A report on KAT-7 and MeerKAT status and plans

Tony Foley

tony@hartrao.ac.za

The Team (Who)

Site (Where)


SKA Site Complex
KAT Support Base
Western Cape
Cape Town
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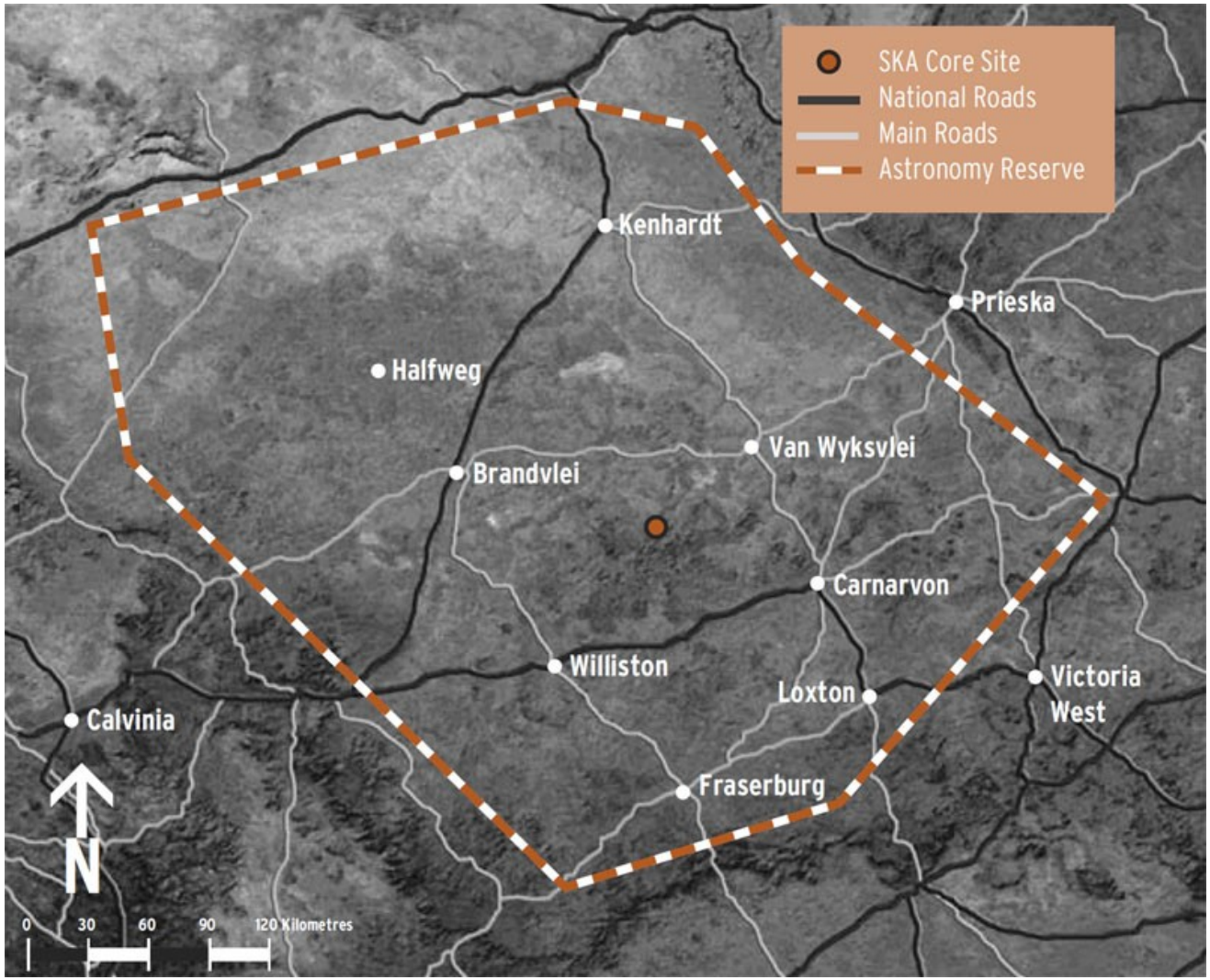
Reserve 21.44E 30.71S



KAT-7 site

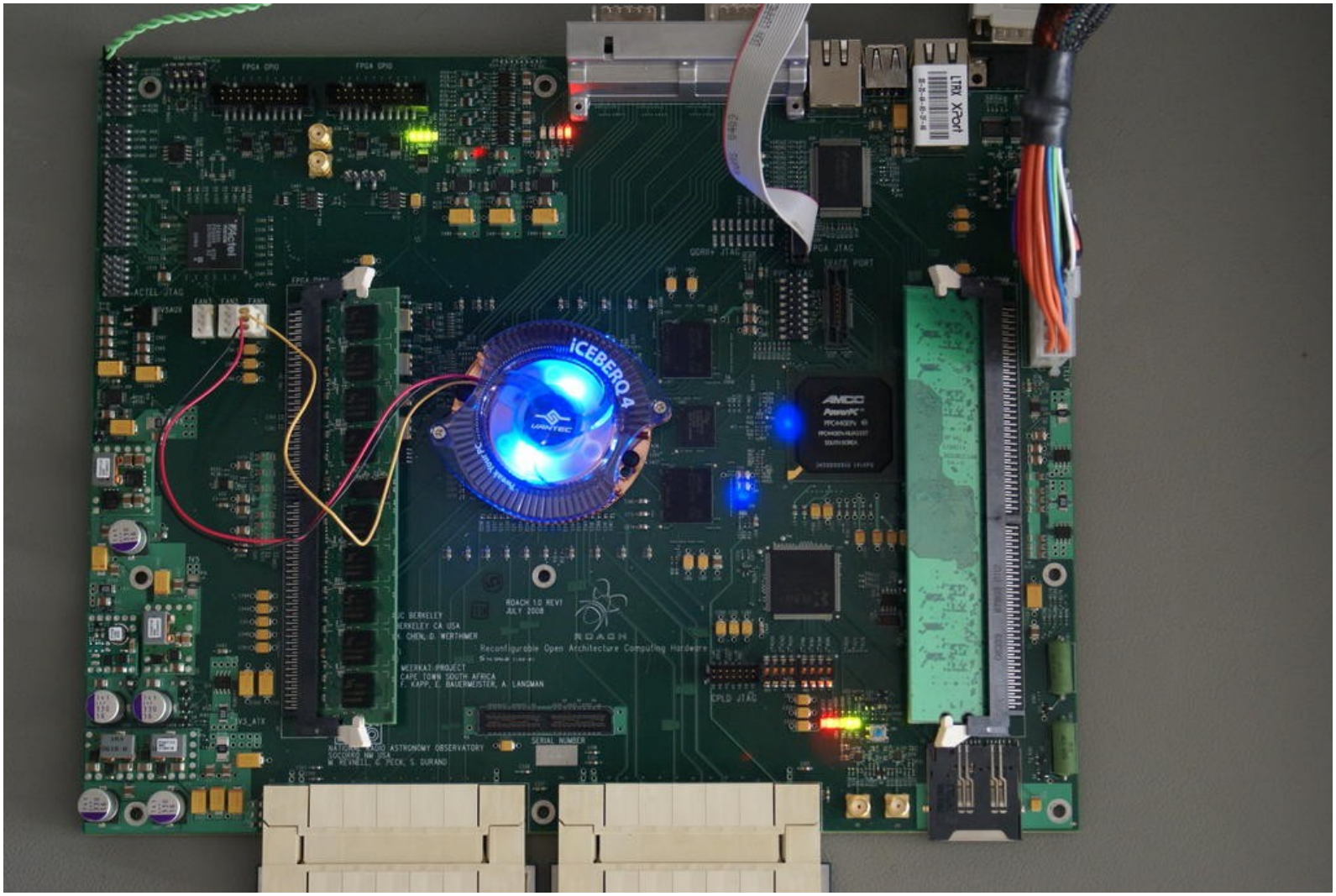
Losberg

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

KAT-7

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

Status

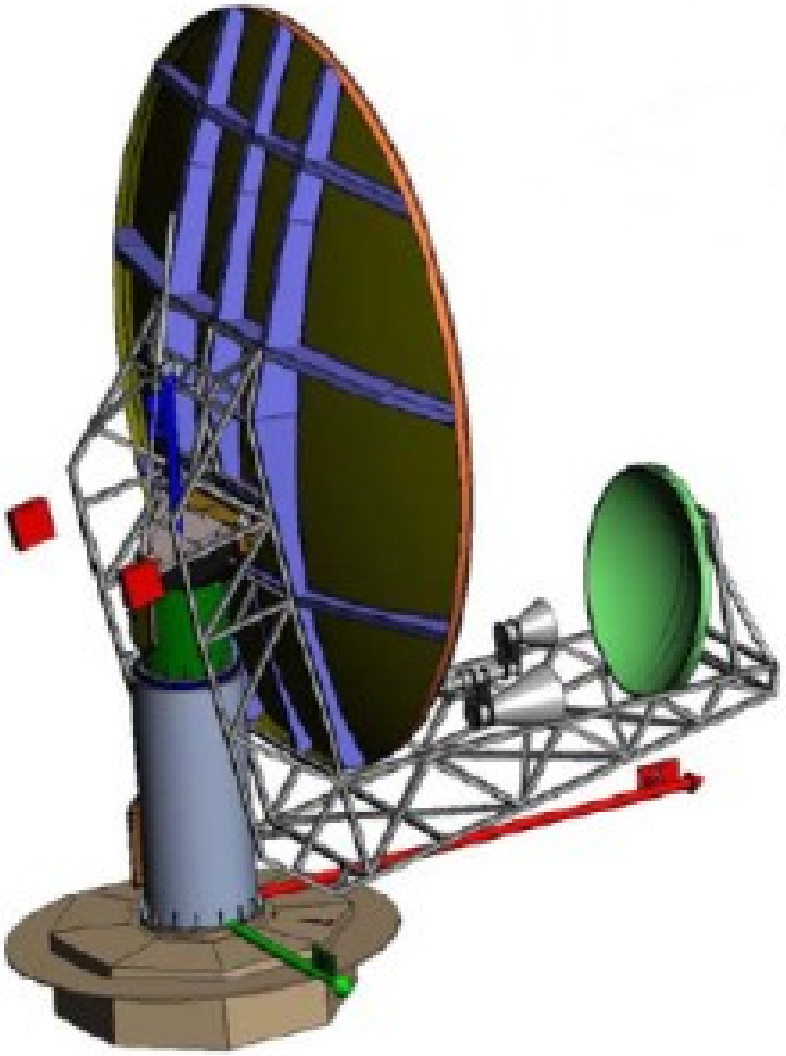
- Mains power next week (currently diesel)
- Cryogenic receivers arrive when mains power is stable
- VSAT link site-Cape Town now
- 10Mbps link October
- 10Gbps 'soon'

Also nearby

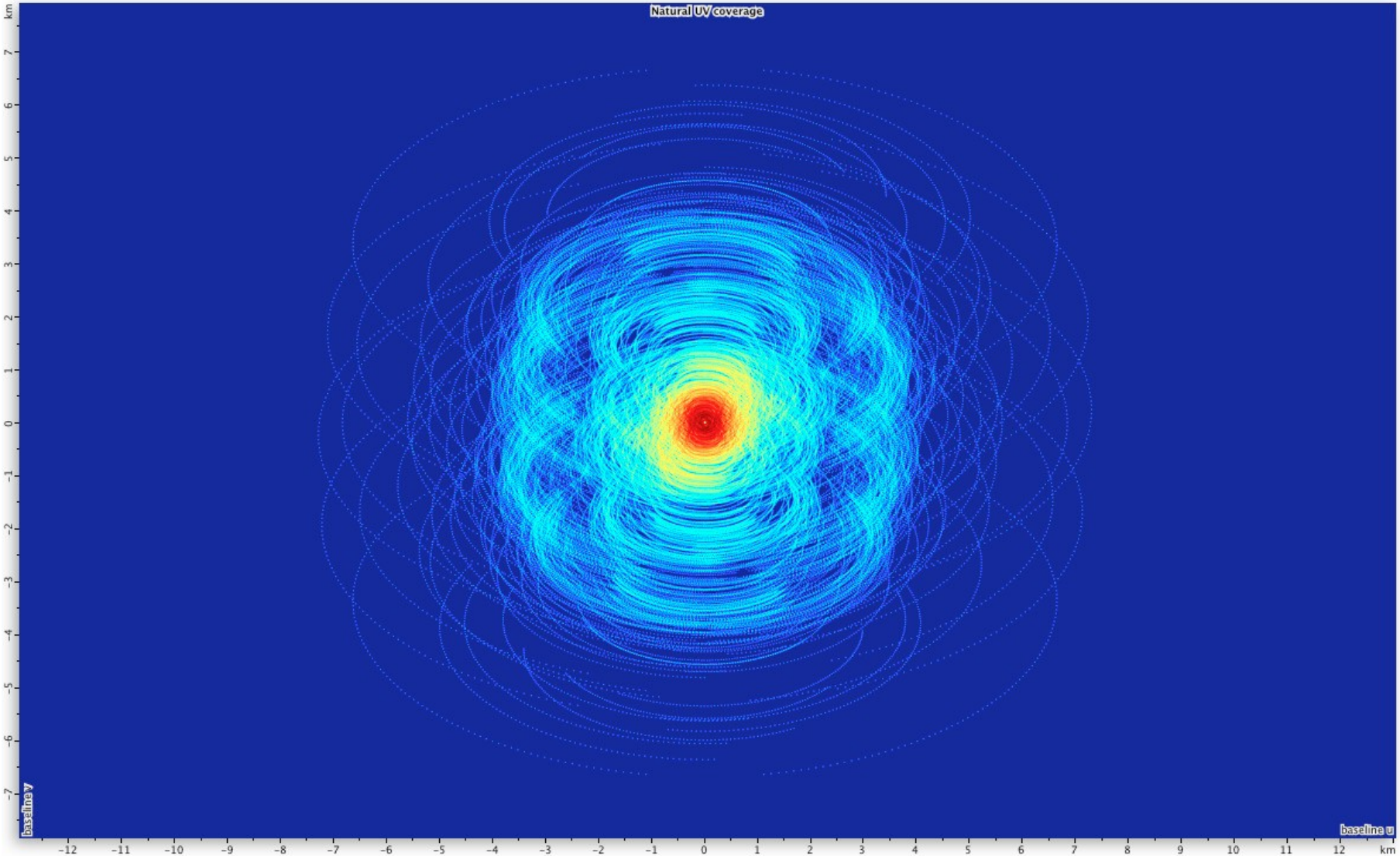
- **PAPER experiment**
- **C-bass dish**

MeerKAT

- Original plan was 80x12m dishes
- Now 64 composite 13.5x12m dishes
- Altaz mount offset Gregorian
- .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

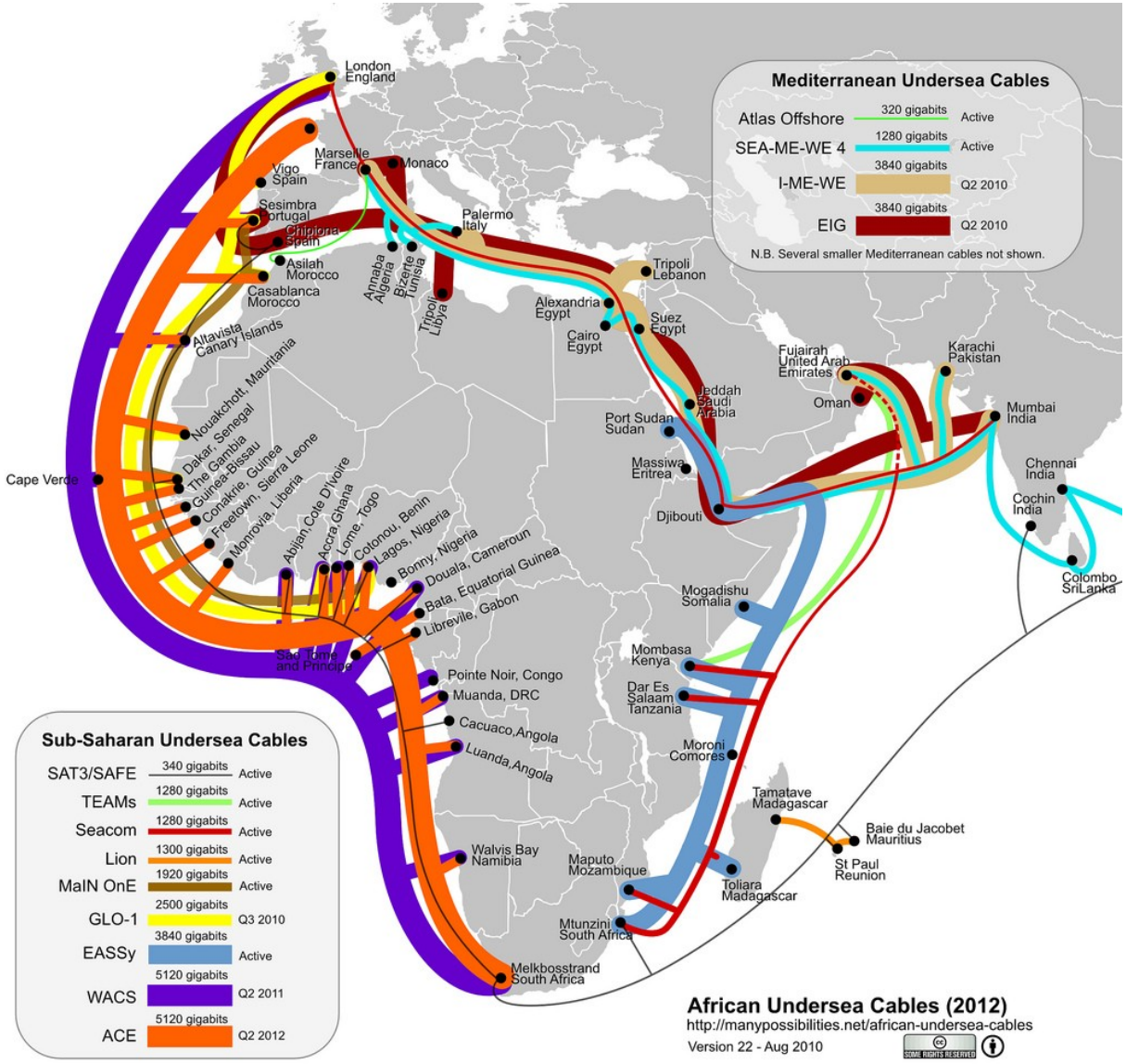


MeerKAT uv coverage



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


Mediterranean Undersea Cables
Atlas Offshore 320 gigabits Active
SEA-ME-WE 4 1280 gigabits Active
I-ME-WE 3840 gigabits Q2 2010
EIG 3840 gigabits Q2 2010
N.B. Several smaller Mediterranean cables not shown.
Sub-Saharan Undersea Cables
SAT3/SAFE 340 gigabits Active
TEAMs 1280 gigabits Active
Seacom 1280 gigabits Active
Lion 1300 gigabits Active
MaIN OnE 1920 gigabits Active
GLO-1 2500 gigabits Q3 2010
EASSy 3840 gigabits Active
WACS 5120 gigabits Q2 2011
ACE 5120 gigabits Q2 2012
London England
Marseille France
Monaco
Vigo Spain
Sesimbra Portugal
Chipiona Spain
Palermo Italy
Asilah Morocco
Casablanca Morocco
Annaba Algeria
Bizerte Tunisia
Tripoli Libya
Tripoli Lebanon
Alexandria Egypt
Cairo Egypt
Suez Egypt
Altavista Canary Islands
Nouakchott, Mauritania
Dakar, Senegal
The Gambia
Guinea-Bissau
Conakrie, Guinea
Freetown, Sierra Leone
Monrovia, Liberia
Cape Verde
Abijan,Cote D'Ivoire
Accra Ghana
Lome, Togo
Cotonou, Benin
Lagos, Nigeria
Bonny, Nigeria
Douala, Cameroun
Bata, Equatorial Guinea
Libreville, Gabon
Sao Tome and Principe
Pointe Noir, Congo
Muanda, DRC
Cacuaco,Angola
Luanda,Angola
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Tamatave Madagascar
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Dar Es Salaam Tanzania
Mogadishu Somalia
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Massiwa Eritrea
Port Sudan Sudan
Jeddah Saudi Arabia
Oman
Fujairah United Arab Emirates
Karachi Pakistan
Mumbai India
Chennai India
Cochin India
Colombo SriLanka
African Undersea Cables (2012)
http://manypossibilities.net/african-undersea-cables
Version 22 - Aug 2010
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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!
- UCT **pwoudt@ast.uct.ac.za**
- UWC **http://www.uwcastro.org/jobs.shtml**