GNSS calibration of CNES and ILNAS receivers with respect to OP G1 (1012-2021)

Summary

In January-March 2021, the LNE-SYRTE in Observatoire de Paris (OP) conducted a trip to calibrate GNSS equipment owned by the French Space Agency (UTC laboratory CNES) and the Institut Luxembourgeois de Normalisation, Accréditation et Sécurité (UTC laboratory LUX). The trip started and finished at the LNE-SYRTE, providing closure with respect to the OP Group1 reference receiver OP71.
The operations and report of measurements are described in the report by OP and its annexes, see here.

- **Final results for the calibrated systems**

The INTDLY values of the receivers given in Table 1 have been computed by OP based on the results of the Group 1 trip 1001-2018 for OP71 (GPS and Galileo) and should not be updated to reflect later changes in the conventional INTDLY values of the reference receiver.

For a P3/E3/PPP UTC link A-B involving any Group 1 and any receiver in this trip, the uncertainty resulting from the calibration, U_B(A-B), is computed as

$$U_B(A\text{-}B) = (U_{CAL0}^2 + \Delta U_{CAL}(A)^2 + \Delta U_{CAL}(B)^2)^{1/2} \quad (1)$$

where U_{CAL0} = 2.5 ns is the conventional Group 2 value, and where ΔU_{CAL} (generally zero) is specified for each system.

Changes in the set-up of the receivers after the calibration must be accounted for as described in section A.3.6 of the most recent Calibration guidelines in https://webtai.bipm.org/ftp/pub/tai/publication/gnss-calibration/guidelines/..

Table 1. Final P1/P2/E1/E5a INTDLY values from the 1012-2021 exercise. Values of REFDLY and CABDLY used to compute calibration results are also indicated for reference. All values are in ns. “Meas. Date” refers to the first day of the differential calibration, to which the calibration results can be applied. “Impl. Date” is the MJD when the results should be implemented in the receiver.

System	BIPM	Meas. date	**INTDLY P1**	**INTDLY P2**	**INTDLY E1**	**INTDLY E5a**	**REF DLY**	**CAB DLY**	Note	**ΔU_{CAL}**	Impl. date
CS21	CS21	2021/02/03	**57.4**	**55.8**	**58.2**	**64.3**	157.4	166.2		0.0	59426
CS22	CS22	2021/02/03	**57.1**	**55.5**	**58.0**	**64.8**	157.1	176.1		0.0	59426
CS23	CS23	2021/02/05	**31.6**	**28.1**	**33.3**	**30.7**	56.8	118.3	(1)	0.0	59426
CS24	CS24	2021/02/05	**35.4**	**32.1**	**36.9**	**37.2**	57.0	118.5	(1)	0.0	59426
LU01	LU01	2021/03/03	**28.2**	**25.0**	**29.9**	**29.6**	36.5	118.0	(1)	0.0	59426
LU02	LU02	2021/03/03	**31.0**	**28.3**	**32.7**	**30.7**	38.6	160.6	(1)	0.0	59426

Notes:

(1) CS23, CS24, LU01 and LU02 are PolaRx5 operated in mode “Autocompensation OFF”..

Version history
V1.0 2021/07/13: Publication of results from V1.0 of the OP report.