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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) = REFDLY.

- X_C = antenna cable delay
- [X_D = short cable + splitter delay]

(X_C + X_D) = 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) = INTDLY.

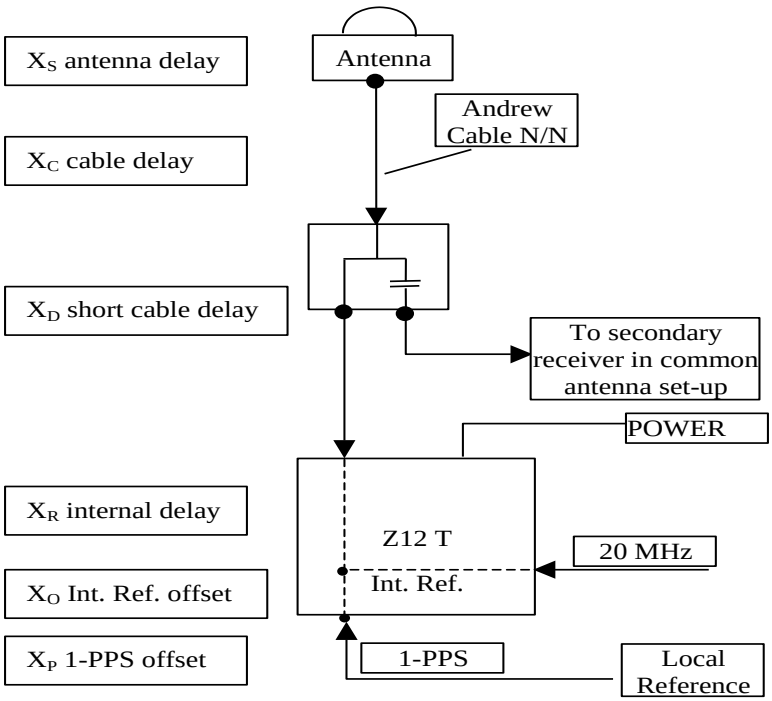


Figure 1: Definition of the different delays used in the most general set-up of a geodetic system (here shown for a Z12-T) from [Petit et al, 2001].

3/ phase 3

Laboratories: BIPM, PTB, ROA, OP

3.1/ BIPM (18291)

Period

MJD 58409 to 58415

Delays

BP1J:

X_O = 134.00 ns	(187.88-53.88)
X_P = 47.60 ns	(BP1R+C139+BP1S+C172)
REFDLY = 181.60 ns	
CABDLY = 128.73 ns	(C138)

BP1X:

REFDLY = 52.60 ns	(BP1R+C166+BP1I+C153)
CABDLY = 129.70 ns	(C178)

BP1C:

X_O = 185.41 ns	(200.89-15.48)
X_P = 52.60 ns	(BP1R+C166+BP1I+C157)
REFDLY = 238.01 ns	
CABDLY = 235.70 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 58409
Date and hour of the end of measurements:	MJD 58415

Information on the system

	Local:	Travelling:
4-character BIPM code	BP1J	BP1C
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx4proTR 27	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:	Septentrio Sepchoke_MC 5131	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:	47.60 ns	52.60 ns
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)	134.00 ns	185.41 ns
• Antenna cable delay:	128.73 ns	235.70 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 (Galileo) /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 58409
Date and hour of the end of measurements:	MJD 58415

Information on the system

	Local:	Travelling:
4-character BIPM code	BP1J	BP1X
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx4proTR 27	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	~ 15 m
• Antenna maker and type: Antenna serial number:	Septentrio Sepchoke_MC 5131	Novatel GPS-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:	47.60 ns	52.60
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)	134.00 ns	
• Antenna cable delay:	128.73 ns	129.70
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)

Data used for the generation of CGGTTS files

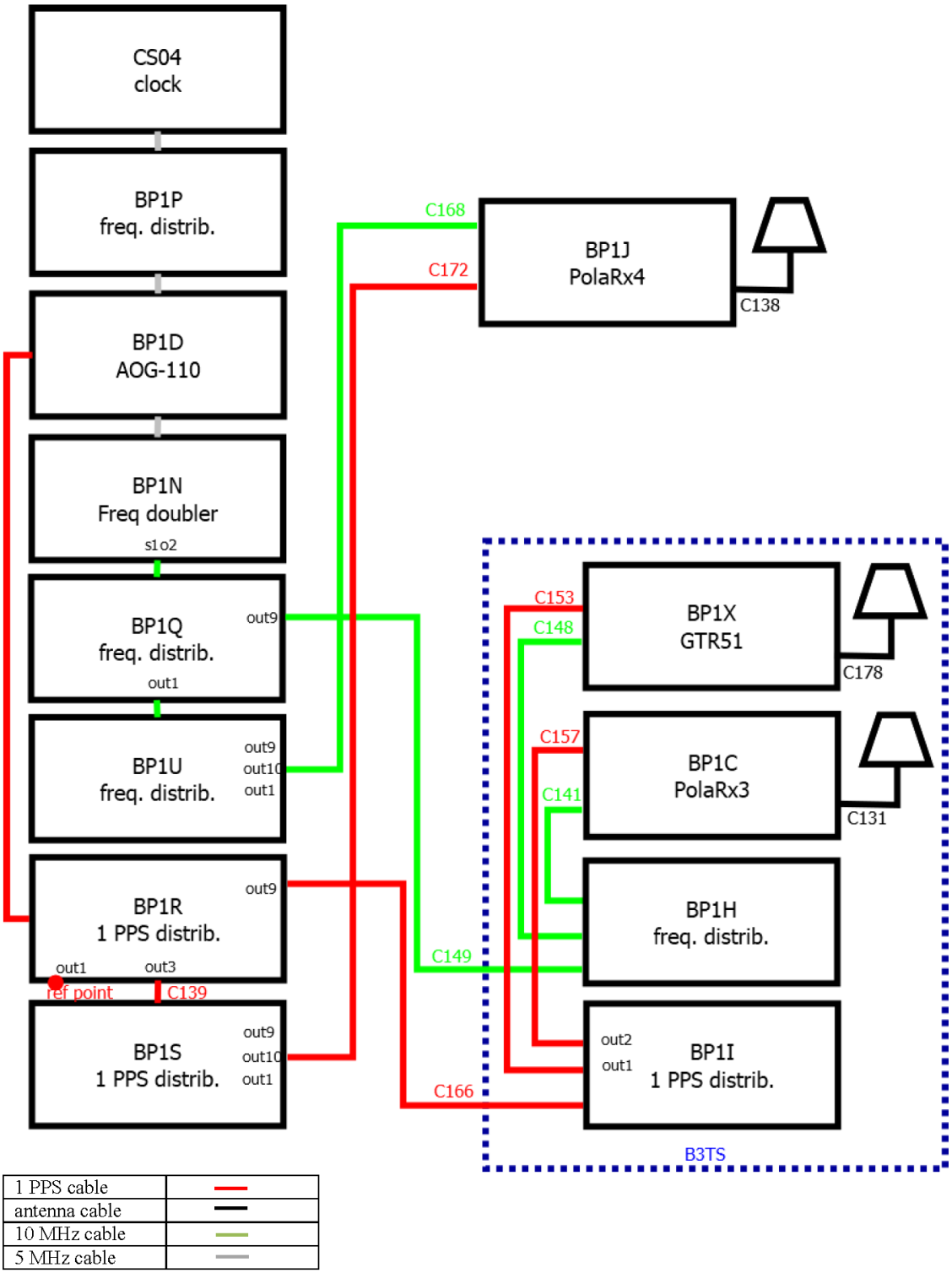
• INT DLY (GPS) /ns:	
• INT DLY (Galileo) /ns:	
• INT DLY (GLONASS) /ns:	
• CAB DLY /ns:	
• REF DLY /ns:	
• Coordinates reference frame:	
Latitude or X /m:	
Longitude or Y /m:	
Height or Z /m:	

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.

BP1X-BP1J

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 142538
Number of huge residuals = 1. New iteration
Computed code bias (P1/P2)/m = 11.455 11.130
Computed baseline (X,Y,Z)/m = 0.954 0.264 -0.352
RMS of residuals /m = 0.554

Number of phase differences to fit baseline
L1/L2 = 139418
L5 = 53368
A priori baseline (X,Y,Z)/m = 0.954 0.264 -0.352
20123 clock jitters computed out of 20123 intervals
AVE jitter /ps = -0.3 RMS jitter /ps = 4.7

Iter 1 Large residuals L1= 1
Iter 1 Large residuals L2= 2
Iter 1 Large residuals L5= 2
Computed baseline L1 (X,Y,Z)/m = -0.218 -0.104 -0.257
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.207 -0.117 -0.251
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = -0.206 -0.129 -0.264
RMS of residuals L5 /m = 0.004

Iter 2 Large residuals L1= 1
Iter 2 Large residuals L2= 2
Iter 2 Large residuals L5= 2
Computed baseline L1 (X,Y,Z)/m = -0.218 -0.104 -0.257
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.207 -0.117 -0.251
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = -0.206 -0.129 -0.264
RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = 0.737 0.160 -0.610
Final baseline L2 (X,Y,Z)/m = 0.747 0.147 -0.603
Final baseline L5 (X,Y,Z)/m = 0.748 0.135 -0.616

COMPUTATION OF CODE DIFFERENCES

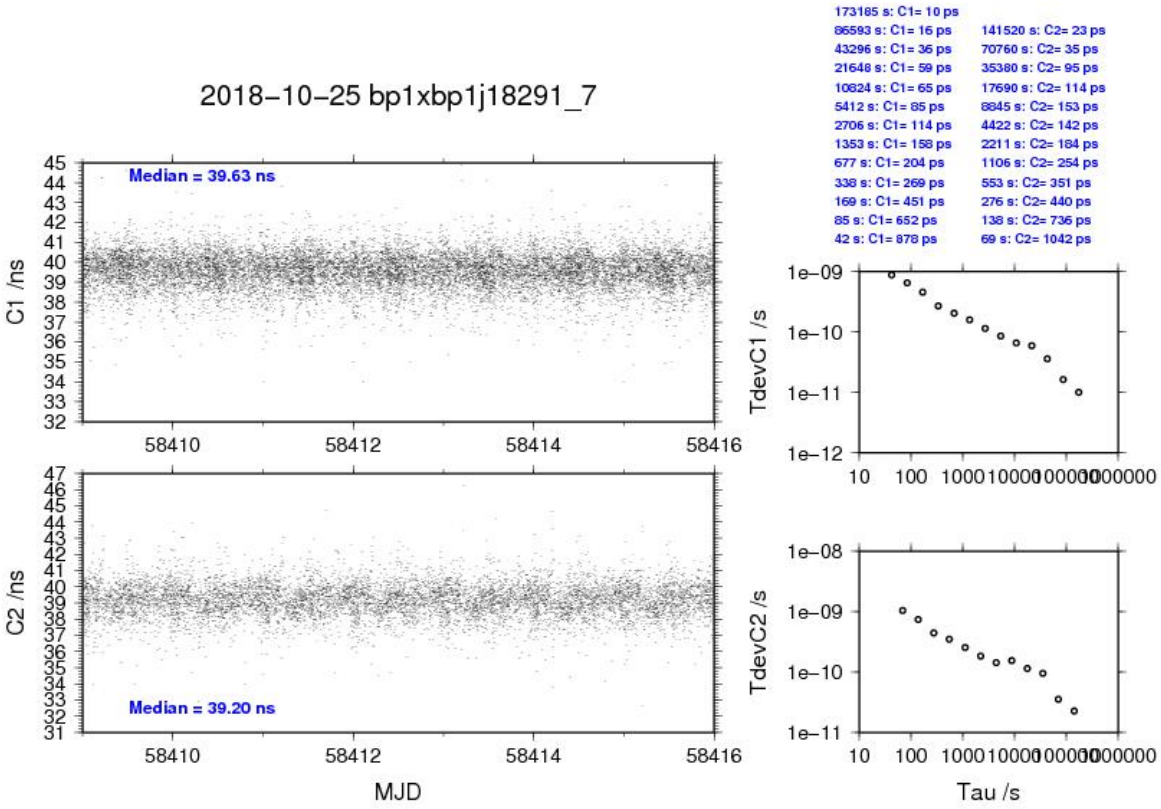
Total number of code differences = 190427

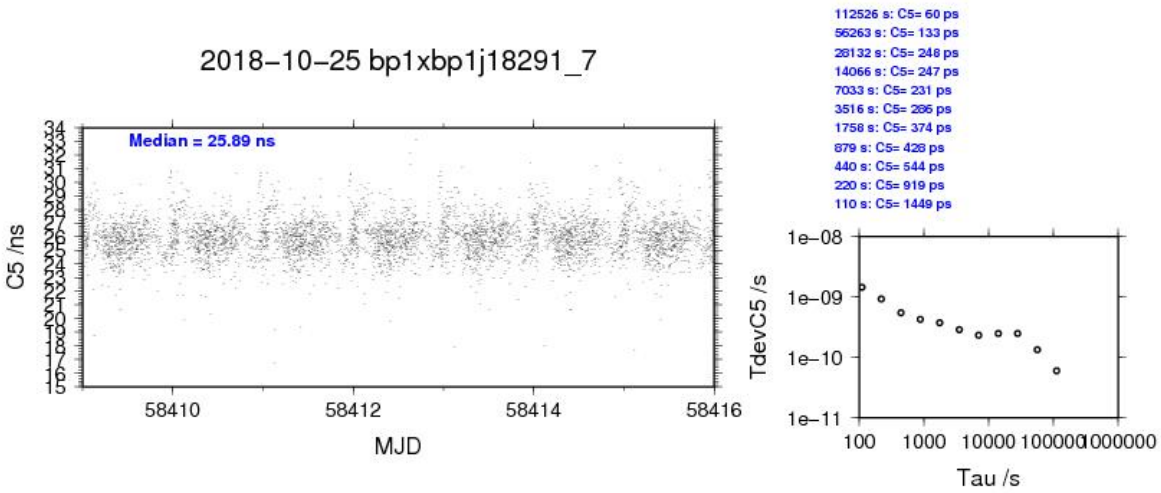
Global average of individual differences

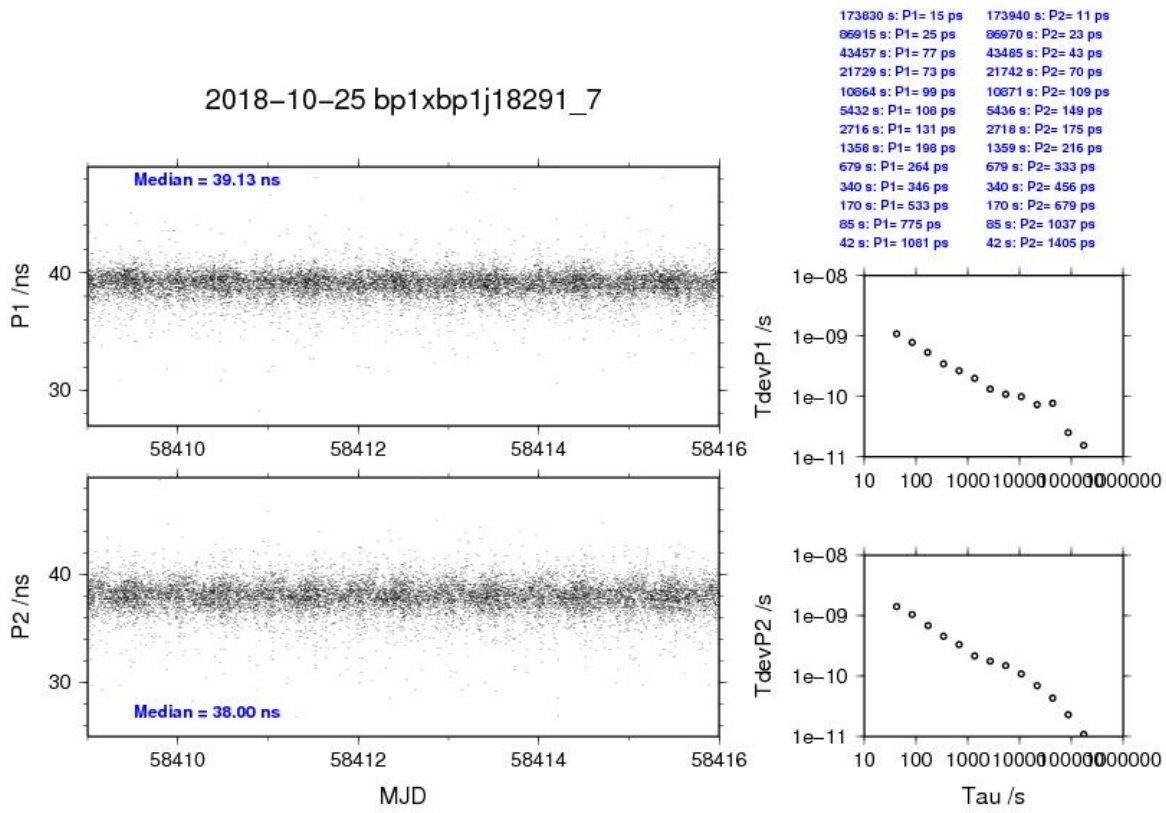
Code	#pts	ave/ns	rms/ns
C1	142999	39.554	1.546
C2	87516	39.154	1.855
C5	54911	25.893	1.884
P1	142361	39.025	2.011
P2	142296	37.930	2.394
E1	46069	41.753	1.375
E5	46383	26.687	1.491

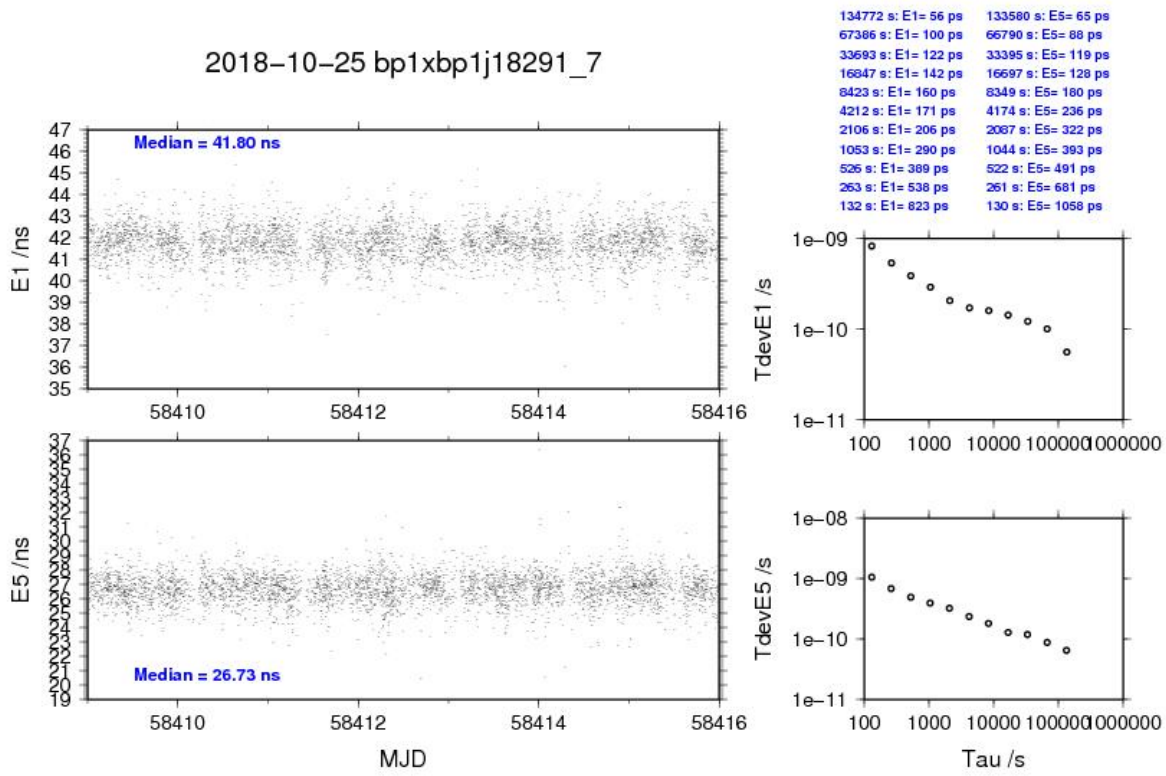
Number of 300s epochs in out file = 2015

Code	#pts	median/ns	ave/ns	rms/ns
C1	14298	39.628	39.579	0.888
C2	8749	39.198	39.169	1.024
C5	5502	25.895	25.905	1.372
P1	14245	39.126	39.051	1.080
P2	14236	37.999	37.943	1.404
E1	4594	41.795	41.771	0.824
E5	635	26.734	26.700	1.053


2018–10–25 bp1xbp1j18291_7
Median = 39.63 ns
C1 /ns
Median = 39.20 ns
C2 /ns
MJD
173185 s: C1= 10 ps
86593 s: C1= 16 ps
43296 s: C1= 36 ps
21648 s: C1= 59 ps
10824 s: C1= 65 ps
5412 s: C1= 85 ps
2706 s: C1= 114 ps
1353 s: C1= 158 ps
677 s: C1= 204 ps
338 s: C1= 269 ps
169 s: C1= 451 ps
85 s: C1= 652 ps
42 s: C1= 878 ps
141520 s: C2= 23 ps
70760 s: C2= 35 ps
35380 s: C2= 95 ps
17690 s: C2= 114 ps
8845 s: C2= 153 ps
4422 s: C2= 142 ps
2211 s: C2= 184 ps
1106 s: C2= 254 ps
553 s: C2= 351 ps
276 s: C2= 440 ps
138 s: C2= 736 ps
69 s: C2= 1042 ps
TdevC1 /s
TdevC2 /s
Tau /s


2018–10–25 bp1xbp1j18291_7
Median = 25.89 ns
C5 /ns
MJD
112526 s: C5= 60 ps
56263 s: C5= 133 ps
28132 s: C5= 248 ps
14066 s: C5= 247 ps
7033 s: C5= 231 ps
3516 s: C5= 286 ps
1758 s: C5= 374 ps
879 s: C5= 428 ps
440 s: C5= 544 ps
220 s: C5= 919 ps
110 s: C5= 1449 ps
TdevC5 /s
Tau /s


2018–10–25 bp1xbp1j18291_7
173830 s: P1= 15 ps
86915 s: P1= 25 ps
43457 s: P1= 77 ps
21729 s: P1= 73 ps
10864 s: P1= 99 ps
5432 s: P1= 108 ps
2716 s: P1= 131 ps
1358 s: P1= 198 ps
679 s: P1= 264 ps
340 s: P1= 346 ps
170 s: P1= 533 ps
85 s: P1= 775 ps
42 s: P1= 1081 ps
173940 s: P2= 11 ps
86970 s: P2= 23 ps
43485 s: P2= 43 ps
21742 s: P2= 70 ps
10871 s: P2= 109 ps
5436 s: P2= 149 ps
2718 s: P2= 175 ps
1359 s: P2= 216 ps
679 s: P2= 333 ps
340 s: P2= 456 ps
170 s: P2= 679 ps
85 s: P2= 1037 ps
42 s: P2= 1405 ps
Median = 39.13 ns
P1 /ns
Median = 38.00 ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s


2018–10–25 bp1xbp1j18291_7
134772 s: E1= 56 ps
67386 s: E1= 100 ps
33693 s: E1= 122 ps
16847 s: E1= 142 ps
8423 s: E1= 160 ps
4212 s: E1= 171 ps
2106 s: E1= 206 ps
1053 s: E1= 290 ps
526 s: E1= 389 ps
263 s: E1= 538 ps
132 s: E1= 823 ps
133580 s: E5= 65 ps
66790 s: E5= 88 ps
33395 s: E5= 119 ps
16697 s: E5= 128 ps
8349 s: E5= 180 ps
4174 s: E5= 236 ps
2087 s: E5= 322 ps
1044 s: E5= 393 ps
522 s: E5= 491 ps
261 s: E5= 681 ps
130 s: E5= 1058 ps
Median = 41.80 ns
E1 /ns
Median = 26.73 ns
E5 /ns
MJD
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-BP1J

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 139635
Computed code bias (P1/P2)/m = 13.396 15.136
Computed baseline (X,Y,Z)/m = -1.417 -0.131 1.599
RMS of residuals /m = 0.585

Number of phase differences to fit baseline
L1/L2 = 136500
L5 = 0
A priori baseline (X,Y,Z)/m = -1.417 -0.131 1.599
19951 clock jitters computed out of 19951 intervals
AVE jitter /ps = -0.1 RMS jitter /ps = 5.2

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 1
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.058 -0.069 -0.267
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.051 -0.077 -0.273
RMS of residuals L2 /m = 0.005
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 0
Iter 2 Large residuals L2= 1
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.058 -0.069 -0.267
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.051 -0.077 -0.273
RMS of residuals L2 /m = 0.005
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -1.474 -0.200 1.331
Final baseline L2 (X,Y,Z)/m = -1.468 -0.208 1.325
Final baseline L5 (X,Y,Z)/m = -1.471 -0.204 1.328

COMPUTATION OF CODE DIFFERENCES

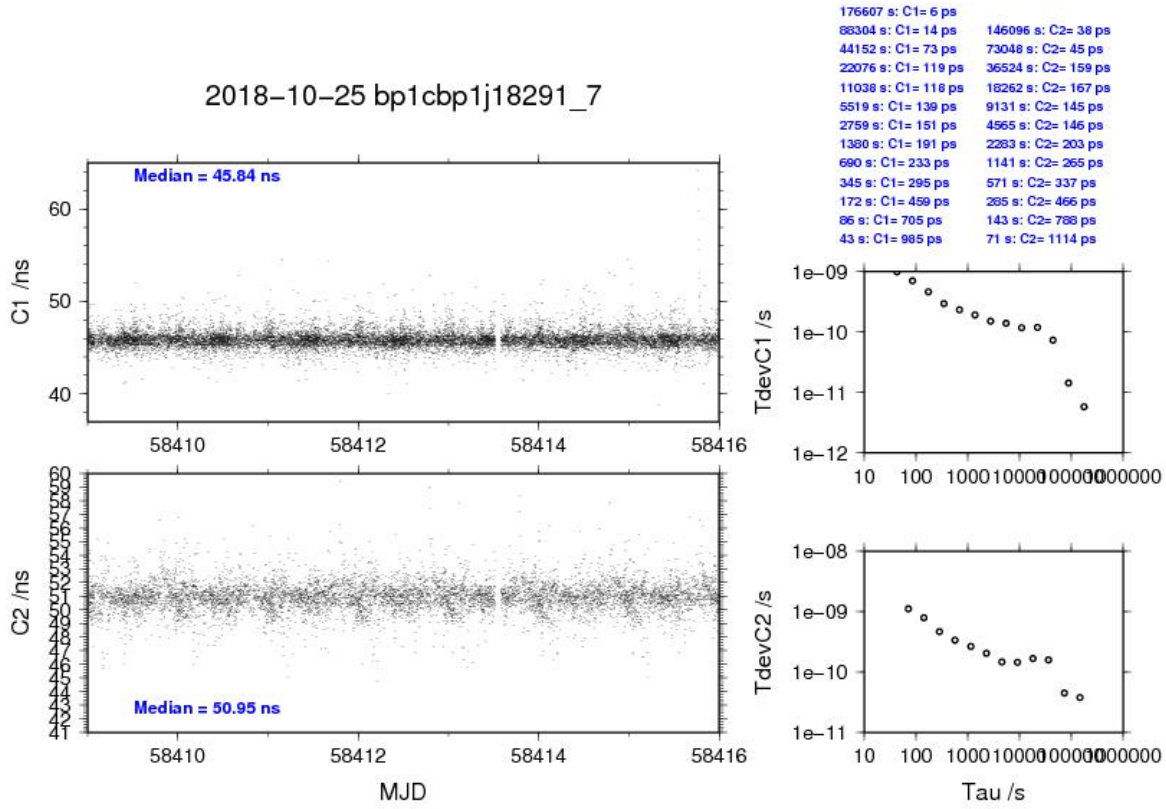
Total number of code differences = 141985

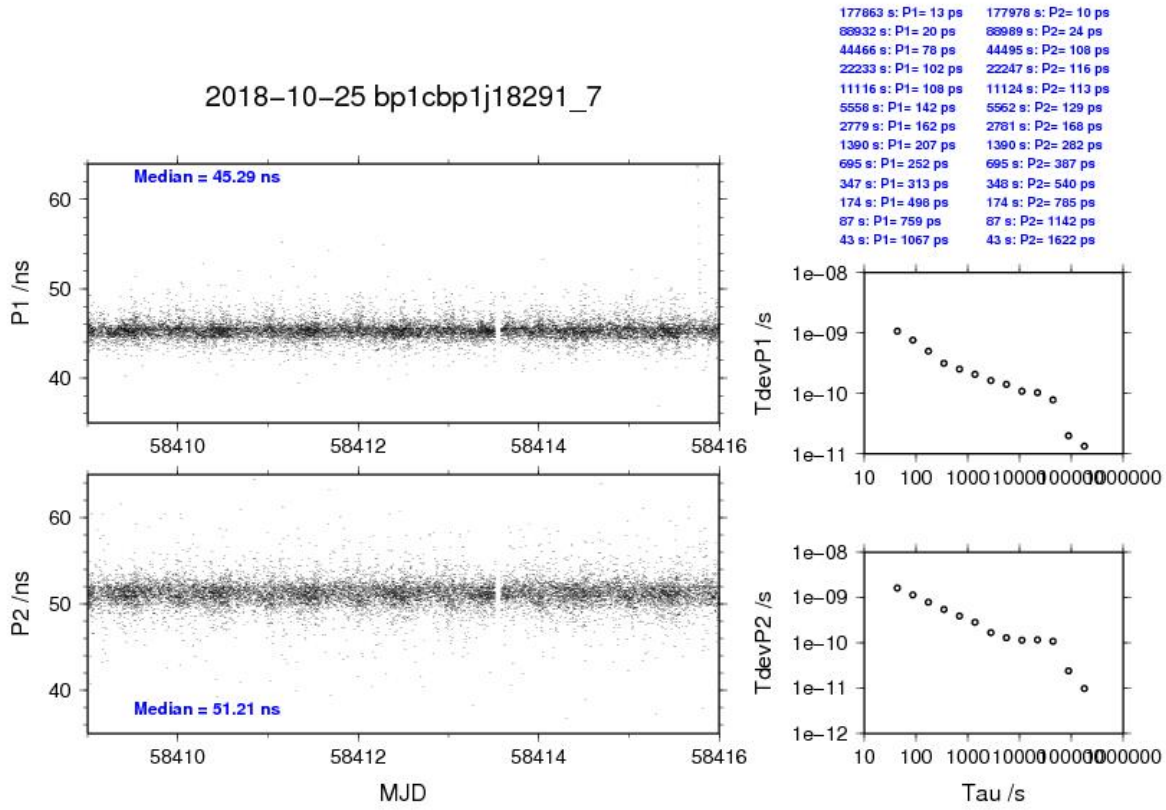
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	140152	45.899	1.836
C2	84810	50.949	2.016
C5	0	NaN	NaN
P1	139109	45.346	1.868
P2	139025	51.178	2.669
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 1997

Code	#pts	median/ns	ave/ns	rms/ns
C1	14021	45.836	45.903	0.983
C2	8475	50.948	50.945	1.094
C5	0	0.000	NaN	NaN
P1	13922	45.294	45.350	1.059
P2	13913	51.212	51.181	1.604
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–10–25 bp1cbp1j18291_7
Median = 45.84 ns
Median = 50.95 ns
C1 /ns
C2 /ns
MJD
TdevC1 /s
TdevC2 /s
Tau /s
176607 s: C1= 6 ps
88304 s: C1= 14 ps
44152 s: C1= 73 ps
22076 s: C1= 119 ps
11038 s: C1= 118 ps
5519 s: C1= 139 ps
2759 s: C1= 151 ps
1380 s: C1= 191 ps
690 s: C1= 233 ps
345 s: C1= 295 ps
172 s: C1= 459 ps
86 s: C1= 705 ps
43 s: C1= 985 ps
146096 s: C2= 38 ps
73048 s: C2= 45 ps
36524 s: C2= 159 ps
18262 s: C2= 167 ps
9131 s: C2= 145 ps
4565 s: C2= 146 ps
2283 s: C2= 203 ps
1141 s: C2= 265 ps
571 s: C2= 337 ps
285 s: C2= 466 ps
143 s: C2= 788 ps
71 s: C2= 1114 ps


2018–10–25 bp1cbp1j18291_7
Median = 45.29 ns
Median = 51.21 ns
P1 /ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s
177863 s: P1= 13 ps
88932 s: P1= 20 ps
44466 s: P1= 78 ps
22233 s: P1= 102 ps
11116 s: P1= 108 ps
5558 s: P1= 142 ps
2779 s: P1= 162 ps
1390 s: P1= 207 ps
695 s: P1= 252 ps
347 s: P1= 313 ps
174 s: P1= 498 ps
87 s: P1= 759 ps
43 s: P1= 1067 ps
177978 s: P2= 10 ps
88989 s: P2= 24 ps
44495 s: P2= 108 ps
22247 s: P2= 116 ps
11124 s: P2= 113 ps
5562 s: P2= 129 ps
2781 s: P2= 168 ps
1390 s: P2= 282 ps
695 s: P2= 387 ps
348 s: P2= 540 ps
174 s: P2= 785 ps
87 s: P2= 1142 ps
43 s: P2= 1622 ps

3.2/ PTB (18324)

Period

MJD 58442 to 58455

Delays

BP1X:

REFDLY = 42.21 + 52.60 = 94.81 ns (cf page 3 & PTB report page 11)
CABDLY = 129.70 ns (C178)

BP1C:

X_O = 202.86 ns (cf PTB report page 12)
X_P = 42.21 + 52.60 = 94.81 ns (cf page 3)
REFDLY = 297.67 ns
CABDLY = 235.70 ns (C131)

PTBB (PT02):

X_O = 38.78+15.8 = 54.58 ns (cf PTB report page 13,15)
X_P = 19.99 ns
REFDLY = 74.57 ns
CABDLY = 301.7 ns

PTBG (PT03):

X_O = 10.6+15.8 = 26.4 ns (cf PTB report page 13,15)
X_P = 20.10 ns
REFDLY = 46.50 ns
CABDLY = 251.4 ns

PT07:

REFDLY = 43.38 ns (cf PTB report page 14)
CABDLY = 245.8 ns
INTDLY = -36.9 ns (GPS P1), -24.3 ns (GPS P2)

PT09:

REFDLY = 183.19 ns (cf PTB report page 13,14)
CABDLY = 198.7 ns

PT10:

REFDLY = 52.04 ns (cf PTB report page 14)
CABDLY = 250.0 ns

Setup at the PTB

Laboratory:	PTB
Date and hour of the beginning of measurements:	2018-11-19 (approx. 13:00 UTC)
Date and hour of the end of measurements:	2018-12-03

Information on the system

	Local: (1) PTBB (2) PTBG	**Travelling:** (1) BP1X, (2) BP1C
• Receiver maker:	(1)+(2) ASHTECH	(1) Mesit, (2) Septentrio
Receiver type:	(1)+(2) Z-XII3T	(1) GTR51, (2) PolaRx3e TR
Receiver serial number:	(1) RT820013901, (2) RT920032501	(1) 1306001, (2) S9000169176
1 PPS trigger level /V:	1 V	1 V
• Antenna cable maker:	(1) Nokia, (2) Belden	
Antenna cable type :	(1) RG214, (2) RG8	(1) C178 (2) C131
Phase stabilised cable (Y/N):		
Length outside the building /m:	approx. 25 m	approx. 25 m
• Antenna maker:	(1) Ashtech, (2) Ashtech	(1) Novatel, (2) Ashtech
Antenna type:	(1) ASH700936 SNOW	(1) GPS-703 GG (2)
Antenna serial number:	(1) CR15930	(1) NEG13160018, (2) CR6200323008
Temperature (if stabilised) /°C	no	no

Measured delays /ns

	Local:	**Travelling:**
• Delay from local UTC to receiver 1 PPS-in (X_P)	See Report for details	See Report for details
Delay from 1 PPS-in to internal Reference (if different): (X_O)		
• Antenna cable delay: (X_C)		??
Splitter delay (if any):	N/A	N/A
Additional cable delay (if any):	N/A	N/A

Data used for the generation of CGGTTS files

	LOCAL: P1 / P2	Travelling
• INT DLY (or X_R+X_S) (GPS) /ns:	(1) 304.5 / 319.8 (2) 301.5 / 323.9	0
• INT DLY (or X_R+X_S) (GLONASS) /ns:		0
• CAB DLY (or X_C) /ns:	(1) 301.7* (2) 251.4*	0
• REF DLY (or X_P+X_O) /ns:	(1) 73.9 (2) 46.1	0
• Coordinates reference frame:	ITRF	ITRF
Latitude or X /m:	(1) 3844059.82^T (2) 3844064.23^T	(1) 3844065.77$^+$ (2) 3844062.23^ü
Longitude or Y /m:	(1) 709661.55^T (2) 709657.83^T	(1) 709658.27$^+$ (2) 709658.62^ü
Height or Z /m:	(1) 5023129.78^T (2) 5023126.73^T	(1) 5023125.32$^+$ (2) 5023128.25^ü

General information

Rise time of the local UTC pulse:	< 5 ns
• Is the laboratory air conditioned:	yes

Set temperature value and uncertainty:	22.8 °C ± 0.5 °C
Set humidity value and uncertainty:	

Notes:

* value not measured in 2018

\+ values determined by PPP 2018-06-14, mast designation P1

T values according to BIPM TM281 (2018)

Ü old coordinate values, mast used with PT05 in the past, designation P9

Laboratory:	PTB
Date and hour of the beginning of measurements:	2018-11-19 (approx. 13:00 UTC)
Date and hour of the end of measurements:	2018-12-03

Information on the system

	Local: (3) PT09 (4) PT10	
• Receiver maker:	(3) Septentrio (4) Dicom (mesit)	
Receiver type:	(3) PolaRx4TR PRO (4) GTR51	
Receiver serial number:	(3) 3001148, (4) 1309042	
1 PPS trigger level /V:	1 V	
• Antenna cable maker:	(3) ??, (4) Belden	
Antenna cable type :	(3) Ecoflex 15plus, (4) 8214 RG-8/U	
Phase stabilised cable (Y/N):	y	
Length outside the building /m:	approx. 25 m	
• Antenna maker:	(3) Novatel, (4) NavExperience	
Antenna type:	(3) NOV750.R4 NOVS (4) 3G+C	
Antenna serial number:	(3) n/a (4) NA 0121	
Temperature (if stabilised) /°C		

Measured delays /ns

	Local:	**Travelling:**
• Delay from local UTC to receiver 1 PPS-in (X_P)	See Report for details	
Delay from 1 PPS-in to internal Reference (if different): (X_O)		
• Antenna cable delay: (X_C)		
Splitter delay (if any):	N/A	
Additional cable delay (if any):	N/A	

Data used for the generation of CGGTTS files

	LOCAL: P1 / P2 :: E1 / E5a	Travelling
• INT DLY (or X_R+X_S) (GPS) /ns:	(3) 55.9 / 55.1 (4) -26.3 / -32.9	
• INT DLY (or X_R+X_S) (GLONASS) /ns:		
INT DLY (GALILEO)	(3) 54 / 58.9 (4) -24.0 / -35.7	
• CAB DLY (or X_C) /ns:	(3) 198.7* (4) 250.0*	
• REF DLY (or X_P+X_O) /ns:	(3) 182.6 (4) 52.0	
• Coordinates reference frame:	ITRF	
Latitude or X /m:	(3) 3844057.34 (4) 3844056.64	
Longitude or Y /m:	(3) 709663.82 (4) 709664.25	
Height or Z /m:	(3) 5023131.76 (4) 5023131.88	

General information

Rise time of the local UTC pulse:	< 5 ns
• Is the laboratory air conditioned:	yes

Set temperature value and uncertainty:	22.8 °C ± 0.5 °C
Set humidity value and uncertainty:	

Note: * not measured in 2018, all antenna coordinates (APC) determined in 2018 using PPP.

Laboratory:	PTB
Date and hour of the beginning of measurements:	2018-11-19 (approx. 13:00 UTC)
Date and hour of the end of measurements:	2018-12-03

Information on the system

	Local: (5) PT07	
• Receiver maker:	(5) Dicom (mesit)	
Receiver type:	(5) GTR50	
Receiver serial number:	(3) 806091,	
1 PPS trigger level /V:	1 V	
• Antenna cable maker:	(5) Andrews	
Antenna cable type :	(5) FSJ-1	
Phase stabilised cable (Y/N):	Y	
Length outside the building /m:	approx. 25 m	
• Antenna maker:	(5) Novatel	
Antenna type:	(5) GPS-702-PP	
Antenna serial number:	(3) SN 01017577	
Temperature (if stabilised) /°C		

Measured delays /ns

	Local:	
• Delay from local UTC to receiver 1 PPS-in (X_P)	See Report for details	
Delay from 1 PPS-in to internal Reference (if different): (X_O)		
• Antenna cable delay: (X_C)		
Splitter delay (if any):	N/A	
Additional cable delay (if any):	N/A	

Data used for the generation of CGGTTS files

	LOCAL: P1 / P2	
• INT DLY (or X_R+X_S) (GPS) /ns:	-36.9 ns / -24.3 ns	
• INT DLY (or X_R+X_S) (GLONASS) /ns:		
• CAB DLY (or X_C) /ns:	245.8*	
• REF DLY (or X_P+X_O) /ns:	43.5	
• Coordinates reference frame:	ITRF	
Latitude or X /m:	3844062.43[P]	
Longitude or Y /m:	709659.03[P]	
Height or Z /m:	5023128.06[P]	

General information

Rise time of the local UTC pulse:	< 5 ns
• Is the laboratory air conditioned:	yes

Set temperature value and uncertainty:	22-8 °C ± 0.5 °C
Set humidity value and uncertainty:	

Notes:

* not measured in 2018

P coordinates likely not up-to-date.

Diagram of the experiment set-up:

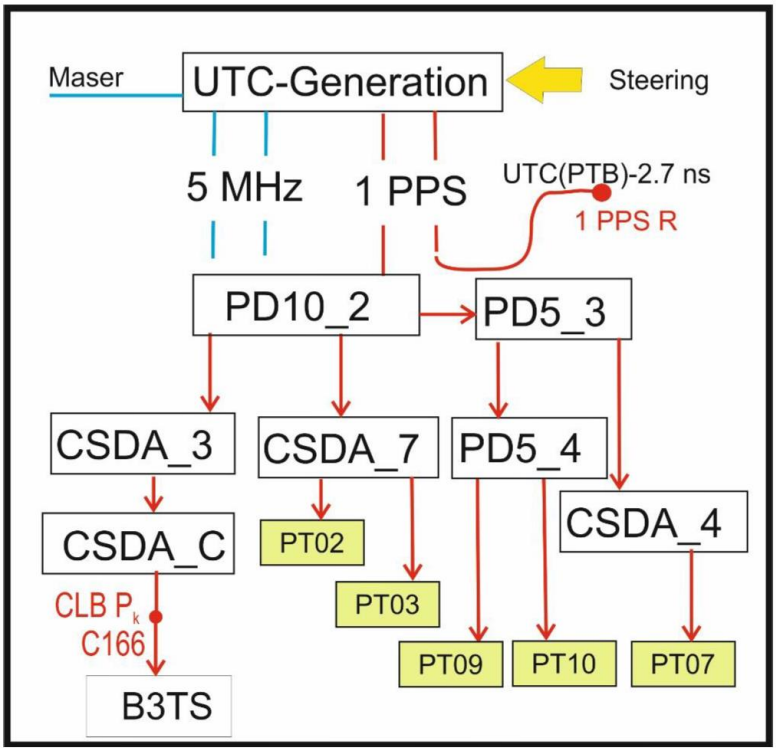


Figure 1: Signal distribution (1pps) to local receivers and B3TS

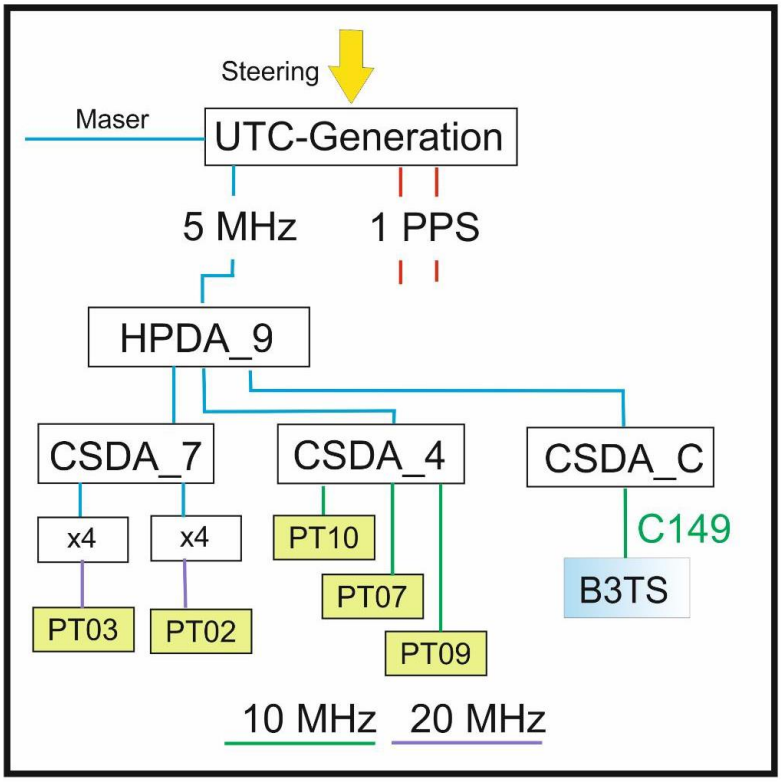


Figure 2: Signal distribution (5 MHz, 10 MHz, 20 MHz) to local receivers and B3TS

Explanation of Acronyms:

HPDA: High Performance Distribution Amplifier (MHz – signals), CSDA: Clock Signal Distribution Amplifier (1PPS and MHz signals), x4: Multiplier 5 MHz -> 20 MHz

Log of Events / Additional Information :

PTB report: "Relative calibration of internal delays of PTB GNSS receivers by means of B3TS – Campaign 1001-2018, v. 1.1, 2018-12-19, A. Bauch, D. Piester, T. Polewka" received by email on December 12th 2018, filename: "PTB_GNSS_Calibration_Report_2018-12-19.docx".

BP1X-PTBB

COMPUTATION OF BASELINE

```
Number of codes to fit baseline and biases = 287643
Number of huge residuals =    14. New iteration
Computed code bias (P1/P2)/m =   -160.620  -165.629
Computed baseline (X,Y,Z)/m =     -5.831     3.247     4.516
RMS of residuals /m =      0.607

Number of phase differences to fit baseline
L1/L2 = 286303
L5    =      0
A priori baseline (X,Y,Z)/m =     -5.831     3.247     4.516
35688 clock jitters computed out of  35688 intervals
AVE jitter /ps =    0.2 RMS jitter /ps =    5.8

Iter  1 Large residuals L1=    1
Iter  1 Large residuals L2=    2
Iter  1 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =     -0.055     0.038     0.017
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =     -0.048     0.041     0.030
RMS of residuals L2 /m =      0.005
No computed baseline L5, will use L1/L2

Iter  2 Large residuals L1=    1
Iter  2 Large residuals L2=    2
Iter  2 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =     -0.055     0.038     0.017
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =     -0.048     0.041     0.030
RMS of residuals L2 /m =      0.005
No computed baseline L5, will use L1/L2


Final baseline L1 (X,Y,Z)/m =     -5.886     3.285     4.533
Final baseline L2 (X,Y,Z)/m =     -5.878     3.288     4.546
Final baseline L5 (X,Y,Z)/m =     -5.882     3.286     4.539
```

COMPUTATION OF CODE DIFFERENCES

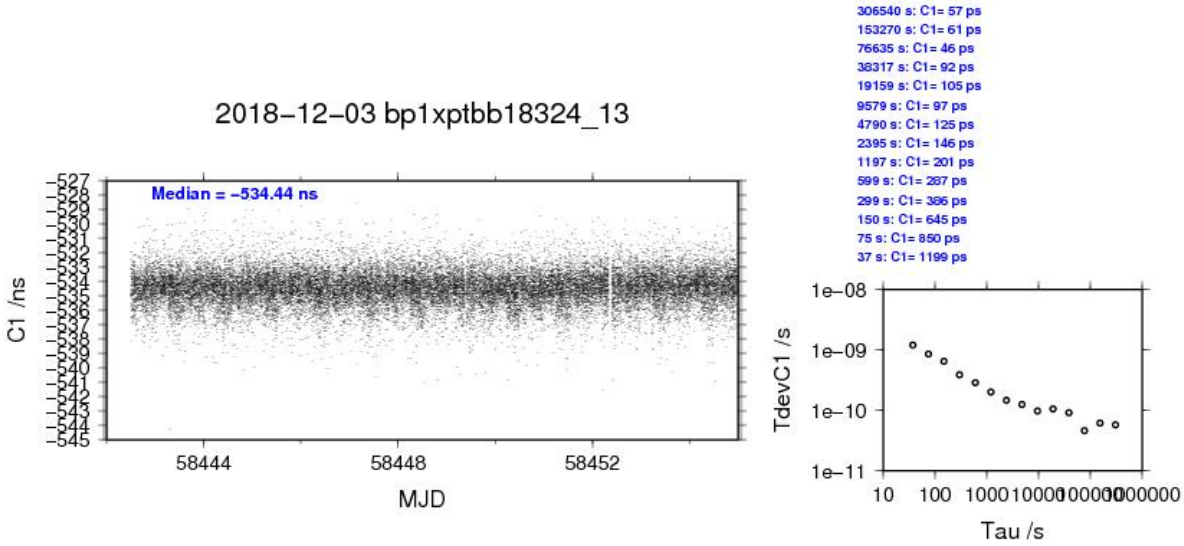
Total number of code differences = 289601

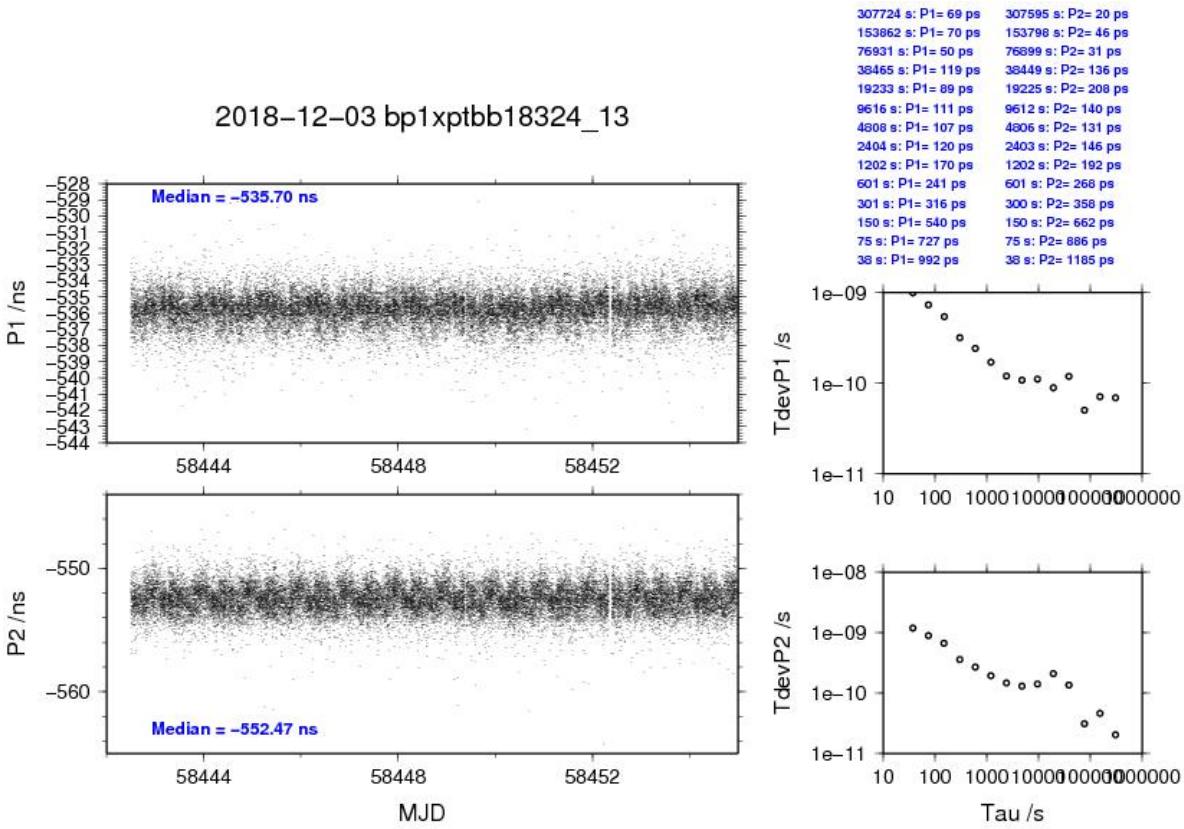
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	289004	-534.448	2.997
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	287692	-535.733	2.216
P2	287923	-552.468	2.427
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3572

Code	#pts	median/ns	ave/ns	rms/ns
C1	28855	-534.437	-534.469	1.210
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	28744	-535.696	-535.738	1.020
P2	28756	-552.473	-552.475	1.229
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1xptbb18324_13
Median = –534.44 ns
C1 /ns
MJD
306540 s: C1= 57 ps
153270 s: C1= 61 ps
76635 s: C1= 46 ps
38317 s: C1= 92 ps
19159 s: C1= 105 ps
9579 s: C1= 97 ps
4790 s: C1= 125 ps
2395 s: C1= 146 ps
1197 s: C1= 201 ps
599 s: C1= 287 ps
299 s: C1= 386 ps
150 s: C1= 645 ps
75 s: C1= 850 ps
37 s: C1= 1199 ps
TdevC1 /s
Tau /s


2018–12–03 bp1xptbb18324_13
Median = –535.70 ns
P1 /ns
Median = –552.47 ns
P2 /ns
MJD
307724 s: P1= 69 ps
153862 s: P1= 70 ps
76931 s: P1= 50 ps
38465 s: P1= 119 ps
19233 s: P1= 89 ps
9616 s: P1= 111 ps
4808 s: P1= 107 ps
2404 s: P1= 120 ps
1202 s: P1= 170 ps
601 s: P1= 241 ps
301 s: P1= 316 ps
150 s: P1= 540 ps
75 s: P1= 727 ps
38 s: P1= 992 ps
307595 s: P2= 20 ps
153798 s: P2= 46 ps
76899 s: P2= 31 ps
38449 s: P2= 136 ps
19225 s: P2= 208 ps
9612 s: P2= 140 ps
4806 s: P2= 131 ps
2403 s: P2= 146 ps
1202 s: P2= 192 ps
601 s: P2= 268 ps
300 s: P2= 358 ps
150 s: P2= 662 ps
75 s: P2= 886 ps
38 s: P2= 1185 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1C-PTBB

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 232897
Number of huge residuals = 888. New iteration
Computed code bias (P1/P2)/m = -163.900 -166.763
Computed baseline (X,Y,Z)/m = -2.385 2.836 1.444
RMS of residuals /m = 0.584

Number of phase differences to fit baseline
L1/L2 = 231761
L5 = 0
A priori baseline (X,Y,Z)/m = -2.385 2.836 1.444
27553 clock jitters computed out of 27554 intervals
AVE jitter /ps = 0.1 RMS jitter /ps = 5.4

Iter 1 Large residuals L1= 10
Iter 1 Large residuals L2= 10
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = 0.069 0.034 0.063
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = 0.066 0.035 0.060
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 10
Iter 2 Large residuals L2= 10
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = 0.069 0.034 0.063
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = 0.066 0.035 0.060
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -2.316 2.870 1.506
Final baseline L2 (X,Y,Z)/m = -2.319 2.870 1.503
Final baseline L5 (X,Y,Z)/m = -2.318 2.870 1.505

COMPUTATION OF CODE DIFFERENCES

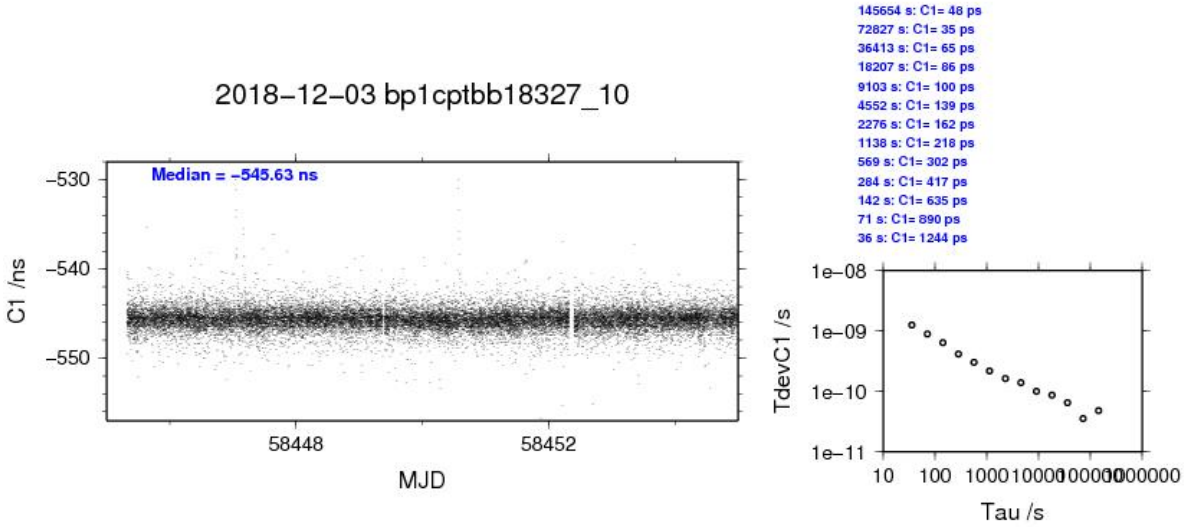
Total number of code differences = 238802

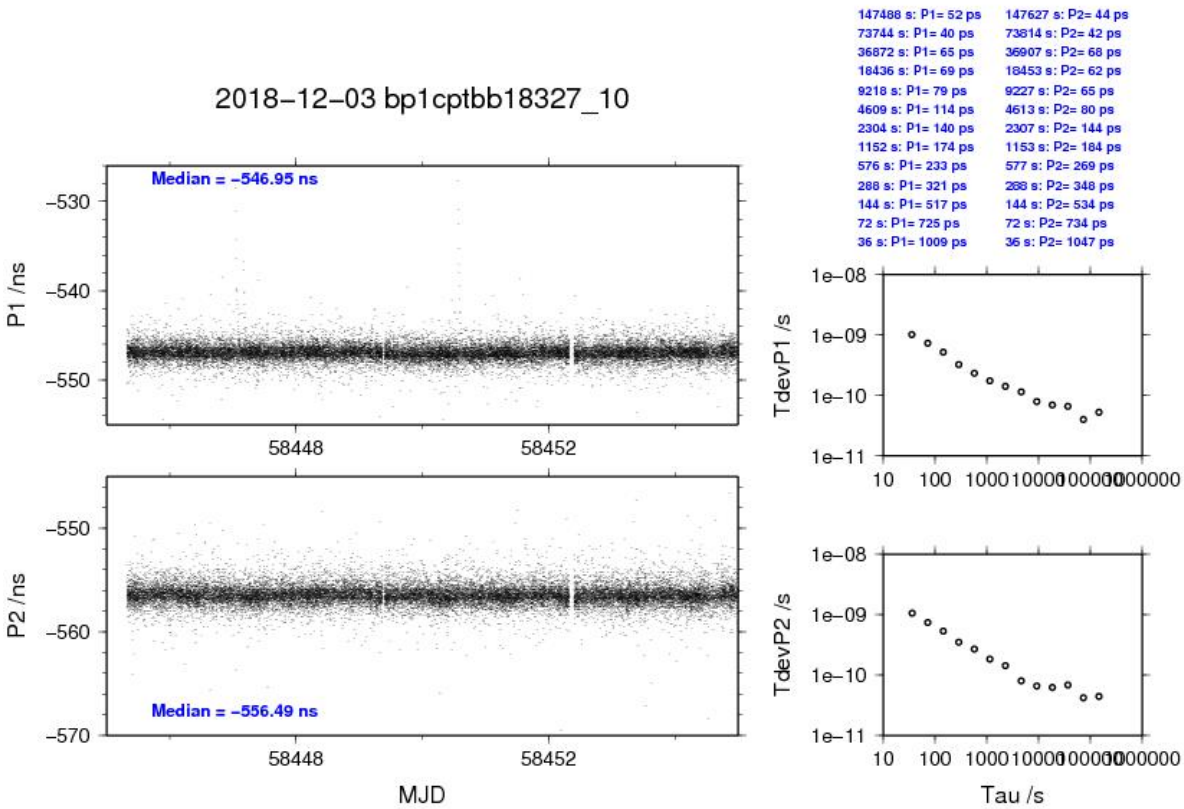
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	236058	-545.612	3.225
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	232935	-546.899	2.284
P2	232726	-556.439	2.392
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 2765

Code	#pts	median/ns	ave/ns	rms/ns
C1	23564	-545.630	-545.627	1.251
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	23271	-546.948	-546.917	1.013
P2	23249	-556.491	-556.452	1.048
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1cptbb18327_10
Median = –545.63 ns
C1 /ns
–530
–540
–550
58448
58452
MJD
145654 s: C1= 48 ps
72827 s: C1= 35 ps
36413 s: C1= 65 ps
18207 s: C1= 86 ps
9103 s: C1= 100 ps
4552 s: C1= 139 ps
2276 s: C1= 162 ps
1138 s: C1= 218 ps
569 s: C1= 302 ps
284 s: C1= 417 ps
142 s: C1= 635 ps
71 s: C1= 890 ps
36 s: C1= 1244 ps
TdevC1 /s
1e–08
1e–09
1e–10
1e–11
10
100
1000
10000
100000
1000000
Tau /s


2018–12–03 bp1cptbb18327_10
Median = –546.95 ns
P1 /ns
–530
–540
–550
58448
58452
147488 s: P1= 52 ps
73744 s: P1= 40 ps
36872 s: P1= 65 ps
18436 s: P1= 69 ps
9218 s: P1= 79 ps
4609 s: P1= 114 ps
2304 s: P1= 140 ps
1152 s: P1= 174 ps
576 s: P1= 233 ps
288 s: P1= 321 ps
144 s: P1= 517 ps
72 s: P1= 725 ps
36 s: P1= 1009 ps
147627 s: P2= 44 ps
73814 s: P2= 42 ps
36907 s: P2= 68 ps
18453 s: P2= 62 ps
9227 s: P2= 65 ps
4613 s: P2= 80 ps
2307 s: P2= 144 ps
1153 s: P2= 184 ps
577 s: P2= 269 ps
288 s: P2= 348 ps
144 s: P2= 534 ps
72 s: P2= 734 ps
36 s: P2= 1047 ps
TdevP1 /s
1e–08
1e–09
1e–10
1e–11
10
100
1000
10000
100000
1000000
P2 /ns
–550
–560
–570
Median = –556.49 ns
58448
58452
MJD
TdevP2 /s
1e–08
1e–09
1e–10
1e–11
10
100
1000
10000
100000
1000000
Tau /s

BP1X-PTBG

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 287702
Number of huge residuals = 42. New iteration
Computed code bias (P1/P2)/m = -152.974 -160.246
Computed baseline (X,Y,Z)/m = -1.410 -0.473 1.490
RMS of residuals /m = 0.611

Number of phase differences to fit baseline
L1/L2 = 286313
L5 = 0
A priori baseline (X,Y,Z)/m = -1.410 -0.473 1.490
35775 clock jitters computed out of 35775 intervals
AVE jitter /ps = 0.3 RMS jitter /ps = 5.8

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 1
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.062 0.052 0.009
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.053 0.052 0.023
RMS of residuals L2 /m = 0.005
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 0
Iter 2 Large residuals L2= 1
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.062 0.052 0.009
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.053 0.052 0.023
RMS of residuals L2 /m = 0.005
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -1.472 -0.420 1.500
Final baseline L2 (X,Y,Z)/m = -1.463 -0.421 1.513
Final baseline L5 (X,Y,Z)/m = -1.468 -0.420 1.506

COMPUTATION OF CODE DIFFERENCES

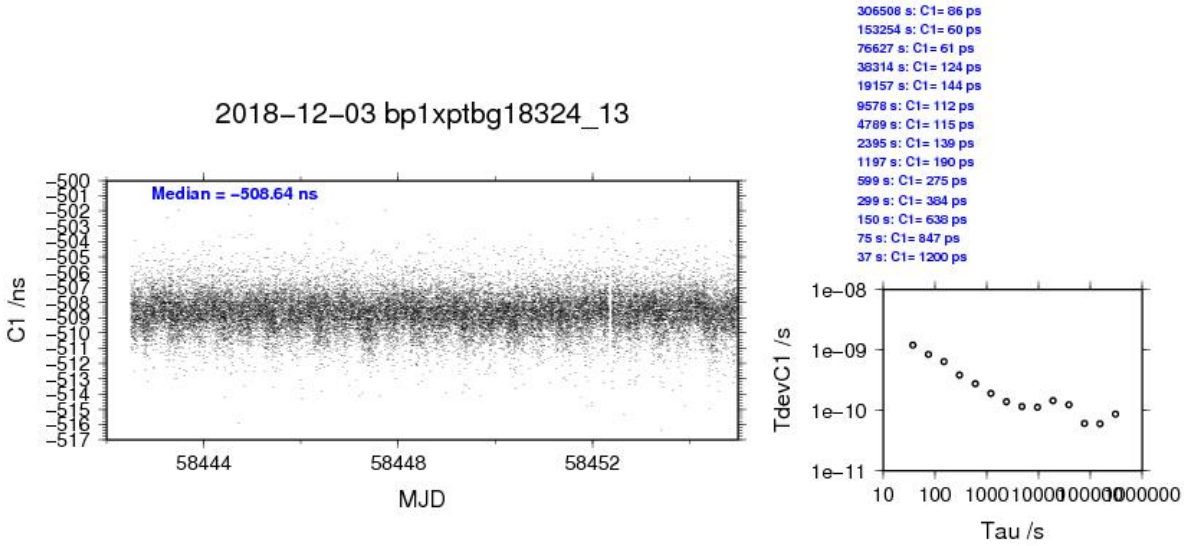
Total number of code differences = 289504

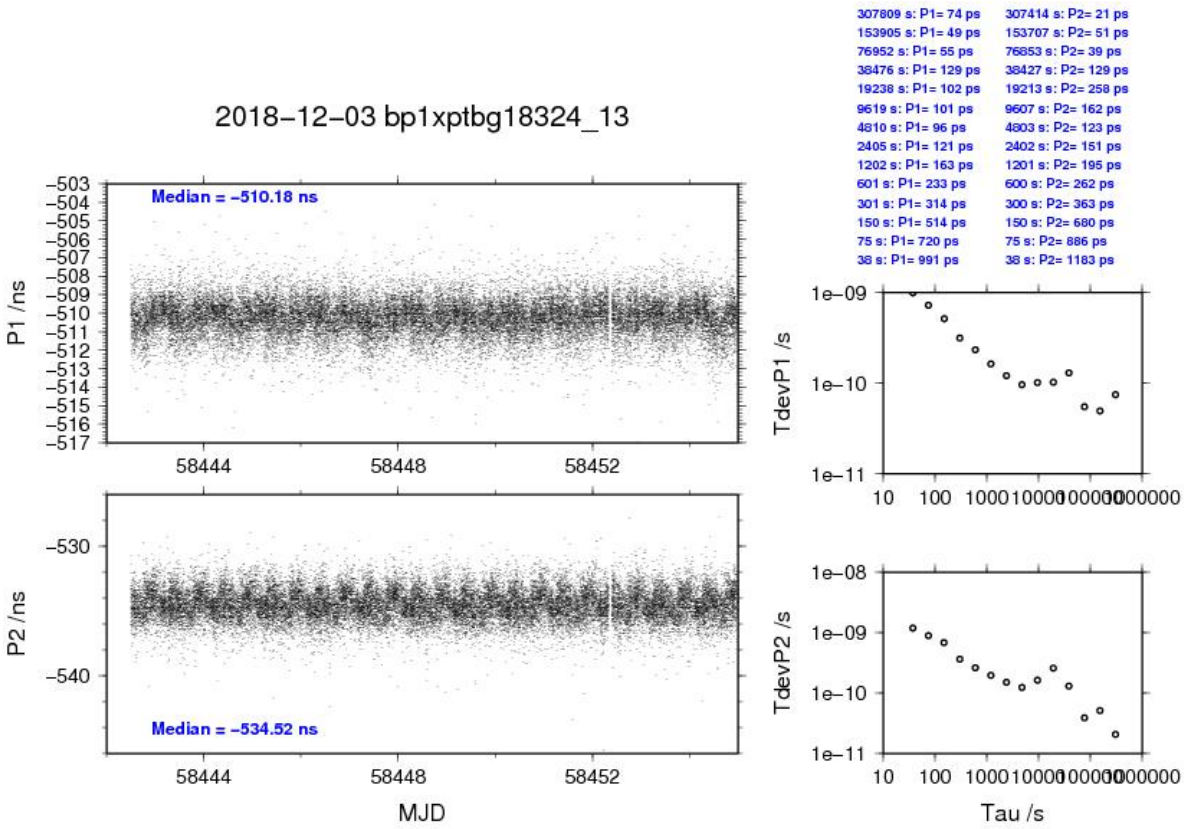
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	288776	-508.614	2.888
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	287653	-510.214	2.166
P2	287952	-534.501	2.403
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3580

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	28858	-508.636	-508.645	1.209
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	28736	-510.184	-510.223	1.006
P2	28773	-534.519	-534.508	1.240
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1xptbg18324_13
Median = –508.64 ns
C1 /ns
MJD
306508 s: C1= 86 ps
153254 s: C1= 60 ps
76627 s: C1= 61 ps
38314 s: C1= 124 ps
19157 s: C1= 144 ps
9578 s: C1= 112 ps
4789 s: C1= 115 ps
2395 s: C1= 139 ps
1197 s: C1= 190 ps
599 s: C1= 275 ps
299 s: C1= 384 ps
150 s: C1= 638 ps
75 s: C1= 847 ps
37 s: C1= 1200 ps
TdevC1 /s
Tau /s


2018–12–03 bp1xptbg18324_13
Median = –510.18 ns
P1 /ns
307809 s: P1= 74 ps
153905 s: P1= 49 ps
76952 s: P1= 55 ps
38476 s: P1= 129 ps
19238 s: P1= 102 ps
9619 s: P1= 101 ps
4810 s: P1= 96 ps
2405 s: P1= 121 ps
1202 s: P1= 163 ps
601 s: P1= 233 ps
301 s: P1= 314 ps
150 s: P1= 514 ps
75 s: P1= 720 ps
38 s: P1= 991 ps
307414 s: P2= 21 ps
153707 s: P2= 51 ps
76853 s: P2= 39 ps
38427 s: P2= 129 ps
19213 s: P2= 258 ps
9607 s: P2= 162 ps
4803 s: P2= 123 ps
2402 s: P2= 151 ps
1201 s: P2= 195 ps
600 s: P2= 262 ps
300 s: P2= 363 ps
150 s: P2= 680 ps
75 s: P2= 886 ps
38 s: P2= 1183 ps
TdevP1 /s
P2 /ns
Median = –534.52 ns
MJD
TdevP2 /s
Tau /s

BP1C-PTBG

COMPUTATION OF BASELINE

```
Number of codes to fit baseline and biases = 233071
Number of huge residuals =   942. New iteration
Computed code bias (P1/P2)/m =   -156.259  -161.379
Computed baseline (X,Y,Z)/m =      2.025    -0.880    -1.580
RMS of residuals /m =      0.587

Number of phase differences to fit baseline
L1/L2 = 231945
L5    =      0
A priori baseline (X,Y,Z)/m =      2.025    -0.880    -1.580
27640 clock jitters computed out of  27641 intervals
AVE jitter /ps =    0.1 RMS jitter /ps =    5.4

Iter  1 Large residuals L1=   10
Iter  1 Large residuals L2=   12
Iter  1 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =      0.072     0.053     0.058
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =      0.069     0.050     0.053
RMS of residuals L2 /m =      0.004
No computed baseline L5, will use L1/L2

Iter  2 Large residuals L1=   10
Iter  2 Large residuals L2=   12
Iter  2 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =      0.072     0.053     0.058
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =      0.069     0.050     0.053
RMS of residuals L2 /m =      0.004
No computed baseline L5, will use L1/L2


Final baseline L1 (X,Y,Z)/m =      2.098    -0.827    -1.522
Final baseline L2 (X,Y,Z)/m =      2.094    -0.830    -1.527
Final baseline L5 (X,Y,Z)/m =      2.096    -0.828    -1.524
```

COMPUTATION OF CODE DIFFERENCES

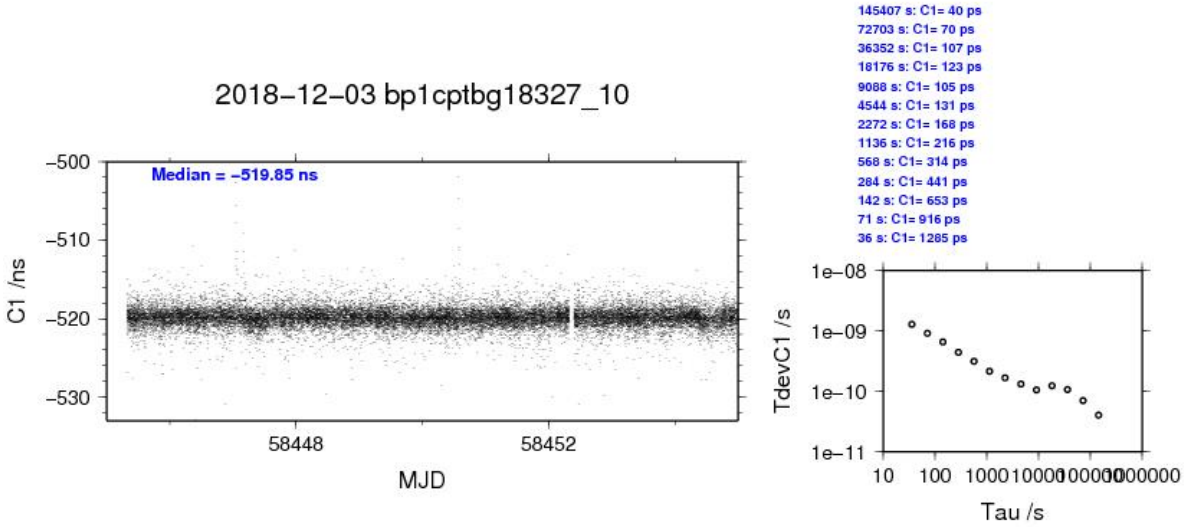
Total number of code differences = 239192

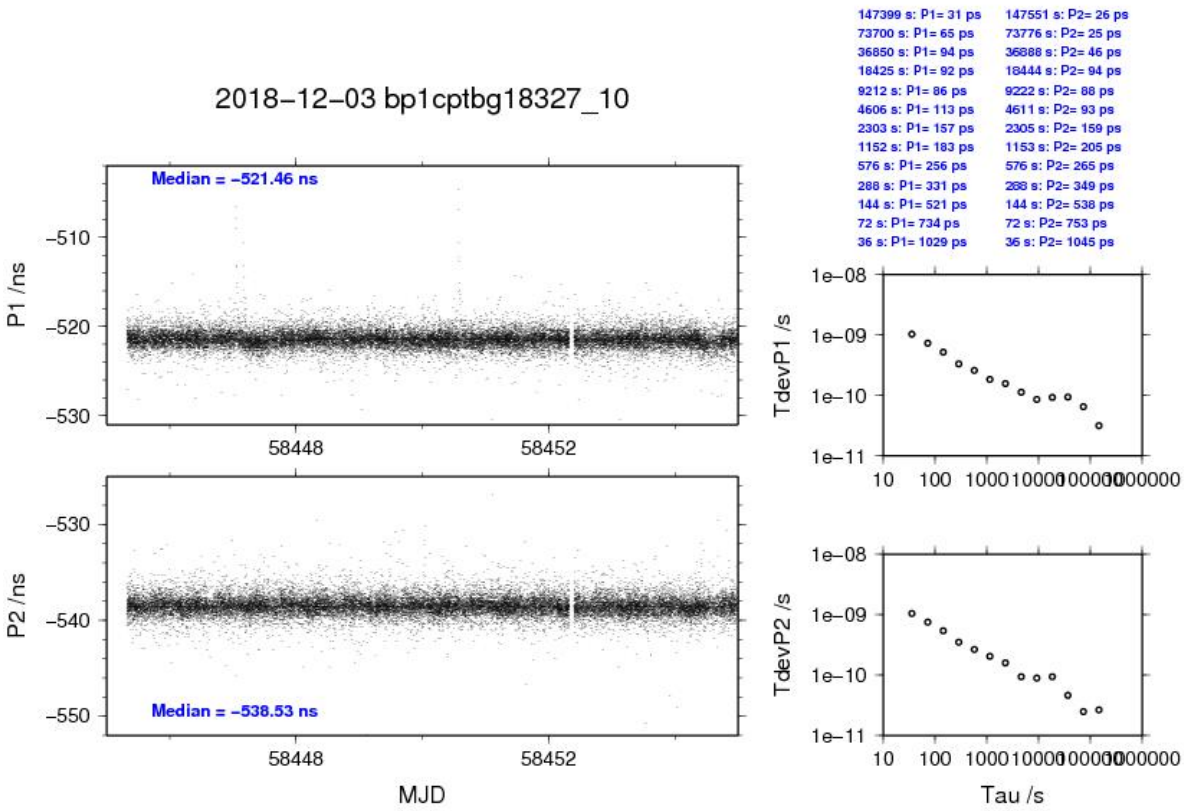
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	236088	-519.812	3.161
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	233196	-521.415	2.275
P2	232804	-538.483	2.391
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 2773

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	23604	-519.854	-519.850	1.295
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	23285	-521.456	-521.432	1.038
P2	23261	-538.531	-538.499	1.061
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1cptbg18327_10
Median = –519.85 ns
C1 /ns
MJD
145407 s: C1= 40 ps
72703 s: C1= 70 ps
36352 s: C1= 107 ps
18176 s: C1= 123 ps
9088 s: C1= 105 ps
4544 s: C1= 131 ps
2272 s: C1= 168 ps
1136 s: C1= 216 ps
568 s: C1= 314 ps
284 s: C1= 441 ps
142 s: C1= 653 ps
71 s: C1= 916 ps
36 s: C1= 1285 ps
TdevC1 /s
Tau /s


2018–12–03 bp1cptbg18327_10
Median = –521.46 ns
P1 /ns
Median = –538.53 ns
P2 /ns
MJD
147399 s: P1= 31 ps
73700 s: P1= 65 ps
36850 s: P1= 94 ps
18425 s: P1= 92 ps
9212 s: P1= 86 ps
4606 s: P1= 113 ps
2303 s: P1= 157 ps
1152 s: P1= 183 ps
576 s: P1= 256 ps
288 s: P1= 331 ps
144 s: P1= 521 ps
72 s: P1= 734 ps
36 s: P1= 1029 ps
147551 s: P2= 26 ps
73776 s: P2= 25 ps
36888 s: P2= 46 ps
18444 s: P2= 94 ps
9222 s: P2= 88 ps
4611 s: P2= 93 ps
2305 s: P2= 159 ps
1153 s: P2= 205 ps
576 s: P2= 265 ps
288 s: P2= 349 ps
144 s: P2= 538 ps
72 s: P2= 753 ps
36 s: P2= 1045 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1X-PT07

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 291811
Number of huge residuals = 29. New iteration
Computed code bias (P1/P2)/m = -1.117 -1.491
Computed baseline (X,Y,Z)/m = -3.188 0.754 2.977
RMS of residuals /m = 0.470

Number of phase differences to fit baseline
L1/L2 = 284743
L5 = 0
A priori baseline (X,Y,Z)/m = -3.188 0.754 2.977
35665 clock jitters computed out of 35710 intervals
AVE jitter /ps = 0.3 RMS jitter /ps = 30.4

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.175 0.049 -0.150
RMS of residuals L1 /m = 0.005
Computed baseline L2 (X,Y,Z)/m = -0.174 0.047 -0.149
RMS of residuals L2 /m = 0.005
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -3.363 0.804 2.827
Final baseline L2 (X,Y,Z)/m = -3.362 0.801 2.828
Final baseline L5 (X,Y,Z)/m = -3.363 0.802 2.827

COMPUTATION OF CODE DIFFERENCES

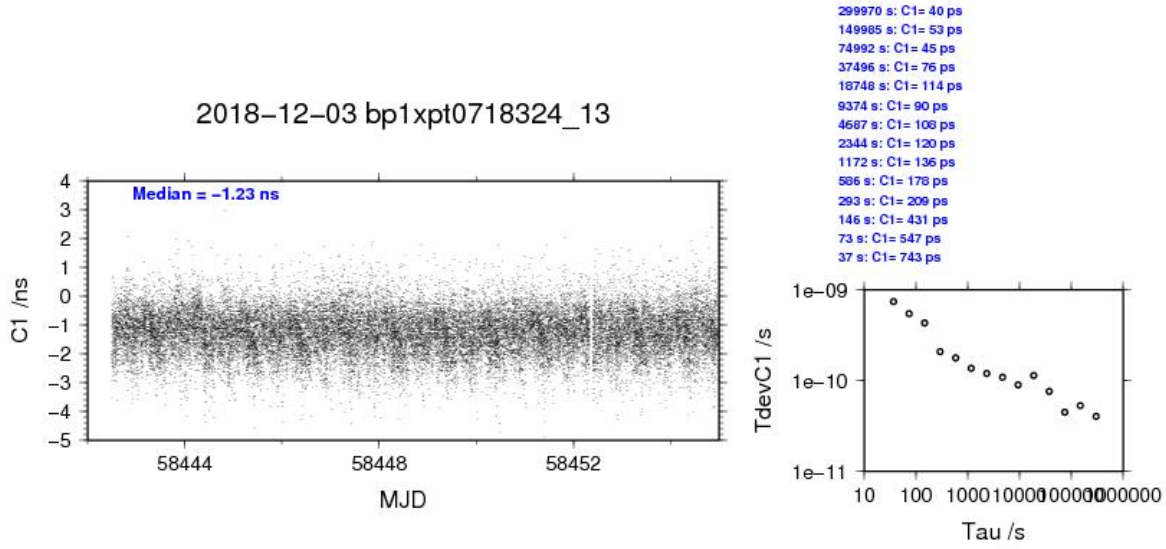
Total number of code differences = 295300

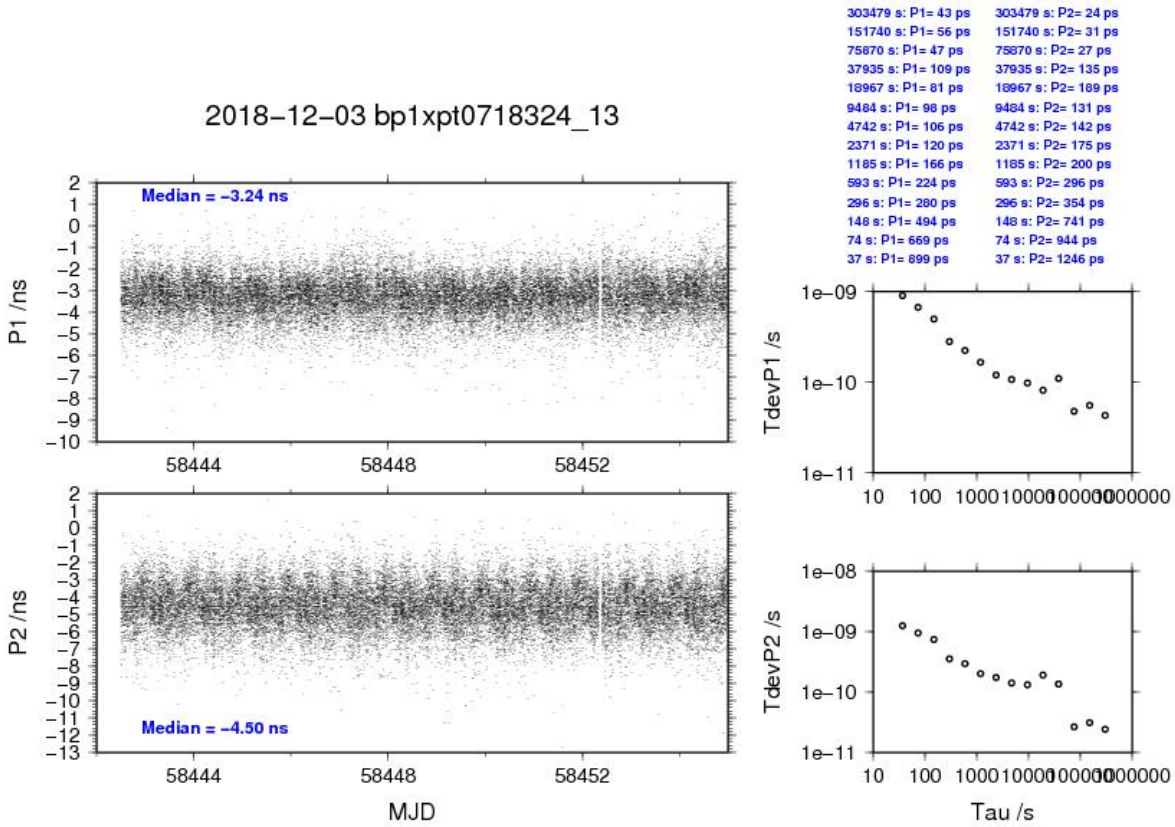
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	295171	-1.255	1.063
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	291733	-3.286	1.447
P2	291731	-4.533	1.814
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3580

Code	#pts	median/ns	ave/ns	rms/ns
C1	29487	-1.233	-1.248	0.775
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	29146	-3.243	-3.274	0.930
P2	29146	-4.504	-4.514	1.305
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1xpt0718324_13
Median = –1.23 ns
C1 /ns
MJD
299970 s: C1= 40 ps
149985 s: C1= 53 ps
74992 s: C1= 45 ps
37496 s: C1= 76 ps
18748 s: C1= 114 ps
9374 s: C1= 90 ps
4687 s: C1= 108 ps
2344 s: C1= 120 ps
1172 s: C1= 136 ps
586 s: C1= 178 ps
293 s: C1= 209 ps
146 s: C1= 431 ps
73 s: C1= 547 ps
37 s: C1= 743 ps
TdevC1 /s
Tau /s


2018–12–03 bp1xpt0718324_13
Median = –3.24 ns
P1 /ns
Median = –4.50 ns
P2 /ns
MJD
303479 s: P1= 43 ps
151740 s: P1= 56 ps
75870 s: P1= 47 ps
37935 s: P1= 109 ps
18967 s: P1= 81 ps
9484 s: P1= 98 ps
4742 s: P1= 106 ps
2371 s: P1= 120 ps
1185 s: P1= 166 ps
593 s: P1= 224 ps
296 s: P1= 280 ps
148 s: P1= 494 ps
74 s: P1= 669 ps
37 s: P1= 899 ps
303479 s: P2= 24 ps
151740 s: P2= 31 ps
75870 s: P2= 27 ps
37935 s: P2= 135 ps
18967 s: P2= 189 ps
9484 s: P2= 131 ps
4742 s: P2= 142 ps
2371 s: P2= 175 ps
1185 s: P2= 200 ps
593 s: P2= 296 ps
296 s: P2= 354 ps
148 s: P2= 741 ps
74 s: P2= 944 ps
37 s: P2= 1246 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1C-PT07

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 222671
Number of huge residuals = 30. New iteration
Computed code bias (P1/P2)/m = -4.402 -2.634
Computed baseline (X,Y,Z)/m = 0.257 0.345 -0.093
RMS of residuals /m = 0.406

Number of phase differences to fit baseline
L1/L2 = 218108
L5 = 0
A priori baseline (X,Y,Z)/m = 0.257 0.345 -0.093
27551 clock jitters computed out of 27572 intervals
AVE jitter /ps = 0.2 RMS jitter /ps = 30.5

Iter 1 Large residuals L1= 12
Iter 1 Large residuals L2= 12
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.050 0.042 -0.102
RMS of residuals L1 /m = 0.005
Computed baseline L2 (X,Y,Z)/m = -0.061 0.038 -0.118
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 12
Iter 2 Large residuals L2= 12
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.050 0.042 -0.102
RMS of residuals L1 /m = 0.005
Computed baseline L2 (X,Y,Z)/m = -0.061 0.038 -0.118
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 0.207 0.387 -0.195
Final baseline L2 (X,Y,Z)/m = 0.196 0.383 -0.211
Final baseline L5 (X,Y,Z)/m = 0.202 0.385 -0.203

COMPUTATION OF CODE DIFFERENCES

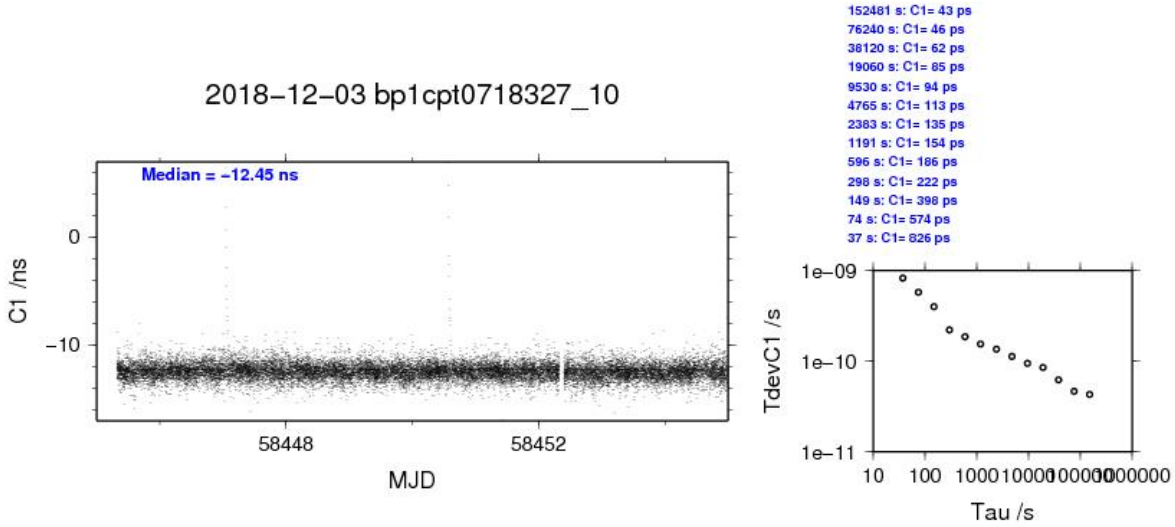
Total number of code differences = 226951

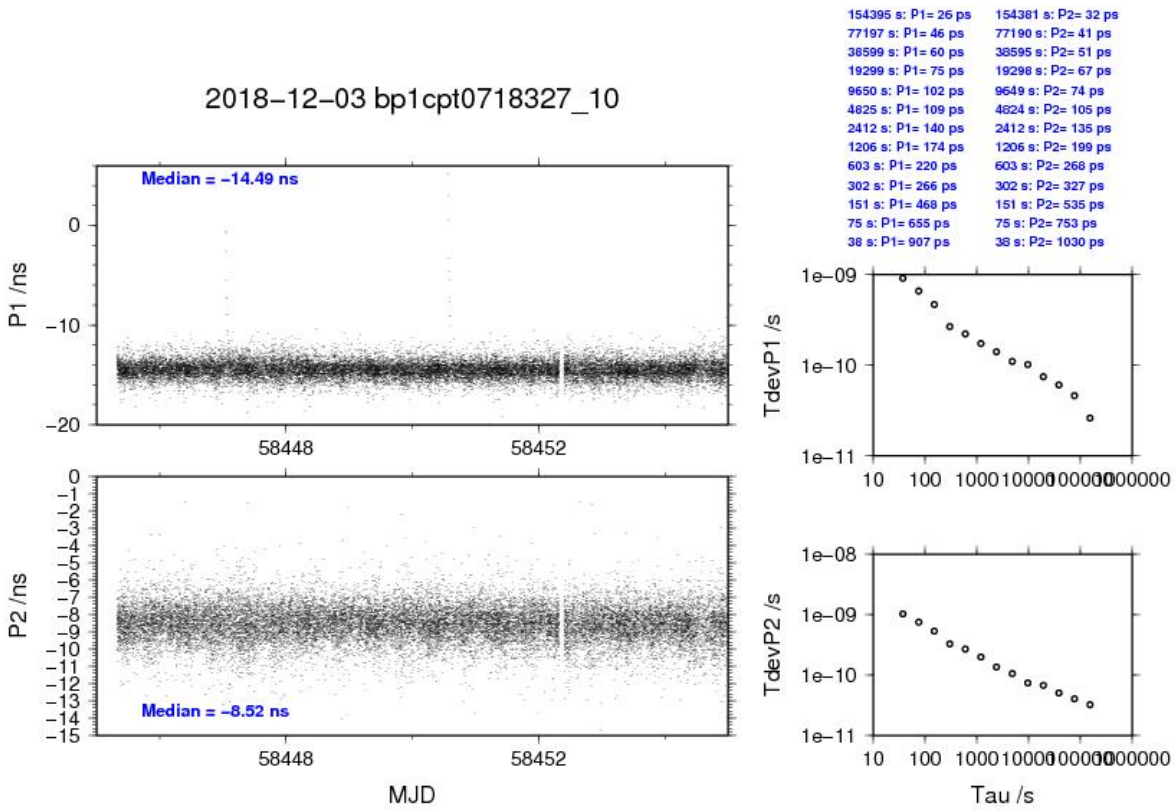
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	225276	-12.439	1.160
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	222547	-14.479	1.292
P2	222565	-8.541	1.513
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 2773

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	22509	-12.448	-12.435	0.815
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	22230	-14.491	-14.480	0.917
P2	22232	-8.518	-8.537	1.047
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1cpt0718327_10
Median = –12.45 ns
C1 /ns
MJD
152481 s: C1= 43 ps
76240 s: C1= 46 ps
38120 s: C1= 62 ps
19060 s: C1= 85 ps
9530 s: C1= 94 ps
4765 s: C1= 113 ps
2383 s: C1= 135 ps
1191 s: C1= 154 ps
596 s: C1= 186 ps
298 s: C1= 222 ps
149 s: C1= 398 ps
74 s: C1= 574 ps
37 s: C1= 826 ps
TdevC1 /s
Tau /s


2018–12–03 bp1cpt0718327_10
Median = –14.49 ns
P1 /ns
Median = –8.52 ns
P2 /ns
MJD
154395 s: P1= 26 ps
77197 s: P1= 46 ps
38599 s: P1= 60 ps
19299 s: P1= 75 ps
9650 s: P1= 102 ps
4825 s: P1= 109 ps
2412 s: P1= 140 ps
1206 s: P1= 174 ps
603 s: P1= 220 ps
302 s: P1= 266 ps
151 s: P1= 468 ps
75 s: P1= 655 ps
38 s: P1= 907 ps
154381 s: P2= 32 ps
77190 s: P2= 41 ps
38595 s: P2= 51 ps
19298 s: P2= 67 ps
9649 s: P2= 74 ps
4824 s: P2= 105 ps
2412 s: P2= 135 ps
1206 s: P2= 199 ps
603 s: P2= 268 ps
302 s: P2= 327 ps
151 s: P2= 535 ps
75 s: P2= 753 ps
38 s: P2= 1030 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1X-PT09

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 297042
Number of huge residuals = 1. New iteration
Computed code bias (P1/P2)/m = -22.682 -22.857
Computed baseline (X,Y,Z)/m = -8.336 5.538 6.507
RMS of residuals /m = 0.460

Number of phase differences to fit baseline
L1/L2 = 295137
L5 = 112560
A priori baseline (X,Y,Z)/m = -8.336 5.538 6.507
35727 clock jitters computed out of 35727 intervals
AVE jitter /ps = 0.2 RMS jitter /ps = 5.7

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.133 0.028 -0.091
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.126 0.026 -0.085
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = -0.120 0.024 -0.078
RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -8.469 5.566 6.416
Final baseline L2 (X,Y,Z)/m = -8.462 5.564 6.423
Final baseline L5 (X,Y,Z)/m = -8.456 5.562 6.430

COMPUTATION OF CODE DIFFERENCES

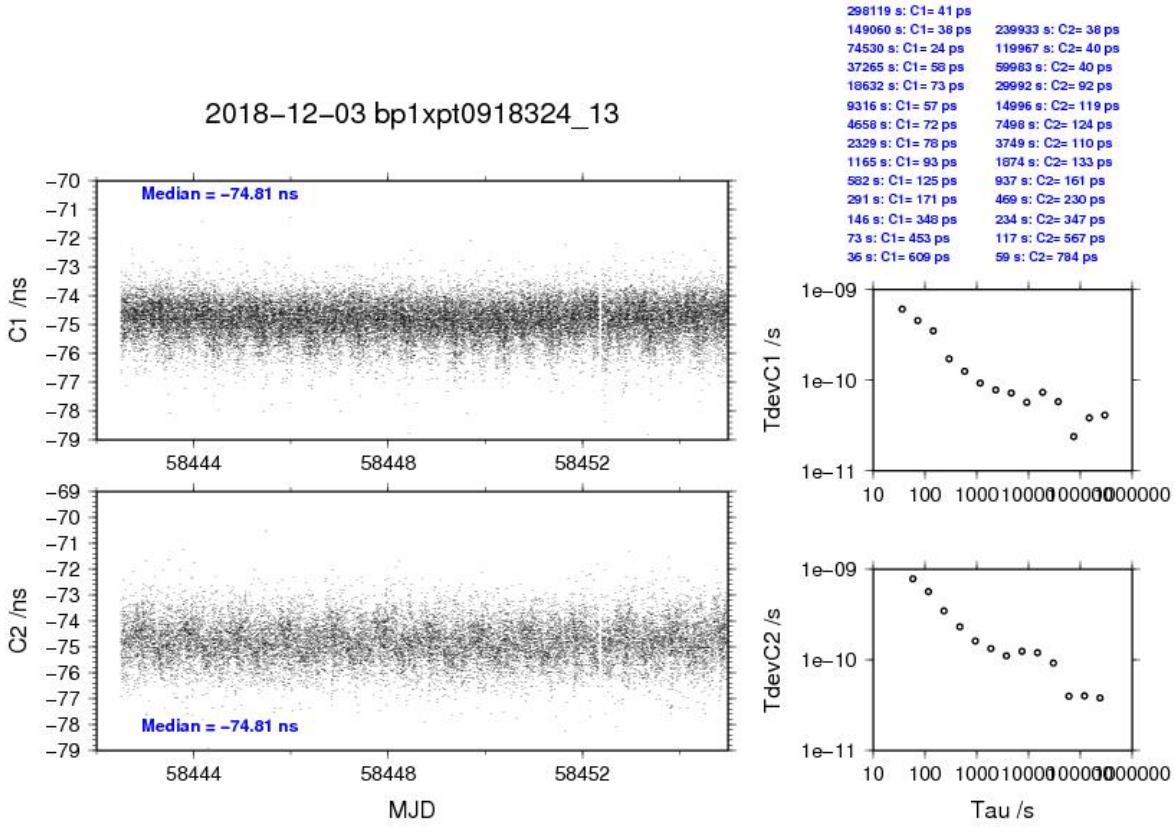
Total number of code differences = 453119

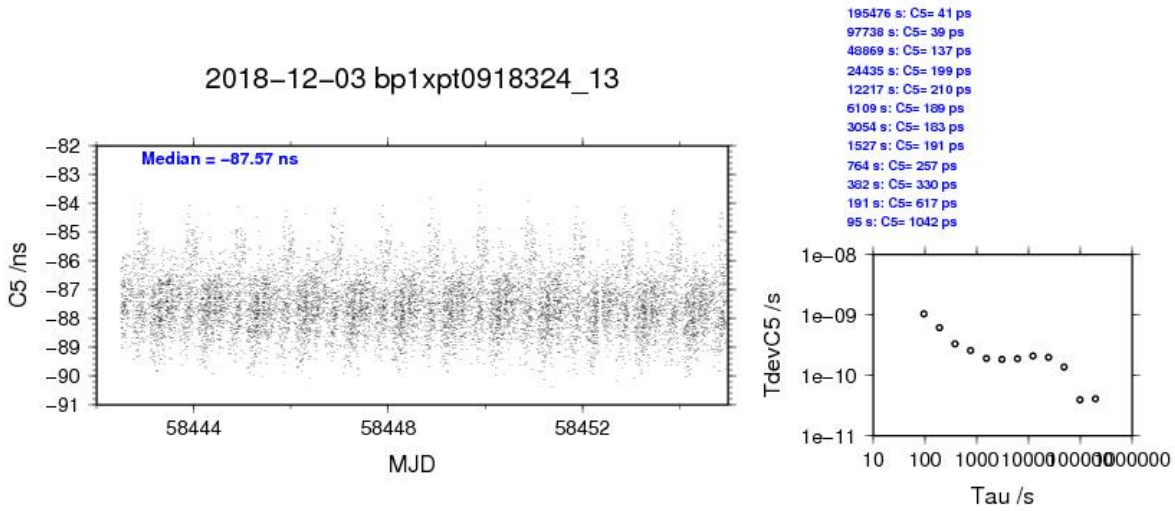
Global average of individual differences

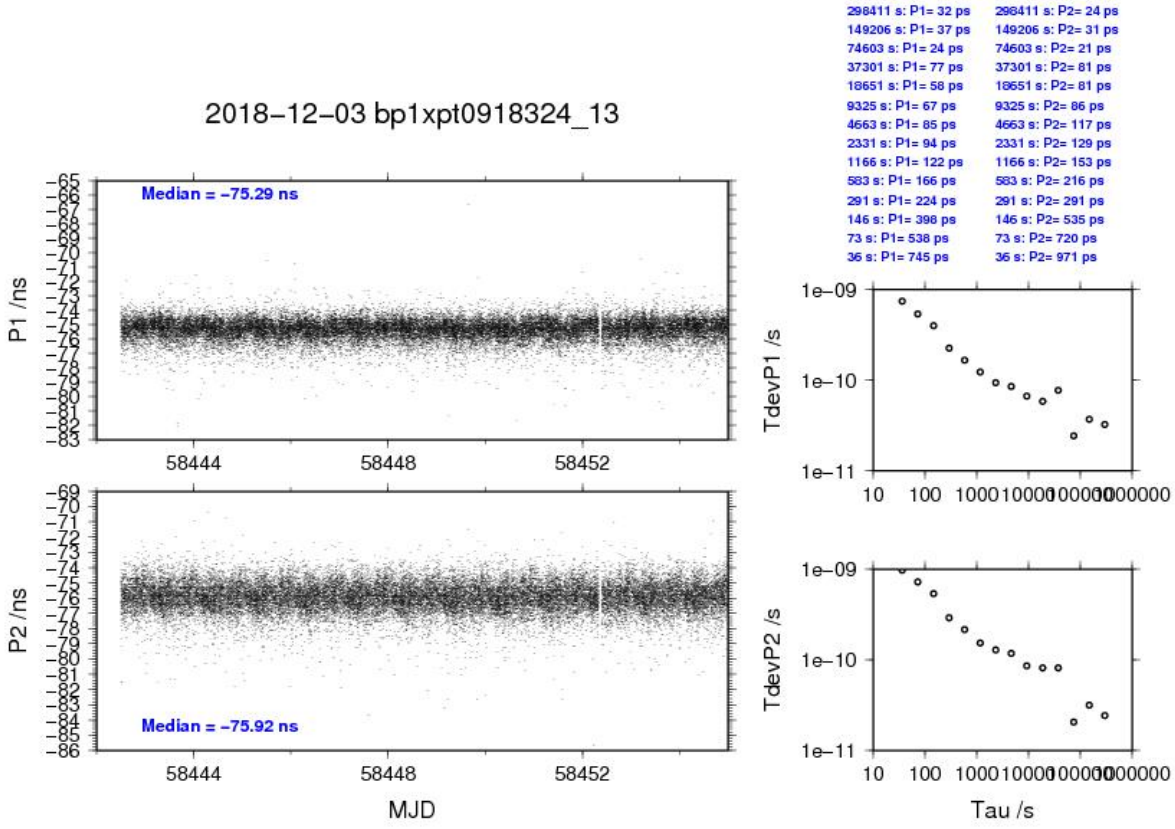
Code	#pts	ave/ns	rms/ns
C1	297298	-74.850	1.144
C2	184606	-74.814	1.477
C5	113362	-87.514	1.300
P1	296965	-75.361	1.510
P2	296958	-75.961	1.763
E1	154860	-72.763	1.055
E5	154748	-86.644	1.050

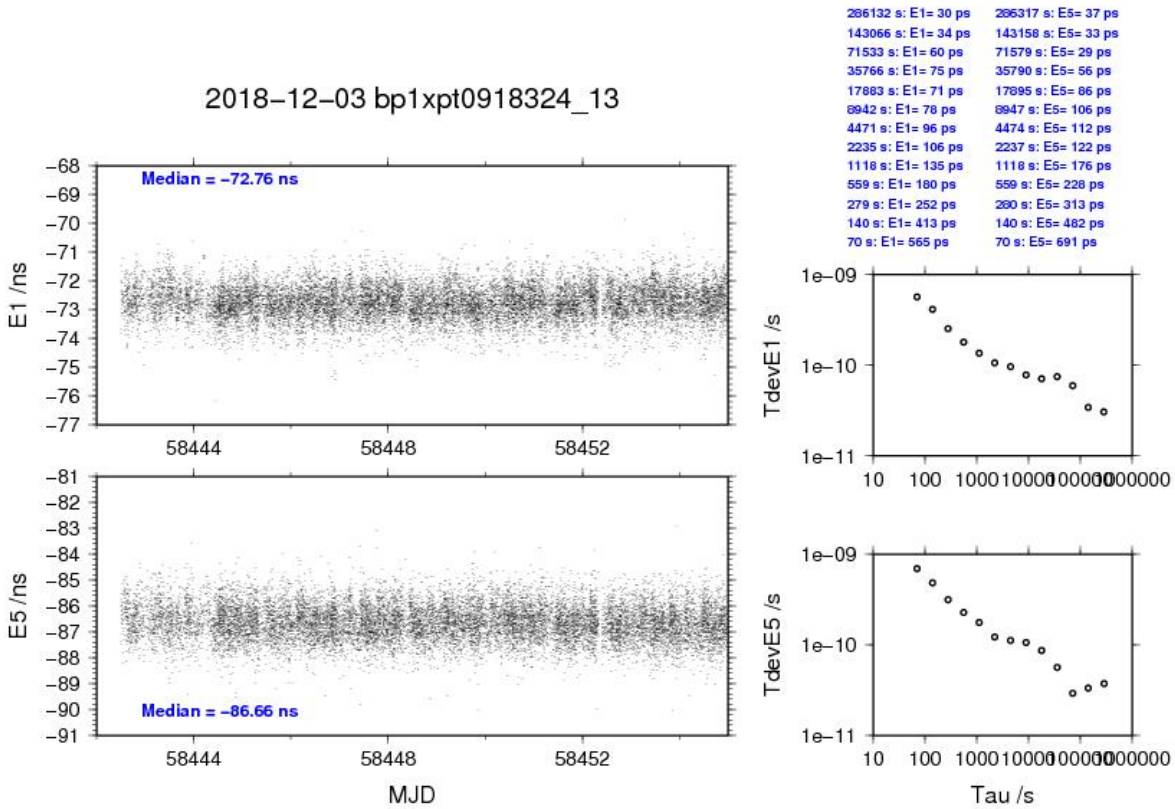
Number of 300s epochs in out file = 3577

Code	#pts	median/ns	ave/ns	rms/ns
C1	29670	-74.807	-74.841	0.625
C2	18433	-74.811	-74.808	0.778
C5	11313	-87.570	-87.512	0.942
P1	29641	-75.293	-75.349	0.751
P2	29641	-75.925	-75.949	0.991
E1	15457	-72.756	-72.753	0.571
E5	15447	-86.656	-86.640	0.688


2018–12–03 bp1xpt0918324_13
Median = –74.81 ns
C1 /ns
C2 /ns
MJD
298119 s: C1= 41 ps
149060 s: C1= 38 ps
74530 s: C1= 24 ps
37265 s: C1= 58 ps
18632 s: C1= 73 ps
9316 s: C1= 57 ps
4658 s: C1= 72 ps
2329 s: C1= 78 ps
1165 s: C1= 93 ps
582 s: C1= 125 ps
291 s: C1= 171 ps
146 s: C1= 348 ps
73 s: C1= 453 ps
36 s: C1= 609 ps
239933 s: C2= 38 ps
119967 s: C2= 40 ps
59983 s: C2= 40 ps
29992 s: C2= 92 ps
14996 s: C2= 119 ps
7498 s: C2= 124 ps
3749 s: C2= 110 ps
1874 s: C2= 133 ps
937 s: C2= 161 ps
469 s: C2= 230 ps
234 s: C2= 347 ps
117 s: C2= 567 ps
59 s: C2= 784 ps
TdevC1 /s
TdevC2 /s
Tau /s


2018–12–03 bp1xpt0918324_13
Median = –87.57 ns
C5 /ns
MJD
195476 s: C5= 41 ps
97738 s: C5= 39 ps
48869 s: C5= 137 ps
24435 s: C5= 199 ps
12217 s: C5= 210 ps
6109 s: C5= 189 ps
3054 s: C5= 183 ps
1527 s: C5= 191 ps
764 s: C5= 257 ps
382 s: C5= 330 ps
191 s: C5= 617 ps
95 s: C5= 1042 ps
TdevC5 /s
Tau /s


2018–12–03 bp1xpt0918324_13
Median = –75.29 ns
Median = –75.92 ns
P1 /ns
P2 /ns
MJD
298411 s: P1= 32 ps
149206 s: P1= 37 ps
74603 s: P1= 24 ps
37301 s: P1= 77 ps
18651 s: P1= 58 ps
9325 s: P1= 67 ps
4663 s: P1= 85 ps
2331 s: P1= 94 ps
1166 s: P1= 122 ps
583 s: P1= 166 ps
291 s: P1= 224 ps
146 s: P1= 398 ps
73 s: P1= 538 ps
36 s: P1= 745 ps
298411 s: P2= 24 ps
149206 s: P2= 31 ps
74603 s: P2= 21 ps
37301 s: P2= 81 ps
18651 s: P2= 81 ps
9325 s: P2= 86 ps
4663 s: P2= 117 ps
2331 s: P2= 129 ps
1166 s: P2= 153 ps
583 s: P2= 216 ps
291 s: P2= 291 ps
146 s: P2= 535 ps
73 s: P2= 720 ps
36 s: P2= 971 ps
TdevP1 /s
TdevP2 /s
Tau /s


2018–12–03 bp1xpt0918324_13
Median = –72.76 ns
Median = –86.66 ns
E1 /ns
E5 /ns
MJD
286132 s: E1= 30 ps
143066 s: E1= 34 ps
71533 s: E1= 60 ps
35766 s: E1= 75 ps
17883 s: E1= 71 ps
8942 s: E1= 78 ps
4471 s: E1= 96 ps
2235 s: E1= 106 ps
1118 s: E1= 135 ps
559 s: E1= 180 ps
279 s: E1= 252 ps
140 s: E1= 413 ps
70 s: E1= 565 ps
286317 s: E5= 37 ps
143158 s: E5= 33 ps
71579 s: E5= 29 ps
35790 s: E5= 56 ps
17895 s: E5= 86 ps
8947 s: E5= 106 ps
4474 s: E5= 112 ps
2237 s: E5= 122 ps
1118 s: E5= 176 ps
559 s: E5= 228 ps
280 s: E5= 313 ps
140 s: E5= 482 ps
70 s: E5= 691 ps
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-PT09

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 228054
Number of huge residuals = 12. New iteration
Computed code bias (P1/P2)/m = -25.957 -23.986
Computed baseline (X,Y,Z)/m = -4.897 5.128 3.421
RMS of residuals /m = 0.418

Number of phase differences to fit baseline
L1/L2 = 226592
L5 = 0
A priori baseline (X,Y,Z)/m = -4.897 5.128 3.421
27592 clock jitters computed out of 27593 intervals
AVE jitter /ps = 0.1 RMS jitter /ps = 5.4

Iter 1 Large residuals L1= 11
Iter 1 Large residuals L2= 12
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.003 0.025 -0.029
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.009 0.022 -0.044
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 11
Iter 2 Large residuals L2= 12
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.003 0.025 -0.029
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.009 0.022 -0.044
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -4.900 5.153 3.392
Final baseline L2 (X,Y,Z)/m = -4.906 5.149 3.377
Final baseline L5 (X,Y,Z)/m = -4.903 5.151 3.385

COMPUTATION OF CODE DIFFERENCES

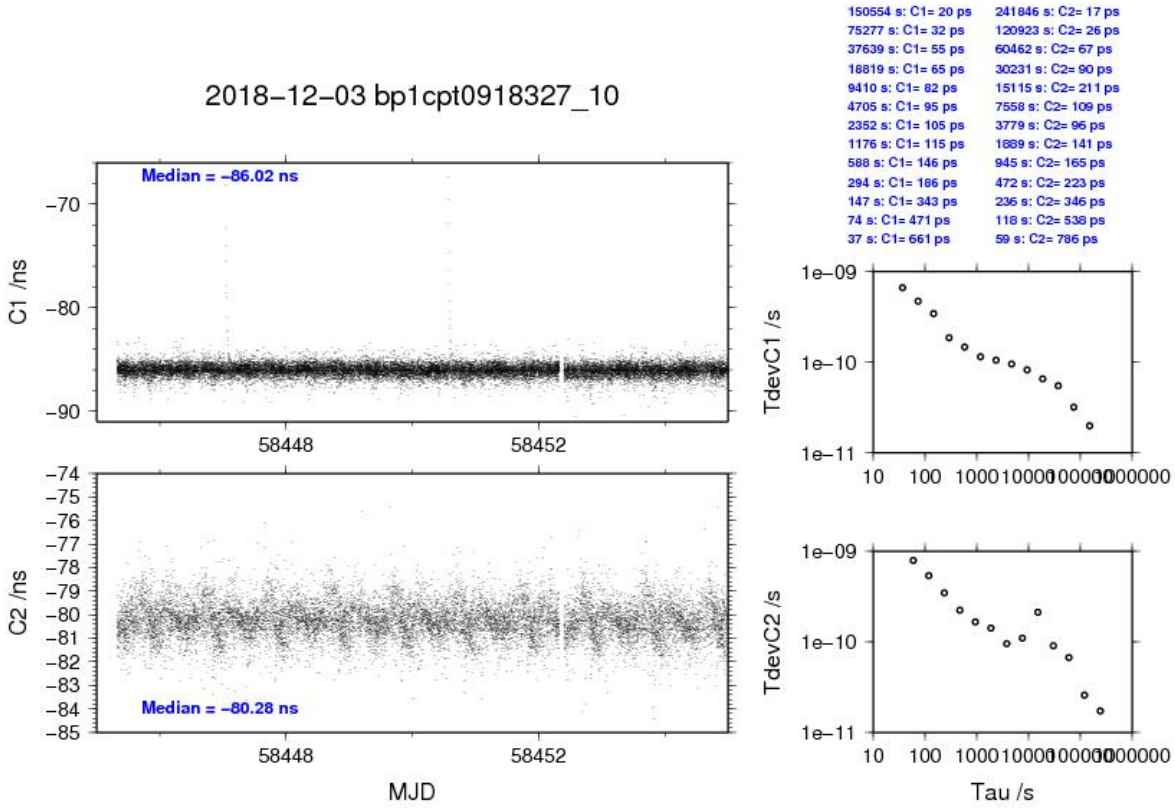
Total number of code differences = 230436

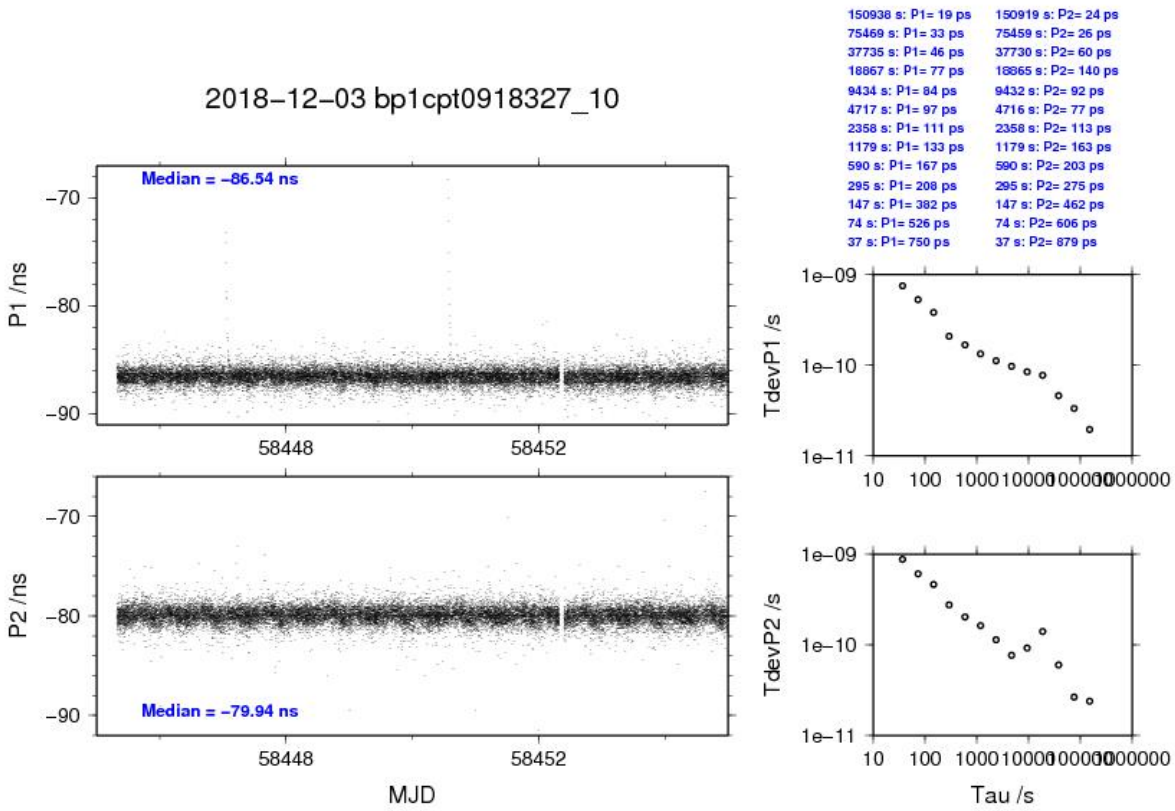
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	228454	-86.031	1.244
C2	142090	-80.268	1.546
C5	0	NaN	NaN
P1	227916	-86.547	1.323
P2	227937	-79.942	1.551
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 2770

Code	#pts	median/ns	ave/ns	rms/ns
C1	22797	-86.018	-86.023	0.664
C2	14192	-80.278	-80.266	0.776
C5	0	0.000	NaN	NaN
P1	22739	-86.543	-86.541	0.744
P2	22742	-79.936	-79.944	0.880
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1cpt0918327_10
Median = –86.02 ns
Median = –80.28 ns
C1 /ns
C2 /ns
MJD
TdevC1 /s
TdevC2 /s
Tau /s
150554 s: C1= 20 ps
75277 s: C1= 32 ps
37639 s: C1= 55 ps
18819 s: C1= 65 ps
9410 s: C1= 82 ps
4705 s: C1= 95 ps
2352 s: C1= 105 ps
1176 s: C1= 115 ps
588 s: C1= 146 ps
294 s: C1= 186 ps
147 s: C1= 343 ps
74 s: C1= 471 ps
37 s: C1= 661 ps
241846 s: C2= 17 ps
120923 s: C2= 26 ps
60462 s: C2= 67 ps
30231 s: C2= 90 ps
15115 s: C2= 211 ps
7558 s: C2= 109 ps
3779 s: C2= 96 ps
1889 s: C2= 141 ps
945 s: C2= 165 ps
472 s: C2= 223 ps
236 s: C2= 346 ps
118 s: C2= 538 ps
59 s: C2= 786 ps


2018–12–03 bp1cpt0918327_10
Median = –86.54 ns
Median = –79.94 ns
P1 /ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s
150938 s: P1= 19 ps
75469 s: P1= 33 ps
37735 s: P1= 46 ps
18867 s: P1= 77 ps
9434 s: P1= 84 ps
4717 s: P1= 97 ps
2358 s: P1= 111 ps
1179 s: P1= 133 ps
590 s: P1= 167 ps
295 s: P1= 208 ps
147 s: P1= 382 ps
74 s: P1= 526 ps
37 s: P1= 750 ps
150919 s: P2= 24 ps
75459 s: P2= 26 ps
37730 s: P2= 60 ps
18865 s: P2= 140 ps
9432 s: P2= 92 ps
4716 s: P2= 77 ps
2358 s: P2= 113 ps
1179 s: P2= 163 ps
590 s: P2= 203 ps
295 s: P2= 275 ps
147 s: P2= 462 ps
74 s: P2= 606 ps
37 s: P2= 879 ps

BP1X-PT10

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 294080
Number of huge residuals = 31. New iteration
Computed code bias (P1/P2)/m = -52.389 -50.859
Computed baseline (X,Y,Z)/m = -9.046 5.979 6.687
RMS of residuals /m = 0.483

Number of phase differences to fit baseline
L1/L2 = 291092
L5 = 111986
A priori baseline (X,Y,Z)/m = -9.046 5.979 6.687
35752 clock jitters computed out of 35752 intervals
AVE jitter /ps = 0.3 RMS jitter /ps = 5.8

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.075 0.048 -0.037
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.074 0.052 -0.036
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = -0.071 0.049 -0.031
RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -9.121 6.027 6.650
Final baseline L2 (X,Y,Z)/m = -9.120 6.031 6.651
Final baseline L5 (X,Y,Z)/m = -9.117 6.029 6.656

COMPUTATION OF CODE DIFFERENCES

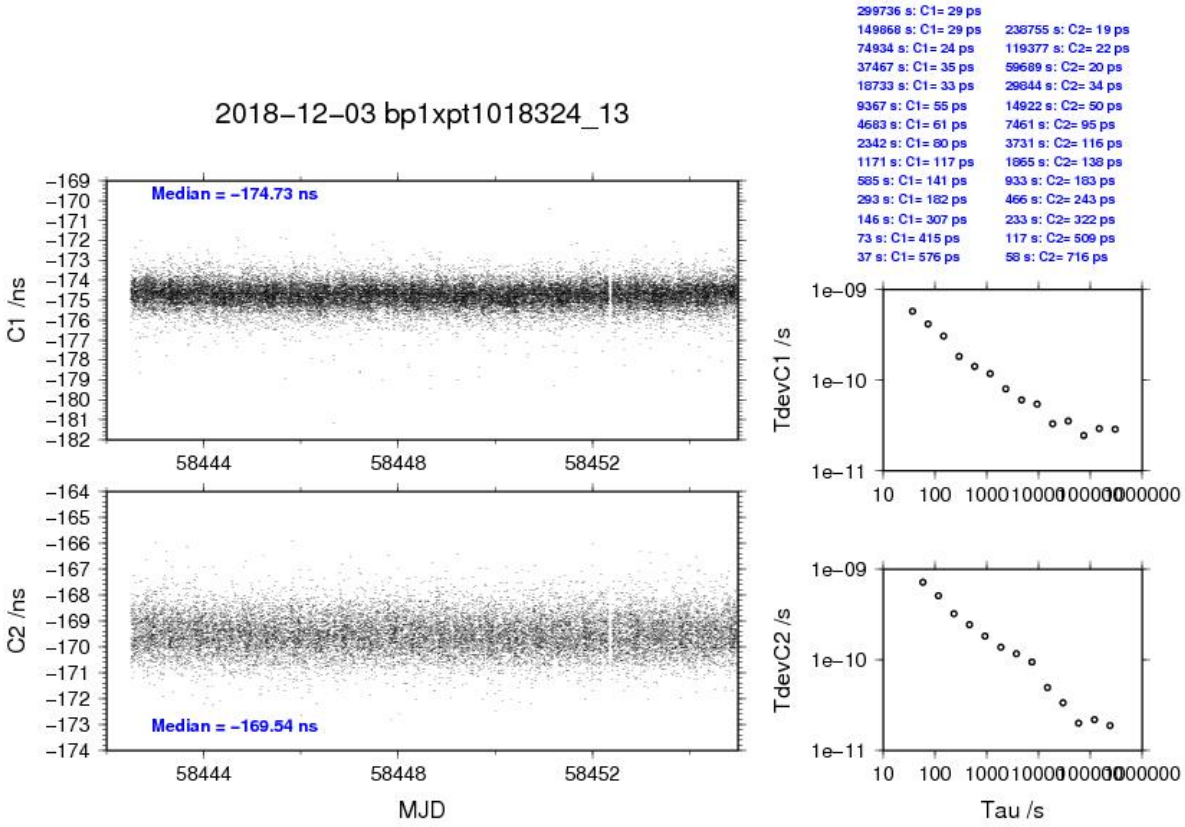
Total number of code differences = 449535

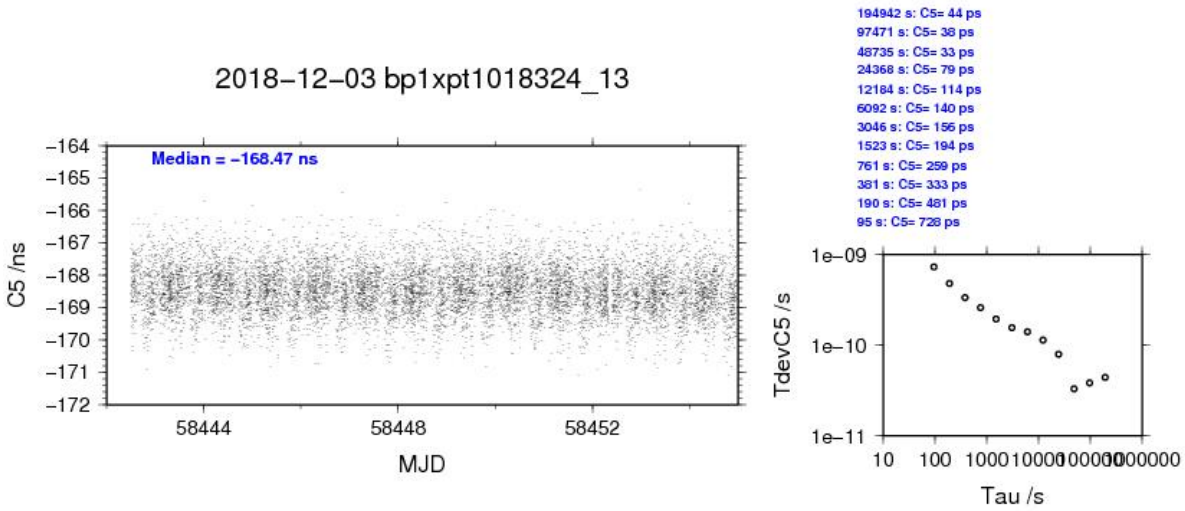
Global average of individual differences

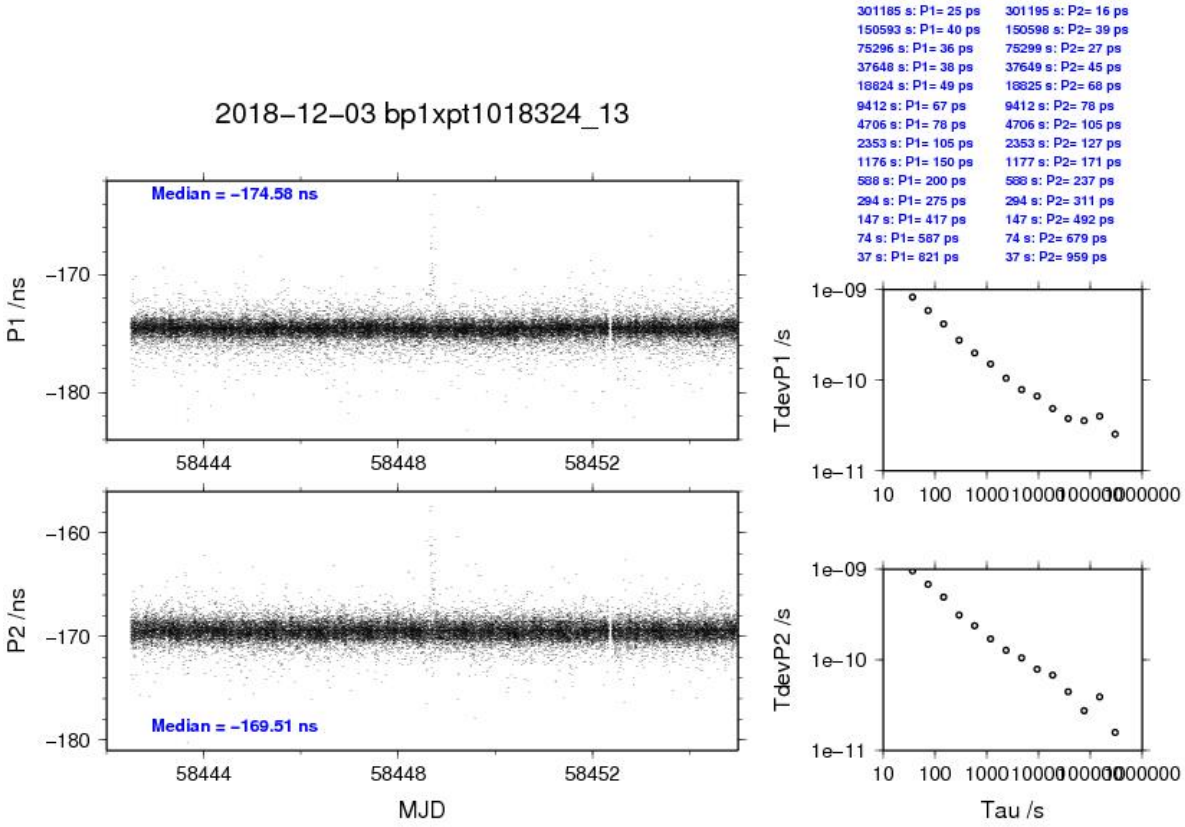
Code	#pts	ave/ns	rms/ns
C1	295319	-174.746	1.097
C2	185333	-169.516	1.369
C5	113477	-168.455	1.099
P1	293992	-174.608	1.761
P2	293960	-169.508	1.936
E1	153225	-174.685	0.980
E5	153222	-168.454	1.092

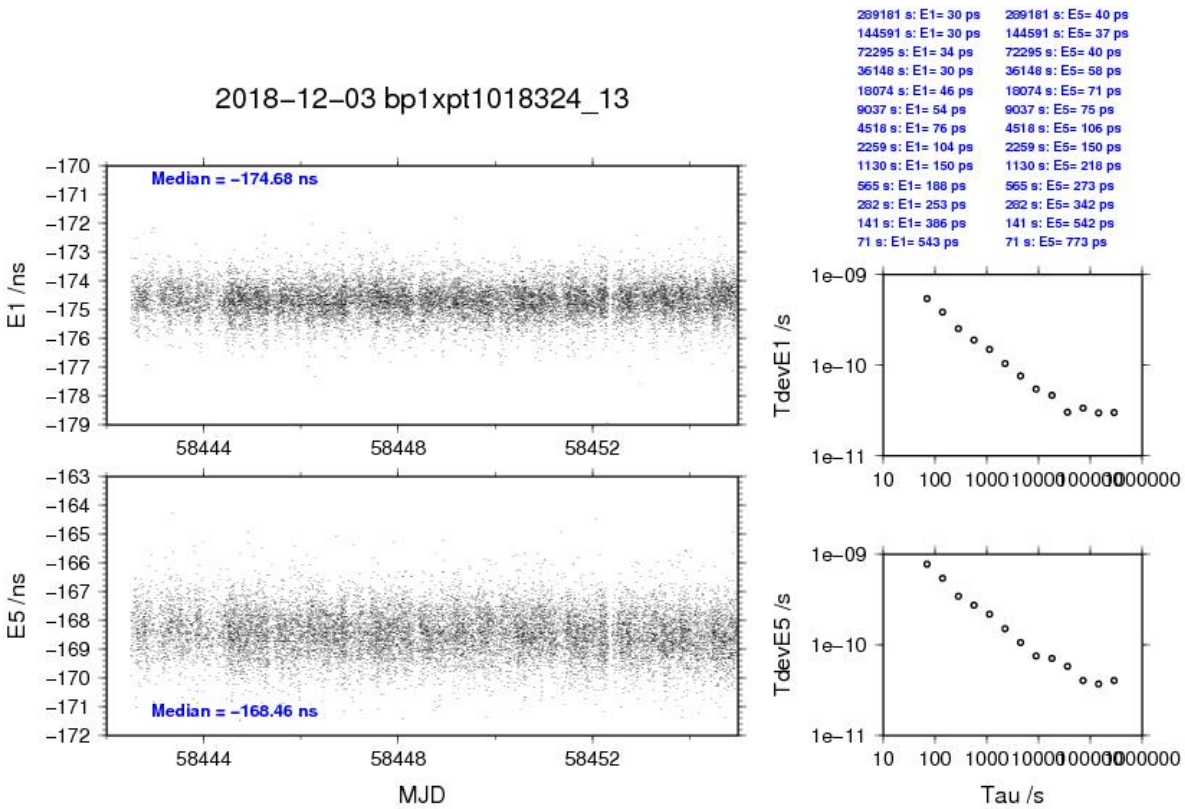
Number of 300s epochs in out file = 3580

Code	#pts	median/ns	ave/ns	rms/ns
C1	29510	-174.731	-174.747	0.587
C2	18524	-169.537	-169.511	0.711
C5	11344	-168.470	-168.451	0.722
P1	29368	-174.582	-174.609	0.825
P2	29367	-169.508	-169.500	0.961
E1	15294	-174.677	-174.685	0.544
E5	15294	-168.458	-168.451	0.770


2018–12–03 bp1xpt1018324_13
Median = –174.73 ns
Median = –169.54 ns
C1 /ns
C2 /ns
MJD
299736 s: C1= 29 ps
149868 s: C1= 29 ps
74934 s: C1= 24 ps
37467 s: C1= 35 ps
18733 s: C1= 33 ps
9367 s: C1= 55 ps
4683 s: C1= 61 ps
2342 s: C1= 80 ps
1171 s: C1= 117 ps
585 s: C1= 141 ps
293 s: C1= 182 ps
146 s: C1= 307 ps
73 s: C1= 415 ps
37 s: C1= 576 ps
238755 s: C2= 19 ps
119377 s: C2= 22 ps
59689 s: C2= 20 ps
29844 s: C2= 34 ps
14922 s: C2= 50 ps
7461 s: C2= 95 ps
3731 s: C2= 116 ps
1865 s: C2= 138 ps
933 s: C2= 183 ps
466 s: C2= 243 ps
233 s: C2= 322 ps
117 s: C2= 509 ps
58 s: C2= 716 ps
TdevC1 /s
TdevC2 /s
Tau /s


2018–12–03 bp1xpt1018324_13
Median = –168.47 ns
C5 /ns
MJD
194942 s: C5= 44 ps
97471 s: C5= 38 ps
48735 s: C5= 33 ps
24368 s: C5= 79 ps
12184 s: C5= 114 ps
6092 s: C5= 140 ps
3046 s: C5= 156 ps
1523 s: C5= 194 ps
761 s: C5= 259 ps
381 s: C5= 333 ps
190 s: C5= 481 ps
95 s: C5= 728 ps
TdevC5 /s
Tau /s


2018–12–03 bp1xpt1018324_13
Median = –174.58 ns
Median = –169.51 ns
P1 /ns
P2 /ns
MJD
301185 s: P1= 25 ps
150593 s: P1= 40 ps
75296 s: P1= 36 ps
37648 s: P1= 38 ps
18824 s: P1= 49 ps
9412 s: P1= 67 ps
4706 s: P1= 78 ps
2353 s: P1= 105 ps
1176 s: P1= 150 ps
588 s: P1= 200 ps
294 s: P1= 275 ps
147 s: P1= 417 ps
74 s: P1= 587 ps
37 s: P1= 821 ps
301195 s: P2= 16 ps
150598 s: P2= 39 ps
75299 s: P2= 27 ps
37649 s: P2= 45 ps
18825 s: P2= 68 ps
9412 s: P2= 78 ps
4706 s: P2= 105 ps
2353 s: P2= 127 ps
1177 s: P2= 171 ps
588 s: P2= 237 ps
294 s: P2= 311 ps
147 s: P2= 492 ps
74 s: P2= 679 ps
37 s: P2= 959 ps
TdevP1 /s
TdevP2 /s
Tau /s


2018–12–03 bp1xpt1018324_13
Median = –174.68 ns
Median = –168.46 ns
E1 /ns
E5 /ns
MJD
289181 s: E1= 30 ps
144591 s: E1= 30 ps
72295 s: E1= 34 ps
36148 s: E1= 30 ps
18074 s: E1= 46 ps
9037 s: E1= 54 ps
4518 s: E1= 76 ps
2259 s: E1= 104 ps
1130 s: E1= 150 ps
565 s: E1= 188 ps
282 s: E1= 253 ps
141 s: E1= 386 ps
71 s: E1= 543 ps
289181 s: E5= 40 ps
144591 s: E5= 37 ps
72295 s: E5= 40 ps
36148 s: E5= 58 ps
18074 s: E5= 71 ps
9037 s: E5= 75 ps
4518 s: E5= 106 ps
2259 s: E5= 150 ps
1130 s: E5= 218 ps
565 s: E5= 273 ps
282 s: E5= 342 ps
141 s: E5= 542 ps
71 s: E5= 773 ps
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-PT10

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 223545
Number of huge residuals = 22. New iteration
Computed code bias (P1/P2)/m = -55.669 -51.996
Computed baseline (X,Y,Z)/m = -5.601 5.567 3.609
RMS of residuals /m = 0.482

Number of phase differences to fit baseline
L1/L2 = 221488
L5 = 0
A priori baseline (X,Y,Z)/m = -5.601 5.567 3.609
27617 clock jitters computed out of 27618 intervals
AVE jitter /ps = 0.2 RMS jitter /ps = 5.5

Iter 1 Large residuals L1= 10
Iter 1 Large residuals L2= 10
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = 0.050 0.046 0.018
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = 0.039 0.046 0.001
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 10
Iter 2 Large residuals L2= 10
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = 0.050 0.046 0.018
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = 0.039 0.046 0.001
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -5.551 5.613 3.627
Final baseline L2 (X,Y,Z)/m = -5.562 5.613 3.610
Final baseline L5 (X,Y,Z)/m = -5.556 5.613 3.619

COMPUTATION OF CODE DIFFERENCES

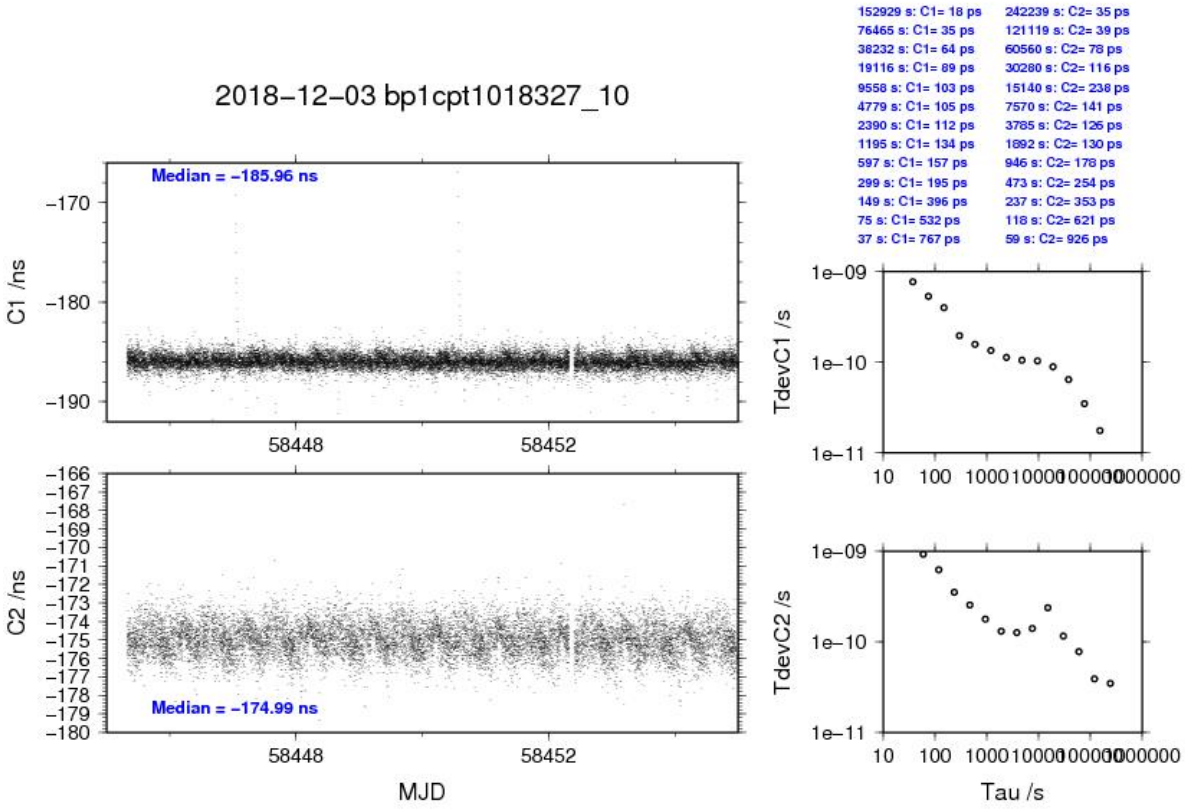
Total number of code differences = 226471

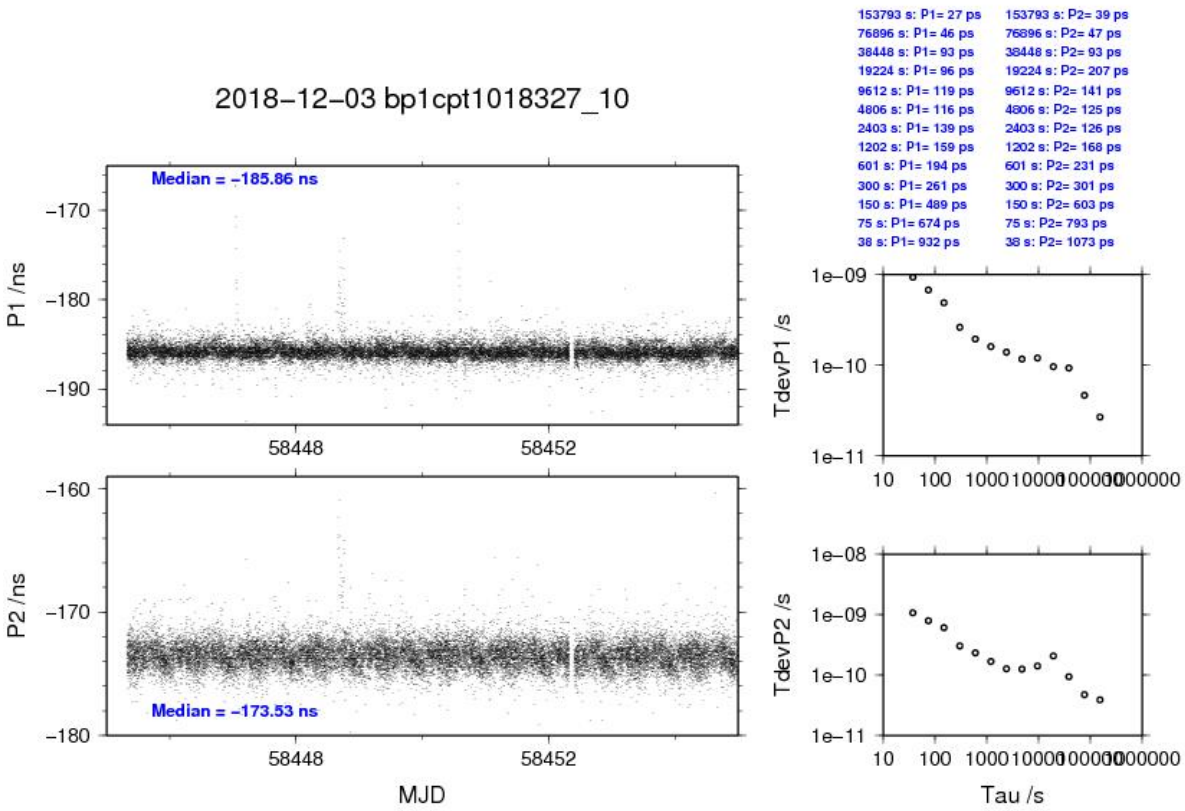
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	224578	-185.929	1.254
C2	141653	-174.983	1.514
C5	0	NaN	NaN
P1	223418	-185.796	1.668
P2	223413	-173.505	1.903
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 2773

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	22443	-185.960	-185.933	0.761
C2	14169	-174.992	-174.983	0.888
C5	0	0.000	NaN	NaN
P1	22317	-185.860	-185.805	0.939
P2	22317	-173.530	-173.517	1.105
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2018–12–03 bp1cpt1018327_10
Median = –185.96 ns
C1 /ns
Median = –174.99 ns
C2 /ns
MJD
152929 s: C1= 18 ps
76465 s: C1= 35 ps
38232 s: C1= 64 ps
19116 s: C1= 89 ps
9558 s: C1= 103 ps
4779 s: C1= 105 ps
2390 s: C1= 112 ps
1195 s: C1= 134 ps
597 s: C1= 157 ps
299 s: C1= 195 ps
149 s: C1= 396 ps
75 s: C1= 532 ps
37 s: C1= 767 ps
242239 s: C2= 35 ps
121119 s: C2= 39 ps
60560 s: C2= 78 ps
30280 s: C2= 116 ps
15140 s: C2= 238 ps
7570 s: C2= 141 ps
3785 s: C2= 126 ps
1892 s: C2= 130 ps
946 s: C2= 178 ps
473 s: C2= 254 ps
237 s: C2= 353 ps
118 s: C2= 621 ps
59 s: C2= 926 ps
TdevC1 /s
TdevC2 /s
Tau /s


2018–12–03 bp1cpt1018327_10
Median = –185.86 ns
P1 /ns
Median = –173.53 ns
P2 /ns
MJD
153793 s: P1= 27 ps
76896 s: P1= 46 ps
38448 s: P1= 93 ps
19224 s: P1= 96 ps
9612 s: P1= 119 ps
4806 s: P1= 116 ps
2403 s: P1= 139 ps
1202 s: P1= 159 ps
601 s: P1= 194 ps
300 s: P1= 261 ps
150 s: P1= 489 ps
75 s: P1= 674 ps
38 s: P1= 932 ps
153793 s: P2= 39 ps
76896 s: P2= 47 ps
38448 s: P2= 93 ps
19224 s: P2= 207 ps
9612 s: P2= 141 ps
4806 s: P2= 125 ps
2403 s: P2= 126 ps
1202 s: P2= 168 ps
601 s: P2= 231 ps
300 s: P2= 301 ps
150 s: P2= 603 ps
75 s: P2= 793 ps
38 s: P2= 1073 ps
TdevP1 /s
TdevP2 /s
Tau /s

3.3/ ROA (18349)

Period

MJD 58467 to 58478

Delays

BP1X: (cf page 60)
REFDLY = 329.90 ns (277.3+52.6)
CABDLY = 129.70 ns (C178)

BP1C: (cf page 60)
X_O = 208.29 ns (223.72-15.43)
X_P = 329.90 ns (277.3+52.6)
REFDLY = 538.19 ns
CABDLY = 235.70 ns (C131)

RO_5: (cf page 54)
REFDLY = 306.9 ns
CABDLY = 91.5 ns
INTDLY: 8.5 ns (GPSC1), 10.3 ns (GPSP1), 27.3 ns (GPSP2)

RO_6: (cf page 55)
REFDLY = 484.9 ns
CABDLY = 82.0 ns

RO_7: (cf page 56)
REFDLY = 452.3 ns
CABDLY = 89.9 ns

RO_8: (cf page 57)
REFDLY = 20.4 ns
CABDLY = 202.7 ns

RO_9: (cf page 58)
REFDLY = 451.8 ns
CABDLY = 59.7 ns

RO10: (cf page 59)
REFDLY = 5.1 ns
CABDLY = 204.8 ns

Setup at the ROA

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory	**ROA**	
Date and hour beginning of measurements	21-12-2018, 12:00 UTC	
Date and hour end of measurements		
Information on the system		
	Local	**Traveling**
4-character BIPM code	RO_5	BP1X/BP1C
Receiver maker and type Receiver serial number	DICOM GTR50 0601012 V1.6.1	DICOM GTR51 S/N 1306001 Septentrio PolaRx3eTR S/N S9000163176
1 PPS trigger level /V	1 V	1V
Antenna cable maker and type Phase stabilized cable (Y/N)	LDF1RK-50	C178/C131
Cable length outside building /m	Approximately 18 m	N/A
Antenna maker and type Antenna serial number	LEICA AR25 S/N 725233	Novatel GPS-703-GG s/n NEG13160018 Ashtech Choke Ring s/n CR6200323008
Temperature if stabilized /°C	N/A	N/A
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	306.9	N/A
Delay from 1 PPS_IN to internal reference (see Annex 1)	N/A	N/A
Antenna cable delay	70.0	N/A
Splitter delay	7.0	N/A
Additional cable delay	14.5	N/A
Data used for the generation of CGGTTS files		
	Local	
INT DLY (GPS) /ns	10.3 (GPS P1), 27.3 (GPS P2)	
INT DLY (GLONASS) /ns	N/A	
CAB DLY /ns	91.5	
REF DLY /ns	306.6	
Coordinate reference frame	ITRF14	
Latitude or X /m	5105581.91	
Longitude or Y /m	-555193.47	
Height or Z /m	3769704.64	
General information		
Rise time of local UTC pulse	< 1 ns	
Air conditioning (Y/N)	Y	
Set temperature value and uncertainty	(23 ± 2) °C	
Set humidity value and uncertainty	< 70 %	

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory	**ROA**	
Date and hour beginning of measurements	21-12-2018, 12:00 UTC	
Date and hour end of measurements		
Information on the system		
	Local	**Traveling**
4-character BIPM code	RO_6	BP1X/BP1C
Receiver maker and type Receiver serial number	Septentrio PolaRx3eTR 200805 v2.1	DICOM GTR51 S/N 1306001 Septentrio PolaRx3eTR S/N S9000163176
1 PPS trigger level /V	1 V	1V
Antenna cable maker and type Phase stabilized cable (Y/N)	LDF1RK-50	C178/C131
Cable length outside building /m	Approximately 18 m	N/A
Antenna maker and type Antenna serial number	LEICA AR25 S/N 725233	Novatel GPS-703-GG s/n NEG13160018 Ashtech Choke Ring s/n CR6200323008
Temperature if stabilized /°C	N/A	N/A
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	292.4	N/A
Delay from 1 PPS_IN to internal reference (see Annex 1)	192.5	N/A
Antenna cable delay	70.0	N/A
Splitter delay	7.0	N/A
Additional cable delay	5.0	N/A
Data used for the generation of CGGTTS files		
	Local	
INT DLY (GPS) /ns	56.7 (GPS P1), 55.4 (GPS P2)	
INT DLY (GLONASS) /ns	N/A	
CAB DLY /ns	82.0	
REF DLY /ns	484.9	
Coordinate reference frame	ITRF14	
Latitude or X /m	5105581.91	
Longitude or Y /m	-555193.47	
Height or Z /m	3769704.64	
General information		
Rise time of local UTC pulse	< 1 ns	
Air conditioning (Y/N)	Y	
Set temperature value and uncertainty	(23 ± 2) °C	
Set humidity value and uncertainty	< 70 %	

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory	**ROA**	
Date and hour beginning of measurements	21-12-2018, 12:00 UTC	
Date and hour end of measurements		
Information on the system		
	Local	**Traveling**
4-character BIPM code	RO_7	BP1X/BP1C
Receiver maker and type Receiver serial number	Septentrio PolaRx4TR PRO 3007633 v2.9.6	DICOM GTR51 S/N 1306001 Septentrio PolaRx3eTR S/N S9000163176
1 PPS trigger level /V	1 V	1V
Antenna cable maker and type Phase stabilized cable (Y/N)	LDF1RK-50	C178/C131
Cable length outside building /m	Approximately 18 m	N/A
Antenna maker and type Antenna serial number	LEICA AR25 S/N 725233	Novatel GPS-703-GG s/n NEG13160018 Ashtech Choke Ring s/n CR6200323008
Temperature if stabilized /°C	N/A	N/A
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	305.5	N/A
Delay from 1 PPS_IN to internal reference (see Annex 1)	146.8	N/A
Antenna cable delay	70.0	N/A
Splitter delay	14.0	N/A
Additional cable delay	5.9	N/A
Data used for the generation of CGGTTS files		
	Local	
INT DLY (GPS) /ns	56.9 (GPS P1), 55.7 (GPS P2)	
INT DLY (GLONASS) /ns	N/A	
CAB DLY /ns	89.9	
REF DLY /ns	452.3	
Coordinate reference frame	ITRF14	
Latitude or X /m	5105581.91	
Longitude or Y /m	-555193.47	
Height or Z /m	3769704.64	
General information		
Rise time of local UTC pulse	< 1 ns	
Air conditioning (Y/N)	Y	
Set temperature value and uncertainty	(23 ± 2) °C	
Set humidity value and uncertainty	< 70 %	

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory	**ROA**	
Date and hour beginning of measurements	21-12-2018, 12:00 UTC	
Date and hour end of measurements		
Information on the system		
	Local	**Traveling**
4-character BIPM code	RO_8	BP1X/BP1C
Receiver maker and type Receiver serial number	DICOM GTR51 1509257 v1.6.3	DICOM GTR51 S/N 1306001 Septentrio PolaRx3eTR S/N S9000163176
1 PPS trigger level /V	1 V	1V
Antenna cable maker and type Phase stabilized cable (Y/N)	LDF1RK-50	C178/C131
Cable length outside building /m	Approximately 37 m	N/A
Antenna maker and type Antenna serial number	LEICA AR25 S/N 726362	Novatel GPS-703-GG s/n NEG13160018 Ashtech Choke Ring s/n CR6200323008
Temperature if stabilized /°C	N/A	N/A
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	20.4	N/A
Delay from 1 PPS_IN to internal reference (see Annex 1)	N/A	N/A
Antenna cable delay	180.5	N/A
Splitter delay	13.0	N/A
Additional cable delay	9.2	N/A
Data used for the generation of CGGTTS files		
	Local	
INT DLY (GPS) /ns	-20.8 ns (GPS P1), -21.0 ns (GPS P2)	
INT DLY (GLONASS) /ns	N/A	
CAB DLY /ns	202.7	
REF DLY /ns	20.4	
Coordinate reference frame	ITRF14	
Latitude or X /m	5105577.48	
Longitude or Y /m	-555208.94	
Height or Z /m	3769714.20	
General information		
Rise time of local UTC pulse	< 1 ns	
Air conditioning (Y/N)	Y	
Set temperature value and uncertainty	(23 ± 2) °C	
Set humidity value and uncertainty	< 70 %	

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory	**ROA**	
Date and hour beginning of measurements	21-12-2018, 12:00 UTC	
Date and hour end of measurements		
Information on the system		
	Local	**Traveling**
4-character BIPM code	RO_9	BP1X/BP1C
Receiver maker and type Receiver serial number	Septentrio PolaRx4TR PRO 3008013 v2.9.6	DICOM GTR51 S/N 1306001 Septentrio PolaRx3eTR S/N S9000163176
1 PPS trigger level /V	1 V	1V
Antenna cable maker and type Phase stabilized cable (Y/N)	LDF1RK-50	C178/C131
Cable length outside building /m	Approximately 20 m	N/A
Antenna maker and type Antenna serial number	LEICA AR25 S/N 726362	Novatel GPS-703-GG s/n NEG13160018 Ashtech Choke Ring s/n CR6200323008
Temperature if stabilized /°C	N/A	N/A
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	305.6	N/A
Delay from 1 PPS_IN to internal reference (see Annex 1)	146.2	N/A
Antenna cable delay	59.7	N/A
Splitter delay	0.0	N/A
Additional cable delay	0.0	N/A
Data used for the generation of CGGTTS files		
	Local	
INT DLY (GPS) /ns	57.0 (GPS P1), 55.9 (GPS P2)	
INT DLY (GLONASS) /ns	N/A	
CAB DLY /ns	59.7	
REF DLY /ns	451.8	
Coordinate reference frame	ITRF14	
Latitude or X /m	5105582.90	
Longitude or Y /m	-555191.22	
Height or Z /m	3769703.66	
General information		
Rise time of local UTC pulse	< 1 ns	
Air conditioning (Y/N)	Y	
Set temperature value and uncertainty	(23 ± 2) °C	
Set humidity value and uncertainty	< 70 %	

Annex A - Information Sheet

(to be repeated for each calibrated system)

Laboratory	**ROA**	
Date and hour beginning of measurements	14-12-2018, 20:00 UTC	
Date and hour end of measurements		
Information on the system		
	Local	**Traveling**
4-character BIPM code	RO_10	BP1X/BP1C
Receiver maker and type Receiver serial number	PolaRx5TR 4701187 V5.2.0	DICOM GTR51 S/N 1306001 Septentrio PolaRx3eTR S/N S9000163176
1 PPS trigger level /V	1 V	1V
Antenna cable maker and type Phase stabilized cable (Y/N)	LDF1RK-50	C178/C131
Cable length outside building /m	Approximately 37 m	N/A
Antenna maker and type Antenna serial number	LEICA AR25 S/N 726362	Novatel GPS-703-GG s/n NEG13160018 Ashtech Choke Ring s/n CR6200323008
Temperature if stabilized /°C	N/A	N/A
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	5.1	N/A
Delay from 1 PPS_IN to internal reference (see Annex 1)	0.0	N/A
Antenna cable delay	180.5	N/A
Splitter delay	13.0	N/A
Additional cable delay	11.3	N/A
Data used for the generation of CGGTTS files		
	Local	
INT DLY (GPS) /ns	31.1 ns (GPS P1), 29.9 ns (GPS P2)	
INT DLY (GLONASS) /ns	N/A	
CAB DLY /ns	204.8	
REF DLY /ns	5.1	
Coordinate reference frame	ITRF14	
Latitude or X /m	5105577.48	
Longitude or Y /m	-555208.94	
Height or Z /m	3769714.20	
General information		
Rise time of local UTC pulse	< 1 ns	
Air conditioning (Y/N)	Y	
Set temperature value and uncertainty	(23 ± 2) °C	
Set humidity value and uncertainty	< 70 %	

Diagram of the experiment set-up:

Friday 14 December 2018

Setup

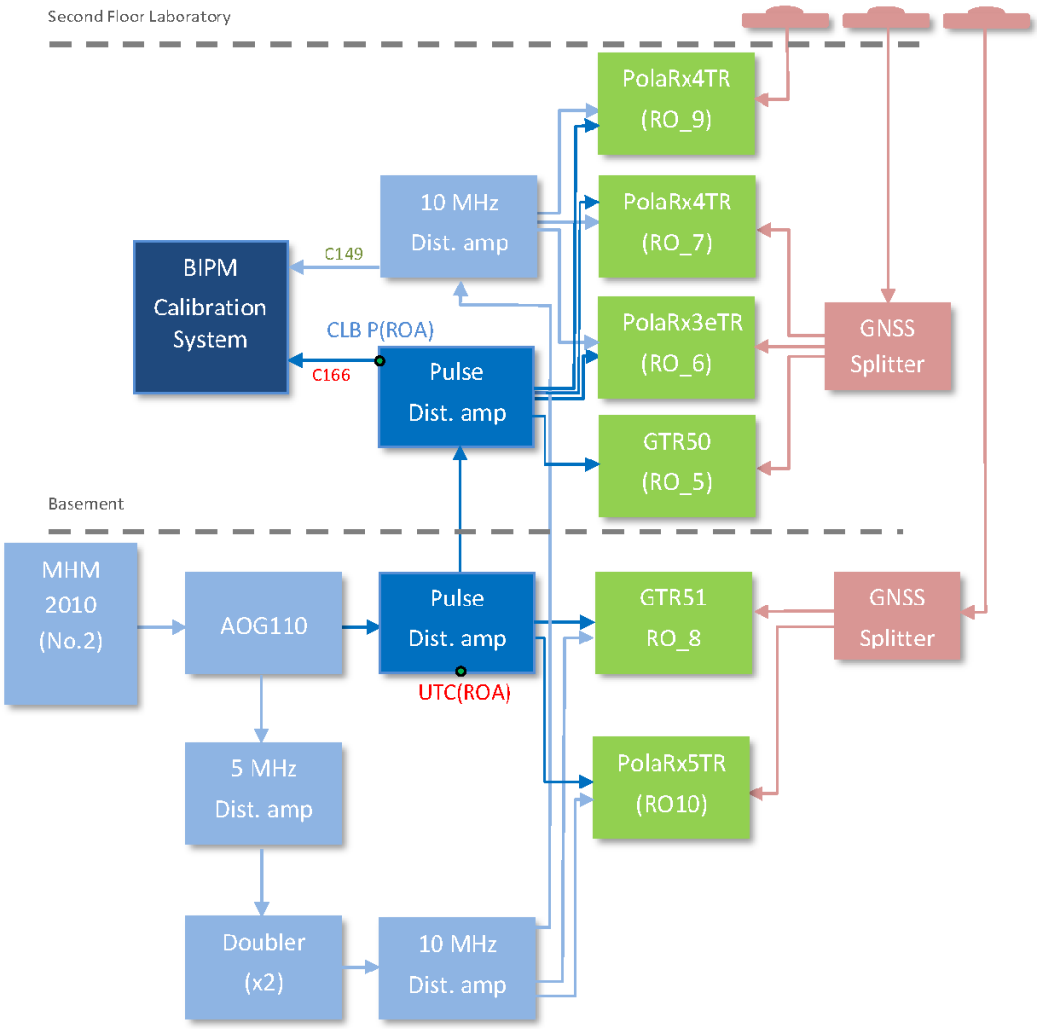


Figure 1 : Hookup diagram of GNSS receivers.

Log of Events / Additional Information :

Friday 14 December 2018

Delay Measurement, 18:20 UTC:

UTC(ROA) – CLB P(ROA) = (277.30± 0.01) ns

Delay Measurement at each receiver:

BP1C (PolaRx3eTR):

Channel A [C183], channel B [C157 (PPS IN)+(Female BNC-BNC)+C155] = (15.43 ± 0.01) ns
Channel A [C183], channel B [PPS OUT+C155] = (223.73 ± 0.07) ns

BP1X (GTR50):

Channel A [C183], channel B [C153 (PPS IN)]= (-12 ± 6) ps

Start data logging at 18:30 UTC.

Friday 21 December 2018

Delay Measurement, 09:20 UTC:

UTC(ROA) – CLB P(ROA) = (277.30± 0.01) ns

Delay Measurement at each receiver:

BP1C (PolaRx3eTR):

Channel A [C183], channel B [C157 (PPS IN)+(Female BNC-BNC)+C155] = (15.43 ± 0.01) ns
Channel A [C183], channel B [PPS OUT+C155] = (223.71 ± 0.07) ns

BP1X (GTR50):

Channel A [C183], channel B [C153 (PPS IN)]= (-13 ± 7) ps

BP1X-RO_5

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 155797
Number of huge residuals = 792. New iteration
Computed code bias (P1/P2)/m = -70.933 -71.736
Computed baseline (X,Y,Z)/m = 2.555 -2.440 -3.185
RMS of residuals /m = 0.549

Number of phase differences to fit baseline
L1/L2 = 148957
L5 = 0
A priori baseline (X,Y,Z)/m = 2.555 -2.440 -3.185
19066 clock jitters computed out of 19130 intervals
AVE jitter /ps = 0.1 RMS jitter /ps = 34.9

Iter 1 Large residuals L1= 15
Iter 1 Large residuals L2= 15
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.232 -0.004 -0.122
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.219 -0.007 -0.119
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 15
Iter 2 Large residuals L2= 15
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.232 -0.004 -0.122
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.219 -0.007 -0.119
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 2.324 -2.444 -3.307
Final baseline L2 (X,Y,Z)/m = 2.336 -2.448 -3.303
Final baseline L5 (X,Y,Z)/m = 2.330 -2.446 -3.305

COMPUTATION OF CODE DIFFERENCES

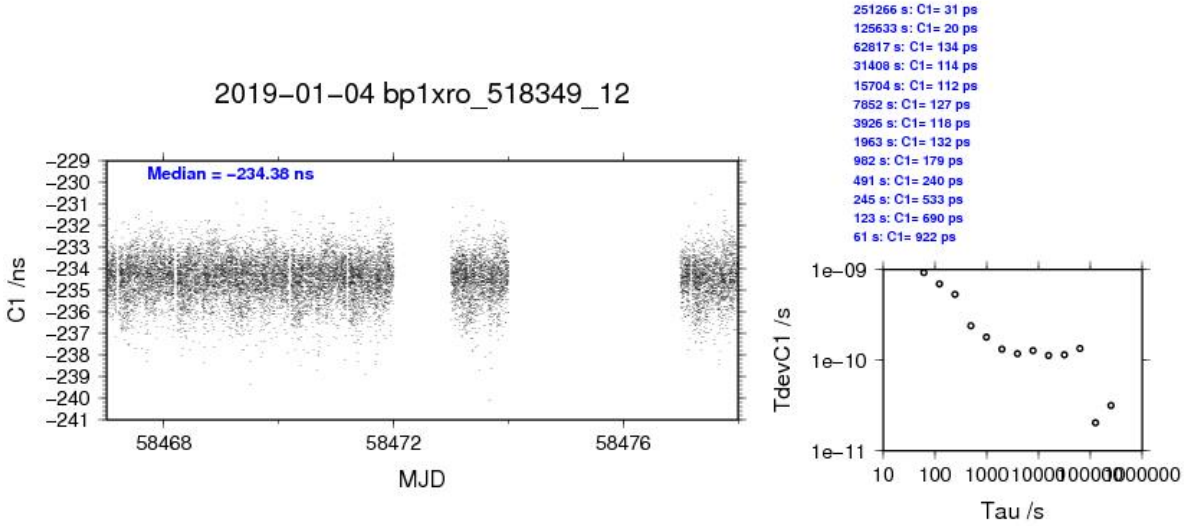
Total number of code differences = 156245

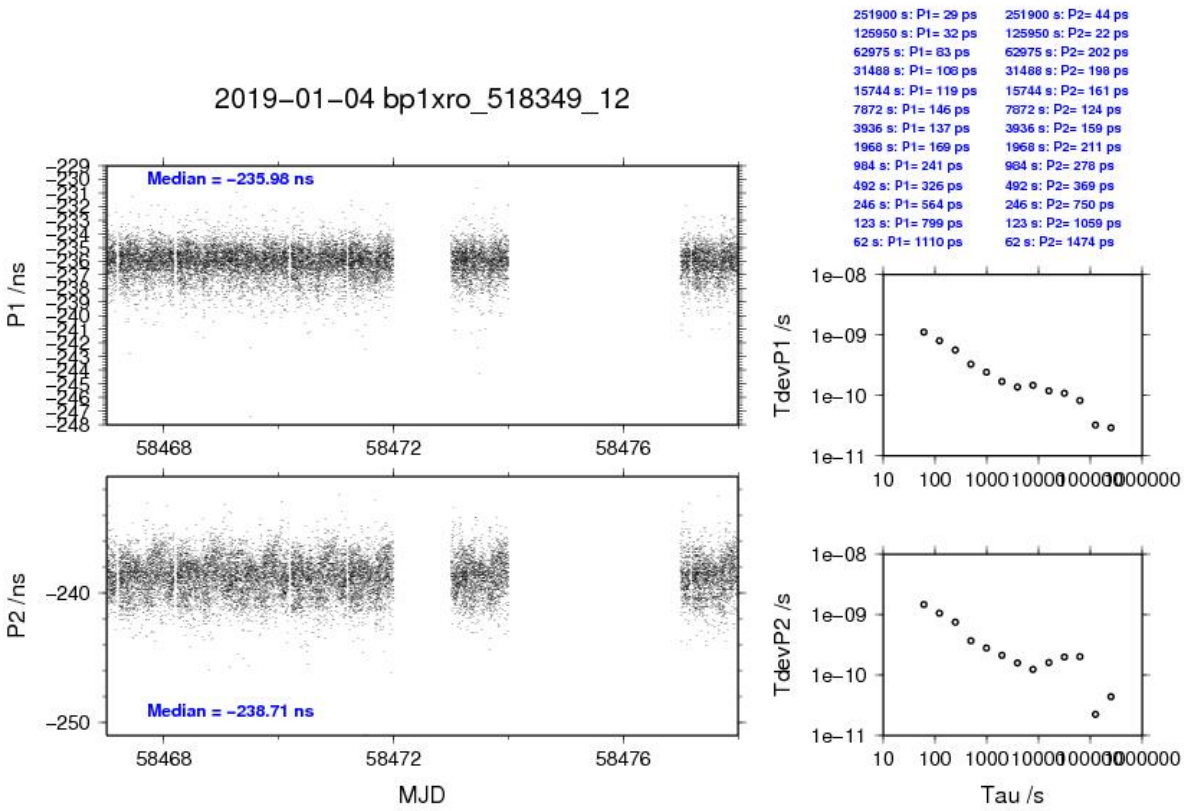
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	155751	-234.457	1.262
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	155354	-236.072	1.822
P2	155354	-238.775	2.109
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 1954

Code	#pts	median/ns	ave/ns	rms/ns
C1	15489	-234.384	-234.452	0.948
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	15450	-235.979	-236.068	1.106
P2	15450	-238.705	-238.767	1.455
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1xro_518349_12
Median = –234.38 ns
C1 /ns
MJD
251266 s: C1= 31 ps
125633 s: C1= 20 ps
62817 s: C1= 134 ps
31408 s: C1= 114 ps
15704 s: C1= 112 ps
7852 s: C1= 127 ps
3926 s: C1= 118 ps
1963 s: C1= 132 ps
982 s: C1= 179 ps
491 s: C1= 240 ps
245 s: C1= 533 ps
123 s: C1= 690 ps
61 s: C1= 922 ps
TdevC1 /s
Tau /s


2019–01–04 bp1xro_518349_12
Median = –235.98 ns
P1 /ns
Median = –238.71 ns
P2 /ns
MJD
251900 s: P1= 29 ps
125950 s: P1= 32 ps
62975 s: P1= 83 ps
31488 s: P1= 108 ps
15744 s: P1= 119 ps
7872 s: P1= 146 ps
3936 s: P1= 137 ps
1968 s: P1= 169 ps
984 s: P1= 241 ps
492 s: P1= 326 ps
246 s: P1= 564 ps
123 s: P1= 799 ps
62 s: P1= 1110 ps
251900 s: P2= 44 ps
125950 s: P2= 22 ps
62975 s: P2= 202 ps
31488 s: P2= 198 ps
15744 s: P2= 161 ps
7872 s: P2= 124 ps
3936 s: P2= 159 ps
1968 s: P2= 211 ps
984 s: P2= 278 ps
492 s: P2= 369 ps
246 s: P2= 750 ps
123 s: P2= 1059 ps
62 s: P2= 1474 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1C-RO_5

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 126295
Computed code bias (P1/P2)/m = -75.872 -74.501
Computed baseline (X,Y,Z)/m = 2.064 -3.279 -2.913
RMS of residuals /m = 0.478

Number of phase differences to fit baseline
L1/L2 = 154357
L5 = 0
A priori baseline (X,Y,Z)/m = 2.064 -3.279 -2.913
19137 clock jitters computed out of 19176 intervals
AVE jitter /ps = 0.2 RMS jitter /ps = 35.0

Iter 1 Large residuals L1= 17
Iter 1 Large residuals L2= 17
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.134 0.014 -0.062
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.134 0.013 -0.070
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 17
Iter 2 Large residuals L2= 17
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.134 0.014 -0.062
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.134 0.013 -0.070
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 1.930 -3.265 -2.975
Final baseline L2 (X,Y,Z)/m = 1.930 -3.266 -2.983
Final baseline L5 (X,Y,Z)/m = 1.930 -3.265 -2.979

COMPUTATION OF CODE DIFFERENCES

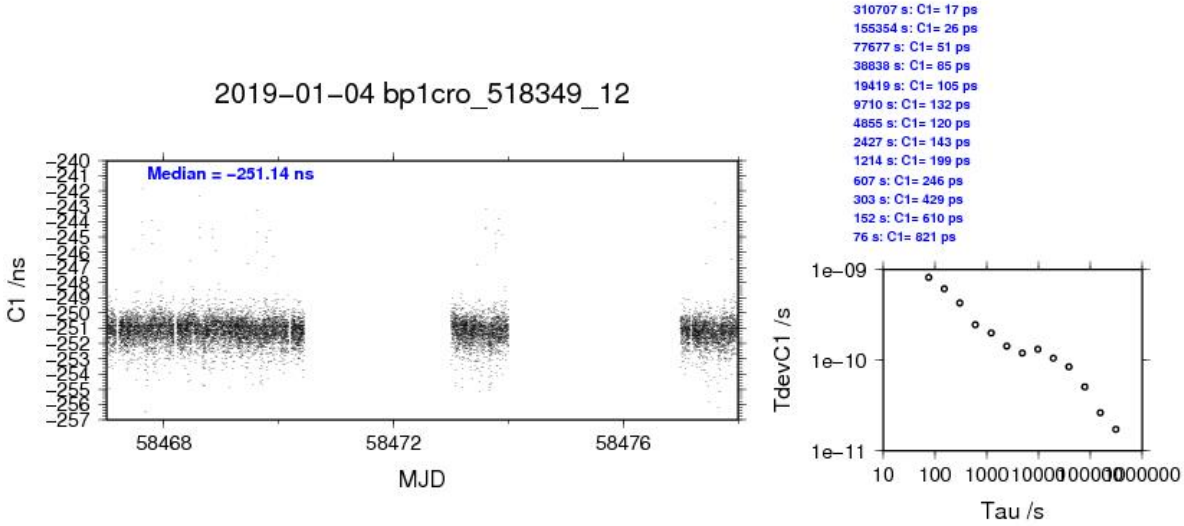
Total number of code differences = 162077

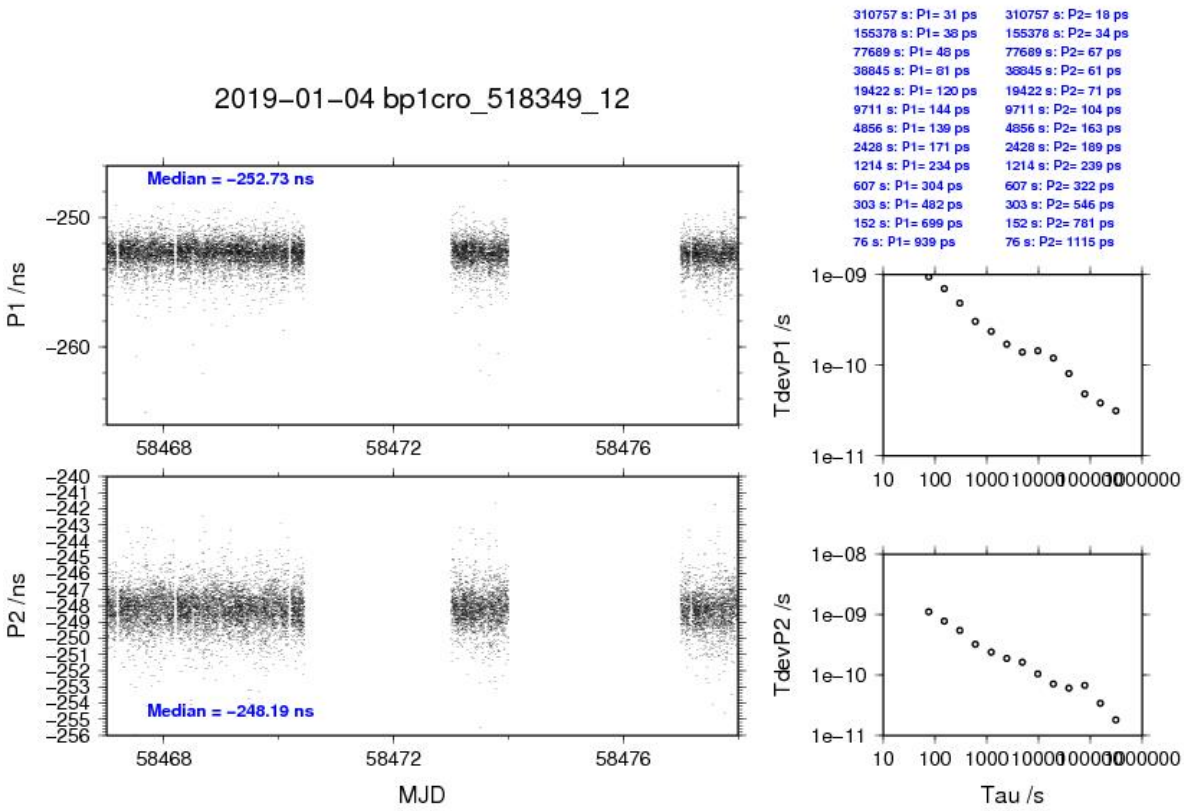
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	126279	-251.180	1.207
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	126248	-252.789	1.655
P2	126248	-248.204	1.810
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 1956

Code	#pts	median/ns	ave/ns	rms/ns
C1	12526	-251.142	-251.179	0.842
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	12524	-252.732	-252.791	0.964
P2	12524	-248.193	-248.208	1.091
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1cro_518349_12
Median = –251.14 ns
C1 /ns
MJD
310707 s: C1= 17 ps
155354 s: C1= 26 ps
77677 s: C1= 51 ps
38838 s: C1= 85 ps
19419 s: C1= 105 ps
9710 s: C1= 132 ps
4855 s: C1= 120 ps
2427 s: C1= 143 ps
1214 s: C1= 199 ps
607 s: C1= 246 ps
303 s: C1= 429 ps
152 s: C1= 610 ps
76 s: C1= 821 ps
TdevC1 /s
Tau /s


2019–01–04 bp1cro_518349_12
Median = –252.73 ns
P1 /ns
310757 s: P1= 31 ps
155378 s: P1= 38 ps
77689 s: P1= 48 ps
38845 s: P1= 81 ps
19422 s: P1= 120 ps
9711 s: P1= 144 ps
4856 s: P1= 139 ps
2428 s: P1= 171 ps
1214 s: P1= 234 ps
607 s: P1= 304 ps
303 s: P1= 482 ps
152 s: P1= 699 ps
76 s: P1= 939 ps
310757 s: P2= 18 ps
155378 s: P2= 34 ps
77689 s: P2= 67 ps
38845 s: P2= 61 ps
19422 s: P2= 71 ps
9711 s: P2= 104 ps
4856 s: P2= 163 ps
2428 s: P2= 189 ps
1214 s: P2= 239 ps
607 s: P2= 322 ps
303 s: P2= 546 ps
152 s: P2= 781 ps
76 s: P2= 1115 ps
TdevP1 /s
P2 /ns
Median = –248.19 ns
MJD
TdevP2 /s
Tau /s

BP1X-RO_6

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 293206
Number of huge residuals = 792. New iteration
Computed code bias (P1/P2)/m = 32.819 32.713
Computed baseline (X,Y,Z)/m = 2.548 -2.457 -3.204
RMS of residuals /m = 0.464

Number of phase differences to fit baseline
L1/L2 = 291933
L5 = 0
A priori baseline (X,Y,Z)/m = 2.548 -2.457 -3.204
34391 clock jitters computed out of 34391 intervals
AVE jitter /ps = -0.1 RMS jitter /ps = 4.2

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.220 0.008 -0.103
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.221 0.006 -0.101
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 2.328 -2.449 -3.307
Final baseline L2 (X,Y,Z)/m = 2.327 -2.451 -3.306
Final baseline L5 (X,Y,Z)/m = 2.327 -2.450 -3.306

COMPUTATION OF CODE DIFFERENCES

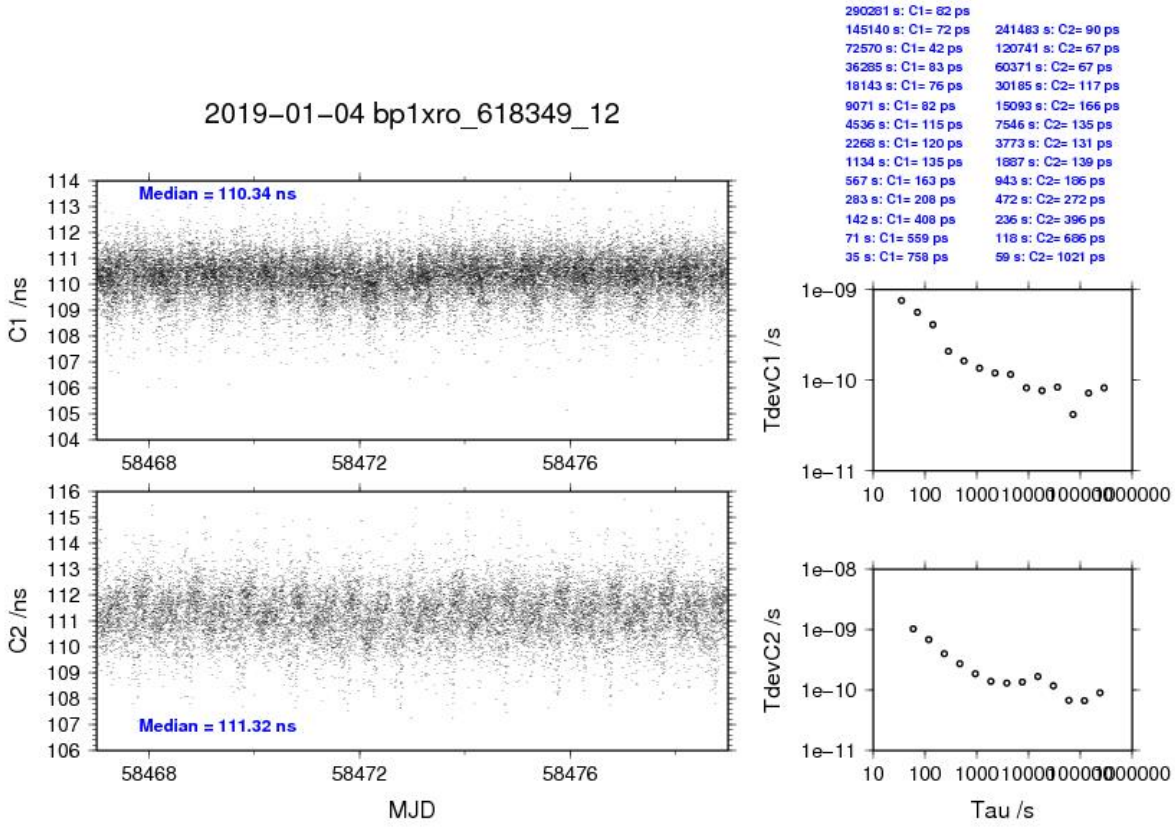
Total number of code differences = 294199

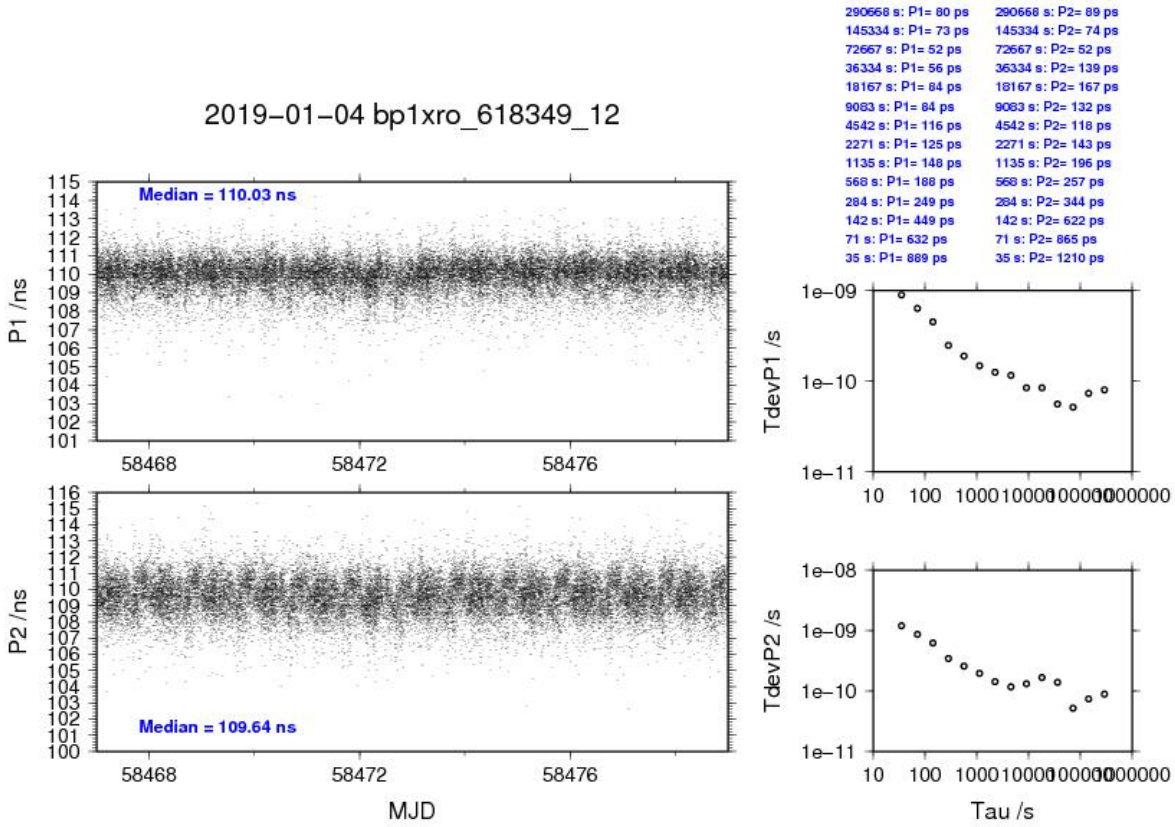
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	293151	110.286	1.126
C2	176174	111.289	1.426
C5	0	NaN	NaN
P1	292755	109.951	1.434
P2	292755	109.595	1.775
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3454

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	29252	110.339	110.288	0.776
C2	17582	111.316	111.289	0.965
C5	0	0.000	NaN	NaN
P1	29213	110.031	109.961	0.884
P2	29213	109.635	109.607	1.212
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1xro_618349_12
Median = 110.34 ns
Median = 111.32 ns
C1 /ns
C2 /ns
MJD
290281 s: C1= 82 ps
145140 s: C1= 72 ps
72570 s: C1= 42 ps
36285 s: C1= 83 ps
18143 s: C1= 76 ps
9071 s: C1= 82 ps
4536 s: C1= 115 ps
2268 s: C1= 120 ps
1134 s: C1= 135 ps
567 s: C1= 163 ps
283 s: C1= 208 ps
142 s: C1= 408 ps
71 s: C1= 559 ps
35 s: C1= 758 ps
241483 s: C2= 90 ps
120741 s: C2= 67 ps
60371 s: C2= 67 ps
30185 s: C2= 117 ps
15093 s: C2= 166 ps
7546 s: C2= 135 ps
3773 s: C2= 131 ps
1887 s: C2= 139 ps
943 s: C2= 186 ps
472 s: C2= 272 ps
236 s: C2= 396 ps
118 s: C2= 686 ps
59 s: C2= 1021 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–04 bp1xro_618349_12
Median = 110.03 ns
Median = 109.64 ns
P1 /ns
P2 /ns
MJD
290668 s: P1= 80 ps
145334 s: P1= 73 ps
72667 s: P1= 52 ps
36334 s: P1= 56 ps
18167 s: P1= 84 ps
9083 s: P1= 84 ps
4542 s: P1= 116 ps
2271 s: P1= 125 ps
1135 s: P1= 148 ps
568 s: P1= 188 ps
284 s: P1= 249 ps
142 s: P1= 449 ps
71 s: P1= 632 ps
35 s: P1= 889 ps
290668 s: P2= 89 ps
145334 s: P2= 74 ps
72667 s: P2= 52 ps
36334 s: P2= 139 ps
18167 s: P2= 167 ps
9083 s: P2= 132 ps
4542 s: P2= 118 ps
2271 s: P2= 143 ps
1135 s: P2= 196 ps
568 s: P2= 257 ps
284 s: P2= 344 ps
142 s: P2= 622 ps
71 s: P2= 865 ps
35 s: P2= 1210 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1C-RO_6

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 299375
Number of huge residuals = *****. New iteration
Number of huge residuals = 10. New iteration
Computed code bias (P1/P2)/m = 27.809 29.835
Computed baseline (X,Y,Z)/m = 2.105 -3.239 -2.827
RMS of residuals /m = 0.282

Number of phase differences to fit baseline
L1/L2 = 334589
L5 = 0
A priori baseline (X,Y,Z)/m = 2.105 -3.239 -2.827
34547 clock jitters computed out of 34549 intervals
AVE jitter /ps = -0.1 RMS jitter /ps = 4.0

Iter 1 Large residuals L1= 6
Iter 1 Large residuals L2= 6
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.170 -0.008 -0.144
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.174 -0.007 -0.152
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 6
Iter 2 Large residuals L2= 6
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.170 -0.008 -0.144
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.174 -0.007 -0.152
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 1.936 -3.247 -2.971
Final baseline L2 (X,Y,Z)/m = 1.931 -3.246 -2.979
Final baseline L5 (X,Y,Z)/m = 1.934 -3.247 -2.975

COMPUTATION OF CODE DIFFERENCES

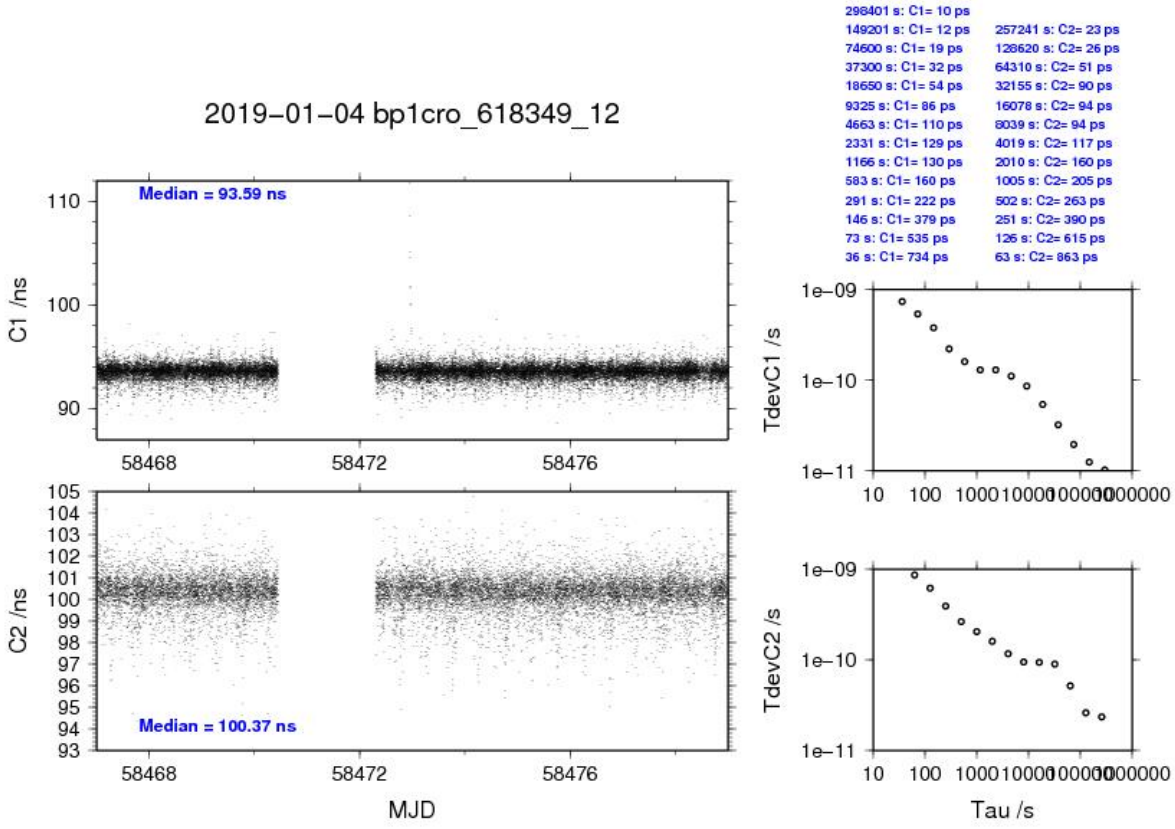
Total number of code differences = 593332

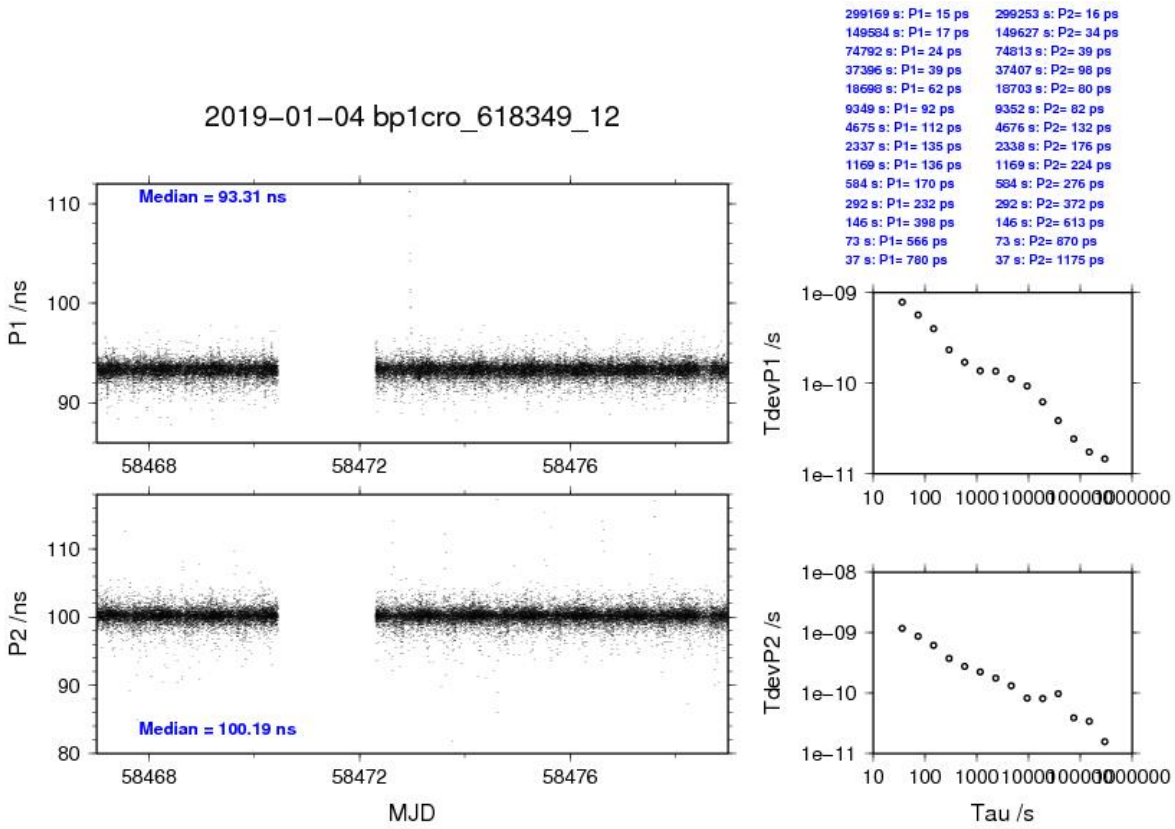
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	284963	93.547	1.206
C2	165169	100.307	1.575
C5	0	NaN	NaN
P1	284179	93.270	1.237
P2	284131	100.159	1.596
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3456

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	28456	93.586	93.544	0.743
C2	16505	100.368	100.307	0.854
C5	0	0.000	NaN	NaN
P1	28383	93.308	93.268	0.786
P2	28375	100.192	100.154	1.198
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1cro_618349_12
Median = 93.59 ns
Median = 100.37 ns
C1 /ns
C2 /ns
MJD
298401 s: C1= 10 ps
149201 s: C1= 12 ps
74600 s: C1= 19 ps
37300 s: C1= 32 ps
18650 s: C1= 54 ps
9325 s: C1= 86 ps
4663 s: C1= 110 ps
2331 s: C1= 129 ps
1166 s: C1= 130 ps
583 s: C1= 160 ps
291 s: C1= 222 ps
146 s: C1= 379 ps
73 s: C1= 535 ps
36 s: C1= 734 ps
257241 s: C2= 23 ps
128620 s: C2= 26 ps
64310 s: C2= 51 ps
32155 s: C2= 90 ps
16078 s: C2= 94 ps
8039 s: C2= 94 ps
4019 s: C2= 117 ps
2010 s: C2= 160 ps
1005 s: C2= 205 ps
502 s: C2= 263 ps
251 s: C2= 390 ps
126 s: C2= 615 ps
63 s: C2= 863 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–04 bp1cro_618349_12
Median = 93.31 ns
Median = 100.19 ns
P1 /ns
P2 /ns
MJD
299169 s: P1= 15 ps
149584 s: P1= 17 ps
74792 s: P1= 24 ps
37396 s: P1= 39 ps
18698 s: P1= 62 ps
9349 s: P1= 92 ps
4675 s: P1= 112 ps
2337 s: P1= 135 ps
1169 s: P1= 136 ps
584 s: P1= 170 ps
292 s: P1= 232 ps
146 s: P1= 398 ps
73 s: P1= 566 ps
37 s: P1= 780 ps
299253 s: P2= 16 ps
149627 s: P2= 34 ps
74813 s: P2= 39 ps
37407 s: P2= 98 ps
18703 s: P2= 80 ps
9352 s: P2= 82 ps
4676 s: P2= 132 ps
2338 s: P2= 176 ps
1169 s: P2= 224 ps
584 s: P2= 276 ps
292 s: P2= 372 ps
146 s: P2= 613 ps
73 s: P2= 870 ps
37 s: P2= 1175 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1X-RO_7

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 295339
Number of huge residuals = 792. New iteration
Computed code bias (P1/P2)/m = 20.602 20.459
Computed baseline (X,Y,Z)/m = 2.546 -2.456 -3.212
RMS of residuals /m = 0.418

Number of phase differences to fit baseline
L1/L2 = 294070
L5 = 112594
A priori baseline (X,Y,Z)/m = 2.546 -2.456 -3.212
34391 clock jitters computed out of 34391 intervals
AVE jitter /ps = -0.1 RMS jitter /ps = 3.5

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.217 0.007 -0.096
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.218 0.004 -0.095
RMS of residuals L2 /m = 0.004
Computed baseline L5 (X,Y,Z)/m = -0.207 0.004 -0.094
RMS of residuals L5 /m = 0.002

Final baseline L1 (X,Y,Z)/m = 2.329 -2.449 -3.308
Final baseline L2 (X,Y,Z)/m = 2.328 -2.452 -3.306
Final baseline L5 (X,Y,Z)/m = 2.339 -2.453 -3.305

COMPUTATION OF CODE DIFFERENCES

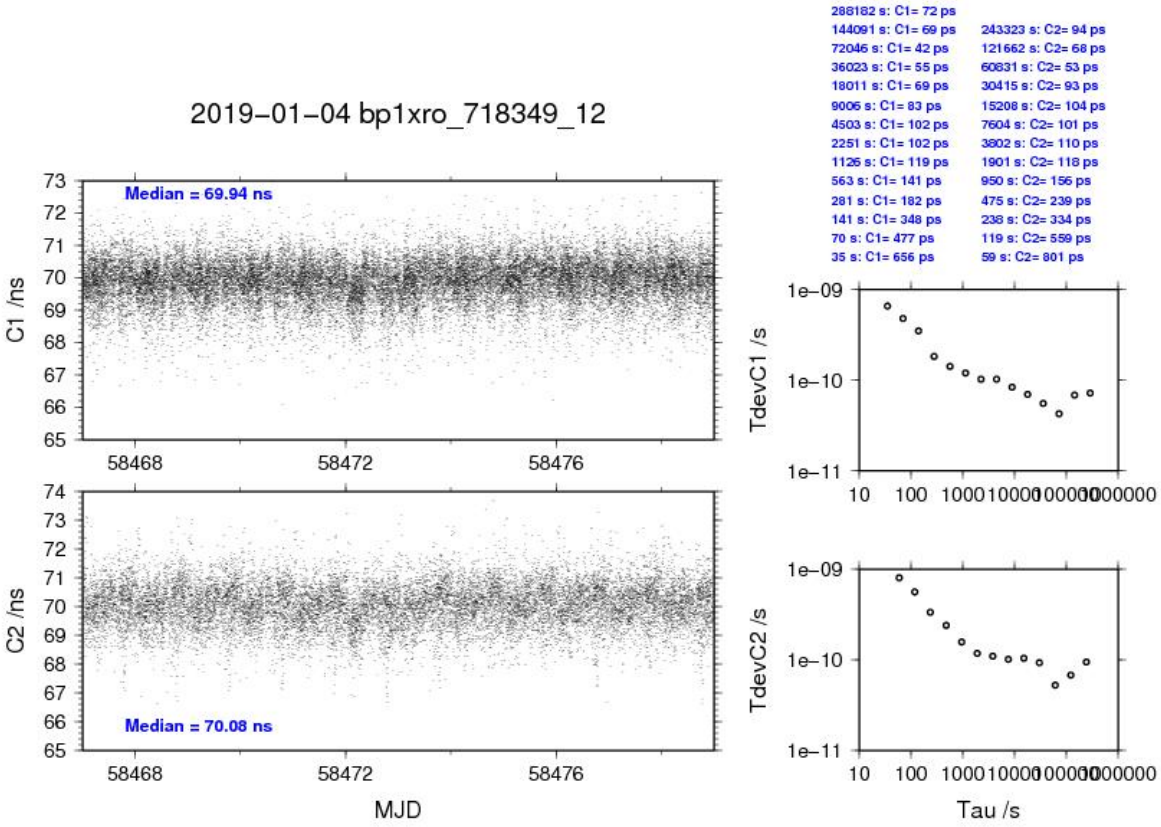
Total number of code differences = 454770

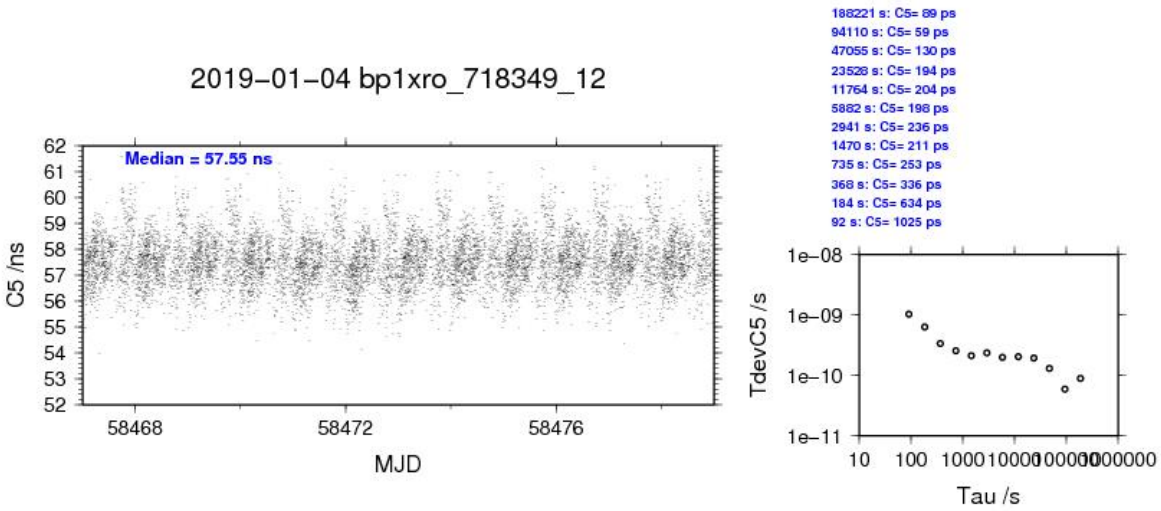
Global average of individual differences

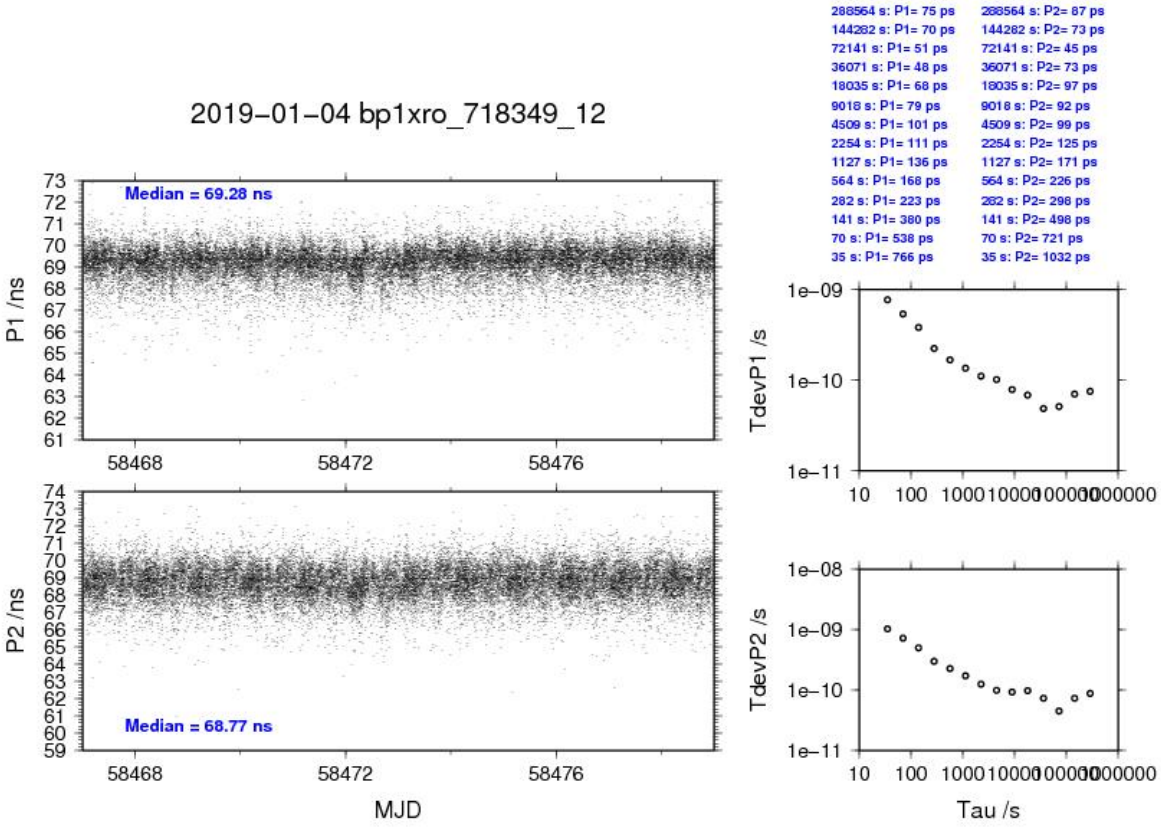
Code	#pts	ave/ns	rms/ns
C1	295284	69.888	1.006
C2	174844	70.045	1.209
C5	112994	57.586	1.093
P1	294888	69.186	1.321
P2	294888	68.707	1.564
E1	157848	71.966	0.894
E5	157200	58.228	0.848

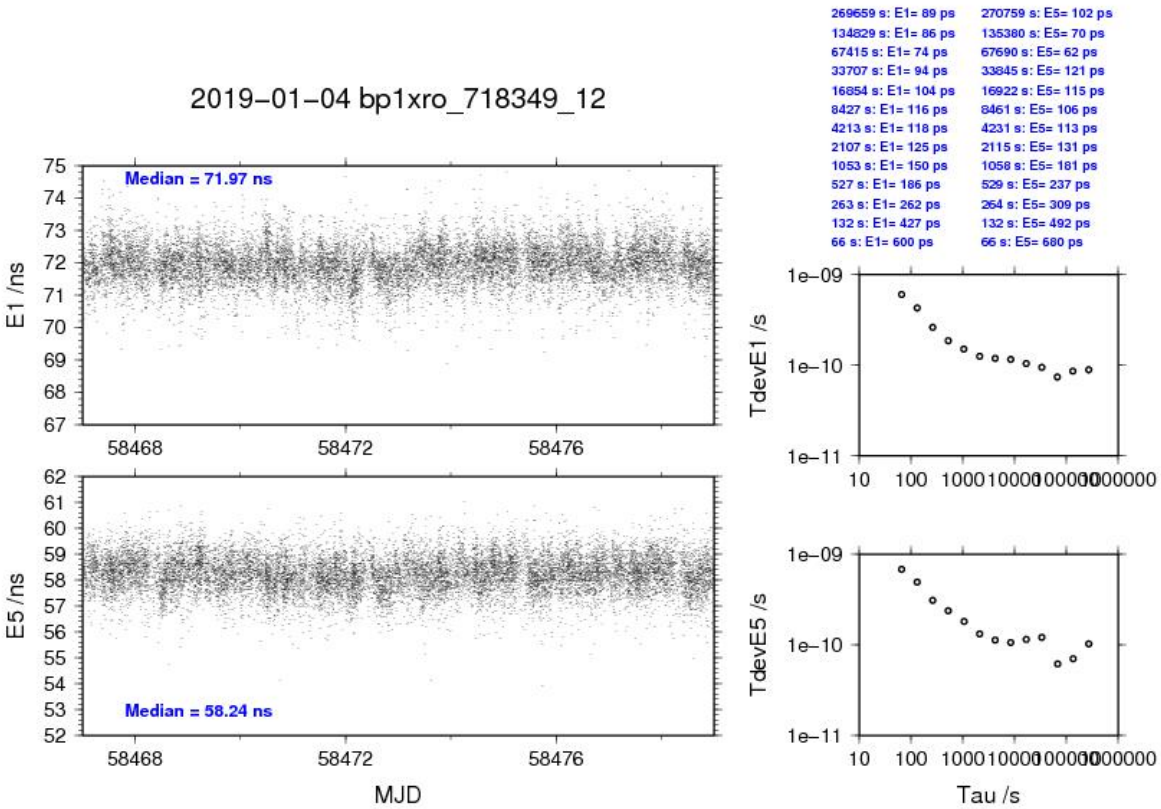
Number of 300s epochs in out file = 3454

Code	#pts	median/ns	ave/ns	rms/ns
C1	29465	69.935	69.893	0.670
C2	17449	70.078	70.052	0.777
C5	11279	57.546	57.589	0.965
P1	29426	69.276	69.199	0.763
P2	29426	68.765	68.722	1.013
E1	15745	71.975	71.972	0.617
E5	15681	58.242	58.230	0.702


2019–01–04 bp1xro_718349_12
Median = 69.94 ns
Median = 70.08 ns
C1 /ns
C2 /ns
MJD
288182 s: C1= 72 ps
144091 s: C1= 69 ps
72046 s: C1= 42 ps
36023 s: C1= 55 ps
18011 s: C1= 69 ps
9006 s: C1= 83 ps
4503 s: C1= 102 ps
2251 s: C1= 102 ps
1126 s: C1= 119 ps
563 s: C1= 141 ps
281 s: C1= 182 ps
141 s: C1= 348 ps
70 s: C1= 477 ps
35 s: C1= 656 ps
243323 s: C2= 94 ps
121662 s: C2= 68 ps
60831 s: C2= 53 ps
30415 s: C2= 93 ps
15208 s: C2= 104 ps
7604 s: C2= 101 ps
3802 s: C2= 110 ps
1901 s: C2= 118 ps
950 s: C2= 156 ps
475 s: C2= 239 ps
238 s: C2= 334 ps
119 s: C2= 559 ps
59 s: C2= 801 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–04 bp1xro_718349_12
Median = 57.55 ns
C5 /ns
MJD
188221 s: C5= 89 ps
94110 s: C5= 59 ps
47055 s: C5= 130 ps
23528 s: C5= 194 ps
11764 s: C5= 204 ps
5882 s: C5= 198 ps
2941 s: C5= 236 ps
1470 s: C5= 211 ps
735 s: C5= 253 ps
368 s: C5= 336 ps
184 s: C5= 634 ps
92 s: C5= 1025 ps
TdevC5 /s
Tau /s


2019–01–04 bp1xro_718349_12
Median = 69.28 ns
Median = 68.77 ns
P1 /ns
P2 /ns
MJD
288564 s: P1= 75 ps
144282 s: P1= 70 ps
72141 s: P1= 51 ps
36071 s: P1= 48 ps
18035 s: P1= 68 ps
9018 s: P1= 79 ps
4509 s: P1= 101 ps
2254 s: P1= 111 ps
1127 s: P1= 136 ps
564 s: P1= 168 ps
282 s: P1= 223 ps
141 s: P1= 380 ps
70 s: P1= 538 ps
35 s: P1= 766 ps
288564 s: P2= 87 ps
144282 s: P2= 73 ps
72141 s: P2= 45 ps
36071 s: P2= 73 ps
18035 s: P2= 97 ps
9018 s: P2= 92 ps
4509 s: P2= 99 ps
2254 s: P2= 125 ps
1127 s: P2= 171 ps
564 s: P2= 226 ps
282 s: P2= 298 ps
141 s: P2= 498 ps
70 s: P2= 721 ps
35 s: P2= 1032 ps
TdevP1 /s
TdevP2 /s
Tau /s


2019–01–04 bp1xro_718349_12
Median = 71.97 ns
Median = 58.24 ns
E1 /ns
E5 /ns
MJD
269659 s: E1= 89 ps
134829 s: E1= 86 ps
67415 s: E1= 74 ps
33707 s: E1= 94 ps
16854 s: E1= 104 ps
8427 s: E1= 116 ps
4213 s: E1= 118 ps
2107 s: E1= 125 ps
1053 s: E1= 150 ps
527 s: E1= 186 ps
263 s: E1= 262 ps
132 s: E1= 427 ps
66 s: E1= 600 ps
270759 s: E5= 102 ps
135380 s: E5= 70 ps
67690 s: E5= 62 ps
33845 s: E5= 121 ps
16922 s: E5= 115 ps
8461 s: E5= 106 ps
4231 s: E5= 113 ps
2115 s: E5= 131 ps
1058 s: E5= 181 ps
529 s: E5= 237 ps
264 s: E5= 309 ps
132 s: E5= 492 ps
66 s: E5= 680 ps
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-RO_7

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 278801
Computed code bias (P1/P2)/m = 15.675 17.703
Computed baseline (X,Y,Z)/m = 2.060 -3.287 -2.955
RMS of residuals /m = 0.366

Number of phase differences to fit baseline
L1/L2 = 327759
L5 = 0
A priori baseline (X,Y,Z)/m = 2.060 -3.287 -2.955
34547 clock jitters computed out of 34549 intervals
AVE jitter /ps = 0.0 RMS jitter /ps = 3.6

Iter 1 Large residuals L1= 6
Iter 1 Large residuals L2= 6
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.127 0.022 -0.021
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.131 0.022 -0.028
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 6
Iter 2 Large residuals L2= 6
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.127 0.022 -0.021
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.131 0.022 -0.028
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 1.932 -3.266 -2.976
Final baseline L2 (X,Y,Z)/m = 1.929 -3.266 -2.982
Final baseline L5 (X,Y,Z)/m = 1.931 -3.266 -2.979

COMPUTATION OF CODE DIFFERENCES

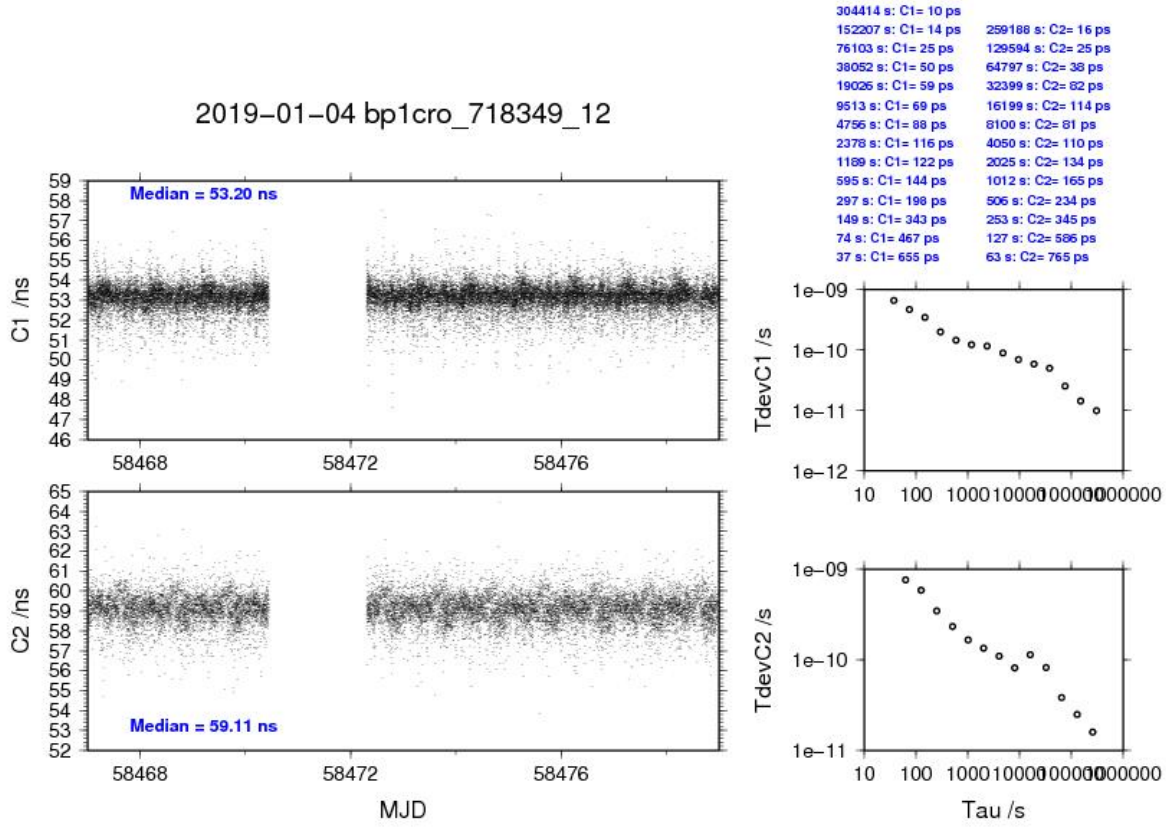
Total number of code differences = 587469

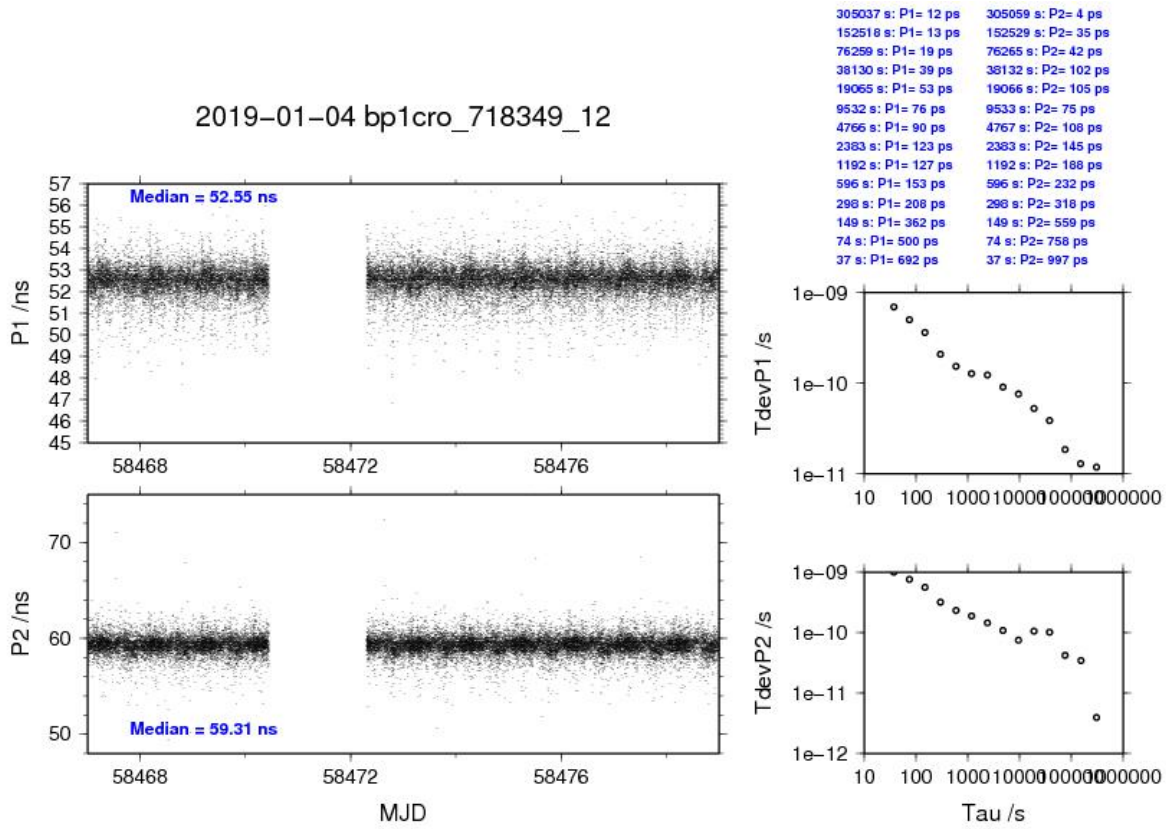
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	279351	53.152	1.099
C2	163897	59.071	1.428
C5	0	NaN	NaN
P1	278732	52.504	1.131
P2	278714	59.280	1.365
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3456

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	27894	53.199	53.153	0.662
C2	16381	59.108	59.076	0.774
C5	0	0.000	NaN	NaN
P1	27837	52.554	52.505	0.700
P2	27835	59.309	59.278	1.040
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1cro_718349_12
Median = 53.20 ns
Median = 59.11 ns
C1 /ns
C2 /ns
MJD
TdevC1 /s
TdevC2 /s
Tau /s
304414 s: C1= 10 ps
152207 s: C1= 14 ps
76103 s: C1= 25 ps
38052 s: C1= 50 ps
19026 s: C1= 59 ps
9513 s: C1= 69 ps
4756 s: C1= 88 ps
2378 s: C1= 116 ps
1189 s: C1= 122 ps
595 s: C1= 144 ps
297 s: C1= 198 ps
149 s: C1= 343 ps
74 s: C1= 467 ps
37 s: C1= 655 ps
259188 s: C2= 16 ps
129594 s: C2= 25 ps
64797 s: C2= 38 ps
32399 s: C2= 62 ps
16199 s: C2= 114 ps
8100 s: C2= 81 ps
4050 s: C2= 110 ps
2025 s: C2= 134 ps
1012 s: C2= 165 ps
506 s: C2= 234 ps
253 s: C2= 345 ps
127 s: C2= 586 ps
63 s: C2= 765 ps


2019–01–04 bp1cro_718349_12
Median = 52.55 ns
Median = 59.31 ns
P1 /ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s
305037 s: P1= 12 ps
152518 s: P1= 13 ps
76259 s: P1= 19 ps
38130 s: P1= 39 ps
19065 s: P1= 53 ps
9532 s: P1= 76 ps
4766 s: P1= 90 ps
2383 s: P1= 123 ps
1192 s: P1= 127 ps
596 s: P1= 153 ps
298 s: P1= 208 ps
149 s: P1= 362 ps
74 s: P1= 500 ps
37 s: P1= 692 ps
305059 s: P2= 4 ps
152529 s: P2= 35 ps
76265 s: P2= 42 ps
38132 s: P2= 102 ps
19066 s: P2= 105 ps
9533 s: P2= 75 ps
4767 s: P2= 108 ps
2383 s: P2= 145 ps
1192 s: P2= 188 ps
596 s: P2= 232 ps
298 s: P2= 318 ps
149 s: P2= 559 ps
74 s: P2= 758 ps
37 s: P2= 997 ps

BP1X-RO_8

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 295161
Number of huge residuals = 792. New iteration
Computed code bias (P1/P2)/m = -119.322 -119.634
Computed baseline (X,Y,Z)/m = -2.015 -17.915 6.316
RMS of residuals /m = 0.403

Number of phase differences to fit baseline
L1/L2 = 293847
L5 = 113564
A priori baseline (X,Y,Z)/m = -2.015 -17.915 6.316
34369 clock jitters computed out of 34369 intervals
AVE jitter /ps = -0.1 RMS jitter /ps = 3.6

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.132 -0.007 -0.073
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.130 -0.009 -0.070
RMS of residuals L2 /m = 0.004
Computed baseline L5 (X,Y,Z)/m = -0.124 -0.013 -0.076
RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -2.146 -17.923 6.243
Final baseline L2 (X,Y,Z)/m = -2.145 -17.924 6.246
Final baseline L5 (X,Y,Z)/m = -2.139 -17.929 6.240

COMPUTATION OF CODE DIFFERENCES

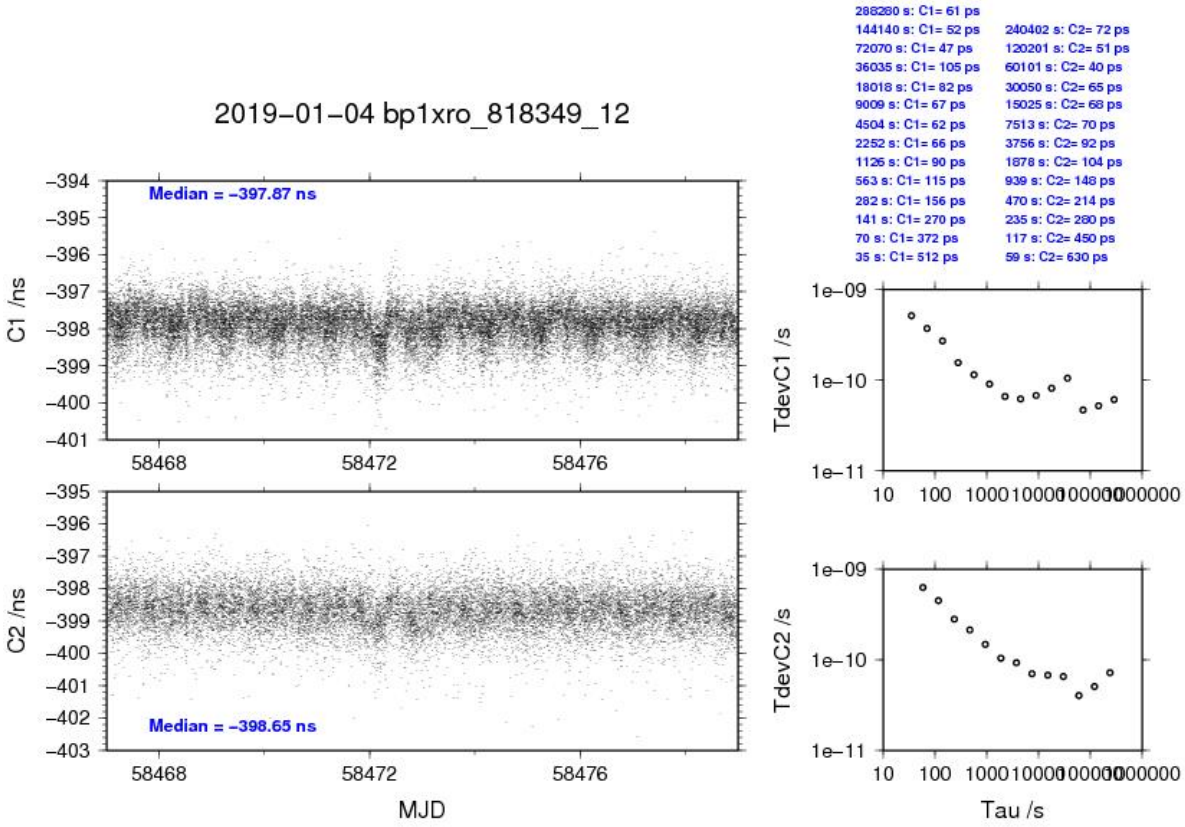
Total number of code differences = 454829

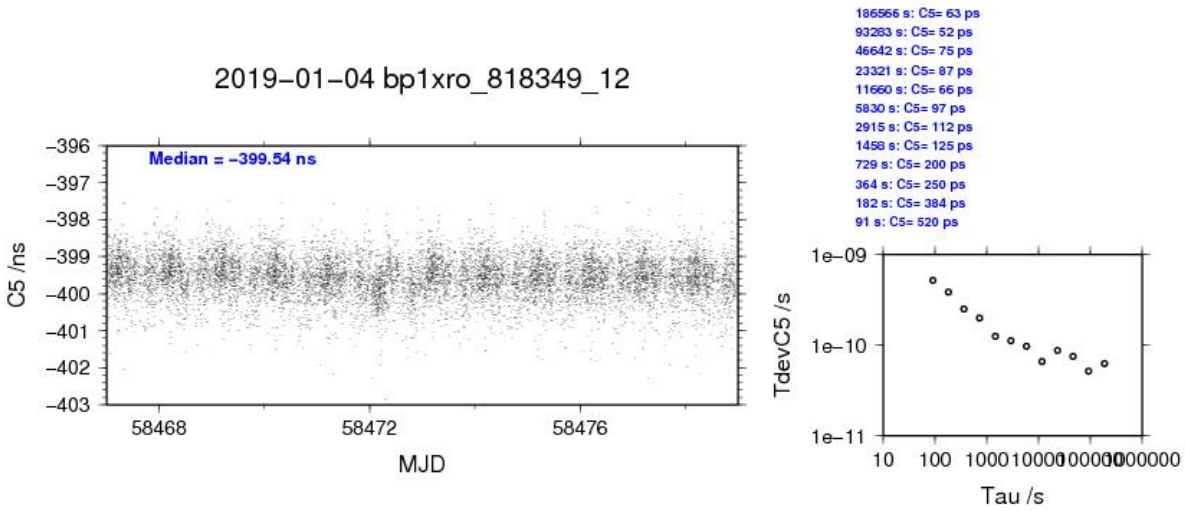
Global average of individual differences

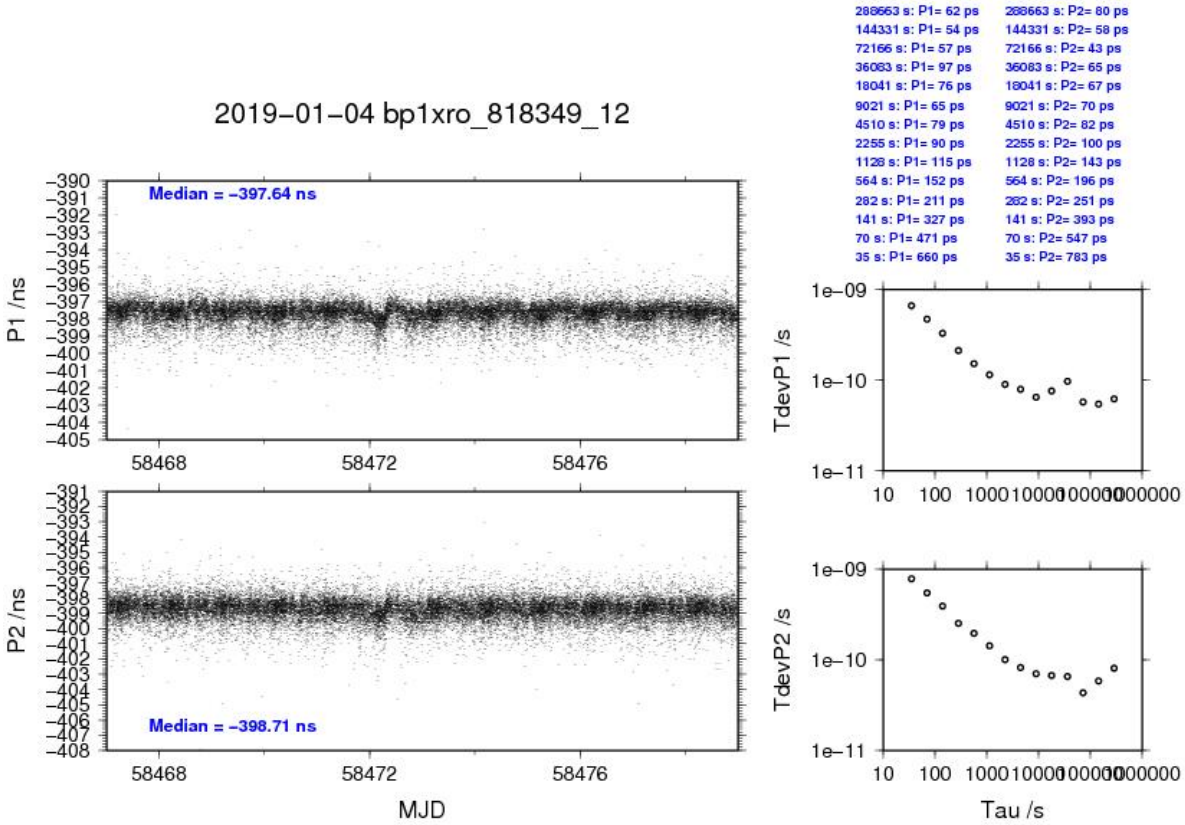
Code	#pts	ave/ns	rms/ns
C1	295106	-397.914	0.868
C2	176924	-398.674	1.014
C5	113980	-399.559	0.710
P1	294710	-397.716	1.318
P2	294710	-398.766	1.485
E1	157881	-397.633	0.792
E5	157881	-399.717	0.764

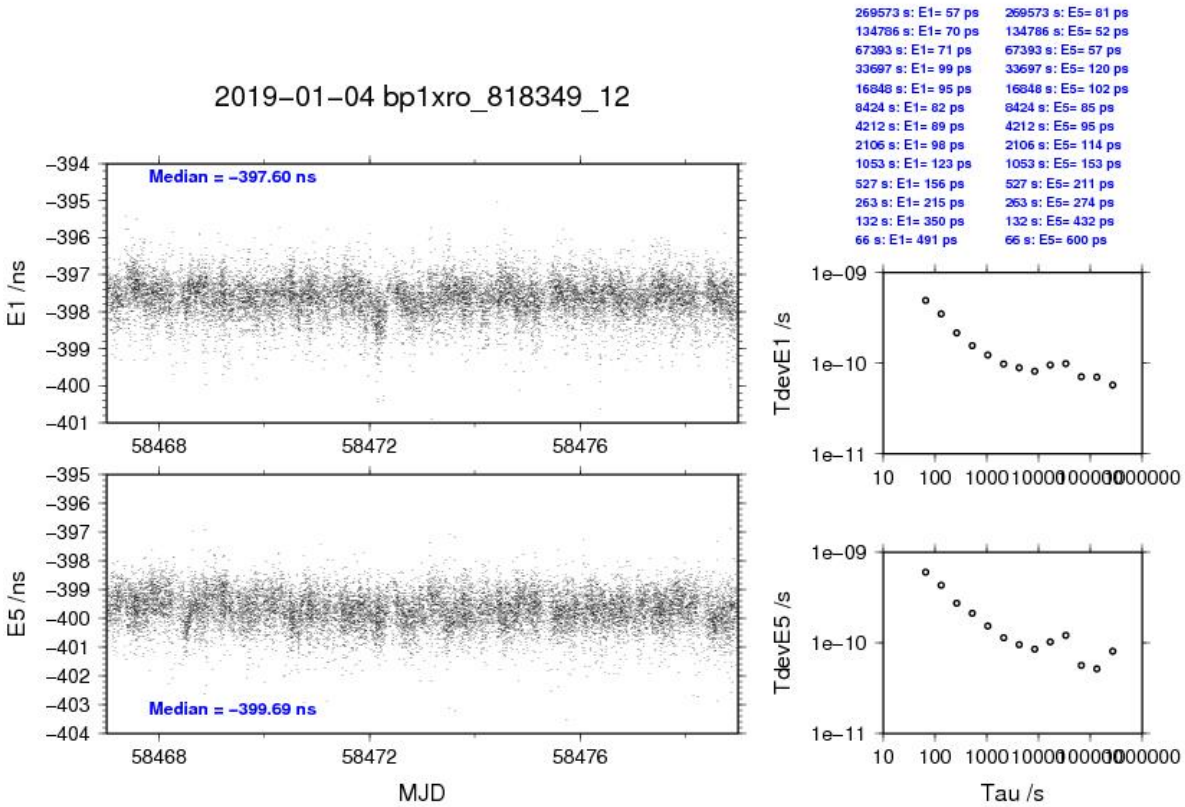
Number of 300s epochs in out file = 3454

Code	#pts	median/ns	ave/ns	rms/ns
C1	29455	-397.871	-397.907	0.529
C2	17661	-398.652	-398.668	0.628
C5	11379	-399.536	-399.553	0.546
P1	29416	-397.639	-397.706	0.667
P2	29416	-398.707	-398.755	0.784
E1	15750	-397.600	-397.627	0.506
E5	15750	-399.694	-399.712	0.622


2019–01–04 bp1xro_818349_12
Median = –397.87 ns
Median = –398.65 ns
C1 /ns
C2 /ns
MJD
288280 s: C1= 61 ps
144140 s: C1= 52 ps
72070 s: C1= 47 ps
36035 s: C1= 105 ps
18018 s: C1= 82 ps
9009 s: C1= 67 ps
4504 s: C1= 62 ps
2252 s: C1= 66 ps
1126 s: C1= 90 ps
563 s: C1= 115 ps
282 s: C1= 156 ps
141 s: C1= 270 ps
70 s: C1= 372 ps
35 s: C1= 512 ps
240402 s: C2= 72 ps
120201 s: C2= 51 ps
60101 s: C2= 40 ps
30050 s: C2= 65 ps
15025 s: C2= 68 ps
7513 s: C2= 70 ps
3756 s: C2= 92 ps
1878 s: C2= 104 ps
939 s: C2= 148 ps
470 s: C2= 214 ps
235 s: C2= 280 ps
117 s: C2= 450 ps
59 s: C2= 630 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–04 bp1xro_818349_12
Median = –399.54 ns
C5 /ns
MJD
186566 s: C5= 63 ps
93283 s: C5= 52 ps
46642 s: C5= 75 ps
23321 s: C5= 87 ps
11660 s: C5= 66 ps
5830 s: C5= 97 ps
2915 s: C5= 112 ps
1458 s: C5= 125 ps
729 s: C5= 200 ps
364 s: C5= 250 ps
182 s: C5= 384 ps
91 s: C5= 520 ps
TdevC5 /s
Tau /s


2019–01–04 bp1xro_818349_12
Median = –397.64 ns
Median = –398.71 ns
P1 /ns
P2 /ns
MJD
288663 s: P1= 62 ps
144331 s: P1= 54 ps
72166 s: P1= 57 ps
36083 s: P1= 97 ps
18041 s: P1= 76 ps
9021 s: P1= 65 ps
4510 s: P1= 79 ps
2255 s: P1= 90 ps
1128 s: P1= 115 ps
564 s: P1= 152 ps
282 s: P1= 211 ps
141 s: P1= 327 ps
70 s: P1= 471 ps
35 s: P1= 660 ps
288663 s: P2= 80 ps
144331 s: P2= 58 ps
72166 s: P2= 43 ps
36083 s: P2= 65 ps
18041 s: P2= 67 ps
9021 s: P2= 70 ps
4510 s: P2= 82 ps
2255 s: P2= 100 ps
1128 s: P2= 143 ps
564 s: P2= 196 ps
282 s: P2= 251 ps
141 s: P2= 393 ps
70 s: P2= 547 ps
35 s: P2= 783 ps
TdevP1 /s
TdevP2 /s
Tau /s


2019–01–04 bp1xro_818349_12
Median = –397.60 ns
Median = –399.69 ns
E1 /ns
E5 /ns
MJD
269573 s: E1= 57 ps
134786 s: E1= 70 ps
67393 s: E1= 71 ps
33697 s: E1= 99 ps
16848 s: E1= 95 ps
8424 s: E1= 82 ps
4212 s: E1= 89 ps
2106 s: E1= 98 ps
1053 s: E1= 123 ps
527 s: E1= 156 ps
263 s: E1= 215 ps
132 s: E1= 350 ps
66 s: E1= 491 ps
269573 s: E5= 81 ps
134786 s: E5= 52 ps
67393 s: E5= 57 ps
33697 s: E5= 120 ps
16848 s: E5= 102 ps
8424 s: E5= 85 ps
4212 s: E5= 95 ps
2106 s: E5= 114 ps
1053 s: E5= 153 ps
527 s: E5= 211 ps
263 s: E5= 274 ps
132 s: E5= 432 ps
66 s: E5= 600 ps
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-RO_8

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 249389
Computed code bias (P1/P2)/m = -124.259 -122.398
Computed baseline (X,Y,Z)/m = -2.502 -18.749 6.588
RMS of residuals /m = 0.356

Number of phase differences to fit baseline
L1/L2 = 293868
L5 = 0
A priori baseline (X,Y,Z)/m = -2.502 -18.749 6.588
34525 clock jitters computed out of 34527 intervals
AVE jitter /ps = 0.0 RMS jitter /ps = 3.5

Iter 1 Large residuals L1= 5
Iter 1 Large residuals L2= 5
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.039 0.011 -0.012
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.046 0.010 -0.021
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 5
Iter 2 Large residuals L2= 5
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.039 0.011 -0.012
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.046 0.010 -0.021
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -2.541 -18.738 6.575
Final baseline L2 (X,Y,Z)/m = -2.548 -18.740 6.567
Final baseline L5 (X,Y,Z)/m = -2.544 -18.739 6.571

COMPUTATION OF CODE DIFFERENCES

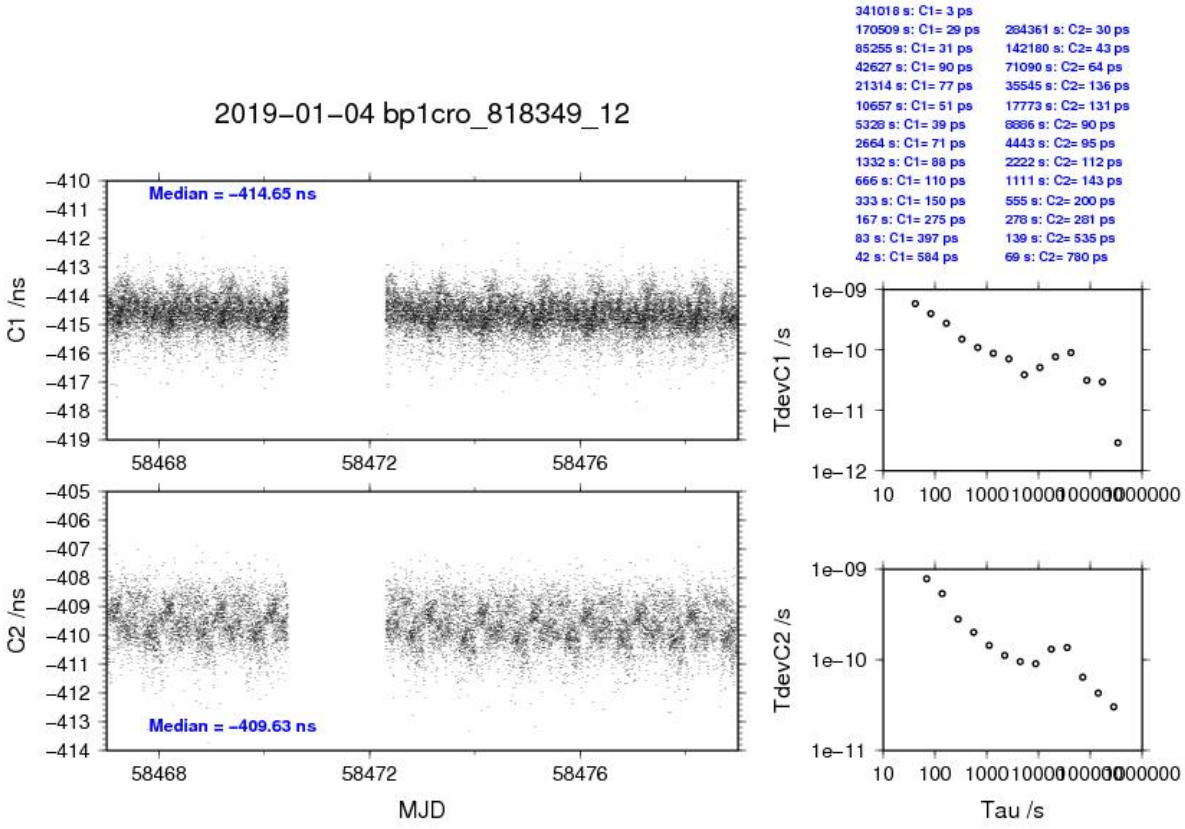
Total number of code differences = 527534

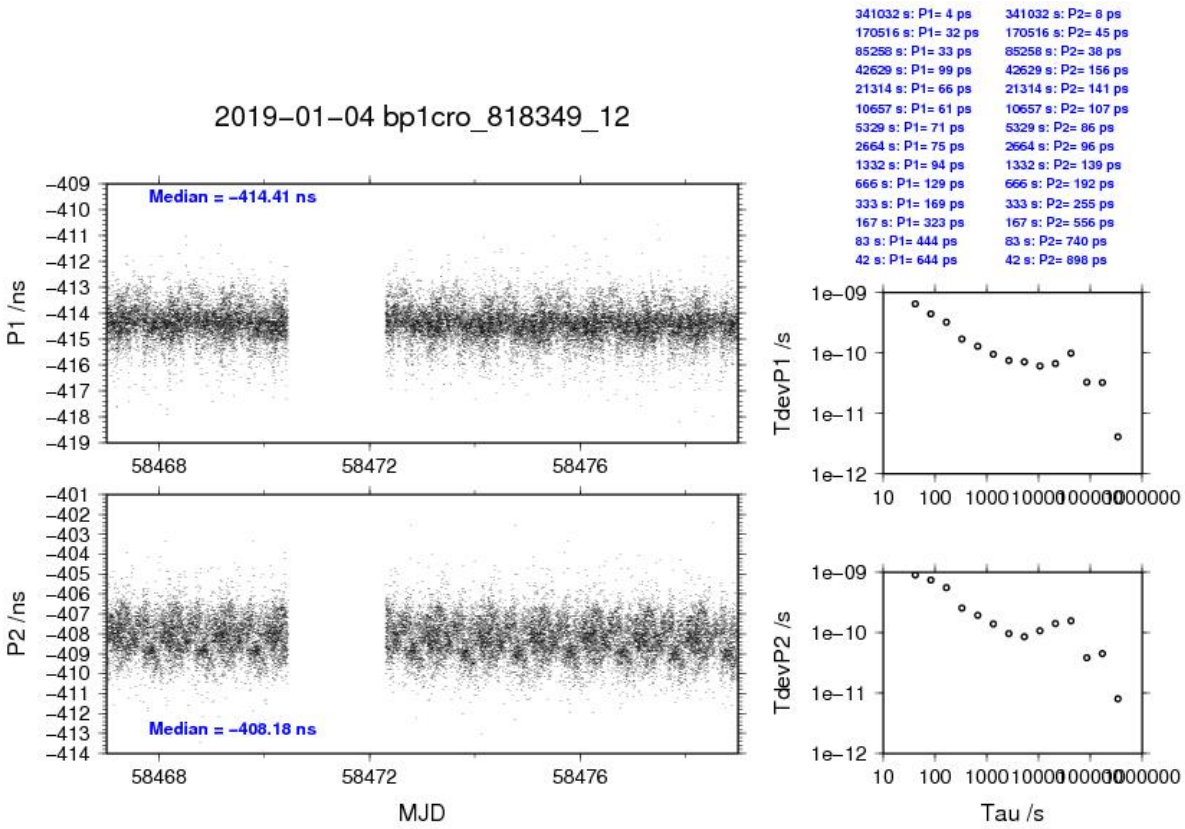
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	249336	-414.645	0.868
C2	149480	-409.628	1.159
C5	0	NaN	NaN
P1	249334	-414.406	1.029
P2	249334	-408.176	1.344
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3456

Code	#pts	median/ns	ave/ns	rms/ns
C1	24900	-414.647	-414.642	0.563
C2	14931	-409.634	-409.624	0.741
C5	0	0.000	NaN	NaN
P1	24899	-414.410	-414.407	0.631
P2	24899	-408.181	-408.177	0.980
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1cro_818349_12
Median = –414.65 ns
Median = –409.63 ns
C1 /ns
C2 /ns
MJD
341018 s: C1= 3 ps
170509 s: C1= 29 ps
85255 s: C1= 31 ps
42627 s: C1= 90 ps
21314 s: C1= 77 ps
10657 s: C1= 51 ps
5328 s: C1= 39 ps
2664 s: C1= 71 ps
1332 s: C1= 88 ps
666 s: C1= 110 ps
333 s: C1= 150 ps
167 s: C1= 275 ps
83 s: C1= 397 ps
42 s: C1= 584 ps
284361 s: C2= 30 ps
142180 s: C2= 43 ps
71090 s: C2= 64 ps
35545 s: C2= 136 ps
17773 s: C2= 131 ps
8886 s: C2= 90 ps
4443 s: C2= 95 ps
2222 s: C2= 112 ps
1111 s: C2= 143 ps
555 s: C2= 200 ps
278 s: C2= 281 ps
139 s: C2= 535 ps
69 s: C2= 780 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–04 bp1cro_818349_12
Median = –414.41 ns
Median = –408.18 ns
P1 /ns
P2 /ns
MJD
341032 s: P1= 4 ps
170516 s: P1= 32 ps
85258 s: P1= 33 ps
42629 s: P1= 99 ps
21314 s: P1= 66 ps
10657 s: P1= 61 ps
5329 s: P1= 71 ps
2664 s: P1= 75 ps
1332 s: P1= 94 ps
666 s: P1= 129 ps
333 s: P1= 169 ps
167 s: P1= 323 ps
83 s: P1= 444 ps
42 s: P1= 644 ps
341032 s: P2= 8 ps
170516 s: P2= 45 ps
85258 s: P2= 38 ps
42629 s: P2= 156 ps
21314 s: P2= 141 ps
10657 s: P2= 107 ps
5329 s: P2= 86 ps
2664 s: P2= 96 ps
1332 s: P2= 139 ps
666 s: P2= 192 ps
333 s: P2= 255 ps
167 s: P2= 556 ps
83 s: P2= 740 ps
42 s: P2= 898 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1X-RO_9

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 280707
Number of huge residuals = 792. New iteration
Computed code bias (P1/P2)/m = 29.345 29.182
Computed baseline (X,Y,Z)/m = 3.530 -0.195 -4.177
RMS of residuals /m = 0.411

Number of phase differences to fit baseline
L1/L2 = 279513
L5 = 106168
A priori baseline (X,Y,Z)/m = 3.530 -0.195 -4.177
32550 clock jitters computed out of 32550 intervals
AVE jitter /ps = -0.2 RMS jitter /ps = 3.6

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.225 0.000 -0.106
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.223 -0.002 -0.102
RMS of residuals L2 /m = 0.004
Computed baseline L5 (X,Y,Z)/m = -0.212 -0.003 -0.100
RMS of residuals L5 /m = 0.002

Final baseline L1 (X,Y,Z)/m = 3.305 -0.194 -4.283
Final baseline L2 (X,Y,Z)/m = 3.307 -0.197 -4.279
Final baseline L5 (X,Y,Z)/m = 3.318 -0.198 -4.277

COMPUTATION OF CODE DIFFERENCES

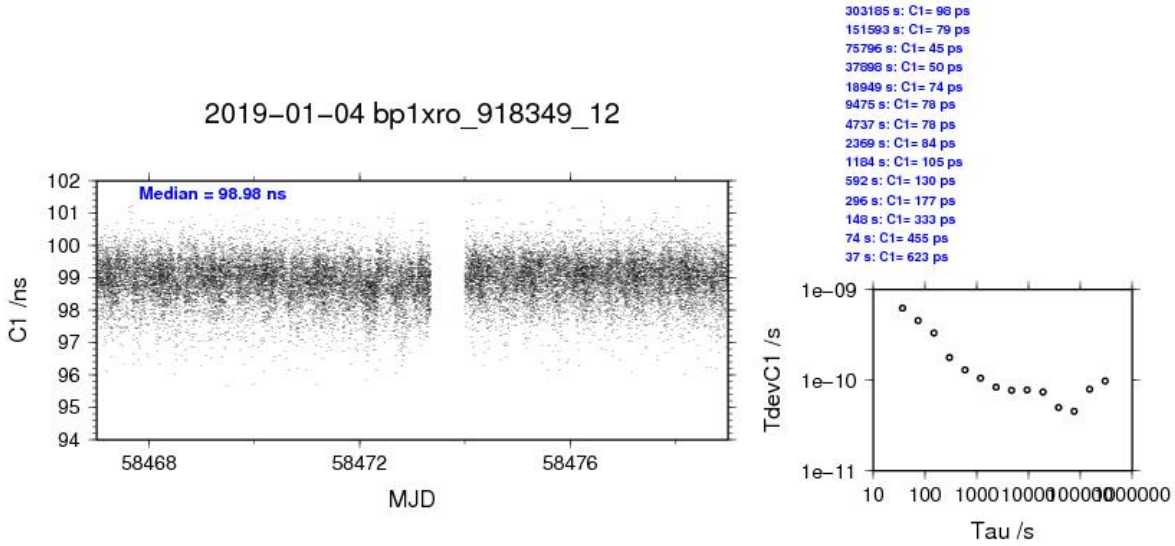
Total number of code differences = 430512

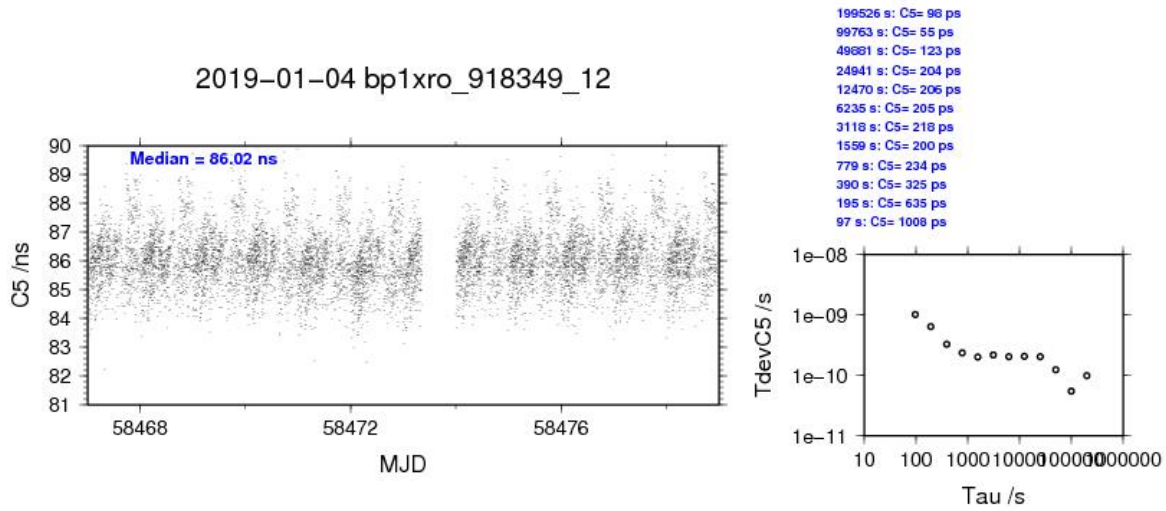
Global average of individual differences

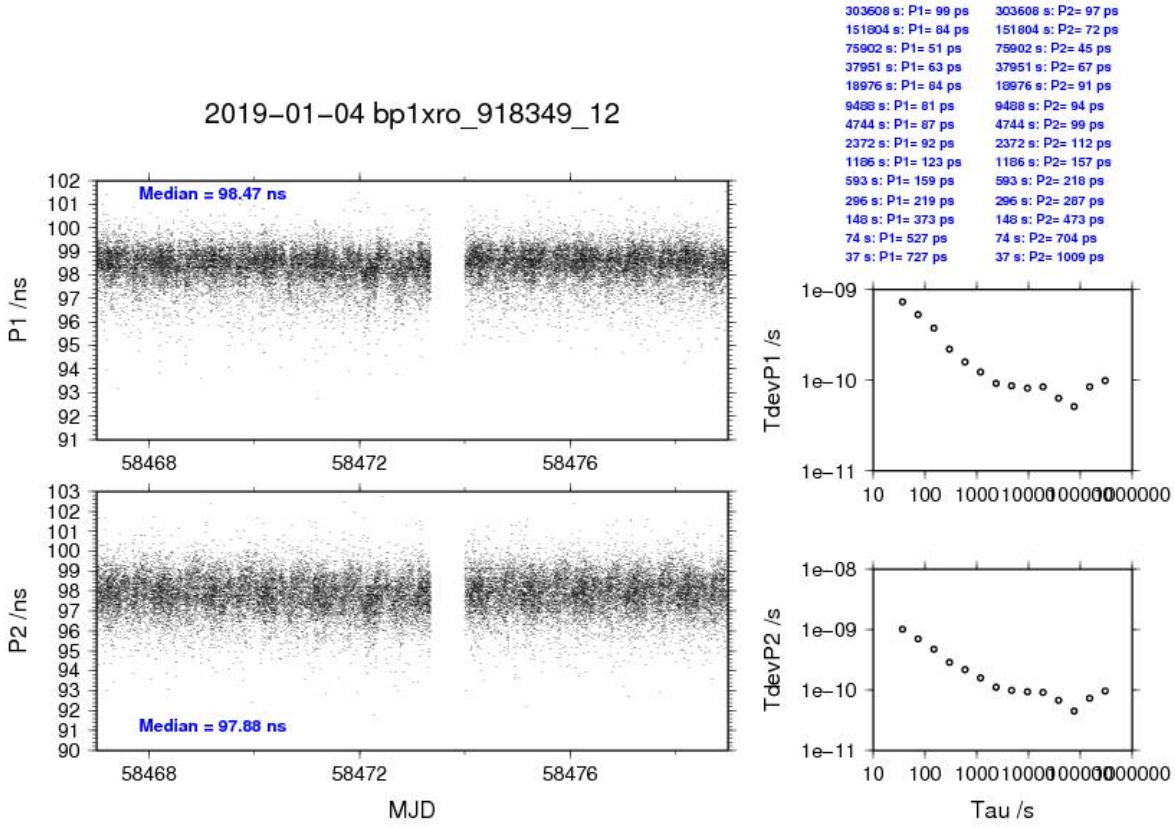
Code	**#pts**	**ave/ns**	**rms/ns**
C1	280652	98.931	0.969
C2	0	NaN	NaN
C5	106542	86.067	1.083
P1	280256	98.374	1.297
P2	280256	97.821	1.534
E1	148648	101.044	0.854
E5	148074	86.817	0.833

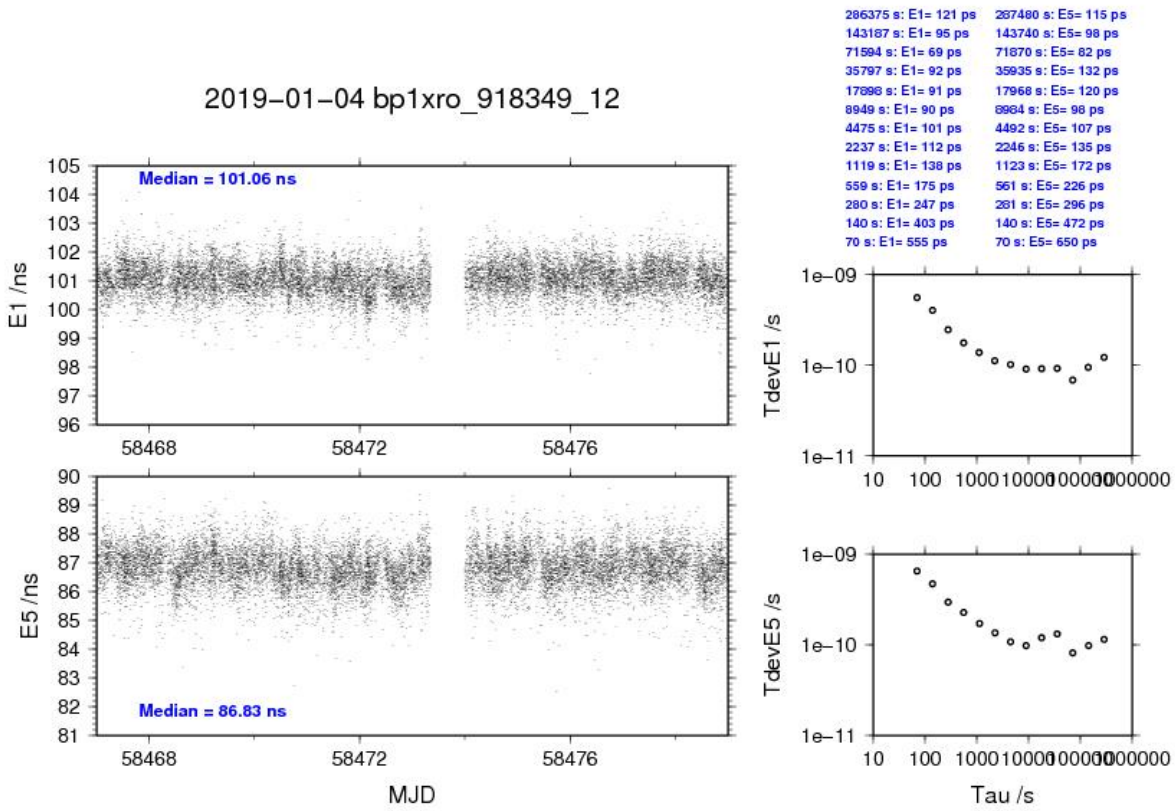
Number of 300s epochs in out file = 3267

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	28007	98.983	98.936	0.635
C2	0	0.000	NaN	NaN
C5	10640	86.023	86.070	0.952
P1	27968	98.468	98.387	0.736
P2	27968	97.875	97.836	0.981
E1	14826	101.058	101.054	0.574
E5	14769	86.834	86.820	0.681


2019–01–04 bp1xro_918349_12
Median = 98.98 ns
C1 /ns
MJD
303185 s: C1= 98 ps
151593 s: C1= 79 ps
75796 s: C1= 45 ps
37898 s: C1= 50 ps
18949 s: C1= 74 ps
9475 s: C1= 78 ps
4737 s: C1= 78 ps
2369 s: C1= 84 ps
1184 s: C1= 105 ps
592 s: C1= 130 ps
296 s: C1= 177 ps
148 s: C1= 333 ps
74 s: C1= 455 ps
37 s: C1= 623 ps
TdevC1 /s
Tau /s


2019–01–04 bp1xro_918349_12
Median = 86.02 ns
C5 /ns
MJD
199526 s: C5= 98 ps
99763 s: C5= 55 ps
49881 s: C5= 123 ps
24941 s: C5= 204 ps
12470 s: C5= 206 ps
6235 s: C5= 205 ps
3118 s: C5= 218 ps
1559 s: C5= 200 ps
779 s: C5= 234 ps
390 s: C5= 325 ps
195 s: C5= 635 ps
97 s: C5= 1008 ps
TdevC5 /s
Tau /s


2019–01–04 bp1xro_918349_12
Median = 98.47 ns
Median = 97.88 ns
P1 /ns
P2 /ns
MJD
303608 s: P1= 99 ps
151804 s: P1= 84 ps
75902 s: P1= 51 ps
37951 s: P1= 63 ps
18976 s: P1= 84 ps
9488 s: P1= 81 ps
4744 s: P1= 87 ps
2372 s: P1= 92 ps
1186 s: P1= 123 ps
593 s: P1= 159 ps
296 s: P1= 219 ps
148 s: P1= 373 ps
74 s: P1= 527 ps
37 s: P1= 727 ps
303608 s: P2= 97 ps
151804 s: P2= 72 ps
75902 s: P2= 45 ps
37951 s: P2= 67 ps
18976 s: P2= 91 ps
9488 s: P2= 94 ps
4744 s: P2= 99 ps
2372 s: P2= 112 ps
1186 s: P2= 157 ps
593 s: P2= 218 ps
296 s: P2= 287 ps
148 s: P2= 473 ps
74 s: P2= 704 ps
37 s: P2= 1009 ps
TdevP1 /s
TdevP2 /s
Tau /s


2019–01–04 bp1xro_918349_12
Median = 101.06 ns
Median = 86.83 ns
E1 /ns
E5 /ns
MJD
286375 s: E1= 121 ps
143187 s: E1= 95 ps
71594 s: E1= 69 ps
35797 s: E1= 92 ps
17898 s: E1= 91 ps
8949 s: E1= 90 ps
4475 s: E1= 101 ps
2237 s: E1= 112 ps
1119 s: E1= 138 ps
559 s: E1= 175 ps
280 s: E1= 247 ps
140 s: E1= 403 ps
70 s: E1= 555 ps
287480 s: E5= 115 ps
143740 s: E5= 98 ps
71870 s: E5= 82 ps
35935 s: E5= 132 ps
17968 s: E5= 120 ps
8984 s: E5= 98 ps
4492 s: E5= 107 ps
2246 s: E5= 135 ps
1123 s: E5= 172 ps
561 s: E5= 226 ps
281 s: E5= 296 ps
140 s: E5= 472 ps
70 s: E5= 650 ps
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-RO_9

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 262529
Number of huge residuals = 444. New iteration
Computed code bias (P1/P2)/m = 24.420 26.425
Computed baseline (X,Y,Z)/m = 3.040 -1.034 -3.914
RMS of residuals /m = 0.355

Number of phase differences to fit baseline
L1/L2 = 311454
L5 = 0
A priori baseline (X,Y,Z)/m = 3.040 -1.034 -3.914
32677 clock jitters computed out of 32677 intervals
AVE jitter /ps = 0.0 RMS jitter /ps = 3.7

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.131 0.020 -0.037
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.137 0.021 -0.044
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 2.909 -1.014 -3.951
Final baseline L2 (X,Y,Z)/m = 2.904 -1.013 -3.958
Final baseline L5 (X,Y,Z)/m = 2.907 -1.013 -3.954

COMPUTATION OF CODE DIFFERENCES

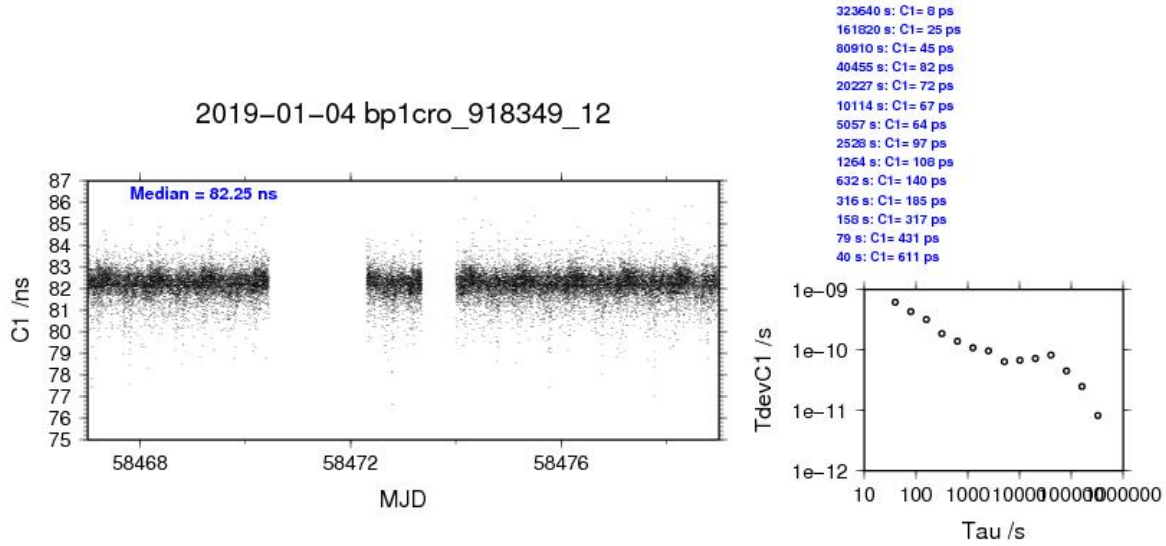
Total number of code differences = 313918

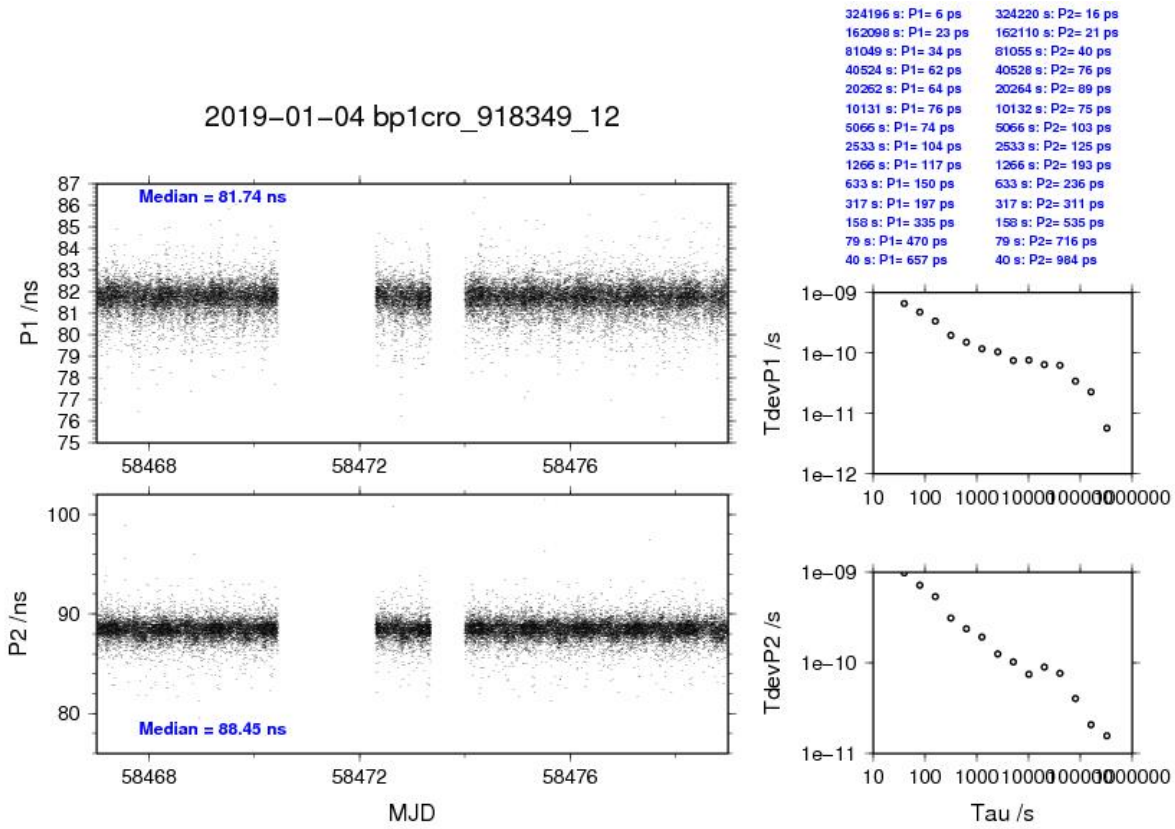
Global average of individual differences

Code	**#pts**	**ave/ns**	**rms/ns**
C1	262760	82.197	1.061
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	262246	81.694	1.097
P2	262228	88.397	1.328
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3269

Code	**#pts**	**median/ns**	**ave/ns**	**rms/ns**
C1	26237	82.246	82.198	0.616
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	26192	81.736	81.694	0.660
P2	26190	88.447	88.398	1.004
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1cro_918349_12
Median = 82.25 ns
C1 /ns
MJD
323640 s: C1= 8 ps
161820 s: C1= 25 ps
80910 s: C1= 45 ps
40455 s: C1= 82 ps
20227 s: C1= 72 ps
10114 s: C1= 67 ps
5057 s: C1= 64 ps
2528 s: C1= 97 ps
1264 s: C1= 108 ps
632 s: C1= 140 ps
316 s: C1= 185 ps
158 s: C1= 317 ps
79 s: C1= 431 ps
40 s: C1= 611 ps
TdevC1 /s
Tau /s


2019–01–04 bp1cro_918349_12
Median = 81.74 ns
P1 /ns
Median = 88.45 ns
P2 /ns
MJD
324196 s: P1= 6 ps
162098 s: P1= 23 ps
81049 s: P1= 34 ps
40524 s: P1= 62 ps
20262 s: P1= 64 ps
10131 s: P1= 76 ps
5066 s: P1= 74 ps
2533 s: P1= 104 ps
1266 s: P1= 117 ps
633 s: P1= 150 ps
317 s: P1= 197 ps
158 s: P1= 335 ps
79 s: P1= 470 ps
40 s: P1= 657 ps
324220 s: P2= 16 ps
162110 s: P2= 21 ps
81055 s: P2= 40 ps
40528 s: P2= 76 ps
20264 s: P2= 89 ps
10132 s: P2= 75 ps
5066 s: P2= 103 ps
2533 s: P2= 125 ps
1266 s: P2= 193 ps
633 s: P2= 236 ps
317 s: P2= 311 ps
158 s: P2= 535 ps
79 s: P2= 716 ps
40 s: P2= 984 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1X-RO10

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 270620
Number of huge residuals = 792. New iteration
Computed code bias (P1/P2)/m = -140.014 -140.143
Computed baseline (X,Y,Z)/m = -1.951 -17.941 6.358
RMS of residuals /m = 0.433

Number of phase differences to fit baseline
L1/L2 = 269357
L5 = 104054
A priori baseline (X,Y,Z)/m = -1.951 -17.941 6.358
31520 clock jitters computed out of 31520 intervals
AVE jitter /ps = -0.0 RMS jitter /ps = 3.4

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 0
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.194 0.011 -0.114
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.192 0.008 -0.110
RMS of residuals L2 /m = 0.004
Computed baseline L5 (X,Y,Z)/m = -0.182 0.005 -0.115
RMS of residuals L5 /m = 0.002

Final baseline L1 (X,Y,Z)/m = -2.145 -17.930 6.245
Final baseline L2 (X,Y,Z)/m = -2.143 -17.933 6.248
Final baseline L5 (X,Y,Z)/m = -2.133 -17.936 6.243

COMPUTATION OF CODE DIFFERENCES

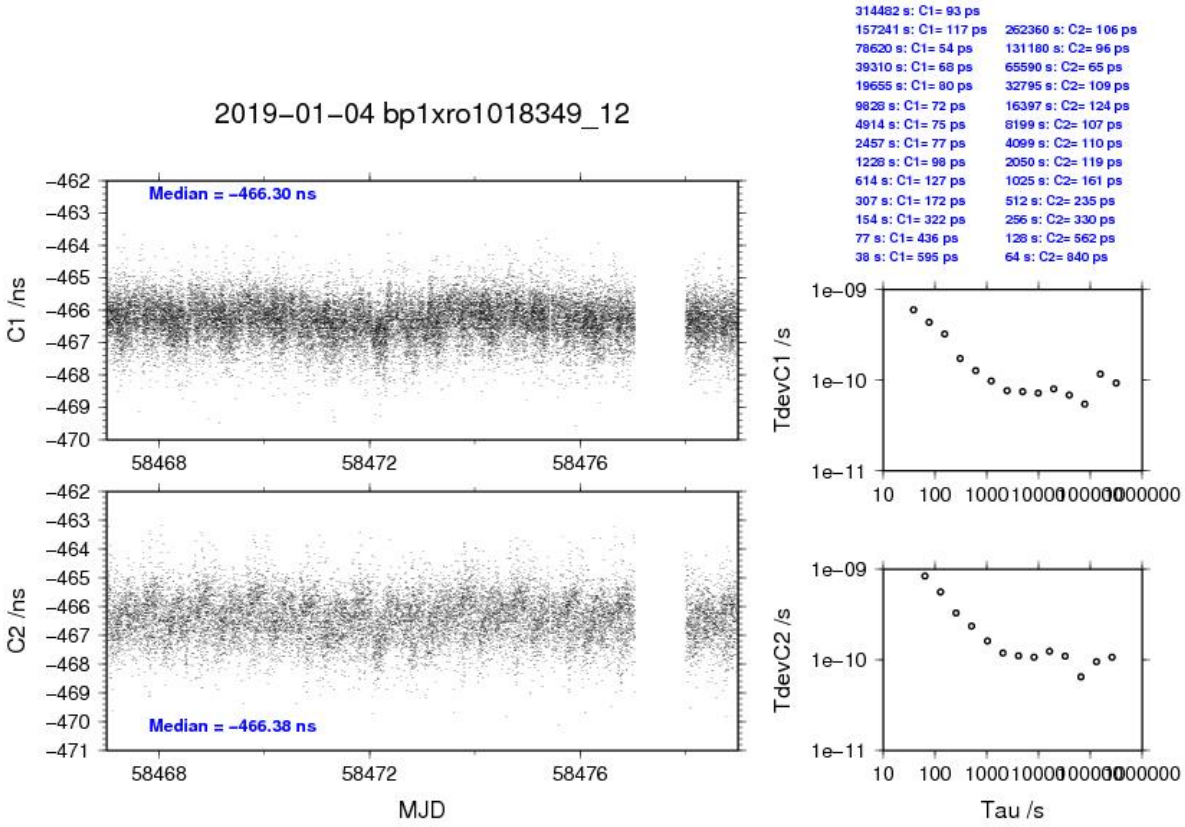
Total number of code differences = 416495

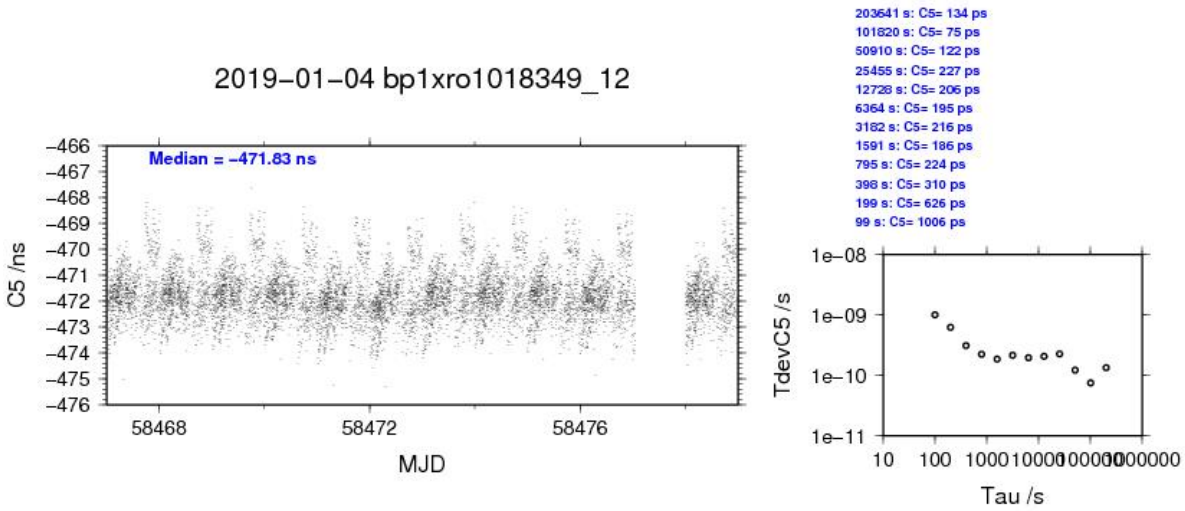
Global average of individual differences

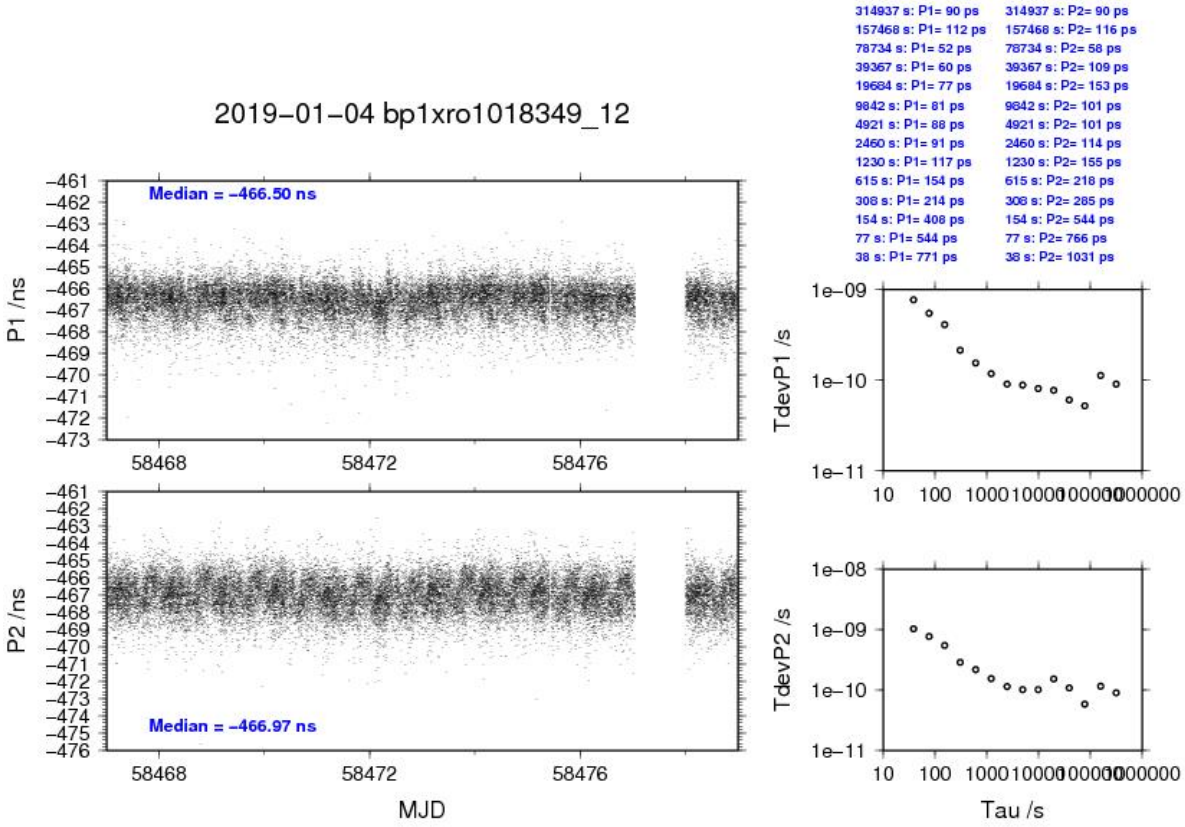
Code	#pts	ave/ns	rms/ns
C1	270565	-466.331	1.010
C2	162143	-466.408	1.184
C5	104464	-471.761	1.068
P1	270169	-466.587	1.358
P2	270169	-467.025	1.614
E1	144291	-464.879	0.860
E5	144291	-470.943	0.791

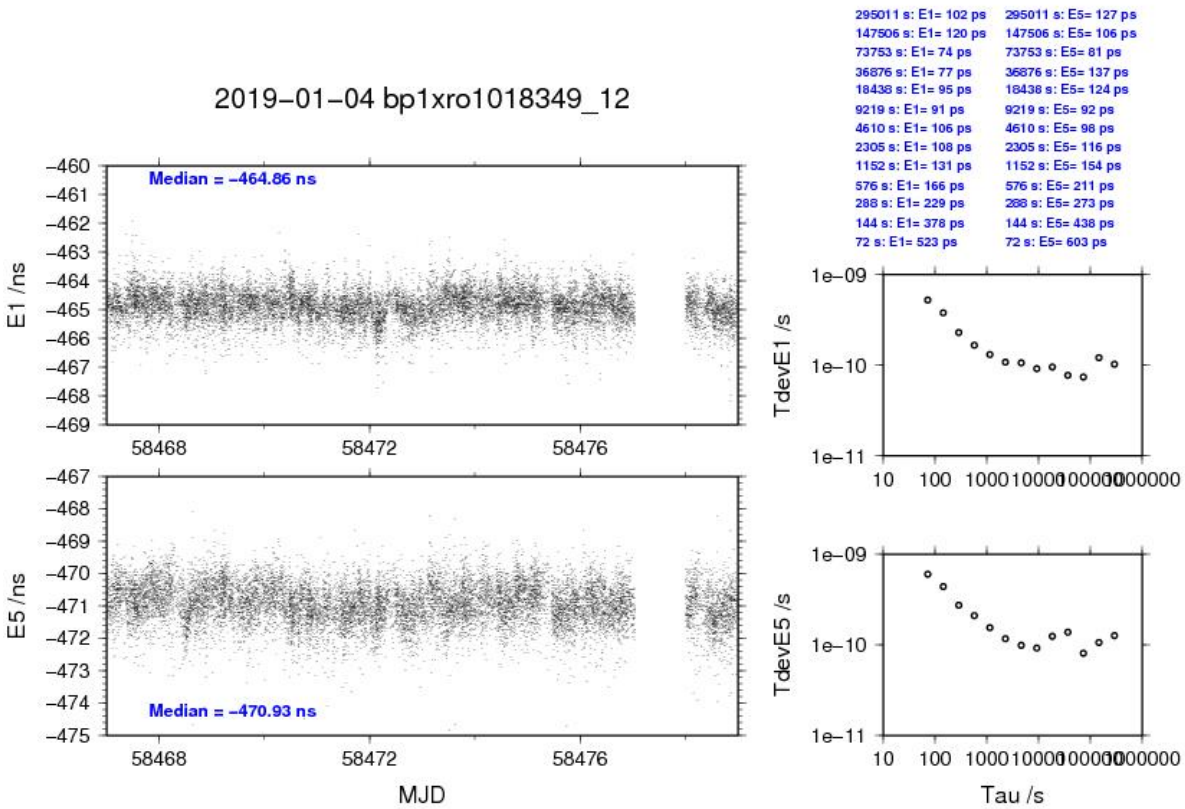
Number of 300s epochs in out file = 3169

Code	#pts	median/ns	ave/ns	rms/ns
C1	27001	-466.298	-466.323	0.615
C2	16183	-466.378	-466.404	0.799
C5	10425	-471.830	-471.757	0.944
P1	26962	-466.504	-466.575	0.770
P2	26962	-466.969	-467.009	1.047
E1	14392	-464.859	-464.874	0.545
E5	14392	-470.928	-470.939	0.637


2019–01–04 bp1xro1018349_12
Median = –466.30 ns
Median = –466.38 ns
C1 /ns
C2 /ns
MJD
314482 s: C1= 93 ps
157241 s: C1= 117 ps
78620 s: C1= 54 ps
39310 s: C1= 68 ps
19655 s: C1= 80 ps
9828 s: C1= 72 ps
4914 s: C1= 75 ps
2457 s: C1= 77 ps
1228 s: C1= 98 ps
614 s: C1= 127 ps
307 s: C1= 172 ps
154 s: C1= 322 ps
77 s: C1= 436 ps
38 s: C1= 595 ps
262360 s: C2= 106 ps
131180 s: C2= 96 ps
65590 s: C2= 65 ps
32795 s: C2= 109 ps
16397 s: C2= 124 ps
8199 s: C2= 107 ps
4099 s: C2= 110 ps
2050 s: C2= 119 ps
1025 s: C2= 161 ps
512 s: C2= 235 ps
256 s: C2= 330 ps
128 s: C2= 562 ps
64 s: C2= 840 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–04 bp1xro1018349_12
Median = –471.83 ns
C5 /ns
MJD
203641 s: C5= 134 ps
101820 s: C5= 75 ps
50910 s: C5= 122 ps
25455 s: C5= 227 ps
12728 s: C5= 206 ps
6364 s: C5= 195 ps
3182 s: C5= 216 ps
1591 s: C5= 186 ps
795 s: C5= 224 ps
398 s: C5= 310 ps
199 s: C5= 626 ps
99 s: C5= 1006 ps
TdevC5 /s
Tau /s


2019–01–04 bp1xro1018349_12
Median = –466.50 ns
Median = –466.97 ns
P1 /ns
P2 /ns
MJD
314937 s: P1= 90 ps
157468 s: P1= 112 ps
78734 s: P1= 52 ps
39367 s: P1= 60 ps
19684 s: P1= 77 ps
9842 s: P1= 81 ps
4921 s: P1= 88 ps
2460 s: P1= 91 ps
1230 s: P1= 117 ps
615 s: P1= 154 ps
308 s: P1= 214 ps
154 s: P1= 408 ps
77 s: P1= 544 ps
38 s: P1= 771 ps
314937 s: P2= 90 ps
157468 s: P2= 116 ps
78734 s: P2= 58 ps
39367 s: P2= 109 ps
19684 s: P2= 153 ps
9842 s: P2= 101 ps
4921 s: P2= 101 ps
2460 s: P2= 114 ps
1230 s: P2= 155 ps
615 s: P2= 218 ps
308 s: P2= 285 ps
154 s: P2= 544 ps
77 s: P2= 766 ps
38 s: P2= 1031 ps
TdevP1 /s
TdevP2 /s
Tau /s


2019–01–04 bp1xro1018349_12
Median = –464.86 ns
Median = –470.93 ns
E1 /ns
E5 /ns
MJD
295011 s: E1= 102 ps
147506 s: E1= 120 ps
73753 s: E1= 74 ps
36876 s: E1= 77 ps
18438 s: E1= 95 ps
9219 s: E1= 91 ps
4610 s: E1= 106 ps
2305 s: E1= 108 ps
1152 s: E1= 131 ps
576 s: E1= 166 ps
288 s: E1= 229 ps
144 s: E1= 378 ps
72 s: E1= 523 ps
295011 s: E5= 127 ps
147506 s: E5= 106 ps
73753 s: E5= 81 ps
36876 s: E5= 137 ps
18438 s: E5= 124 ps
9219 s: E5= 92 ps
4610 s: E5= 98 ps
2305 s: E5= 116 ps
1152 s: E5= 154 ps
576 s: E5= 211 ps
288 s: E5= 273 ps
144 s: E5= 438 ps
72 s: E5= 603 ps
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-RO10

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 251706
Computed code bias (P1/P2)/m = -144.933 -142.892
Computed baseline (X,Y,Z)/m = -2.441 -18.775 6.614
RMS of residuals /m = 0.360

Number of phase differences to fit baseline
L1/L2 = 300879
L5 = 0
A priori baseline (X,Y,Z)/m = -2.441 -18.775 6.614
31676 clock jitters computed out of 31678 intervals
AVE jitter /ps = 0.1 RMS jitter /ps = 3.4

Iter 1 Large residuals L1= 6
Iter 1 Large residuals L2= 6
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.106 0.032 -0.042
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.113 0.033 -0.050
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 6
Iter 2 Large residuals L2= 6
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.106 0.032 -0.042
RMS of residuals L1 /m = 0.002
Computed baseline L2 (X,Y,Z)/m = -0.113 0.033 -0.050
RMS of residuals L2 /m = 0.003
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -2.548 -18.744 6.572
Final baseline L2 (X,Y,Z)/m = -2.554 -18.742 6.565
Final baseline L5 (X,Y,Z)/m = -2.551 -18.743 6.568

COMPUTATION OF CODE DIFFERENCES

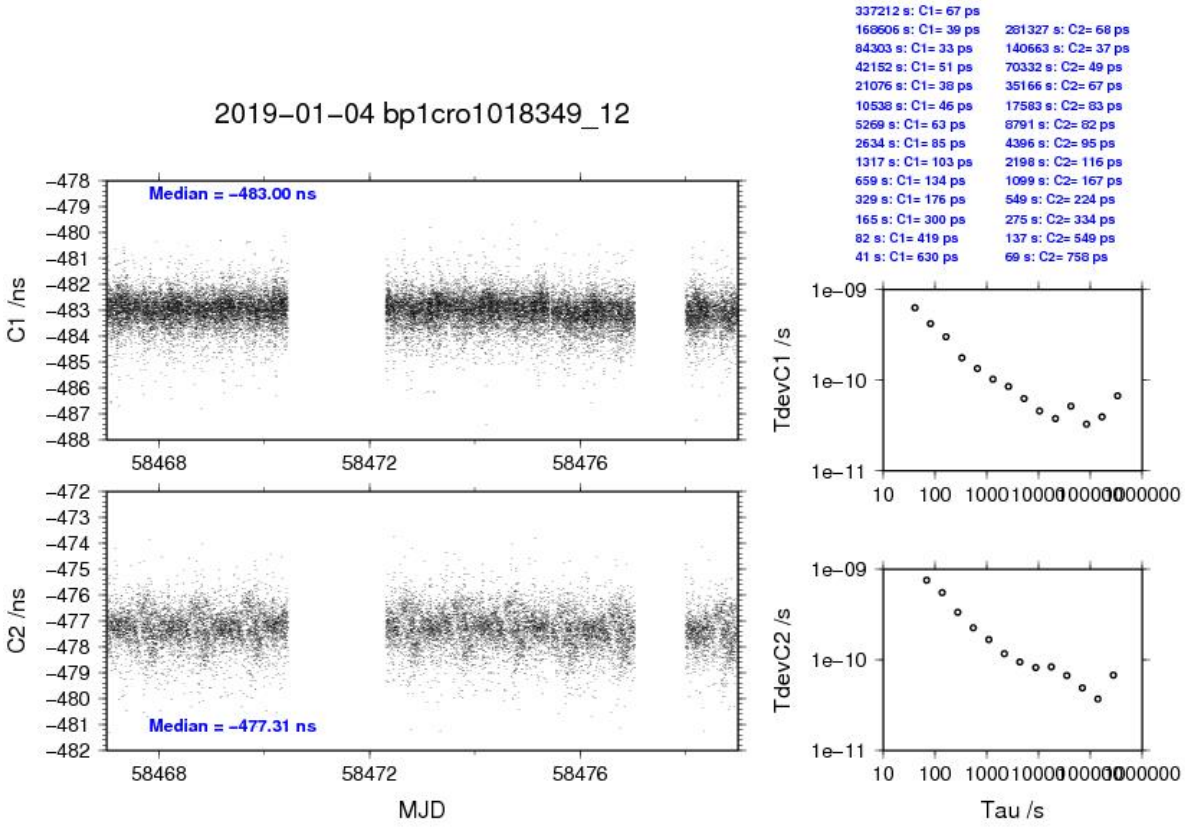
Total number of code differences = 538456

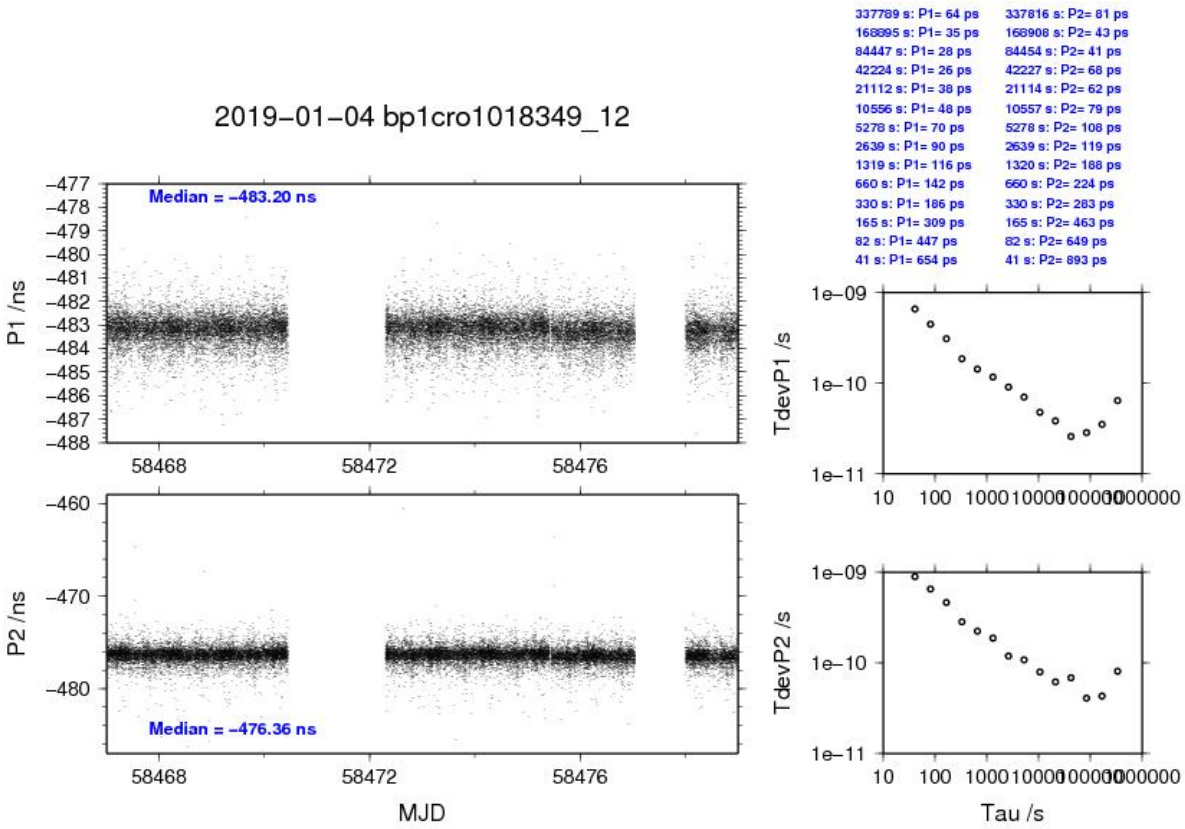
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	252099	-483.035	1.107
C2	150987	-477.343	1.369
C5	0	NaN	NaN
P1	251645	-483.239	1.135
P2	251631	-476.413	1.324
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3171

Code	#pts	median/ns	ave/ns	rms/ns
C1	25181	-482.998	-483.036	0.608
C2	15092	-477.309	-477.338	0.747
C5	0	0.000	NaN	NaN
P1	25138	-483.196	-483.239	0.636
P2	25136	-476.364	-476.417	0.912
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–04 bp1cro1018349_12
Median = –483.00 ns
Median = –477.31 ns
C1 /ns
C2 /ns
MJD
337212 s: C1= 67 ps
168606 s: C1= 39 ps
84303 s: C1= 33 ps
42152 s: C1= 51 ps
21076 s: C1= 38 ps
10538 s: C1= 46 ps
5269 s: C1= 63 ps
2634 s: C1= 85 ps
1317 s: C1= 103 ps
659 s: C1= 134 ps
329 s: C1= 176 ps
165 s: C1= 300 ps
82 s: C1= 419 ps
41 s: C1= 630 ps
281327 s: C2= 68 ps
140663 s: C2= 37 ps
70332 s: C2= 49 ps
35166 s: C2= 67 ps
17583 s: C2= 83 ps
8791 s: C2= 82 ps
4396 s: C2= 95 ps
2198 s: C2= 116 ps
1099 s: C2= 167 ps
549 s: C2= 224 ps
275 s: C2= 334 ps
137 s: C2= 549 ps
69 s: C2= 758 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–04 bp1cro1018349_12
Median = –483.20 ns
Median = –476.36 ns
P1 /ns
P2 /ns
MJD
337789 s: P1= 64 ps
168895 s: P1= 35 ps
84447 s: P1= 28 ps
42224 s: P1= 26 ps
21112 s: P1= 38 ps
10556 s: P1= 48 ps
5278 s: P1= 70 ps
2639 s: P1= 90 ps
1319 s: P1= 116 ps
660 s: P1= 142 ps
330 s: P1= 186 ps
165 s: P1= 309 ps
82 s: P1= 447 ps
41 s: P1= 654 ps
337816 s: P2= 81 ps
168908 s: P2= 43 ps
84454 s: P2= 41 ps
42227 s: P2= 68 ps
21114 s: P2= 62 ps
10557 s: P2= 79 ps
5278 s: P2= 108 ps
2639 s: P2= 119 ps
1320 s: P2= 188 ps
660 s: P2= 224 ps
330 s: P2= 283 ps
165 s: P2= 463 ps
82 s: P2= 649 ps
41 s: P2= 893 ps
TdevP1 /s
TdevP2 /s
Tau /s

3.4/ OP (19017)

Period

MJD 58500 to 58511

Delays

BP1X: (cf page 103)
REFDLY = 104.48 ns (51.88+52.60)
CABDLY = 129.70 ns (C178)

BP1C: (cf page 103)
X_O = 183.70 ns
X_P = 104.48 ns (51.88+52.60)
REFDLY = 288.18 ns
CABDLY = 235.70 ns (C131)

OPMT: (cf page 103)
REFDLY = 155.95 ns
CABDLY = 156.50 ns

OPM9: (cf page 104)
REFDLY = 60.50 ns
CABDLY = 173.30 ns
INTDLY = -33.70 (GPS P1), -37.00 (GPS P2)

OP71: (cf page 105)
REFDLY = 191.66 ns
CABDLY = 128.70 ns

Setup at the OP

BIPM Information Sheet

Laboratory	LNE-SYRTE / OP	
Date and hour beginning of measurements	2019-01-17 (MJD58500) 00h00min00s	
Date and hour end of measurements	2019-01-28 (MJD58511) 23h59min59s	
Information on the system		
	Local	**Traveling**
4-character BIPM code	OPMT	B3TS
Receiver maker and type Receiver serial number	Ashtech Z-XII3T LP02942	
1 PPS trigger level /V	1.0	1.0
Antenna cable maker and type Phase stabilized cable (Y/N)	Andrew N	
Cable length outside building /m	≈ 6	≈ 20
Antenna maker and type Antenna serial number	3S-02-TSADM 19	
Temperature if stabilized /°C	40.5	
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	128.37	51.88 CLB_Pk – UTC(OP)
Delay from 1 PPS_IN to internal reference (see Annex 1)	11.78 Inverted 20 MHz_IN – PPS_IN	
Antenna cable delay	156.5	
Splitter delay		
Additional cable delay		
Data used for the generation of CGGTTS files		
	Local	**Traveling**
INT DLY (GPS) /ns	309.0 (P1) 320.9 (P2) Cal_id 1002-2016	183.70 (PPS_OUT – PPS_IN)
INT DLY (GLONASS) /ns		
CAB DLY /ns	156.5	
REF DLY /ns	155.95	51.88
Coordinate reference frame	ITRF	
Latitude or X /m	+ 4 202 777.347	
Longitude or Y /m	+ 171 368.230	
Height or Z /m	+ 4 778 660.487	
General information		
Rise time of local UTC pulse	2.0 ns	
Air conditioning (Y/N)	Y (but issues on the system to be changed soon)	
Set temperature value and uncertainty	22 ± 2 °C	
Set humidity value and uncertainty		

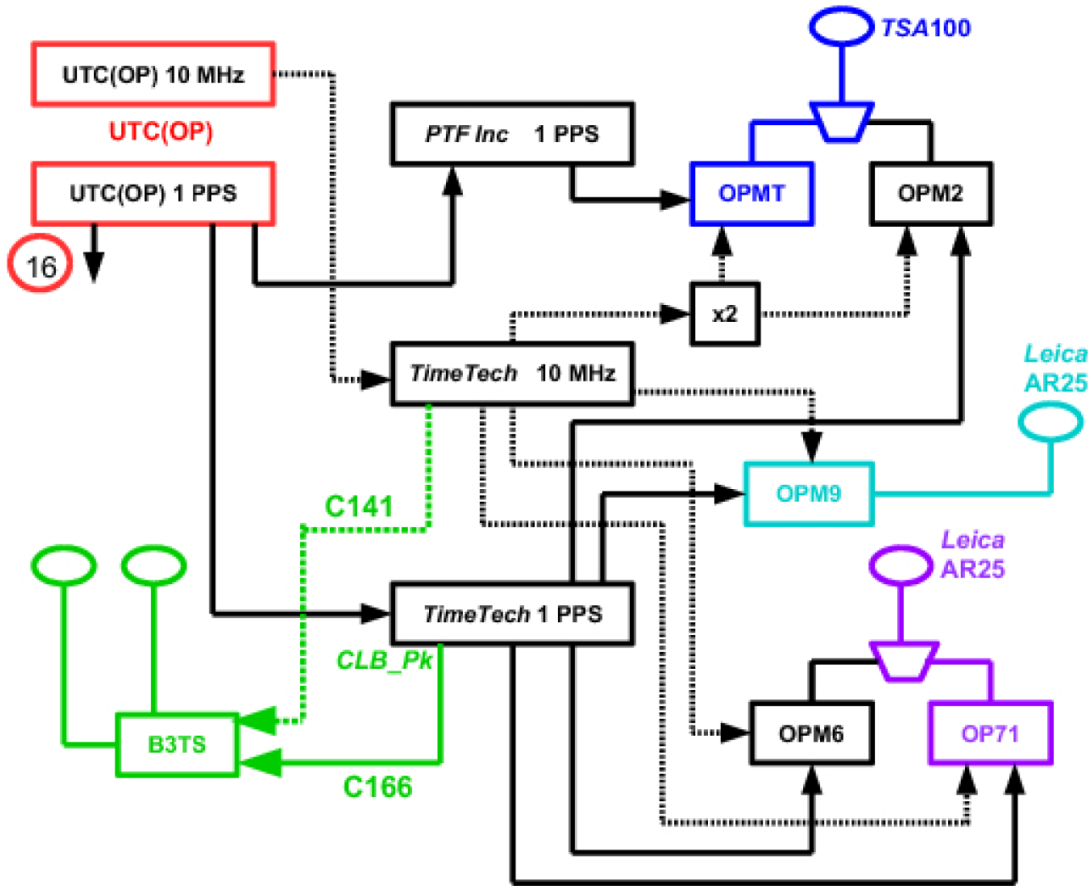
BIPM Information Sheet

Laboratory	LNE-SYRTE / OP	
Date and hour beginning of measurements	2019-01-17 (MJD58500) 00h00min00s	
Date and hour end of measurements	2019-01-28 (MJD58511) 23h59min59s	
Information on the system		
	Local	**Traveling**
4-character BIPM code	OPM9	B3TS
Receiver maker and type Receiver serial number	DICOM GTR51 1 402 025	
1 PPS trigger level /V	1.0	1.0
Antenna cable maker and type Phase stabilized cable (Y/N)	Andrew 42394-24 N	
Cable length outside building /m	≈ 10	≈ 20
Antenna maker and type Antenna serial number	Leica AR25 n/a	
Temperature if stabilized /°C		
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	60.52	51.88 CLB_Pk – UTC(OP)
Delay from 1 PPS_IN to internal reference (see Annex 1)		
Antenna cable delay	173.3	
Splitter delay		
Additional cable delay		
Data used for the generation of CGGTTS files		
	Local	**Traveling**
INT DLY (GPS) /ns	- 33.7 (P1) - 37.0 (P2) Cal_Id # 1002-2016	183.70 (PPS_OUT – PPS_IN)
INT DLY (GLONASS) /ns		
CAB DLY /ns	173.3	
REF DLY /ns	60.5	51.88
Coordinate reference frame	ITRF	
Latitude or X /m	+ 4 202 777.497	
Longitude or Y /m	+ 171 367.080	
Height or Z /m	+ 4 778 660.685	
General Information		
Rise time of local UTC pulse	2.0 ns	
Air conditioning (Y/N)	Y (but issues on the system to be changed soon)	
Set temperature value and uncertainty	22 ± 2 °C	
Set humidity value and uncertainty		

BIPM Information Sheet

Laboratory	LNE-SYRTE / OP	
Date and hour beginning of measurements	2019-01-17 (MJD58500) 00h00min00s	
Date and hour end of measurements	2019-01-28 (MJD58511) 23h59min59s	
Information on the system		
	Local	**Traveling**
4-character BIPM code	OP71	B3TS
Receiver maker and type Receiver serial number	Septentrio PolaRx4 3 102 320	
1 PPS trigger level /V	1.0	1.0
Antenna cable maker and type Phase stabilized cable (Y/N)	Andrew FSJ2P-50 N	
Cable length outside building /m	≈ 6	≈ 20
Antenna maker and type Antenna serial number	Leica AR25 725498	
Temperature if stabilized /°C		
Measured delays / ns		
	Local	**Traveling**
Delay from local UTC(k) to receiver 1 PPS_IN	191.66 PPS_OUT – UTC(OP)	51.88 CLB_Pk – UTC(OP)
Delay from 1 PPS_IN to internal reference (see Annex 1)		
Antenna cable delay	128.70	
Splitter delay		
Additional cable delay		
Data used for the generation of CGGTTS files		
	Local	**Traveling**
INT DLY (GPS) /ns	55.7 (P1) 54.4 (P2) Ca_Id # 1001-2016	183.70 (PPS_OUT – PPS_IN)
INT DLY (GLONASS) /ns		
CAB DLY /ns	128.70	
REF DLY /ns	191.66	51.88
Coordinate reference frame	ITRF	
Latitude or X /m	+ 4 202 779.899	
Longitude or Y /m	+ 171 370.766	
Height or Z /m	+ 4 778 660.819	
General information		
Rise time of local UTC pulse	2.0 ns	
Air conditioning (Y/N)	Y (but issues on the system to be changed soon)	
Set temperature value and uncertainty	22 ± 2 °C	
Set humidity value and uncertainty		

Diagram of the experiment set-up:



Log of Events / Additional Information :

All PPS-IN or PPS-OUTdelay measurements are achieved against the output 16 of the UTC(OP) 1 PPS distribution amplifier.
When two measurements wera made (at the begining and at the end), only the mean value is given.
Except stated otherwise, the uncertainty of the delays is estimated at 200 ps (one sigma).

BIPM receivers in OP site :

B3TS : CLB_Pk – UTC(OP)_16 = 51.88 ns
PPS_OUT – PPS_IN (PolaRx3) = 183.70 ns

Geodetic receivers in OP site :

OPMT : *Ashtech Z12-T [GPS only IGS station]*
CLOCK CAB DELAY = 155.9 ns [uncertainty = 360 ps]
ANT CAB DELAY = 156,5 ns [uncertainty = 300 ps]

OPM9 : *DICOM GTR51 [GPS/GLONASS/Galileo/EGNOS]*
CLOCK CAB DELAY = 60.52 ns
ANT CAB DELAY = 173.3 ns [uncertainty = 300 ps]

OP71 : *Septentrio PolaRx4 [GPS/GLONASS/Galileo/Beidou/EGNOS] [multi-GNSS IGS station]*
CLOCK CAB DELAY = 191.66 ns
ANT CAB DELAY = 128.70 ns [uncertainty = 300 ps]

P. Uhrich
2019-02-28

BP1X-OPMT

COMPUTATION OF BASELINE

```
Number of codes to fit baseline and biases = 248922
Number of huge residuals =    30. New iteration
Computed code bias (P1/P2)/m =    -96.395  -100.414
Computed baseline (X,Y,Z)/m =     -6.075    -0.219     2.898
RMS of residuals /m =      0.609

Number of phase differences to fit baseline
L1/L2 = 247725
L5    =      0
A priori baseline (X,Y,Z)/m =     -6.075    -0.219     2.898
32252 clock jitters computed out of  32252 intervals
AVE jitter /ps =    0.2 RMS jitter /ps =    4.1

Iter  1 Large residuals L1=    3
Iter  1 Large residuals L2=    3
Iter  1 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =      0.049     0.053     0.032
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =      0.060     0.053     0.050
RMS of residuals L2 /m =      0.004
No computed baseline L5, will use L1/L2

Iter  2 Large residuals L1=    3
Iter  2 Large residuals L2=    3
Iter  2 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =      0.049     0.053     0.032
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =      0.060     0.053     0.050
RMS of residuals L2 /m =      0.004
No computed baseline L5, will use L1/L2


Final baseline L1 (X,Y,Z)/m =     -6.026    -0.166     2.930
Final baseline L2 (X,Y,Z)/m =     -6.015    -0.166     2.949
Final baseline L5 (X,Y,Z)/m =     -6.020    -0.166     2.940
```

COMPUTATION OF CODE DIFFERENCES

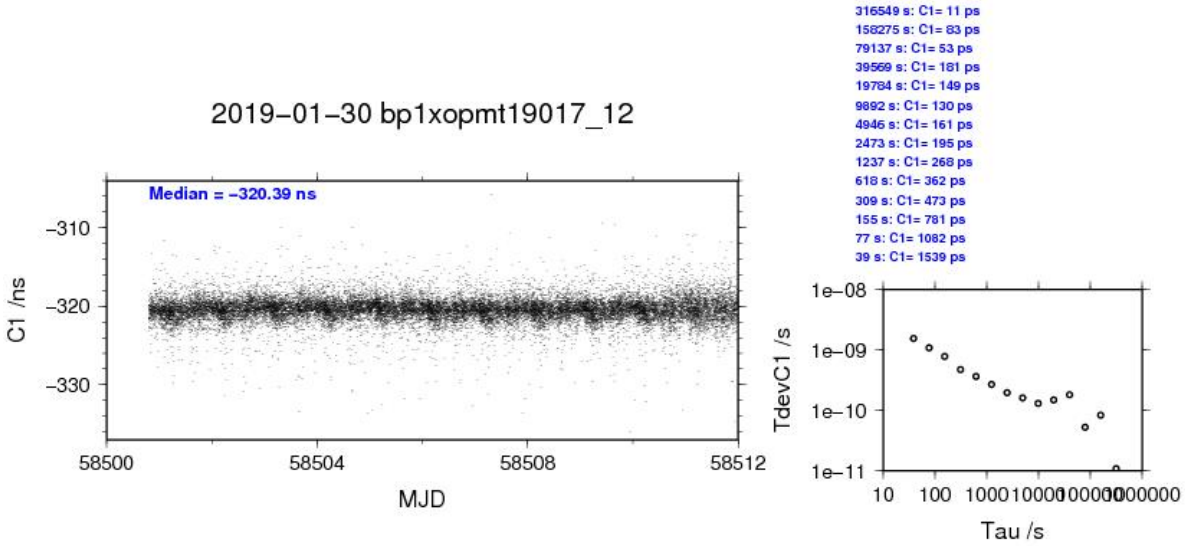
Total number of code differences = 251287

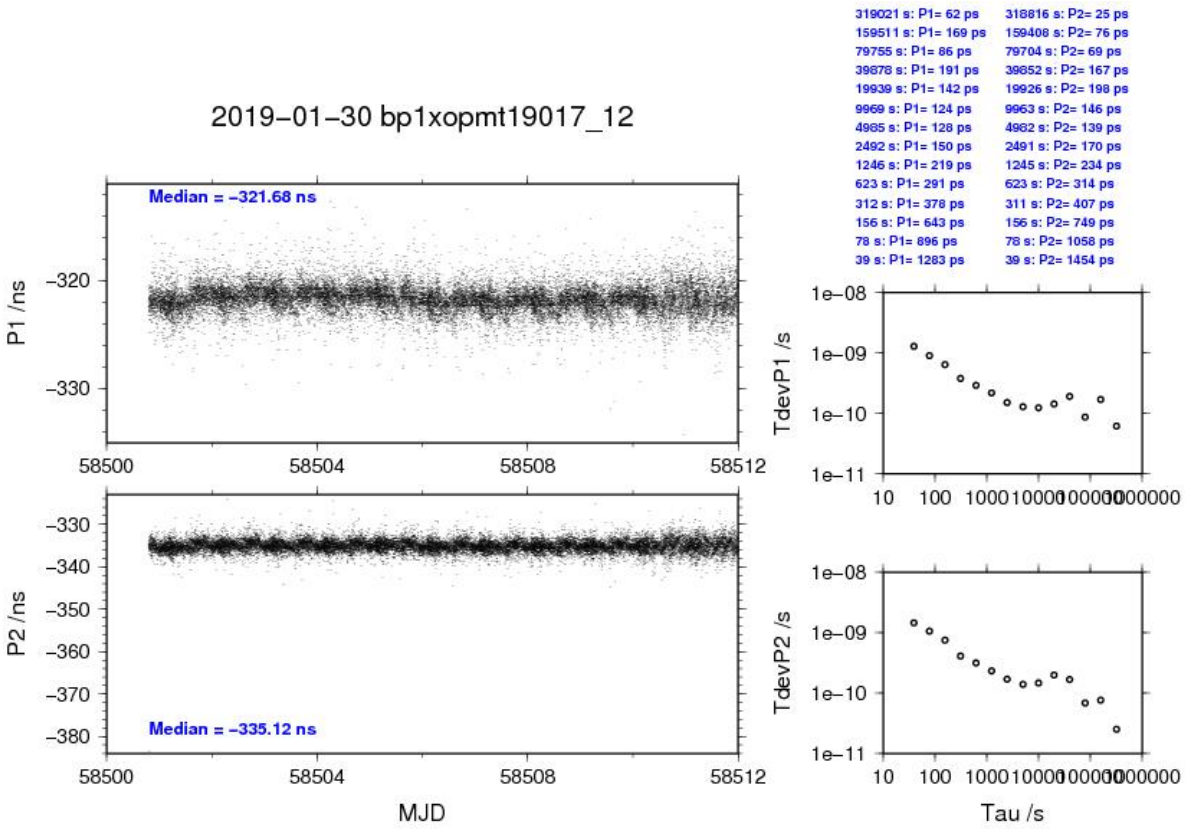
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	250492	-320.399	3.116
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	248964	-321.672	2.365
P2	249055	-335.116	2.445
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3226

Code	#pts	median/ns	ave/ns	rms/ns
C1	25039	-320.387	-320.422	1.538
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	24845	-321.676	-321.687	1.299
P2	24861	-335.121	-335.121	1.483
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–30 bp1xopmt19017_12
Median = –320.39 ns
C1 /ns
MJD
316549 s: C1= 11 ps
158275 s: C1= 83 ps
79137 s: C1= 53 ps
39569 s: C1= 181 ps
19784 s: C1= 149 ps
9892 s: C1= 130 ps
4946 s: C1= 161 ps
2473 s: C1= 195 ps
1237 s: C1= 268 ps
618 s: C1= 362 ps
309 s: C1= 473 ps
155 s: C1= 781 ps
77 s: C1= 1082 ps
39 s: C1= 1539 ps
TdevC1 /s
Tau /s


2019–01–30 bp1xopmt19017_12
Median = –321.68 ns
P1 /ns
Median = –335.12 ns
P2 /ns
MJD
319021 s: P1= 62 ps
159511 s: P1= 169 ps
79755 s: P1= 86 ps
39878 s: P1= 191 ps
19939 s: P1= 142 ps
9969 s: P1= 124 ps
4985 s: P1= 128 ps
2492 s: P1= 150 ps
1246 s: P1= 219 ps
623 s: P1= 291 ps
312 s: P1= 378 ps
156 s: P1= 643 ps
78 s: P1= 896 ps
39 s: P1= 1283 ps
318816 s: P2= 25 ps
159408 s: P2= 76 ps
79704 s: P2= 69 ps
39852 s: P2= 167 ps
19926 s: P2= 198 ps
9963 s: P2= 146 ps
4982 s: P2= 139 ps
2491 s: P2= 170 ps
1245 s: P2= 234 ps
623 s: P2= 314 ps
311 s: P2= 407 ps
156 s: P2= 749 ps
78 s: P2= 1058 ps
39 s: P2= 1454 ps
TdevP1 /s
TdevP2 /s
Tau /s

BP1C-OPMT

COMPUTATION OF BASELINE

```
Number of codes to fit baseline and biases = 268414
Number of huge residuals =   258. New iteration
Computed code bias (P1/P2)/m =    -93.982   -95.881
Computed baseline (X,Y,Z)/m =     -6.028     0.602     2.685
RMS of residuals /m =      0.614

Number of phase differences to fit baseline
L1/L2 = 266640
L5    =      0
A priori baseline (X,Y,Z)/m =     -6.028     0.602     2.685
32243 clock jitters computed out of  32249 intervals
AVE jitter /ps =    0.0 RMS jitter /ps =    4.5

Iter  1 Large residuals L1=    3
Iter  1 Large residuals L2=    2
Iter  1 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =      0.105     0.053     0.071
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =      0.098     0.053     0.067
RMS of residuals L2 /m =      0.004
No computed baseline L5, will use L1/L2

Iter  2 Large residuals L1=    3
Iter  2 Large residuals L2=    2
Iter  2 Large residuals L5=    0
Computed baseline L1 (X,Y,Z)/m =      0.105     0.053     0.071
RMS of residuals L1 /m =      0.004
Computed baseline L2 (X,Y,Z)/m =      0.098     0.053     0.067
RMS of residuals L2 /m =      0.004
No computed baseline L5, will use L1/L2


Final baseline L1 (X,Y,Z)/m =     -5.923     0.655     2.756
Final baseline L2 (X,Y,Z)/m =     -5.930     0.655     2.753
Final baseline L5 (X,Y,Z)/m =     -5.926     0.655     2.754
```

COMPUTATION OF CODE DIFFERENCES

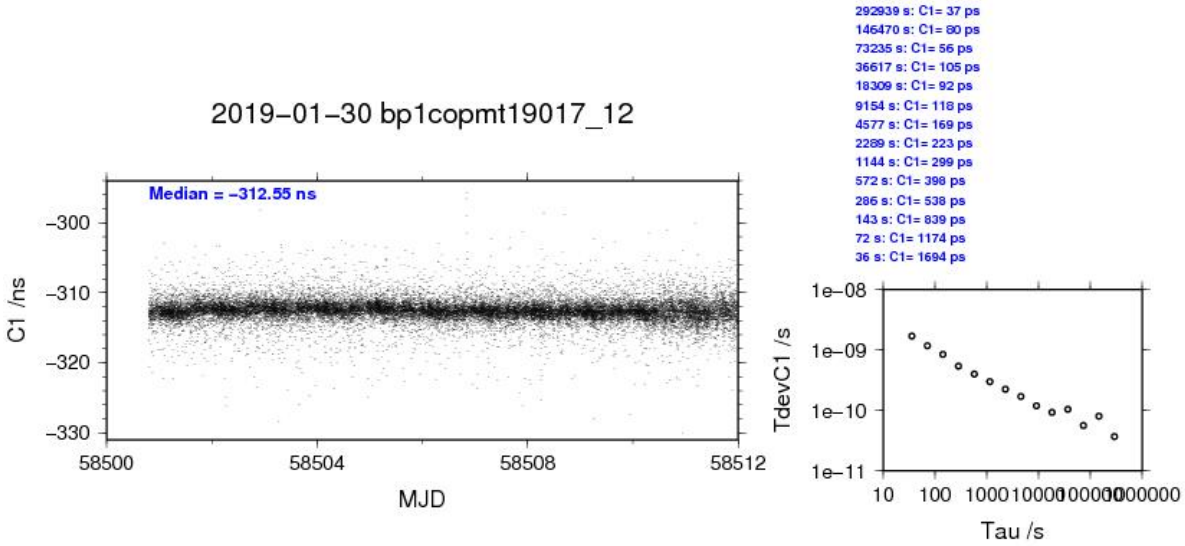
Total number of code differences = 272236

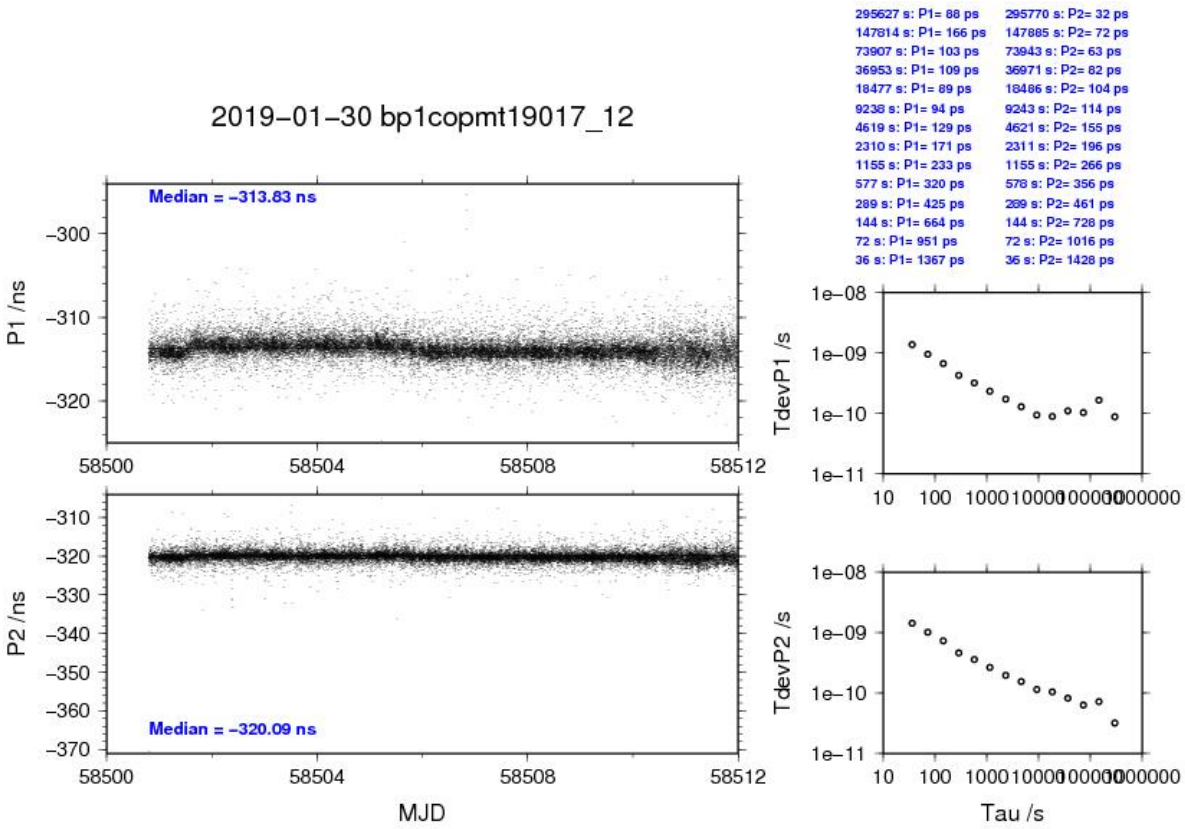
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	270522	-312.523	3.522
C2	0	NaN	NaN
C5	0	NaN	NaN
P1	268515	-313.762	2.663
P2	268410	-320.064	2.602
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3226

Code	#pts	median/ns	ave/ns	rms/ns
C1	27057	-312.549	-312.545	1.680
C2	0	0.000	NaN	NaN
C5	0	0.000	NaN	NaN
P1	26811	-313.834	-313.776	1.391
P2	26798	-320.087	-320.077	1.463
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–30 bp1copmt19017_12
Median = –312.55 ns
C1 /ns
MJD
292939 s: C1= 37 ps
146470 s: C1= 80 ps
73235 s: C1= 56 ps
36617 s: C1= 105 ps
18309 s: C1= 92 ps
9154 s: C1= 118 ps
4577 s: C1= 169 ps
2289 s: C1= 223 ps
1144 s: C1= 299 ps
572 s: C1= 398 ps
286 s: C1= 538 ps
143 s: C1= 839 ps
72 s: C1= 1174 ps
36 s: C1= 1694 ps
TdevC1 /s
Tau /s


2019–01–30 bp1copmt19017_12
Median = –313.83 ns
P1 /ns
295627 s: P1= 88 ps
147814 s: P1= 166 ps
73907 s: P1= 103 ps
36953 s: P1= 109 ps
18477 s: P1= 89 ps
9238 s: P1= 94 ps
4619 s: P1= 129 ps
2310 s: P1= 171 ps
1155 s: P1= 233 ps
577 s: P1= 320 ps
289 s: P1= 425 ps
144 s: P1= 664 ps
72 s: P1= 951 ps
36 s: P1= 1367 ps
295770 s: P2= 32 ps
147885 s: P2= 72 ps
73943 s: P2= 63 ps
36971 s: P2= 82 ps
18486 s: P2= 104 ps
9243 s: P2= 114 ps
4621 s: P2= 155 ps
2311 s: P2= 196 ps
1155 s: P2= 266 ps
578 s: P2= 356 ps
289 s: P2= 461 ps
144 s: P2= 728 ps
72 s: P2= 1016 ps
36 s: P2= 1428 ps
TdevP1 /s
P2 /ns
Median = –320.09 ns
MJD
TdevP2 /s
Tau /s

BP1X-OPM9

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 262263
Number of huge residuals = 11. New iteration
Computed code bias (P1/P2)/m = -27.431 -26.901
Computed baseline (X,Y,Z)/m = -5.944 -1.355 3.063
RMS of residuals /m = 0.546

Number of phase differences to fit baseline
L1/L2 = 259946
L5 = 98213
A priori baseline (X,Y,Z)/m = -5.944 -1.355 3.063
32241 clock jitters computed out of 32245 intervals
AVE jitter /ps = 0.3 RMS jitter /ps = 4.0

Iter 1 Large residuals L1= 2
Iter 1 Large residuals L2= 2
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.010 0.035 -0.022
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = 0.003 0.034 -0.012
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = 0.009 0.028 -0.006
RMS of residuals L5 /m = 0.003

Iter 2 Large residuals L1= 2
Iter 2 Large residuals L2= 2
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.010 0.035 -0.022
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = 0.003 0.034 -0.012
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = 0.009 0.028 -0.006
RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -5.954 -1.320 3.041
Final baseline L2 (X,Y,Z)/m = -5.941 -1.321 3.051
Final baseline L5 (X,Y,Z)/m = -5.935 -1.327 3.057

COMPUTATION OF CODE DIFFERENCES

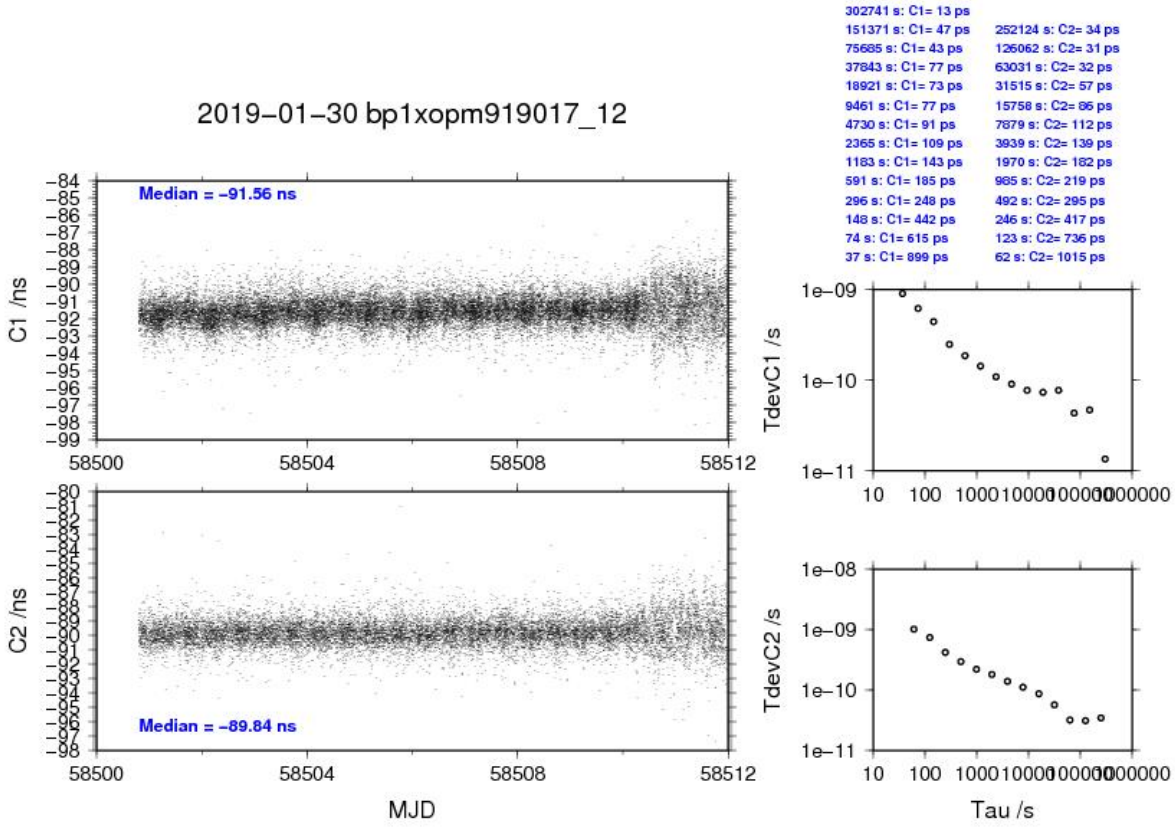
Total number of code differences = 262565

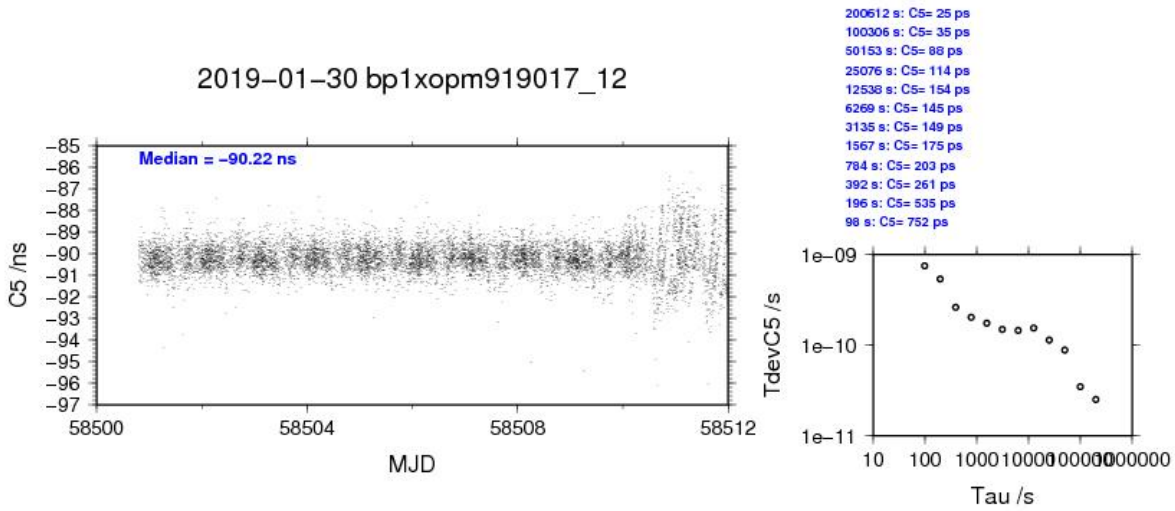
Global average of individual differences

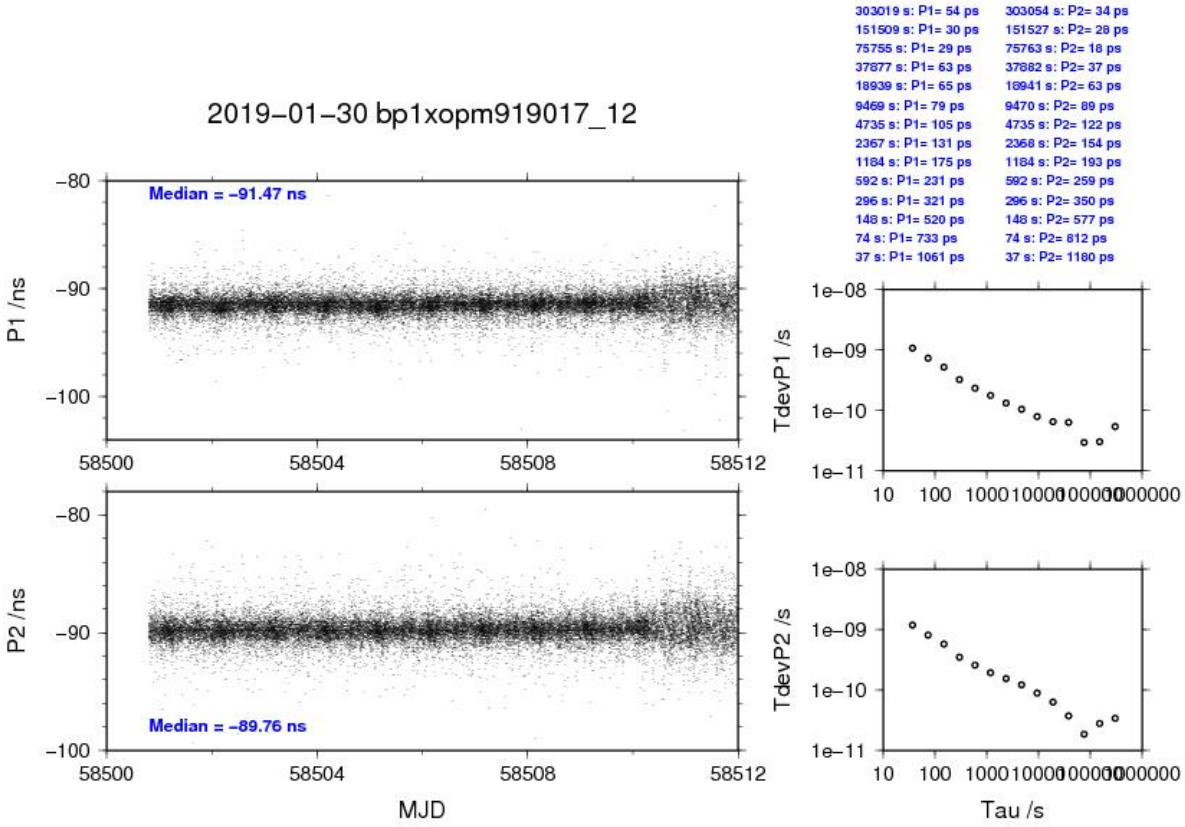
Code	#pts	ave/ns	rms/ns
C1	262443	-91.535	1.588
C2	157535	-89.798	1.925
C5	98895	-90.197	1.013
P1	262102	-91.460	2.148
P2	262058	-89.729	2.344
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3226

Code	#pts	median/ns	ave/ns	rms/ns
C1	26181	-91.563	-91.548	0.881
C2	15719	-89.838	-89.809	0.987
C5	9878	-90.224	-90.202	0.736
P1	26157	-91.468	-91.466	1.039
P2	26154	-89.763	-89.732	1.153
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–30 bp1xopm919017_12
Median = –91.56 ns
Median = –89.84 ns
C1 /ns
C2 /ns
MJD
302741 s: C1= 13 ps
151371 s: C1= 47 ps
75685 s: C1= 43 ps
37843 s: C1= 77 ps
18921 s: C1= 73 ps
9461 s: C1= 77 ps
4730 s: C1= 91 ps
2365 s: C1= 109 ps
1183 s: C1= 143 ps
591 s: C1= 185 ps
296 s: C1= 248 ps
148 s: C1= 442 ps
74 s: C1= 615 ps
37 s: C1= 899 ps
252124 s: C2= 34 ps
126062 s: C2= 31 ps
63031 s: C2= 32 ps
31515 s: C2= 57 ps
15758 s: C2= 86 ps
7879 s: C2= 112 ps
3939 s: C2= 139 ps
1970 s: C2= 182 ps
985 s: C2= 219 ps
492 s: C2= 295 ps
246 s: C2= 417 ps
123 s: C2= 736 ps
62 s: C2= 1015 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–30 bp1xopm919017_12
Median = –90.22 ns
C5 /ns
MJD
200612 s: C5= 25 ps
100306 s: C5= 35 ps
50153 s: C5= 88 ps
25076 s: C5= 114 ps
12538 s: C5= 154 ps
6269 s: C5= 145 ps
3135 s: C5= 149 ps
1567 s: C5= 175 ps
784 s: C5= 203 ps
392 s: C5= 261 ps
196 s: C5= 535 ps
98 s: C5= 752 ps
TdevC5 /s
Tau /s


2019–01–30 bp1xopm919017_12
Median = –91.47 ns
Median = –89.76 ns
P1 /ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s
303019 s: P1= 54 ps
151509 s: P1= 30 ps
75755 s: P1= 29 ps
37877 s: P1= 63 ps
18939 s: P1= 65 ps
9469 s: P1= 79 ps
4735 s: P1= 105 ps
2367 s: P1= 131 ps
1184 s: P1= 175 ps
592 s: P1= 231 ps
296 s: P1= 321 ps
148 s: P1= 520 ps
74 s: P1= 733 ps
37 s: P1= 1061 ps
303054 s: P2= 34 ps
151527 s: P2= 28 ps
75763 s: P2= 18 ps
37882 s: P2= 37 ps
18941 s: P2= 63 ps
9470 s: P2= 89 ps
4735 s: P2= 122 ps
2368 s: P2= 154 ps
1184 s: P2= 193 ps
592 s: P2= 259 ps
296 s: P2= 350 ps
148 s: P2= 577 ps
74 s: P2= 812 ps
37 s: P2= 1180 ps

BP1C-OPM9

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 255348
Number of huge residuals = 13. New iteration
Computed code bias (P1/P2)/m = -25.000 -22.340
Computed baseline (X,Y,Z)/m = -5.918 -0.543 2.829
RMS of residuals /m = 0.557

Number of phase differences to fit baseline
L1/L2 = 253158
L5 = 0
A priori baseline (X,Y,Z)/m = -5.918 -0.543 2.829
32213 clock jitters computed out of 32242 intervals
AVE jitter /ps = 0.2 RMS jitter /ps = 4.2

Iter 1 Large residuals L1= 2
Iter 1 Large residuals L2= 4
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = 0.065 0.034 0.033
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = 0.066 0.030 0.026
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 2
Iter 2 Large residuals L2= 4
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = 0.065 0.034 0.033
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = 0.066 0.030 0.026
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -5.853 -0.509 2.862
Final baseline L2 (X,Y,Z)/m = -5.853 -0.513 2.855
Final baseline L5 (X,Y,Z)/m = -5.853 -0.511 2.858

COMPUTATION OF CODE DIFFERENCES

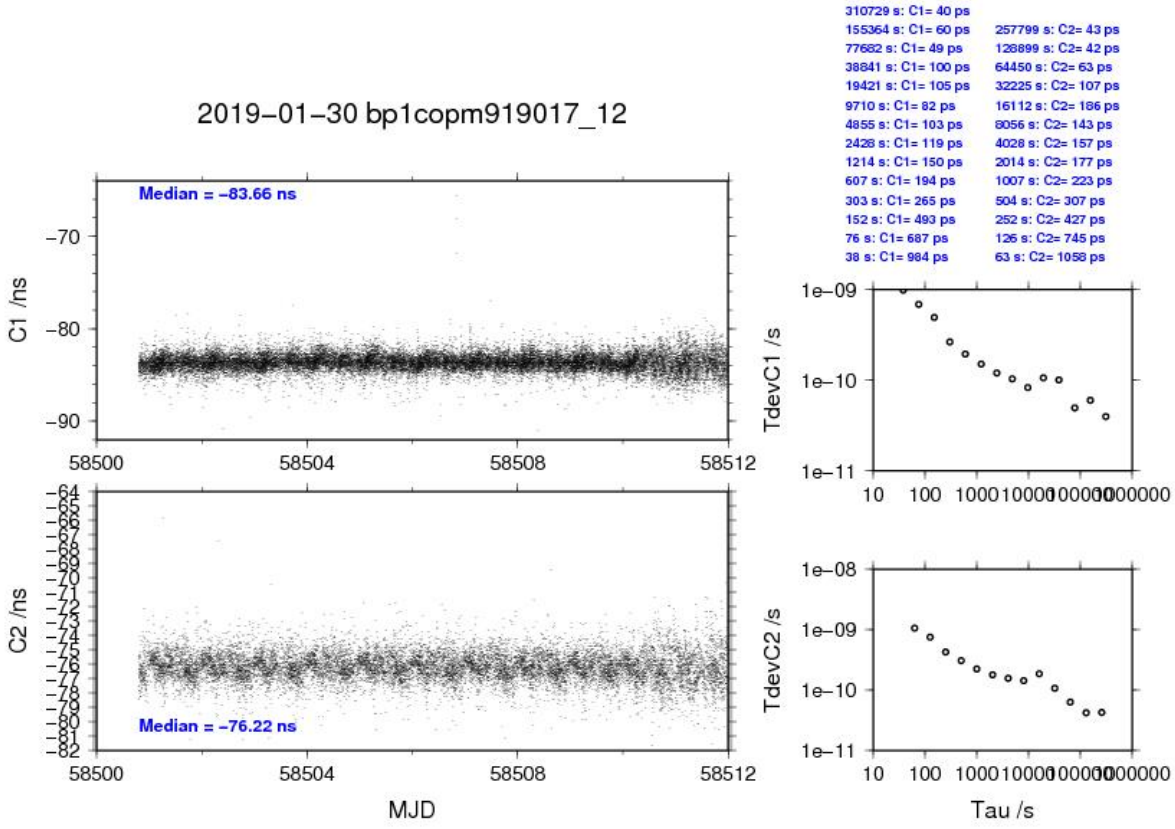
Total number of code differences = 256025

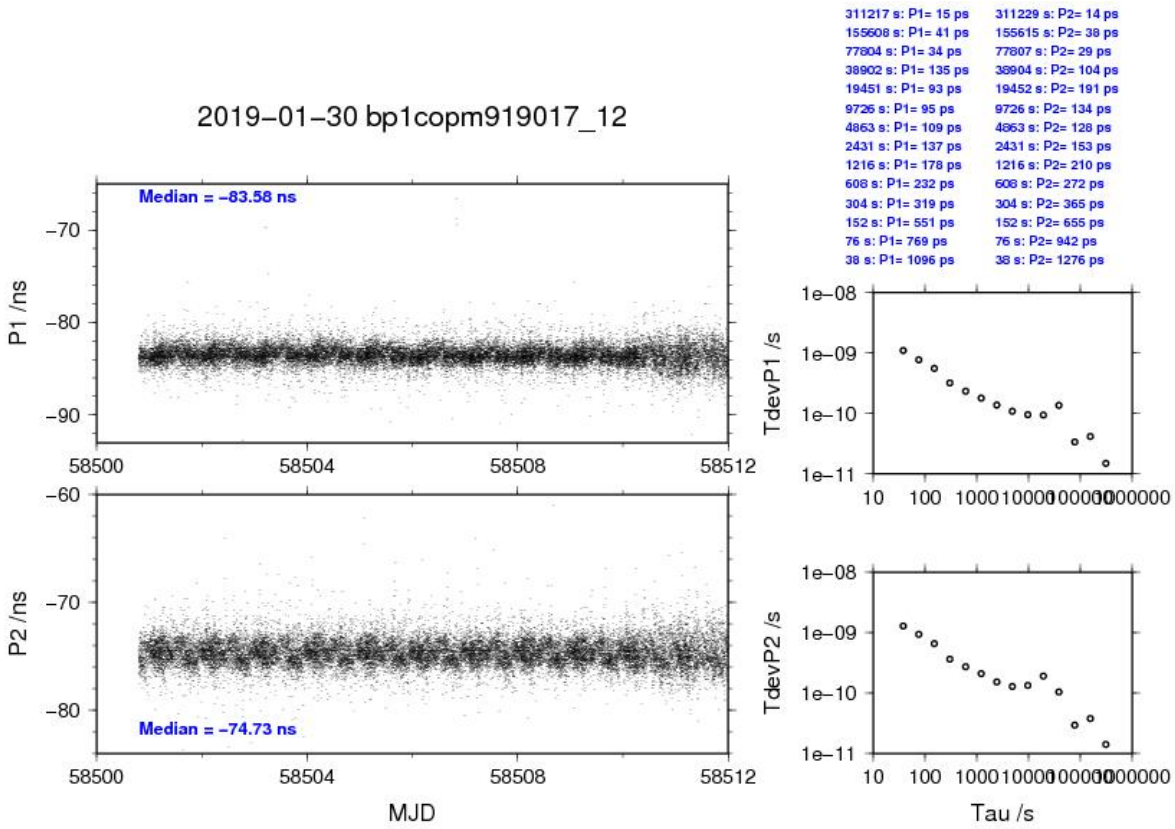
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	255720	-83.635	1.733
C2	154020	-76.201	1.969
C5	0	NaN	NaN
P1	255181	-83.544	2.115
P2	255164	-74.664	2.317
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3226

Code	#pts	median/ns	ave/ns	rms/ns
C1	25508	-83.656	-83.650	0.966
C2	15373	-76.224	-76.211	1.028
C5	0	0.000	NaN	NaN
P1	25468	-83.576	-83.555	1.086
P2	25467	-74.734	-74.672	1.286
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–30 bp1copm919017_12
Median = –83.66 ns
Median = –76.22 ns
C1 /ns
C2 /ns
MJD
TdevC1 /s
TdevC2 /s
Tau /s
310729 s: C1= 40 ps
155364 s: C1= 60 ps
77682 s: C1= 49 ps
38841 s: C1= 100 ps
19421 s: C1= 105 ps
9710 s: C1= 82 ps
4855 s: C1= 103 ps
2428 s: C1= 119 ps
1214 s: C1= 150 ps
607 s: C1= 194 ps
303 s: C1= 265 ps
152 s: C1= 493 ps
76 s: C1= 687 ps
38 s: C1= 984 ps
257799 s: C2= 43 ps
128899 s: C2= 42 ps
64450 s: C2= 63 ps
32225 s: C2= 107 ps
16112 s: C2= 186 ps
8056 s: C2= 143 ps
4028 s: C2= 157 ps
2014 s: C2= 177 ps
1007 s: C2= 223 ps
504 s: C2= 307 ps
252 s: C2= 427 ps
126 s: C2= 745 ps
63 s: C2= 1058 ps


2019–01–30 bp1copm919017_12
Median = –83.58 ns
Median = –74.73 ns
P1 /ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s
311217 s: P1= 15 ps
155608 s: P1= 41 ps
77804 s: P1= 34 ps
38902 s: P1= 135 ps
19451 s: P1= 93 ps
9726 s: P1= 95 ps
4863 s: P1= 109 ps
2431 s: P1= 137 ps
1216 s: P1= 178 ps
608 s: P1= 232 ps
304 s: P1= 319 ps
152 s: P1= 551 ps
76 s: P1= 769 ps
38 s: P1= 1096 ps
311229 s: P2= 14 ps
155615 s: P2= 38 ps
77807 s: P2= 29 ps
38904 s: P2= 104 ps
19452 s: P2= 191 ps
9726 s: P2= 134 ps
4863 s: P2= 128 ps
2431 s: P2= 153 ps
1216 s: P2= 210 ps
608 s: P2= 272 ps
304 s: P2= 365 ps
152 s: P2= 655 ps
76 s: P2= 942 ps
38 s: P2= 1276 ps

BP1X-OP71

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 142902
Number of huge residuals = 1. New iteration
Computed code bias (P1/P2)/m = -1.618 -1.635
Computed baseline (X,Y,Z)/m = -3.338 2.367 3.207
RMS of residuals /m = 0.472

Number of phase differences to fit baseline
L1/L2 = 141990
L5 = 53212
A priori baseline (X,Y,Z)/m = -3.338 2.367 3.207
17276 clock jitters computed out of 17276 intervals
AVE jitter /ps = 0.3 RMS jitter /ps = 3.9

Iter 1 Large residuals L1= 3
Iter 1 Large residuals L2= 3
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.122 0.028 -0.108
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.112 0.024 -0.098
RMS of residuals L2 /m = 0.004
Computed baseline L5 (X,Y,Z)/m = -0.122 0.025 -0.090
RMS of residuals L5 /m = 0.003

Iter 2 Large residuals L1= 3
Iter 2 Large residuals L2= 3
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.122 0.028 -0.108
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.112 0.024 -0.098
RMS of residuals L2 /m = 0.004
Computed baseline L5 (X,Y,Z)/m = -0.122 0.025 -0.090
RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -3.461 2.394 3.099
Final baseline L2 (X,Y,Z)/m = -3.451 2.391 3.108
Final baseline L5 (X,Y,Z)/m = -3.461 2.392 3.116

COMPUTATION OF CODE DIFFERENCES

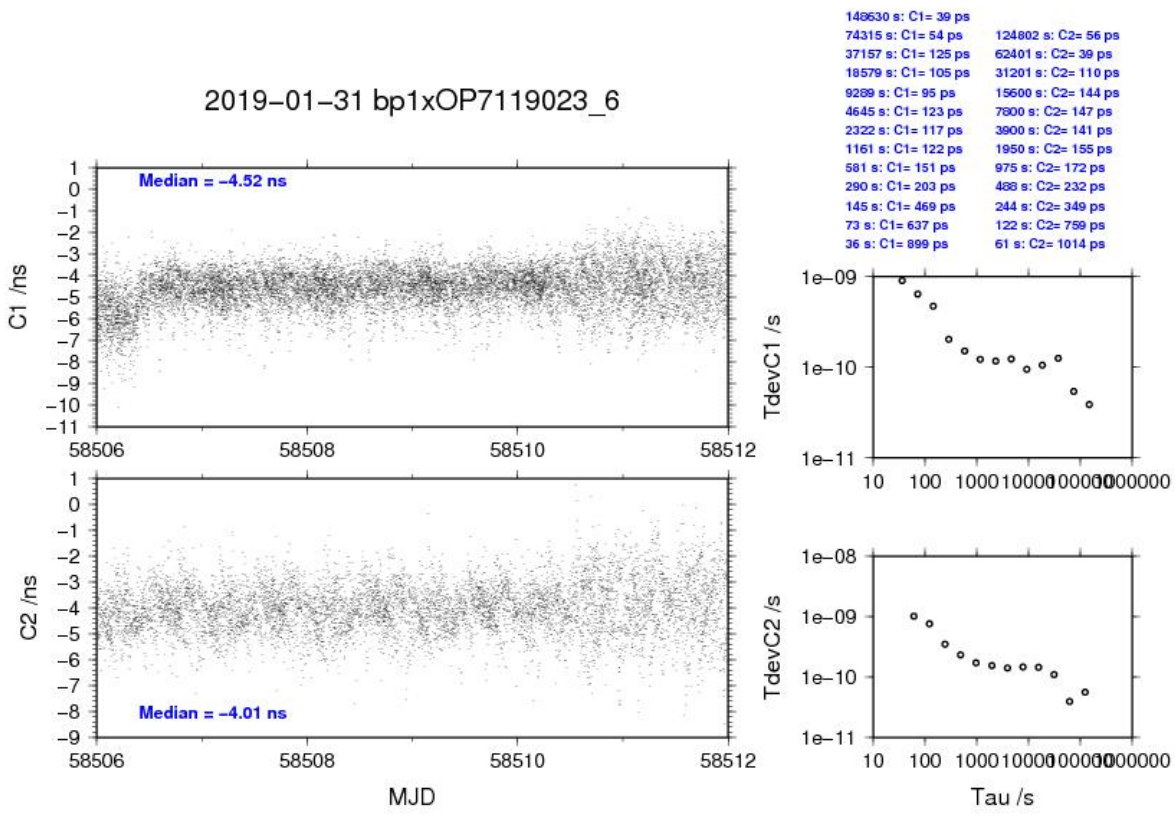
Total number of code differences = 220419

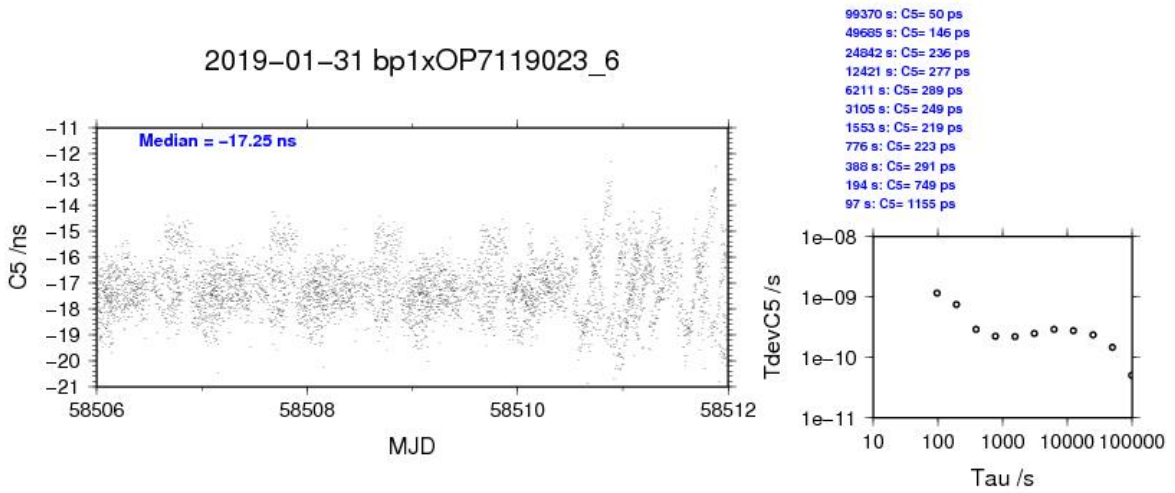
Global average of individual differences

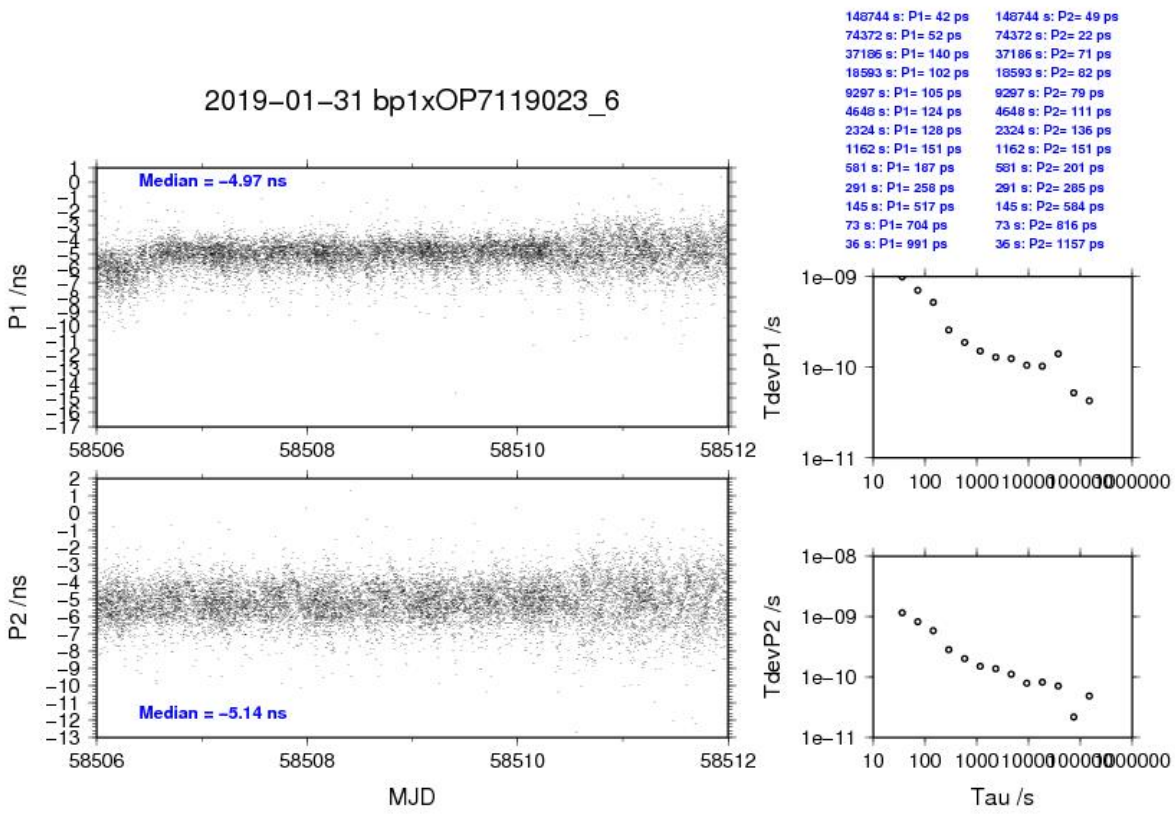
Code	#pts	ave/ns	rms/ns
C1	142985	-4.595	1.398
C2	85162	-4.006	1.422
C5	53421	-17.194	1.240
P1	142842	-5.068	1.672
P2	142833	-5.153	1.694
E1	77169	-2.452	1.212
E5	77156	-16.344	1.008

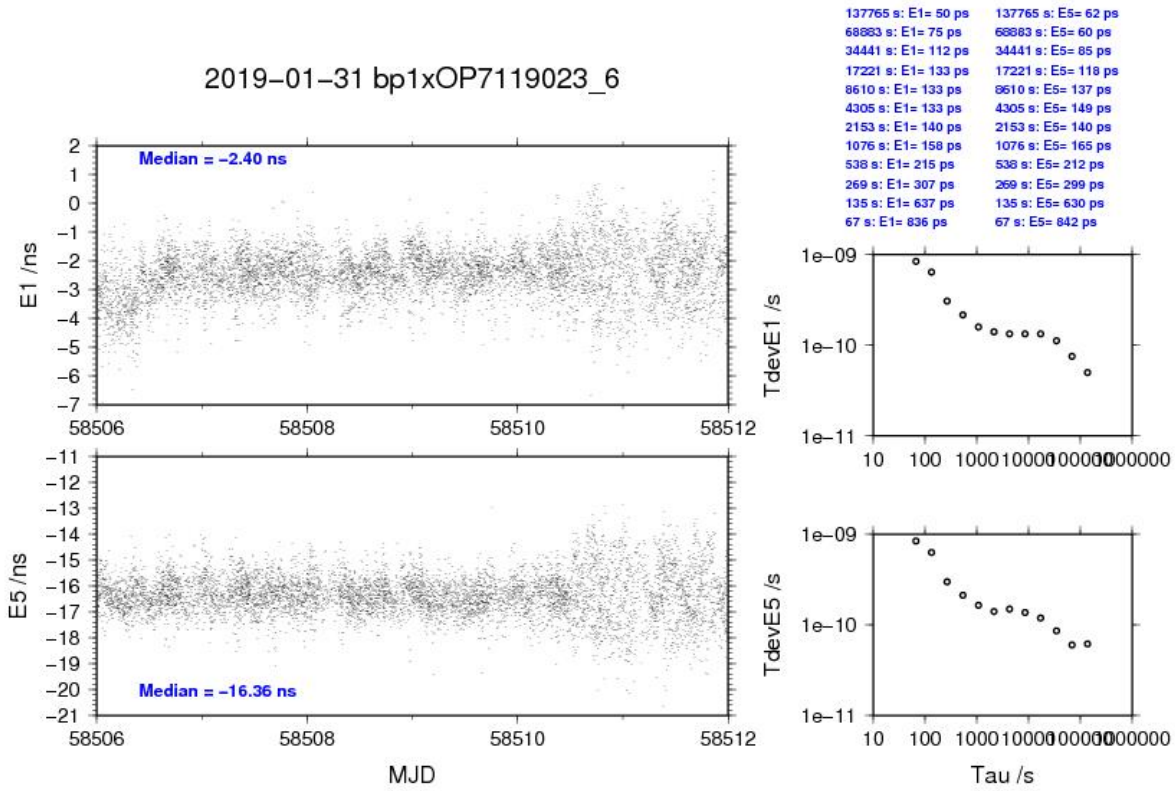
Number of 300s epochs in out file = 1728

Code	#pts	median/ns	ave/ns	rms/ns
C1	14279	-4.521	-4.586	0.944
C2	8503	-4.014	-4.002	0.976
C5	5340	-17.245	-17.196	1.077
P1	14268	-4.968	-5.057	1.035
P2	14268	-5.145	-5.147	1.124
E1	7703	-2.400	-2.439	0.863
E5	7703	-16.362	-16.345	0.818


2019–01–31 bp1xOP7119023_6
Median = –4.52 ns
Median = –4.01 ns
C1 /ns
C2 /ns
MJD
148630 s: C1= 39 ps
74315 s: C1= 54 ps
37157 s: C1= 125 ps
18579 s: C1= 105 ps
9289 s: C1= 95 ps
4645 s: C1= 123 ps
2322 s: C1= 117 ps
1161 s: C1= 122 ps
581 s: C1= 151 ps
290 s: C1= 203 ps
145 s: C1= 469 ps
73 s: C1= 637 ps
36 s: C1= 899 ps
124802 s: C2= 56 ps
62401 s: C2= 39 ps
31201 s: C2= 110 ps
15600 s: C2= 144 ps
7800 s: C2= 147 ps
3900 s: C2= 141 ps
1950 s: C2= 155 ps
975 s: C2= 172 ps
488 s: C2= 232 ps
244 s: C2= 349 ps
122 s: C2= 759 ps
61 s: C2= 1014 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–01–31 bp1xOP7119023_6
Median = –17.25 ns
C5 /ns
MJD
99370 s: C5= 50 ps
49685 s: C5= 146 ps
24842 s: C5= 236 ps
12421 s: C5= 277 ps
6211 s: C5= 289 ps
3105 s: C5= 249 ps
1553 s: C5= 219 ps
776 s: C5= 223 ps
388 s: C5= 291 ps
194 s: C5= 749 ps
97 s: C5= 1155 ps
TdevC5 /s
Tau /s


2019–01–31 bp1xOP7119023_6
148744 s: P1= 42 ps
74372 s: P1= 52 ps
37186 s: P1= 140 ps
18593 s: P1= 102 ps
9297 s: P1= 105 ps
4648 s: P1= 124 ps
2324 s: P1= 128 ps
1162 s: P1= 151 ps
581 s: P1= 187 ps
291 s: P1= 258 ps
145 s: P1= 517 ps
73 s: P1= 704 ps
36 s: P1= 991 ps
148744 s: P2= 49 ps
74372 s: P2= 22 ps
37186 s: P2= 71 ps
18593 s: P2= 82 ps
9297 s: P2= 79 ps
4648 s: P2= 111 ps
2324 s: P2= 136 ps
1162 s: P2= 151 ps
581 s: P2= 201 ps
291 s: P2= 285 ps
145 s: P2= 584 ps
73 s: P2= 816 ps
36 s: P2= 1157 ps
Median = –4.97 ns
P1 /ns
Median = –5.14 ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s


2019–01–31 bp1xOP7119023_6
137765 s: E1= 50 ps
68883 s: E1= 75 ps
34441 s: E1= 112 ps
17221 s: E1= 133 ps
8610 s: E1= 133 ps
4305 s: E1= 133 ps
2153 s: E1= 140 ps
1076 s: E1= 158 ps
538 s: E1= 215 ps
269 s: E1= 307 ps
135 s: E1= 637 ps
67 s: E1= 836 ps
137765 s: E5= 62 ps
68883 s: E5= 60 ps
34441 s: E5= 85 ps
17221 s: E5= 118 ps
8610 s: E5= 137 ps
4305 s: E5= 149 ps
2153 s: E5= 140 ps
1076 s: E5= 165 ps
538 s: E5= 212 ps
269 s: E5= 299 ps
135 s: E5= 630 ps
67 s: E5= 842 ps
Median = –2.40 ns
E1 /ns
Median = –16.36 ns
E5 /ns
MJD
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-OP71

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 156335
Computed code bias (P1/P2)/m = 0.809 2.941
Computed baseline (X,Y,Z)/m = -3.493 3.101 3.107
RMS of residuals /m = 0.452

Number of phase differences to fit baseline
L1/L2 = 155225
L5 = 0
A priori baseline (X,Y,Z)/m = -3.493 3.101 3.107
17276 clock jitters computed out of 17276 intervals
AVE jitter /ps = 0.2 RMS jitter /ps = 4.1

Iter 1 Large residuals L1= 2
Iter 1 Large residuals L2= 2
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.027 0.033 -0.031
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.029 0.028 -0.040
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 2
Iter 2 Large residuals L2= 2
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.027 0.033 -0.031
RMS of residuals L1 /m = 0.003
Computed baseline L2 (X,Y,Z)/m = -0.029 0.028 -0.040
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -3.520 3.133 3.075
Final baseline L2 (X,Y,Z)/m = -3.522 3.128 3.067
Final baseline L5 (X,Y,Z)/m = -3.521 3.131 3.071

COMPUTATION OF CODE DIFFERENCES

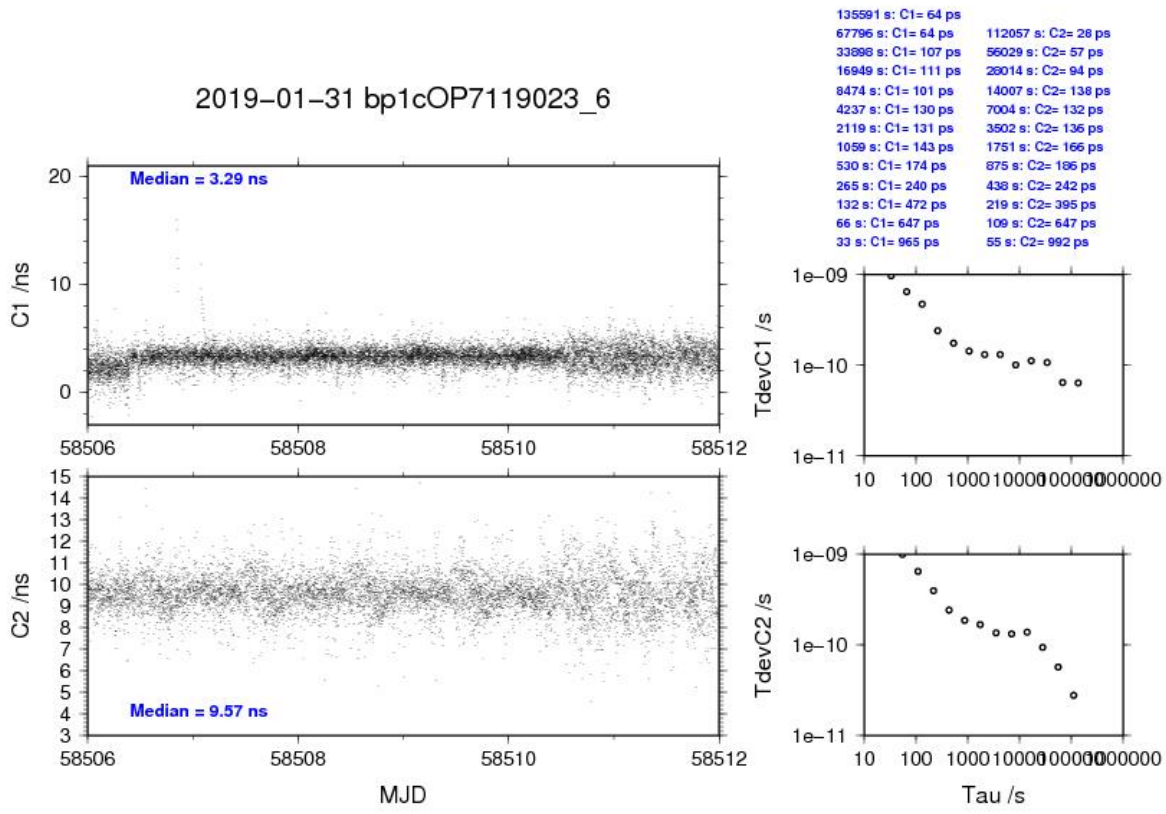
Total number of code differences = 157114

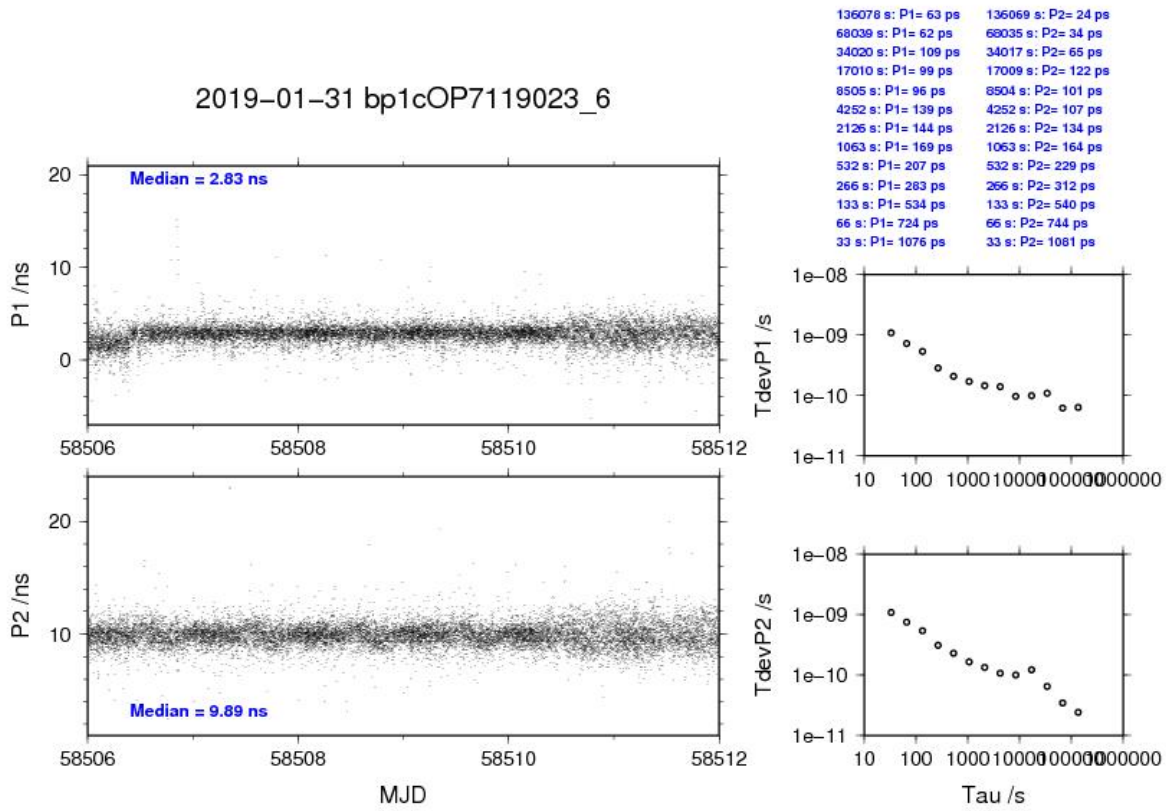
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	156828	3.228	1.588
C2	94852	9.576	1.587
C5	0	NaN	NaN
P1	156251	2.765	1.695
P2	156263	9.896	1.535
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 1728

Code	#pts	median/ns	ave/ns	rms/ns
C1	15652	3.289	3.229	0.965
C2	9470	9.571	9.584	0.924
C5	0	0.000	NaN	NaN
P1	15596	2.831	2.765	1.073
P2	15597	9.893	9.899	1.056
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–01–31 bp1cOP7119023_6
135591 s: C1= 64 ps
67796 s: C1= 64 ps
33898 s: C1= 107 ps
16949 s: C1= 111 ps
8474 s: C1= 101 ps
4237 s: C1= 130 ps
2119 s: C1= 131 ps
1059 s: C1= 143 ps
530 s: C1= 174 ps
265 s: C1= 240 ps
132 s: C1= 472 ps
66 s: C1= 647 ps
33 s: C1= 965 ps
112057 s: C2= 28 ps
56029 s: C2= 57 ps
28014 s: C2= 94 ps
14007 s: C2= 138 ps
7004 s: C2= 132 ps
3502 s: C2= 136 ps
1751 s: C2= 166 ps
875 s: C2= 186 ps
438 s: C2= 242 ps
219 s: C2= 395 ps
109 s: C2= 647 ps
55 s: C2= 992 ps
Median = 3.29 ns
C1 /ns
TdevC1 /s
Median = 9.57 ns
C2 /ns
TdevC2 /s
MJD
Tau /s


2019–01–31 bp1cOP7119023_6
136078 s: P1= 63 ps
68039 s: P1= 62 ps
34020 s: P1= 109 ps
17010 s: P1= 99 ps
8505 s: P1= 96 ps
4252 s: P1= 139 ps
2126 s: P1= 144 ps
1063 s: P1= 169 ps
532 s: P1= 207 ps
266 s: P1= 283 ps
133 s: P1= 534 ps
66 s: P1= 724 ps
33 s: P1= 1076 ps
136069 s: P2= 24 ps
68035 s: P2= 34 ps
34017 s: P2= 65 ps
17009 s: P2= 122 ps
8504 s: P2= 101 ps
4252 s: P2= 107 ps
2126 s: P2= 134 ps
1063 s: P2= 164 ps
532 s: P2= 229 ps
266 s: P2= 312 ps
133 s: P2= 540 ps
66 s: P2= 744 ps
33 s: P2= 1081 ps
Median = 2.83 ns
P1 /ns
TdevP1 /s
Median = 9.89 ns
P2 /ns
TdevP2 /s
MJD
Tau /s

3.5/ BIPM (19042)

Period

MJD 58525 to 58535

Delays

BP1J:

X_O = 134.09 ns	(187.95-53.86)
X_P = 47.60 ns	(BP1R+C139+BP1S+C172)
REFDLY = 181.69 ns	
CABDLY = 128.73 ns	(C138)

BP1X:

REFDLY = 52.60 ns	(BP1R+C166+BP1I+C153)
CABDLY = 129.70 ns	(C178)

BP1C:

X_O = 185.40 ns	(200.90-15.50)
X_P = 52.60 ns	(BP1R+C166+BP1I+C157)
REFDLY = 238.00 ns	
CABDLY = 235.70 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 58525
Date and hour of the end of measurements:	MJD 58535

Information on the system

	Local:	Travelling:
4-character BIPM code	BP1J	BP1C
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx4proTR 27	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:	Septentrio Sepchoke_MC 5131	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:	47.60 ns	52.60 ns
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)	134.09 ns	185.40 ns
• Antenna cable delay:	128.73 ns	235.70 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 (Galileo) /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 58525
Date and hour of the end of measurements:	MJD 58535

Information on the system

	Local:	Travelling:
4-character BIPM code	BP1J	BP1X
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx4proTR 27	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	~ 15 m
• Antenna maker and type: Antenna serial number:	Septentrio Sepchoke_MC 5131	Novatel GPS-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:	47.60 ns	52.60
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)	134.09 ns	
• Antenna cable delay:	128.73 ns	129.70
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 (Galileo) /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.

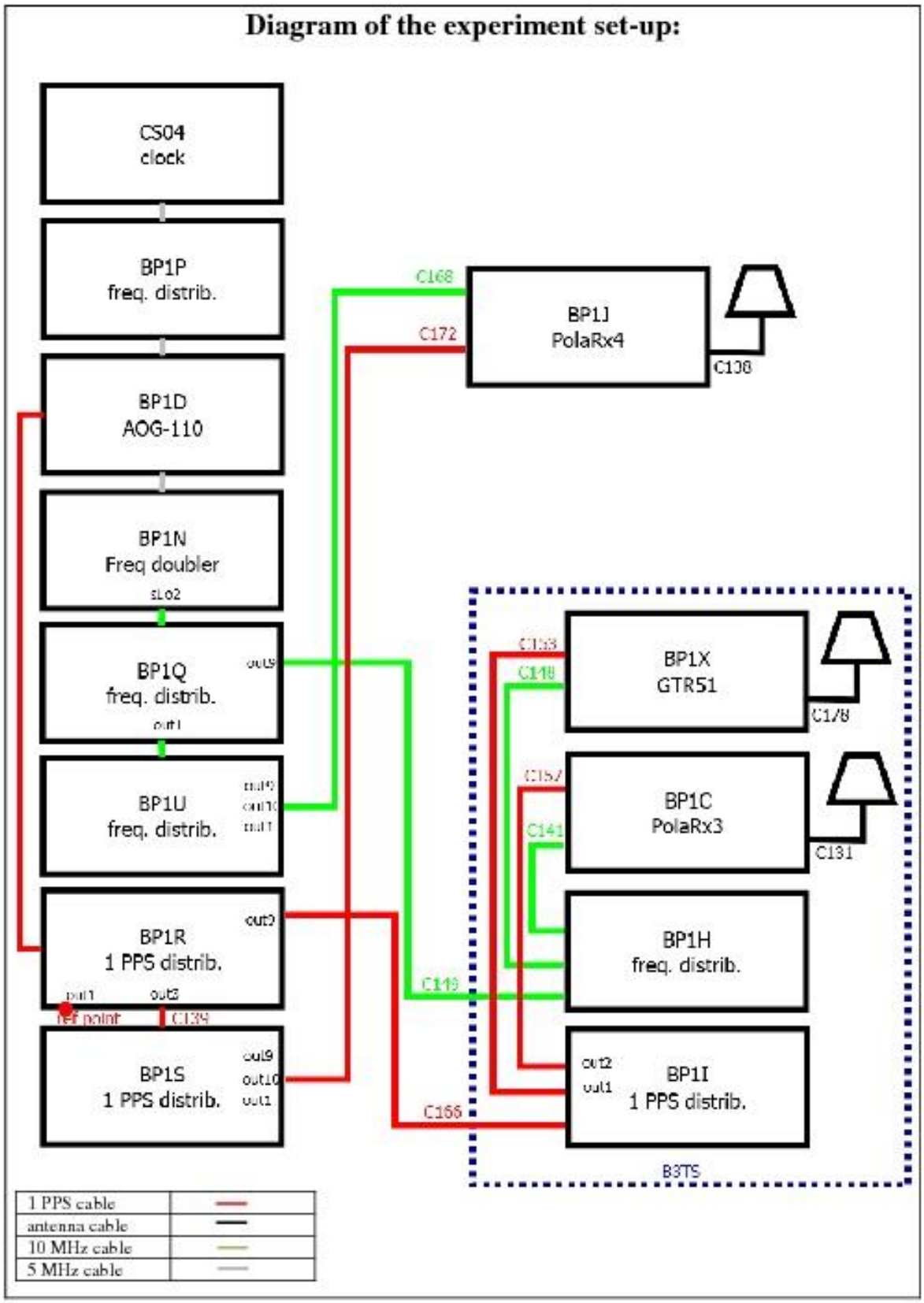


Diagram of the experiment set-up:
CS04
clock
BP1P
freq. distrib.
BP1D
AOG-110
BP1N
Freq doubler
sLo2
BP1Q
freq. distrib.
out9
out1
BP1U
freq. distrib.
out9
out10
out1
BP1R
1 PPS distrib.
out2
out1
out2
ref point
C139
BP1S
1 PPS distrib.
out9
out10
out1
C168
C172
BP1J
PolaRx4
C138
C153
C148
BP1X
GTR51
C178
C157
C141
BP1C
PolaRx3
C131
BP1H
freq. distrib.
C149
out2
out1
BP1I
1 PPS distrib.
C166
B3TS
1 PPS cable
antenna cable
10 MHz cable
5 MHz cable

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.

BP1X-BP1J

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 210429
Number of huge residuals = 8. New iteration
Computed code bias (P1/P2)/m = 11.397 11.065
Computed baseline (X,Y,Z)/m = 0.954 0.280 -0.349
RMS of residuals /m = 0.572

Number of phase differences to fit baseline
L1/L2 = 206198
L5 = 78064
A priori baseline (X,Y,Z)/m = 0.954 0.280 -0.349
29659 clock jitters computed out of 29659 intervals
AVE jitter /ps = -0.4 RMS jitter /ps = 4.6

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 3
Iter 1 Large residuals L5= 1
Computed baseline L1 (X,Y,Z)/m = -0.219 -0.113 -0.254
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.196 -0.124 -0.246
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = -0.178 -0.129 -0.244
RMS of residuals L5 /m = 0.004

Iter 2 Large residuals L1= 0
Iter 2 Large residuals L2= 3
Iter 2 Large residuals L5= 1
Computed baseline L1 (X,Y,Z)/m = -0.219 -0.113 -0.254
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.196 -0.124 -0.246
RMS of residuals L2 /m = 0.005
Computed baseline L5 (X,Y,Z)/m = -0.178 -0.129 -0.244
RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = 0.735 0.167 -0.603
Final baseline L2 (X,Y,Z)/m = 0.759 0.156 -0.595
Final baseline L5 (X,Y,Z)/m = 0.776 0.152 -0.593

COMPUTATION OF CODE DIFFERENCES

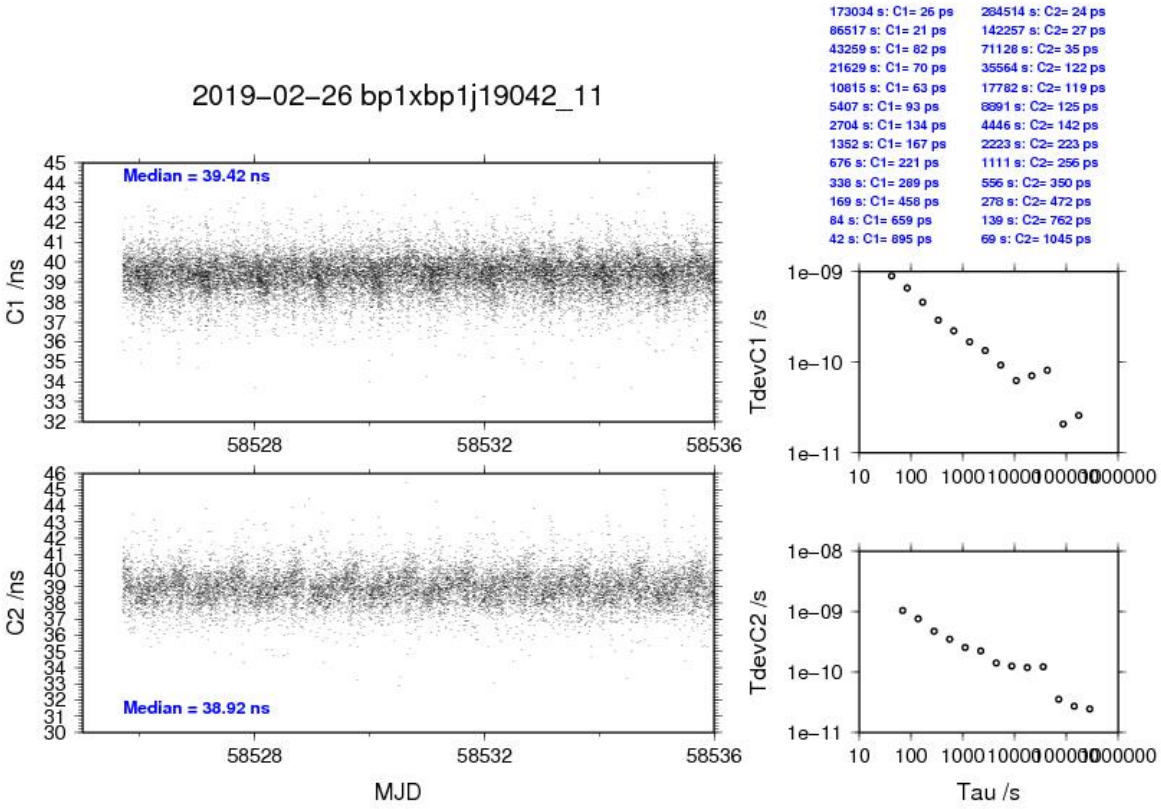
Total number of code differences = 336775

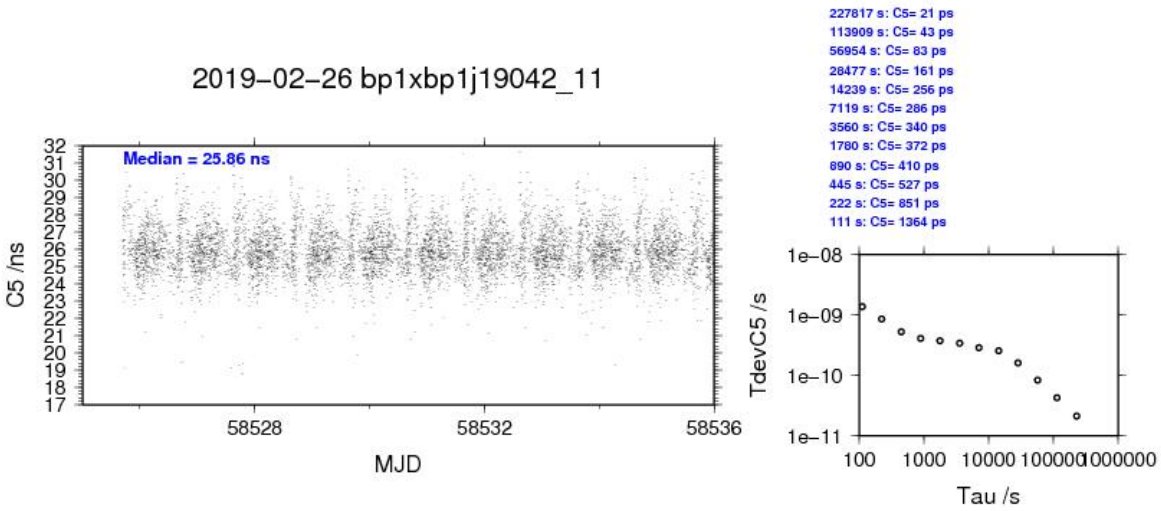
Global average of individual differences

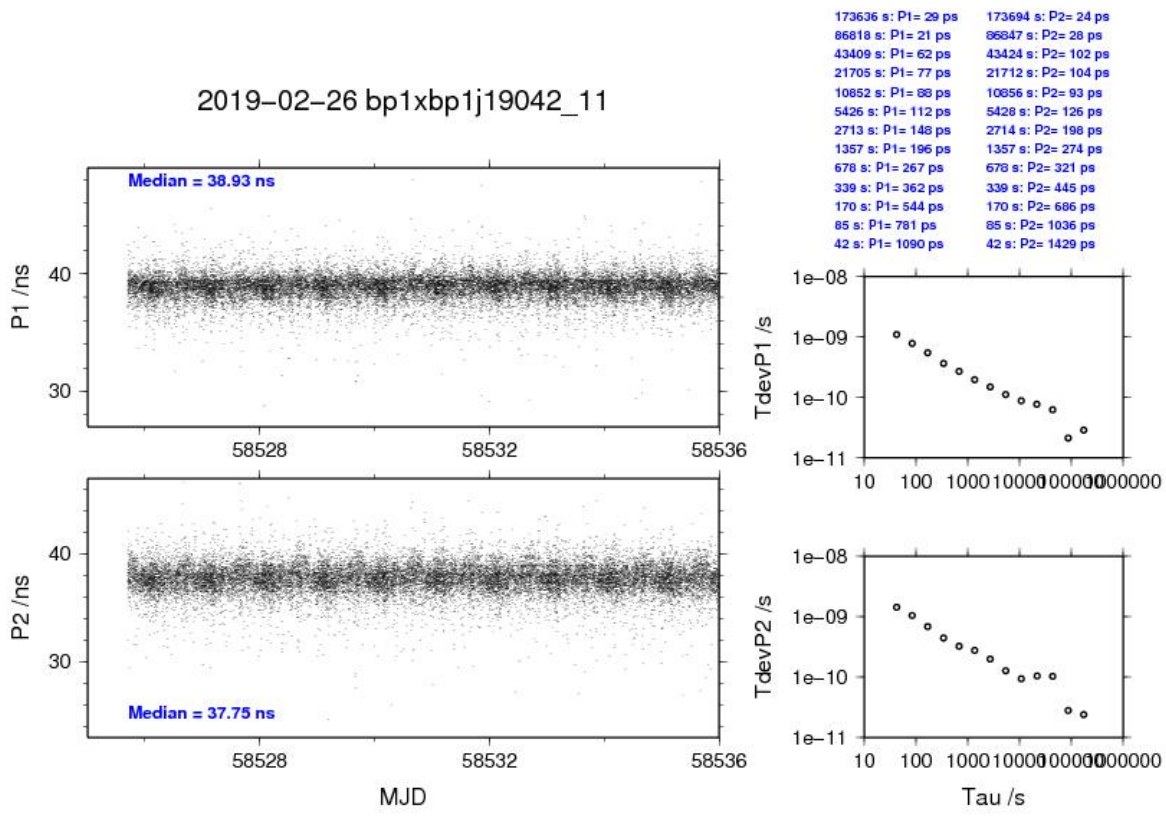
Code	#pts	ave/ns	rms/ns
C1	211025	39.347	1.601
C2	128252	38.904	1.868
C5	80156	25.939	1.875
P1	210172	38.825	2.084
P2	210075	37.679	2.486
E1	123704	41.469	1.466
E5	124257	26.663	1.522

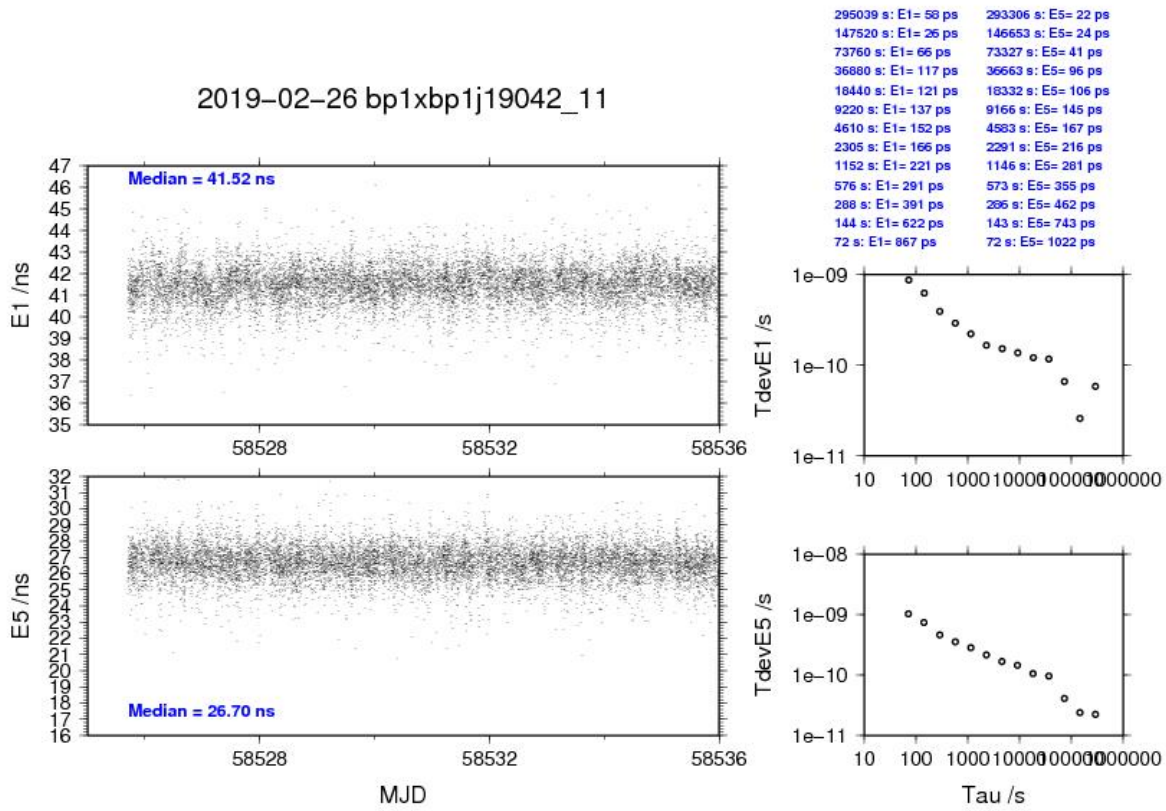
Number of 300s epochs in out file = 2967

Code	#pts	median/ns	ave/ns	rms/ns
C1	21064	39.420	39.378	0.913
C2	12811	38.918	38.934	1.052
C5	8000	25.860	25.948	1.311
P1	20991	38.932	38.858	1.096
P2	20984	37.749	37.699	1.421
E1	12354	41.521	41.494	0.878
E5	12427	26.705	26.672	1.035


2019–02–26 bp1xbp1j19042_11
Median = 39.42 ns
Median = 38.92 ns
C1 /ns
C2 /ns
MJD
58528
58532
58536
173034 s: C1= 26 ps
86517 s: C1= 21 ps
43259 s: C1= 62 ps
21629 s: C1= 70 ps
10815 s: C1= 63 ps
5407 s: C1= 93 ps
2704 s: C1= 134 ps
1352 s: C1= 167 ps
676 s: C1= 221 ps
338 s: C1= 289 ps
169 s: C1= 458 ps
84 s: C1= 659 ps
42 s: C1= 895 ps
284514 s: C2= 24 ps
142257 s: C2= 27 ps
71128 s: C2= 35 ps
35564 s: C2= 122 ps
17782 s: C2= 119 ps
8891 s: C2= 125 ps
4446 s: C2= 142 ps
2223 s: C2= 223 ps
1111 s: C2= 256 ps
556 s: C2= 350 ps
278 s: C2= 472 ps
139 s: C2= 762 ps
69 s: C2= 1045 ps
TdevC1 /s
TdevC2 /s
Tau /s


2019–02–26 bp1xbp1j19042_11
Median = 25.86 ns
C5 /ns
MJD
58528
58532
58536
227817 s: C5= 21 ps
113909 s: C5= 43 ps
56954 s: C5= 83 ps
28477 s: C5= 161 ps
14239 s: C5= 256 ps
7119 s: C5= 286 ps
3560 s: C5= 340 ps
1780 s: C5= 372 ps
890 s: C5= 410 ps
445 s: C5= 527 ps
222 s: C5= 851 ps
111 s: C5= 1364 ps
TdevC5 /s
Tau /s


2019–02–26 bp1xbp1j19042_11
173636 s: P1= 29 ps
86818 s: P1= 21 ps
43409 s: P1= 62 ps
21705 s: P1= 77 ps
10852 s: P1= 88 ps
5426 s: P1= 112 ps
2713 s: P1= 148 ps
1357 s: P1= 196 ps
678 s: P1= 267 ps
339 s: P1= 362 ps
170 s: P1= 544 ps
85 s: P1= 781 ps
42 s: P1= 1090 ps
173694 s: P2= 24 ps
86847 s: P2= 28 ps
43424 s: P2= 102 ps
21712 s: P2= 104 ps
10856 s: P2= 93 ps
5428 s: P2= 126 ps
2714 s: P2= 198 ps
1357 s: P2= 274 ps
678 s: P2= 321 ps
339 s: P2= 445 ps
170 s: P2= 686 ps
85 s: P2= 1036 ps
42 s: P2= 1429 ps
Median = 38.93 ns
P1 /ns
Median = 37.75 ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s


2019–02–26 bp1xbp1j19042_11
295039 s: E1= 58 ps
147520 s: E1= 26 ps
73760 s: E1= 66 ps
36880 s: E1= 117 ps
18440 s: E1= 121 ps
9220 s: E1= 137 ps
4610 s: E1= 152 ps
2305 s: E1= 166 ps
1152 s: E1= 221 ps
576 s: E1= 291 ps
288 s: E1= 391 ps
144 s: E1= 622 ps
72 s: E1= 867 ps
293306 s: E5= 22 ps
146653 s: E5= 24 ps
73327 s: E5= 41 ps
36663 s: E5= 96 ps
18332 s: E5= 106 ps
9166 s: E5= 145 ps
4583 s: E5= 167 ps
2291 s: E5= 216 ps
1146 s: E5= 281 ps
573 s: E5= 355 ps
286 s: E5= 462 ps
143 s: E5= 743 ps
72 s: E5= 1022 ps
Median = 41.52 ns
E1 /ns
Median = 26.70 ns
E5 /ns
MJD
TdevE1 /s
TdevE5 /s
Tau /s

BP1C-BP1J

COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 225737
Number of huge residuals = 1. New iteration
Computed code bias (P1/P2)/m = 13.496 15.277
Computed baseline (X,Y,Z)/m = -1.413 -0.178 1.494
RMS of residuals /m = 0.619

Number of phase differences to fit baseline
L1/L2 = 221147
L5 = 0
A priori baseline (X,Y,Z)/m = -1.413 -0.178 1.494
31676 clock jitters computed out of 31676 intervals
AVE jitter /ps = 0.0 RMS jitter /ps = 4.9

Iter 1 Large residuals L1= 0
Iter 1 Large residuals L2= 2
Iter 1 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.057 -0.038 -0.166
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.046 -0.047 -0.176
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 0
Iter 2 Large residuals L2= 2
Iter 2 Large residuals L5= 0
Computed baseline L1 (X,Y,Z)/m = -0.057 -0.038 -0.166
RMS of residuals L1 /m = 0.004
Computed baseline L2 (X,Y,Z)/m = -0.046 -0.047 -0.176
RMS of residuals L2 /m = 0.004
No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -1.470 -0.216 1.328
Final baseline L2 (X,Y,Z)/m = -1.459 -0.225 1.318
Final baseline L5 (X,Y,Z)/m = -1.464 -0.221 1.323

COMPUTATION OF CODE DIFFERENCES

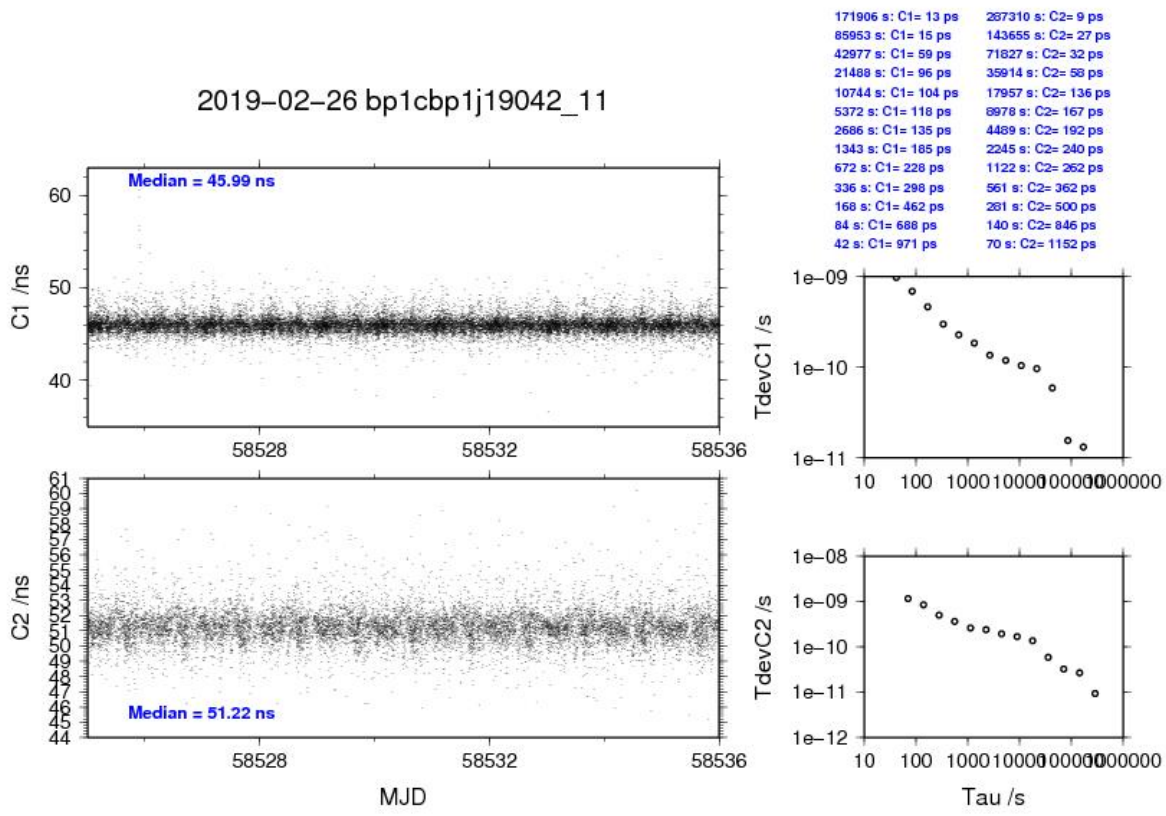
Total number of code differences = 229178

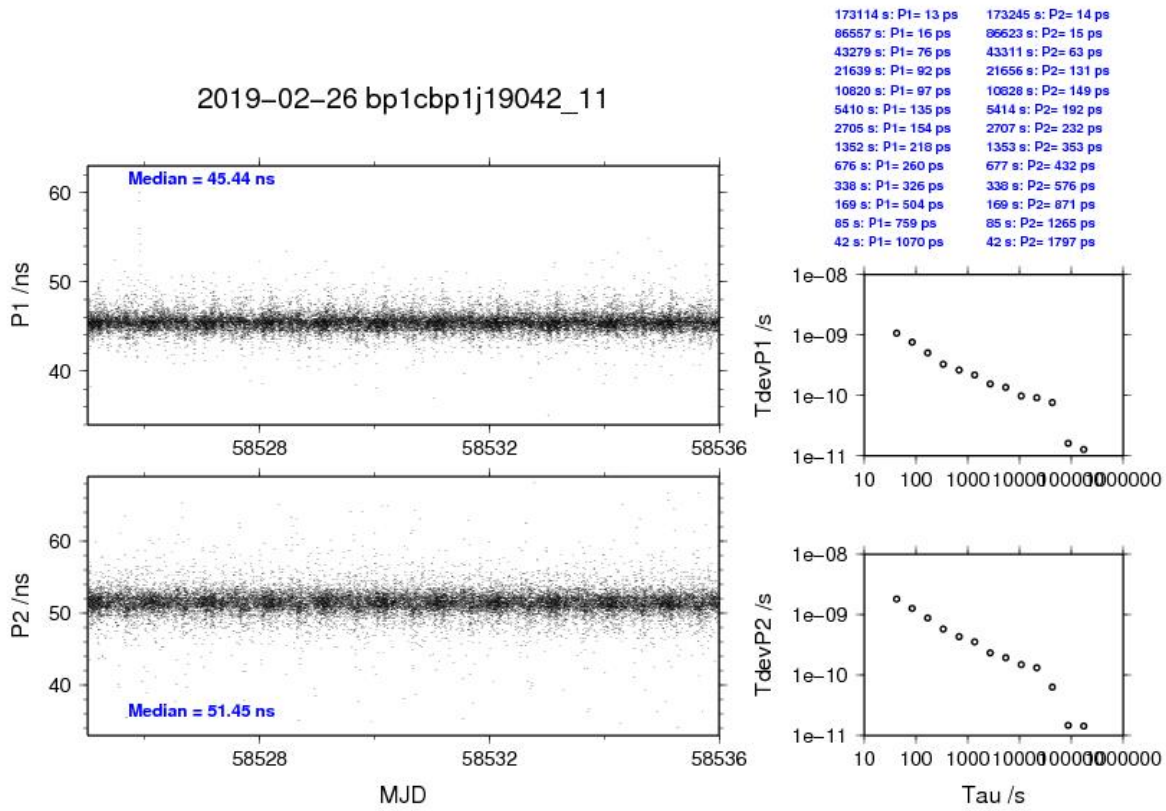
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	226700	46.040	1.906
C2	135646	51.253	2.059
C5	0	NaN	NaN
P1	225052	45.490	1.966
P2	224883	51.445	2.984
E1	0	NaN	NaN
E5	0	NaN	NaN

Number of 300s epochs in out file = 3168

Code	#pts	median/ns	ave/ns	rms/ns
C1	22639	45.987	46.037	0.964
C2	13546	51.224	51.260	1.147
C5	0	0.000	NaN	NaN
P1	22481	45.437	45.492	1.064
P2	22464	51.447	51.445	1.782
E1	0	0.000	NaN	NaN
E5	0	0.000	NaN	NaN


2019–02–26 bp1cbp1j19042_11
171906 s: C1= 13 ps
85953 s: C1= 15 ps
42977 s: C1= 59 ps
21488 s: C1= 96 ps
10744 s: C1= 104 ps
5372 s: C1= 118 ps
2686 s: C1= 135 ps
1343 s: C1= 185 ps
672 s: C1= 228 ps
336 s: C1= 298 ps
168 s: C1= 462 ps
84 s: C1= 688 ps
42 s: C1= 971 ps
287310 s: C2= 9 ps
143655 s: C2= 27 ps
71827 s: C2= 32 ps
35914 s: C2= 58 ps
17957 s: C2= 136 ps
8978 s: C2= 167 ps
4489 s: C2= 192 ps
2245 s: C2= 240 ps
1122 s: C2= 262 ps
561 s: C2= 362 ps
281 s: C2= 500 ps
140 s: C2= 846 ps
70 s: C2= 1152 ps
Median = 45.99 ns
C1 /ns
Median = 51.22 ns
C2 /ns
MJD
TdevC1 /s
TdevC2 /s
Tau /s


2019–02–26 bp1cbp1j19042_11
173114 s: P1= 13 ps
86557 s: P1= 16 ps
43279 s: P1= 76 ps
21639 s: P1= 92 ps
10820 s: P1= 97 ps
5410 s: P1= 135 ps
2705 s: P1= 154 ps
1352 s: P1= 216 ps
676 s: P1= 260 ps
338 s: P1= 326 ps
169 s: P1= 504 ps
85 s: P1= 759 ps
42 s: P1= 1070 ps
173245 s: P2= 14 ps
86623 s: P2= 15 ps
43311 s: P2= 63 ps
21656 s: P2= 131 ps
10828 s: P2= 149 ps
5414 s: P2= 192 ps
2707 s: P2= 232 ps
1353 s: P2= 353 ps
677 s: P2= 432 ps
338 s: P2= 576 ps
169 s: P2= 871 ps
85 s: P2= 1265 ps
42 s: P2= 1797 ps
Median = 45.44 ns
P1 /ns
Median = 51.45 ns
P2 /ns
MJD
TdevP1 /s
TdevP2 /s
Tau /s