GPS/Galileo IPPP time links of ROB based on Atomium software

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Abstract

The current best performance of GNSS frequency transfer is obtained through Integer Precise Point Positioning with ambiguities (IPPP), i.e. resolving integer ambiguities of carrier phases. This technique allows to compare clocks with a stability of sub 10-16 for averaging times longer than a few days. Atomium is a GNSS data processing software developed at the Royal Observatory of Belgium, mainly for time and frequency transfer. Now the software has supported the regular calculation of both GPS and Galileo time links based on dual-frequency ionosphere-free observations. In this study, we will present the initial results of IPPP time links between time laboratories maintaining a stable realization of UTC, and the experiments we carried out to determine the added value of using other constellations on high-precision time links such as Galileo or even BeiDou. Time links released by BIPM are also used for comparison. Besides, in GNSS time and frequency analyses, there is a non-negligible correlation between the tropospheric delays and the clock. The influences of tropospheric mapping functions (GMF/NMF/VMF) on the receiver clock solutions will also be investigated.

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