^{© NSOAS} HY-2A data quality assessment over ocean





Service Altimetrie Localisation Precise

N. Picot, J.M. Lachiver (CNES) M. Raynal, M. Ablain, Y. Faugere (CLS)



OSTST 2014

October 27-31, 2014 Konstanz, Germany

Overview

As announced during past OSTST meeting, and since April 2014 Hy-2a RS-IGDR products are assimilated in SALP / DUACS.



SSALTO/DUACS 2014 UPGRADES: 4 SATELLITES IN THE REAL TIME SYSTEM AND A NEW PROCESSING Y. Faugère, M.-I. Pujol and the DUACS Team *CLS*

E. Bronner, N Picot

DUACS-NRT provides GODAE, climate forecasting centers, the MyOcean EU FP7 project, and real time oceanographic research (e.g.: in-situ campaigns) with directly usable, high quality near real time altimeter data. Regional products (Mediterranean Sea, Mozambic, Arctic, European Shelves ...) are also delivered to operational projects. This poster highlights the 2014 updates of the DUACS-NRT component



- This provides an additional altimeter data set inside DUACS L3&L4 products, particularly interesting over high latitudes.
- L3 products also circulated on FTP server (L2 also to some Pis) and CORSSH via ODES system : 'The full series of our <u>CorSSHs</u> (all satellites: 60+ years of cumulated data!), including AltiKa and HY-2A altimeter missions'

This presentation focus on the analysis of Hy-2a data quality



OSTST, 28-31th, October 2014, Konstanz, Germany

Overview of the CNES HPP processing





OSTST, 28-31th, October 2014, Konstanz, Germany

- Based on the input provided by NSOAS : S-IGDRs
- Focusing on the Ku band retracking, with updated geophysical corrections (GDR-D standard) and updated SSB table
- No availability of instrument calibrations to compute LUT and/or numerical retracking solutions
- No analysis of HY-2 radiometer data
- We thus rely on the input data quality for some/most of the instrumental corrections



- Missing data mainly related to telemetry incidents
- Data availability over ocean around 90% after removing major incidents, well below the one on Jason-2 and/or SARAL mission but still of interest for SALP/DUACS system.





Slide 5

Data availability over ocean

Missing measurements over ocean mainly located above 60° of latitudes
Linked to onboard altimeter tracker behavior over sea ice surfaces



Slide 6

Data availability over land

- Few measurements available over the land
- Results are comparable with Jason-1 performances, again linked with onboard altimeter tracker behavior







Slide 7

The percentage of valid measurements is good, except in the 48°S 55°S band of latitude (Inconsistent Doppler correction values in NSOAS S-IGDRs products)



H2: Percentage of valid measurements



OSTST, 28-31th, October 2014, Konstanz, Germany

Sea-level performances

- Hy-2a Sea Level Anomaly is strongly impacted by the USO drift (as far as we can say ...) and other ground processing side impacts (new observation ...). Not stable !!
- In DUACS it is corrected thanks to the cross-calibration (HY2 SLA is set to JA2 values) and has no significant impact on SLA estimations.





Slide 9

Hy-2a and Jason-2 spectral contents are very similar, demonstrating the good data quality after updated processing.





Slide 10

After accounting for a residual datation bias, the mean difference between Hy-2a ascending and descending passes is low but additional post processing is required to easily merge HY2 with JA2 data.







OSTST, 28-31th, October 2014, Konstanz, Germany

- SSH errors at crossovers (per cycle) show the good performances of HY-2A altimeter
- Statistics are clearly impacted by the number of available measurements. This is not the case in DUACS since HY-2A long wavelength errors are corrected thanks to the cross calibration to Jason-2.



Std of SSH differences at Xovers



OSTST, 28-31th, October 2014, Konstanz, Germany

- SSH errors at crossovers (per cycle) show the good performances of HY-2A altimeter
- Statistics are clearly impacted by the number of available measurements. This is not the case in DUACS since HY-2A long wavelength errors are corrected thanks to the cross calibration to Jason-2
- GDR products (differed time) show a good improvement of the data quality





OSTST, 28-31th, October 2014, Konstanz, Germany

Compared to the other missions, SSH errors at crossovers show the good performances of HY-2A altimeter





Slide 14

Compared to the NSOAS official products, John pinpointed that :

There is a lot of range 'noise' at the tens of cm level in NSOAS official products. Previously I was forced to smooth the data alongtrack (~ 45 km scale) **which is clearly not the case with CNES RS-IGDrs**



36°

37°

38°

39°

0

-6

40°

Depth (km)



OS

32°

33°

34°

35°

- With a new repetitive ground track and good quality of RS-IGDR products, Hy-2a is an excellent opportunity mission for ocean monitoring.
- HY-2 secure the virtual altimeter data constellation used in SALP/ DUACS system





OSTST, 28-31th, October 2014, Konstanz, Germany

Conclusion and perspectives

- We are however still impacted by the input data quality and stability an accurate and daily monitoring of the data quality is required on this mission.
- Further improvements might be implemented (C band, long term analysis, radiometer wet correction, SWH, wind, ...) but would require additional input information from NSOAS.

