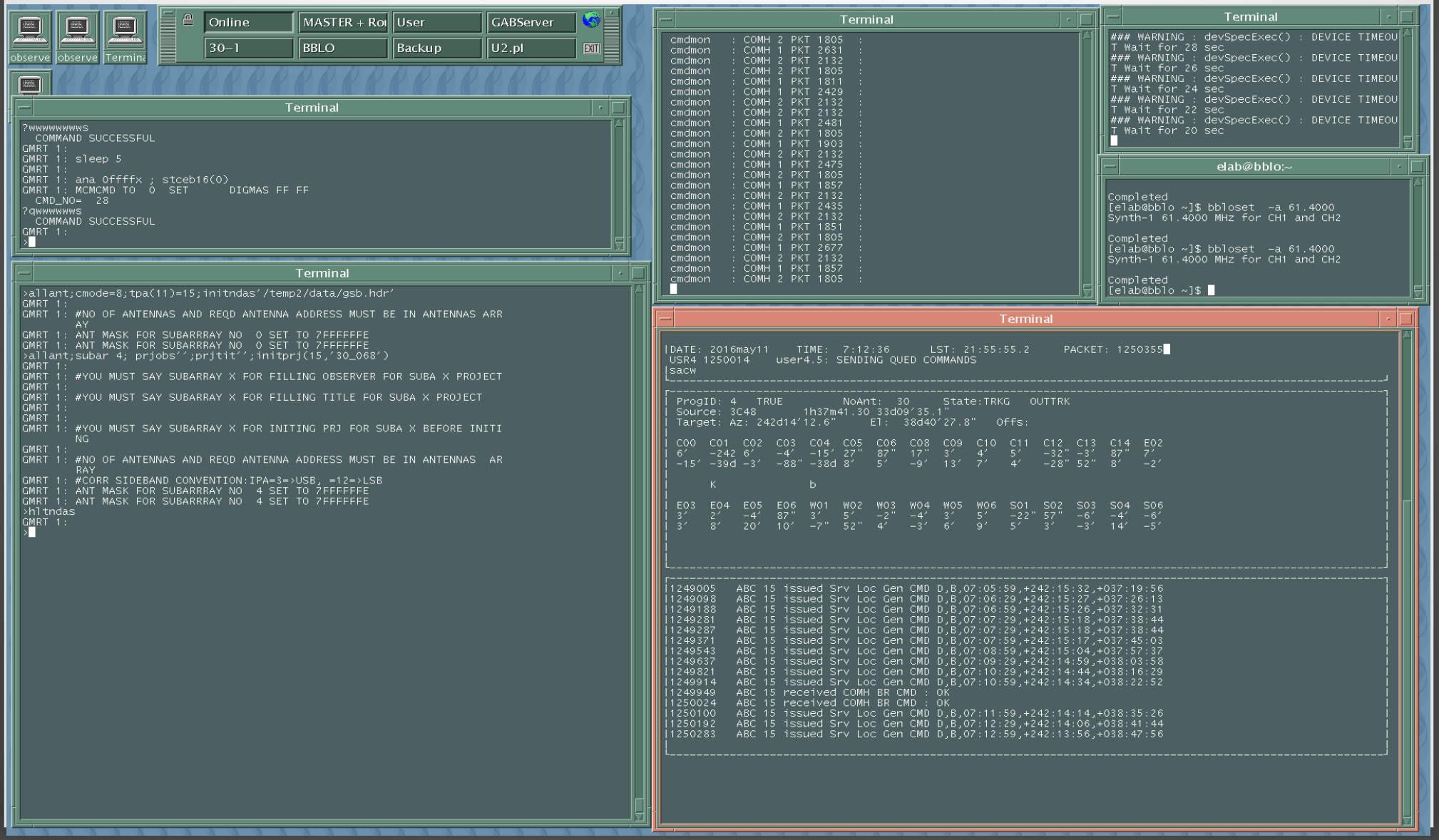
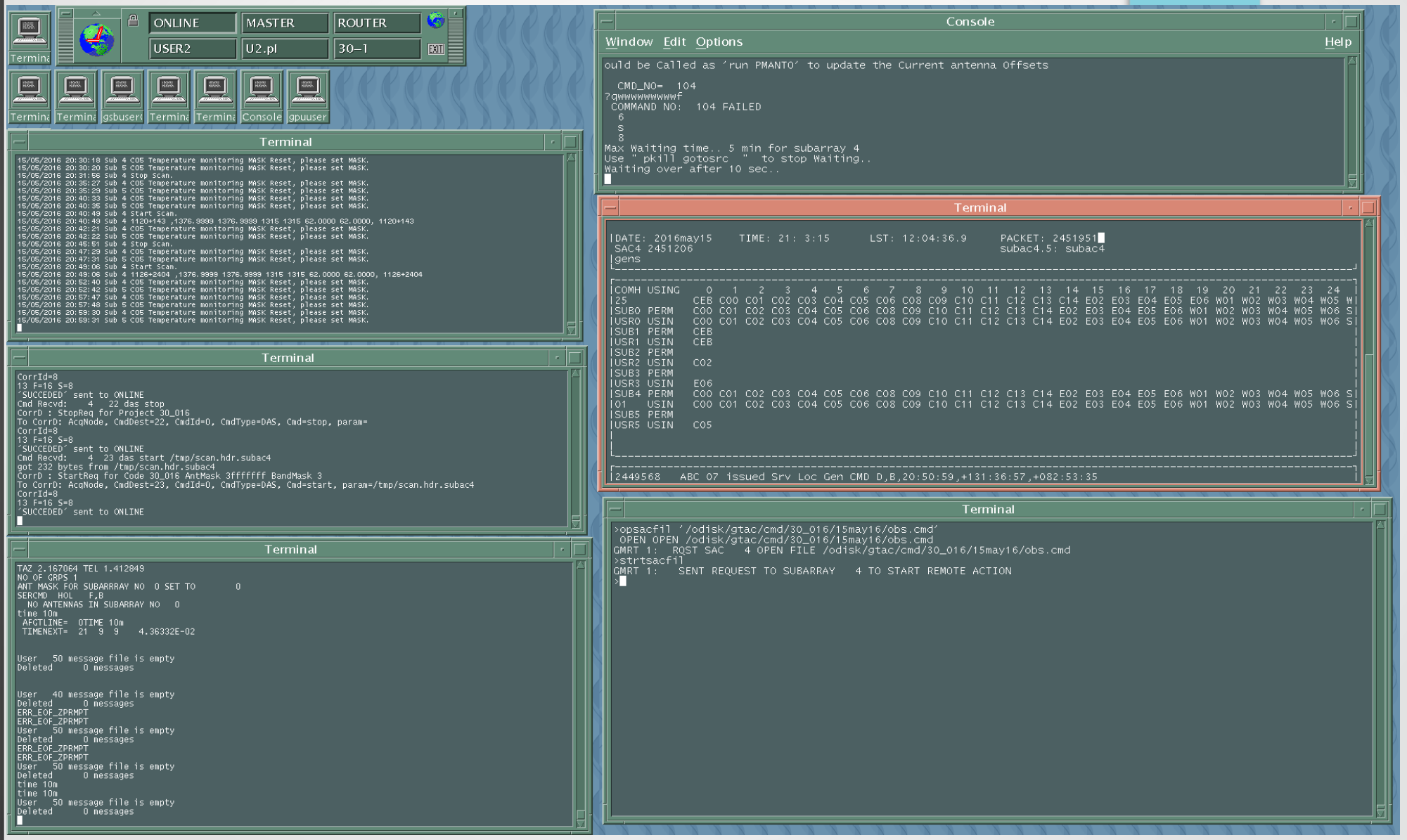
Control Room Activities

Jayprakash R. Kamble
Date 16/05/2016

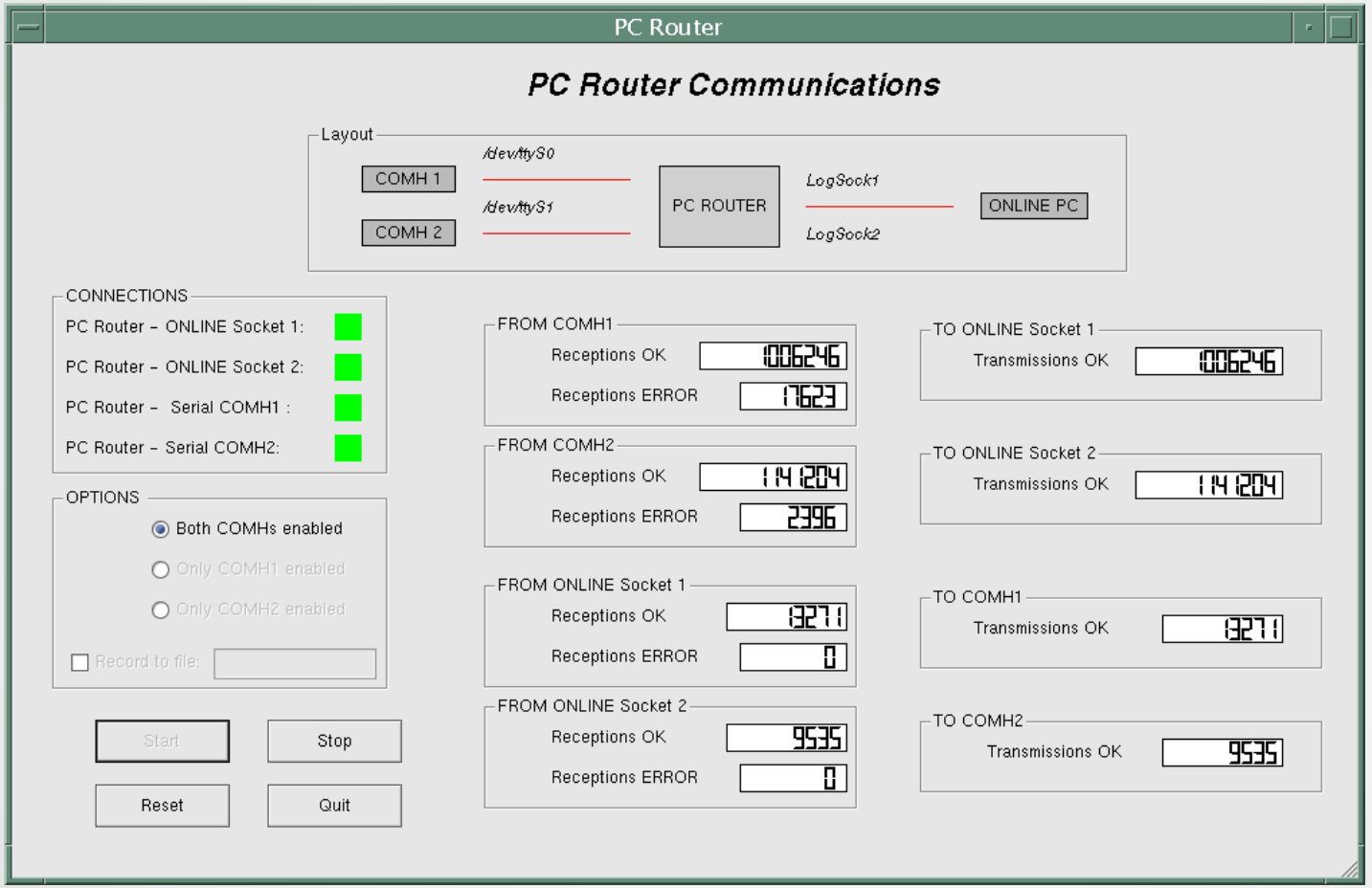
Brief Introduction about Online



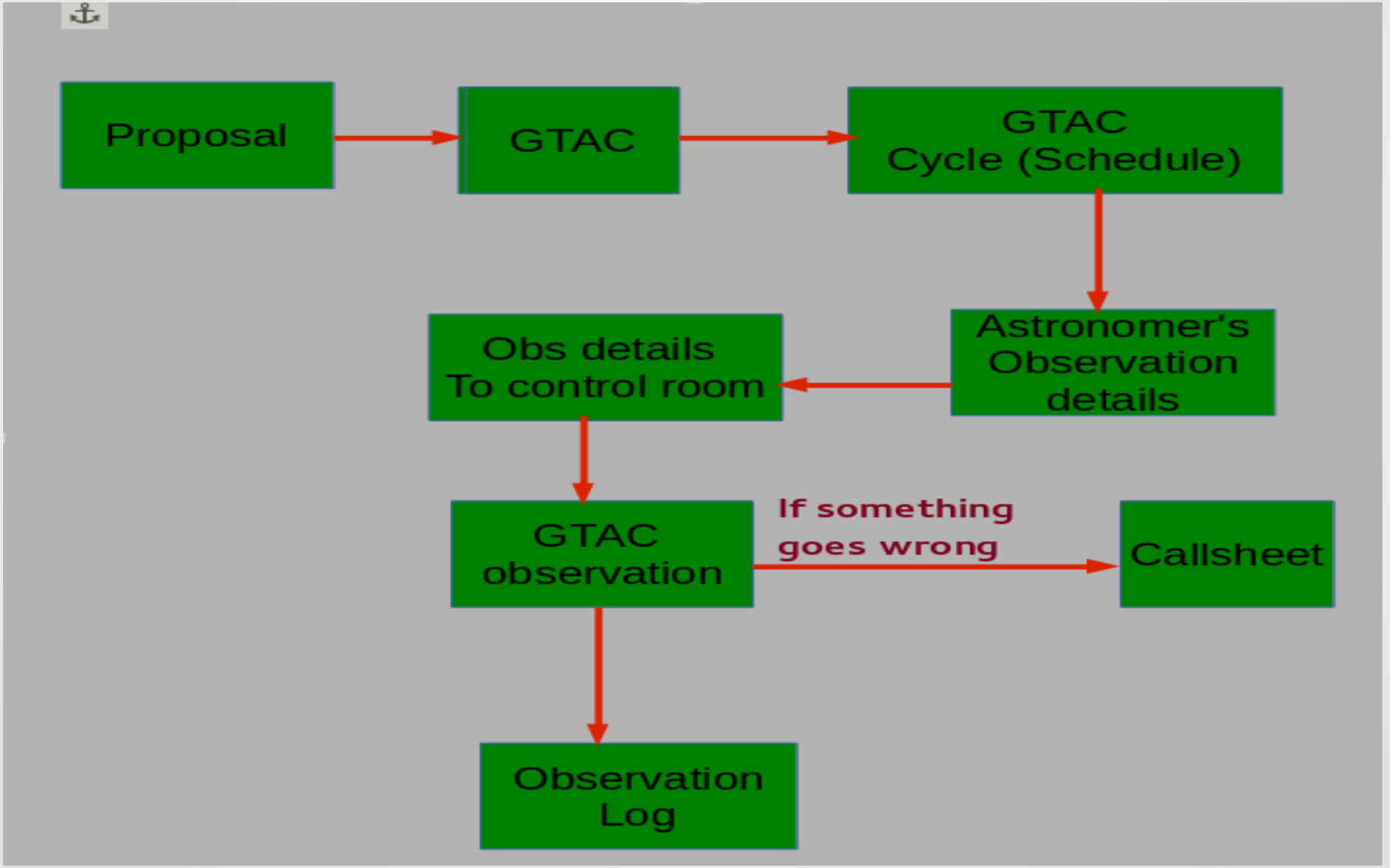
Shivneri


ONLINE
MASTER
ROUTER
USER2
U2.pl
30-1
EXIT
Termina
Termina
Termina
gsbuser
Termina
Termina
Console
gpuuser
Terminal
15/05/2016 20:30:18 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:30:20 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:31:58 Sub 4 Stop Scan.
15/05/2016 20:35:27 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:35:29 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:40:33 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:40:35 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:40:49 Sub 4 Start Scan.
15/05/2016 20:40:49 Sub 4 1120+143 ,1376.9999 1376.9999 1315 1315 62.0000 62.0000, 1120+143
15/05/2016 20:42:21 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:42:22 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:45:51 Sub 4 Stop Scan.
15/05/2016 20:47:29 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:47:31 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:49:06 Sub 4 Start Scan.
15/05/2016 20:49:06 Sub 4 1126+2404 ,1376.9999 1376.9999 1315 1315 62.0000 62.0000, 1126+2404
15/05/2016 20:52:40 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:52:42 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:57:47 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:57:48 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:59:30 Sub 4 C05 Temperature monitoring MASK Reset, please set MASK.
15/05/2016 20:59:31 Sub 5 C05 Temperature monitoring MASK Reset, please set MASK.
Terminal
CorrId=8
13 F=16 S=8
'SUCCEDED' sent to ONLINE
Cmd Recvd: 4 22 das stop
CorrD : StopReq for Project 30_016
To CorrD: AcqNode, CmdDest=22, CmdId=0, CmdType=DAS, Cmd=stop, param=
CorrId=8
13 F=16 S=8
'SUCCEDED' sent to ONLINE
Cmd Recvd: 4 23 das start /tmp/scan.hdr.subac4
got 232 bytes from /tmp/scan.hdr.subac4
CorrD : StartReq for Code 30_016 AntMask 3fffffff BandMask 3
To CorrD: AcqNode, CmdDest=23, CmdId=0, CmdType=DAS, Cmd=start, param=/tmp/scan.hdr.subac4
CorrId=8
13 F=16 S=8
'SUCCEDED' sent to ONLINE
Terminal
TAZ 2.167064 TEL 1.412849
NO OF GRPS 1
ANT MASK FOR SUBARRRAY NO 0 SET TO 0
SERCMD HOL F,B
NO ANTENNAS IN SUBARRAY NO 0
time 10m
AFGTLINE= OTIME 10m
TIMENEXT= 21 9 9 4.36332E-02
User 50 message file is empty
Deleted 0 messages
User 40 message file is empty
Deleted 0 messages
ERR_EOF_ZPRMPT
ERR_EOF_ZPRMPT
User 50 message file is empty
Deleted 0 messages
ERR_EOF_ZPRMPT
ERR_EOF_ZPRMPT
User 50 message file is empty
Deleted 0 messages
time 10m
time 10m
User 50 message file is empty
Deleted 0 messages
Console
Window Edit Options
Help
ould be Called as 'run PMANTO' to update the Current antenna Offsets
CMD_NO= 104
?qwwwwwwwwf
COMMAND NO: 104 FAILED
6
s
8
Max Waiting time.. 5 min for subarray 4
Use " pkill gotosrc " to stop Waiting..
Waiting over after 10 sec..
Terminal
|DATE: 2016may15 TIME: 21: 3:15 LST: 12:04:36.9 PACKET: 2451951
SAC4 2451206 subac4.5: subac4
|gens
|COMH USING 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
|25 CEB C00 C01 C02 C03 C04 C05 C06 C08 C09 C10 C11 C12 C13 C14 E02 E03 E04 E05 E06 W01 W02 W03 W04 W05 W
|SUB0 PERM C00 C01 C02 C03 C04 C05 C06 C08 C09 C10 C11 C12 C13 C14 E02 E03 E04 E05 E06 W01 W02 W03 W04 W05 W06 S
|USR0 USIN C00 C01 C02 C03 C04 C05 C06 C08 C09 C10 C11 C12 C13 C14 E02 E03 E04 E05 E06 W01 W02 W03 W04 W05 W06 S
|SUB1 PERM CEB
|USR1 USIN CEB
|SUB2 PERM
|USR2 USIN C02
|SUB3 PERM
|USR3 USIN E06
|SUB4 PERM C00 C01 C02 C03 C04 C05 C06 C08 C09 C10 C11 C12 C13 C14 E02 E03 E04 E05 E06 W01 W02 W03 W04 W05 W06 S
|01 USIN C00 C01 C02 C03 C04 C05 C06 C08 C09 C10 C11 C12 C13 C14 E02 E03 E04 E05 E06 W01 W02 W03 W04 W05 W06 S
|SUB5 PERM
|USR5 USIN C05
|2449568 ABC 07 issued Srv Loc Gen CMD D,B,20:50:59,+131:36:57,+082:53:35
Terminal
>opsacfil '/odisk/gtac/cmd/30_016/15may16/obs.cmd'
OPEN OPEN /odisk/gtac/cmd/30_016/15may16/obs.cmd
GMRT 1: RQST SAC 4 OPEN FILE /odisk/gtac/cmd/30_016/15may16/obs.cmd
>strtsacfil
GMRT 1: SENT REQUEST TO SUBARRAY 4 TO START REMOTE ACTION
>

PC Router


PC Router
PC Router Communications
Layout
COMH 1
COMH 2
/dev/ttyS0
/dev/ttyS1
PC ROUTER
LogSock1
LogSock2
ONLINE PC
CONNECTIONS
PC Router – ONLINE Socket 1:
PC Router – ONLINE Socket 2:
PC Router – Serial COMH1 :
PC Router – Serial COMH2:
OPTIONS
Both COMHs enabled
Only COMH1 enabled
Only COMH2 enabled
Record to file:
Start
Stop
Reset
Quit
FROM COMH1
Receptions OK
1006246
Receptions ERROR
17623
FROM COMH2
Receptions OK
114204
Receptions ERROR
2396
FROM ONLINE Socket 1
Receptions OK
13271
Receptions ERROR
0
FROM ONLINE Socket 2
Receptions OK
9535
Receptions ERROR
0
TO ONLINE Socket 1
Transmissions OK
1006246
TO ONLINE Socket 2
Transmissions OK
114204
TO COMH1
Transmissions OK
13271
TO COMH2
Transmissions OK
9535

GTAC Flow Diagram



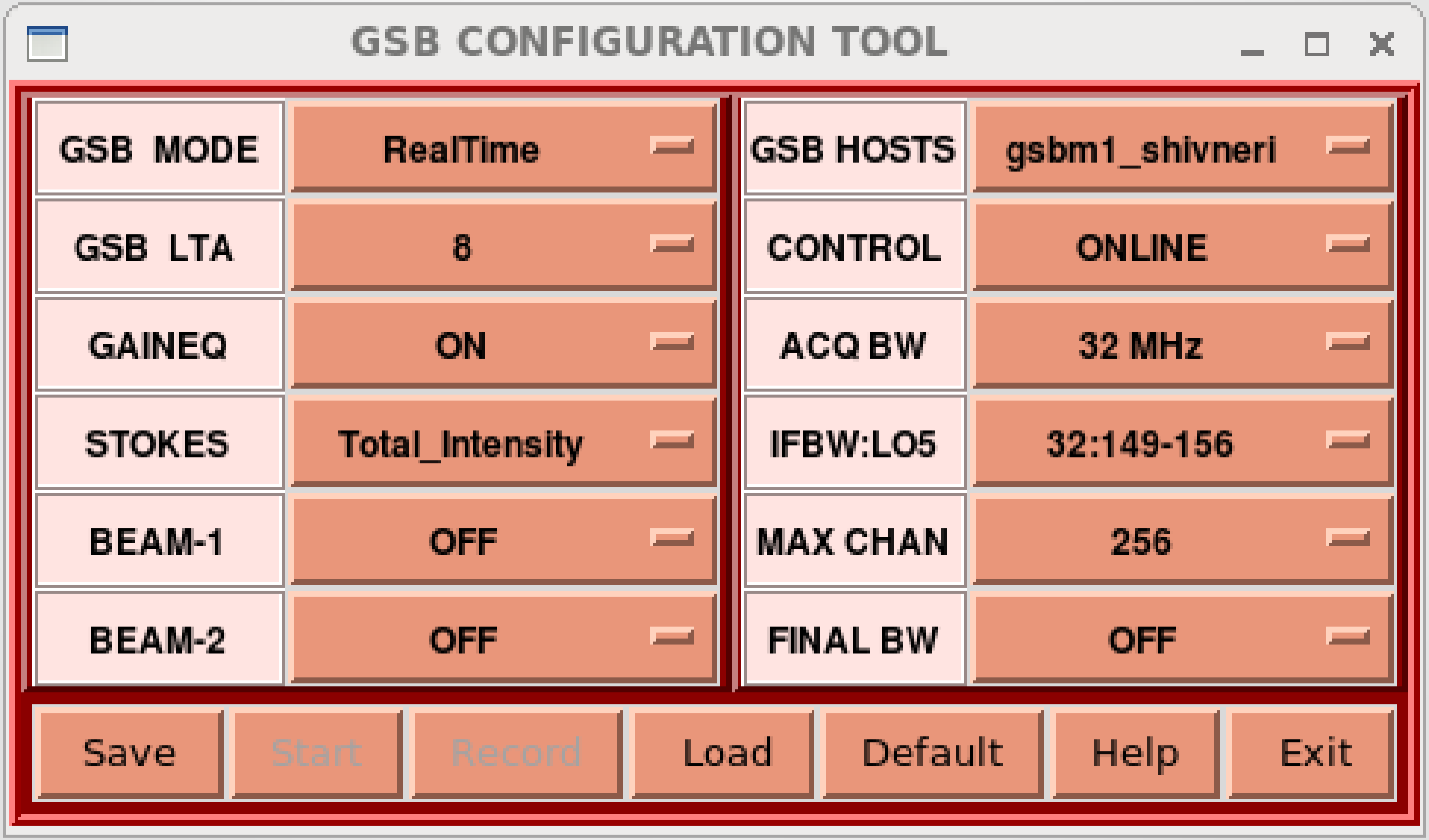
Frequency Setting of Radio Telescope

```
* FRONT END PARAMETERS. Give 1420 only for full 1420 band
selection.
* select freq. of observation
(50/150/235/325/610/1060/1170/1280/1390/1420 MHz.)
1390
* select solar attenuator (0/14/30/44 dB. -1 for FE
Termination.)
0
* select polarisation unswapped(0) or swapped(1)
0
* select cal-noise level.(E-HI(0)/HI(1)/MED(2)/LO(3) (-1
for RF OFF).)
0

* Lo parAMETERS.   * select LO freq.(100 - 1600 MHz)
1315
1315

* select pre_attenuator & post_gain for CH1.(0,2,4,...,30
dB)
4
12
* select pre_attenuator & post_gain for CH2.
(0,0.5,1,1.5,2,4,...,30 dB)
4
12
* select IF band width for CH1 & CH2 resp.(6/16/32 MHz).
16
16
* select ALC OFF(0) or ON(1). for CH1 and CH2
1
1
```

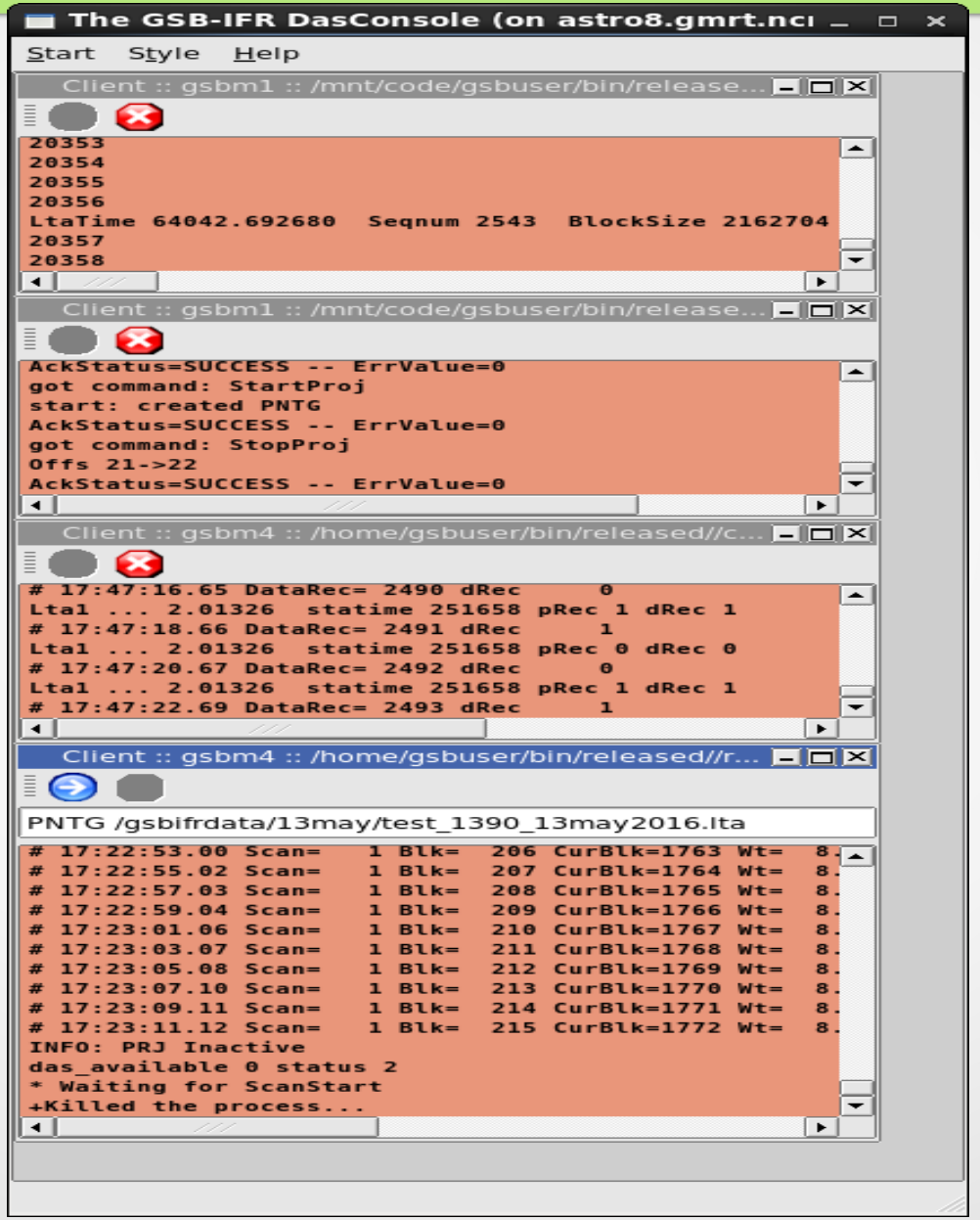
Frequency Setting of Radio Telescope

```
* New parameters being added :
* enter Walsh Enable(1) or Disable(0)
0
* Select the Walsh Group : Low Group(0) or Highr Group(1)
0
* set GAB LO [600 - 1500 MHz in-steps of 500 kHz]
*
1450000
1450000
* set GAB ATTEN 0.0 to 31.5 in steps of 0.5 dB [D0-D5, D15-
D20]
12
12
* Antenna or Noise Input [ANT RF(0), VGA CAL(1), BUF or TEST
CAL (2) ] [D6-7, D21-22]
0
0
* Mixer (0) or Direct Path (1) [D8, D23]
0
0

* 0 SYNTHESIZER, 1 SIGGEN inputs [D30,D31]
0
0

* FilRF [0,1,2,3,4,5,6,7] [D9-11, D24-26]
0
0
* LPF [100 MHz , 200 MHz, 400 MHz, Direct Path(0)] [D12-13,
D27,28]
200
200
* Spare [D14,D29]
0
0
```

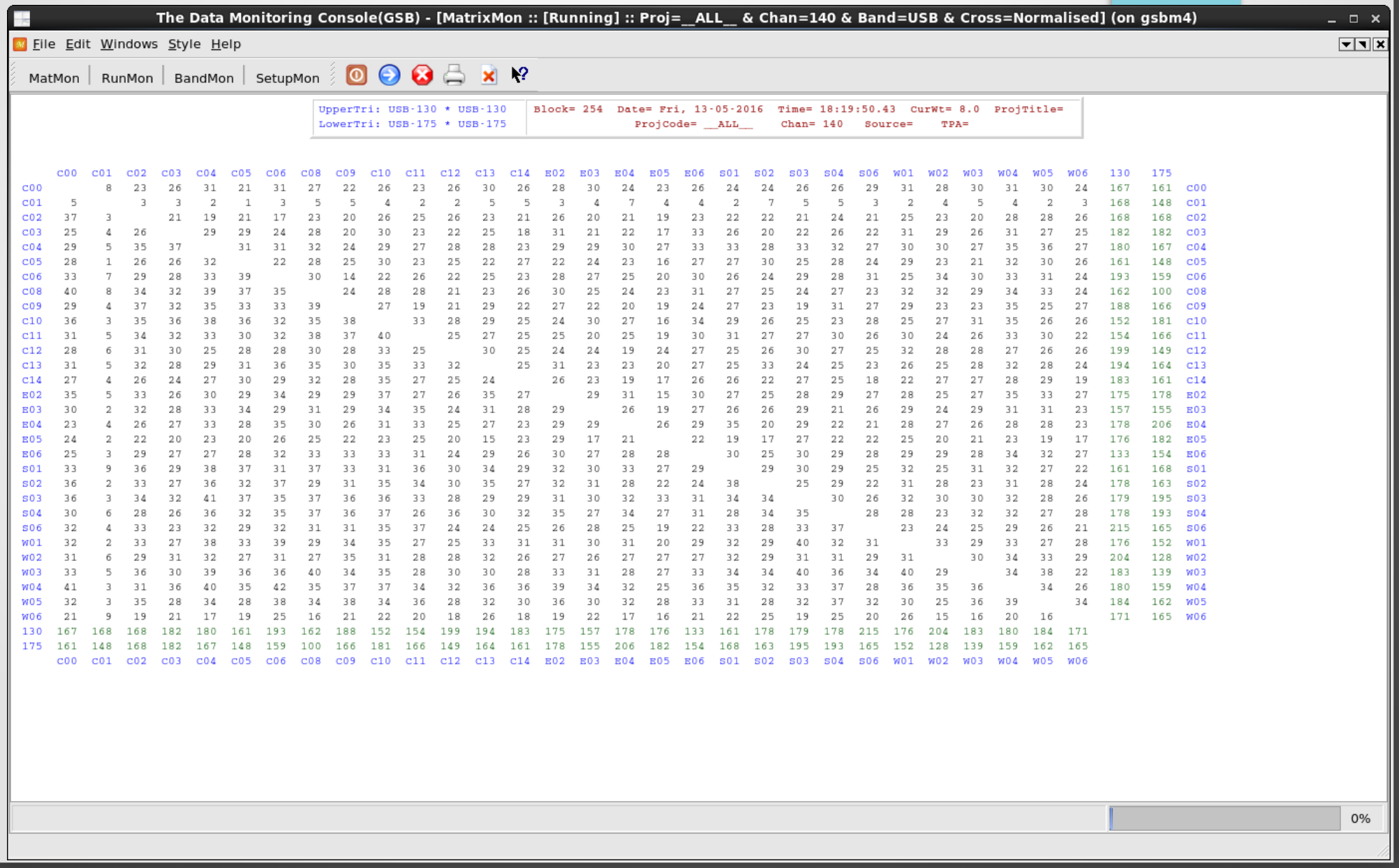
GSB Configuration



GSB DAS Console



Checking Fringe Status



How to detect and debug the problems?

- ONDISPLAY
- DASMON : MATMON & BANDMON
- 30to1 SWITCH O/P

ONDISPLAY

```
|DATE: 2016may14    TIME: 17:22:16      LST: 08:19:05.0     PACKET: 2146142
 SAC4 2144699    subac4.5: ABC SET TIME17:14:22,14-05-2016
|sacw
└-------------------------------------------------------------------------------
┌-------------------------------------------------------------------------------
| ProgID: 4   TRUE          NoAnt:  30     State:TRKG   OUTTRK
| Source: KISO3867   9h40m12.99 29d35'30.0       Phs Center: KISO3867
| Target: Az: 236d54'10.1"     El:  68d38'21.2"   Offs:
|
| C00  C01  C02  C03  C04  C05  C06  C08  C09  C10  C11  C12  C13  C14  E02
| -90" -357 -80" -40" -60" -80" -70" -80" -90" -30" -70" -2'  -60" -2'  -2'
| 8"   21d  -12" -22" -22" -21" -32" -32" -1"  -82" -22" -22" -2'  -11" 2'
|
|      R
|
| E03  E04  E05  E06  W01  W02  W03  W04  W05  W06  S01  S02  S03  S04  S06
| -2'  -2'  -4'  -3'  9"   3'   7'   10'  13'  16'  -6'  -7'  -10' -13' -18'
| 3'   4'   6'   7'   -31" -2'  -3'  -3'  -2'  -3'  -21" -71" -91" -2'  -4'
|
|
|
└-------------------------------------------------------------------------------
┌-------------------------------------------------------------------------------
|2146073   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2146093   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2146099   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2146112   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2146118   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2146138   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|
```

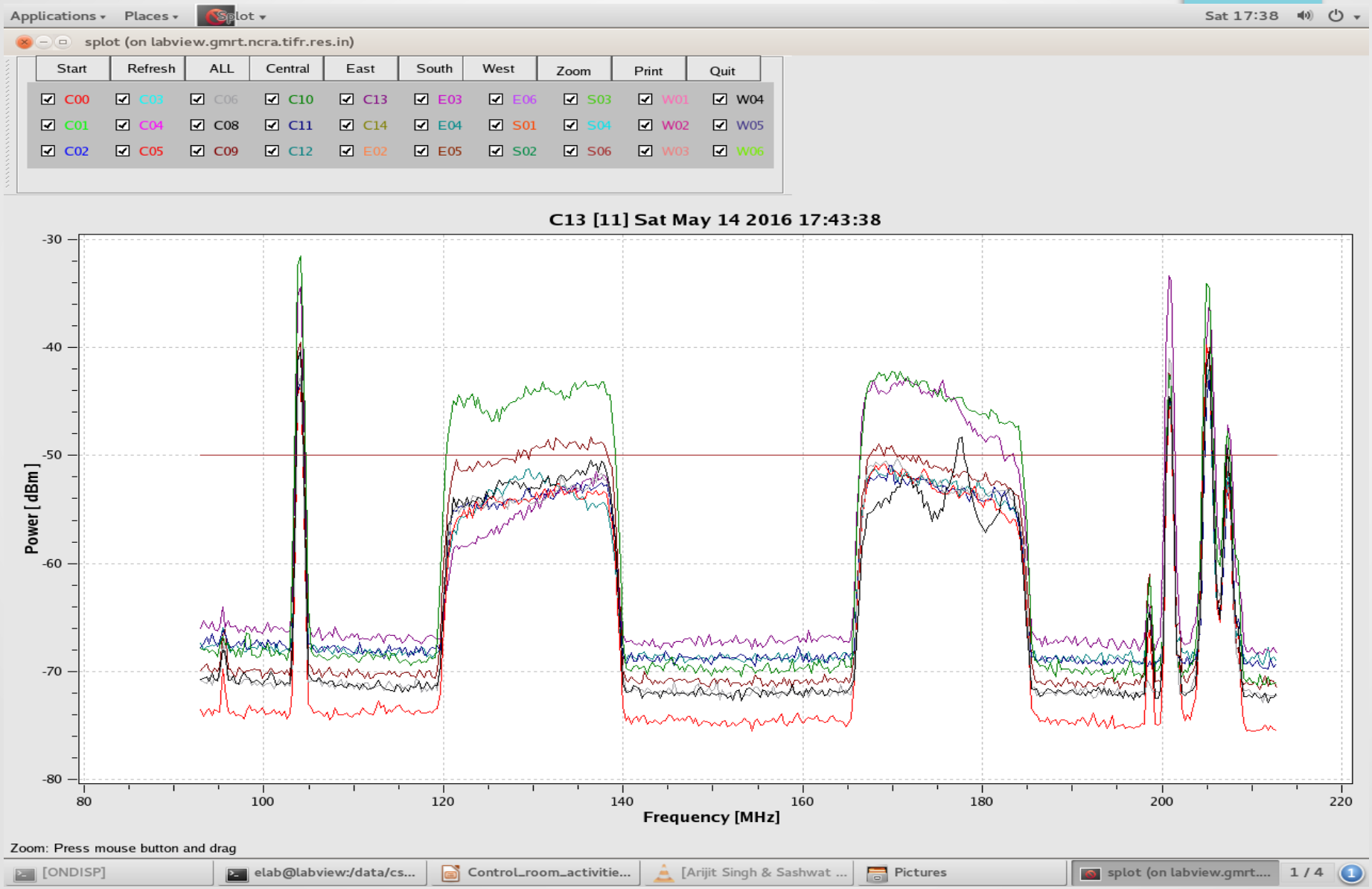
ONDISPLAY

```
|DATE: 2016may14    TIME: 17:29:27      LST: 08:26:17.2      PACKET: 2147450
 SAC4 2146596                                                 subac4.5: subac4
|sela 3                  ABC   3
└------------------------------------------------------------------------------
┌------------------------------------------------------------------------------
|  SERVO C04(03)  servo time  017:29:25          DIG STAT  2: 2: 2: 0: ac:2:
|                AZIMUTH     ELEVATION            ELEV     AZIM     GEN
|  astro po  +054:25:20    +070:09:50       D
|  encod po  +234:25:20    +070:09:50       I     run        run
|  targe po  +234:25:40    +070:09:50       G                          remo
|  poten po  +000:00:00    +000:00:00       I                          acok
|  motor1          1.34          0.61       T
|  motor2         -0.73          1.83       A                          ssok
|  tacho1         21.99        -27.78       L
|  tacho2          2.31          2.31                                  trkg
|  wind12         13.00         15.00       S
|                                           T     strl                 cwrp
|                                           A
|                                           T
|
|
└------------------------------------------------------------------------------
┌------------------------------------------------------------------------------
|2147229   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147249   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147262   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147274   ABC 00 TIMEOUT
|2147281   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147287   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147294   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147300   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147313   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147326   ABC 00 TIMEOUT
|2147365   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147377   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147390   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147416   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147428   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|
```

ONDISPLAY

```
|DATE: 2016may14    TIME: 17:29:48      LST: 08:26:38.2     PACKET: 2147513
 SAC4 2146596                                               subac4.5: subac4
|abcs
└-------------------------------------------------------------------------------------------------------------------------------
┌-------------------------------------------------------------------------------------------------------------------------------
|   ABCSTATC04(3) [APPLN]         time  017:29:47   pkt no: 673906    0              LOC TRK
| Prog  Ver                     03-06-1998,01.30    MCM STATUS
| Debug Mode                    1                   Mcm Timeouts         898
| LINK STATUS                                       Mcm Chksums          1
| For Link Timeouts             0                   ABC Timeouts By MCM  1
| For Link Chksums              0                   ABC Chksums By MCM   0
| Ret Link Timeouts             2512
| Ret Link Chksums              30                  SERVO STATUS
| ABC Sent large Pkts           0                   Servo Cmds Issued    494703
| Cmds Issued/Aborted For ABC   0:0                 Naks From/To Servo   0:1
| BR Cmds Issued/Aborted For ABC 6672:10            Enqs From/To Servo   12:1219
| ABC Not Ready                 6                   Servo Cmd Tm Out     102
| Mcm Cmds Issued               838423              BufErrCnt BufFulcnt  0:11
| Mcms Active     0: 2: 3: a: e:
| Mcm Link       --:--:--:--:--:
|
└-------------------------------------------------------------------------------------------------------------------------------
┌-------------------------------------------------------------------------------------------------------------------------------
|2147249   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147262   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147274   ABC 00 TIMEOUT
|2147281   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147287   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147294   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147300   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147313   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147326   ABC 00 TIMEOUT
|2147365   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147377   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147390   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147416   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147428   COMH Got ABC 00 CHKSUM ERROR : CRC Err
|2147488   ABC 03 issued Srv Loc Gen CMD D,B,17:30:29,+234:06:26,+070:22:20
|
```

Output of 30to1 switch



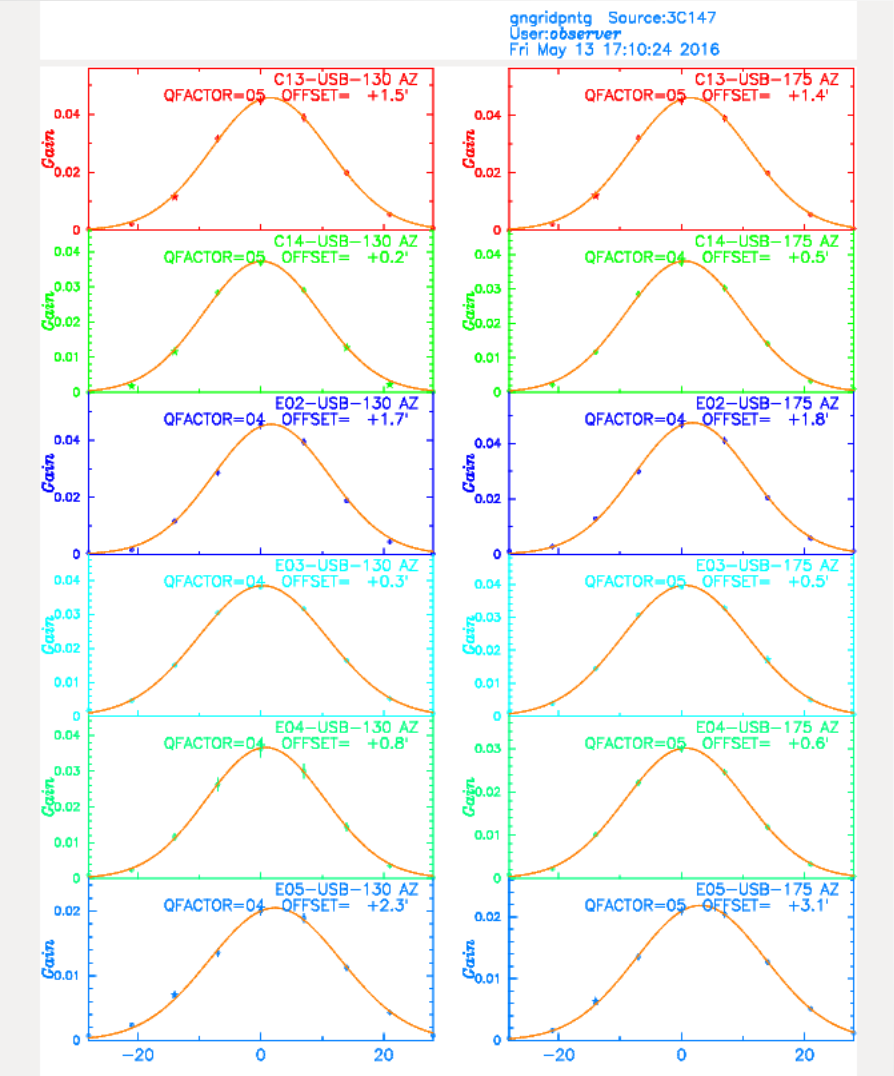
Web tools for Remote monitoring

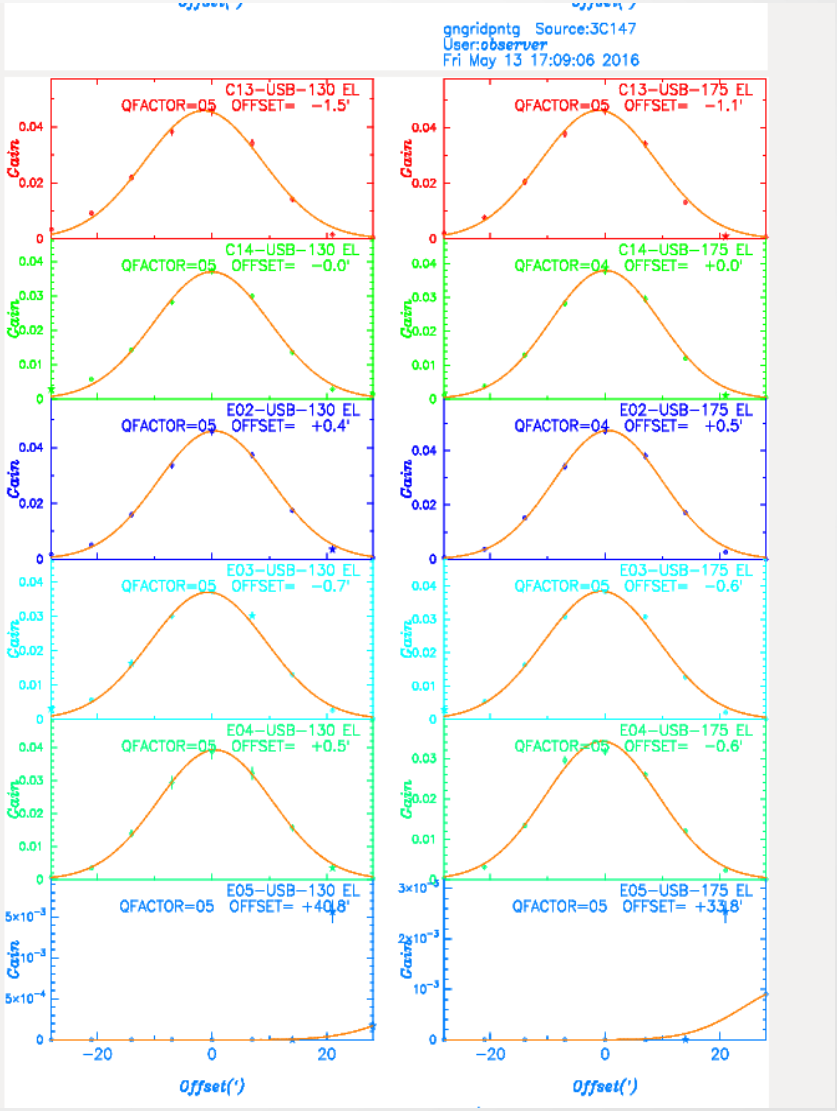
Observing Help & Monitoring Tools

home

For Astronomers	For Engineers
User Documents	**Antenna Parameters**
GMRT Observer's Manual	Ondisplay Antenna Tracking Status
System Parameters and Current Status	Ondisplay History
Polarisation observations with GMRT (V2)	Feed position status
Dual band multi-pointing with GMRT (V2)	Pointing Offsets
GMRT Software Backend Documents	Wind Status
uGMRT upgrade status	Temperature Status
	Servo data
Before Observations	Electrical Power Status
GTAC Schedule [NCRA] [GMRT]	
White Slot Request[NCRA] [GMRT]	**Logs**
Command file Creater and Observations Setup	
Line Observations Frequency Setup (tune)	**IF Analog Signal Data**
Source(s) Rise and Set Time	Band Shapes, Deflection data
Observing Time Calculator	Gray Plots
VLA Calibrator Search	
Dual band multi-pointing coordinates	**Digital Backend Data**
Online Archive (GOA)	Corr band shapes and Project State
	Fringe Status (rantsol amp-gain)
During Observations	Gain-amplitude and Phase (rantsol)
Antenna Tracking Status	Visibility - amplitude and phase (xtract)
Corr band shapes and Project State *	Correlator Room Temperature
Gain-amplitude and Phase (rantsol)	
Visibility - amplitude and phase (xtract)	**Test Results, Callsheets and Schedules**
Wind Status	Recent Callsheets
Satellite passes	GMRT Upgrade Status
	Results of Weekly PMQC tests
After Observations	GDDP, RFI status gray plots
LTA to FITS conversion:	Antenna Beam Width Plots
AIPS help:	Schedules and white slot request
RFI Plots:	Satellite tools
GDDP summary:	
	Contact
Contact	astrosupp@gmrt.ncra.tifr.res.in
* gmrtoperations@ncra.tifr.res.in	snk@gmrt.ncra.tifr.res.in
* snk@gmrt.ncra.tifr.res.in	

Pointing Offset





GTAC Observation Log

GTAC Observation Log

1. Date : 13/09/2015
2. Observation Sr. No. : 8060
3. Observer : O.Ivy Wong, Chandreyee Sengupta, Gyula I.G. Jozsa, Kevin Schawinski, Karen Masters
4. Observer's Email : ivy.wong@csiro.au, sengupta.chandreyee@gmail.com, gjozsa@ska.ac.za, kevin.schawinski@phys.ethz.ch, karen.masters@port.ac.uk
5. Project Name : Probing the cause of rapid star formation truncation in galaxies
6. Project Code : 28_086
7. Operator(s) : Deepak, Pramod, Rupsing
8. Command File : /odisk/gtac/cmd/28_086/obs.cmd
9. LTA File : /gsbifrdata/13sep/28_086_13sep2015.lta.1, /gsbifrdata/13sep/28_086_13sep2015.lta
10. LogFlag File : /odisk/online1/logflags/28_086.FLAGS.2, /odisk/online1/logflags/28_086.FLAGS.1

ANTENNA SETTINGS :

11. RF Band(MHz) & Solar Attn(dB)- RF1 : 1382 MHz ,RF2 : 1382 MHz, SA1 : 0 dB, SA2 : 0 dB
12. Ist LO (MHz) & IVth LO (MHz): ILO1 : 1320 MHz, ILO2 : 1320MHz , IVLO1 : 62 MHz, IVLO2 : 62 MHz
13. IF Attn(dB) , IF BW(MHz) & IF ALC : IF-CH1 : 4+12 dB, 16 MHz,ON, IF-CH2 : 4+12 dB, 16 MHz,ON

GSB SETTINGS :

14. GSB Host : gsbm1
15. GSB Mode : Realtime
16. GSB LTA : 8
17. GSB CTRL : ONLINE
18. GSB Fstop : ON
19. GAIN EQ : ON
20. Stokes : Total_Intensity
21. Beam - 1 : OFF
22. Beam - 2 : OFF
23. ACQ BW : 16.666666 MHz
24. Final BW : 16.666666 MHz; Step #
25. Maximum Channels : 512
26. Channel Numbers : 0:511:1
27. LO5 -1 : 138
28. LO5 -2 : 167

GTAC Observation Log

```
29. Frequency Parameters (TPA) : 1382 1382 1320 1320 62 62
30. Integration Time : 16.1061 Sec
31. No of Antennas Working(Fringing) at the beginning :29

32. Name of Non-Working Antennas (with reason for each) :
S02 : Taken for BLDC.

33. Note for Backup :

34. Start and End Time of Obs.(IST): 13 Sep 2015 12:00:00 - 13 Sep 2015 22:00:00

35. ONLINE Machine : Shivneri

36. No of Antennas Working(Fringing) at the end :29

37. Comments (During Observations) :
11:30 : Started set up.
12:00 : Started scan on 3C286.
12:46 : Stopped scan.
12:45 : Note  : Restarted GSB because of South arm electrical power failure.
12:49 : Started scan on 3C286 for 10 min.
13:00 : Stopped scan and started command file.
       /odisk/gtac/cmd/28_086/obs.cmd
16:44 : Stopped command file.
16:48 : Started scan on 3C286.
17:00 : Stopped scan.
17:04 : Restarted command file.
-------------------------------------------------------------------------
18:40 : Data shows scintillation
-------------------------------------------------------------------------
22:02 : Stopped command file.
22:08 : Started scan on 3C48.(scintillation)
22:21 : Stopped scan and observation session.
```

Different Types of Observation

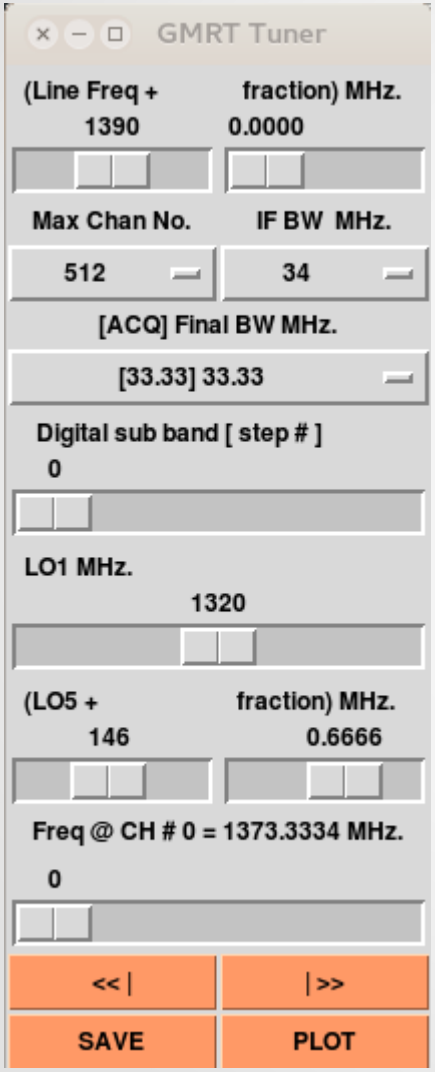
- Interferometry observation.
- Line Observation.
- Pulsar Observation : - Incoherent phased Array.

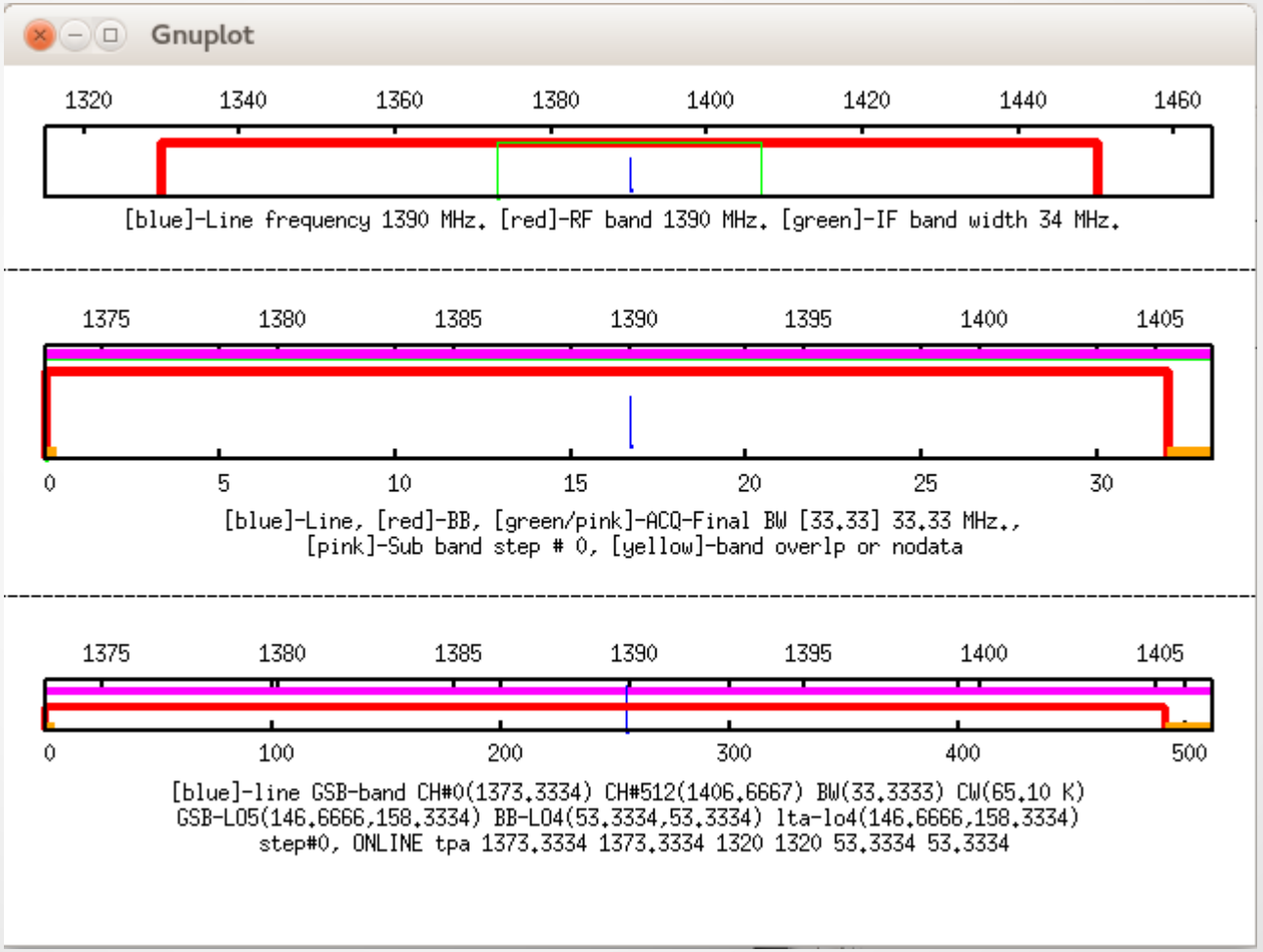
  Coherent phased Array.

Interferometry Observation

```
cmode 1
lnkndas

subar 4
dellist 2
addlist '/odisk/gtac/cmd/29_003/src.list'

goin
gosacin

*goout
*gosacout

$1

gts'0825+031'
sndsacsrc(1,12h)
sndsacsrc(1,12h)
stabct
/(gotosrc)

strtndas
time 5m
stpndas

gts'J0856+00'
sndsacsrc(1,12h)
sndsacsrc(1,12h)
/(pntmod)
run pmanto
stabct
/(gotosrc)

strtndas
time 10m
subhnd
time 10m
subhnd
time 10m
stpndas

goto 1
end
```

Line Observation

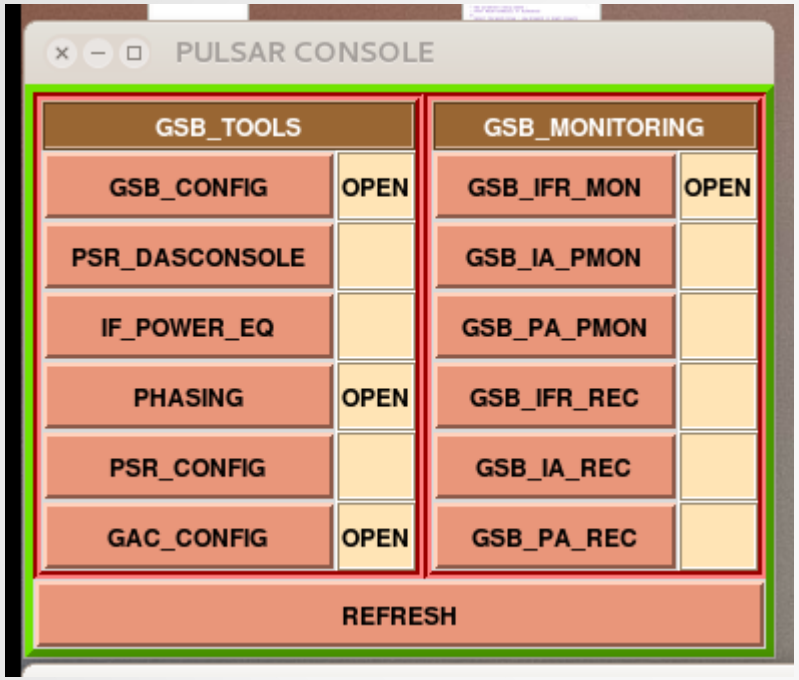




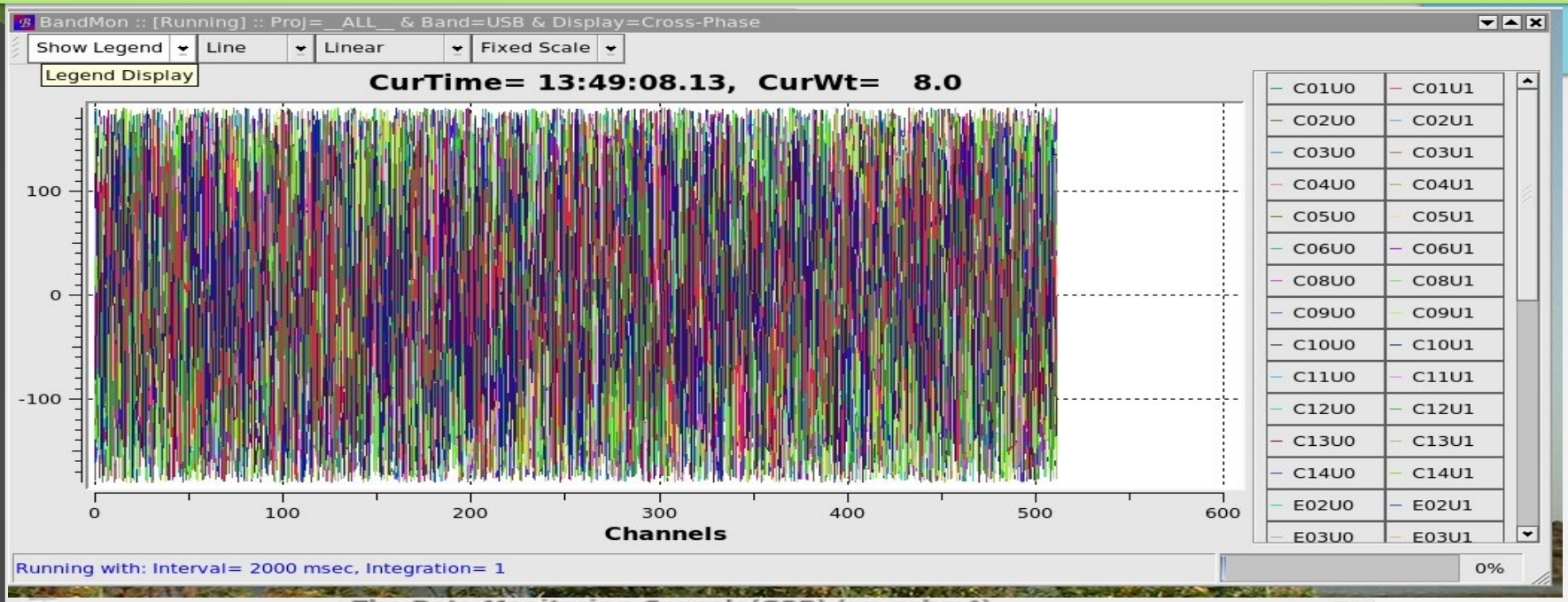
Tune Out put

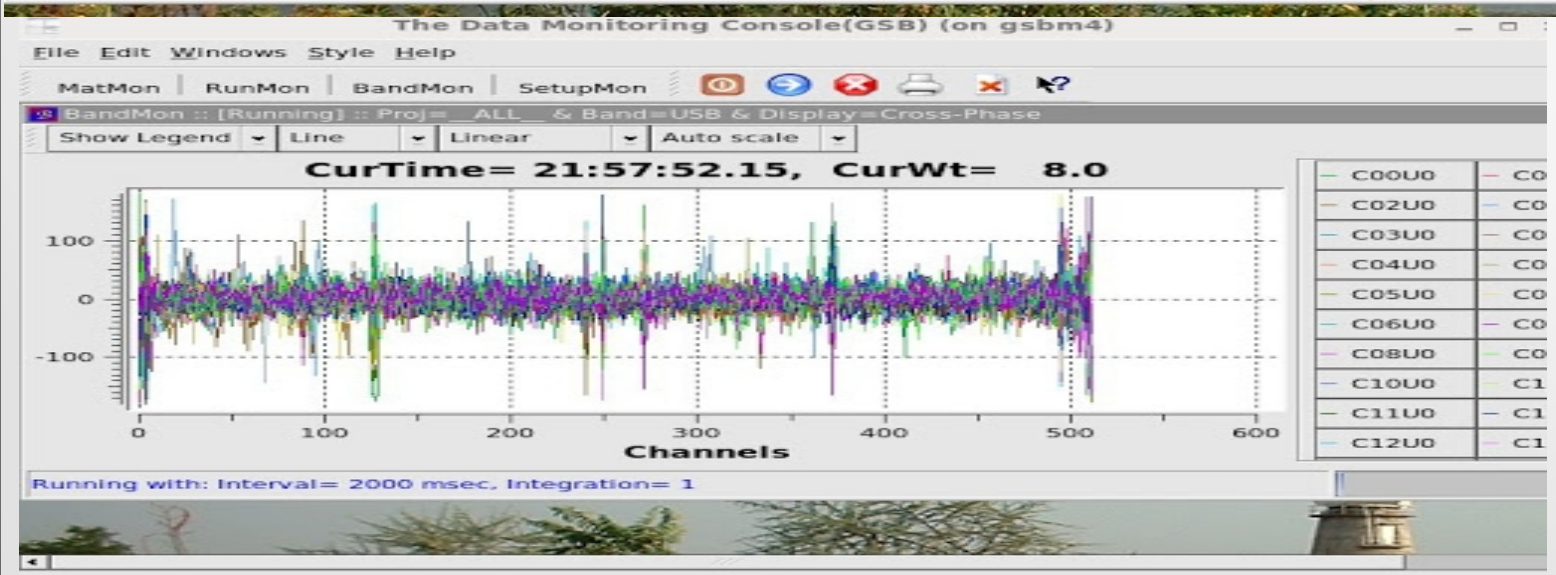
```
GSB line observation setup
RF band= 1390 (1330 - 1450)
LO1= 1320 (lower)
IFBW= 34
GSB [ACQ] BW= 33.3333
Total Channel= 512

Line/Center Frequency= 1390
CH#[0]= 1373.3334
CH#[512]= 1406.6667
BW= +33.3333
CW= 65.10 (KHz.)

Digital SubBand/step#= 0
GSB_CONFIG LO5= 146.6666  158.3334
LTA_FILE   L05= 146.6666  158.3334
BASE_BAND  LO4= 53.3334  53.3334
tpa 1373.3334 1373.3334 1320 1320 53.3334 53.3334
```

Pulsar Observation

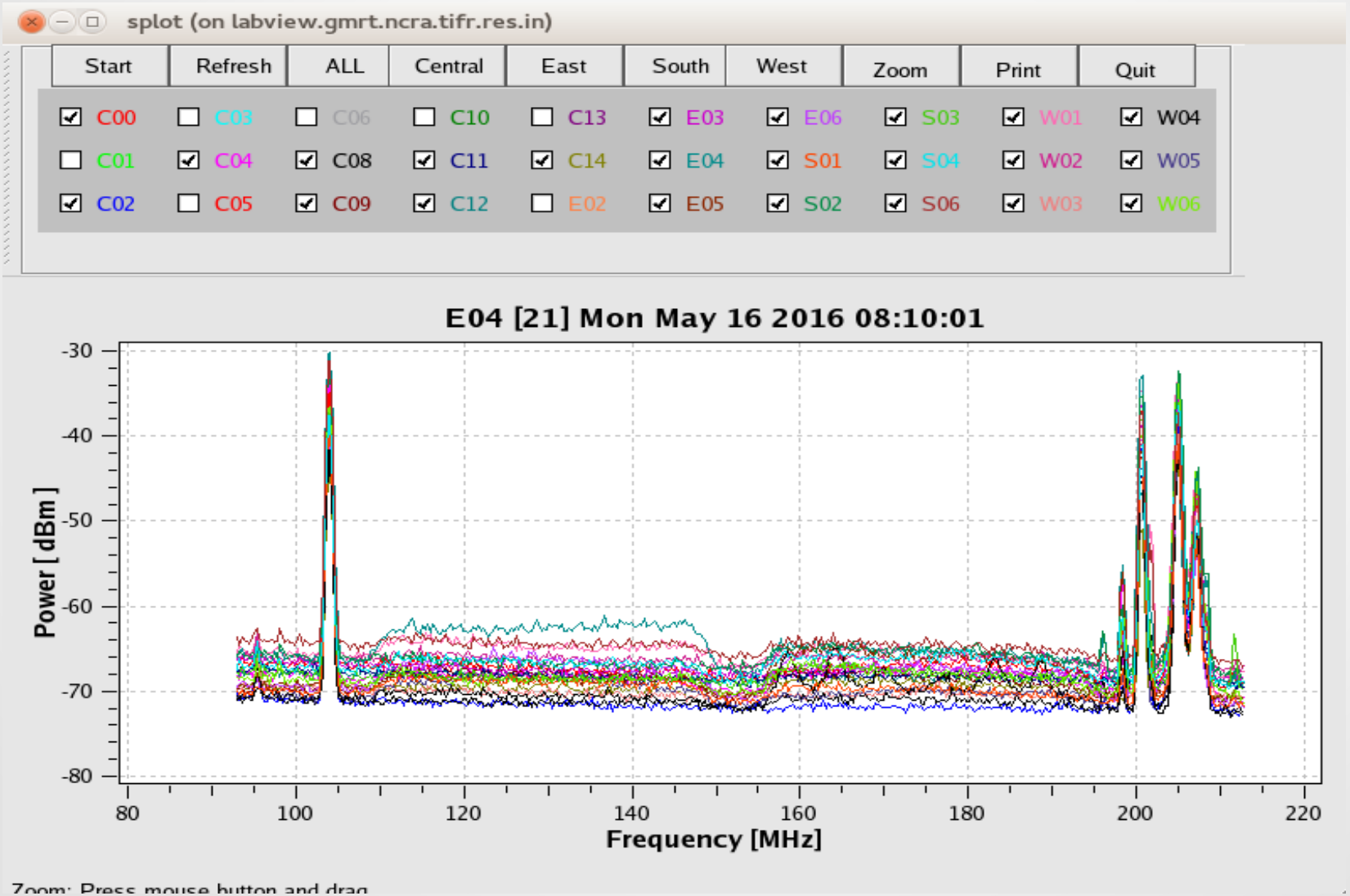


Before and After Phasing

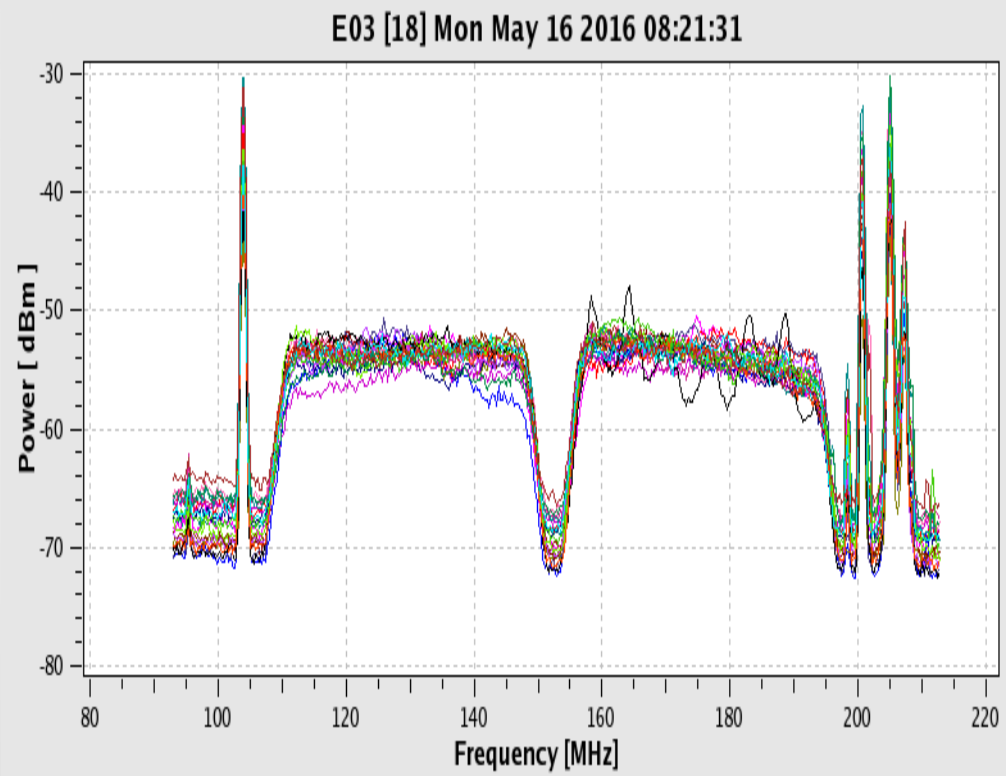


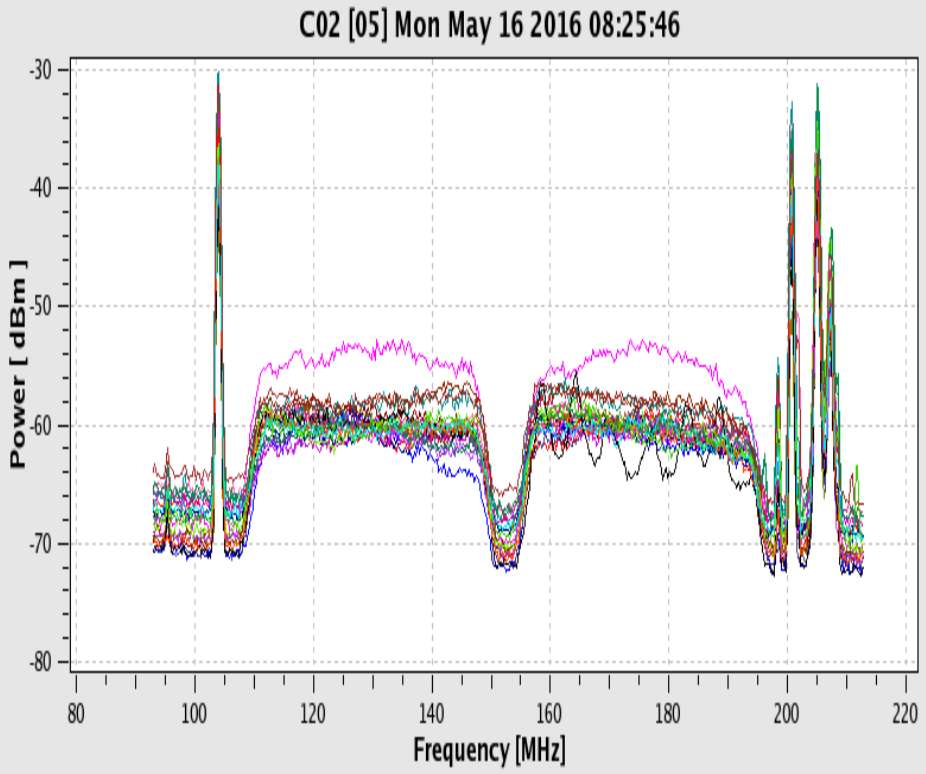


Deflection Test by using 30to1 switch



ON and OFF source (CRAB)

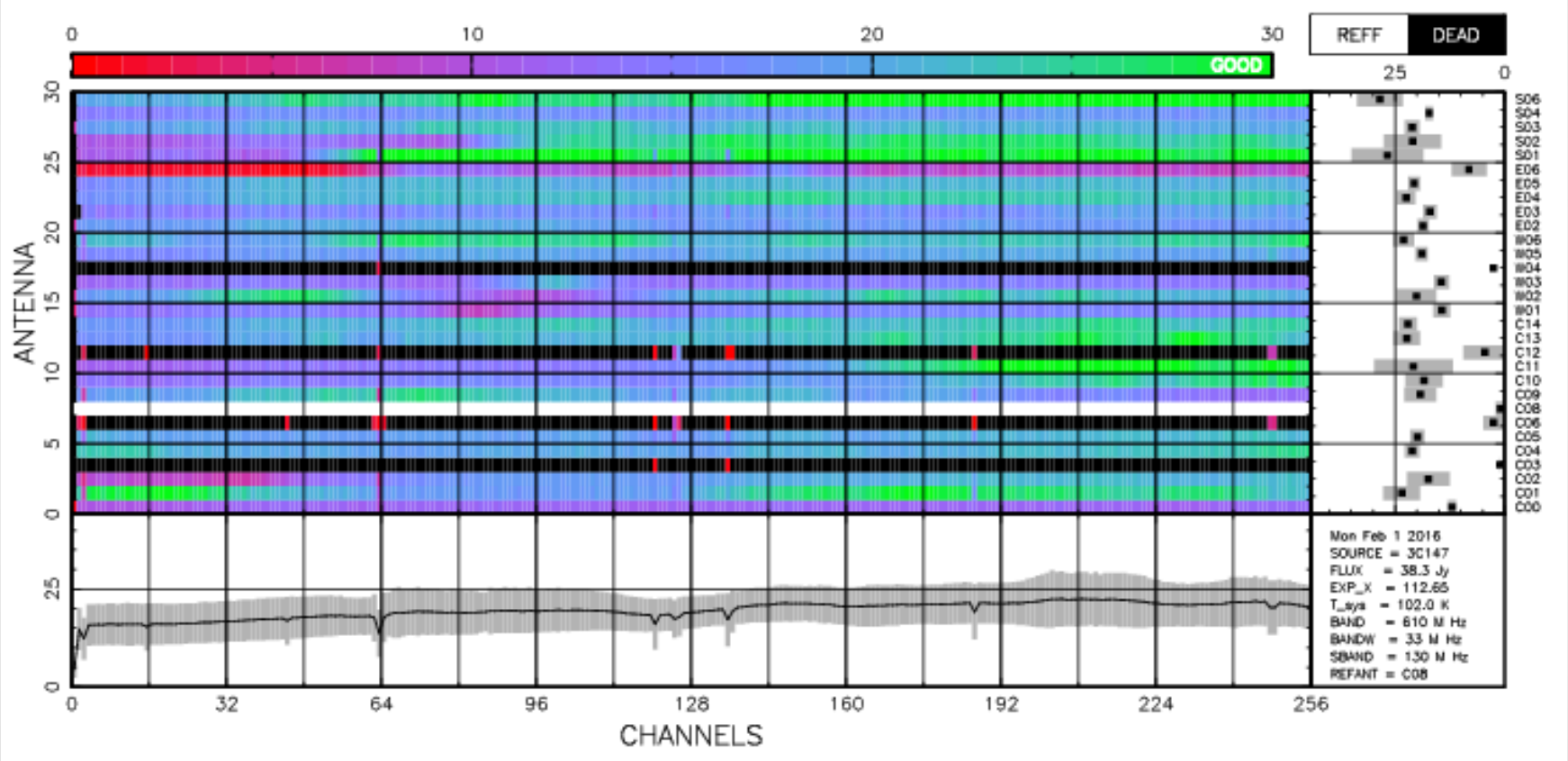




* Total Number of antennas : 30
* Source : CRAB
* Frequency : 1390 MHz., IFBW : 32 MHz.
* Expected Deflection : 5.80 dB
* On source file : CRAB_1390_on.spd ## Date : Thu Dec 24 04:15:07 2015
* Off source file : CRAB_1390_off.spd ## Date : Thu Dec 24 04:22:31 2015

Antenna	ON SOURCE	OFF SOURCE	DEFL in dB	DEFL less by	COMMENT
C00-130	-53.6	-58.1	4.5	1.3	BAD
C00-175	-53.2	-57.7	4.6	1.2	BAD
C01-130	-54.1	-57.9	3.7	2.1	BAD
C01-175	-54.7	-58.2	3.4	2.4	BAD
C02-130	-54.5	-58.6	4.1	1.7	BAD
C02-175	-54.6	-59.1	4.5	1.3	BAD
C03-130	-54.9	-58.8	3.9	1.9	BAD
C03-175	-54.2	-58.1	3.8	2.0	BAD
C04-130	-54.6	-59.2	4.6	1.2	BAD
C04-175	-54.1	-58.6	4.4	1.4	BAD
C05-130	-54.3	-58.6	4.3	1.5	BAD
C05-175	-54.9	-59.3	4.4	1.4	BAD
C06-130	-54.6	-59.7	5.1	0.7	GOOD
C06-175	-54.3	-59.2	4.9	0.9	GOOD
C08-130	-54.3	-59.3	5.0	0.8	GOOD
C08-175	-54.5	-59.6	5.1	0.7	GOOD
C09-130	-54.0	-58.9	4.9	0.9	GOOD
C09-175	-54.6	-59.5	4.9	0.9	GOOD
C10-130	-54.3	-57.4	3.1	2.7	BAD
C10-175	-54.6	-59.4	4.8	1.0	GOOD
C11-130	-54.8	-58.8	4.0	1.8	BAD
C11-175	-54.4	-58.9	4.4	1.4	BAD
C12-130	-55.2	-59.5	4.3	1.5	BAD
C12-175	-54.4	-58.6	4.3	1.5	BAD
C13-130	-54.9	-59.4	4.5	1.3	BAD
C13-175	-57.3	-61.6	4.3	1.5	BAD
C14-130	-54.6	-54.7	0.1	5.7	UGLY
C14-175	-54.6	-54.6	0.1	5.7	UGLY
E02-130	-54.4	-58.6	4.2	1.6	BAD
E02-175	-54.4	-58.5	4.1	1.7	BAD
E03-130	-54.8	-58.9	4.1	1.7	BAD
E03-175	-55.3	-59.7	4.4	1.4	BAD
E04-130	-54.5	-58.7	4.2	1.6	BAD
E04-175	-54.7	-59.3	4.6	1.2	BAD
E05-130	-54.6	-59.6	5.0	0.8	GOOD
E05-175	-54.6	-59.5	5.0	0.8	GOOD
E06-130	-54.2	-57.3	3.1	2.7	BAD
E06-175	-54.0	-56.9	2.9	2.9	BAD
S01-130	-54.4	-59.2	4.8	1.0	GOOD
S01-175	-54.9	-59.8	4.9	0.9	GOOD
S02-130	-54.6	-59.2	4.6	1.2	BAD
S02-175	-54.4	-59.0	4.6	1.2	BAD
S03-130	-54.2	-58.3	4.1	1.7	BAD
S03-175	-54.9	-59.5	4.6	1.2	BAD
S04-130	-54.3	-58.9	4.5	1.3	BAD
S04-175	-54.9	-59.8	4.9	0.9	GOOD
S06-130	-54.7	-58.9	4.3	1.5	BAD
S06-175	-54.9	-59.4	4.5	1.3	BAD
W01-130	-66.0	-66.1	0.1	5.7	UGLY
W01-175	-68.6	-68.7	0.1	5.7	UGLY
W02-130	-54.8	-59.2	4.4	1.4	BAD
W02-175	-55.5	-59.3	3.8	2.0	BAD
W03-130	-54.7	-59.5	4.8	1.0	GOOD
W03-175	-54.5	-59.6	5.2	0.6	GOOD
W04-130	-53.5	-58.8	5.2	0.6	GOOD
W04-175	-54.7	-60.2	5.6	0.2	GOOD
W05-130	-54.5	-60.0	5.5	0.3	GOOD
W05-175	-54.3	-59.8	5.5	0.3	GOOD
W06-130	-55.2	-59.6	4.5	1.3	BAD
W06-175	-54.9	-59.5	4.6	1.2	BAD

Polarisation Isolation



THANK YOU