

Participants (60+)

Simon Banville, Pascale Defraigne, Bingbing Duan, Clément Gazzino, Jianghui Geng, Jiang Guo, André Hauschild, Gina Katsigianni, Andrzej Krankowski, Feiyu Mao, Lotfi Massarweh, Camille Parra, Jie Ran, Peter Shih, Giulio Tagliaferro, Steffen Thörlert, Conghan Wang, Yangyang Wang, Marcus Wareyka-Glaner, Ulrich Weinbach, Qiang Wen, Zhetao Zhang, Yixin Zhao, Alexei Zinoviev among others ...

1 Purpose

The BAR Committee held its kick-off virtual meeting. The BAR Committee integrates the former Bias & Calibration Working Group and the PPP-AR Pilot Project. Its main objective is to coordinate research, standardization, validation, and dissemination of satellite bias products for current GNSS constellations and future low Earth orbit (LEO) systems. The online meeting aimed to review the one-year progress of the PPP-AR Pilot Project and to introduce the newly established BAR Committee to the IGS community. Two invited presentations about “GPS Flex Power Impact on DCB Estimates” and “IPPP Time Transfer for UTC Based on IGS Continuous Products” were also delivered, which shared recent advances on Biases and PPP-AR topics.

2 Points of discussion

1. All members reviewed the one-year progress of the IGS ACs’ PPP-AR products. Specifically, EMR provides GPS code and phase OSBs in its OPS final products. Simon Banville from NRCAN told that EMR had upgraded its processing strategy. WUM’s MGEX final products include QZSS phase OSBs, while GFZ MGEX rapid and GRG MGEX final products include code and phase OSBs for BDS satellites with PRN numbers higher than C46.
2. The one-year routine orbit/clock/bias combination results from the PPP-AR Pilot Project were reviewed. This year, BDS-3 PPP-AR product combination was included in the final combined solution, thanks to the release of the HUS final products, which enabled the inclusion of three ACs providing BDS-3 products. The day-boundary continuity issue was not considered in the combined products of the PPP-AR Pilot Project. In contrast, the combined final products released by the Wuhan Combination Center (WCC, <https://bdspride.com/wcc/>) have taken this issue into account, making them suitable for time transfer applications.
3. The meeting also recommended specifying the exact ANTEX file in the product header to avoid potential inconsistencies in precise positioning. The CODE AC team provided feedback on this issue after the meeting, that is to avoid PCO/PCVs changes without any update of IGS reference frame, hence start naming IGS ANTEX files accordingly to demonstrate consistency.
4. Lotfi Massarweh from TU Delft led the review of the background, main objectives, tasks, and charter of the newly established BAR Committee. The objectives of the BAR Committee are divided into three main parts: 1) Harmonization and methodology consolidation; 2) Product interoperability and bias combination; 3) Ambiguity resolution and integrity monitoring.
5. Peter Steigenberger from DLR presented his findings on the impact of GPS Flex Power on the continuity of DCB estimates. Although he tested high-rate DCB estimation to mitigate the Flex Power effect, he suggested that performing full high-rate DCB estimation is not recommended. A more effective approach

is to first detect discontinuities caused by Flex Power and then estimate constant DCBs for each period affected by these discontinuities. In addition, no significant changes in phase biases due to Flex Power were observed in his study.

6. Jiang Guo from BIPM presented his research on time transfer using continuous precise products. By employing the multi-GNSS WUM rapid products, he achieved improved stability in multi-day time transfer links compared with other rapid products. The results also showed that a continuous multi-day solution is more robust compared to splicing separately daily solutions because it avoids daily resets.
7. Bingbing Duan from TUM recommended that outlier or abnormal data should be specified in the combination. WCC is proposing to develop a new format standard for combination statistics. This standard will include "anomaly tags" for problematic products from each AC—such as anomalous satellites, untrustworthy phase biases, and clock irregularities—presented in a standardized format. Users will be able to easily identify and exclude problematic products from their PPP solutions, which will avoid many issues, especially for timing users.
8. Sylvain Loyer from CNES asked about the specific requirement for the continuity of satellite products by the time transfer applications. Giulio Tagliaferro from BIPM would share the ICG recommendation for this point in the community to specify the requirement.