EAVN and SKA

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水沢VLBI観測所の目標(FY2015)

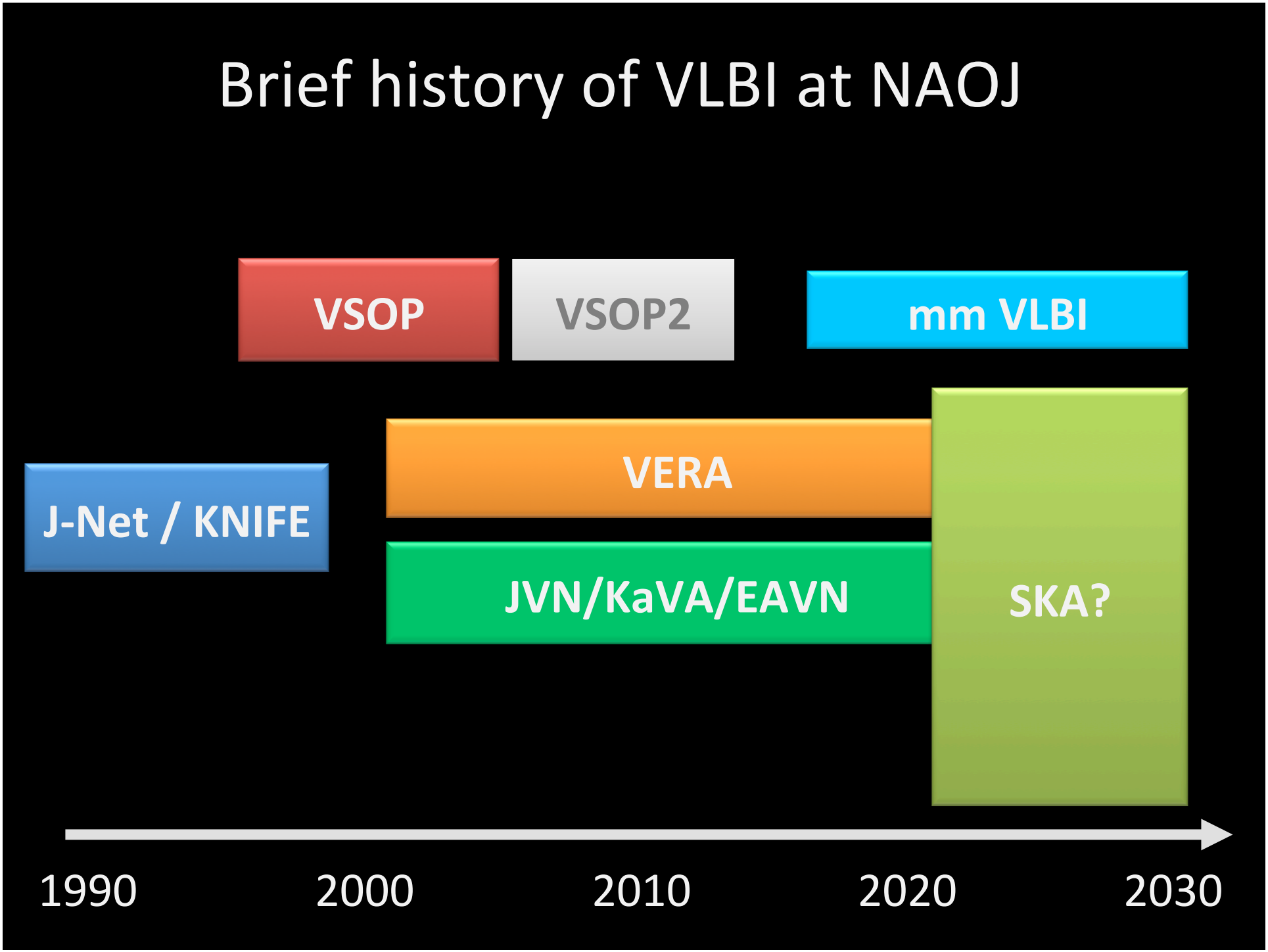
1. VERAによる観測を継続して研究成果を挙げる。

2. 大学間連携・国内VLBI観測網の中核局として大学を支援し、大学間連携VLBIで研究成果を挙げる。大学連携VLBI観測の体制および事業内容を検証する。

3. VERAの観測が7年後に終了することを想定し、日本の電波コミュニティ等の意向に沿う形の水沢VLBI観測所の将来計画を検討する。

4. 東アジアVLBI観測網を運用し、研究成果を挙げる。

5. 中央標準時の決定と現示を行う。


Brief history of VLBI at NAOJ
VSOP
VSOP2
mm VLBI
VERA
J-Net / KNIFE
JVN/KaVA/EAVN
SKA?
1990
2000
2010
2020
2030

Announcement on mm VLBI

- VLBI with ALMA will be open from Cycle-4 (risk-share mode)
- Band 3 (7mm) and Band 6 (1.3mm) will be available
- Two proposals needed (to the array and to ALMA)
- The array proposal for Band 3 should go to GMVA. The proposal for Band 6 should go to NRAO/EHT(TBD).
- The array proposal deadline will be 1 Feb 2016 (at least for GMVA)

Radio astronomy in 2020's and beyond: SKA era

- SKA (Square Kilometer Array)

  Next-generation big-project in radio astronomy

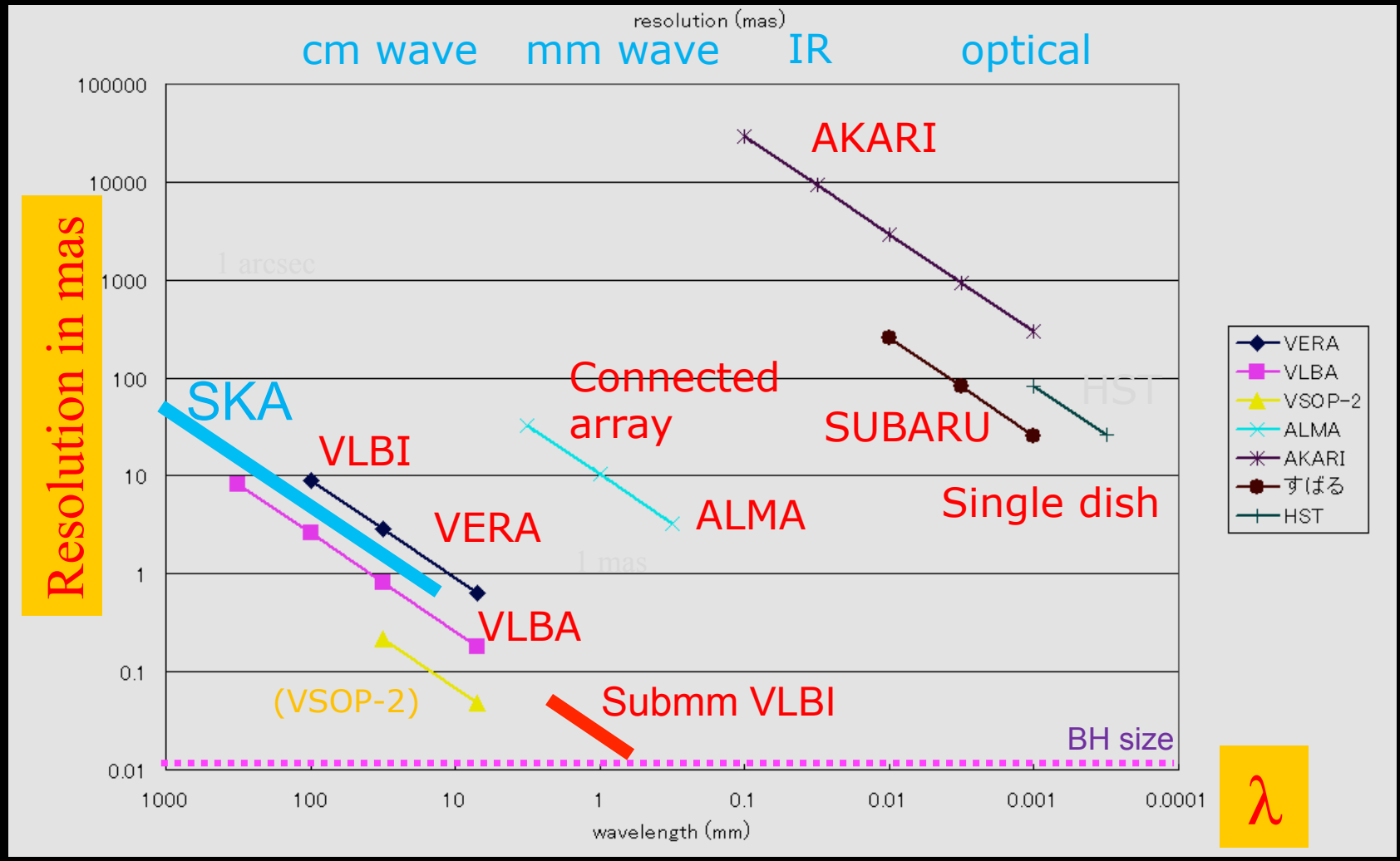
- Possible synergies with VLBI

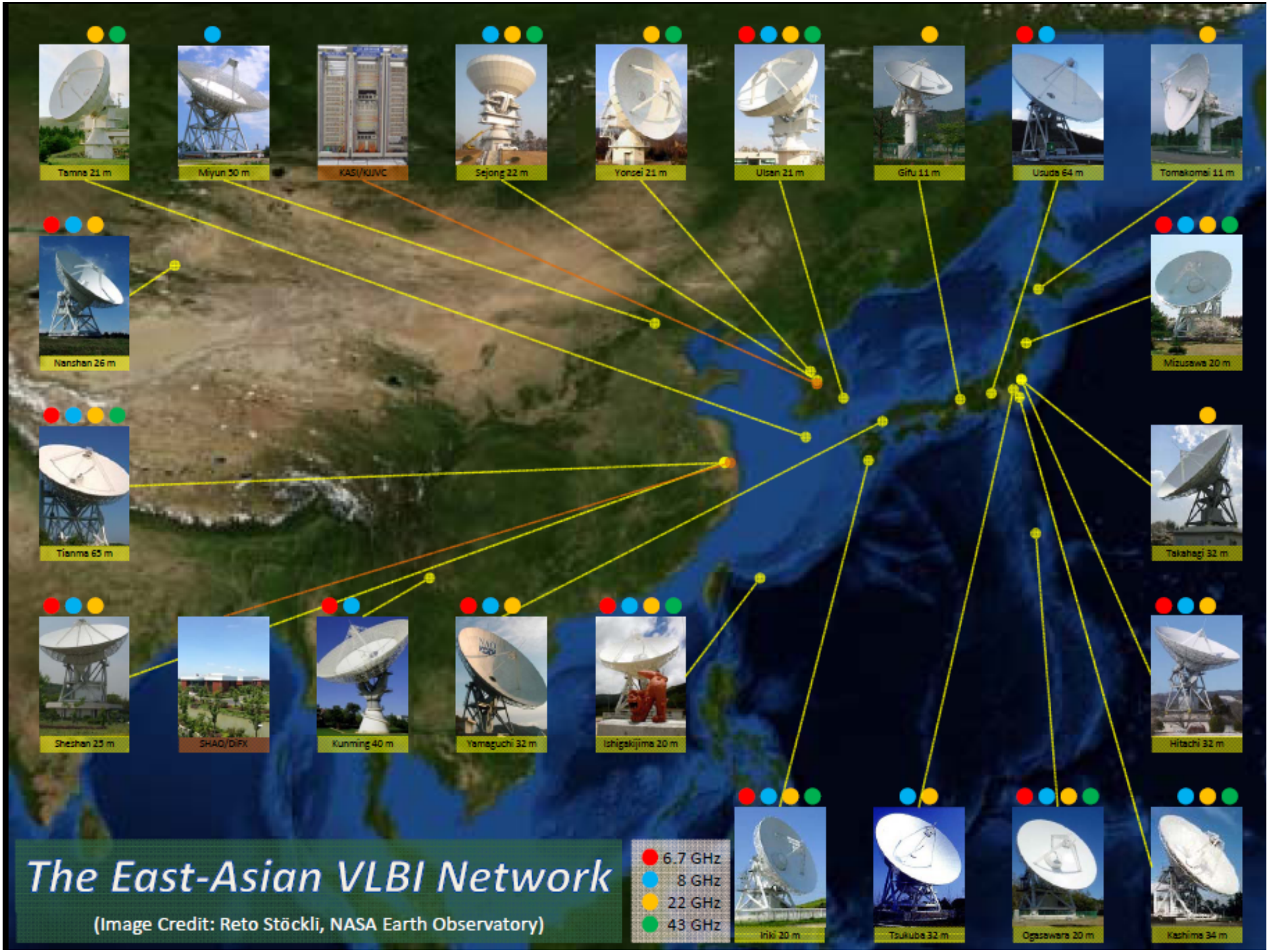
  technical overlap (interferometer)

  frequency overlap, science overlap

Wavelength - Angular-resolution

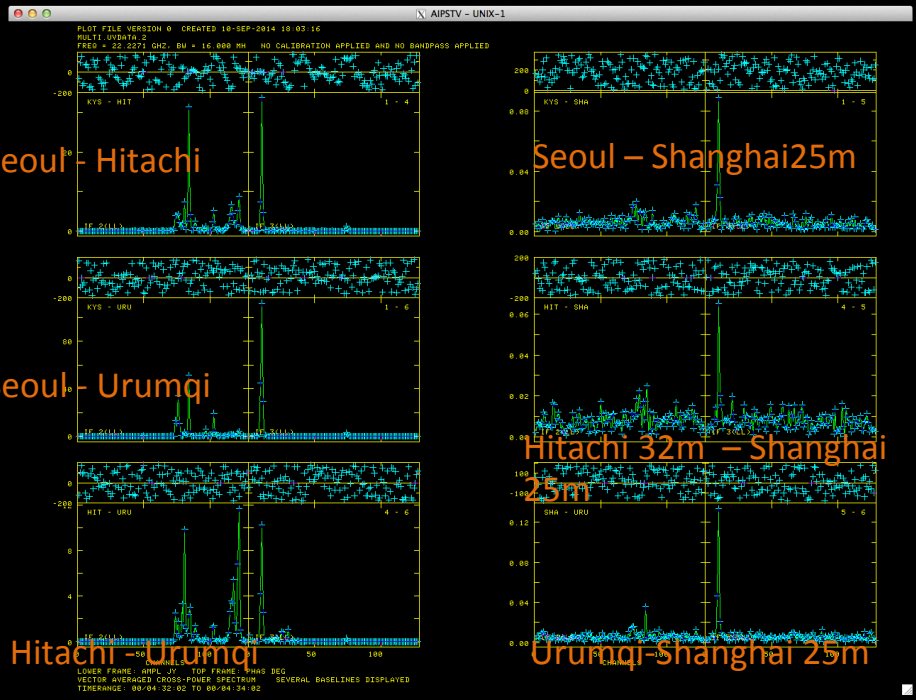
- angular resolution: Θ～λ / D




Tamna 21 m
Miyun 50 m
KASI/KJVC
Sejong 22 m
Yonsei 21 m
Ulsan 21 m
Gifu 11 m
Usuda 64 m
Tomakomai 11 m
Nanshan 26 m
Mizusawa 20 m
Tianma 65 m
Takahagi 32 m
Sheshan 25 m
SHAO/DiFX
Kunming 40 m
Yamaguchi 32 m
Ishigakijima 20 m
Hitachi 32 m
Iriki 20 m
Tsukuba 32 m
Ogasawara 20 m
Kashima 34 m
The East-Asian VLBI Network
(Image Credit: Reto Stöckli, NASA Earth Observatory)
6.7 GHz
8 GHz
22 GHz
43 GHz

EAVN VLBI fringe tests

- 2014 January (3rd fringe test)
- Source: W49N (22 GHz maser)



EAVN "Tiger Team" (Test observation team) face-to-face meeting at Shanghai in July 2014

A plan for new telescope in Thailand

- NARIT has a plan to build TVN.

KaVA Science WG in Krabi
21-24 Feb 2016

Comparison of SKA, EAVN and other array

	EAVN	EAVN +FAST	EAVN +QT,FAST	EVN	VLBA+ GBT+ VLA	Global VLBI (EA/Eu/ US)	SKA-1 (mid)	SKA-2 (mid)
Operating from	2018?	2022?	2022?	Operating	Operating	?	2023?	2028??
Max. Baseline (km)	5000	5000	5000	2000-10000	8000	10000	150	3000
Collecting area (m^2)	**15000**	**86000**	**96000**	**20000**	**26000**	61000 ~ 142000	**32600**	**440000**

FAST 500m corresponds to an effective diameter of 300m

QT: Planned new 110m in Urumqi

建設中のFAST, 2016年秋完成予定

Science cases

- AGNs
- Masers, SFR, AGB stars
- Galactic structure

+

- Pulsars
- Radio transients
- Cosmology
- SETI (!?)

Proposal

Shouldn’t we seriously consider what to do with VLBI in SKA era ?