Status of VERA correlator and future plan

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1. Current status of VERA correlator
2. Requirement for next generation VERA Correlator

VERA array and Correlator

20m x 4 telescopes + FX Correlator @ Mitaka

Iriki

Mizusawa

Ishigaki-jima

Ogasawara

Mitaka FX Correlator

Originally developed for VSOP

256 Mbps, 10 stations (45 baselines)

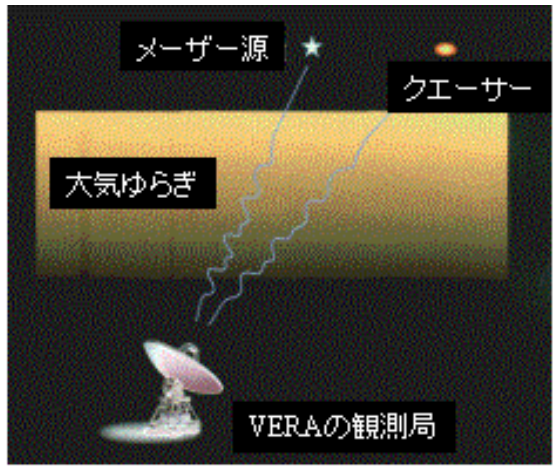
Modified for VERA (dual beam, 1 Gps)

1024 Mbps, 5 stations (10 baselines)

Flexibility in bandwidth and resolution

Band, resolution etc.

- VSOP : 16 MHz x 2 CH
  32 MHz x 2 CH



- VERA:
  16 MHz x 1 + 15 Maser + QSO
  32 MHz x 1 + 7 Maser + QSO
  32 MHz x 2 + 6 SiOx2 + QSO
  128 MHz x 1 + 1 QSO + QSO
  16 MHz x 4 + 12 S/X
  spectral resolution : 512, 1024, 2048, …

Future extension 1

Data rate : currently 1 Gbps

possibly 2 Gpbs for some stations

(maybe 10 Gbps in 2020… ?)

Band assign : will be more complicated

e.g., Dual-pol. SiO mode

maser 4 + QSO 12

Future extension 2

Stations : collaborations with other telescopes
(NRO45m, NICT34m, universities,
KVN, VSOP-2, GSI…)

Terminal : Different terminal, recording rate

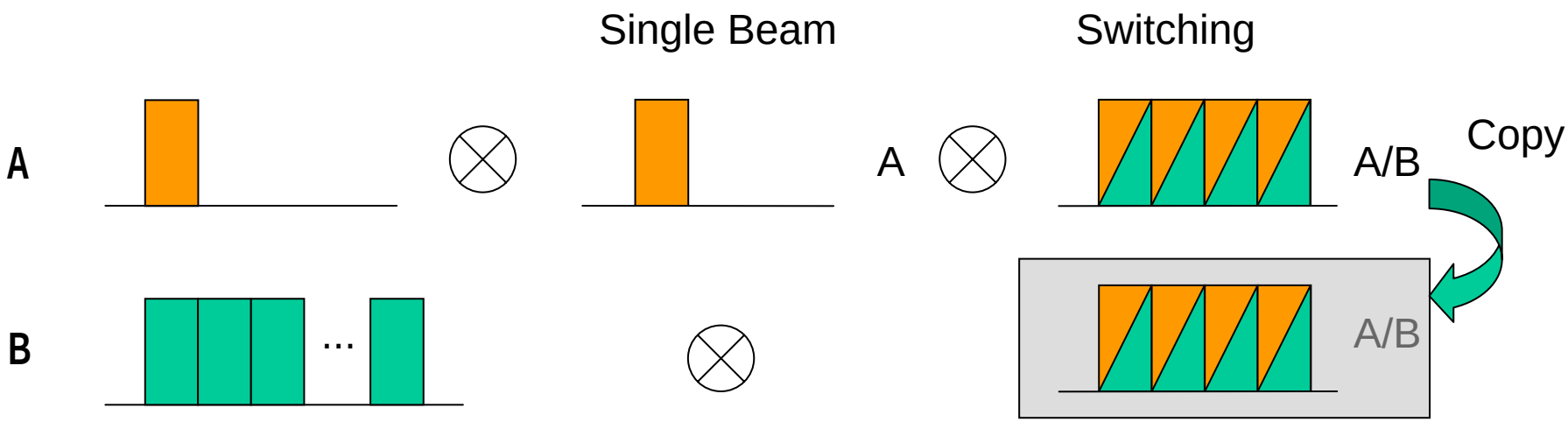
Obs.mode: 2B (VERA) + 1B(others)
2B (VERA) + Switching (others)

Correlation scheme

VERA (DIR2000)

Station A (DIR1000 ?)

Station B (K5/Mark5 ?)



Next Generation VERA correlator

- Requires flexibility to accept varieties in

  terminal (DIR1000, 2000, K5, Mark5, …)
  band assignment
  spectral resolution
  observation mode (2beam, 1beam, switching)

  + potentials for higher data rate

- Accurate apr. model