A report on KAT-7 and MeerKAT status and plans

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The Team (Who)
Reserve 21.44E 30.71S
KAT-7 site
Losberg
KAT-7 (What)

- 7 composite 12m dishes
- Altaz mount prime focus
- 4 operational with uncooled receivers
- Cryogenic receivers from October
- Lband (1200-1950MHz)
- 256MHz instantaneous IF
- RF over fibre links
- LOFAR containers for digital
A ROACH board
KAT-7 Correlator

- ROACH based (FX type)
- Uses the SPEAD (Streaming Protocol for Exchange of Astronomical Data) for internal data streaming
- 'KAT-7' – 16 inputs late 2010/early 2011
- Will have fringe and delay stopping
- Continuum mode and line modes (will support 8192 channels)
- Tied array option for Pulsars, VLBI etc.
- Will be used for more commissioning & some science
• Mains power next week (currently diesel)
• Cryogenic receivers arrive when mains power is stable
• VSAT link site-Cape Town now
• 10Mbps link October soon
• 10Gbps 'soon'
• Mains power next week (currently diesel)
Also nearby

- PAPER experiment
- C-bass dish
MeerKAT

- Original plan was 80x12m dishes
- Now 64 composite 13.5x12m dishes
- Altaz mount offset Gregorian
- 0.5-2GHz and 8-14GHz
- The model is only a straw man version
- Correlator will be a mixture of ROACH2 and GPU hardware
- Maybe FFX architecture
- 1 → 2 → 4 GHz instantaneous bandwidths
MeerKAT uv coverage
MeerKAT VLBI

- New dish type will delay the project (phase 1 2015..)
- 15° elevation limit prevents VLBI with VLBA
- Spur out to 60km will come last
- There is space for a C band feed (agitate now!)
- The main plan is for eVLBI
VLBI plans

- Both the KAT-7 and MeerKAT will do tied-array VLBI, so testing will be on KAT-7
- Initial tests will be with Hartebeesthoek and the Australians
- 18cm 64MHz bandwidth dual pol, FTP-VLBI
- Single dish early 2011
- Tied array late 2011/early 2012
Current VLBI limitations

- Only Rb clock at present (will get H Maser for MeerKAT)
- No recorder yet!
- Fiber to Cape Town late 2010
- Need SPEAD → VDIF converter
- Need VEX → local schedule converter
- Only Lband receivers on KAT-7
- Linear polarization
- Tied array operational in 2011
- KAT-7 Total collecting area equivalent to a 30m dish
- Cooled receivers on all dishes early 2011
But...

- Rb should be adequate for Lband
- Mark5C is a modified ROACH with disk array
- It can be done manually on site if we have a simple schedule
- Australians can convert simple raw data formats
- Single dish Lband uncooled receiver is simple and robust
Watch this space

- South Africa is recruiting an astromomer base!
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