Towards Regional Products

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Abstract

Ssalto/Duacs system processes data from all altimeter missions to provide a consistent and homogeneous catalogue of products for varied applications, both for near real time applications and offline studies in the framework of the SALP/CNES and MyOcean/SL TAC project.

We present here a focus on the lastest updates of the SSALTO/DUACS production : new regional products and improved data processing.

New Europe product (Fig 1)

L3 available in December 2011

Specificities of the product :

o SLA corrections are based on the same standards as used for global processing.

o L3 along-track data where optimally filtered (Lanczos) in the area to better reduce measurement noises (Fig 2).

o L3 product is delivered with a full 1Hz (~7 km) sampling.

Fig 2a : Power spectrum of Jason-1 data over the Europe area and for year 2008. Filtering applied for regional processing allows to better resolve short wavelengths. 95 to 85 km wavelengths, are present in the regional product whereas near absent in the global product.
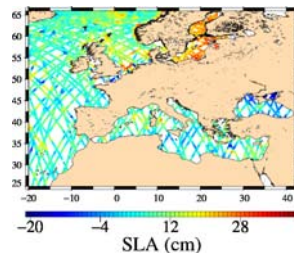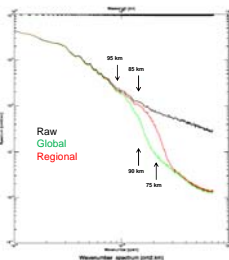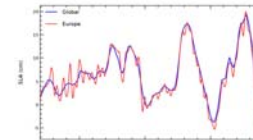

Fig 1 : Example of Jason1, Jason2 and Envisat data over the Europe area (5 days of data)

Fig 2b : Example of Jason2 along-track data (track 148) for global and Europe products.

New Arctic product

L3 available in December 2011

Specificities of the product :

o Mainly based on Envisat (new orbit) for latitudes > 66°N

o TPXO7.2 [1] tidal correction is applied, instead of GOT4.8 as for global product.
This allows a significant reduction of the errors in the Arctic Ocean (North of Polar Circle) (Fig 3)

o Mean Sea Surface DTU 2010 [2] is used instead of MSS CNES/CLS 2011.
This allows improved performances, in a large part of the Arctic Ocean, in summer with the minimum of ice coverage (Fig 4).

o L3 along-track data are optimally filtered (Lanczos) in the area to better reduce measurement noises. Signal wavelengths until 85 km are present in the regional L3 product , when main part of 95 to 85 km wavelength are absent in the global product.

o L3 product is delivered with a 14 km sampling.

EN 2007 Var[SLA(TPX)]−Var[SLA(GOT47)]

Fig 4a : Difference of variance of SLA with MSS DTU10 (referenced to the 7 years 1993-99) and MSS CNES/CLS 11 over Envisat cycle 61 in September 2007. Negative values traduce a reduced variance when MSS DTU10 is used. It is considered as an improvement, associated with the fact that MSS CNES/CLS 2011 is mainly based on Geoid value in the areas concerned. The improvement is associated with a minimum of ice coverage and vary with time according to the ocean surface free of ice (Fig2b)
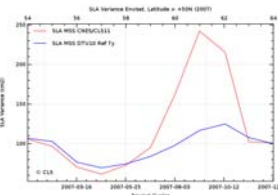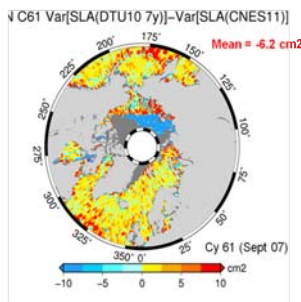

Fig 4b: Envisat SLA variance (2007) with selection on latitudes > 50°N with MSS CNES/CLS 11 and DTU 10 referenced over the same period of 7 years.
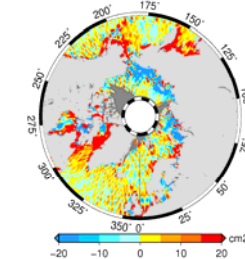

Fig 3 : Map of variance differences of SLA corrected from oceanic tide derived from TPXO7.2 and GOT4.7 models. Envisat data over year 2007 are used. Negative values traduce a reduced variance when TPXO model is used. It is considered as an improvement, mainly associated with the fact that TPXO performances are improved by the use of tide gauges in theses areas.

New Mozambique product

L3 and L4 available since March 2011

Specificities of the product:

o SLA corrections are based on the same standards as used for global processing.

o L3 along-track data where optimally filtered (Lanczos) in the area to better reduce measurement noises and restore as much as possible shorter wavelengths.

o L3 product is delivered with 0.5Hz (~14km) resolution.

o Gridded product (L4) was generated with 1/8°x1/8° spatial resolution, using correlation scales better fitted to the characteristics of the signal in the area. It allows to better reproduce mesoscale activity in the area (Fig 5 and 6).

Fig 5 : Example MSLA product for Mozambique area (left) (map of day 05/10/2011) and differences with global product (right)
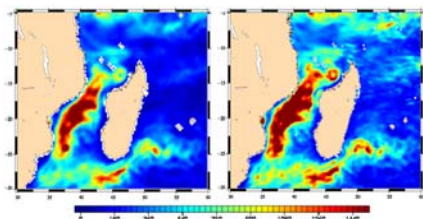

Fig 6 : Example of EKE (cm²/s²) observed with global product (left) and regional product (right) over year 2009. Higher EKE level in the regional product underlines the signature of mesoscale activity better reproduced by this product.
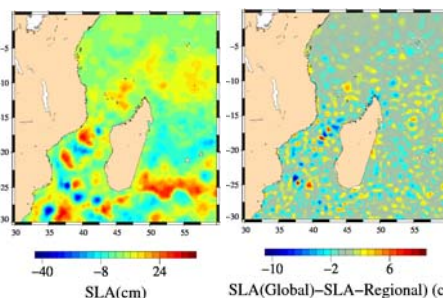
Improved Mediterranean product

Data NRT processing was improved in order to better take into account shorter tracks. The impact is especially visible in the Alboran Sea where more along-track data are now present in the product (Fig 7)

Mediterranean area coverage was extended to -6°E and now completely include the Gibraltar Strait.

High resolution (1Hz) along track data over the Mediterranean and Black Seas are also available in the new Europe product

Fig 7: Exemple of along-track NRT product in the Mediterranean Sea (12 days of Jason-1, Jason-2 and Envisat data) before (left) and after (right) the improved processing of short tracks, and area coverage redefinition
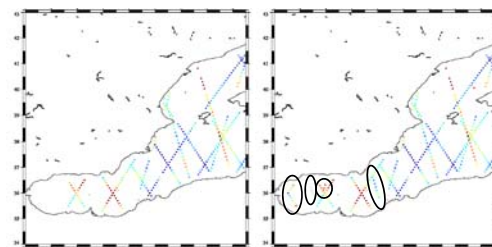
Experimental Kerguelen product

Regional products were also implemented as experimental datasets. It is the case of Kerguelen products, implemented with a specific support from CNES, in support of the KEOPS2 oceanic campaign.

More information is given in the dedicated poster.

[1] Egbert et al., 2002; see http://volkov.oce.orst.edu/tides/global.html
[2] Andersen O. B., T. Bondo, P. Knudsen and P. Berry. ESA Living Planet Symposium, Bergen, 2010. Poster « The Mean Sea Surface DTU10; Comparison with GPS and tide gauges »

More information on the AVISO website
www.aviso.oceanobs.com
www.cls.fr/duacs (mirror)