GNSS calibration of ESA receivers with respect to PTB G1 (1014-2022)

Summary

From July to August 2022, the Physikalisch-Technische Bundesanstalt (PTB) conducted a trip to calibrate GNSS equipment owned by the European Space Agency (ESA). The trip started and finished at the PTB, providing closure with respect to the PTB Group1 reference receiver PT13. The operations and report of measurements are described in the report by PTB.

- Final results for the calibrated systems

The INTDLY values of the receivers given in Table 1 have been computed by PTB based on the results of the Group 1 trip 1001-2020 for PT13 (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, \( U_{\text{B}}(A-B) \), is computed as

\[
U_{\text{B}}(A-B) = (U_{\text{CAL}0}^2 + \Delta U_{\text{CAL}}(A)^2 + \Delta U_{\text{CAL}}(B)^2)^{1/2}
\]

where \( U_{\text{CAL}0} = 2.5 \) ns is the conventional Group 2 value, and where \( \Delta U_{\text{CAL}} \) (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 ftp://ftp2.bipm.org/pub/tai/publication/gnss-calibration/guidelines/.

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<th>System</th>
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<th>INTDLY P2</th>
<th>INTDLY E1</th>
<th>INTDLY E5a</th>
<th>REFDLY</th>
<th>CABDLHY</th>
<th>Note</th>
<th>( \Delta U_{\text{CAL}} )</th>
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</table>

Notes:

(1) Receiver autocompensating for PPSIN internal delays

Version history

V1.0 2022/09/15: Publication of results from V1.1 of the PTB report.