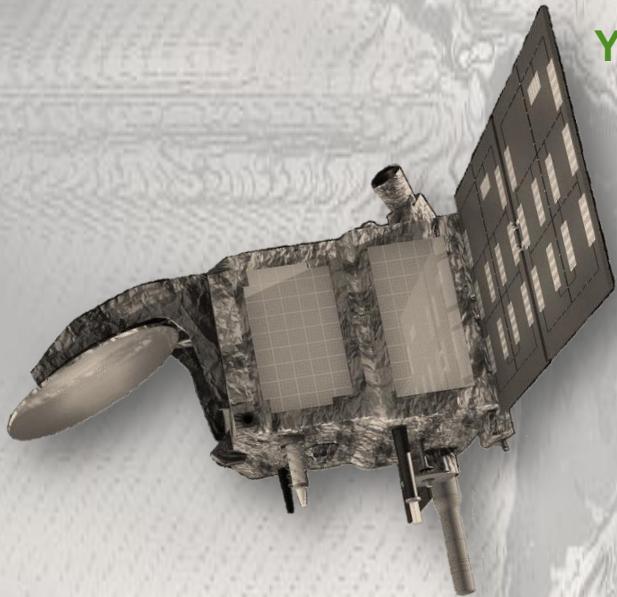


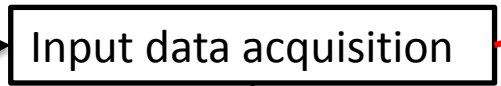
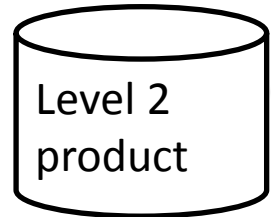
AltiKa in DUACS: Status after 2 months (and perspectives)

Y Faugere, A Delepouille, F.Briol, I Pujol and DUACS Team
N Picot, E Bronner

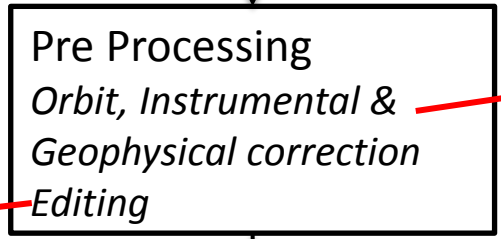


- Altika has been integrated in Duacs system on the **1st of July...**
- **...just 10 days** after the lost of Jason-1
- Since then, Duacs products (along track SLA maps) are computed using the 3 satellites **Jason-2, Cryosat-2 and Altika** and delivered to Aviso and Myocean users
- The Purpose of this presentation is to:
 - Describe the **Altika parametrization** in the multimission processing and to show examples of quality control monitoring
 - Show some illustrations of the **impact of using Altika in the system** based on the 2 months dataset
 - Discuss the perspectives, and notably the potential interest of Altika to improve the resolution of Duacs along track and maps products

Altika in the DUACS multimission system: parameterization and exemple of QC outputs

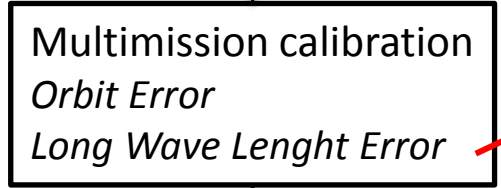
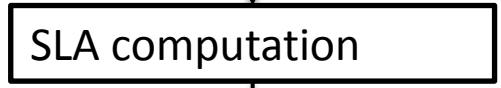


Altika OGDR and IGDR



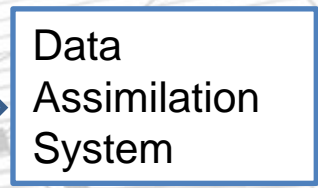
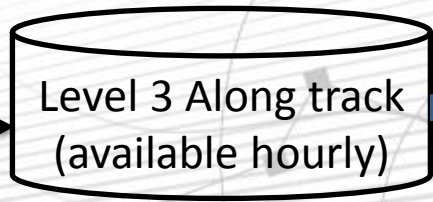
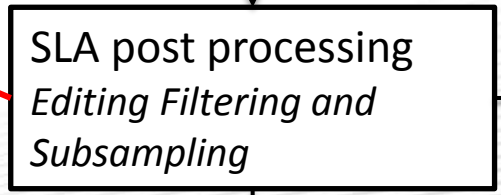
No change versus the product (SSB to be considered)

Threshold on altimetric parameters same as Jason-2 except Sigma0 and mispointing (S Philipps)

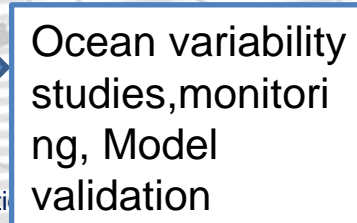
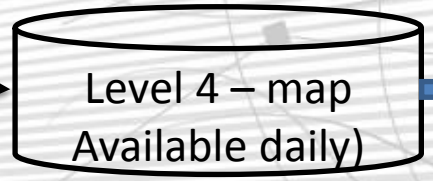
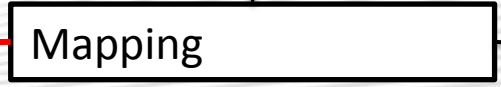


« A priori error » used is the one same as Envisat (lower than C2)

Same cut-off frequency as Jason-2 and Cryosat-2



A priori noise level same as Jason-2



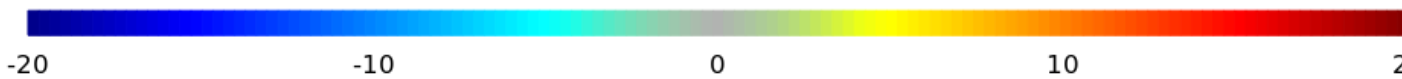
Ratio of Edited Measurement on the 3 last month (%)

Percentage of edited measurements for al (%)

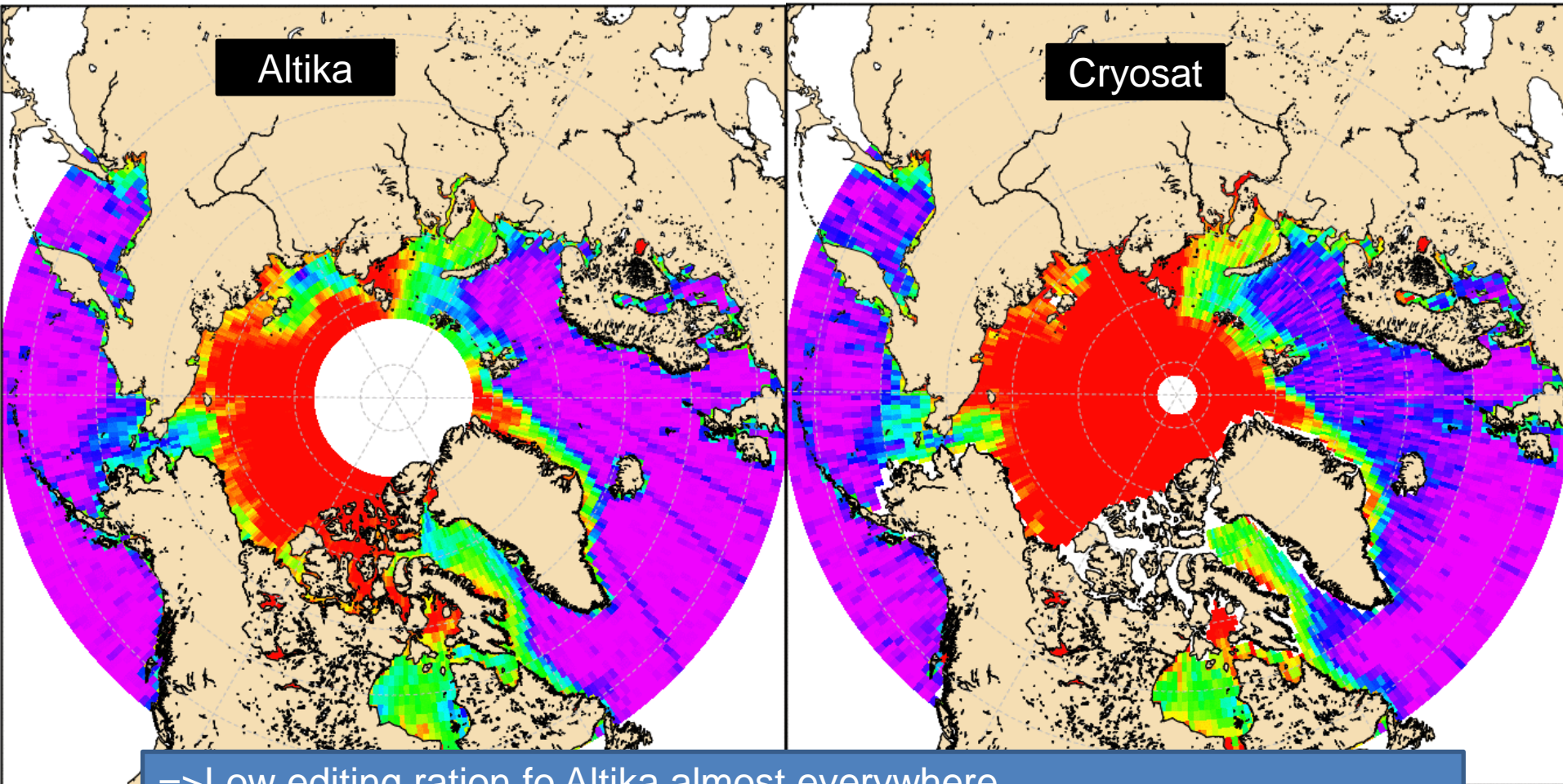
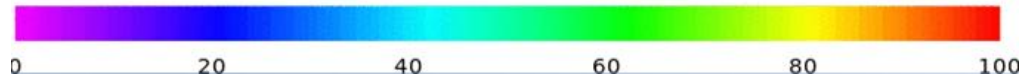
Altika

=>Low editing ratio fo Altika almost everywhere
=>indicates the good quality of Altika data but might also indicate that some thresholds are too permissive on Altika, at least for a global product

Jason-2 - Altika



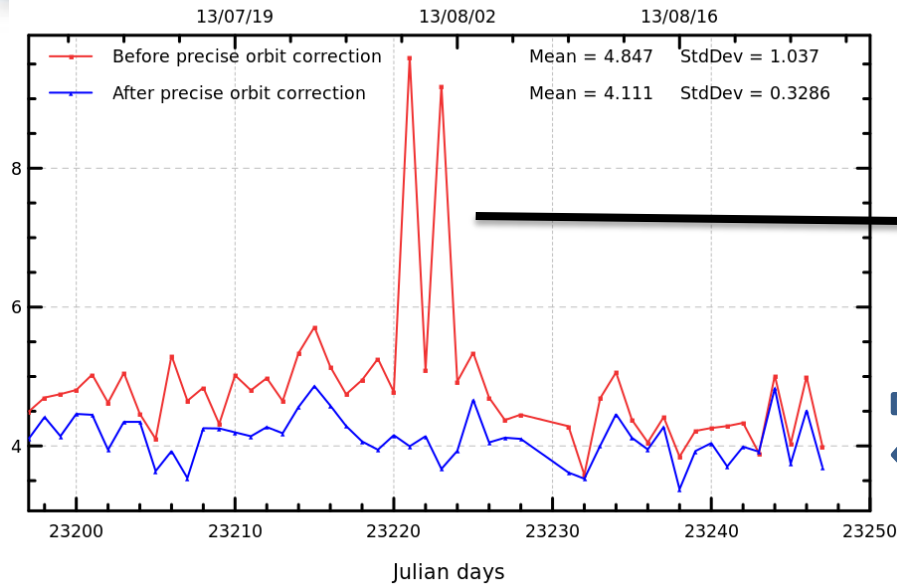
Ratio of Edited Measurement on the 3 last month (%)



=>Low editing ration fo Altika almost everywhere
=>indicates the good quality of Altika data but might also indicate that some threshold are too permissive on Altika, at least for a global product

Altika in Duacs: orbit error reduction

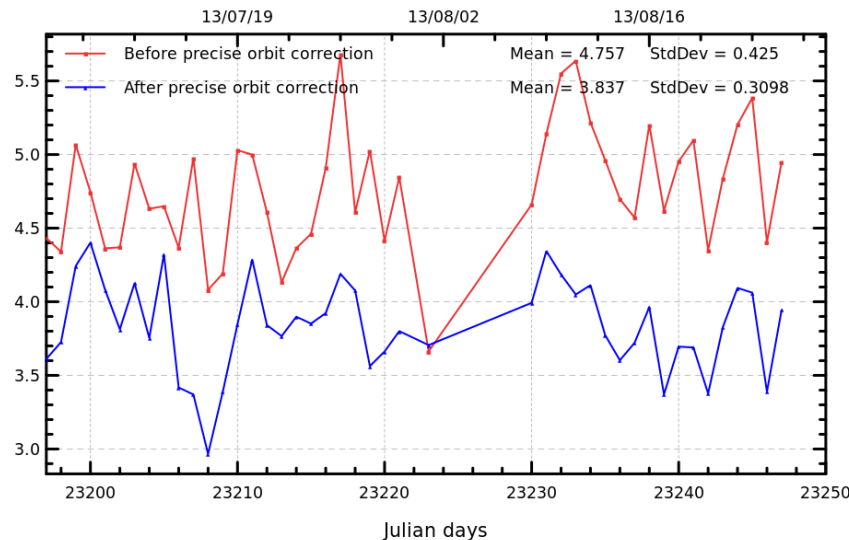
Impact of Orbit error reduction procedure on **Altika/Jason-2** differences at 1-day crossovers (cm)



High variance at crossovers due to manoeuvres end of July, corrected by the process

6.6cm² reduction

Impact of Orbit error reduction procedure on **Cryosat/Jason-2** differences at at 1-day crossovers (cm)

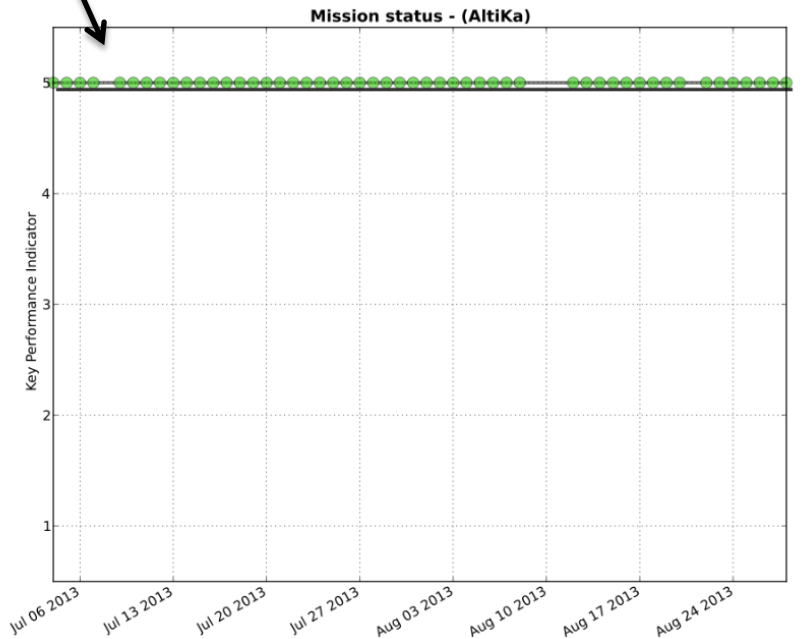
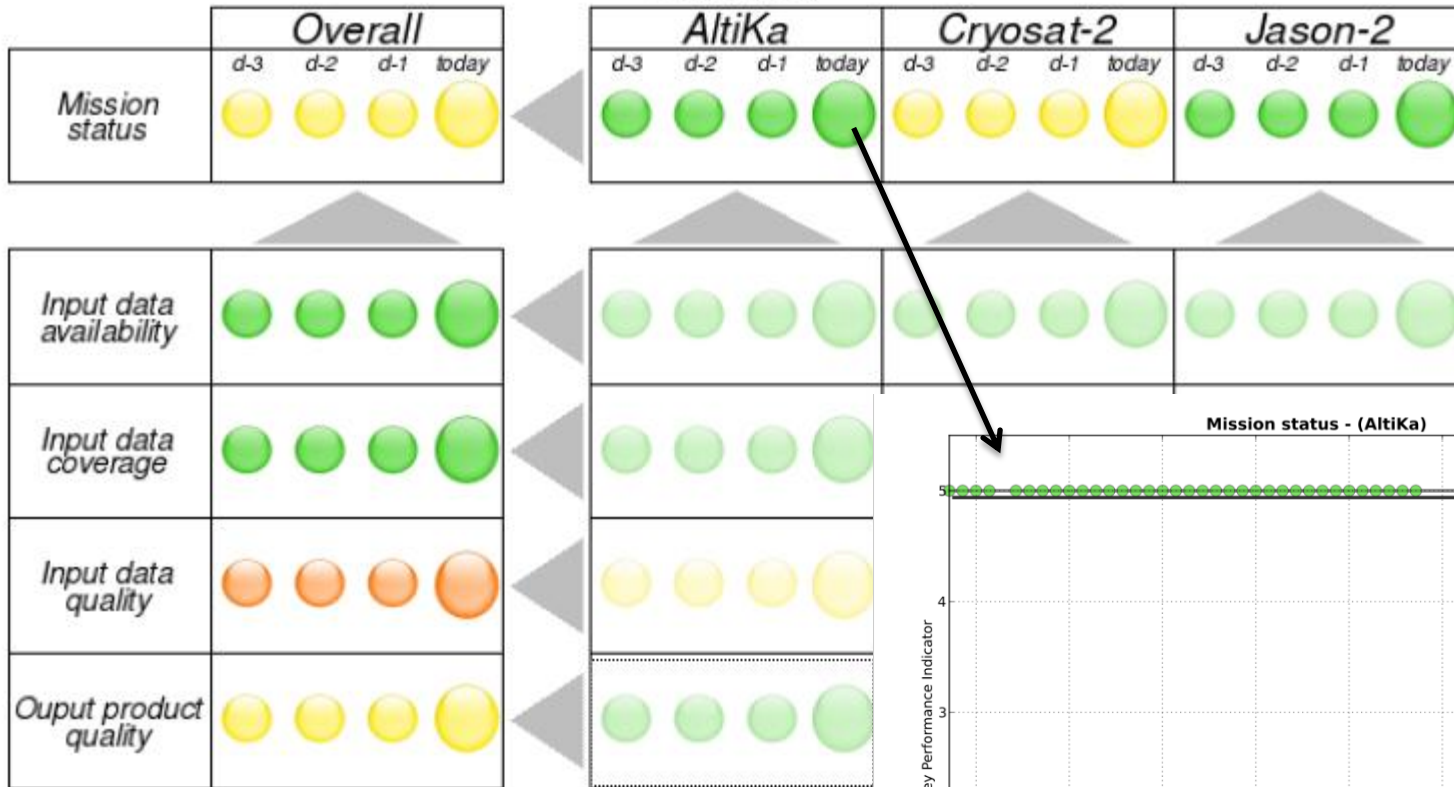


7.9 cm² reduction



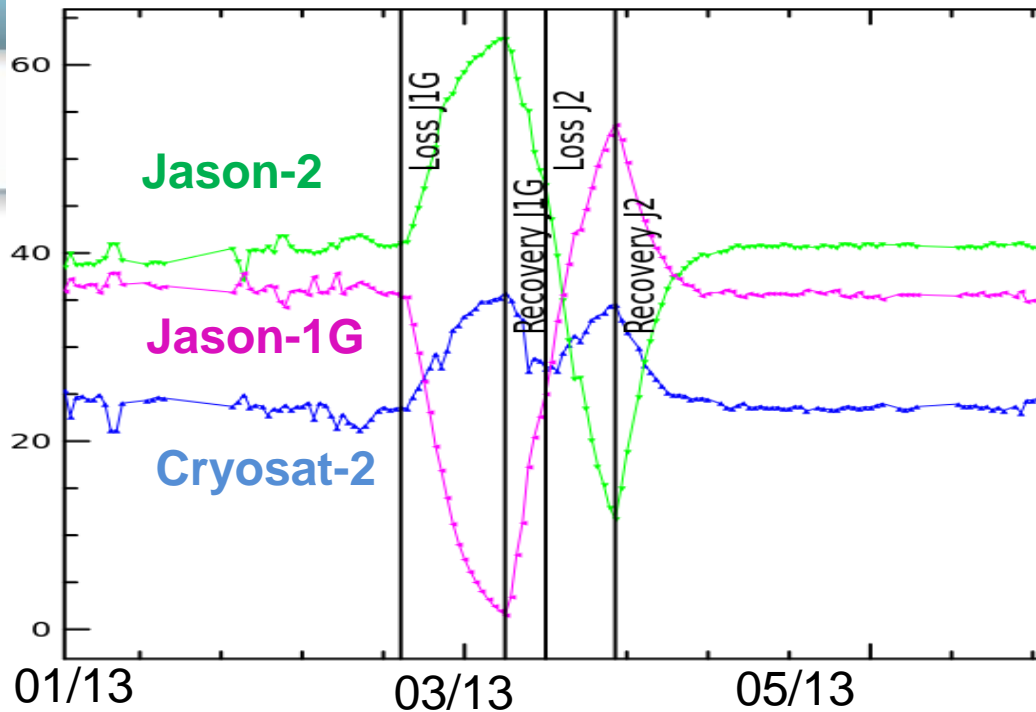
AltiKa in Duacs: Key Performance Indicator

SALP / DUACS Key Performance Indicators
2013/28/08



Impact of using AltiKa in the DUACS multimission system

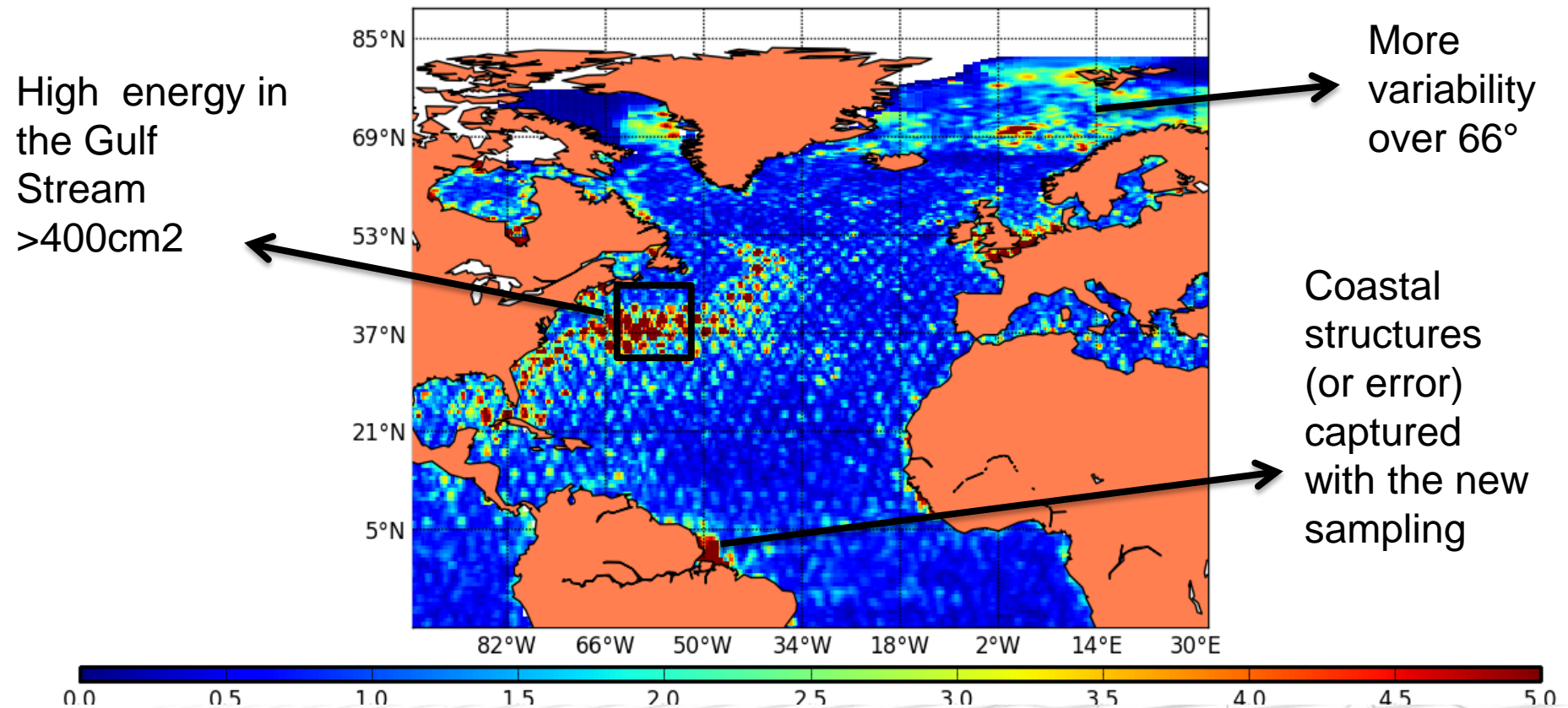
Contribution of each satellite in the DUACS High resolution mapping (DFS) In 2013



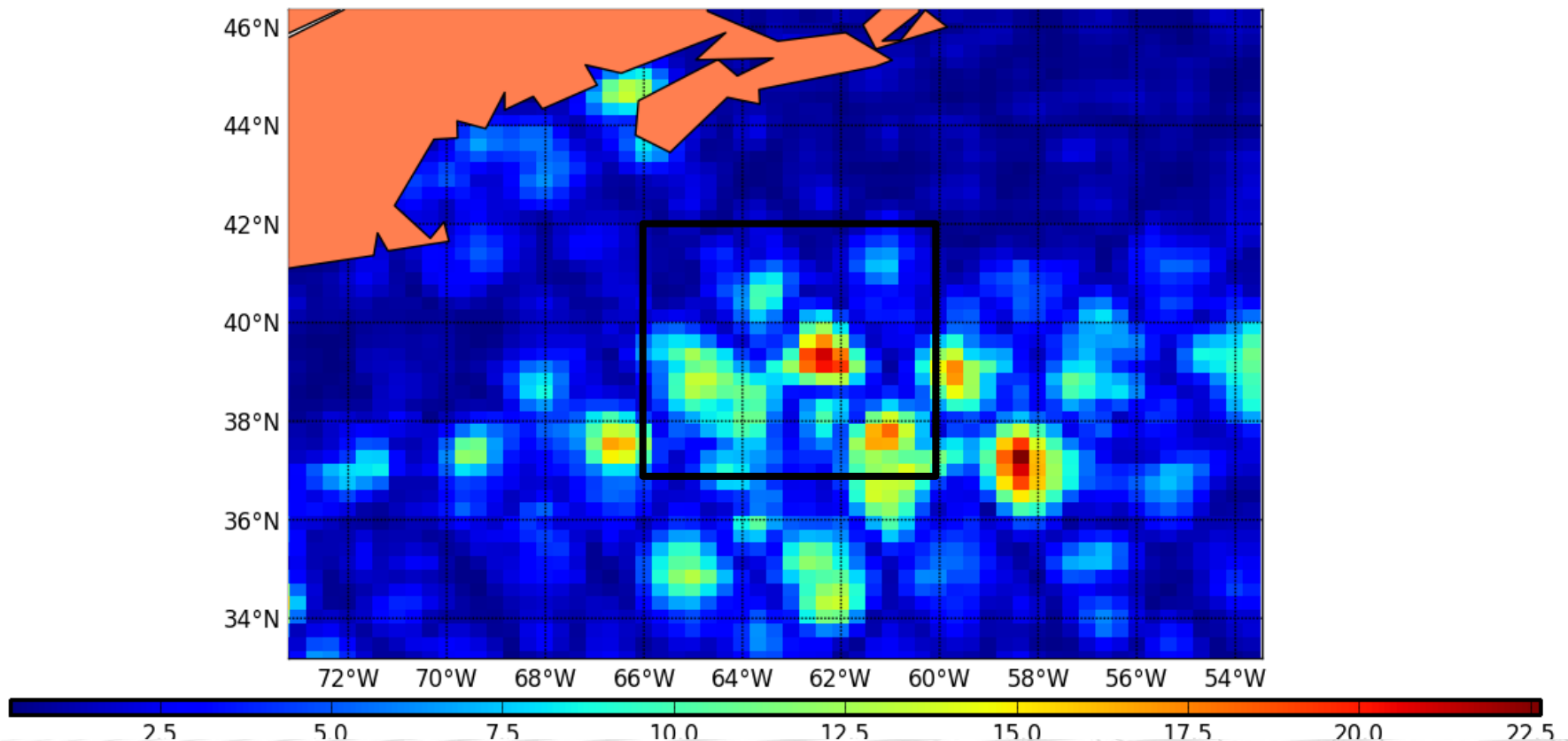
Formal error of the DUACS MAP (% of signal variance)

=>performed juste after Jason-1 loss, the timing of the introduction of Altika was very good
=>Altika also helped us to mitigate the dissemination gaps and delay in the Cryosat-2 data use by DUACS (CPP)

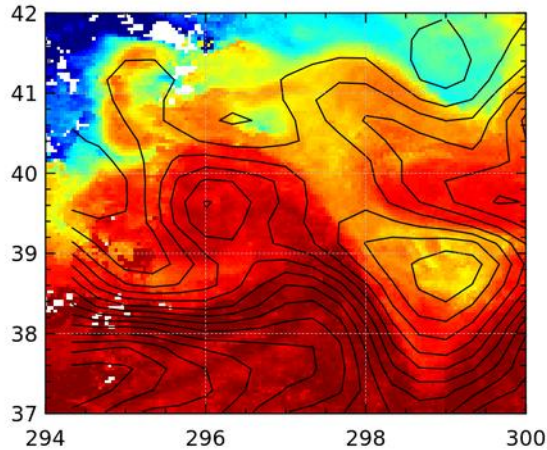
Standard deviation of [J2/C2/Al map – J2/C2 maps over July] (cm)



Standard deviation of [J2/C2/Al map – J2/C2 maps over July] (cm) Zoom in the Gulf Stream



ADT with Altika on 26/07/2013 – Gulf Stream



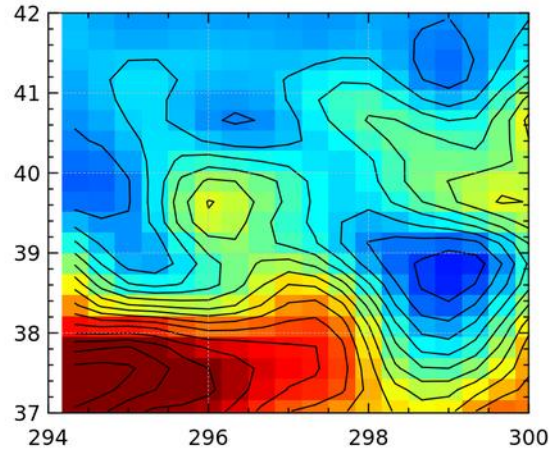
SST - 23217



Sea Surface Temperature (10-day composite maps from AVHRR/MODIS)

ADT superimposed

Unit in °C



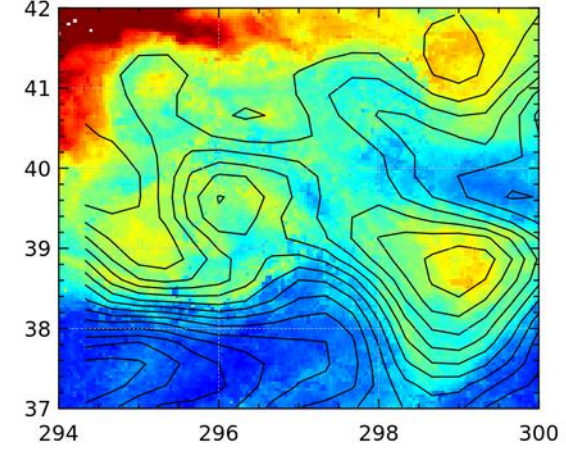
ADT - 23217



Absolute Dynamic topography (using Jason-2, Cryosat-2 and Altika)

ADT superimposed

Unit in cm



COLOR - 23217



Comparison to ocean Color (10-day composite maps of the chlorophyll-a concentration from VIIRS Sensor using Polymer algorithm)

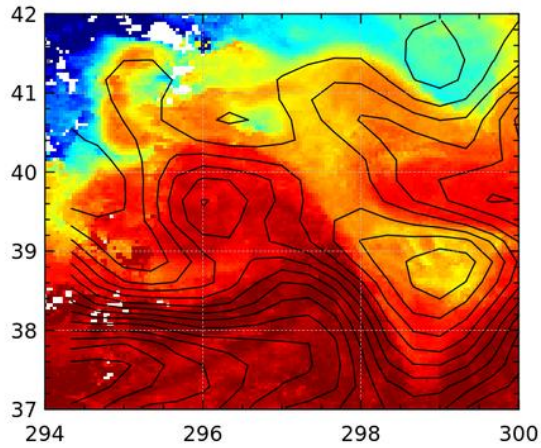
ADT superimposed

Unit in mg/m³

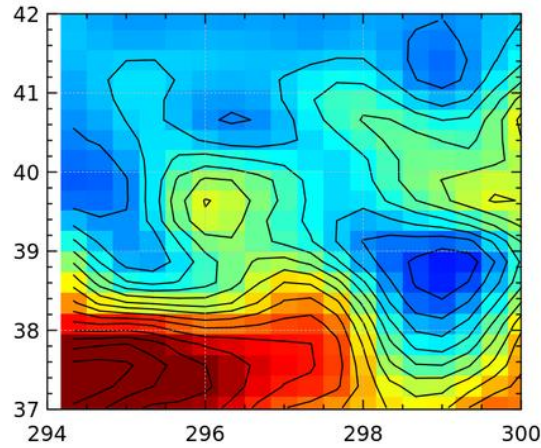
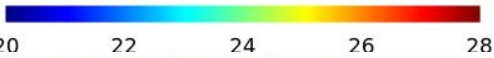
Absolute Dynamic topography= SLA + MDT



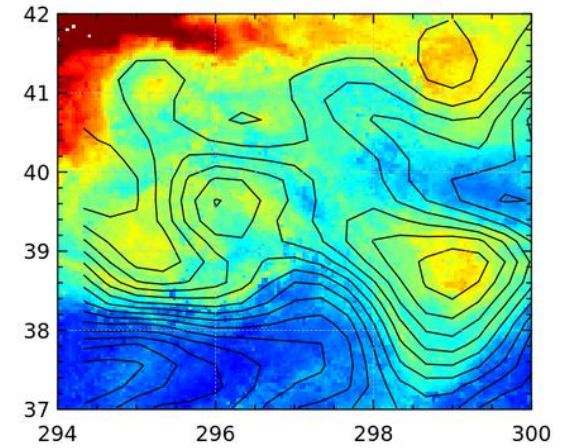
ADT with Altika on 26/07/2013



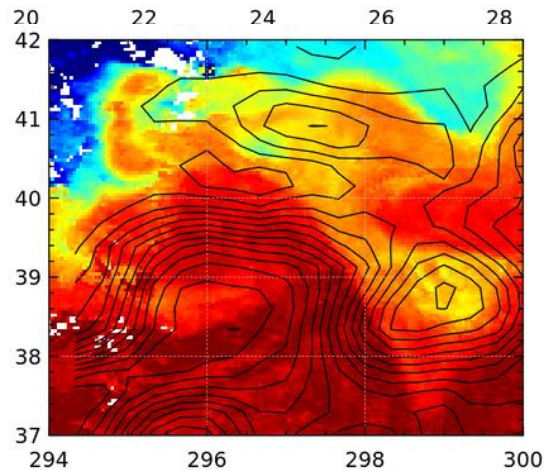
SST - 23217 (°C)



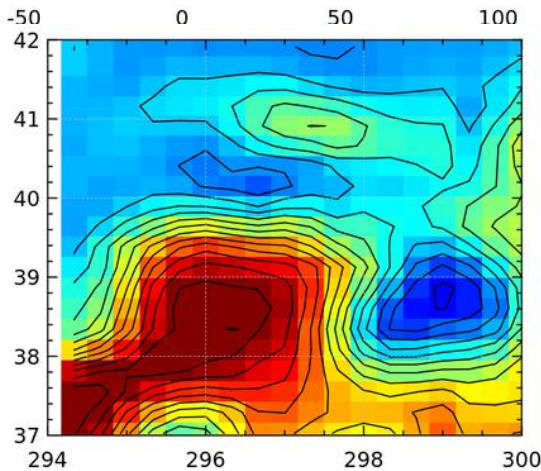
ADT - 23217 (cm)



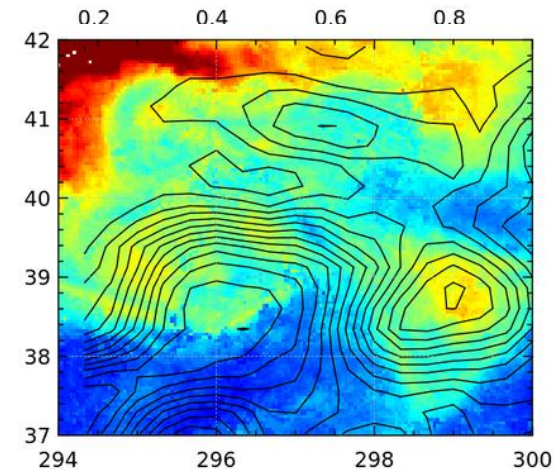
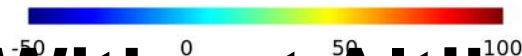
COLOR - 23217(mg/m³)



SST - 23217 (°C)



ADT - 23217 (cm)

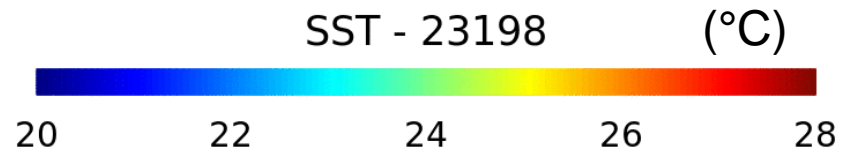
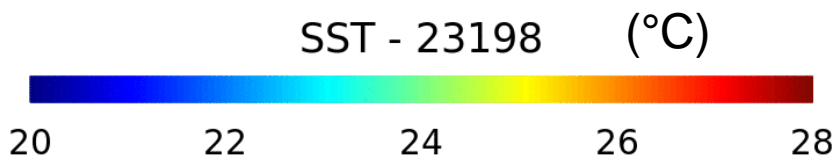
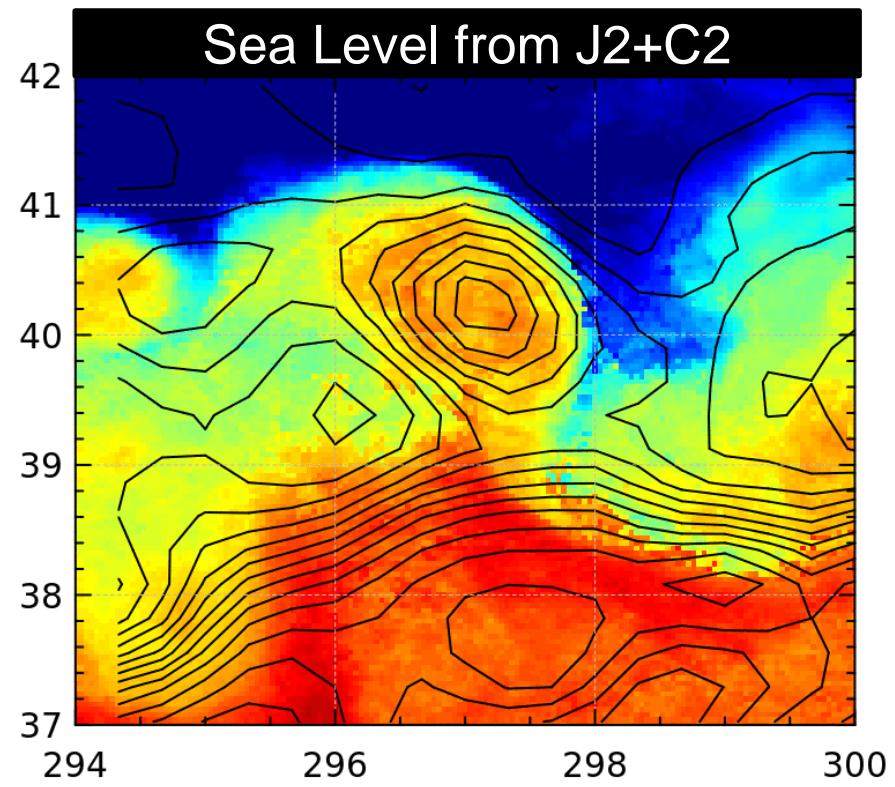
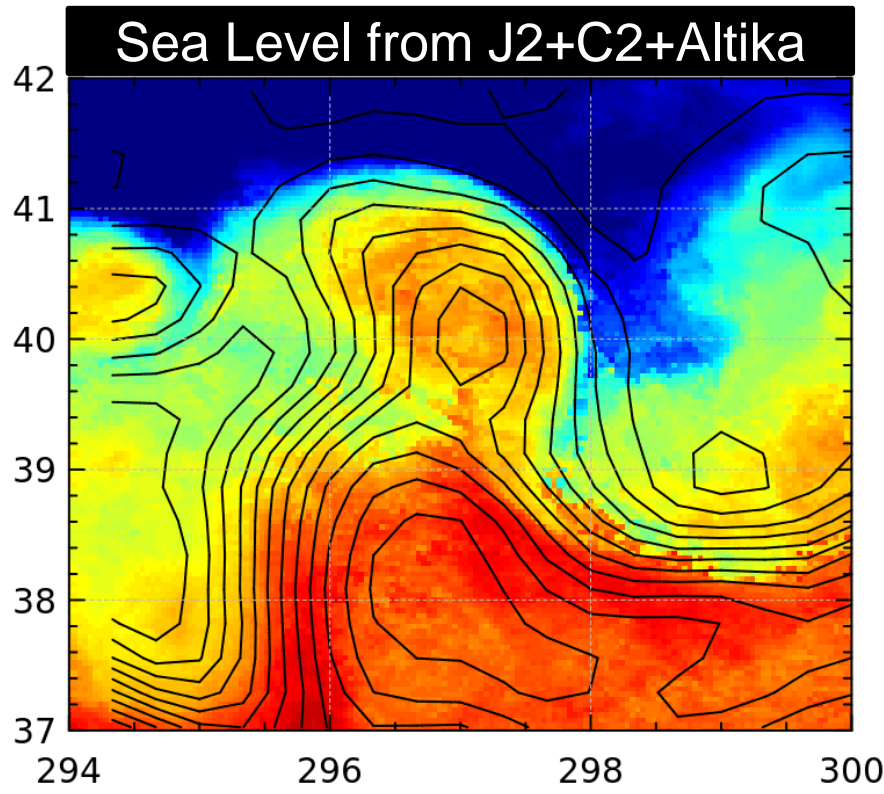


COLOR - 23217(mg/m³)

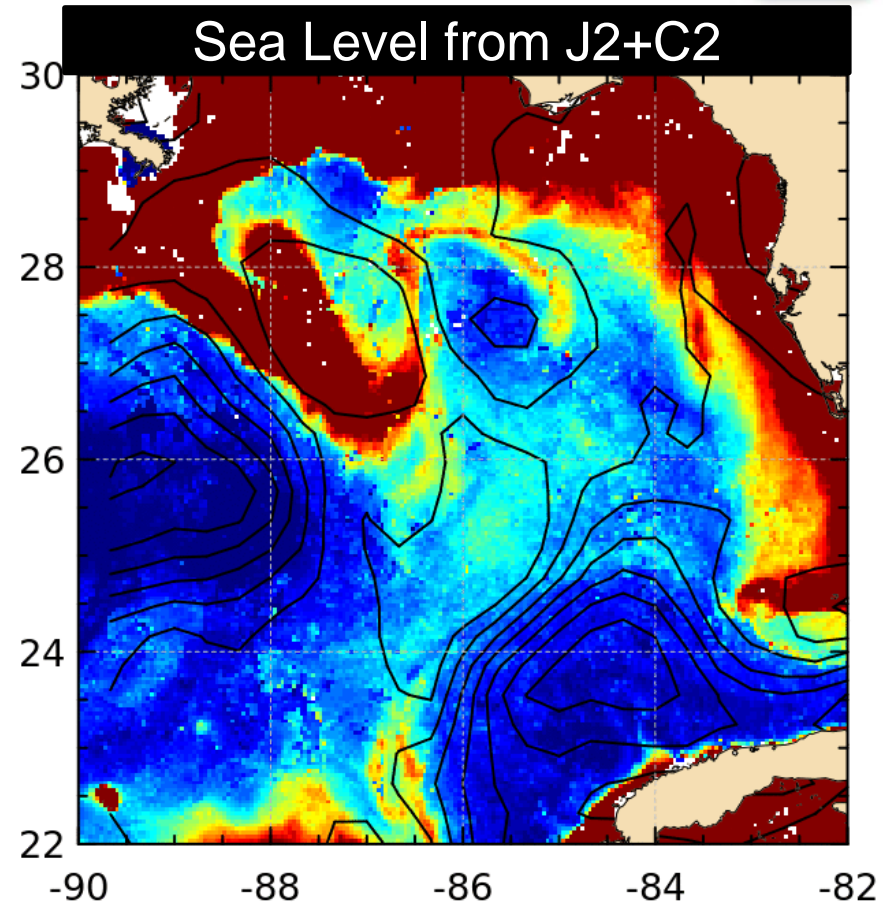
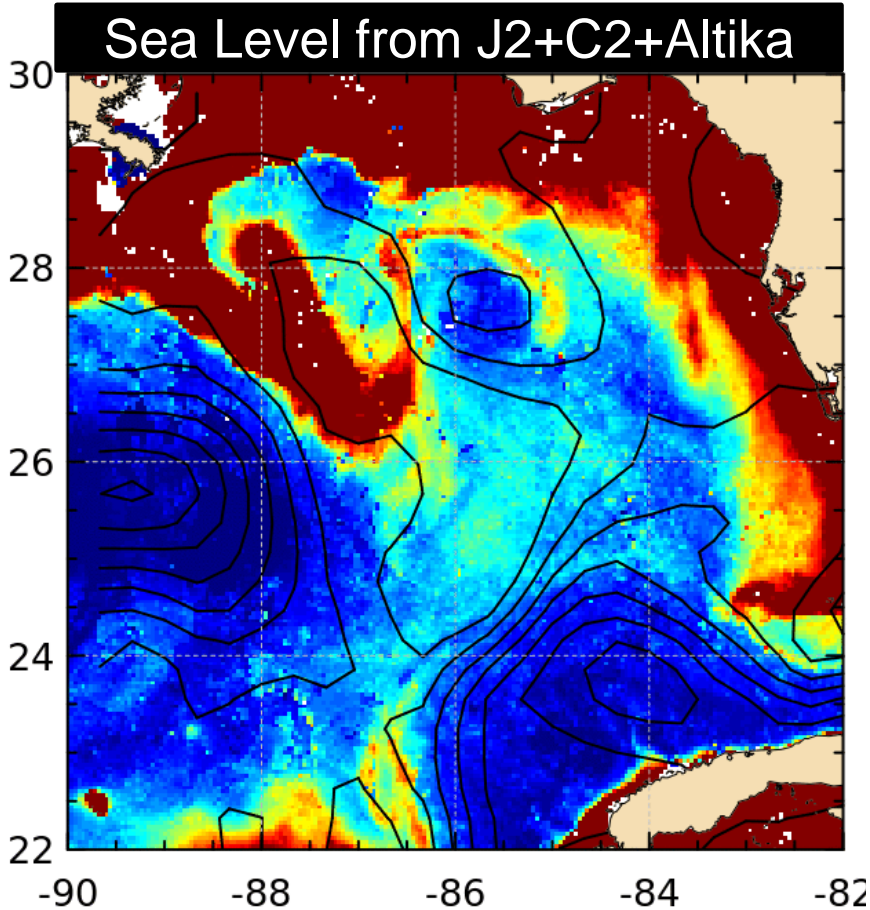


Without Altika

Sea Surface Temperature + ADT- Gulf stream in July 2013



Ocean Color + ADT - Gulf Mexico in July 2013



COLOR - 23198 (mg/m3)

COLOR - 23198 (mg/m3)



Conclusion and perspectives

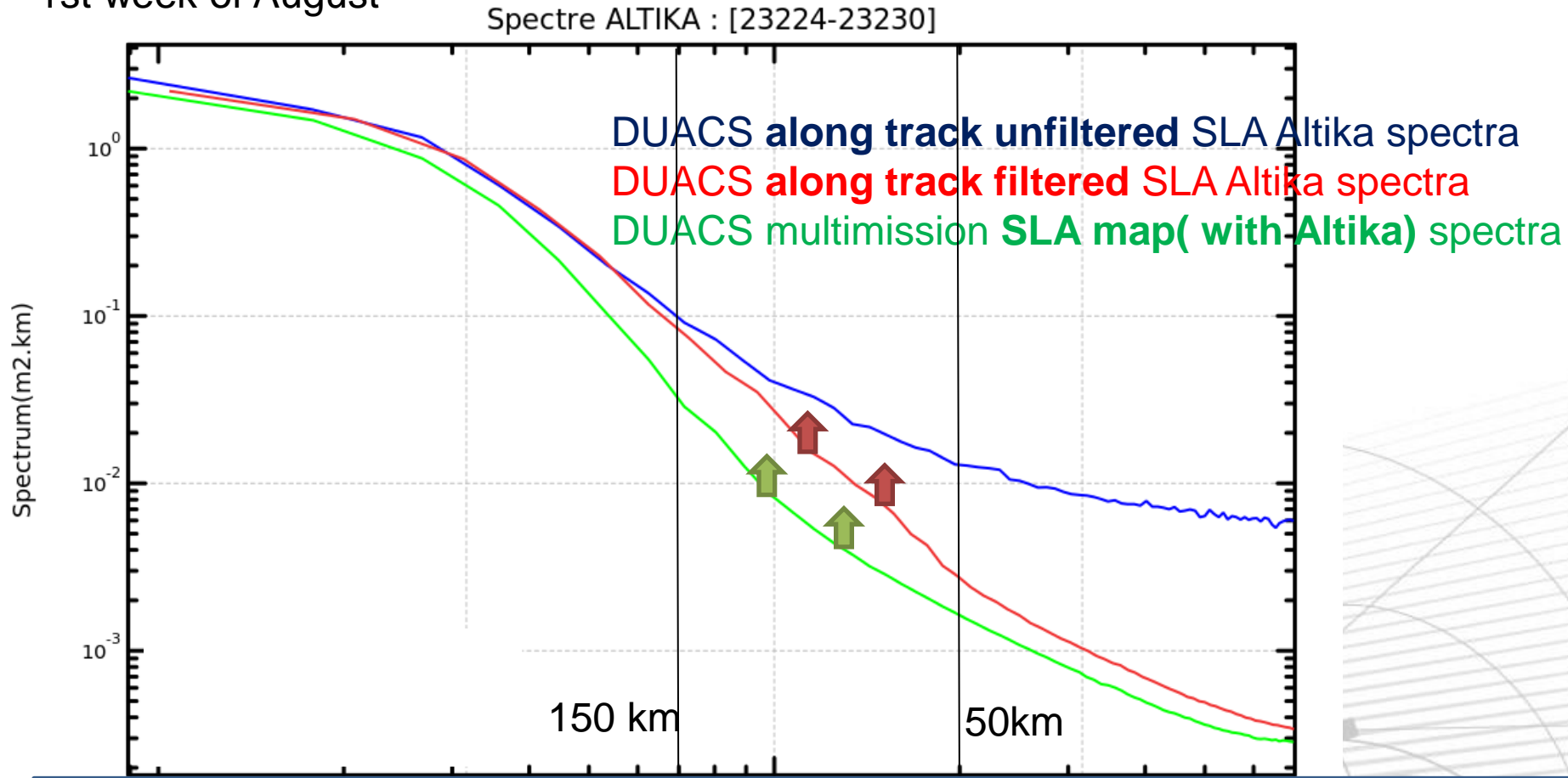
Preliminary conclusions after 2 month of Altika in the system

- **Introduction of Altika allowed us to maintain a rather good quality despite the loss of Jason-1**
- **Duacs Quality control outputs confirms the very good performances of Altika**, as already shown exhaustively by the Altika Calval teams: good orbit, good availability of data, good noise level, ...
- The mesoscale is better resolved with Altika (3 satellites), though an additional would be welcome in real time,
 - Energy of the map products is increased (strongly in the area of high variability)
 - Better positionning of the eddies, as checked in the comparison with Sea Surface temperature and Ocean Color.

Prerspectives

- Improvement of the Altika processing can be made in the future:
 - Level 2 correction/algo
 - SSB
 - Editing thresholds (20hz range standard deviation, Sigma0, mispointing)
 - Level 3 correction/algo
 - Optimal Filtering and subsampling => spectral analysis showed a low level of noise on Altika, lower on Jason-1 (JC Poisson et al). The Cut-off frequency of the filter applied on Altika could be lowered to values lower than today (100 km at 30-40° in DUACS today)
 - Level 4 correction/algo (mapping)
 - A priori error level on Altika
 - Regional Correlation scales / 2 step mapping / other?

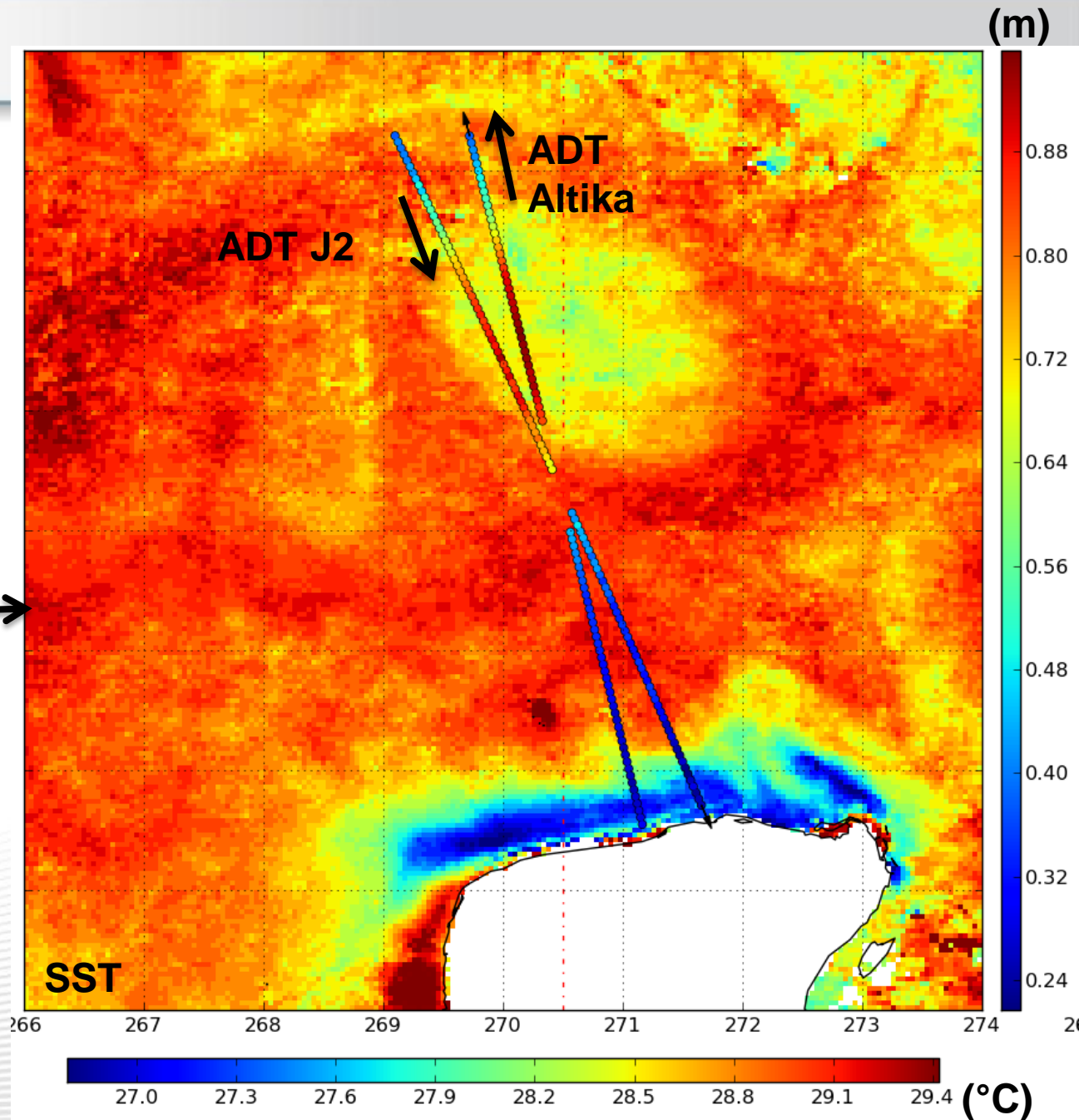
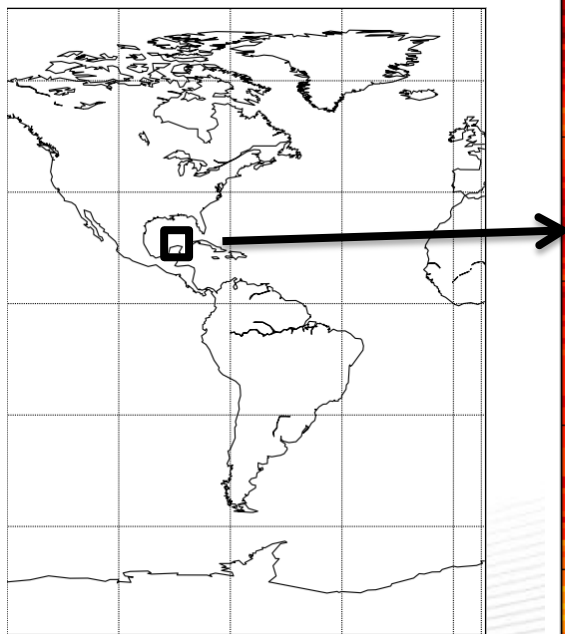
Spectra of Altika SLA (along track) and DUACS maps averaged on a global area on 1st week of August



Goal is too increase the level of energy of the ocean signal:

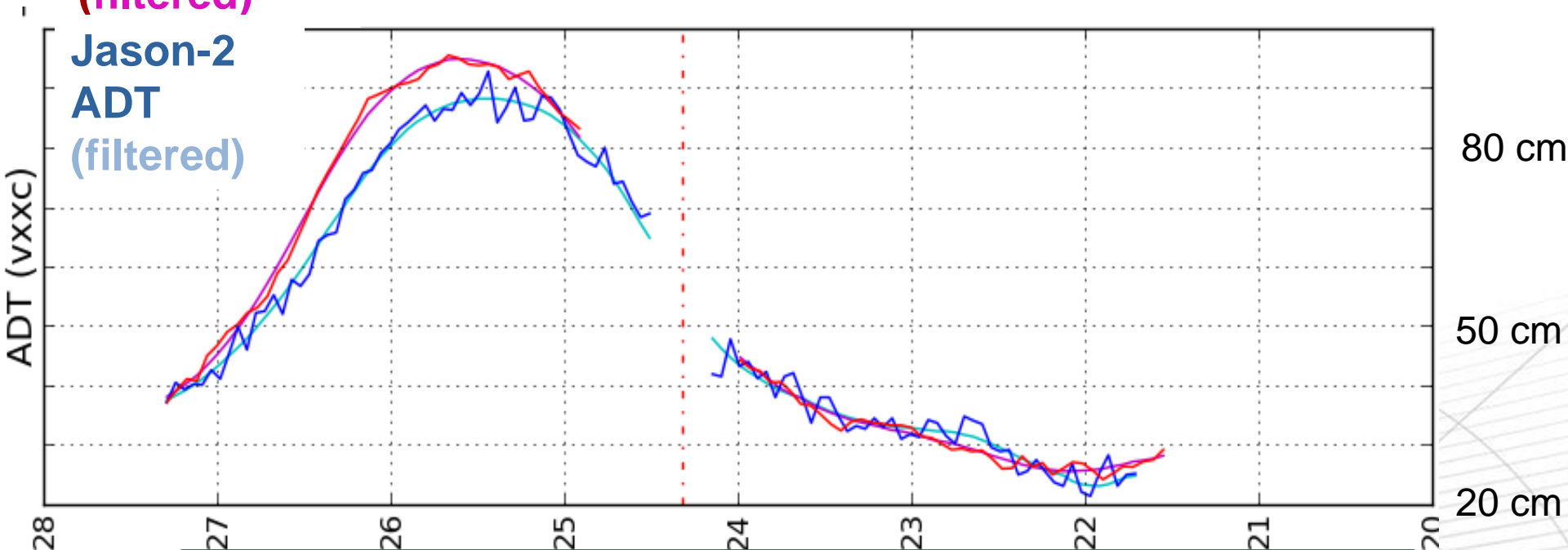
- ⇒ on the red curve (along track) by optimal filtering
- ⇒ on the green curve (map) by improving the interpolation algorithm

Jason-2 / Altika at crossovers with 35 mn time difference



**Altika ADT
(filtered)**

**Jason-2
ADT
(filtered)**



- Large eddy well monitored by Jason-2 and Altika
- High frequency signal lower on Altika on this exemple

=> There is certainly a real interest of Altika to improve the resolution of Duacs products