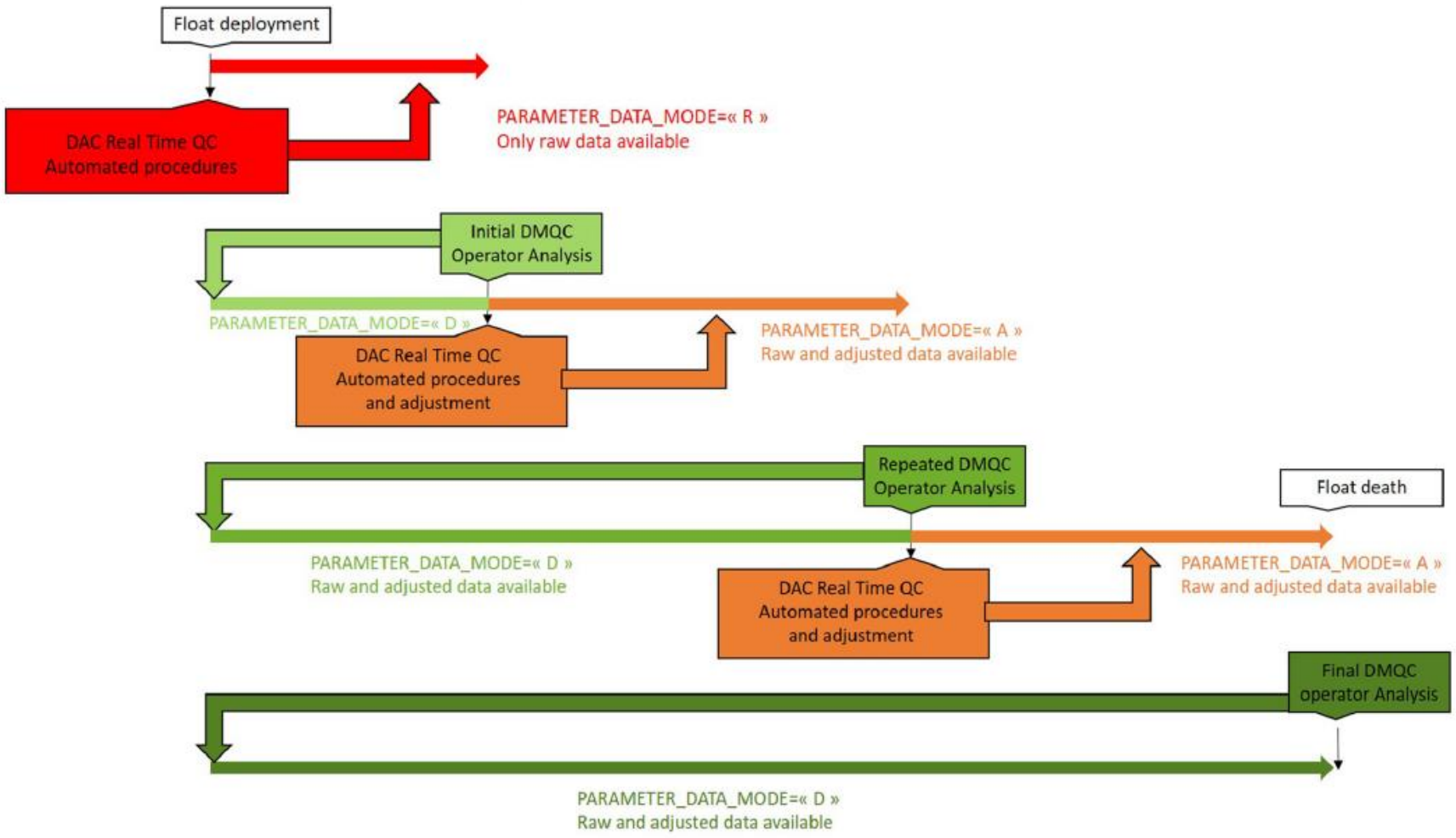
Coriolis Real Time Adjustment and Alert to PI

ADMT21 29th November 2020

Real time adjustment procedure set up by DAC Coriolis
To improve DOXY quality in real time



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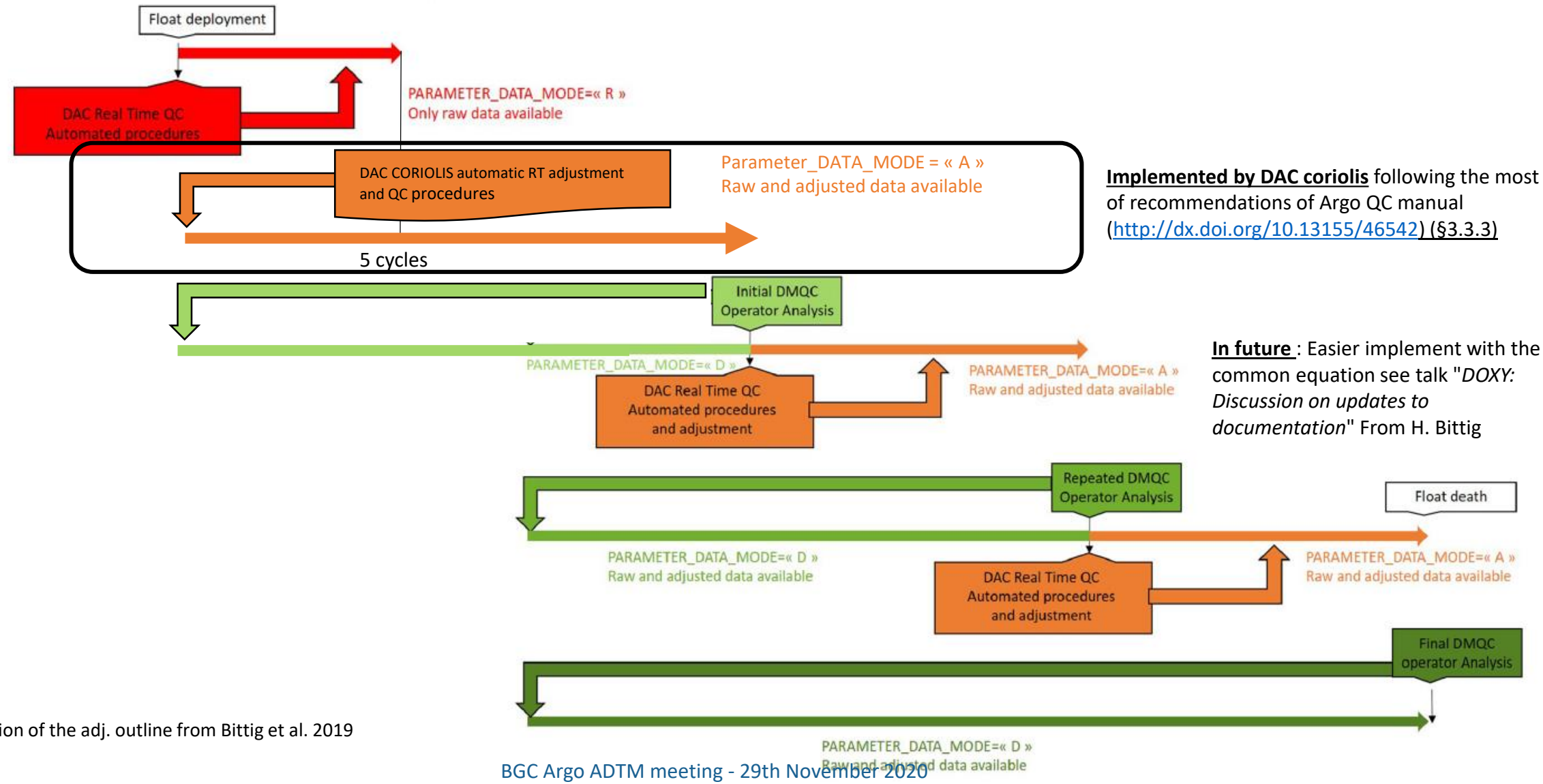


Implemented by DAC coriolis following the most of recommendations of Argo QC manual (http://dx.doi.org/10.13155/46542) (§3.3.3)

In future : Easier implement with the common equation see talk "*DOXY: Discussion on updates to documentation*" From H. Bittig

Modified version of the adj. outline from Bittig et al. 2019

Real time adjustment procedure set up by DAC Coriolis
Method if no previous delayed-mode adjustment is available

(https://doi.org/10.13155/76709)

- **Description** : Gain estimated from the comparison between in water PPOX from float and PPOX from WOA climatology at most in the upper 10 dbar (or 20 dbar) of the water column. ***WOA PPOX is computed from WOA PSAT and from TEMP and PSAL float data at the atmospheric pressure of 1 atm***.

DOXY_ADJUSTED = DOXY .* G
G (gain factor) = median(gi) gi = (PPOX_woa/PPOX_DOXY_float)cycle i

- **Parametrization**

Climatology	WOA18 PSAT objectively analyzed mean (Garcia et al., 2018)
Climatology resolution	monthly
Climatology level	1 (depth = 0 m)
Profiles for G estimation	5st ascending profiles from cycle 2(and before cycle 20)
	<u>with</u> valid data (DOXY_QC & PSAL_QC~4, TEMP_QC and PRES_QC ~3 & 4) measured in the 10 first dbar (or 20 dbar)
	<u>without</u> profiles in greylist /under ice/ badly positioned

- **O_2 quantity conversion**

  SCOR WG 142 recommendations (#RD5)

Real time adjustment procedure set up by DAC Coriolis
Method if no previous delayed-mode adjustment is available

(https://doi.org/10.13155/76709)

- **GO / No GO**

Based on this internal study, we have devided to visualize all cycles for which :

(1) Median Absolute Deviation > $MAD_{threshold}$(=10 /ppox_woa_monthly)
(2) |median(PPOX_$clim_1$–PPOX_adjusted)| > 10 in surface
(3) |median(PPOX_$clim_2$–PPOX_adjusted)| > 10 in surface (if no data from $clim_1$)
(4) no data from $clim_1$ or $clim_2$ are available for comparison

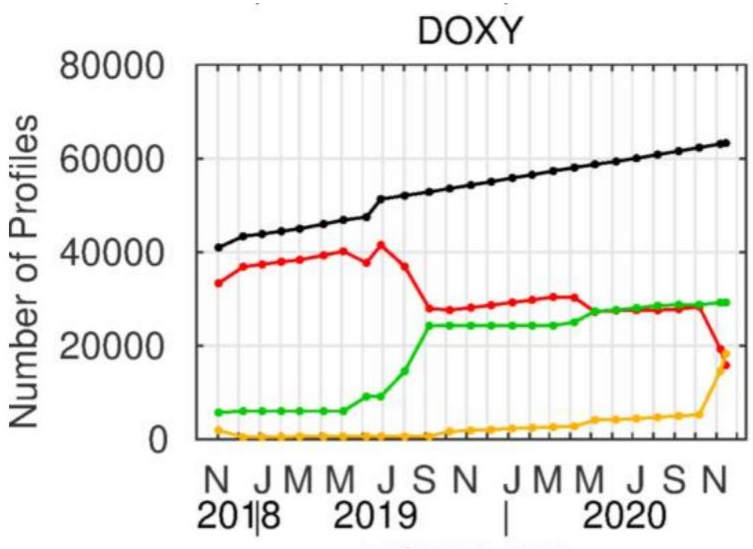
Where $clim_1$= the mapped O_2 product GlodapV2.2016b (Lauvset et al. 2016)
$clim_2$= the annual mapped O_2 product WOA18 (Garcia et al., 2018)

- **To validate No Go**

Coriolis in going to build a “in house” tool based on salinity tool correction and GLODAPv2.2020 (Olsen et al., 2020 merged with CARIMED (M. Alvarez) in the first step

(*and waiting the reference database for ARGO-O2 see “discussion of potential for a BGC Argo reference database” Tuesday December 1st at 6h45 (+9 for CET*)) .

Real time adjustment procedure set up by DAC Coriolis
How many floats have been adjusted in RT



- 119 floats have been adjusted this month (excepted Old floats with a simple calibration – DM in progress)

  an e-mail to inform PI must be sent

Dear Birgit,
the float 6900666 (equipped with Optode S/N 4212) was deployed last month
We used the method : https://doi.org/10.13155/76709 to adjust the Doxy profiles, the DOXY_ADJUSTED profiles are available on the GDAC

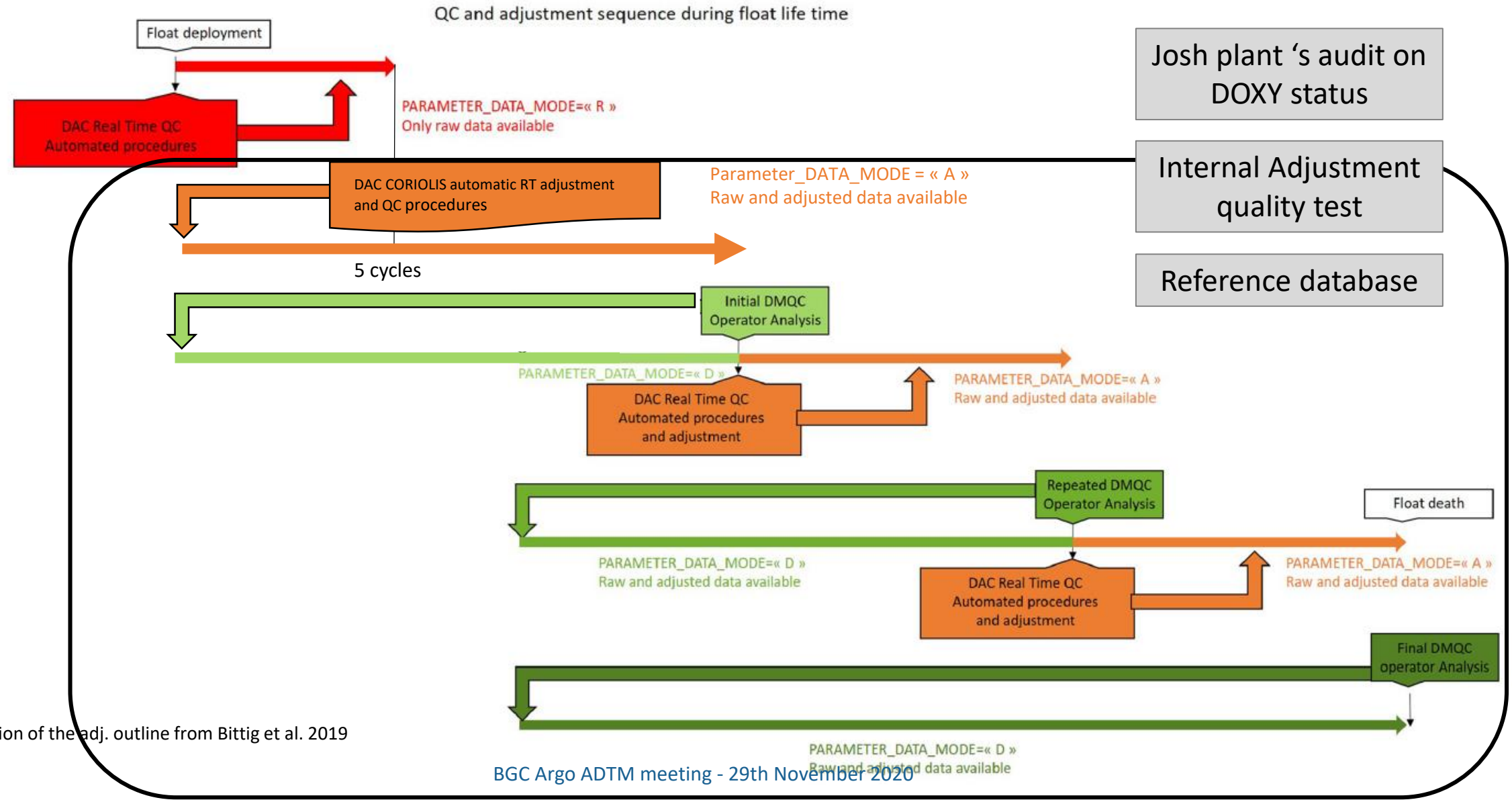
Please let me know if you disagree with this adjustment and I will re-process the float
Regards,
Vincent

- 63 floats with No Go

  need to build 'in house' tool to validate or not

- Automatic implementation asap for new floats (~in Dec. Jan.)

Coriolis Strategy to detect adjustment anomalies and get rid of the backlog



Josh plant 's audit on DOXY status

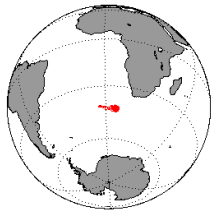
Internal Adjustment quality test

Reference database

Modified version of the adj. outline from Bittig et al. 2019

Internal Adjustment quality test

https://doi.org/10.13155/76709

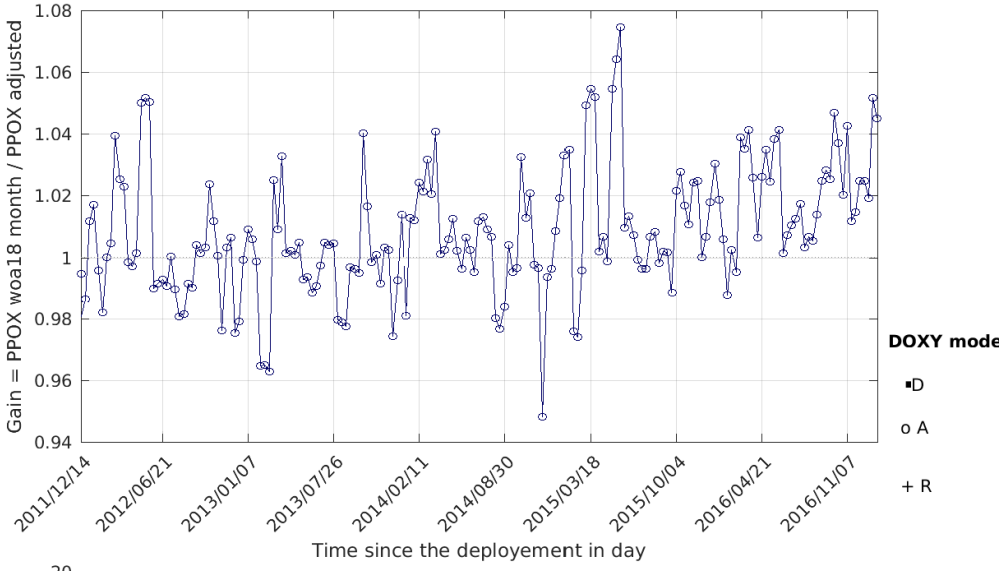


6900954 (coriolis)
PROVOR (AANDERAA OPTODE 3830)
PI : Sabrina SPEICH

- New estimation of the GAIN from DOXY_ADJUSTED variable

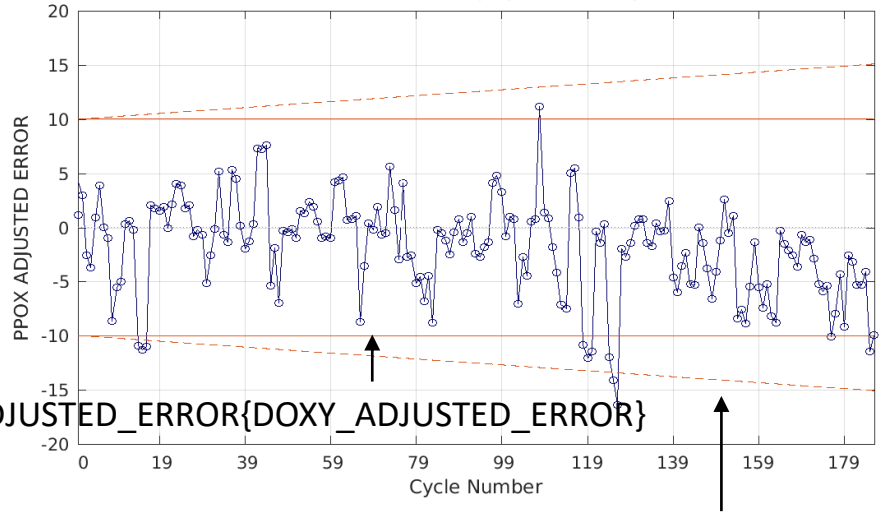
Adjusted_GAIN= PPOX_WOA18_monthly / PPOX_DOXY_ADJUSTED

PPOX_woa{PSAT_woa,TEMP_float,PSAL_float,Patm = 1atm}
PPOX_float{MOLAR_DOXY_float,TEMP_float,PSAL_float,Patm = 1atm}



- Error adjustment comparison with information available in the files (PPOX_DOXY_ADJUSTED_ERROR{DOXY_ADJUSTED_ERROR})

ERROR of the adjustment =
(1-adjusted_GAIN).* PPOX_WOA18_monthly



PPOX_DOXY_ADJUSTED_ERROR{DOXY_ADJUSTED_ERROR}

- Alert for 5 cycles = Inform PI that his float needs a DM adjustment
  for 10 cycles = cycles in greylist waiting PI action

$ERROR_{adjustment}$ > PPOX_DOXY_ADJUSTED_ERROR

PPOX_ADJUSTED_ERROR with time evolution recommanded in http://dx.doi.org/10.13155/46542 (soon)

Thanks for your attention

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