Correlation Status

Project Code	Block Code	Sources	DOYS	UT	Freq	Stations	Status	PI	Comment
	f242a		284		86	European			
	c242a		284		86,43	Global			
	c242b		285		86	Global			
	c242c		286		86	Global			
	c242d		286		86,43	Global			

General comments

Stations

- Nn has pad N09
- Apex joining for the first time
- Ef is out

Observing Notes

- Fringe test was successful in detecting fringes between Nn, Pv, On, Ys, Mh.
- Pv stowed at ~07:15 UTC until scan 576, stopping again at 20:20 UTC, back at scan 743, then stopped after an hour.
- Nn stowed due to wind at 16:20 UTC and until 23:40 UTC(c242a)
- Apex initially out at start of c242b due to site power failure, on source ~13:30 UTC, then sun avoidance (stowed) 14:40 to ~18:05 UTC
- Ys lost scans 209-222
- Oct 12 Nn stopped at 14:07
- Pv on sky since 14:30 UTC (scan 320).
- c242c/d Ys very foggy, cloudy
- Pv stopped due to strong wind at 19:45 UTC.
- Oct 13 Nn started with scan at 05:45 but had acquisition problems 07:30-08:30

Mounting the APEX GMVA Module

APEX data are on BHC%0141 in CD502. In order to hand-carry GMVA data from APEX to Bonn, data were consolidated from two Mark6 modules (2 x 8 disks) onto a more readily transportable set of 8 loose disks.

Data of one polarization are in the standard per-disk subdirectory 'data', data of the other polarization are in 'GMVA_slot2'.

To mount the "two modules" contained on BHC%0141, use:

```
d281
# assuming that BHC%0141 is in slot 1:
fuseMk6 -r '/mnt/disks/1/*/data' /`hostname -s`_fuse/1
fuseMk6 -r '/mnt/disks/1/*/GMVA_slot2' /`hostname -s`_fuse/2
```

Yebes data layout

Info from Javi Gonzales Garcia: we configured our FiLa10G with the following parameters:

```
2024.284.15:54:25.34/form/wastro

2024.284.15:54:24.83#dbbcn#fila10g/VDIF Frame properties:
2024.284.15:54:24.83#dbbcn#fila10g/ channel width (in bits)        : 2
2024.284.15:54:24.83#dbbcn#fila10g/ number of channels per frame   : 4
2024.284.15:54:24.83#dbbcn#fila10g/ payload size (in bytes)        : 8000
2024.284.15:54:24.83#dbbcn#fila10g/ => frame size (in bytes)       : 8032
2024.284.15:54:24.83#dbbcn#fila10g/ => number of frames per second :
128000 (64bit@128MHz)
2024.284.15:54:24.83#dbbcn#fila10g/ => number of data threads      : 8
2024.284.15:54:24.83#dbbcn#fila10g/ => number of frames per thread :
16000 (8bit@128MHz)
```

And cornerturning was on, thus we recorded each VDIF thread in a separate file (8 files in total). Channel mapping to the channel ID in the VEX file would be:

VDIF Thread channel #	DS0	DS1	DS2	DS3	DS4	DS5	DS6	DS7
1	&CH01	&CH05	&CH09	&CH13	&CH17	&CH21	&CH25	&CH29
2	&CH02	&CH06	&CH10	&CH14	&CH18	&CH22	&CH26	&CH30
3	&CH03	&CH07	&CH11	&CH15	&CH19	&CH23	&CH27	&CH31
4	&CH04	&CH08	&CH12	&CH16	&CH20	&CH24	&CH28	&CH32

APEX Disk Recovery - for future reference

During unrelated tests at MPIfR, unfortunately the filesystem metadata on 1 out of the 8 disks got erased, i.e., "erased" part of the module. During a later trip to APEX the missing 'GMVA_slot2' files of that disk were copied out from the still existing module there. These were then integrated back into BHC%0141. The missing 'data' files of that disk were less trivial to recover. Nevertheless, full recovery was successful. Module BHC%0141 contains the full original data again. For future reference the steps were:

```
# Make a low level backup of the wiped disk
root@mark6-08> cd /data/gmva2024_2/
root@mark6-08> dd bs=1M if=/dev/sdb of=apex-module-disk1-wiped.raw
status=progress
root@mark6-08> chmod a-w apex-module-disk1-wiped.raw
root@mark6-08> fdisk -lu apex-module-disk1-wiped.raw
 #         Start          End    Size  Type            Name
 1          2048  15627857919    7.3T  Microsoft basic MPIH%024_5
 2  15627857920  15628052479     95M  Microsoft basic MPIH%024_5m

# Grab the XFS file system structure from an intact disk
```

```
root@mark6-08> cd /data/gmva2024_2/
root@mark6-08> losetup --read-only -o $((512*2048)) /dev/loop1 /dev/sdc
root@mark6-08> xfs_metadump -g -f -o -w -a /dev/loop1
apex-module-disk2-intact.xfs_metadump
root@mark6-08> losetup -D ; losetup -a

# Transplant XFS structure from intact disk onto wiped-disk raw content
root@fxmanager> cd /data/gmva2024_2/
root@fxmanager> dd bs=512 if=apex-module-disk1-wiped.raw \
   of=recovery-attempt.fs skip=2048 count=$((15627857919-2048+1))
status=progress conv=notrunc
root@fxmanager> dd status=progress conv=notrunc bs=512 count=1024 \
    seek=15627855872 if=/dev/zero of=recovery-attempt.fs  # appends a bit
of 0x00 padding
root@fxmanager> losetup -v -o 0 /dev/loop0 recovery-attempt.fs
root@fxmanager> xfs_mdrestore -g apex-module-disk2-intact.xfs_metadump
/dev/loop0
  2070 MB read
root@fxmanager> mkdir cloop ; mount /dev/loop0 ./cloop/ -txfs -oro
  # success!
# Copy out data from the mounted loop device i.e. from the fixed xfs
partition:
oper@fxmanager> cd /data/gmva2024_2/ ; mkdir recovered_content
oper@fxmanager> cp -anv ./cloop/data/*.vdif ./recovered_content/
oper@fxmanager> mkdir recovered_GMVA_slot2
oper@fxmanager> cp -anv ./cloop/data/*.vdif ./recovered_GMVA_slot2/

# Restore content: init the half-wiped partitions, restore Mk6 metadata
root@mark6-08> mkfs.xfs -f /dev/sdb1
root@mark6-08> mkfs.xfs -f /dev/sdb2
root@mark6-08> mount /dev/sdb2 /tmp ; cp -av /mnt/disks/.meta/1/2/* /tmp;
umount /tmp
#
# 1) Add GMVA_slot2 data from new disk from post-GMVA APEX visit
#    (could actually use ./recovered_GMVA_slot2/, too, but did not get to
proceed
#    with the low-level recovery attempts until after the post-GMVA APEX
visit :P)
stop & start mk5daemon
oper@mark6-08> sudo mount /mnt/disks/1/2/ -oremount,rw
root@mark6-08> cp -anv /mnt/disks/3/1/GMVA_slot2_copy/* /mnt/disks/1/2/
GMVA_slot2/
# 2) Also add the 'data' files from restored image
oper@mark6-08> cp -anv /data/gmva2024_2/recovered_content/*.vdif /mnt/
disks/1/2/data/
oper@mark6-08> sudo mount /mnt/disks/1/2/ -oremount,ro
```

Recording Media

see the: media distribution plan