

**Table of contents**

1.1/ BIPM (22203) ..... 3  
1.2/ NIM (22249) ..... 16  
1.3/ NICT (22321) ..... 84  
1.4/ TL (23006) ..... 110  
1.5/ BIPM (23047) ..... 146

## Notations

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

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

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

- $X_C$  = antenna cable delay

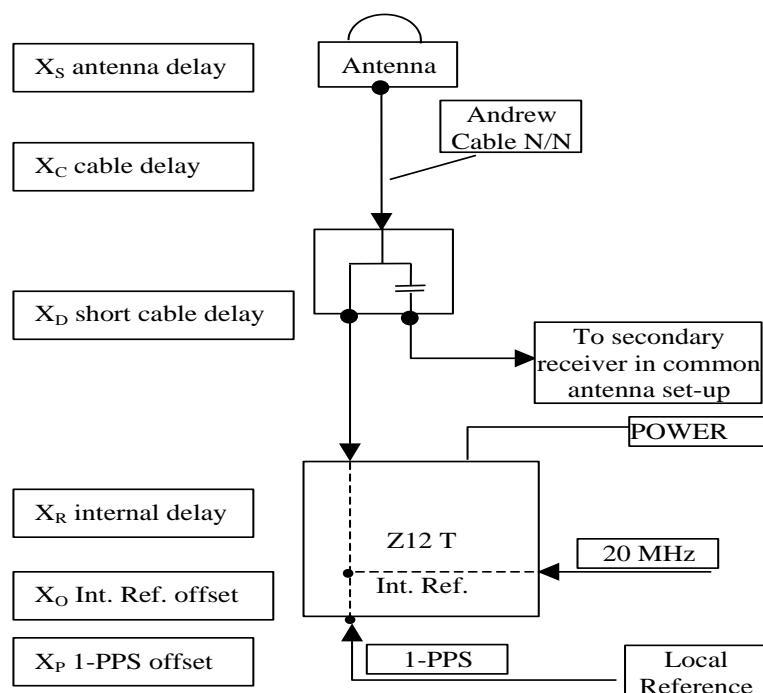
- $[X_D = \text{short cable} + \text{splitter delay}]$

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

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

- $X_S$  = antenna delay

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



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

**1/ phase 1**

Laboratories: BIPM, NIM, NICT, TL

**1.1/ BIPM (22203)**

**Period**

MJD 59782 to 59788

**Delays**

BP25: (cf page 4)  
REFDLY = 53.38 ns (68.41-15.03)  
CABDLY = 176.24 ns (C208)

BP2G: (cf page 5)  
REFDLY = 53.48 ns (68.51-15.03)  
CABDLY = 176.38 ns (C211)

BP21: (cf page 4)  
REFDLY = 43.29 ns (58.32-15.03)  
CABDLY = 140.80 ns (C201)

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 59782	
Date and hour of the end of measurements:	MJD 59788	
<b>Information on the system</b>		
	Local:	Travelling:
4-character BIPM code	BP21	BP25
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx5TR 4701229	Mesit GTR55 1808001
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):	LMR-195	HYLM195
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type: Antenna serial number:	Septentrio SEPCHOKE B3E6 5253	Novatel GNSS-850 NMLK18070096N
Temperature (if stabilised) /°C		
<b>Measured delays /ns</b>		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	43.29 ns	53.38 ns
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)	PPSin compensation enable	
• Antenna cable delay:	140.80 ns	176.24 ns
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
<b>Data used for the generation of CGGTTS files</b>		
• 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:		
<b>General information</b>		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		22 ± 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.



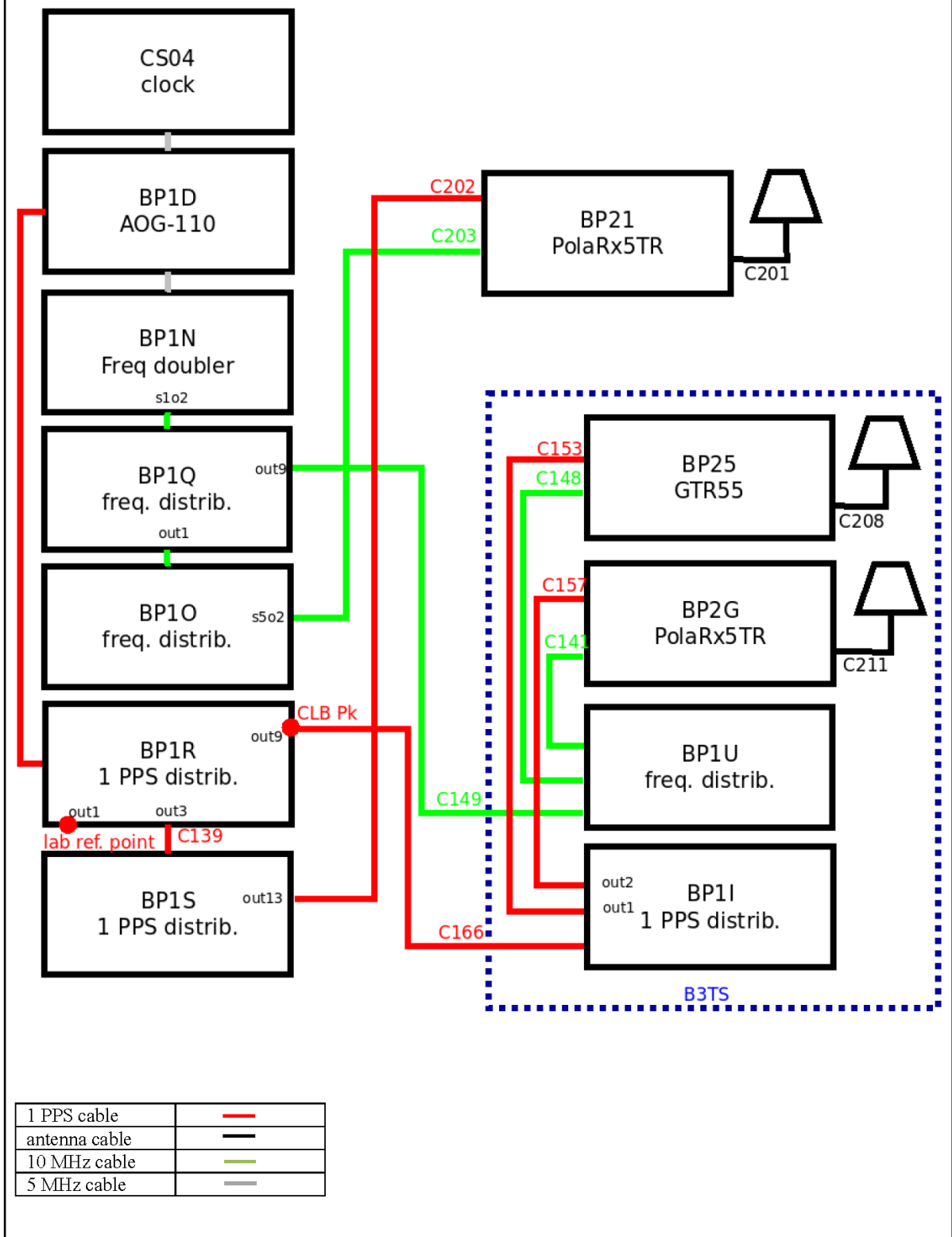
**Annex A - Information Sheet**

(to be repeated for each calibrated system)

Laboratory:	BIPM	
Date and hour of the beginning of measurements:	MJD 59782	
Date and hour of the end of measurements:	MJD 59788	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	BP21	BP2G
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx5TR 4701229	Septentrio PolaRx5TR 4701533
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):	LMR-195	HYLM195
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type: Antenna serial number:	Septentrio SEPCHOKE B3E6 5253	Septentrio SEPCHOKE B3E6 6023
Temperature (if stabilised) /°C		
<b>Measured delays /ns</b>		
(if needed fill box "Additional Information" below)		
	<b>Local:</b>	<b>Travelling:</b>
• Delay from local UTC to receiver 1 PPS-in:	43.29 ns	53.48 ns
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)	PPSin compensation enable	PPSin compensation enable
• Antenna cable delay:	140.80 ns	176.38 ns
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
<b>Data used for the generation of CGGTTS files</b>		
• 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:		
<b>General information</b>		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		22 ± 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 is a Time Interval Counter (TIC), model 53230A, maker Keysight, S/N MY58390132, with measurement uncertainty typically less than 0.5 ns (using external reference frequency as timebase).

The delay between the laboratory reference point and the 1 PPS input connector of the B3TS (CLB P<sub>k</sub>) is 0 ns.

**BP25-BP21**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 137156  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 25999 high elev obs : 3.791 5.511  
 Iteration 0: Obs used = 219282; Huge residuals = 0; Large residuals = 5560  
 Iteration 1: Obs used = 219282; Huge residuals = 0; Large residuals = 5560  
 Computed code bias (P1/P2)/m = 3.510 5.229  
 Computed baseline (X,Y,Z)/m = -4.960 -0.580 4.538  
 RMS of residuals /m = 0.620

Number of phase differences to fit baseline  
 L1/L2 = 131658  
 L5 = 71262  
 A priori baseline (X,Y,Z)/m = -4.960 -0.580 4.538  
 20156 clock jitters computed out of 20156 intervals  
 AVE jitter /ps = -0.7 RMS jitter /ps = 5.0

Iter 1 Large residuals L1= 2  
 Iter 1 Large residuals L2= 3  
 Iter 1 Large residuals L5= 12  
 Computed baseline L1 (X,Y,Z)/m = -0.093 -0.120 0.136  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = -0.072 -0.124 0.147  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = -0.098 -0.107 0.163  
 RMS of residuals L5 /m = 0.004

Iter 2 Large residuals L1= 2  
 Iter 2 Large residuals L2= 3  
 Iter 2 Large residuals L5= 12  
 Computed baseline L1 (X,Y,Z)/m = -0.093 -0.120 0.136  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = -0.072 -0.124 0.147  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = -0.098 -0.107 0.163  
 RMS of residuals L5 /m = 0.004

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -5.042 -0.702 4.679  
 20156 clock jitters computed out of 20156 intervals  
 AVE jitter /ps = 0.4 RMS jitter /ps = 0.4

Iter 3 Large residuals L1= 2  
 Iter 3 Large residuals L2= 3  
 Iter 3 Large residuals L5= 12  
 Computed baseline L1 (X,Y,Z)/m = 0.000 -0.036 0.000  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.021 -0.039 0.012  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = 0.004 -0.026 0.028  
 RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -5.042 -0.738 4.679  
 Final baseline L2 (X,Y,Z)/m = -5.021 -0.741 4.691  
 Final baseline L5 (X,Y,Z)/m = -5.038 -0.728 4.707

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 531601

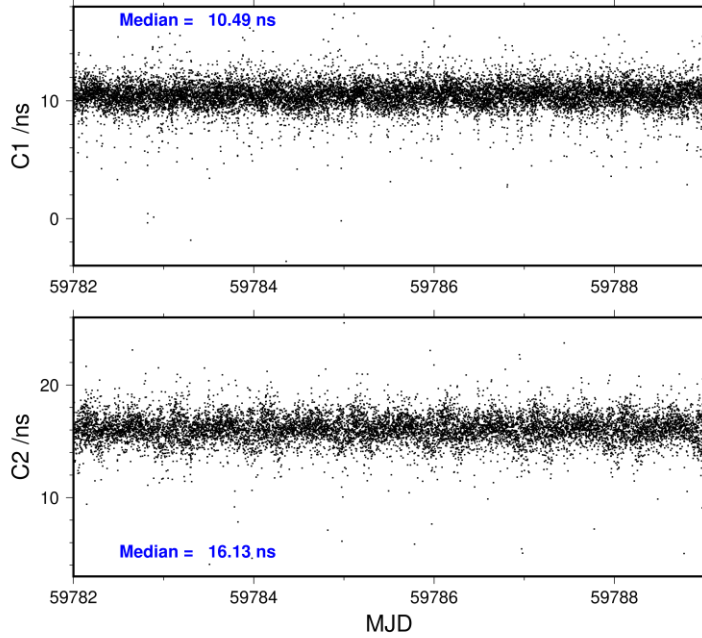
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	142061	10.447	2.107
C2	109087	16.117	2.104
P1	136500	11.771	1.936
P2	136349	17.536	2.569
E1	99553	10.022	1.800
E5	99925	16.094	1.774
BC	124914	9.733	2.102
B5	127258	15.716	2.021

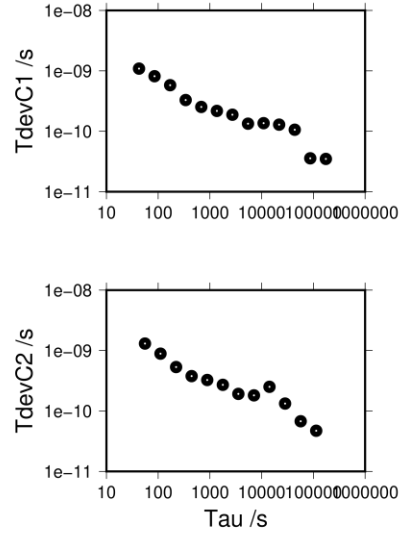
Number of 300s epochs in out file = 2016

Code	#pts	median/ns	ave/ns	rms/ns
C1	14191	10.492	10.461	1.126
C2	10895	16.128	16.119	1.273
P1	13530	11.802	11.811	1.070
P2	13522	17.587	17.546	1.505
E1	9942	10.036	10.010	1.041
E5	9952	16.134	16.079	1.152
BC	12523	9.749	9.726	1.262
B5	12756	15.761	15.704	1.336

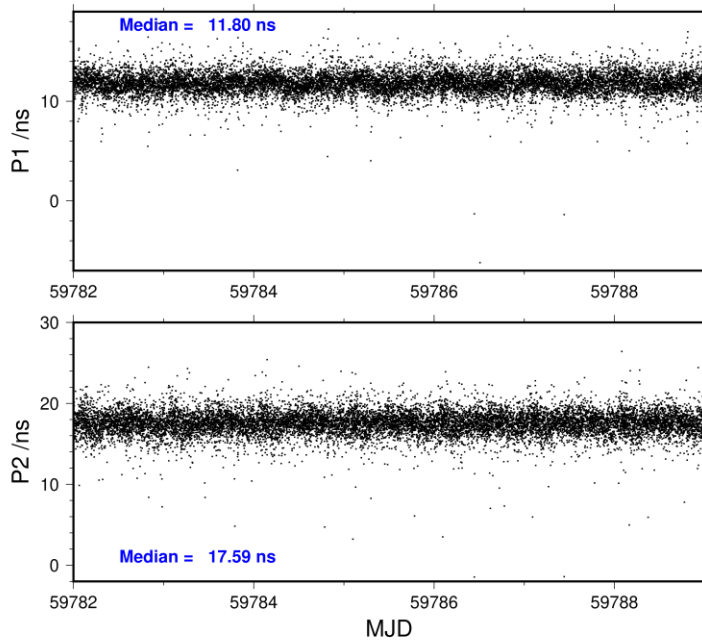
2022-08-09 BP25BP2122203\_7



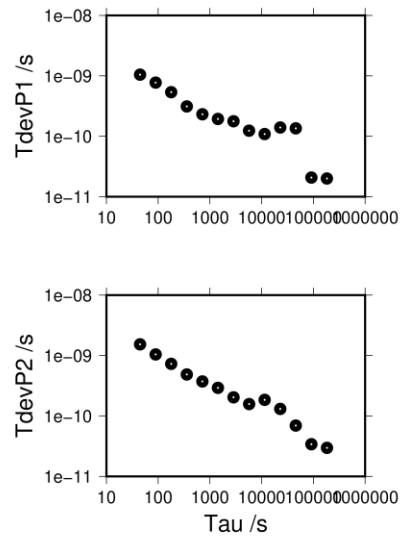
174491 s: C1= 35 ps  
 87246 s: C1= 36 ps 113642 s: C2= 47 ps  
 43623 s: C1= 106 ps 56821 s: C2= 68 ps  
 21811 s: C1= 129 ps 28410 s: C2= 133 ps  
 10906 s: C1= 136 ps 14205 s: C2= 251 ps  
 5453 s: C1= 134 ps 7103 s: C2= 181 ps  
 2726 s: C1= 188 ps 3551 s: C2= 192 ps  
 1363 s: C1= 217 ps 1776 s: C2= 271 ps  
 682 s: C1= 253 ps 888 s: C2= 325 ps  
 341 s: C1= 329 ps 444 s: C2= 378 ps  
 170 s: C1= 580 ps 222 s: C2= 534 ps  
 85 s: C1= 816 ps 111 s: C2= 888 ps  
 43 s: C1= 1090 ps 55 s: C2= 1304 ps



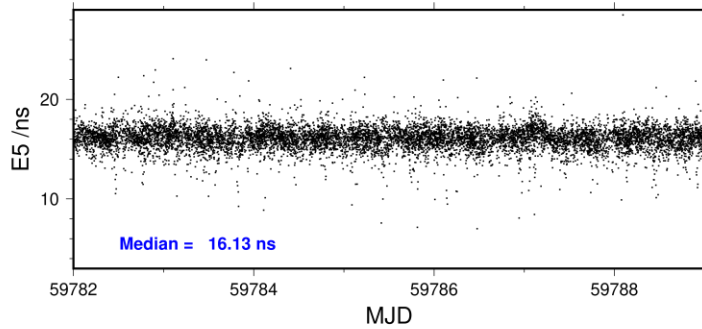
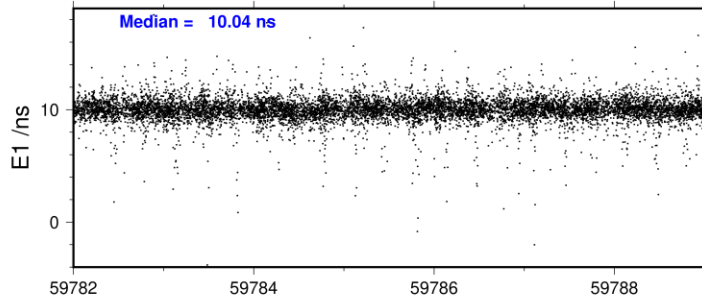
2022-08-09 BP25BP2122203\_7



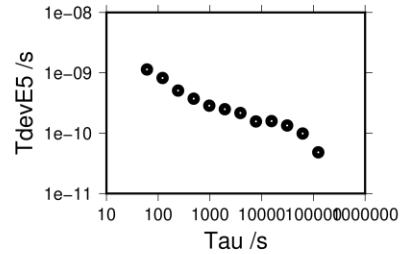
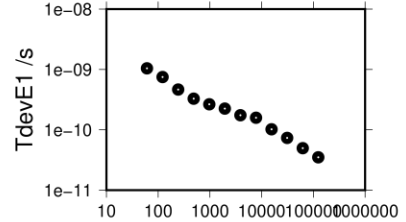
183017 s: P1= 20 ps 183125 s: P2= 30 ps  
 91508 s: P1= 21 ps 91562 s: P2= 34 ps  
 45754 s: P1= 135 ps 45781 s: P2= 69 ps  
 22877 s: P1= 140 ps 22891 s: P2= 131 ps  
 11439 s: P1= 109 ps 11445 s: P2= 185 ps  
 5719 s: P1= 124 ps 5723 s: P2= 157 ps  
 2860 s: P1= 177 ps 2861 s: P2= 203 ps  
 1430 s: P1= 194 ps 1431 s: P2= 292 ps  
 715 s: P1= 232 ps 715 s: P2= 373 ps  
 357 s: P1= 312 ps 358 s: P2= 486 ps  
 179 s: P1= 538 ps 179 s: P2= 728 ps  
 89 s: P1= 774 ps 89 s: P2= 1044 ps  
 45 s: P1= 1046 ps 45 s: P2= 1531 ps



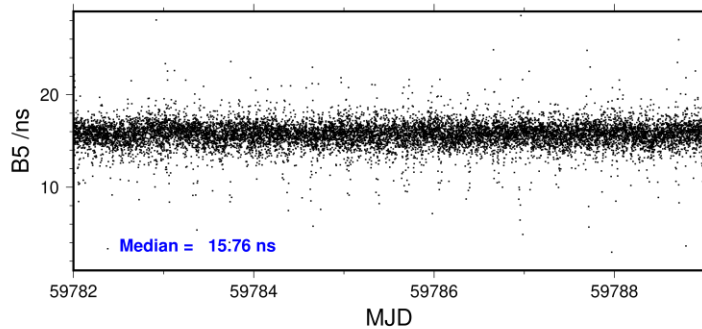
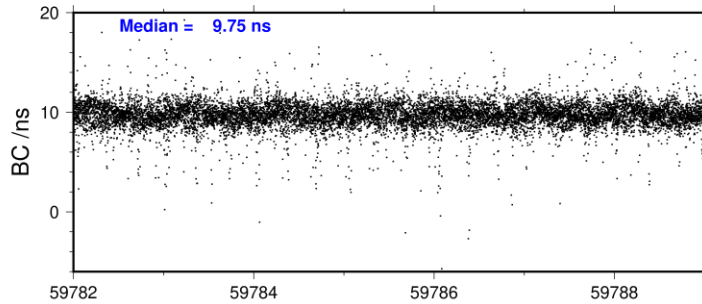
2022-08-09 BP25BP2122203\_7



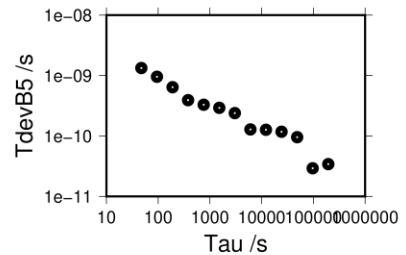
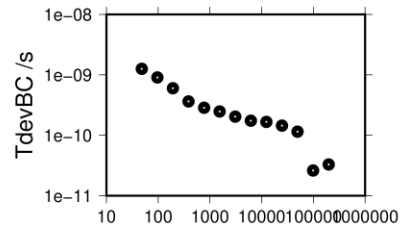
124536 s: E1= 35 ps 124411 s: E5= 48 ps  
 62268 s: E1= 50 ps 62206 s: E5= 99 ps  
 31134 s: E1= 73 ps 31103 s: E5= 134 ps  
 15567 s: E1= 102 ps 15551 s: E5= 159 ps  
 7784 s: E1= 159 ps 7776 s: E5= 156 ps  
 3892 s: E1= 174 ps 3888 s: E5= 216 ps  
 1946 s: E1= 225 ps 1944 s: E5= 250 ps  
 973 s: E1= 265 ps 972 s: E5= 285 ps  
 486 s: E1= 328 ps 486 s: E5= 372 ps  
 243 s: E1= 464 ps 243 s: E5= 508 ps  
 122 s: E1= 749 ps 122 s: E5= 821 ps  
 61 s: E1= 1042 ps 61 s: E5= 1137 ps



2022-08-09 BP25BP2122203\_7



197735 s: BC= 33 ps 194122 s: B5= 34 ps  
 98867 s: BC= 26 ps 97061 s: B5= 29 ps  
 49434 s: BC= 115 ps 48531 s: B5= 95 ps  
 24717 s: BC= 145 ps 24265 s: B5= 117 ps  
 12358 s: BC= 167 ps 12133 s: B5= 127 ps  
 6179 s: BC= 174 ps 6066 s: B5= 128 ps  
 3090 s: BC= 204 ps 3033 s: B5= 239 ps  
 1545 s: BC= 248 ps 1517 s: B5= 292 ps  
 772 s: BC= 286 ps 758 s: B5= 328 ps  
 386 s: BC= 363 ps 379 s: B5= 391 ps  
 193 s: BC= 601 ps 190 s: B5= 641 ps  
 97 s: BC= 905 ps 95 s: B5= 954 ps  
 48 s: BC= 1257 ps 47 s: B5= 1333 ps



**BP2G-BP21**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 146284  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 25999 high elev obs : 7.718 7.288  
 Iteration 0: Obs used = 220470; Huge residuals = 3; Large residuals = 22628  
 Iteration 1: Obs used = 220471; Huge residuals = 0; Large residuals = 22621  
 Computed code bias (P1/P2)/m = 6.728 6.330  
 Computed baseline (X,Y,Z)/m = -3.062 0.286 4.003  
 RMS of residuals /m = 0.772

Number of phase differences to fit baseline  
 L1/L2 = 136661  
 L5 = 72877  
 A priori baseline (X,Y,Z)/m = -3.062 0.286 4.003  
 20156 clock jitters computed out of 20156 intervals  
 AVE jitter /ps = -1.8 RMS jitter /ps = 4.0

Iter 1 Large residuals L1= 5  
 Iter 1 Large residuals L2= 8  
 Iter 1 Large residuals L5= 9  
 Computed baseline L1 (X,Y,Z)/m = -0.599 -0.647 -0.650  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.601 -0.652 -0.657  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = -0.633 -0.644 -0.640  
 RMS of residuals L5 /m = 0.003

Iter 2 Large residuals L1= 5  
 Iter 2 Large residuals L2= 8  
 Iter 2 Large residuals L5= 9  
 Computed baseline L1 (X,Y,Z)/m = -0.599 -0.648 -0.651  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.601 -0.652 -0.657  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = -0.634 -0.644 -0.640  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -3.662 -0.364 3.349  
 20156 clock jitters computed out of 20156 intervals  
 AVE jitter /ps = 1.2 RMS jitter /ps = 1.5



Iter 3 Large residuals L1= 5  
 Iter 3 Large residuals L2= 8  
 Iter 3 Large residuals L5= 9  
 Computed baseline L1 (X,Y,Z)/m = 0.022 -0.135 -0.010  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.021 -0.139 -0.017  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = -0.002 -0.136 -0.010  
 RMS of residuals L5 /m = 0.003  
 WARNING Phase baseline L1 differs from a priori by > 10 cm

Final baseline L1 (X,Y,Z)/m = -3.640 -0.498 3.339  
 Final baseline L2 (X,Y,Z)/m = -3.641 -0.503 3.332  
 Final baseline L5 (X,Y,Z)/m = -3.664 -0.500 3.339

#### COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 569876

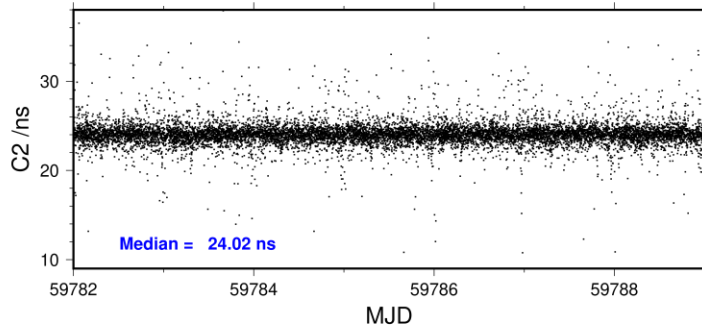
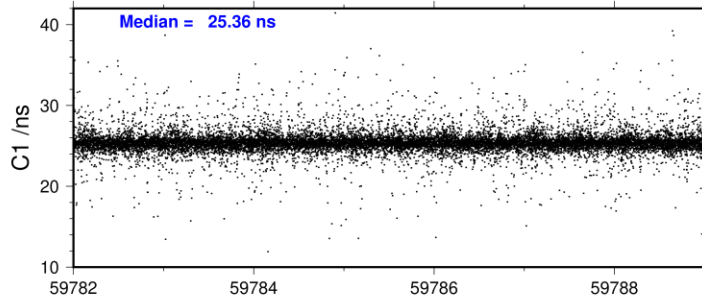
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	150400	25.403	2.933
C2	113919	24.045	2.567
P1	143375	24.917	2.963
P2	143606	23.556	3.689
E1	105304	25.336	2.501
E5	106597	24.458	2.284
BC	128570	25.340	2.472
B5	129551	24.444	2.269

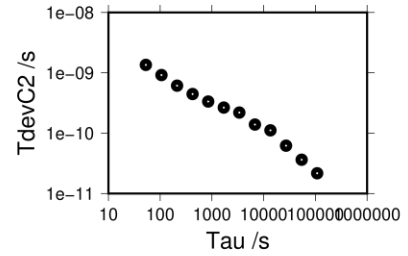
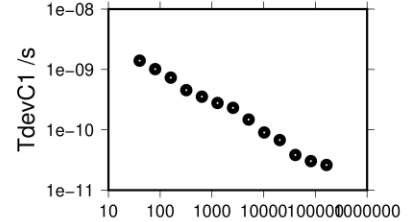
Number of 300s epochs in out file = 2016

Code	#pts	median/ns	ave/ns	rms/ns
C1	15094	25.355	25.405	1.420
C2	11410	24.019	24.041	1.324
P1	14303	25.187	24.937	2.270
P2	14327	23.866	23.558	2.672
E1	10578	25.312	25.349	1.377
E5	10685	24.449	24.462	1.338
BC	12900	25.313	25.342	1.342
B5	12982	24.446	24.462	1.335

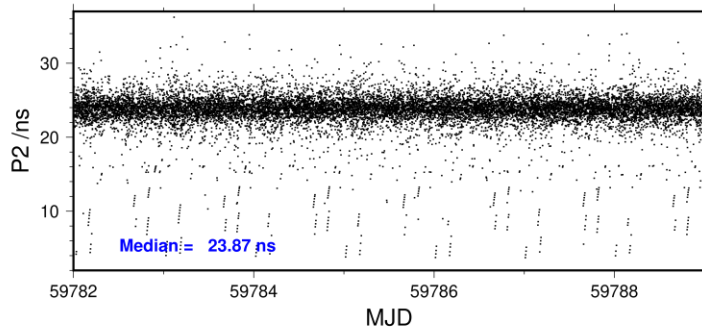
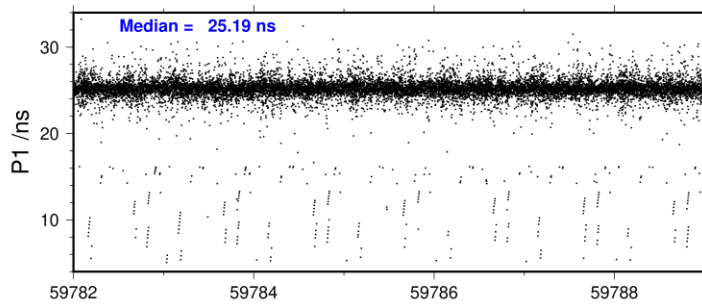
2022-08-09 BP2GBP2122203\_7



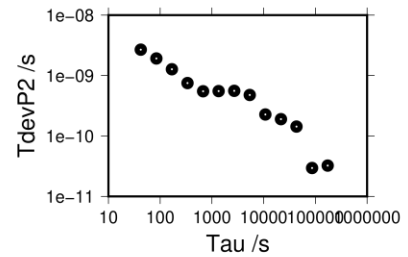
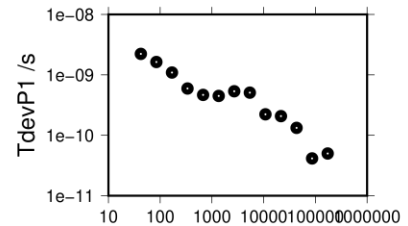
164052 s: C1= 26 ps  
 82026 s: C1= 30 ps 108512 s: C2= 22 ps  
 41013 s: C1= 38 ps 54256 s: C2= 36 ps  
 20506 s: C1= 68 ps 27128 s: C2= 62 ps  
 10253 s: C1= 90 ps 13564 s: C2= 111 ps  
 5127 s: C1= 148 ps 6782 s: C2= 139 ps  
 2563 s: C1= 231 ps 3391 s: C2= 219 ps  
 1282 s: C1= 278 ps 1696 s: C2= 265 ps  
 641 s: C1= 354 ps 848 s: C2= 334 ps  
 320 s: C1= 455 ps 424 s: C2= 445 ps  
 160 s: C1= 732 ps 212 s: C2= 612 ps  
 80 s: C1= 1012 ps 106 s: C2= 920 ps  
 40 s: C1= 1399 ps 53 s: C2= 1353 ps



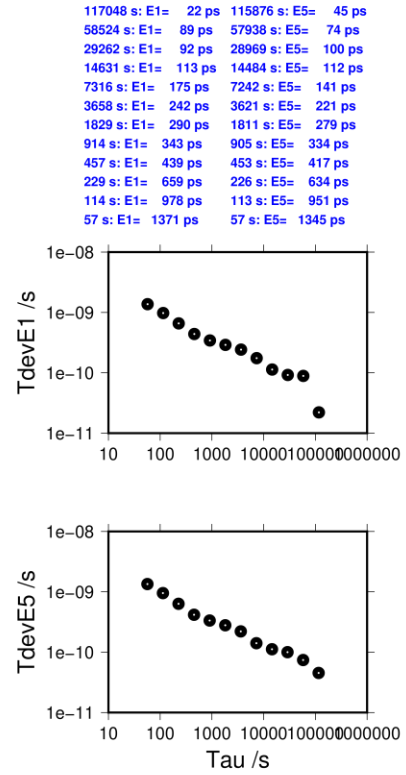
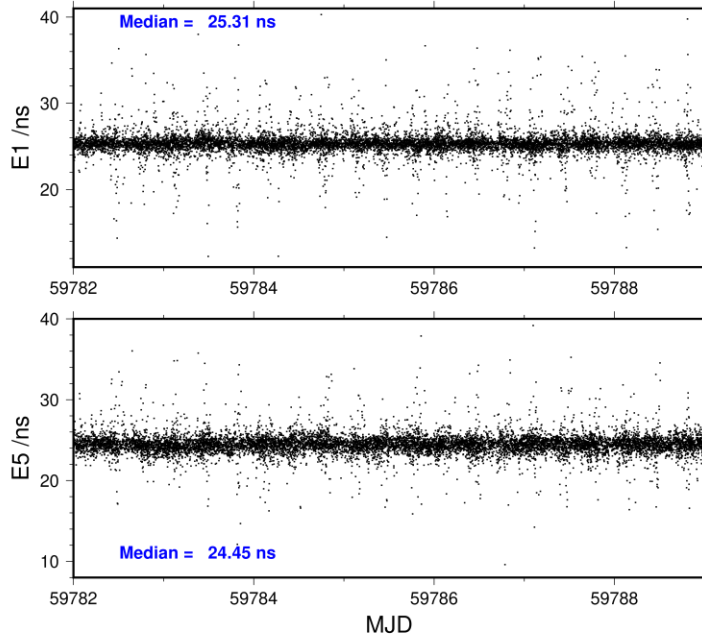
2022-08-09 BP2GBP2122203\_7



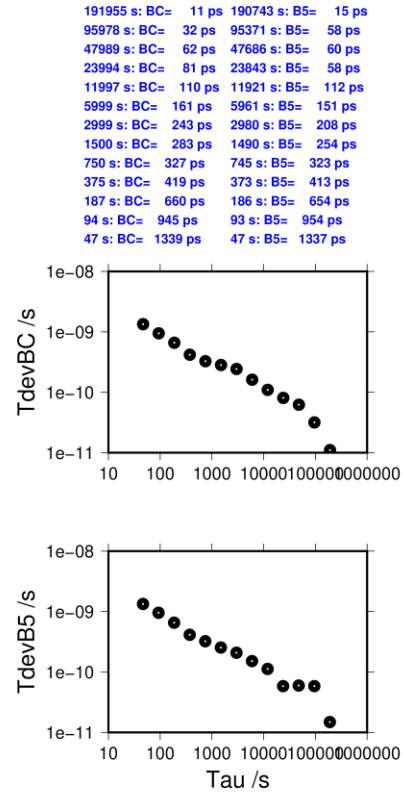
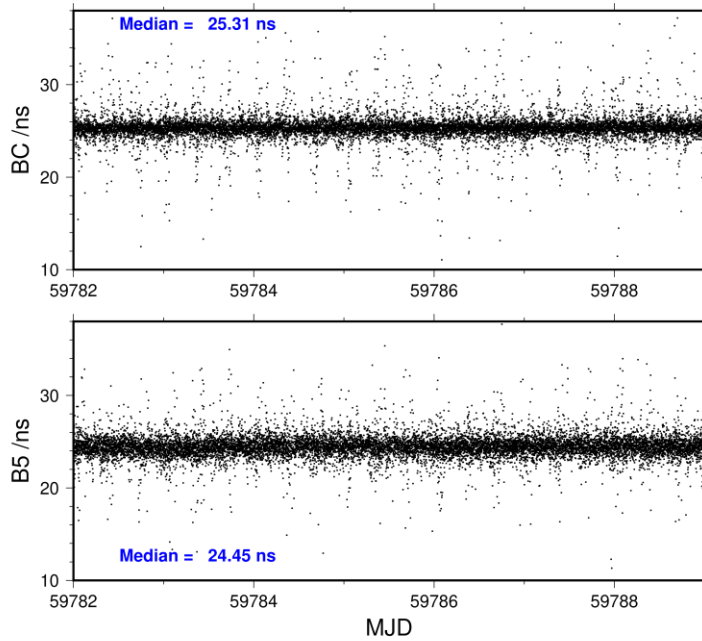
173125 s: P1= 50 ps 172835 s: P2= 32 ps  
 86562 s: P1= 41 ps 86417 s: P2= 30 ps  
 43281 s: P1= 133 ps 43209 s: P2= 143 ps  
 21641 s: P1= 207 ps 21604 s: P2= 190 ps  
 10820 s: P1= 223 ps 10802 s: P2= 227 ps  
 5410 s: P1= 509 ps 5401 s: P2= 477 ps  
 2705 s: P1= 535 ps 2701 s: P2= 559 ps  
 1353 s: P1= 448 ps 1350 s: P2= 553 ps  
 676 s: P1= 466 ps 675 s: P2= 549 ps  
 338 s: P1= 595 ps 338 s: P2= 752 ps  
 169 s: P1= 1093 ps 169 s: P2= 1271 ps  
 85 s: P1= 1635 ps 84 s: P2= 1920 ps  
 42 s: P1= 2226 ps 42 s: P2= 2679 ps



2022-08-09 BP2GBP2122203\_7



2022-08-09 BP2GBP2122203\_7



**1.2/ NIM (22249)****Period**

MJD 59828 to 59835

**Delays**

BP25:	(cf page 16)
REFDLY = 176.46 ns	
CABDLY = 176.24 ns	(C208)
BP2G:	(cf page 16)
REFDLY = 176.57 ns	
CABDLY = 176.38 ns	(C211)
IMEU (IM03):	(cf page 16)
REFDLY = 131.89 ns	
CABDLY = 250.30 ns	
IMEJ (IM06):	(cf page 18)
REFDLY = 134.53 ns	
CABDLY = 248.70 ns	
INT DLY: -31.7 ns (GPS C1), -32.4 ns (GPS P1), -19.0 ns (GPS P2)	
IMEC (IM09):	(cf page 20)
REFDLY = 199.89 ns	
CABDLY = 212.90 ns	
IMEK (IM11):	(cf page 22)
REFDLY = 199.93 ns	
CABDLY = 213.50 ns	
IM15:	(cf page 24)
REFDLY = 171.65 ns	
CABDLY = 212.40 ns	
IM22:	(cf page 26)
REFDLY = 205.66 ns	
CABDLY = 213.10 ns	
GS16 (IM02):	(cf page 28)
REFDLY = 174.63 ns	
CABDLY = 213.60 ns	
GS17 (IM04):	(cf page 30)
REFDLY = 176.26 ns	
CABDLY = 212.90 ns	

Setup at the NIM**IM03**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	IM03	BP25 BP2G
Receiver maker and type: Receiver serial number:	NIM NIM-TF-GNSS-2J YTJ160	Mesit / GTR55 / 1808001  Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	NONE JNSMARANT_GGD 0155	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	131.89 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.

Antenna cable delay:	250.3 ns	177.65 ns 178.43 ns
Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	-40.3 ns (GPS C1), -24.8 ns (GPS P1), -12.1 ns (GPS P2)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	250.3 ns	
REF DLY /ns:	131.89 ns	
Coordinates reference frame:	ITRF	
Latitude or X /m:	X: -2154288.619 m	
Longitude or Y /m:	Y: +4373441.259 m	
Height or Z /m:	Z: +4098883.749 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	

**IM06**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	IM06	BP25 BP2G
Receiver maker and type: Receiver serial number:	DICOM GTR50 1007011	Mesit / GTR55 / 1808001  Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	Novatel /	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	134.53 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.
Antenna cable delay:	248.7 ns	177.65 ns

		178.43 ns
Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	-31.7 ns (GPS C1), -32.4 ns (GPS P1), -19.0 ns (GPS P2)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	248.7 ns	
REF DLY /ns:	134.53 ns	
Coordinates reference frame:	ITRF	
Latitude or X /m:	X: -2154288.27 m	
Longitude or Y /m:	Y: +4373440.52 m	
Height or Z /m:	Z: +4098884.88 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	



**IM09**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	IM09	BP25 BP2G
Receiver maker and type: Receiver serial number:	Navcompass NIMTFGNSS-2 201401	Mesit / GTR55 / 1808001  Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	NONE AERAT1675-200 5098	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	199.89 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.
Antenna cable delay:	212.9 ns	177.65 ns

		178.43 ns
Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	0 ns (GPS C1), 0 ns (GPS P1), 0 ns (GPS P2)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	212.9 ns	
REF DLY /ns:	199.89 ns	
Coordinates reference frame:	ITRF	
Latitude or X /m:	X:-2154287.087 m	
Longitude or Y /m:	Y: +4373436.124 m	
Height or Z /m:	Z: +4098890.268 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	

**IM11**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	IM11	BP25 BP2G
Receiver maker and type: Receiver serial number:	JAVAD TRE_G3T GTR51 S/N 1405004	Mesit / GTR55 / 1808001  Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	NovAtel NOV703GGG.R2 NEG14100010	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	199.93 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.
Antenna cable delay:	213.5 ns	177.65 ns 178.43 ns

Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	0 ns (GPS C1), 0 ns (GPS P1), 0 ns (GPS P2)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	213.5 ns	
REF DLY /ns:	199.93 ns	
Coordinates reference frame:	ITRF	
Latitude or X /m:	X: -2154286.274 m	
Longitude or Y /m:	Y: +4373436.613 m	
Height or Z /m:	Z: +4098890.162 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	

**IM15**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	IM15	BP25 BP2G
Receiver maker and type: Receiver serial number:	Navcompass NIMTFGNSS-3 2016016	Mesit / GTR55 / 1808001 Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	NONE HXCCSX601A 2016016	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	171.65 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.
Antenna cable delay:	212.4 ns	177.65 ns 178.43 ns

Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	-27.3 ns (GPS C1), -28.2 ns (GPS P1), -38.8 ns (GPS P2) -23.4 ns(BDS B1i),-25.8 ns(BDS B2i)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	212.4 ns	
REF DLY /ns:	171.65 ns	
Coordinates reference frame:	ITRF	
Latitude or X /m:	X:-2154286.895 m	
Longitude or Y /m:	Y: +4373440.505 m	
Height or Z /m:	Z: +4098885.481 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	

**IM22**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	IM22	BP25 BP2G
Receiver maker and type: Receiver serial number:	JAVAD TRE_3S GTR55 2202001	Mesit / GTR55 / 1808001 Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	Novatel NOV-850 NMLK21430017C	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	205.66 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.
Antenna cable delay:	213.1 ns	177.65 ns 178.43 ns

Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	20.32 ns (GPS C1), 17.32 ns (GPS P1), 7.70 ns (GPS P2) 21.26 ns(GALILEO E1),12.27 ns(GALILEO E5a) 0 ns(BDS B1),0 ns(BDS B2),0 ns(BDS B3)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	213.1 ns	
REF DLY /ns:	205.66 ns	
Coordinates reference frame:	WGS84	
Latitude or X /m:	X:-2154285.204 m	
Longitude or Y /m:	Y: +4373435.356 m	
Height or Z /m:	Z: +4098892.042 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	



**GS16**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	GS16	BP25 BP2G
Receiver maker and type: Receiver serial number:	Navcompass TF-GNSS-NIM11 T42108004	Mesit / GTR55 / 1808001 Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	NONE HX-CSX601A C20120102060	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	174.63 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.
Antenna cable delay:	213.6 ns	177.65 ns 178.43 ns

Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	-3.32 ns (GPS C1), -1.23 ns (GPS P1), -1.23 ns (GPS P2) -8.11 ns(BDS B1I),-7.06 ns(BDS B2I),0 ns(BDS B3I)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	213.6 ns	
REF DLY /ns:	174.63 ns	
Coordinates reference frame:	ITRF	
Latitude or X /m:	X:-2154288.453 m	
Longitude or Y /m:	Y: +4373431.741 m	
Height or Z /m:	Z: +4098894.142 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	

**GS17**

Laboratory:	National Institute of Metrology, China	
Date and hour of the beginning of measurements:	2022-09-06 00:00 (UTC)	
Date and hour of the end of measurements:	2022-09-13 23:59 (UTC)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	GS17	BP25 BP2G
Receiver maker and type: Receiver serial number:	Navcompass TF-GNSS-NIM11 T42108005	Mesit / GTR55 / 1808001 Septentrio / PolaRx5TR / 701533
1 PPS trigger level /V:	1V	1V
Antenna cable maker and type: Phase stabilised cable (Y/N):	Linktrend 5D-FB No	/
Length outside the building /m:	~ 15 m	~12m
Antenna maker and type: Antenna serial number:	Navcompass HX-CSX601A C20120102056	/
Temperature (if stabilised) /°C	Not applicable	Not applicable
<b>Measured delays /ns</b>		
	<b>Local:</b>	<b>Travelling:</b>
Delay from local UTC to receiver 1 PPS-in:	176.26 ns	176.46 ns 176.57 ns
Delay from 1 PPS-in to internal Reference (if different):	Not applicable	Not stated.
Antenna cable delay:	212.9 ns	177.65 ns 178.43 ns

Splitter delay (if any):	Not applicable	Not stated
Additional cable delay (if any):	Not applicable	Not stated
<b>Data used for the generation of CGGTTS files</b>		
INT DLY (GPS) /ns:	-3.57 ns (GPS C1), -1.35 ns (GPS P1), -1.35 ns (GPS P2) -7.67 ns(BDS B1I),-6.72 ns(BDS B2I),0 ns(BDS B3I)	
INT DLY (GLONASS) /ns:	Not known	
CAB DLY /ns:	212.9 ns	
REF DLY /ns:	176.26 ns	
Coordinates reference frame:	ITRF	
Latitude or X /m:	X:-2154284.369 m	
Longitude or Y /m:	Y: +4373434.345 m	
Height or Z /m:	Z: +4098893.531 m	
<b>General information</b>		
Rise time of the local UTC pulse	$\leq 5$ ns	
Is the laboratory air conditioned	Yes	
Set temperature value and uncertainty:	$(23.5 \pm 0.5)$ °C	
Set humidity value and uncertainty:	Not controlled	

**Log of Events / Additional Information:**

**IMEU-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 148200  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28737 high elev obs : 24.643 27.224  
 Iteration 0: Obs used = 240244; Huge residuals = 9; Large residuals = 1274  
 Iteration 1: Obs used = 240238; Huge residuals = 0; Large residuals = 1271  
 Computed code bias (P1/P2)/m = 24.156 26.566  
 Computed baseline (X,Y,Z)/m = 1.191 -6.450 5.980  
 RMS of residuals /m = 0.557

Number of phase differences to fit baseline  
 L1/L2 = 147553  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = 1.191 -6.450 5.980  
 20139 clock jitters computed out of 20139 intervals  
 AVE jitter /ps = 0.3 RMS jitter /ps = 5.9

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 = -0.350 0.659 0.558  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.344 0.659 0.552  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 0.844 -5.792 6.535  
 20139 clock jitters computed out of 20139 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 1.5

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.029 0.036 0.030  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.023 0.035 0.024  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 0.815 -5.755 6.565  
 Final baseline L2 (X,Y,Z)/m = 0.821 -5.756 6.559  
 Final baseline L5 (X,Y,Z)/m = 0.818 -5.756 6.562

## COMPUTATION OF CODE DIFFERENCES

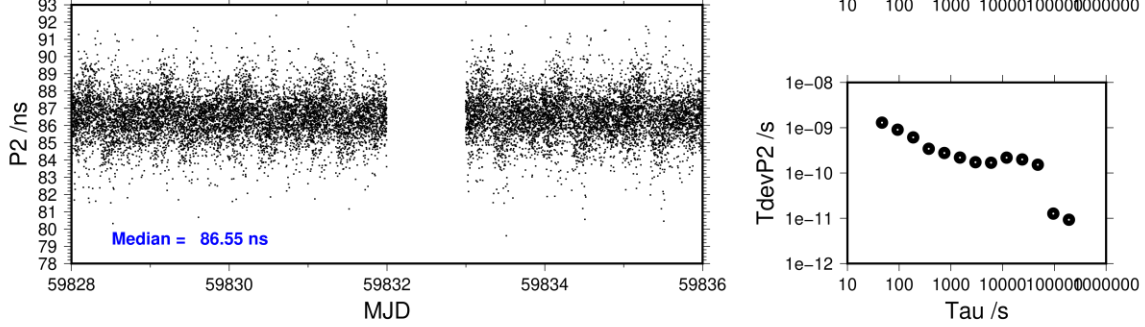
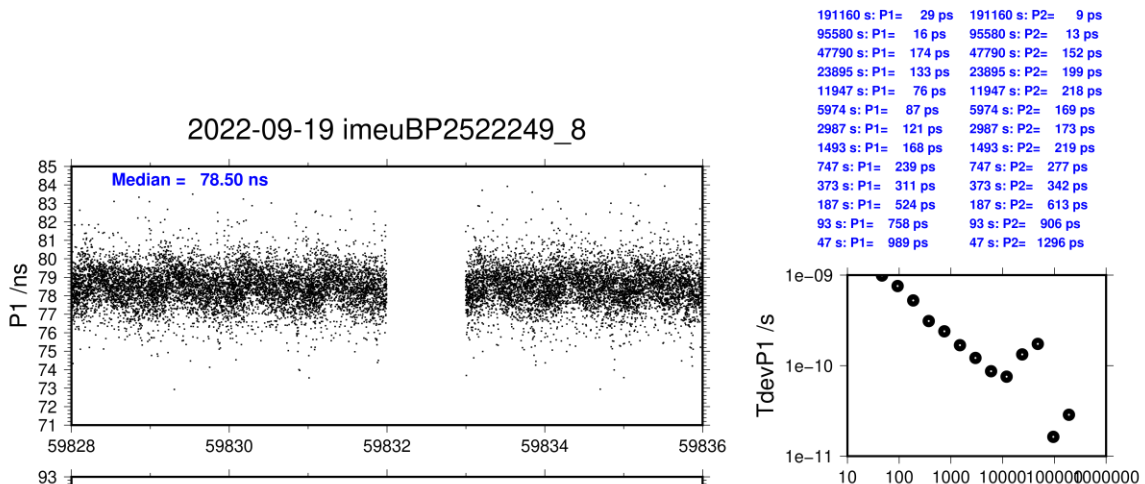
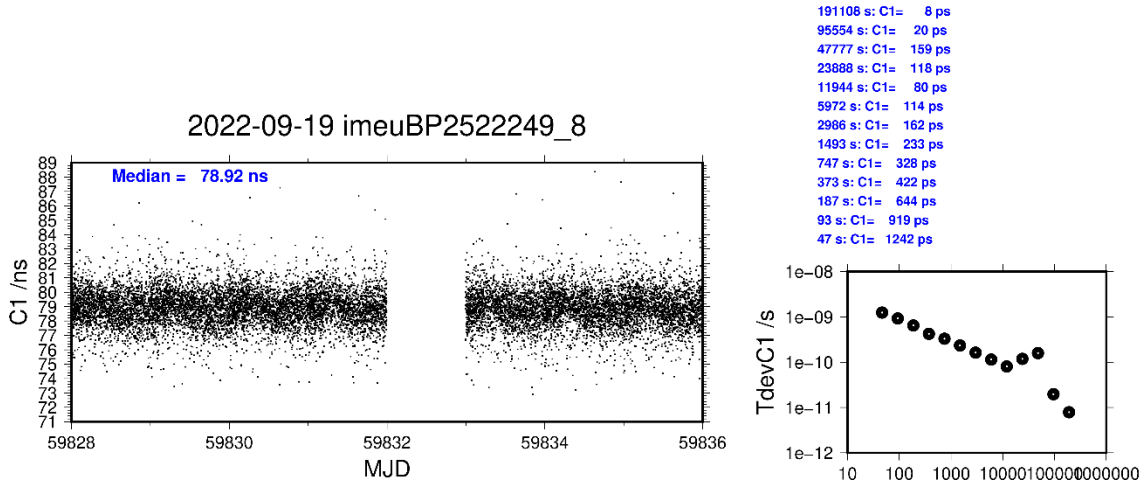
Total number of code differences = 256661

Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	148161	78.880	2.573
P1	148132	78.470	1.662
P2	148130	86.535	1.790

Number of 300s epochs in out file = 2016

Code	#pts	median/ns	ave/ns	rms/ns
C1	14809	78.920	78.915	1.276
P1	14805	78.500	78.494	1.028
P2	14805	86.552	86.552	1.280



**IMEU-BP2G**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 148157  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28737 high elev obs : 20.844 25.520  
 Iteration 0: Obs used = 240108; Huge residuals = 8; Large residuals = 1324  
 Iteration 1: Obs used = 240105; Huge residuals = 0; Large residuals = 1319  
 Computed code bias (P1/P2)/m = 20.328 24.884  
 Computed baseline (X,Y,Z)/m = 0.355 -6.943 6.101  
 RMS of residuals /m = 0.544

Number of phase differences to fit baseline  
 L1/L2 = 147516  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = 0.355 -6.943 6.101  
 20139 clock jitters computed out of 20139 intervals  
 AVE jitter /ps = 0.3 RMS jitter /ps = 5.4

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 = -0.365 0.675 0.609  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.365 0.687 0.619  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -0.010 -6.262 6.715  
 20139 clock jitters computed out of 20139 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 1.7

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.030 0.031 0.024  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.030 0.042 0.034  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -0.040 -6.231 6.739  
 Final baseline L2 (X,Y,Z)/m = -0.040 -6.220 6.749  
 Final baseline L5 (X,Y,Z)/m = -0.040 -6.226 6.744

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 257003

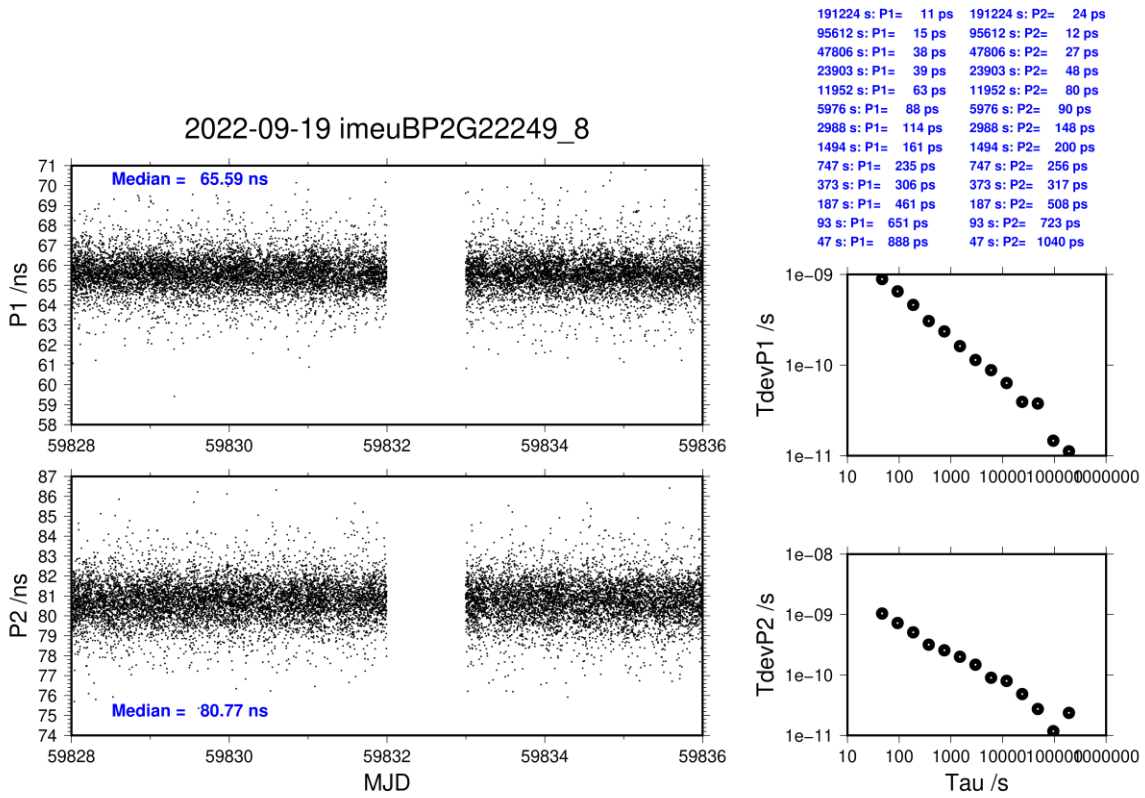
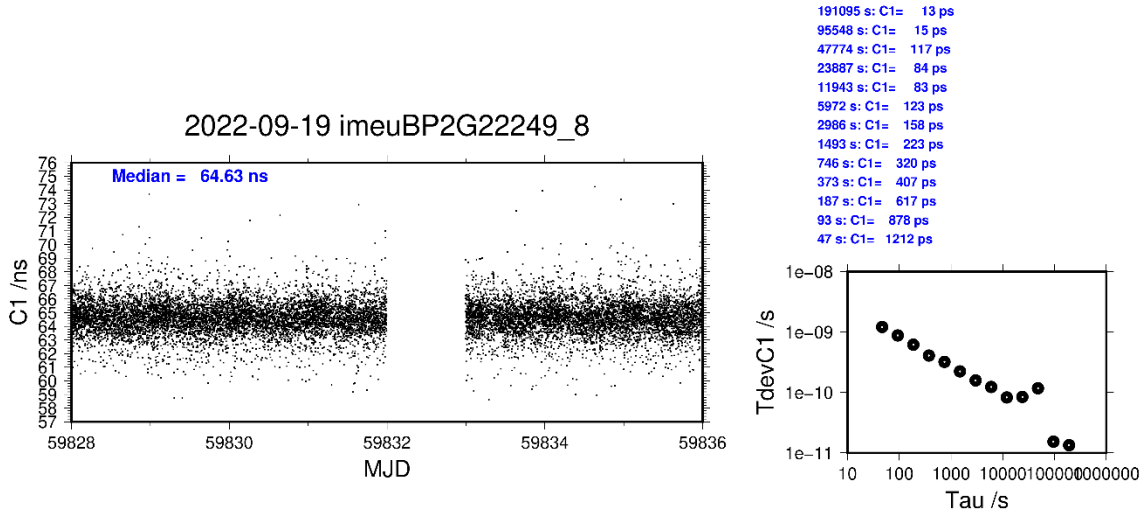
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	148136	64.603	2.587
P1	148090	65.575	1.650
P2	148088	80.739	1.700



Number of 300s epochs in out file = 2016

Code	#pts	median/ns	ave/ns	rms/ns
C1	14810	64.634	64.636	1.230
P1	14800	65.588	65.598	0.907
P2	14800	80.765	80.752	1.024



IMEJ-BP25

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 160442  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28941 high elev obs : -3.570 -5.039  
 Iteration 0: Obs used = 264453; Huge residuals = 0; Large residuals = 1155  
 Iteration 1: Obs used = 264453; Huge residuals = 0; Large residuals = 1155  
 Computed code bias (P1/P2)/m = -4.154 -5.647  
 Computed baseline (X,Y,Z)/m = 0.500 -5.515 5.014  
 RMS of residuals /m = 0.516

Number of phase differences to fit baseline  
 L1/L2 = 141399  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = 0.500 -5.515 5.014  
 18491 clock jitters computed out of 18768 intervals  
 AVE jitter /ps = 2.5 RMS jitter /ps = 46.5

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 = -0.270 0.507 0.429  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.265 0.501 0.416  
 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 = -0.270 0.507 0.429  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.265 0.501 0.416  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 0.233 -5.011 5.436  
 18491 clock jitters computed out of 18768 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 1.2

Iter 3 Large residuals L1= 2  
 Iter 3 Large residuals L2= 2  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.022 0.031 0.032  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.018 0.025 0.018  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 0.211 -4.981 5.468  
 Final baseline L2 (X,Y,Z)/m = 0.215 -4.987 5.455  
 Final baseline L5 (X,Y,Z)/m = 0.213 -4.984 5.462

COMPUTATION OF CODE DIFFERENCES

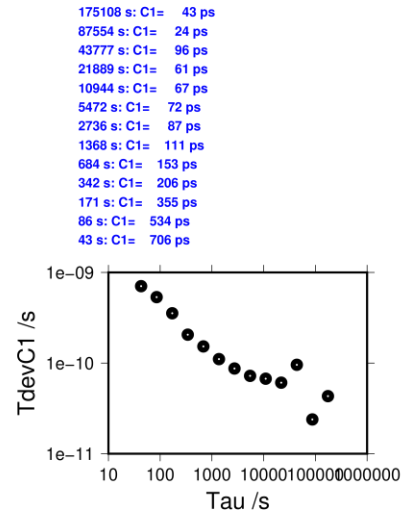
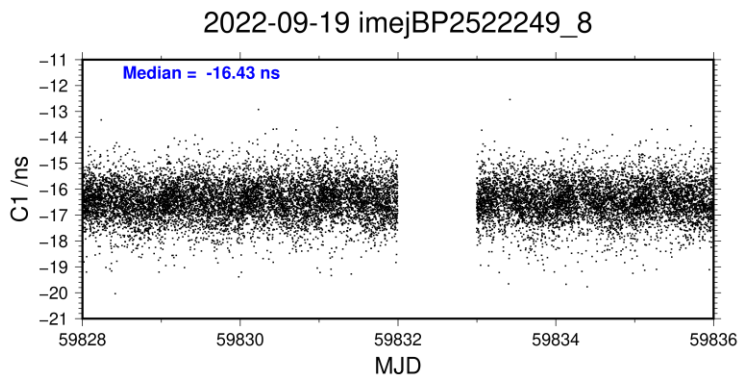
Total number of code differences = 161620

Global average of individual differences

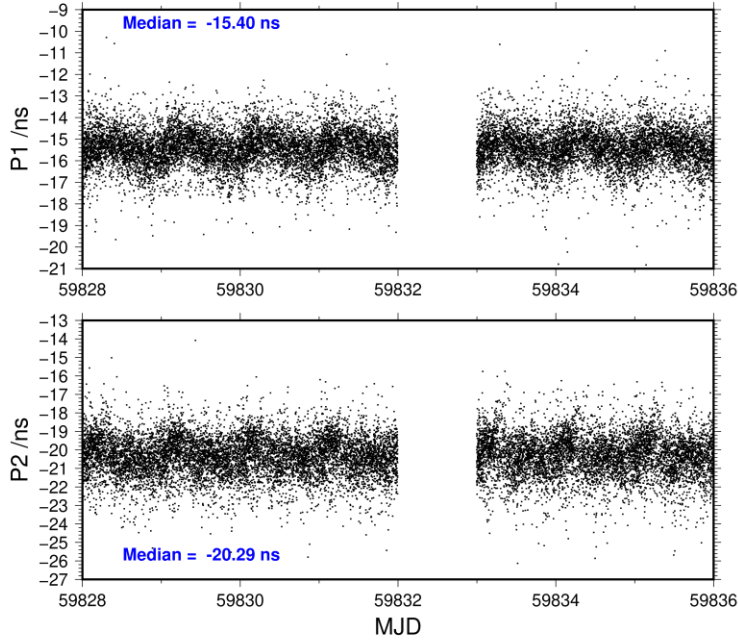
Code	#pts	ave/ns	rms/ns
C1	161555	-16.437	1.177
P1	160372	-15.431	1.432
P2	160372	-20.351	1.748

Number of 300s epochs in out file = 2016

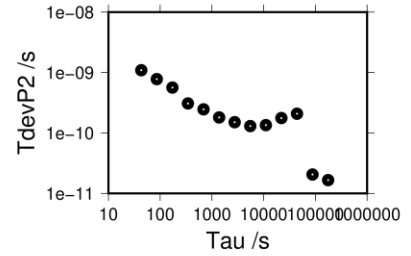
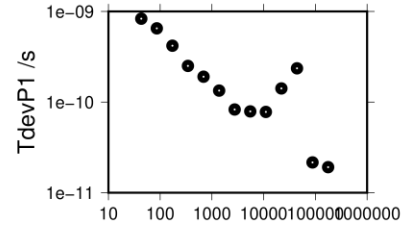
Code	#pts	median/ns	ave/ns	rms/ns
C1	16162	-16.430	-16.427	0.713
P1	16036	-15.399	-15.417	0.870
P2	16036	-20.293	-20.329	1.105



2022-09-19 imejBP2522249\_8



176484 s: P1= 19 ps	176484 s: P2= 17 ps
88242 s: P1= 22 ps	88242 s: P2= 21 ps
44121 s: P1= 236 ps	44121 s: P2= 208 ps
22061 s: P1= 141 ps	22061 s: P2= 176 ps
11030 s: P1= 78 ps	11030 s: P2= 135 ps
5515 s: P1= 79 ps	5515 s: P2= 130 ps
2758 s: P1= 83 ps	2758 s: P2= 151 ps
1379 s: P1= 134 ps	1379 s: P2= 181 ps
689 s: P1= 191 ps	689 s: P2= 246 ps
345 s: P1= 251 ps	345 s: P2= 308 ps
172 s: P1= 419 ps	172 s: P2= 564 ps
86 s: P1= 651 ps	86 s: P2= 778 ps
43 s: P1= 831 ps	43 s: P2= 1091 ps



IMEJ-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 160556  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28941 high elev obs : -7.361 -6.734  
 Iteration 0: Obs used = 264460; Huge residuals = 0; Large residuals = 1376  
 Iteration 1: Obs used = 264460; Huge residuals = 0; Large residuals = 1376  
 Computed code bias (P1/P2)/m = -7.976 -7.321  
 Computed baseline (X,Y,Z)/m = -0.337 -6.018 5.129  
 RMS of residuals /m = 0.519

Number of phase differences to fit baseline  
 L1/L2 = 142446  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -0.337 -6.018 5.129  
 18455 clock jitters computed out of 18705 intervals  
 AVE jitter /ps = 2.5 RMS jitter /ps = 46.6

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 = -0.288 0.534 0.488  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.292 0.547 0.496  
 RMS of residuals L2 /m = 0.003  
 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 = -0.288 0.534 0.488  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.292 0.547 0.496  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -0.627 -5.478 5.621  
 18455 clock jitters computed out of 18705 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 1.3

Iter 3 Large residuals L1= 0  
 Iter 3 Large residuals L2= 0  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.025 0.026 0.023  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.028 0.040 0.030  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Iter 4 Large residuals L1= 0  
 Iter 4 Large residuals L2= 0  
 Iter 4 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.025 0.026 0.023  
 RMS of residuals L1 /m = 0.003

Computed baseline L2 (X,Y,Z)/m = -0.028 0.040 0.030  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -0.653 -5.451 5.644  
 Final baseline L2 (X,Y,Z)/m = -0.656 -5.438 5.651  
 Final baseline L5 (X,Y,Z)/m = -0.654 -5.445 5.648

COMPUTATION OF CODE DIFFERENCES

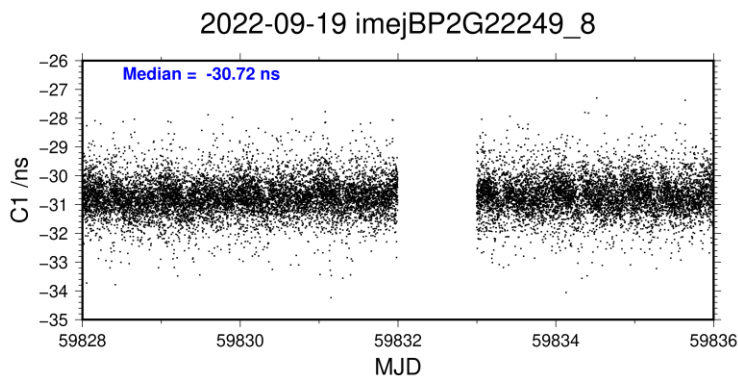
Total number of code differences = 161772

Global average of individual differences

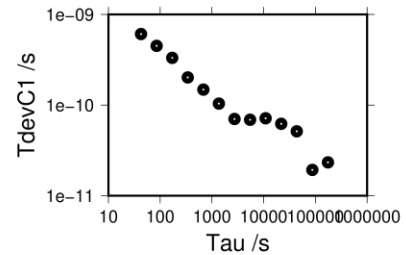
Code	#pts	ave/ns	rms/ns
C1	161700	-30.718	1.214
P1	160480	-28.338	1.434
P2	160484	-26.164	1.754

Number of 300s epochs in out file = 2016

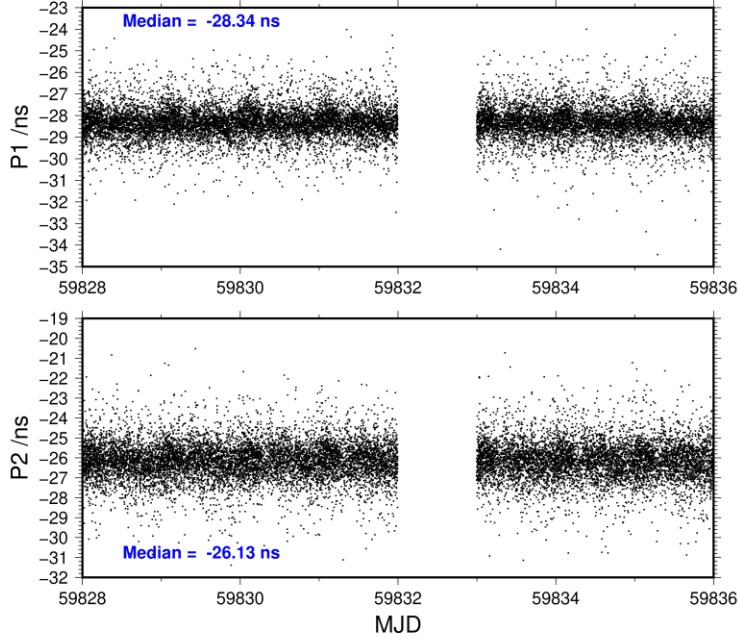
Code	#pts	median/ns	ave/ns	rms/ns
C1	16179	-30.724	-30.712	0.627
P1	16048	-28.336	-28.327	0.743
P2	16050	-26.130	-26.148	0.962



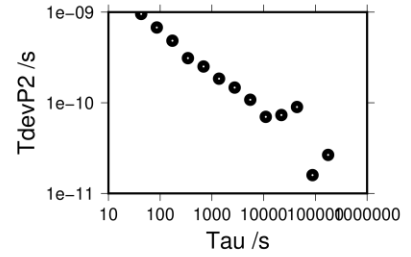
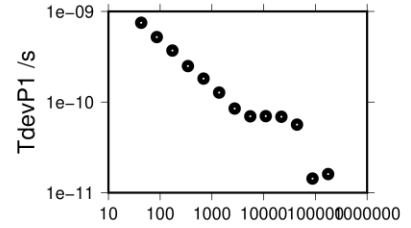
- 174924 s: C1= 23 ps
- 87462 s: C1= 19 ps
- 43731 s: C1= 51 ps
- 21866 s: C1= 62 ps
- 10933 s: C1= 72 ps
- 5466 s: C1= 69 ps
- 2733 s: C1= 70 ps
- 1367 s: C1= 104 ps
- 683 s: C1= 148 ps
- 342 s: C1= 202 ps
- 171 s: C1= 332 ps
- 85 s: C1= 450 ps
- 43 s: C1= 607 ps



2022-09-19 imejBP2G22249\_8



176352 s: P1= 16 ps	176330 s: P2= 27 ps
88176 s: P1= 14 ps	88165 s: P2= 16 ps
44088 s: P1= 56 ps	44083 s: P2= 90 ps
22044 s: P1= 69 ps	22041 s: P2= 73 ps
11022 s: P1= 70 ps	11021 s: P2= 70 ps
5511 s: P1= 70 ps	5510 s: P2= 108 ps
2756 s: P1= 85 ps	2755 s: P2= 147 ps
1378 s: P1= 127 ps	1378 s: P2= 184 ps
689 s: P1= 182 ps	689 s: P2= 251 ps
344 s: P1= 250 ps	344 s: P2= 311 ps
172 s: P1= 371 ps	172 s: P2= 484 ps
86 s: P1= 522 ps	86 s: P2= 677 ps
43 s: P1= 751 ps	43 s: P2= 955 ps



IMEC-BP25

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 168489  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : -6.487 -6.327  
 Iteration 0: Obs used = 273206; Huge residuals = 0; Large residuals = 608  
 Iteration 1: Obs used = 273206; Huge residuals = 0; Large residuals = 608  
 Computed code bias (P1/P2)/m = -6.476 -6.367  
 Computed baseline (X,Y,Z)/m = -0.791 -0.569 0.107  
 RMS of residuals /m = 0.419

Number of phase differences to fit baseline  
 L1/L2 = 167835  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -0.791 -0.569 0.107  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 9.7

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 = -0.019 0.010 -0.007  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.011 -0.008 -0.025  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -0.806 -0.568 0.091  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 0.0

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.009 0.006 0.008  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.001 -0.011 -0.009  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -0.815 -0.562 0.099  
 Final baseline L2 (X,Y,Z)/m = -0.807 -0.579 0.082  
 Final baseline L5 (X,Y,Z)/m = -0.811 -0.570 0.090



COMPUTATION OF CODE DIFFERENCES

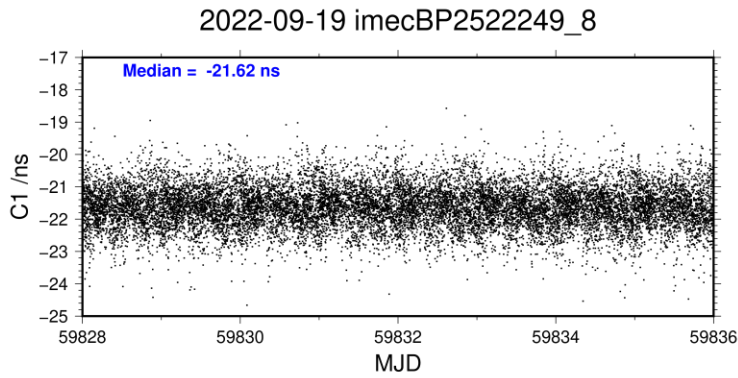
Total number of code differences = 290838

Global average of individual differences

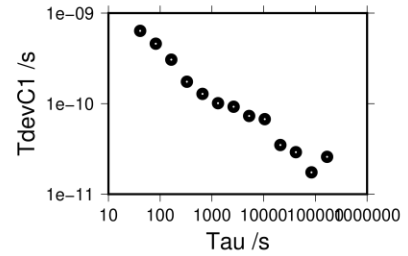
Code	#pts	ave/ns	rms/ns
C1	168447	-21.634	1.095
P1	168423	-21.608	1.209
P2	168423	-21.175	1.469

Number of 300s epochs in out file = 2304

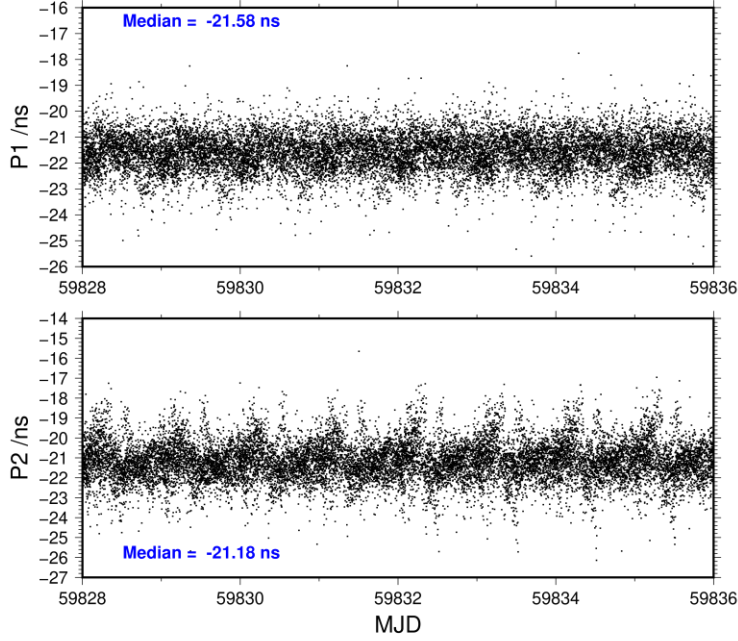
Code	#pts	median/ns	ave/ns	rms/ns
C1	16821	-21.622	-21.626	0.625
P1	16820	-21.576	-21.601	0.713
P2	16819	-21.185	-21.166	0.996



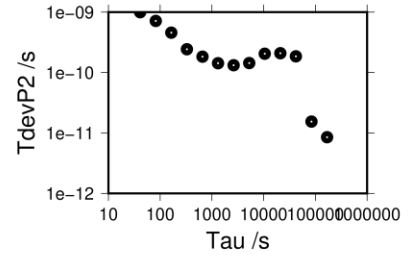
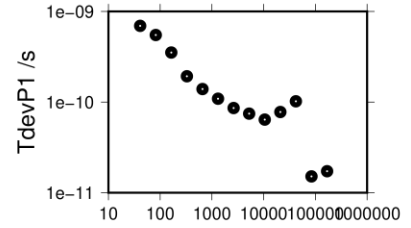
168248 s: C1= 26 ps  
 84124 s: C1= 17 ps  
 42062 s: C1= 29 ps  
 21031 s: C1= 35 ps  
 10515 s: C1= 67 ps  
 5258 s: C1= 73 ps  
 2629 s: C1= 92 ps  
 1314 s: C1= 101 ps  
 657 s: C1= 128 ps  
 329 s: C1= 175 ps  
 164 s: C1= 306 ps  
 82 s: C1= 459 ps  
 41 s: C1= 636 ps



2022-09-19 imecBP2522249\_8



168258 s: P1= 17 ps	168268 s: P2= 9 ps
84129 s: P1= 15 ps	84134 s: P2= 15 ps
42064 s: P1= 102 ps	42067 s: P2= 185 ps
21032 s: P1= 78 ps	21033 s: P2= 209 ps
10516 s: P1= 64 ps	10517 s: P2= 205 ps
5258 s: P1= 75 ps	5258 s: P2= 144 ps
2629 s: P1= 86 ps	2629 s: P2= 132 ps
1315 s: P1= 109 ps	1315 s: P2= 143 ps
657 s: P1= 139 ps	657 s: P2= 183 ps
329 s: P1= 193 ps	329 s: P2= 243 ps
164 s: P1= 352 ps	164 s: P2= 456 ps
82 s: P1= 549 ps	82 s: P2= 716 ps
41 s: P1= 693 ps	41 s: P2= 995 ps



IMEC-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 168491  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : -10.226 -8.008  
 Iteration 0: Obs used = 273153; Huge residuals = 0; Large residuals = 665  
 Iteration 1: Obs used = 273153; Huge residuals = 0; Large residuals = 665  
 Computed code bias (P1/P2)/m = -10.283 -8.028  
 Computed baseline (X,Y,Z)/m = -1.613 -1.085 0.206  
 RMS of residuals /m = 0.398

Number of phase differences to fit baseline  
 L1/L2 = 167841  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -1.613 -1.085 0.206  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = 0.2 RMS jitter /ps = 9.4

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 = -0.047 0.048 0.064  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.045 0.043 0.063  
 RMS of residuals L2 /m = 0.002  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -1.658 -1.040 0.270  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 0.2

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.012 0.001 0.003  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.009 -0.003 0.003  
 RMS of residuals L2 /m = 0.002  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -1.670 -1.038 0.273  
 Final baseline L2 (X,Y,Z)/m = -1.668 -1.043 0.273  
 Final baseline L5 (X,Y,Z)/m = -1.669 -1.041 0.273

COMPUTATION OF CODE DIFFERENCES

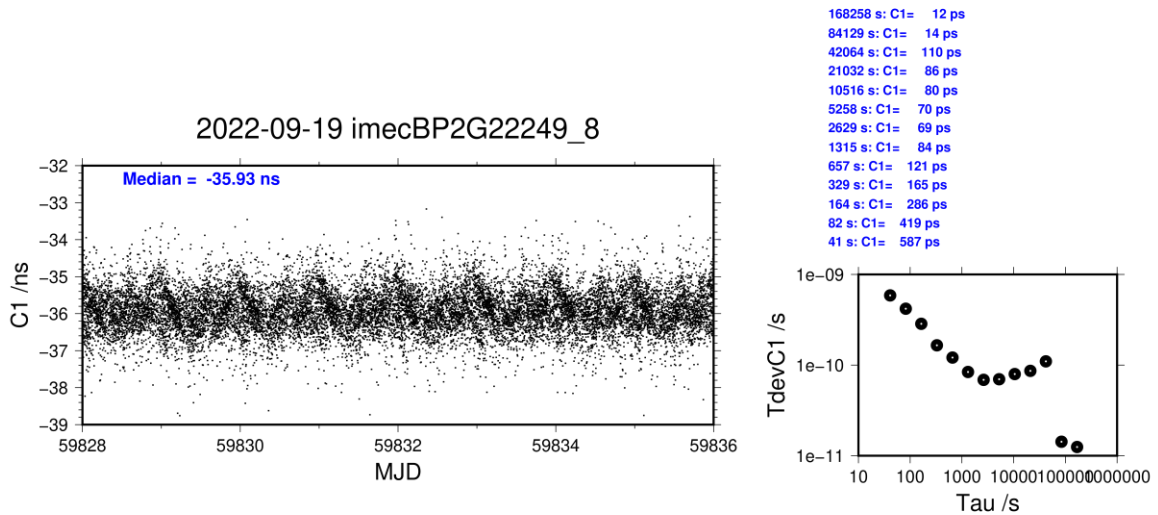
Total number of code differences = 291151

Global average of individual differences

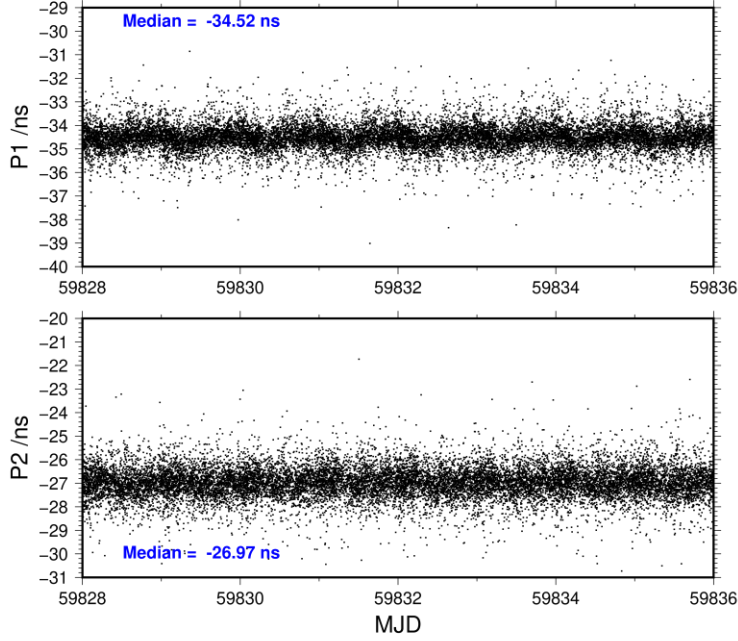
Code	#pts	ave/ns	rms/ns
C1	168450	-35.917	1.145
P1	168417	-34.512	1.187
P2	168415	-26.975	1.350

Number of 300s epochs in out file = 2304

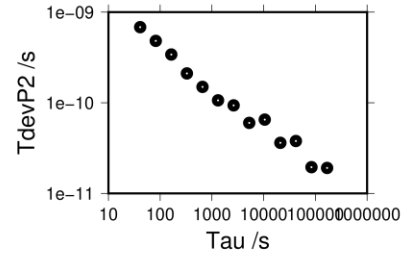
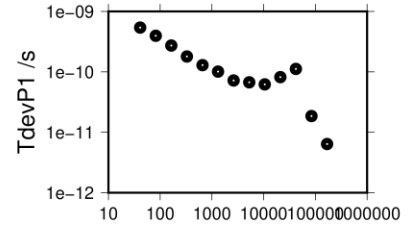
Code	#pts	median/ns	ave/ns	rms/ns
C1	16820	-35.926	-35.913	0.585
P1	16816	-34.516	-34.506	0.557
P2	16816	-26.974	-26.972	0.674



2022-09-19 imecBP2G22249\_8



168298 s: P1= 6 ps	168298 s: P2= 19 ps
84149 s: P1= 19 ps	84149 s: P2= 19 ps
42074 s: P1= 112 ps	42074 s: P2= 38 ps
21037 s: P1= 82 ps	21037 s: P2= 36 ps
10519 s: P1= 62 ps	10519 s: P2= 65 ps
5259 s: P1= 67 ps	5259 s: P2= 60 ps
2630 s: P1= 72 ps	2630 s: P2= 94 ps
1315 s: P1= 101 ps	1315 s: P2= 106 ps
657 s: P1= 129 ps	657 s: P2= 150 ps
329 s: P1= 179 ps	329 s: P2= 211 ps
164 s: P1= 273 ps	164 s: P2= 341 ps
82 s: P1= 396 ps	82 s: P2= 482 ps
41 s: P1= 541 ps	41 s: P2= 684 ps



IMEK-BP25

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 193188  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 34602 high elev obs : 9.286 7.802  
 Iteration 0: Obs used = 319766; Huge residuals = 0; Large residuals = 494  
 Iteration 1: Obs used = 319766; Huge residuals = 0; Large residuals = 494  
 Computed code bias (P1/P2)/m = 9.242 7.737  
 Computed baseline (X,Y,Z)/m = -1.511 -1.064 0.301  
 RMS of residuals /m = 0.351

Number of phase differences to fit baseline  
 L1/L2 = 192160  
 L5 = 99140  
 A priori baseline (X,Y,Z)/m = -1.511 -1.064 0.301  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = 0.4 RMS jitter /ps = 4.6

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 = -0.097 0.047 -0.073  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.093 0.043 -0.079  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.100 0.048 -0.078  
 RMS of residuals L5 /m = 0.004

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -1.606 -1.020 0.225  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = -0.2 RMS jitter /ps = 0.1

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.024 -0.008 0.002  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.020 -0.013 -0.003  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.026 -0.006 -0.004  
 RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -1.630 -1.028 0.226  
 Final baseline L2 (X,Y,Z)/m = -1.626 -1.032 0.221  
 Final baseline L5 (X,Y,Z)/m = -1.632 -1.026 0.221

COMPUTATION OF CODE DIFFERENCES

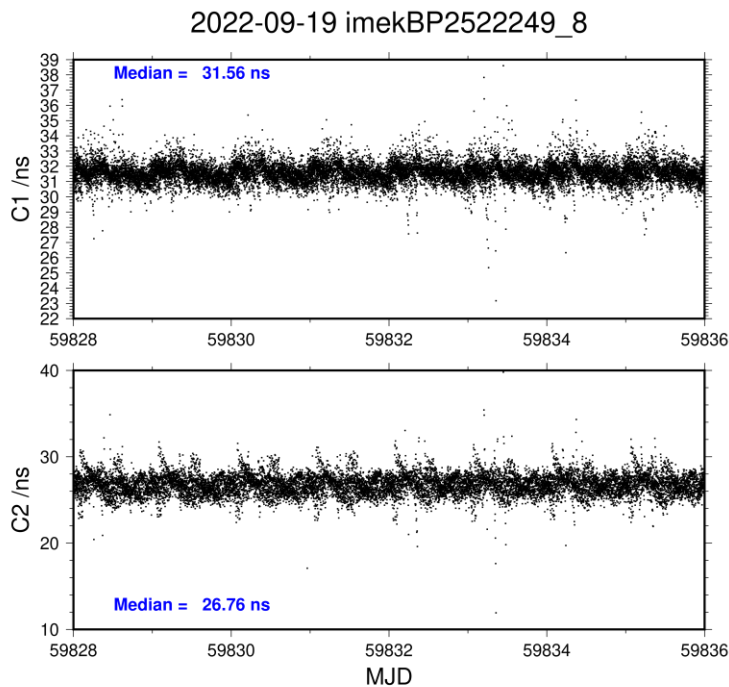
Total number of code differences = 485327

Global average of individual differences

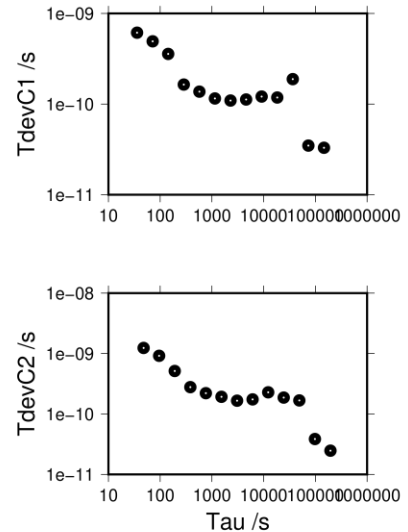
Code	#pts	ave/ns	rms/ns
C1	193214	31.577	0.806
C2	144632	26.753	1.334
P1	193014	30.802	0.915
P2	193013	25.823	1.344
E1	153327	33.629	0.787
E5	153326	23.479	1.010

Number of 300s epochs in out file = 2304

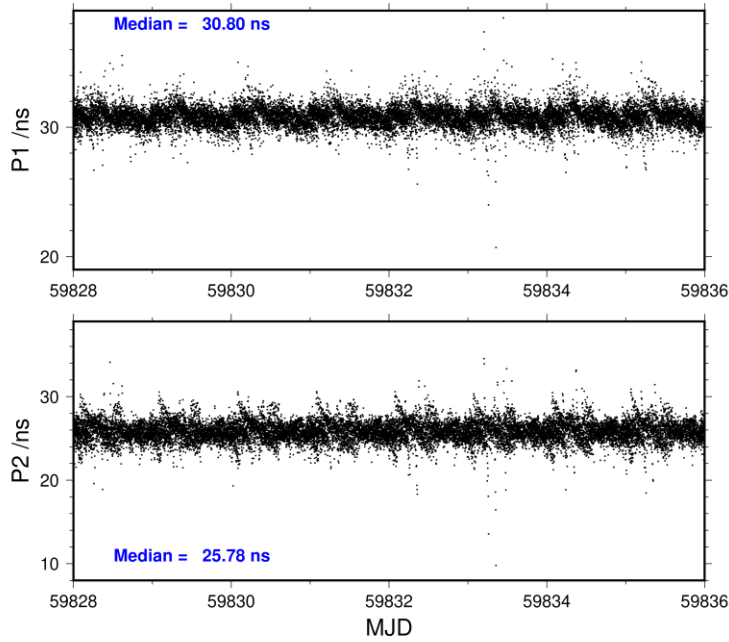
Code	#pts	median/ns	ave/ns	rms/ns
C1	19306	31.564	31.573	0.678
C2	14443	26.760	26.749	1.228
P1	19290	30.805	30.797	0.771
P2	19290	25.781	25.821	1.233
E1	15333	33.618	33.624	0.669
E5	15333	23.467	23.475	0.937



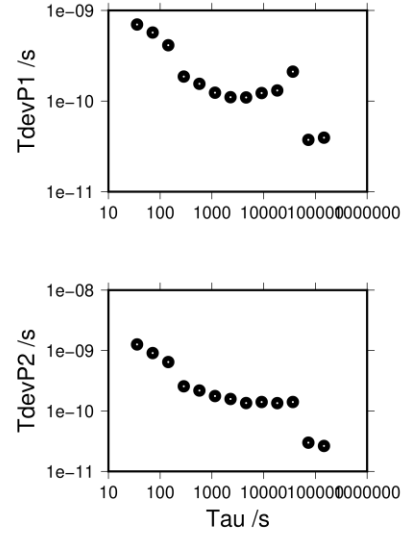
146590 s: C1= 33 ps 195951 s: C2= 25 ps  
 73295 s: C1= 35 ps 97976 s: C2= 38 ps  
 36648 s: C1= 188 ps 48988 s: C2= 168 ps  
 18324 s: C1= 118 ps 24494 s: C2= 187 ps  
 9162 s: C1= 121 ps 12247 s: C2= 228 ps  
 4581 s: C1= 112 ps 6123 s: C2= 174 ps  
 2290 s: C1= 109 ps 3062 s: C2= 166 ps  
 1145 s: C1= 115 ps 1531 s: C2= 192 ps  
 573 s: C1= 137 ps 765 s: C2= 221 ps  
 286 s: C1= 164 ps 383 s: C2= 278 ps  
 143 s: C1= 357 ps 191 s: C2= 515 ps  
 72 s: C1= 492 ps 96 s: C2= 918 ps  
 36 s: C1= 613 ps 48 s: C2= 1239 ps



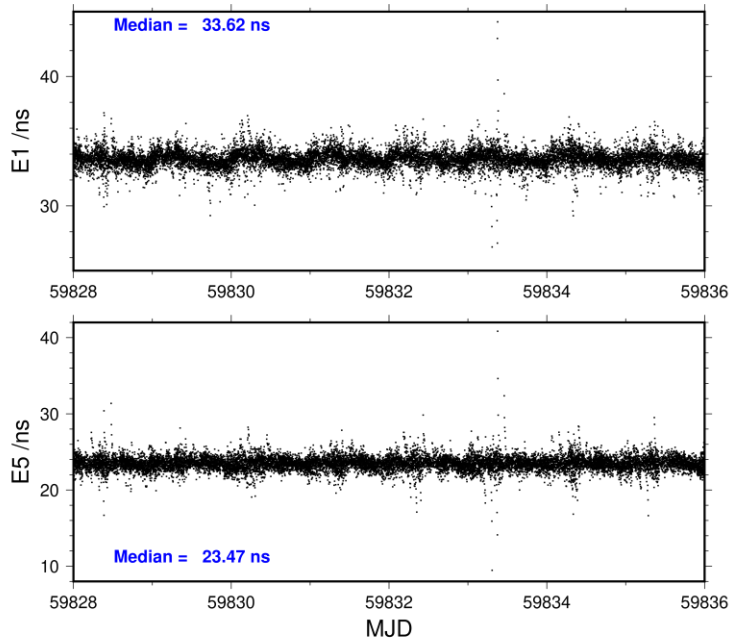
2022-09-19 imekBP2522249\_8



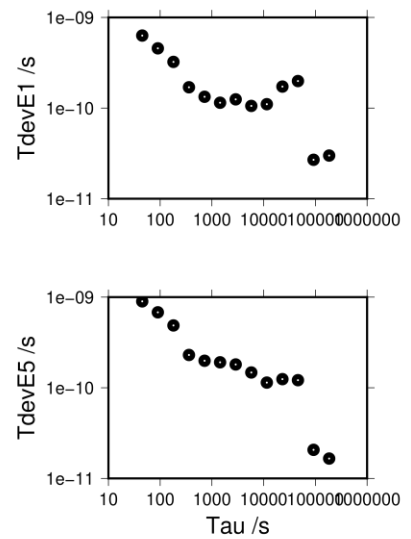
146712 s: P1= 39 ps	146712 s: P2= 26 ps
73356 s: P1= 37 ps	73356 s: P2= 30 ps
36678 s: P1= 211 ps	36678 s: P2= 141 ps
18339 s: P1= 131 ps	18339 s: P2= 135 ps
9170 s: P1= 123 ps	9170 s: P2= 141 ps
4585 s: P1= 110 ps	4585 s: P2= 135 ps
2292 s: P1= 110 ps	2292 s: P2= 158 ps
1146 s: P1= 124 ps	1146 s: P2= 177 ps
573 s: P1= 155 ps	573 s: P2= 218 ps
287 s: P1= 186 ps	287 s: P2= 256 ps
143 s: P1= 413 ps	143 s: P2= 645 ps
72 s: P1= 570 ps	72 s: P2= 909 ps
36 s: P1= 699 ps	36 s: P2= 1264 ps



2022-09-19 imekBP2522249\_8



184576 s: E1= 30 ps	184576 s: E5= 17 ps
92288 s: E1= 27 ps	92288 s: E5= 21 ps
46144 s: E1= 199 ps	46144 s: E5= 121 ps
23072 s: E1= 173 ps	23072 s: E5= 124 ps
11536 s: E1= 110 ps	11536 s: E5= 114 ps
5768 s: E1= 106 ps	5768 s: E5= 147 ps
2884 s: E1= 125 ps	2884 s: E5= 181 ps
1442 s: E1= 115 ps	1442 s: E5= 191 ps
721 s: E1= 133 ps	721 s: E5= 199 ps
360 s: E1= 170 ps	360 s: E5= 230 ps
180 s: E1= 324 ps	180 s: E5= 487 ps
90 s: E1= 456 ps	90 s: E5= 680 ps
45 s: E1= 631 ps	45 s: E5= 899 ps





IMEK-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 185505  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : 5.552 6.132  
 Iteration 0: Obs used = 307344; Huge residuals = 0; Large residuals = 502  
 Iteration 1: Obs used = 307344; Huge residuals = 0; Large residuals = 502  
 Computed code bias (P1/P2)/m = 5.454 6.094  
 Computed baseline (X,Y,Z)/m = -2.337 -1.593 0.384  
 RMS of residuals /m = 0.371

Number of phase differences to fit baseline  
 L1/L2 = 184693  
 L5 = 98420  
 A priori baseline (X,Y,Z)/m = -2.337 -1.593 0.384  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = 0.4 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 = -0.128 0.097 0.017  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.133 0.110 0.029  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = -0.134 0.117 0.031  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -2.467 -1.489 0.407  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = -0.2 RMS jitter /ps = 0.2

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.022 -0.014 -0.004  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.027 -0.001 0.008  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = -0.032 0.005 0.010  
 RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -2.488 -1.503 0.403  
 Final baseline L2 (X,Y,Z)/m = -2.493 -1.490 0.415  
 Final baseline L5 (X,Y,Z)/m = -2.499 -1.484 0.417

COMPUTATION OF CODE DIFFERENCES

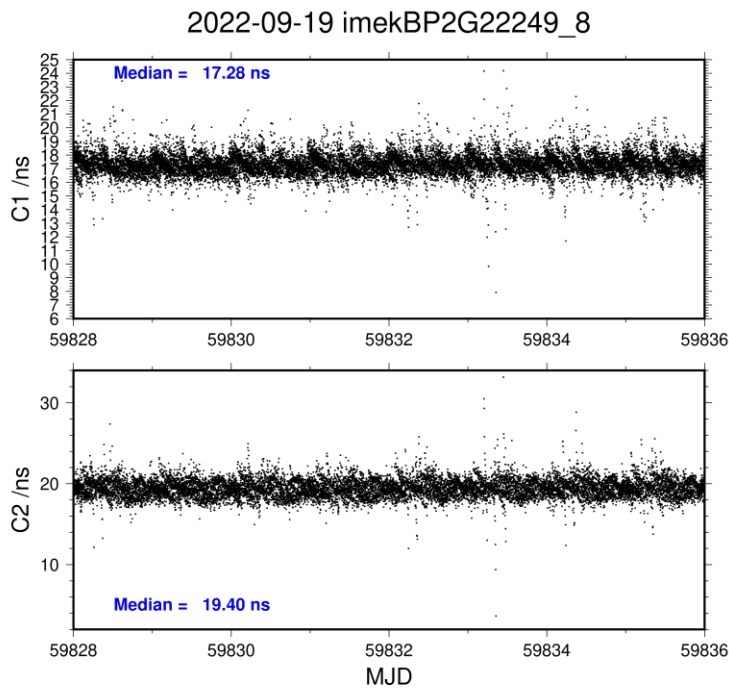
Total number of code differences = 473007

Global average of individual differences

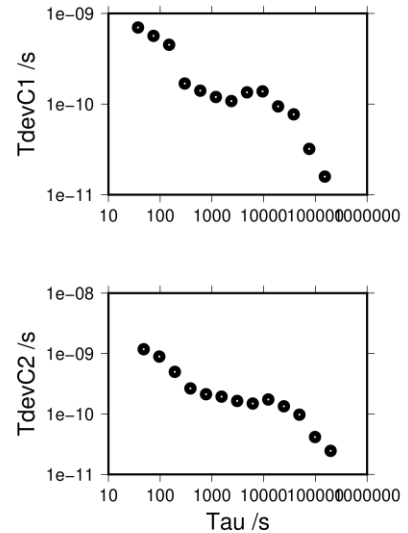
Code	#pts	ave/ns	rms/ns
C1	185663	17.319	1.006
C2	143886	19.439	1.383
P1	185417	17.920	1.015
P2	185413	20.034	1.395
E1	148421	18.821	0.806
E5	148452	15.667	1.036

Number of 300s epochs in out file = 2304

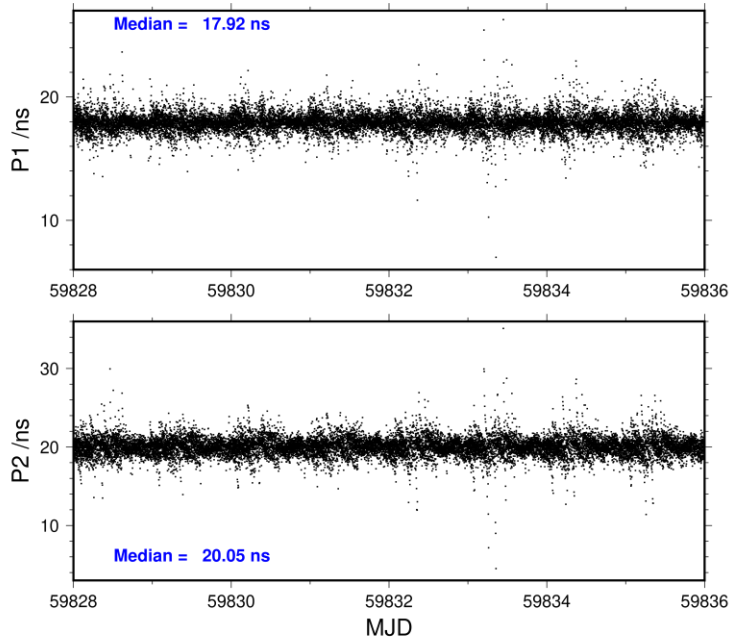
Code	#pts	median/ns	ave/ns	rms/ns
C1	18550	17.277	17.319	0.763
C2	14370	19.397	19.434	1.169
P1	18523	17.922	17.921	0.753
P2	18522	20.048	20.026	1.182
E1	14842	18.785	18.822	0.639
E5	14844	15.662	15.663	0.942



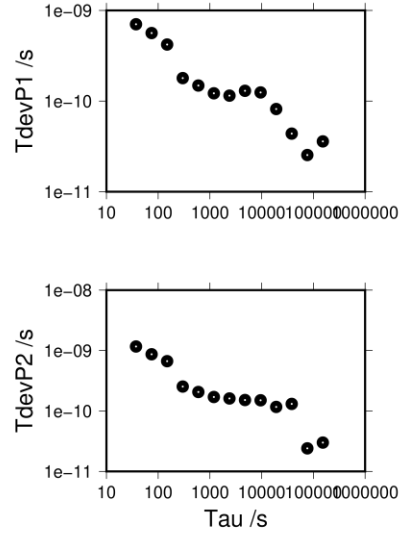
152565 s: C1= 16 ps 196947 s: C2= 25 ps  
 76282 s: C1= 32 ps 98473 s: C2= 42 ps  
 38141 s: C1= 77 ps 49237 s: C2= 98 ps  
 19071 s: C1= 94 ps 24618 s: C2= 134 ps  
 9535 s: C1= 138 ps 12309 s: C2= 174 ps  
 4768 s: C1= 135 ps 6155 s: C2= 149 ps  
 2384 s: C1= 108 ps 3077 s: C2= 164 ps  
 1192 s: C1= 120 ps 1539 s: C2= 194 ps  
 596 s: C1= 140 ps 769 s: C2= 213 ps  
 298 s: C1= 169 ps 385 s: C2= 264 ps  
 149 s: C1= 451 ps 192 s: C2= 497 ps  
 74 s: C1= 565 ps 96 s: C2= 890 ps  
 37 s: C1= 700 ps 48 s: C2= 1180 ps



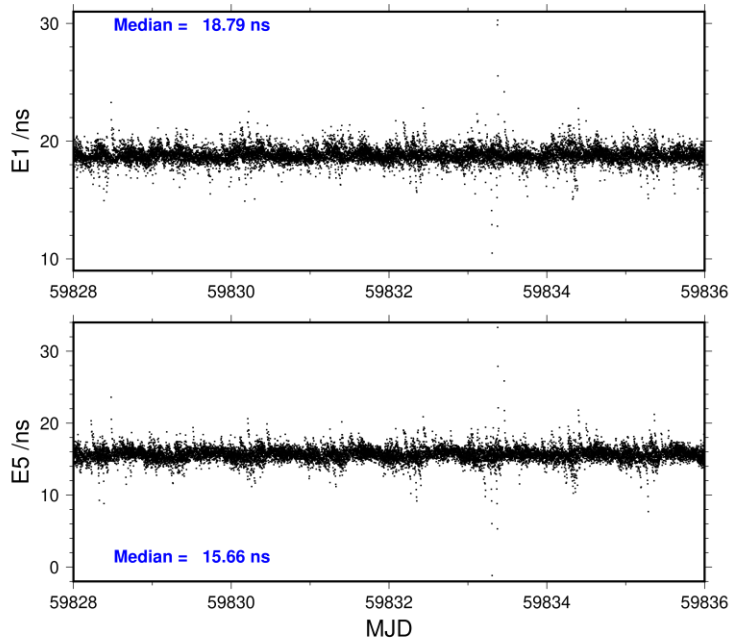
2022-09-19 imekBP2G22249\_8



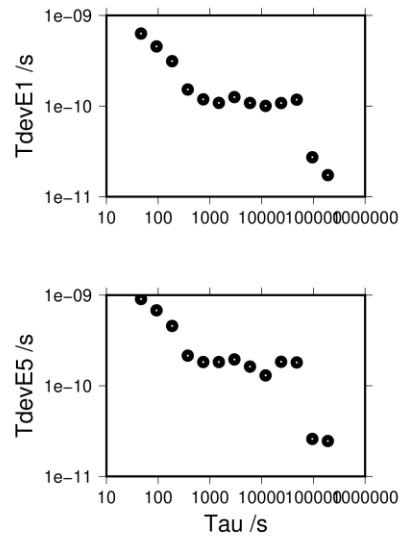
152787 s: P1= 36 ps	152796 s: P2= 30 ps
76394 s: P1= 25 ps	76398 s: P2= 24 ps
38197 s: P1= 44 ps	38199 s: P2= 131 ps
19098 s: P1= 82 ps	19099 s: P2= 117 ps
9549 s: P1= 124 ps	9550 s: P2= 150 ps
4775 s: P1= 130 ps	4775 s: P2= 152 ps
2387 s: P1= 115 ps	2387 s: P2= 161 ps
1194 s: P1= 122 ps	1194 s: P2= 170 ps
597 s: P1= 148 ps	597 s: P2= 207 ps
298 s: P1= 179 ps	298 s: P2= 254 ps
149 s: P1= 420 ps	149 s: P2= 667 ps
75 s: P1= 563 ps	75 s: P2= 869 ps
37 s: P1= 704 ps	37 s: P2= 1168 ps



2022-09-19 imekBP2G22249\_8



190683 s: E1= 17 ps	190657 s: E5= 25 ps
95342 s: E1= 27 ps	95329 s: E5= 26 ps
47671 s: E1= 118 ps	47664 s: E5= 181 ps
23835 s: E1= 108 ps	23832 s: E5= 184 ps
11918 s: E1= 101 ps	11916 s: E5= 130 ps
5959 s: E1= 108 ps	5958 s: E5= 163 ps
2979 s: E1= 126 ps	2979 s: E5= 195 ps
1490 s: E1= 108 ps	1490 s: E5= 183 ps
745 s: E1= 119 ps	745 s: E5= 183 ps
372 s: E1= 152 ps	372 s: E5= 215 ps
186 s: E1= 313 ps	186 s: E5= 458 ps
93 s: E1= 455 ps	93 s: E5= 680 ps
47 s: E1= 631 ps	47 s: E5= 906 ps



**IM15-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 168497  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : 0.272 -4.425  
 Iteration 0: Obs used = 273768; Huge residuals = 0; Large residuals = 62  
 Iteration 1: Obs used = 273768; Huge residuals = 0; Large residuals = 62  
 Computed code bias (P1/P2)/m = -0.211 -4.826  
 Computed baseline (X,Y,Z)/m = -0.826 -5.560 4.395  
 RMS of residuals /m = 0.396

Number of phase differences to fit baseline  
 L1/L2 = 167843  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -0.826 -5.560 4.395  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = -0.0 RMS jitter /ps = 4.4

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 = -0.243 0.509 0.405  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.243 0.507 0.400  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -1.069 -5.052 4.798  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = 0.0 RMS jitter /ps = 1.2

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.011 0.033 0.023  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.011 0.031 0.018  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -1.080 -5.019 4.820  
 Final baseline L2 (X,Y,Z)/m = -1.079 -5.020 4.815  
 Final baseline L5 (X,Y,Z)/m = -1.079 -5.020 4.818

COMPUTATION OF CODE DIFFERENCES

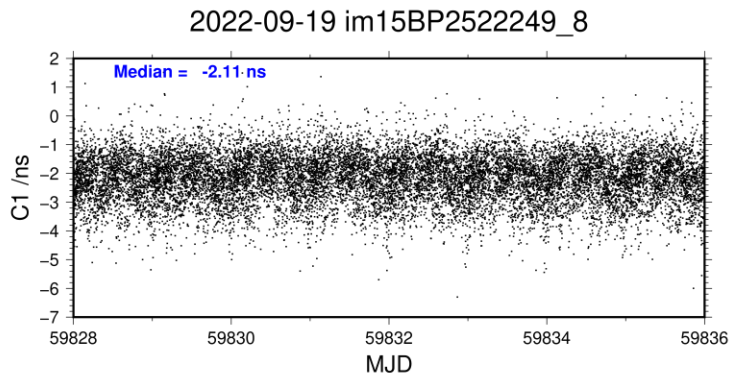
Total number of code differences = 511300

Global average of individual differences

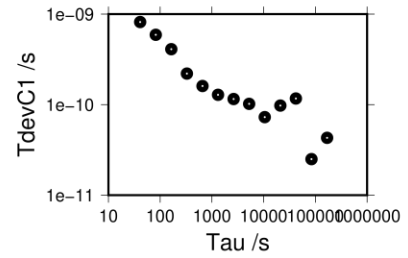
Code	#pts	ave/ns	rms/ns
C1	168455	-2.170	1.287
P1	168431	-2.283	1.080
P2	168430	-17.641	1.232
E1	113111	-2.203	1.113
E5	113571	-19.522	1.164

Number of 300s epochs in out file = 2304

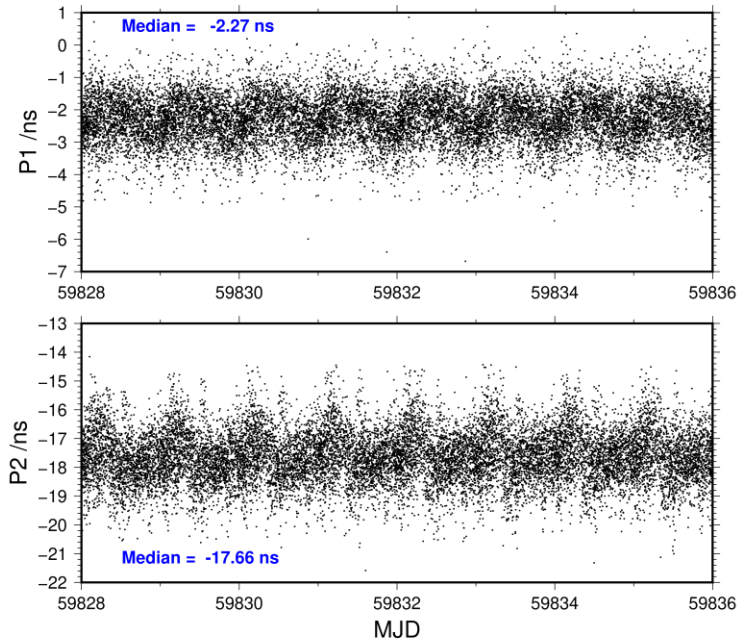
Code	#pts	median/ns	ave/ns	rms/ns
C1	16824	-2.106	-2.156	0.814
P1	16821	-2.267	-2.277	0.719
P2	16821	-17.655	-17.632	0.907
E1	11297	-2.177	-2.195	0.660
E5	11343	-19.505	-19.516	0.877



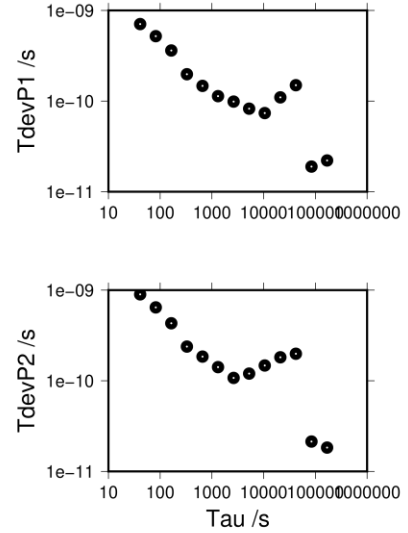
168218 s: C1= 43 ps  
 84109 s: C1= 25 ps  
 42054 s: C1= 117 ps  
 21027 s: C1= 98 ps  
 10514 s: C1= 73 ps  
 5257 s: C1= 102 ps  
 2628 s: C1= 115 ps  
 1314 s: C1= 128 ps  
 657 s: C1= 161 ps  
 329 s: C1= 220 ps  
 164 s: C1= 409 ps  
 82 s: C1= 591 ps  
 41 s: C1= 817 ps



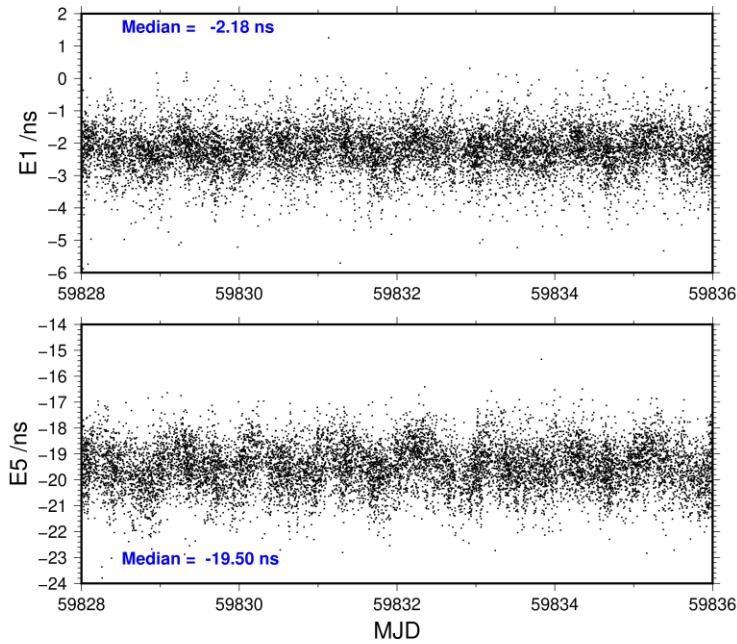
2022-09-19 im15BP2522249\_8



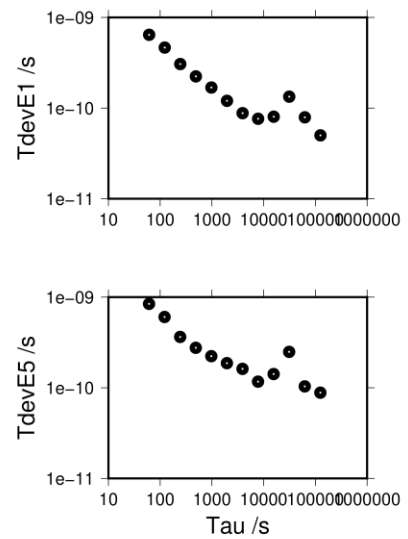
168248 s: P1= 22 ps	168248 s: P2= 18 ps
84124 s: P1= 19 ps	84124 s: P2= 21 ps
42062 s: P1= 150 ps	42062 s: P2= 198 ps
21031 s: P1= 110 ps	21031 s: P2= 182 ps
10515 s: P1= 74 ps	10515 s: P2= 147 ps
5258 s: P1= 83 ps	5258 s: P2= 120 ps
2629 s: P1= 99 ps	2629 s: P2= 108 ps
1314 s: P1= 113 ps	1314 s: P2= 141 ps
657 s: P1= 147 ps	657 s: P2= 185 ps
329 s: P1= 198 ps	329 s: P2= 238 ps
164 s: P1= 362 ps	164 s: P2= 431 ps
82 s: P1= 520 ps	82 s: P2= 644 ps
41 s: P1= 707 ps	41 s: P2= 899 ps



2022-09-19 im15BP2522249\_8



125262 s: E1= 50 ps	124754 s: E5= 88 ps
62631 s: E1= 79 ps	62377 s: E5= 103 ps
31316 s: E1= 134 ps	31189 s: E5= 249 ps
15658 s: E1= 80 ps	15594 s: E5= 142 ps
7829 s: E1= 76 ps	7797 s: E5= 117 ps
3914 s: E1= 88 ps	3899 s: E5= 162 ps
1957 s: E1= 120 ps	1949 s: E5= 187 ps
979 s: E1= 168 ps	975 s: E5= 223 ps
489 s: E1= 224 ps	487 s: E5= 276 ps
245 s: E1= 306 ps	244 s: E5= 364 ps
122 s: E1= 466 ps	122 s: E5= 604 ps
61 s: E1= 643 ps	61 s: E5= 842 ps



IM15-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 168454  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : -3.474 -6.103  
 Iteration 0: Obs used = 273600; Huge residuals = 0; Large residuals = 144  
 Iteration 1: Obs used = 273600; Huge residuals = 0; Large residuals = 144  
 Computed code bias (P1/P2)/m = -4.021 -6.489  
 Computed baseline (X,Y,Z)/m = -1.648 -6.073 4.497  
 RMS of residuals /m = 0.407

Number of phase differences to fit baseline  
 L1/L2 = 167799  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -1.648 -6.073 4.497  
 23036 clock jitters computed out of 23036 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 = -0.270 0.544 0.473  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.276 0.556 0.484  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -1.921 -5.523 4.976  
 23036 clock jitters computed out of 23036 intervals  
 AVE jitter /ps = -0.0 RMS jitter /ps = 1.3

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.014 0.028 0.018  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.019 0.039 0.029  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -1.934 -5.495 4.994  
 Final baseline L2 (X,Y,Z)/m = -1.940 -5.484 5.005  
 Final baseline L5 (X,Y,Z)/m = -1.937 -5.490 4.999



COMPUTATION OF CODE DIFFERENCES

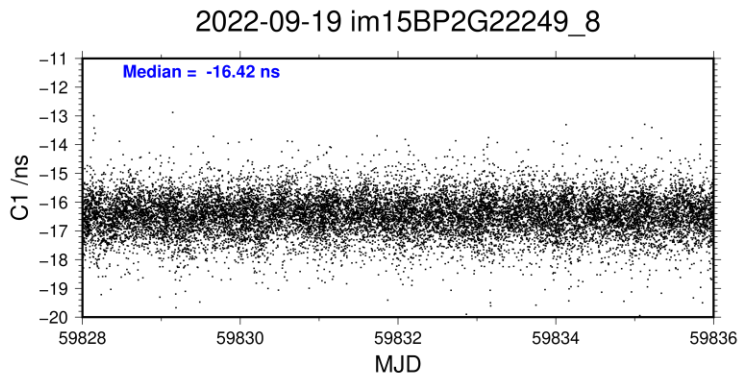
Total number of code differences = 507374

Global average of individual differences

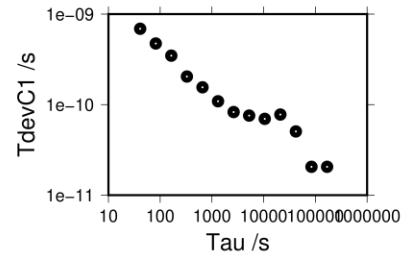
Code	#pts	ave/ns	rms/ns
C1	168429	-16.453	1.266
P1	168387	-15.187	1.141
P2	168386	-23.439	1.217
E1	109349	-16.997	1.091
E5	109816	-27.286	1.078

Number of 300s epochs in out file = 2304

Code	#pts	median/ns	ave/ns	rms/ns
C1	16823	-16.417	-16.439	0.678
P1	16819	-15.132	-15.184	0.689
P2	16819	-23.416	-23.437	0.730
E1	10919	-16.970	-16.986	0.587
E5	10966	-27.271	-27.281	0.741

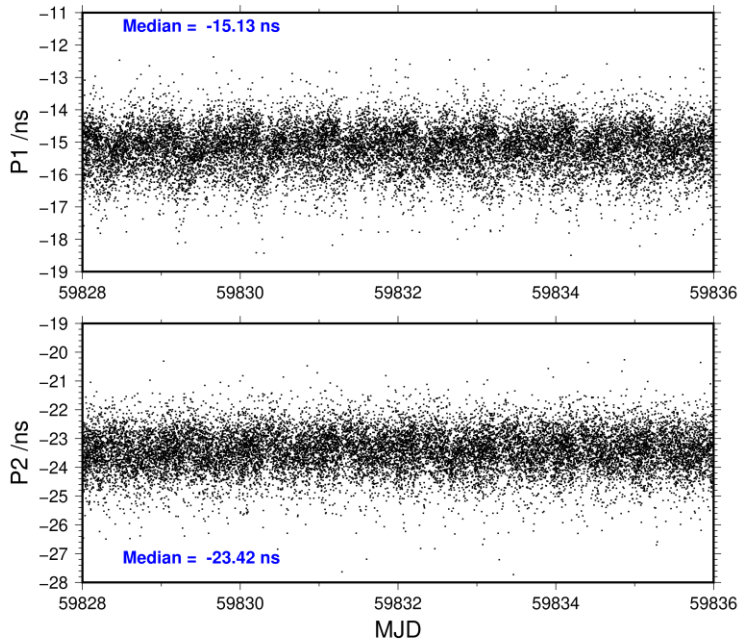


168228 s: C1= 21 ps  
 84114 s: C1= 21 ps  
 42057 s: C1= 51 ps  
 21028 s: C1= 78 ps  
 10514 s: C1= 70 ps  
 5257 s: C1= 76 ps  
 2629 s: C1= 83 ps  
 1314 s: C1= 109 ps  
 657 s: C1= 155 ps  
 329 s: C1= 204 ps  
 164 s: C1= 347 ps  
 82 s: C1= 473 ps  
 41 s: C1= 689 ps

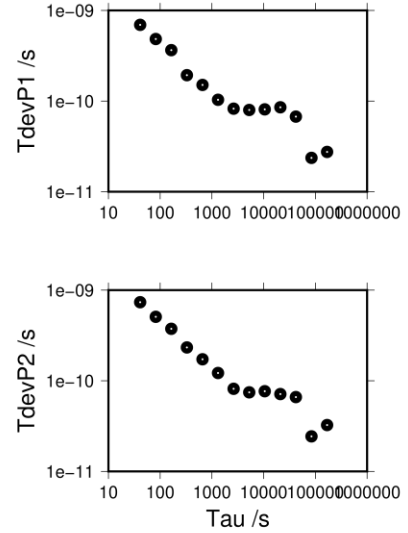




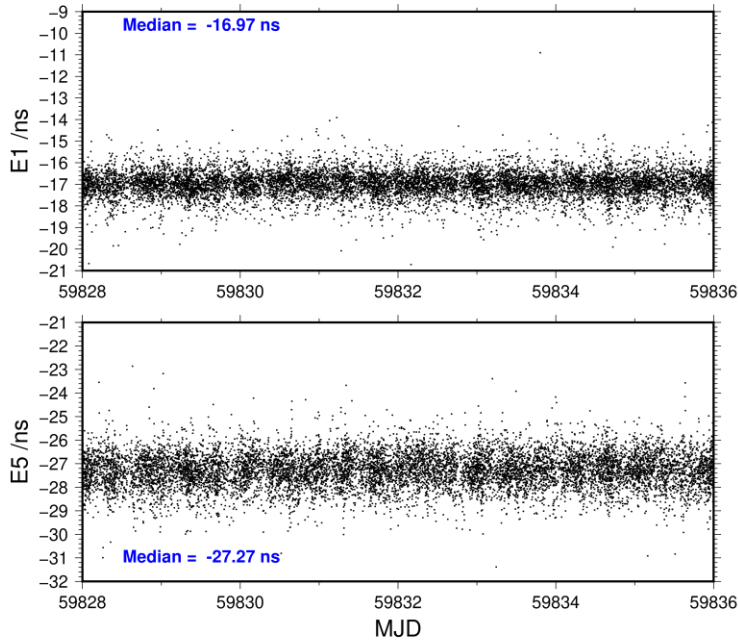
2022-09-19 im15BP2G22249\_8



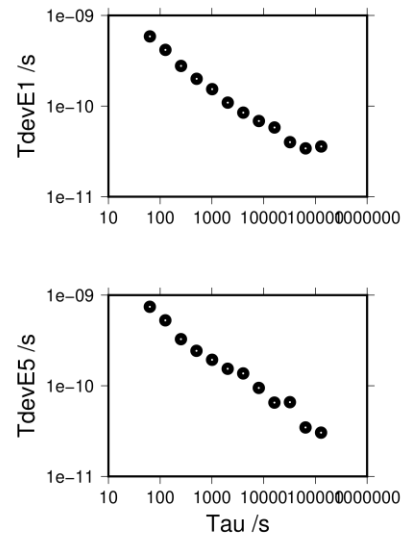
168268 s: P1= 27 ps	168268 s: P2= 32 ps
84134 s: P1= 24 ps	84134 s: P2= 24 ps
42067 s: P1= 67 ps	42067 s: P2= 66 ps
21033 s: P1= 85 ps	21033 s: P2= 71 ps
10517 s: P1= 81 ps	10517 s: P2= 77 ps
5258 s: P1= 80 ps	5258 s: P2= 75 ps
2629 s: P1= 82 ps	2629 s: P2= 82 ps
1315 s: P1= 103 ps	1315 s: P2= 122 ps
657 s: P1= 151 ps	657 s: P2= 173 ps
329 s: P1= 193 ps	329 s: P2= 233 ps
164 s: P1= 365 ps	164 s: P2= 375 ps
82 s: P1= 484 ps	82 s: P2= 508 ps
41 s: P1= 693 ps	41 s: P2= 736 ps



2022-09-19 im15BP2G22249\_8



129599 s: E1= 36 ps	129044 s: E5= 30 ps
64800 s: E1= 34 ps	64522 s: E5= 35 ps
32400 s: E1= 40 ps	32261 s: E5= 66 ps
16200 s: E1= 58 ps	16130 s: E5= 65 ps
8100 s: E1= 68 ps	8065 s: E5= 95 ps
4050 s: E1= 85 ps	4033 s: E5= 137 ps
2025 s: E1= 109 ps	2016 s: E5= 154 ps
1012 s: E1= 154 ps	1008 s: E5= 193 ps
506 s: E1= 200 ps	504 s: E5= 243 ps
253 s: E1= 277 ps	252 s: E5= 326 ps
127 s: E1= 417 ps	126 s: E5= 527 ps
63 s: E1= 587 ps	63 s: E5= 743 ps



IM22-BP25

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 192781  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 34590 high elev obs : 1.775 -2.325  
 Iteration 0: Obs used = 317412; Huge residuals = 882; Large residuals = 2056  
 Iteration 1: Obs used = 318240; Huge residuals = 0; Large residuals = 346  
 Computed code bias (P1/P2)/m = 1.990 -2.199  
 Computed baseline (X,Y,Z)/m = -2.642 0.285 -1.558  
 RMS of residuals /m = 0.329

Number of phase differences to fit baseline  
 L1/L2 = 170219  
 L5 = 87953  
 A priori baseline (X,Y,Z)/m = -2.642 0.285 -1.558  
 20522 clock jitters computed out of 20536 intervals  
 AVE jitter /ps = 0.3 RMS jitter /ps = 4.8

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 = -0.049 -0.044 -0.086  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.045 -0.046 -0.089  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.048 -0.040 -0.088  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -2.690 0.240 -1.645  
 20522 clock jitters computed out of 20536 intervals  
 AVE jitter /ps = -0.2 RMS jitter /ps = 0.2

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.023 -0.012 -0.000  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.019 -0.013 -0.003  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.019 -0.006 -0.003  
 RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -2.712 0.228 -1.645  
 Final baseline L2 (X,Y,Z)/m = -2.708 0.227 -1.648  
 Final baseline L5 (X,Y,Z)/m = -2.709 0.234 -1.648

COMPUTATION OF CODE DIFFERENCES

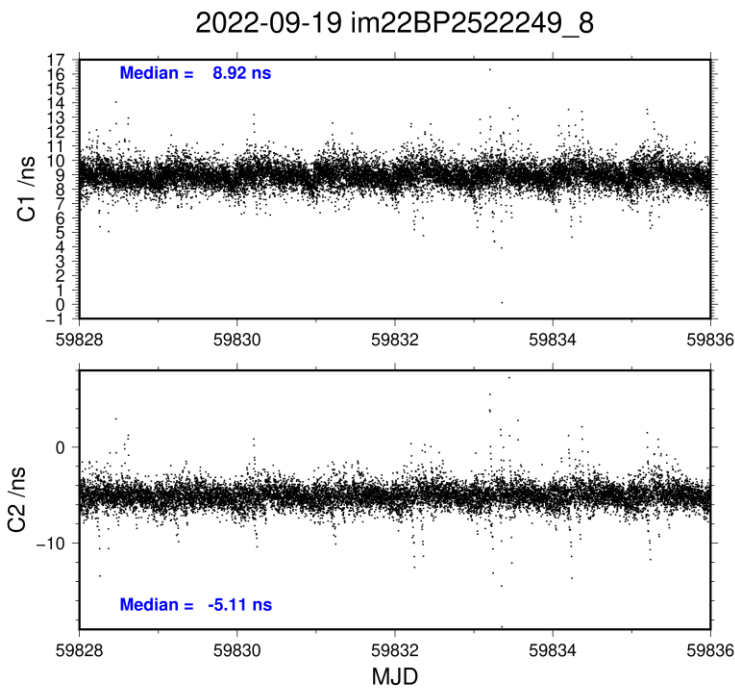
Total number of code differences = 818342

Global average of individual differences

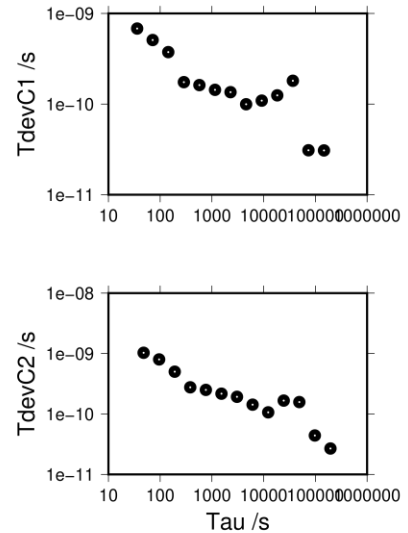
Code	#pts	ave/ns	rms/ns
C1	192918	8.941	0.854
C2	144797	-5.094	1.204
P1	192267	6.803	0.961
P2	192264	-7.121	1.180
E1	153917	9.913	0.821
E5	153924	-5.141	1.081

Number of 300s epochs in out file = 2304

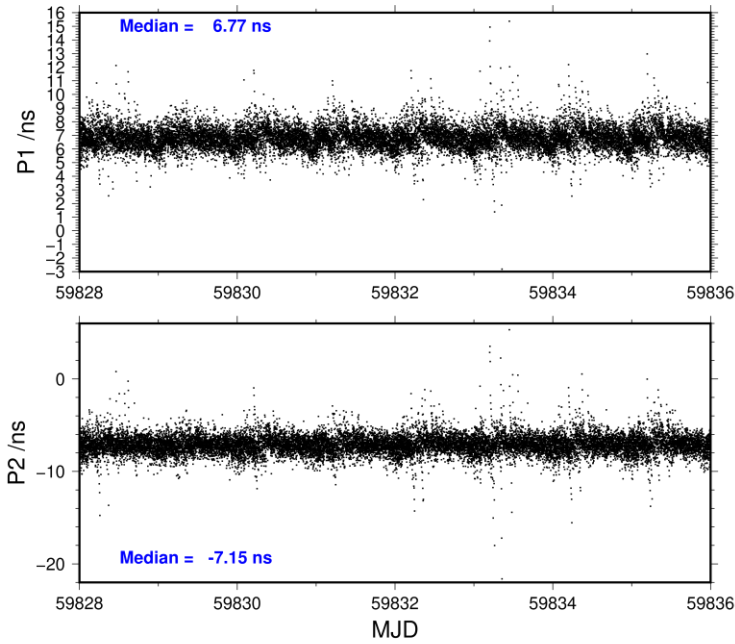
Code	#pts	median/ns	ave/ns	rms/ns
C1	19269	8.922	8.936	0.723
C2	14457	-5.113	-5.096	1.077
P1	19209	6.771	6.798	0.825
P2	19209	-7.146	-7.125	1.052
E1	15376	9.903	9.912	0.685
E5	15378	-5.139	-5.145	1.005



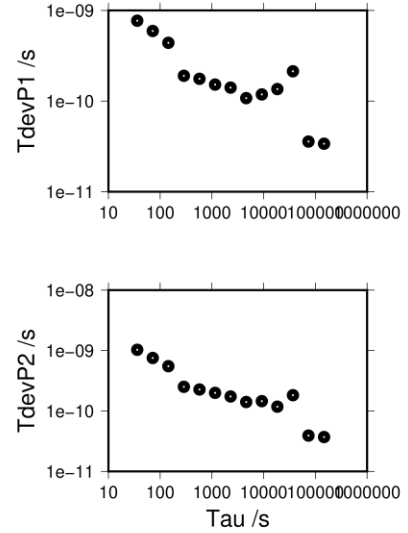
146872 s: C1= 31 ps 195761 s: C2= 27 ps  
 73436 s: C1= 31 ps 97881 s: C2= 44 ps  
 36718 s: C1= 181 ps 48940 s: C2= 158 ps  
 18359 s: C1= 125 ps 24470 s: C2= 167 ps  
 9179 s: C1= 109 ps 12235 s: C2= 107 ps  
 4590 s: C1= 100 ps 6118 s: C2= 143 ps  
 2295 s: C1= 135 ps 3059 s: C2= 192 ps  
 1147 s: C1= 144 ps 1529 s: C2= 217 ps  
 574 s: C1= 162 ps 765 s: C2= 251 ps  
 287 s: C1= 174 ps 382 s: C2= 276 ps  
 143 s: C1= 374 ps 191 s: C2= 502 ps  
 72 s: C1= 509 ps 96 s: C2= 800 ps  
 36 s: C1= 681 ps 48 s: C2= 1030 ps



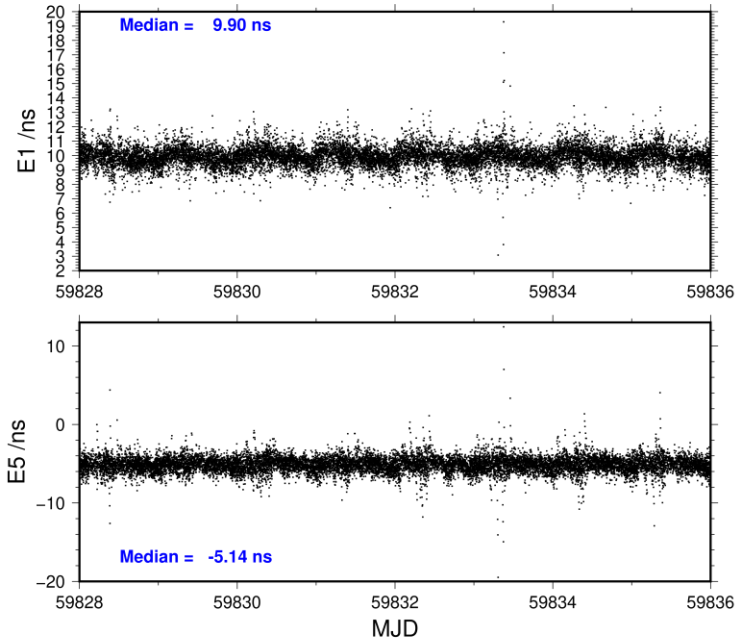
2022-09-19 im22BP2522249\_8



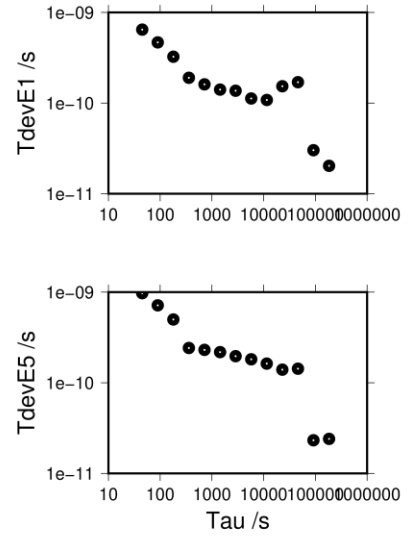
147331 s: P1= 34 ps	147331 s: P2= 37 ps
73665 s: P1= 36 ps	73665 s: P2= 39 ps
36833 s: P1= 213 ps	36833 s: P2= 183 ps
18416 s: P1= 136 ps	18416 s: P2= 118 ps
9208 s: P1= 118 ps	9208 s: P2= 146 ps
4604 s: P1= 108 ps	4604 s: P2= 141 ps
2302 s: P1= 141 ps	2302 s: P2= 174 ps
1151 s: P1= 152 ps	1151 s: P2= 199 ps
576 s: P1= 176 ps	576 s: P2= 227 ps
288 s: P1= 190 ps	288 s: P2= 251 ps
144 s: P1= 440 ps	144 s: P2= 551 ps
72 s: P1= 594 ps	72 s: P2= 752 ps
36 s: P1= 770 ps	36 s: P2= 1031 ps



2022-09-19 im22BP2522249\_8



184060 s: E1= 20 ps	184036 s: E5= 24 ps
92030 s: E1= 30 ps	92018 s: E5= 23 ps
46015 s: E1= 170 ps	46009 s: E5= 143 ps
23008 s: E1= 153 ps	23005 s: E5= 139 ps
11504 s: E1= 108 ps	11502 s: E5= 163 ps
5752 s: E1= 112 ps	5751 s: E5= 182 ps
2876 s: E1= 137 ps	2876 s: E5= 196 ps
1438 s: E1= 141 ps	1438 s: E5= 218 ps
719 s: E1= 161 ps	719 s: E5= 231 ps
359 s: E1= 190 ps	359 s: E5= 242 ps
180 s: E1= 325 ps	180 s: E5= 499 ps
90 s: E1= 467 ps	90 s: E5= 716 ps
45 s: E1= 646 ps	45 s: E5= 974 ps



IM22-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 185796  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33058 high elev obs : -2.019 -4.016  
 Iteration 0: Obs used = 305314; Huge residuals = 882; Large residuals = 3134  
 Iteration 1: Obs used = 307018; Huge residuals = 0; Large residuals = 548  
 Computed code bias (P1/P2)/m = -1.837 -3.877  
 Computed baseline (X,Y,Z)/m = -3.477 -0.207 -1.438  
 RMS of residuals /m = 0.388

Number of phase differences to fit baseline  
 L1/L2 = 164122  
 L5 = 87367  
 A priori baseline (X,Y,Z)/m = -3.477 -0.207 -1.438  
 20518 clock jitters computed out of 20539 intervals  
 AVE jitter /ps = 0.3 RMS jitter /ps = 3.5

Iter 1 Large residuals L1= 1  
 Iter 1 Large residuals L2= 0  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.067 -0.026 -0.032  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.074 -0.010 -0.016  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.072 -0.005 -0.014  
 RMS of residuals L5 /m = 0.003

Iter 2 Large residuals L1= 1  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.067 -0.026 -0.032  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.074 -0.010 -0.016  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.072 -0.005 -0.014  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -3.548 -0.225 -1.462  
 20518 clock jitters computed out of 20539 intervals  
 AVE jitter /ps = -0.3 RMS jitter /ps = 0.1

Iter 3 Large residuals L1= 1  
 Iter 3 Large residuals L2= 0  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.022 -0.021 -0.008  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.029 -0.006 0.009  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.027 0.001 0.009  
 RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -3.570 -0.246 -1.469

Final baseline L2 (X,Y,Z)/m = -3.576 -0.230 -1.453  
 Final baseline L5 (X,Y,Z)/m = -3.575 -0.224 -1.453

COMPUTATION OF CODE DIFFERENCES

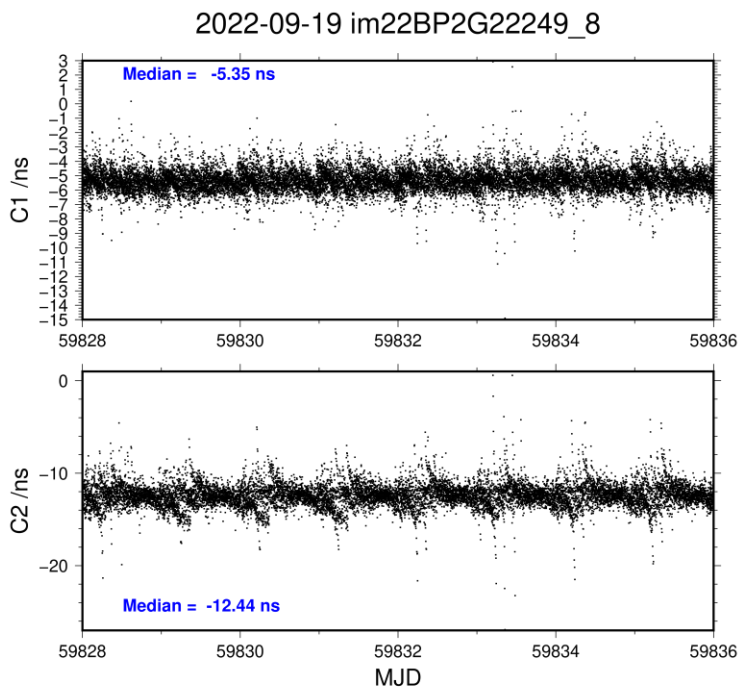
Total number of code differences = 806285

Global average of individual differences

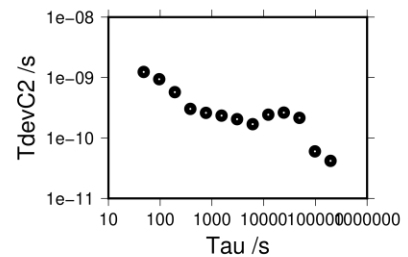
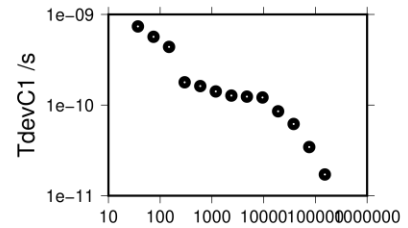
Code	#pts	ave/ns	rms/ns
C1	186035	-5.324	1.032
C2	144191	-12.412	1.495
P1	185289	-6.089	1.049
P2	185288	-12.922	1.467
E1	148902	-4.891	0.835
E5	149060	-12.953	1.118

Number of 300s epochs in out file = 2304

Code	#pts	median/ns	ave/ns	rms/ns
C1	18585	-5.354	-5.323	0.779
C2	14401	-12.438	-12.419	1.277
P1	18505	-6.114	-6.088	0.795
P2	18505	-12.976	-12.931	1.264
E1	14883	-4.911	-4.891	0.647
E5	14900	-12.948	-12.957	1.030

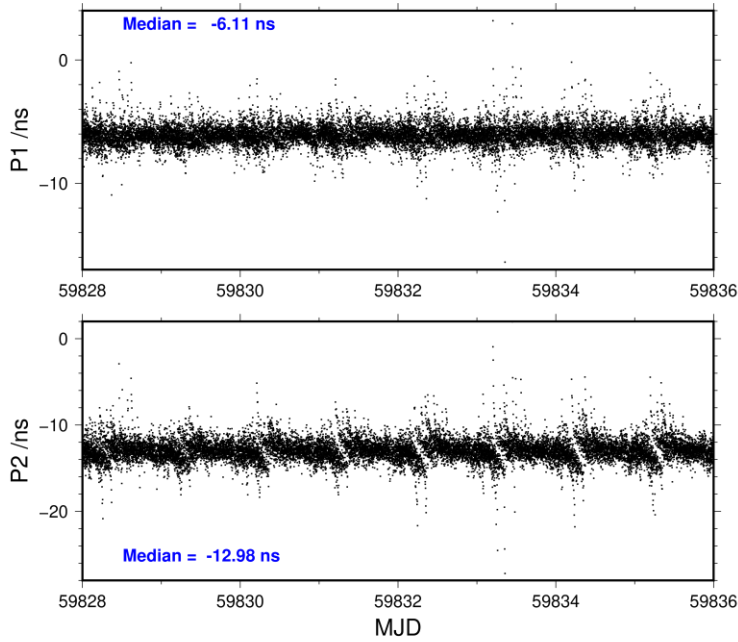


152278 s: C1= 17 ps 196523 s: C2= 42 ps  
 76139 s: C1= 34 ps 98261 s: C2= 60 ps  
 38069 s: C1= 62 ps 49131 s: C2= 215 ps  
 19035 s: C1= 85 ps 24565 s: C2= 263 ps  
 9517 s: C1= 121 ps 12283 s: C2= 243 ps  
 4759 s: C1= 124 ps 6141 s: C2= 169 ps  
 2379 s: C1= 127 ps 3071 s: C2= 205 ps  
 1190 s: C1= 142 ps 1535 s: C2= 234 ps  
 595 s: C1= 162 ps 768 s: C2= 260 ps  
 297 s: C1= 179 ps 384 s: C2= 303 ps  
 149 s: C1= 438 ps 192 s: C2= 573 ps  
 74 s: C1= 566 ps 96 s: C2= 939 ps  
 37 s: C1= 737 ps 48 s: C2= 1236 ps

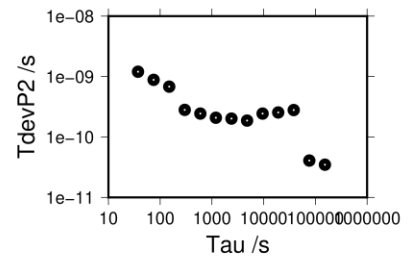
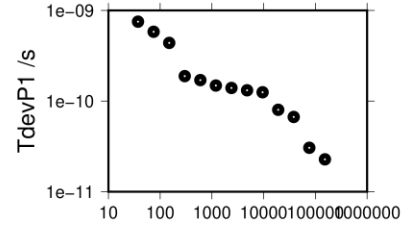




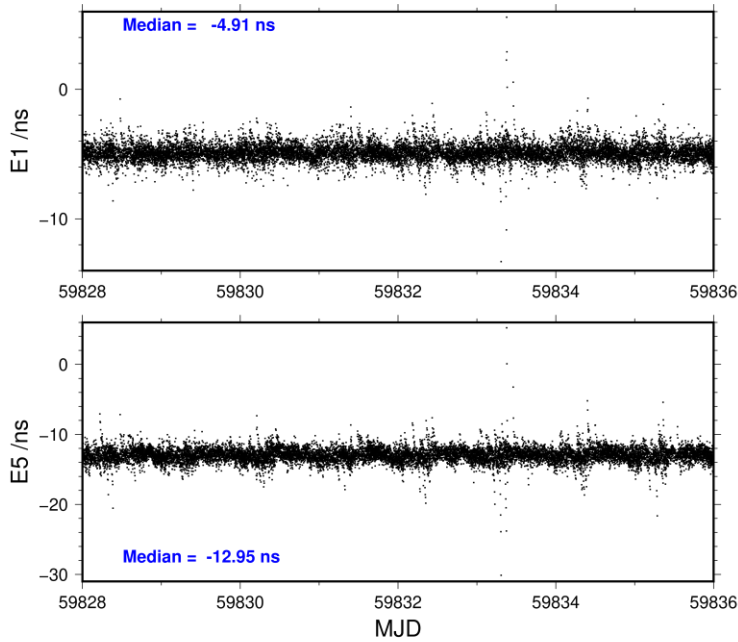
2022-09-19 im22BP2G22249\_8



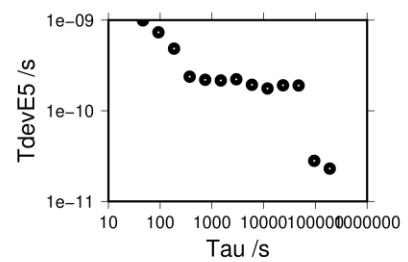
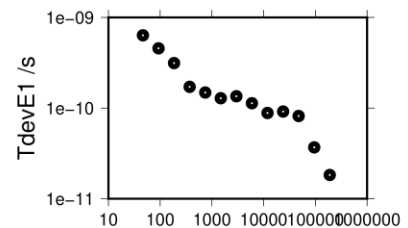
152936 s: P1= 23 ps	152936 s: P2= 35 ps
76468 s: P1= 31 ps	76468 s: P2= 41 ps
38234 s: P1= 67 ps	38234 s: P2= 279 ps
19117 s: P1= 80 ps	19117 s: P2= 255 ps
9558 s: P1= 125 ps	9558 s: P2= 244 ps
4779 s: P1= 132 ps	4779 s: P2= 187 ps
2390 s: P1= 140 ps	2390 s: P2= 202 ps
1195 s: P1= 148 ps	1195 s: P2= 208 ps
597 s: P1= 171 ps	597 s: P2= 244 ps
299 s: P1= 188 ps	299 s: P2= 281 ps
149 s: P1= 439 ps	149 s: P2= 680 ps
75 s: P1= 581 ps	75 s: P2= 883 ps
37 s: P1= 752 ps	37 s: P2= 1204 ps



2022-09-19 im22BP2G22249\_8



190158 s: E1= 18 ps	189941 s: E5= 23 ps
95079 s: E1= 37 ps	94970 s: E5= 28 ps
47539 s: E1= 82 ps	47485 s: E5= 190 ps
23770 s: E1= 92 ps	23743 s: E5= 191 ps
11885 s: E1= 88 ps	11871 s: E5= 176 ps
5942 s: E1= 113 ps	5936 s: E5= 194 ps
2971 s: E1= 135 ps	2968 s: E5= 223 ps
1486 s: E1= 128 ps	1484 s: E5= 216 ps
743 s: E1= 148 ps	742 s: E5= 220 ps
371 s: E1= 172 ps	371 s: E5= 238 ps
186 s: E1= 313 ps	185 s: E5= 485 ps
93 s: E1= 456 ps	93 s: E5= 734 ps
46 s: E1= 635 ps	46 s: E5= 993 ps



**GS16-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 185547  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : 4.871 2.728  
 Iteration 0: Obs used = 307685; Huge residuals = 0; Large residuals = 245  
 Iteration 1: Obs used = 307685; Huge residuals = 0; Large residuals = 245  
 Computed code bias (P1/P2)/m = 5.256 3.016  
 Computed baseline (X,Y,Z)/m = 0.399 4.119 -3.476  
 RMS of residuals /m = 0.309

Number of phase differences to fit baseline  
 L1/L2 = 184497  
 L5 = 98335  
 A priori baseline (X,Y,Z)/m = 0.399 4.119 -3.476  
 23032 clock jitters computed out of 23034 intervals  
 AVE jitter /ps = -0.0 RMS jitter /ps = 25.5

Iter 1 Large residuals L1= 1  
 Iter 1 Large residuals L2= 0  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.135 -0.277 -0.280  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.140 -0.281 -0.284  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = 0.125 -0.281 -0.276  
 RMS of residuals L5 /m = 0.003

Iter 2 Large residuals L1= 1  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.135 -0.277 -0.280  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.140 -0.281 -0.284  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = 0.125 -0.281 -0.276  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 0.536 3.840 -3.758  
 23032 clock jitters computed out of 23034 intervals  
 AVE jitter /ps = 0.0 RMS jitter /ps = 0.6

Iter 3 Large residuals L1= 0  
 Iter 3 Large residuals L2= 0  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.002 -0.011 -0.007  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.007 -0.015 -0.012  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = 0.003 -0.006 -0.006  
 RMS of residuals L5 /m = 0.003

Iter 4 Large residuals L1= 0  
 Iter 4 Large residuals L2= 0  
 Iter 4 Large residuals L5= 0



Computed baseline L1 (X,Y,Z)/m = 0.002 -0.011 -0.007  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.007 -0.015 -0.012  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = 0.003 -0.006 -0.006  
 RMS of residuals L5 /m = 0.003  
  
 Final baseline L1 (X,Y,Z)/m = 0.538 3.829 -3.766  
 Final baseline L2 (X,Y,Z)/m = 0.543 3.825 -3.770  
 Final baseline L5 (X,Y,Z)/m = 0.539 3.834 -3.764

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 611685

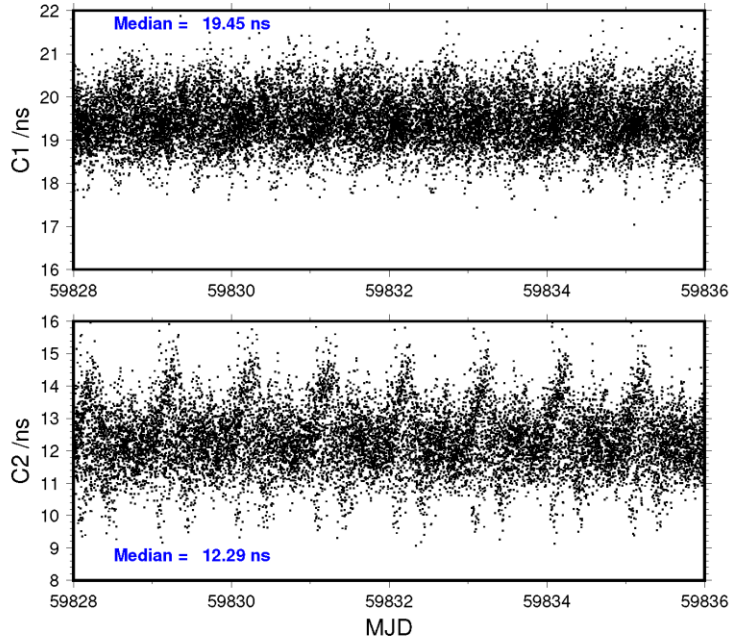
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	185952	19.483	0.711
C2	144084	12.344	1.072
P1	185402	18.469	0.822
P2	185439	11.031	1.093
E1	148522	19.989	0.591
E5	148606	15.256	0.774
BC	72660	20.428	0.692
B5	72701	15.544	0.827

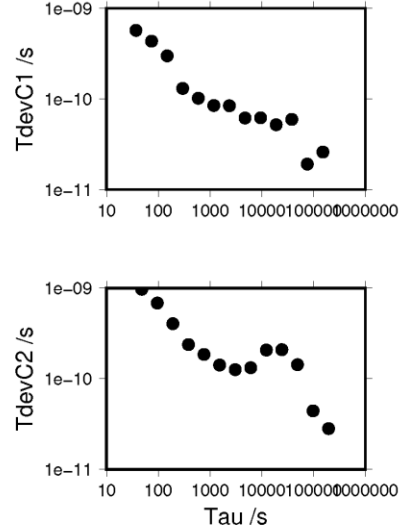
Number of 300s epochs in out file = 2304

Code	#pts	median/ns	ave/ns	rms/ns
C1	18571	19.445	19.477	0.575
C2	14389	12.291	12.339	0.957
P1	18517	18.466	18.466	0.655
P2	18518	11.006	11.033	0.940
E1	14843	19.977	19.983	0.460
E5	14848	15.252	15.252	0.696
BC	7249	20.428	20.422	0.582
B5	7251	15.536	15.539	0.769

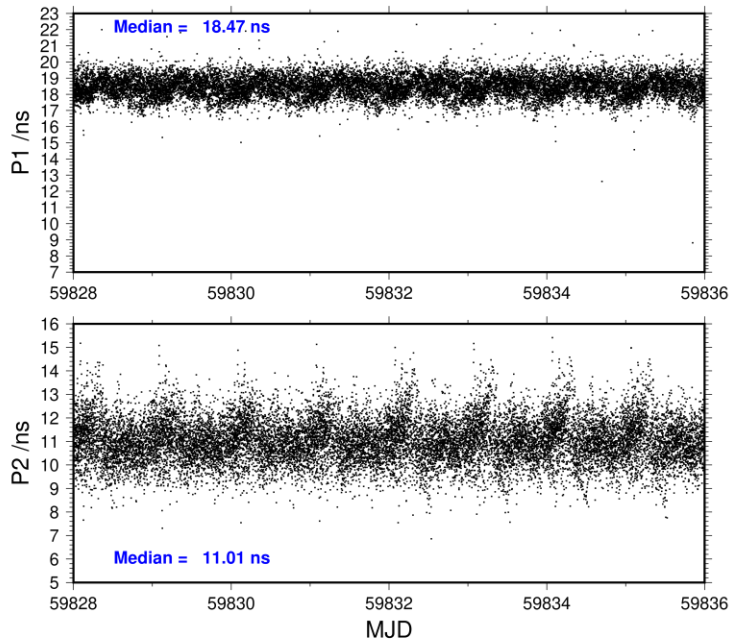
2022-09-19 gs16BP2522249\_8



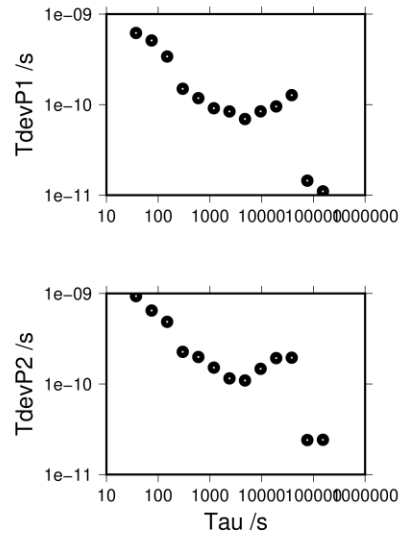
152392 s: C1= 26 ps	196687 s: C2= 28 ps
76196 s: C1= 19 ps	98343 s: C2= 44 ps
38098 s: C1= 60 ps	49172 s: C2= 143 ps
19049 s: C1= 52 ps	24586 s: C2= 209 ps
9525 s: C1= 62 ps	12293 s: C2= 208 ps
4762 s: C1= 62 ps	6146 s: C2= 132 ps
2381 s: C1= 84 ps	3073 s: C2= 126 ps
1191 s: C1= 85 ps	1537 s: C2= 142 ps
595 s: C1= 102 ps	768 s: C2= 185 ps
298 s: C1= 131 ps	384 s: C2= 239 ps
149 s: C1= 300 ps	192 s: C2= 406 ps
74 s: C1= 436 ps	96 s: C2= 684 ps
37 s: C1= 573 ps	48 s: C2= 971 ps

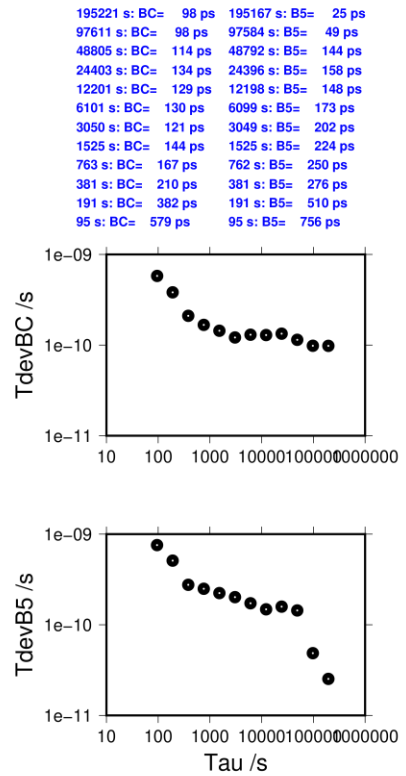
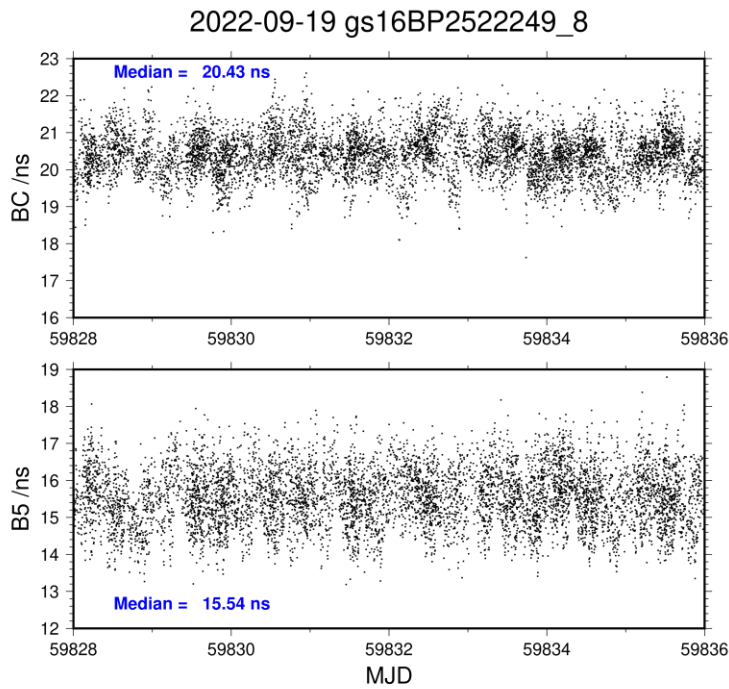
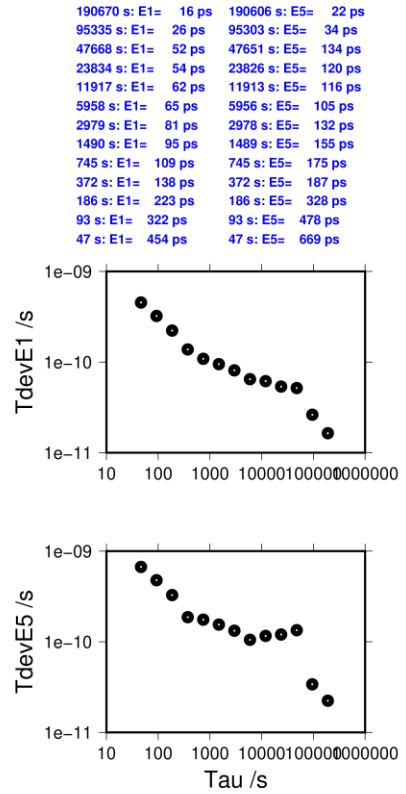
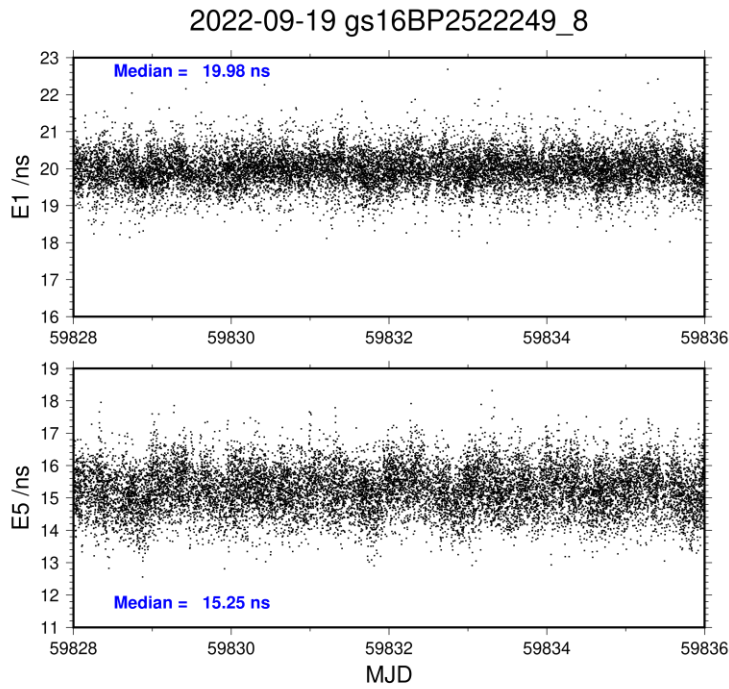


2022-09-19 gs16BP2522249\_8



152837 s: P1= 11 ps	152829 s: P2= 24 ps
76418 s: P1= 14 ps	76414 s: P2= 24 ps
38209 s: P1= 127 ps	38207 s: P2= 195 ps
19105 s: P1= 95 ps	19104 s: P2= 193 ps
9552 s: P1= 84 ps	9552 s: P2= 147 ps
4776 s: P1= 69 ps	4776 s: P2= 109 ps
2388 s: P1= 84 ps	2388 s: P2= 115 ps
1194 s: P1= 91 ps	1194 s: P2= 152 ps
597 s: P1= 118 ps	597 s: P2= 199 ps
299 s: P1= 150 ps	298 s: P2= 226 ps
149 s: P1= 340 ps	149 s: P2= 486 ps
75 s: P1= 511 ps	75 s: P2= 648 ps
37 s: P1= 619 ps	37 s: P2= 935 ps





**GS16-BP2G**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 188240  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : 1.055 1.044  
 Iteration 0: Obs used = 311676; Huge residuals = 0; Large residuals = 1640  
 Iteration 1: Obs used = 311676; Huge residuals = 0; Large residuals = 1640  
 Computed code bias (P1/P2)/m = 1.383 1.295  
 Computed baseline (X,Y,Z)/m = -0.417 3.641 -3.273  
 RMS of residuals /m = 0.323

Number of phase differences to fit baseline  
 L1/L2 = 186164  
 L5 = 99335  
 A priori baseline (X,Y,Z)/m = -0.417 3.641 -3.273  
 23033 clock jitters computed out of 23034 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 25.3

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 = 0.106 -0.267 -0.306  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = 0.098 -0.251 -0.292  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = 0.087 -0.257 -0.284  
 RMS of residuals L5 /m = 0.002

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -0.315 3.382 -3.572  
 23033 clock jitters computed out of 23034 intervals  
 AVE jitter /ps = -0.0 RMS jitter /ps = 0.6

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.001 -0.025 -0.017  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.007 -0.008 -0.003  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = -0.007 -0.005 0.003  
 RMS of residuals L5 /m = 0.002

Final baseline L1 (X,Y,Z)/m = -0.315 3.357 -3.588  
 Final baseline L2 (X,Y,Z)/m = -0.322 3.374 -3.574  
 Final baseline L5 (X,Y,Z)/m = -0.322 3.377 -3.568

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 620475

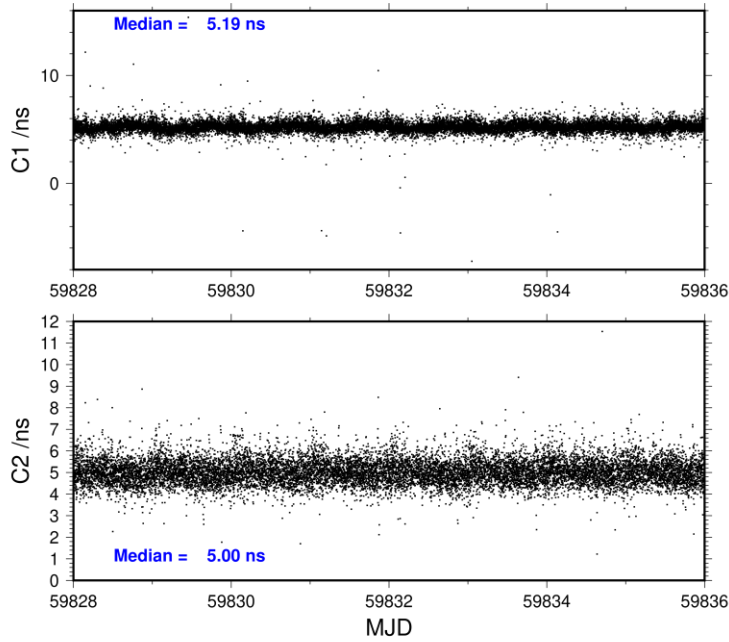
Global average of individual differences

<b>Code</b>	<b>#pts</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	188661	5.202	0.937
C2	145962	5.026	0.994
P1	188088	5.511	1.203
P2	188094	5.169	1.350
E1	150263	5.183	0.634
E5	150684	7.448	0.722
BC	73157	5.353	0.635
B5	73365	7.395	0.723

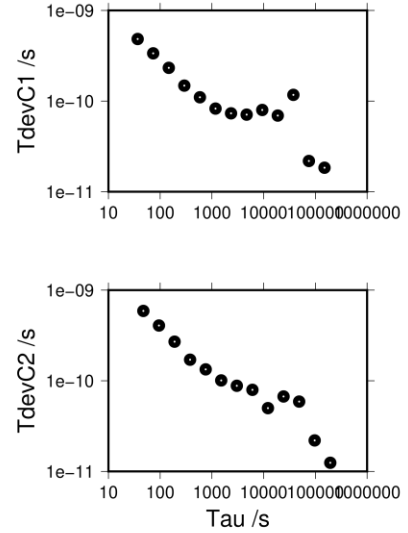
Number of 300s epochs in out file = 2304

<b>Code</b>	<b>#pts</b>	<b>median/ns</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	18844	5.188	5.206	0.490
C2	14581	4.998	5.021	0.578
P1	18786	5.550	5.518	0.949
P2	18786	5.201	5.170	1.074
E1	15013	5.164	5.180	0.379
E5	15058	7.431	7.443	0.565
BC	7299	5.330	5.351	0.371
B5	7321	7.377	7.392	0.587

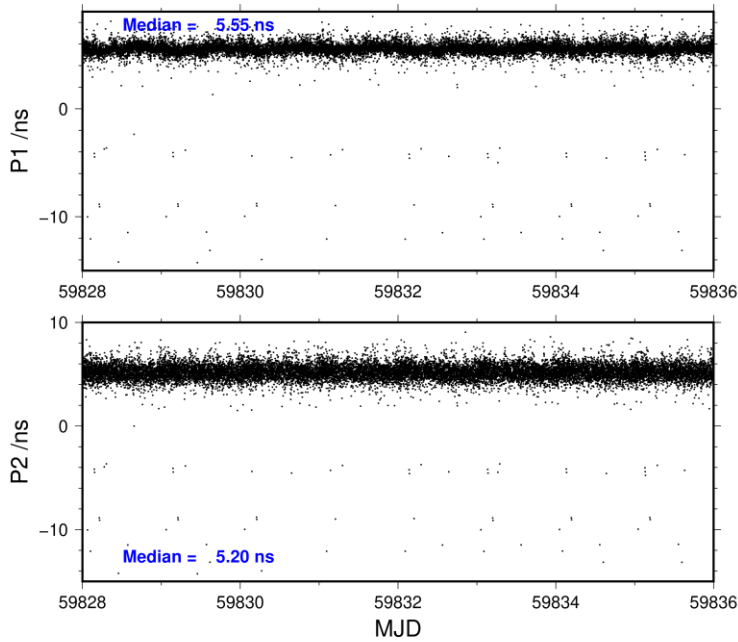
2022-09-19 gs16BP2G22249\_8



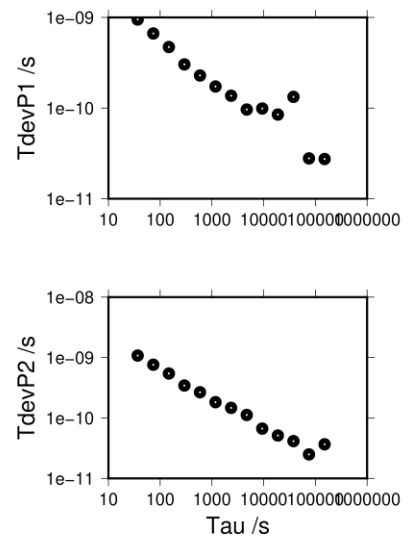
150184 s: C1= 18 ps	194096 s: C2= 12 ps
75092 s: C1= 22 ps	97048 s: C2= 22 ps
37546 s: C1= 117 ps	48524 s: C2= 59 ps
18773 s: C1= 69 ps	24262 s: C2= 67 ps
9367 s: C1= 80 ps	12131 s: C2= 50 ps
4693 s: C1= 71 ps	6066 s: C2= 80 ps
2347 s: C1= 73 ps	3033 s: C2= 88 ps
1173 s: C1= 83 ps	1516 s: C2= 101 ps
587 s: C1= 110 ps	758 s: C2= 134 ps
293 s: C1= 148 ps	379 s: C2= 171 ps
147 s: C1= 233 ps	190 s: C2= 270 ps
73 s: C1= 337 ps	95 s: C2= 407 ps
37 s: C1= 484 ps	47 s: C2= 590 ps



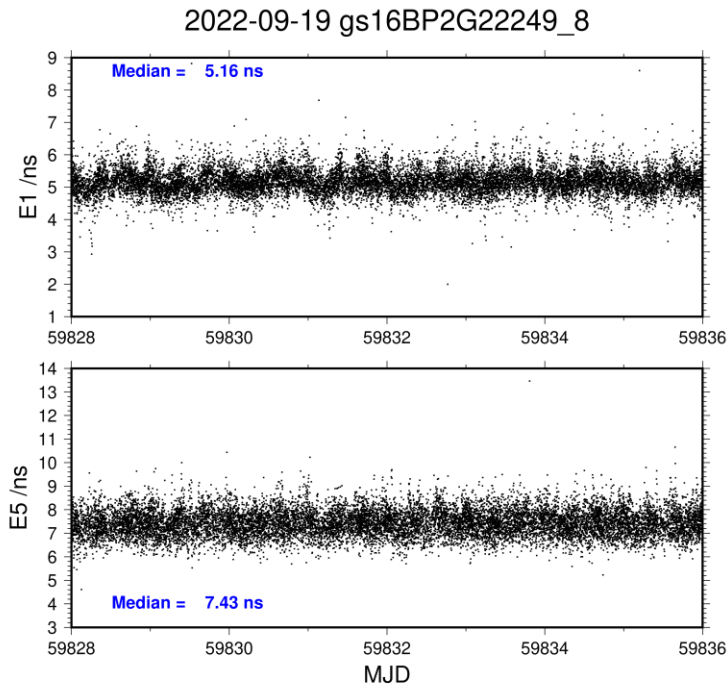
2022-09-19 gs16BP2G22249\_8



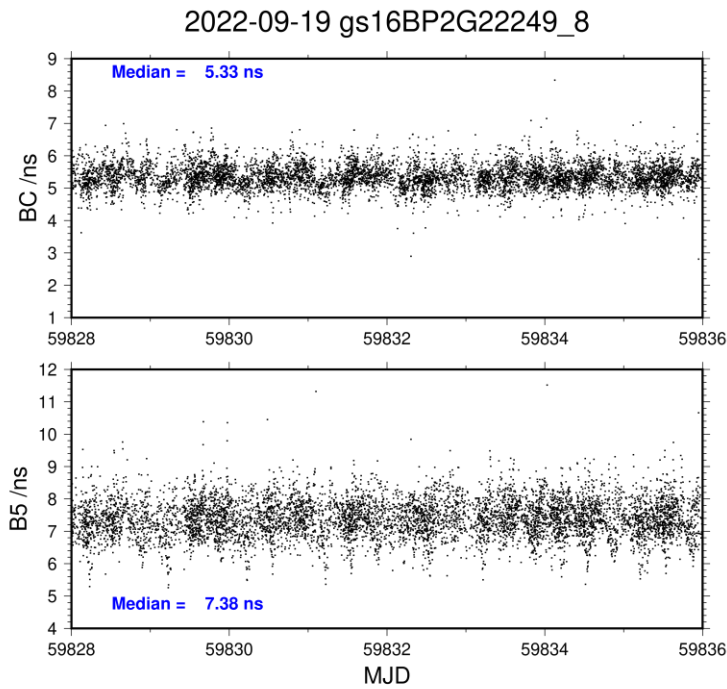
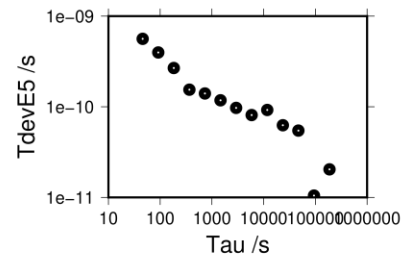
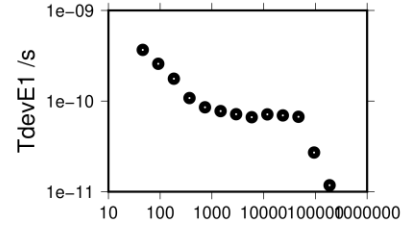
150648 s: P1= 27 ps	150648 s: P2= 37 ps
75324 s: P1= 28 ps	75324 s: P2= 25 ps
37662 s: P1= 133 ps	37662 s: P2= 41 ps
18831 s: P1= 85 ps	18831 s: P2= 51 ps
9416 s: P1= 99 ps	9416 s: P2= 67 ps
4708 s: P1= 96 ps	4708 s: P2= 112 ps
2354 s: P1= 137 ps	2354 s: P2= 147 ps
1177 s: P1= 173 ps	1177 s: P2= 182 ps
588 s: P1= 228 ps	588 s: P2= 267 ps
294 s: P1= 303 ps	294 s: P2= 344 ps
147 s: P1= 471 ps	147 s: P2= 544 ps
74 s: P1= 665 ps	74 s: P2= 762 ps
37 s: P1= 949 ps	37 s: P2= 1079 ps



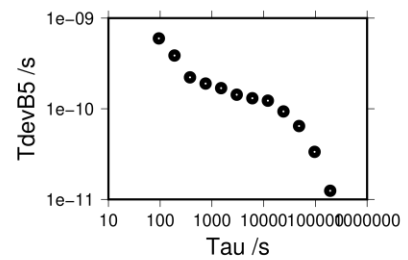
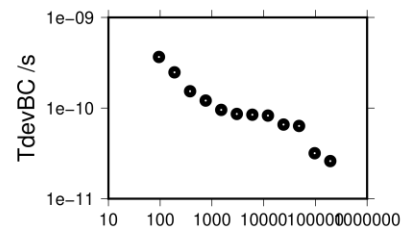




18851 s: E1= 12 ps	187948 s: E5= 20 ps
94255 s: E1= 27 ps	93974 s: E5= 10 ps
47128 s: E1= 67 ps	46987 s: E5= 55 ps
23564 s: E1= 70 ps	23493 s: E5= 63 ps
11782 s: E1= 71 ps	11747 s: E5= 92 ps
5891 s: E1= 66 ps	5873 s: E5= 81 ps
2945 s: E1= 72 ps	2937 s: E5= 97 ps
1473 s: E1= 77 ps	1468 s: E5= 118 ps
736 s: E1= 85 ps	734 s: E5= 140 ps
368 s: E1= 108 ps	367 s: E5= 155 ps
184 s: E1= 177 ps	184 s: E5= 268 ps
92 s: E1= 258 ps	92 s: E5= 398 ps
46 s: E1= 367 ps	46 s: E5= 561 ps



193884 s: BC= 26 ps	193301 s: B5= 12 ps
96942 s: BC= 32 ps	96650 s: B5= 33 ps
48471 s: BC= 63 ps	48325 s: B5= 64 ps
24235 s: BC= 66 ps	24163 s: B5= 94 ps
12118 s: BC= 83 ps	12081 s: B5= 123 ps
6059 s: BC= 84 ps	6041 s: B5= 131 ps
3029 s: BC= 86 ps	3020 s: B5= 143 ps
1515 s: BC= 96 ps	1510 s: B5= 169 ps
757 s: BC= 121 ps	755 s: B5= 190 ps
379 s: BC= 153 ps	378 s: B5= 222 ps
189 s: BC= 248 ps	189 s: B5= 387 ps
95 s: BC= 367 ps	94 s: B5= 597 ps



**GS17-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 185298  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : 4.155 1.925  
 Iteration 0: Obs used = 307057; Huge residuals = 0; Large residuals = 375  
 Iteration 1: Obs used = 307057; Huge residuals = 0; Large residuals = 375  
 Computed code bias (P1/P2)/m = 4.458 2.099  
 Computed baseline (X,Y,Z)/m = -3.613 1.442 -2.892  
 RMS of residuals /m = 0.327

Number of phase differences to fit baseline  
 L1/L2 = 177048  
 L5 = 94296  
 A priori baseline (X,Y,Z)/m = -3.613 1.442 -2.892  
 22543 clock jitters computed out of 22621 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 43.9

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 = 0.071 -0.197 -0.253  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.073 -0.199 -0.256  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = 0.063 -0.202 -0.254  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -3.541 1.244 -3.147  
 22543 clock jitters computed out of 22621 intervals  
 AVE jitter /ps = -0.0 RMS jitter /ps = 0.6

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.005 -0.014 -0.006  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.003 -0.017 -0.009  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = -0.004 -0.010 -0.010  
 RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -3.546 1.230 -3.153  
 Final baseline L2 (X,Y,Z)/m = -3.544 1.227 -3.156  
 Final baseline L5 (X,Y,Z)/m = -3.545 1.234 -3.157



## COMPUTATION OF CODE DIFFERENCES

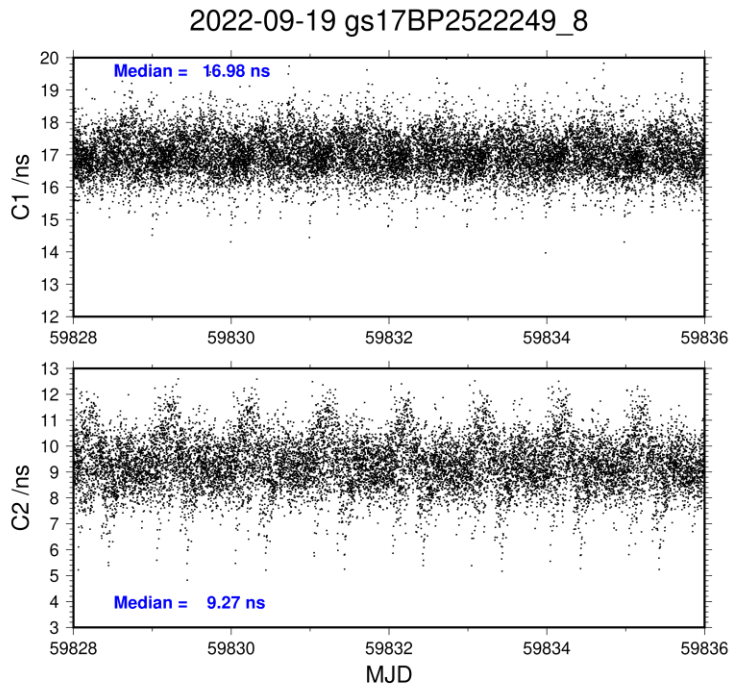
Total number of code differences = 682234

Global average of individual differences

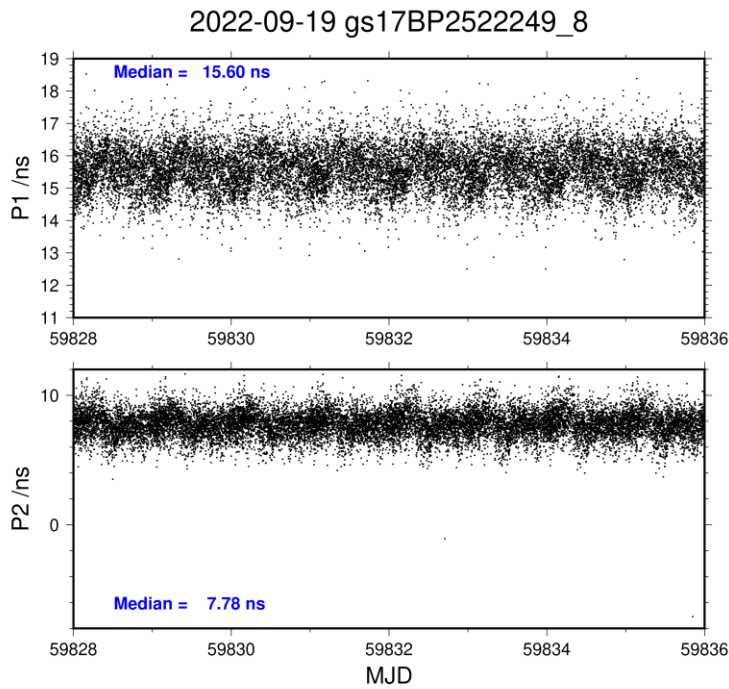
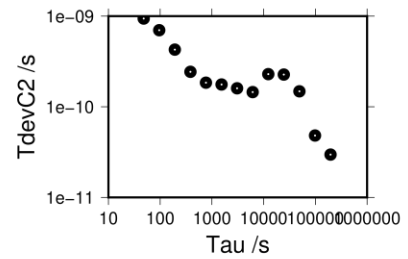
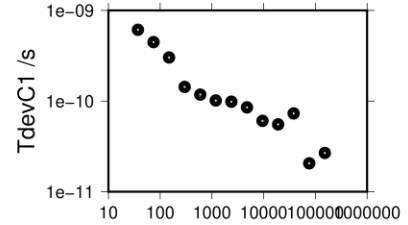
<b>Code</b>	<b>#pts</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	186070	17.013	0.752
C2	144198	9.293	1.096
P1	185048	15.607	0.814
P2	185114	7.744	1.205
E1	148722	17.503	0.662
E5	148784	13.038	0.838
BC	108674	17.909	0.722
B5	108752	13.439	0.788

Number of 300s epochs in out file = 2304

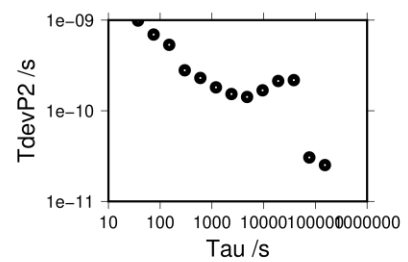
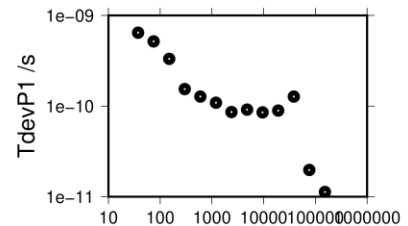
<b>Code</b>	<b>#pts</b>	<b>median/ns</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	18581	16.979	17.008	0.606
C2	14397	9.268	9.290	0.971
P1	18489	15.603	15.602	0.670
P2	18495	7.777	7.750	1.023
E1	14862	17.494	17.498	0.519
E5	14867	13.031	13.035	0.747
BC	10851	17.884	17.906	0.602
B5	10857	13.405	13.436	0.710

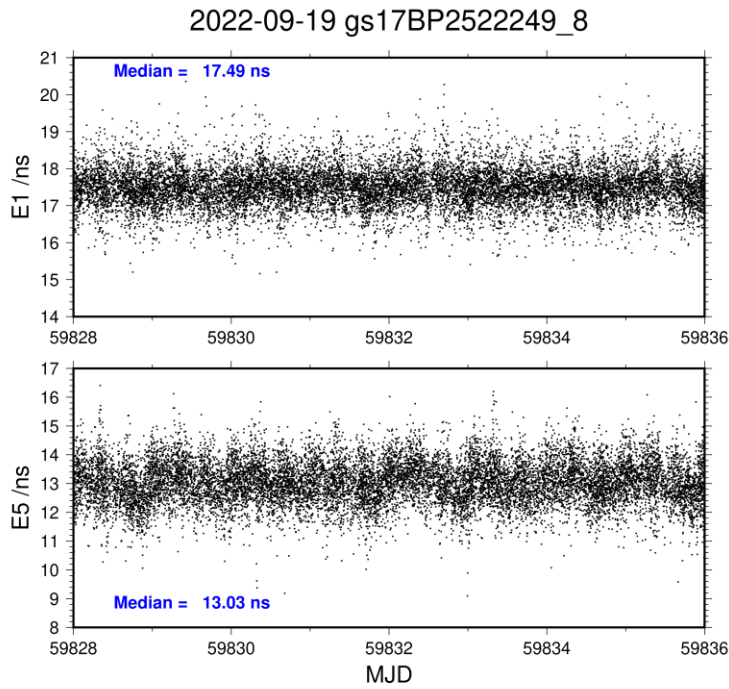


152310 s: C1= 27 ps	196577 s: C2= 30 ps
76155 s: C1= 21 ps	98289 s: C2= 48 ps
38078 s: C1= 73 ps	49144 s: C2= 148 ps
19039 s: C1= 55 ps	24572 s: C2= 227 ps
9519 s: C1= 60 ps	12286 s: C2= 229 ps
4760 s: C1= 85 ps	6143 s: C2= 145 ps
2380 s: C1= 98 ps	3072 s: C2= 160 ps
1190 s: C1= 102 ps	1536 s: C2= 176 ps
595 s: C1= 118 ps	768 s: C2= 185 ps
297 s: C1= 143 ps	384 s: C2= 243 ps
149 s: C1= 303 ps	192 s: C2= 427 ps
74 s: C1= 447 ps	96 s: C2= 699 ps
37 s: C1= 611 ps	48 s: C2= 941 ps

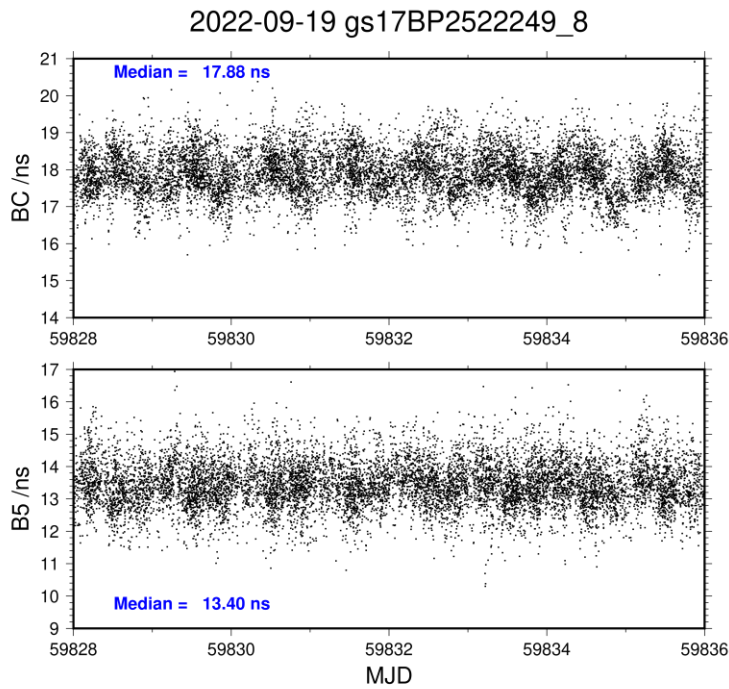
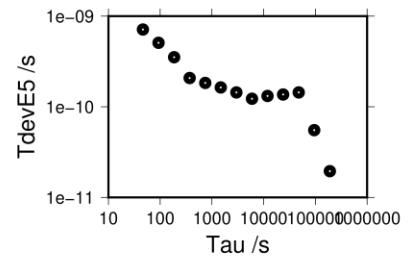
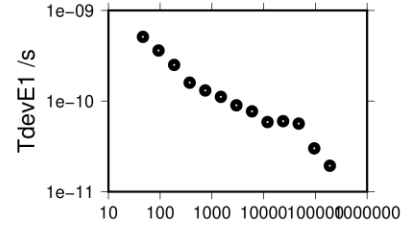


153068 s: P1= 11 ps	153019 s: P2= 25 ps
76534 s: P1= 20 ps	76509 s: P2= 31 ps
38267 s: P1= 127 ps	38255 s: P2= 218 ps
19134 s: P1= 89 ps	19127 s: P2= 213 ps
9567 s: P1= 85 ps	9564 s: P2= 168 ps
4783 s: P1= 91 ps	4782 s: P2= 142 ps
2392 s: P1= 86 ps	2391 s: P2= 153 ps
1196 s: P1= 109 ps	1195 s: P2= 181 ps
598 s: P1= 127 ps	598 s: P2= 230 ps
299 s: P1= 154 ps	299 s: P2= 280 ps
149 s: P1= 332 ps	149 s: P2= 534 ps
75 s: P1= 517 ps	75 s: P2= 693 ps
37 s: P1= 645 ps	37 s: P2= 990 ps

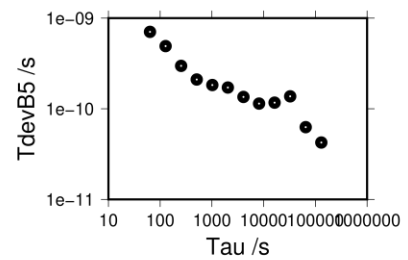
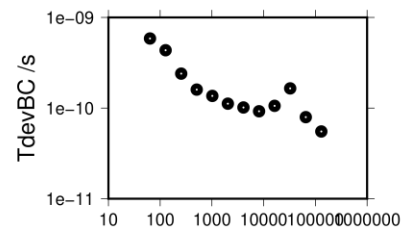




190426 s: E1=	19 ps	190362 s: E5=	19 ps
95213 s: E1=	30 ps	95181 s: E5=	55 ps
47607 s: E1=	56 ps	47591 s: E5=	144 ps
23803 s: E1=	60 ps	23795 s: E5=	137 ps
11902 s: E1=	59 ps	11898 s: E5=	132 ps
5951 s: E1=	77 ps	5949 s: E5=	123 ps
2975 s: E1=	90 ps	2974 s: E5=	144 ps
1488 s: E1=	111 ps	1487 s: E5=	164 ps
744 s: E1=	131 ps	744 s: E5=	183 ps
372 s: E1=	160 ps	372 s: E5=	207 ps
186 s: E1=	251 ps	186 s: E5=	352 ps
93 s: E1=	361 ps	93 s: E5=	508 ps
46 s: E1=	511 ps	46 s: E5=	713 ps



130411 s: BC=	55 ps	130339 s: B5=	42 ps
65206 s: BC=	79 ps	65170 s: B5=	63 ps
32603 s: BC=	165 ps	32585 s: B5=	137 ps
16301 s: BC=	106 ps	16292 s: B5=	117 ps
8151 s: BC=	92 ps	8146 s: B5=	114 ps
4075 s: BC=	102 ps	4073 s: B5=	135 ps
2038 s: BC=	112 ps	2037 s: B5=	172 ps
1019 s: BC=	136 ps	1018 s: B5=	183 ps
509 s: BC=	160 ps	509 s: B5=	210 ps
255 s: BC=	240 ps	255 s: B5=	297 ps
127 s: BC=	435 ps	127 s: B5=	491 ps
64 s: BC=	586 ps	64 s: B5=	706 ps



**GS17-BP2G**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 187809  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 33069 high elev obs : 0.363 0.195  
 Iteration 0: Obs used = 309995; Huge residuals = 0; Large residuals = 2459  
 Iteration 1: Obs used = 309995; Huge residuals = 0; Large residuals = 2459  
 Computed code bias (P1/P2)/m = 0.542 0.329  
 Computed baseline (X,Y,Z)/m = -4.417 1.011 -2.636  
 RMS of residuals /m = 0.347

Number of phase differences to fit baseline  
 L1/L2 = 179426  
 L5 = 95726  
 A priori baseline (X,Y,Z)/m = -4.417 1.011 -2.636  
 22503 clock jitters computed out of 22603 intervals  
 AVE jitter /ps = 0.3 RMS jitter /ps = 43.9

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 = 0.038 -0.229 -0.329  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = 0.031 -0.214 -0.315  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = 0.025 -0.222 -0.314  
 RMS of residuals L5 /m = 0.002

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -4.383 0.790 -2.958  
 22503 clock jitters computed out of 22603 intervals  
 AVE jitter /ps = -0.2 RMS jitter /ps = 0.7

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.012 -0.030 -0.018  
 RMS of residuals L1 /m = 0.002  
 Computed baseline L2 (X,Y,Z)/m = -0.019 -0.016 -0.005  
 RMS of residuals L2 /m = 0.003  
 Computed baseline L5 (X,Y,Z)/m = -0.018 -0.014 -0.005  
 RMS of residuals L5 /m = 0.002

Final baseline L1 (X,Y,Z)/m = -4.394 0.759 -2.977  
 Final baseline L2 (X,Y,Z)/m = -4.402 0.773 -2.963  
 Final baseline L5 (X,Y,Z)/m = -4.400 0.776 -2.963

## COMPUTATION OF CODE DIFFERENCES

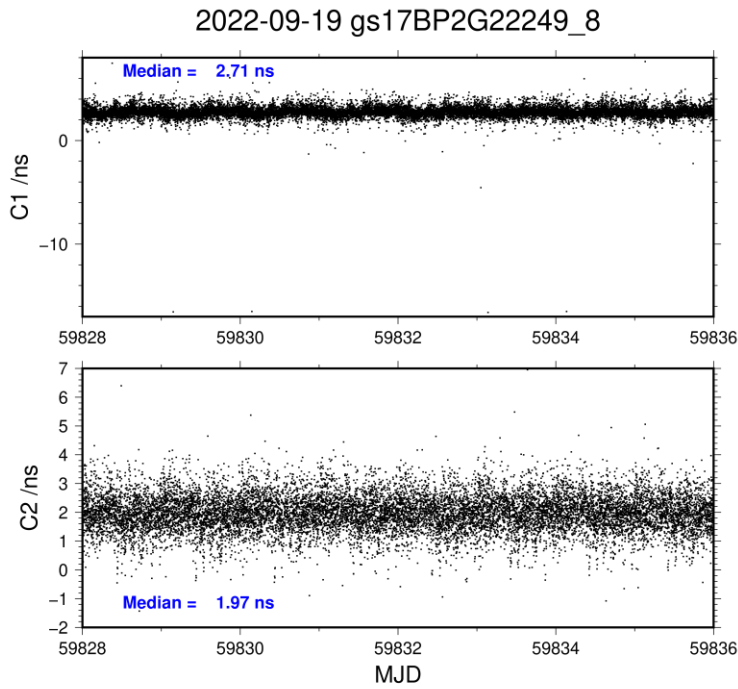
Total number of code differences = 691691

Global average of individual differences

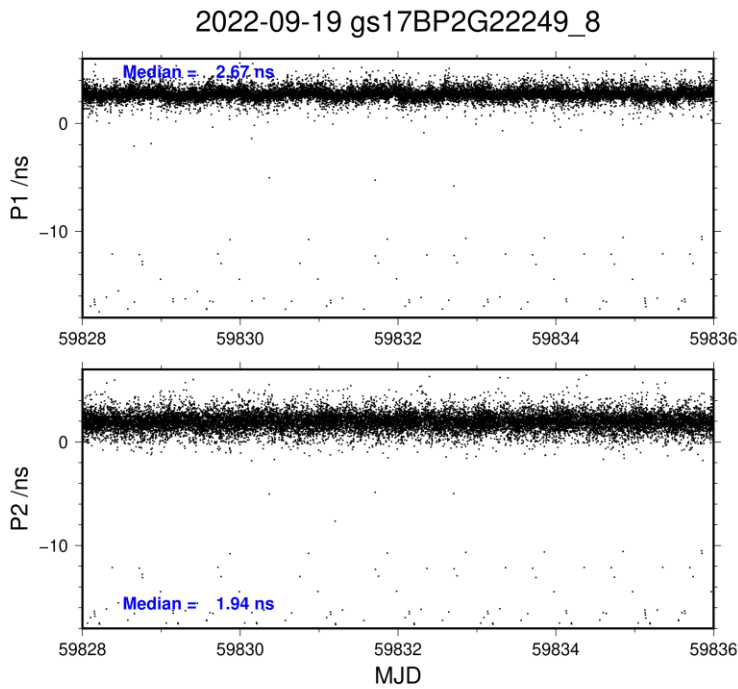
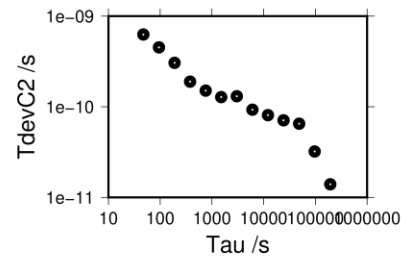
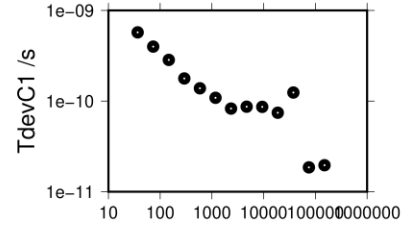
<b>Code</b>	<b>#pts</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	188635	2.730	1.047
C2	145994	1.983	1.038
P1	187553	2.606	1.570
P2	187740	1.836	1.806
E1	150439	2.699	0.701
E5	150888	5.239	0.793
BC	109488	2.850	0.676
B5	109798	5.288	0.744

Number of 300s epochs in out file = 2304

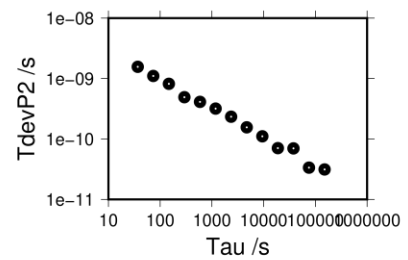
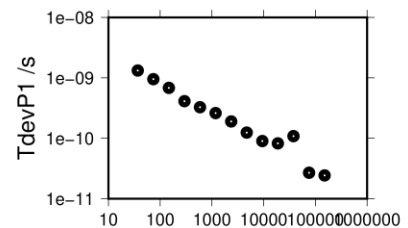
<b>Code</b>	<b>#pts</b>	<b>median/ns</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	18844	2.712	2.736	0.581
C2	14582	1.969	1.978	0.640
P1	18745	2.675	2.618	1.332
P2	18768	1.944	1.840	1.574
E1	15034	2.673	2.699	0.440
E5	15079	5.250	5.235	0.628
BC	10927	2.812	2.846	0.401
B5	10962	5.311	5.285	0.577



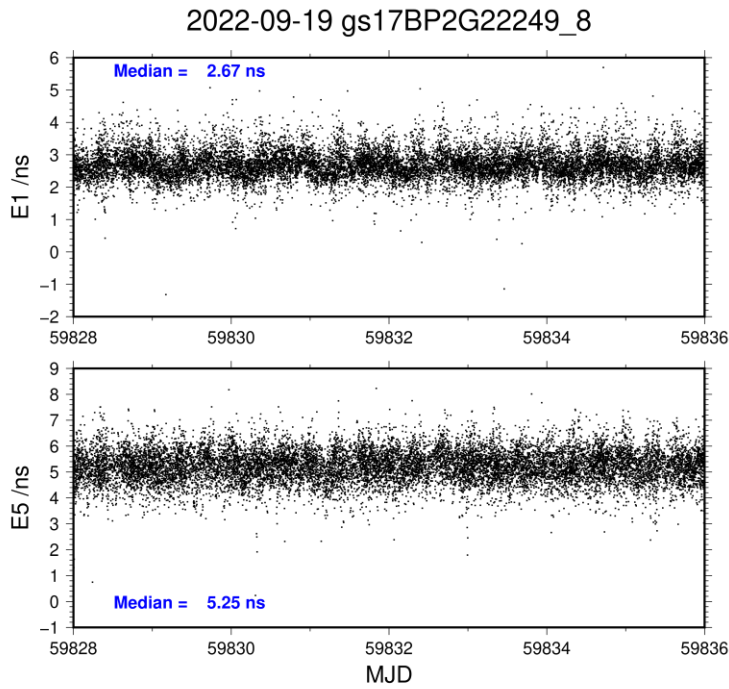
150184 s: C1= 20 ps	194083 s: C2= 14 ps
75092 s: C1= 19 ps	97042 s: C2= 32 ps
37546 s: C1= 124 ps	48521 s: C2= 65 ps
18773 s: C1= 74 ps	24260 s: C2= 71 ps
9367 s: C1= 86 ps	12130 s: C2= 81 ps
4693 s: C1= 87 ps	6065 s: C2= 93 ps
2347 s: C1= 83 ps	3033 s: C2= 131 ps
1173 s: C1= 109 ps	1516 s: C2= 128 ps
587 s: C1= 138 ps	758 s: C2= 151 ps
293 s: C1= 178 ps	379 s: C2= 189 ps
147 s: C1= 284 ps	190 s: C2= 305 ps
73 s: C1= 399 ps	95 s: C2= 452 ps
37 s: C1= 573 ps	47 s: C2= 627 ps



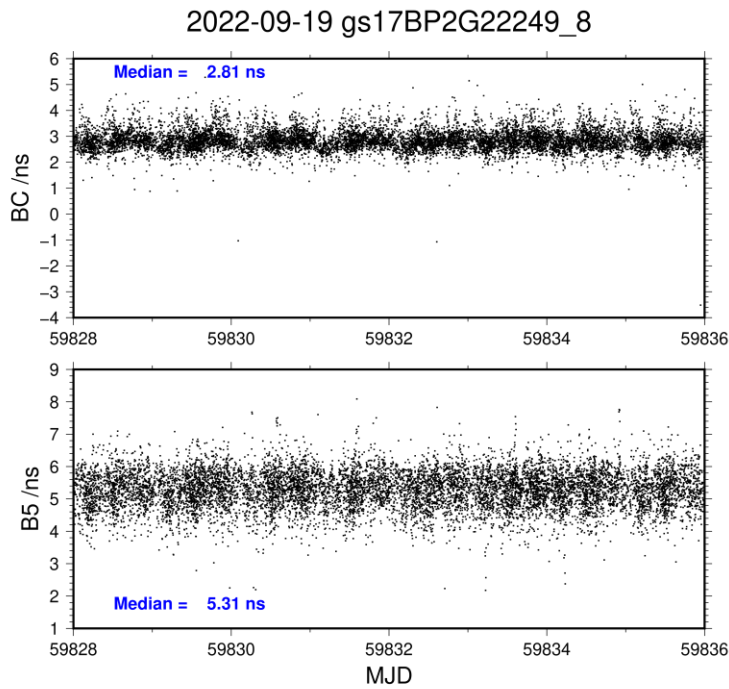
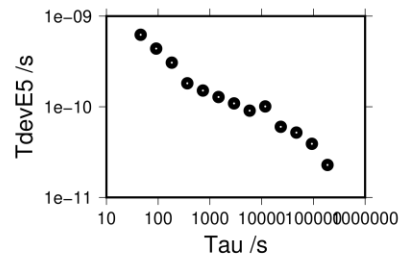
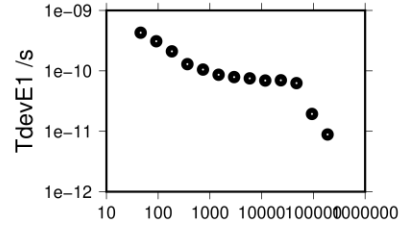
150978 s: P1= 24 ps	150793 s: P2= 31 ps
75489 s: P1= 27 ps	75396 s: P2= 34 ps
37744 s: P1= 109 ps	37698 s: P2= 70 ps
18872 s: P1= 82 ps	18849 s: P2= 71 ps
9436 s: P1= 90 ps	9425 s: P2= 111 ps
4718 s: P1= 124 ps	4712 s: P2= 156 ps
2359 s: P1= 190 ps	2356 s: P2= 234 ps
1180 s: P1= 261 ps	1178 s: P2= 319 ps
590 s: P1= 327 ps	589 s: P2= 411 ps
295 s: P1= 412 ps	295 s: P2= 491 ps
147 s: P1= 682 ps	147 s: P2= 818 ps
74 s: P1= 952 ps	74 s: P2= 1104 ps
37 s: P1= 1324 ps	37 s: P2= 1565 ps



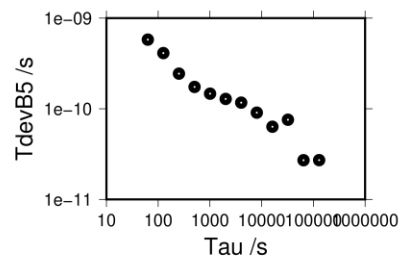
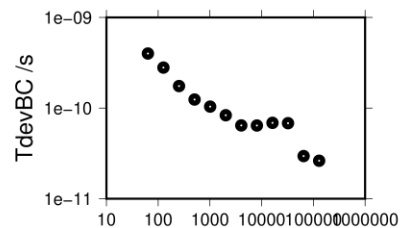




188248 s: E1= 9 ps	187686 s: E5= 23 ps
94124 s: E1= 19 ps	93843 s: E5= 39 ps
47062 s: E1= 63 ps	46921 s: E5= 52 ps
23531 s: E1= 70 ps	23461 s: E5= 60 ps
11765 s: E1= 69 ps	11730 s: E5= 101 ps
5883 s: E1= 75 ps	5865 s: E5= 91 ps
2941 s: E1= 79 ps	2933 s: E5= 109 ps
1471 s: E1= 86 ps	1466 s: E5= 128 ps
735 s: E1= 105 ps	733 s: E5= 151 ps
368 s: E1= 129 ps	367 s: E5= 182 ps
184 s: E1= 210 ps	183 s: E5= 307 ps
92 s: E1= 309 ps	92 s: E5= 439 ps
46 s: E1= 428 ps	46 s: E5= 623 ps



129504 s: BC= 26 ps	129091 s: B5= 27 ps
64752 s: BC= 30 ps	64545 s: B5= 27 ps
32376 s: BC= 68 ps	32273 s: B5= 76 ps
16188 s: BC= 69 ps	16136 s: B5= 63 ps
8094 s: BC= 64 ps	8068 s: B5= 91 ps
4047 s: BC= 64 ps	4034 s: B5= 117 ps
2024 s: BC= 83 ps	2017 s: B5= 128 ps
1012 s: BC= 104 ps	1009 s: B5= 147 ps
506 s: BC= 124 ps	504 s: B5= 174 ps
253 s: BC= 175 ps	252 s: B5= 244 ps
126 s: BC= 280 ps	126 s: B5= 411 ps
63 s: BC= 400 ps	63 s: B5= 579 ps



**1.3/ NICT (22321)****Period**

MJD 59900 to 59906

**Delays**

BP25:	(cf page 4 & 84)
REFDLY = 280.08 ns	(226.7+53.38)
CABDLY = 176.24 ns	(C208)
BP2G:	(cf page 5 & 84)
REFDLY = 280.18 ns	(226.7+53.48)
CABDLY = 176.38 ns	(C211)
NC4S:	(cf page 80)
$X_P = 167.40$ ns	
$X_O = 148.10$ ns	
REFDLY = 315.50 ns	
CABDLY = 0 ns	
NC5S:	(cf page 81)
$X_P = 209.90$ ns	
$X_O = 56.60$ ns	
REFDLY = 266.50 ns	
CABDLY = 0 ns	
NC5G:	(cf page 82)
REFDLY = 171.30 ns	
CABDLY = 268.70 ns	



Setup at the NICT

**Annex A - Information Sheet**

(to be repeated for each calibrated system)

Laboratory:	National Institute of Information and Communication Technology	
Date and hour of the beginning of measurements:	10/11/2022 0 h UTC	
Date and hour of the end of measurements:	06/12/2022 0 h UTC	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	NC4S	BP2G / BP25
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx4 TR Pro S/N: 3102252	
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):	FUJIKURA 8D-SFA-LITE Phase stabilized: No	
Length outside the building /m:		
• Antenna maker and type: Antenna serial number:	AeroAntenna AT1675-120SW S/N: 5411	
Temperature (if stabilised) /°C		
<b>Measured delays /ns</b>		
(if needed fill box "Additional Information" below)		
	<b>Local:</b>	<b>Travelling:</b>
• Delay from local UTC to receiver 1 PPS-in:	167.4 ns	
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	148.1 ns (167.4 + 148.1 = 315.5 ns)	
• Antenna cable delay:		(1)
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
<b>Data used for the generation of CGGTTS files</b>		
• INT DLY (GPS) /ns:	278.6 ns (C1), 277.4 ns (P1), 276.8 ns (P2)	
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:	314.1 ns	
• Coordinates reference frame:		
Latitude or X /m:	-3942091.40	
Longitude or Y /m:	3368261.97	
Height or Z /m:	3701993.34	
<b>General information</b>		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:	Yes	
Set temperature value and uncertainty:	24 degree C	
Set humidity value and uncertainty:	40 %	

(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:	National Institute of Information and Communication Technology	
Date and hour of the beginning of measurements:	10/11/2022 0 h UTC	
Date and hour of the end of measurements:	06/12/2022 0 h UTC	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	NC5S	BP2G / BP25
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx5 TR S/N: 4701293	
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):	FUJIKURA 8D-SFA-LITE Phase stabilized: No	
Length outside the building /m:		
• Antenna maker and type: Antenna serial number:	NovAtel GPS-703-GGG-MV NMFV16270013R	
Temperature (if stabilised) /°C		
<b>Measured delays /ns</b>		
(if needed fill box "Additional Information" below)		
	<b>Local:</b>	<b>Travelling:</b>
• Delay from local UTC to receiver 1 PPS-in:	209.9 ns	
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)	56.6 ns (209.9 + 56.6 = 266.5 ns)	
• Antenna cable delay:		(1)
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
<b>Data used for the generation of CGGTTS files</b>		
• INT DLY (GPS) /ns:	395.7 ns (C1), 393.4 ns (P1), 392.6 ns (P2)	
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:		
• REF DLY /ns:	265.4 ns	
• Coordinates reference frame:		
Latitude or X /m:	-3942090.07	
Longitude or Y /m:	3368263.35	
Height or Z /m:	3701993.60	
<b>General information</b>		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:	Yes	
Set temperature value and uncertainty:	24 degree C	
Set humidity value and uncertainty:	40 %	

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

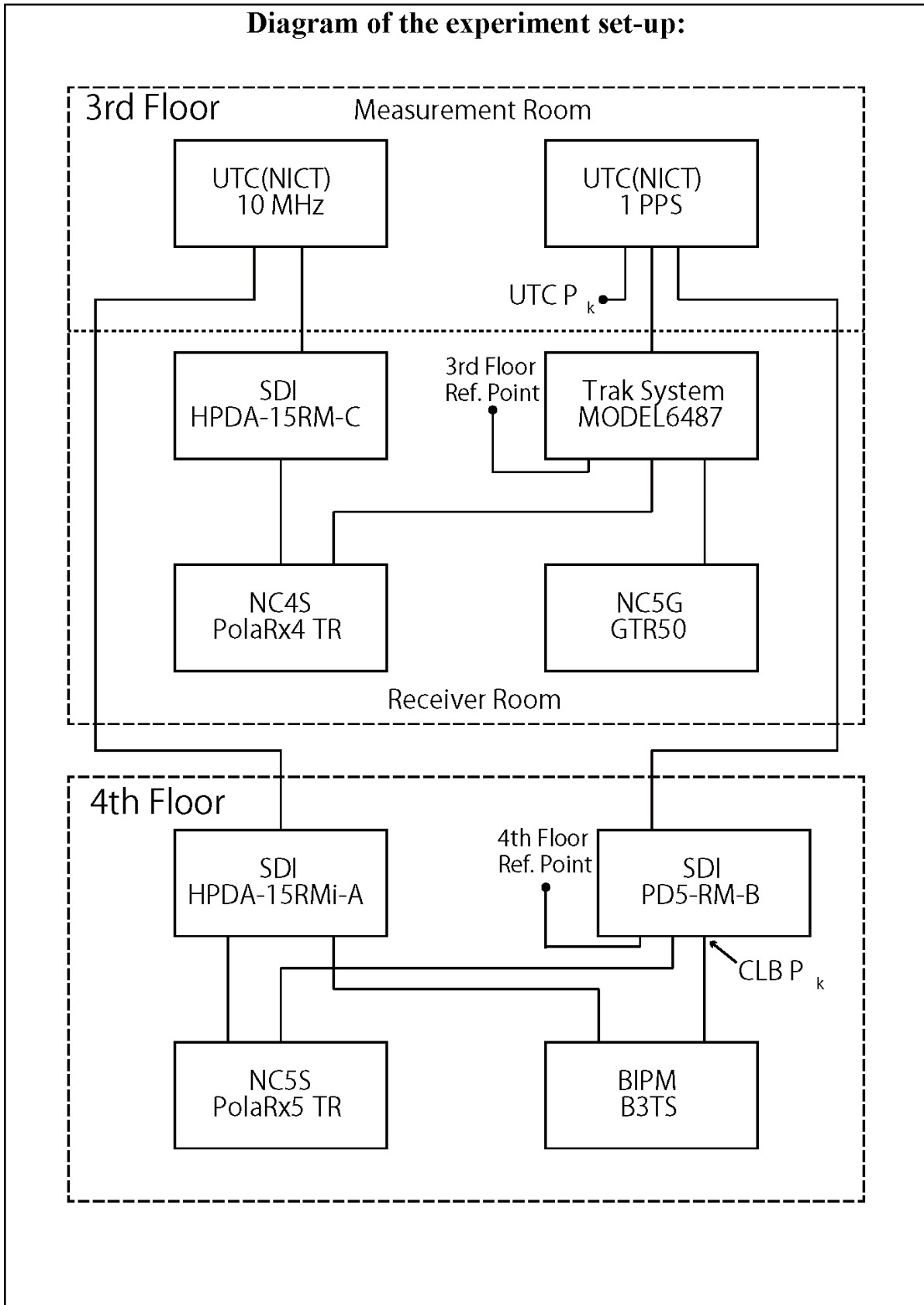
**Annex A - Information Sheet**

(to be repeated for each calibrated system)

Laboratory:	National Institute of Information and Communication Technology	
Date and hour of the beginning of measurements:	10/11/2022 0 h UTC	
Date and hour of the end of measurements:	06/12/2022 0 h UTC	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	NC5G	BP2G / BP25
• Receiver maker and type: Receiver serial number:	Dicom GTR50 S/N: 0801404	
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):	Andrew Heliac FSJ4-50B Phase stabilized: No	
Length outside the building /m:		
• Antenna maker and type: Antenna serial number:	NovAtel GPS-702-GG P/N: 01017577	
Temperature (if stabilised) /°C		
<b>Measured delays /ns</b>		
(if needed fill box "Additional Information" below)		
	<b>Local:</b>	<b>Travelling:</b>
• Delay from local UTC to receiver 1 PPS-in:	171.3 ns	
Delay from 1 PPS-in to internal Reference (if different): (see section 2 for details)		
• Antenna cable delay:	268.7 ns	(1)
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
<b>Data used for the generation of CGGTTS files</b>		
• INT DLY (GPS) /ns:	-29.9 ns (C1), -30.9 ns (P1), -19.0 ns (P2)	
• INT DLY (GLONASS) /ns:		
• CAB DLY /ns:	268.7 ns	
• REF DLY /ns:	170.2 ns	
• Coordinates reference frame:		
Latitude or X /m:	-3942088.21	
Longitude or Y /m:	3368252.34	
Height or Z /m:	3702001.40	
<b>General information</b>		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:	Yes	
Set temperature value and uncertainty:	24 degree C	
Set humidity value and uncertainty:	40 %	

(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 :**

1. UTC(NICT) – each reference points measured by clock transportation

3<sup>rd</sup> floor reference point (GNSS) = 162.9 ns

4<sup>th</sup> floor reference point (GNSS) = 209.3 ns

2. Reference delay measurements, 09/11/2022

UTC(NICT) – B3TS CLB Pk = 226.7 ns

3. Reference delay measurements, 06/12/2022

UTC(NICT) – B3TS CLB Pk = 226.7 ns

UTC(NICT) – BP2G input = 280.9 ns

UTC(NICT) – BP2G output = 319.5 ns

UTC(NICT) – NC5G input = 171.3 ns

UTC(NICT) – NC4S input = 167.5 ns

UTC(NICT) – NC4S output = 315.5 ns

UTC(NICT) – NC5S input = 210.0 ns

UTC(NICT) – NC5S output = 266.6 ns

NC4S-BP25

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 146356  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 21216 high elev obs : 14.130 12.732  
 Iteration 0: Obs used = 252802; Huge residuals = 0; Large residuals = 494  
 Iteration 1: Obs used = 252802; Huge residuals = 0; Large residuals = 494  
 Computed code bias (P1/P2)/m = 14.694 13.304  
 Computed baseline (X,Y,Z)/m = 16.926 13.416 3.029  
 RMS of residuals /m = 0.431

Number of phase differences to fit baseline  
 L1/L2 = 145400  
 L5 = 78747  
 A priori baseline (X,Y,Z)/m = 16.926 13.416 3.029  
 17266 clock jitters computed out of 17266 intervals  
 AVE jitter /ps = -0.2 RMS jitter /ps = 5.6

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 = 0.484 -0.363 -0.388  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.495 -0.372 -0.393  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.481 -0.381 -0.389  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 17.416 13.049 2.638  
 17266 clock jitters computed out of 17266 intervals  
 AVE jitter /ps = 0.2 RMS jitter /ps = 0.9

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.020 0.005 -0.007  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.031 -0.003 -0.012  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.033 -0.004 -0.012  
 RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = 17.436 13.054 2.632  
 Final baseline L2 (X,Y,Z)/m = 17.447 13.045 2.626  
 Final baseline L5 (X,Y,Z)/m = 17.448 13.044 2.626

COMPUTATION OF CODE DIFFERENCES

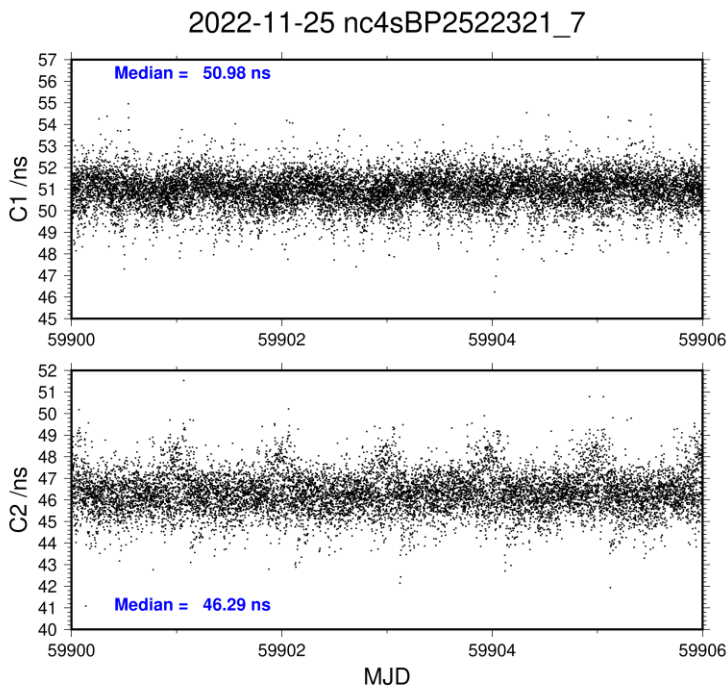
Total number of code differences = 324202

Global average of individual differences

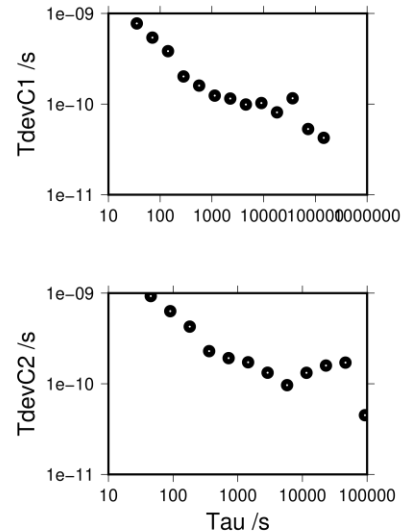
Code	#pts	ave/ns	rms/ns
C1	146615	50.947	1.398
C2	114908	46.322	1.338
P1	146284	50.577	1.452
P2	146267	45.943	1.233
E1	83746	51.024	0.870
E5	84318	53.744	0.915

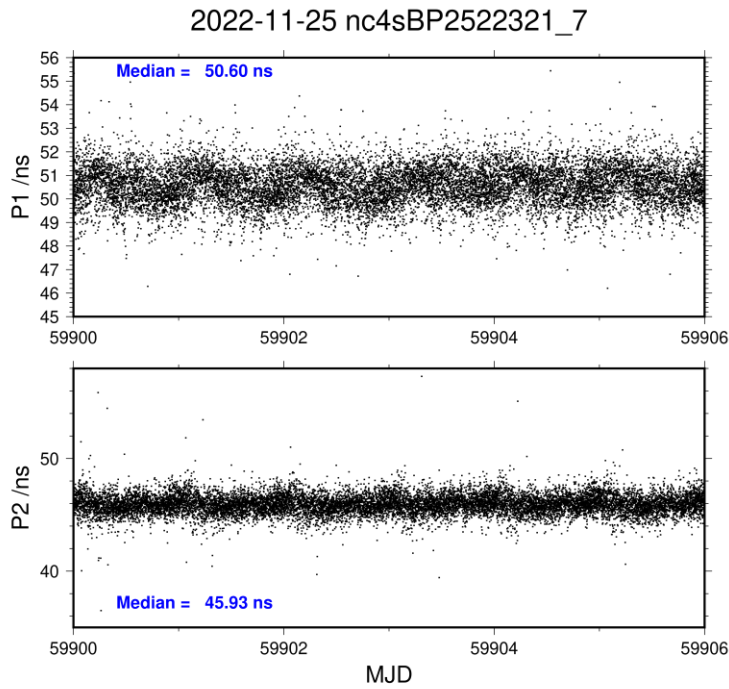
Number of 300s epochs in out file = 1728

Code	#pts	median/ns	ave/ns	rms/ns
C1	14634	50.979	50.953	0.765
C2	11472	46.289	46.323	0.915
P1	14605	50.597	50.579	0.808
P2	14604	45.927	45.939	0.889
E1	8373	51.029	51.020	0.553
E5	8437	53.739	53.744	0.741

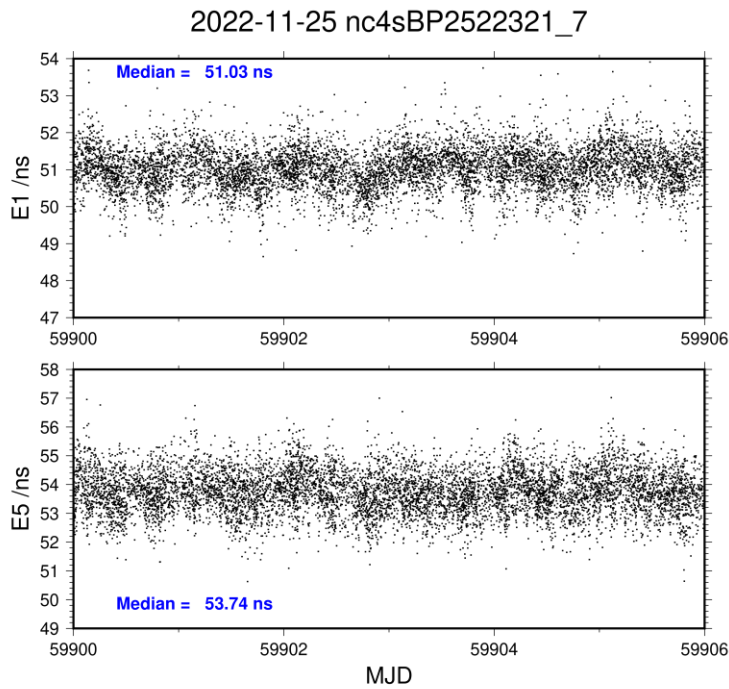
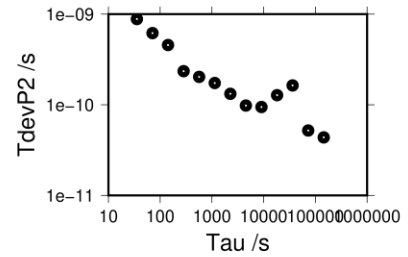
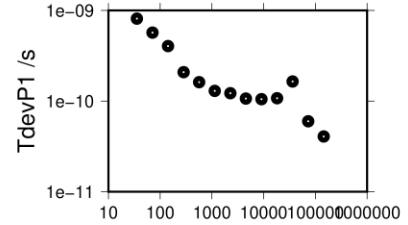


145024 s: C1= 42 ps  
 72512 s: C1= 53 ps 92500 s: C2= 45 ps  
 36256 s: C1= 116 ps 46250 s: C2= 171 ps  
 18128 s: C1= 81 ps 23125 s: C2= 159 ps  
 9064 s: C1= 103 ps 11563 s: C2= 132 ps  
 4532 s: C1= 99 ps 5781 s: C2= 97 ps  
 2266 s: C1= 115 ps 2891 s: C2= 132 ps  
 1133 s: C1= 124 ps 1445 s: C2= 173 ps  
 566 s: C1= 160 ps 723 s: C2= 192 ps  
 283 s: C1= 202 ps 361 s: C2= 229 ps  
 142 s: C1= 384 ps 181 s: C2= 427 ps  
 71 s: C1= 542 ps 90 s: C2= 632 ps  
 35 s: C1= 775 ps 45 s: C2= 928 ps

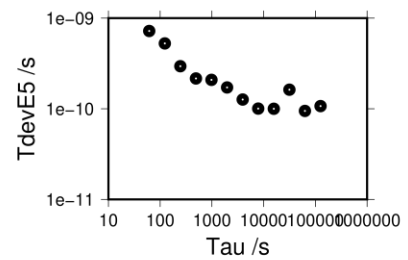
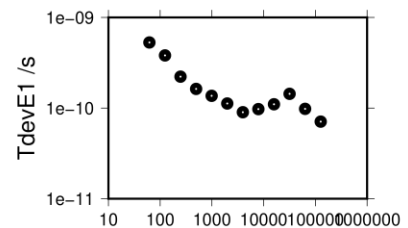




145312 s:	P1= 41 ps	145322 s:	P2= 44 ps
72656 s:	P1= 60 ps	72661 s:	P2= 52 ps
36328 s:	P1= 165 ps	36331 s:	P2= 163 ps
18164 s:	P1= 108 ps	18165 s:	P2= 128 ps
9082 s:	P1= 105 ps	9083 s:	P2= 95 ps
4541 s:	P1= 107 ps	4541 s:	P2= 98 ps
2270 s:	P1= 122 ps	2271 s:	P2= 132 ps
1135 s:	P1= 129 ps	1135 s:	P2= 174 ps
568 s:	P1= 162 ps	568 s:	P2= 203 ps
284 s:	P1= 208 ps	284 s:	P2= 235 ps
142 s:	P1= 404 ps	142 s:	P2= 456 ps
71 s:	P1= 569 ps	71 s:	P2= 617 ps
35 s:	P1= 811 ps	35 s:	P2= 882 ps



126740 s:	E1= 71 ps	125779 s:	E5= 107 ps
63370 s:	E1= 98 ps	62889 s:	E5= 95 ps
31685 s:	E1= 143 ps	31445 s:	E5= 162 ps
15843 s:	E1= 110 ps	15722 s:	E5= 100 ps
7921 s:	E1= 97 ps	7861 s:	E5= 100 ps
3961 s:	E1= 90 ps	3931 s:	E5= 126 ps
1980 s:	E1= 112 ps	1965 s:	E5= 172 ps
990 s:	E1= 136 ps	983 s:	E5= 208 ps
495 s:	E1= 163 ps	491 s:	E5= 216 ps
248 s:	E1= 222 ps	246 s:	E5= 295 ps
124 s:	E1= 381 ps	123 s:	E5= 526 ps
62 s:	E1= 529 ps	61 s:	E5= 722 ps





NC4S-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 162856  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 21225 high elev obs : 10.523 11.094  
 Iteration 0: Obs used = 283963; Huge residuals = 78; Large residuals = 2315  
 Iteration 1: Obs used = 283981; Huge residuals = 0; Large residuals = 2219  
 Computed code bias (P1/P2)/m = 11.025 11.700  
 Computed baseline (X,Y,Z)/m = 17.436 13.464 3.340  
 RMS of residuals /m = 0.514

Number of phase differences to fit baseline  
 L1/L2 = 160873  
 L5 = 89708  
 A priori baseline (X,Y,Z)/m = 17.436 13.464 3.340  
 17261 clock jitters computed out of 17262 intervals  
 AVE jitter /ps = -0.0 RMS jitter /ps = 4.8

Iter 1 Large residuals L1= 2  
 Iter 1 Large residuals L2= 2  
 Iter 1 Large residuals L5= 724  
 Computed baseline L1 (X,Y,Z)/m = 0.350 -0.259 -0.301  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.350 -0.256 -0.299  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = 0.326 -0.296 -0.345  
 RMS of residuals L5 /m = 0.004

Iter 2 Large residuals L1= 2  
 Iter 2 Large residuals L2= 2  
 Iter 2 Large residuals L5= 724  
 Computed baseline L1 (X,Y,Z)/m = 0.350 -0.259 -0.301  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.350 -0.256 -0.299  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = 0.329 -0.297 -0.349  
 RMS of residuals L5 /m = 0.004

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 17.786 13.206 3.040  
 17261 clock jitters computed out of 17262 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 0.6

Iter 3 Large residuals L1= 2  
 Iter 3 Large residuals L2= 2  
 Iter 3 Large residuals L5= 724  
 Computed baseline L1 (X,Y,Z)/m = 0.011 -0.001 -0.007  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.011 0.001 -0.004  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = -0.003 -0.033 -0.056  
 RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = 17.797 13.205 3.033

Final baseline L2 (X,Y,Z)/m = 17.797 13.207 3.036  
 Final baseline L5 (X,Y,Z)/m = 17.783 13.174 2.984

COMPUTATION OF CODE DIFFERENCES

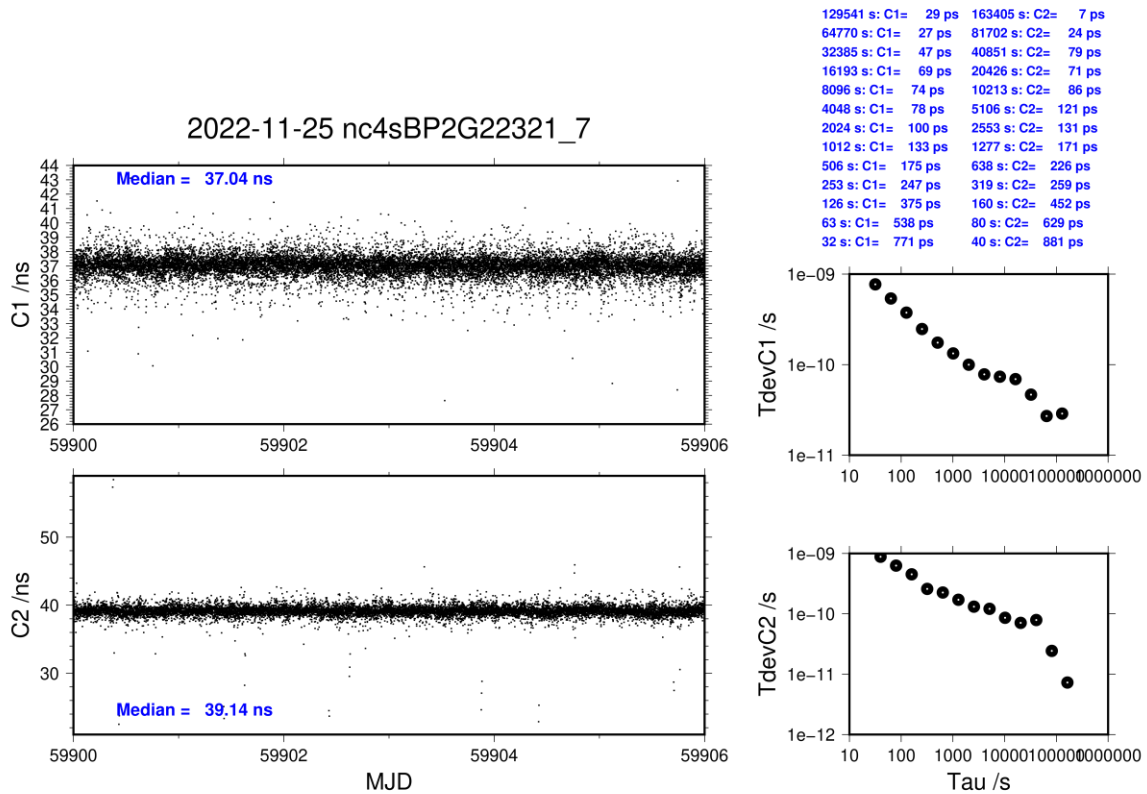
Total number of code differences = 355057

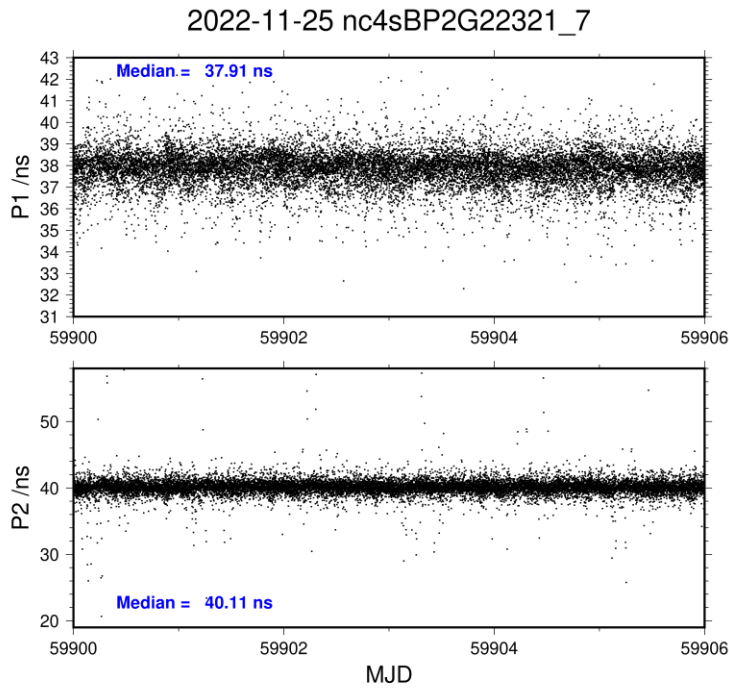
Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	163903	37.009	1.725
C2	130028	39.136	1.591
P1	162594	37.864	1.726
P2	162483	40.117	1.720
E1	85151	36.488	0.902
E5	86846	46.445	0.834

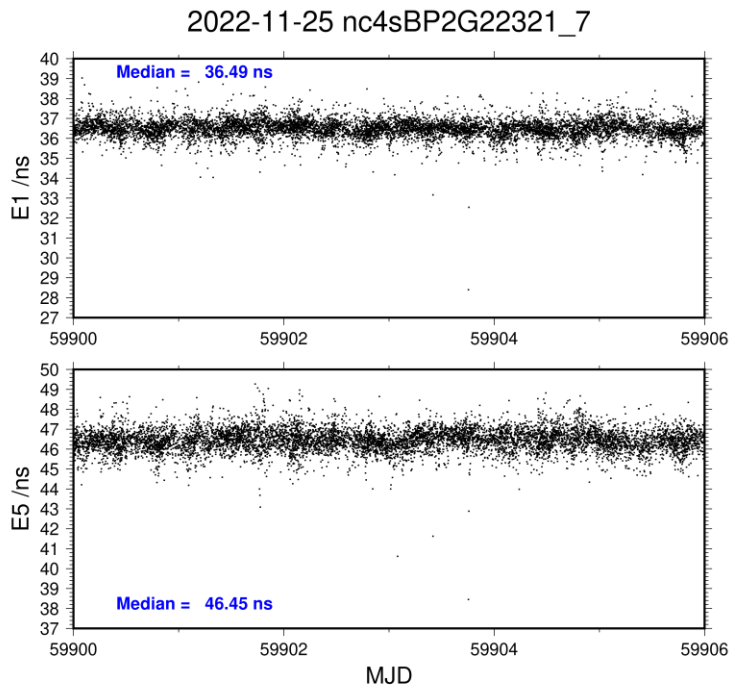
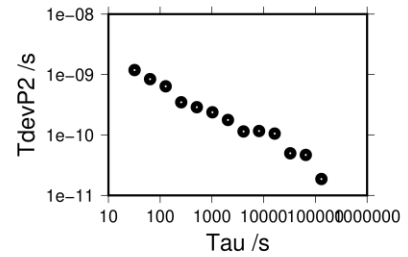
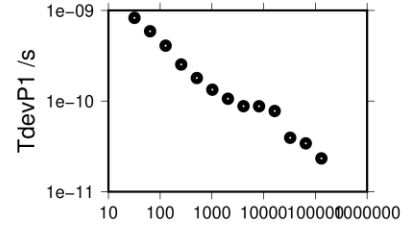
Number of 300s epochs in out file = 1728

Code	#pts	median/ns	ave/ns	rms/ns
C1	16383	37.039	37.010	0.762
C2	12988	39.142	39.136	0.888
P1	16244	37.910	37.868	0.821
P2	16228	40.111	40.106	1.195
E1	8527	36.491	36.484	0.459
E5	8682	46.452	46.444	0.571

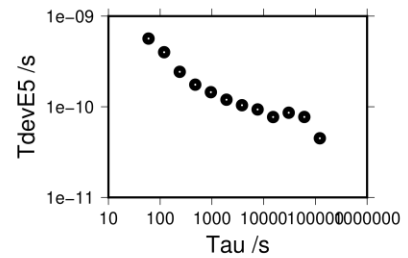
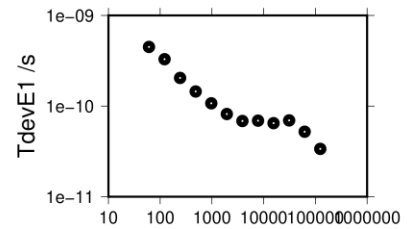




130649 s: P1= 23 ps	130778 s: P2= 19 ps
65325 s: P1= 34 ps	65389 s: P2= 47 ps
32662 s: P1= 39 ps	32695 s: P2= 50 ps
16331 s: P1= 78 ps	16347 s: P2= 105 ps
8166 s: P1= 88 ps	8174 s: P2= 116 ps
4083 s: P1= 88 ps	4087 s: P2= 115 ps
2041 s: P1= 106 ps	2043 s: P2= 177 ps
1021 s: P1= 134 ps	1022 s: P2= 238 ps
510 s: P1= 180 ps	511 s: P2= 288 ps
255 s: P1= 254 ps	255 s: P2= 348 ps
128 s: P1= 409 ps	128 s: P2= 638 ps
64 s: P1= 590 ps	64 s: P2= 840 ps
32 s: P1= 827 ps	32 s: P2= 1185 ps



124451 s: E1= 34 ps	122229 s: E5= 45 ps
62225 s: E1= 52 ps	61114 s: E5= 77 ps
31113 s: E1= 69 ps	30557 s: E5= 86 ps
15556 s: E1= 65 ps	15279 s: E5= 77 ps
7778 s: E1= 69 ps	7639 s: E5= 94 ps
3889 s: E1= 68 ps	3820 s: E5= 104 ps
1945 s: E1= 82 ps	1910 s: E5= 120 ps
972 s: E1= 107 ps	955 s: E5= 145 ps
486 s: E1= 145 ps	477 s: E5= 175 ps
243 s: E1= 205 ps	239 s: E5= 243 ps
122 s: E1= 329 ps	119 s: E5= 400 ps
61 s: E1= 449 ps	60 s: E5= 566 ps



NC5S-BP25

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 147051  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 21216 high elev obs : 63.335 61.978  
 Iteration 0: Obs used = 254086; Huge residuals = 38; Large residuals = 600  
 Iteration 1: Obs used = 254106; Huge residuals = 0; Large residuals = 542  
 Computed code bias (P1/P2)/m = 63.983 62.597  
 Computed baseline (X,Y,Z)/m = 15.492 12.149 2.774  
 RMS of residuals /m = 0.523

Number of phase differences to fit baseline  
 L1/L2 = 146100  
 L5 = 79445  
 A priori baseline (X,Y,Z)/m = 15.492 12.149 2.774  
 17264 clock jitters computed out of 17264 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 5.2

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 = 0.500 -0.449 -0.361  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.495 -0.446 -0.353  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.479 -0.451 -0.342  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 15.990 11.702 2.417  
 17264 clock jitters computed out of 17264 intervals  
 AVE jitter /ps = 0.0 RMS jitter /ps = 0.9

Iter 2 Large residuals L1= 0  
 Iter 2 Large residuals L2= 0  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.015 -0.016 -0.012  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.011 -0.013 -0.005  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.010 -0.011 0.001  
 RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = 16.005 11.687 2.404  
 Final baseline L2 (X,Y,Z)/m = 16.001 11.690 2.412  
 Final baseline L5 (X,Y,Z)/m = 16.000 11.691 2.418

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 616223

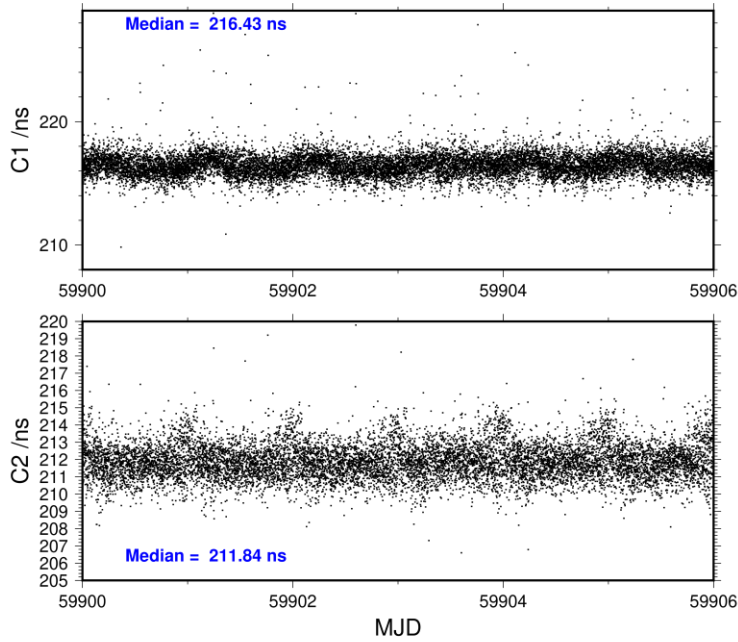
Global average of individual differences

<b>Code</b>	<b>#pts</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	148406	216.464	1.534
C2	116000	211.889	1.608
P1	146961	215.089	1.446
P2	146960	210.408	1.774
E1	112545	217.080	1.168
E5	112558	211.058	1.076
BC	148468	217.188	1.307
B5	148585	211.486	1.041

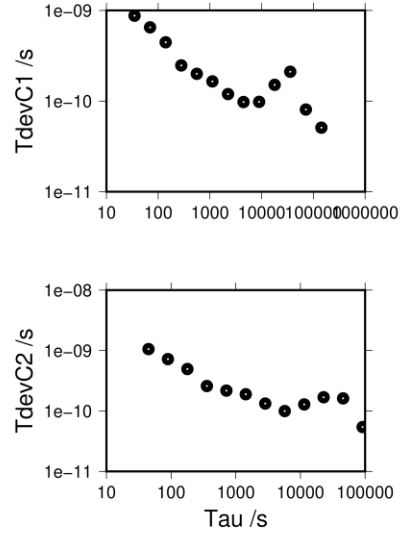
Number of 300s epochs in out file = 1728

<b>Code</b>	<b>#pts</b>	<b>median/ns</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	14835	216.428	216.454	0.903
C2	11599	211.842	211.894	1.037
P1	14670	215.088	215.077	0.907
P2	14669	210.420	210.424	1.144
E1	11268	217.076	217.084	0.709
E5	11267	211.053	211.067	0.809
BC	14833	217.191	217.197	0.880
B5	14843	211.479	211.488	0.800

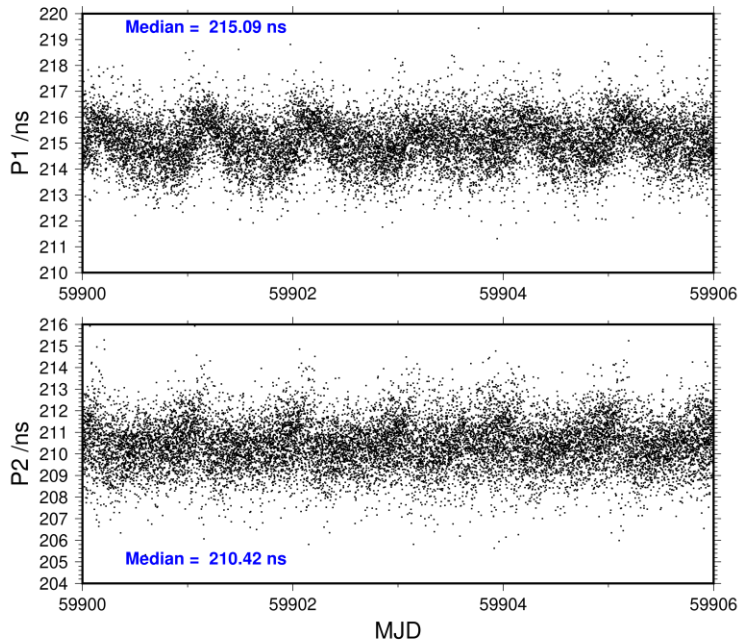
2022-11-25 NC5SBP2522321\_7



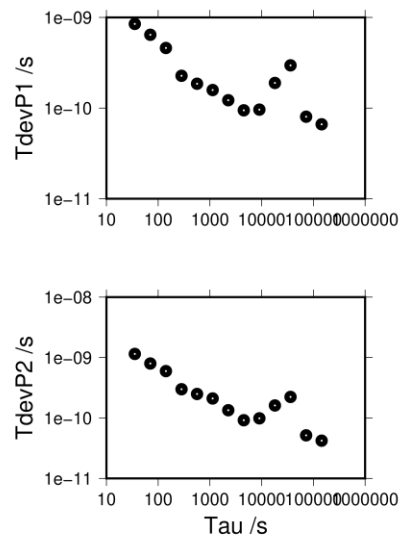
143059 s: C1= 51 ps	91487 s: C2= 54 ps
71530 s: C1= 81 ps	45744 s: C2= 162 ps
35765 s: C1= 211 ps	22872 s: C2= 169 ps
17882 s: C1= 151 ps	11436 s: C2= 128 ps
8941 s: C1= 98 ps	5718 s: C2= 100 ps
4471 s: C1= 98 ps	2859 s: C2= 133 ps
2235 s: C1= 120 ps	1429 s: C2= 189 ps
1118 s: C1= 165 ps	715 s: C2= 218 ps
559 s: C1= 200 ps	357 s: C2= 259 ps
279 s: C1= 248 ps	179 s: C2= 495 ps
140 s: C1= 445 ps	89 s: C2= 723 ps
70 s: C1= 650 ps	45 s: C2= 1058 ps
35 s: C1= 874 ps	



2022-11-25 NC5SBP2522321\_7

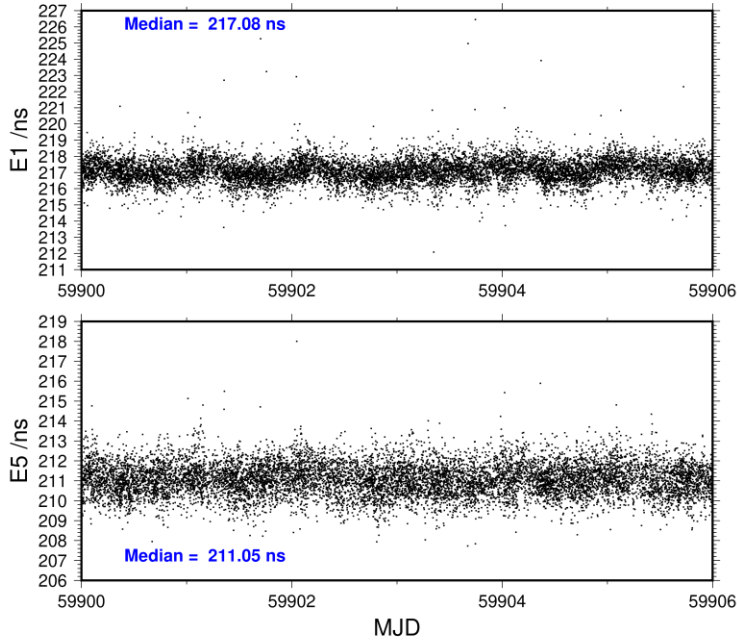


144668 s: P1= 66 ps	144678 s: P2= 42 ps
72334 s: P1= 80 ps	72339 s: P2= 52 ps
36167 s: P1= 296 ps	36170 s: P2= 223 ps
18084 s: P1= 189 ps	18085 s: P2= 161 ps
9042 s: P1= 96 ps	9042 s: P2= 99 ps
4521 s: P1= 95 ps	4521 s: P2= 92 ps
2260 s: P1= 122 ps	2261 s: P2= 134 ps
1130 s: P1= 158 ps	1130 s: P2= 210 ps
565 s: P1= 186 ps	565 s: P2= 250 ps
283 s: P1= 227 ps	283 s: P2= 299 ps
141 s: P1= 460 ps	141 s: P2= 597 ps
71 s: P1= 643 ps	71 s: P2= 798 ps
35 s: P1= 848 ps	35 s: P2= 1149 ps

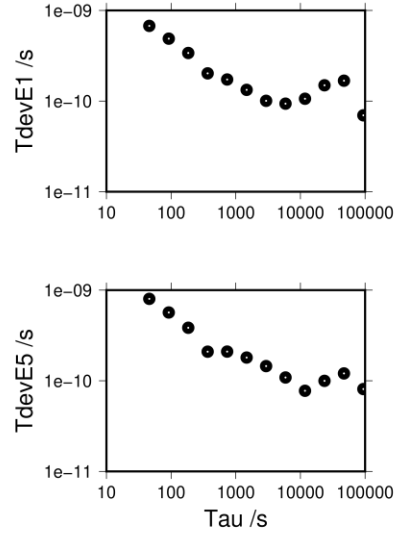




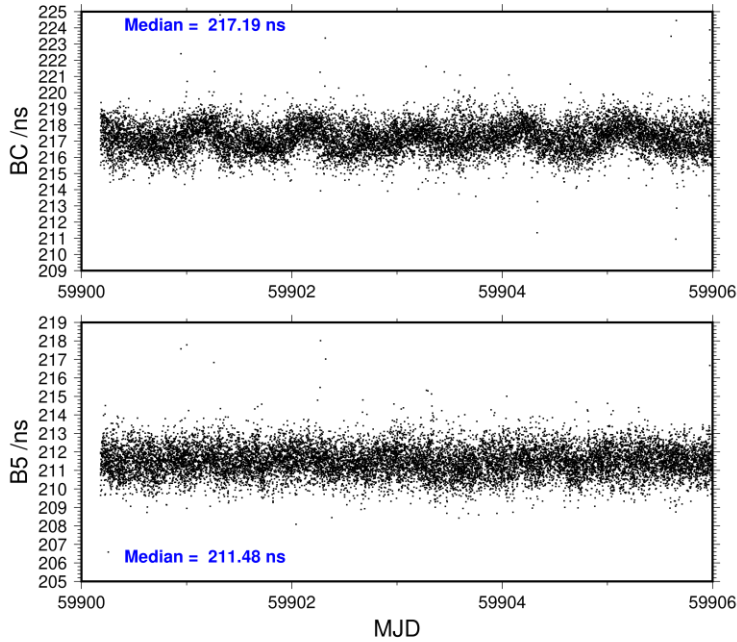
2022-11-25 NC5SBP2522321\_7



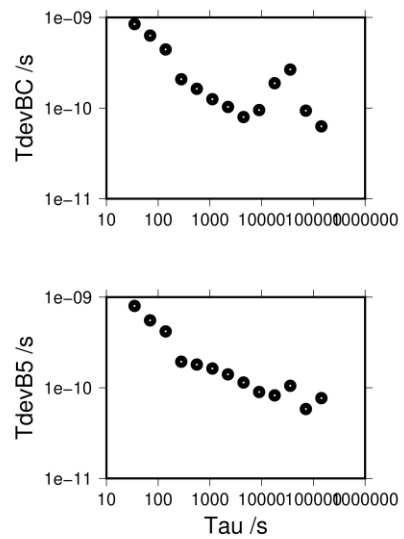
94175 s: E1= 70 ps	94183 s: E5= 81 ps
47087 s: E1= 168 ps	47092 s: E5= 121 ps
23544 s: E1= 149 ps	23546 s: E5= 100 ps
11772 s: E1= 106 ps	11773 s: E5= 78 ps
5886 s: E1= 94 ps	5886 s: E5= 109 ps
2943 s: E1= 101 ps	2943 s: E5= 145 ps
1471 s: E1= 133 ps	1472 s: E5= 180 ps
736 s: E1= 173 ps	736 s: E5= 210 ps
368 s: E1= 202 ps	368 s: E5= 209 ps
184 s: E1= 340 ps	184 s: E5= 384 ps
92 s: E1= 489 ps	92 s: E5= 567 ps
46 s: E1= 675 ps	46 s: E5= 801 ps



2022-11-25 NC5SBP2522321\_7



143078 s: BC= 63 ps	142982 s: B5= 77 ps
71539 s: BC= 94 ps	71491 s: B5= 58 ps
35770 s: BC= 266 ps	35745 s: B5= 105 ps
17885 s: BC= 188 ps	17873 s: B5= 82 ps
8942 s: BC= 95 ps	8936 s: B5= 90 ps
4471 s: BC= 80 ps	4468 s: B5= 114 ps
2236 s: BC= 103 ps	2234 s: B5= 140 ps
1118 s: BC= 125 ps	1117 s: B5= 163 ps
559 s: BC= 163 ps	559 s: B5= 181 ps
279 s: BC= 208 ps	279 s: B5= 194 ps
140 s: BC= 444 ps	140 s: B5= 419 ps
70 s: BC= 630 ps	70 s: B5= 555 ps
35 s: BC= 845 ps	35 s: B5= 800 ps



NC5S-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 165840  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 21225 high elev obs : 59.689 60.305  
 Iteration 0: Obs used = 290399; Huge residuals = 8; Large residuals = 1847  
 Iteration 1: Obs used = 290413; Huge residuals = 0; Large residuals = 1825  
 Computed code bias (P1/P2)/m = 60.340 61.019  
 Computed baseline (X,Y,Z)/m = 16.016 12.200 3.034  
 RMS of residuals /m = 0.568

Number of phase differences to fit baseline  
 L1/L2 = 164775  
 L5 = 92570  
 A priori baseline (X,Y,Z)/m = 16.016 12.200 3.034  
 17259 clock jitters computed out of 17260 intervals  
 AVE jitter /ps = 0.2 RMS jitter /ps = 4.1

Iter 1 Large residuals L1= 17  
 Iter 1 Large residuals L2= 18  
 Iter 1 Large residuals L5= 649  
 Computed baseline L1 (X,Y,Z)/m = 0.347 -0.350 -0.224  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.332 -0.332 -0.207  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.284 -0.361 -0.217  
 RMS of residuals L5 /m = 0.004

Iter 2 Large residuals L1= 17  
 Iter 2 Large residuals L2= 18  
 Iter 2 Large residuals L5= 649  
 Computed baseline L1 (X,Y,Z)/m = 0.347 -0.350 -0.224  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.332 -0.332 -0.207  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.285 -0.362 -0.217  
 RMS of residuals L5 /m = 0.004

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 16.356 11.858 2.818  
 17259 clock jitters computed out of 17260 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 0.5

Iter 3 Large residuals L1= 17  
 Iter 3 Large residuals L2= 18  
 Iter 3 Large residuals L5= 649  
 Computed baseline L1 (X,Y,Z)/m = 0.007 -0.022 -0.012  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.008 -0.004 0.005  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.047 -0.030 -0.007  
 RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = 16.362 11.837 2.806



Final baseline L2 (X,Y,Z)/m = 16.347 11.854 2.823  
 Final baseline L5 (X,Y,Z)/m = 16.309 11.828 2.811

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 693251

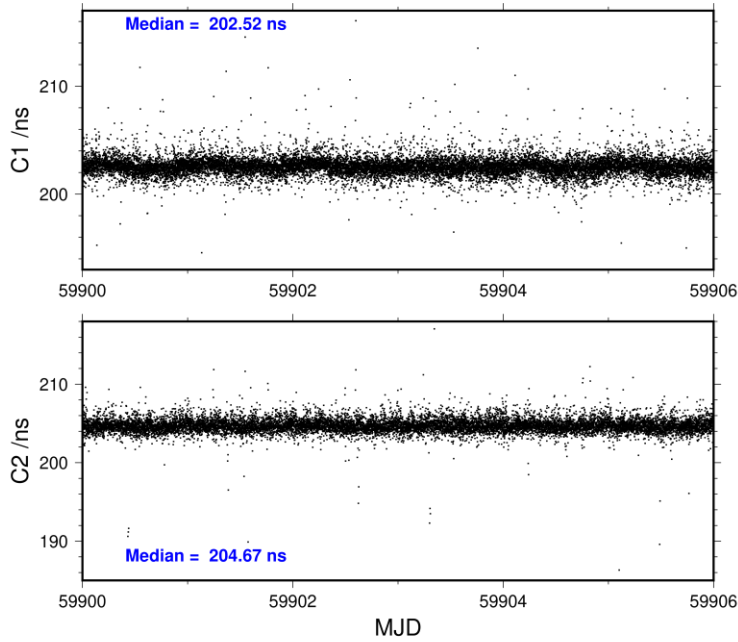
Global average of individual differences

<b>Code</b>	<b>#pts</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	168385	202.545	1.750
C2	132701	204.714	1.811
P1	165749	202.401	1.594
P2	165724	204.618	2.053
E1	128357	202.566	1.320
E5	128508	203.733	1.135
BC	166311	202.434	1.421
B5	166689	203.761	1.186

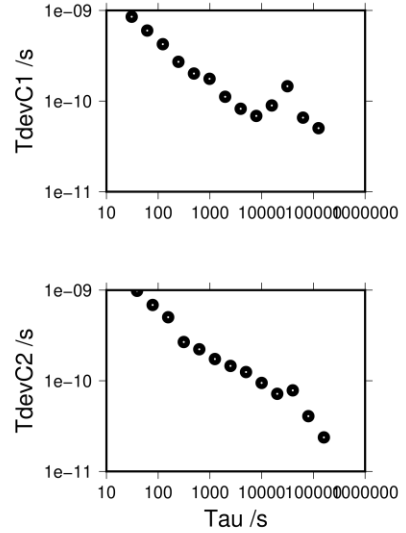
Number of 300s epochs in out file = 1728

<b>Code</b>	<b>#pts</b>	<b>median/ns</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	16843	202.517	202.540	0.860
C2	13269	204.672	204.719	0.971
P1	16539	202.392	202.391	0.792
P2	16534	204.601	204.628	1.206
E1	12834	202.557	202.567	0.692
E5	12846	203.707	203.741	0.716
BC	16633	202.425	202.443	0.851
B5	16662	203.727	203.764	0.834

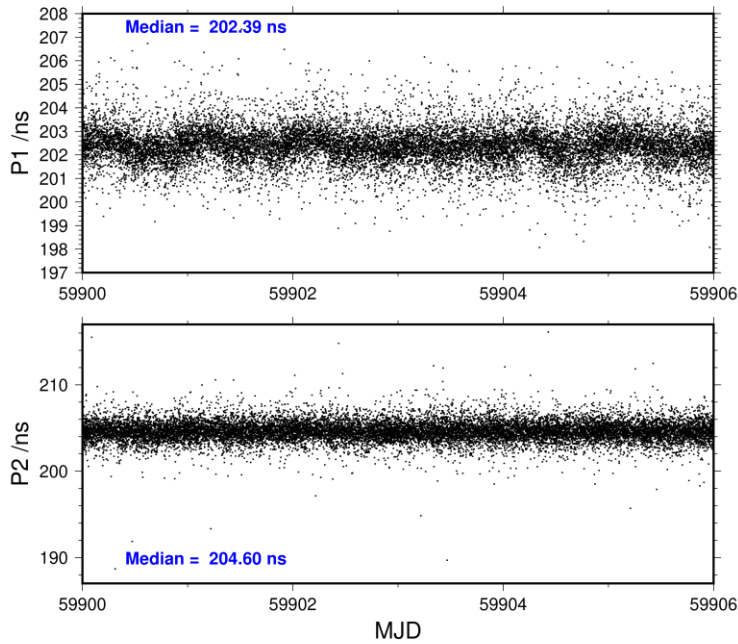
2022-11-25 NC5SBP2G22321\_7



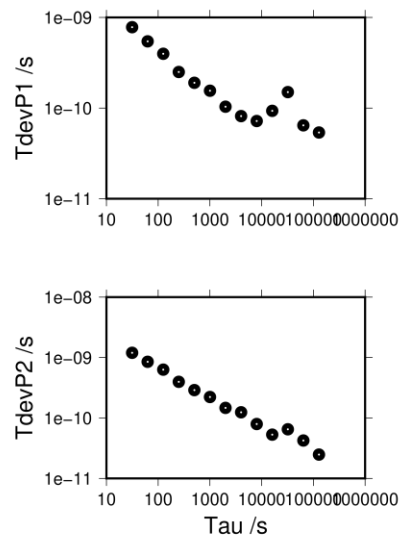
126003 s:	C1= 50 ps	159944 s:	C2= 24 ps
63001 s:	C1= 66 ps	79972 s:	C2= 41 ps
31501 s:	C1= 146 ps	39986 s:	C2= 78 ps
15750 s:	C1= 89 ps	19993 s:	C2= 72 ps
7875 s:	C1= 69 ps	9996 s:	C2= 95 ps
3938 s:	C1= 82 ps	4998 s:	C2= 125 ps
1969 s:	C1= 112 ps	2499 s:	C2= 146 ps
984 s:	C1= 176 ps	1250 s:	C2= 174 ps
492 s:	C1= 201 ps	625 s:	C2= 223 ps
246 s:	C1= 271 ps	312 s:	C2= 268 ps
123 s:	C1= 424 ps	156 s:	C2= 503 ps
62 s:	C1= 600 ps	78 s:	C2= 685 ps
31 s:	C1= 853 ps	39 s:	C2= 982 ps

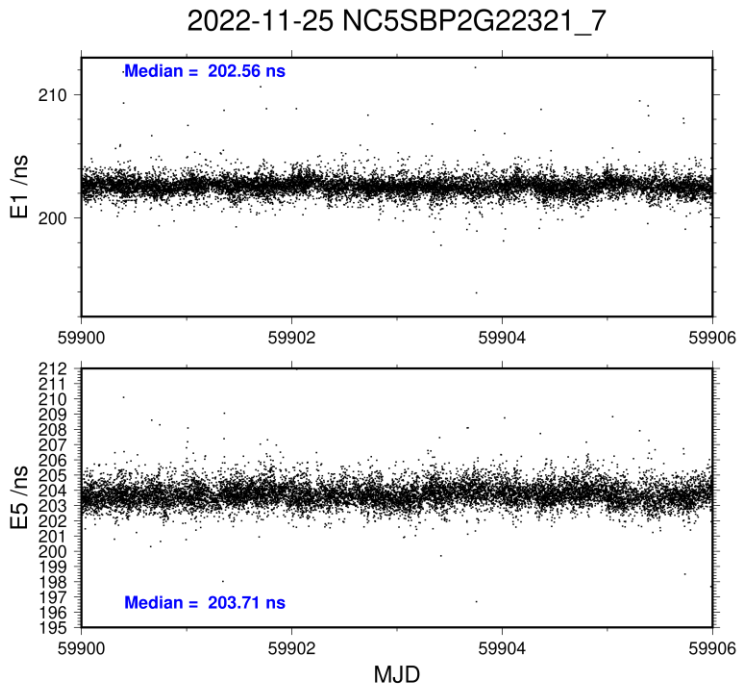


2022-11-25 NC5SBP2G22321\_7

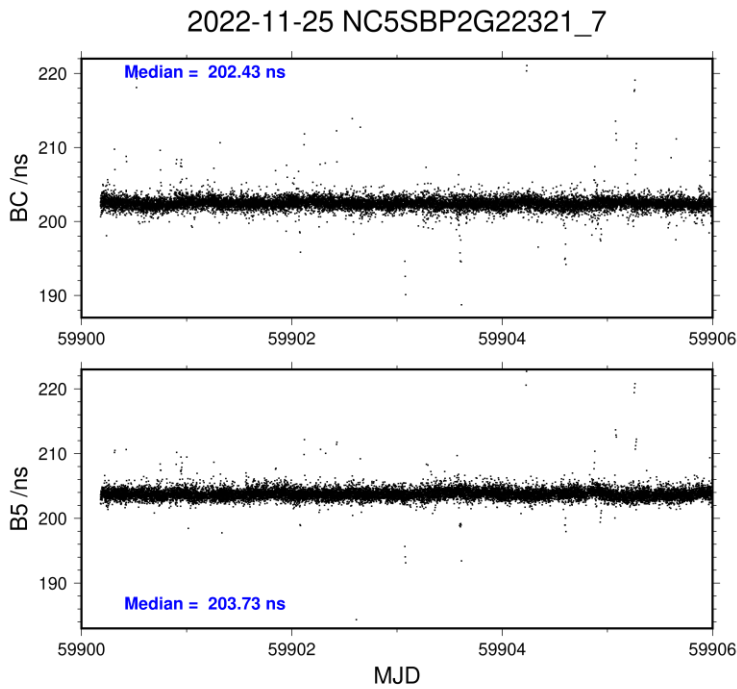
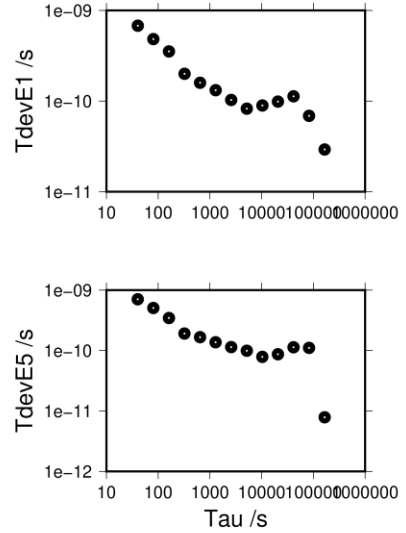


128319 s:	P1= 54 ps	128358 s:	P2= 25 ps
64159 s:	P1= 65 ps	64179 s:	P2= 42 ps
32080 s:	P1= 150 ps	32089 s:	P2= 65 ps
16040 s:	P1= 93 ps	16045 s:	P2= 53 ps
8020 s:	P1= 72 ps	8022 s:	P2= 79 ps
4010 s:	P1= 81 ps	4011 s:	P2= 124 ps
2005 s:	P1= 104 ps	2006 s:	P2= 147 ps
1002 s:	P1= 155 ps	1003 s:	P2= 222 ps
501 s:	P1= 190 ps	501 s:	P2= 289 ps
251 s:	P1= 250 ps	251 s:	P2= 397 ps
125 s:	P1= 397 ps	125 s:	P2= 631 ps
63 s:	P1= 545 ps	63 s:	P2= 852 ps
31 s:	P1= 780 ps	31 s:	P2= 1196 ps

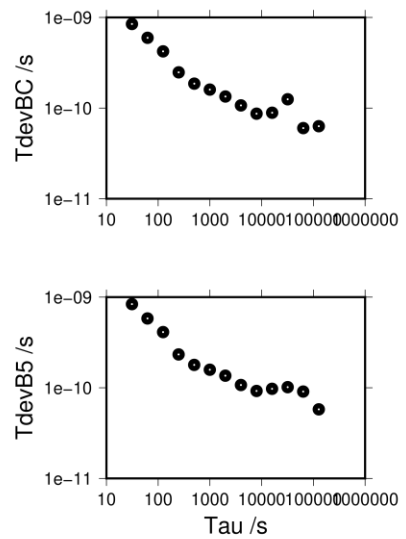




165366 s: E1= 29 ps	165211 s: E5= 8 ps
82683 s: E1= 69 ps	82606 s: E5= 111 ps
41341 s: E1= 113 ps	41303 s: E5= 113 ps
20671 s: E1= 99 ps	20651 s: E5= 87 ps
10335 s: E1= 89 ps	10326 s: E5= 79 ps
5168 s: E1= 82 ps	5163 s: E5= 99 ps
2584 s: E1= 103 ps	2581 s: E5= 114 ps
1292 s: E1= 132 ps	1291 s: E5= 137 ps
646 s: E1= 159 ps	645 s: E5= 166 ps
323 s: E1= 200 ps	323 s: E5= 191 ps
161 s: E1= 353 ps	161 s: E5= 345 ps
81 s: E1= 483 ps	81 s: E5= 506 ps
40 s: E1= 678 ps	40 s: E5= 706 ps



127594 s: BC= 63 ps	127372 s: B5= 58 ps
63797 s: BC= 60 ps	63686 s: B5= 91 ps
31898 s: BC= 125 ps	31843 s: B5= 101 ps
15949 s: BC= 89 ps	15921 s: B5= 97 ps
7975 s: BC= 87 ps	7961 s: B5= 92 ps
3987 s: BC= 107 ps	3980 s: B5= 107 ps
1994 s: BC= 134 ps	1990 s: B5= 136 ps
997 s: BC= 160 ps	995 s: B5= 158 ps
498 s: BC= 186 ps	498 s: B5= 179 ps
249 s: BC= 248 ps	249 s: B5= 233 ps
125 s: BC= 422 ps	124 s: B5= 411 ps
62 s: BC= 596 ps	62 s: B5= 582 ps
31 s: BC= 847 ps	31 s: B5= 838 ps



NC5G-BP25

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 144856  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 21216 high elev obs : 25.543 23.848  
 Iteration 0: Obs used = 246891; Huge residuals = 4; Large residuals = 3405  
 Iteration 1: Obs used = 246893; Huge residuals = 0; Large residuals = 3399  
 Computed code bias (P1/P2)/m = 25.928 24.353  
 Computed baseline (X,Y,Z)/m = 13.962 23.058 -5.132  
 RMS of residuals /m = 0.653

Number of phase differences to fit baseline  
 L1/L2 = 96026  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = 13.962 23.058 -5.132  
 12410 clock jitters computed out of 12967 intervals  
 AVE jitter /ps = -1.8 RMS jitter /ps = 52.7

Iter 1 Large residuals L1= 25  
 Iter 1 Large residuals L2= 24  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.333 -0.285 -0.263  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.328 -0.283 -0.260  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 25  
 Iter 2 Large residuals L2= 24  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.335 -0.286 -0.263  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.330 -0.283 -0.261  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 14.294 22.774 -5.394  
 12425 clock jitters computed out of 12967 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 3.4

Iter 3 Large residuals L1= 21  
 Iter 3 Large residuals L2= 21  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.030 -0.027 -0.018  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.025 -0.024 -0.016  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Iter 4 Large residuals L1= 21  
 Iter 4 Large residuals L2= 21  
 Iter 4 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.030 -0.027 -0.018  
 RMS of residuals L1 /m = 0.005

Computed baseline L2 (X,Y,Z)/m = 0.025 -0.024 -0.016  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 14.324 22.747 -5.412  
 Final baseline L2 (X,Y,Z)/m = 14.319 22.750 -5.409  
 Final baseline L5 (X,Y,Z)/m = 14.321 22.748 -5.411

COMPUTATION OF CODE DIFFERENCES

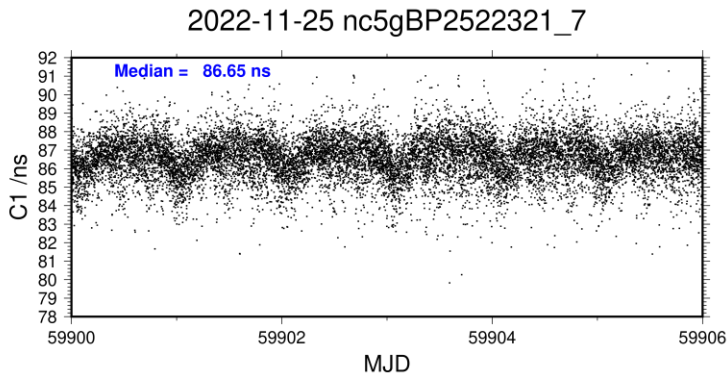
Total number of code differences = 146145

Global average of individual differences

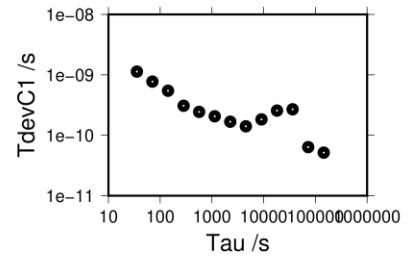
Code	#pts	ave/ns	rms/ns
C1	146064	86.580	1.604
P1	144773	87.648	2.018
P2	144772	82.389	2.393

Number of 300s epochs in out file = 1728

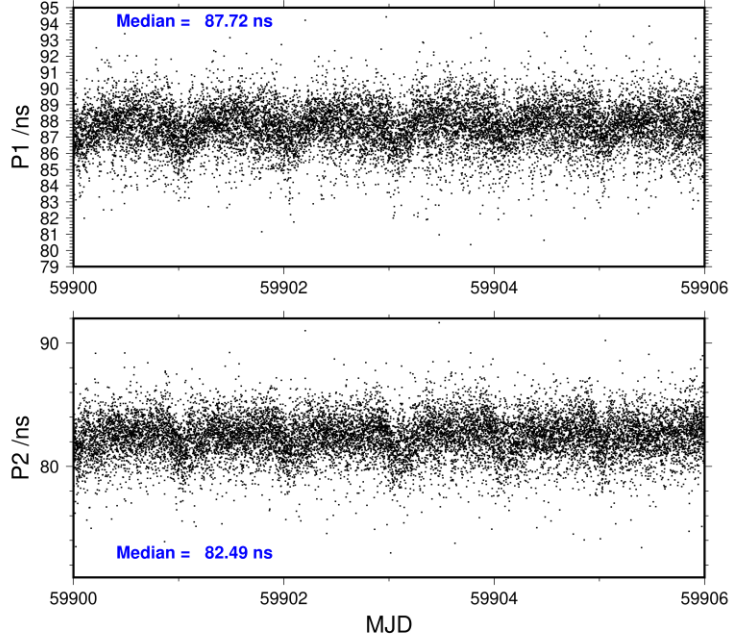
Code	#pts	median/ns	ave/ns	rms/ns
C1	14615	86.650	86.592	1.141
P1	14492	87.716	87.671	1.381
P2	14492	82.490	82.419	1.714



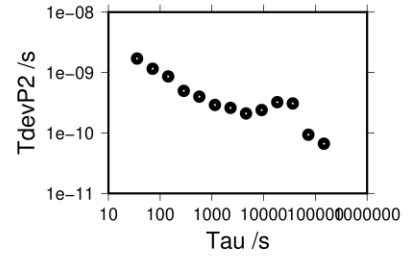
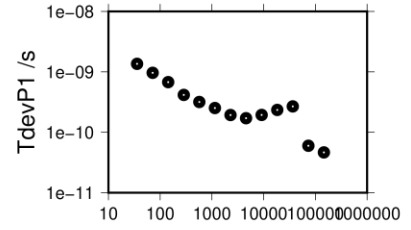
- 145213 s: C1= 52 ps
- 72606 s: C1= 64 ps
- 36303 s: C1= 269 ps
- 18152 s: C1= 256 ps
- 9076 s: C1= 183 ps
- 4538 s: C1= 141 ps
- 2269 s: C1= 167 ps
- 1134 s: C1= 206 ps
- 567 s: C1= 244 ps
- 284 s: C1= 308 ps
- 142 s: C1= 547 ps
- 71 s: C1= 773 ps
- 35 s: C1= 1132 ps



2022-11-25 nc5gBP2522321\_7



146445 s: P1= 46 ps	146445 s: P2= 66 ps
73223 s: P1= 60 ps	73223 s: P2= 93 ps
36611 s: P1= 268 ps	36611 s: P2= 308 ps
18306 s: P1= 235 ps	18306 s: P2= 324 ps
9153 s: P1= 194 ps	9153 s: P2= 240 ps
4576 s: P1= 171 ps	4576 s: P2= 210 ps
2288 s: P1= 193 ps	2288 s: P2= 260 ps
1144 s: P1= 252 ps	1144 s: P2= 291 ps
572 s: P1= 317 ps	572 s: P2= 399 ps
286 s: P1= 415 ps	286 s: P2= 498 ps
143 s: P1= 676 ps	143 s: P2= 863 ps
72 s: P1= 964 ps	72 s: P2= 1155 ps
36 s: P1= 1357 ps	36 s: P2= 1705 ps



NC5G-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 145155  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 21225 high elev obs : 21.937 22.382  
 Iteration 0: Obs used = 246374; Huge residuals = 0; Large residuals = 4502  
 Iteration 1: Obs used = 246374; Huge residuals = 0; Large residuals = 4502  
 Computed code bias (P1/P2)/m = 22.258 22.759  
 Computed baseline (X,Y,Z)/m = 14.478 23.115 -4.848  
 RMS of residuals /m = 0.664

Number of phase differences to fit baseline  
 L1/L2 = 96916  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = 14.478 23.115 -4.848  
 12335 clock jitters computed out of 12784 intervals  
 AVE jitter /ps = -1.6 RMS jitter /ps = 52.7

Iter 1 Large residuals L1= 36  
 Iter 1 Large residuals L2= 36  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.198 -0.201 -0.153  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.178 -0.188 -0.147  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 36  
 Iter 2 Large residuals L2= 36  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.198 -0.201 -0.153  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.179 -0.187 -0.147  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = 14.666 22.921 -4.998  
 12353 clock jitters computed out of 12784 intervals  
 AVE jitter /ps = -0.0 RMS jitter /ps = 3.6

Iter 3 Large residuals L1= 35  
 Iter 3 Large residuals L2= 35  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.011 -0.023 -0.007  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = -0.008 -0.009 -0.001  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Iter 4 Large residuals L1= 35  
 Iter 4 Large residuals L2= 35  
 Iter 4 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.011 -0.023 -0.007  
 RMS of residuals L1 /m = 0.004

Computed baseline L2 (X,Y,Z)/m = -0.008 -0.009 -0.001  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = 14.677 22.898 -5.005  
 Final baseline L2 (X,Y,Z)/m = 14.658 22.912 -4.999  
 Final baseline L5 (X,Y,Z)/m = 14.668 22.905 -5.002

COMPUTATION OF CODE DIFFERENCES

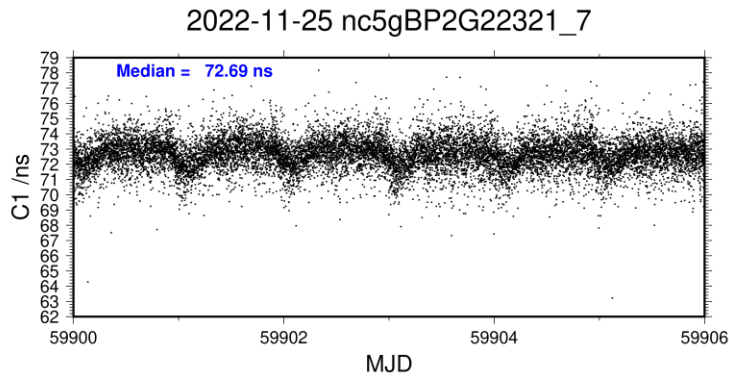
Total number of code differences = 146627

Global average of individual differences

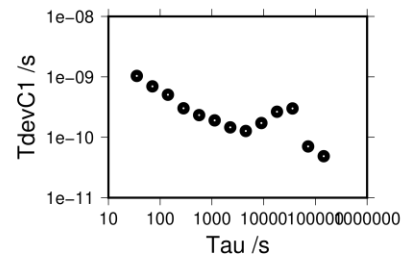
Code	#pts	ave/ns	rms/ns
C1	146536	72.648	1.649
P1	145074	74.960	2.077
P2	145074	76.585	2.555

Number of 300s epochs in out file = 1728

Code	#pts	median/ns	ave/ns	rms/ns
C1	14651	72.685	72.664	1.061
P1	14511	74.997	74.972	1.335
P2	14511	76.639	76.603	1.717

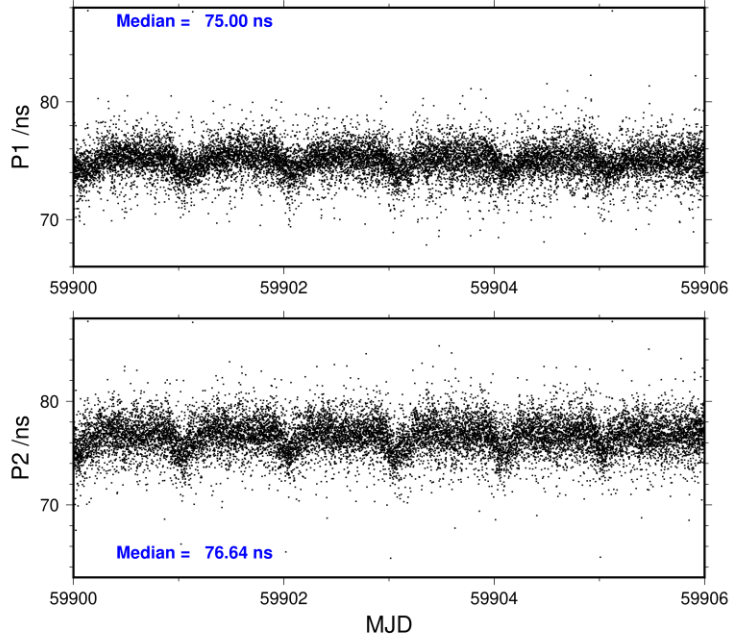


- 144856 s: C1= 49 ps
- 72428 s: C1= 71 ps
- 36214 s: C1= 300 ps
- 18107 s: C1= 264 ps
- 9053 s: C1= 172 ps
- 4527 s: C1= 127 ps
- 2263 s: C1= 146 ps
- 1132 s: C1= 191 ps
- 566 s: C1= 233 ps
- 283 s: C1= 302 ps
- 141 s: C1= 506 ps
- 71 s: C1= 696 ps
- 35 s: C1= 1036 ps

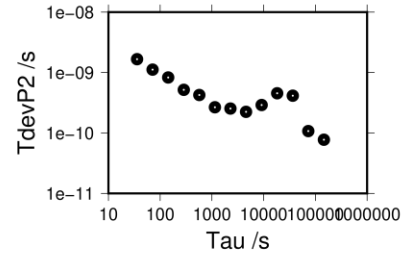
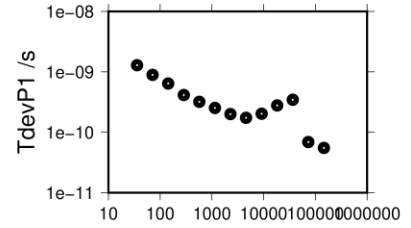




2022-11-25 nc5gBP2G22321\_7



146253 s:	P1= 55 ps	146253 s:	P2= 77 ps
73127 s:	P1= 69 ps	73127 s:	P2= 108 ps
36563 s:	P1= 346 ps	36563 s:	P2= 415 ps
18282 s:	P1= 278 ps	18282 s:	P2= 454 ps
9141 s:	P1= 203 ps	9141 s:	P2= 290 ps
4570 s:	P1= 174 ps	4570 s:	P2= 224 ps
2285 s:	P1= 200 ps	2285 s:	P2= 254 ps
1143 s:	P1= 252 ps	1143 s:	P2= 266 ps
571 s:	P1= 319 ps	571 s:	P2= 425 ps
286 s:	P1= 414 ps	286 s:	P2= 518 ps
143 s:	P1= 642 ps	143 s:	P2= 828 ps
71 s:	P1= 891 ps	71 s:	P2= 1118 ps
36 s:	P1= 1289 ps	36 s:	P2= 1665 ps



**1.4/ TL (23006)****Period**

MJD 59950 to 59960

**Delays**

BP25: (cf page 4 &amp; 104)

REFDLY = 53.38 ns

CABDLY = 176.24 ns (C208)

BP2G: (cf page 5 &amp; 104)

REFDLY = 53.48 ns

CABDLY = 176.38 ns (C211)

TWTF (TLT0): (cf page 104)

 $X_p = 25.58$  ns $X_o = 132.34$  ns

REFDLY = 157.92 ns

CABDLY = 119.80 ns

TLT1: (cf page 106)

REFDLY = 0 ns

CABDLY = 0 ns

TLT3: (cf page 108)

REFDLY = 25.64 ns

CABDLY = 143.60 ns

TLT5: (cf page 110)

REFDLY = 14.59 ns

CABDLY = 0 ns

Setup at the TL

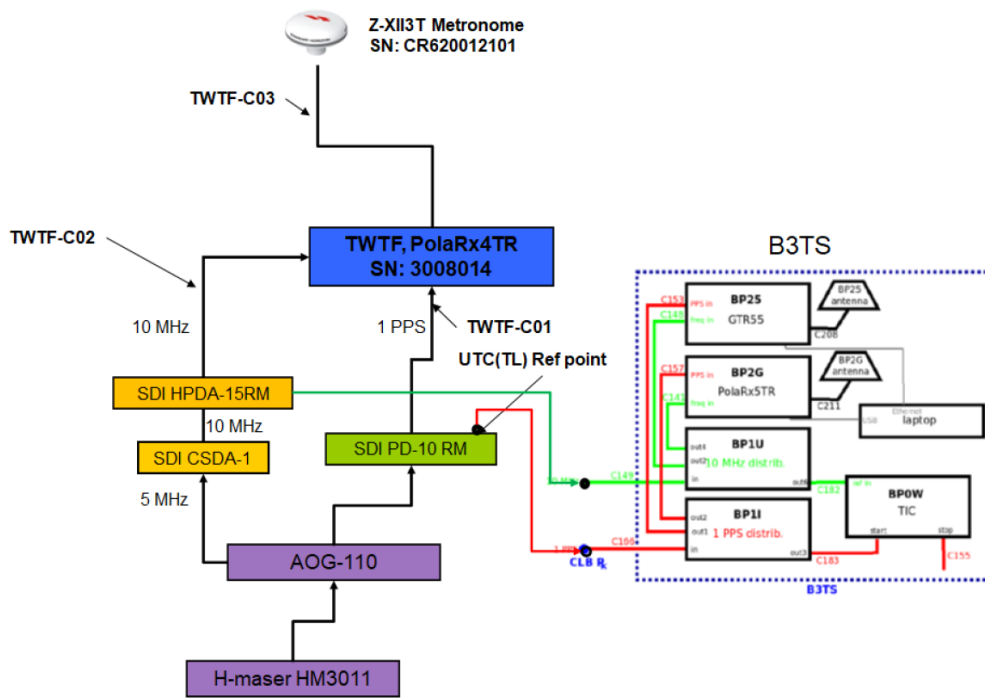
**Annex A - Information Sheet**

Laboratory: TL		
Date and hour of the beginning of measurements:		2023-01-06 00:00:00 UTC
Date and hour of the end of measurements:		2023-01-16 23:59:00 UTC
<b>Information on the system</b>		
	Local:	Travelling:
4-character BIPM code	TLT0 <sup>1</sup>	B3TS
● Receiver maker and type: Receiver serial number:	Septentrio PolaRx4TR Pro 3008014	BP2G/BP25
1 PPS trigger level /V:	1 V	1 V
● Antenna cable maker and type: Phase stabilized cable (Y/N):	Andrew FSJ, yes	-
Length outside the building /m:	~ 30	~5
● Antenna maker and type: Antenna serial number:	ASH701945C M SCIS CR620012101	-
Temperature (if stabilized) /°C	23	23
<b>Measured delays/ns</b>		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
● Delay from local UTC to receiver 1 PPS-in:	25.583±0.020 ns	0 <sup>2</sup>
Delay from 1 PPS-in to internal Reference (if different):	132.341±0.114 ns	-
● Antenna cable delay:	~ 119.8 ns	(1)
Splitter delay (if any):	Null	(1)
Additional cable delay (if any):	Null	(1)
<b>Data used for the generation of CGGTTS files</b>		
● INT DLY (GPS) /ns:		P1: 22.3, P2: 24.6 <sup>3</sup>
● INT DLY (GLONASS) /ns:		No measurement
● CAB DLY /ns:		Included in INTDLY
● REF DLY /ns:		Included in INTDLY
● Coordinates reference frame:		WGS-84
Latitude or X /m:		-2994428.62
Longitude or Y /m:		+4951309.05
Height or Z /m:		+2674496.70
<b>General information</b>		
● Rise time of the local UTC pulse:		3 ns
● Is the laboratory air conditioned:		Yes
Set temperature value and uncertainty:		23 ± 1 °C
Set humidity value and uncertainty:		No humidity control

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

<sup>1</sup> IGS station name: TWTF, IERS DOME number: 23603S002<sup>2</sup> The Cable C166 of B3TS is connected to the UTC(TL) ref point, the delay from UTC(TL) to the input of cable C166 is 0 ns.<sup>3</sup> The P1 and P2 INTDLY of TLT0 used for generating CGGTTS are actually TOTDLY, already including CABDLY and REFDLY

### Diagram of the experiment set-up:



**Annex A - Information Sheet**

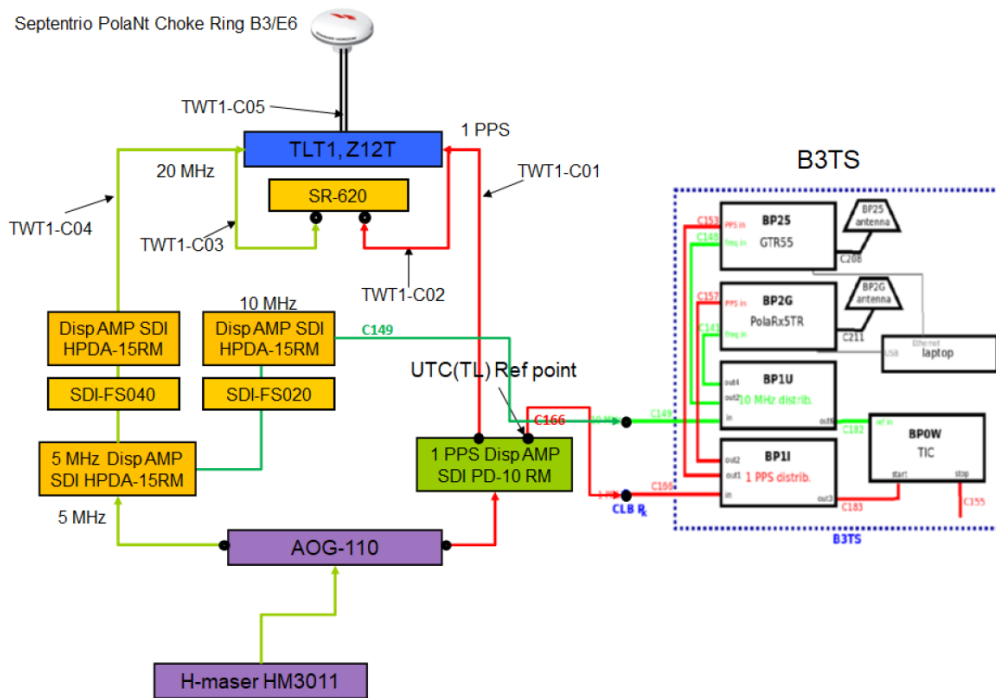
Laboratory: TL		
Date and hour of the beginning of measurements:		2023-01-06 00:00:00 UTC
Date and hour of the end of measurements:		2023-01-16 23:59:00 UTC
<b>Information on the system</b>		
	Local:	Travelling:
4-character BIPM code	TLT1	B3TS
● Receiver maker and type: Receiver serial number:	Ashtech Z-XII3T Metronome RT919994504	BP2G/BP25
1 PPS trigger level /V:	1 V	1 V
● Antenna cable maker and type: Phase stabilised cable (Y/N):	Andrew FSJ, Yes	-
Length outside the building /m:	~ 30	~5
● Antenna maker and type: Antenna serial number:	SEPCHOKE_B3E6 SPKE 5006	-
Temperature (if stabilised) /°C	23	23
<b>Measured delays/ns</b>		
	Local:	Travelling:
● Delay from local UTC to receiver 1 PPS-in:	No measurement	0 <sup>1</sup>
Delay from 1 PPS-in to internal Reference (if different):	-	-
● Antenna cable delay:	No measurement	(1)
Splitter delay (if any):	Null	(1)
Additional cable delay (if any):	Null	(1)
<b>Data used for the generation of CGGTTS files</b>		
● INT DLY (GPS) /ns:		P1: 415.0, P2: 423.8 <sup>2</sup>
● INT DLY (GLONASS) /ns:		No measurement
● CAB DLY /ns:		included in INT DLY
● REF DLY /ns:		included in INT DLY
● Coordinates reference frame:		
Latitude or X /m:		-2994425.61
Longitude or Y /m:		+4951311.77
Height or Z /m:		+2674498.27
<b>General information</b>		
● Rise time of the local UTC pulse:		3 ns
● Is the laboratory air conditioned:		Yes
Set temperature value and uncertainty:		23 ± 1 °C
Set humidity value and uncertainty:		No humidity control

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

<sup>1</sup> The Cable C166 of B3TS is connected to the UTC(TL) ref point, the delay from UTC(TL) to the input of cable C166 is 0 ns.

<sup>2</sup> The P1 and P2 INTDLY of TLT1 used for generating CGGTTS are actually TOTDLY, already including CABDLY and REF DLY

### Diagram of the experiment set-up:



- The latch points of the TLT1 are re-defined from its external 20 MHz frequency input to be the external 1 PPS reference. The time difference between its external reference 1 PPS and 20 MHz frequency inputs were measured by a time interval counter (SR-620) and compensated into the pseudorange measurement of the RINEX files of TLT1. (reference paper: *Shinn-Yan Lin et al, "A Modification of Z12T Metronome Time Transfer System", 2014 EFTF*)

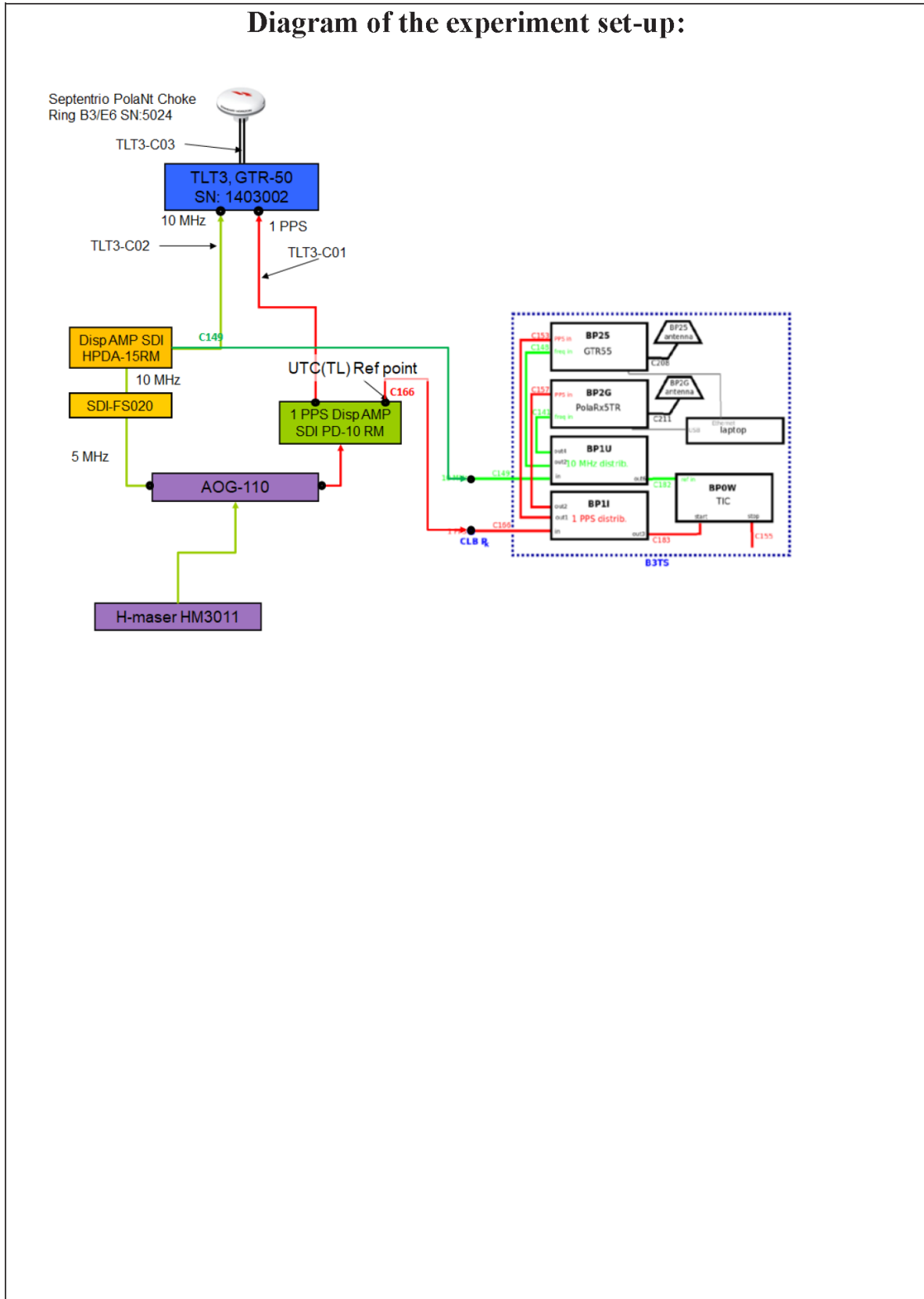
## Annex A - Information Sheet

Laboratory: TL		
Date and hour of the beginning of measurements:	2023-01-06 00:00:00 UTC	
Date and hour of the end of measurements:	2023-01-16 23:59:00 UTC	
Information on the system		
	Local:	Travelling:
4-character BIPM code	TLT3	BP25/BP2G
● Receiver maker and type: Receiver serial number:	Dicom GTR-50 1403002	-
1 PPS trigger level /V:	1 V	1 V
● Antenna cable maker and type: Phase stabilised cable (Y/N):	Andrew FSJ, yes	-
Length outside the building /m:	~ 35	~5
● Antenna maker and type: Antenna serial number:	SEPCHOKE_B3E6 SPKE 5024	-
Temperature (if stabilised) /°C	23	23
Measured delays/ns		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
● Delay from local UTC to receiver 1 PPS-in:	25.641±0.015 ns	0
Delay from 1 PPS-in to internal Reference (if different):	No measurement	-
● Antenna cable delay:	~ 143.6 ns	(1)
Splitter delay (if any):	Null	(1)
Additional cable delay (if any):	Null	(1)
Data used for the generation of CGGTTS files		
● INT DLY (GPS) /ns:	P1: 82.4, P2: 85.8 <sup>1</sup>	
● INT DLY (GLONASS) /ns:	No measurement	
● CAB DLY /ns:	Included in INT DLY	
● REF DLY /ns:	Included in INT DLY	
● Coordinates reference frame:		
Latitude or X /m:	-2994424.46	
Longitude or Y /m:	+4951312.87	
Height or Z /m:	+2674496.83	
General information		
● Rise time of the local UTC pulse:	3 ns	
● Is the laboratory air conditioned:	Yes	
Set temperature value and uncertainty:	23 ± 1 °C	
Set humidity value and uncertainty:	No humidity control	

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

<sup>1</sup> The P1 and P2 INTDLY of TLT3 used for generating CGGTTS are actually TOTDLY, already including CABDLY and REFDLY

### Diagram of the experiment set-up:





## Annex A - Information Sheet

Laboratory: TL		
Date and hour of the beginning of measurements:		2020-10-31 00:00:00 UTC
Date and hour of the end of measurements:		2020-11-16 23:59:00 UTC
Information on the system		
	Local:	Travelling:
4-character BIPM code	TLT5	B3TS
● Receiver maker and type: Receiver serial number:	Septentrio PolaRx5TR 3227923	BPIJ/BP25
1 PPS trigger level /V:	1 V	1 V
● Antenna cable maker and type: Phase stabilised cable (Y/N):	Andrew FSJ, yes	-
Length outside the building /m:	~ 35	~5
● Antenna maker and type: Antenna serial number:	SEPCHOKE_B3E6 SPKE 5303	-
Temperature (if stabilised) /°C	23	23
Measured delays/ns		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
● Delay from local UTC to receiver 1 PPS-in:	14.593±0.017 ns	0 <sup>1</sup>
Delay from 1 PPS-in to internal Reference (if different):	-	-
● Antenna cable delay:	No measurement	(1)
Splitter delay (if any):	Null	(1)
Additional cable delay (if any):	Enable compensation of PPS-in internal delay set to "auto"	(1)
Data used for the generation of CGGTTS files		
● INT DLY (GPS) /ns:		P1: 204.0, P2: 202.9 <sup>2</sup>
● INT DLY (GAL) /ns:		E1: 206.3, E5a: 204.1 <sup>3</sup>
● CAB DLY /ns:		Included in INTDLY
● REF DLY /ns:		Included in INTDLY
● Coordinates reference frame:		WGS-84
Latitude or X /m:		-2994423.91
Longitude or Y /m:		+4951311.91
Height or Z /m:		+2674499.18
General information		
● Rise time of the local UTC pulse:		3 ns
● Is the laboratory air conditioned:		Yes
Set temperature value and uncertainty:		23 ± 1 °C
Set humidity value and uncertainty:		No humidity control

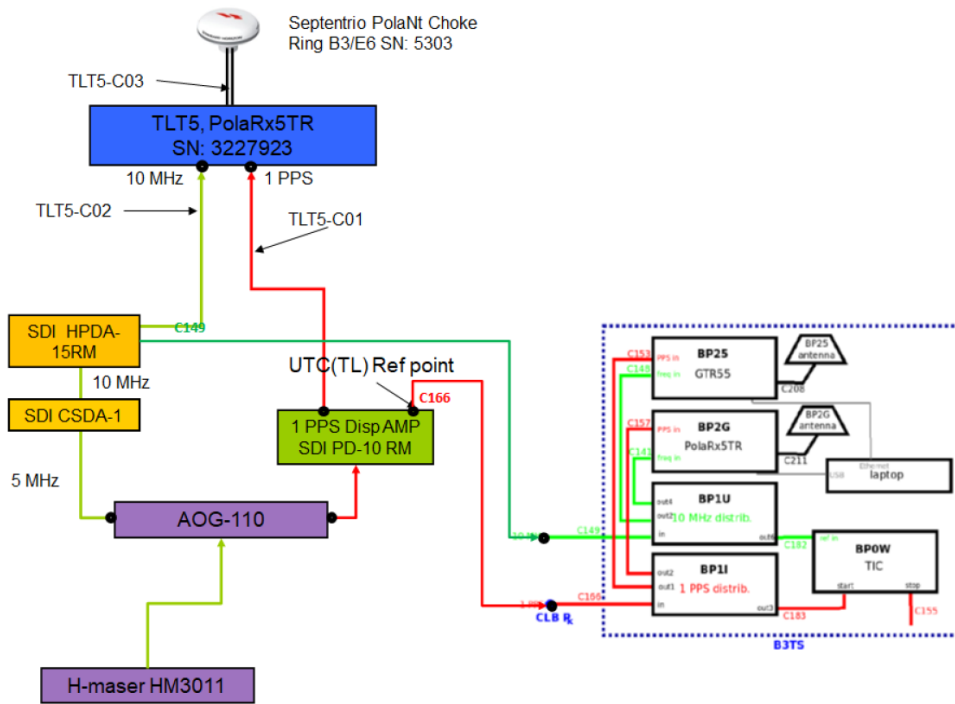
(1) For a trip with closure, not needed if the traveling equipment is used in the same set-up throughout.

<sup>1</sup> The Cable C166 of B3TS is connected to the UTC(TL) ref point, the delay from UTC(TL) to the input of cable C166 is 0 ns.

<sup>2</sup> The P1 and P2 INTDLY of TLT5 used for generating CGGTTS are actually TOTDLY, already including CABDLY and REFDLY

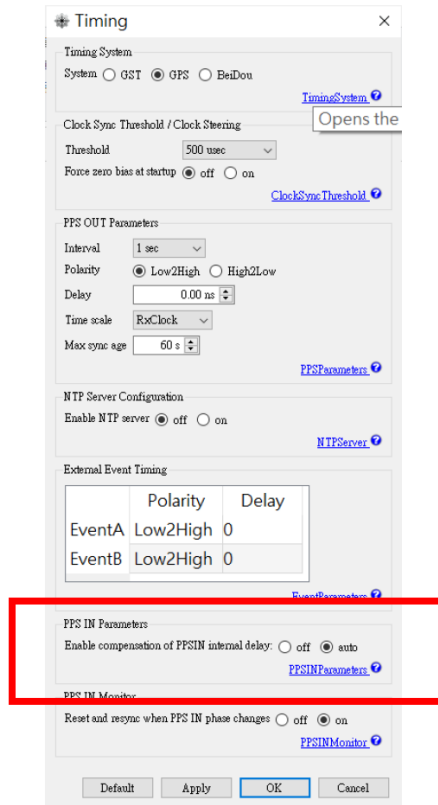
<sup>3</sup> The E1 and E5a INTDLY of TL T5 used for generating CGGTTS are actually TOTDLY, already including CABDLY and REFDLY

### Diagram of the experiment set-up:



## Log of Events / Additional Information:

The timing configuration of TLT5, the PPS-IN parameter enable compensation of PPSIN internal delay is set to be “auto”



The screenshot shows the 'Timing' configuration window with the following sections:

- Timing System:** System  GST  GPS  BeiDou
- Clock Sync Threshold / Clock Steering:** Threshold: 500 usec, Force zero bias at startup:  off  on
- PPS OUT Parameters:** Interval: 1 sec, Polarity:  Low2High  High2Low, Delay: 0.00 ns, Time scale: RxClock, Max sync age: 60 s
- NTP Server Configuration:** Enable NTP server:  off  on
- External Event Timing:**

	Polarity	Delay
EventA	Low2High	0
EventB	Low2High	0
- PPS IN Parameters:** Enable compensation of PPSIN internal delay:  off  auto
- PPS IN Monitor:** Reset and resync when PPS IN phase changes:  off  on

Buttons at the bottom: Default, Apply, OK, Cancel

**TWTF-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 272591  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28320 high elev obs : -36.017 -36.946  
 Iteration 0: Obs used = 490768; Huge residuals = 12; Large residuals = 230  
 Iteration 1: Obs used = 490766; Huge residuals = 0; Large residuals = 220  
 Computed code bias (P1/P2)/m = -35.470 -36.151  
 Computed baseline (X,Y,Z)/m = -8.479 -5.162 -1.708  
 RMS of residuals /m = 0.394

Number of phase differences to fit baseline  
 L1/L2 = 264432  
 L5 = 17378  
 A priori baseline (X,Y,Z)/m = -8.479 -5.162 -1.708  
 31281 clock jitters computed out of 31399 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 38.3

Iter 1 Large residuals L1= 1  
 Iter 1 Large residuals L2= 1  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.473 -0.760 -0.353  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.483 -0.771 -0.357  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.471 -0.759 -0.361  
 RMS of residuals L5 /m = 0.006

Iter 2 Large residuals L1= 1  
 Iter 2 Large residuals L2= 1  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.473 -0.760 -0.353  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.483 -0.771 -0.357  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.471 -0.759 -0.361  
 RMS of residuals L5 /m = 0.006

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -8.001 -5.928 -2.063  
 31281 clock jitters computed out of 31399 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 1.1

Iter 3 Large residuals L1= 1  
 Iter 3 Large residuals L2= 1  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.009 -0.013 -0.009  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.019 -0.023 -0.013  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.001 -0.029 -0.010  
 RMS of residuals L5 /m = 0.006

Final baseline L1 (X,Y,Z)/m = -7.992 -5.940 -2.072  
 Final baseline L2 (X,Y,Z)/m = -7.982 -5.951 -2.077

Final baseline L5 (X,Y,Z)/m = -8.002 -5.956 -2.073

COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 828867

Global average of individual differences

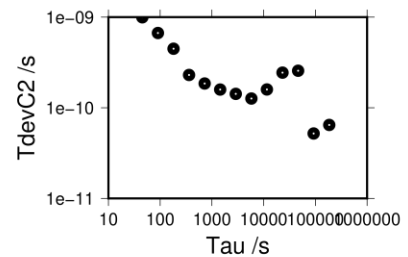
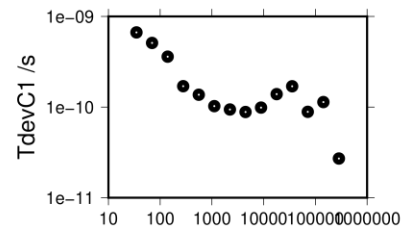
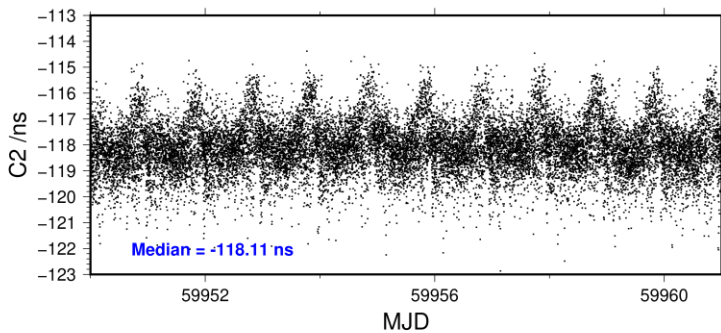
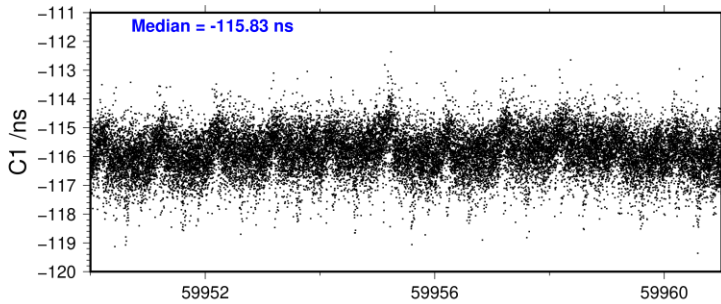
Code	#pts	ave/ns	rms/ns
C1	272876	-115.846	1.029
C2	210187	-118.090	1.358
P1	272511	-116.287	1.033
P2	272509	-118.469	1.195
E1	190695	-115.712	0.925
E5	3308	-137.760	1.155

Number of 300s epochs in out file = 3168

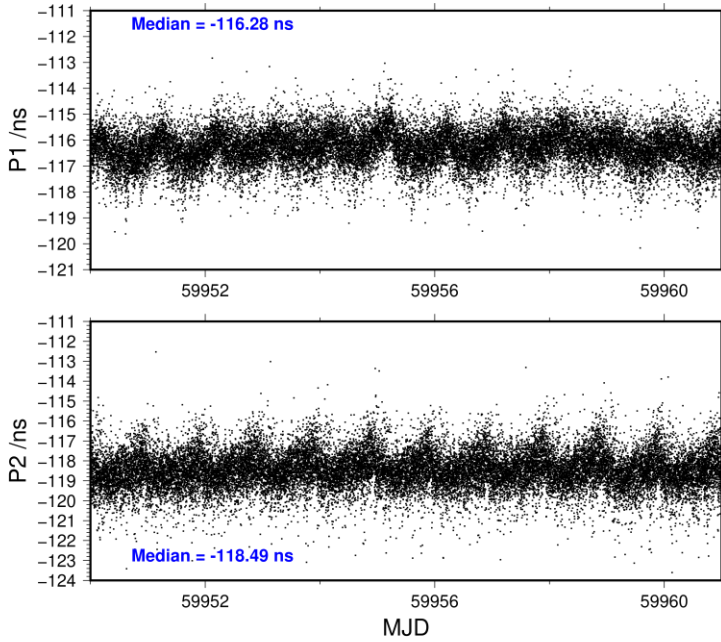
Code	#pts	median/ns	ave/ns	rms/ns
C1	27270	-115.831	-115.849	0.710
C2	20998	-118.115	-118.088	0.990
P1	27245	-116.284	-116.292	0.688
P2	27245	-118.487	-118.467	0.954
E1	19047	-115.647	-115.719	0.706
E5	329	-137.745	-137.787	0.935

285424 s: C1= 27 ps  
 142712 s: C1= 114 ps 185341 s: C2= 65 ps  
 71356 s: C1= 89 ps 92671 s: C2= 52 ps  
 35678 s: C1= 170 ps 46335 s: C2= 256 ps  
 17839 s: C1= 139 ps 23168 s: C2= 244 ps  
 8919 s: C1= 99 ps 11584 s: C2= 159 ps  
 4460 s: C1= 88 ps 5792 s: C2= 126 ps  
 2230 s: C1= 94 ps 2896 s: C2= 142 ps  
 1115 s: C1= 102 ps 1448 s: C2= 159 ps  
 557 s: C1= 137 ps 724 s: C2= 185 ps  
 279 s: C1= 170 ps 362 s: C2= 230 ps  
 139 s: C1= 360 ps 181 s: C2= 448 ps  
 70 s: C1= 510 ps 90 s: C2= 668 ps  
 35 s: C1= 667 ps 45 s: C2= 996 ps

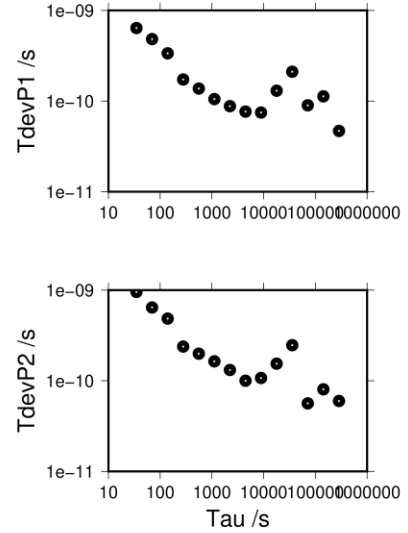
2023-01-19 TWTFBP2523006\_11



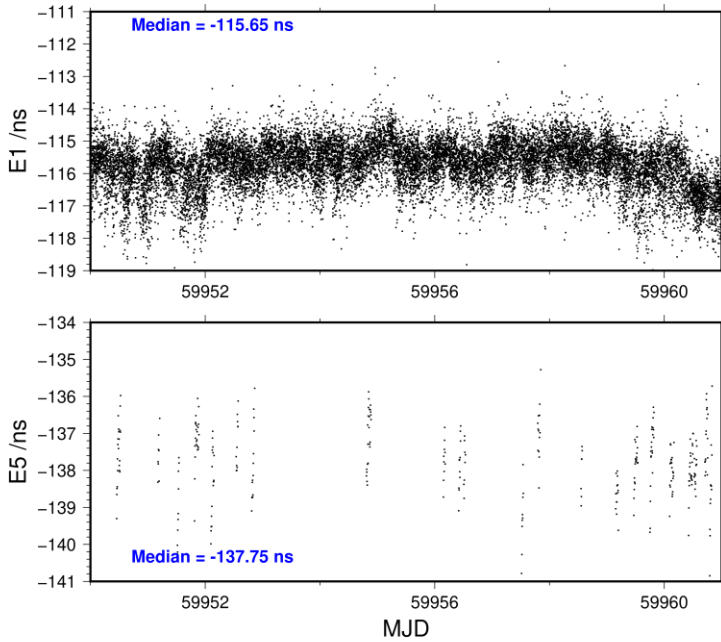
2023-01-19 TWTFBP2523006\_11



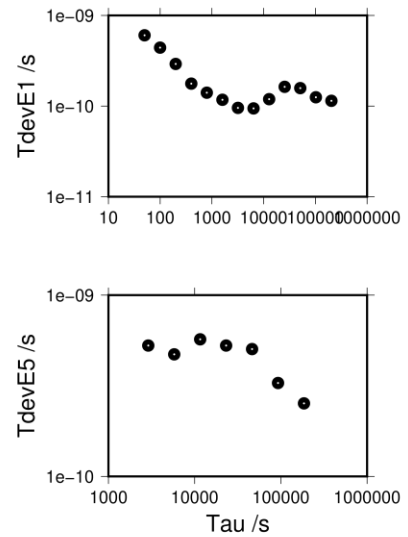
285686 s: P1= 47 ps	285686 s: P2= 60 ps
142843 s: P1= 113 ps	142843 s: P2= 81 ps
71421 s: P1= 90 ps	71421 s: P2= 56 ps
35711 s: P1= 211 ps	35711 s: P2= 247 ps
17855 s: P1= 130 ps	17855 s: P2= 154 ps
8928 s: P1= 75 ps	8928 s: P2= 107 ps
4464 s: P1= 76 ps	4464 s: P2= 100 ps
2232 s: P1= 88 ps	2232 s: P2= 132 ps
1116 s: P1= 105 ps	1116 s: P2= 164 ps
558 s: P1= 138 ps	558 s: P2= 199 ps
279 s: P1= 173 ps	279 s: P2= 238 ps
139 s: P1= 336 ps	139 s: P2= 485 ps
70 s: P1= 483 ps	70 s: P2= 643 ps
35 s: P1= 640 ps	35 s: P2= 954 ps



2023-01-19 TWTFBP2523006\_11



204327 s: E1= 114 ps	
102163 s: E1= 125 ps	
51082 s: E1= 158 ps	
25541 s: E1= 163 ps	
12770 s: E1= 119 ps	
6385 s: E1= 94 ps	
3193 s: E1= 96 ps	185385 s: E5= 253 ps
1596 s: E1= 117 ps	92693 s: E5= 327 ps
798 s: E1= 140 ps	46346 s: E5= 504 ps
399 s: E1= 177 ps	23173 s: E5= 527 ps
200 s: E1= 292 ps	11587 s: E5= 570 ps
100 s: E1= 441 ps	5793 s: E5= 471 ps
50 s: E1= 604 ps	2897 s: E5= 527 ps



**TWTF-BP2G**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 296886  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28325 high elev obs : -39.930 -38.435  
 Iteration 0: Obs used = 536022; Huge residuals = 626; Large residuals = 3556  
 Iteration 1: Obs used = 535672; Huge residuals = 0; Large residuals = 3280  
 Computed code bias (P1/P2)/m = -39.167 -37.695  
 Computed baseline (X,Y,Z)/m = -8.039 -5.721 -0.270  
 RMS of residuals /m = 0.517

Number of phase differences to fit baseline  
 L1/L2 = 288552  
 L5 = 17452  
 A priori baseline (X,Y,Z)/m = -8.039 -5.721 -0.270  
 31316 clock jitters computed out of 31406 intervals  
 AVE jitter /ps = 0.0 RMS jitter /ps = 38.0

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 = 0.432 -0.677 -0.249  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.434 -0.678 -0.249  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.453 -0.686 -0.270  
 RMS of residuals L5 /m = 0.005

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 = 0.432 -0.677 -0.249  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.434 -0.678 -0.249  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.453 -0.686 -0.270  
 RMS of residuals L5 /m = 0.005

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -7.606 -6.398 -0.519  
 31317 clock jitters computed out of 31406 intervals  
 AVE jitter /ps = 0.0 RMS jitter /ps = 0.9

Iter 3 Large residuals L1= 0  
 Iter 3 Large residuals L2= 2  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.010 -0.013 -0.006  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.011 -0.014 -0.006  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.019 -0.037 -0.026  
 RMS of residuals L5 /m = 0.005

Final baseline L1 (X,Y,Z)/m = -7.596 -6.411 -0.525  
 Final baseline L2 (X,Y,Z)/m = -7.594 -6.412 -0.525

Final baseline L5 (X,Y,Z)/m = -7.587 -6.435 -0.545

COMPUTATION OF CODE DIFFERENCES

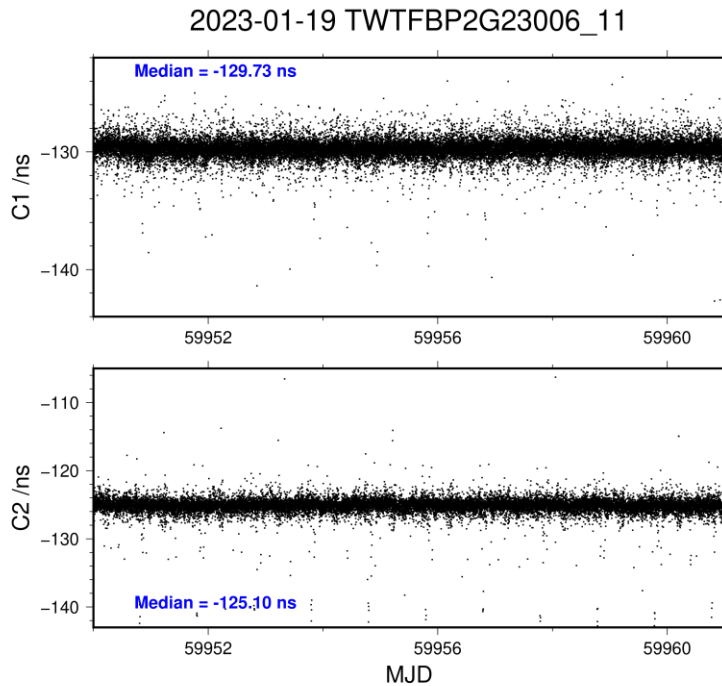
Total number of code differences = 925601

Global average of individual differences

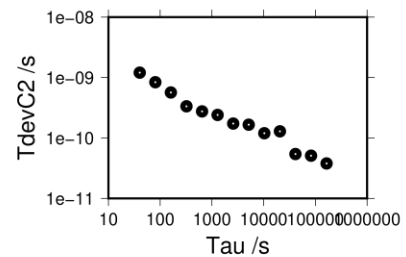
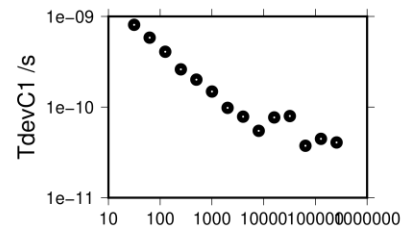
Code	#pts	ave/ns	rms/ns
C1	303304	-129.753	1.622
C2	236541	-125.160	1.947
P1	296500	-128.912	1.465
P2	296491	-124.000	1.814
E1	214149	-130.039	1.262
E5	3308	-145.093	1.220

Number of 300s epochs in out file = 3168

Code	#pts	median/ns	ave/ns	rms/ns
C1	30293	-129.728	-129.739	0.816
C2	23588	-125.101	-125.157	1.186
P1	29629	-128.879	-128.901	0.799
P2	29628	-123.973	-124.003	1.215
E1	21396	-130.001	-130.033	0.704
E5	329	-145.053	-145.125	1.016

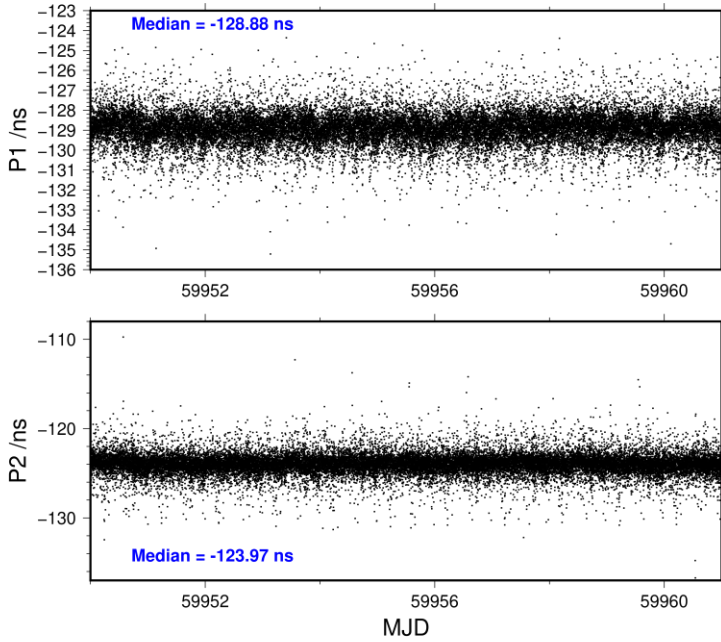


256940 s: C1= 41 ps 164990 s: C2= 38 ps  
 128470 s: C1= 45 ps 82495 s: C2= 51 ps  
 64235 s: C1= 37 ps 41247 s: C2= 54 ps  
 32117 s: C1= 80 ps 20624 s: C2= 129 ps  
 16059 s: C1= 77 ps 10312 s: C2= 120 ps  
 8029 s: C1= 55 ps 5156 s: C2= 166 ps  
 4015 s: C1= 78 ps 2578 s: C2= 173 ps  
 2007 s: C1= 98 ps 1289 s: C2= 241 ps  
 1004 s: C1= 148 ps 644 s: C2= 275 ps  
 502 s: C1= 201 ps 322 s: C2= 334 ps  
 251 s: C1= 261 ps 161 s: C2= 566 ps  
 125 s: C1= 408 ps 81 s: C2= 837 ps  
 63 s: C1= 583 ps 40 s: C2= 1206 ps  
 31 s: C1= 808 ps

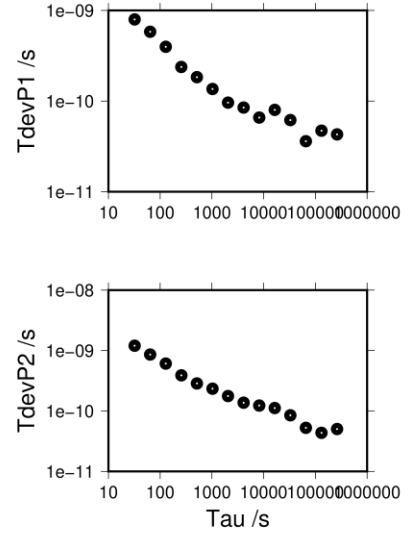




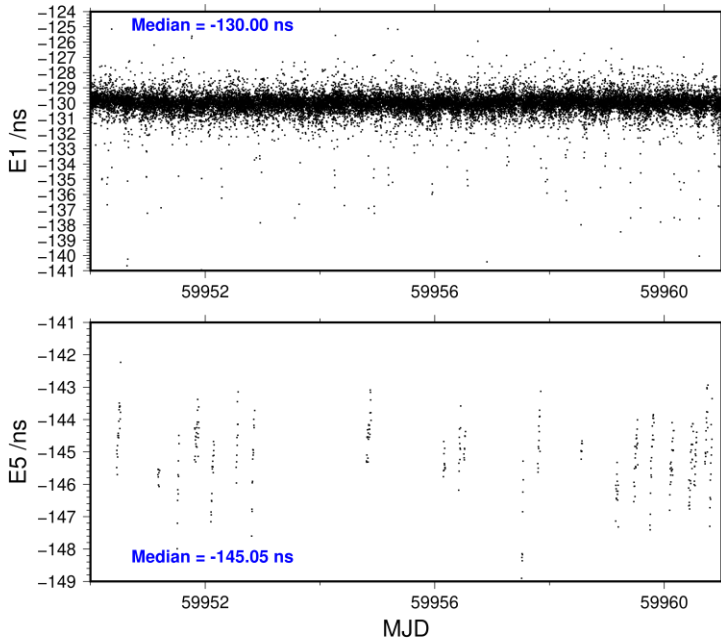
2023-01-19 TWTFBP2G23006\_11



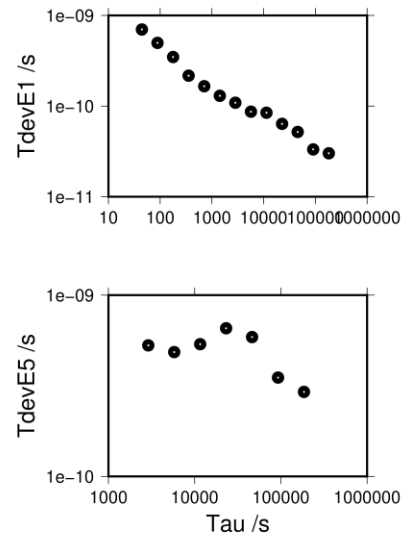
262698 s: P1= 43 ps	262707 s: P2= 50 ps
131349 s: P1= 47 ps	131353 s: P2= 44 ps
65675 s: P1= 36 ps	65677 s: P2= 53 ps
32837 s: P1= 62 ps	32838 s: P2= 85 ps
16419 s: P1= 80 ps	16419 s: P2= 112 ps
8209 s: P1= 66 ps	8210 s: P2= 123 ps
4105 s: P1= 85 ps	4105 s: P2= 137 ps
2052 s: P1= 96 ps	2052 s: P2= 177 ps
1026 s: P1= 136 ps	1026 s: P2= 234 ps
513 s: P1= 184 ps	513 s: P2= 286 ps
257 s: P1= 238 ps	257 s: P2= 388 ps
128 s: P1= 397 ps	128 s: P2= 608 ps
64 s: P1= 582 ps	64 s: P2= 858 ps
32 s: P1= 797 ps	32 s: P2= 1201 ps



2023-01-19 TWTFBP2G23006\_11



181893 s: E1= 30 ps	
90947 s: E1= 33 ps	
45473 s: E1= 52 ps	
22737 s: E1= 64 ps	
11368 s: E1= 84 ps	
5684 s: E1= 87 ps	
2842 s: E1= 109 ps	185385 s: E5= 293 ps
1421 s: E1= 130 ps	92693 s: E5= 351 ps
711 s: E1= 165 ps	46346 s: E5= 587 ps
355 s: E1= 217 ps	23173 s: E5= 657 ps
178 s: E1= 348 ps	11587 s: E5= 536 ps
89 s: E1= 498 ps	5793 s: E5= 485 ps
44 s: E1= 700 ps	2897 s: E5= 528 ps



**TLT1-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 253711  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28321 high elev obs : 80.650 81.662  
 Iteration 0: Obs used = 450427; Huge residuals = 0; Large residuals = 2809  
 Iteration 1: Obs used = 450427; Huge residuals = 0; Large residuals = 2809  
 Computed code bias (P1/P2)/m = 81.702 82.914  
 Computed baseline (X,Y,Z)/m = -11.981 -7.140 -2.924  
 RMS of residuals /m = 0.568

Number of phase differences to fit baseline  
 L1/L2 = 248463  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -11.981 -7.140 -2.924  
 31267 clock jitters computed out of 31382 intervals  
 AVE jitter /ps = 0.4 RMS jitter /ps = 38.4

Iter 1 Large residuals L1= 1  
 Iter 1 Large residuals L2= 1  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 1.011 -1.459 -0.706  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 1.019 -1.469 -0.713  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 1  
 Iter 2 Large residuals L2= 1  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 1.011 -1.459 -0.706  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 1.019 -1.469 -0.713  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -10.966 -8.604 -3.633  
 31267 clock jitters computed out of 31382 intervals  
 AVE jitter /ps = -0.2 RMS jitter /ps = 2.1

Iter 3 Large residuals L1= 1  
 Iter 3 Large residuals L2= 1  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.012 -0.052 -0.023  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.005 -0.062 -0.029  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -10.978 -8.656 -3.656  
 Final baseline L2 (X,Y,Z)/m = -10.971 -8.666 -3.663  
 Final baseline L5 (X,Y,Z)/m = -10.974 -8.661 -3.659

COMPUTATION OF CODE DIFFERENCES

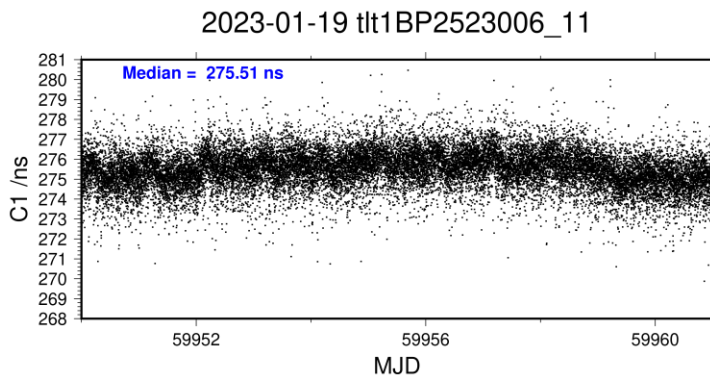
Total number of code differences = 256819

Global average of individual differences

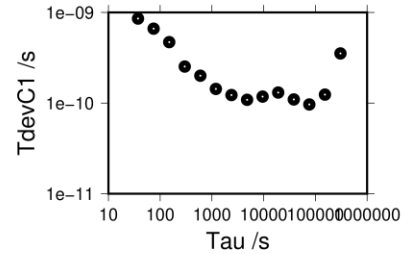
Code	#pts	ave/ns	rms/ns
C1	254684	275.468	1.692
P1	253637	276.677	1.418
P2	253964	280.782	1.609

Number of 300s epochs in out file = 3168

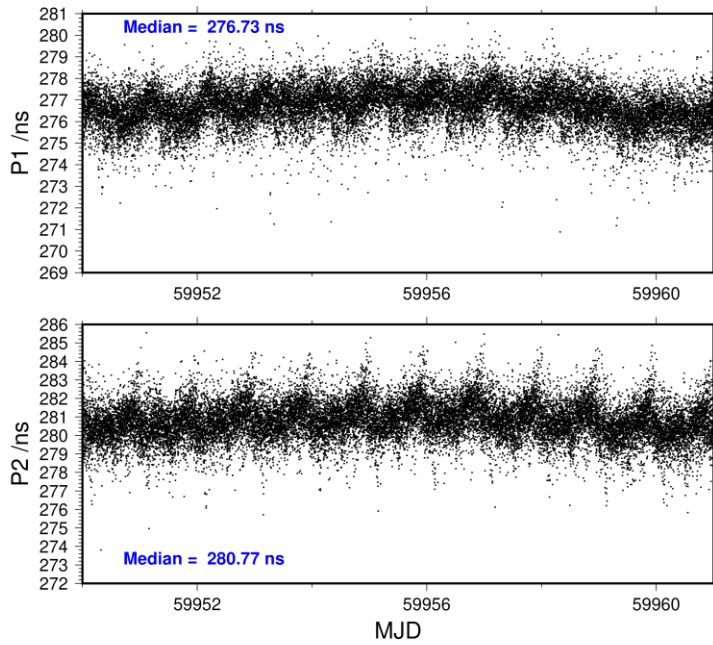
Code	#pts	median/ns	ave/ns	rms/ns
C1	25443	275.514	275.483	0.946
P1	25351	276.725	276.683	0.908
P2	25381	280.770	280.785	1.042



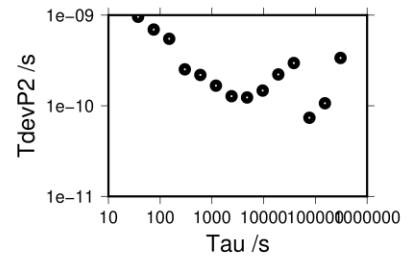
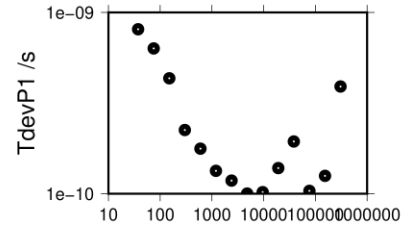
- 305920 s: C1= 353 ps
- 152960 s: C1= 124 ps
- 76480 s: C1= 97 ps
- 38240 s: C1= 110 ps
- 19120 s: C1= 131 ps
- 9560 s: C1= 118 ps
- 4780 s: C1= 109 ps
- 2390 s: C1= 123 ps
- 1195 s: C1= 143 ps
- 598 s: C1= 200 ps
- 299 s: C1= 253 ps
- 149 s: C1= 470 ps
- 75 s: C1= 663 ps
- 37 s: C1= 855 ps



2023-01-19 tl1BP2523006\_11



307030 s: P1= 390 ps	306667 s: P2= 337 ps
153515 s: P1= 125 ps	153334 s: P2= 107 ps
76758 s: P1= 104 ps	76667 s: P2= 74 ps
38379 s: P1= 194 ps	38333 s: P2= 296 ps
19189 s: P1= 138 ps	19167 s: P2= 222 ps
9595 s: P1= 102 ps	9583 s: P2= 147 ps
4797 s: P1= 100 ps	4792 s: P2= 123 ps
2399 s: P1= 118 ps	2396 s: P2= 128 ps
1199 s: P1= 134 ps	1198 s: P2= 167 ps
600 s: P1= 177 ps	599 s: P2= 219 ps
300 s: P1= 224 ps	299 s: P2= 252 ps
150 s: P1= 433 ps	150 s: P2= 549 ps
75 s: P1= 633 ps	75 s: P2= 694 ps
37 s: P1= 807 ps	37 s: P2= 959 ps



**TLT1-BP2G**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 266507  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28325 high elev obs : 76.757 80.107  
 Iteration 0: Obs used = 469512; Huge residuals = 114; Large residuals = 9308  
 Iteration 1: Obs used = 470025; Huge residuals = 0; Large residuals = 8681  
 Computed code bias (P1/P2)/m = 78.015 81.357  
 Computed baseline (X,Y,Z)/m = -11.562 -7.693 -1.503  
 RMS of residuals /m = 0.607

Number of phase differences to fit baseline  
 L1/L2 = 261917  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -11.562 -7.693 -1.503  
 31295 clock jitters computed out of 31395 intervals  
 AVE jitter /ps = 1.1 RMS jitter /ps = 38.1

Iter 1 Large residuals L1= 7  
 Iter 1 Large residuals L2= 7  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 1.025 -1.360 -0.590  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 1.025 -1.361 -0.591  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 7  
 Iter 2 Large residuals L2= 7  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 1.025 -1.360 -0.590  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 1.025 -1.361 -0.591  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -10.537 -9.053 -2.094  
 31295 clock jitters computed out of 31395 intervals  
 AVE jitter /ps = -0.6 RMS jitter /ps = 1.8

Iter 3 Large residuals L1= 7  
 Iter 3 Large residuals L2= 7  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = -0.037 -0.069 -0.021  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.037 -0.070 -0.022  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -10.574 -9.123 -2.115  
 Final baseline L2 (X,Y,Z)/m = -10.574 -9.124 -2.116  
 Final baseline L5 (X,Y,Z)/m = -10.574 -9.123 -2.116

COMPUTATION OF CODE DIFFERENCES

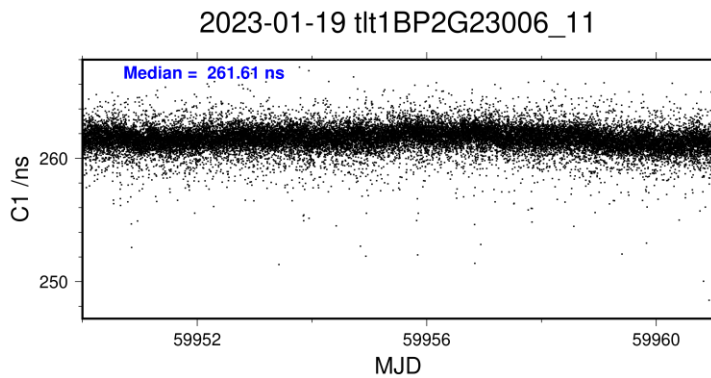
Total number of code differences = 276362

Global average of individual differences

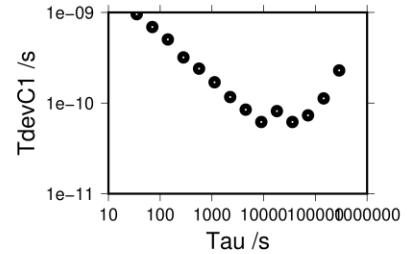
Code	#pts	ave/ns	rms/ns
C1	270403	261.548	2.101
P1	266376	264.055	1.716
P2	266704	275.207	2.064

Number of 300s epochs in out file = 3168

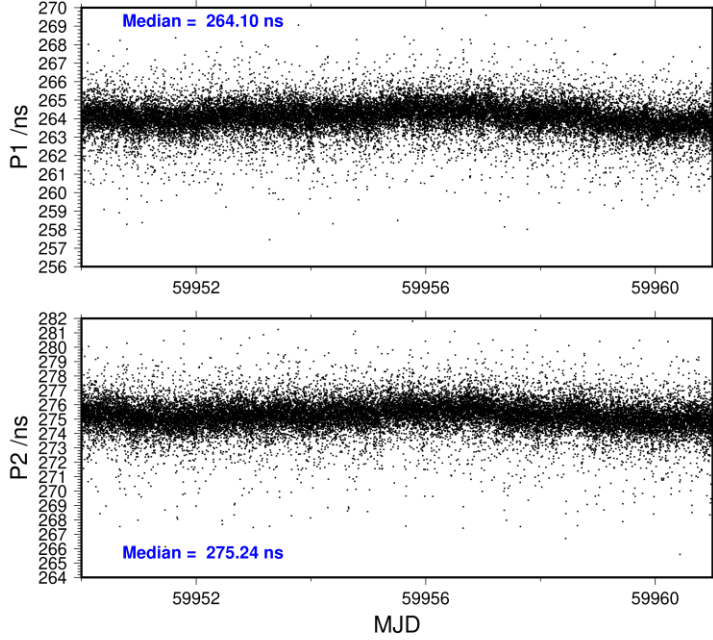
Code	#pts	median/ns	ave/ns	rms/ns
C1	26970	261.608	261.576	0.991
P1	26610	264.099	264.067	0.861
P2	26640	275.239	275.210	1.120



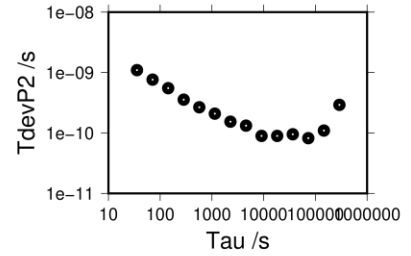
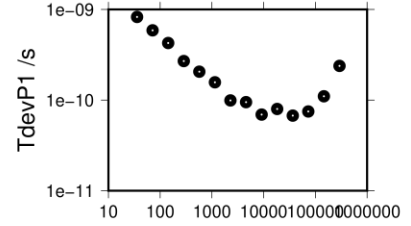
288599 s: C1= 229 ps  
 144299 s: C1= 113 ps  
 72150 s: C1= 73 ps  
 36075 s: C1= 62 ps  
 18037 s: C1= 82 ps  
 9019 s: C1= 62 ps  
 4509 s: C1= 85 ps  
 2255 s: C1= 117 ps  
 1127 s: C1= 170 ps  
 564 s: C1= 240 ps  
 282 s: C1= 319 ps  
 141 s: C1= 503 ps  
 70 s: C1= 690 ps  
 35 s: C1= 957 ps



2023-01-19 tl1BP2G23006\_11



292503 s: P1= 238 ps	292174 s: P2= 293 ps
146252 s: P1= 110 ps	146087 s: P2= 110 ps
73126 s: P1= 75 ps	73043 s: P2= 82 ps
36563 s: P1= 67 ps	36522 s: P2= 95 ps
18281 s: P1= 80 ps	18261 s: P2= 89 ps
9141 s: P1= 69 ps	9130 s: P2= 90 ps
4570 s: P1= 95 ps	4565 s: P2= 132 ps
2285 s: P1= 99 ps	2283 s: P2= 154 ps
1143 s: P1= 157 ps	1141 s: P2= 209 ps
571 s: P1= 206 ps	571 s: P2= 267 ps
286 s: P1= 269 ps	285 s: P2= 356 ps
143 s: P1= 426 ps	143 s: P2= 551 ps
71 s: P1= 588 ps	71 s: P2= 765 ps
36 s: P1= 825 ps	36 s: P2= 1096 ps



**TLT3-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 265137  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28320 high elev obs : -18.755 -19.197  
 Iteration 0: Obs used = 473680; Huge residuals = 18; Large residuals = 2410  
 Iteration 1: Obs used = 473673; Huge residuals = 0; Large residuals = 2399  
 Computed code bias (P1/P2)/m = -17.785 -17.993  
 Computed baseline (X,Y,Z)/m = -12.841 -8.436 -1.597  
 RMS of residuals /m = 0.517

Number of phase differences to fit baseline  
 L1/L2 = 113084  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -12.841 -8.436 -1.597  
 14366 clock jitters computed out of 15823 intervals  
 AVE jitter /ps = 0.5 RMS jitter /ps = 78.7

Iter 1 Large residuals L1= 2472  
 Iter 1 Large residuals L2= 2465  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.705 -1.245 -0.549  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.713 -1.265 -0.557  
 RMS of residuals L2 /m = 0.005  
 No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 2472  
 Iter 2 Large residuals L2= 2464  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.710 -1.255 -0.554  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.718 -1.274 -0.561  
 RMS of residuals L2 /m = 0.005  
 No computed baseline L5, will use L1/L2

Iter 3 Large residuals L1= 2472  
 Iter 3 Large residuals L2= 2464  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.710 -1.255 -0.554  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.717 -1.275 -0.561  
 RMS of residuals L2 /m = 0.005  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -12.127 -9.701 -2.155  
 14578 clock jitters computed out of 15823 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 12.6

Iter 4 Large residuals L1= 2305  
 Iter 4 Large residuals L2= 2307  
 Iter 4 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.021 -0.049 -0.033  
 RMS of residuals L1 /m = 0.004



Computed baseline L2 (X,Y,Z)/m = 0.028 -0.069 -0.041  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Iter 5 Large residuals L1= 2305  
 Iter 5 Large residuals L2= 2307  
 Iter 5 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.022 -0.050 -0.033  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.028 -0.069 -0.041  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -12.106 -9.751 -2.188  
 Final baseline L2 (X,Y,Z)/m = -12.099 -9.770 -2.196  
 Final baseline L5 (X,Y,Z)/m = -12.102 -9.760 -2.192

#### COMPUTATION OF CODE DIFFERENCES

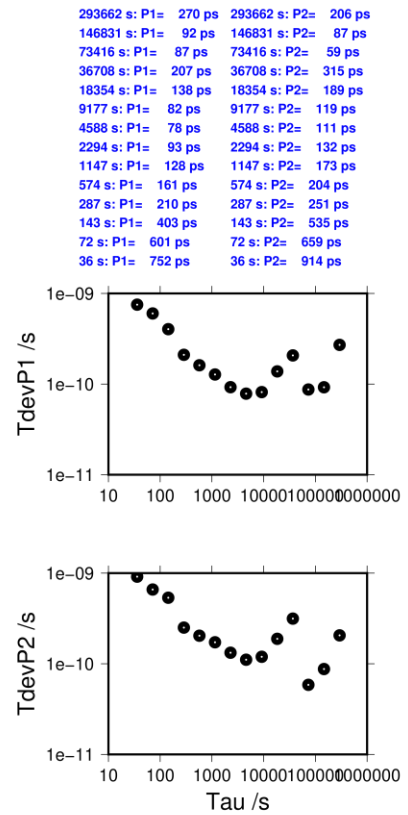
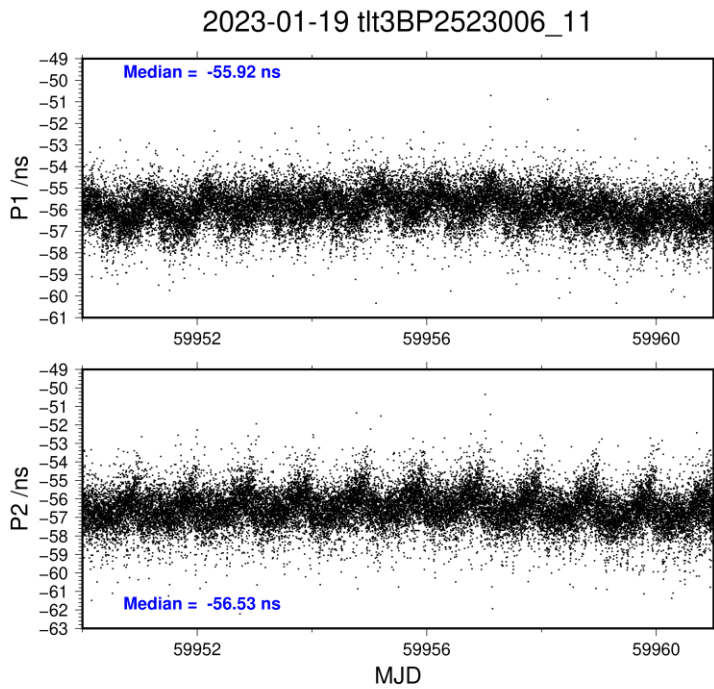
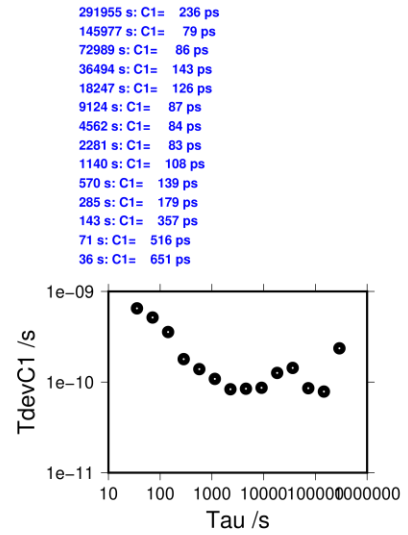
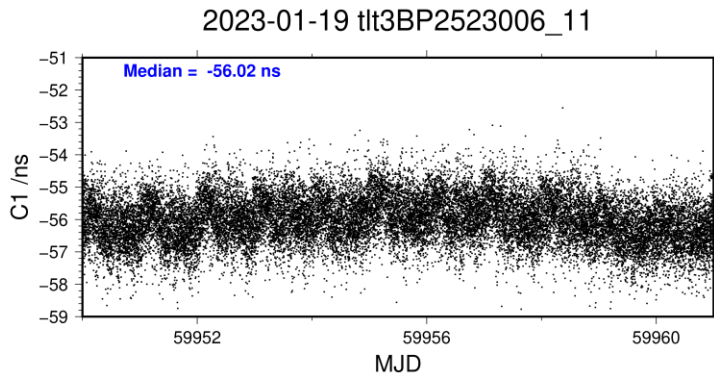
Total number of code differences = 266767

Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	266627	-56.018	1.073
P1	265036	-55.932	1.266
P2	265035	-56.533	1.494

Number of 300s epochs in out file = 3168

Code	#pts	median/ns	ave/ns	rms/ns
C1	26660	-56.018	-56.017	0.721
P1	26505	-55.917	-55.936	0.833
P2	26505	-56.532	-56.528	0.985



**TLT3-BP2G**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 271167  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28325 high elev obs : -22.692 -20.720  
 Iteration 0: Obs used = 481161; Huge residuals = 196; Large residuals = 6979  
 Iteration 1: Obs used = 480882; Huge residuals = 0; Large residuals = 7062  
 Computed code bias (P1/P2)/m = -21.489 -19.566  
 Computed baseline (X,Y,Z)/m = -12.410 -8.986 -0.126  
 RMS of residuals /m = 0.556

Number of phase differences to fit baseline  
 L1/L2 = 115888  
 L5 = 0  
 A priori baseline (X,Y,Z)/m = -12.410 -8.986 -0.126  
 14196 clock jitters computed out of 15490 intervals  
 AVE jitter /ps = 0.3 RMS jitter /ps = 79.0

Iter 1 Large residuals L1= 2915  
 Iter 1 Large residuals L2= 2905  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.675 -1.179 -0.494  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.685 -1.183 -0.495  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Iter 2 Large residuals L1= 2915  
 Iter 2 Large residuals L2= 2906  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.680 -1.187 -0.498  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.690 -1.190 -0.498  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

Iter 3 Large residuals L1= 2915  
 Iter 3 Large residuals L2= 2906  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.680 -1.187 -0.498  
 RMS of residuals L1 /m = 0.005  
 Computed baseline L2 (X,Y,Z)/m = 0.691 -1.190 -0.498  
 RMS of residuals L2 /m = 0.004  
 No computed baseline L5, will use L1/L2

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -11.725 -10.175 -0.624  
 14376 clock jitters computed out of 15490 intervals  
 AVE jitter /ps = 0.1 RMS jitter /ps = 11.2

Iter 4 Large residuals L1= 2777  
 Iter 4 Large residuals L2= 2778  
 Iter 4 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.013 -0.059 -0.025  
 RMS of residuals L1 /m = 0.003

Computed baseline L2 (X,Y,Z)/m = 0.022 -0.062 -0.026  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Iter 5 Large residuals L1= 2777  
 Iter 5 Large residuals L2= 2778  
 Iter 5 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.012 -0.059 -0.025  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.022 -0.062 -0.026  
 RMS of residuals L2 /m = 0.003  
 No computed baseline L5, will use L1/L2

Final baseline L1 (X,Y,Z)/m = -11.713 -10.234 -0.649  
 Final baseline L2 (X,Y,Z)/m = -11.703 -10.237 -0.650  
 Final baseline L5 (X,Y,Z)/m = -11.708 -10.235 -0.649

#### COMPUTATION OF CODE DIFFERENCES

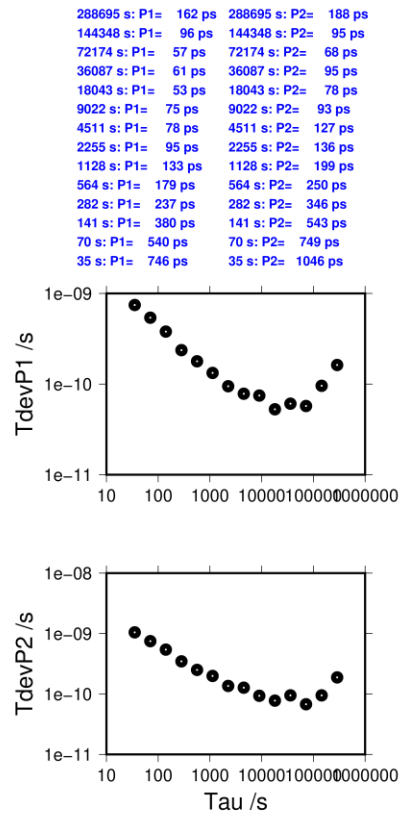
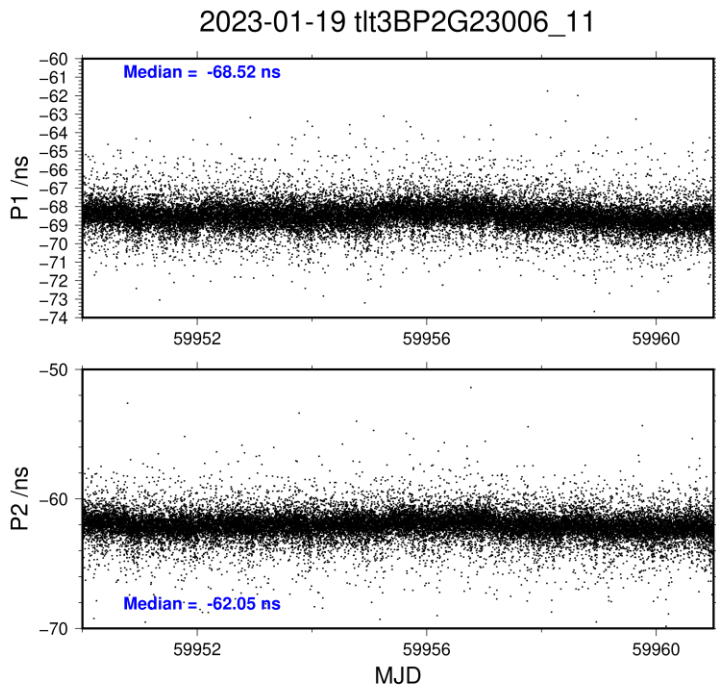
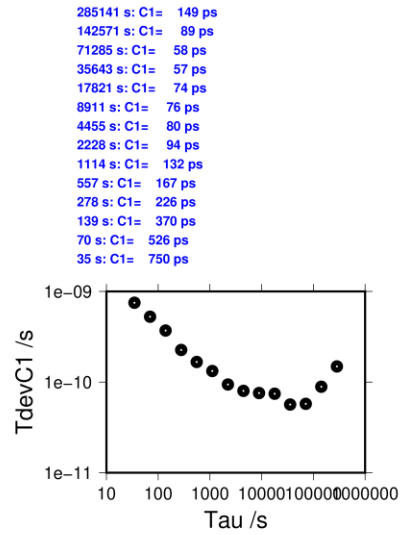
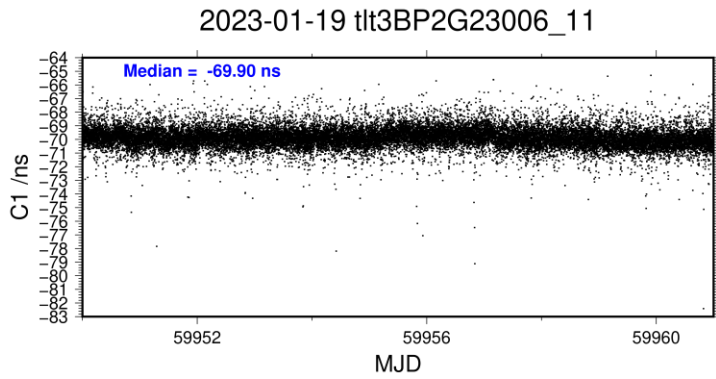
Total number of code differences = 275928

Global average of individual differences

Code	#pts	ave/ns	rms/ns
C1	274561	-69.889	1.449
P1	270701	-68.500	1.485
P2	270744	-62.071	1.921

Number of 300s epochs in out file = 3168

Code	#pts	median/ns	ave/ns	rms/ns
C1	27297	-69.898	-69.878	0.754
P1	26961	-68.524	-68.503	0.766
P2	26961	-62.054	-62.077	1.071



**TLT5-BP25**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 272816  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28320 high elev obs : 17.970 15.976  
 Iteration 0: Obs used = 491032; Huge residuals = 0; Large residuals = 416  
 Iteration 1: Obs used = 491032; Huge residuals = 0; Large residuals = 416  
 Computed code bias (P1/P2)/m = 18.928 17.208  
 Computed baseline (X,Y,Z)/m = -13.464 -7.582 -3.998  
 RMS of residuals /m = 0.473

Number of phase differences to fit baseline  
 L1/L2 = 264790  
 L5 = 142139  
 A priori baseline (X,Y,Z)/m = -13.464 -7.582 -3.998  
 31305 clock jitters computed out of 31385 intervals  
 AVE jitter /ps = -0.4 RMS jitter /ps = 38.4

Iter 1 Large residuals L1= 1  
 Iter 1 Large residuals L2= 1  
 Iter 1 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.716 -1.208 -0.557  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.720 -1.218 -0.564  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.704 -1.219 -0.557  
 RMS of residuals L5 /m = 0.003

Iter 2 Large residuals L1= 1  
 Iter 2 Large residuals L2= 1  
 Iter 2 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.716 -1.208 -0.557  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.721 -1.218 -0.564  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.704 -1.219 -0.557  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -12.746 -8.795 -4.558  
 31305 clock jitters computed out of 31385 intervals  
 AVE jitter /ps = 0.2 RMS jitter /ps = 1.7

Iter 3 Large residuals L1= 1  
 Iter 3 Large residuals L2= 1  
 Iter 3 Large residuals L5= 0  
 Computed baseline L1 (X,Y,Z)/m = 0.032 -0.018 -0.010  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.036 -0.028 -0.016  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.033 -0.031 -0.021  
 RMS of residuals L5 /m = 0.003

Final baseline L1 (X,Y,Z)/m = -12.714 -8.813 -4.568

Final baseline L2 (X,Y,Z)/m = -12.710 -8.823 -4.574  
 Final baseline L5 (X,Y,Z)/m = -12.713 -8.827 -4.579

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = \*\*\*\*\*

Global average of individual differences

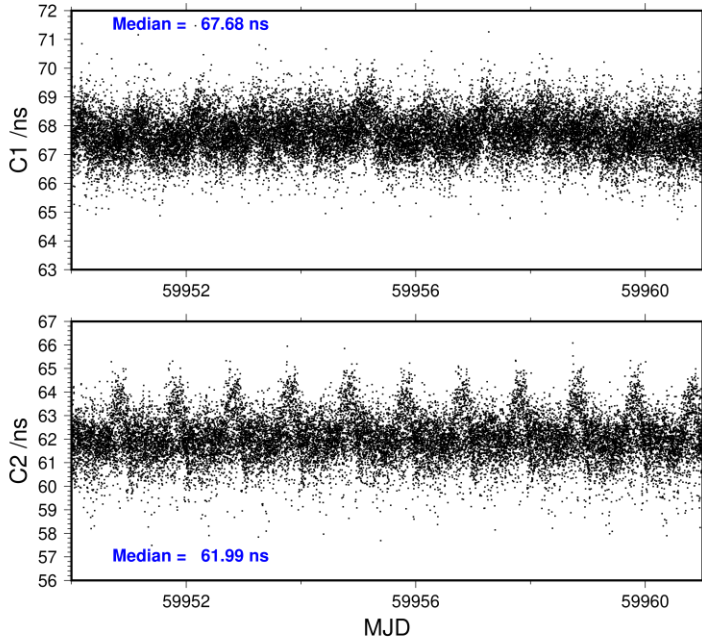
<b>Code</b>	<b>#pts</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	273205	67.700	1.017
C2	214399	62.037	1.276
P1	272742	66.337	1.067
P2	272740	60.685	1.231
E1	219644	68.030	0.915
E5	219656	59.738	0.882
BC	160535	68.510	1.031
B5	160667	60.165	0.920

Number of 300s epochs in out file = 3168

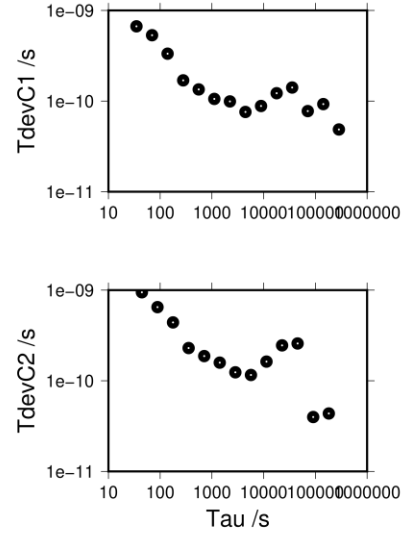
<b>Code</b>	<b>#pts</b>	<b>median/ns</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	27302	67.684	67.697	0.703
C2	21418	61.994	62.036	0.956
P1	27266	66.348	66.335	0.753
P2	27266	60.679	60.687	0.973
E1	21949	68.088	68.030	0.703
E5	21952	59.702	59.736	0.740
BC	16020	68.545	68.512	0.797
B5	16037	60.131	60.162	0.777



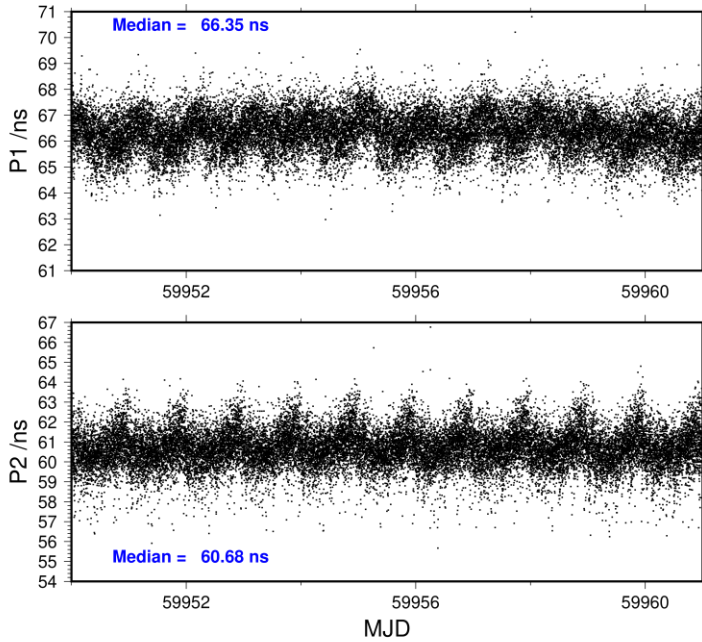
2023-01-19 TLT5BP2523006\_11



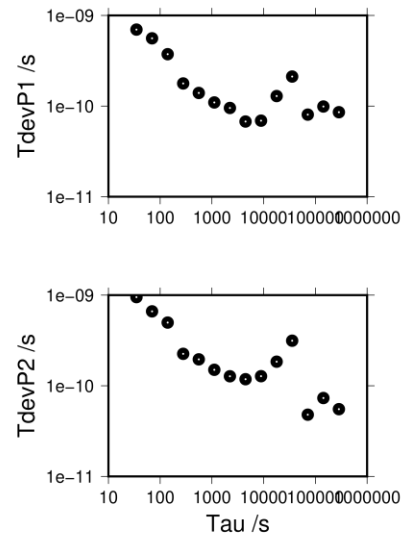
285089 s: C1= 49 ps  
142545 s: C1= 93 ps 181707 s: C2= 44 ps  
71272 s: C1= 78 ps 90853 s: C2= 40 ps  
35636 s: C1= 141 ps 45427 s: C2= 258 ps  
17818 s: C1= 122 ps 22713 s: C2= 246 ps  
8909 s: C1= 88 ps 11357 s: C2= 163 ps  
4455 s: C1= 76 ps 5678 s: C2= 116 ps  
2227 s: C1= 99 ps 2839 s: C2= 124 ps  
1114 s: C1= 106 ps 1420 s: C2= 159 ps  
557 s: C1= 135 ps 710 s: C2= 187 ps  
278 s: C1= 169 ps 355 s: C2= 229 ps  
139 s: C1= 334 ps 177 s: C2= 440 ps  
70 s: C1= 533 ps 89 s: C2= 649 ps  
35 s: C1= 668 ps 44 s: C2= 946 ps



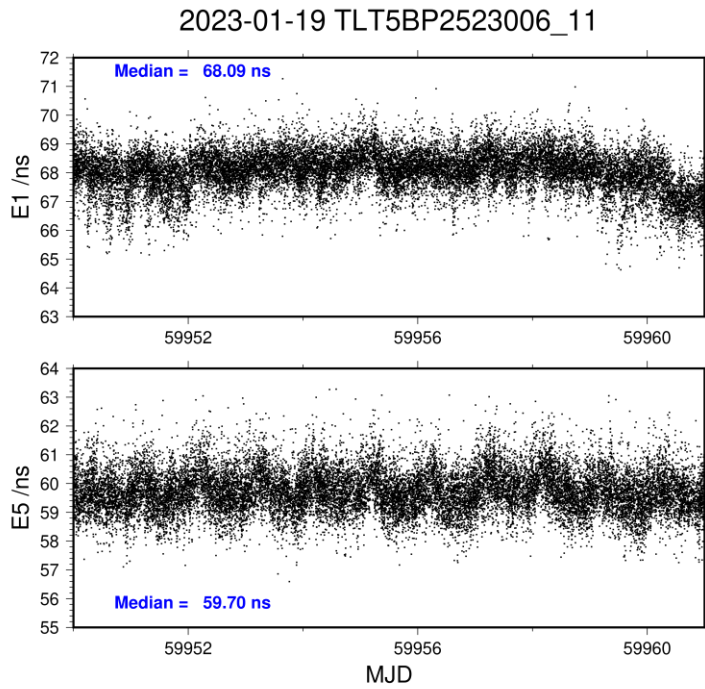
2023-01-19 TLT5BP2523006\_11



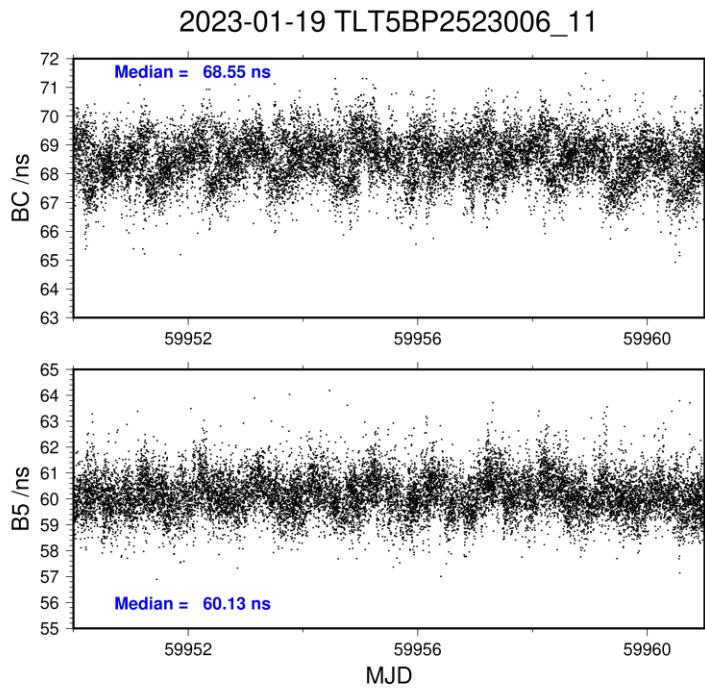
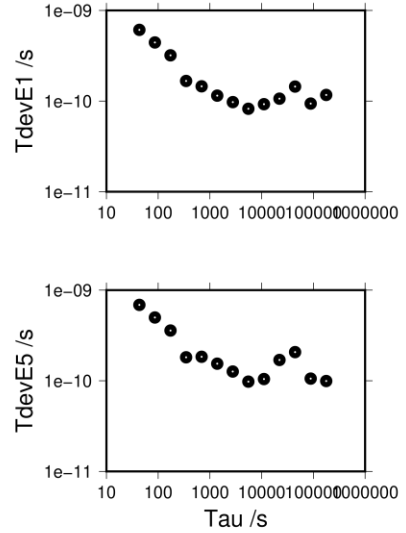
285466 s: P1= 86 ps 285466 s: P2= 55 ps  
142733 s: P1= 99 ps 142733 s: P2= 73 ps  
71366 s: P1= 80 ps 71366 s: P2= 48 ps  
35683 s: P1= 212 ps 35683 s: P2= 314 ps  
17842 s: P1= 129 ps 17842 s: P2= 184 ps  
8921 s: P1= 69 ps 8921 s: P2= 128 ps  
4460 s: P1= 68 ps 4460 s: P2= 118 ps  
2230 s: P1= 95 ps 2230 s: P2= 127 ps  
1115 s: P1= 110 ps 1115 s: P2= 150 ps  
558 s: P1= 139 ps 558 s: P2= 195 ps  
279 s: P1= 178 ps 279 s: P2= 225 ps  
139 s: P1= 373 ps 139 s: P2= 498 ps  
70 s: P1= 559 ps 70 s: P2= 662 ps  
35 s: P1= 697 ps 35 s: P2= 951 ps



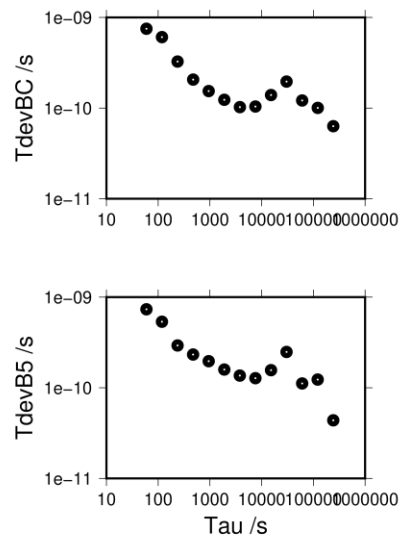




177310 s: E1= 117 ps 177286 s: E5= 99 ps  
 88655 s: E1= 94 ps 88643 s: E5= 106 ps  
 44328 s: E1= 145 ps 44322 s: E5= 207 ps  
 22164 s: E1= 106 ps 22161 s: E5= 170 ps  
 11082 s: E1= 92 ps 11080 s: E5= 104 ps  
 5541 s: E1= 82 ps 5540 s: E5= 98 ps  
 2770 s: E1= 97 ps 2770 s: E5= 127 ps  
 1385 s: E1= 115 ps 1385 s: E5= 154 ps  
 693 s: E1= 145 ps 693 s: E5= 184 ps  
 346 s: E1= 167 ps 346 s: E5= 182 ps  
 173 s: E1= 320 ps 173 s: E5= 359 ps  
 87 s: E1= 443 ps 87 s: E5= 499 ps  
 43 s: E1= 611 ps 43 s: E5= 688 ps



242937 s: BC= 63 ps 242680 s: B5= 44 ps  
 121469 s: BC= 100 ps 121340 s: B5= 123 ps  
 60734 s: BC= 121 ps 60670 s: B5= 112 ps  
 30367 s: BC= 196 ps 30335 s: B5= 249 ps  
 15184 s: BC= 139 ps 15167 s: B5= 157 ps  
 7592 s: BC= 104 ps 7584 s: B5= 128 ps  
 3796 s: BC= 102 ps 3792 s: B5= 136 ps  
 1898 s: BC= 123 ps 1896 s: B5= 159 ps  
 949 s: BC= 154 ps 948 s: B5= 197 ps  
 474 s: BC= 206 ps 474 s: B5= 233 ps  
 237 s: BC= 326 ps 237 s: B5= 293 ps  
 119 s: BC= 606 ps 118 s: B5= 535 ps  
 59 s: BC= 750 ps 59 s: B5= 734 ps



TLT5-BP2G

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 296766  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 28325 high elev obs : 14.031 14.448  
 Iteration 0: Obs used = 531646; Huge residuals = 445; Large residuals = 7692  
 Iteration 1: Obs used = 532199; Huge residuals = 0; Large residuals = 6694  
 Computed code bias (P1/P2)/m = 15.184 15.610  
 Computed baseline (X,Y,Z)/m = -13.069 -8.110 -2.488  
 RMS of residuals /m = 0.567

Number of phase differences to fit baseline  
 L1/L2 = 287998  
 L5 = 157914  
 A priori baseline (X,Y,Z)/m = -13.069 -8.110 -2.488  
 31323 clock jitters computed out of 31396 intervals  
 AVE jitter /ps = -0.1 RMS jitter /ps = 37.9

Iter 1 Large residuals L1= 124  
 Iter 1 Large residuals L2= 119  
 Iter 1 Large residuals L5= 251  
 Computed baseline L1 (X,Y,Z)/m = 0.724 -1.154 -0.531  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.724 -1.156 -0.532  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.769 -0.975 -0.552  
 RMS of residuals L5 /m = 0.005

Iter 2 Large residuals L1= 124  
 Iter 2 Large residuals L2= 119  
 Iter 2 Large residuals L5= 252  
 Computed baseline L1 (X,Y,Z)/m = 0.724 -1.155 -0.532  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.724 -1.156 -0.532  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.771 -0.985 -0.561  
 RMS of residuals L5 /m = 0.005

Iter 3 Large residuals L1= 124  
 Iter 3 Large residuals L2= 119  
 Iter 3 Large residuals L5= 252  
 Computed baseline L1 (X,Y,Z)/m = 0.724 -1.155 -0.532  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.724 -1.156 -0.532  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.771 -0.985 -0.561  
 RMS of residuals L5 /m = 0.005

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -12.345 -9.266 -3.020  
 31324 clock jitters computed out of 31396 intervals  
 AVE jitter /ps = 0.2 RMS jitter /ps = 1.7

Iter 4 Large residuals L1= 124  
 Iter 4 Large residuals L2= 120

Iter 4 Large residuals L5= 255  
 Computed baseline L1 (X,Y,Z)/m = 0.029 -0.015 -0.007  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.028 -0.016 -0.008  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.089 0.152 -0.044  
 RMS of residuals L5 /m = 0.004

Iter 5 Large residuals L1= 124  
 Iter 5 Large residuals L2= 120  
 Iter 5 Large residuals L5= 255  
 Computed baseline L1 (X,Y,Z)/m = 0.029 -0.015 -0.007  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.028 -0.016 -0.008  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = 0.089 0.152 -0.044  
 RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -12.317 -9.281 -3.028  
 Final baseline L2 (X,Y,Z)/m = -12.317 -9.282 -3.029  
 Final baseline L5 (X,Y,Z)/m = -12.256 -9.114 -3.064

#### COMPUTATION OF CODE DIFFERENCES

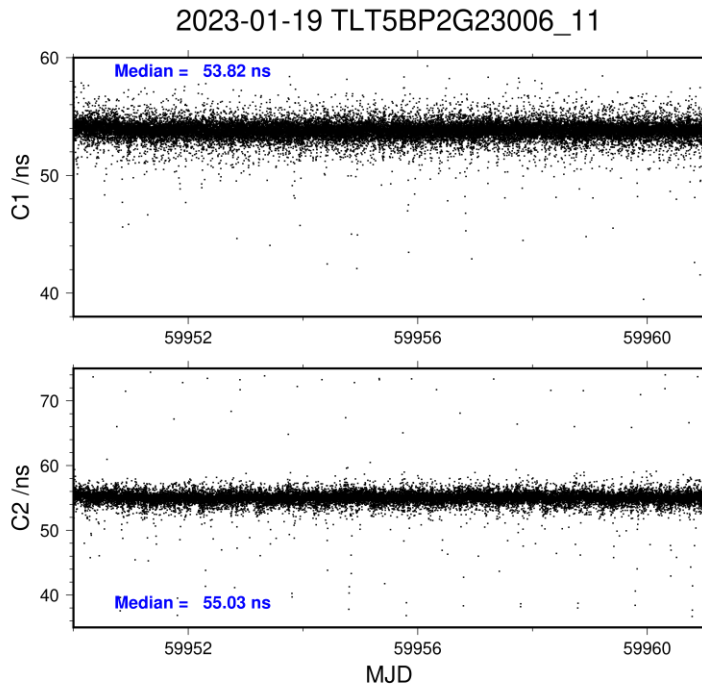
Total number of code differences = \*\*\*\*\*

Global average of individual differences

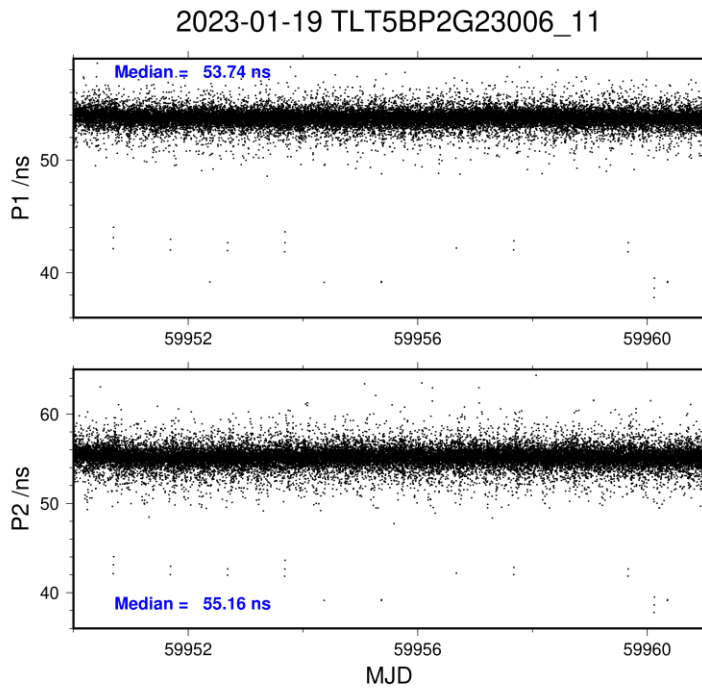
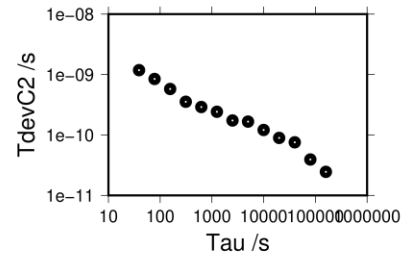
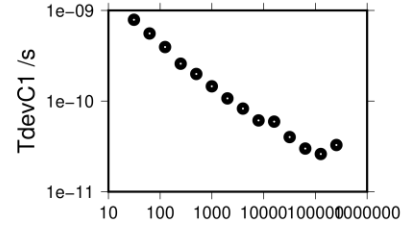
Code	#pts	ave/ns	rms/ns
C1	305621	53.780	1.657
C2	244106	54.984	1.920
P1	295880	53.698	1.478
P2	295879	55.129	1.818
E1	248628	53.699	1.313
E5	249388	52.082	1.155
BC	178743	53.717	1.387
B5	179310	52.057	1.109

Number of 300s epochs in out file = 3168

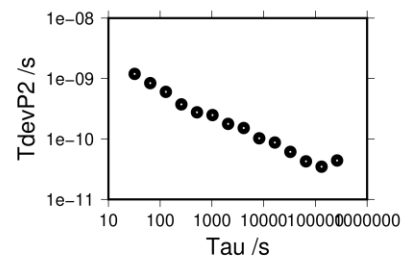
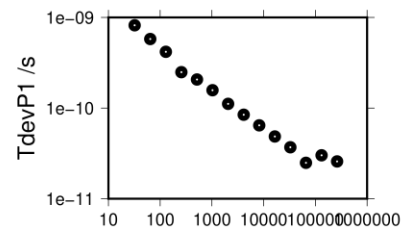
Code	#pts	median/ns	ave/ns	rms/ns
C1	30502	53.822	53.798	0.791
C2	24340	55.029	54.999	1.186
P1	29558	53.741	53.710	0.819
P2	29558	55.158	55.126	1.196
E1	24843	53.746	53.714	0.739
E5	24938	52.079	52.083	0.770
BC	17841	53.776	53.726	0.785
B5	17905	52.046	52.058	0.724



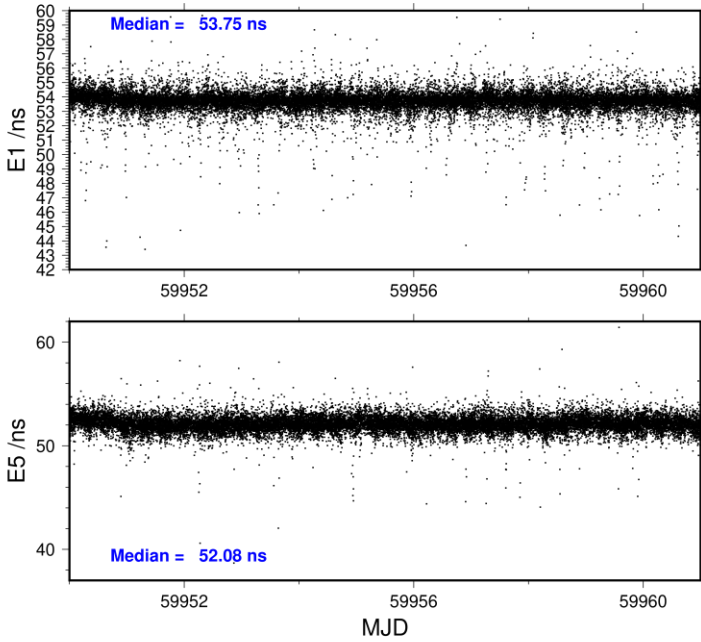
255179 s: C1= 33 ps  
 127590 s: C1= 26 ps 159892 s: C2= 25 ps  
 63795 s: C1= 30 ps 79946 s: C2= 39 ps  
 31897 s: C1= 40 ps 39973 s: C2= 76 ps  
 15949 s: C1= 59 ps 19986 s: C2= 89 ps  
 7974 s: C1= 61 ps 9993 s: C2= 121 ps  
 3987 s: C1= 83 ps 4997 s: C2= 167 ps  
 1994 s: C1= 107 ps 2498 s: C2= 174 ps  
 997 s: C1= 145 ps 1249 s: C2= 242 ps  
 498 s: C1= 199 ps 625 s: C2= 291 ps  
 249 s: C1= 258 ps 312 s: C2= 355 ps  
 125 s: C1= 395 ps 156 s: C2= 578 ps  
 62 s: C1= 556 ps 78 s: C2= 845 ps  
 31 s: C1= 789 ps 39 s: C2= 1184 ps



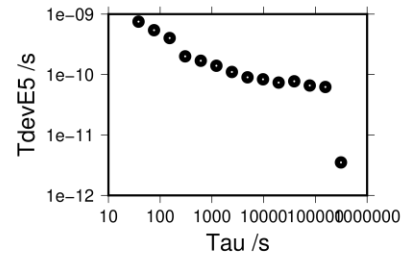
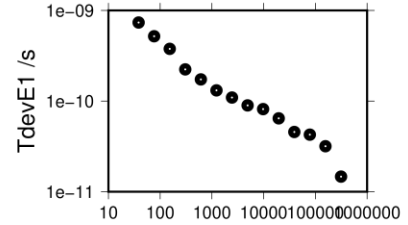
263329 s: P1= 26 ps 263329 s: P2= 44 ps  
 131665 s: P1= 30 ps 131665 s: P2= 35 ps  
 65832 s: P1= 25 ps 65832 s: P2= 43 ps  
 32916 s: P1= 37 ps 32916 s: P2= 61 ps  
 16458 s: P1= 49 ps 16458 s: P2= 87 ps  
 8229 s: P1= 64 ps 8229 s: P2= 103 ps  
 4115 s: P1= 84 ps 4115 s: P2= 152 ps  
 2057 s: P1= 111 ps 2057 s: P2= 178 ps  
 1029 s: P1= 157 ps 1029 s: P2= 249 ps  
 514 s: P1= 207 ps 514 s: P2= 276 ps  
 257 s: P1= 249 ps 257 s: P2= 374 ps  
 129 s: P1= 418 ps 129 s: P2= 602 ps  
 64 s: P1= 578 ps 64 s: P2= 839 ps  
 32 s: P1= 819 ps 32 s: P2= 1193 ps



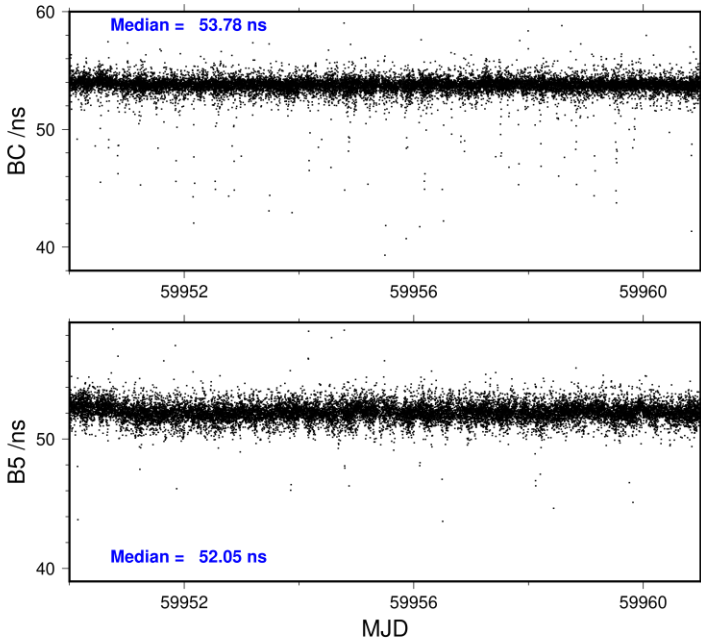
2023-01-19 TLT5BP2G23006\_11



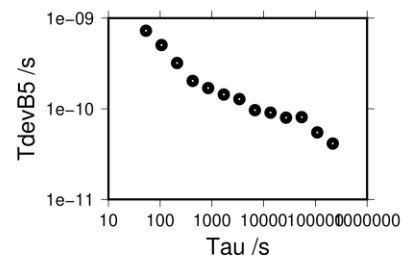
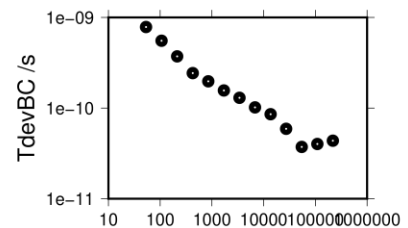
313309 s: E1= 15 ps	312115 s: E5= 4 ps
156654 s: E1= 32 ps	156058 s: E5= 62 ps
78327 s: E1= 43 ps	78029 s: E5= 66 ps
39164 s: E1= 46 ps	39014 s: E5= 77 ps
19582 s: E1= 64 ps	19507 s: E5= 74 ps
9791 s: E1= 82 ps	9754 s: E5= 84 ps
4895 s: E1= 90 ps	4877 s: E5= 90 ps
2448 s: E1= 109 ps	2438 s: E5= 110 ps
1224 s: E1= 131 ps	1219 s: E5= 140 ps
612 s: E1= 174 ps	610 s: E5= 169 ps
306 s: E1= 223 ps	305 s: E5= 200 ps
153 s: E1= 377 ps	152 s: E5= 402 ps
76 s: E1= 519 ps	76 s: E5= 542 ps
38 s: E1= 735 ps	38 s: E5= 752 ps



2023-01-19 TLT5BP2G23006\_11



218140 s: BC= 44 ps	217360 s: B5= 41 ps
109070 s: BC= 40 ps	108680 s: B5= 55 ps
54535 s: BC= 37 ps	54340 s: B5= 81 ps
27267 s: BC= 59 ps	27170 s: B5= 80 ps
13634 s: BC= 86 ps	13585 s: B5= 91 ps
6817 s: BC= 102 ps	6792 s: B5= 96 ps
3408 s: BC= 130 ps	3396 s: B5= 128 ps
1704 s: BC= 156 ps	1698 s: B5= 144 ps
852 s: BC= 197 ps	849 s: B5= 169 ps
426 s: BC= 243 ps	425 s: B5= 203 ps
213 s: BC= 372 ps	212 s: B5= 320 ps
107 s: BC= 553 ps	106 s: B5= 504 ps
53 s: BC= 784 ps	53 s: B5= 726 ps



**1.5/ BIPM (23047)****Period**

MJD 59991 to 59995

**Delays**

BP25: (cf page 138)  
REFDLY = 53.36 ns (68.38-15.02)  
CABDLY = 176.24 ns (C208)

BP2G: (cf page 139)  
REFDLY = 53.47 ns (68.49-15.02)  
CABDLY = 176.38 ns (C211)

BP21: (cf page 138)  
REFDLY = 43.27 ns (58.29-15.02)  
CABDLY = 140.80 ns (C201)

## 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 59991	
Date and hour of the end of measurements:	MJD 59995	
<b>Information on the system</b>		
	Local:	Travelling:
4-character BIPM code	BP21	BP25
• Receiver maker and type:	Septentrio PolaRx5TR	Mesit GTR55
Receiver serial number:	4701229	1808001
1 PPS trigger level /V:		
• Antenna cable maker and type:	LMR-195	HYLM195
Phase stabilised cable (Y/N):		
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type:	Septentrio SEPCHOKE B3E6	Novatel GNSS-850
Antenna serial number:	5253	NMLK18070096N
Temperature (if stabilised) /°C		
<b>Measured delays /ns</b>		
(if needed fill box "Additional Information" below)		
	Local:	Travelling:
• Delay from local UTC to receiver 1 PPS-in:	43.27 ns	53.36 ns
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	PPSin compensation enable	
• Antenna cable delay:	140.80 ns	176.24 ns
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
<b>Data used for the generation of CGGTTS files</b>		
• 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:		
<b>General information</b>		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		22 ± 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 59991	
Date and hour of the end of measurements:	MJD 59995	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	BP21	BP2G
• Receiver maker and type: Receiver serial number:	Septentrio PolaRx5TR 4701229	Septentrio PolaRx5TR 4701533
1 PPS trigger level /V:		
• Antenna cable maker and type: Phase stabilised cable (Y/N):	LMR-195	HYLM195
Length outside the building /m:	~ 15 m	~ 15 m
• Antenna maker and type: Antenna serial number:	Septentrio SEPCHOKE B3E6 5253	Septentrio SEPCHOKE B3E6 6023
Temperature (if stabilised) /°C		
<b>Measured delays /ns</b>		
(if needed fill box "Additional Information" below)		
	<b>Local:</b>	<b>Travelling:</b>
• Delay from local UTC to receiver 1 PPS-in:	43.27 ns	53.47 ns
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	PPSin compensation enable	PPSin compensation enable
• Antenna cable delay:	140.80 ns	176.38 ns
Splitter delay (if any):		(1)
Additional cable delay (if any):		(1)
<b>Data used for the generation of CGGTTS files</b>		
• 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:		
<b>General information</b>		
• Rise time of the local UTC pulse:		
• Is the laboratory air conditioned:		
Set temperature value and uncertainty:		22 ± 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.





**Log of Events / Additional Information :**

All measurements at BIPM carried out by L. Tisserand.

Equipment used to measure delays is a Time Interval Counter (TIC), model 53230A, maker Keysight, S/N MY58390132, with measurement uncertainty typically less than 0.5 ns (using external reference frequency as timebase).

The delay between the laboratory reference point and the 1 PPS input connector of the B3TS (CLB P<sub>k</sub>) is 0 ns.

**BP25-BP21**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 102407  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 19057 high elev obs : 3.887 5.545  
 Iteration 0: Obs used = 130530; Huge residuals = 1096; Large residuals = 37804  
 Iteration 1: Obs used = 163208; Huge residuals = 0; Large residuals = 4028  
 Computed code bias (P1/P2)/m = 3.643 5.276  
 Computed baseline (X,Y,Z)/m = -5.041 -0.651 4.521  
 RMS of residuals /m = 0.638

Number of phase differences to fit baseline  
 L1/L2 = 99855  
 L5 = 57010  
 A priori baseline (X,Y,Z)/m = -5.041 -0.651 4.521  
 14374 clock jitters computed out of 14374 intervals  
 AVE jitter /ps = -0.5 RMS jitter /ps = 4.8

Iter 1 Large residuals L1= 4  
 Iter 1 Large residuals L2= 9  
 Iter 1 Large residuals L5= 21  
 Computed baseline L1 (X,Y,Z)/m = 0.014 -0.065 0.166  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.056 -0.063 0.190  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = 0.019 -0.067 0.179  
 RMS of residuals L5 /m = 0.004

Iter 2 Large residuals L1= 4  
 Iter 2 Large residuals L2= 9  
 Iter 2 Large residuals L5= 21  
 Computed baseline L1 (X,Y,Z)/m = 0.014 -0.065 0.166  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.056 -0.063 0.190  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = 0.019 -0.067 0.179  
 RMS of residuals L5 /m = 0.004

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -5.006 -0.714 4.699  
 14374 clock jitters computed out of 14374 intervals  
 AVE jitter /ps = 0.3 RMS jitter /ps = 0.3

Iter 3 Large residuals L1= 4  
 Iter 3 Large residuals L2= 9  
 Iter 3 Large residuals L5= 21  
 Computed baseline L1 (X,Y,Z)/m = -0.005 -0.037 -0.005  
 RMS of residuals L1 /m = 0.004  
 Computed baseline L2 (X,Y,Z)/m = 0.035 -0.035 0.019  
 RMS of residuals L2 /m = 0.005  
 Computed baseline L5 (X,Y,Z)/m = 0.005 -0.038 0.009  
 RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = -5.011 -0.751 4.694

Final baseline L2 (X,Y,Z)/m = -4.970 -0.749 4.718  
 Final baseline L5 (X,Y,Z)/m = -5.000 -0.752 4.708

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 411072

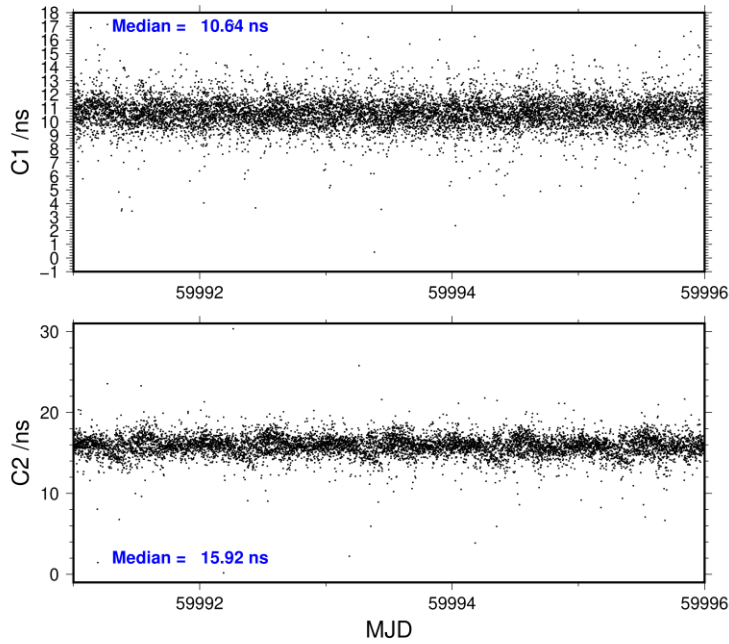
Global average of individual differences

<b>Code</b>	<b>#pts</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	104301	10.631	2.077
C2	83862	15.897	2.130
P1	101189	11.938	1.956
P2	101121	17.334	2.617
E1	84088	10.204	1.883
E5	84234	16.249	1.810
BC	92745	9.851	2.152
B5	94361	15.861	2.072

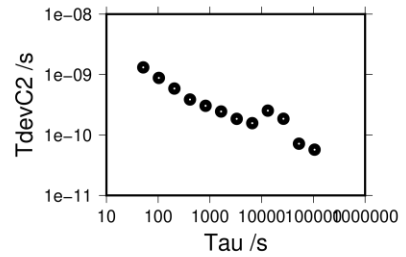
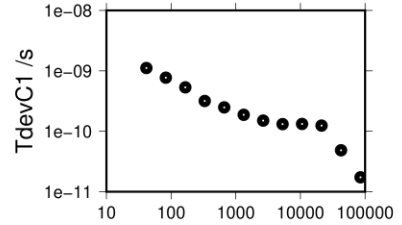
Number of 300s epochs in out file = 1440

<b>Code</b>	<b>#pts</b>	<b>median/ns</b>	<b>ave/ns</b>	<b>rms/ns</b>
C1	10420	10.641	10.645	1.091
C2	8384	15.921	15.884	1.284
P1	10087	11.943	11.962	1.090
P2	10089	17.357	17.330	1.534
E1	8422	10.216	10.194	1.063
E5	8423	16.271	16.236	1.151
BC	9285	9.841	9.838	1.254
B5	9432	15.874	15.848	1.347

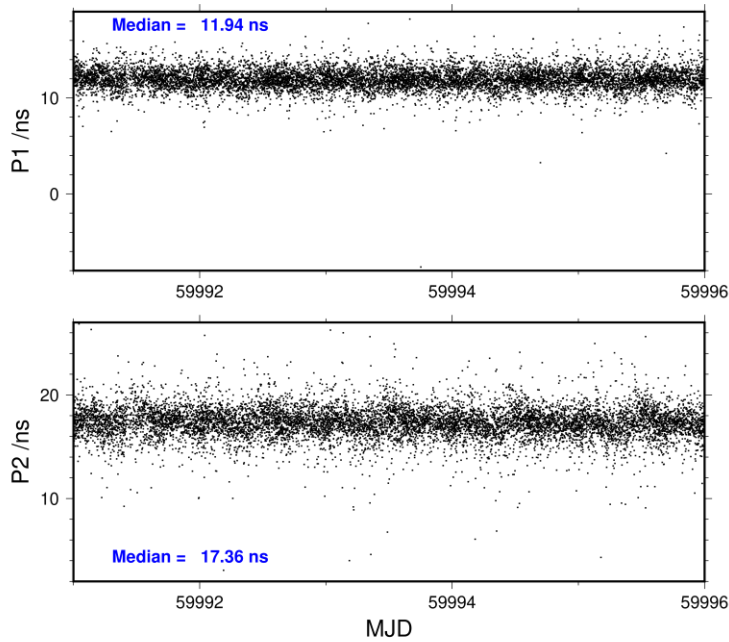
2023-02-21 BP25BP2123047\_5



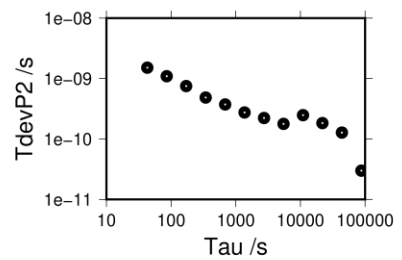
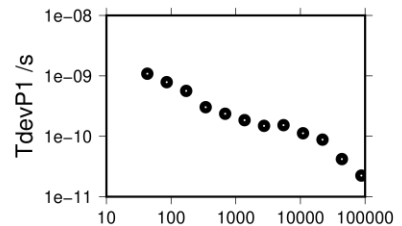
84857 s: C1= 17 ps	105466 s: C2= 57 ps
42428 s: C1= 48 ps	52733 s: C2= 72 ps
21214 s: C1= 124 ps	26366 s: C2= 186 ps
10607 s: C1= 132 ps	13183 s: C2= 253 ps
5304 s: C1= 132 ps	6592 s: C2= 157 ps
2652 s: C1= 150 ps	3296 s: C2= 185 ps
1326 s: C1= 188 ps	1648 s: C2= 245 ps
663 s: C1= 249 ps	824 s: C2= 304 ps
331 s: C1= 317 ps	412 s: C2= 386 ps
166 s: C1= 533 ps	206 s: C2= 587 ps
83 s: C1= 771 ps	103 s: C2= 879 ps
41 s: C1= 1116 ps	52 s: C2= 1316 ps



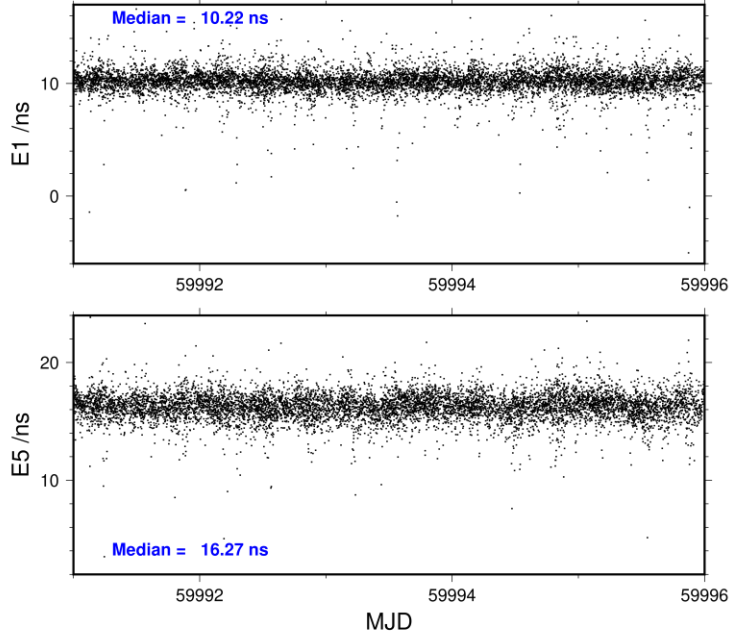
2023-02-21 BP25BP2123047\_5



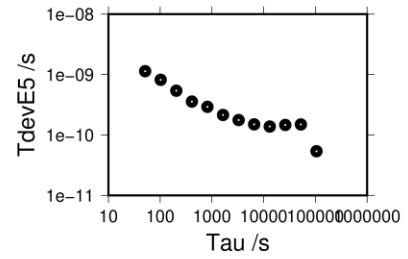
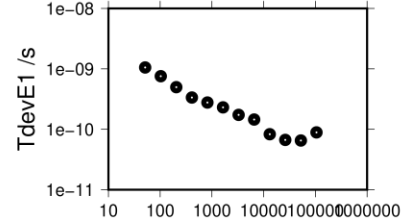
87658 s: P1= 22 ps	87641 s: P2= 30 ps
43829 s: P1= 42 ps	43820 s: P2= 127 ps
21915 s: P1= 88 ps	21910 s: P2= 183 ps
10957 s: P1= 112 ps	10955 s: P2= 248 ps
5479 s: P1= 153 ps	5478 s: P2= 178 ps
2739 s: P1= 149 ps	2739 s: P2= 222 ps
1370 s: P1= 185 ps	1369 s: P2= 275 ps
685 s: P1= 236 ps	685 s: P2= 372 ps
342 s: P1= 303 ps	342 s: P2= 485 ps
171 s: P1= 565 ps	171 s: P2= 750 ps
86 s: P1= 787 ps	86 s: P2= 1092 ps
43 s: P1= 1086 ps	43 s: P2= 1512 ps



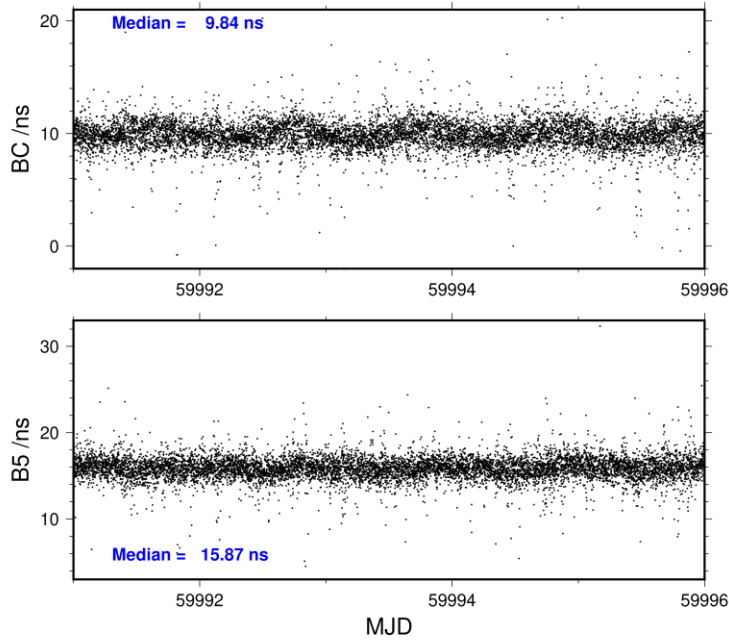
2023-02-21 BP25BP2123047\_5



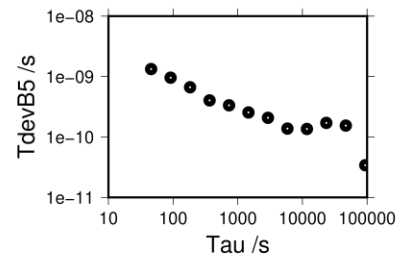
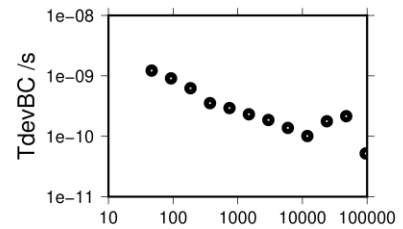
104990 s: E1= 89 ps	104978 s: E5= 54 ps
52495 s: E1= 65 ps	52489 s: E5= 149 ps
26248 s: E1= 67 ps	26244 s: E5= 146 ps
13124 s: E1= 83 ps	13122 s: E5= 138 ps
6562 s: E1= 145 ps	6561 s: E5= 150 ps
3281 s: E1= 173 ps	3281 s: E5= 177 ps
1640 s: E1= 231 ps	1640 s: E5= 214 ps
820 s: E1= 277 ps	820 s: E5= 293 ps
410 s: E1= 336 ps	410 s: E5= 358 ps
205 s: E1= 498 ps	205 s: E5= 540 ps
103 s: E1= 757 ps	103 s: E5= 817 ps
51 s: E1= 1054 ps	51 s: E5= 1137 ps



2023-02-21 BP25BP2123047\_5



95231 s: BC= 52 ps	93746 s: B5= 34 ps
47615 s: BC= 215 ps	46873 s: B5= 154 ps
23808 s: BC= 177 ps	23437 s: B5= 171 ps
11904 s: BC= 101 ps	11718 s: B5= 136 ps
5952 s: BC= 137 ps	5859 s: B5= 138 ps
2976 s: BC= 186 ps	2930 s: B5= 208 ps
1488 s: BC= 231 ps	1465 s: B5= 255 ps
744 s: BC= 293 ps	732 s: B5= 334 ps
372 s: BC= 354 ps	366 s: B5= 403 ps
186 s: BC= 625 ps	183 s: B5= 664 ps
93 s: BC= 909 ps	92 s: B5= 957 ps
46 s: BC= 1220 ps	46 s: B5= 1330 ps



**BP2G-BP21**

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 106771  
 Compute baseline with sin(elev) between 0.05 and 0.90  
 Apriori codes biases from 19073 high elev obs : 7.721 7.205  
 Iteration 0: Obs used = 162516; Huge residuals = 2; Large residuals = 14514  
 Iteration 1: Obs used = 162516; Huge residuals = 0; Large residuals = 14510  
 Computed code bias (P1/P2)/m = 6.974 6.507  
 Computed baseline (X,Y,Z)/m = -3.145 0.062 3.756  
 RMS of residuals /m = 0.761

Number of phase differences to fit baseline  
 L1/L2 = 102075  
 L5 = 58203  
 A priori baseline (X,Y,Z)/m = -3.145 0.062 3.756  
 14392 clock jitters computed out of 14392 intervals  
 AVE jitter /ps = -1.4 RMS jitter /ps = 3.9

Iter 1 Large residuals L1= 5  
 Iter 1 Large residuals L2= 4  
 Iter 1 Large residuals L5= 3  
 Computed baseline L1 (X,Y,Z)/m = -0.508 -0.472 -0.409  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.492 -0.462 -0.399  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.533 -0.459 -0.407  
 RMS of residuals L5 /m = 0.003

Iter 2 Large residuals L1= 5  
 Iter 2 Large residuals L2= 4  
 Iter 2 Large residuals L5= 3  
 Computed baseline L1 (X,Y,Z)/m = -0.508 -0.472 -0.409  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = -0.493 -0.463 -0.400  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.533 -0.459 -0.407  
 RMS of residuals L5 /m = 0.003

New iteration of baseline  
 New apriori baseline (X,Y,Z)/m = -3.646 -0.405 3.352  
 14392 clock jitters computed out of 14392 intervals  
 AVE jitter /ps = 0.9 RMS jitter /ps = 1.0

Iter 3 Large residuals L1= 5  
 Iter 3 Large residuals L2= 4  
 Iter 3 Large residuals L5= 3  
 Computed baseline L1 (X,Y,Z)/m = 0.007 -0.107 -0.014  
 RMS of residuals L1 /m = 0.003  
 Computed baseline L2 (X,Y,Z)/m = 0.022 -0.097 -0.005  
 RMS of residuals L2 /m = 0.004  
 Computed baseline L5 (X,Y,Z)/m = -0.009 -0.093 -0.014  
 RMS of residuals L5 /m = 0.003

WARNING Phase baseline L1 differs from a priori by > 10 cm

Final baseline L1 (X,Y,Z)/m = -3.639 -0.512 3.338

Final baseline L2 (X,Y,Z)/m = -3.624 -0.502 3.347  
 Final baseline L5 (X,Y,Z)/m = -3.655 -0.498 3.338

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 434586

Global average of individual differences

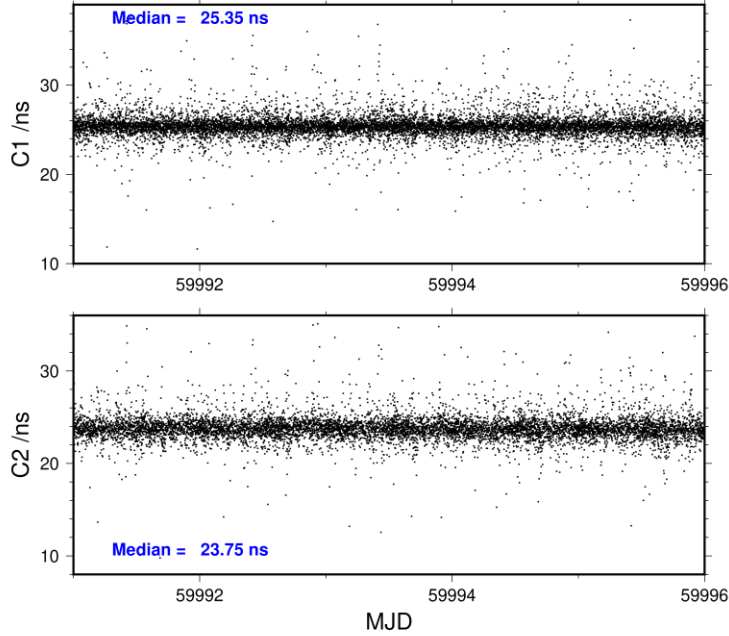
Code	#pts	ave/ns	rms/ns
C1	108060	25.382	2.750
C2	86521	23.787	2.565
P1	105015	25.087	2.682
P2	105064	23.435	3.621
E1	87184	25.279	2.429
E5	88063	24.293	2.232
BC	94703	25.266	2.469
B5	95928	24.299	2.256

Number of 300s epochs in out file = 1440

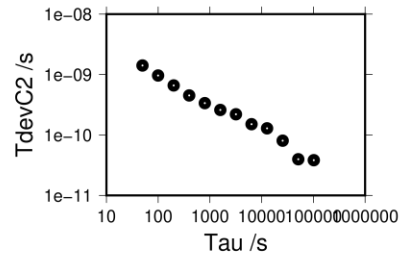
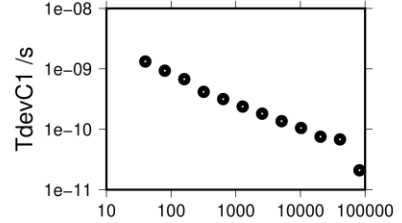
Code	#pts	median/ns	ave/ns	rms/ns
C1	10808	25.347	25.397	1.316
C2	8668	23.747	23.791	1.382
P1	10500	25.201	25.100	1.820
P2	10503	23.567	23.444	2.333
E1	8752	25.265	25.266	1.308
E5	8828	24.316	24.287	1.367
BC	9499	25.260	25.264	1.281
B5	9593	24.310	24.300	1.379



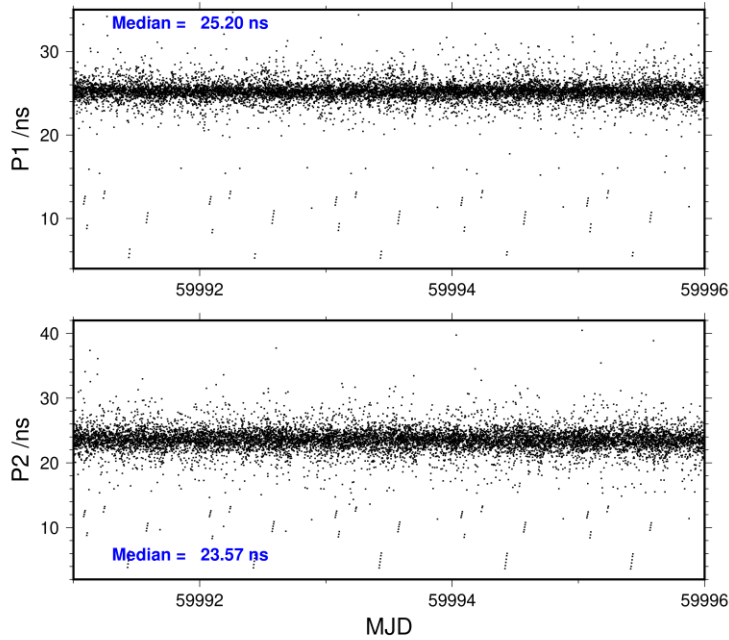
2023-02-21 BP2GBP2123047\_5



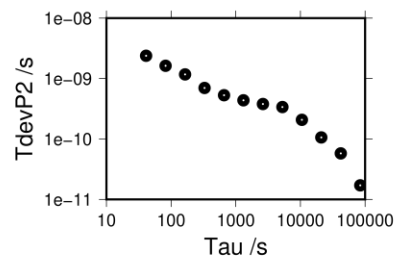
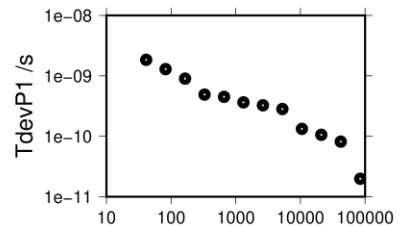
81810 s: C1= 21 ps	102010 s: C2= 38 ps
40905 s: C1= 68 ps	51005 s: C2= 40 ps
20453 s: C1= 75 ps	25503 s: C2= 80 ps
10226 s: C1= 105 ps	12751 s: C2= 129 ps
5113 s: C1= 136 ps	6376 s: C2= 151 ps
2557 s: C1= 181 ps	3188 s: C2= 220 ps
1278 s: C1= 238 ps	1594 s: C2= 260 ps
639 s: C1= 316 ps	797 s: C2= 337 ps
320 s: C1= 417 ps	398 s: C2= 451 ps
160 s: C1= 675 ps	199 s: C2= 660 ps
80 s: C1= 934 ps	100 s: C2= 964 ps
40 s: C1= 1321 ps	50 s: C2= 1414 ps



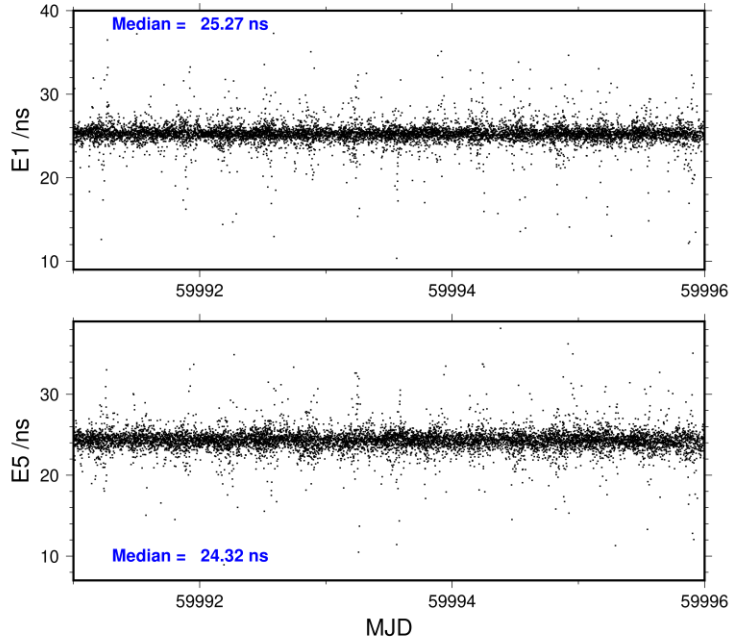
2023-02-21 BP2GBP2123047\_5



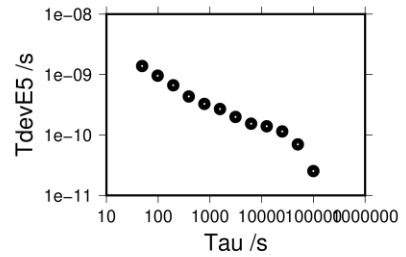
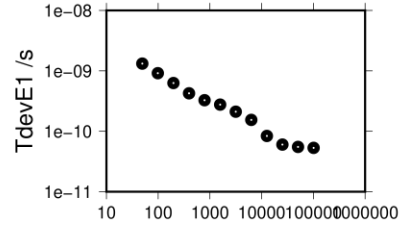
84210 s: P1= 20 ps	84186 s: P2= 17 ps
42105 s: P1= 82 ps	42093 s: P2= 58 ps
21053 s: P1= 106 ps	21047 s: P2= 106 ps
10526 s: P1= 133 ps	10523 s: P2= 207 ps
5263 s: P1= 283 ps	5262 s: P2= 338 ps
2632 s: P1= 326 ps	2631 s: P2= 379 ps
1316 s: P1= 364 ps	1315 s: P2= 436 ps
658 s: P1= 450 ps	658 s: P2= 530 ps
329 s: P1= 490 ps	329 s: P2= 698 ps
164 s: P1= 900 ps	164 s: P2= 1170 ps
82 s: P1= 1294 ps	82 s: P2= 1626 ps
41 s: P1= 1841 ps	41 s: P2= 2385 ps



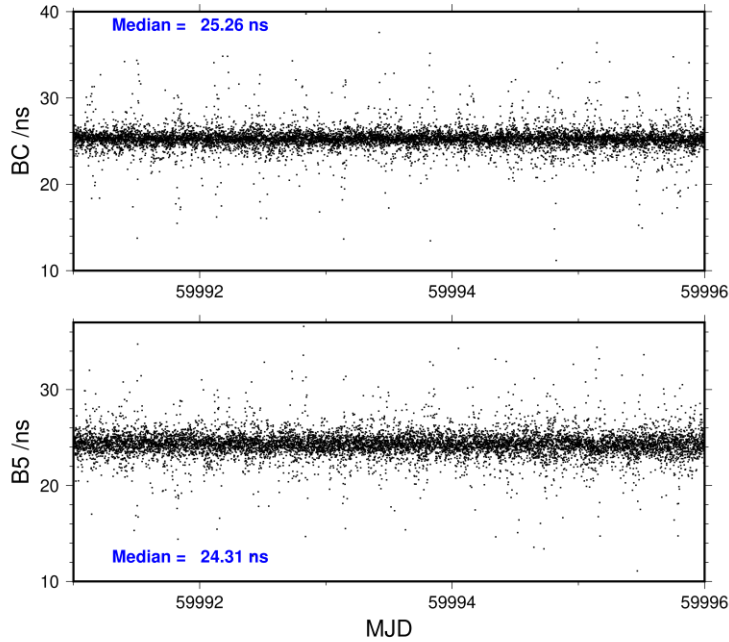
2023-02-21 BP2GBP2123047\_5



101031 s: E1= 53 ps	100161 s: E5= 25 ps
50515 s: E1= 55 ps	50081 s: E5= 70 ps
25258 s: E1= 60 ps	25040 s: E5= 115 ps
12629 s: E1= 84 ps	12520 s: E5= 139 ps
6314 s: E1= 154 ps	6260 s: E5= 154 ps
3157 s: E1= 211 ps	3130 s: E5= 199 ps
1579 s: E1= 276 ps	1565 s: E5= 269 ps
789 s: E1= 326 ps	783 s: E5= 327 ps
395 s: E1= 426 ps	391 s: E5= 434 ps
197 s: E1= 630 ps	196 s: E5= 664 ps
99 s: E1= 916 ps	98 s: E5= 959 ps
49 s: E1= 1318 ps	49 s: E5= 1386 ps



2023-02-21 BP2GBP2123047\_5



93085 s: BC= 35 ps	92173 s: B5= 26 ps
46543 s: BC= 47 ps	46086 s: B5= 46 ps
23271 s: BC= 105 ps	23043 s: B5= 69 ps
11636 s: BC= 124 ps	11522 s: B5= 135 ps
5818 s: BC= 150 ps	5761 s: B5= 179 ps
2909 s: BC= 210 ps	2880 s: B5= 219 ps
1454 s: BC= 243 ps	1440 s: B5= 297 ps
727 s: BC= 320 ps	720 s: B5= 345 ps
364 s: BC= 407 ps	360 s: B5= 409 ps
182 s: BC= 631 ps	180 s: B5= 669 ps
91 s: BC= 916 ps	90 s: B5= 983 ps
45 s: BC= 1270 ps	45 s: B5= 1383 ps

