

Calibration Report No. 2002-2022/UFE

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

Instrument: Name: **GNSS Time Transfer Receiver**
Type: GTR 51
SN: 2204004

Antenna: Type: Novatel GNSS-850
SN: NMLK21450010H

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 2476
Receiver: GPS Time Transfer Receiver GTR 55, SN 1711887,
calibrated by BIPM, Cal. ID 1015-2019

Measurement Date: 10 April 2022, 00:00:00–23:59:59 UTC

Measurement Results:

Internal Receiver Delays:

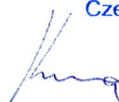
GPS L1 C/A: (30.5 ± 1.0) ns
GPS L1P: (30.5 ± 1.0) ns
GPS L2P: (23.9 ± 1.0) ns

Measurement performed by: Alexander Kuna, Ph.D.

Attachment: Graphs with measured values.

Prague, 20 April 2022

INSTITUTE OF PHOTONICS
AND ELECTRONICS
Chaberská 1014/57, 182 51
Czech Republic



Alexander Kuna, Ph.D.
Head of the LNTFS

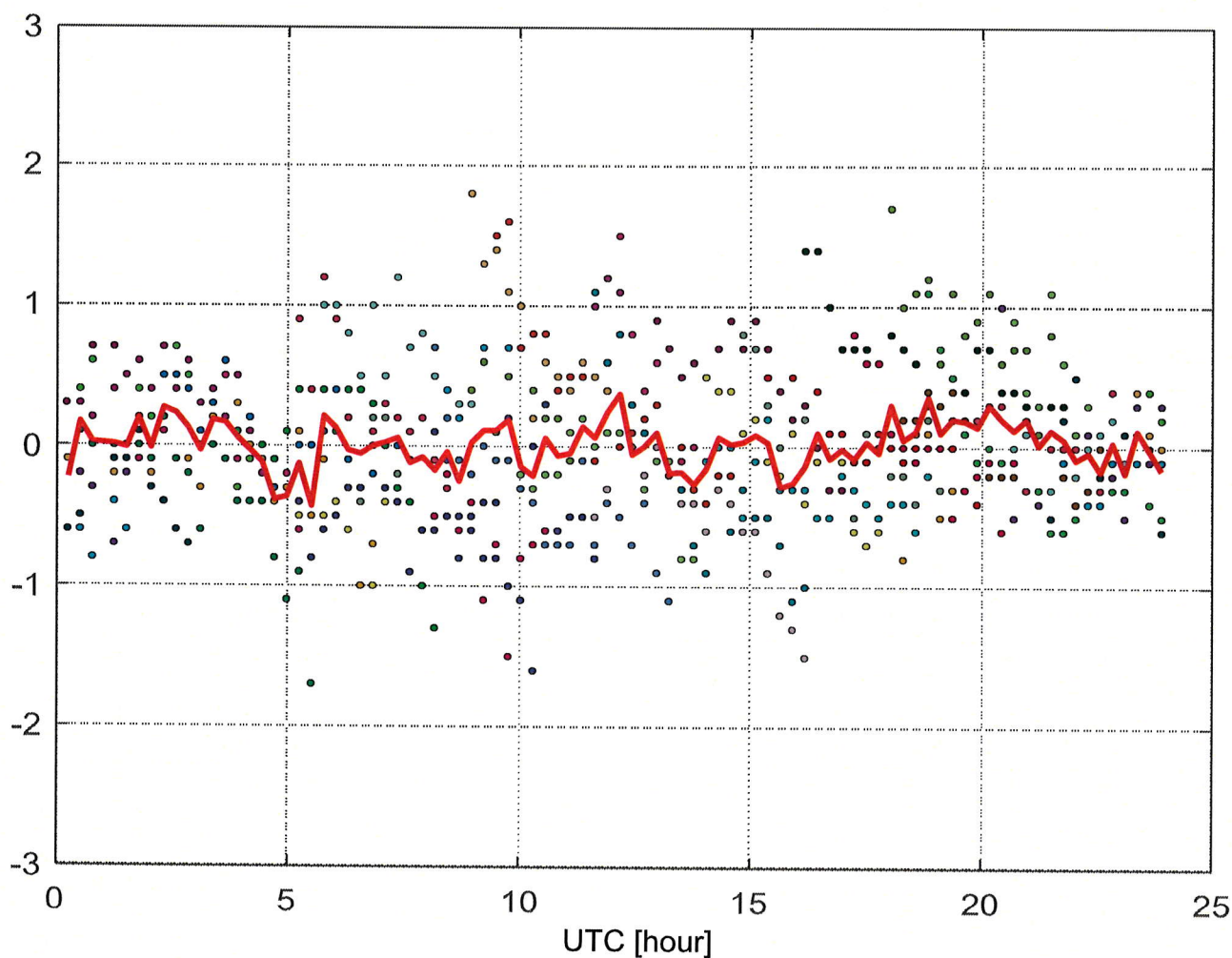
TEST MEASUREMENT

TESTED RECEIVER: GTR51 S/N 2204004
ANTENNA: NOV-850 S/N NMLK21450010H
REFERENCE RECEIVER: GTR55 S/N: 1711887
DATE: 2022-04-10
SITE: PRAGUE
BASELINE: 8 m

OUTPUT DATA: **CGGTTS**
SATELLITES: ALL IN VIEW
SIGNAL: GPS L1C/A

SIGMA = 170 ps

TIME DIFFERENCE [ns]



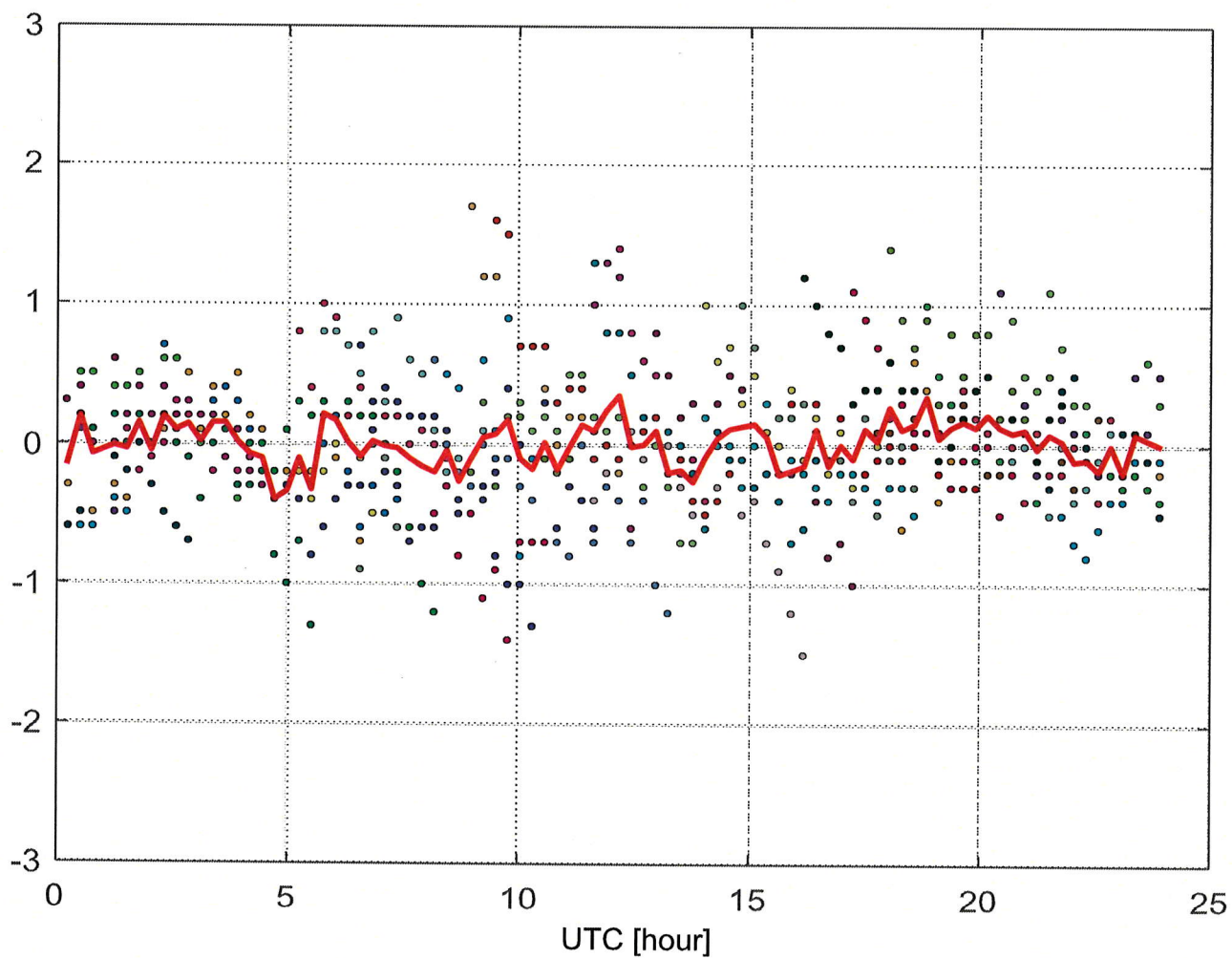
POINTS = TRACKS
COLOR = SATELLITE

RED LINE = AVERAGE OVER ALL SATELLITES IN VIEW

OUTPUT DATA: **CGGTTS**
SATELLITES: ALL IN VIEW
SIGNAL: GPS L1P

SIGMA = 160 ps

TIME DIFFERENCE [ns]



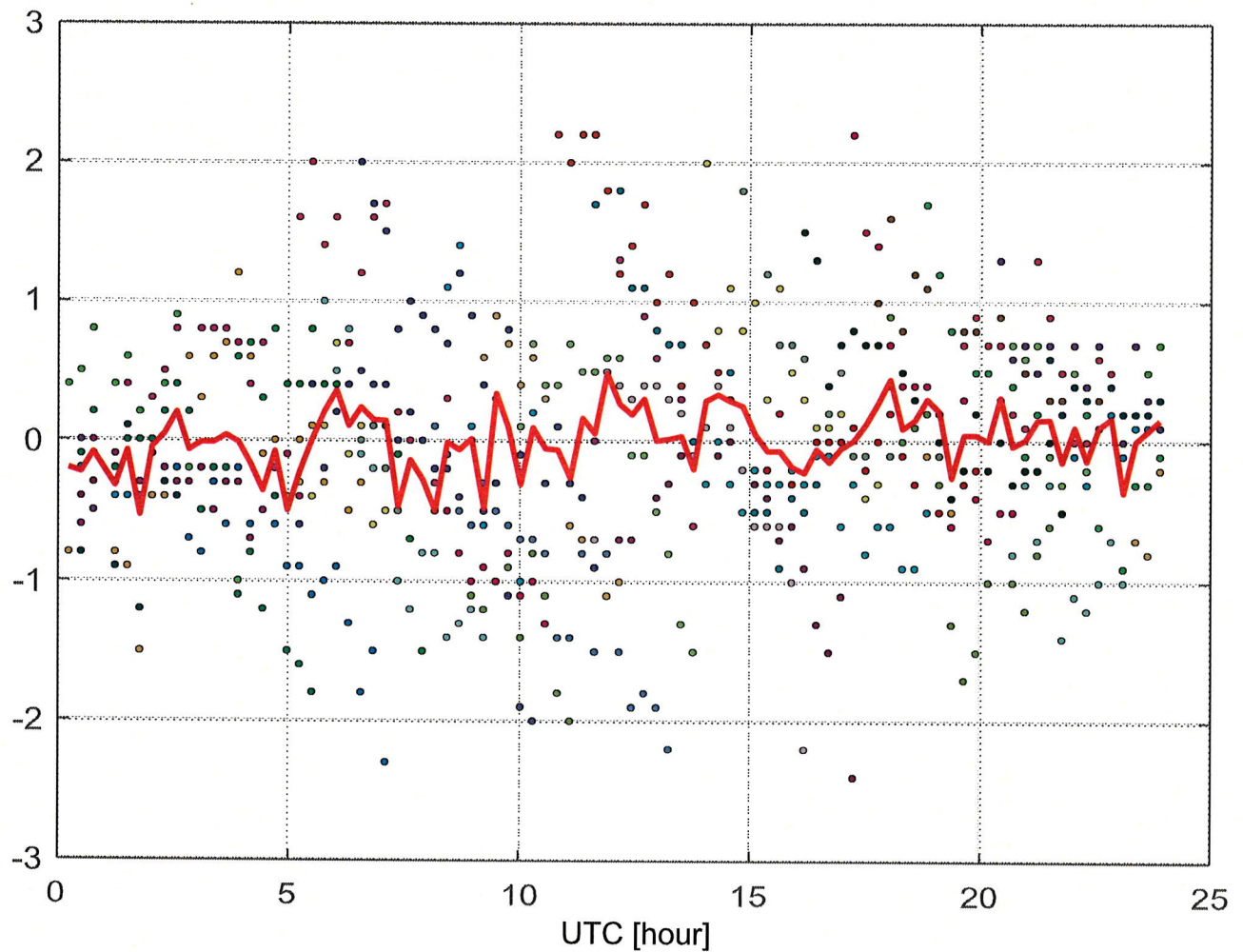
POINTS = TRACKS
COLOR = SATELLITE

RED LINE = AVERAGE OVER ALL SATELLITES IN VIEW

OUTPUT DATA: **CGGTTS**
SATELLITES: ALL IN VIEW
SIGNAL: GPS L2P

SIGMA = 230 ps

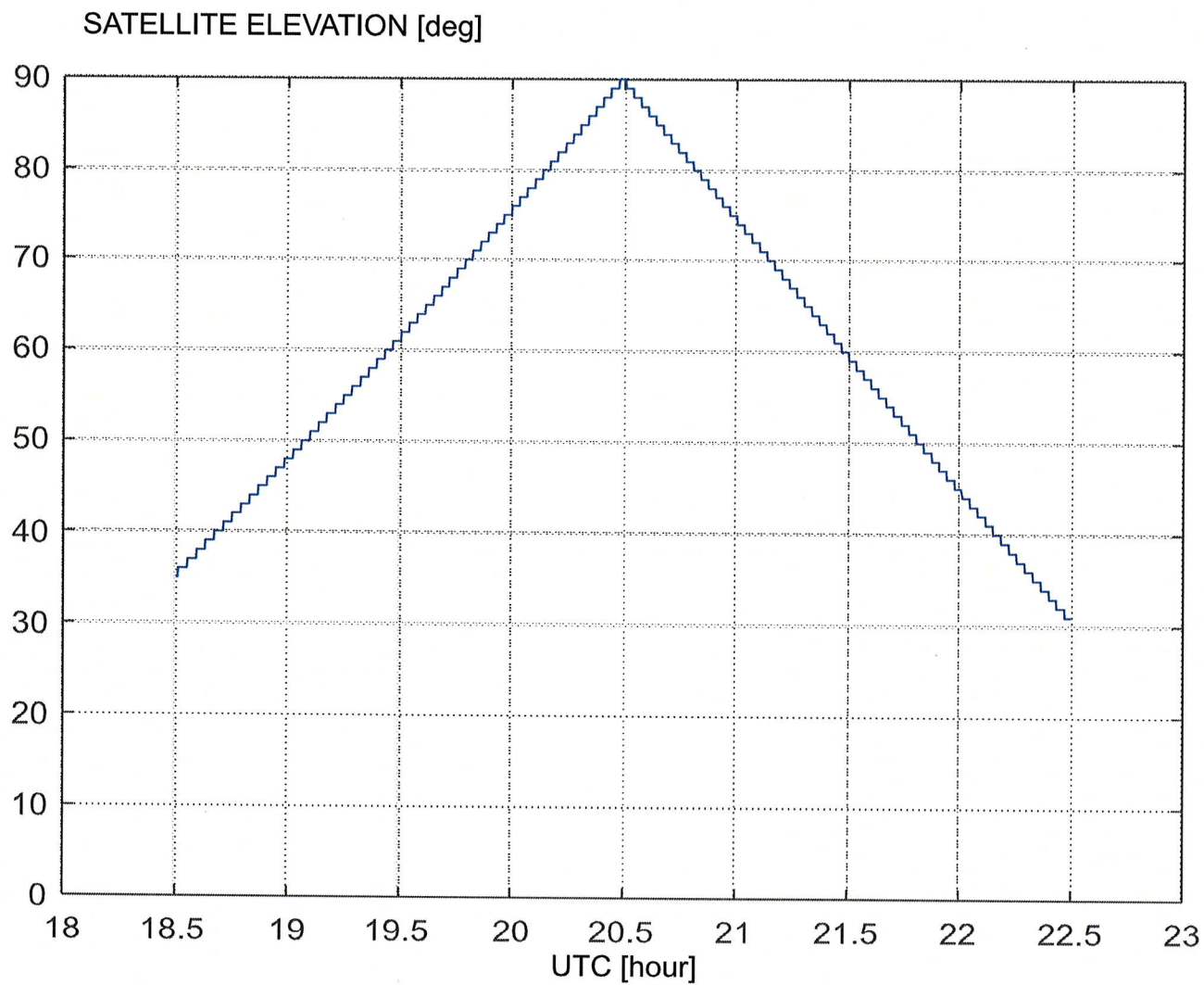
TIME DIFFERENCE [ns]



POINTS = TRACKS
COLOR = SATELLITE

RED LINE = AVERAGE OVER ALL SATELLITES IN VIEW

OUTPUT DATA: RAW
SATELLITE: PRN 01
SIGNAL: GPS L1C/A

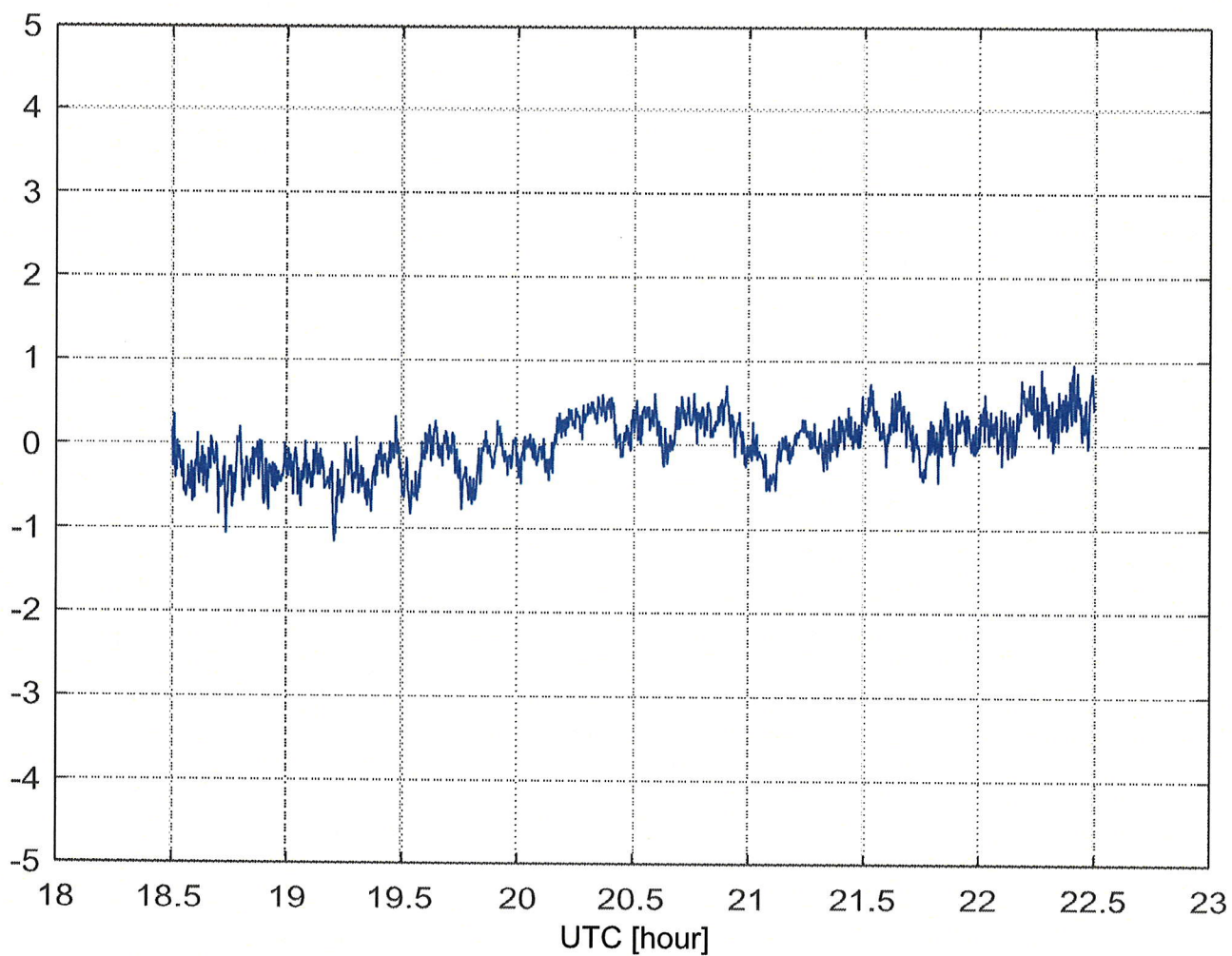


OUTPUT DATA: RAW
SATELLITE: PRN 01
SIGNAL: GPS L1C/A

CODE MEASUREMENT

SIGMA = 0.3 ns

TIME DIFFERENCE [ns]



OUTPUT DATA: RAW
SATELLITE: PRN 01
SIGNAL: GPS L1C/A

CARRIER PHASE MEASUREMENT

SIGMA = 8 ps

TIME DIFFERENCE [ns]

