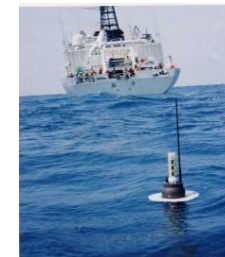




| Coriolis |



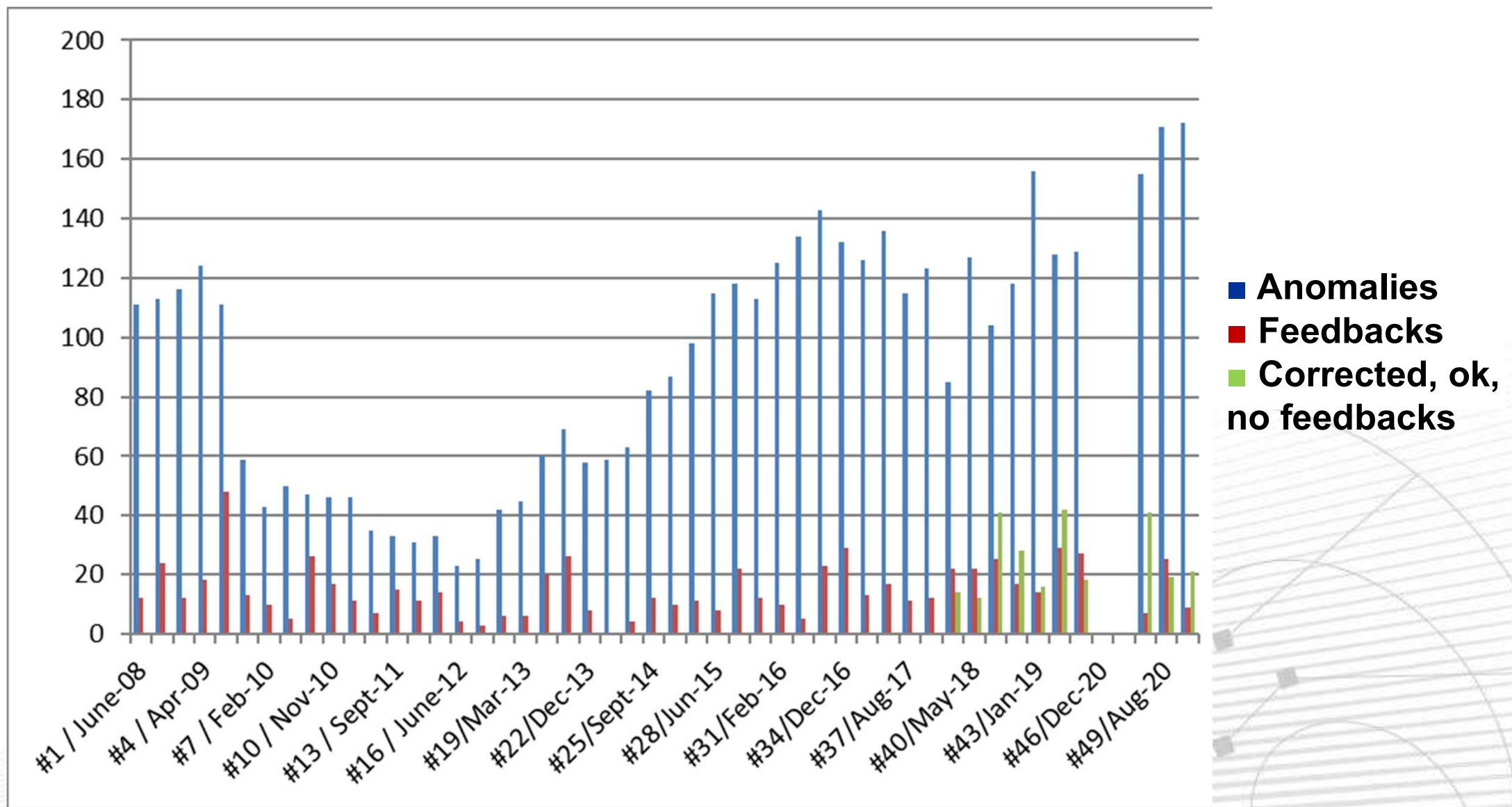
Status on anomalies detected with altimetry

Nathalie Verbrugge

CLS, Environment & Climate

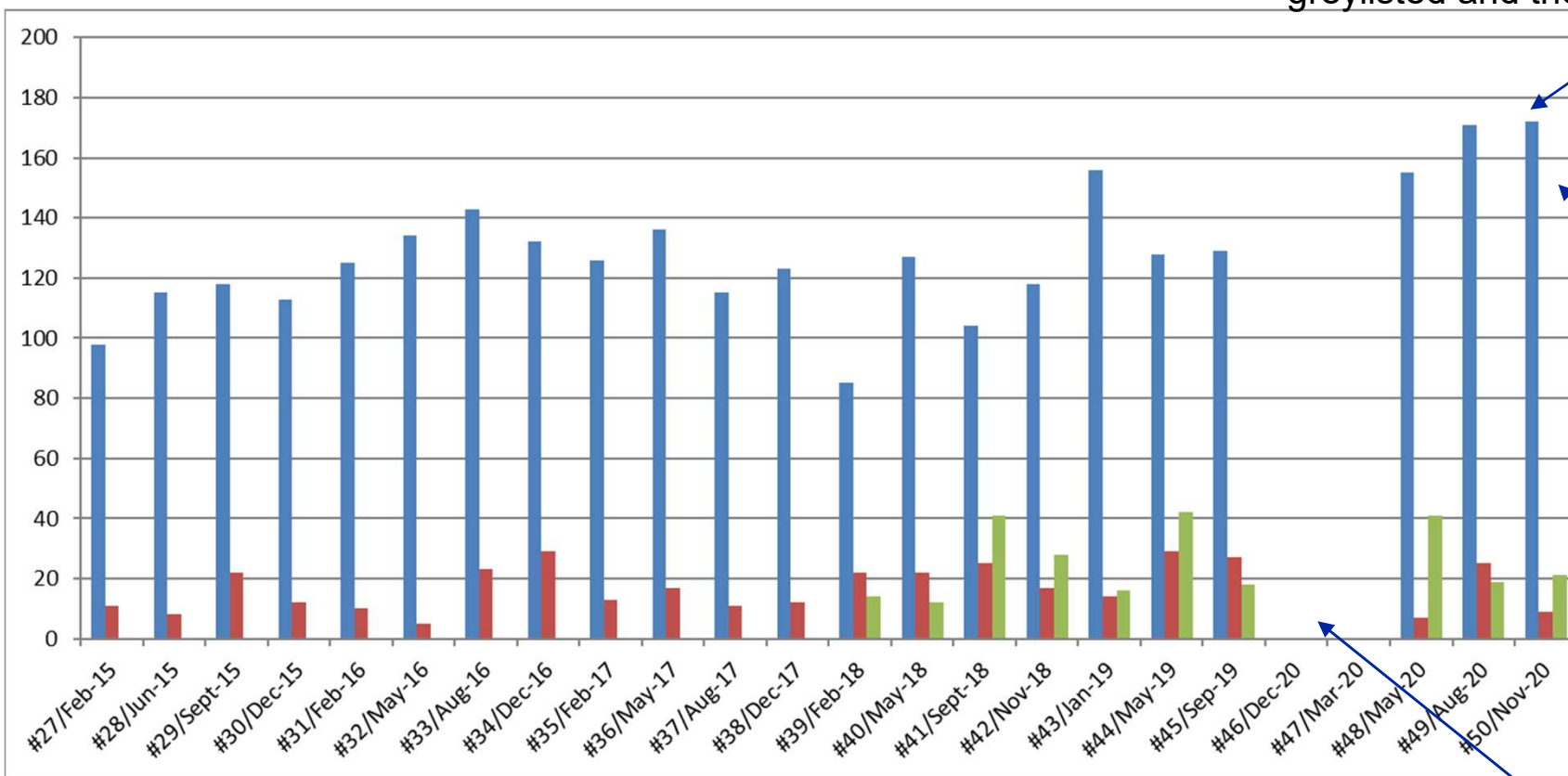
SYNTHESIS OF THE QUARTERLY ANALYSES

Status on the anomalies detected since June 2008



Status on the anomalies detected since Feb 2015

13 platforms for which a greylisting recommendation from the previous analysis was issued are corrected but are not greylisted and the latest cycle is wrong



5 floats (with feedbacks) are still in the list until they are examined in DT mode.

■ **Anomalies**
 ■ **Feedbacks**
 ■ **Corrected, ok, no feedbacks**

Values in the office and not accessible due to COVID situation ;-)

Please send Feedbacks !

Status on the anomalies detected since June 2008

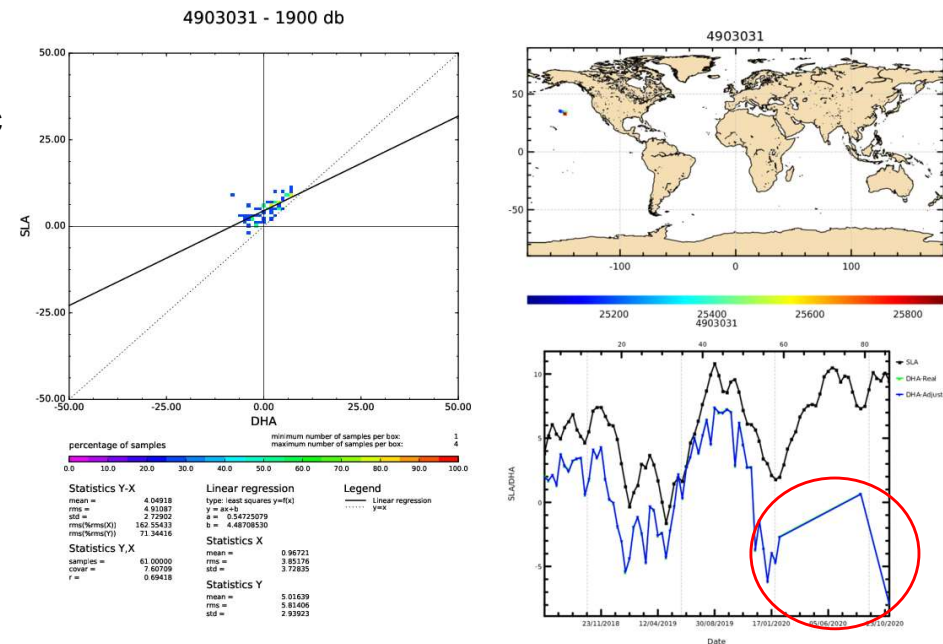
- ➔ Status distributed through the Argo Information Center (AIC) since Nov 2010 – and recorded in the AIC database
- ➔ Two tags are included in the subject of the email (since Dec 2016):
 - ➔ CHK : check
 - ➔ BLK: grey list
- ➔ An email is sent for each anomaly to the DAC & the DM-Operator
- ➔ The full list is also available here: ftp://ftp.ifremer.fr/ifremer/argo/etc/argo-ast9-item13-AltimeterComparison/QC_ARGO_ALTI_112020.txt
- ➔ Please feedback using the link provided in the email – so that your feedback is also recorded (August 2020: 21 platforms corrected but no feedback / 9 feedbacks)
- ➔ THANK YOU for all feedbacks received so far !!

Type of figures visualized to identified the alerts

When an alert is raised for a platform based on the statistics of comparison between Sea Level Anomalies (SLA) and Dynamic height anomalies (DHA) from the T/S profiles, the **following figures are analysed to confirm or deny this alert** :

1- Time series of DHA and SLA, scatter plot and associated statistics (rms of the differences, correlation, mean error, % of error, ...)

→ The alert raised for this example is : drift, greylist

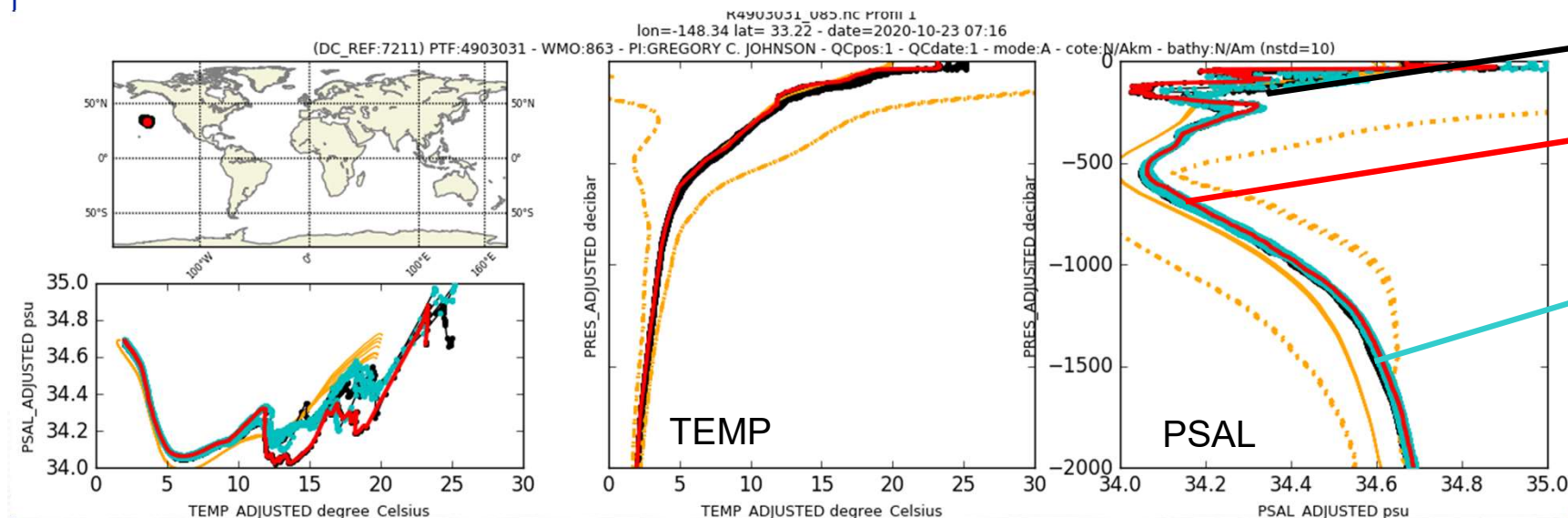


Profile 79 with QC=1

latest Profile (cycle 86) with QC=1

Profiles with QC=Bad

2- Profiles (R, A, D) can be visualized to confirm, precise or overrule an alert



Argo Data Management Meeting (ADMT-21) – 2-4/12/2020

decoding of alerts

Examples of alerts delivered

```
1902198;drift,greylist,R,76  
2900096;bias,A,110-  
2900398;spike,A,89-90  
2900617;spike,A,57  
2901431;spike,A,141  
2902402;bias,A,88-140  
2903422;Bad Adj in RT,DT,A,D,5-
```

Platform number; alert type; Mode; cycles in alert

- Drift : The differences between the SLA and the Argo Dynamic Height (DHA) anomalies increase over time
- Greylist: drift can be significant. Profiles seem to get really wrong
- Bias : the differences between the time series of SLA and DHA are quite large and table over time

- Spike: A spike is identified either in the DHA time series or in the profile measurements along the vertical
- Bad Adj in RT or Bad Adj in DT : The differences between DHA and ALTI are greater for adjusted values (in RT or in DT) than for non-adjusted values.
- Bad salinity / bad temp : Bad values of salinity or temperature in the profile measurements.

**Don't hesitate to contact me
if the alert is not clear for you
(nverbrugge@groupcls.com)**

Status on the anomalies detected in November 2020

- ❑ Last distribution #50 → 708 floats has been analyzed / 172 floats in alert

- ❑ **172 floats extracted :**
 - ❑ 49 'R', 86 'A', 44 'D' → Mainly bad adjustment in DT
 - ❑ 43 BLK, 129 CHK
 - ↘ 15 with only the latest values in alert. Corrected before but still in the list. Not in greylist in this case...

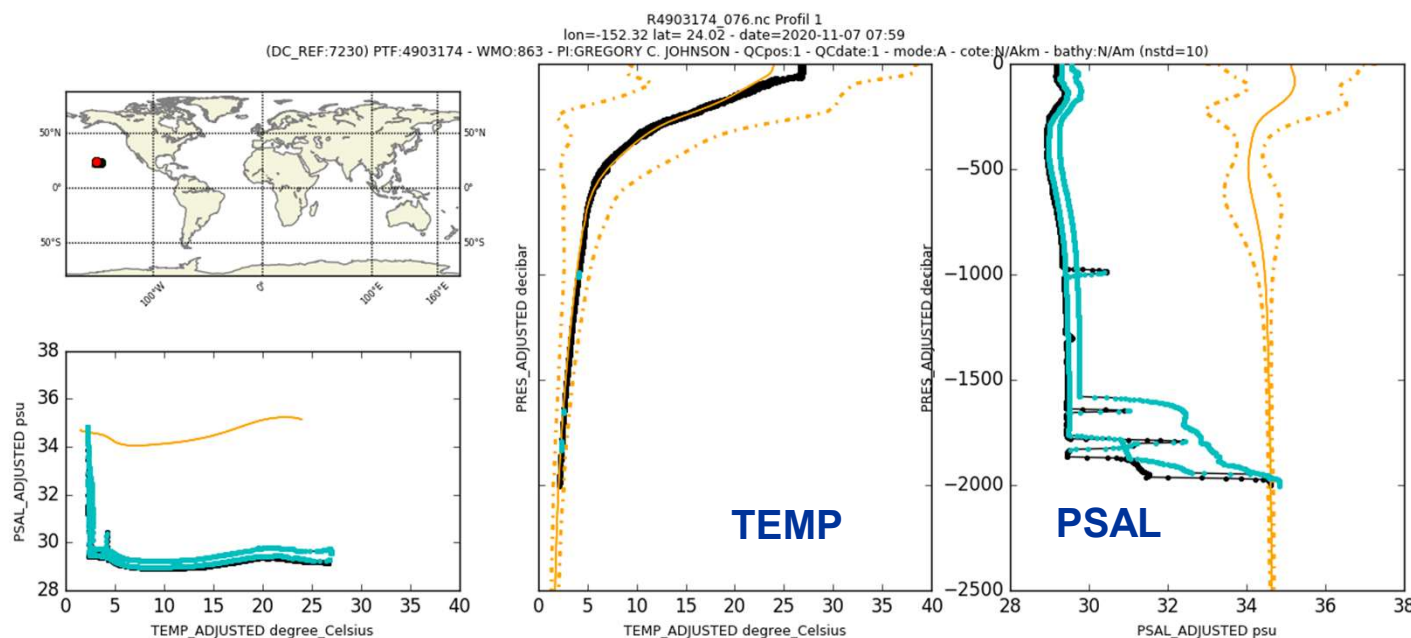
- Feedbacks was received for 9 floats & 21 have been corrected since the last analysis but without feedbacks

- At the time of the ADMT 20, 9 platforms were on alert with a greylist tag from several analysis: 3901548, 3901889, 3901896, 3901904, 3901954, 3901956, 2901758, 2901759, 2901760. They are now only 3 left in this list: 2901758, 2901759, 2901760. Thank you

- ❑ Relative to the fact that ~31 % of the floats extracted show only one isolated very bad profile (or few cycles)...

Status on the anomalies detected in November 2020

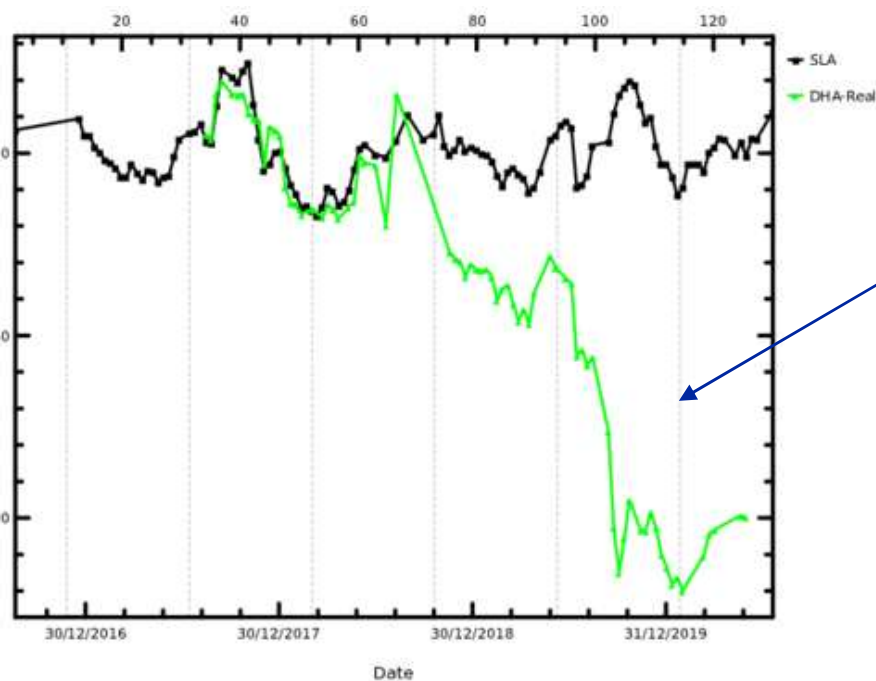
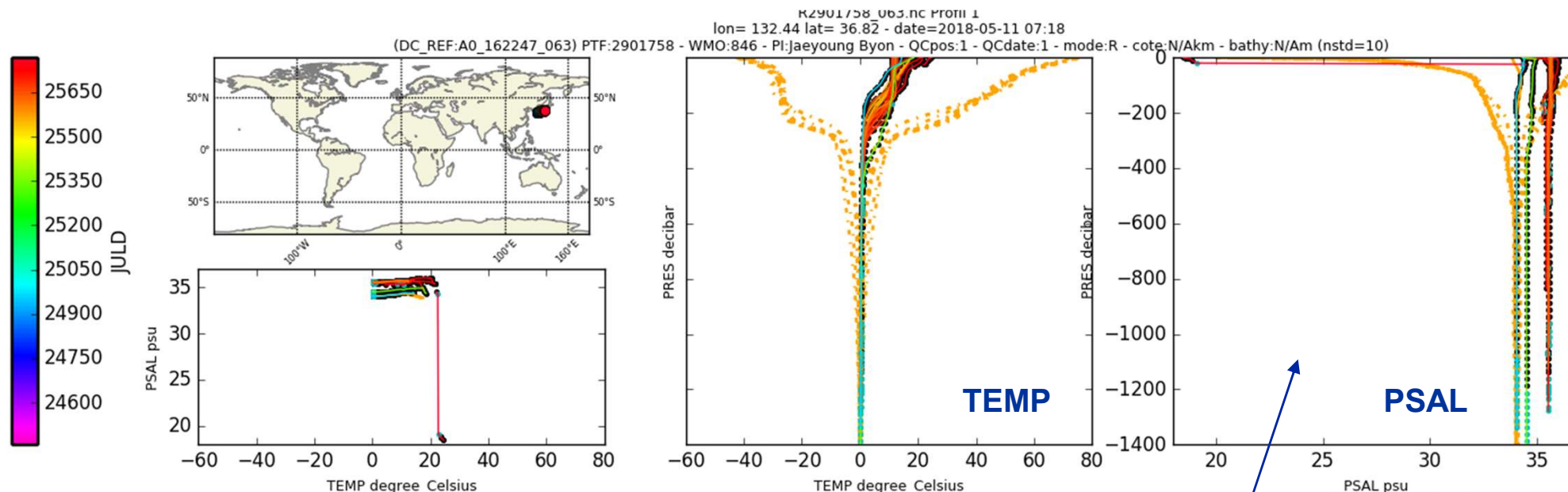
- Some floats are in alert and grey list is recommended. Some cycles are corrected except the latest. The float is not in the greylist... Why? Is the drift considered too small ?



Latest in black
QC=1
In blue, cycles just
before. Flagged bad

List of platforms concerned:
4902087, 4902312, 4902895,
4903031, 4903032, 4903171,
4903174, 4903176, 4903177,
4903182, 4903185, 4903186,
4903197, 6902809

Status on the anomalies detected in November 2020

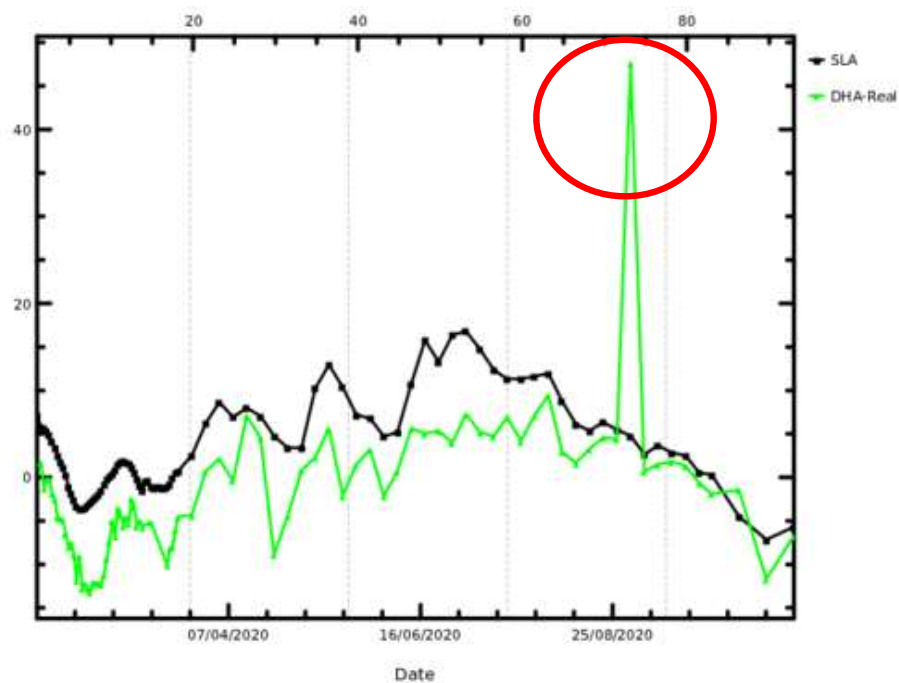
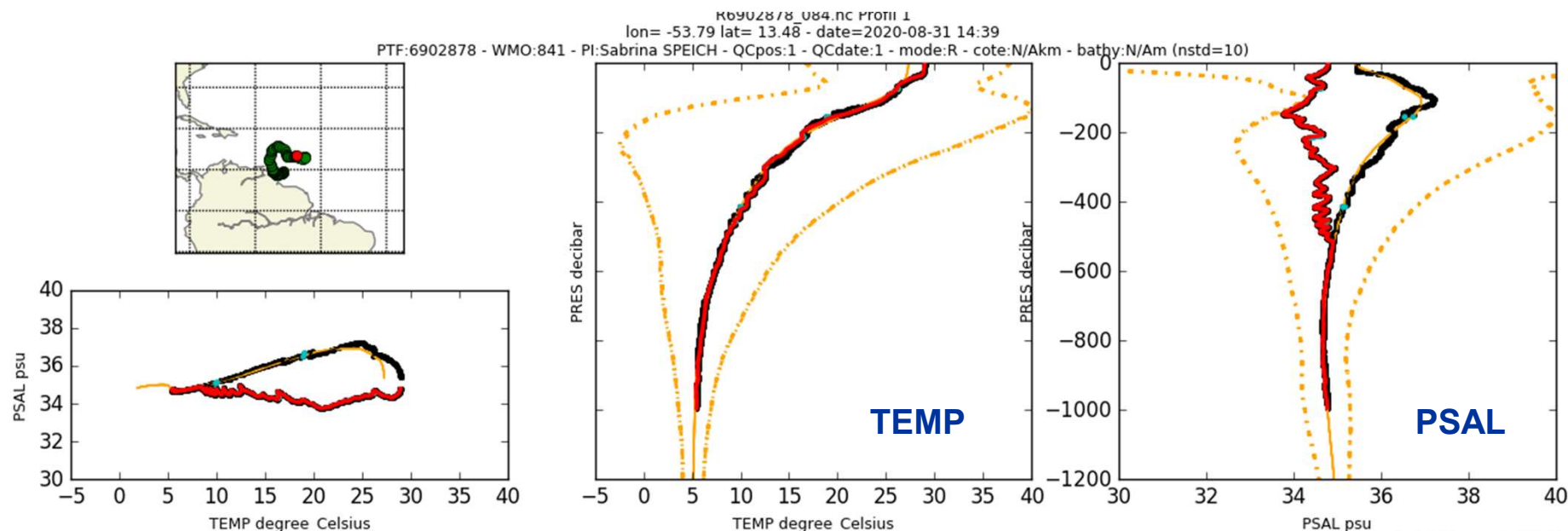


☐ Drift / BLK tag since January 2019

Platform 2901758

ment Meeting (ADMT-21) – 2-4/12/2020

Status on the anomalies detected in November 2020

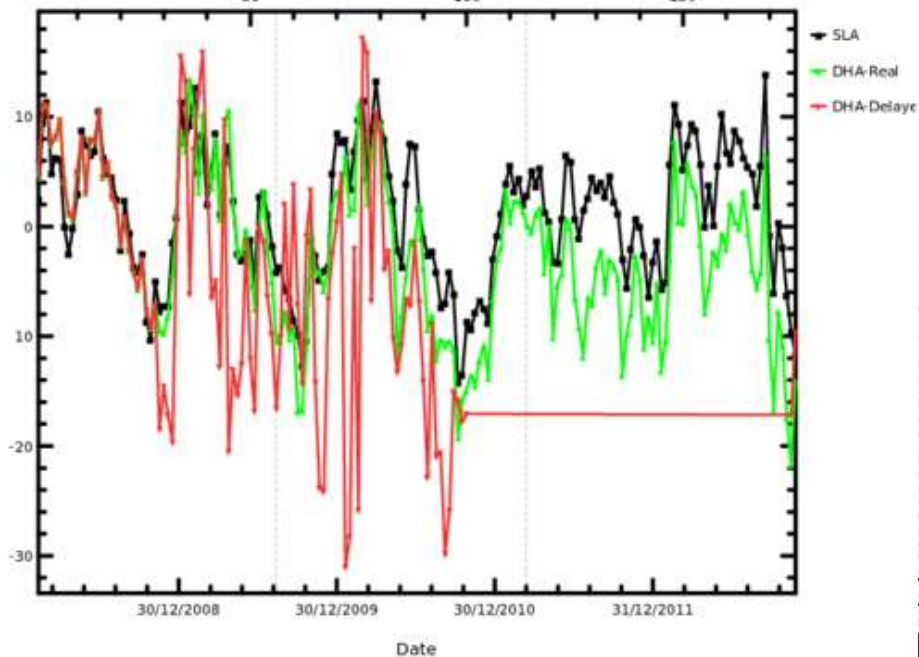
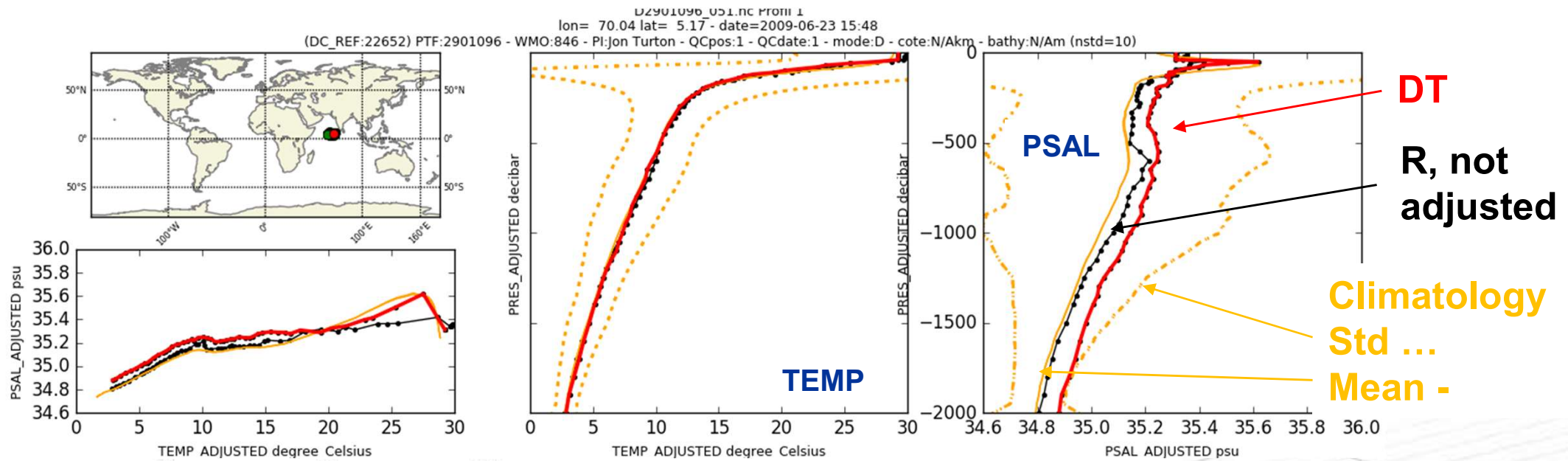


□ Spike / CHK

Platform 6902878

ment Meeting (ADMT-21) – 2-4/12/2020

Status on the anomalies detected in September 2019



❑ Bad Adjustment in DT / CHK
Platform 2901096

GENERAL QUALITY OF THE ARGO NETWORK

General quality of Argo dataset

❑ All profiles, QC='1' = 1 405 441 profiles (as of November 2020)

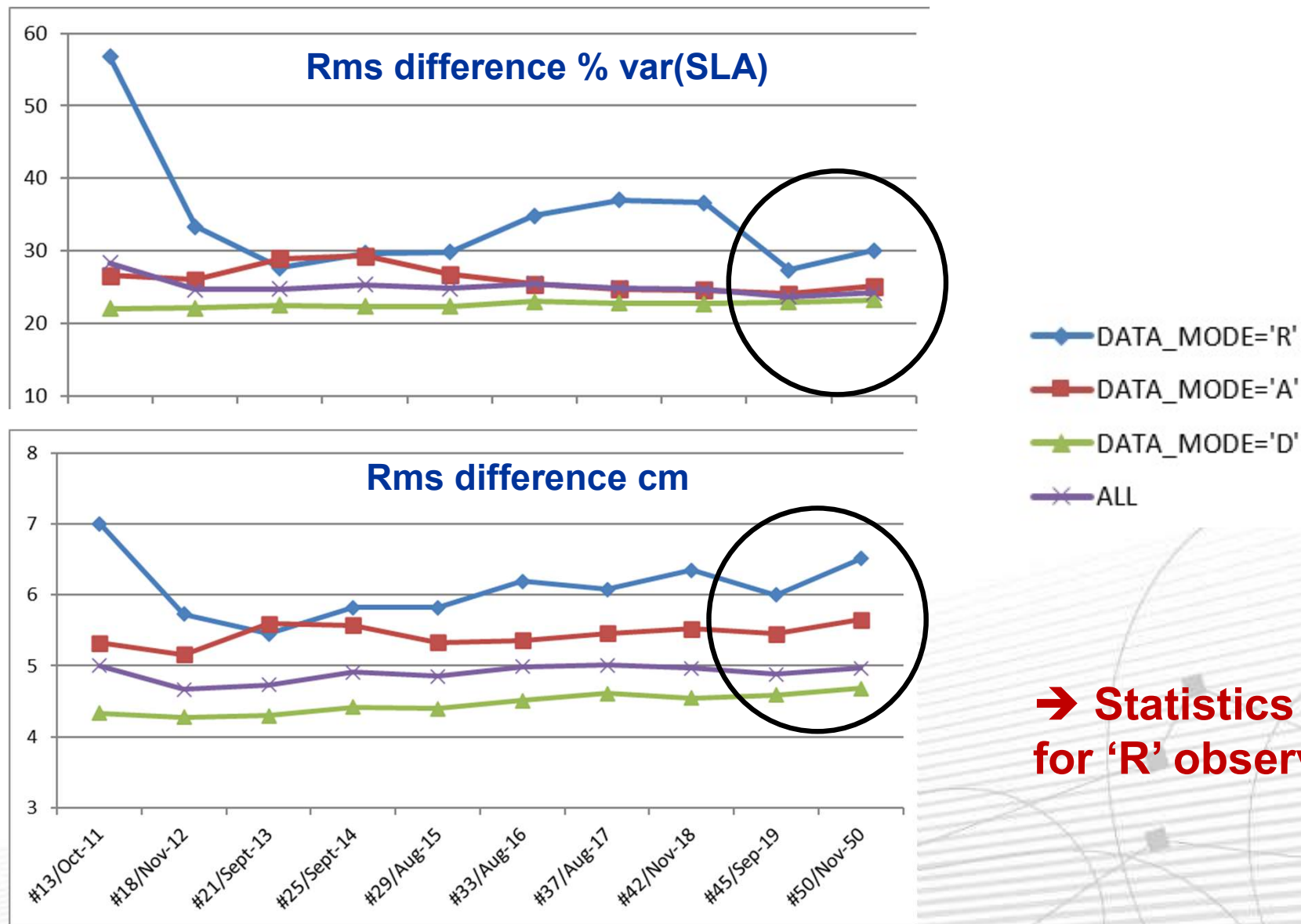
	Corrélation	Moyenne différences (cm)	Rms différences (cm)	Rms différences (%)	Nb profils	% Total profils
ALL	0.86	0.77	4.97	24.25	1 816 564	100
DATA_MODE='R'	0.83	2.19	6.51	30.04	134 905	7.4
DATA_MODE='A'	0.85	1.76	5.65	25.12	216 262	11.4
DATA_MODE='D'	0.87	0.49	4.68	23.28	1 465 397	80.7

❑ All profiles, QC='1' = 1 552 414 profiles (as of September 2019)

Floats	Correlation	Moyenne différences (cm)	Rms différences (cm)	Rms différences (%)	Nb profils	% Total profiles
ALL	0.86	0.59	4.88	23.68	1 604 415	100
DATA_MODE='R'	0.85	1.69	6	27.35	132 546	8.3
DATA_MODE='A'	0.84	1.46	5.45	24.09	296 591	18.5
DATA_MODE='D'	0.87	0.25	4.59	22.95	1 175 278	73.2

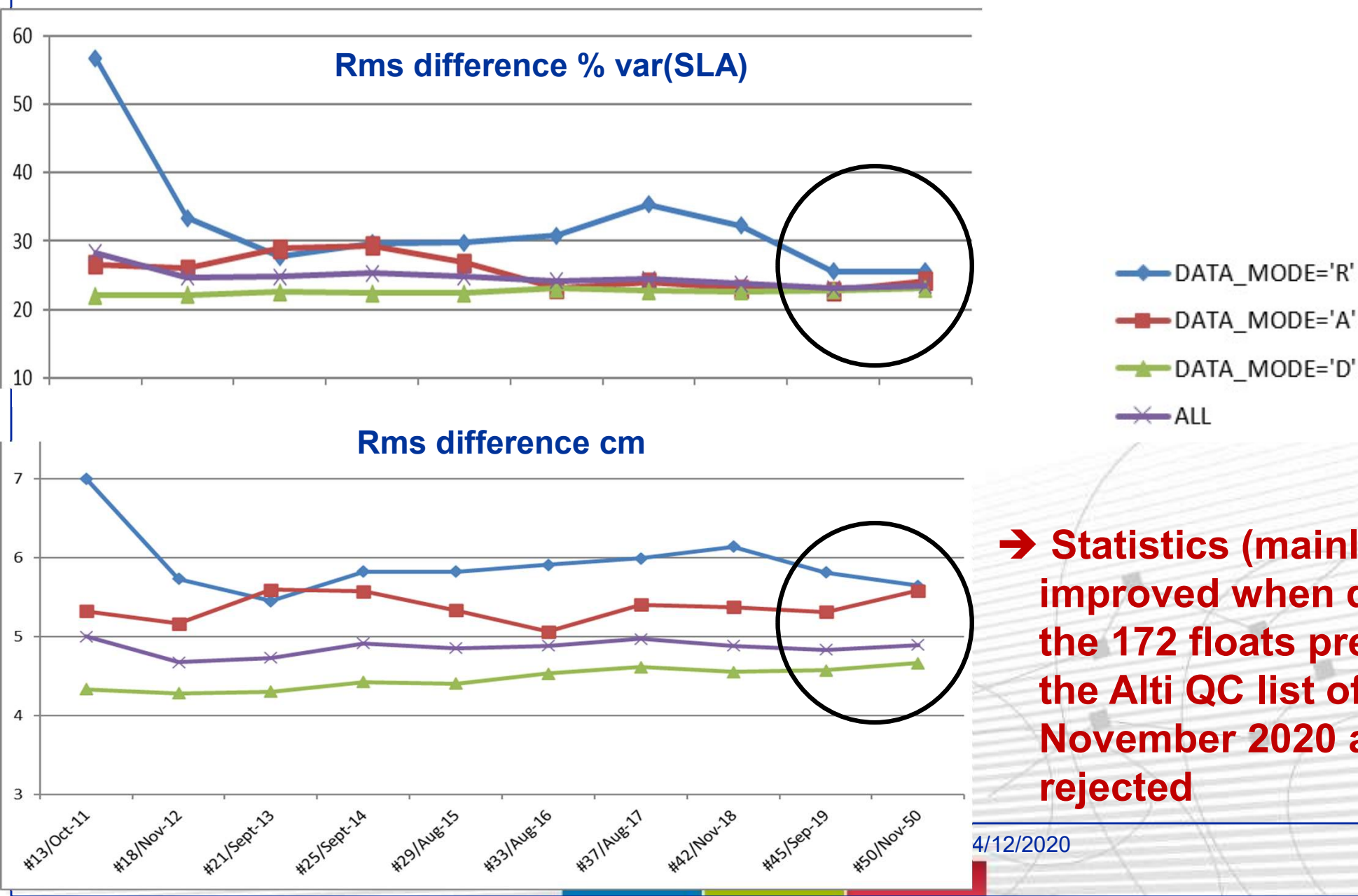
➔ Statistics were degraded between 2015 and 2017. In 2018, Statistics remains relatively stable. In 2019, statistics are improved, except for the mean. **The statistics are a little less good in 2020, in particular on the R mode**

General quality of Argo dataset



→ Statistics are degraded for 'R' observations (and A)

General quality of Argo dataset

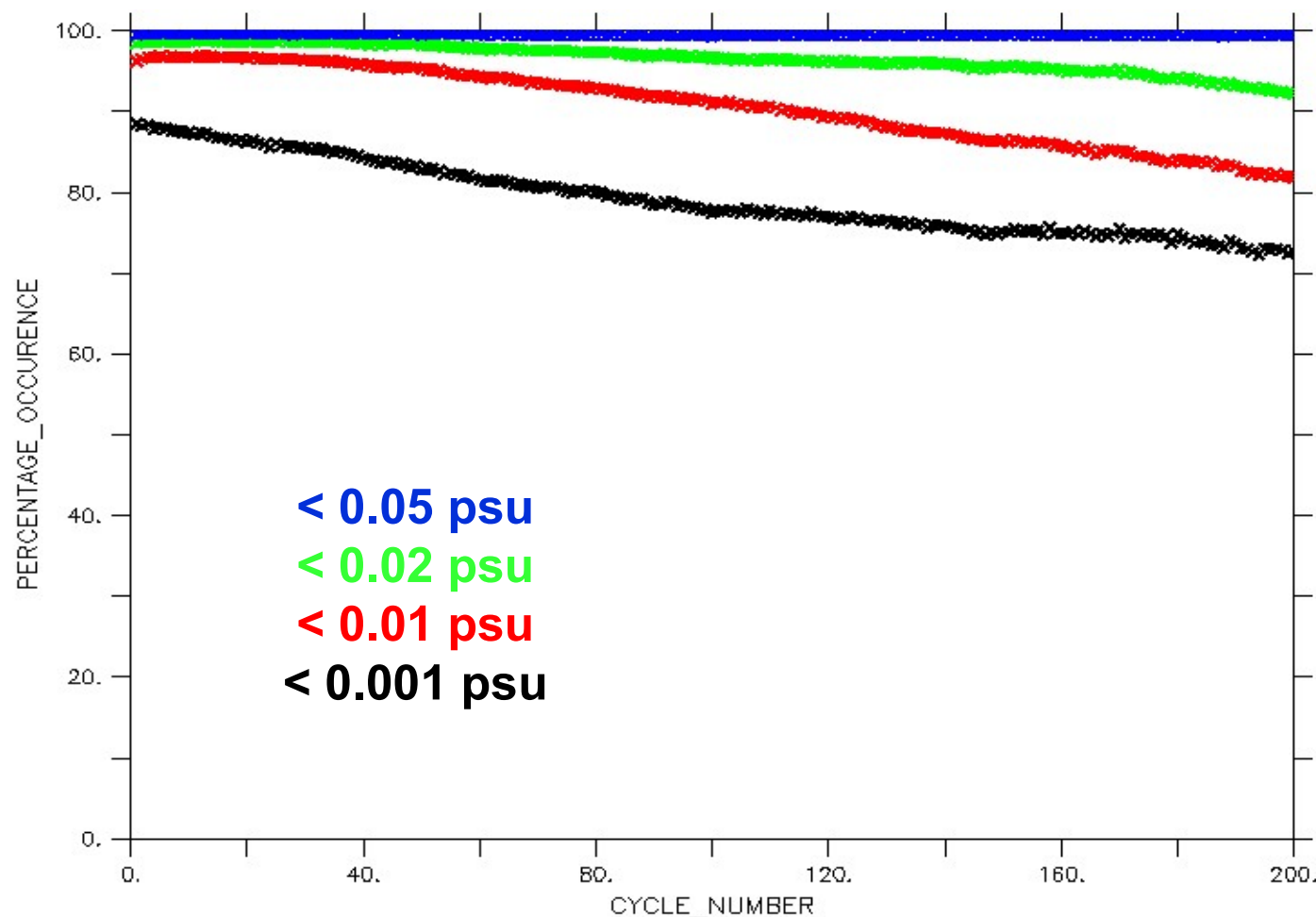


→ Statistics (mainly 'R') are improved when data from the 172 floats present in the Alti QC list of November 2020 are rejected

4/12/2020

Order of magnitude of delayed time adjustments

□ PSAL adjustments vs cycle number (1 452 284 profiles – 11 162 floats – QC='1')

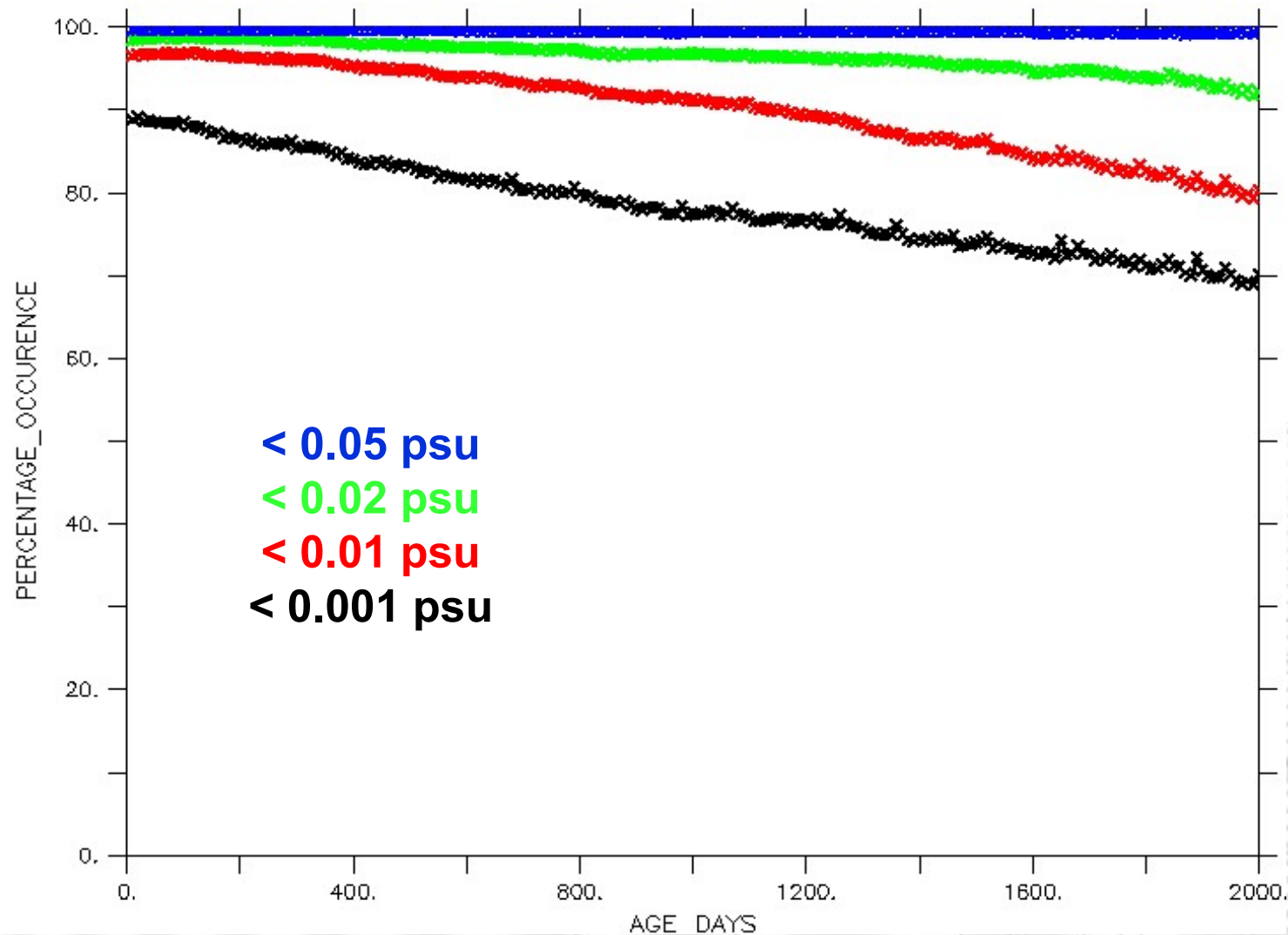


Values of the Salinity adjustments made in delayed time are stable, with low amplitudes for a large majority of the floats 85% of the profiles were adjusted less than 0.01 psu in salinity

*computed as the last valid value for each profile

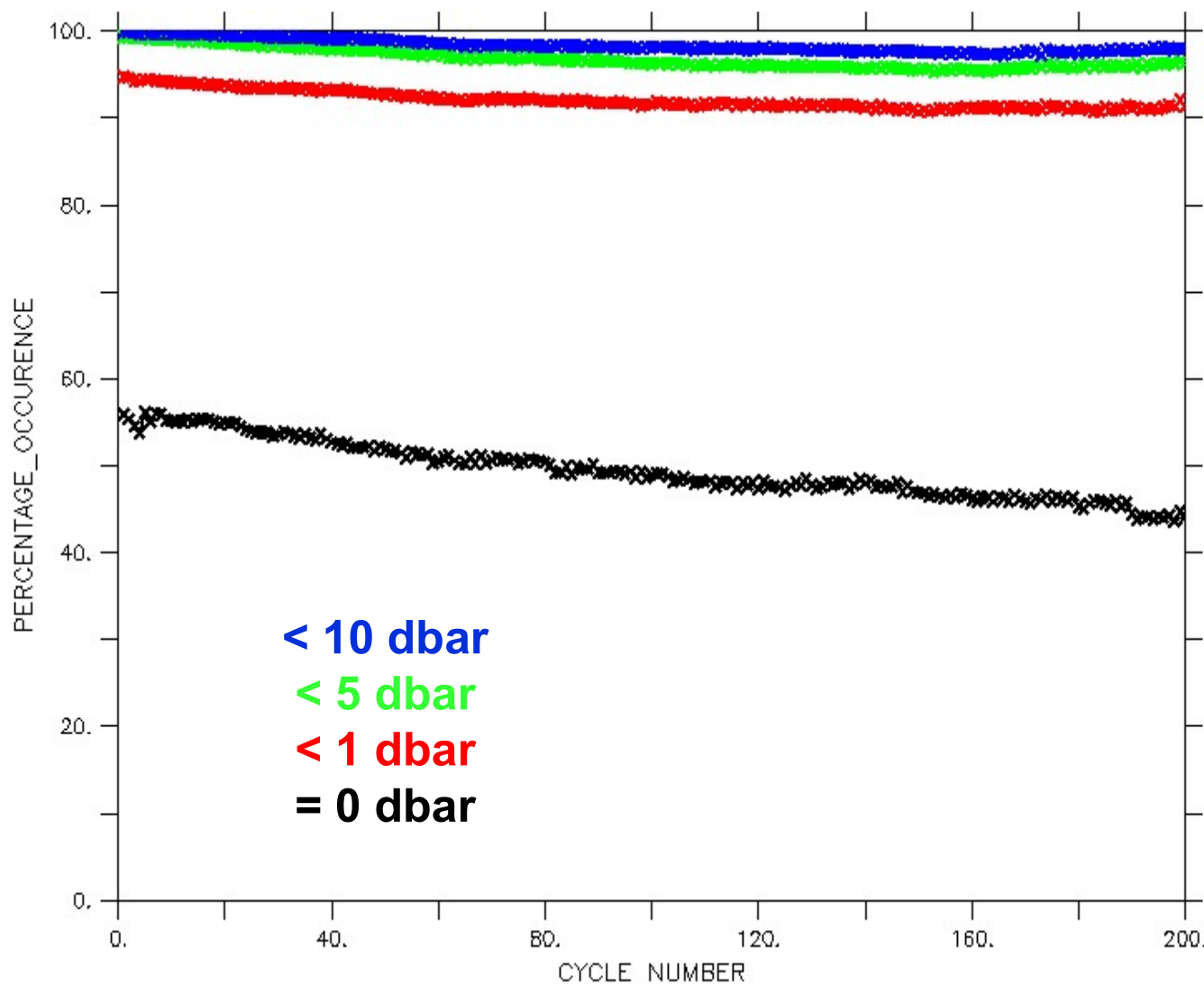
Order of magnitude of delayed time adjustments

PSAL adjustments vs age in days



Order of magnitude of delayed time adjustments

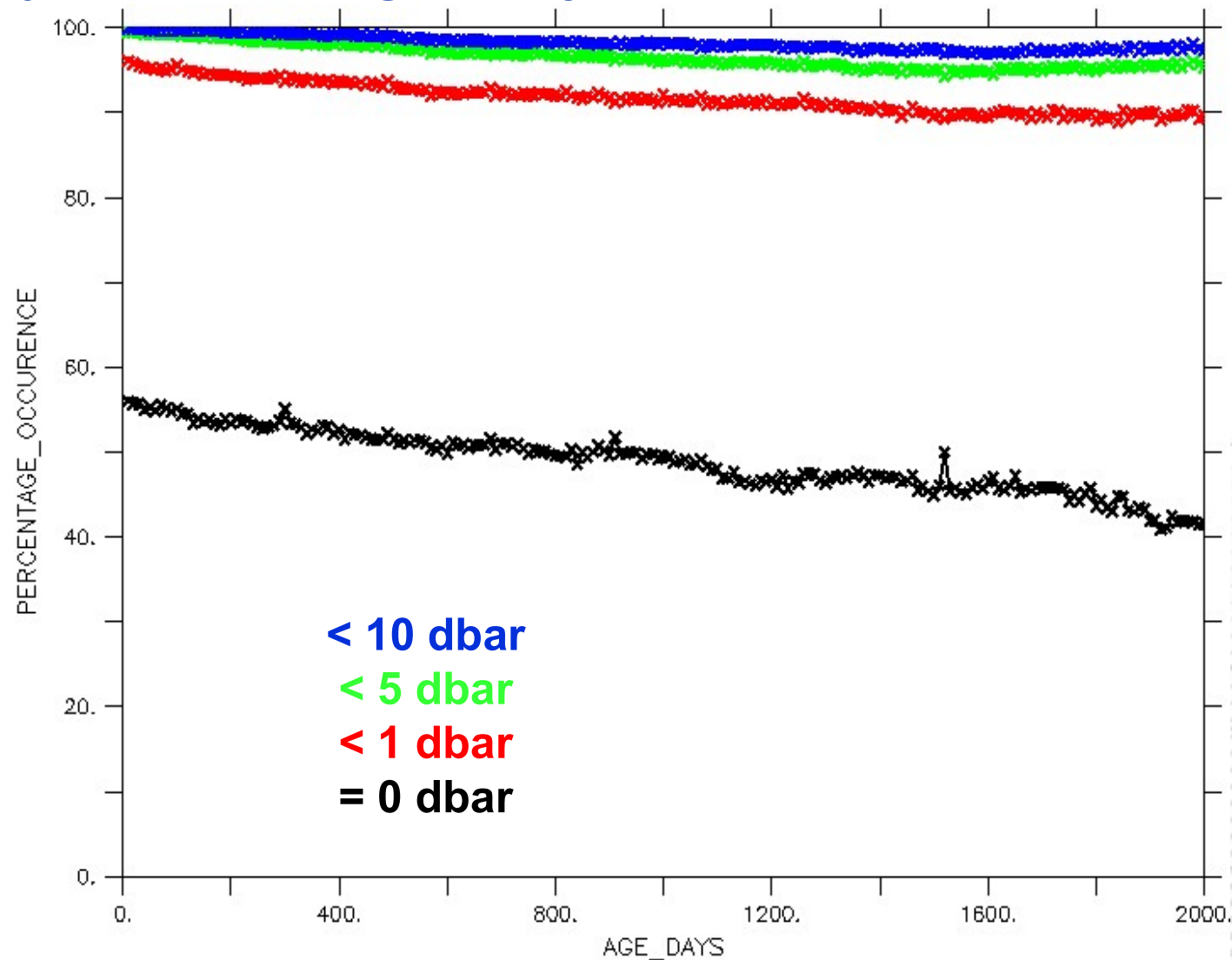
■ PRES adjustments vs cycle number



Values of the pressure adjustments made in delayed time are stable, with low amplitudes for a large majority of the floats 90% of the profiles were adjusted less than 1 dbar in pressure

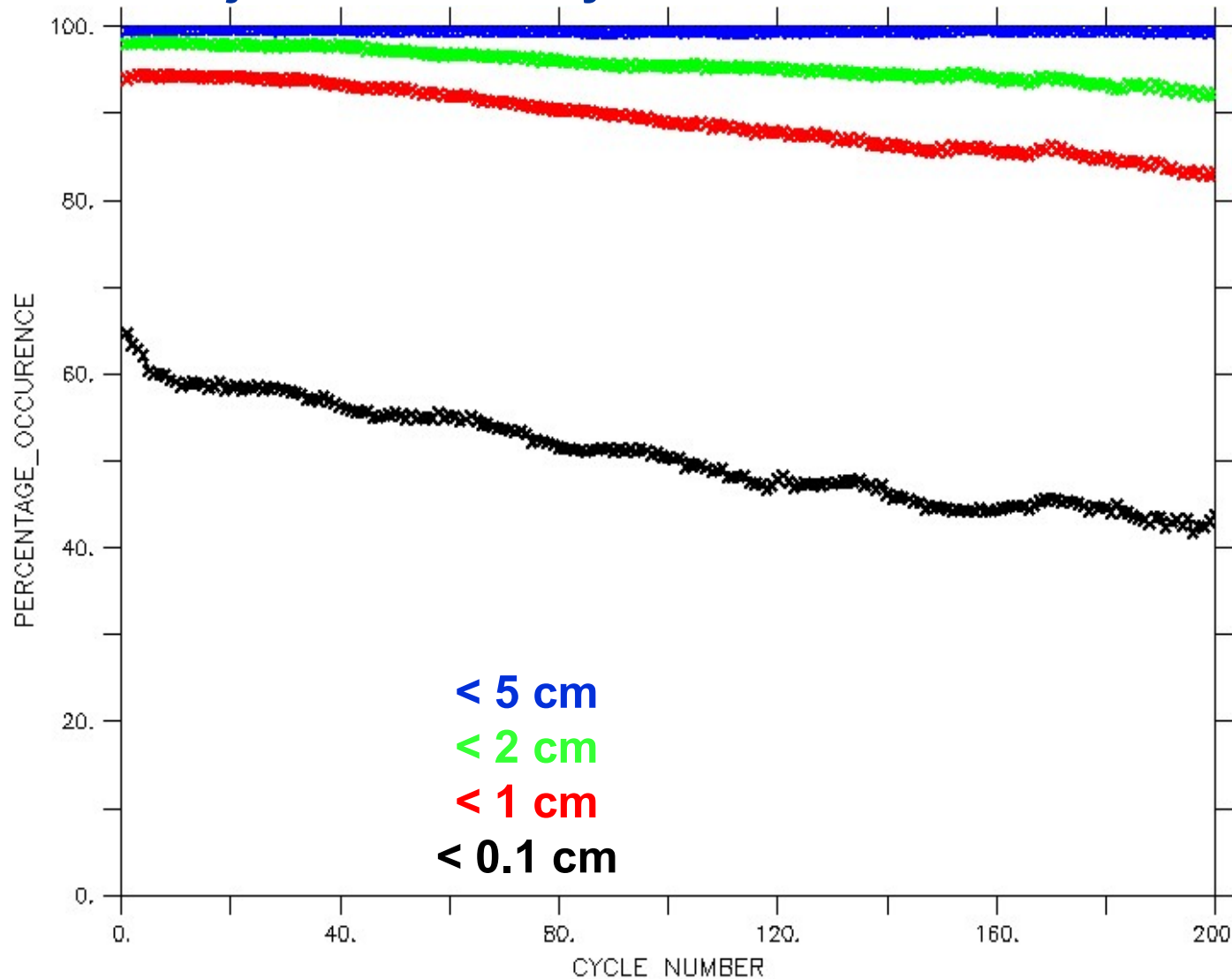
Order of magnitude of delayed time adjustments

❑ PRES adjustments vs age in days



Order of magnitude of delayed time adjustments

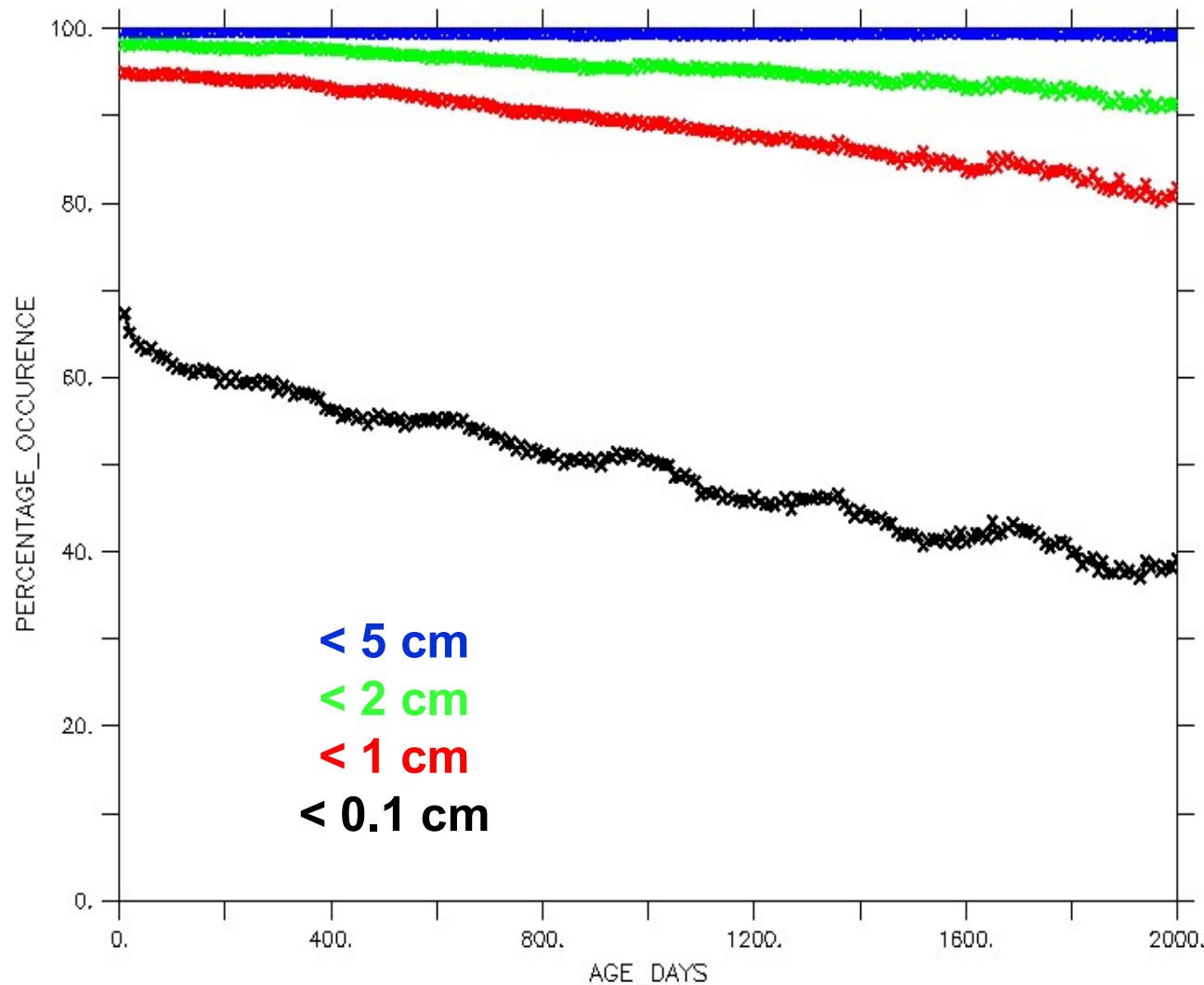
□ DHA adjustments vs cycle number



85% also show differences of less than 1 cm between adjusted and unadjusted dynamic heights.

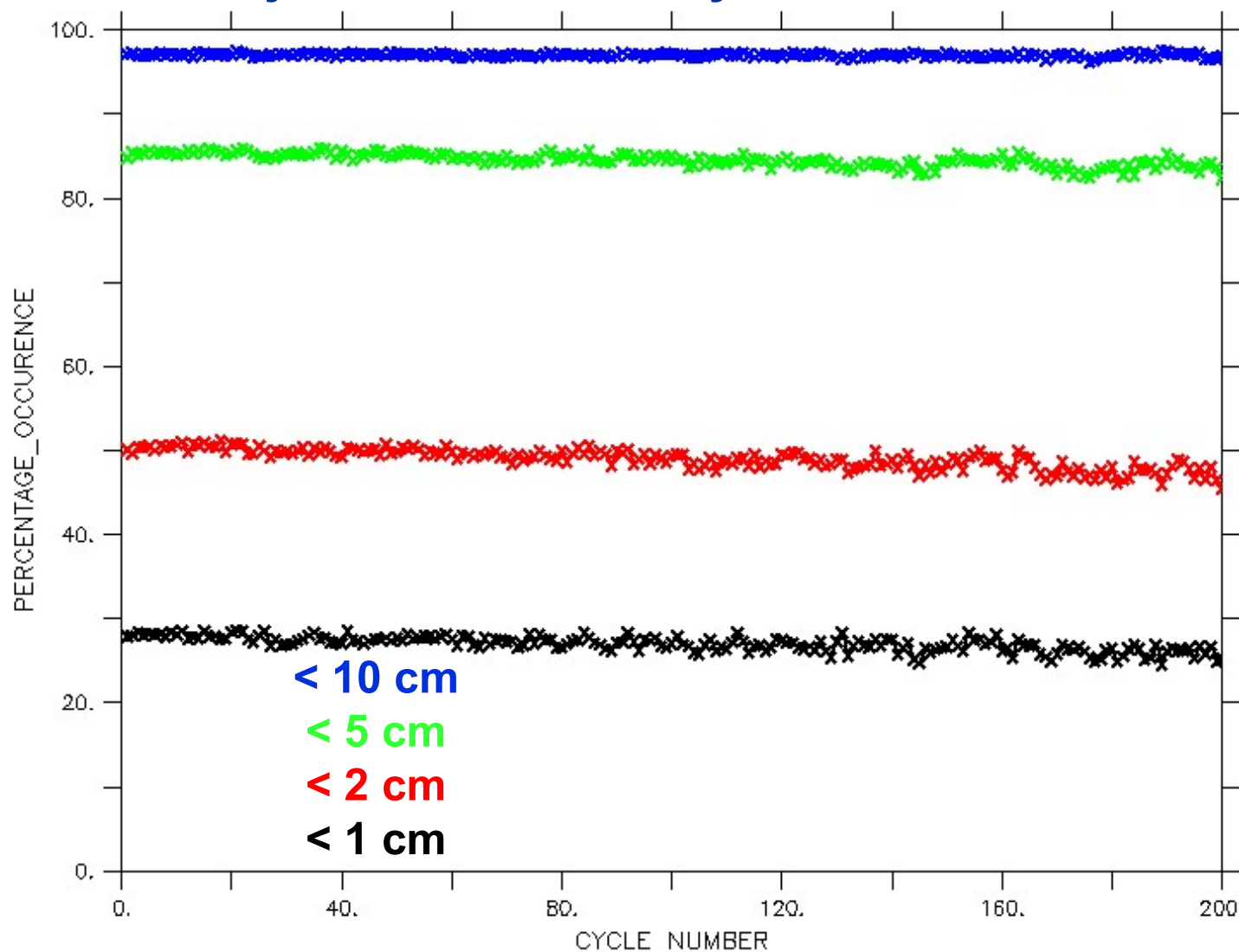
Order of magnitude of delayed time adjustments

□ DHA adjustments vs age in days



Order of magnitude of delayed time adjustments

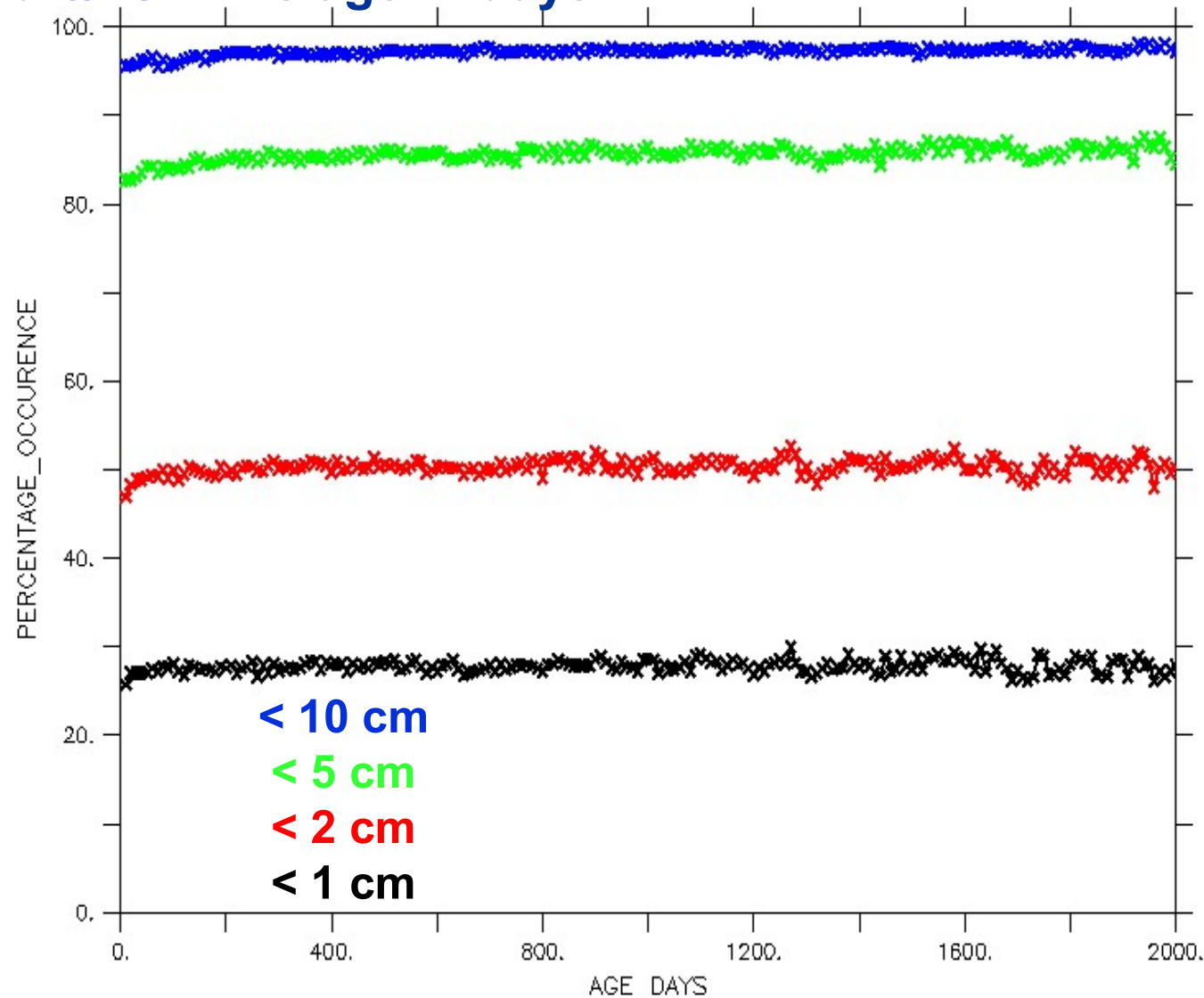
□ DHA adjusted // SLA vs cycle number



The differences with the co-located altimetry data are also small and stable over time and less than 5 cm for 84% of the profiles => good coherence between these two types of observation throughout the life of the floats

Order of magnitude of delayed time adjustments

□ DHA adjusted // SLA vs age in days



Perspectives

- Continue the quarterly analysis
- Follows the general quality of Argo dataset (global statistics)
- Continue to work with some of you to clean the datasets (172 floats in the list)
- Extend the reference period for the hdyn synthetic climatology & mean SLA (2003-2014 → 2003-2018)