

KVN

Korean Radio Telescopes

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한국우주전파관측망
KOREAN VLBI NETWORK · KASI



1st Radio Facility in Korea



- ❖ Taeduk Radio Astronomy Observatory
 - 14 m Radio Telescope Enclosed by Radome
 - First Light in 1987



TRAO 14 m Radio Telescope

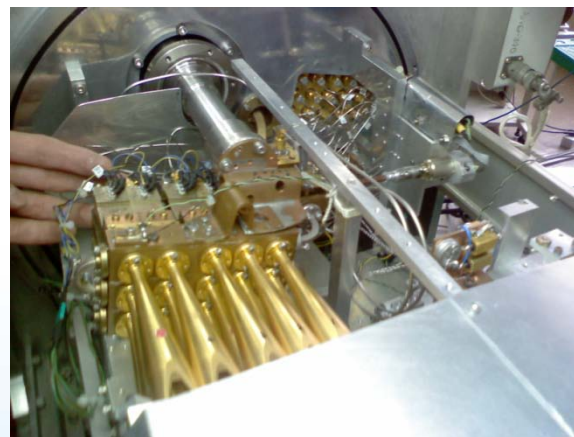


❖ Recent States

- Multi-Beam System (5 x 3)
- Freq. : 85 – 116 GHz
- Targets : Molecular Cloud Survey

❖ Future (on discussion)

- Wide band Rx
- New SIS Multi-Beam System (6 x 6)
- 86/129 GHz Rx for the 4th Site of KVN



KVN (Korean VLBI Network)



- $3 \times 21\text{m}$ Antennas (Seoul, Ulsan, Jeju)
- Maximum Baseline : 480 km
- 4 Frequencies bands (22, 43, 86, 129 GHz)
Simultaneous Observing System
- Multi-Frequency Phase Correction System
by Simultaneous Observation
- Korea & Japan Correlator with 16 Recorders
for EAVN

KVN : History

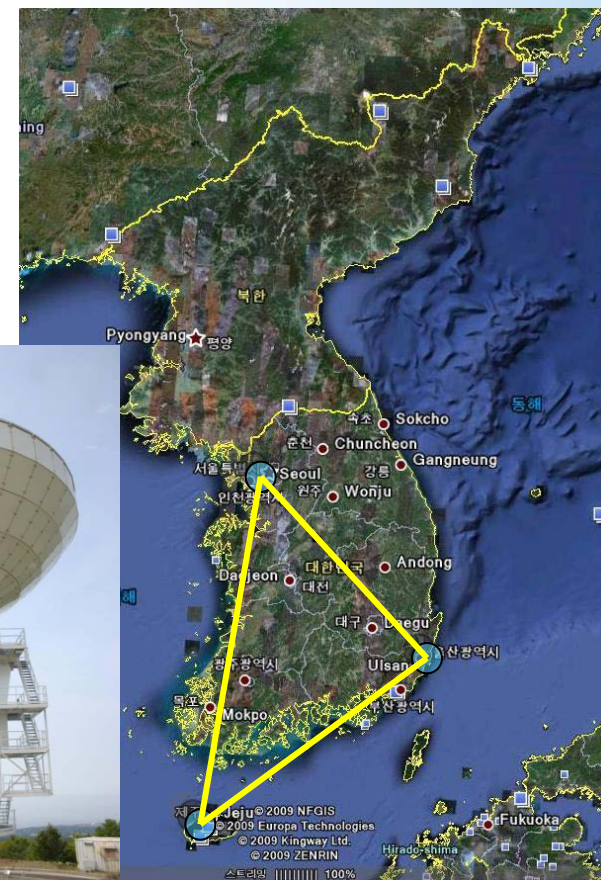


- 2001 : Start Construction of KVN
- 2008 : Install 3 Radio Telescopes
- 2008 : Install 1 set of 22/43 GHz Rx on Yonsei Telescope
- 2008 : First Light of 22/43 GHz H₂O & SiO Maser Lines
- 2009 : Install 3 set of 22/43 GHz Rx
- 2009 : Detection of VLBI Fringes of H₂O & SiO Maser Lines
- 2009 : Start Single Antenna Research Observation
- 2010 : Install Korea-Japan Correlator,
but S/W is still on Develop
- 2010 : 1 Gbps (Kreonet) btn each Observatory for e-VLBI
- 2011 : Install 1 set of 86/129 GHz Rx on Yonsei Telescope
- 2011 : Simultaneous Detection of the Maser Lines in
22/43/86/129 GHz (H₂O & SiO Lines) toward Ori-KL
- 2011 : KVN-JIVE e-VLBI Formatter Test (K band)

KVN : Telescopes



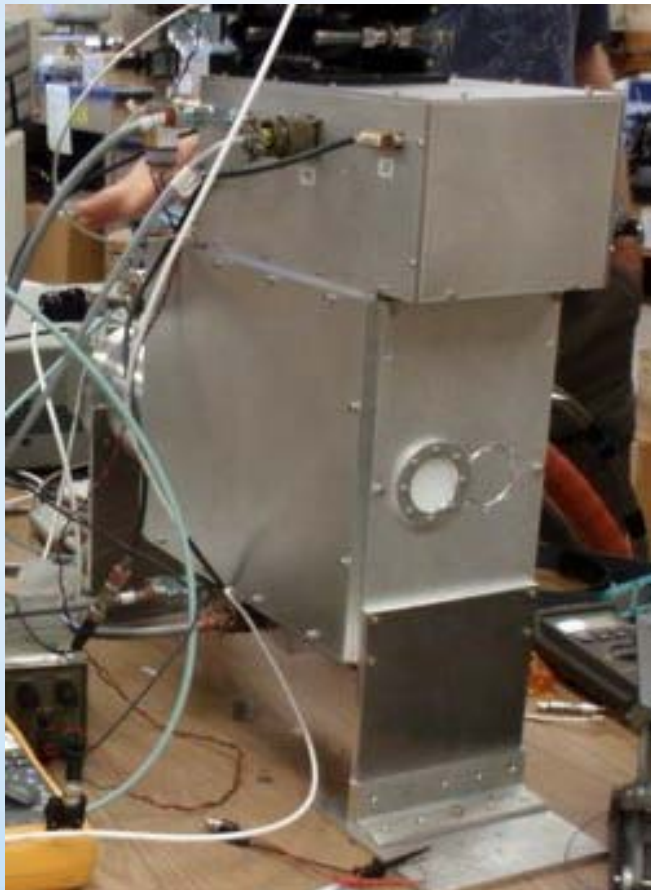
- ❖ Mount : ALT-Az Type
- ❖ Surface : Shaped Cassegrain type
- ❖ Install : Dec. 1, 2008
- ❖ pointing accuracy $\leq 4''$



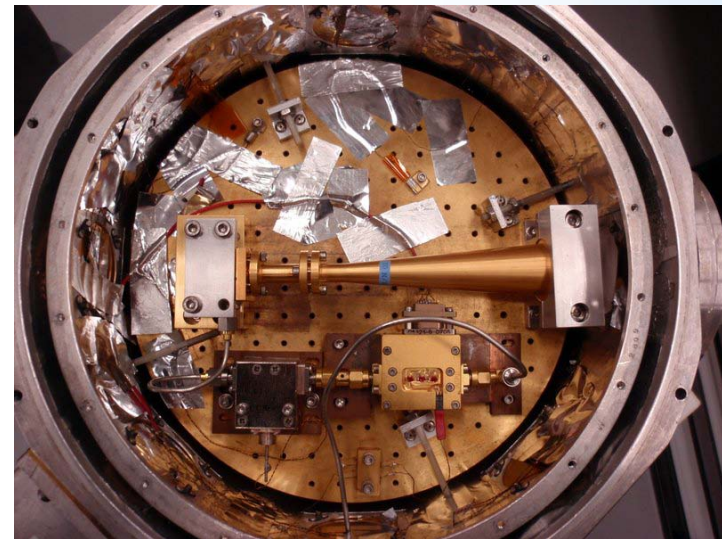
KVN : Receivers



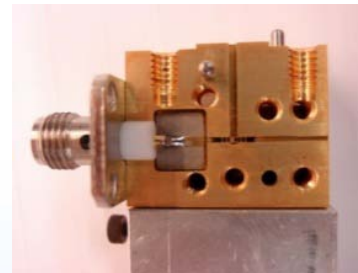
86 GHz Receiver



129 GHz Receiver



• Inner of Test dewar

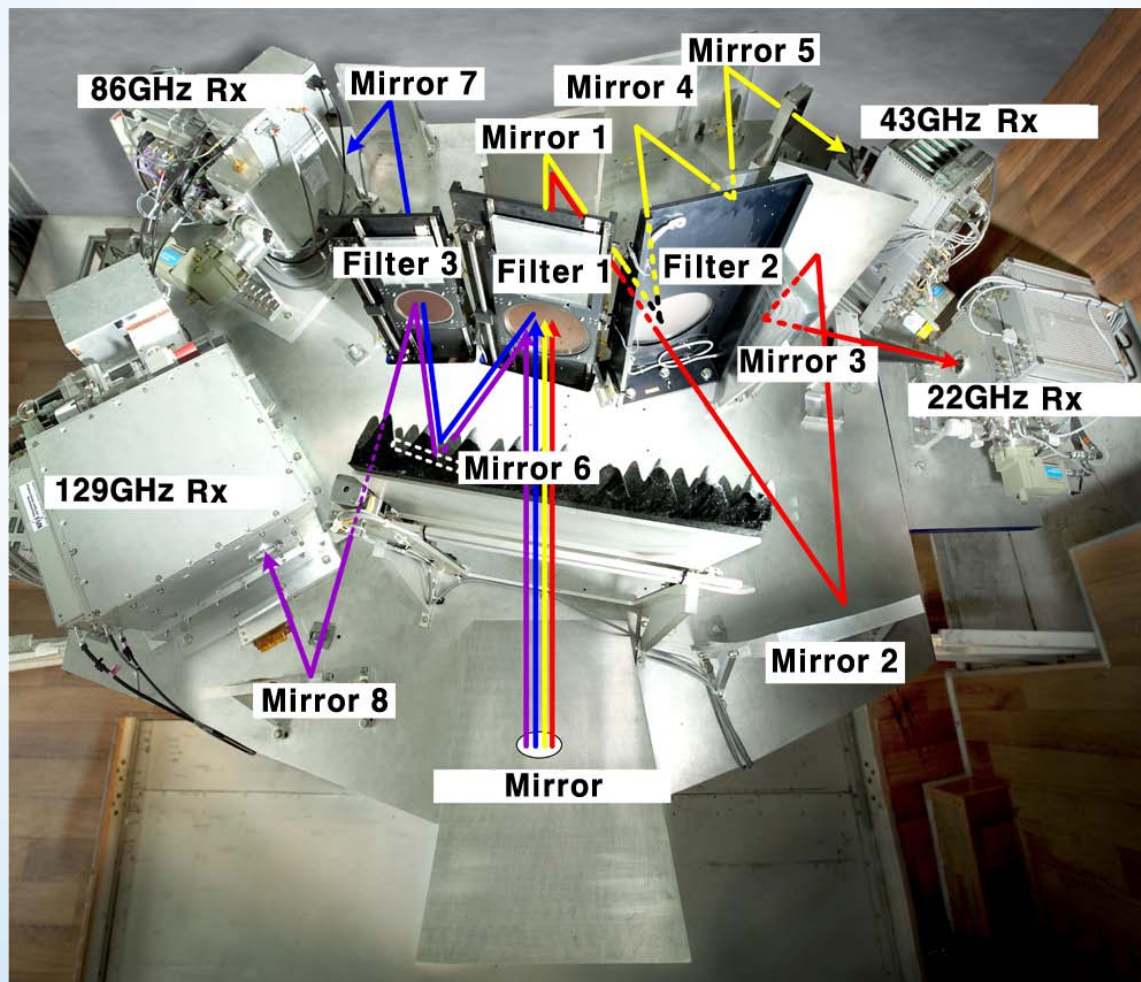


mixer block

KVN : Receivers



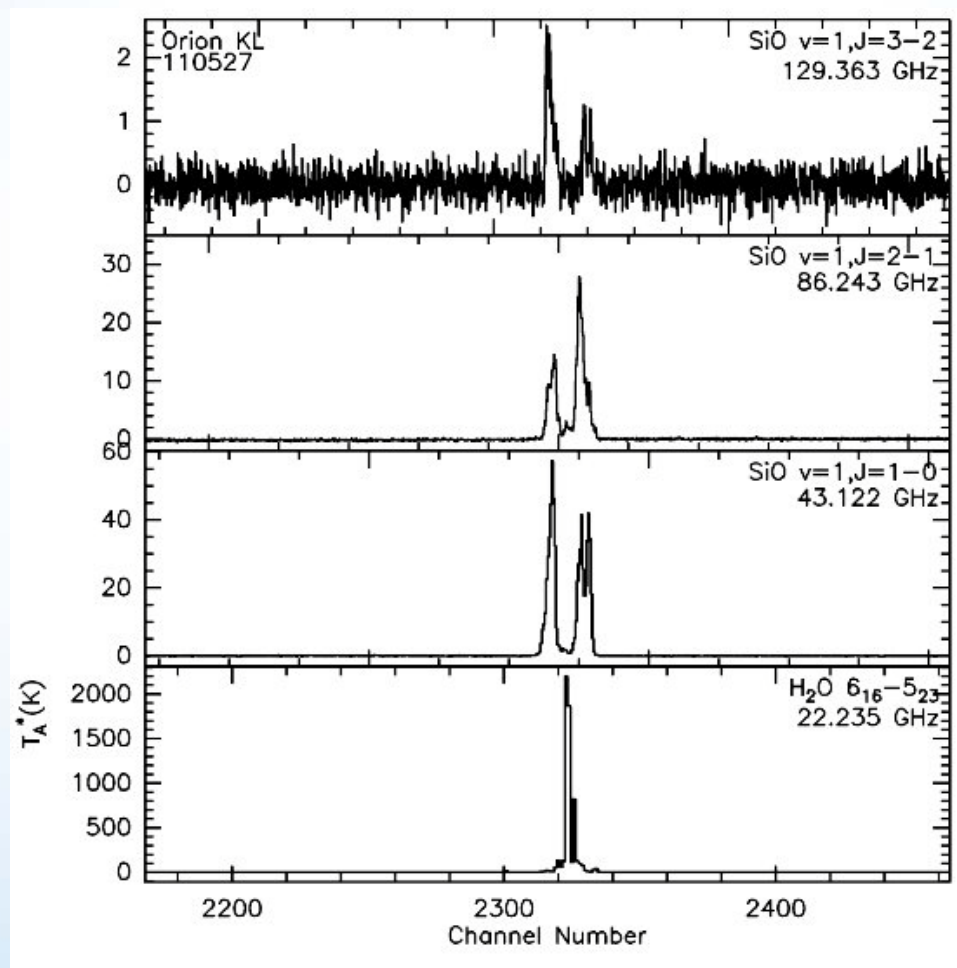
- ❖ 4 Ch Receiver System installed on Yonsei Telescope



KVN : 4 Ch. Simultaneous Observation



❖ 22/43/86/129 GHz toward Ori-KL



KVN : T_{rx} & n_A



Frequency	22 GHz	43 GHz	86 GHz	129 GHz
Trx	~30 K	~60 K	~70 K	~60 K(?)
Aperture efficiency	69 %	72 %	60 % (?)	45 % (?)

KJJVC(Korea-Japan Joint VLBI Correlator)



Korea-Japan Joint VLBI Correlator (KJJVC)
2009.10.16.

KVN : Future Works



- 2011 : KVN-EVN e-VLBI Fringe Detection
(Yebeo 40m, Metsahavi 14m)
- 2011 : Install all set of 86/129 GHz Receiver Systems
- 2011 : Complete Install of KJJVC
- 2012 : Operation of KJJVC
- 2012 : VLBI Test Observation of 22/43/86/129 GHz band
- 2012 : Install 6.7-8 GHz Receiver System (with Prof. Ogawa)
- 2012 : Start VLBI Research Observation with VERA
(22/43 GHz Band)
- 2012 : Complete KVN HQ in Daejeon
- 2012 : Move KVN HQ from Seoul to Daejeon (~August)
- 2013 : Start VLBI Research Observation with 4 Channel
Receiving System (22/43/86/129 GHz)

KVN : New Building



- 1.2 Billion Japanese Yen
- 6,600 m²
- Aug. 2012 : Completion



Next Facility in Radio Astronomy



- ❖ Participate in East Asian ALMA ?
- ❖ Participate in SKA Project?
- ❖ Korea Basic Science Institute
 - Will Found in 2012
 - Similar to Niken Institute of Japan
 - ~50 Research Projects
 - 12 billion Japanese Yen/yr for each Project

