SA^3

www.sa3.ac.za

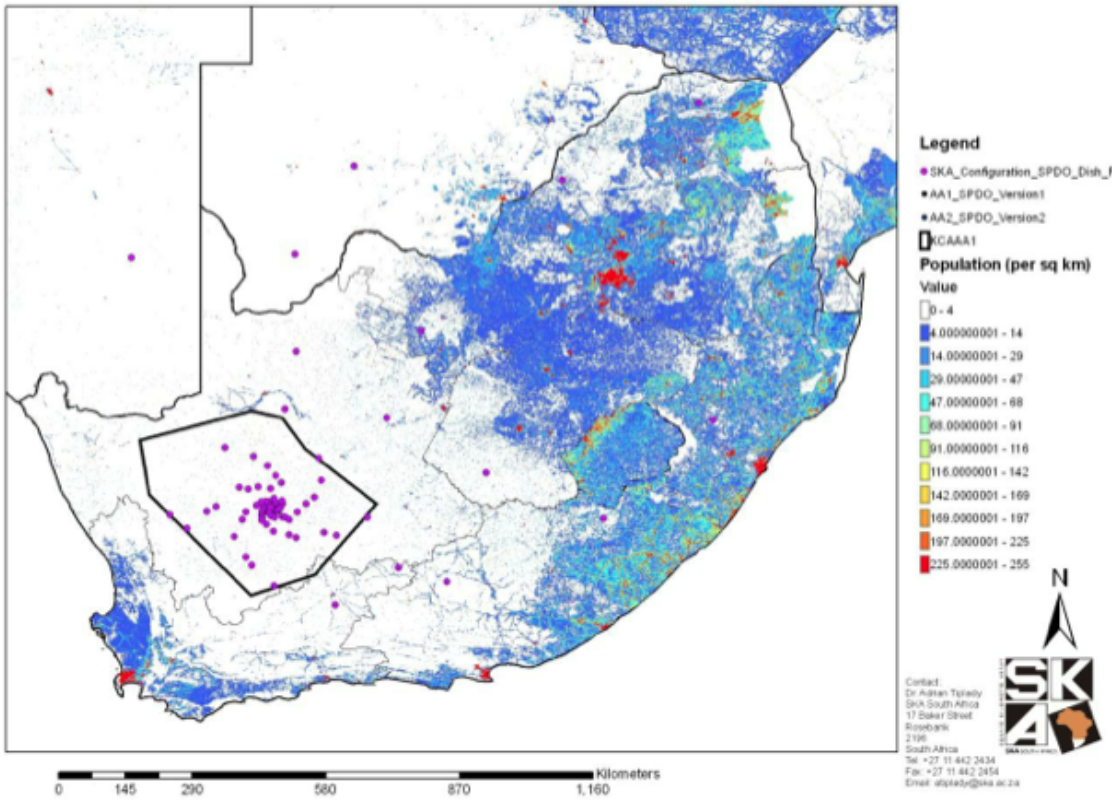
L. Magnus, P. Whitelock, S. Barway

IVOA Interop Spain 2014

National Research Foundation | SA^3 South African Astroinformatics Alliance

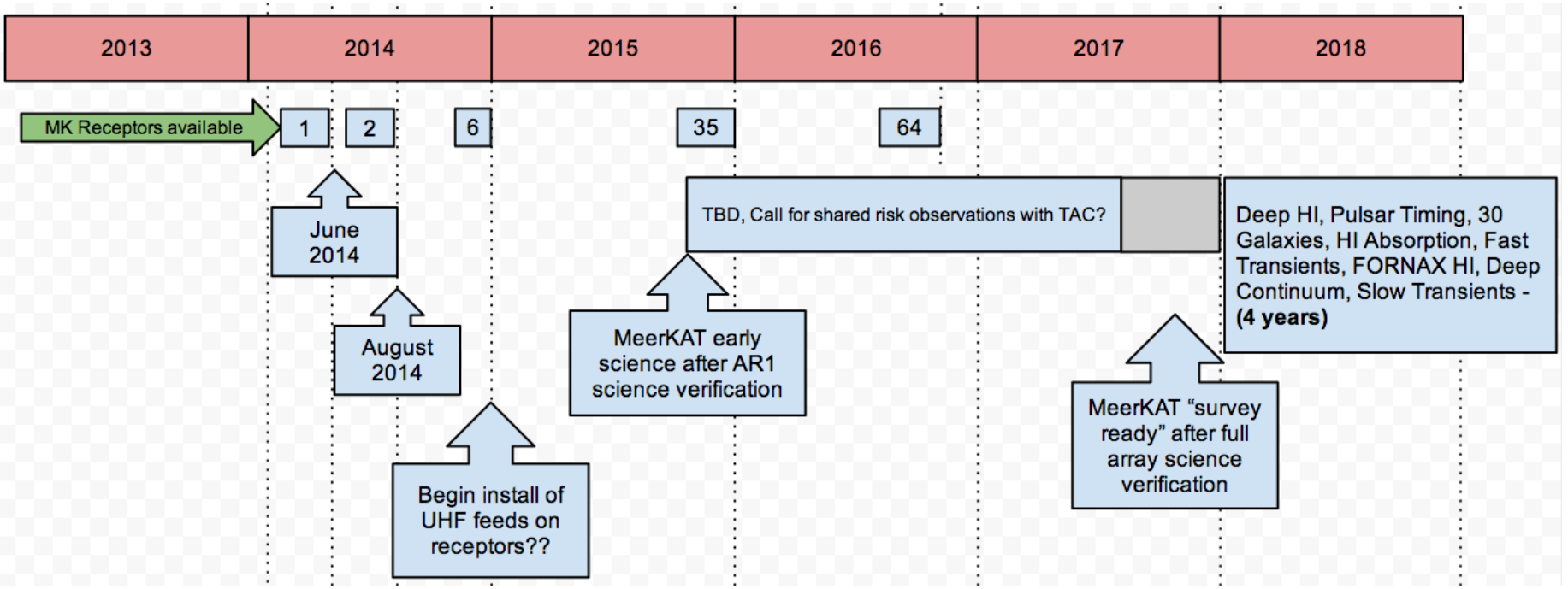
SKA AFRICA SQUARE KILOMETRE ARRAY

Where is the MeerKAT located



MeerKAT is coming together on the ground

MeerKAT timelines



MeerKAT L-Band Science

Radio Pulsar Timing: Testing Einstein's theory of gravity and gravitational radiation - Investigating the physics of enigmatic neutron stars through observations of pulsars.

LADUMA (Looking at the Distant Universe with the MeerKAT Array) - An ultra-deep survey of neutral hydrogen gas in the early universe. 5000hrs 1 field

MeerKAT Absorption Line Survey for atomic hydrogen and OH lines in absorption against distant continuum sources (OH line ratios may give clues about changes in the fundamental constants in the early universe). 2hrs 1000 fields

MHONGOOSE (MeerKAT HI Observations of Nearby Galactic Objects: Observing Southern Emitters) - Investigations of different types of galaxies; dark matter and the cosmic web. 200hr 30 fields

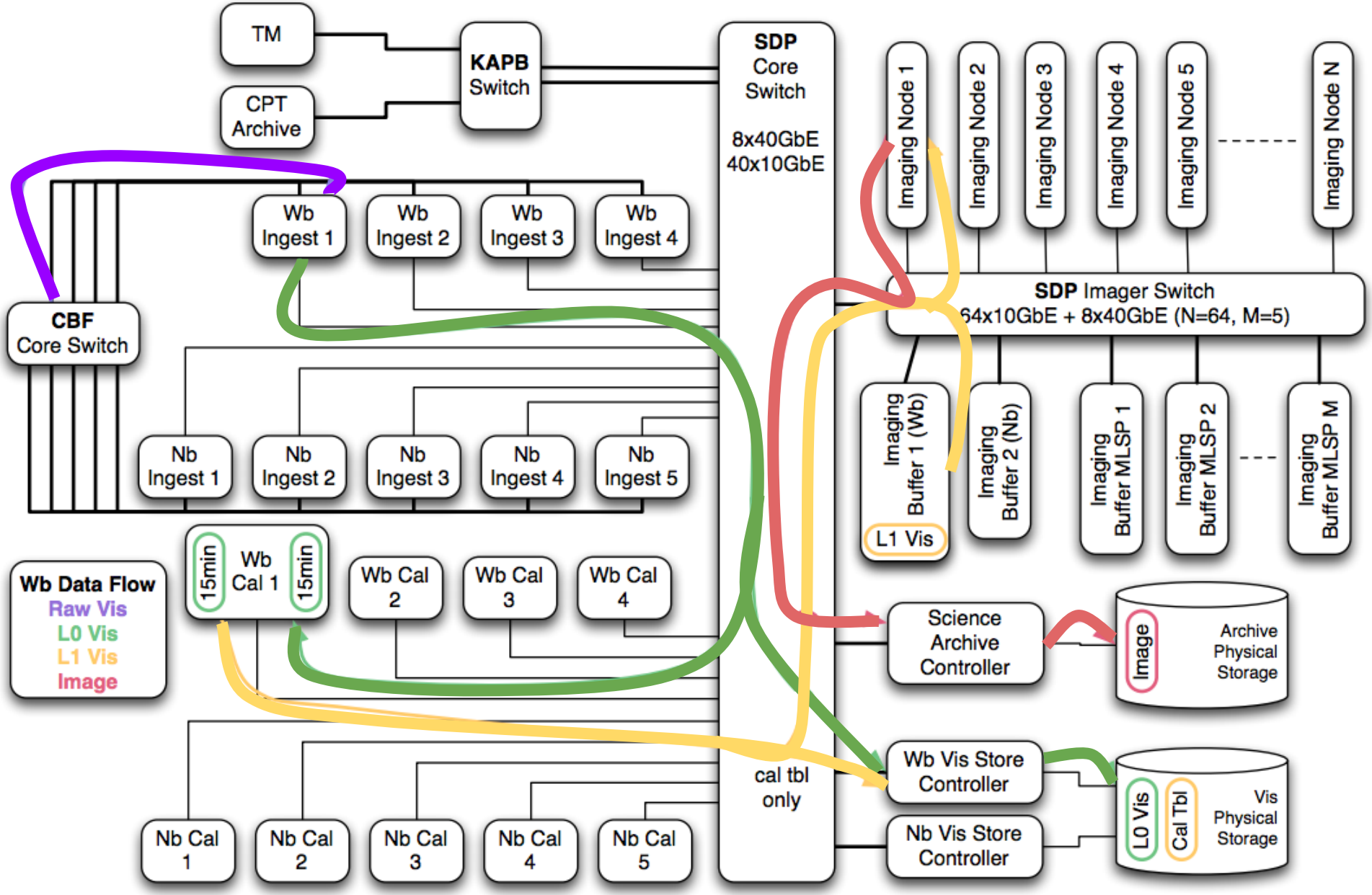
TRAPUM (Transients and Pulsars with MeerKAT) - Searching for, and investigating new and exotic pulsars.

A MeerKAT HI Survey of the Fornax Cluster (Galaxy formation and evolution in the cluster environment). 50hr on 49 mosaiced fields

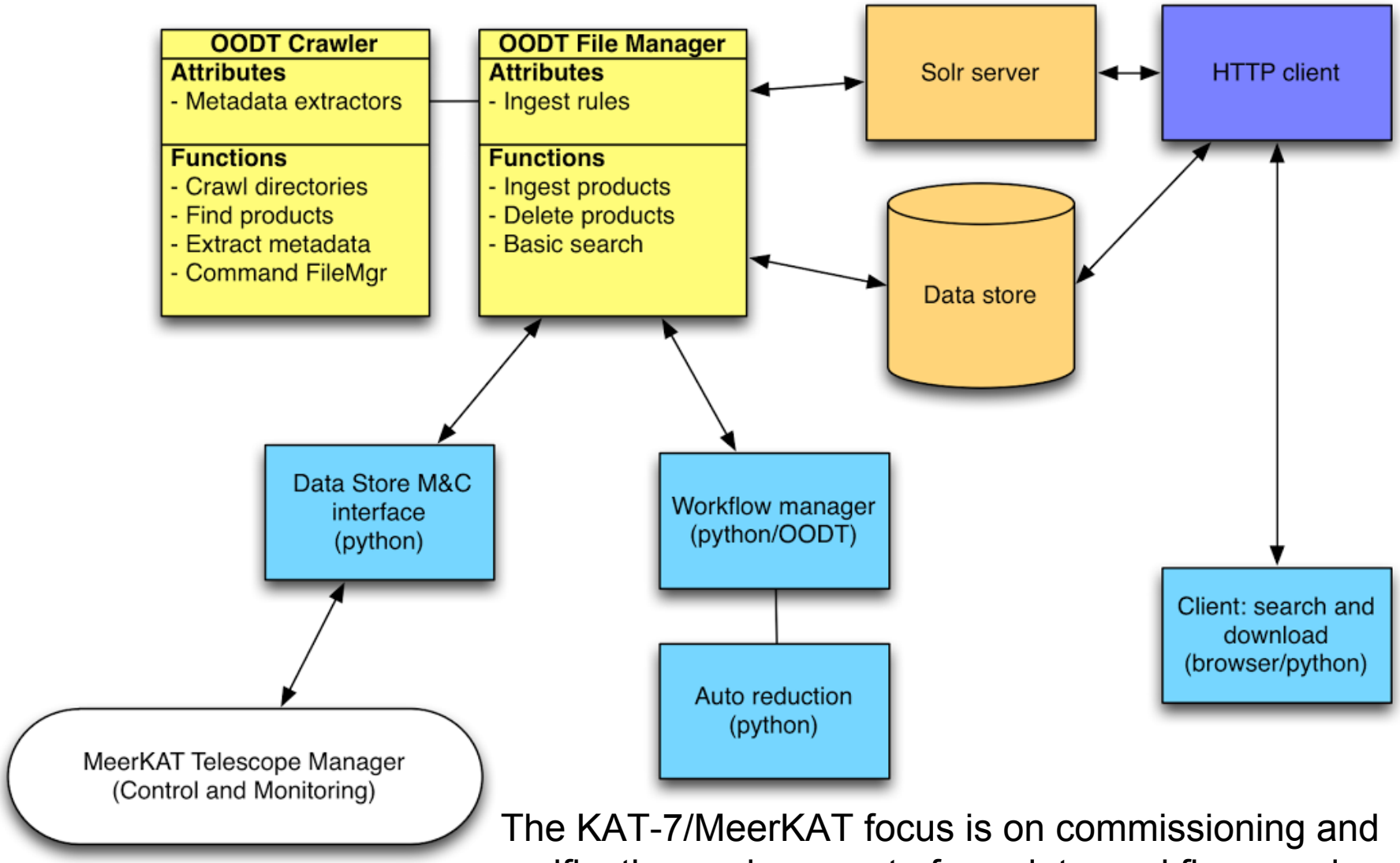
MIGHTEE (MeerKAT International GigaHertz Tiered Extragalactic Exploration Survey) - Deep continuum observations of the earliest radio galaxies

ThunderKAT (The Hunt for Dynamic and Explosive Radio Transients with MeerKAT) - eg gamma ray bursts, novae and supernovae, plus new types of transient radio sources. 3000hr survey time unknown fields

Science and data processing



What are we doing now



The KAT-7/MeerKAT focus is on commissioning and verification and so most of our data workflows and archiving tools are centred around access to the raw visibility data

The raw data archive

Data Archive

Observer

Description

Target

File Name

Start Date

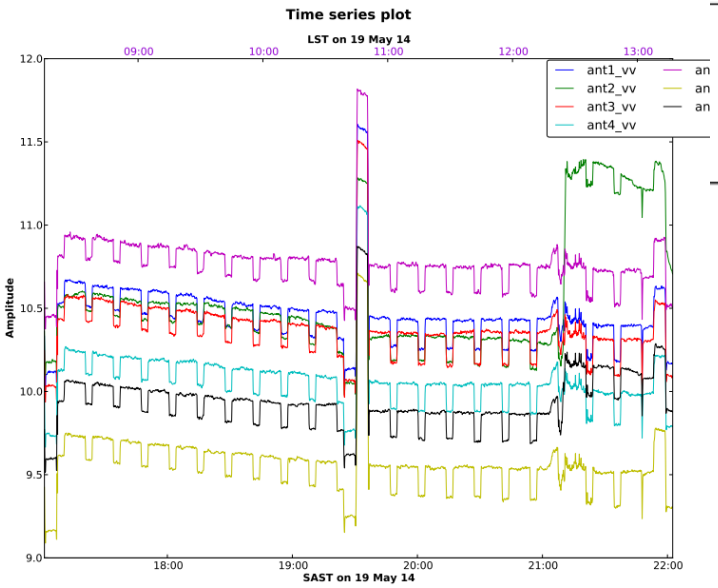
End Date

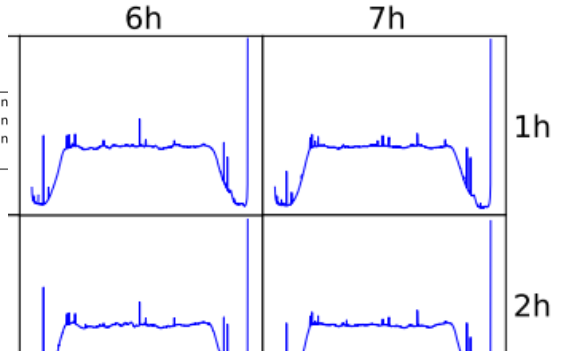
Archive Search

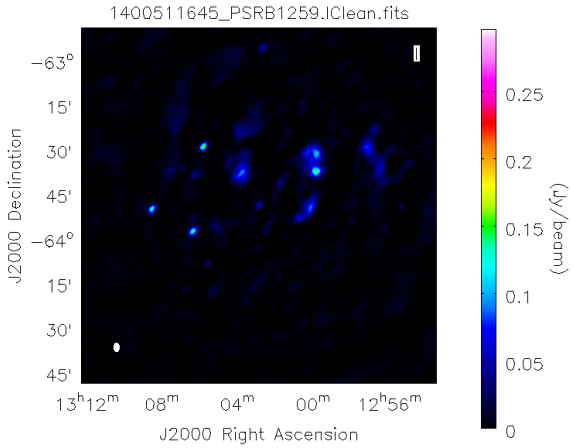
File Name	Experiment ID	Capture Start Time	Capture Duration	Observer	Description	Instruction Set	Targets	Antennas	File Size	Center Frequency
1400511645.h5	20140519-0009	2014-05-19 17:00:56 SAST	5:01:40	Tony Foley	Radio flux and incoherent beamformer monitoring of PSR B1259-63 around the 2014 periastron passage	/home/kat/scripts/observation/image.py -f 1822 --mode c16n400M1k -b 300 -g 180 -t 600 -i 8580 -m 18000 /home/kat/comm/catalogues/PSRB1259-63.csv --stow-when-done --project-id 20140122RA-01 --sb-id-code=20140519-0009 --description=Radio flux and incoherent beamformer monitoring of PSR B1259-63 around the 2014 periastron passage --observer=Tony Foley	PSRB1259, 1329-665, 0823-500, PKS 1934-638	1234567	2.0 GB	1.8 GHz

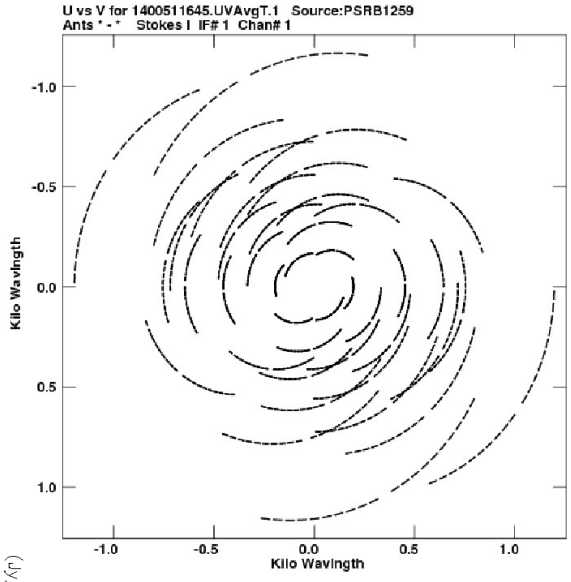
Processed/Pipelined data

- Processing and pipeline tools are focused on quality analysis at the moment. QA1 interrogated the raw data file and presents raw data time series, spectra, phase and other system dependent information
- The QA2 are the output of a continuum imaging pipeline and reports UV plots, calibration tables and a continuum image for each target observed including the calibrators









Way forward

- Our three main data products will be
  - Images, Cubes and Catalogues
- These are pretty well understood (??) VO products and so we don't expect too much hassle
- The issue of large survey proprietary periods is also being workshopped
- There is an intention for data products that are developed by the survey teams to be contained within the MeerKAT official archive
- A further question is raw data sharing and I'm open to ideas discussions in the breaks etc

Questions

info@sa3.ac.za
lindsay@ska.ac.za

www.sa3.ac.za
www.ska.ac.za