New upgrades of Open-Loop Tracking Command (OLTC) tables of nadir altimeters in 2020 and benefits for inland waters users

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Fresh water is an essential resource that requires a close monitoring and a constant preservation effort. The evolution of hydrological bodies water level constitutes a key indicator on the available quantity of fresh water in a given region. The limited extent of the in situ networks currently deployed has generated a growing interest in using space borne altimetry as a complementary data source to increase the coverage of emerged fresh water stocks and ensure a more global and continuous monitoring of their water surface height.

A great effort has been carried out over the past decade to improve altimeters’ capability to acquire quality measurements over inland waters. In particular, the Open-Loop Tracking Command (OLTC), which consists in calibrating the altimeter signal acquisition window with a prior information on the overflown hydrological surface height, represents a major evolution of the tracking function. This tracking mode’s efficiency is such that it is now stated as operational mode for current Sentinel-3 and Jason-3 missions as well as the recently launched Sentinel-6A mission. The improvements brought to onboard tables contents in 2017 (Jason-3), 2018 (Sentinel-3B) and 2019 (Sentinel-3A) enhanced and confirmed the OLTC performances.

In 2020, the onboard OLTC tables of the Jason-3, Sentinel-3A and Sentinel-3B missions have benefitted from further new major upgrades. The first version of the Sentinel-6A onboard OLTC tables holds the same content as Jason-3. The tracking command defined over Jason-3 and Sentinel-6A repeat cycle now accounts for more than 30,000 hydrological targets which represents five times more targets than in the previous version. For each Sentinel-3, the number of water body surface heights coded into the OLTC has been increased by a factor of 3 to 70,000. This further major step is made possible by the analysis and merging of the most recent digital elevation models (SRTM, MERIT and ALOS/Palsar) and water bodies databases (HydroLakes, GraND v1.3, SWBD, GSW). This methodology ensures coherency and consistent standards between all nadir altimetry missions and types of hydrological targets.

A detailed description of the 2020 upgrades will be given as well as measurements validation results obtained since their upload. An overview of the global validation of Sentinel-6A
measurements over hydrological targets will also be presented.

These 2020 OLTC upgrades constitute a great asset for building a valuable and continuous record of the water surface height of worldwide lakes, rivers, reservoirs and wetlands. In addition, for a continuous improvement of the OLTC tracking mode, the users can check the content of the onboard OLTC tables over hydrological targets for both Sentinel-3 missions on the https://www.altimetry-hydro.eu/ web portal. When relevant, they can correct existing water surface heights or submit new targets.