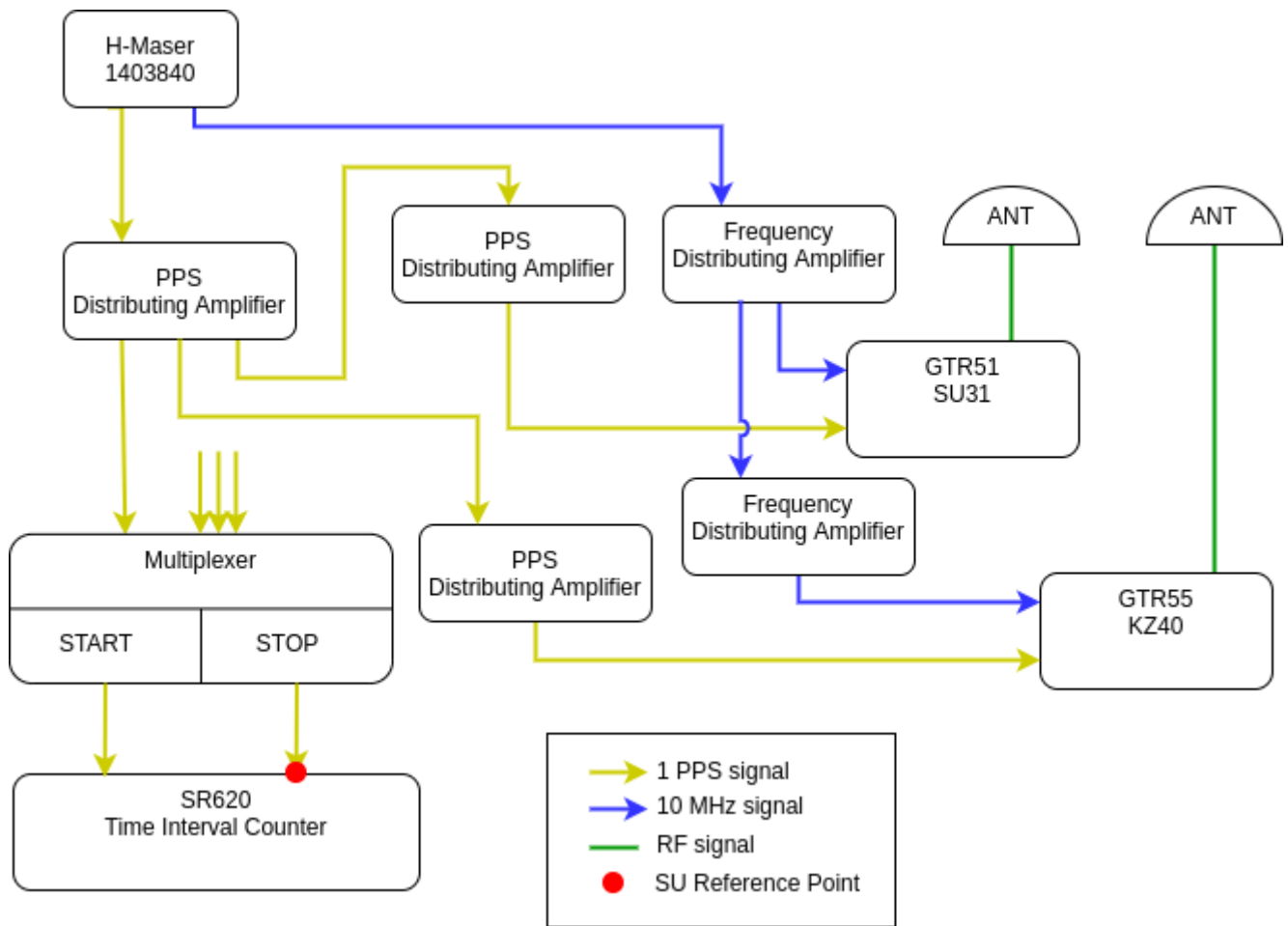


## Information Sheet

Laboratory:	SU	
Date and hour of the beginning of measurements:	2021-11-20 00:00:00 UTC (MJD 59538)	
Date and hour of the end of measurements:	2021-11-23 23:59:30 UTC (MJD 59541)	
<b>Information on the system</b>		
	<b>Local:</b>	<b>Travelling:</b>
4-character BIPM code	SU31	KZ04
• Receiver maker and type:	DICOM (MESIT) GTR51	DICOM (MESIT) GTR55
Receiver serial number:	1604031	2107240
1 PPS trigger level /V:	1.0 V	1.0 V
• Antenna cable maker and type:	Andrew FSJ-1	Andrew LDF1
Phase stabilised cable (Y/N):	Y	Y
Length outside the building /m:	Approx. 15 m	Approx. 15 m
• Antenna maker and type:	Leica Geosystems LEIAR25.R4 LEIT	NovAtel NOV850 NONE
Antenna serial number:	726435	NMLK20420025F
Temperature (if stabilised) /°C	45.0 °C	42.0 °C ± 2 °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:	193.8 ns	294.1 ns
Delay from 1 PPS-in to internal Reference (if different): <small>(see section 2 for details)</small>	-	-
• Antenna cable delay:	143.2 ns	611.5 ns
Splitter delay (if any):	-	-
Additional cable delay (if any):	-	-
<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:	2 ns	
• Is the laboratory air conditioned:	Y	
Set temperature value and uncertainty:	19.5 °C ± 0.5 °C	
Set humidity value and uncertainty:	-	

## Diagram of the experiment setup



Reference delay measurements were carried out using Portable Hydrogen Maser (PHM) VCH-1007 and a TIC SR620 with typical measurement uncertainty of 0.5 ns (when connected to external reference frequency source). Each delay estimate includes two measurements:

- between laboratory reference source UTC(SU) and PHM;
- between 1 PPS input connector of a receiver and PHM.

KZ04 antenna cable delay was measured using Vector Network Analyzer Rohde & Schwarz ZVB4. SU31 cable delay was taken from 1001-2018 calibration report.

### Measured delays:

Delay type	Value, ns	
	MJD 59537	MJD 59542
Between laboratory reference source UTC(SU) and the 1 PPS input connector of the SU31 receiver	193.9	193.8
Between laboratory reference source UTC(SU) and the 1 PPS input connector of the KZ04 receiver	294.1	294.1
Antenna cable delay of SU31 receiver	143.2	-
Antenna cable delay of KZ04 receiver	611.5	-

# KZ04 - SU31

## COMPUTATION OF BASELINE

Number of codes to fit baseline and biases = 106871  
Compute baseline with sin(elev) between 0.05 and 0.90  
Apriori codes biases from 13475 high elev obs : 100.624 100.169  
Iteration 0: Obs used = 187607; Huge residuals = 12; Large residuals = 193  
Iteration 1: Obs used = 187608; Huge residuals = 0; Large residuals = 180  
Computed code bias (P1/P2)/m = 100.587 100.089  
Computed baseline (X,Y,Z)/m = 2.442 -1.094 -1.133  
RMS of residuals /m = 0.359

Number of phase differences to fit baseline  
L1/L2 = 105841  
L5 = 51161  
A priori baseline (X,Y,Z)/m = 2.442 -1.094 -1.133  
11516 clock jitters computed out of 11516 intervals  
AVE jitter /ps = -0.0 RMS jitter /ps = 5.0

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 = 0.031 0.030 0.095  
RMS of residuals L1 /m = 0.004  
Computed baseline L2 (X,Y,Z)/m = 0.045 0.038 0.106  
RMS of residuals L2 /m = 0.004  
Computed baseline L5 (X,Y,Z)/m = 0.035 0.029 0.107  
RMS of residuals L5 /m = 0.004

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 = 0.031 0.030 0.095  
RMS of residuals L1 /m = 0.004  
Computed baseline L2 (X,Y,Z)/m = 0.045 0.038 0.106  
RMS of residuals L2 /m = 0.004  
Computed baseline L5 (X,Y,Z)/m = 0.035 0.029 0.107  
RMS of residuals L5 /m = 0.004

New iteration of baseline  
New apriori baseline (X,Y,Z)/m = 2.480 -1.060 -1.032  
11516 clock jitters computed out of 11516 intervals  
AVE jitter /ps = -0.0 RMS jitter /ps = 0.2

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 = -0.006 -0.002 -0.002  
RMS of residuals L1 /m = 0.004  
Computed baseline L2 (X,Y,Z)/m = 0.008 0.006 0.008  
RMS of residuals L2 /m = 0.004  
Computed baseline L5 (X,Y,Z)/m = -0.002 -0.004 0.010  
RMS of residuals L5 /m = 0.004

Final baseline L1 (X,Y,Z)/m = 2.474 -1.062 -1.034  
Final baseline L2 (X,Y,Z)/m = 2.488 -1.053 -1.023  
Final baseline L5 (X,Y,Z)/m = 2.478 -1.063 -1.022

## COMPUTATION OF CODE DIFFERENCES

Total number of code differences = 107107

Global average of individual differences

Code #pts, ave/ns, rms/ns  
C1: 107040 336.223 0.924  
C2: 74823 335.490 1.245  
P1: 106805 335.301 1.071  
P2: 106800 333.593 1.290

```

D1:      0      NaN      NaN
D2:      0      NaN      NaN
R1:      0      NaN      NaN
R2:      0      NaN      NaN
E1:      0      NaN      NaN
E5:      0      NaN      NaN
B1:      0      NaN      NaN
B2:      0      NaN      NaN
BC:      0      NaN      NaN
B5:      0      NaN      NaN

```

Number of 300s epochs in out file = 1152

```

Code #pts, median/ns, ave/ns, rms/ns
C1:  10706  336.275  336.214  0.675
C2:   7480  335.512  335.480  1.008
P1:  10683  335.327  335.291  0.753
P2:  10682  333.611  333.580  1.011
D1:      0      0.000      NaN      NaN
D2:      0      0.000      NaN      NaN
R1:      0      0.000      NaN      NaN
R2:      0      0.000      NaN      NaN
E1:      0      0.000      NaN      NaN
E5:      0      0.000      NaN      NaN
B1:      0      0.000      NaN      NaN
B2:      0      0.000      NaN      NaN
BC:      0      0.000      NaN      NaN
B5:      0      0.000      NaN      NaN

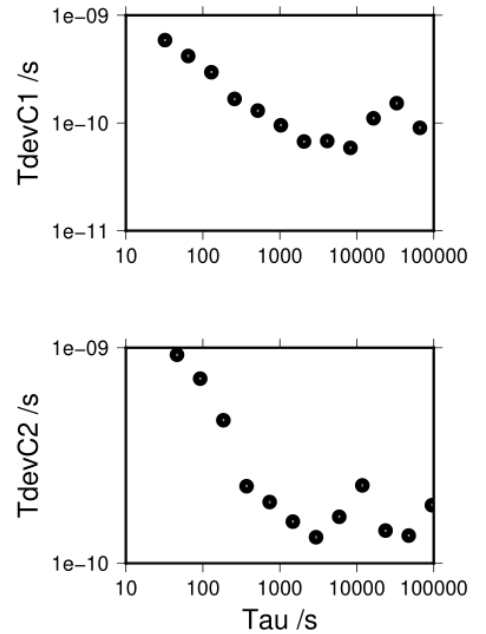
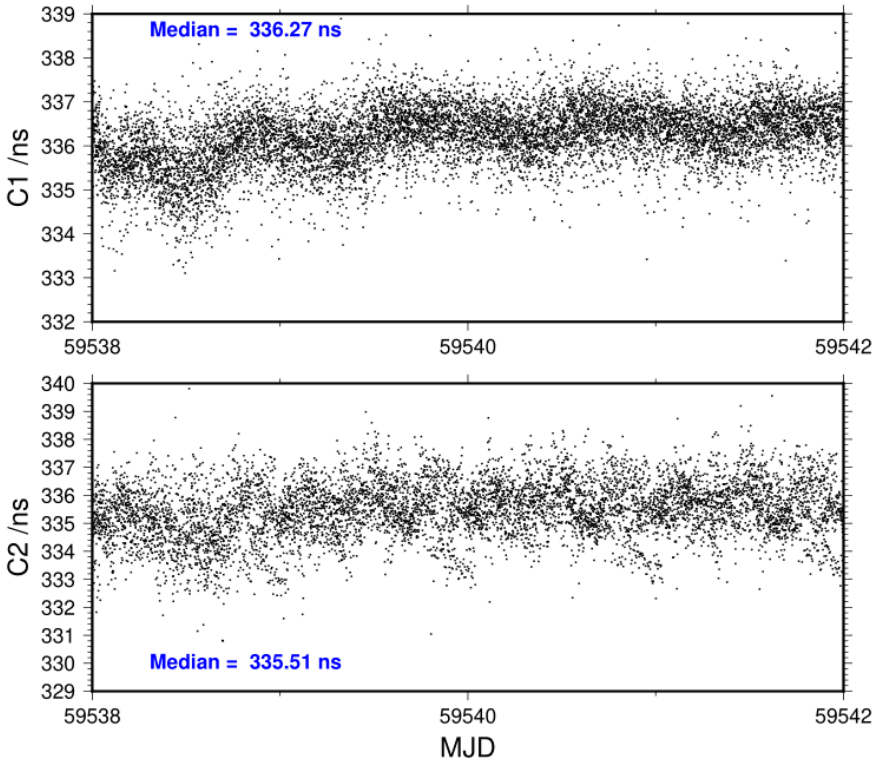
```

```

66060 s: C1= 90 ps  94555 s: C2= 186 ps
33030 s: C1= 153 ps 47277 s: C2= 134 ps
16515 s: C1= 111 ps 23639 s: C2= 142 ps
8258 s: C1= 59 ps  11819 s: C2= 230 ps
4129 s: C1= 68 ps  5910 s: C2= 164 ps
2064 s: C1= 67 ps  2955 s: C2= 132 ps
1032 s: C1= 95 ps  1477 s: C2= 156 ps
516 s: C1= 130 ps  739 s: C2= 192 ps
258 s: C1= 167 ps  369 s: C2= 228 ps
129 s: C1= 296 ps  185 s: C2= 461 ps
65 s: C1= 419 ps  92 s: C2= 719 ps
32 s: C1= 589 ps  46 s: C2= 928 ps

```

### 2021-12-06 KZ40SU3121324\_4



2021-12-06 KZ40SU3121324\_4

66202 s: P1= 91 ps	66209 s: P2= 125 ps
33101 s: P1= 158 ps	33104 s: P2= 132 ps
16551 s: P1= 115 ps	16552 s: P2= 140 ps
8275 s: P1= 62 ps	8276 s: P2= 145 ps
4138 s: P1= 68 ps	4138 s: P2= 124 ps
2069 s: P1= 77 ps	2069 s: P2= 131 ps
1034 s: P1= 111 ps	1035 s: P2= 149 ps
517 s: P1= 149 ps	517 s: P2= 184 ps
259 s: P1= 186 ps	259 s: P2= 234 ps
129 s: P1= 357 ps	129 s: P2= 490 ps
65 s: P1= 477 ps	65 s: P2= 742 ps
32 s: P1= 668 ps	32 s: P2= 932 ps

