Impact of Operations on Data Analysis

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Impact of Operations on Analysis

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- **PLEASE Inform Coordinating Center about Changes in Station Status**
  - Typical Problems
    - Increased SEFDs, e.g., warm receiver
    - Antenna slewing problems
    - Staffing Problems
    - Station not operational, i.e., "down" or unreliable
    - Observing conflicts
    - Insufficient media
    - Or any other issues that impact station performance or experiments that can be supported
  - Report expected duration
    - One day, One week …
    - If expected duration is unknown, a minimum estimate of duration is still helpful
  - Send messages to ivs-urgent@ivscc.gsfc.nasa.gov
  - This information will help the coordinating center determine how to handle the situation and get the best data possible.
  - We are happy to hear about improvements in status as well.

- **Three primary ways to deal with problems**
  - Change Master Schedule
    - Mostly for observing conflicts and extended periods when a station may be "down"
  - Modify scheduling parameters
    - Used for problems that limit station performance, e.g., warm receiver, antenna slewing degraded, temporarily or permanently
  - Change scheduling status to "Tag-along"
    - Works well for temporary situations that may prevent observing or make station unreliable
    - Allows a station to contribute to network if it can observe, but limits bad consequences if it is unable to observe

- **Formatter Clock Jumps**
  - The Mark IV correlator does not handle arbitrary formatter offsets
  - If sub-second portion (available from gps-fmout or fmout-gps) of the clock offset exceeds about ±30 milliseconds it must be reset.
  - If the integer second portion (available normally from "sy=run setcl &") of the clock offset exceeds about ±5 seconds it must be reset.
  - Correct as soon as possible
  - You should **not** reset the clock if a jump results is a smaller offset than these limits.

- **Extra Cable delay**
  - If you leave the cable extender for the cable measurement in the line by accident, don't take it out once the experiment has started unless you believe there is something wrong with the extender.
  - Likewise do not make the cable measurement during the experiment. If you forget to make it beforehand, please wait until the end.
  - Phase meter must be in the middle half of the range

- **Sensitivity Effects**
  - Geodetic Precision is roughly proportional to observation sigma σ
  - $$\sigma \propto \frac{1}{SNR} \propto \sqrt{\frac{SEFD_1 SEFD_2}{T_{\text{int}}}} \Big/ S_c$$
    - σ is the precision of the observation (sigma) or how good a measurement we are making (the smaller the better)
    - *SNR* is the signal-to-noise ratio, or how much stronger the signal is than the noise (the larger the better)
    - $SEFD_1$ is SEFD at antenna 1 (the smaller the better)
    - $SEFD_2$ is SEFD at antenna 2 (the smaller the better)
    - T_{int} is the integration (recording time) of observation (the larger the better)
    - S_c is the correlated source flux (the larger the better)
    - Note:
      - Observation sigma σ is inversely proportional to *SNR*
      - Observation sigma σ is proportional to square root of product of SEFDs
      - Observation sigma σ is inversely proportional to square root of T_{int}, recording time
      - Warm receiver with SEFD 3 times normal is the same as observing 1/3 of the time

- **Sensitivity Effects (continued)**
  - Geodetic Precision and a Warm Receiver
    - If one station's receiver is warm, that station's SEFD might typically go up by a factor of three. Then the average sigma would go up a factor of $\sqrt{3}$ or about 1.7, a station position estimate that would have been precise to about 5 mm would instead be precise to about 8.5 mm.
    - Warm receiver with SEFD 3 times normal is the same as observing 1/3 of the time
    - Target (minimum) SNR values are typically 20 at X-band, there are no fringes of SNR falls below about 7. With an SEFD 3 times normal, the target SNR becomes 11, not fatal and many observations exceed the target.
    - A warm receiver at one station usually will not destroy an experiment as is, but it may prevent fringes to a high SEFD station if it was scheduled with a lower SNR target. For example, baselines to O'Higgins are typically scheduled with a target of 15. If Hobart warms-up the SNR is reduced below 9 and the Hobart-O'Higgins baseline will be marginal at best.
  - Other effects that increase SEFD
    - Pointing off by one half of a full-width-half-maximum (FWHM) drops the response of the antenna by a factor of two and so doubles the SEFD and the sigma is increased by $\sqrt{2}$
    - If the focus is off, the same rule applies, if the response is down half, the SEFD is doubled and the sigma is increased by $\sqrt{2}$
    - Poor image rejection:
      - Front-end, doubles the noise level in all channels, so increases sigma by $\sqrt{2}$ (also does bad things to phase-cal: adds spurious signals)
      - VC/BBC, doubles the noise level in that channel, so increases the sigma by about a small amount, but also adds spurious signals
  - Missing channels
    - Each lost channel reduces data yield by about 7%
    - In addition it can compromise the delay resolution function, please see the accompanying write-up by Axel Nothnagel
  - Phase-cal
    - Should be about 1% in power
    - Too strong reduces sensitivity and produces spurious signals
    - Phase-cal too weak spurious signals can be a problem

- **Reduced Channel Amplitude Caused by Spurious Signal, RFI, bad channels, etc.**
  - Sometimes channel must be deleted
  - See accompany fringe plots:
    - HartRAO autocorrelation: strong spur, channel deleted
    - Matera-Wettzell S Band & Matera autocorrelation: strong spur at Matera
    - Gilcreek-Westford S-band, bad BBC at Gc, RFI at Westford, note: sidelobes of MBD high
    - TIGO-Wettzell, Upper X-band problem at TIGO
    - Gilcreek-Hobart S-band, Hobart noisy LO in VC14
    - Seshan-Wettzell X-Band: Seshan roll-off in upper channels, all four channels deleted

- **Gilcreek Maser Problem, Fall/Winter 2004-2005**
  - See accompany clock/residual plots from R1150:
    - Problem: Gilcreek versus Westford, wrms=149 pico-seconds
    - Normal: Kokee versus Westford, wrms=29 pico-seconds
  - See accompany fringe plots from R1154
    - Phase jump at X and S at Gilcreek
  - Very roughly the effect was to double Gilcreek's coordinate sigmas
    - Corresponds to losing about 75% of the data

- **Tape Overwriting**
  - See Gilcreek-Hobart Fringe Plot with significant data loss

- **Phase-cal epoch jumps**
  - S-band MBD delays jumps
    - When S-band ambiguity spacing was no longer 200 nanoseconds, now fixed
    - AEDIT plot for R1171, see Station O
    - If Phase-cal 5 MHz is interrupted there is 4 out of 5 chance the epoch will change
    - Possible causes:
      - Disconnecting and reconnecting Phase-cal 5 MHz cable, e.g., removing cable sign check extension cable during session, please don't.
      - Bad connectors
      - Bad power supplies
      - Anything else that can cause the epoch of Phase-cal pulse to change

- **Mark 5 Cable crosstalk**
  - See Matera-West_5B fringe plot, including blow-up of Amp and Phase vs. time

- **Multiple Formatter Jumps**
  - See AEDIT plot for experiment 3164

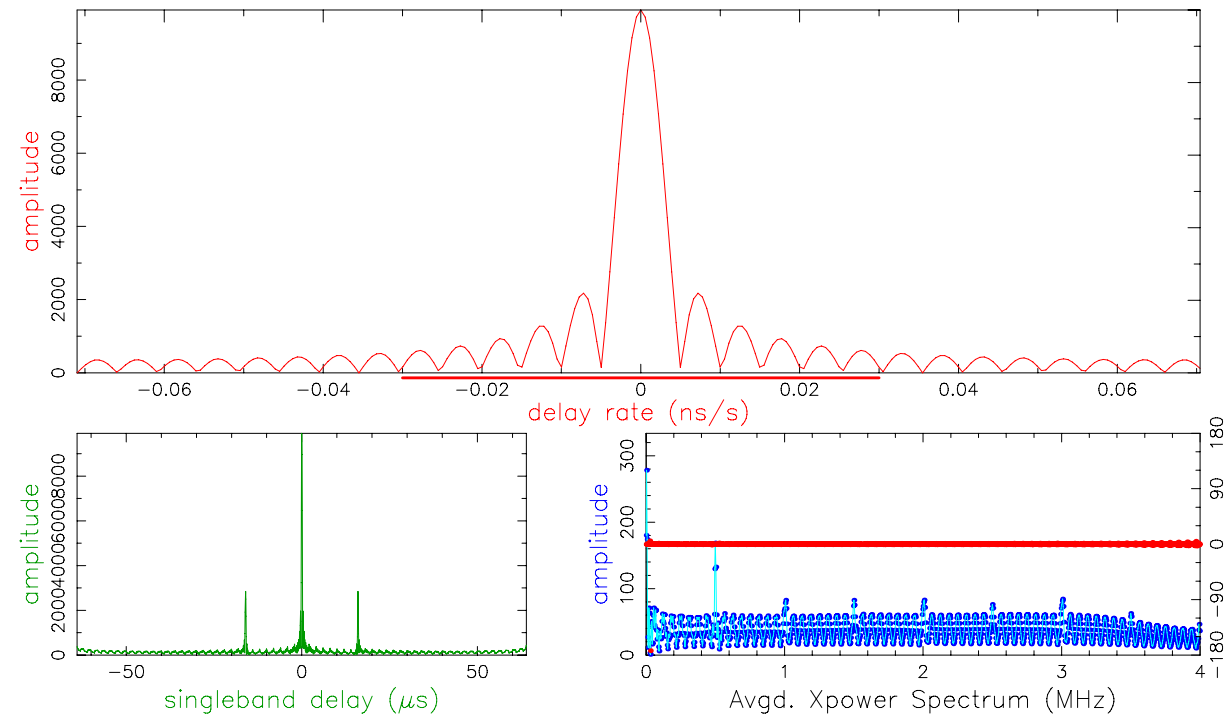
- **Non-detection due to weak X-band**
  - See fringe plot of Urumqi-Crimea

- **Unstable Phase-cal**
  - See blow-up of Amp and Phase vs time

- **Phase-cal Spurious signals**
  - See AEDIT plot for experiment 3151

Mk4 Fringe Plot

0302-623.rktinp, 075-1719, JJ
HARTRAO - HARTRAO, fgroup S, pol RR

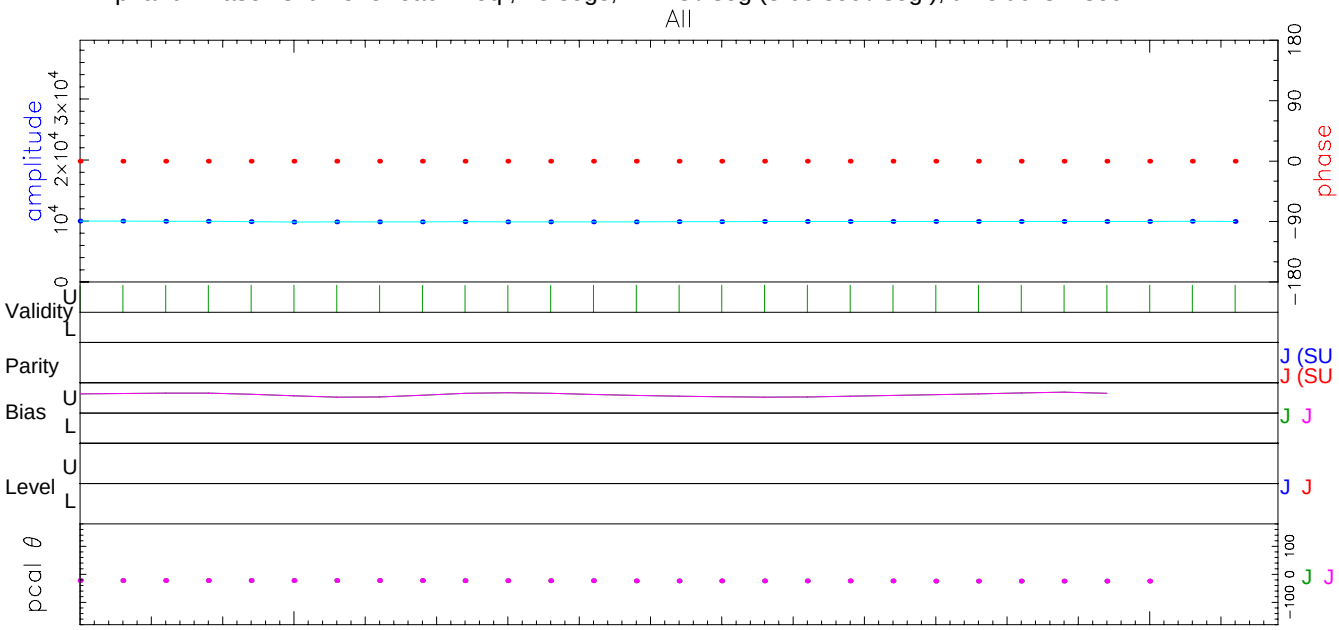


Fringe quality 9

SNR 14593.5
PFD 0.0e+00
Intg.time 82.513
Amp 9912.812
Phase 0.0
Sbdelay (us) 0.000004
Mbdelay (us) 0.000000
Fr. rate (Hz) 0.000000
Ref freq (MHz) 2347.9900
AP (sec) 3.000

Exp. CRDS17
Exper # 7578
Yr:day 2005:075
Start 171945.00
Stop 172109.00
FRT 172025.00
Corr. date: 2005:082:135744
Fourfit date: 2005:097:190245
Position (J2000) 03h03m50.6313s -62°11'25.550"

Amp. and Phase vs. time for each freq., 28 segs, 1 APs / seg (3.00 sec / seg.), time ticks 1 sec

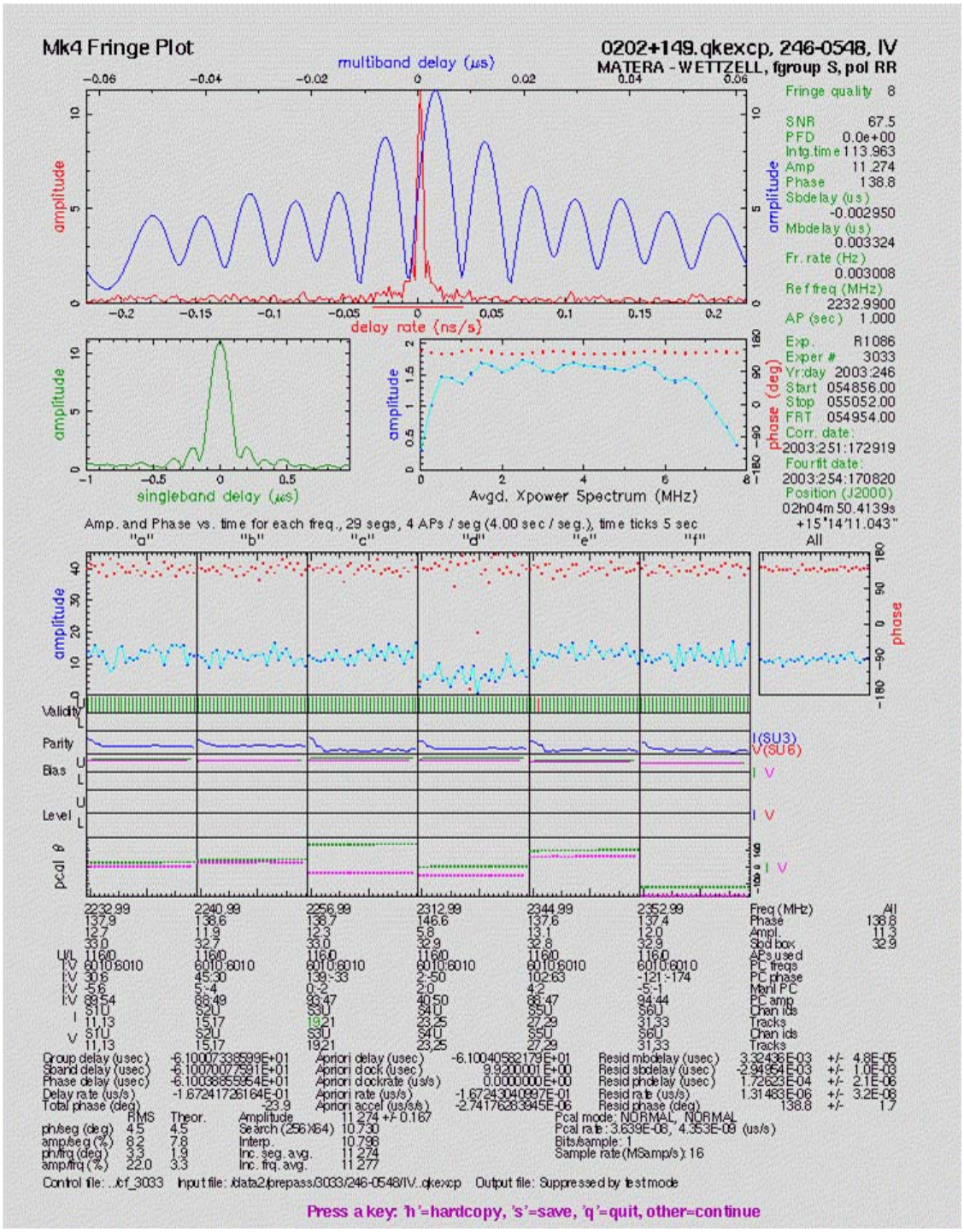


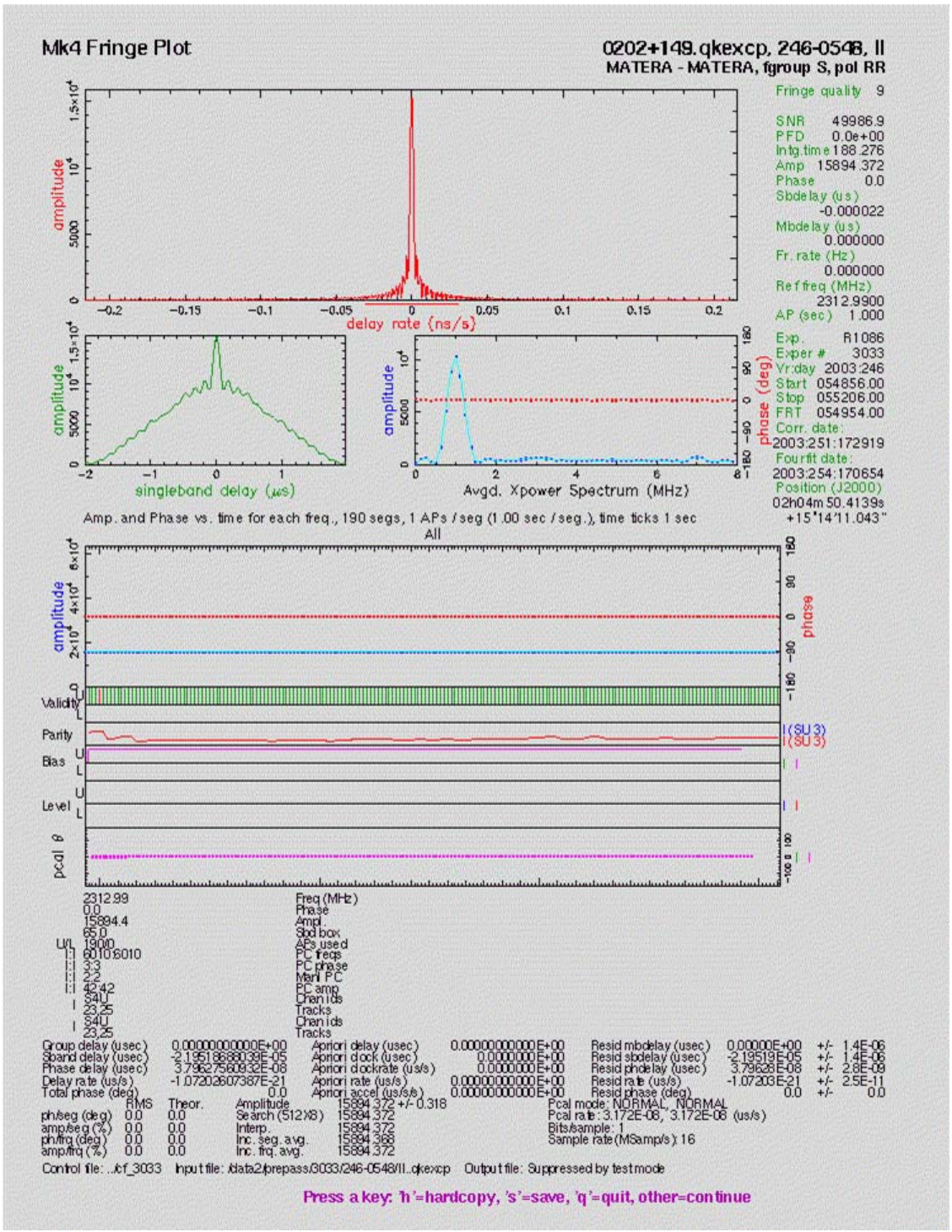
	2347.99	Freq (MHz)
	0.0	Phase
	9912.8	Ampl.
	1025.0	Sbd box
U/L	28/0	APs used
J:J	10:10	PC freqs
J:J	-23:-23	PC phase
J:J	0:0	Manl PC
J:J	45:45	PC amp
J	S5U 27,29	Chan ids Tracks
J	S5U 27,29	Chan ids Tracks

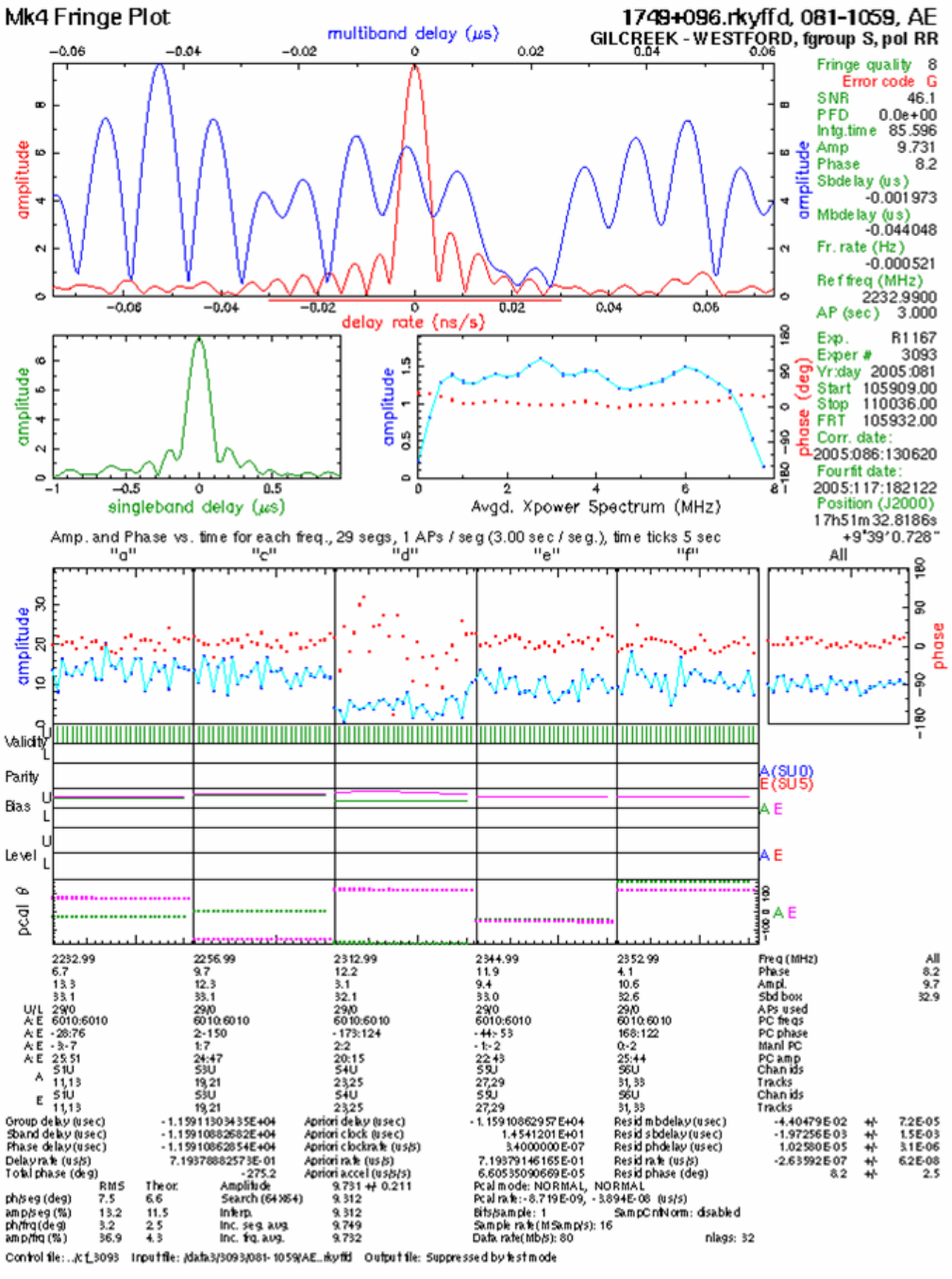
Group delay (usec)	0.00000000000E+00		Apriori delay (usec)	0.00000000000E+00		Resid mbdelay (usec)	0.00000E+00	+/- 9.4E-06
Sband delay (usec)	3.86891376835E-06		Apriori clock (usec)	0.0000000E+00		Resid sbdelay (usec)	3.86891E-06	+/- 9.4E-06
Phase delay (usec)	-3.29551128270E-09		Apriori clockrate (us/s)	0.0000000E+00		Resid phdelay (usec)	-3.29551E-09	+/- 9.3E-09
Delay rate (us/s)	6.61744490042E-22		Apriori rate (us/s)	0.00000000000E+00		Resid rate (us/s)	6.61744E-22	+/- 1.9E-10
Total phase (deg)	0.0		Apriori accel (us/s/s)	0.00000000000E+00		Resid phase (deg)	0.0	+/- 0.0

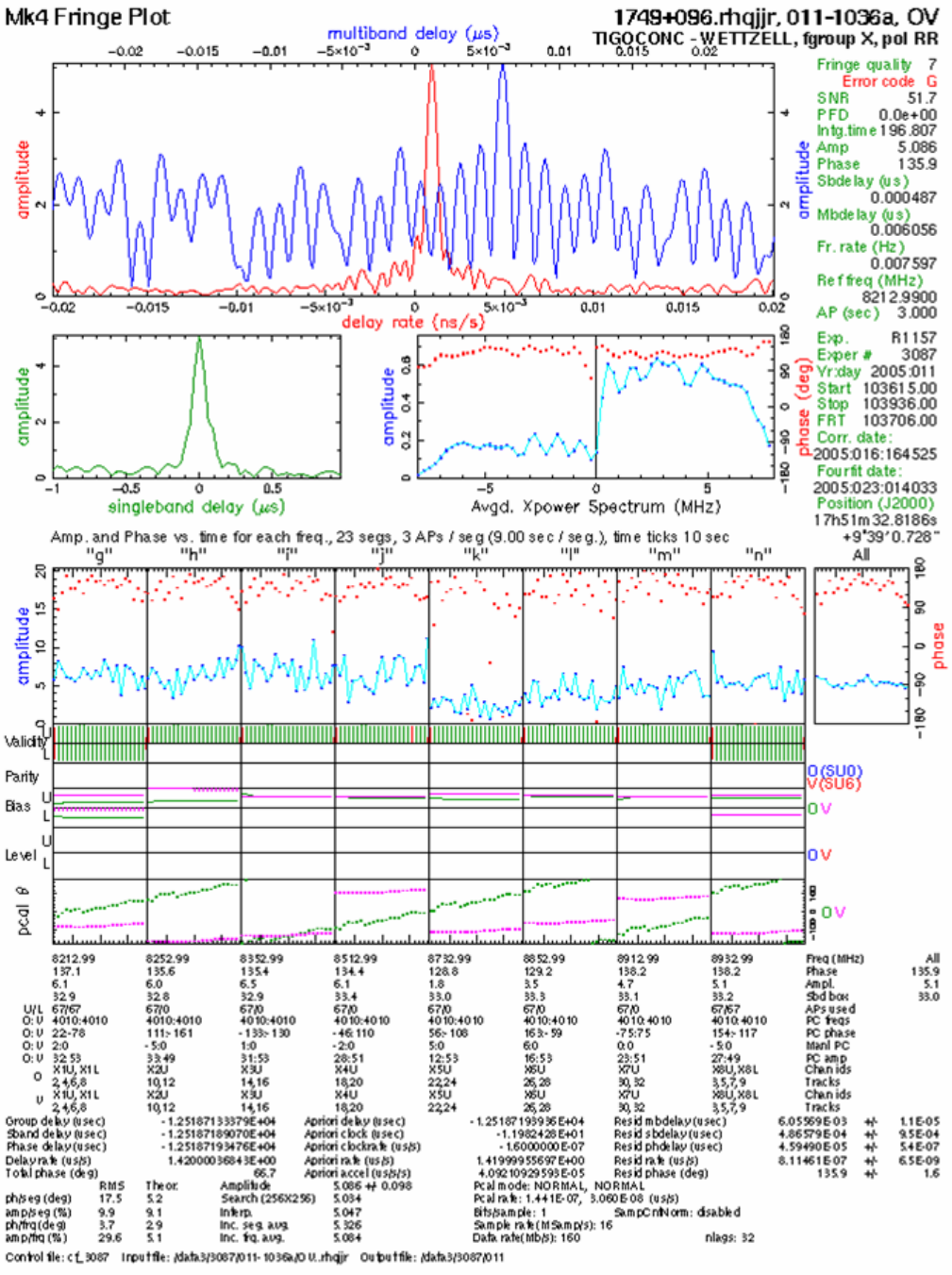
	RMS	Theor.			
			Amplitude	9912.812 +/- 0.679	Pcal mode: NORMAL, NORMAL
ph/seg (deg)	0.0	0.0	Search (64X8)	9912.812	Pcal rate: -4.657E-08, -4.657E-08 (us/s)
amp/seg (%)	0.4	0.0	Interp.	9912.812	Bits/sample: 1
ph/frq (deg)	0.0	0.0	Inc. seg. avg.	9912.812	Sample rate(MSamp/s): 8
amp/frq (%)	0.0	0.0	Inc. frq. avg.	9912.812	Data rate(Mb/s): 8 nlags: 1024

Control file: cf_7578 Input file: /correlator/data/7578/075-1719/JJ..rktinp Output file: Suppressed by test mode

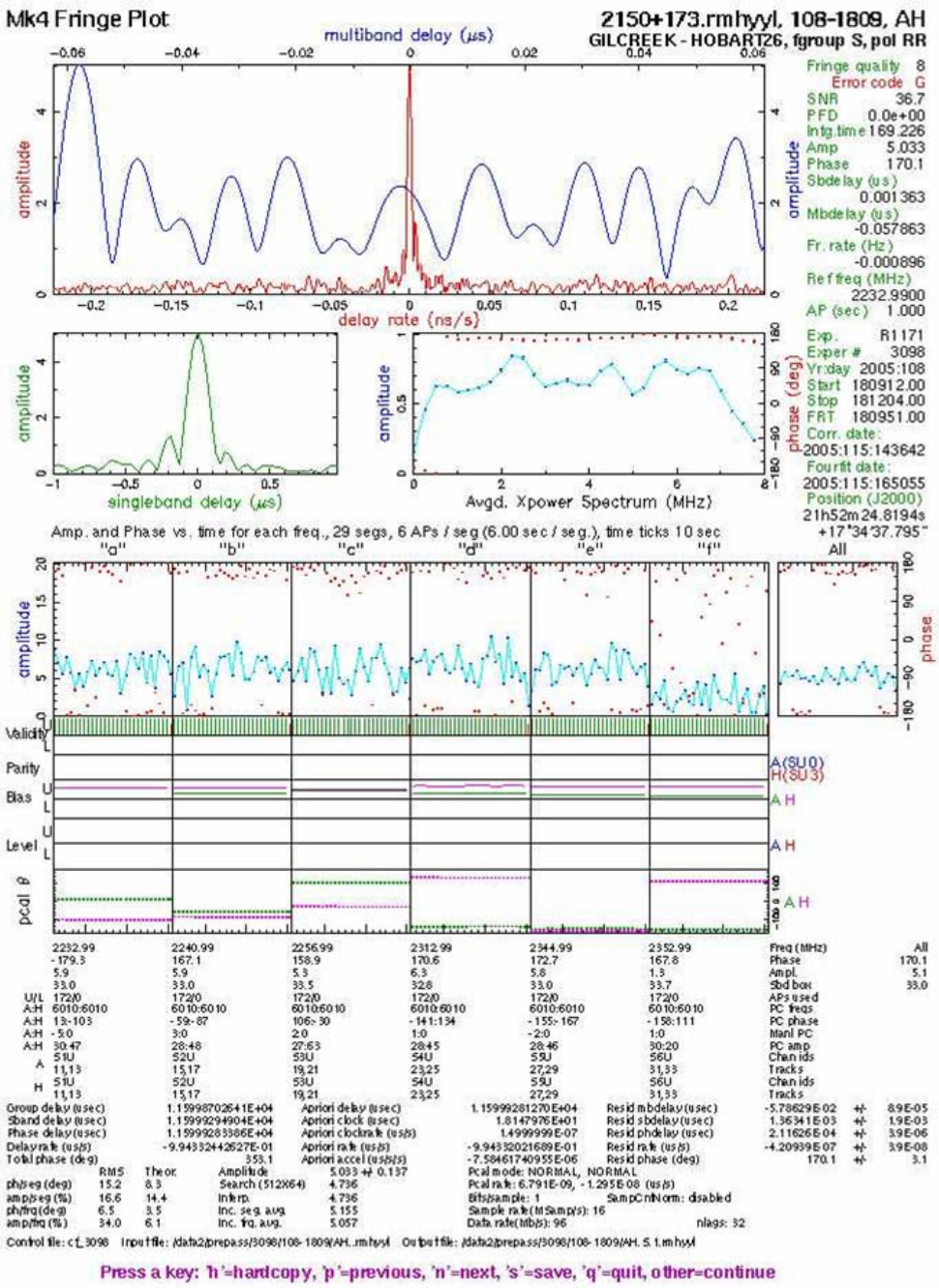

Mk4 Fringe Plot
0202+149.qkexcp, 246-0548, IV
MATERA - WETTZELL, fgroup S, pol RR
multiband delay (μs)
amplitude
delay rate (ns/s)
singleband delay (μs)
Avgd. Xpower Spectrum (MHz)
phase (deg)
Fringe quality 8
SNR 67.5
PFD 0.0e+00
Intg.time 113.963
Amp 11.274
Phase 138.8
Sbdelay (us) -0.002950
Mbdelay (us) 0.003324
Fr. rate (Hz) 0.003008
Ref freq (MHz) 2232.9900
AP (sec) 1.000
Exp. R1086
Exper # 3033
Yr:day 2003:246
Start 054856.00
Stop 055052.00
FRT 054954.00
Corr. date: 2003:251:172919
Fourfit date: 2003:254:170820
Position (J2000) 02h04m50.4139s +15°14'11.043"
Amp. and Phase vs. time for each freq., 29 segs, 4 APs / seg (4.00 sec / seg.), time ticks 5 sec
"a" "b" "c" "d" "e" "f"
All
phase
Validity
Parity
Bias
Level
pcal θ
I(SU3)
V(SU6)
2232.99 2240.99 2256.99 2312.99 2344.99 2352.99
137.9 138.6 138.7 146.6 137.6 137.4
12.7 11.9 12.3 5.8 13.1 12.0
33.0 32.7 33.0 32.9 32.8 32.9
U/L 11&0 11&0 11&0 11&0 11&0 11&0
I,V 6010:6010 6010:6010 6010:6010 6010:6010 6010:6010 6010:6010
I,V 30:6 45:30 139:-33 2:-50 102:63 -121:-174
I,V -5:6 5:-4 0:-2 2:0 4:2 -5:-1
I,V 88:54 88:49 93:47 40:50 88:47 94:44
I S1U S2U S3U S4U S5U S6U
11,13 15,17 19,21 23,25 27,29 31,33
V S1U S2U S3U S4U S5U S6U
11,13 15,17 19,21 23,25 27,29 31,33
Freq (MHz) All
Phase 138.8
Ampl. 11.3
Sbd box 32.9
APs used
PC freqs
PC phase
Manl PC
PC amp
Chan ids
Tracks
Chan ids
Tracks
Group delay (usec) -6.100073385991E+01
Sband delay (usec) -6.100700775911E+01
Phase delay (usec) -6.100388559541E+01
Delay rate (us/s) -1.872417261 64E-01
Total phase (deg) -23.9
Apriori delay (usec) -6.100405821791E+01
Apriori clock (usec) 9.920000 1E+00
Apriori clockrate (us/s) 0.0000000E+00
Apriori rate (us/s) -1.672430409 97E-01
Apriori accel (us/s/s) -2.741762839 45E-06
Resid mbdelay (usec) 3.32436E-03 +/- 4.8E-05
Resid sbdelay (usec) -2.94954E-03 +/- 1.0E-03
Resid phdelay (usec) 1.72623E-04 +/- 2.1E-06
Resid rate (us/s) 1.31483E-06 +/- 3.2E-08
Resid phase (deg) 138.8 +/- 1.7
RMS Theor.
ph/seg (deg) 4.5 4.5
amp/seg (%) 8.2 7.8
ph/frq (deg) 3.3 1.9
amp/frq (%) 22.0 3.3
Amplitude 11.274 +/- 0.167
Search (256X64) 10.730
Interp. 10.798
Inc. seg. avg. 11.274
Inc. frq. avg. 11.277
Pcal mode: NORMAL, NORMAL
Pcal rate: 3.639E-08, 4.353E-09 (us/s)
Bits/sample: 1
Sample rate (MSamp/s): 16
Control file: .../cf_3033 Input file: /data2/prepass/3033/246-0548/IV..qkexcp Output file: Suppressed by test mode
Press a key: 'h'=hardcopy, 's'=save, 'q'=quit, other=continue


Mk4 Fringe Plot
0202+149.qkexcp, 246-0548, II
MATERA - MATERA, fgroup S, pol RR
Fringe quality 9
SNR 49986.9
PFD 0.0e+00
Intg.time 188.276
Amp 15894.372
Phase 0.0
Sbdelay (us) -0.000022
Mbdelay (us) 0.000000
Fr.rate (Hz) 0.000000
Ref freq (MHz) 2312.9900
AP (sec) 1.000
Exp. R1086
Exper # 3033
Yr:day 2003:246
Start 054856.00
Stop 055206.00
FRT 054954.00
Corr. date: 2003:251:172919
Fourfit date: 2003:254:170654
Position (J2000) 02h04m50.4139s +15°14'11.043"
amplitude
delay rate (ns/s)
singleband delay (μs)
Avgd. Xpower Spectrum (MHz)
phase (deg)
Amp. and Phase vs. time for each freq., 190 segs, 1 APs / seg (1.00 sec / seg.), time ticks 1 sec
All
Validity
Parity
Bias
Level
pcal θ
phase
2312.99 Freq (MHz)
0.0 Phase
15884.4 Ampl.
65.0 Sbd box
190/0 APs used
6010/6010 PC freqs
3:3 PC phase
2:2 Manl PC
42:42 PC amp
S4U Chan ids
23,25 Tracks
S4U Chan ids
23,25 Tracks
Group delay (usec) 0.000000000000E+00
Sband delay (usec) -2.195186880039E-05
Phase delay (usec) 3.796275609132E-08
Delay rate (us/s) -1.07202607387E-21
Total phase (deg) 0.0
Apriori delay (usec) 0.000000000000E+00
Apriori clock (usec) 0.000000000E+00
Apriori clockrate (us/s) 0.000000000E+00
Apriori rate (us/s) 0.000000000000E+00
Apriori accel (us/s/s) 0.000000000000E+00
Resid mbdelay (usec) 0.00000E+00 +/- 1.4E-06
Resid sbdelay (usec) -2.19519E-05 +/- 1.4E-06
Resid phdelay (usec) 3.79628E-08 +/- 2.8E-09
Resid rate (us/s) -1.07203E-21 +/- 2.5E-11
Resid phase (deg) 0.0 +/- 0.0
RMS Theor.
ph/seg (deg) 0.0 0.0
amp/seg (%) 0.0 0.0
ph/frq (deg) 0.0 0.0
amp/frq (%) 0.0 0.0
Amplitude 15894.372 +/- 0.318
Search (512X8) 15894.372
Interp. 15894.372
Inc. seg. avg. 15894.368
Inc. frq. avg. 15894.372
Pcal mode: NORMAL, NORMAL
Pcal rate: 3.172E-08, 3.172E-08 (us/s)
Bits/sample: 1
Sample rate (MSamp/s): 16
Control file: .../cf_3033 Input file: /data2/prepass/3033/246-0548/II..qkexcp Output file: Suppressed by test mode
Press a key: 'h'=hardcopy, 's'=save, 'q'=quit, other=continue


Mk4 Fringe Plot
1749+096.rkyffd, 081-1059, AE
GILCREEK - WESTFORD, fgroup S, pol RR
multiband delay (μs)
amplitude
delay rate (ns/s)
singleband delay (μs)
Avgd. Xpower Spectrum (MHz)
phase (deg)
Fringe quality 8
Error code G
SNR 46.1
PFD 0.0e+00
Intg.time 85.596
Amp 9.731
Phase 8.2
Sbdelay (us) -0.001973
Mbdelay (us) -0.044048
Fr. rate (Hz) -0.000521
Ref freq (MHz) 2232.9900
AP (sec) 3.000
Exp. R1167
Exper # 3093
Yr:day 2005:081
Start 105909.00
Stop 110036.00
FRT 105932.00
Corr. date: 2005:086:130620
Fourfit date: 2005:117:182122
Position (J2000) 17h51m32.8186s +9°39'0.728"
Amp. and Phase vs. time for each freq., 29 segs, 1 APs / seg (3.00 sec / seg.), time ticks 5 sec
"a"
"c"
"d"
"e"
"f"
All
Validity
Parity
Bias
Level
pcal θ
A(SU0)
E(SU5)
2232.99 2256.99 2312.99 2344.99 2352.99 Freq (MHz) All
6.7 9.7 12.2 11.9 4.1 Phase 8.2
13.3 12.3 3.1 9.4 10.6 Ampl. 9.7
33.1 33.1 32.1 33.0 32.6 Sbd box 32.9
U/L 29/0 29/0 29/0 29/0 29/0 APs used
A: E 6010:6010 6010:6010 6010:6010 6010:6010 6010:6010 PC freqs
A: E -28:76 2-150 -173:124 -44>53 168:122 PC phase
A: E -3:-7 1:7 2:2 -1:-2 0:-2 Manl PC
A: E 25,51 24:47 20:15 22,43 25:44 PC amp
A 51U 53U 54U 55U 56U Chan ids
A 11,13 19,21 23,25 27,29 31,33 Tracks
E 51U 53U 54U 55U 56U Chan ids
E 11,13 19,21 23,25 27,29 31,33 Tracks
Group delay (usec) -1.159113034355E+04 Apriori delay (usec) -1.159108629575E+04 Resid mbdelay (usec) -4.40479E-02 +/- 7.2E-05
Sband delay (usec) -1.159108826826E+04 Apriori clock (usec) 1.454120154E+01 Resid sbdelay (usec) -1.97256E-03 +/- 1.5E-03
Phase delay (usec) -1.159108628546E+04 Apriori clockrate (us/s) 3.400000E-07 Resid phdelay (usec) 1.02580E-05 +/- 3.1E-06
Delay rate (us/s) 7.193788825736E-01 Apriori rate (us/s) 7.193791461656E-01 Resid rate (us/s) -2.63592E-07 +/- 6.2E-08
Total phase (deg) -275.2 Apriori accel (us/s/s) 6.605350906696E-05 Resid phase (deg) 8.2 +/- 2.5
RMS Theor. Amplitude 9.731 +/- 0.211
ph/seg (deg) 7.5 6.6 Search (64X64) 9.312 Pcal mode: NORMAL, NORMAL
amp/seg (%) 13.2 11.5 Interp. 9.312 Pcal rate: -8.719E-09, -3.894E-08 (us/s)
ph/frq (deg) 3.2 2.5 Inc. seg. avg. 9.749 Bits/sample: 1 SampCnNorm: disabled
amp/frq (%) 36.9 4.3 Inc. frq. avg. 9.732 Sample rate (MSamp/s): 16
Data rate(Mb/s): 80 nlags: 32
Control file: ../ctl_3093 Input file: /data3/3093/081-1059/AE..rkyffd Output file: Suppressed by fest mode
Press a key: 'h'=hardcopy, 's'=save, 'q'=quit, other=continue


Mk4 Fringe Plot
1749+096.rhqjjr, 011-1036a, OV
TIGOCONC - WETTZELL, fgroup X, pol RR
multiband delay (μs)
delay rate (ns/s)
singleband delay (μs)
Avgd. Xpower Spectrum (MHz)
amplitude
phase (deg)
Fringe quality 7
Error code G
SNR 51.7
PFD 0.0e+00
Intg.time 196.807
Amp 5.086
Phase 135.9
Sbdelay (us) 0.000487
Mbdelay (us) 0.006056
Fr. rate (Hz) 0.007597
Ref freq (MHz) 8212.9900
AP (sec) 3.000
Exp. R1157
Exper # 3087
Yr:day 2005:011
Start 103615.00
Stop 103936.00
FRT 103706.00
Corr. date: 2005:016:164525
Fourfit date: 2005:023:014033
Position (J2000) 17h51m32.8186s +9°39'0.728"
Amp. and Phase vs. time for each freq., 23 segs, 3 APs / seg (9.00 sec / seg.), time ticks 10 sec
"g" "h" "i" "j" "k" "l" "m" "n" All
Validity
Parity
Bias
Level
pcal θ
8212.99 8252.99 8352.99 8512.99 8732.99 8852.99 8912.99 8932.99 Freq (MHz) All
137.1 135.6 135.4 134.4 128.8 129.2 138.2 138.2 Phase 135.9
6.1 6.0 6.5 6.1 1.8 3.5 4.7 5.1 Ampl. 5.1
32.9 32.8 32.9 33.4 33.0 33.3 33.1 33.2 Sbd box 33.0
U/L 67/67 67/0 67/0 67/0 67/0 67/0 67/0 67/67 APs used
O: U 4010:4010 4010:4010 4010:4010 4010:4010 4010:4010 4010:4010 4010:4010 4010:4010 PC freqs
O: U 22-78 111>161 -133>130 -46:110 56>108 163>59 -75:75 154>117 PC phase
O: U 2:0 -5:0 1:0 -2:0 5:0 6:0 0:0 -5:0 Manl PC
O: U 32:53 33:49 31:53 28:51 12:53 16:53 23:51 27:49 PC amp
O X1U,X1L X2U X3U X4U X5U X6U X7U X8U,X8L Chan ids
2,4,6,8 10,12 14,16 18,20 22,24 26,28 30,32 3,5,7,9 Tracks
U X1U,X1L X2U X3U X4U X5U X6U X7U X8U,X8L Chan ids
2,4,6,8 10,12 14,16 18,20 22,24 26,28 30,32 3,5,7,9 Tracks
Group delay (usec) -1.251871333796E+04 Apriori delay (usec) -1.251871939936E+04 Resid mbdelay (usec) 6.055696E-03 +/- 1.1E-05
Sband delay (usec) -1.251871890706E+04 Apriori clock (usec) -1.198242816E+01 Resid sbdelay (usec) 4.865796E-04 +/- 9.5E-04
Phase delay (usec) -1.251871934766E+04 Apriori clockrate (us/s) -1.600000E-07 Resid phdelay (usec) 4.594906E-05 +/- 5.4E-07
Delay rate (us/s) 1.420000368433E+00 Apriori rate (us/s) 1.419999556976E+00 Resid rate (us/s) 8.114616E-07 +/- 6.5E-09
Total phase (deg) 66.7 Apriori accel (us/s/s) 4.092109295936E-05 Resid phase (deg) 135.9 +/- 1.6
RMS Theor. Amplitude 5.086 +/- 0.098
ph/seg (deg) 17.5 5.2 Search (256X256) 5.034
amp/seg (%) 9.9 9.1 Interp. 5.047
ph/frq (deg) 3.7 2.9 Inc. seg. avg. 5.326
amp/frq (%) 29.6 5.1 Inc. frq. avg. 5.084
Pcal mode: NORMAL, NORMAL
Pcal rate: 1.441E-07, 3.060E-08 (us/s)
Bits/sample: 1 SampCrNorm: disabled
Sample rate (MSamp/s): 16
Data rate (Mb/s): 160 nlags: 32
Control file: c1_3087 Input file: /data3/3087/011-1036a/O U.rhqjjr Output file: /data3/3087/011

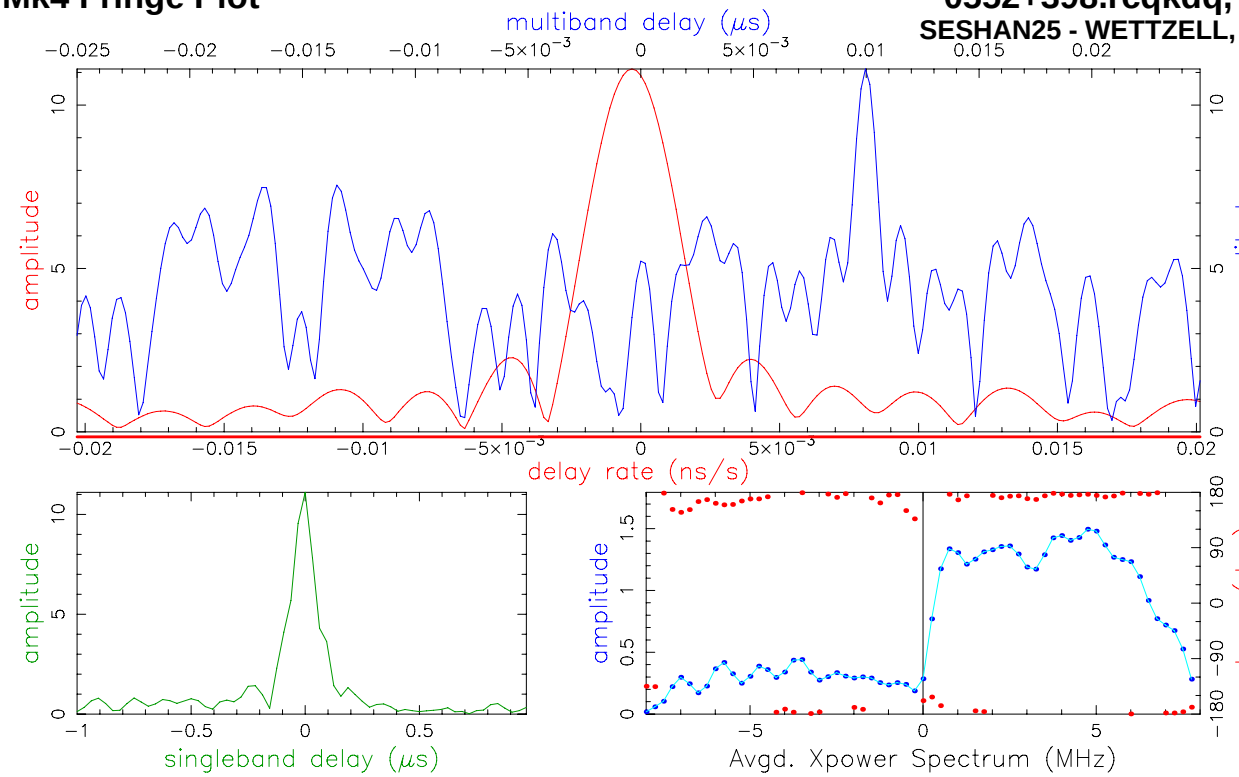
ghostscript



Mk4 Fringe Plot

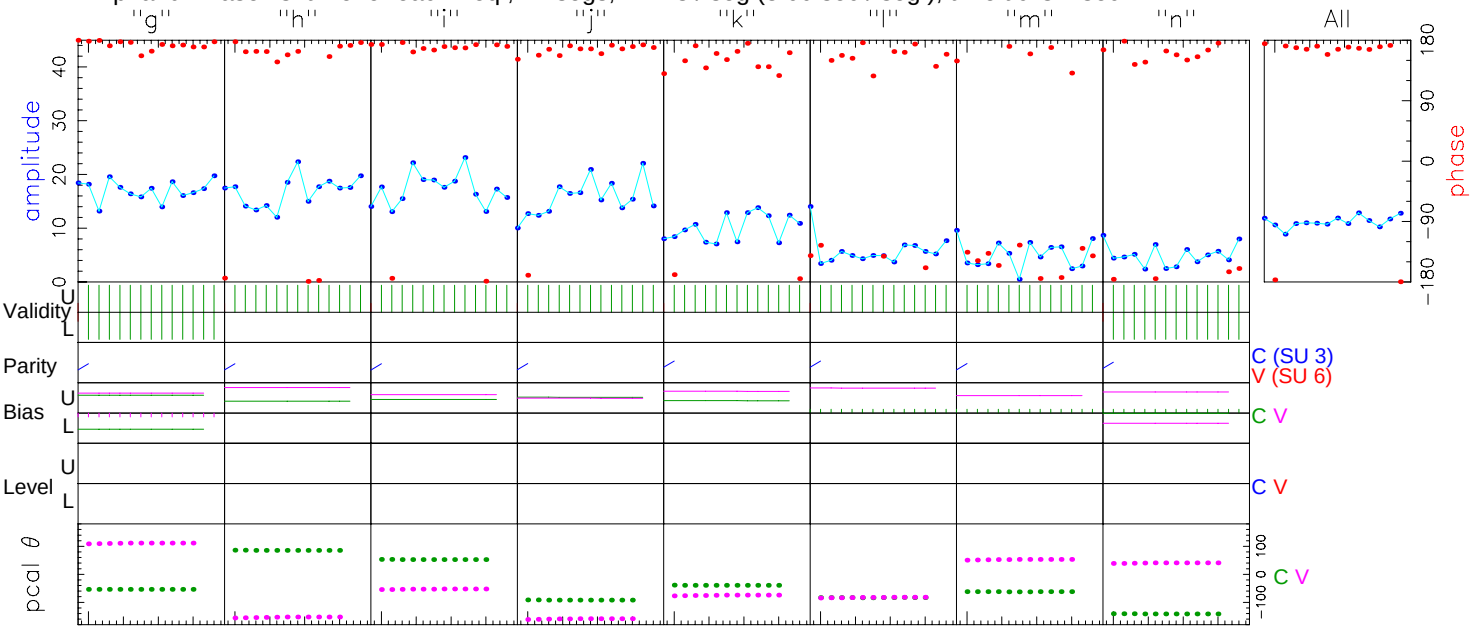
0552+398.rcqkdq, 272-0111, CV

SESHAN25 - WETTZELL, fgroup X, pol RR



Fringe quality	7
Error code	G
SNR	50.5
PFD	0.0e+00
Intg.time	39.353
Amp	11.241
Phase	170.3
Sbdelay (us)	-0.007407
Mbdelay (us)	0.009974
Fr. rate (Hz)	-0.002107
Ref freq (MHz)	8212.9900
AP (sec)	3.000
Exp.	R1142
Exper #	3076
Yr:day	2004:272
Start	011157.00
Stop	011239.00
FRT	011219.00
Corr. date:	2004:276:213534
Fourfit date:	2005:119:194317
Position (J2000)	05h55m30.8056s
	+39°48'49.165"

Amp. and Phase vs. time for each freq., 14 segs, 1 APs / seg (3.00 sec / seg.), time ticks 2 sec

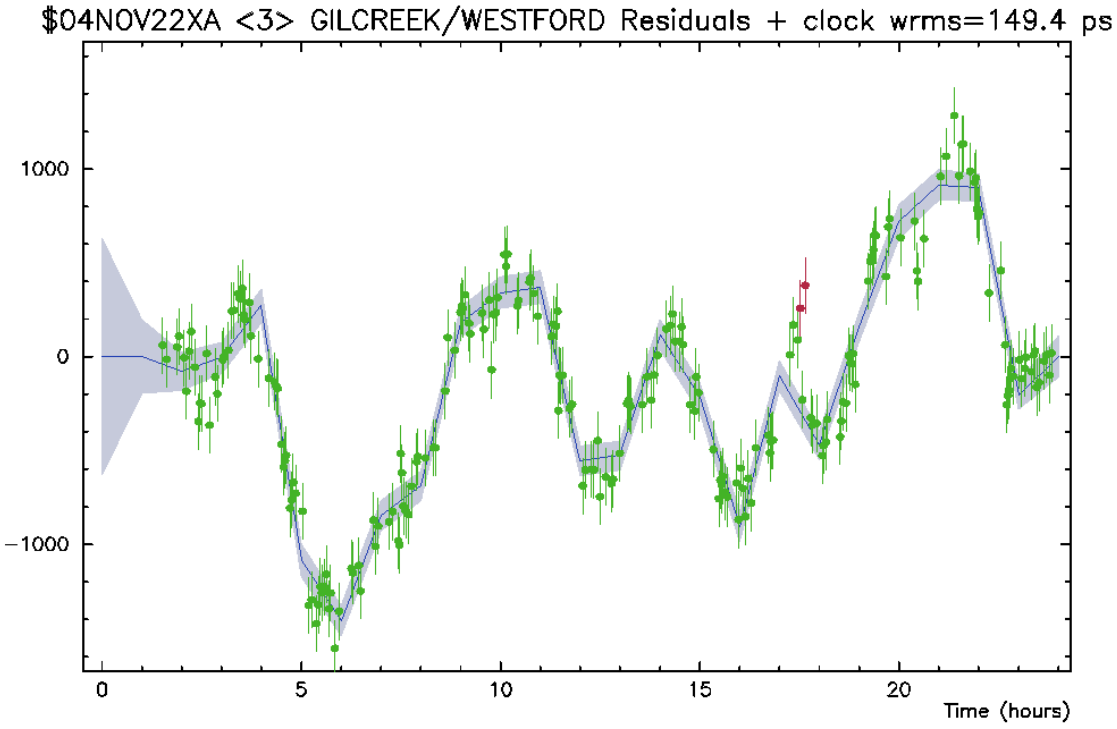


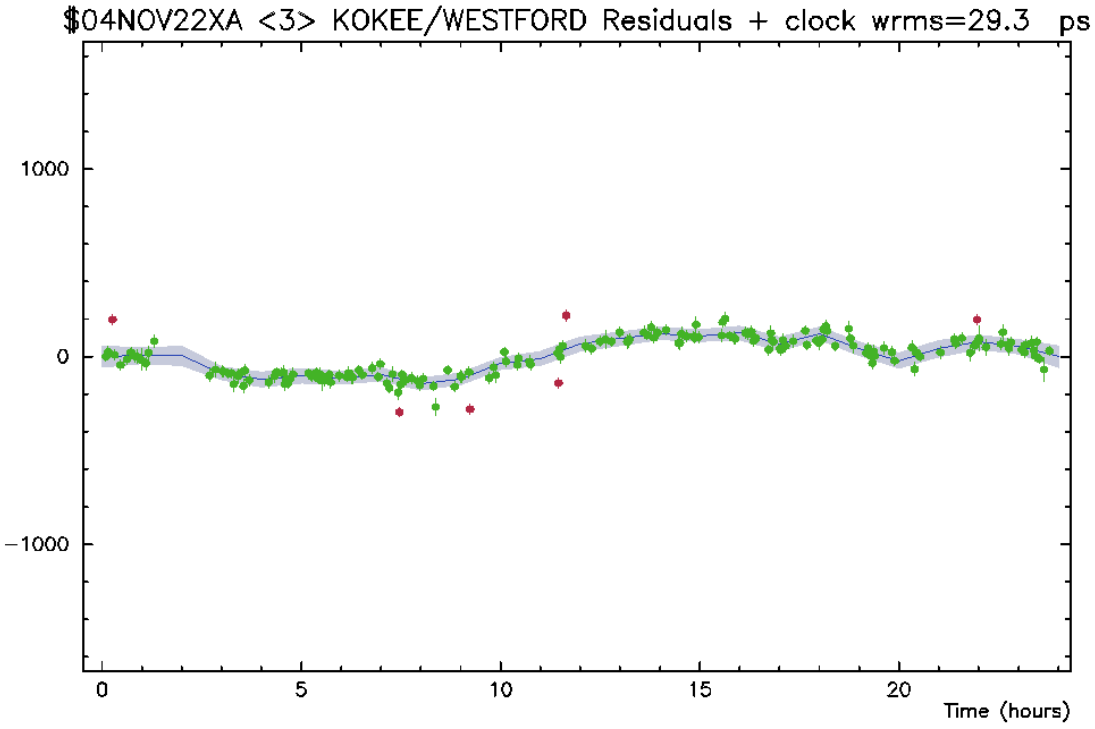
	8212.99	8252.99	8352.99	8512.99	8732.99	8852.99	8912.99	8932.99	Freq (MHz)	All
	172.5	168.2	171.2	168.0	157.7	171.2	-169.7	172.1	Phase	170.3
	17.1	16.8	17.6	16.0	9.8	4.9	4.4	4.7	Ampl.	11.3
	32.8	32.9	32.5	33.2	32.3	32.6	32.4	32.7	Sbd box	32.8
U/L	14/14	14/0	14/0	14/0	14/0	14/0	14/0	14/14	APs used	
C:V	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	PC freqs	
C:V	-54:111	86:-153	53:-53	-92:-159	-39:-75	-83:-83	-62:53	-141:40	PC phase	
C:V	1:0	0:0	-2:0	-4:0	5:0	-8:0	6:0	4:0	Manl PC	
C:V	43:41	48:38	45:41	36:37	26:40	18:41	14:38	18:36	PC amp	
C	X1U,X1L	X2U	X3U	X4U	X5U	X6U	X7U	X8U,X8L	Chan ids	
	2,4,6,8	10,12	14,16	18,20	22,24	26,28	30,32	3,5,7,9	Tracks	
V	X1U,X1L	X2U	X3U	X4U	X5U	X6U	X7U	X8U,X8L	Chan ids	
	2,4,6,8	10,12	14,16	18,20	22,24	26,28	30,32	3,5,7,9	Tracks	

Group delay (usec)	-2.55791849100E+03	Apriori delay (usec)	-2.55792846521E+03	Resid mbdelay (usec)	9.97421E-03	+/-	1.1E-05
Sband delay (usec)	-2.55793587181E+03	Apriori clock (usec)	-6.5386245E+01	Resid sbdelay (usec)	-7.40660E-03	+/-	9.7E-04
Phase delay (usec)	-2.55792840760E+03	Apriori clockrate (us/s)	-9.4000000E-07	Resid phdelay (usec)	5.76090E-05	+/-	5.5E-07
Delay rate (us/s)	-1.46684328124E+00	Apriori rate (us/s)	-1.46684305371E+00	Resid rate (us/s)	-2.27532E-07	+/-	3.2E-08
Total phase (deg)	-155.6	Apriori accel (us/s/s)	-4.08101362948E-06	Resid phase (deg)	170.3	+/-	1.6

	RMS	Theor.			
			Amplitude	11.241 +/- 0.223	Pcal mode: NORMAL, NORMAL
ph/seg (deg)	5.9	4.1	Search (32X256)	10.896	Pcal rate: -3.309E-09, 2.565E-08 (us/s)
amp/seg (%)	9.0	7.1	Interp.	10.896	Bits/sample: 1 SampCntNorm: disabled
ph/frq (deg)	8.4	3.0	Inc. seg. avg.	11.271	Sample rate(MSamp/s): 16
amp/frq (%)	50.8	5.2	Inc. frq. avg.	11.279	Data rate(Mb/s): 160 nlags: 32

Control file: ../cf_3076 Input file: /data2/geodesy/3076/272-0111/CV..rcqkdq Output file: Suppressed by test mode

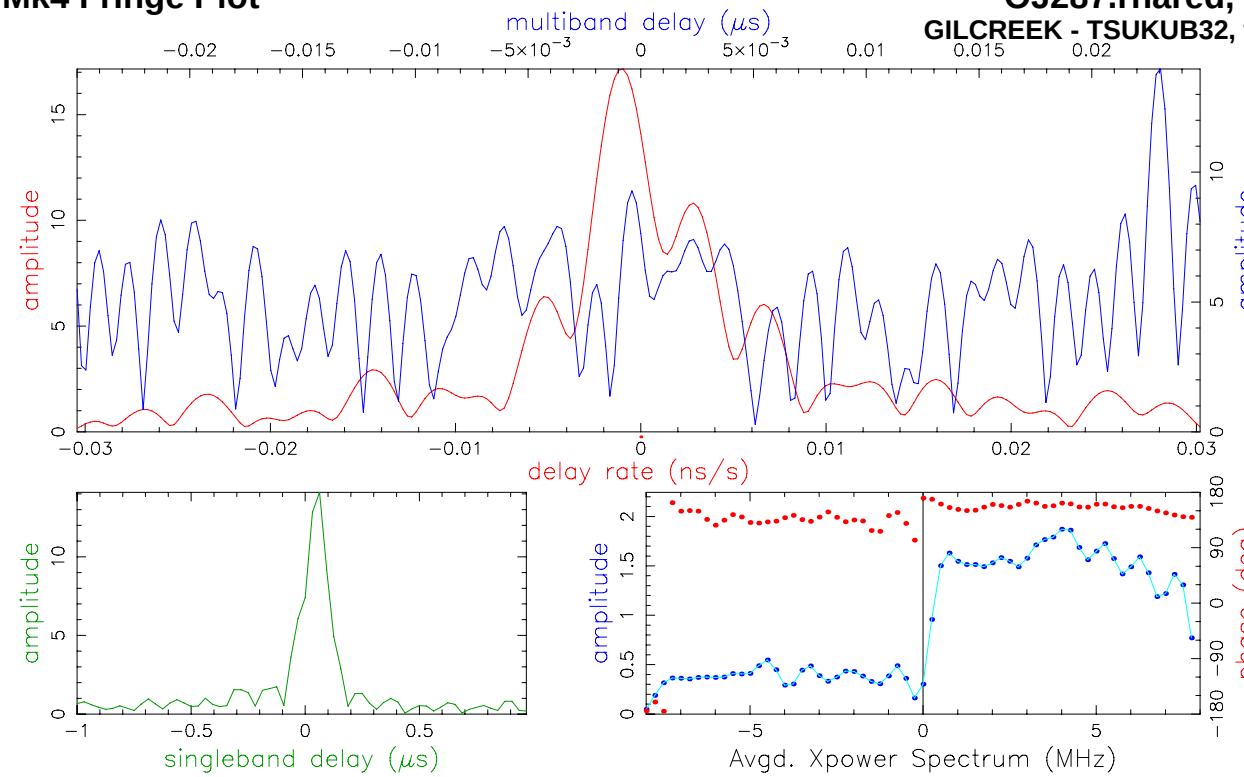

$04NOV22XA <3> GILCREEK/WESTFORD Residuals + clock wrms=149.4 ps
1000
0
−1000
0
5
10
15
20
Time (hours)


$04NOV22XA <3> KOKEE/WESTFORD Residuals + clock wrms=29.3 ps
1000
0
−1000
0
5
10
15
20
Time (hours)

Mk4 Fringe Plot

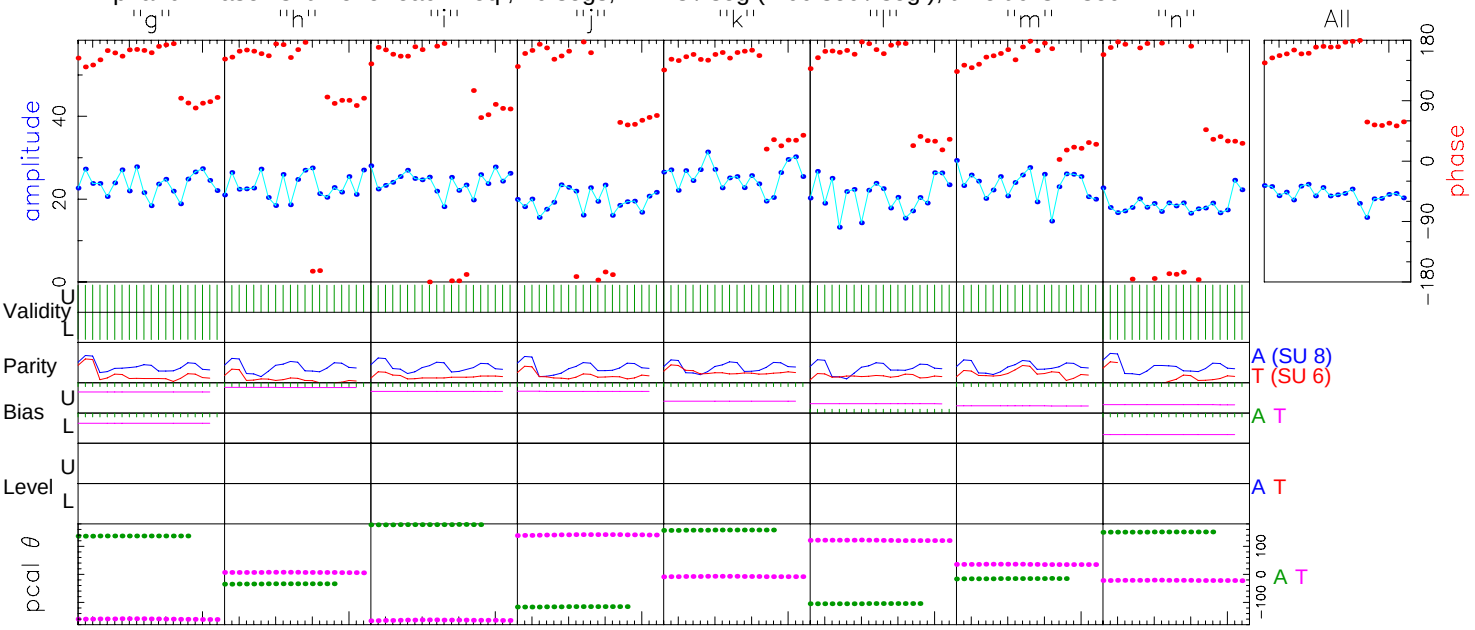
OJ287.rhared, 356-1317, AT

GILCREEK - TSUKUB32, fgroup X, pol RR



Fringe quality	4
SNR	64.3
PFD	0.0e+00
Intg.time	39.580
Amp	14.597
Phase	141.9
Sbdelay (us)	0.049605
Mbdelay (us)	0.022972
Fr. rate (Hz)	0.000146
Ref freq (MHz)	8212.9900
AP (sec)	2.000
Exp.	R1154
Exper #	1815
Yr:day	2004:356
Start	131726.00
Stop	131806.00
FRT	131746.00
Corr. date:	2005:003:160934
Fourfit date:	2005:118:202759
Position (J2000)	08h54m48.8749s
	+20°06'30.641"

Amp. and Phase vs. time for each freq., 20 segs, 1 APs / seg (2.00 sec / seg.), time ticks 2 sec



	8212.99	8252.99	8352.99	8512.99	8732.99	8852.99	8912.99	8932.99	Freq (MHz)	All
	139.6	146.9	144.9	143.7	130.4	137.7	133.6	155.4	Phase	141.9
	20.3	19.2	18.6	13.1	15.2	10.7	12.1	8.8	Ampl.	14.7
	34.9	34.8	35.0	34.0	34.4	33.9	34.6	34.2	Sbd box	34.6
U/L	20/20	20/0	20/0	20/0	20/0	20/0	20/0	20/20	APs used	
A:T	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	4010:4010	PC freqs	
A:T	137:-160	-34:7	177:-164	-116:141	158:-8	-105:121	-15:35	151:-22	PC phase	
A:T	0:3	0:-1	0:-8	0:3	0:-4	0:2	0:-5	0:5	Manl PC	
A:T	46:34	49:35	47:37	45:34	57:34	51:34	53:34	52:34	PC amp	
A	X1R,X2R	X3R	X4R	X5R	X6R	X7R	X8R	X9R,XAR	Chan ids	
	2,4,6,8	10,12	14,16	18,20	22,24	26,28	30,32	3,5,7,9	Tracks	
T	X1R,X2R	X3R	X4R	X5R	X6R	X7R	X8R	X9R,XAR	Chan ids	
	2,4,6,8	10,12	14,16	18,20	22,24	26,28	30,32	3,5,7,9	Tracks	

Group delay (usec)	3.56536460962E+03	Apriori delay (usec)	3.56534163759E+03	Resid mbdelay (usec)	2.29720E-02	+/-	8.8E-06
Sband delay (usec)	3.56539124293E+03	Apriori clock (usec)	7.6237335E+00	Resid sbdelay (usec)	4.96053E-02	+/-	7.7E-04
Phase delay (usec)	3.56534168559E+03	Apriori clockrate (us/s)	-2.7999998E-07	Resid phdelay (usec)	4.79949E-05	+/-	4.3E-07
Delay rate (us/s)	-1.15005449666E+00	Apriori rate (us/s)	-1.15005449666E+00	Resid rate (us/s)	-8.27181E-25	+/-	2.6E-08
Total phase (deg)	219.7	Apriori accel (us/s/s)	-6.61359613283E-06	Resid phase (deg)	141.9	+/-	1.3

	RMS	Theor.	Amplitude	14.597 +/- 0.227
ph/seg (deg)	37.3	3.9	Search (64X256)	13.742
amp/seg (%)	51.3	6.8	Interp.	13.742
ph/frq (deg)	7.4	2.4	Inc. seg. avg.	21.805
amp/frq (%)	27.3	4.1	Inc. frq. avg.	14.692

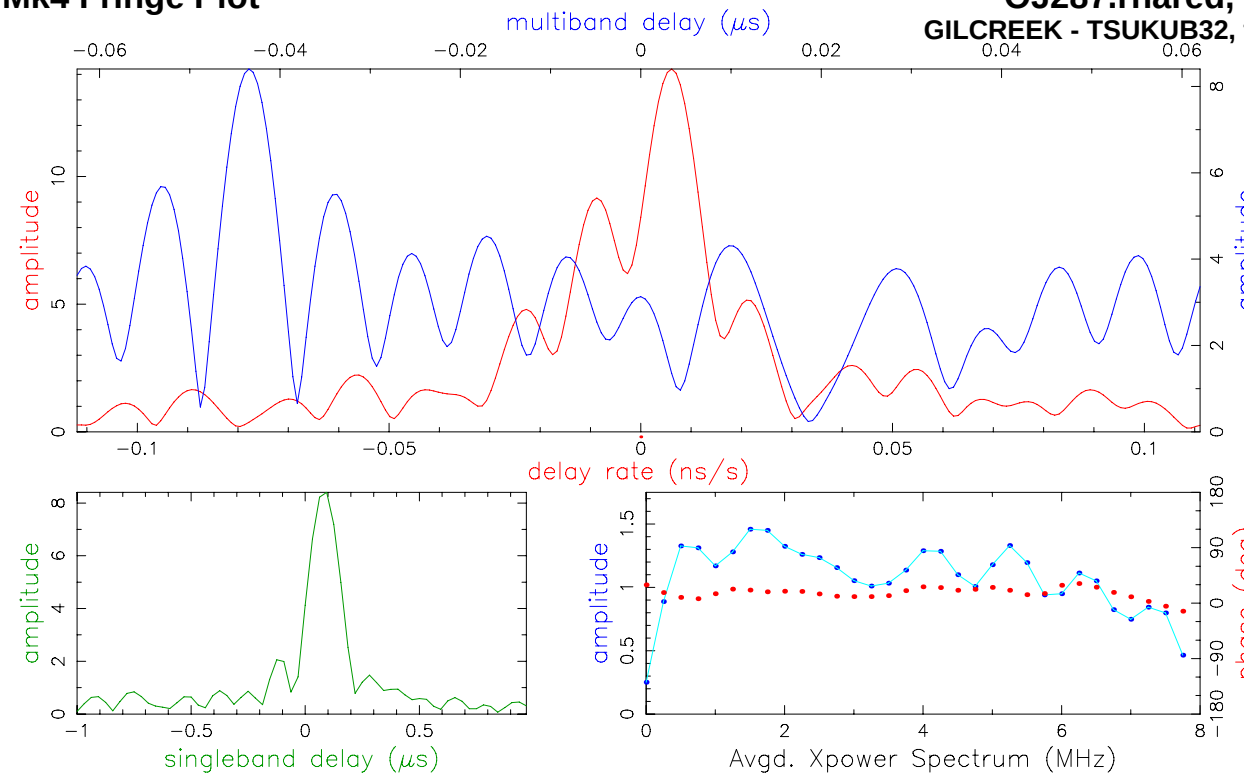
Pcal mode: NORMAL, NORMAL
Pcal rate: 1.312E-08, -4.655E-09 (us/s)
Bits/sample: 1 SampCntNorm: disabled
Sample rate(MSamp/s): 16
Data rate(Mb/s): 160 nlags: 32

Control file: ../cf_3083 Input file: /users5/bec/1815/356-1317/AT..rhared Output file: /users5/bec/1815/356-1317/AT.X.14.rhared

Mk4 Fringe Plot

OJ287.rhared, 356-1317, AT

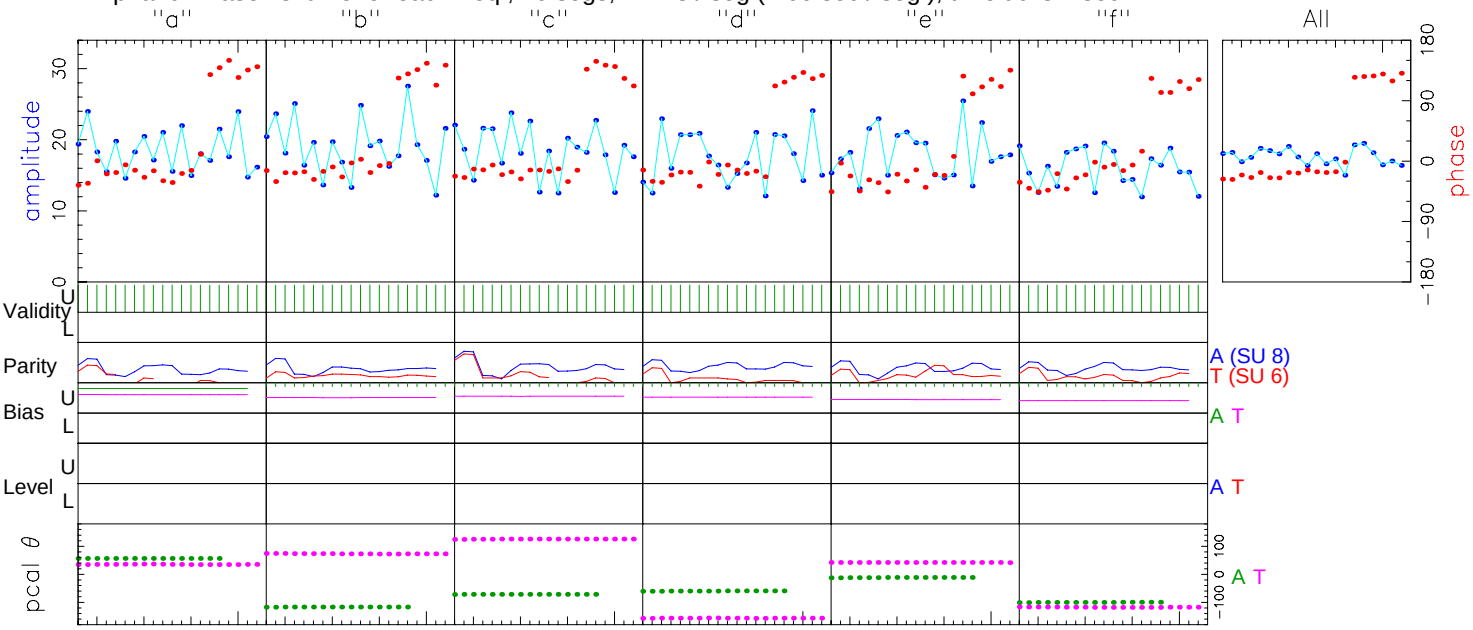
GILCREEK - TSUKUB32, fgroup S, pol RR



Fringe quality 7

SNR	29.7
PFD	0.0e+00
Intg.time	39.615
Amp	8.501
Phase	2.1
Sbdelay (us)	0.082263
Mbdelay (us)	-0.043415
Fr. rate (Hz)	0.000094
Ref freq (MHz)	2232.9900
AP (sec)	2.000
Exp.	R1154
Exper #	1815
Yr:day	2004:356
Start	131726.00
Stop	131806.00
FRT	131746.00
Corr. date:	2005:003:160934
Fourfit date:	2005:118:202758
Position (J2000)	08h54m48.8749s
	+20°06'30.641"

Amp. and Phase vs. time for each freq., 20 segs, 1 APs / seg (2.00 sec / seg.), time ticks 2 sec



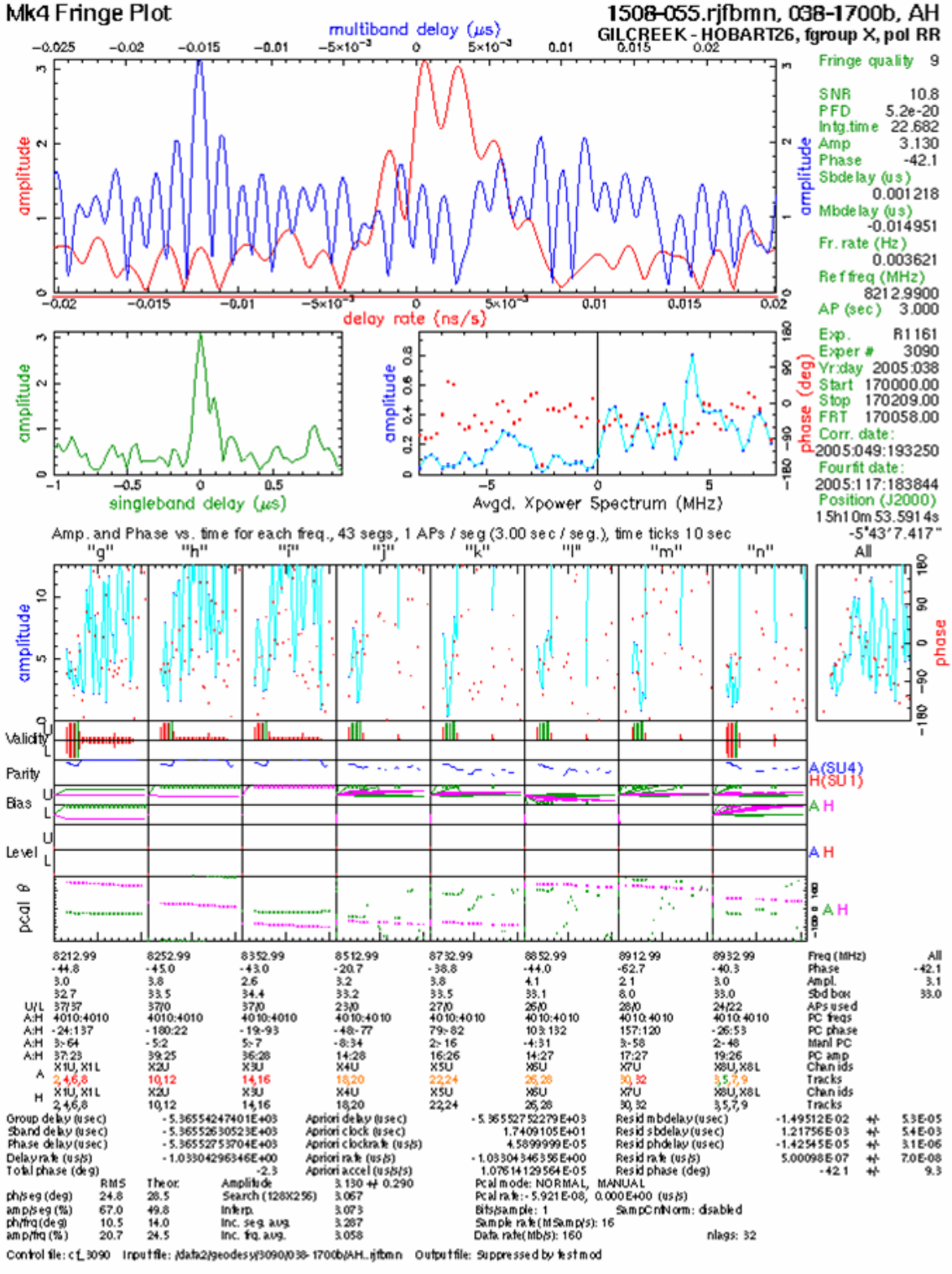
	2232.99	2240.99	2256.99	2312.99	2344.99	2352.99	Freq (MHz)	All
	-0.9	5.9	-0.3	5.9	-1.8	3.4	Phase	2.1
	8.2	9.0	8.9	8.4	8.3	8.3	Ampl.	8.5
	35.7	35.7	35.6	35.7	35.8	35.3	Sbd box	35.6
U/L	20/0	20/0	20/0	20/0	20/0	20/0	APs used	
A:T	6010:6010	6010:6010	6010:6010	6010:6010	6010:6010	6010:6010	PC freqs	
A:T	57:35	-117:74	-71:126	-60:-157	-12:42	-100:-117	PC phase	
A:T	0:1	0:1	0:0	0:-7	0:3	0:2	Manl PC	
A:T	31:42	29:43	29:44	28:43	29:41	30:40	PC amp	
A	S1R	S2R	S3R	S4R	S5R	S6R	Chan ids	
	11,13	15,17	19,21	23,25	27,29	31,33	Tracks	
T	S1R	S2R	S3R	S4R	S5R	S6R	Chan ids	
	11,13	15,17	19,21	23,25	27,29	31,33	Tracks	

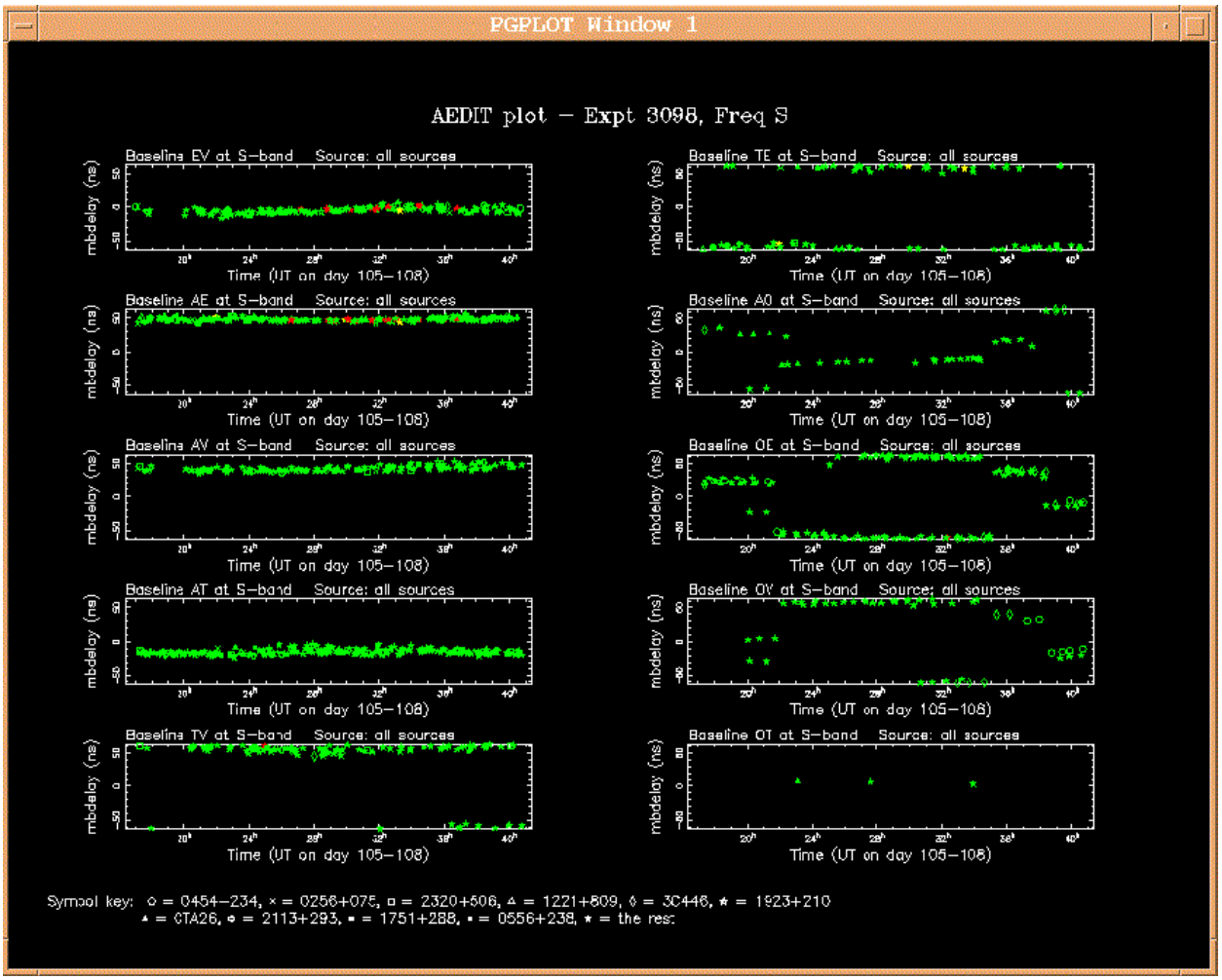
Group delay (usec)	3.56529822268E+03	Apriori delay (usec)	3.56534163759E+03	Resid mbdelay (usec)	-4.34149E-02	+/-	1.1E-04
Sband delay (usec)	3.56542390031E+03	Apriori clock (usec)	7.6237335E+00	Resid sbdelay (usec)	8.22627E-02	+/-	2.3E-03
Phase delay (usec)	3.56534164018E+03	Apriori clockrate (us/s)	-2.7999998E-07	Resid phdelay (usec)	2.59169E-06	+/-	4.8E-06
Delay rate (us/s)	-1.15005449666E+00	Apriori rate (us/s)	-1.15005449666E+00	Resid rate (us/s)	0.00000E+00	+/-	2.1E-07
Total phase (deg)	82.5	Apriori accel (us/s/s)	-6.61359613283E-06	Resid phase (deg)	2.1	+/-	3.9

	RMS	Theor.		
ph/seg (deg)	31.5	8.4	Amplitude	8.501 +/- 0.286
amp/seg (%)	110.6	14.7	Search (64X64)	8.272
ph/frq (deg)	3.2	4.3	Interp.	8.272
amp/frq (%)	3.7	7.5	Inc. seg. avg.	17.639
			Inc. frq. avg.	8.485

Pcal mode: NORMAL, NORMAL
Pcal rate: 3.076E-08, -1.125E-08 (us/s)
Bits/sample: 1 SampCntNorm: disabled
Sample rate(MSamp/s): 16
Data rate(Mb/s): 96 nlags: 32

Control file: ../cf_3083 Input file: /users5/bec/1815/356-1317/AT..rhared Output file: /users5/bec/1815/356-1317/AT.S.13.rhared

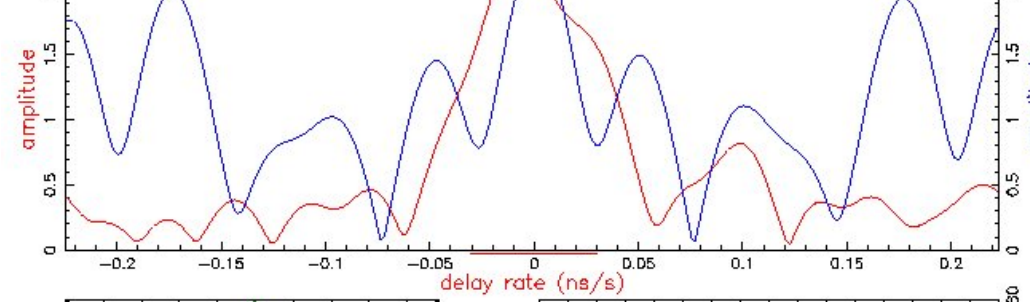

Mk4 Fringe Plot
1508-055.rjfbmn, 038-1700b, AH
GILCREEK - HOBART26, fgroup X, pol RR
multiband delay (μs)
amplitude
delay rate (ns/s)
singleband delay (μs)
Avgd. Xpower Spectrum (MHz)
phase (deg)
Fringe quality 9
SNR 10.8
PFD 5.2e-20
Intg.time 22.682
Amp 3.130
Phase -42.1
Sbdelay (us) 0.001218
Mbdelay (us) -0.014951
Fr. rate (Hz) 0.003621
Ref freq (MHz) 8212.9900
AP (sec) 3.000
Exp. R1161
Exper # 3090
Yr:day 2005:038
Start 170000.00
Stop 170209.00
FRT 170058.00
Corr. date: 2005:049:193250
Fourfit date: 2005:117:183844
Position (J2000)
15h10m53.5914s
-5°43'7.417"
Amp. and Phase vs. time for each freq., 43 segs, 1 APs / seg (3.00 sec / seg.), time ticks 10 sec
"g" "h" "i" "j" "k" "l" "m" "n" All
Validity
Parity
Bias
Level
pcal θ
A(SU4)
H(SU1)
Group delay (usec) -5.365542474014E+03
Sband delay (usec) -5.365526305234E+03
Phase delay (usec) -5.365527537044E+03
Delay rate (us/s) -1.033042963466E+00
Total phase (deg) -2.3
Apriori delay (usec) -5.365527522794E+03
Apriori clock (usec) 1.740910514E+01
Apriori clockrate (us/s) 4.589999946E-05
Apriori rate (us/s) -1.033043463956E+00
Apriori accel (us/s/s) 1.076141295646E-05
Resid mbdelay (usec) -1.495126E-02 +/- 5.3E-05
Resid sbdelay (usec) 1.217566E-03 +/- 5.4E-03
Resid phdelay (usec) -1.425455E-05 +/- 3.1E-06
Resid rate (us/s) 5.000986E-07 +/- 7.0E-08
Resid phase (deg) -42.1 +/- 9.3
Pcal mode: NORMAL, MANUAL
Pcal rate: -5.921E-08, 0.000E+00 (us/s)
Bits/sample: 1 SampCrtnNorm: disabled
Sample rate (MSamp/s): 16
Data rate (MB/s): 160 nlags: 32
Control file: cf_3090 Input file: /data2/geodesy/3090/038-1700b/AH..rjfbmn Output file: Suppressed by fastmod

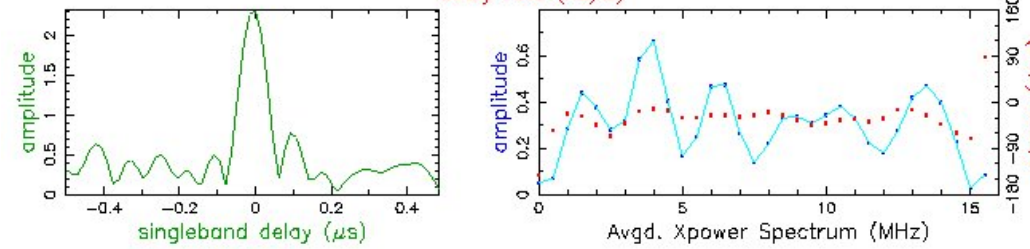

PGPLOT Window 1
AEDIT plot – Expt 3098, Freq S
Baseline EV at S-band Source: all sources
Baseline TE at S-band Source: all sources
Baseline AE at S-band Source: all sources
Baseline A0 at S-band Source: all sources
Baseline AV at S-band Source: all sources
Baseline OE at S-band Source: all sources
Baseline AT at S-band Source: all sources
Baseline OV at S-band Source: all sources
Baseline TV at S-band Source: all sources
Baseline OT at S-band Source: all sources
mbdelay (ns)
Time (UT on day 105–108)
Symbol key: ○ = 0454–234, × = 0256+075, □ = 2320+506, △ = 1221+809, ◊ = 3C446, ★ = 1923+210
▲ = CTA26, ⊙ = 2113+293, ▪ = 1751+288, • = 0556+238, ★ = the rest

Mk4 Fringe Plot

0607-157.ssictb, 052-2259, IF

MATERA - WEST_5B, fgroup S, pol RR

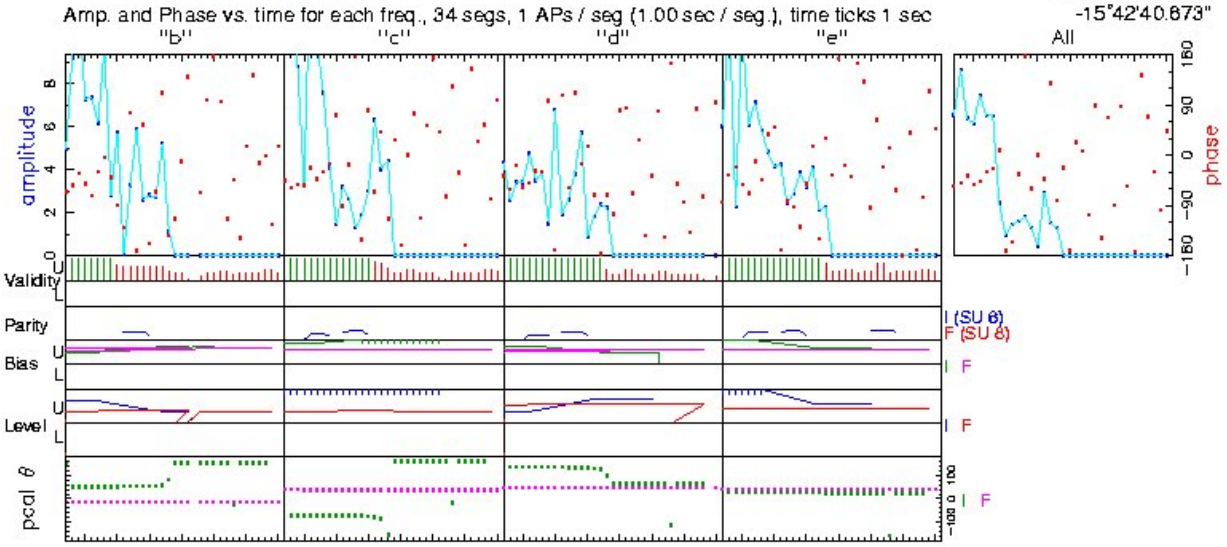




Fringe quality 9
Error code H
SNR 9.6
PFD 6.9e-16
Intg.time 21.578
Amp 2.337
Phase -43.4
Sbdelay (us)
-0.005374
Mbdelay (us)
0.000416
Fr. rate (Hz)
-0.014131
Ref freq (MHz)
2225.9900
AP (sec) 1.000

Exp. RD0701
Exper # 3173
Yr:day 2007:052
Start 225907.00
Stop 225941.00
FRT 225921.00
Corr. date:
2007:062:182003
Fourfit date:
2007:067:160048
Position (J2000)
06h09m40.94955s
-15°42'40.673"

Amp. and Phase vs. time for each freq., 34 segs, 1 APs / seg (1.00 sec / seg.), time ticks 1 sec



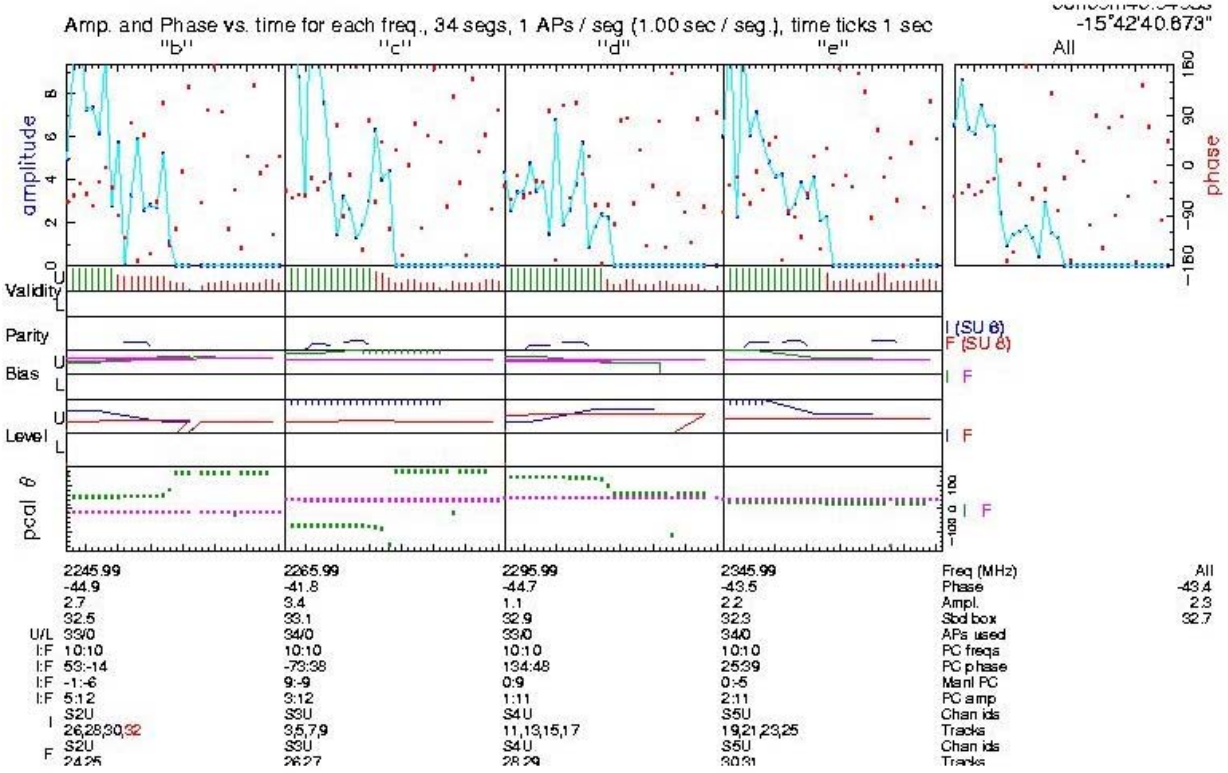
	2245.99	2265.99	2295.99	2345.99	Freq (MHz)	All
	-44.9	-41.8	-44.7	-43.5	Phase	-43.4
	2.7	3.4	1.1	2.2	Ampl.	2.3
	32.5	33.1	32.9	32.3	Sbd box	32.7
U/L	33/0	34/0	33/0	34/0	APs used	
I:F	10:10	10:10	10:10	10:10	PC freqs	
I:F	53:-14	-73:38	134:48	25:39	PC phase	
I:F	-1:-6	9:-9	0:9	0:-5	Manl PC	
I:F	5:12	3:12	1:11	2:11	PC amp	
I	S2U	S3U	S4U	S5U	Chan ids	
	26,28,30,32	3,5,7,9	11,13,15,17	19,21,23,25	Tracks	
F	S2U	S3U	S4U	S5U	Chan ids	
	24,25	26,27	28,29	30,31	Tracks	

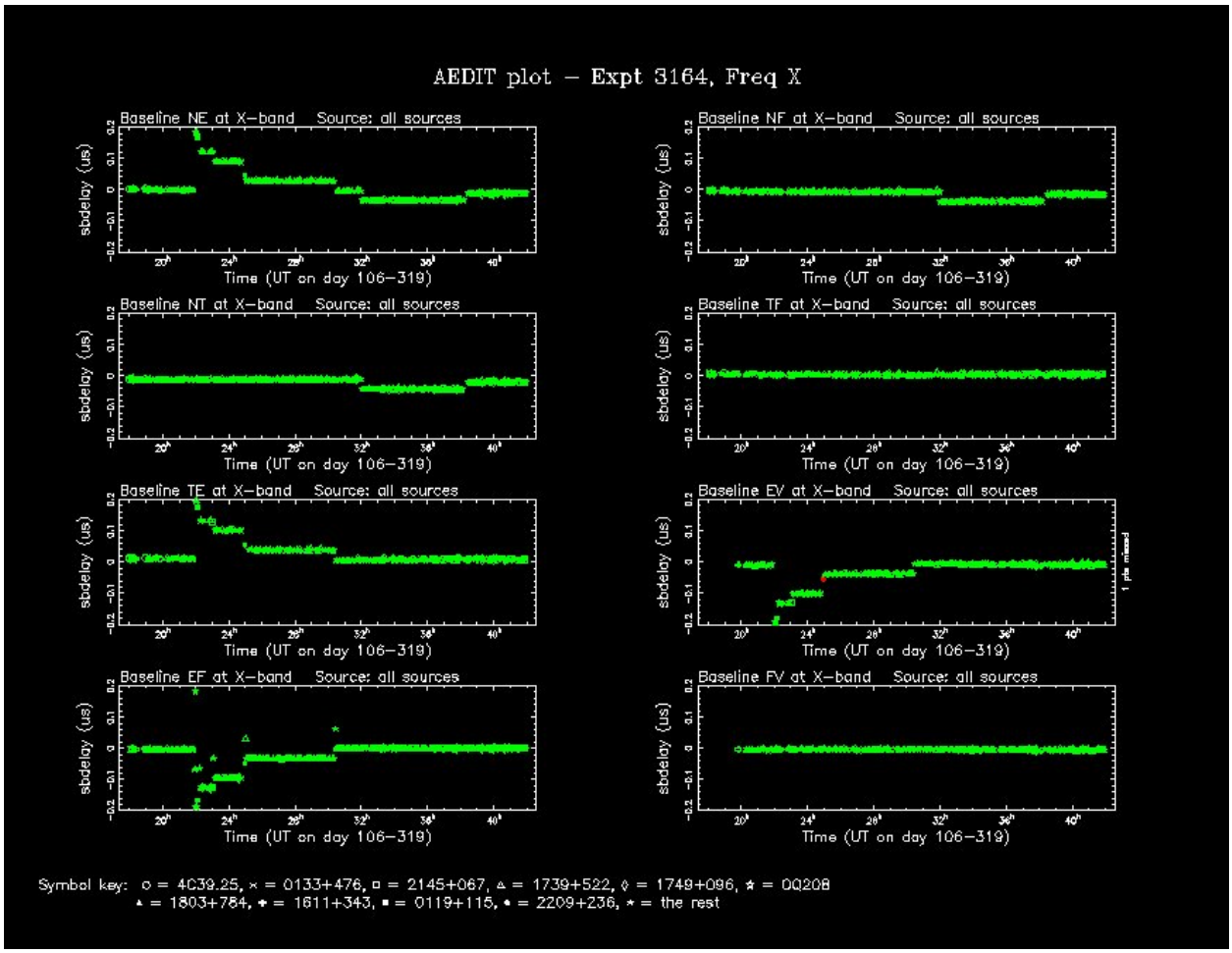
Group delay (usec)	-5.513823756 20E+03	Apriori delay (usec)	-5.513824172 54E+03	Resid mbdelay (usec)	4.16340E-04	+/-	4.4E-04
Sband delay (usec)	-5.513829546 96E+03	Apriori clock (usec)	4.8396960E+01	Resid sbdelay (usec)	-5.37442E-03	+/-	3.6E-03
Phase delay (usec)	-5.513824228 68E+03	Apriori clock rate (us/s)	1.6600001E-06	Resid phdelay (usec)	-5.41395E-05	+/-	1.5E-05
Delay rate (us/s)	-1.499206605 98E+00	Apriori rate (us/s)	-1.499202897 33E+00	Resid rate (us/s)	-3.70865E-06	+/-	7.7E-07
Total phase (deg)	-212.5	Apriori accel (us/s/s)	3.035452109 03E-05	Resid phase (deg)	-43.4	+/-	12.1

	RMS	Theor.		
ph/seg (deg)	32.3	34.0	Amplitude	2.337 +/- 0.243
amp/seg (%)	127.6	59.3	Search (128X64)	2.294
ph/frq (deg)	1.3	10.3	Interp.	2.295
amp/frq (%)	35.3	18.0	Inc. seg. avg.	2.401
			Inc. frq. avg.	2.288

Pcal mode: NORMAL, NORMAL
Pcal rate: -2.687E-06, -4.729E-08 (us/s)
Bits/sample: 2 SampCntNorm: enabled
Sample rate(MSamp/s): 32
Data rate(Mb/s): 256 nlags: 32

Control file: cf_3173 Input file: /data/geodesy/3173/052-2259/IF.ssictb Output file: /data/geodesy/3173/052-2259/IF.S.57.ssictb

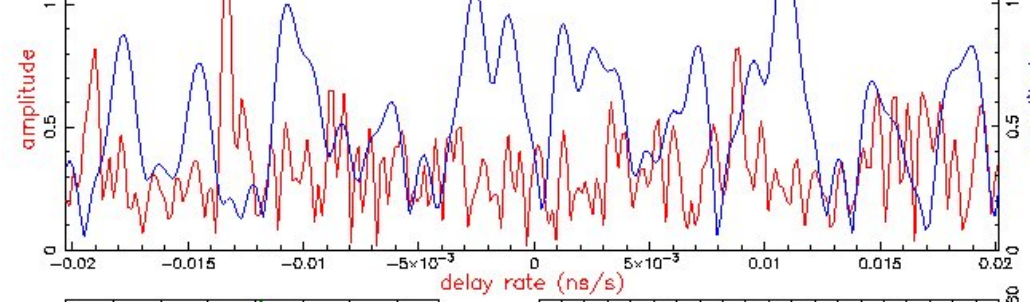

Amp. and Phase vs. time for each freq., 34 segs, 1 APs / seg (1.00 sec / seg.), time ticks 1 sec
-15°42'40.673"
"b"
"c"
"d"
"e"
All
amplitude
phase
Validity
Parity
Bias
Level
pcal θ
I (SU 6)
F (SU 6)
2245.99 2265.99 2295.99 2345.99 Freq (MHz) All
-44.9 -41.8 -44.7 -43.5 Phase -43.4
2.7 3.4 1.1 2.2 Ampl. 2.3
32.5 33.1 32.9 32.3 Sbd box 32.7
U/L 33/0 34/0 33/0 34/0 APs used
I:F 10:10 10:10 10:10 10:10 PC freqs
I:F 53:-14 -73:38 134:48 25:39 PC phase
I:F -1:-6 9:-9 0:9 0:-5 Manl PC
I:F 5:12 3:12 1:11 2:11 PC amp
I S2U S3U S4U S5U Chan ids
26,28,30,32 9,5,7,9 11,13,15,17 19,21,23,25 Tracks
F S2U S3U S4U S5U Chan ids
24,25 26,27 28,29 30,31 Tracks


AEDIT plot – Expt 3164, Freq X
Baseline NE at X-band Source: all sources
Baseline NF at X-band Source: all sources
Baseline NT at X-band Source: all sources
Baseline TF at X-band Source: all sources
Baseline TE at X-band Source: all sources
Baseline EV at X-band Source: all sources
Baseline EF at X-band Source: all sources
Baseline FV at X-band Source: all sources
sbdelay (us)
Time (UT on day 106-319)
1 pts missed
Symbol key: ○ = 4C39.25, × = 0133+476, □ = 2145+067, △ = 1739+522, ◇ = 1749+096, ☆ = OQ208
▲ = 1803+784, ✚ = 1611+343, ■ = 0119+115, ● = 2209+236, ★ = the rest

Mk4 Fringe Plot non detection due to weak X band

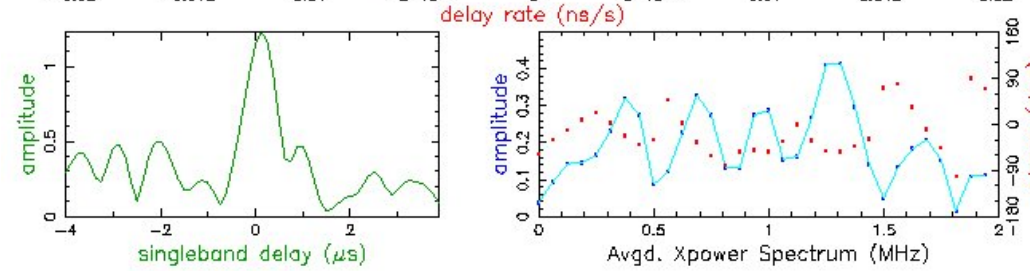
1519-273.sgkiwu, 143-1833b, VC

URUMQI - CRIMEA, fgroup X, pol RR

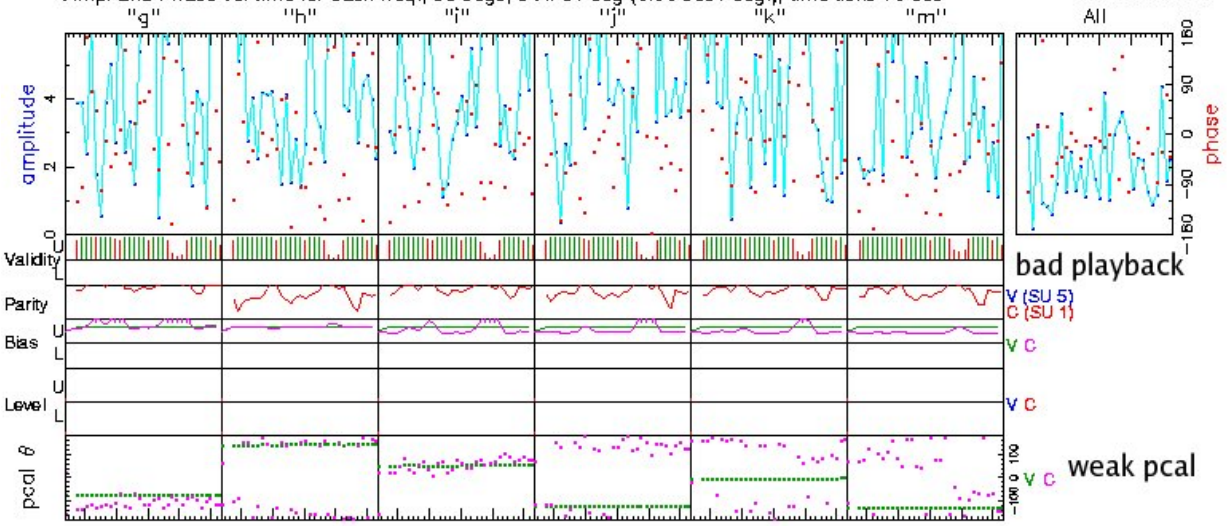


Fringe quality 0

SNR	5.4
PFD	2.9e-01
Intg.time	241.733
Amp	1.479
Phase	-23.0
Sbdelay (us)	0.134042
Mbdelay (us)	0.026805
Fr. rate (Hz)	-0.109837
Ref freq (MHz)	8210.9900
AP (sec)	3.000
Exp.	T2044
Exper #	3151
Yr:day	2006:143
Start	183324.00
Stop	183818.00
FRT	183552.00
Corr. date:	2006:175:160349
Fourfit date:	2006:190:231705
Position (J2000)	15h22m37.6760s
	-27°30'10.785"



Amp. and Phase vs. time for each freq., 33 segs, 3 APs / seg (9.00 sec / seg.), time ticks 10 sec



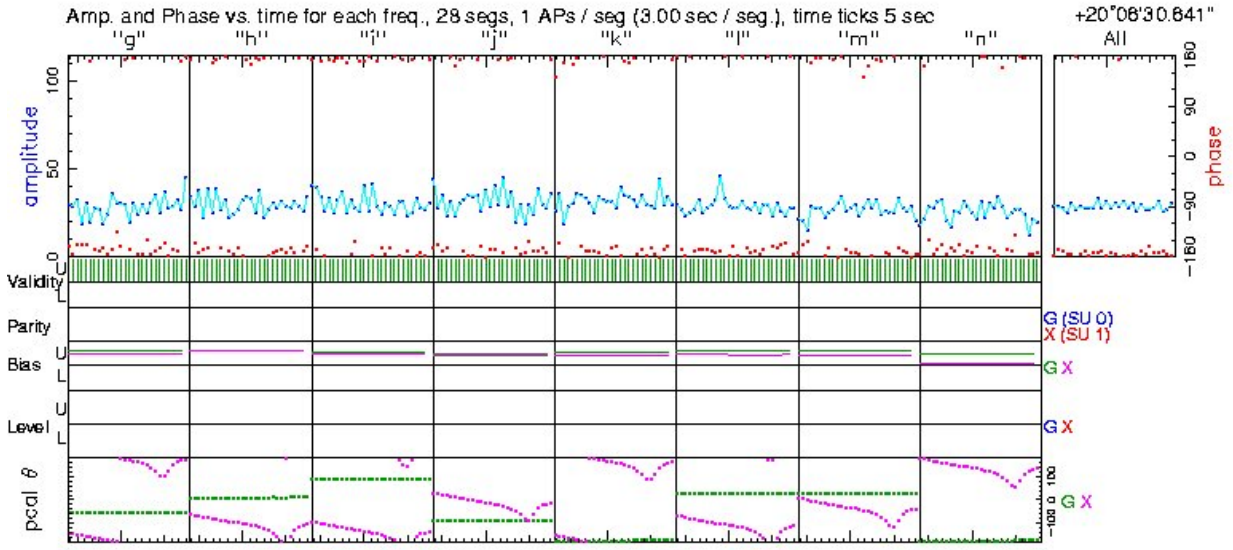
	8210.99	8220.99	8250.99	8310.99	8420.99	8550.99	Freq (MHz)	All
	3.8	-62.9	-27.2	-39.7	4.4	-32.7	Phase	-23.0
	2.4	1.1	1.6	2.5	1.3	0.7	Ampl.	1.5
	33.9	10.4	15.3	34.2	16.6	56.1	Sbd box	34.1
U/L	92/0	92/0	92/0	92/0	92/0	92/0	APs used	
V:C	10:10	10:10	10:10	10:10	10:10	10:10	PC freqs	
V:C	-75:-110	140:172	51:58	-122:143	-5:150	-130:123	PC phase	
V:C	-2:33	4:44	-3:37	-15:-4	28:61	-11:25	Manl PC	
V:C	18:4	23:3	12:4	20:3	25:1	22:0	PC amp	
V	X1U	X2U	X3U	X4U	X5U	X7U	Chan ids	
	2,4	10,12	14,16	18,20	22,24	30,32	Tracks	
C	X1U	X2U	X3U	X4U	X5U	X7U	Chan ids	
	19	5	21	7	23	25	Tracks	

Group delay (usec)	2.40669493701E+03	Apriori delay (usec)	2.40666813217E+03	Resid mbdelay (usec)	2.68048E-02	+/-	2.4E-04
Sband delay (usec)	2.40680217393E+03	Apriori clock (usec)	-6.7943168E+00	Resid sbdelay (usec)	1.34042E-01	+/-	5.5E-02
Phase delay (usec)	2.40666812438E+03	Apriori clock rate (us/s)	-5.6640001E-06	Resid phdelay (usec)	-7.78520E-06	+/-	7.6E-06
Delay rate (us/s)	-8.72886621719E-01	Apriori rate (us/s)	-8.72873242118E-01	Resid rate (us/s)	-1.33796E-05	+/-	4.5E-05
Total phase (deg)	325.0	Apriori accel (us/s/s)	-1.22381645668E-05	Resid phase (deg)	-23.0	+/-	22.4

	RMS	Theor.	Amplitude	1.479 +/- 0.276
ph/seg (deg)	30.9	58.5	Search (256X256)	1.180
amp/seg (%)	105.1	102.2	Interp.	1.187
ph/frq (deg)	22.7	23.9	Inc. seg. avg.	1.478
amp/frq (%)	45.0	41.7	Inc. frq. avg.	1.458

Pcal mode: NORMAL, MANUAL
Pcal rate: 2.778E-09, 0.000E+00 (us/s)
Bits/sample: 1 SampCntNorm: disabled
Sample rate(MSamp/s): 4
Data rate(Mb/s): 24 nlags: 32

Control file: cf_3151 Input file: /data3/3151/143-1833b/VC.sgkiwu Output file: /data3/3151/143-1833b/VC.X.2.sgkiwu

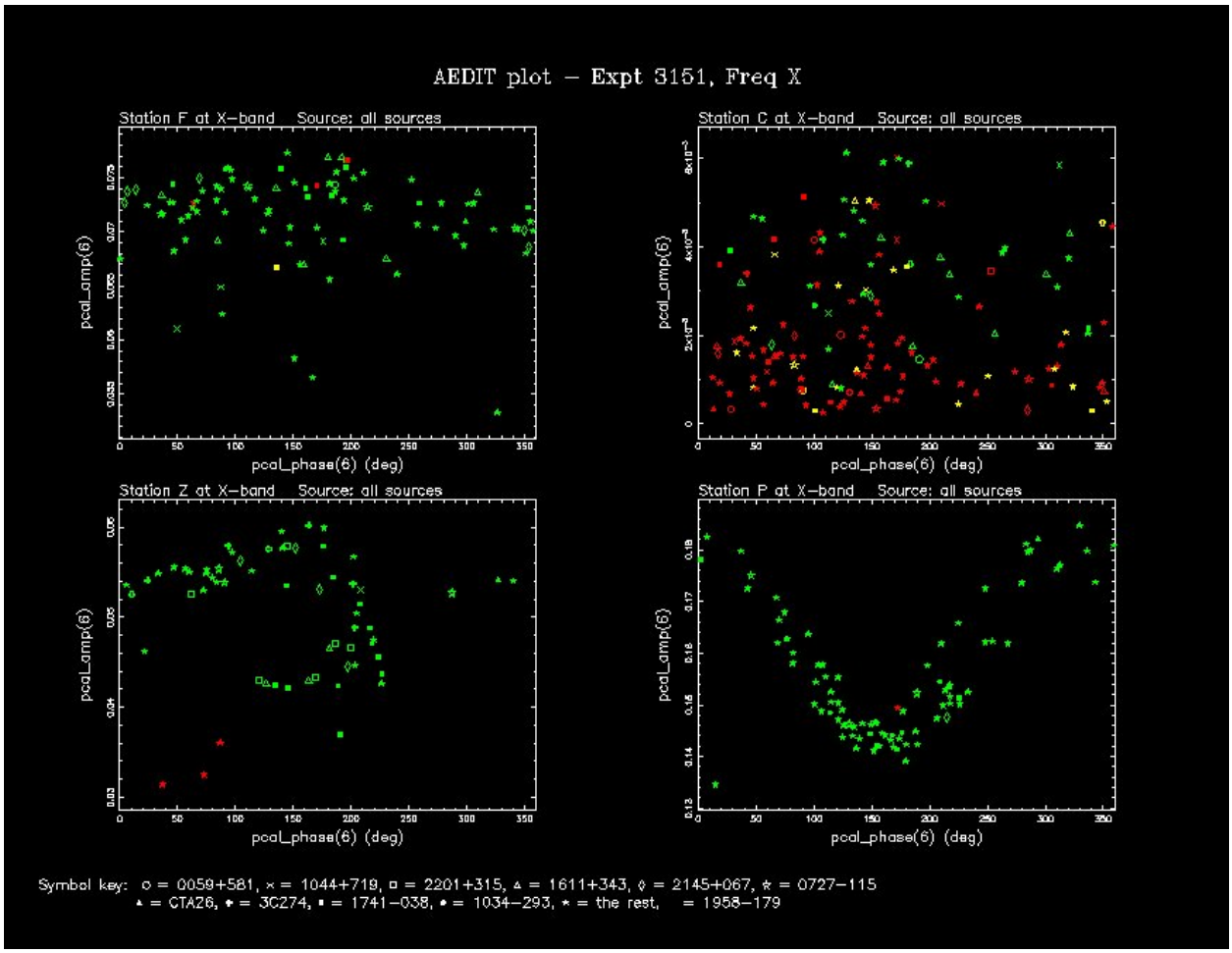


	8210.99	8220.99	8250.99	8310.99	8420.99	8500.99	8550.99	8570.99	Freq (MHz)	All
	-168.6	-175.1	-179.4	-174.4	-176.0	-171.1	-178.5	-171.4	Phase	-174.4
	28.0	29.5	29.9	30.8	31.1	28.4	26.2	24.9	Ampl.	28.6
	33.3	32.9	33.7	33.0	32.9	33.0	33.0	32.9	Sbd box	33.1
U/L	28/0	28/0	28/0	28/0	28/0	28/0	28/0	28/0	APs used	
G:X	10:10	10:10	10:10	10:10	10:10	10:10	10:10	10:10	PC freqs	
G:X	-57:176	9:-105	89:-137	-89:-13	-176:164	28:-111	29:-36	-176:135	PC phase	
G:X	-2:-7	-10:0	17:0	3:8	-1:-1	-7:1	4:-3	0:1	Manl PC	
G:X	71:78	67:83	74:75	70:75	69:69	70:74	74:63	73:71	PC amp	
G	X1U	X2U	X3U	X4U	X5U	X6U	X7U	X8U	Chan ids	
	2,4	10,12	14,16	18,20	22,24	26,28	30,32	3,5	Tracks	
X	X1U	X2U	X3U	X4U	X5U	X6U	X7U	X8U	Chan ids	
	19	5	21	7	23	9	25	11	Tracks	

Group delay (usec)	6.19398252106E+03	Apriori delay (usec)	6.19393958938E+03	Resid mbdelay (usec)	4.29317E-02	+/-	1.4E-05
Sbband delay (usec)	6.19395059101E+03	Apriori clock (usec)	-8.8193130E+00	Resid sbdelay (usec)	1.10016E-02	+/-	3.3E-03
Phase delay (usec)	6.19393953039E+03	Apriori clockrate (us/s)	3.1499998E-07	Resid phdelay (usec)	-5.89968E-05	+/-	4.6E-07
Delay rate (us/s)	-2.98691354736E-01	Apriori rate (us/s)	-2.98690261678E-01	Resid rate (us/s)	-1.09306E-06	+/-	9.6E-09
Total phase (deg)	-168.9	Apriori accel (us/s/s)	-3.95110779126E-05	Resid phase (deg)	-174.4	+/-	1.4

	RMS	Theor.			
ph/seg (deg)	4.9	3.6	Amplitude	28.544 +/- 0.342	Pcal mode: NORMAL, NORMAL
amp/seg (%)	6.7	6.2	Search (64X256)	28.122	Pcal rate: 8.952E-09, -3.459E-07 (us/s)
ph/frq (deg)	3.5	1.8	Interp.	28.266	Bits/sample: 1 SampCntNorm: disabled
amp/frq (%)	7.2	3.2	Inc. seg. avg.	28.590	Sample rate(MSamp/s): 4
			Inc. frq. avg.	28.581	Data rate(Mb/s): 32 nlags: 32

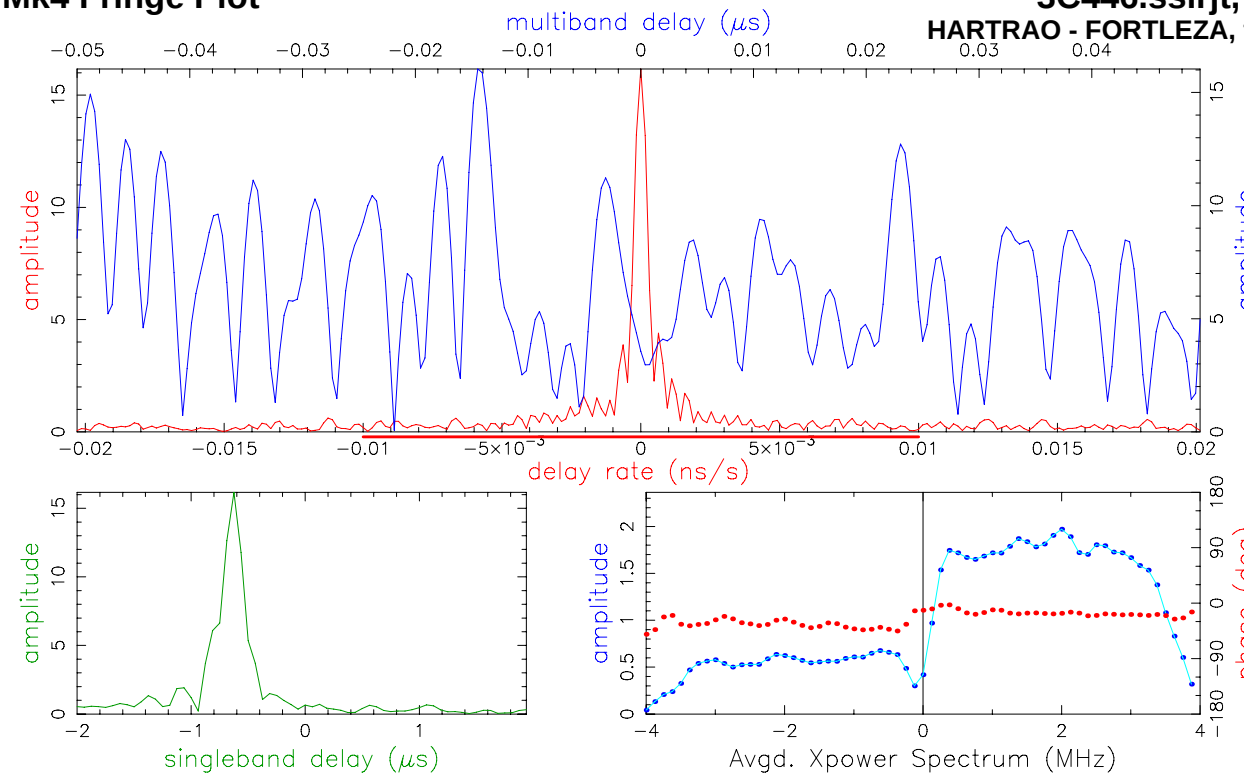
Control file: cf_3151 Input file: /data3/3151/143-2115/GX..sftnvy Output file: /data3/3151/143-2115/GX.X.4.sftnvy


AEDIT plot – Expt 3151, Freq X
Station F at X-band Source: all sources
Station C at X-band Source: all sources
Station Z at X-band Source: all sources
Station P at X-band Source: all sources
pcal_amp(6)
pcal_phase(6) (deg)
Symbol key: ○ = 0059+581, × = 1044+719, □ = 2201+315, △ = 1611+343, ◇ = 2145+067, ☆ = 0727−115
▲ = CTA26, ◆ = 3C274, ■ = 1741−038, ● = 1034−293, ★ = the rest, = 1958−179

Mk4 Fringe Plot

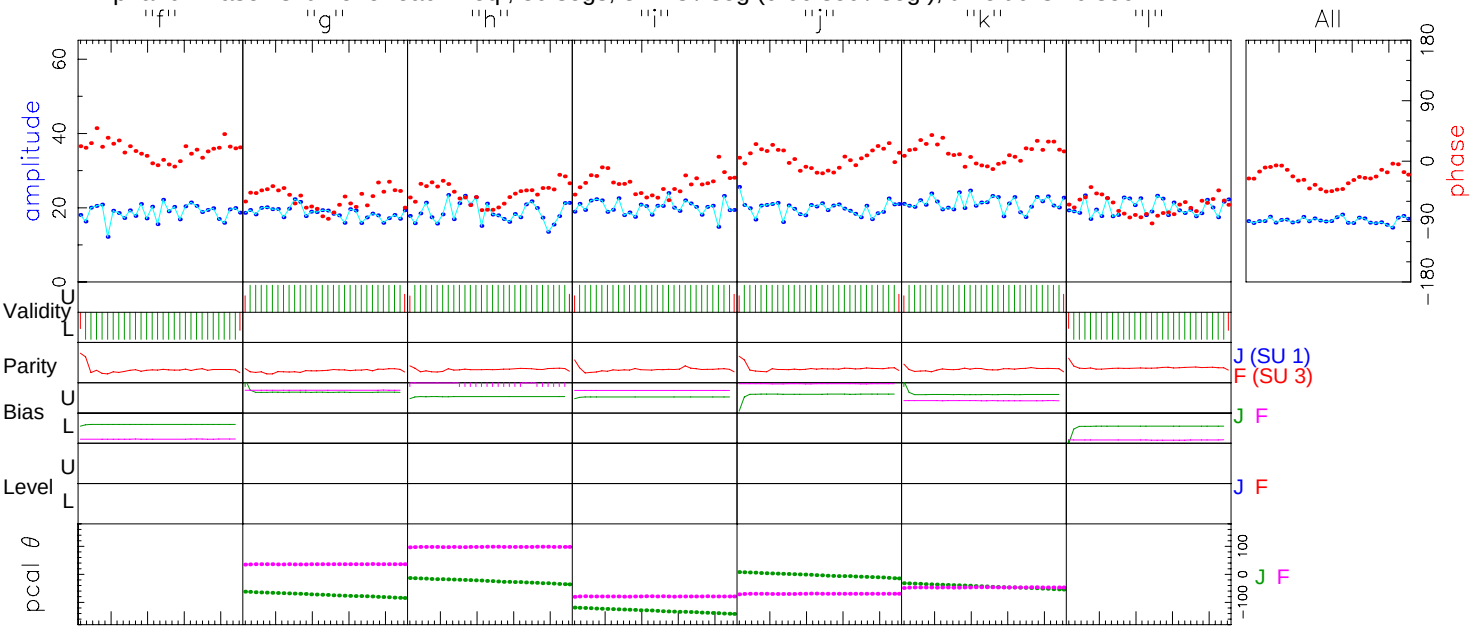
3C446.sslrjt, 332-1852, JF

HARTRAO - FORTLEZA, fgroup X, pol RR



Fringe quality	6
Error code	H
SNR	111.6
PFD	0.0e+00
Intg.time	259.204
Amp	16.282
Phase	-24.0
Sbdelay (us)	-0.635729
Mbdelay (us)	-0.014297
Fr. rate (Hz)	0.000610
Ref freq (MHz)	8210.9900
AP (sec)	3.000
Exp.	T2047
Exper #	2018
Yr:day	2006:332
Start	185206.00
Stop	185633.00
FRT	185337.00
Corr. date:	2007:065:095803
Fourfit date:	2007:106:081954
Position (J2000)	22h25m47.2593s
	-4°57' 1.391"

Amp. and Phase vs. time for each freq., 30 segs, 3 APs / seg (9.00 sec / seg.), time ticks 10 sec



	8210.99	8220.99	8250.99	8310.99	8420.99	8500.99	8570.99	Freq (MHz)	All
	15.9	-55.2	-47.4	-33.4	4.0	12.7	-67.0	Phase	-24.0
	18.4	18.2	18.3	19.7	19.4	20.7	19.6	Ampl.	19.2
	22.6	22.7	22.7	22.6	22.8	22.6	22.8	Sbd box	22.8
U/L	0/89	89/0	89/0	89/0	89/0	89/0	0/89	APs used	
J:F	0:0	10:10	10:10	10:10	10:10	10:10	0:0	PC freqs	
J:F	-90:-90	-73:36	-24:98	-130:-79	-3:-70	-43:-47	-90:-90	PC phase	
J:F	0:0	0:0	0:0	0:0	0:0	0:0	0:0	Manl PC	
J:F	0:0	41:32	37:33	41:31	38:34	42:34	0:0	PC amp	
J	X2R	X3R	X4R	X5R	X6R	X7R	XAR	Chan ids	
	6,8	10,12	14,16	18,20	22,24	26,28	7,9	Tracks	
F	X2R	X3R	X4R	X5R	X6R	X7R	XAR	Chan ids	
	6,8	10,12	14,16	18,20	22,24	26,28	7,9	Tracks	

Group delay (usec)	-4.49135983934E+03	Apriori delay (usec)	-4.49134554281E+03	Resid mbdelay (usec)	-1.42965E-02	+/-	1.1E-05
Sband delay (usec)	-4.49198127229E+03	Apriori clock (usec)	-8.4346485E+00	Resid sbdelay (usec)	-6.35729E-01	+/-	7.9E-04
Phase delay (usec)	-4.49134555093E+03	Apriori clockrate (us/s)	1.8000000E-07	Resid phdelay (usec)	-8.11703E-06	+/-	2.2E-07
Delay rate (us/s)	-1.56072078833E+00	Apriori rate (us/s)	-1.56072089214E+00	Resid rate (us/s)	1.03809E-07	+/-	2.3E-09
Total phase (deg)	-145.9	Apriori accel (us/s/s)	2.73943640255E-05	Resid phase (deg)	-24.0	+/-	0.6

	RMS	Theor.		
ph/seg (deg)	12.5	2.8	Amplitude	16.282 +/- 0.146
amp/seg (%)	5.3	4.8	Search (256X256)	15.224
ph/frq (deg)	29.9	1.3	Interp.	15.224
amp/frq (%)	18.6	2.2	Inc. seg. avg.	16.667
			Inc. frq. avg.	19.185

Pcal mode: NORMAL, NORMAL
Pcal rate: -2.847E-08, 1.001E-09 (us/s)
Bits/sample: 1 SampCntNorm: disabled
Sample rate(MSamp/s): 8
Data rate(Mb/s): 56 nlags: 32

Control file: default Input file: /.amd_mnt/ccc/root/data/2018/332-1852/JF..sslrjt Output file: Suppressed by test mode