

## Calibration Report No. 2009-2019/UFE

Laboratory of the National Time and Frequency Standard  
(Designated Institute of the Czech Metrology Institute)

**Instrument:** Name: **GNSS Time Transfer Receiver**  
Type: GTR 55  
SN: 1711887

**Antenna:** Type: Novatel GNSS-850  
SN: NMLK18480038D

**Antenna Cable:** Type: Belden 50Ω LOW LOSS H155 PVC  
Length: 30 m

**Reference:** Signal: 1 PPS and 10 MHz signals of UTC(TP) generated from  
the Cesium clock 5071A SN 1227  
Receiver: GNSS Time Transfer Receiver GTR 55, SN 1541941,  
calibrated by BIPM, Cal. ID 1102-2017

**Measurement Date:** 29 March – 2 April 2019, 00:00:00–23:59:59 UTC

### Measurement Results:

Internal Receiver Delays:

GPS L1 C/A: (16.1 ± 0.5) ns,  $k = 1$   
GPS L1P: (15.3 ± 0.4) ns,  $k = 1$   
GPS L2P: (17.6 ± 0.5) ns,  $k = 1$

**Measurement performed by:** Alexander Kuna, Ph.D.

Attachment: Graphs with measured values.

**Prague, 3 April 2019**

.....  
**Alexander Kuna, Ph.D.**  
Head of the LNTFS

	Local		Traveling
<b>Information on the system</b>			
4-character BIPM code	TP01		TP02
Receiver maker and type	MESIT defence GTR55		MESIT defence GTR55
Receiver serial number	S/N 1541941		S/N 1711887
1 PPS trigger level /V		1.00	1.00
Antenna cable maker and type	Andrews FSJ-1		Belden 50Ω LOW LOSS H155
Phase stabilized cable (Y/N)	N		N
Length outside the building /m		30	30
Antenna maker and type	Novatel NOV-704-WB		Novatel GNSS-850
Antenna serial number	NMHB16390010R		NMLK18480038D
Temperature (if stabilized) /°C			

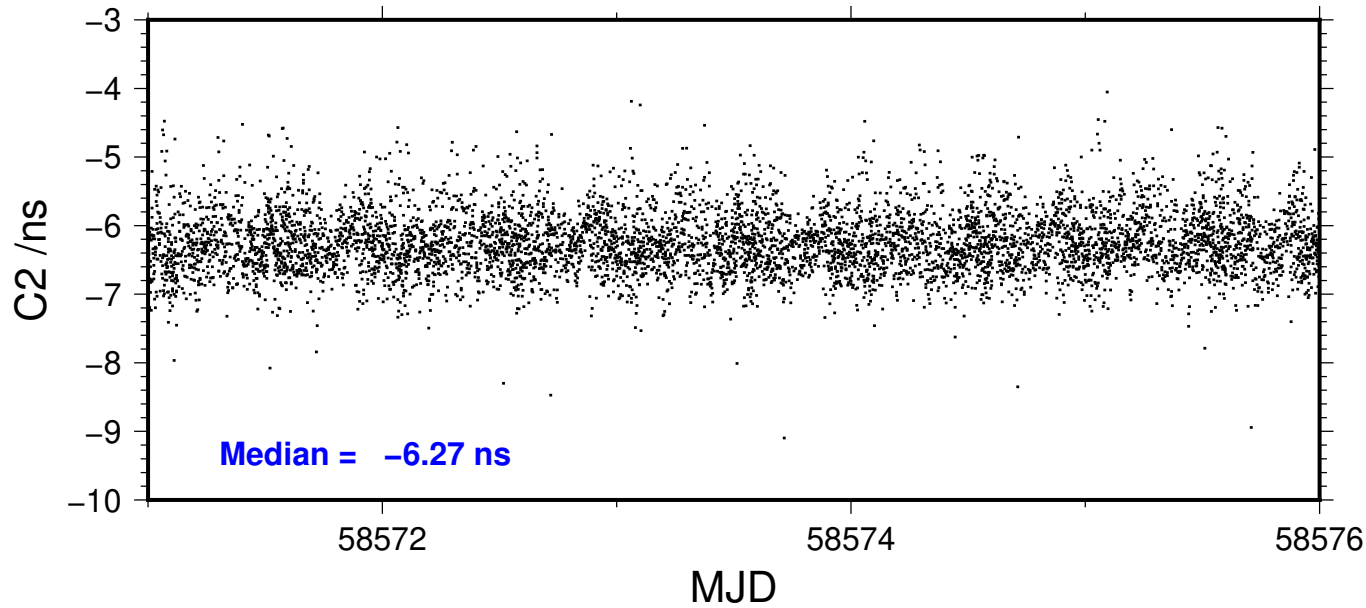
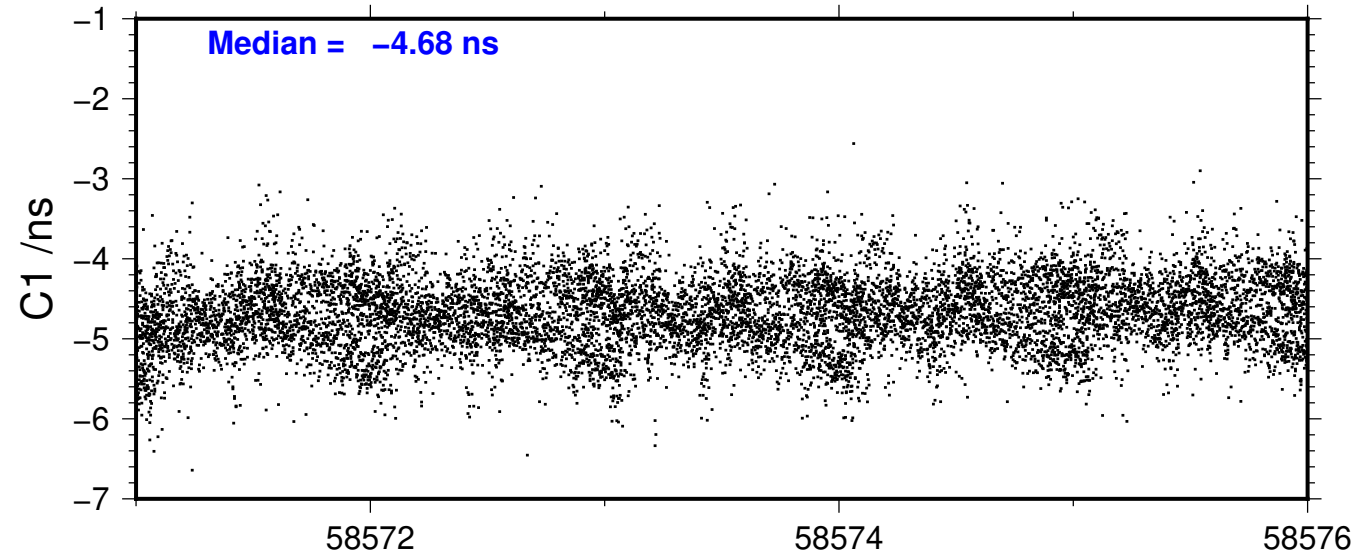
### Measured delays /ns

Delay from local UTC to receiver 1 PPS-in (XP) / ns		0.0	11.9
Delay from 1 PPS-in to internal reference (if different) (or XO) / ns			
Antenna cable delay (or XC) / ns		149.0	154.7
Splitter delay (if any)			
Additional cable delay (if any)			

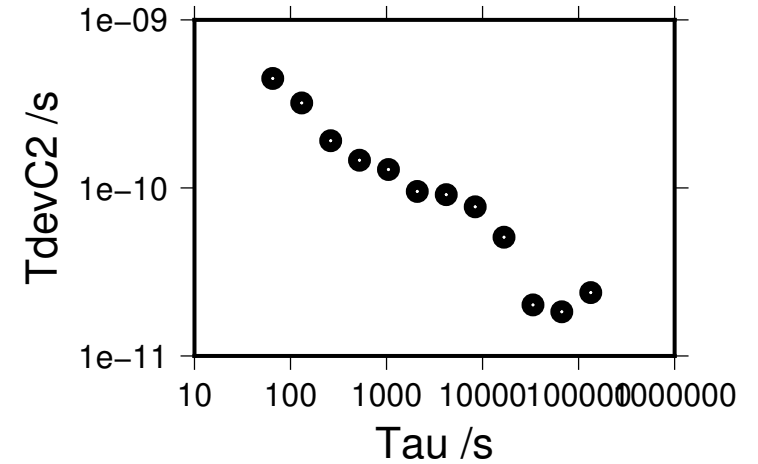
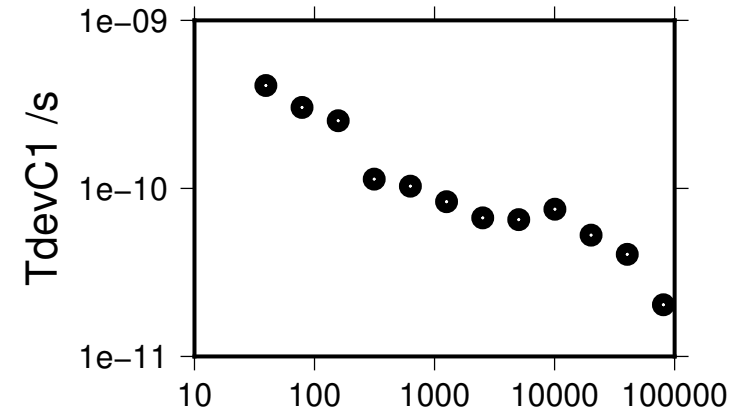
### Data used for the generation of CGGTTS files

INT DLY (or XR+XS) /ns			
GPS C1		14.6	0.0
GPS C2		0.0	0.0
GPS C5		0.0	0.0
GPS P1		13.5	0.0
GPS P2		17.6	0.0
GALILEO E1		12.3	0.0
GALILEO E5 (E5a)		12.7	0.0
GALILEO E6		0.0	0.0
GALILEO E7 (E5b)		0.0	0.0
GALILEO E8 (E5 AltBOC)		0.0	0.0
BEIDOU B1 (BeiDou-2 B1i)		0.0	0.0
BEIDOU B2 (BeiDou-2 B2i)		0.0	0.0
BEIDOU B3 (BeiDou-2 B3i)		0.0	0.0
BEIDOU B5 (BeiDou-3/3S B2a)		0.0	0.0
BEIDOU B7 (BeiDou-3/3S B2b)		0.0	0.0
BEIDOU B8 (BeiDou-3/3S B2 ABOC)		0.0	0.0
CAB DLY (or XC) /ns		149.0	154.7
REF_DLY (or XP+XO) /ns		0.0	11.9
Coordinates reference frame	ITRF		ITRF
X /m		3,967,283.15	3,967,279.43
Y /m		1,022,538.18	1,022,535.80
Z /m		4,872,414.48	4,872,416.50

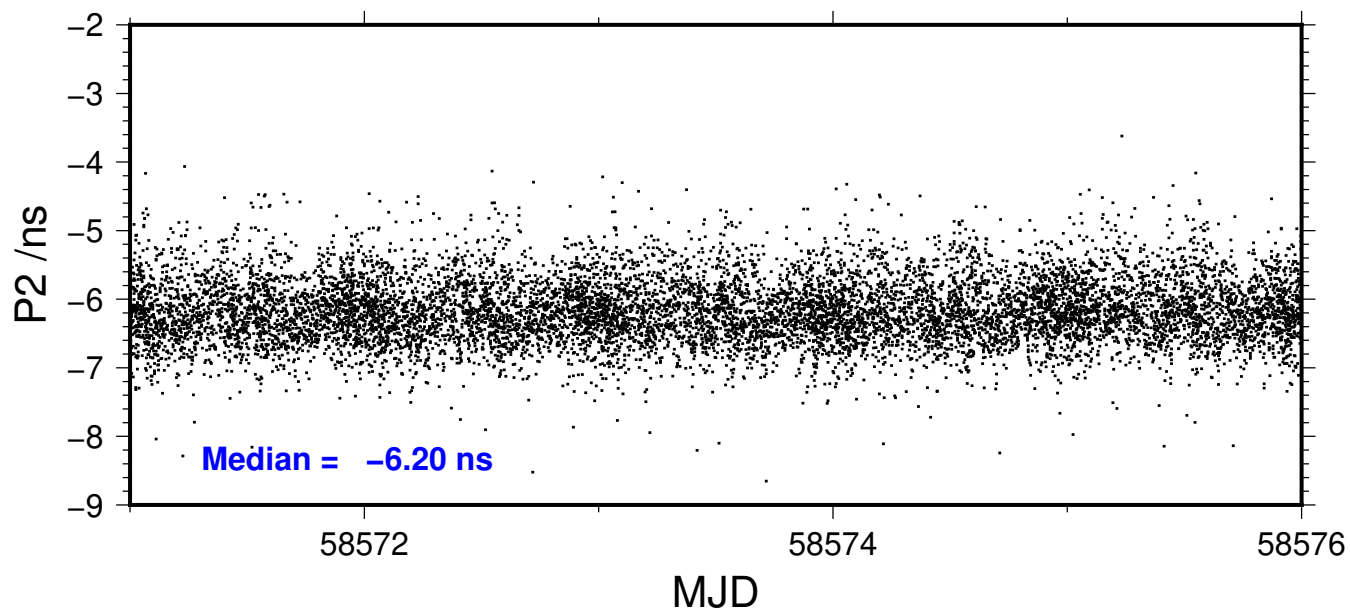
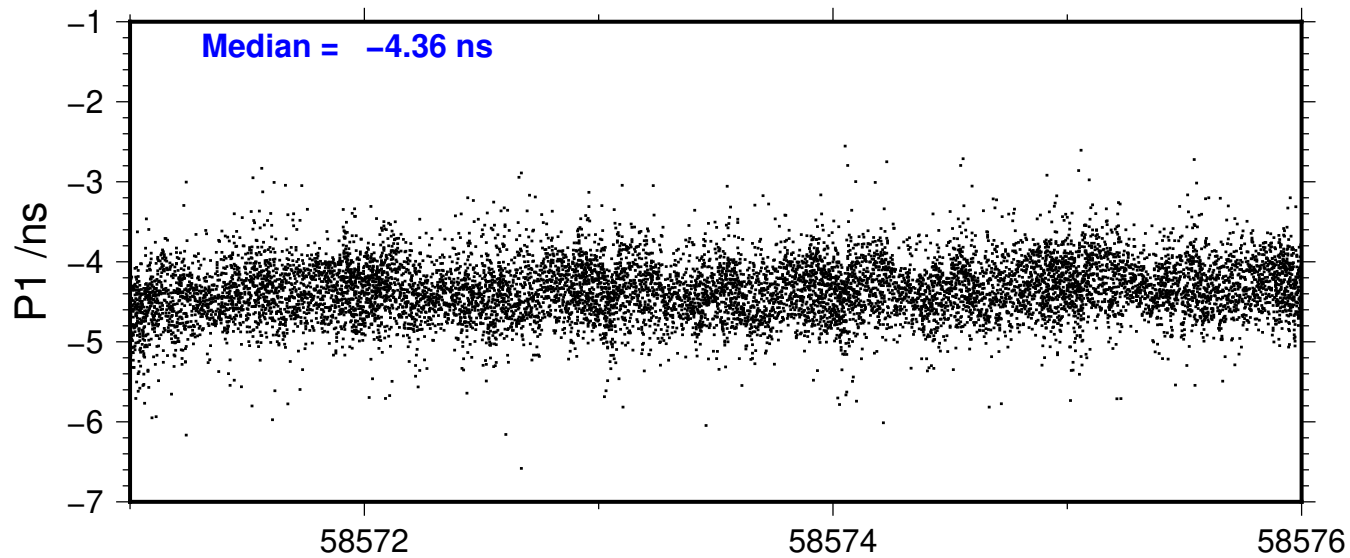
# 2019-04-03 TP02TP0119088\_5



80558 s: C1= 20 ps	133897 s: C2= 24 ps
40279 s: C1= 41 ps	66948 s: C2= 18 ps
20139 s: C1= 53 ps	33474 s: C2= 20 ps
10070 s: C1= 75 ps	16737 s: C2= 51 ps
5035 s: C1= 65 ps	8369 s: C2= 77 ps
2517 s: C1= 67 ps	4184 s: C2= 91 ps
1259 s: C1= 83 ps	2092 s: C2= 95 ps
629 s: C1= 103 ps	1046 s: C2= 129 ps
315 s: C1= 114 ps	523 s: C2= 146 ps
157 s: C1= 253 ps	262 s: C2= 191 ps
79 s: C1= 303 ps	131 s: C2= 320 ps
39 s: C1= 410 ps	65 s: C2= 448 ps



# 2019-04-03 TP02TP0119088\_5



80572 s: P1=	22 ps	80572 s: P2=	20 ps
40286 s: P1=	42 ps	40286 s: P2=	19 ps
20143 s: P1=	34 ps	20143 s: P2=	35 ps
10072 s: P1=	60 ps	10072 s: P2=	50 ps
5036 s: P1=	57 ps	5036 s: P2=	62 ps
2518 s: P1=	63 ps	2518 s: P2=	84 ps
1259 s: P1=	78 ps	1259 s: P2=	100 ps
629 s: P1=	97 ps	629 s: P2=	119 ps
315 s: P1=	109 ps	315 s: P2=	139 ps
157 s: P1=	184 ps	157 s: P2=	240 ps
79 s: P1=	245 ps	79 s: P2=	330 ps
39 s: P1=	335 ps	39 s: P2=	453 ps

