

GNSS calibration of CNES and LUX receivers with respect to OP G1 (1011-2025)

Summary

From January to March 2025, LNE-OP (OP) conducted a trip to calibrate GNSS equipment owned by Centre National d'Etudes Spatiales (CNES) and Bureau Luxembourgeois de Métrologie (UTC acronym LUX). The trip started and finished at OP, providing closure with respect to the OP Group1 reference receivers.

The operations and report of measurements are described in the [report by OP](#).

• 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 [1001-2022](#) for OP73 (GPS, Galileo and BDS) and should not be updated to reflect later changes in the conventional INTDLY values of the reference receiver.

For a P3/E3/B3/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

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

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 [BIPM calibration guidelines](#).

Table 1. Final P1/P2/E1/E5a/B1C/B2a INTDLY values from the 1011-2025 exercise. Values of REFDLY and CABDLY during the calibration are also indicated for reference. All values are in ns date in YYYY/MM/DD format. “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						REFDLY	CABDLY	Note	ΔU_{CAL}	Impl. date
			P1	P2	E1	E5a	B1C	B2a					
CS23	CS23	2025/02/01	31.3	27.9	33.3	31.7	33.0	31.1	60.0	118.3		0.0	60947
CS24	CS24	2025/02/01	34.8	31.7	36.9	38.1	36.9	37.5	60.1	118.5		0.0	60947
LU01	LU01	2025/02/24	28.2	25.1	30.6	31.0	-	-	36.6	117.4		0.0	60945
LU02	LU02	2025/02/24	30.6	27.7	32.8	31.5	32.4	31.0	38.6	160.6		0.0	60945

Notes:

Version history

V1.0 2025/09/29: Publication of results from V1.0 of the OP report.