SKAO

MASUM 2022

MeerKAT Integration & SMPWG

Gerhard Swart

11 May 2022

Integrating the MeerKAT precursor into SKA Mid
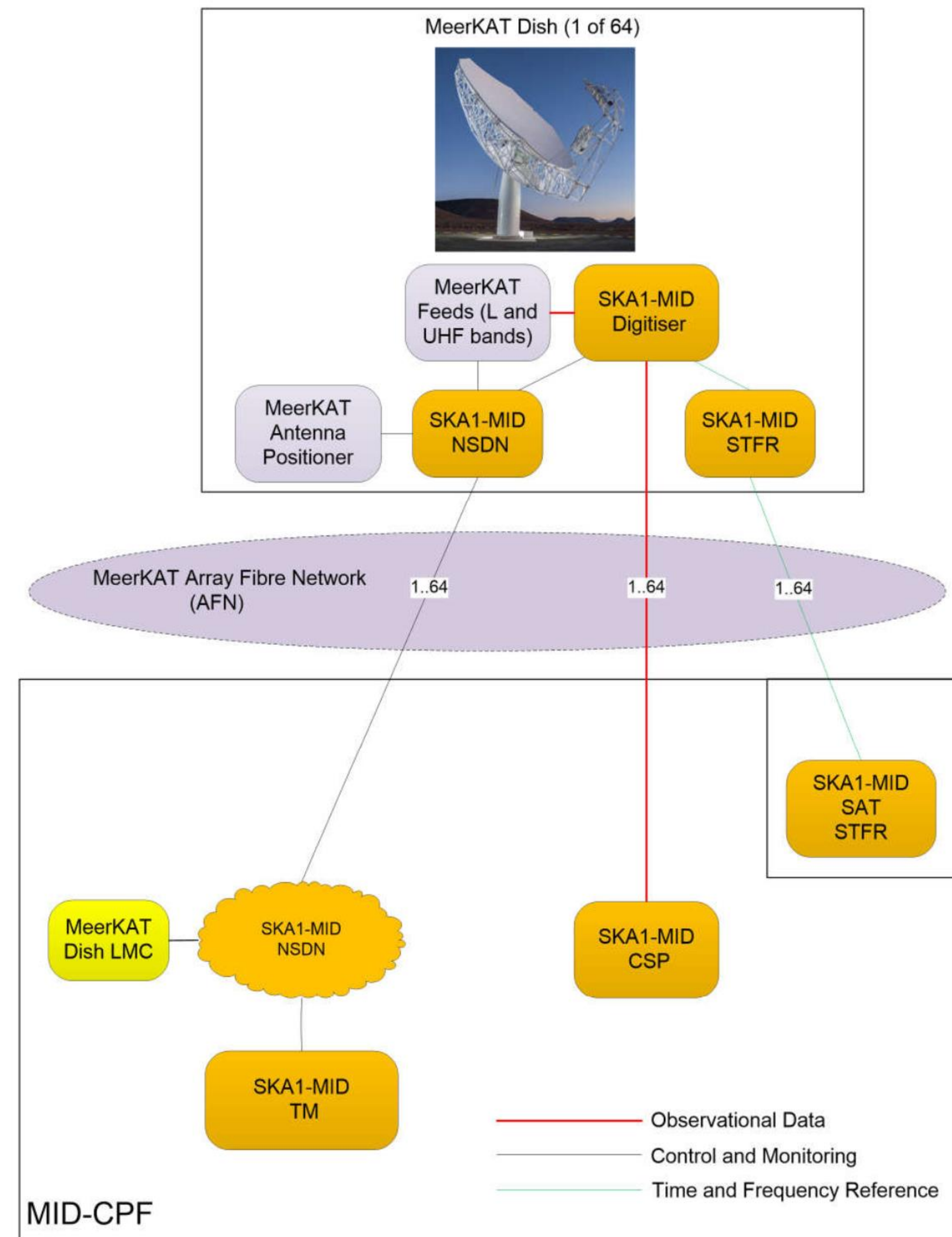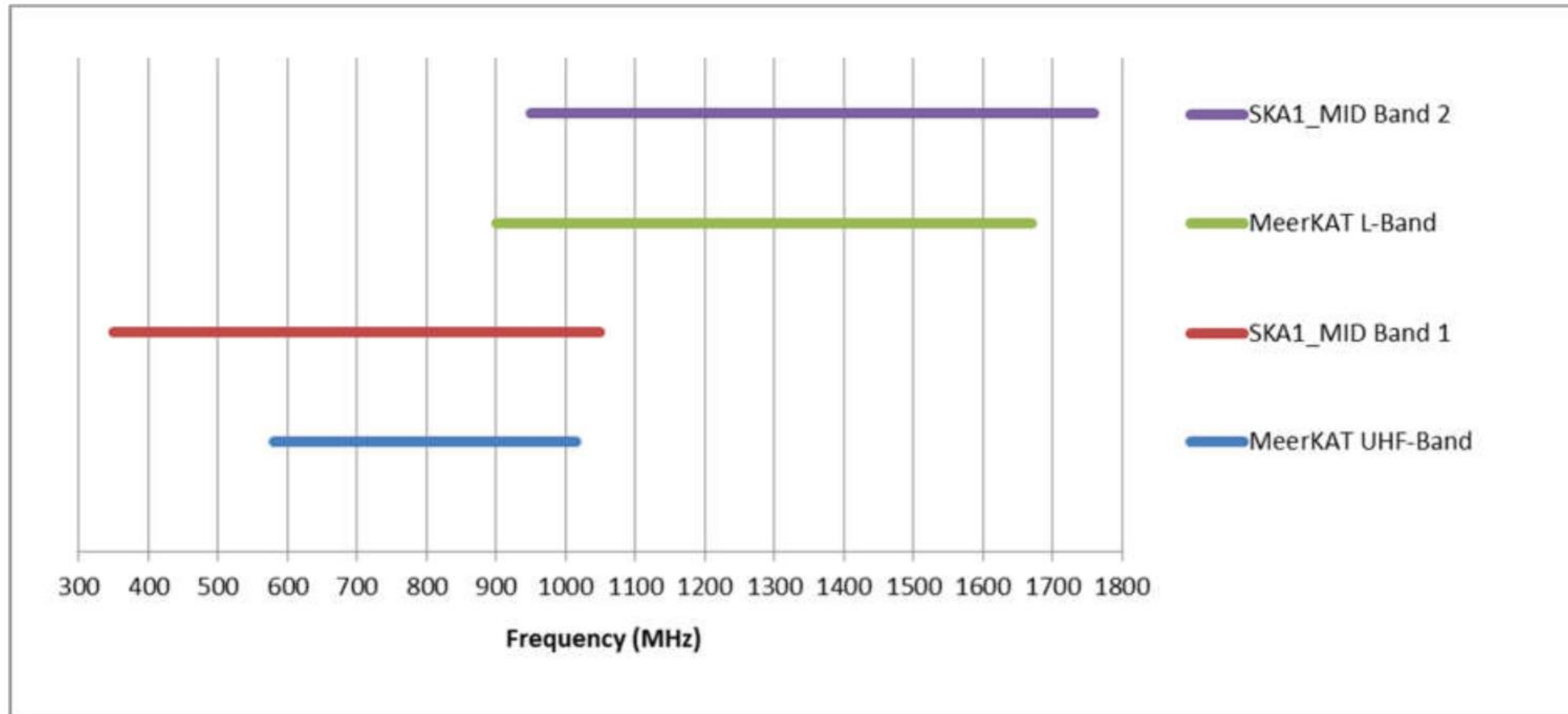

From: https://www.sarao.ac.za/

What is integrated?

- Retain MeerKAT Dish and Feeds

- Add SKA digitiser, SAT and NSDN to pedestal

- Re-use MK network Fibres

- All LMCs on one server in CPF communicating to 64 x Dish & Feed controllers

See: R. Lord et al,
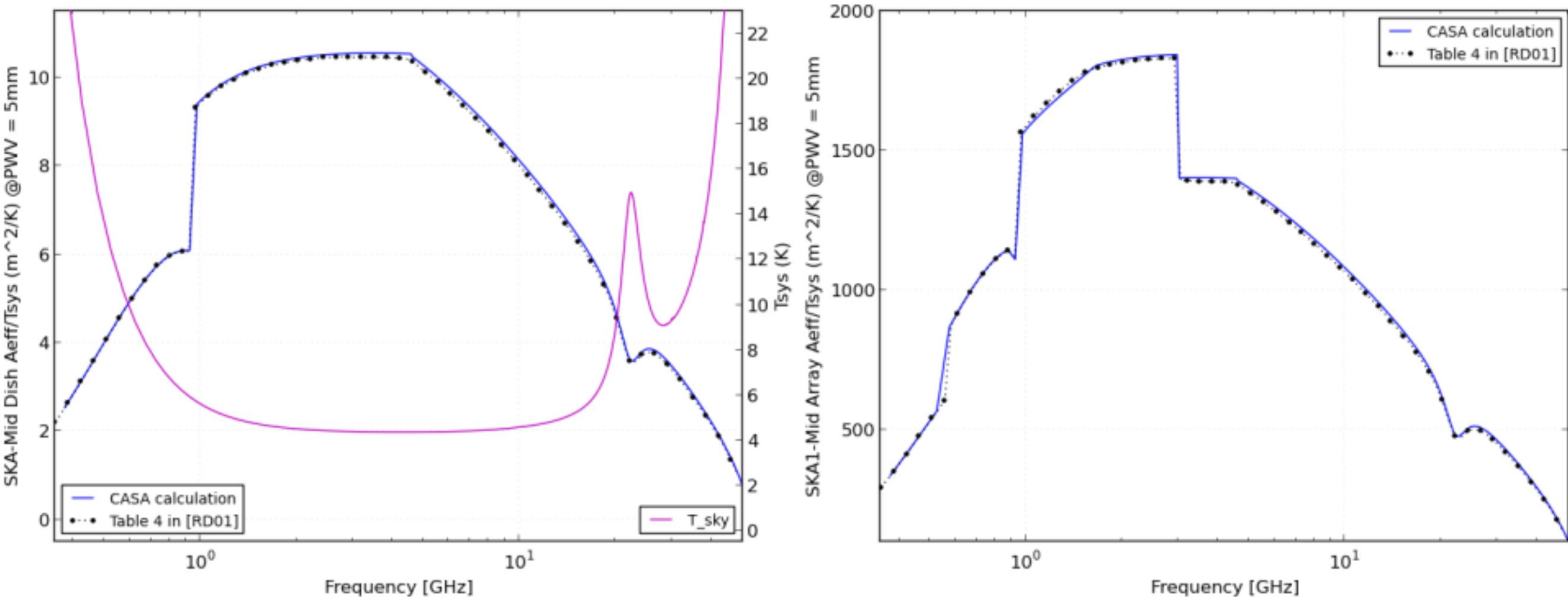SKA-TEL-AIV-2440001 MeerKAT Precursor Integration Plan

MeerKAT Bands after integration

- Use SKA SPFRx123 Digitiser

- Use MeerKAT UHF and L-Band feeds

Expected Mid imaging sensitivity with MeerKAT added

Ref. S. Asayama, *SKA1-Mid Sensitivity analysis with CASA*
See: R. Braun et al., SKA-TEL-SKO-0000818 *Anticipated SKA1 Performance*
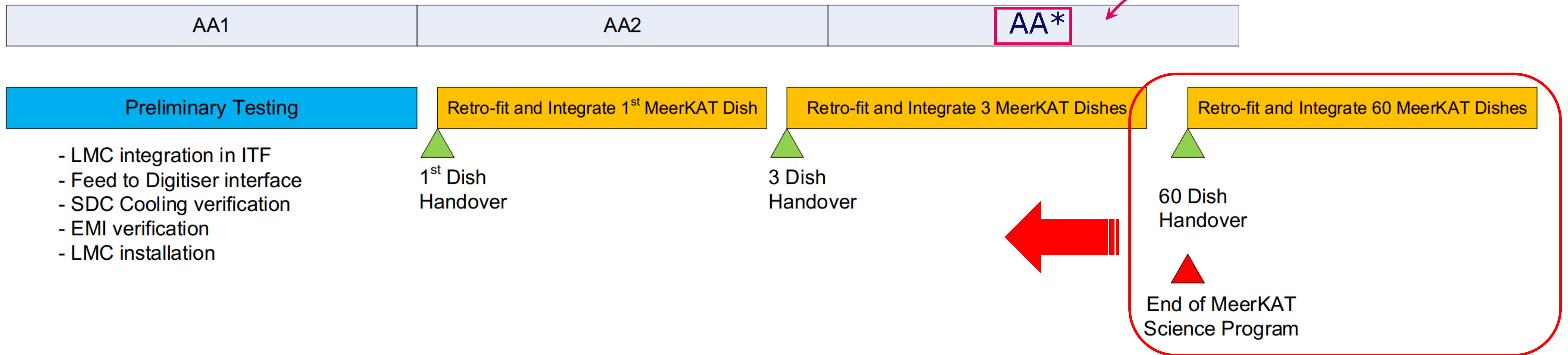
Extended MeerKAT (MK+)

- SARAO and MPI are extending the MeerKAT through the addition of 16 SKA Mid Dishes with Band 2 Feeds

- Located on SKA Mid Dish locations

- To be integrated fully into SKA Mid and retrofitted to be equivalent to an SKA Dish

- MK+ Dish Structure manufacture kicked off before SKA Dish CDR, & has other suppliers, so is a bit different

- Builds some of Mid Infrastructure, e.g. 20 of the 197 SKA Foundations

MK Integration into the Mid Array

- Separate MK Integration contract (Q4 2022)

- Each MK Dish to undergo Dish AIV process

- Qualify one conversion before doing the remainder

- Final schedule determined by SKA progress

+16x MK+ Dishes

AA1	AA2		AA*	

Preliminary Testing

Retro-fit and Integrate 1st MeerKAT Dish

Retro-fit and Integrate 3 MeerKAT Dishes

Retro-fit and Integrate 60 MeerKAT Dishes

- LMC integration in ITF
- Feed to Digitiser interface
- SDC Cooling verification
- EMI verification
- LMC installation

1st Dish
Handover

3 Dish
Handover

60 Dish
Handover

End of MeerKAT
Science Program

Other MeerKAT interfaces

- SKA inherits engineering ops processes and records

- Power distribution, buildings and facilities

- Integrate their Masers into our SAT Timescale (without losing accurate timing to SKA operations!)

- Potential interference from working on their operational site (Tracey's talk)

- SOC, EOC and SPC (Tracey's talk)

SKA MeerKAT Programmatic Working Group (SMPWG)

- Series of engagement meetings between SARAO/SKAO:

  - Technical forums (e.g. SAT, RFI, Operations)

  - Co-ordination meetings (Site activities, SKA Programmes at SARAO)

- SMPWG Meeting once per quarter

  - Report back on the above meetings

  - Report on SKA Mid progress

  - MeerKAT and MeerKAT+ status and interfaces

  - Host country work

Thank you.
gerhard.swart@skao.int

*We recognise and acknowledge the
Indigenous peoples and cultures that have
traditionally lived on the lands on which
our facilities are located.*

SKAO