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Notations

As presented in [Petit et al., 2001] for the Z12-T, the calibration of a geodetic system is divided in (up to) 6 different parts (Figure 1)

- X_P = Delay of the 1PPS-in with respect to the laboratory reference
- X_O = Delay of the “internal reference” with respect to the 1PPS-in

$(X_P + X_O) = \text{REFDLY.}$

- X_C = antenna cable delay
- $[X_D = \text{short cable} + \text{splitter delay}]$

$(X_C + X_D) = \text{CABDLY.}$ In practice, X_D is generally not used.

- X_R = receiver internal delay, measured from the “internal reference”
- X_S = antenna delay

$(X_R + X_S) = \text{INTDLY.}$

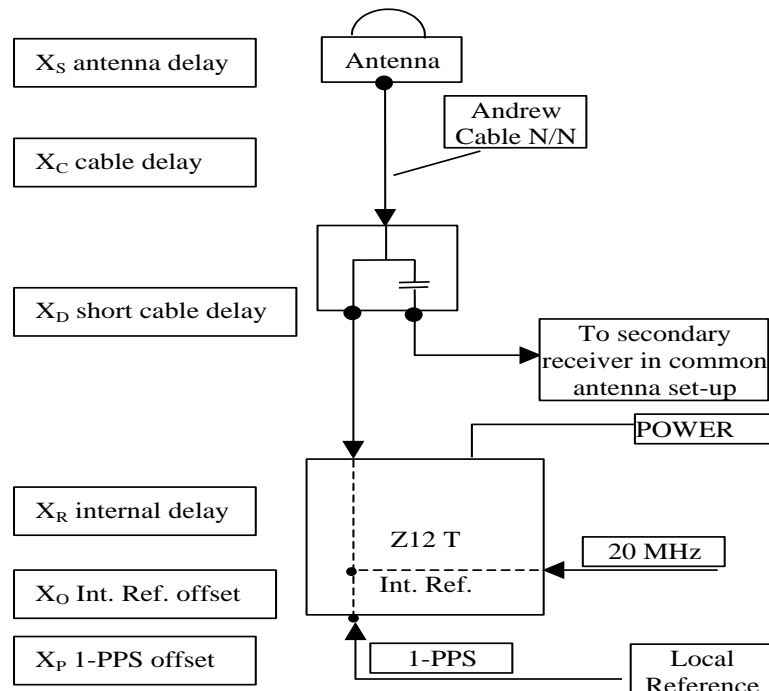


Figure 1: Definition of the different delays used in the most general set-up of a geodetic system (here shown for a Z12-T) from [Petit et al, 2001].

3/ phase 3

Laboratories: BIPM, USNO, NIST

3.1/ BIPM (17025)Period

MJD 57778 to 57782

Delays

BP0R:

$X_O = 226.2$ ns	(266.2-48.7+8.7)
$X_P = 42.7$ ns	(BP1R+C139+BP1S+C72)
REFDLY = 268.9 ns	
CABDLY = 133.4 ns	(C113)

BP1J:

$X_O = 132.3$ ns	(186.1-53.8)
$X_P = 47.6$ ns	(BP1R+C139+BP1S+C172)
REFDLY = 179.9 ns	
CABDLY = 128.7 ns	(C138)

BP1X:

REFDLY = 42.6 ns	(BP1R+C139+BP1S+C126)
CABDLY = 129.7 ns	(C178)
INT DLY = -27.5 ns (GPS C1)	
-33.5 ns (GPS P1)	
-37.4 ns (GPS P2)	

BP0U:

REFDLY = 52.6 ns	(BP1R+C166+BP1I+C153)
CABDLY = 181.7 ns	(C134)

BP1C:

$X_O = 203.9$ ns	(219.3-15.4)
$X_P = 52.6$ ns	(BP1R+C166+BP1I+C157)
REFDLY = 256.5 ns	
CABDLY = 235.7 ns	(C131)

Setup at the BIPM**Annex A - Information Sheet**

(to be repeated for each calibrated system)

Laboratory:	BIPM	
Date and hour of the beginning of measurements:	MJD 57778	
Date and hour of the end of measurements:	MJD 57782	
Information on the system		
	Local:	Travelling:
4-character BIPM code	BP0R	BP1C
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx2e 3113	Septentrio PolaRx3eTR S9000169176
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):		
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type: Antenna serial number:	Ashtech Chokering 701945-2 CR6200539014	Ashtech Chokering 701945-2 CR62000323008
Temperature (if stabilised) /°C		
Measured delays /ns		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	42.7 ns	52.6 ns
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	226.2 ns	203.9 ns
• Antenna cable delay:	133.4 ns	235.7 ns
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
Data used for the generation of CGGTTS files		
• INT DLY (GPS) /ns:		
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:		
• Coordinates reference frame:		
Latitude or X /m:		
Longitude or Y /m:		
Height or Z /m:		
General information		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		21 ± 1°C
Set humidity value and uncertainty:		

(1) For a trip with closure, not needed if the traveling equipment is used in the same set-up throughout.

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory:	BIPM	
Date and hour of the beginning of measurements:	MJD 57778	
Date and hour of the end of measurements:	MJD 57782	
Information on the system		
	Local:	Travelling:
4-character BIPM code:	BP1J	BP0U
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx4proTR 27	Dicom GTR50 0801068
1 PPS trigger level /V:		1 V
• Antenna cable maker and type: Phase stabilised cable (Y/N):		
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type: Antenna serial number:	Septentrio Sepchoke_MC 5131	Novatel 702-GG NAE10190011
Temperature (if stabilised) /°C		
Measured delays /ns		
<small>(if needed fill box "Additional Information" below)</small>		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	47.6 ns	52.6
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	132.3 ns	
• Antenna cable delay:	128.7 ns	181.7
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
Data used for the generation of CGGTTS files		
• INT DLY (GPS) /ns:		
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:		
• Coordinates reference frame:		
Latitude or X /m:		
Longitude or Y /m:		
Height or Z /m:		
General information		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		21 ± 1°C
Set humidity value and uncertainty:		

(1) For a trip with closure, not needed if the traveling equipment is used in the same set-up throughout.

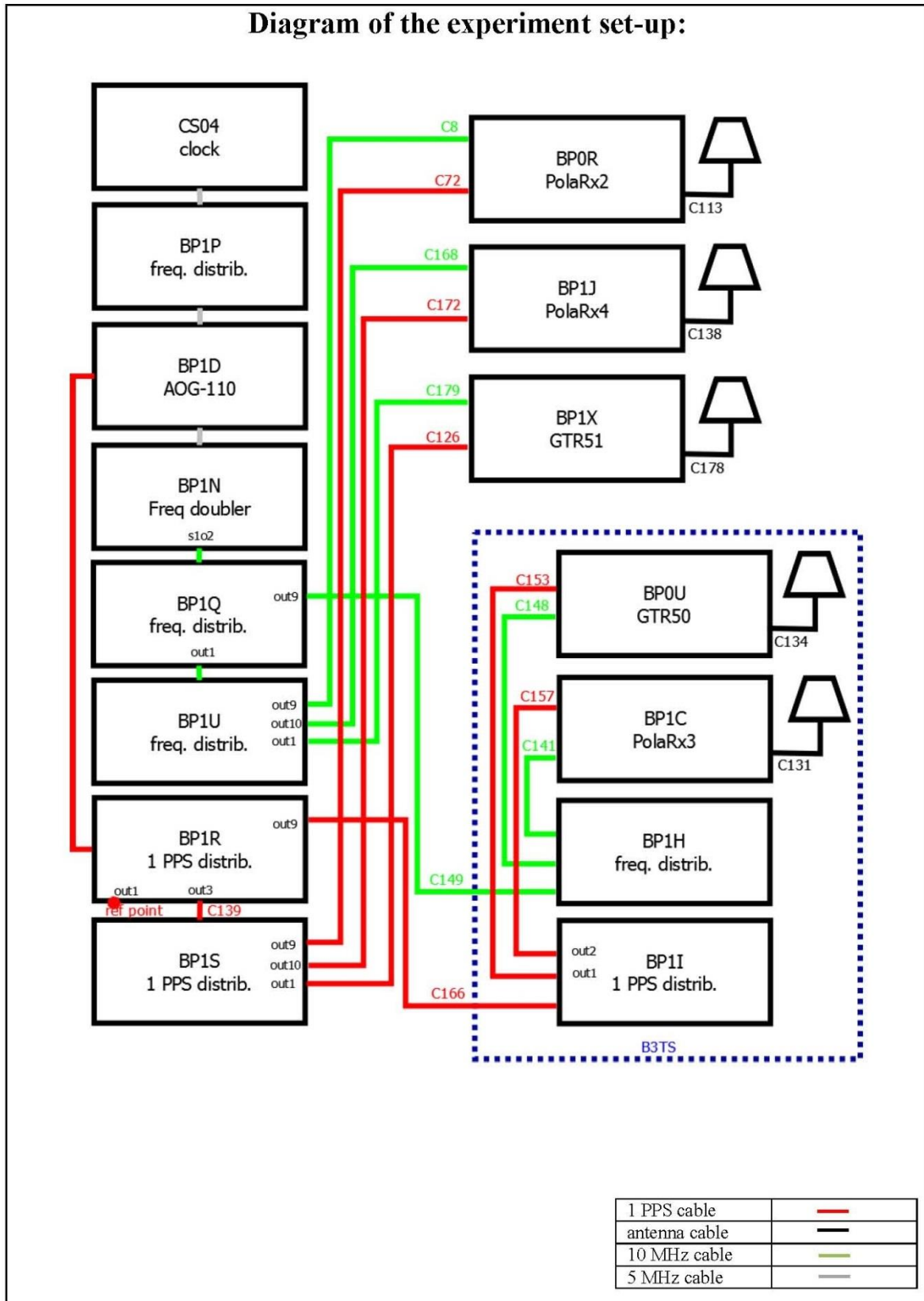
Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory:	BIPM	
Date and hour of the beginning of measurements:	MJD 57778	
Date and hour of the end of measurements:	MJD 57782	
Information on the system		
	Local:	Travelling:
4-character BIPM code	BP1X	
• Receiver maker and type: Receiver serial number:	Dicom GTR51 1306001	
1 PPS trigger level /V:	1 V	
• Antenna cable maker and type: Phase stabilised cable (Y/N):		
Length outside the building /m:	~15 m	
• Antenna maker and type: Antenna serial number:	Novatel 703-GG NEG13160018	
Temperature (if stabilised) /°C		
Measured delays /ns		
<small>(if needed fill box "Additional Information" below)</small>		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	42.6 ns	
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>		
• Antenna cable delay:	129.7 ns	(1)
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
Data used for the generation of CGGTTS files		
• INT DLY (GPS) /ns:	-27.5 ns (GPS C1), -33.5 ns (GPS P1), -37.4 ns (GPS P2)	
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:		
• Coordinates reference frame:		
Latitude or X /m:		
Longitude or Y /m:		
Height or Z /m:		
General information		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:	21 ± 1°C	
Set humidity value and uncertainty:		

(1) For a trip with closure, not needed if the traveling equipment is used in the same set-up throughout.

Diagram of the experiment set-up:



Log of Events / Additional Information :

All measurements at BIPM carried out by L. Tisserand.

Equipment used to measure delays are two time interval counter (TIC), model SR620, maker Stanford Research Systems, with measurement uncertainty typically less than 0.5 ns (using external reference frequency as timebase).

TIC serial number 4680 used for local receivers.

TIC serial number 5482 used for traveling receivers.

BP0U-BP0R

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 66318
 Number of huge residuals = 4. New iteration
 Computed code bias (P1/P2)/m = -28.334 -27.040
 Computed baseline (X,Y,Z)/m = -5.320 -0.814 4.225
 RMS of residuals /m = 0.690

Number of phase differences to fit baseline = 59156
 A priori baseline (X,Y,Z)/m = -5.320 -0.814 4.225
 13753 clock jitters computed out of 13923 intervals
 AVE jitter /ps = -0.7 RMS jitter /ps = 40.9

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.148 0.045 0.262
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.164 0.042 0.276
 RMS of residuals L2 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -5.173 -0.768 4.487
 Final baseline L2 (X,Y,Z)/m = -5.156 -0.771 4.501

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 66511

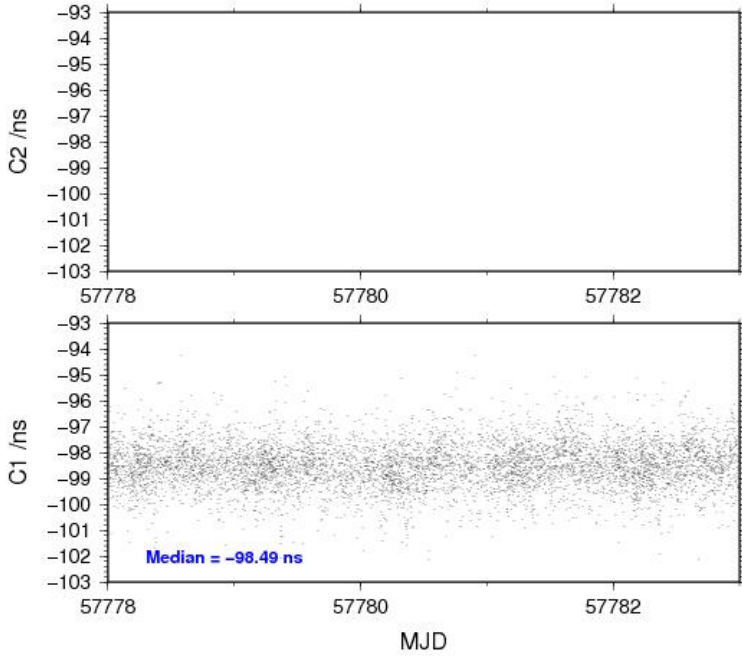
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 66468 -98.483 1.535
 C2: 0 NaN NaN
 P1: 66276 -95.262 2.422
 P2: 66268 -90.999 2.675

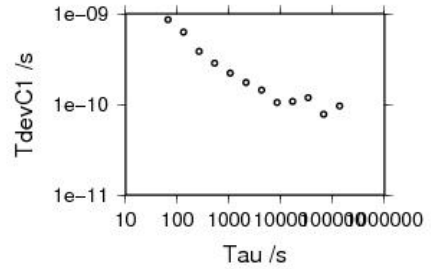
Number of 300s epochs in out file = 1440

Code #pts, median/ns, ave/ns, rms/ns
 C1: 6551 -98.490 -98.491 0.871
 C2: 0 0.000 NaN NaN
 P1: 6540 -95.348 -95.321 1.200
 P2: 6539 -90.990 -90.998 1.494

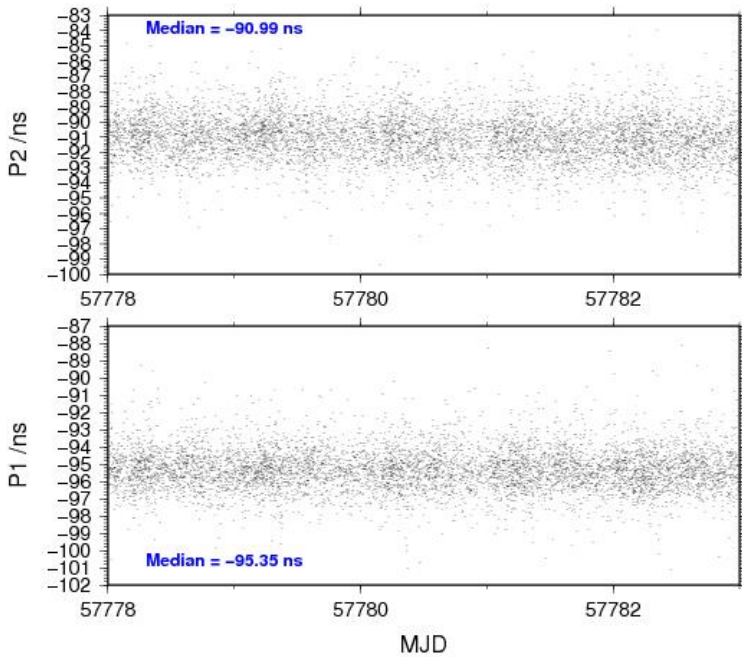
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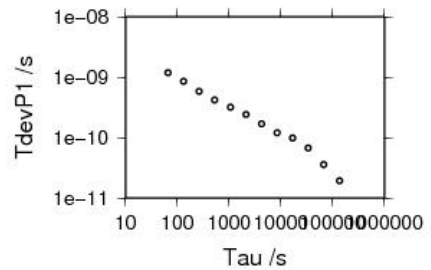
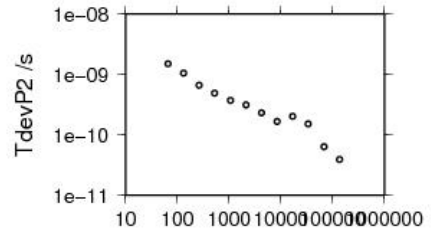
- 134980 s: C1= 96 ps
- 67490 s: C1= 78 ps
- 33745 s: C1= 119 ps
- 16873 s: C1= 108 ps
- 8436 s: C1= 105 ps
- 4218 s: C1= 144 ps
- 2109 s: C1= 175 ps
- 1055 s: C1= 220 ps
- 527 s: C1= 285 ps
- 264 s: C1= 363 ps
- 132 s: C1= 626 ps
- 66 s: C1= 864 ps



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|---------------------|---------------------|
| 135207 s: P1= 19 ps | 135228 s: P2= 39 ps |
| 67604 s: P1= 36 ps | 67614 s: P2= 64 ps |
| 33802 s: P1= 67 ps | 33807 s: P2= 153 ps |
| 16901 s: P1= 99 ps | 16904 s: P2= 204 ps |
| 8450 s: P1= 120 ps | 8452 s: P2= 166 ps |
| 4225 s: P1= 170 ps | 4226 s: P2= 231 ps |
| 2113 s: P1= 242 ps | 2113 s: P2= 314 ps |
| 1056 s: P1= 319 ps | 1056 s: P2= 373 ps |
| 528 s: P1= 418 ps | 528 s: P2= 493 ps |
| 264 s: P1= 587 ps | 264 s: P2= 665 ps |
| 132 s: P1= 852 ps | 132 s: P2= 1056 ps |
| 66 s: P1= 1183 ps | 66 s: P2= 1501 ps |



BP1C-BP0R

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 94135
 Number of huge residuals = 190. New iteration
 Number of huge residuals = 2. New iteration
 Computed code bias (P1/P2)/m = -17.646 -16.511
 Computed baseline (X,Y,Z)/m = -4.630 -0.892 3.553
 RMS of residuals /m = 0.701

Number of phase differences to fit baseline = 91712
 A priori baseline (X,Y,Z)/m = -4.630 -0.892 3.553
 14396 clock jitters computed out of 14396 intervals
 AVE jitter /ps = 0.5 RMS jitter /ps = 6.0

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 3
 Computed baseline L1 (X,Y,Z)/m = 0.187 0.163 0.260
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.188 0.170 0.257
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 0
 Iter 2 Large residuals L2= 3
 Computed baseline L1 (X,Y,Z)/m = 0.187 0.163 0.260
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.188 0.170 0.257
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -4.443 -0.729 3.814
 Final baseline L2 (X,Y,Z)/m = -4.442 -0.723 3.811

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 96853

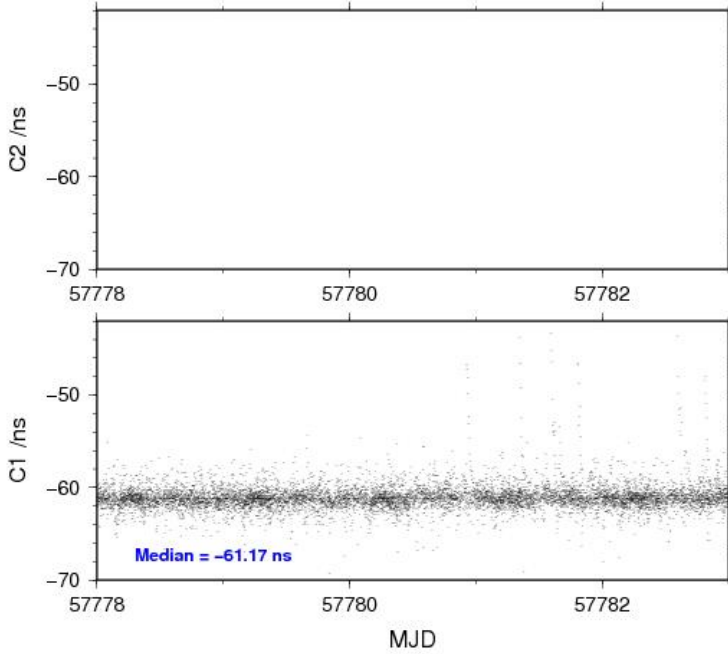
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 95986 -61.087 2.275
 C2: 0 NaN NaN
 P1: 93815 -59.703 2.764
 P2: 93811 -55.925 3.042

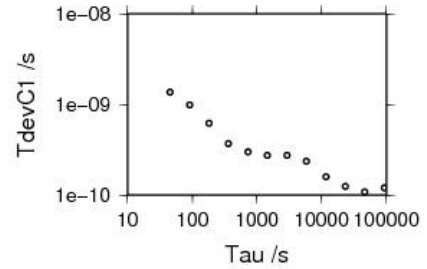
Number of 300s epochs in out file = 1440

Code #pts, median/ns, ave/ns, rms/ns
 C1: 9525 -61.175 -61.081 1.369
 C2: 0 0.000 NaN NaN
 P1: 9325 -59.856 -59.737 1.582
 P2: 9327 -55.958 -55.931 1.732

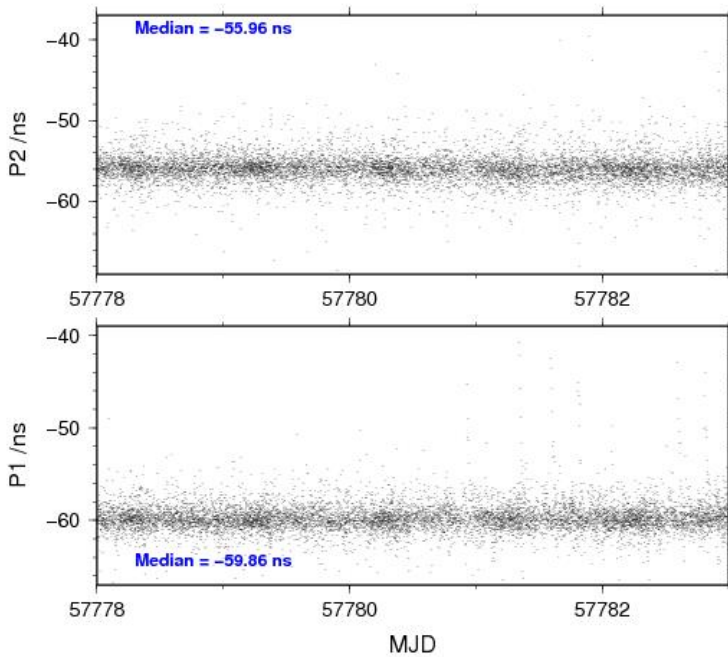
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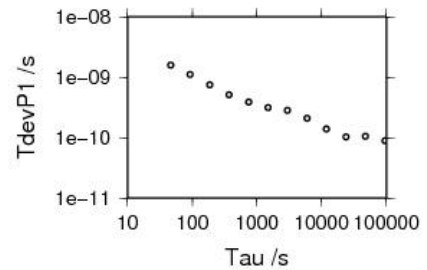
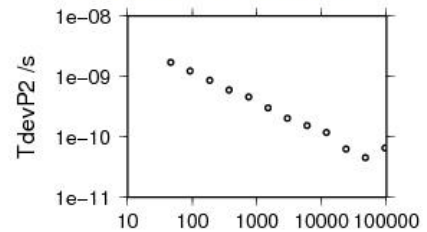
- 92831 s: C1= 120 ps
- 46415 s: C1= 108 ps
- 23208 s: C1= 125 ps
- 11604 s: C1= 159 ps
- 5802 s: C1= 235 ps
- 2901 s: C1= 273 ps
- 1450 s: C1= 275 ps
- 725 s: C1= 301 ps
- 363 s: C1= 368 ps
- 181 s: C1= 621 ps
- 91 s: C1= 989 ps
- 45 s: C1= 1364 ps



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|---------------------|---------------------|
| 94822 s: P1= 89 ps | 94802 s: P2= 66 ps |
| 47411 s: P1= 105 ps | 47401 s: P2= 46 ps |
| 23706 s: P1= 103 ps | 23700 s: P2= 63 ps |
| 11853 s: P1= 139 ps | 11850 s: P2= 119 ps |
| 5926 s: P1= 208 ps | 5925 s: P2= 155 ps |
| 2963 s: P1= 283 ps | 2963 s: P2= 205 ps |
| 1482 s: P1= 314 ps | 1481 s: P2= 303 ps |
| 741 s: P1= 389 ps | 741 s: P2= 458 ps |
| 370 s: P1= 511 ps | 370 s: P2= 595 ps |
| 185 s: P1= 748 ps | 185 s: P2= 866 ps |
| 93 s: P1= 1116 ps | 93 s: P2= 1239 ps |
| 46 s: P1= 1583 ps | 46 s: P2= 1716 ps |



BPOU-BPIJ

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 66506
 Computed code bias (P1/P2)/m = -2.823 -0.858
 Computed baseline (X,Y,Z)/m = -2.360 -0.366 1.825
 RMS of residuals /m = 0.613

Number of phase differences to fit baseline = 59514
 A priori baseline (X,Y,Z)/m = -2.360 -0.366 1.825
 13770 clock jitters computed out of 13915 intervals
 AVE jitter /ps = -0.6 RMS jitter /ps = 41.1

Iter 1 Large residuals L1= 1
 Iter 1 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.167 0.047 0.153
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.179 0.042 0.158
 RMS of residuals L2 /m = 0.003

Iter 2 Large residuals L1= 1
 Iter 2 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.167 0.047 0.153
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.179 0.042 0.158
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -2.193 -0.319 1.979
 Final baseline L2 (X,Y,Z)/m = -2.181 -0.324 1.984

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 66571

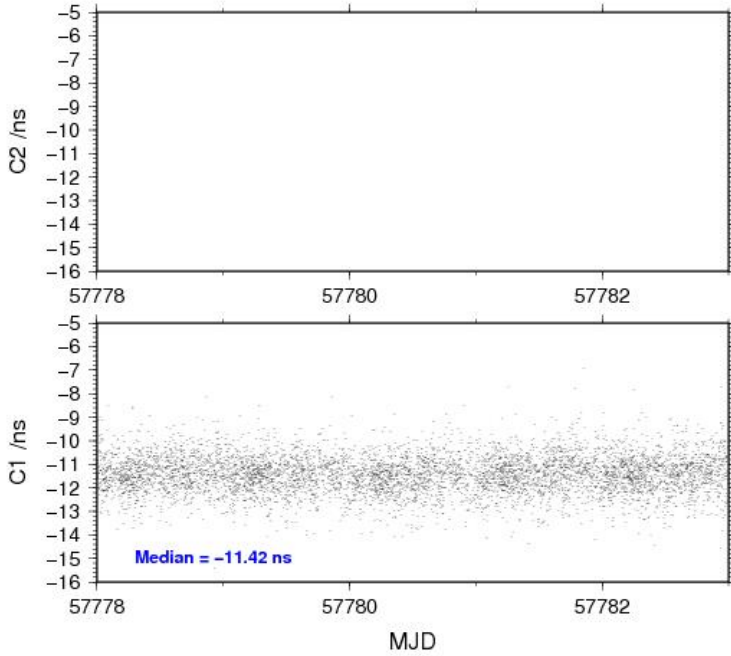
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 66528 -11.425 1.388
 C2: 0 NaN NaN
 P1: 66462 -10.008 1.877
 P2: 66460 -3.483 2.439

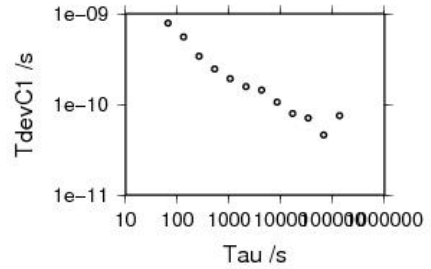
Number of 300s epochs in out file = 1440

Code #pts, median/ns, ave/ns, rms/ns
 C1: 6553 -11.421 -11.430 0.777
 C2: 0 0.000 NaN NaN
 P1: 6551 -10.043 -10.026 0.988
 P2: 6551 -3.460 -3.466 1.415

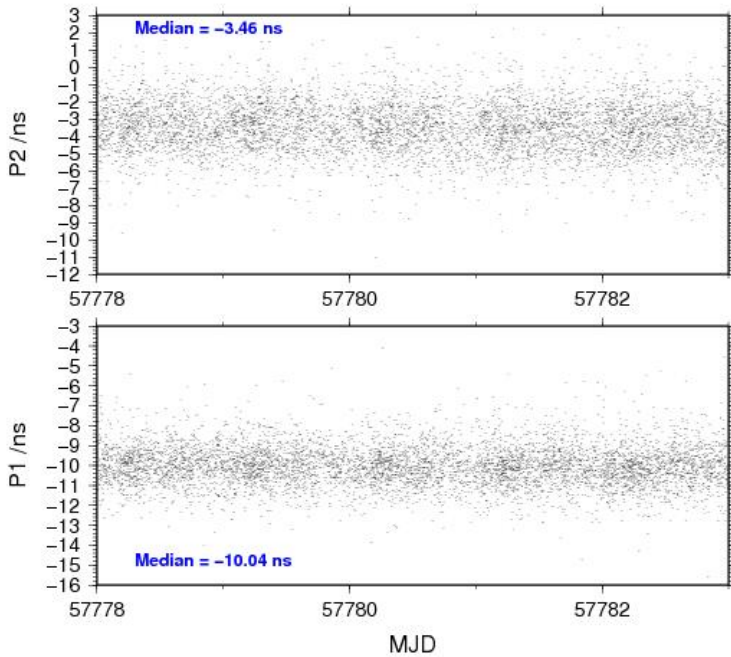
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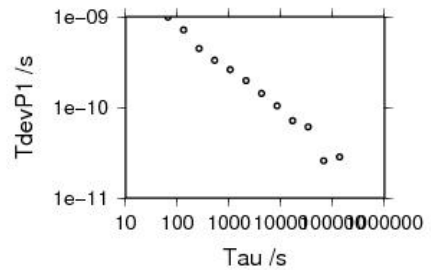
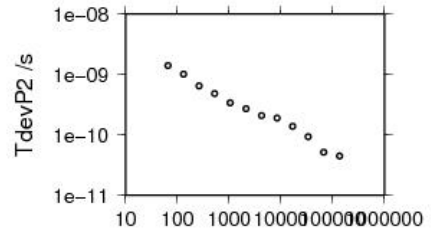
- 134939 s: C1= 75 ps
- 67470 s: C1= 46 ps
- 33735 s: C1= 70 ps
- 16867 s: C1= 79 ps
- 8434 s: C1= 106 ps
- 4217 s: C1= 143 ps
- 2108 s: C1= 156 ps
- 1054 s: C1= 193 ps
- 527 s: C1= 247 ps
- 264 s: C1= 341 ps
- 132 s: C1= 554 ps
- 66 s: C1= 789 ps



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- | | |
|---------------------|---------------------|
| 134980 s: P1= 26 ps | 134980 s: P2= 45 ps |
| 67490 s: P1= 26 ps | 67490 s: P2= 52 ps |
| 33745 s: P1= 61 ps | 33745 s: P2= 94 ps |
| 16873 s: P1= 71 ps | 16873 s: P2= 140 ps |
| 8436 s: P1= 104 ps | 8436 s: P2= 192 ps |
| 4218 s: P1= 143 ps | 4218 s: P2= 208 ps |
| 2109 s: P1= 198 ps | 2109 s: P2= 273 ps |
| 1055 s: P1= 262 ps | 1055 s: P2= 340 ps |
| 527 s: P1= 330 ps | 527 s: P2= 466 ps |
| 264 s: P1= 447 ps | 264 s: P2= 645 ps |
| 132 s: P1= 714 ps | 132 s: P2= 1019 ps |
| 66 s: P1= 988 ps | 66 s: P2= 1414 ps |



BP1C-BP1J

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 93430
 Computed code bias (P1/P2)/m = 7.587 9.344
 Computed baseline (X,Y,Z)/m = -1.461 -0.207 1.413
 RMS of residuals /m = 0.590

Number of phase differences to fit baseline = 91324
 A priori baseline (X,Y,Z)/m = -1.461 -0.207 1.413
 14396 clock jitters computed out of 14396 intervals
 AVE jitter /ps = 0.1 RMS jitter /ps = 5.2

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 3
 Computed baseline L1 (X,Y,Z)/m = -0.011 -0.013 -0.099
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = -0.002 -0.020 -0.102
 RMS of residuals L2 /m = 0.004

Iter 2 Large residuals L1= 0
 Iter 2 Large residuals L2= 3
 Computed baseline L1 (X,Y,Z)/m = -0.011 -0.013 -0.099
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = -0.002 -0.020 -0.102
 RMS of residuals L2 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -1.472 -0.220 1.314
 Final baseline L2 (X,Y,Z)/m = -1.462 -0.228 1.311

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 95153

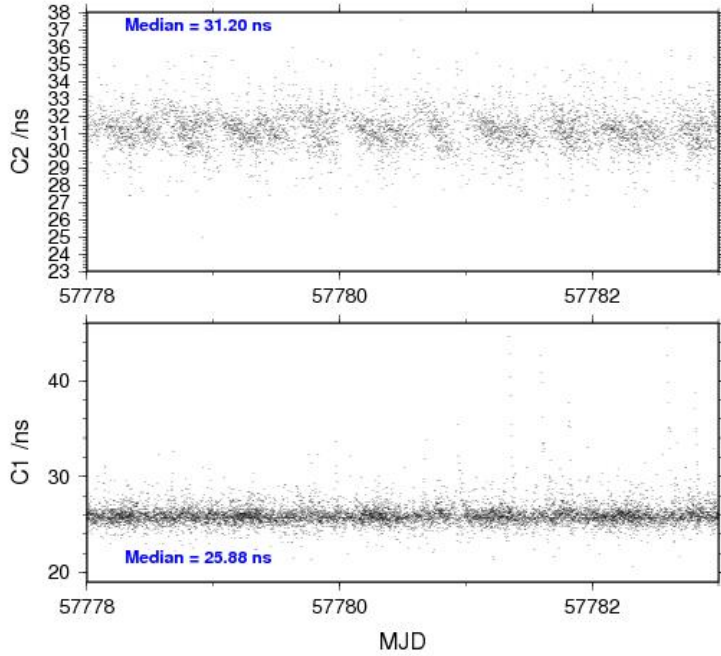
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 93857 26.015 2.000
 C2: 54982 31.198 1.926
 P1: 93099 25.515 2.081
 P2: 93027 31.420 2.716

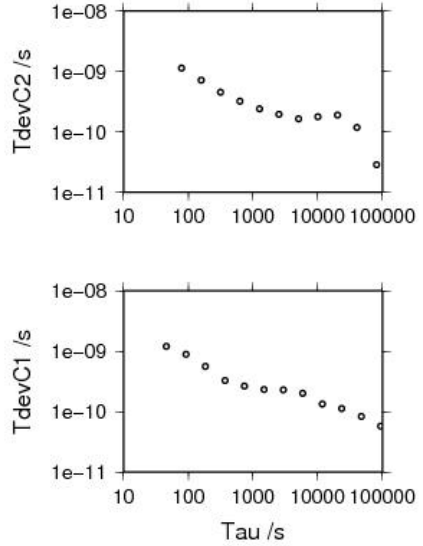
Number of 300s epochs in out file = 1440

Code #pts, median/ns, ave/ns, rms/ns
 C1: 9379 25.883 26.018 1.206
 C2: 5479 31.197 31.196 1.069
 P1: 9271 25.413 25.524 1.243
 P2: 9267 31.463 31.408 1.623

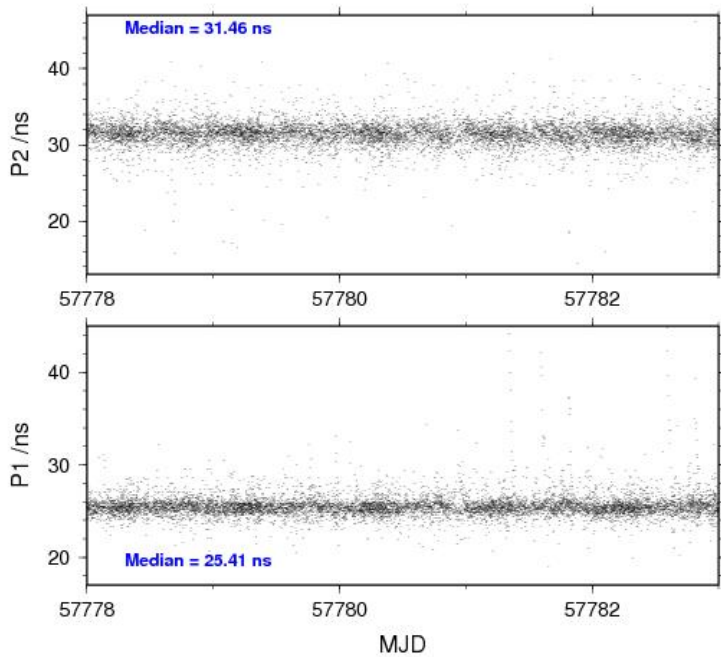
03/02/17 bp1cbp1j17025_5



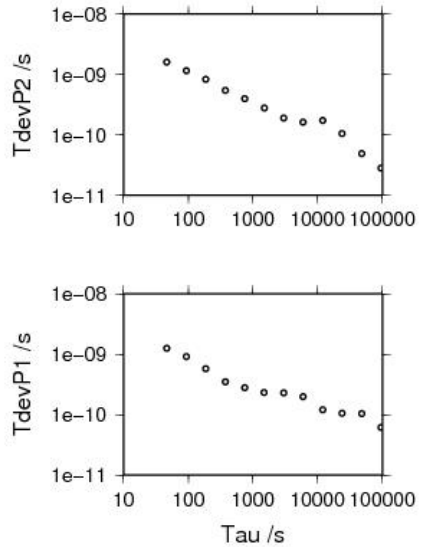
94276 s: C1= 57 ps	80697 s: C2= 29 ps
47138 s: C1= 83 ps	40349 s: C2= 119 ps
23569 s: C1= 112 ps	20174 s: C2= 190 ps
11785 s: C1= 133 ps	10087 s: C2= 177 ps
5892 s: C1= 201 ps	5044 s: C2= 165 ps
2946 s: C1= 229 ps	2522 s: C2= 197 ps
1473 s: C1= 231 ps	1261 s: C2= 243 ps
737 s: C1= 265 ps	630 s: C2= 323 ps
368 s: C1= 325 ps	315 s: C2= 452 ps
184 s: C1= 559 ps	158 s: C2= 719 ps
92 s: C1= 886 ps	79 s: C2= 1143 ps
46 s: C1= 1200 ps	



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95374 s: P1= 62 ps	95416 s: P2= 28 ps
47687 s: P1= 104 ps	47708 s: P2= 49 ps
23844 s: P1= 105 ps	23854 s: P2= 106 ps
11922 s: P1= 120 ps	11927 s: P2= 174 ps
5961 s: P1= 199 ps	5963 s: P2= 163 ps
2980 s: P1= 228 ps	2982 s: P2= 189 ps
1490 s: P1= 234 ps	1491 s: P2= 279 ps
745 s: P1= 280 ps	745 s: P2= 396 ps
373 s: P1= 348 ps	373 s: P2= 543 ps
186 s: P1= 575 ps	186 s: P2= 826 ps
93 s: P1= 912 ps	93 s: P2= 1162 ps
47 s: P1= 1243 ps	47 s: P2= 1608 ps



BP0U-BP1X

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 66566
 Computed code bias (P1/P2)/m = -0.866 0.228
 Computed baseline (X,Y,Z)/m = -3.208 -0.559 2.293
 RMS of residuals /m = 0.643

Number of phase differences to fit baseline = 59306
 A priori baseline (X,Y,Z)/m = -3.208 -0.559 2.293
 13752 clock jitters computed out of 13924 intervals
 AVE jitter /ps = -0.5 RMS jitter /ps = 40.9

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.271 0.094 0.309
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.263 0.092 0.294
 RMS of residuals L2 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -2.937 -0.466 2.602
 Final baseline L2 (X,Y,Z)/m = -2.944 -0.467 2.587

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 66635

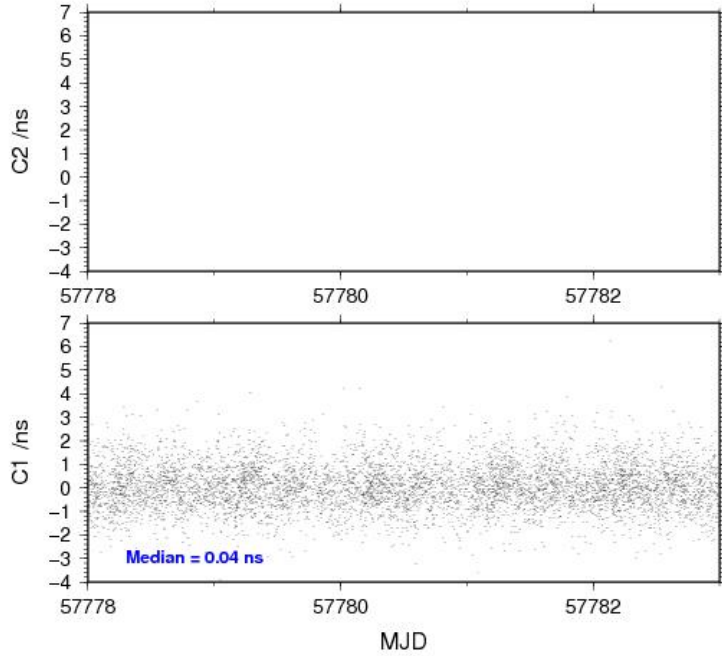
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 66592 0.090 1.523
 C2: 0 NaN NaN
 P1: 66519 -3.967 2.086
 P2: 66517 -0.279 2.521

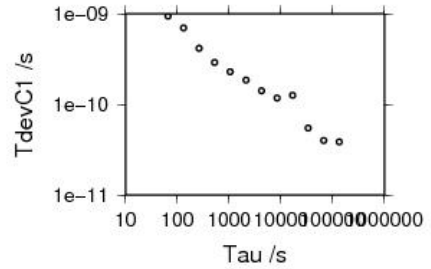
Number of 300s epochs in out file = 1440

Code #pts, median/ns, ave/ns, rms/ns
 C1: 6562 0.039 0.072 0.940
 C2: 0 0.000 NaN NaN
 P1: 6561 -4.064 -4.001 1.186
 P2: 6561 -0.276 -0.260 1.580

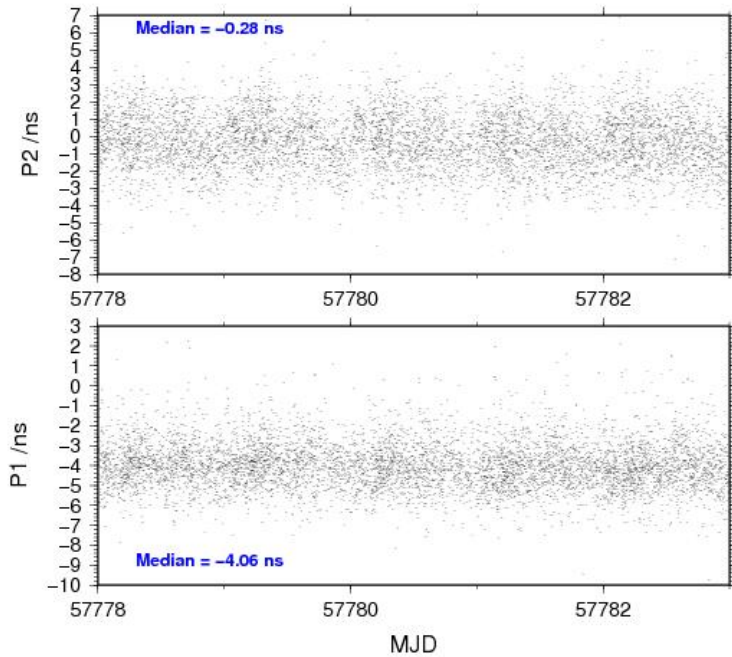
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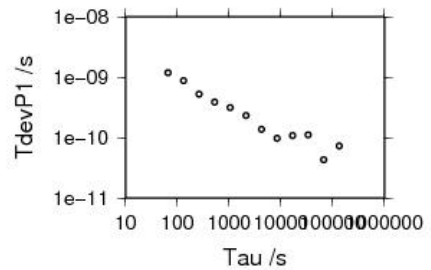
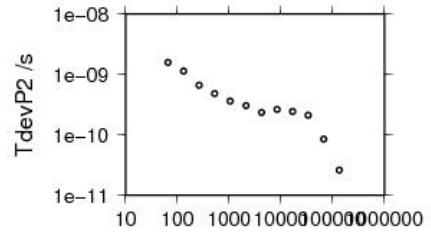
- 134754 s: C1= 39 ps
- 67377 s: C1= 40 ps
- 33689 s: C1= 55 ps
- 16844 s: C1= 126 ps
- 8422 s: C1= 118 ps
- 4211 s: C1= 142 ps
- 2106 s: C1= 186 ps
- 1053 s: C1= 230 ps
- 526 s: C1= 291 ps
- 263 s: C1= 415 ps
- 132 s: C1= 697 ps
- 66 s: C1= 940 ps



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- | | |
|---------------------|---------------------|
| 134775 s: P1= 73 ps | 134775 s: P2= 26 ps |
| 67387 s: P1= 43 ps | 67387 s: P2= 85 ps |
| 33694 s: P1= 111 ps | 33694 s: P2= 211 ps |
| 16847 s: P1= 109 ps | 16847 s: P2= 245 ps |
| 8423 s: P1= 97 ps | 8423 s: P2= 265 ps |
| 4212 s: P1= 136 ps | 4212 s: P2= 236 ps |
| 2106 s: P1= 232 ps | 2106 s: P2= 306 ps |
| 1053 s: P1= 316 ps | 1053 s: P2= 361 ps |
| 526 s: P1= 390 ps | 526 s: P2= 488 ps |
| 263 s: P1= 523 ps | 263 s: P2= 668 ps |
| 132 s: P1= 878 ps | 132 s: P2= 1140 ps |
| 66 s: P1= 1179 ps | 66 s: P2= 1586 ps |



BP1C-BP1X

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 92032
 Number of huge residuals = 1. New iteration
 Computed code bias (P1/P2)/m = 9.781 10.688
 Computed baseline (X,Y,Z)/m = -2.473 -0.533 1.647
 RMS of residuals /m = 0.630

Number of phase differences to fit baseline = 89940
 A priori baseline (X,Y,Z)/m = -2.473 -0.533 1.647
 14396 clock jitters computed out of 14396 intervals
 AVE jitter /ps = 0.4 RMS jitter /ps = 5.8

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.261 0.148 0.264
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.249 0.155 0.261
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 0
 Iter 2 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.261 0.148 0.264
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.249 0.155 0.261
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -2.212 -0.385 1.912
 Final baseline L2 (X,Y,Z)/m = -2.224 -0.378 1.909

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 93243

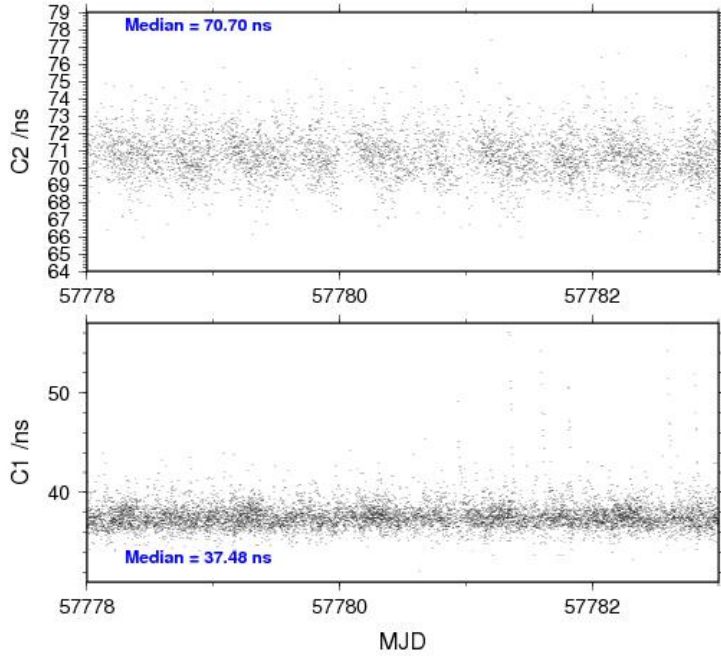
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 92448 37.660 2.052
 C2: 54714 70.747 2.029
 P1: 91829 31.739 2.376
 P2: 91802 34.799 2.897

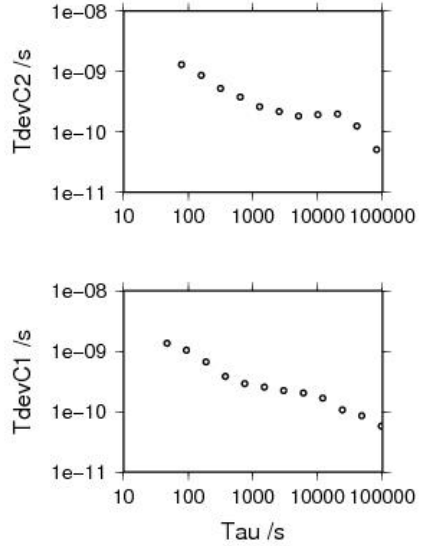
Number of 300s epochs in out file = 1440

Code #pts, median/ns, ave/ns, rms/ns
 C1: 9227 37.482 37.637 1.383
 C2: 5461 70.699 70.725 1.235
 P1: 9169 31.530 31.695 1.458
 P2: 9166 34.739 34.788 1.756

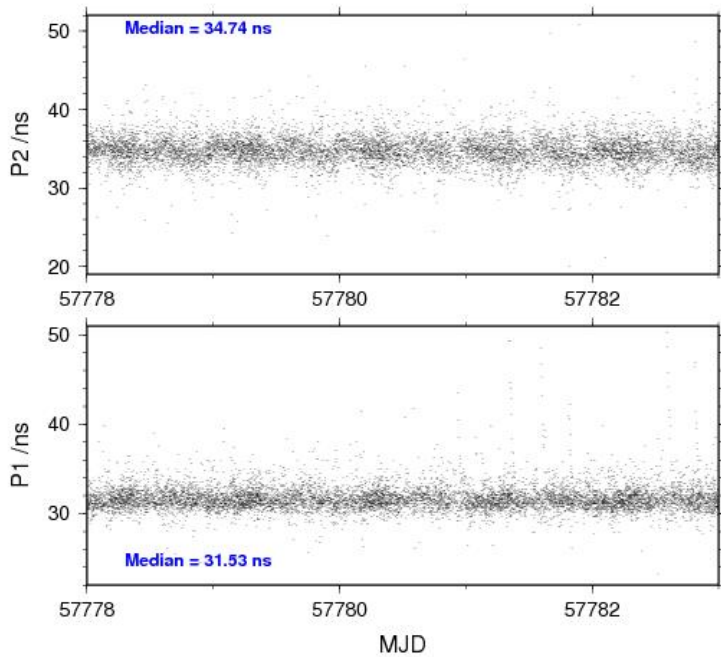
03/02/17 bp1cbp1x17025_5



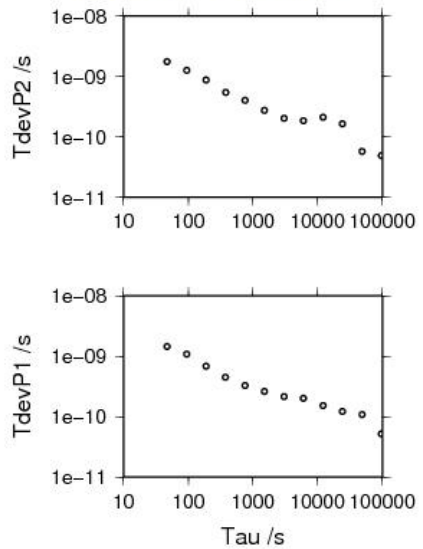
95829 s: C1= 58 ps	80964 s: C2= 51 ps
47915 s: C1= 85 ps	40482 s: C2= 125 ps
23957 s: C1= 107 ps	20241 s: C2= 199 ps
11979 s: C1= 166 ps	10120 s: C2= 193 ps
5989 s: C1= 204 ps	5060 s: C2= 184 ps
2995 s: C1= 223 ps	2530 s: C2= 218 ps
1497 s: C1= 254 ps	1265 s: C2= 263 ps
749 s: C1= 292 ps	633 s: C2= 379 ps
374 s: C1= 382 ps	316 s: C2= 522 ps
187 s: C1= 666 ps	158 s: C2= 865 ps
94 s: C1= 1045 ps	79 s: C2= 1295 ps
47 s: C1= 1346 ps	



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96436 s: P1= 52 ps	96467 s: P2= 49 ps
48218 s: P1= 108 ps	48234 s: P2= 58 ps
24109 s: P1= 121 ps	24117 s: P2= 166 ps
12054 s: P1= 153 ps	12058 s: P2= 211 ps
6027 s: P1= 200 ps	6029 s: P2= 186 ps
3014 s: P1= 215 ps	3015 s: P2= 203 ps
1507 s: P1= 263 ps	1507 s: P2= 275 ps
753 s: P1= 328 ps	754 s: P2= 404 ps
377 s: P1= 449 ps	377 s: P2= 547 ps
188 s: P1= 685 ps	188 s: P2= 882 ps
94 s: P1= 1084 ps	94 s: P2= 1269 ps
47 s: P1= 1442 ps	47 s: P2= 1755 ps



3.2/ USNO (17086)Period

MJD 57839 to 57850

Delays

BP0U:

REFDLY = $72.42+52.6 = 125.02$ ns (72.42+52.6, cf page 3 & 22)
CABDLY = 181.7 ns (C134)

BP1C:

$X_O = 181.80$ ns (cf page 23)
 $X_P = 72.42+52.6 = 125.02$ ns (72.42+52.6, cf page 3 & 22)
REFDLY = 306.82 ns
CABDLY = 235.7 ns (C131)

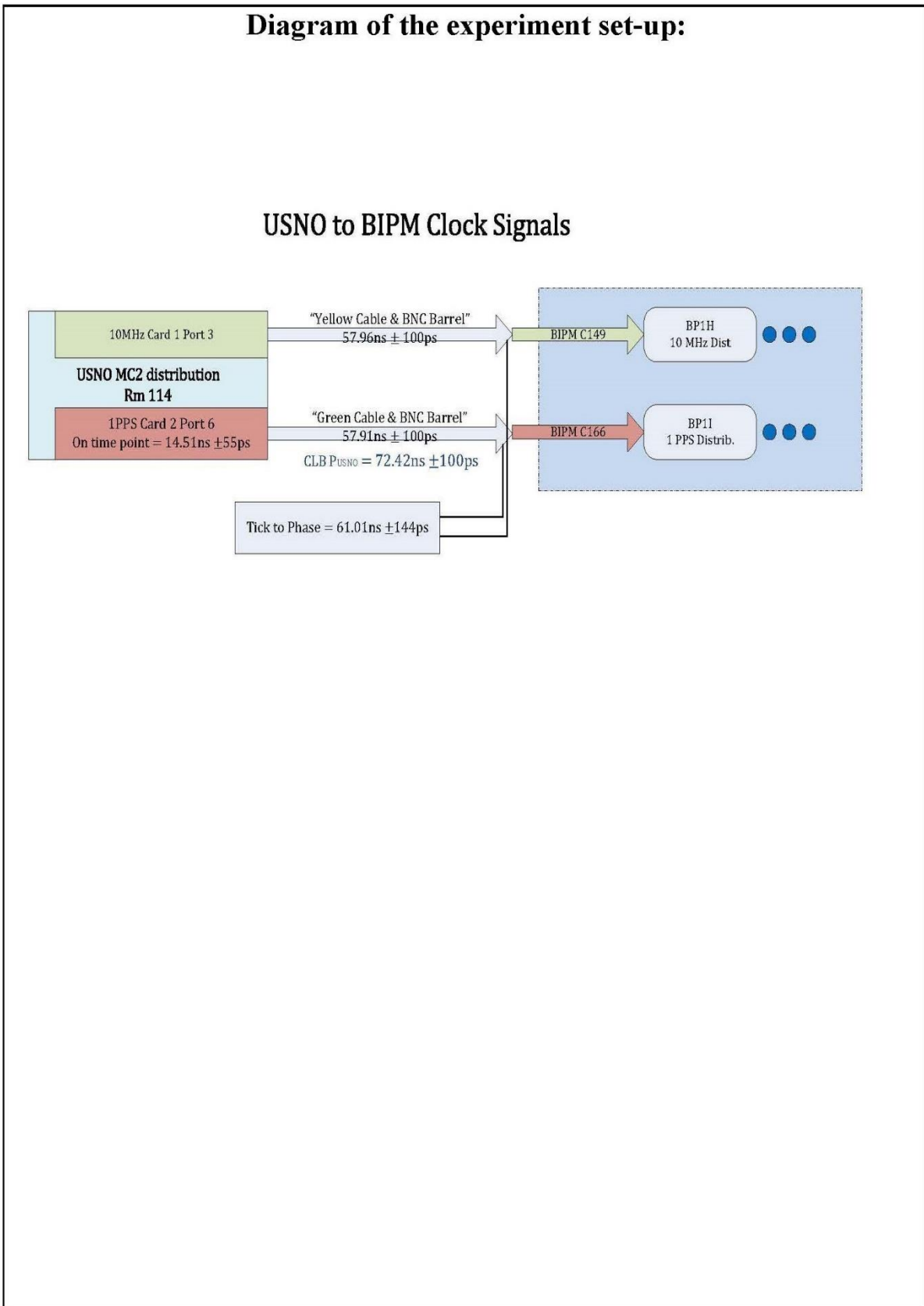
USN6:

(from cggts file gzus0657.839)
REFDLY = 0.0 ns
CABDLY = 0.0 ns

USN7:

(from cggts file gzus0757.839)
REFDLY = 0.0 ns
CABDLY = 0.0 ns

Setup at the USNO



Log of Events / Additional Information :

BPOU Settings

BPOU Antenna Position:
Ref Frame = IGS08 (EPOCH:2017.2315)

X = 1112167.261(m) 0.008(m)
 Y = -4842853.862(m) 0.015(m)
 Z = 3985497.174(m) 0.012(m)
 OBS USED = 64024/65491 (98%)
 Fixed AMB = 222/227 (98%)
 OVERALL RMS = 0.013(m)

GTR50 (snippet from log46.txt)

...
 Int_dly = 0.0 ns
 Cab_dly = 128.5 ns
 Ref_dly = 0.0 ns
 Rx_type = gtr50
 Rx_num = 0801068
 ...

NOTES:

- C141 was incorrectly connected at FreqIN of GTR50
- Missing page 6 of BIPM Guidelines (Annex-A)
- SR620 TIC voltage card was at 220V. Needed to remove voltage card with long-nose pliers and rotate to 120V. ½A 250V slow blow fuse was blown when initially plugged to 120V line. Replaced with 1A 250V slow blow fuse.
- Septentrio PolaRx3 was used to survey position of Chokering antenna. Surveyed for 24hrs:
 Ref Frame = IGS08 (Epoch:2017.2315)
 X = 1112167.261(m) 0.008(m)
 Y = -4842853.862(m) 0.015(m)
 Z = 3985497.174(m) 0.012(m)

BIPM Pre and Post Tare/Delay Measurements for PolaRx3eTR(BP1C)

MEASUREMENT DEVICE	START OF EXPERIMENT			END OF EXPERIMENT		
	3/27/2017	STD DEV (ns)		4/7/2017	STD DEV (ns)	
BIPM Stanford SR620 SN: 5482-01	TARE (ns)	15.423	0.031	TARE (ns)	15.395	0.006
	DELAY (ns)	197.246	0.071	DELAY (ns)	197.167	0.069
	Δ (ns)	181.823	0.010	Δ (ns)	181.772	0.002

BP0U-USN6

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 182880
 Computed code bias (P1/P2)/m = -22.286 -19.719
 Computed baseline (X,Y,Z)/m = -5.161 -0.821 -0.114
 RMS of residuals /m = 0.503

Number of phase differences to fit baseline = 168555
 A priori baseline (X,Y,Z)/m = -5.161 -0.821 -0.114
 29192 clock jitters computed out of 29311 intervals
 AVE jitter /ps = 0.1 RMS jitter /ps = 36.3

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.024 -0.074 0.083
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.026 -0.080 0.082
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -5.136 -0.894 -0.031
 Final baseline L2 (X,Y,Z)/m = -5.135 -0.901 -0.032

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 182896

Global average of individual differences

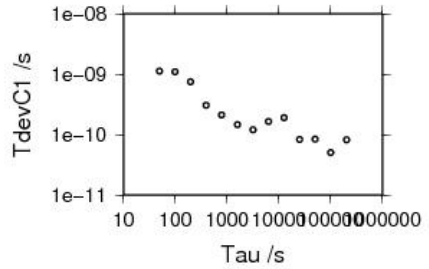
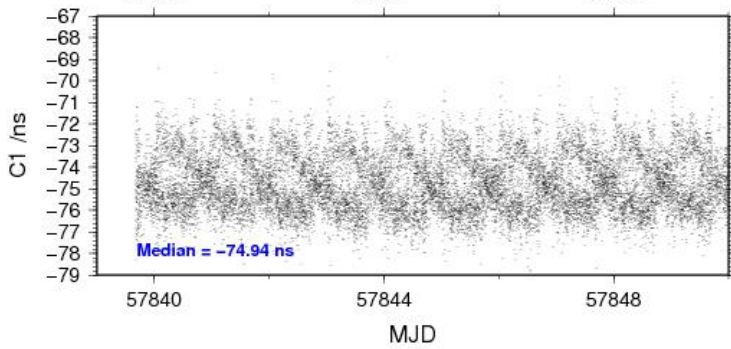
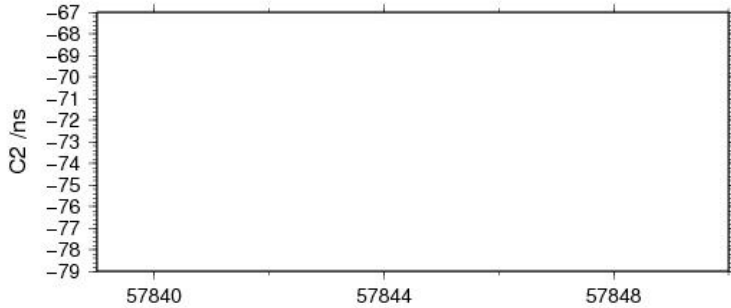
Code #pts, ave/ns, rms/ns
 C1: 182803 -74.772 1.645
 C2: 0 NaN NaN
 P1: 182787 -74.604 1.643
 P2: 182787 -66.053 1.844

Number of 300s epochs in out file = 2976

Code #pts, median/ns, ave/ns, rms/ns
 C1: 18148 -74.935 -74.773 1.314
 C2: 0 0.000 NaN NaN
 P1: 18148 -74.659 -74.616 0.859
 P2: 18148 -66.049 -66.042 0.941

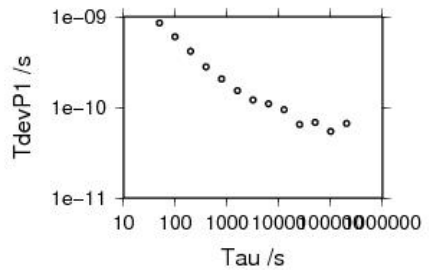
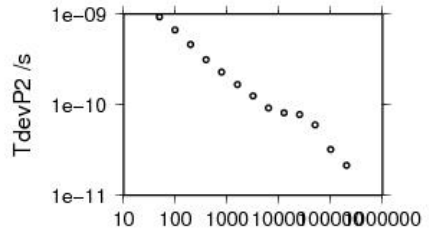
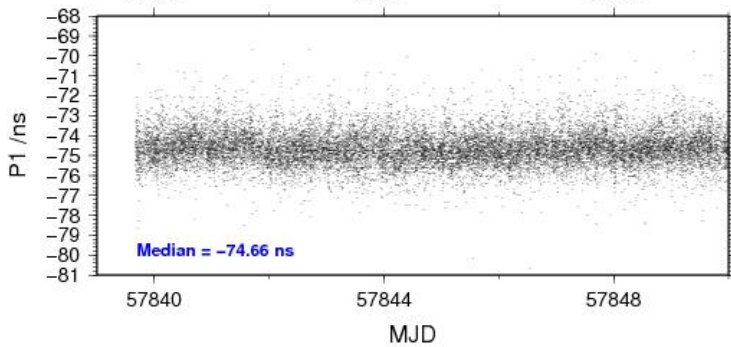
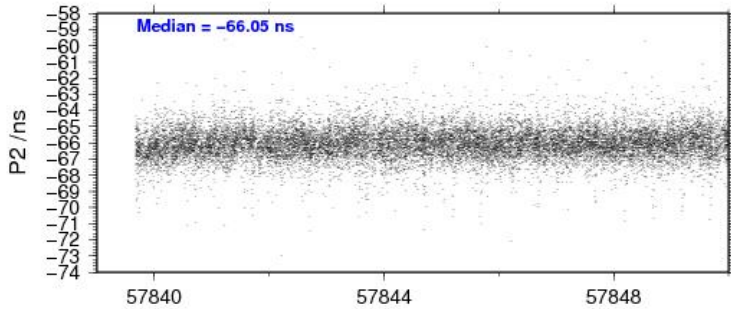
04/24/17 bp0uusn617086_11

201448 s: C1= 82 ps
 100724 s: C1= 51 ps
 50362 s: C1= 84 ps
 25181 s: C1= 83 ps
 12591 s: C1= 191 ps
 6295 s: C1= 164 ps
 3148 s: C1= 120 ps
 1574 s: C1= 146 ps
 787 s: C1= 211 ps
 393 s: C1= 307 ps
 197 s: C1= 748 ps
 98 s: C1= 1091 ps
 49 s: C1= 1128 ps



04/24/17 bp0uusn617086_11

201448 s: P1= 66 ps 201448 s: P2= 21 ps
 100724 s: P1= 54 ps 100724 s: P2= 32 ps
 50362 s: P1= 68 ps 50362 s: P2= 60 ps
 25181 s: P1= 65 ps 25181 s: P2= 78 ps
 12591 s: P1= 94 ps 12591 s: P2= 81 ps
 6295 s: P1= 109 ps 6295 s: P2= 92 ps
 3148 s: P1= 121 ps 3148 s: P2= 126 ps
 1574 s: P1= 154 ps 1574 s: P2= 167 ps
 787 s: P1= 206 ps 787 s: P2= 228 ps
 393 s: P1= 279 ps 393 s: P2= 314 ps
 197 s: P1= 416 ps 197 s: P2= 463 ps
 98 s: P1= 603 ps 98 s: P2= 668 ps
 49 s: P1= 856 ps 49 s: P2= 935 ps



BP1C-USN6

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 290163
 Computed code bias (P1/P2)/m = -5.198 -2.700
 Computed baseline (X,Y,Z)/m = -4.386 -1.206 -0.621
 RMS of residuals /m = 0.410

Number of phase differences to fit baseline = 288281
 A priori baseline (X,Y,Z)/m = -4.386 -1.206 -0.621
 31395 clock jitters computed out of 31395 intervals
 AVE jitter /ps = 0.1 RMS jitter /ps = 4.7

Iter 1 Large residuals L1= 1
 Iter 1 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.010 0.024 0.003
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.012 0.028 0.001
 RMS of residuals L2 /m = 0.004

Iter 2 Large residuals L1= 1
 Iter 2 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.010 0.024 0.003
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.012 0.028 0.001
 RMS of residuals L2 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -4.375 -1.181 -0.617
 Final baseline L2 (X,Y,Z)/m = -4.374 -1.178 -0.620

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 290695

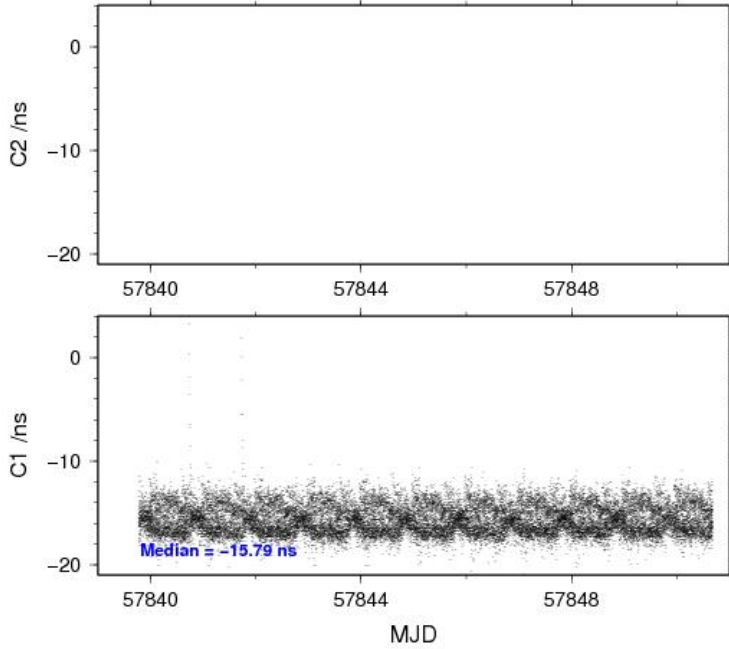
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 290335 -15.628 1.749
 C2: 0 NaN NaN
 P1: 290028 -17.315 1.337
 P2: 290041 -8.973 1.484

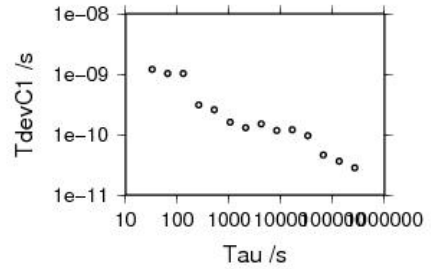
Number of 300s epochs in out file = 3141

Code #pts, median/ns, ave/ns, rms/ns
 C1: 28986 -15.787 -15.630 1.407
 C2: 0 0.000 NaN NaN
 P1: 28960 -17.342 -17.317 0.820
 P2: 28961 -8.951 -8.973 0.849

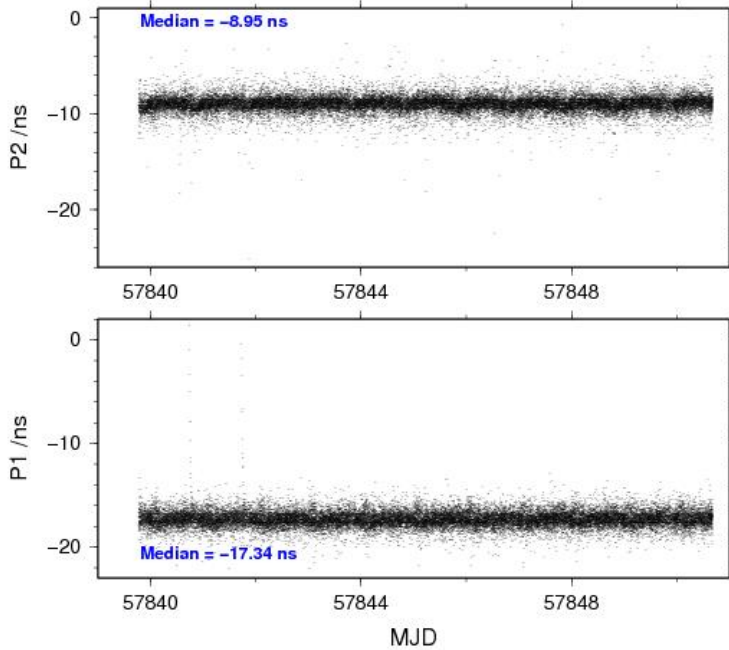
04/24/17 bp1cusn617086_12



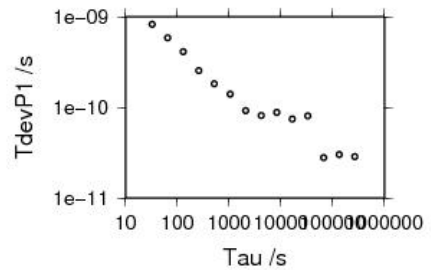
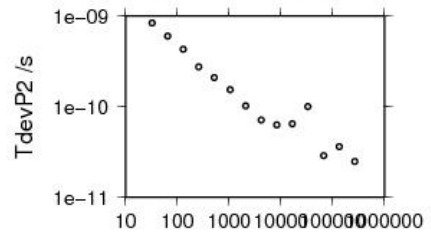
266236 s: C1= 28 ps
133118 s: C1= 37 ps
66559 s: C1= 46 ps
33280 s: C1= 96 ps
16640 s: C1= 121 ps
8320 s: C1= 117 ps
4160 s: C1= 150 ps
2080 s: C1= 131 ps
1040 s: C1= 161 ps
520 s: C1= 258 ps
260 s: C1= 309 ps
130 s: C1= 1028 ps
65 s: C1= 1026 ps
32 s: C1= 1200 ps



04/24/17 bp1cusn617086_12



266476 s: P1= 29 ps	266466 s: P2= 25 ps
133238 s: P1= 30 ps	133233 s: P2= 36 ps
66619 s: P1= 28 ps	66617 s: P2= 29 ps
33309 s: P1= 81 ps	33308 s: P2= 100 ps
16655 s: P1= 74 ps	16654 s: P2= 65 ps
8327 s: P1= 88 ps	8327 s: P2= 63 ps
4164 s: P1= 81 ps	4164 s: P2= 71 ps
2082 s: P1= 92 ps	2082 s: P2= 102 ps
1041 s: P1= 140 ps	1041 s: P2= 154 ps
520 s: P1= 183 ps	520 s: P2= 209 ps
260 s: P1= 255 ps	260 s: P2= 276 ps
130 s: P1= 413 ps	130 s: P2= 432 ps
65 s: P1= 584 ps	65 s: P2= 600 ps
33 s: P1= 826 ps	33 s: P2= 842 ps



BP0U-USN7

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 182529
 Computed code bias (P1/P2)/m = -22.412 -19.831
 Computed baseline (X,Y,Z)/m = -5.169 -0.757 -0.150
 RMS of residuals /m = 0.587

Number of phase differences to fit baseline = 168518
 A priori baseline (X,Y,Z)/m = -5.169 -0.757 -0.150
 29192 clock jitters computed out of 29301 intervals
 AVE jitter /ps = 0.0 RMS jitter /ps = 36.3

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.035 -0.131 0.116
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.037 -0.137 0.115
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -5.133 -0.888 -0.034
 Final baseline L2 (X,Y,Z)/m = -5.132 -0.894 -0.034

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 182896

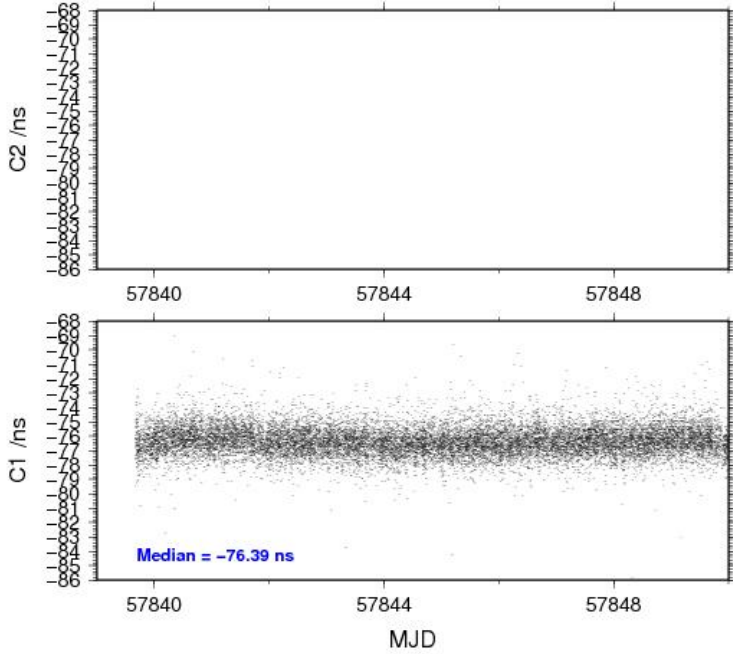
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 182802 -76.338 2.351
 C2: 0 NaN NaN
 P1: 182456 -75.179 2.093
 P2: 182706 -66.577 2.268

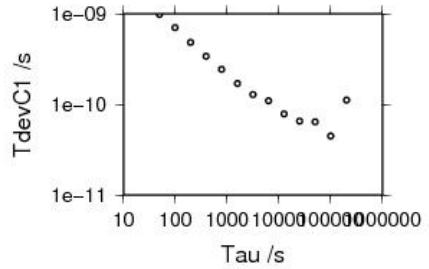
Number of 300s epochs in out file = 2976

Code #pts, median/ns, ave/ns, rms/ns
 C1: 18148 -76.388 -76.358 1.000
 C2: 0 0.000 NaN NaN
 P1: 18095 -75.247 -75.203 0.950
 P2: 18140 -66.587 -66.575 1.032

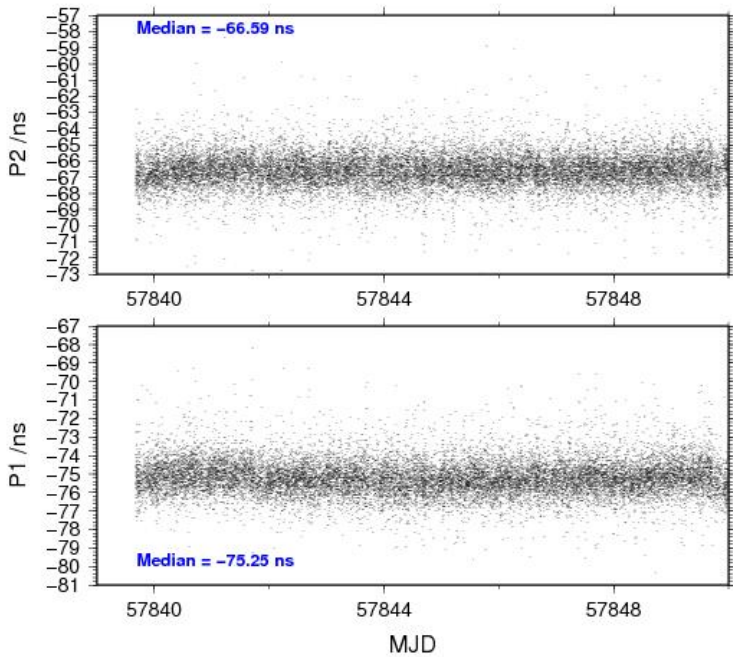
04/24/17 bp0uusn717086_11



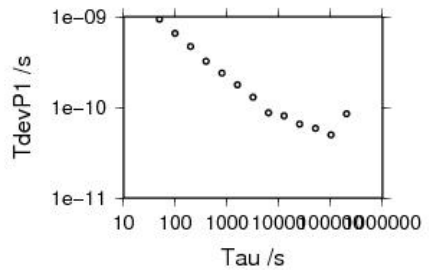
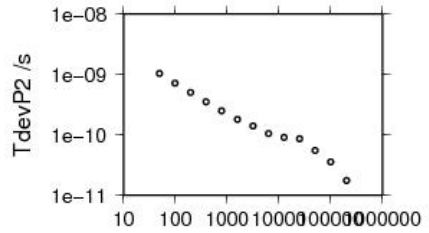
- 201448 s: C1= 111 ps
- 100724 s: C1= 45 ps
- 50362 s: C1= 64 ps
- 25181 s: C1= 65 ps
- 12591 s: C1= 78 ps
- 6295 s: C1= 110 ps
- 3148 s: C1= 129 ps
- 1574 s: C1= 171 ps
- 787 s: C1= 244 ps
- 393 s: C1= 341 ps
- 197 s: C1= 485 ps
- 98 s: C1= 706 ps
- 49 s: C1= 986 ps



04/24/17 bp0uusn717086_11



- | | |
|---------------------|---------------------|
| 202038 s: P1= 85 ps | 201537 s: P2= 18 ps |
| 101019 s: P1= 50 ps | 100769 s: P2= 36 ps |
| 50510 s: P1= 59 ps | 50384 s: P2= 55 ps |
| 25255 s: P1= 65 ps | 25192 s: P2= 86 ps |
| 12627 s: P1= 81 ps | 12596 s: P2= 91 ps |
| 6314 s: P1= 87 ps | 6298 s: P2= 105 ps |
| 3157 s: P1= 129 ps | 3149 s: P2= 141 ps |
| 1578 s: P1= 177 ps | 1575 s: P2= 181 ps |
| 789 s: P1= 240 ps | 787 s: P2= 250 ps |
| 395 s: P1= 322 ps | 394 s: P2= 355 ps |
| 197 s: P1= 471 ps | 197 s: P2= 506 ps |
| 98 s: P1= 656 ps | 98 s: P2= 723 ps |
| 49 s: P1= 941 ps | 49 s: P2= 1035 ps |



BP1C-USN7

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 289729
 Computed code bias (P1/P2)/m = -5.333 -2.797
 Computed baseline (X,Y,Z)/m = -4.398 -1.129 -0.656
 RMS of residuals /m = 0.618

Number of phase differences to fit baseline = 289658
 A priori baseline (X,Y,Z)/m = -4.398 -1.129 -0.656
 31395 clock jitters computed out of 31395 intervals
 AVE jitter /ps = 0.0 RMS jitter /ps = 5.2

Iter 1 Large residuals L1= 2
 Iter 1 Large residuals L2= 3
 Computed baseline L1 (X,Y,Z)/m = 0.025 -0.048 0.038
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.026 -0.043 0.035
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 2
 Iter 2 Large residuals L2= 3
 Computed baseline L1 (X,Y,Z)/m = 0.025 -0.048 0.038
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.026 -0.043 0.035
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -4.372 -1.178 -0.618
 Final baseline L2 (X,Y,Z)/m = -4.371 -1.173 -0.621

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 292913

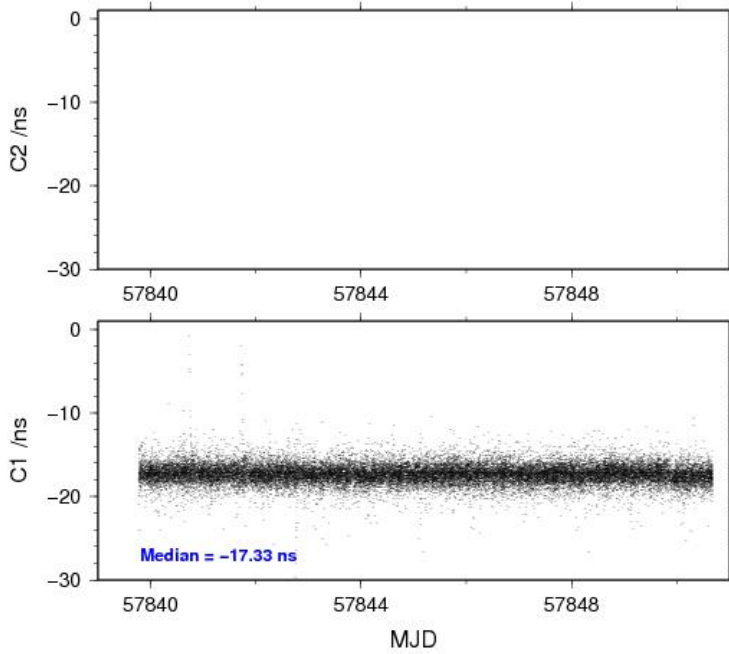
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 292023 -17.292 2.999
 C2: 0 NaN NaN
 P1: 289869 -17.913 2.378
 P2: 290341 -9.441 2.525

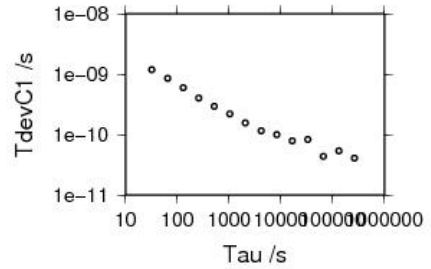
Number of 300s epochs in out file = 3141

Code #pts, median/ns, ave/ns, rms/ns
 C1: 29145 -17.330 -17.331 1.202
 C2: 0 0.000 NaN NaN
 P1: 28984 -17.953 -17.939 1.018
 P2: 28994 -9.480 -9.472 1.026

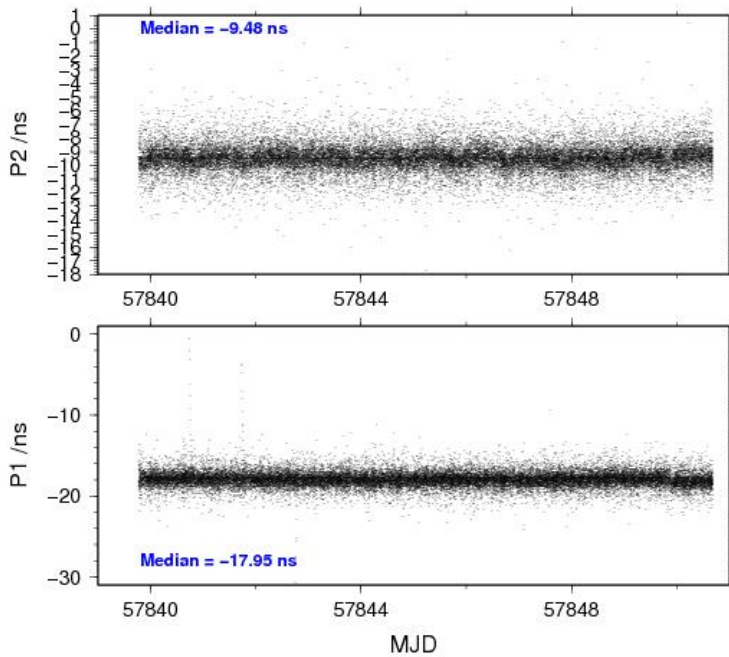
04/24/17 bp1cusr717086_12



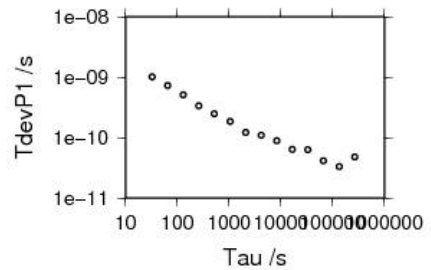
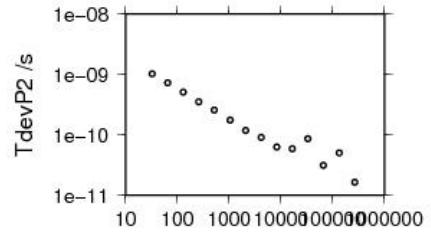
- 264784 s: C1= 41 ps
- 132392 s: C1= 54 ps
- 66196 s: C1= 44 ps
- 33098 s: C1= 83 ps
- 16549 s: C1= 79 ps
- 8274 s: C1= 101 ps
- 4137 s: C1= 116 ps
- 2069 s: C1= 157 ps
- 1034 s: C1= 221 ps
- 517 s: C1= 296 ps
- 259 s: C1= 406 ps
- 129 s: C1= 598 ps
- 65 s: C1= 854 ps
- 32 s: C1= 1186 ps



04/24/17 bp1cusr717086_12



- 266255 s: P1= 48 ps
- 133127 s: P1= 33 ps
- 66564 s: P1= 41 ps
- 33282 s: P1= 63 ps
- 16641 s: P1= 64 ps
- 8320 s: P1= 89 ps
- 4160 s: P1= 109 ps
- 2080 s: P1= 122 ps
- 1040 s: P1= 186 ps
- 520 s: P1= 247 ps
- 260 s: P1= 335 ps
- 130 s: P1= 508 ps
- 65 s: P1= 726 ps
- 32 s: P1= 1011 ps
- 266163 s: P2= 16 ps
- 133062 s: P2= 51 ps
- 66541 s: P2= 32 ps
- 33270 s: P2= 87 ps
- 16635 s: P2= 59 ps
- 8318 s: P2= 63 ps
- 4159 s: P2= 91 ps
- 2079 s: P2= 119 ps
- 1040 s: P2= 177 ps
- 520 s: P2= 258 ps
- 260 s: P2= 354 ps
- 130 s: P2= 510 ps
- 65 s: P2= 727 ps
- 32 s: P2= 1021 ps



3.3/ NIST (17110)Period

MJD 57863 to 57873

Delays

BP0U:

REFDLY = $523.02+52.6 = 575.62$ ns (cf page 3 & 33)
CABDLY = 181.7 ns (C134)

BP1C:

$X_O = 213.28-15.40 = 197.88$ ns (cf page 33)
 $X_P = 523.02+52.6 = 575.62$ ns (cf page 3 & 33)
REFDLY = 773.5 ns
CABDLY = 235.7 ns (C131)

NIST:

(cf page 33)
REFDLY = 87.33 ns
CABDLY = 275.5 ns

NISS:

(cf page 34)
REFDLY = $1552.69+184.18 = 1736.87$ ns
CABDLY = 298.9 ns

NB01:

(cf page 35)
REFDLY = $1587.12+9.83 = 1596.95$ ns
CABDLY = 298.5 ns

NB02:

(cf page 36)
REFDLY = $1561.0+5.42 = 1566.42$ ns
CABDLY = 298.0 ns

Setup at the NIST

Annex A - Information Sheet

Laboratory:	NIST	
Date and hour of the beginning of measurements:	20 April 2017, 57863, 110	
Date and hour of the end of measurements:		
Information on the system		
	Local:	Travelling:
4-character BIPM code	NIST	BP1C, BP0U
Receiver maker and type:	Novatel OEM4-G2	PolaRx3eTR, GTR50
Receiver serial number:	S/N	S9000169176, 0801068
1 PPS trigger level /V:	1	1
Antenna cable maker and type:	Andrew FSJ-50A	RG58
Phase stabilised cable (Y/N):	N	C131, C134
Length outside the building /m:	65	25
Antenna maker and type:	Novatel 702	Ashtech Choke, Novatel 702-GG
Antenna serial number:		CR6200323008, NAE10190011
Temperature (if stabilised) /°C		
Measured delays /ns		
	Local:	Travelling:
Delay from local UTC to receiver 1 PPS-in (X_P)		(*) 523.02 ± 0.01
Delay from 1 PPS-in to internal Reference (if different): (X_O)	$X_P + X_O = 87.33 \pm 0.03$ (**)	(***) Tare 15.40 ± 0.01 ; PolaRx 213.28 ± 0.01
Antenna cable delay: (X_C)	275.5	
Splitter delay (if any):	N/A	
Additional cable delay (if any):	N/A	
Data used for the generation of CGGTTS files		
• INT DLY (or $X_R + X_S$) (GPS) /ns:		
• INT DLY (or $X_R + X_S$) (GLONASS) /ns:		
• CAB DLY (or X_C) /ns:		
• REF DLY (or $X_P + X_O$) /ns:		
• Coordinates reference frame:	WGS84	
X /m:		
Y /m:		
Z /m:		
General information		
• Rise time of the local UTC pulse:	3 ns	
• Is the laboratory air conditioned:	yes	
Set temperature value and uncertainty:		
Set humidity value and uncertainty:		

(*) 449.75±0.04 average to date +local delay with respect to PPSin to system (as per instructions)

(**) meas from Dec 2015

(***) PolaRx3eTR only

Annex A - Information Sheet

Laboratory:	NIST	
Date and hour of the beginning of measurements:	20 April 2017, 57863, 110	
Date and hour of the end of measurements:		
Information on the system		
	Local:	Travelling:
4-character BIPM code	NISS	BP1C, BP0U
Receiver maker and type: Receiver serial number:	Septentrio PolaRx3e TRPro S/N 2001106	PolaRx3eTR, GTR50 S9000169176, 0801068
1 PPS trigger level /V:	1	1
Antenna cable maker and type: Phase stabilized cable (Y/N):	Andrew LDF2-50 (white) N	RG58 C131, C134
Length outside the building /m:	7.5	25
Antenna maker and type: Antenna serial number:	Novatel 703 NEG10450005	Ashtech Choke, Novatel 702-GG CR6200323008, NAE10190011
Temperature (if stabilized) /°C		
Measured delays /ns		
	Local:	Travelling:
Delay from local UTC to receiver 1 PPS-in (X_P)	$1552.69 \pm 0.13 (**)$	(*) 523.02 ± 0.01
Delay from 1 PPS-in to internal Reference (if different): (X_O)	$184.18 \pm 0.13 (** **)$	(***)Tare 15.40 ± 0.01 PolaRx 213.28 ± 0.01
Antenna cable delay: (X_C)	298.9	
Splitter delay (if any):	N/A	
Additional cable delay (if any):	N/A	
Data used for the generation of CCGTTS files		
• INT DLY (or X_R+X_S) (GPS) /ns:		
• INT DLY (or X_R+X_S) (GLONASS) /ns:		
• CAB DLY (or X_C) /ns:		
• REF DLY (or X_P+X_O) /ns:		
• Coordinates reference frame:	WGS84	
X /m:		
Y /m:		
Z /m:		
General information		
• Rise time of the local UTC pulse:	3 ns	
• Is the laboratory air conditioned:	yes	
Set temperature value and uncertainty:		
Set humidity value and uncertainty:		

(*) 449.75 ± 0.04 average to date +local delay with respect to PPSin to system

(**) 1436.9 ± 0.13 (April 2017 meas) + 115.79 ± 0.01 average to Dec 2015 (***) PolaRx3eTR only

(** **) average over MJD 57871

Annex A - Information Sheet

Laboratory:		NIST
Date and hour of the beginning of measurements:		20 April 2017, 57863, 110
Date and hour of the end of measurements:		
Information on the system		
	Local:	Travelling:
4-character BIPM code	NB01	BP1C, BP0U
Receiver maker and type: Receiver serial number:	Novatel OEM5 S/N NAP10500009	PolaRx3eTR, GTR50 S9000169176, 0801068
1 PPS trigger level /V:	0.5	1
Antenna cable maker and type: Phase stabilized cable (Y/N):	Andrew LDF2-50 (blue) N	RG58 C131, C134
Length outside the building /m:	7.5	25
Antenna maker and type: Antenna serial number:	Novatel 703 NEG10500001	Ashtech Choke, Novatel 702-GG CR6200323008, NAE10190011
Temperature (if stabilized) /°C		
Measured delays /ns		
	Local:	Travelling:
Delay from local UTC to receiver 1 PPS-in (X_P)	1587.12 ± 0.14 (**)	(*) 523.02 ± 0.01
Delay from 1 PPS-in to internal Reference (if different): (X_O)	9.83 ± 0.05 (** **)	(***)Tare 15.40 ± 0.01 PolaRx 213.28 ± 0.01
Antenna cable delay: (X_C)	298.5 ± 0.25	
Splitter delay (if any):	N/A	
Additional cable delay (if any):	N/A	
Data used for the generation of CGGTTS files		
• INT DLY (or X_R+X_S) (GPS) /ns:		
• INT DLY (or X_R+X_S) (GLONASS) /ns:		
• CAB DLY (or X_C) /ns:		
• REF DLY (or X_P+X_O) /ns:		
• Coordinates reference frame:	WGS84	
X /m:		
Y /m:		
Z /m:		
General information		
• Rise time of the local UTC pulse:	3 ns	
• Is the laboratory air conditioned:	yes	
Set temperature value and uncertainty:		
Set humidity value and uncertainty:		

(*) 449.75±0.04 average to date +local delay with respect to PPSin to system (as per instructions)
(**)1436.9 ± 0.13 (April 2017 meas) + 150.22 ± 0.04 average to Dec 2015 (***) PolaRx3eTR only
(** ***) average over MJD 57871

Annex A - Information Sheet

Laboratory:		NIST
Date and hour of the beginning of measurements:		20 April 2017, 57863, 110
Date and hour of the end of measurements:		
Information on the system		
	Local:	Travelling:
4-character BIPM code	NB02	BP1C, BP0U
Receiver maker and type: Receiver serial number:	Novatel OEM5 S/N NAP10500008	PolaRx3eTR, GTR50 S9000169176, 0801068
1 PPS trigger level /V:	0.5	1
Antenna cable maker and type: Phase stabilized cable (Y/N):	Andrew LDF2-50 (green) N	RG58 C131, C134
Length outside the building /m:	7.5	25
Antenna maker and type: Antenna serial number:	Novatel 703 NEG10390004	Ashtech Choke, Novatel 702-GG CR6200323008, NAE10190011
Temperature (if stabilized) /°C		
Measured delays /ns		
	Local:	Travelling:
Delay from local UTC to receiver 1 PPS-in (X_P)	1561 ± 0.13 (**)	(*) 523.02 ± 0.01
Delay from 1 PPS-in to internal Reference (if different): (X_O)	5.42 ± 0.06 (** ***)	(***)Tare 15.40 ± 0.01 PolaRx 213.28 ± 0.01
Antenna cable delay: (X_C)	298 ± 0.3	
Splitter delay (if any):	N/A	
Additional cable delay (if any):	N/A	
Data used for the generation of CGGTTS files		
• INT DLY (or X_R+X_S) (GPS) /ns:		
• INT DLY (or X_R+X_S) (GLONASS) /ns:		
• CAB DLY (or X_C) /ns:		
• REF DLY (or X_P+X_O) /ns:		
• Coordinates reference frame:	WGS84	
X /m:		
Y /m:		
Z /m:		
General information		
• Rise time of the local UTC pulse:	3 ns	
• Is the laboratory air conditioned:	yes	
Set temperature value and uncertainty:		
Set humidity value and uncertainty:		

(*) 449.75 ± 0.04 average to date +local delay with respect to PPSin to system

(**) 1436.9 ± 0.13 (April 2017 meas) + 124.10 ± 0.02 average to Dec 2015 (***) PolaRx3eTR only

(** ***) average over MJD 57871

BPOU-NIST

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 187441
 Computed code bias (P1/P2)/m = -193.831 -192.279
 Computed baseline (X,Y,Z)/m = -65.847 -35.569 -59.070
 RMS of residuals /m = 0.579

Number of phase differences to fit baseline = 177277
 A priori baseline (X,Y,Z)/m = -65.847 -35.569 -59.070
 31261 clock jitters computed out of 31275 intervals
 AVE jitter /ps = -0.3 RMS jitter /ps = 28.1

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.025 -0.038 0.071
 RMS of residuals L1 /m = 0.003
 Computed baseline L2 (X,Y,Z)/m = 0.039 -0.005 0.045
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -65.822 -35.607 -58.999
 Final baseline L2 (X,Y,Z)/m = -65.808 -35.575 -59.025

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 187473

Global average of individual differences

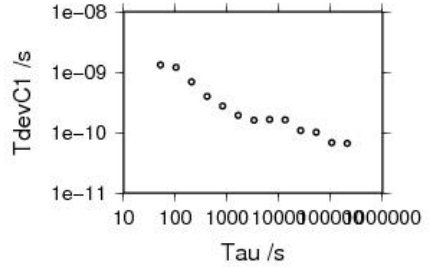
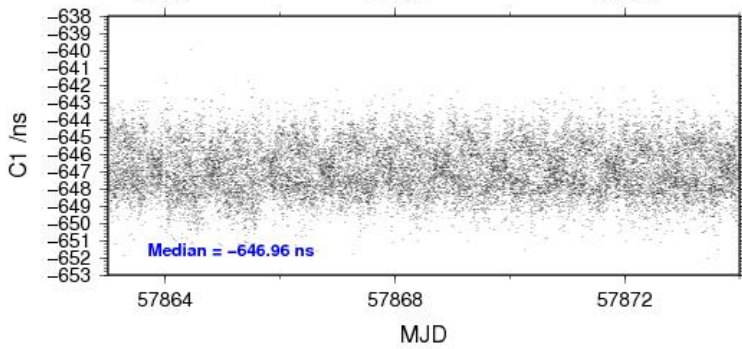
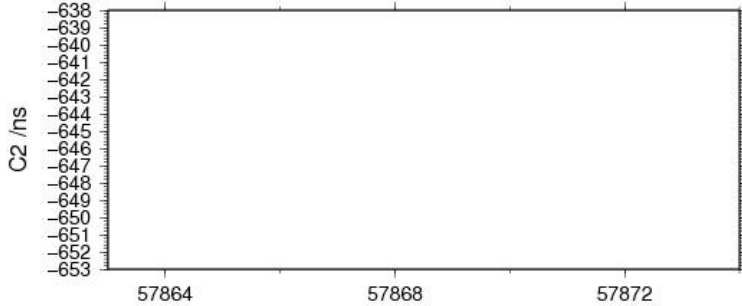
Code #pts, ave/ns, rms/ns
 C1: 187443 -646.855 1.811
 C2: 0 NaN NaN
 P1: 187410 -646.712 1.844
 P2: 187405 -641.429 2.223

Number of 300s epochs in out file = 3162

Code #pts, median/ns, ave/ns, rms/ns
 C1: 18500 -646.962 -646.864 1.449
 C2: 0 0.000 NaN NaN
 P1: 18499 -646.768 -646.736 1.171
 P2: 18499 -641.409 -641.413 1.545

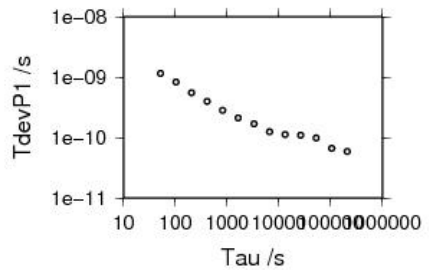
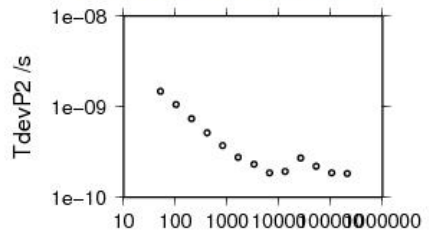
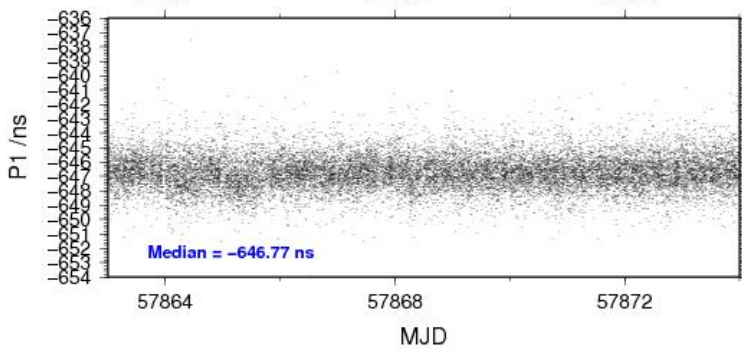
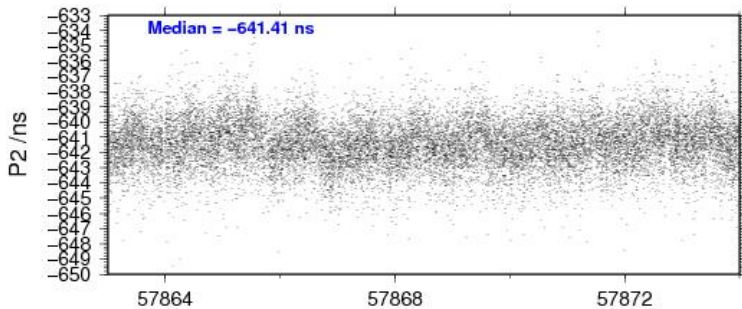
05/11/17 bp0unist17110_11

210369 s: C1= 66 ps
105184 s: C1= 68 ps
52592 s: C1= 102 ps
26296 s: C1= 109 ps
13148 s: C1= 162 ps
6574 s: C1= 164 ps
3287 s: C1= 161 ps
1644 s: C1= 193 ps
822 s: C1= 275 ps
411 s: C1= 397 ps
205 s: C1= 696 ps
103 s: C1= 1203 ps
51 s: C1= 1311 ps



05/11/17 bp0unist17110_11

210380 s: P1= 59 ps	210380 s: P2= 184 ps
105190 s: P1= 67 ps	105190 s: P2= 186 ps
52595 s: P1= 99 ps	52595 s: P2= 220 ps
26298 s: P1= 110 ps	26298 s: P2= 271 ps
13149 s: P1= 113 ps	13149 s: P2= 193 ps
6574 s: P1= 124 ps	6574 s: P2= 187 ps
3287 s: P1= 169 ps	3287 s: P2= 232 ps
1644 s: P1= 210 ps	1644 s: P2= 278 ps
822 s: P1= 282 ps	822 s: P2= 371 ps
411 s: P1= 397 ps	411 s: P2= 515 ps
205 s: P1= 555 ps	205 s: P2= 741 ps
103 s: P1= 835 ps	103 s: P2= 1058 ps
51 s: P1= 1162 ps	51 s: P2= 1484 ps



BP1C-NIST

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 265706
 Computed code bias (P1/P2)/m = -181.551 -180.053
 Computed baseline (X,Y,Z)/m = -68.744 -34.634 -58.645
 RMS of residuals /m = 0.493

Number of phase differences to fit baseline = 260007
 A priori baseline (X,Y,Z)/m = -68.744 -34.634 -58.645
 31672 clock jitters computed out of 31672 intervals
 AVE jitter /ps = -0.2 RMS jitter /ps = 4.8

Iter 1 Large residuals L1= 1
 Iter 1 Large residuals L2= 2
 Computed baseline L1 (X,Y,Z)/m = 0.062 0.184 -0.040
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.064 0.184 -0.050
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 1
 Iter 2 Large residuals L2= 2
 Computed baseline L1 (X,Y,Z)/m = 0.062 0.184 -0.040
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.065 0.184 -0.050
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -68.681 -34.450 -58.685
 Final baseline L2 (X,Y,Z)/m = -68.679 -34.450 -58.695

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 265809

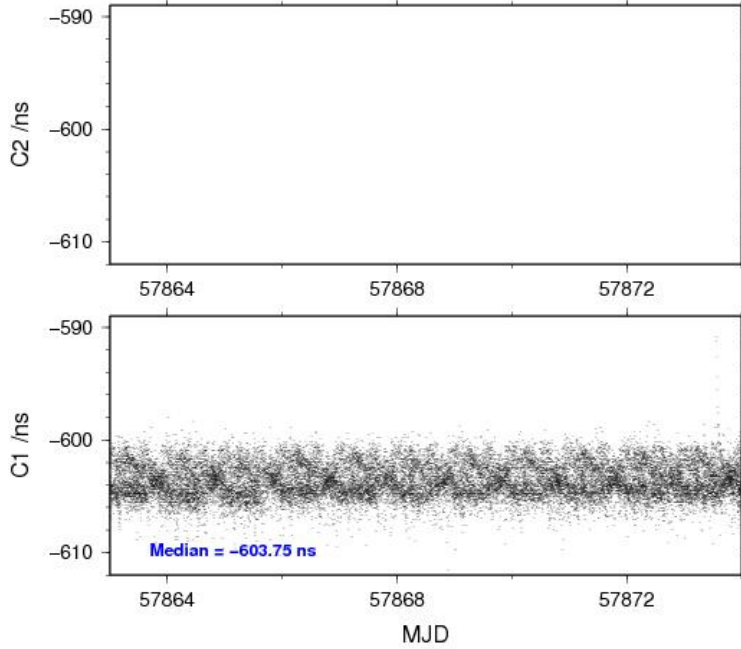
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 265683 -603.608 1.942
 C2: 0 NaN NaN
 P1: 265645 -605.254 1.563
 P2: 265624 -600.246 1.935

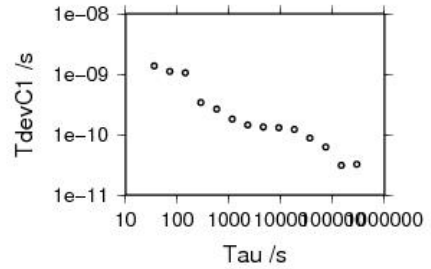
Number of 300s epochs in out file = 3168

Code #pts, median/ns, ave/ns, rms/ns
 C1: 26596 -603.746 -603.610 1.521
 C2: 0 0.000 NaN NaN
 P1: 26593 -605.199 -605.256 0.982
 P2: 26591 -600.248 -600.245 1.304

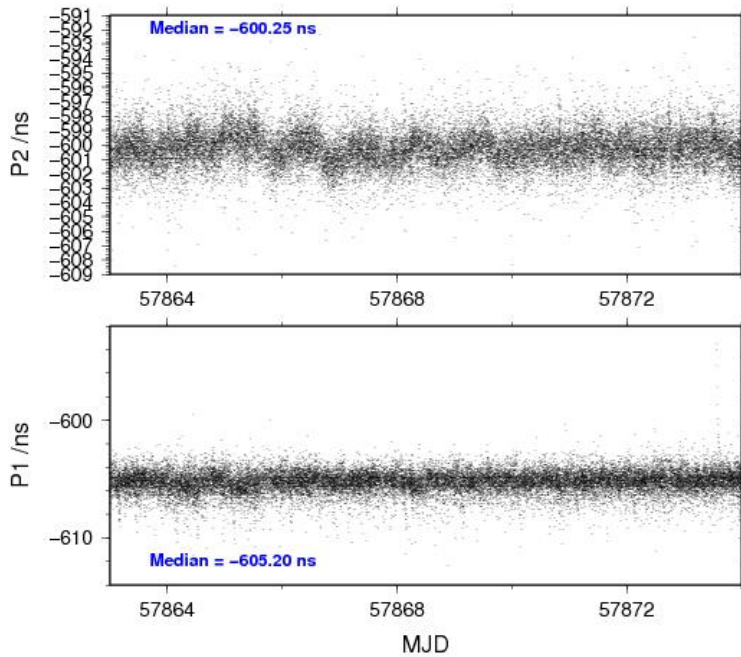
05/11/17 bp1cnist17110_11



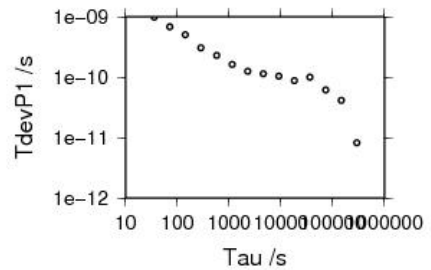
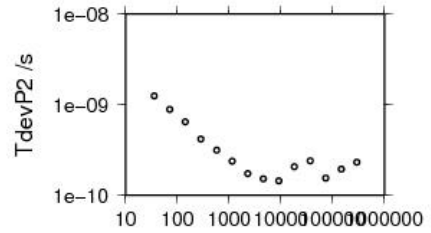
- 292657 s: C1= 32 ps
- 146329 s: C1= 31 ps
- 73164 s: C1= 62 ps
- 36582 s: C1= 88 ps
- 16291 s: C1= 122 ps
- 9146 s: C1= 130 ps
- 4573 s: C1= 134 ps
- 2286 s: C1= 144 ps
- 1143 s: C1= 180 ps
- 572 s: C1= 263 ps
- 286 s: C1= 338 ps
- 143 s: C1= 1057 ps
- 71 s: C1= 1110 ps
- 36 s: C1= 1371 ps



05/11/17 bp1cnist17110_11



- 292690 s: P1= 8 ps
- 146345 s: P1= 42 ps
- 73173 s: P1= 62 ps
- 36586 s: P1= 100 ps
- 16293 s: P1= 88 ps
- 9147 s: P1= 104 ps
- 4573 s: P1= 114 ps
- 2287 s: P1= 125 ps
- 1143 s: P1= 162 ps
- 572 s: P1= 228 ps
- 286 s: P1= 305 ps
- 143 s: P1= 504 ps
- 71 s: P1= 686 ps
- 36 s: P1= 981 ps
- 292712 s: P2= 232 ps
- 146356 s: P2= 195 ps
- 73178 s: P2= 155 ps
- 36589 s: P2= 241 ps
- 16295 s: P2= 207 ps
- 9147 s: P2= 144 ps
- 4574 s: P2= 152 ps
- 2287 s: P2= 173 ps
- 1143 s: P2= 237 ps
- 572 s: P2= 316 ps
- 286 s: P2= 417 ps
- 143 s: P2= 647 ps
- 71 s: P2= 888 ps
- 36 s: P2= 1251 ps



BPOU-NISS

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 100474
 Computed code bias (P1/P2)/m = 258.423 260.003
 Computed baseline (X,Y,Z)/m = -209.407 -37.241 -93.620
 RMS of residuals /m = 0.617

Number of phase differences to fit baseline = 176735
 A priori baseline (X,Y,Z)/m = -209.407 -37.241 -93.620
 31262 clock jitters computed out of 31281 intervals
 AVE jitter /ps = -0.5 RMS jitter /ps = 28.2

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.113 0.154 0.001
 RMS of residuals L1 /m = 0.003
 Computed baseline L2 (X,Y,Z)/m = 0.126 0.194 -0.023
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -209.294 -37.086 -93.619
 Final baseline L2 (X,Y,Z)/m = -209.281 -37.047 -93.644

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 187049

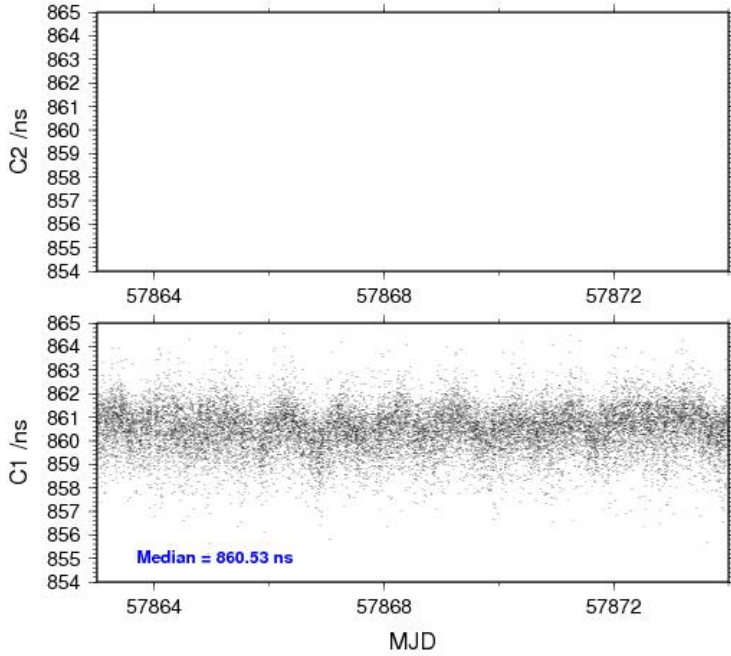
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 187009 860.482 1.514
 C2: 0 NaN NaN
 P1: 186968 862.286 1.889
 P2: 186961 867.616 2.903

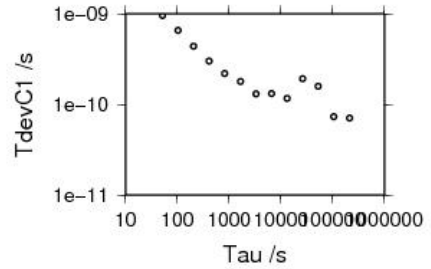
Number of 300s epochs in out file = 3162

Code #pts, median/ns, ave/ns, rms/ns
 C1: 18444 860.532 860.474 0.965
 C2: 0 0.000 NaN NaN
 P1: 18443 862.293 862.267 1.171
 P2: 18443 867.704 867.613 1.885

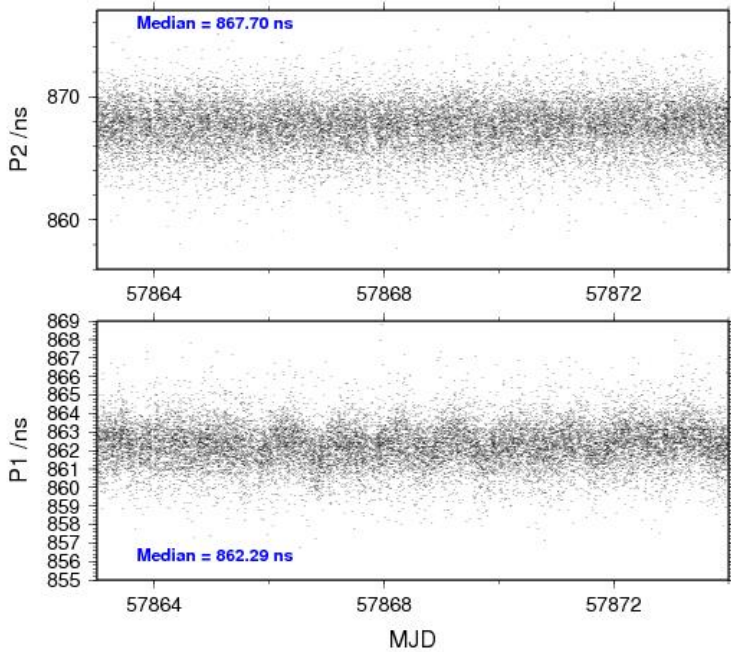
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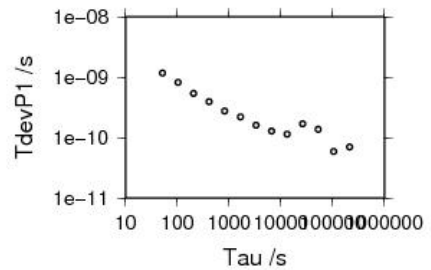
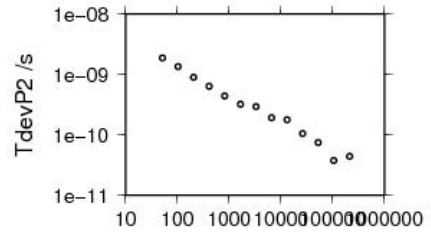
- 211007 s: C1= 71 ps
- 105504 s: C1= 74 ps
- 52752 s: C1= 159 ps
- 26376 s: C1= 192 ps
- 13188 s: C1= 116 ps
- 6594 s: C1= 132 ps
- 3297 s: C1= 131 ps
- 1648 s: C1= 180 ps
- 824 s: C1= 220 ps
- 412 s: C1= 300 ps
- 206 s: C1= 440 ps
- 103 s: C1= 659 ps
- 52 s: C1= 953 ps



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- | | |
|---------------------|---------------------|
| 211019 s: P1= 71 ps | 211019 s: P2= 44 ps |
| 105509 s: P1= 59 ps | 105509 s: P2= 38 ps |
| 52755 s: P1= 137 ps | 52755 s: P2= 75 ps |
| 26377 s: P1= 170 ps | 26377 s: P2= 106 ps |
| 13189 s: P1= 114 ps | 13189 s: P2= 178 ps |
| 6594 s: P1= 129 ps | 6594 s: P2= 193 ps |
| 3297 s: P1= 161 ps | 3297 s: P2= 293 ps |
| 1649 s: P1= 219 ps | 1649 s: P2= 322 ps |
| 824 s: P1= 275 ps | 824 s: P2= 441 ps |
| 412 s: P1= 392 ps | 412 s: P2= 642 ps |
| 206 s: P1= 539 ps | 206 s: P2= 900 ps |
| 103 s: P1= 819 ps | 103 s: P2= 1350 ps |
| 52 s: P1= 1166 ps | 52 s: P2= 1889 ps |



BP1C-NISS

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 144092
 Number of huge residuals = 8. New iteration
 Computed code bias (P1/P2)/m = 270.708 272.178
 Computed baseline (X,Y,Z)/m = -212.255 -36.357 -93.239
 RMS of residuals /m = 0.618

Number of phase differences to fit baseline = 287418
 A priori baseline (X,Y,Z)/m = -212.255 -36.357 -93.239
 31676 clock jitters computed out of 31676 intervals
 AVE jitter /ps = -0.5 RMS jitter /ps = 5.3

Iter 1 Large residuals L1= 1
 Iter 1 Large residuals L2= 2
 Computed baseline L1 (X,Y,Z)/m = 0.095 0.421 -0.037
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.101 0.431 -0.045
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 1
 Iter 2 Large residuals L2= 2
 Computed baseline L1 (X,Y,Z)/m = 0.095 0.421 -0.037
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.101 0.431 -0.045
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -212.160 -35.936 -93.276
 Final baseline L2 (X,Y,Z)/m = -212.155 -35.926 -93.284

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 290086

Global average of individual differences

Code #pts, ave/ns, rms/ns

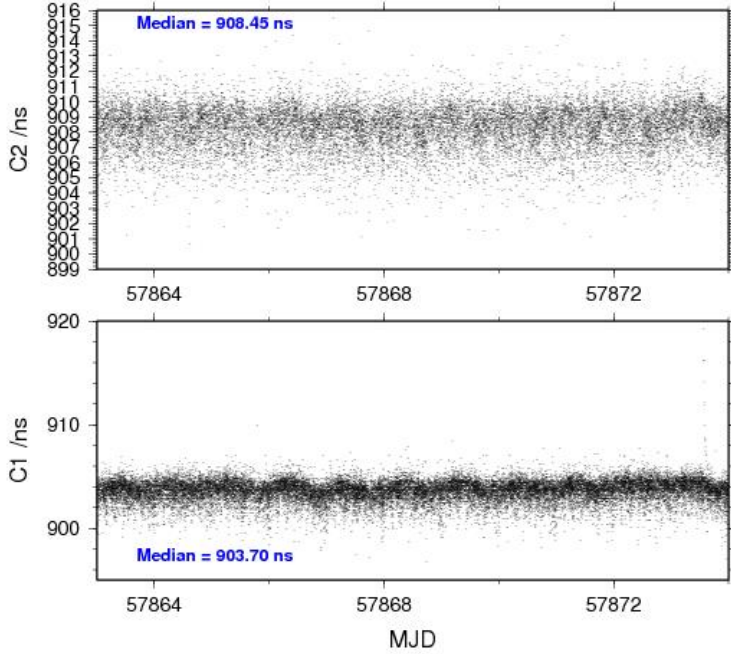
C1: 289878 903.580 1.731
 C2: 175373 908.286 2.332
 P1: 289546 903.578 1.785
 P2: 289518 908.566 2.974

Number of 300s epochs in out file = 3168

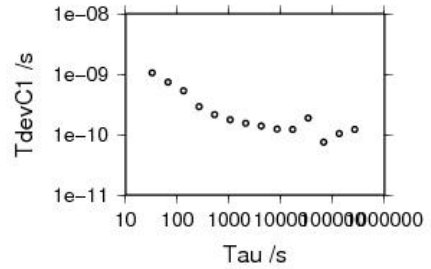
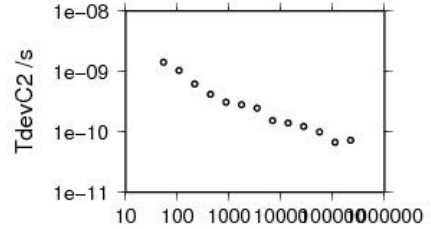
Code #pts, median/ns, ave/ns, rms/ns

C1: 28954 903.702 903.576 1.060
 C2: 17529 908.450 908.281 1.413
 P1: 28924 903.703 903.573 1.115
 P2: 28925 908.652 908.539 1.972

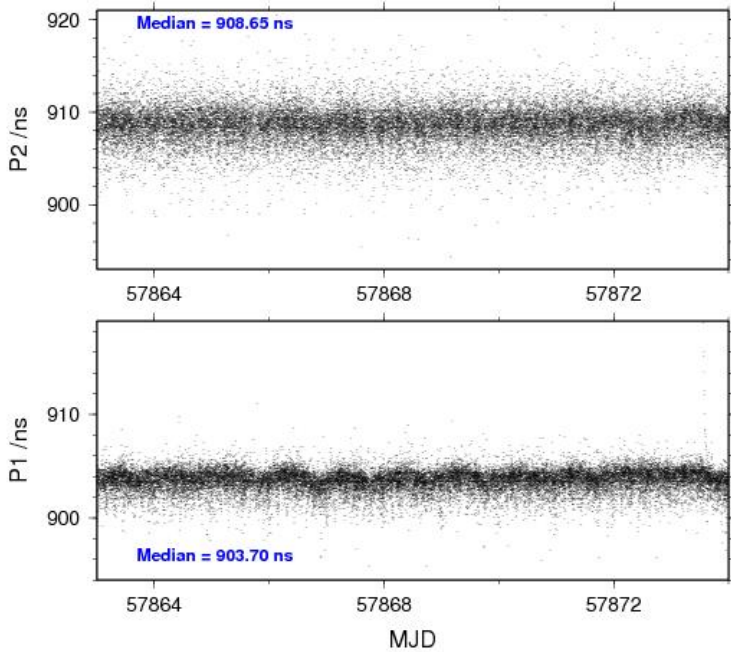
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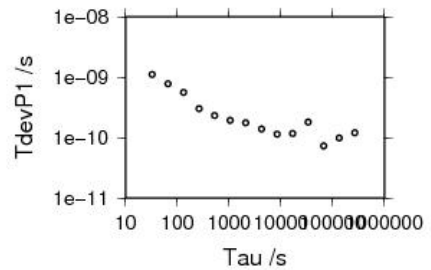
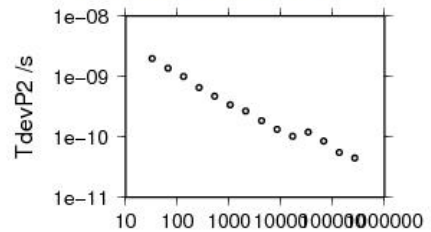
268823 s: C1= 121 ps	222022 s: C2= 73 ps
134411 s: C1= 104 ps	111011 s: C2= 67 ps
67206 s: C1= 75 ps	55906 s: C2= 100 ps
33603 s: C1= 188 ps	27753 s: C2= 123 ps
16801 s: C1= 122 ps	13876 s: C2= 140 ps
8401 s: C1= 124 ps	6938 s: C2= 155 ps
4200 s: C1= 138 ps	3469 s: C2= 247 ps
2100 s: C1= 154 ps	1735 s: C2= 283 ps
1050 s: C1= 177 ps	867 s: C2= 309 ps
525 s: C1= 214 ps	434 s: C2= 417 ps
263 s: C1= 289 ps	217 s: C2= 620 ps
131 s: C1= 529 ps	108 s: C2= 1038 ps
66 s: C1= 740 ps	54 s: C2= 1426 ps
33 s: C1= 1052 ps	



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269101 s: P1= 120 ps	269092 s: P2= 45 ps
134551 s: P1= 98 ps	134546 s: P2= 55 ps
67275 s: P1= 73 ps	67273 s: P2= 85 ps
33638 s: P1= 180 ps	33637 s: P2= 120 ps
16819 s: P1= 118 ps	16818 s: P2= 103 ps
8409 s: P1= 114 ps	8409 s: P2= 133 ps
4205 s: P1= 139 ps	4205 s: P2= 185 ps
2102 s: P1= 176 ps	2102 s: P2= 267 ps
1051 s: P1= 192 ps	1051 s: P2= 342 ps
526 s: P1= 231 ps	526 s: P2= 471 ps
263 s: P1= 303 ps	263 s: P2= 656 ps
131 s: P1= 562 ps	131 s: P2= 1002 ps
66 s: P1= 779 ps	66 s: P2= 1380 ps
33 s: P1= 1113 ps	33 s: P2= 1988 ps



BP0U-NB01

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 118571
 Computed code bias (P1/P2)/m = 231.637 236.696
 Computed baseline (X,Y,Z)/m = -214.460 -39.811 -97.816
 RMS of residuals /m = 0.636

Number of phase differences to fit baseline = 177300
 A priori baseline (X,Y,Z)/m = -214.460 -39.811 -97.816
 31265 clock jitters computed out of 31278 intervals
 AVE jitter /ps = -0.9 RMS jitter /ps = 28.1

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.110 0.237 -0.128
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.124 0.273 -0.152
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -214.351 -39.574 -97.944
 Final baseline L2 (X,Y,Z)/m = -214.337 -39.538 -97.968

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 187707

Global average of individual differences

Code #pts, ave/ns, rms/ns

C1: 187670 773.264 2.679

C2: 0 NaN NaN

P1: 187635 773.408 2.659

P2: 187628 790.376 2.461

Number of 300s epochs in out file = 3162

Code #pts, median/ns, ave/ns, rms/ns

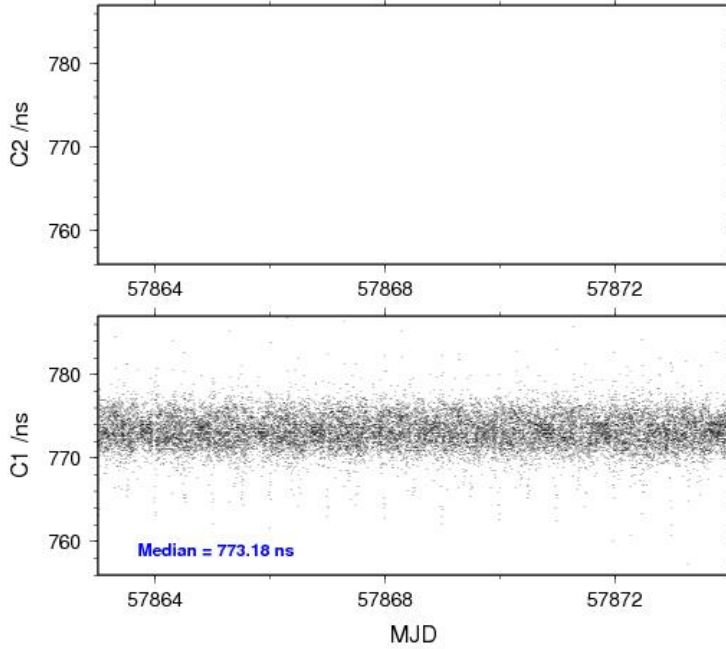
C1: 18508 773.183 773.236 2.041

C2: 0 0.000 NaN NaN

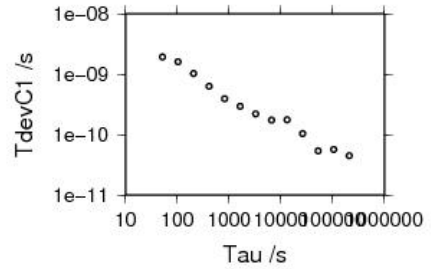
P1: 18507 773.367 773.364 1.770

P2: 18507 790.458 790.381 1.731

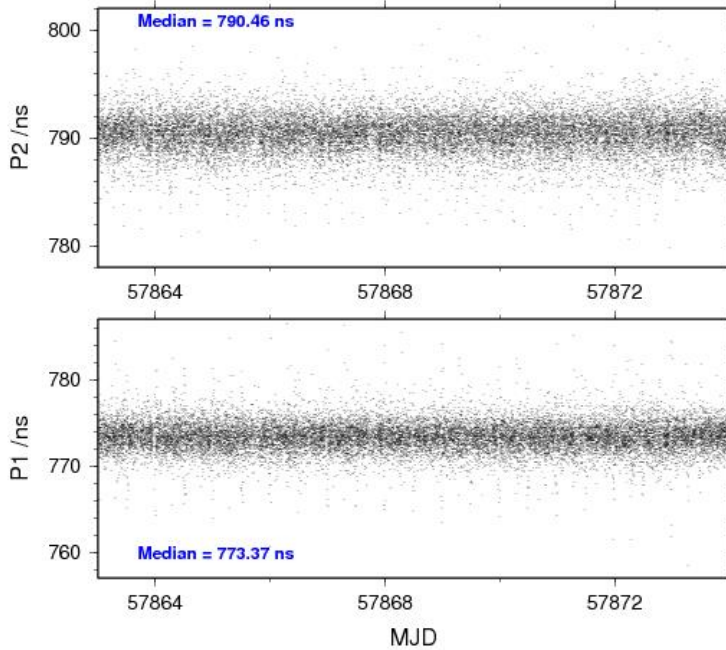
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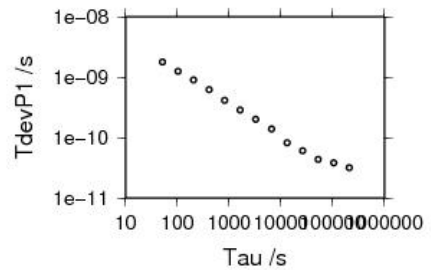
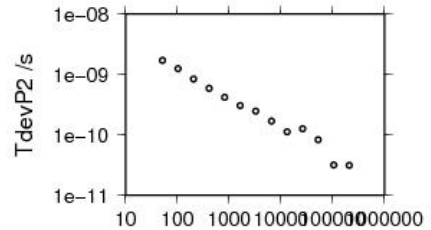
210278 s: C1= 45 ps
 105139 s: C1= 56 ps
 52569 s: C1= 54 ps
 26285 s: C1= 104 ps
 13142 s: C1= 175 ps
 6571 s: C1= 173 ps
 3286 s: C1= 221 ps
 1643 s: C1= 296 ps
 821 s: C1= 395 ps
 411 s: C1= 629 ps
 205 s: C1= 1029 ps
 103 s: C1= 1603 ps
 51 s: C1= 1937 ps



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210289 s: P1= 32 ps 210289 s: P2= 31 ps
 105145 s: P1= 38 ps 105145 s: P2= 32 ps
 52572 s: P1= 44 ps 52572 s: P2= 83 ps
 26286 s: P1= 61 ps 26286 s: P2= 127 ps
 13143 s: P1= 82 ps 13143 s: P2= 112 ps
 6572 s: P1= 139 ps 6572 s: P2= 169 ps
 3286 s: P1= 200 ps 3286 s: P2= 247 ps
 1643 s: P1= 286 ps 1643 s: P2= 305 ps
 821 s: P1= 412 ps 821 s: P2= 418 ps
 411 s: P1= 624 ps 411 s: P2= 567 ps
 205 s: P1= 896 ps 205 s: P2= 838 ps
 103 s: P1= 1249 ps 103 s: P2= 1245 ps
 51 s: P1= 1790 ps 51 s: P2= 1723 ps



BP1C-NB01

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 158614
 Computed code bias (P1/P2)/m = 244.069 249.029
 Computed baseline (X,Y,Z)/m = -217.382 -38.786 -97.514
 RMS of residuals /m = 0.604

Number of phase differences to fit baseline = 277430
 A priori baseline (X,Y,Z)/m = -217.382 -38.786 -97.514
 31676 clock jitters computed out of 31676 intervals
 AVE jitter /ps = -0.5 RMS jitter /ps = 5.2

Iter 1 Large residuals L1= 1
 Iter 1 Large residuals L2= 2
 Computed baseline L1 (X,Y,Z)/m = 0.124 0.376 -0.096
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.122 0.375 -0.101
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 1
 Iter 2 Large residuals L2= 2
 Computed baseline L1 (X,Y,Z)/m = 0.124 0.376 -0.096
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.122 0.375 -0.101
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -217.257 -38.410 -97.611
 Final baseline L2 (X,Y,Z)/m = -217.260 -38.411 -97.615

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 279566

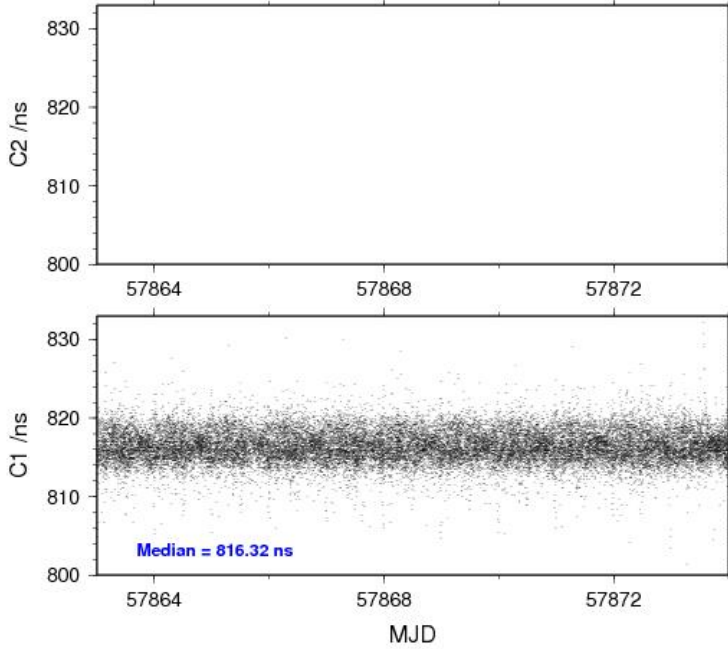
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 279401 816.417 2.778
 C2: 0 NaN NaN
 P1: 279274 814.764 2.505
 P2: 279231 831.372 2.376

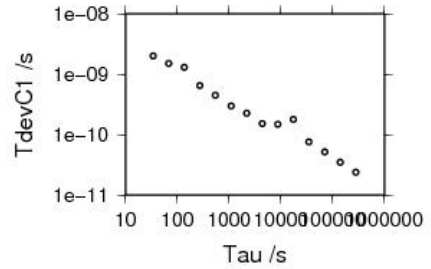
Number of 300s epochs in out file = 3168

Code #pts, median/ns, ave/ns, rms/ns
 C1: 27907 816.318 816.397 2.108
 C2: 0 0.000 NaN NaN
 P1: 27894 814.760 814.744 1.724
 P2: 27889 831.484 831.364 1.717

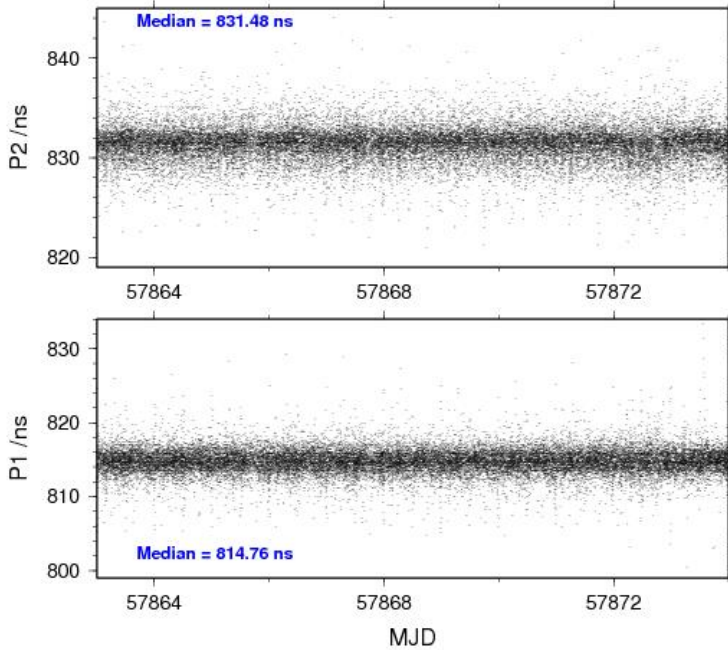
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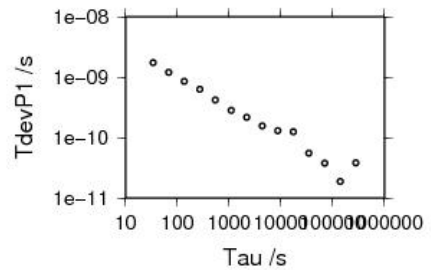
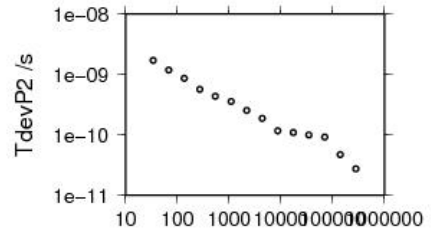
- 276908 s: C1= 24 ps
- 139454 s: C1= 35 ps
- 69727 s: C1= 52 ps
- 34864 s: C1= 76 ps
- 17432 s: C1= 180 ps
- 8716 s: C1= 149 ps
- 4358 s: C1= 152 ps
- 2179 s: C1= 225 ps
- 1089 s: C1= 298 ps
- 545 s: C1= 447 ps
- 272 s: C1= 648 ps
- 136 s: C1= 1294 ps
- 68 s: C1= 1501 ps
- 34 s: C1= 2004 ps



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- | | |
|---------------------|---------------------|
| 279038 s: P1= 38 ps | 279068 s: P2= 27 ps |
| 139519 s: P1= 19 ps | 139544 s: P2= 47 ps |
| 69760 s: P1= 38 ps | 69772 s: P2= 93 ps |
| 34880 s: P1= 55 ps | 34886 s: P2= 100 ps |
| 17440 s: P1= 125 ps | 17443 s: P2= 110 ps |
| 8720 s: P1= 129 ps | 8722 s: P2= 117 ps |
| 4360 s: P1= 156 ps | 4361 s: P2= 188 ps |
| 2180 s: P1= 218 ps | 2180 s: P2= 253 ps |
| 1090 s: P1= 284 ps | 1090 s: P2= 358 ps |
| 545 s: P1= 420 ps | 545 s: P2= 436 ps |
| 272 s: P1= 627 ps | 273 s: P2= 569 ps |
| 136 s: P1= 850 ps | 136 s: P2= 870 ps |
| 68 s: P1= 1195 ps | 68 s: P2= 1186 ps |
| 34 s: P1= 1745 ps | 34 s: P2= 1712 ps |



BPOU-NB02

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 122772
 Computed code bias (P1/P2)/m = 223.873 229.068
 Computed baseline (X,Y,Z)/m = -217.568 -37.581 -95.354
 RMS of residuals /m = 0.680

Number of phase differences to fit baseline = 177367
 A priori baseline (X,Y,Z)/m = -217.568 -37.581 -95.354
 31264 clock jitters computed out of 31276 intervals
 AVE jitter /ps = -0.7 RMS jitter /ps = 28.2

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.119 0.212 -0.085
 RMS of residuals L1 /m = 0.003
 Computed baseline L2 (X,Y,Z)/m = 0.130 0.240 -0.111
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -217.449 -37.370 -95.439
 Final baseline L2 (X,Y,Z)/m = -217.438 -37.342 -95.465

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 187735

Global average of individual differences

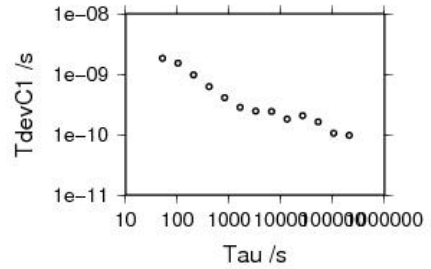
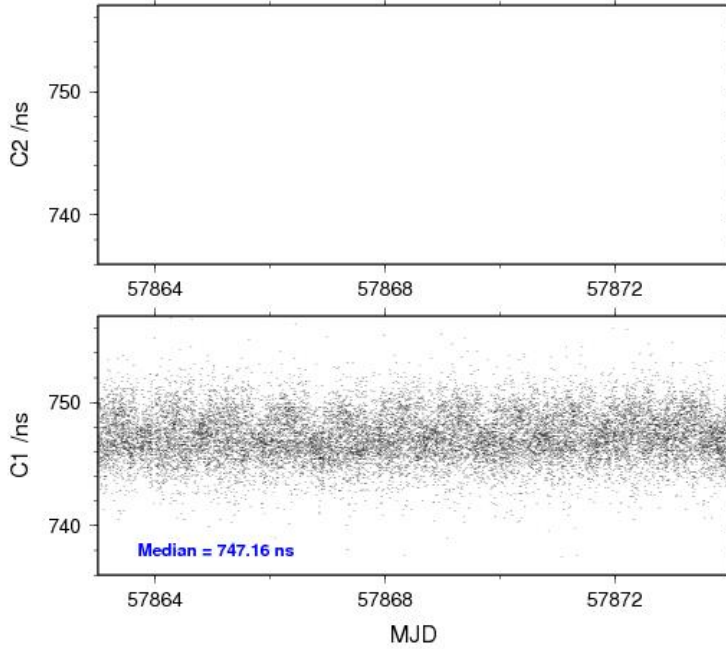
Code #pts, ave/ns, rms/ns
 C1: 187699 747.300 2.562
 C2: 0 NaN NaN
 P1: 187663 747.444 2.579
 P2: 187655 764.786 2.957

Number of 300s epochs in out file = 3162

Code #pts, median/ns, ave/ns, rms/ns
 C1: 18512 747.161 747.263 1.970
 C2: 0 0.000 NaN NaN
 P1: 18511 747.414 747.397 1.757
 P2: 18511 764.816 764.778 2.170

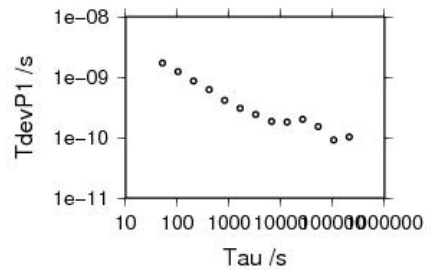
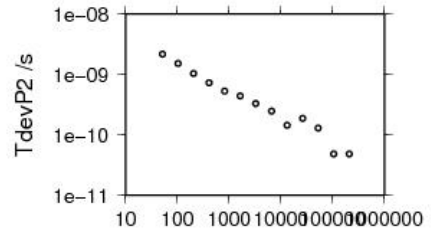
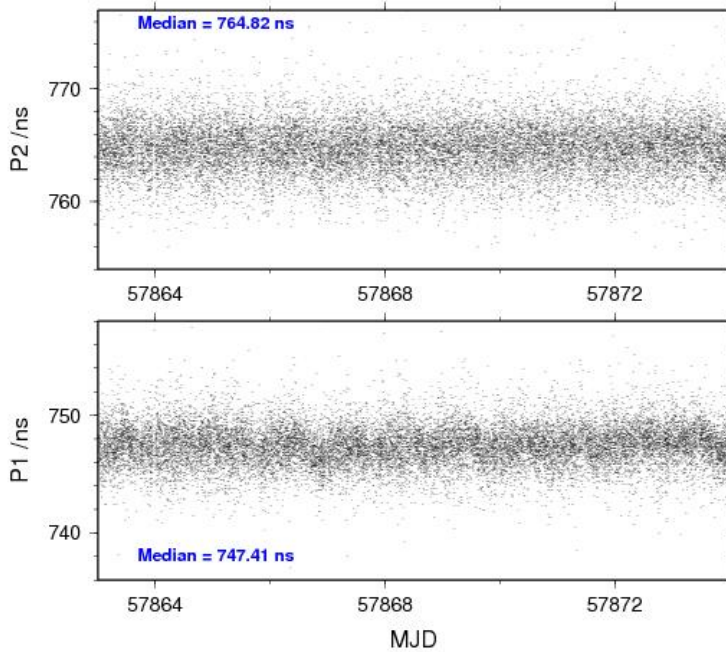
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210232 s: C1= 98 ps
 105116 s: C1= 105 ps
 52568 s: C1= 162 ps
 26279 s: C1= 205 ps
 13140 s: C1= 181 ps
 6570 s: C1= 241 ps
 3285 s: C1= 246 ps
 1642 s: C1= 282 ps
 821 s: C1= 410 ps
 411 s: C1= 620 ps
 205 s: C1= 977 ps
 103 s: C1= 1533 ps
 51 s: C1= 1831 ps



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210244 s: P1= 103 ps 210244 s: P2= 48 ps
 105122 s: P1= 92 ps 105122 s: P2= 48 ps
 52561 s: P1= 152 ps 52561 s: P2= 129 ps
 26280 s: P1= 201 ps 26280 s: P2= 189 ps
 13140 s: P1= 180 ps 13140 s: P2= 145 ps
 6570 s: P1= 184 ps 6570 s: P2= 248 ps
 3285 s: P1= 240 ps 3285 s: P2= 329 ps
 1643 s: P1= 307 ps 1643 s: P2= 440 ps
 821 s: P1= 414 ps 821 s: P2= 531 ps
 411 s: P1= 621 ps 411 s: P2= 733 ps
 205 s: P1= 870 ps 205 s: P2= 1045 ps
 103 s: P1= 1235 ps 103 s: P2= 1527 ps
 51 s: P1= 1717 ps 51 s: P2= 2166 ps



BP1C-NB02

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 165303
 Computed code bias (P1/P2)/m = 236.215 241.318
 Computed baseline (X,Y,Z)/m = -220.455 -36.605 -94.965
 RMS of residuals /m = 0.672

Number of phase differences to fit baseline = 276939
 A priori baseline (X,Y,Z)/m = -220.455 -36.605 -94.965
 31676 clock jitters computed out of 31676 intervals
 AVE jitter /ps = -0.5 RMS jitter /ps = 5.6

Iter 1 Large residuals L1= 1
 Iter 1 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.116 0.388 -0.135
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.119 0.403 -0.154
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 1
 Iter 2 Large residuals L2= 1
 Computed baseline L1 (X,Y,Z)/m = 0.116 0.388 -0.135
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.119 0.403 -0.154
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -220.339 -36.218 -95.100
 Final baseline L2 (X,Y,Z)/m = -220.336 -36.202 -95.119

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 279634

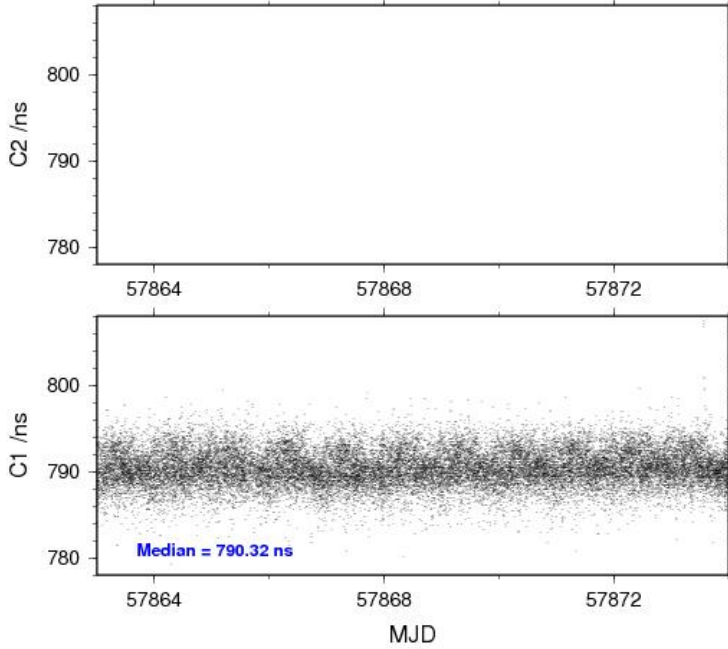
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 279469 790.428 2.786
 C2: 0 NaN NaN
 P1: 279333 788.775 2.516
 P2: 279305 805.769 2.895

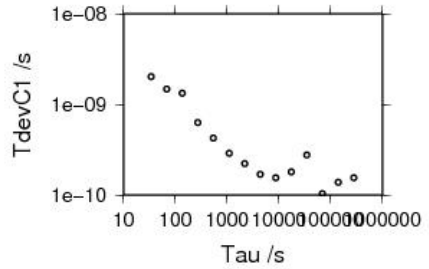
Number of 300s epochs in out file = 3168

Code #pts, median/ns, ave/ns, rms/ns
 C1: 27916 790.316 790.400 2.129
 C2: 0 0.000 NaN NaN
 P1: 27903 788.819 788.748 1.757
 P2: 27897 805.755 805.734 2.162

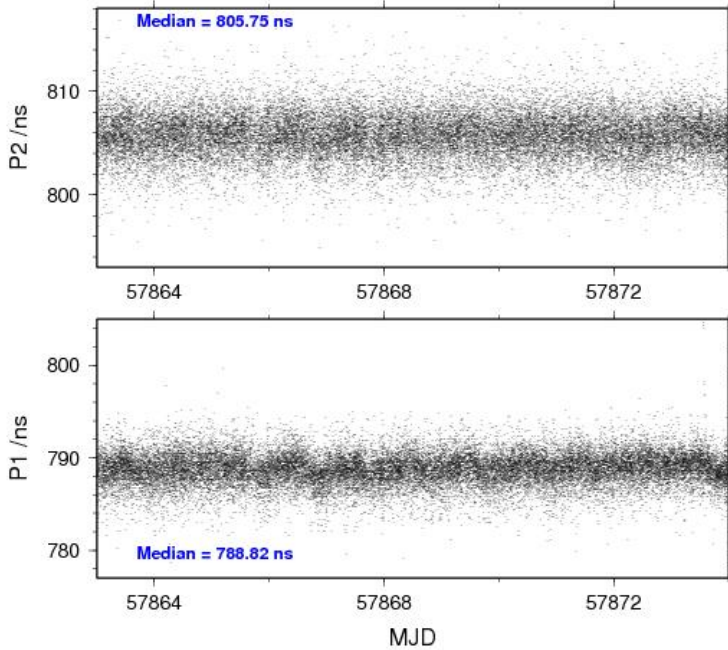
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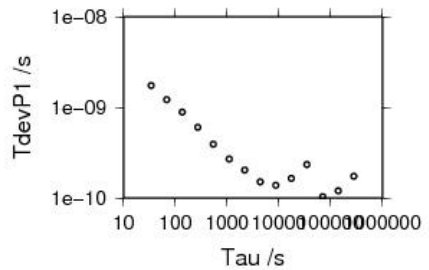
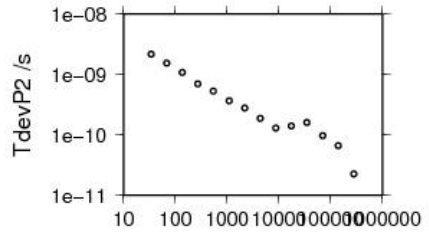
- 276819 s: C1= 156 ps
- 139409 s: C1= 139 ps
- 69705 s: C1= 103 ps
- 34652 s: C1= 277 ps
- 17426 s: C1= 180 ps
- 8713 s: C1= 155 ps
- 4357 s: C1= 170 ps
- 2178 s: C1= 222 ps
- 1089 s: C1= 288 ps
- 545 s: C1= 425 ps
- 272 s: C1= 630 ps
- 136 s: C1= 1324 ps
- 68 s: C1= 1480 ps
- 34 s: C1= 2023 ps



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- 276948 s: P1= 174 ps
- 139474 s: P1= 120 ps
- 69737 s: P1= 104 ps
- 34869 s: P1= 235 ps
- 17434 s: P1= 165 ps
- 8717 s: P1= 138 ps
- 4359 s: P1= 151 ps
- 2179 s: P1= 204 ps
- 1090 s: P1= 270 ps
- 545 s: P1= 393 ps
- 272 s: P1= 605 ps
- 136 s: P1= 887 ps
- 68 s: P1= 1221 ps
- 34 s: P1= 1747 ps
- 279008 s: P2= 22 ps
- 139504 s: P2= 67 ps
- 69752 s: P2= 97 ps
- 34876 s: P2= 160 ps
- 17438 s: P2= 141 ps
- 8719 s: P2= 129 ps
- 4360 s: P2= 187 ps
- 2190 s: P2= 278 ps
- 1090 s: P2= 370 ps
- 545 s: P2= 533 ps
- 272 s: P2= 701 ps
- 136 s: P2= 1088 ps
- 68 s: P2= 1548 ps
- 34 s: P2= 2167 ps



3.4/ BIPM (17143)Period

MJD 57896 to 57906

Delays

BP0R:

$X_O = 226.3$ ns (266.3-48.7+8.7)
 $X_P = 42.7$ ns (BP1R+C139+BP1S+C72)
 REFDLY = 269.0 ns
 CABDLY = 133.4 ns (C113)

BP1J:

$X_O = 132.5$ ns (186.3-53.8)
 $X_P = 47.6$ ns (BP1R+C139+BP1S+C172)
 REFDLY = 180.1 ns
 CABDLY = 128.7 ns (C138)

BP1X:

REFDLY = 42.6 ns (BP1R+C139+BP1S+C126)
 CABDLY = 129.7 ns (C178)
 INT DLY = -27.5 ns (GPS C1)
 -33.5 ns (GPS P1)
 -37.4 ns (GPS P2)

BP0U:

REFDLY = 52.6 ns (BP1R+C166+BP1I+C153)
 CABDLY = 181.7 ns (C134)

BP1C:

$X_O = 203.8$ ns (219.2-15.4)
 $X_P = 52.6$ ns (BP1R+C166+BP1I+C157)
 REFDLY = 256.4 ns
 CABDLY = 235.7 ns (C131)

Setup at the BIPM**Annex A - Information Sheet**

(to be repeated for each calibrated system)

Laboratory:	BIPM	
Date and hour of the beginning of measurements:	MJD 57896	
Date and hour of the end of measurements:	MJD 57906	
Information on the system		
	Local:	Travelling:
4-character BIPM code	BP0R	BP1C
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx2e 3113	Septentrio PolaRx3eTR S9000169176
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):		
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type: Antenna serial number:	Ashtech Chokering 701945-2 CR6200539014	Ashtech Chokering 701945-2 CR62000323008
Temperature (if stabilised) /°C		
Measured delays /ns		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	42.7 ns	52.6 ns
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	226.3 ns	203.8 ns
• Antenna cable delay:	133.4 ns	235.7 ns
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
Data used for the generation of CGGTTS files		
• INT DLY (GPS) /ns:		
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:		
• Coordinates reference frame:		
Latitude or X /m:		
Longitude or Y /m:		
Height or Z /m:		
General information		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		21 ± 1°C
Set humidity value and uncertainty:		

(1) For a trip with closure, not needed if the traveling equipment is used in the same set-up throughout.

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory:	BIPM	
Date and hour of the beginning of measurements:	MJD 57896	
Date and hour of the end of measurements:	MJD 57906	
Information on the system		
	Local:	Travelling:
4-character BIPM code	BP1J	BP0U
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx4proTR 27	Dicom GTR50 0801068
1 PPS trigger level /V:		1 V
• Antenna cable maker and type: Phase stabilised cable (Y/N):		
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type: Antenna serial number:	Septentrio Sepchoke_MC 5131	Novatel 702-GG NAE10190011
Temperature (if stabilised) /°C		
Measured delays /ns		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	47.6 ns	52.6
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	132.5 ns	
• Antenna cable delay:	128.7 ns	181.7
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
Data used for the generation of CGGTTS files		
• INT DLY (GPS) /ns:		
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:		
• Coordinates reference frame:		
Latitude or X /m:		
Longitude or Y /m:		
Height or Z /m:		
General information		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		21 ± 1°C
Set humidity value and uncertainty:		

(1) For a trip with closure, not needed if the traveling equipment is used in the same set-up throughout.

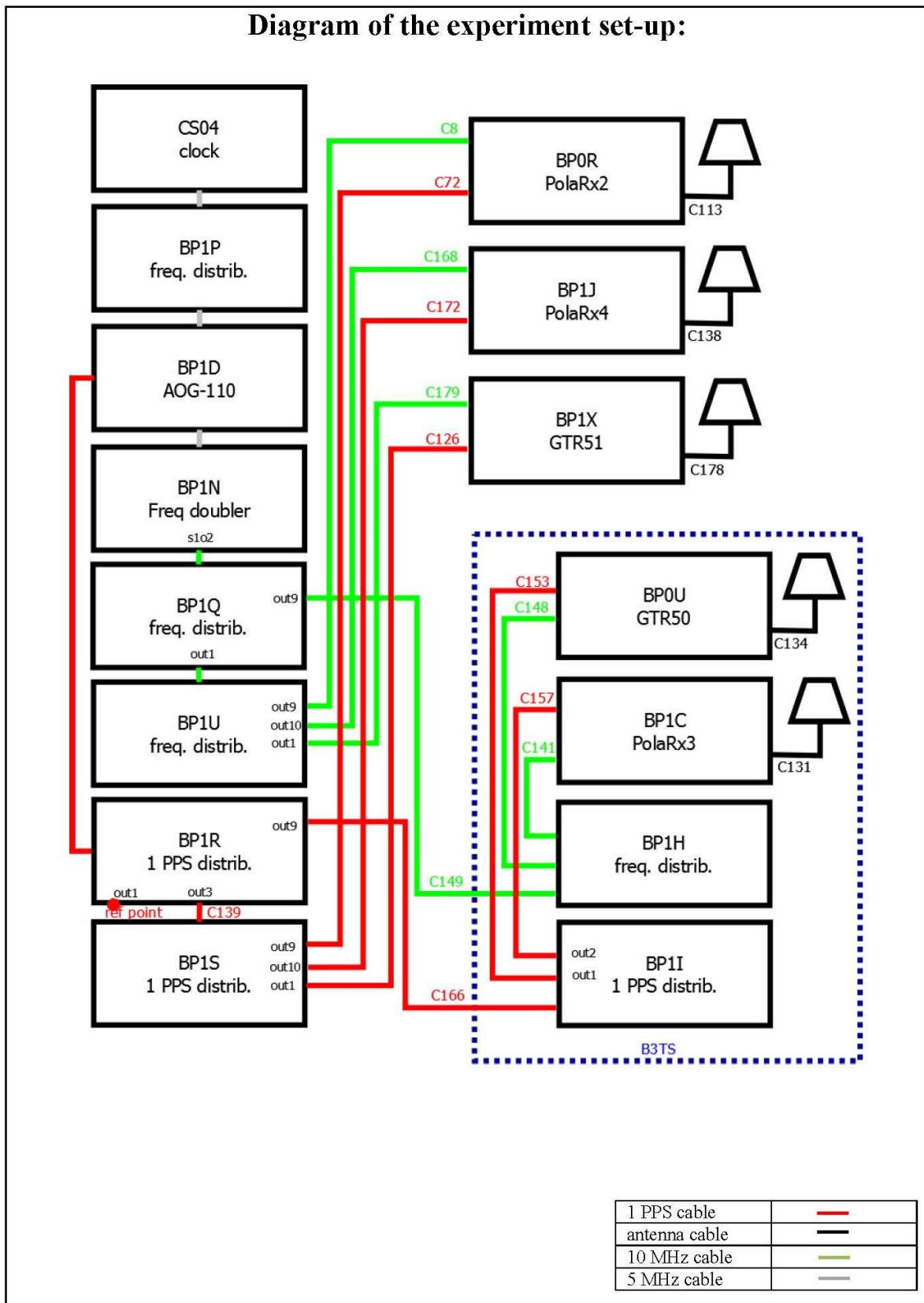
Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory:	BIPM	
Date and hour of the beginning of measurements:	MJD 57896	
Date and hour of the end of measurements:	MJD 57906	
Information on the system		
	Local:	Travelling:
4-character BIPM code	BP1X	
• Receiver maker and type: Receiver serial number:	Dicom GTR51 1306001	
1 PPS trigger level /V:	1 V	
• Antenna cable maker and type: Phase stabilised cable (Y/N):		
Length outside the building /m:	~15 m	
• Antenna maker and type: Antenna serial number:	Novatel 703-GG NEG13160018	
Temperature (if stabilised) /°C		
Measured delays /ns		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	42.6 ns	
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>		
• Antenna cable delay:	129.7 ns	(1)
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
Data used for the generation of CGGTTS files		
• INT DLY (GPS) /ns:		
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:		
• Coordinates reference frame:		
Latitude or X /m:		
Longitude or Y /m:		
Height or Z /m:		
General information		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		21 ± 1°C
Set humidity value and uncertainty:		

(1) For a trip with closure, not needed if the traveling equipment is used in the same set-up throughout.

Diagram of the experiment set-up:



Log of Events / Additional Information :

All measurements at BIPM carried out by L. Tisserand.

Equipment used to measure delays are two time interval counter (TIC), model SR620, maker Stanford Research Systems, with measurement uncertainty typically less than 0.5 ns (using external reference frequency as timebase).

TIC serial number 4680 used for local receivers.

TIC serial number 5482 used for traveling receivers.

BP0U-BP0R

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 140663
 Number of huge residuals = 22. New iteration
 Computed code bias (P1/P2)/m = -28.355 -27.240
 Computed baseline (X,Y,Z)/m = -5.264 -0.789 4.343
 RMS of residuals /m = 0.694

Number of phase differences to fit baseline = 124484
 A priori baseline (X,Y,Z)/m = -5.264 -0.789 4.343
 28438 clock jitters computed out of 28828 intervals
 AVE jitter /ps = -0.9 RMS jitter /ps = 41.2

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.096 0.025 0.147
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.102 0.020 0.157
 RMS of residuals L2 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -5.168 -0.764 4.490
 Final baseline L2 (X,Y,Z)/m = -5.163 -0.770 4.500

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 142285

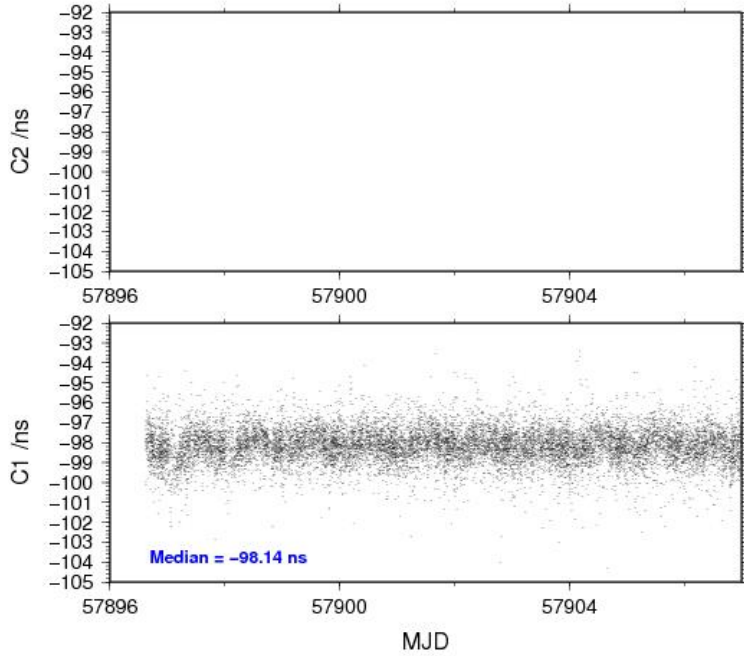
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 141706 -98.151 1.535
 C2: 0 NaN NaN
 P1: 140594 -95.024 2.470
 P2: 140584 -91.328 2.705

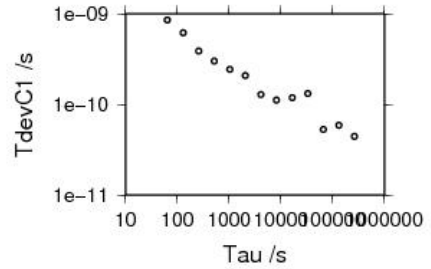
Number of 300s epochs in out file = 3001

Code #pts, median/ns, ave/ns, rms/ns
 C1: 13989 -98.143 -98.155 0.878
 C2: 0 0.000 NaN NaN
 P1: 13892 -95.086 -95.065 1.237
 P2: 13891 -91.312 -91.305 1.524

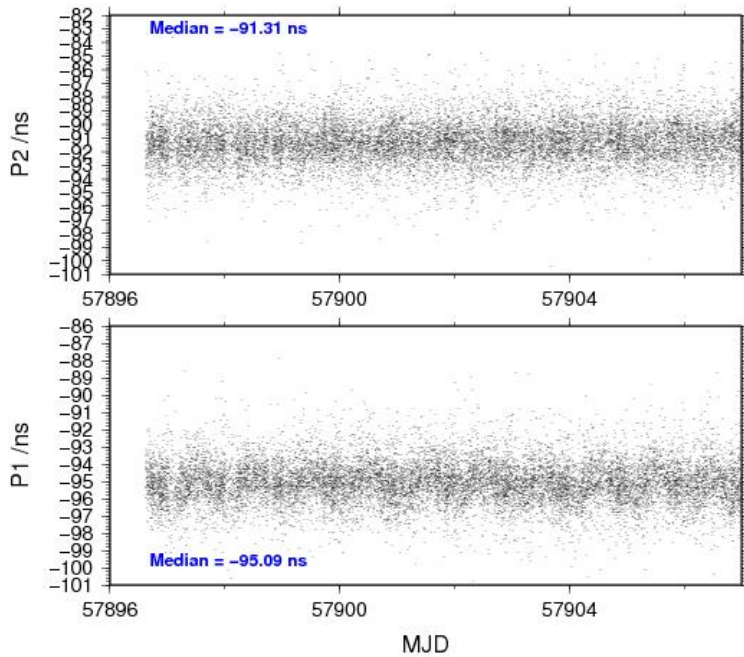
06/14/17 bp0ubp0r17143_11



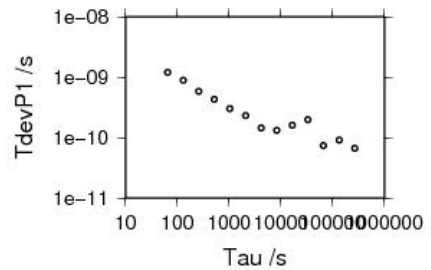
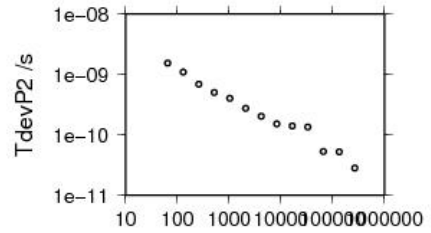
- 263979 s: C1= 44 ps
- 131990 s: C1= 59 ps
- 69995 s: C1= 53 ps
- 32997 s: C1= 132 ps
- 16499 s: C1= 119 ps
- 8249 s: C1= 111 ps
- 4125 s: C1= 129 ps
- 2062 s: C1= 208 ps
- 1031 s: C1= 245 ps
- 516 s: C1= 302 ps
- 258 s: C1= 387 ps
- 129 s: C1= 615 ps
- 64 s: C1= 857 ps



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- | | |
|---------------------|---------------------|
| 265823 s: P1= 67 ps | 265842 s: P2= 28 ps |
| 132911 s: P1= 91 ps | 132921 s: P2= 53 ps |
| 66456 s: P1= 74 ps | 66460 s: P2= 53 ps |
| 33228 s: P1= 198 ps | 33230 s: P2= 136 ps |
| 16614 s: P1= 161 ps | 16615 s: P2= 140 ps |
| 8307 s: P1= 132 ps | 8308 s: P2= 153 ps |
| 4153 s: P1= 144 ps | 4154 s: P2= 205 ps |
| 2077 s: P1= 233 ps | 2077 s: P2= 275 ps |
| 1038 s: P1= 303 ps | 1038 s: P2= 402 ps |
| 519 s: P1= 433 ps | 519 s: P2= 503 ps |
| 260 s: P1= 585 ps | 260 s: P2= 694 ps |
| 130 s: P1= 890 ps | 130 s: P2= 1097 ps |
| 65 s: P1= 1204 ps | 65 s: P2= 1534 ps |



BP1C-BP0R

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 191895
 Number of huge residuals = 596. New iteration
 Number of huge residuals = 2. New iteration
 Computed code bias (P1/P2)/m = -17.535 -16.577
 Computed baseline (X,Y,Z)/m = -4.657 -0.922 3.601
 RMS of residuals /m = 0.694

Number of phase differences to fit baseline = 186595
 A priori baseline (X,Y,Z)/m = -4.657 -0.922 3.601
 29932 clock jitters computed out of 29934 intervals
 AVE jitter /ps = 0.4 RMS jitter /ps = 6.0

Iter 1 Large residuals L1= 2
 Iter 1 Large residuals L2= 11
 Computed baseline L1 (X,Y,Z)/m = 0.198 0.191 0.215
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.190 0.189 0.202
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 2
 Iter 2 Large residuals L2= 11
 Computed baseline L1 (X,Y,Z)/m = 0.198 0.191 0.215
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.190 0.189 0.202
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -4.459 -0.732 3.816
 Final baseline L2 (X,Y,Z)/m = -4.467 -0.733 3.803

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 198262

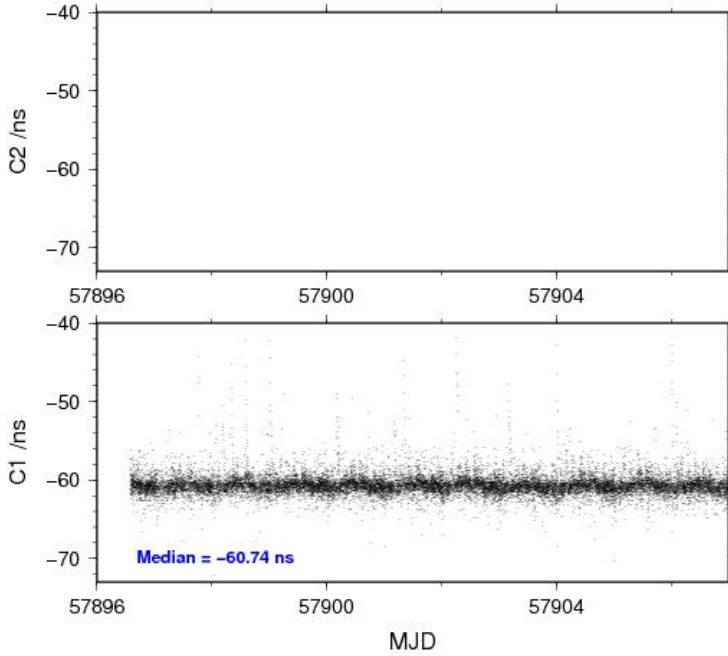
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 196267 -60.630 2.210
 C2: 0 NaN NaN
 P1: 191285 -59.322 2.726
 P2: 191228 -56.090 2.995

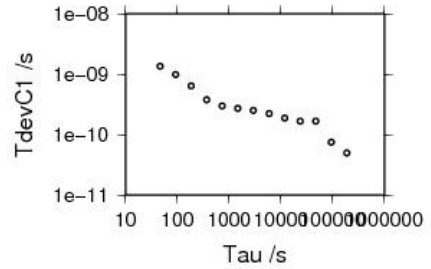
Number of 300s epochs in out file = 3000

Code #pts, median/ns, ave/ns, rms/ns
 C1: 19514 -60.745 -60.638 1.372
 C2: 0 0.000 NaN NaN
 P1: 19092 -59.487 -59.347 1.595
 P2: 19093 -56.106 -56.105 1.751

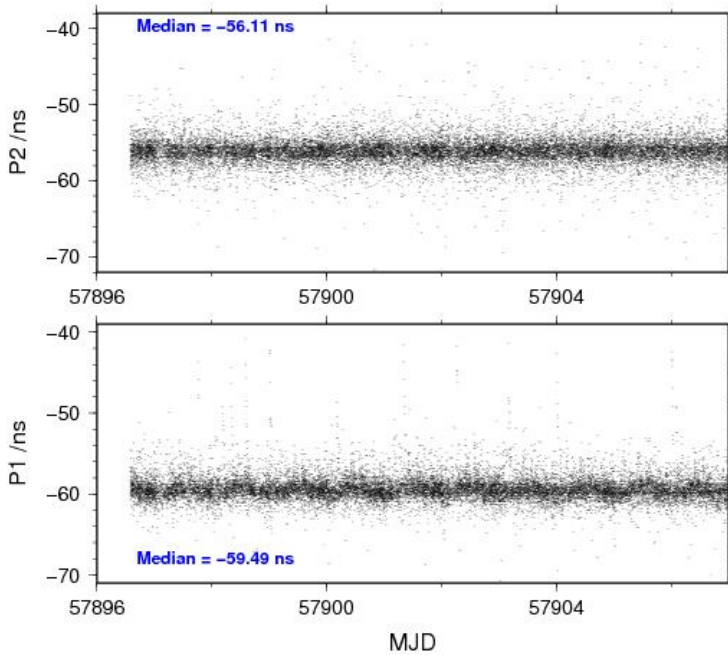
06/14/17 bp1cbp0r17143_11



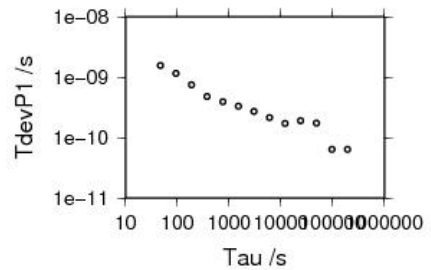
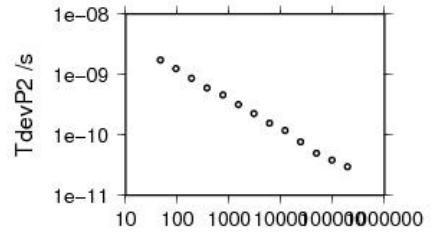
- 188857 s: C1= 50 ps
- 94429 s: C1= 75 ps
- 47214 s: C1= 167 ps
- 23607 s: C1= 167 ps
- 11804 s: C1= 188 ps
- 5902 s: C1= 224 ps
- 2951 s: C1= 252 ps
- 1475 s: C1= 270 ps
- 738 s: C1= 300 ps
- 369 s: C1= 375 ps
- 184 s: C1= 643 ps
- 92 s: C1= 993 ps
- 46 s: C1= 1350 ps



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- 193032 s: P1= 64 ps
- 96516 s: P1= 64 ps
- 48258 s: P1= 174 ps
- 24129 s: P1= 190 ps
- 12064 s: P1= 172 ps
- 6032 s: P1= 214 ps
- 3016 s: P1= 270 ps
- 1508 s: P1= 330 ps
- 754 s: P1= 391 ps
- 377 s: P1= 477 ps
- 189 s: P1= 747 ps
- 94 s: P1= 1149 ps
- 47 s: P1= 1568 ps
- 193022 s: P2= 30 ps
- 96511 s: P2= 38 ps
- 48255 s: P2= 50 ps
- 24128 s: P2= 77 ps
- 12064 s: P2= 118 ps
- 6032 s: P2= 157 ps
- 3016 s: P2= 226 ps
- 1508 s: P2= 320 ps
- 754 s: P2= 458 ps
- 377 s: P2= 600 ps
- 188 s: P2= 867 ps
- 94 s: P2= 1254 ps
- 47 s: P2= 1735 ps



BP0U-BP1J

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 142737
 Computed code bias (P1/P2)/m = -2.878 -1.026
 Computed baseline (X,Y,Z)/m = -2.330 -0.360 1.890
 RMS of residuals /m = 0.618

Number of phase differences to fit baseline = 127061
 A priori baseline (X,Y,Z)/m = -2.330 -0.360 1.890
 28541 clock jitters computed out of 28864 intervals
 AVE jitter /ps = -0.7 RMS jitter /ps = 41.3

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.150 0.043 0.093
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.156 0.033 0.092
 RMS of residuals L2 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -2.180 -0.317 1.983
 Final baseline L2 (X,Y,Z)/m = -2.175 -0.327 1.982

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 143677

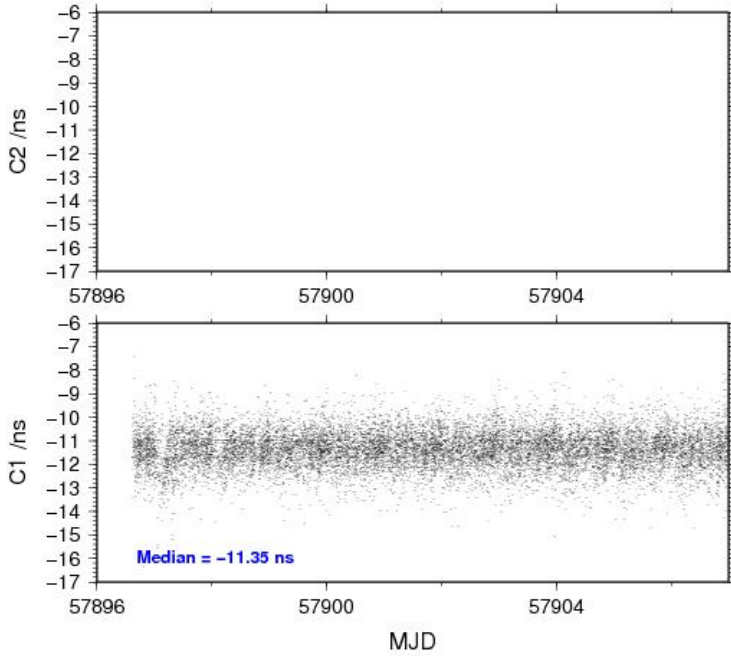
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 142990 -11.363 1.364
 C2: 0 NaN NaN
 P1: 142672 -10.052 1.921
 P2: 142671 -3.874 2.476

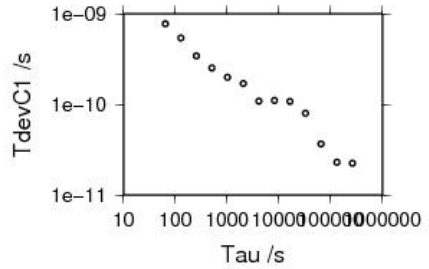
Number of 300s epochs in out file = 3001

Code #pts, median/ns, ave/ns, rms/ns
 C1: 14104 -11.348 -11.365 0.772
 C2: 0 0.000 NaN NaN
 P1: 14081 -10.086 -10.069 1.020
 P2: 14081 -3.819 -3.853 1.423

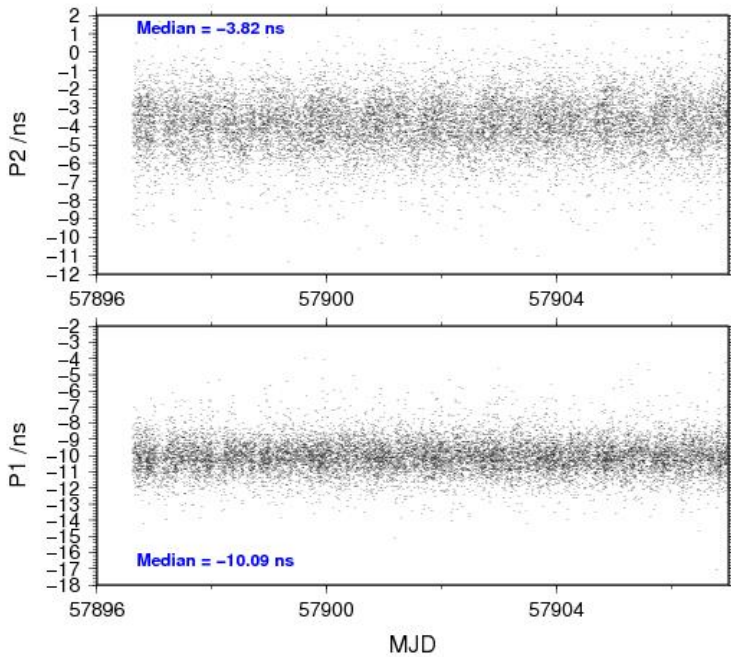
06/14/17 bp0ubp1j17143_11



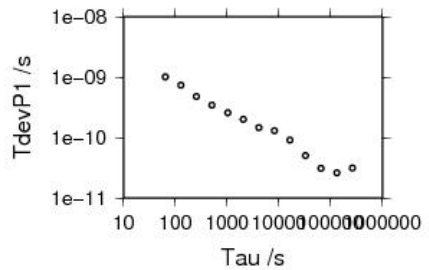
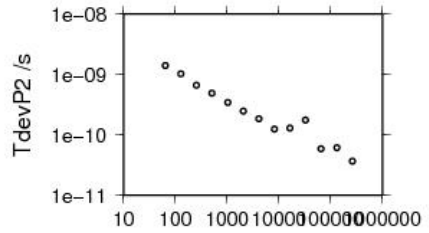
- 261827 s: C1= 22 ps
- 130913 s: C1= 23 ps
- 65457 s: C1= 37 ps
- 32728 s: C1= 80 ps
- 16364 s: C1= 108 ps
- 8182 s: C1= 110 ps
- 4091 s: C1= 109 ps
- 2046 s: C1= 170 ps
- 1023 s: C1= 199 ps
- 511 s: C1= 253 ps
- 256 s: C1= 342 ps
- 128 s: C1= 539 ps
- 64 s: C1= 778 ps



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- | | |
|---------------------|---------------------|
| 262255 s: P1= 31 ps | 262255 s: P2= 37 ps |
| 131127 s: P1= 26 ps | 131127 s: P2= 61 ps |
| 65564 s: P1= 31 ps | 65564 s: P2= 59 ps |
| 32782 s: P1= 50 ps | 32782 s: P2= 175 ps |
| 16391 s: P1= 91 ps | 16391 s: P2= 130 ps |
| 8195 s: P1= 129 ps | 8195 s: P2= 125 ps |
| 4098 s: P1= 147 ps | 4098 s: P2= 187 ps |
| 2049 s: P1= 201 ps | 2049 s: P2= 246 ps |
| 1024 s: P1= 259 ps | 1024 s: P2= 343 ps |
| 512 s: P1= 343 ps | 512 s: P2= 489 ps |
| 256 s: P1= 477 ps | 256 s: P2= 668 ps |
| 128 s: P1= 738 ps | 128 s: P2= 1032 ps |
| 64 s: P1= 1014 ps | 64 s: P2= 1416 ps |



BP1C-BP1J

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 191875
 Computed code bias (P1/P2)/m = 7.630 9.314
 Computed baseline (X,Y,Z)/m = -1.501 -0.237 1.399
 RMS of residuals /m = 0.577

Number of phase differences to fit baseline = 187114
 A priori baseline (X,Y,Z)/m = -1.501 -0.237 1.399
 29995 clock jitters computed out of 29995 intervals
 AVE jitter /ps = 0.1 RMS jitter /ps = 5.5

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 10
 Computed baseline L1 (X,Y,Z)/m = 0.007 0.011 -0.100
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.013 0.003 -0.099
 RMS of residuals L2 /m = 0.005

Iter 2 Large residuals L1= 0
 Iter 2 Large residuals L2= 10
 Computed baseline L1 (X,Y,Z)/m = 0.007 0.011 -0.100
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.013 0.003 -0.099
 RMS of residuals L2 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -1.495 -0.225 1.299
 Final baseline L2 (X,Y,Z)/m = -1.489 -0.234 1.299

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 196364

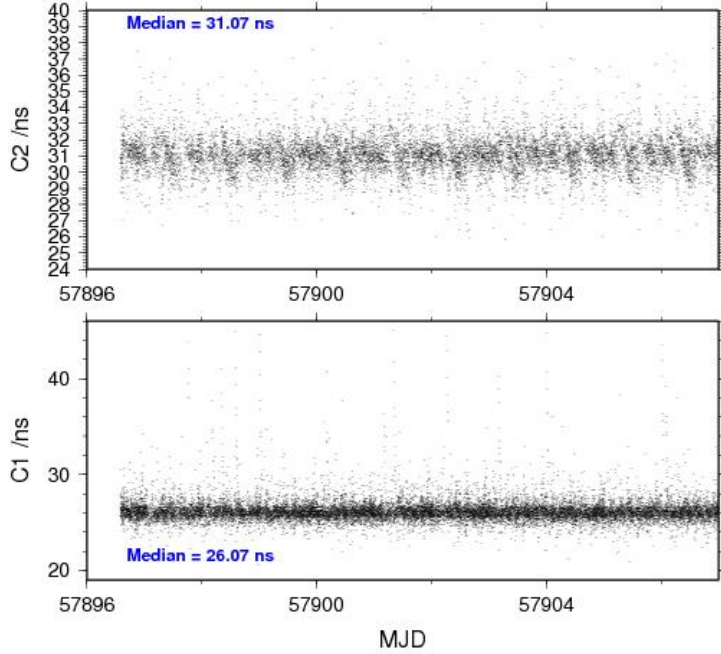
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 193041 26.206 1.938
 C2: 113934 31.081 1.970
 P1: 191224 25.627 2.039
 P2: 191021 31.302 2.681

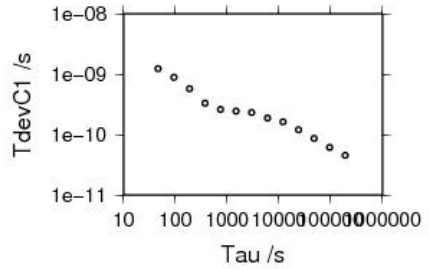
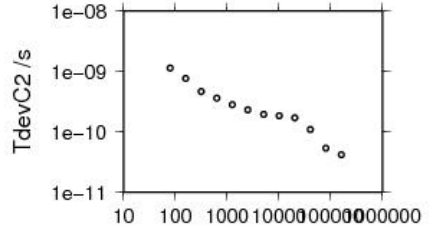
Number of 300s epochs in out file = 3000

Code #pts, median/ns, ave/ns, rms/ns
 C1: 19244 26.071 26.198 1.231
 C2: 11377 31.072 31.087 1.112
 P1: 19058 25.537 25.639 1.267
 P2: 19061 31.328 31.307 1.664

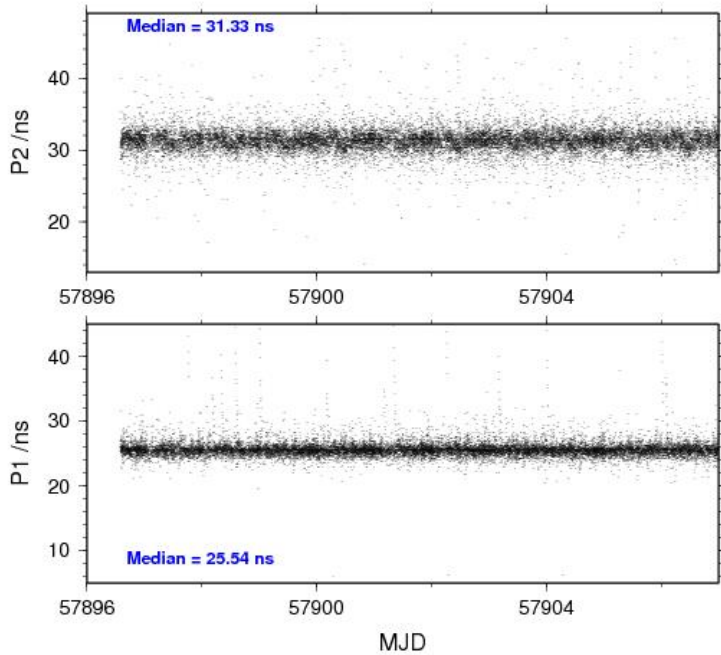
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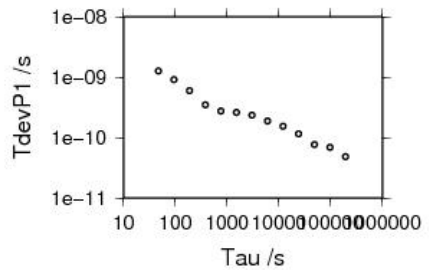
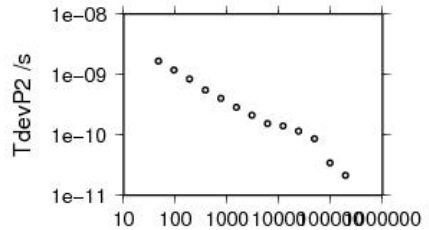
191507 s: C1= 45 ps	161971 s: C2= 42 ps
95754 s: C1= 61 ps	80986 s: C2= 54 ps
47877 s: C1= 87 ps	40493 s: C2= 110 ps
23838 s: C1= 121 ps	20246 s: C2= 172 ps
11969 s: C1= 163 ps	10123 s: C2= 185 ps
5985 s: C1= 188 ps	5062 s: C2= 195 ps
2992 s: C1= 231 ps	2531 s: C2= 231 ps
1496 s: C1= 244 ps	1265 s: C2= 281 ps
748 s: C1= 260 ps	633 s: C2= 363 ps
374 s: C1= 332 ps	316 s: C2= 466 ps
187 s: C1= 577 ps	158 s: C2= 770 ps
94 s: C1= 894 ps	79 s: C2= 1136 ps
47 s: C1= 1229 ps	



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193376 s: P1= 49 ps	193346 s: P2= 21 ps
96688 s: P1= 70 ps	96673 s: P2= 35 ps
48344 s: P1= 77 ps	48336 s: P2= 87 ps
24172 s: P1= 116 ps	24168 s: P2= 115 ps
12086 s: P1= 155 ps	12084 s: P2= 141 ps
6043 s: P1= 188 ps	6042 s: P2= 154 ps
3022 s: P1= 234 ps	3021 s: P2= 211 ps
1511 s: P1= 262 ps	1511 s: P2= 287 ps
755 s: P1= 275 ps	755 s: P2= 401 ps
378 s: P1= 350 ps	378 s: P2= 550 ps
189 s: P1= 595 ps	189 s: P2= 838 ps
94 s: P1= 916 ps	94 s: P2= 1189 ps
47 s: P1= 1267 ps	47 s: P2= 1661 ps



BP0U-BP1X

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 142063
 Computed code bias (P1/P2)/m = -1.009 0.049
 Computed baseline (X,Y,Z)/m = -3.170 -0.552 2.354
 RMS of residuals /m = 0.651

Number of phase differences to fit baseline = 125659
 A priori baseline (X,Y,Z)/m = -3.170 -0.552 2.354
 28505 clock jitters computed out of 28897 intervals
 AVE jitter /ps = -0.4 RMS jitter /ps = 41.2

Iter 1 Large residuals L1= 0
 Iter 1 Large residuals L2= 0
 Computed baseline L1 (X,Y,Z)/m = 0.250 0.092 0.246
 RMS of residuals L1 /m = 0.004
 Computed baseline L2 (X,Y,Z)/m = 0.244 0.085 0.238
 RMS of residuals L2 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -2.920 -0.461 2.600
 Final baseline L2 (X,Y,Z)/m = -2.926 -0.467 2.592

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 142900

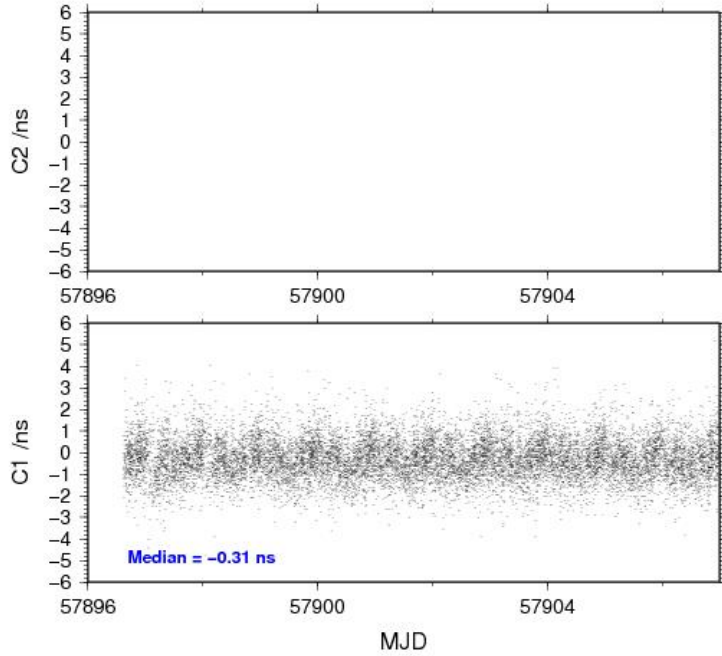
Global average of individual differences

Code #pts, ave/ns, rms/ns
 C1: 142345 -0.276 1.486
 C2: 0 NaN NaN
 P1: 141997 -4.297 2.134
 P2: 141981 -0.735 2.623

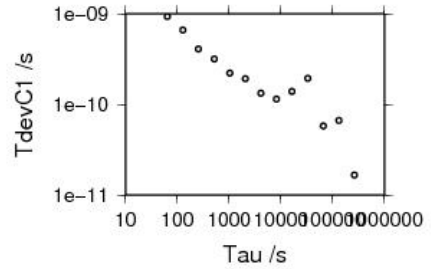
Number of 300s epochs in out file = 3001

Code #pts, median/ns, ave/ns, rms/ns
 C1: 14047 -0.310 -0.285 0.938
 C2: 0 0.000 NaN NaN
 P1: 14019 -4.384 -4.328 1.188
 P2: 14020 -0.719 -0.723 1.664

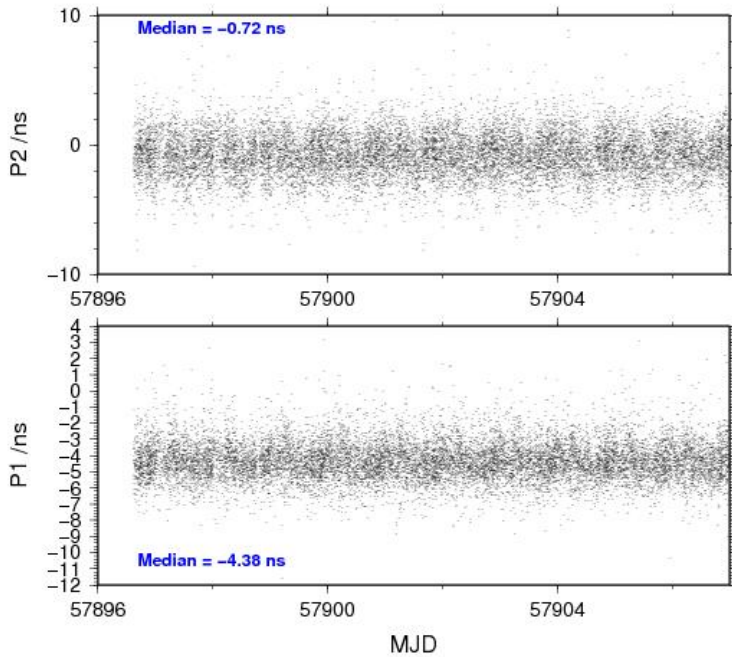
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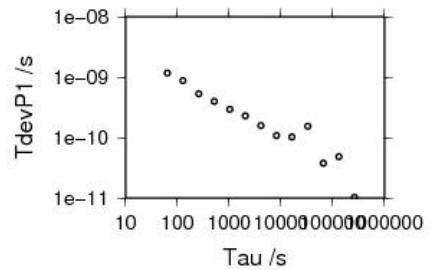
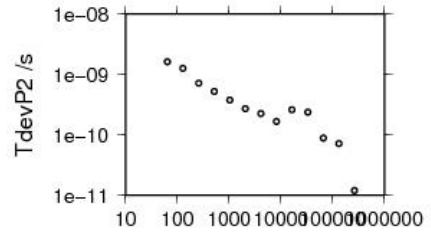
262889 s: C1= 17 ps
 131445 s: C1= 67 ps
 65722 s: C1= 58 ps
 32861 s: C1= 194 ps
 16431 s: C1= 139 ps
 8215 s: C1= 115 ps
 4108 s: C1= 133 ps
 2054 s: C1= 192 ps
 1027 s: C1= 222 ps
 513 s: C1= 316 ps
 257 s: C1= 410 ps
 129 s: C1= 660 ps
 64 s: C1= 932 ps



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263414 s: P1= 10 ps	263396 s: P2= 12 ps
131707 s: P1= 49 ps	131688 s: P2= 72 ps
65854 s: P1= 38 ps	65849 s: P2= 89 ps
32827 s: P1= 155 ps	32924 s: P2= 238 ps
16463 s: P1= 103 ps	16462 s: P2= 262 ps
8232 s: P1= 109 ps	8231 s: P2= 167 ps
4116 s: P1= 158 ps	4116 s: P2= 227 ps
2058 s: P1= 229 ps	2058 s: P2= 272 ps
1029 s: P1= 293 ps	1029 s: P2= 377 ps
514 s: P1= 399 ps	514 s: P2= 525 ps
257 s: P1= 531 ps	257 s: P2= 718 ps
129 s: P1= 882 ps	129 s: P2= 1273 ps
64 s: P1= 1177 ps	64 s: P2= 1634 ps



BP1C-BP1X

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 187955
 Computed code bias (P1/P2)/m = 9.755 10.669
 Computed baseline (X,Y,Z)/m = -2.531 -0.568 1.627
 RMS of residuals /m = 0.624

Number of phase differences to fit baseline = 183169
 A priori baseline (X,Y,Z)/m = -2.531 -0.568 1.627
 29995 clock jitters computed out of 29995 intervals
 AVE jitter /ps = 0.3 RMS jitter /ps = 6.0

Iter 1 Large residuals L1= 1
 Iter 1 Large residuals L2= 6
 Computed baseline L1 (X,Y,Z)/m = 0.306 0.184 0.283
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.285 0.184 0.262
 RMS of residuals L2 /m = 0.006

Iter 2 Large residuals L1= 1
 Iter 2 Large residuals L2= 6
 Computed baseline L1 (X,Y,Z)/m = 0.306 0.184 0.283
 RMS of residuals L1 /m = 0.005
 Computed baseline L2 (X,Y,Z)/m = 0.286 0.184 0.263
 RMS of residuals L2 /m = 0.006

Final baseline L1 (X,Y,Z)/m = -2.226 -0.384 1.910
 Final baseline L2 (X,Y,Z)/m = -2.246 -0.384 1.889

COMPUTATION OF CODE DIFFERENCES

Number of code differences = 191391

Global average of individual differences

Code #pts, ave/ns, rms/ns

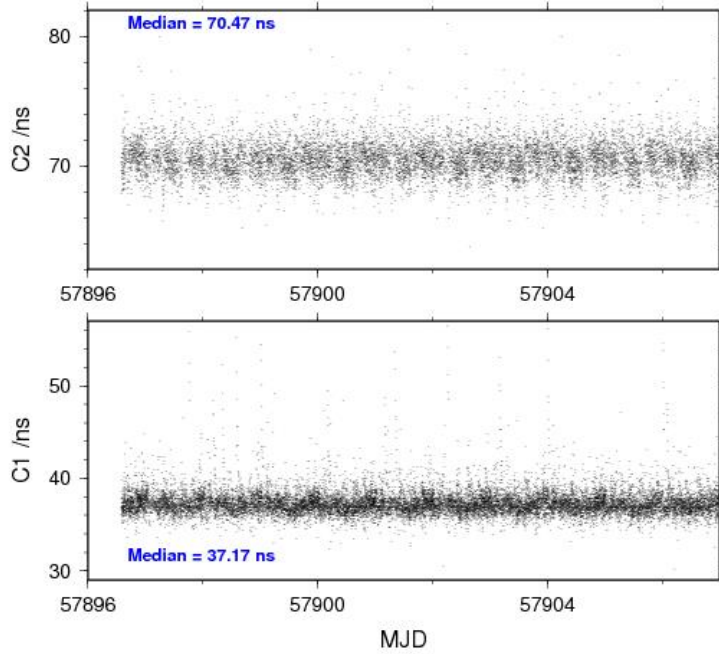
C1: 189313 37.368 2.031
 C2: 112531 70.529 2.095
 P1: 187588 31.516 2.367
 P2: 187513 34.638 2.916

Number of 300s epochs in out file = 3000

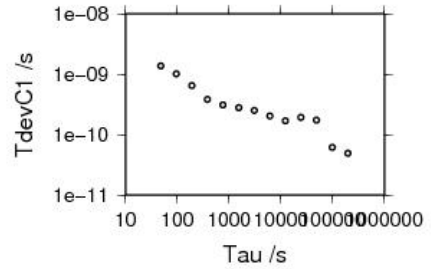
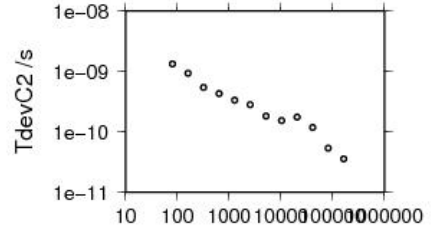
Code #pts, median/ns, ave/ns, rms/ns

C1: 18850 37.169 37.337 1.391
 C2: 11210 70.471 70.507 1.309
 P1: 18674 31.281 31.482 1.500
 P2: 18670 34.576 34.620 1.806

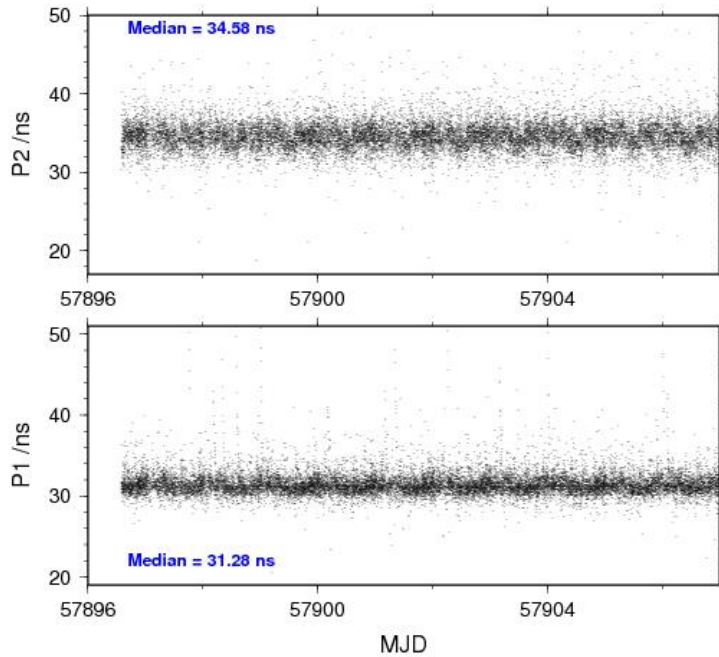
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195510 s: C1= 49 ps	164384 s: C2= 36 ps
97755 s: C1= 62 ps	82192 s: C2= 54 ps
48878 s: C1= 174 ps	41096 s: C2= 119 ps
24439 s: C1= 193 ps	20548 s: C2= 175 ps
12219 s: C1= 169 ps	10274 s: C2= 154 ps
6110 s: C1= 203 ps	5137 s: C2= 184 ps
3055 s: C1= 253 ps	2569 s: C2= 285 ps
1527 s: C1= 281 ps	1284 s: C2= 338 ps
764 s: C1= 311 ps	642 s: C2= 432 ps
382 s: C1= 381 ps	321 s: C2= 543 ps
191 s: C1= 652 ps	161 s: C2= 931 ps
95 s: C1= 1014 ps	80 s: C2= 1340 ps
48 s: C1= 1364 ps	



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197353 s: P1= 53 ps	197395 s: P2= 34 ps
98676 s: P1= 66 ps	98698 s: P2= 32 ps
49338 s: P1= 171 ps	49349 s: P2= 114 ps
24669 s: P1= 195 ps	24674 s: P2= 197 ps
12335 s: P1= 167 ps	12337 s: P2= 205 ps
6167 s: P1= 219 ps	6169 s: P2= 207 ps
3084 s: P1= 266 ps	3084 s: P2= 245 ps
1542 s: P1= 301 ps	1542 s: P2= 312 ps
771 s: P1= 345 ps	771 s: P2= 422 ps
385 s: P1= 432 ps	386 s: P2= 567 ps
193 s: P1= 693 ps	193 s: P2= 923 ps
96 s: P1= 1094 ps	96 s: P2= 1321 ps
48 s: P1= 1478 ps	48 s: P2= 1751 ps

