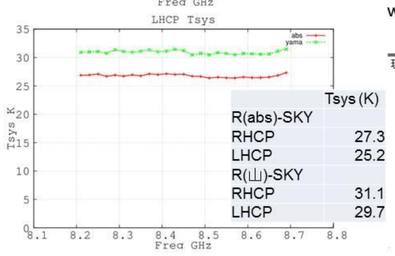
New / Old

Results (Speana –data by Uehara)

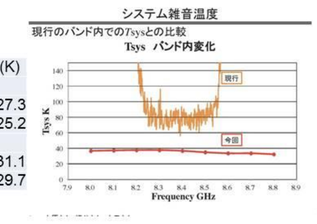


Top-left : RHCP Green : Mountain/EL=90 (Az=260, El=7.5 deg)
Red : using Absorber
Mountain is not the exact black body and gives higher Tsys, but simple way to measure the top level of Tsys.

Bottom - left : LHCP
Bottom right : Previous measurement with using mountain.



	Tsys (K)
R(abs)-SKY	
RHCP	27.3
LHCP	25.2
R(山)-SKY	
RHCP	31.1
LHCP	29.7



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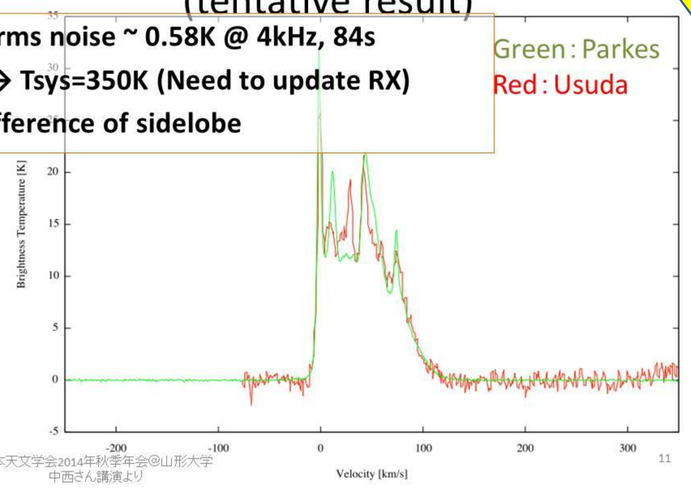
HI line comparison with Parkes 64m (tentative result)

❖ **rms noise ~ 0.58K @ 4kHz, 84s**
→ **Tsys=350K (Need to update RX)**
Difference of sidelobe

Green : Parkes
Red : Usuda



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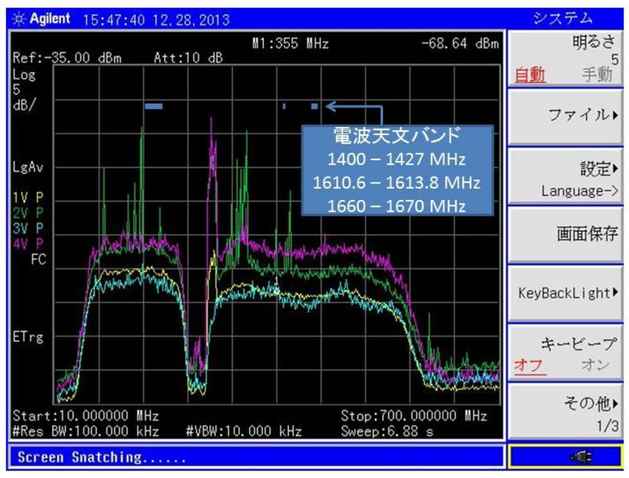
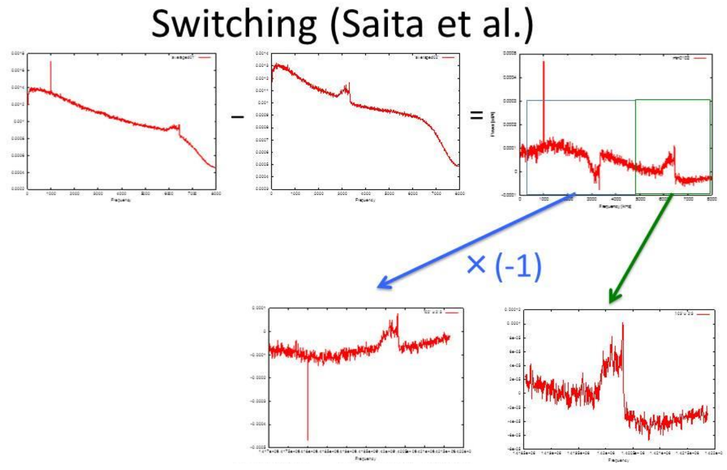
Replace this port for new low freq. RX?

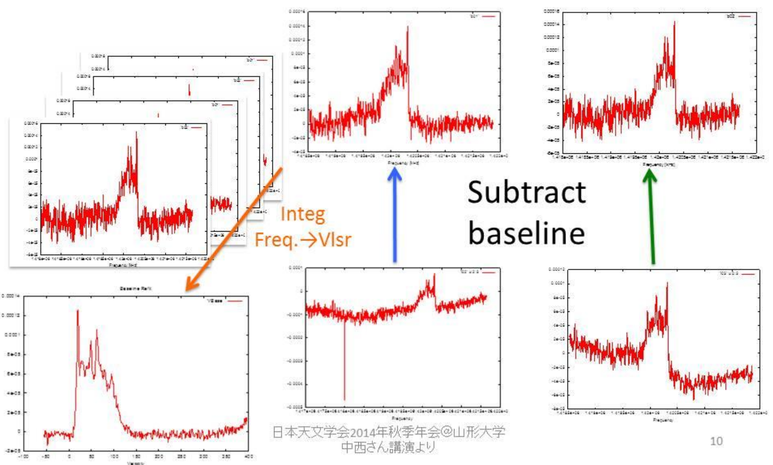
RFI@Lband (LO=1250MHz)



HI observation with frequency Switching (Saita et al.)



Analysis of HI observation



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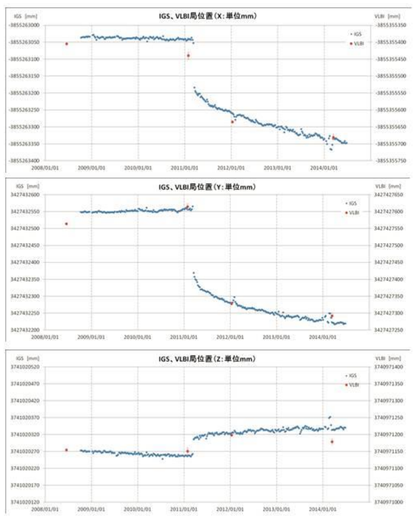

Results of Usuda64 geodesy Last session at March 11, 2014

[m]
X=3855355.6805±0.0098
Y=3427427.2920 ±0.0098
Z=3740971.1789 ±0.0094

Recording System-3

ADS-3000+ & K5/VSI（2Gbps recording）

Future:

- Make new X band receiver in operation.
- JVN VLBI observation： Sensitive X-band VLBI
- Join RADIOASTRON
- Geodesy (for deep space tracking).
- Single dish Usage.
  - Pulsars
  - HI and molecules (OH, CH)
  - Continuum spectrum at low frequency.
- Next generation deep space tracking antenna

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