GNSS calibration of INCP and INM receivers with respect to NIST G1 (1012-2023)

Summary

From August 2023 to September 2025, National Institute of Standards and Technology (NIST) conducted a trip to calibrate GNSS equipment owned by Instituto Nacional de Calidad of Peru (INCP) and Instituto Nacional de Metrología of Colombia (INM) The trip started and finished at NIST, providing closure with respect to the NIST Group1 reference receivers.
The operations and report of measurements are described in the reports by NIST.

- **Final results for the calibrated systems**

The INTDLY values of the receivers given in Table 1 have been computed by NIST based on the results of the Group 1 trip 1001-2022 for NISX (GPS) and should not be updated to reflect later changes in the conventional INTDLY values of the reference receiver.

For a C1 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 BIPM calibration guidelines.

Table 1. Final C1 INTDLY values from the 1012-2023 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	INTLDY C1	REFDLY	CABDLY	Note	ΔU_{CAL}	Impl. date
CP__	CP__	2024/08/10	35.8	7.7	181.4		3	60837
IC__	IC__	2025/01/24	45.2	60.6	176.6		3	60837

Notes:

Version history
V1.0 2025/11/DD: Publication of results from the two NIST reports