2025 Session I (c251)

Correlation Status

Project Code	Block Code	ALMA ProjID	Sources	DOYS	UT	Freq	Stations	Status	PI	Comment
	f251a			114-115		86 GHz		complete		
MP014A	c251a	?				43 GHz		mixed-pol complete, released to PI	Park	missing ALMA APP QA2
MJ008	mj008	-na-				43 GHz		released to PI	Janssen	Americas only, no GBT (skipped), no ALMA (tech. fault)
MP014B	c251b	?				86 GHz		mixed-pol complete, released to PI	Park	missing ALMA APP QA2
POLCAL1	c251b								Krichbaum	
MH007(b)	c251b							released to PI	Hada	
MH007(c)	c251c					86 GHz		released to PI	Hada	
MN005C	c251c							released to PI	Nagar	
POLCAL1	c251c								Krichbaum	
POLCAL3	c251c								Krichbaum	
MK032	c251d	?				43 GHz, 86 GHz		mixed-pol complete, released to PI	Kam	missing ALMA APP QA2

Project Code	Block Code	ALMA ProjID	Sources	DOYS	UT	Freq	Stations	Status	PI	Comment
100GTest	c251z					104/114 GHz	Pv Nn On Ax	released to PI	DWKim	DDT technical test observation

General comments

Station feedback is in feedback_apr25.asc

Mark6 modules are listed in the C251 media distribution plan

APEX observed 86G in receiver LSB, as in Autumn 2024, but this time reverted back to a built-in crappier modular 1st LO synthesizer rather than an Agilent bench top synthesizer. These simple modular LO synth(s) (from VDI Inc and Holzworth) have a tuning-dependent numerical inaccuracy, leading to an APEX LO offset that was ca +8.94 Hz for the 86 GHz GMVA tracks.

APEX in DW Kim's 104/114G track had LO offsets of +21.536 Hz (~~-21.50 Hz~~) at 104 GHz, and -8.262 Hz (~~+8.50 Hz~~) at 114 GHz. VEX channel definitions are in the APEX frequency spreadsheet on the tabs named Daewon Test 104G USB Hi and 114G USB Hi.

NOEMA antenna on A12 pad N007 was the array phase center. NOEMA tunings for the 104 GHz and 114 GHz portions of C251Z translate into VEX chan_defs that (please double check) can be generated with

```
noema-vex-defs.py -r 3 -f 95.788 | grep U  # matches spreadsheet
noema-vex-defs.py -r 3 -f 107.004 | grep L  # NB: edit VEX CH13-CH15/CH61
```

ALMA tunings at 43 GHz according to their log file:

```
<< ALMA mp014a-M87-script.log >>
2025-04-24T22:58:02.116 StandardVLBI HW FS[BB_1] useUSB:true 12GHz:false
2025-04-24T22:58:02.116 StandardVLBI HW FS[BB_2] useUSB:true 12GHz:false
2025-04-24T22:58:02.117 StandardVLBI HW FS[BB_3] useUSB:true 12GHz:true s
2025-04-24T22:58:02.118 StandardVLBI HW FS[BB_4] useUSB:true 12GHz:true s
2025-04-24T22:58:02.118 StandardVLBI HW BB Centers: [43168000000.0, 41168
$ alma-vex-defs.py -f 43168.000 -ralma -s U -n W -o  0 -b 07
$ alma-vex-defs.py -f 43168.000 -ralma -s U -n W -o  32 -b 08
```

LMT co-observed some scans in c251d as a fringe test

JCMT reports that their first track c251b (April 25/26) went OK, then closed down due to bad weather for most part of their second track c251d (April 27/28) with some scans taken after weather improved but these were hampered by equipment issues e.g. tau meter down.

LBA Station(s)

ATCA pulled from observations.

Details for Mopra (clock, tuning, Tsys) are available via:

- https://www.atnf.csiro.au/vlbi/dokuwiki/doku.php/lbaops/lbaapr2025/c251a
- https://www.atnf.csiro.au/vlbi/dokuwiki/doku.php/lbaops/lbaapr2025/c251b
- for c251a the difx VEX turned out as: MP rate -3.29e-11 s/s, MP offset -27.5492 usec (Ref: KVN Ky with -38.2711 usec)

Mopra polarization is linear X,Y, not circular.
Mopra recorded not in VDIF but in LBA format, DAS1 files are 2-channel RCP(?), DAS2 files are 2-channel LCP(?)

```
$ ls -1 /data/c251a/Mp/*.lba > filelist.Mp.dat
$ chk_vlbi.py filelist.Mp.dat > filelist.Mp
$ grep DAS1 filelist.Mp > filelist.Mp_das1
$ grep DAS2 filelist.Mp > filelist.Mp_das2

# v2d: MP format=LBASTD
# In 2025 Mopra recorded in LBA format (like ATCA) with old recorder and
ANTENNA MP { datastreams = mpDAS1,mpDAS2 }
DATASTREAM mpDAS1 { filelist=filelist.Mp_das1 format=LBASTD }
DATASTREAM mpDAS2 { filelist=filelist.Mp_das2 format=LBASTD }

# VEX
def FREQ_Mp;
    * https://www.atnf.csiro.au/vlbi/dokuwiki/doku.php/lbaops/lbaapr2025/
    * Channel 1 DAS #1 IFP#1 42912 - 42976 MHz USB RCP
    * Channel 2 DAS #1 IFP#2 42912 - 42976 MHz USB LCP
    * Channel 3 DAS #2 IFP#1 42976 - 43040 MHz USB RCP
    * Channel 4 DAS #2 IFP#2 42976 - 43040 MHz USB LCP
    * DAS 1 Skyfreq 42944 MHz
    * DAS 2 Skyfreq 43008 MHz
    * Bandwidth 64 MHz
     sample_rate =   128.000 Ms/sec;  * (2bits/sample)
     chan_def = : 42912.00 MHz : U :  64.00 MHz : &CH01 : &BBC01 : &NoCal
     chan_def = : 42912.00 MHz : U :  64.00 MHz : &CH02 : &BBC02 : &NoCal
     chan_def = : 42976.00 MHz : U :  64.00 MHz : &CH03 : &BBC01 : &NoCal
```

```
      chan_def = : 42976.00 MHz : U :   64.00 MHz : &CH04 : &BBC02 : &NoCal
enddef;
```

E-transfer of VLBA Sc Hn

Attempts at using jive5ab/m5copy failed (firewall issues at NRAO?), but etc/etd worked
out fine:

```
evlbi@eportal1:~> etc -m 5 --resume --udt-bw 1000Mbps --udt-mss 1500 'tcp
evlbi@eportal1:~> etc -m 5 --resume --udt-bw 1000Mbps --udt-mss 1500 'tcp

evlbi@eportal1:~> etc -m 5 --resume --udt-bw 1000Mbps --udt-mss 1500 'tcp
evlbi@eportal1:~> etc -m 5 --resume --udt-bw 1000Mbps --udt-mss 1500 'tcp
```

Station data status

Availability of Mark6 recordings at correlator i.e. all completed e-transfers and
shipments:

c251	EF	ON	PV	NN	AA	MH	GL	MM	GB	NL	FD	PT	LA	KP	OV	BR	MK	KY	KU	KT
A	ok	ok	-	-	-	ok	-	-	[mk6]	mk6	mk6	mk6	mk6	mk6	mk6	mk6	-	ok	ok	ok
B	ok	ok	ok	mk6	mk6	ok	mk6	mk6	ok	mk6	mk6	mk6	mk6	mk6	mk6	mk6	mk6	ok	ok	ok
C	ok	ok	ok	mk6	mk6	ok	mk6	-	-	mk6	mk6	mk6	mk6	mk6	mk6	mk6	mk6	ok	ok	ok
D	ok	ok	ok	mk6	mk6	ok	mk6	mk6	ok	mk6	mk6	mk6	mk6	mk6	mk6	mk6	mk6	ok	ok	ok
Z	-	ok	ok	mk6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MJ	-	-	-	-	[mk6]	-	-	-	[mk6]	mk6	mk6	mk6	mk6	mk6	mk6	mk6	-	-	-	-

ok = all expected files e-transferred or copied off mk6 are are on cluster file system
short = some e-transferred data available but looks incomplete
mk6 = on Mark6 module at correlator, [mk6] = recordings on module but from invalid/
failed observation
Note: ATCA cancelled the campaign i.e. no data