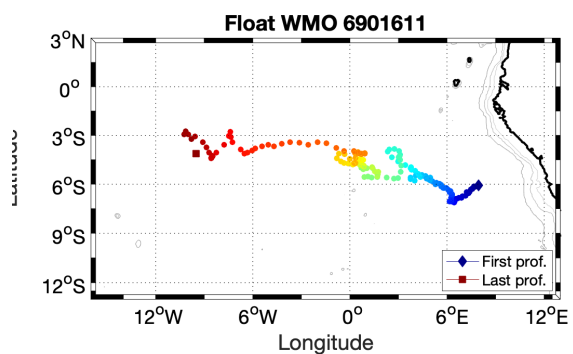


Delayed Mode Quality Control Float #WMO 6901611 - DAC Coriolis

by Carole Saout-Grit - **GlazeO**¹

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1 Presentation :

Platform Number	6901611
DAC	IF-CORIOLIS
Float Status	Active
Project	PIRATA FR26
Deployment Platform	THALASSA
Institution	IRD Brest, France
Name of the PI	B. Bourlès
Platform Model	ARVOR (844)
Serial Number	OIN-013-ARN-005
Sensor type	SBE41 CP
Positionning System	ARGOS
Data handbook	1.2
Format Version	3.1

Table 1: Float characteristics.

Deepest pressure in ascending profile (m)	2000
Parking depth (m)	1000
Cycle time (hours)	240
Deployment date	2016/04/01
Deployment position	long = 7.99, lat = -5.99
Last studied cycle number	161
last studied cycle date	2019/09/03
last studied cycle position	long = -9.51 , lat = -4

Table 2: Programmation and evolution.

2 Trajectory, positions and dates :

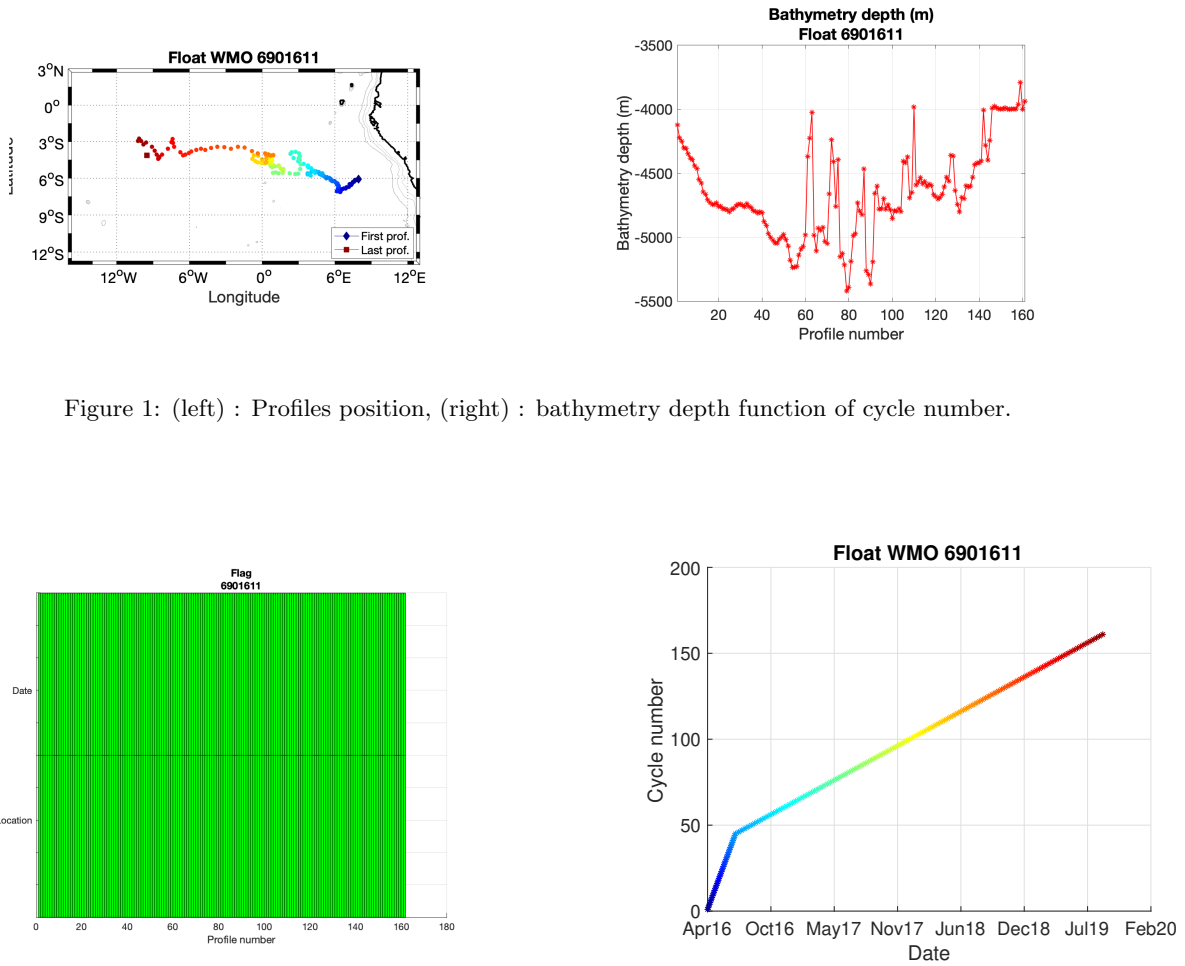


Figure 1: (left) : Profiles position, (right) : bathymetry depth function of cycle number.

Figure 2: (left) : flags on profiles positions and dates.
(right) : relationship between cycle number, date and color.

3 Informations on Meta-Data

NAME
ANOMALY
CONTROLLER_BOARD_TYPE_SECONDARY
CONTROLLER_BOARD_SERIAL_NO_SECONDARY
SPECIAL_FEATURES
CUSTOMISATION
STARTUP_DATE
STARTUP_DATE_QC
DEPLOYMENT_CRUISE_ID
END_MISSION_DATE
END_MISSION_STATUS
CONFIG_MISSION_COMMENT
PREDEPLOYMENT_CALIB_COMMENT

Table 3: Missing on Meta Data.

4 Quality check on basic parameters :

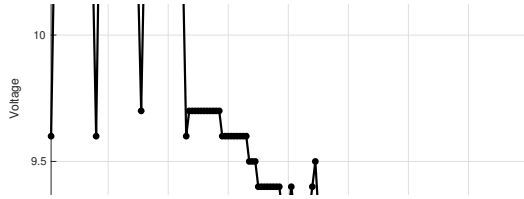


Figure 3: (left) : battery voltage - (right) : surface pressure from technical files.

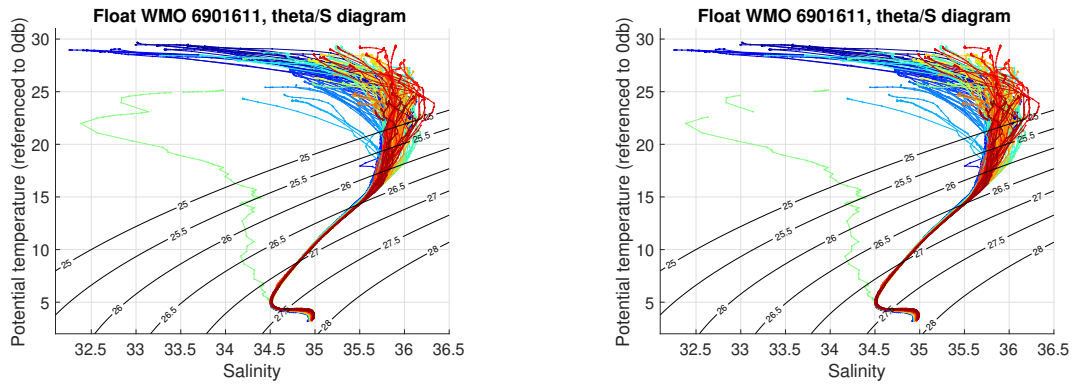


Figure 4: θ/S diagrams.
(left panel) Flags are not taken into account.
(right panel) Quality flags are taken into account.

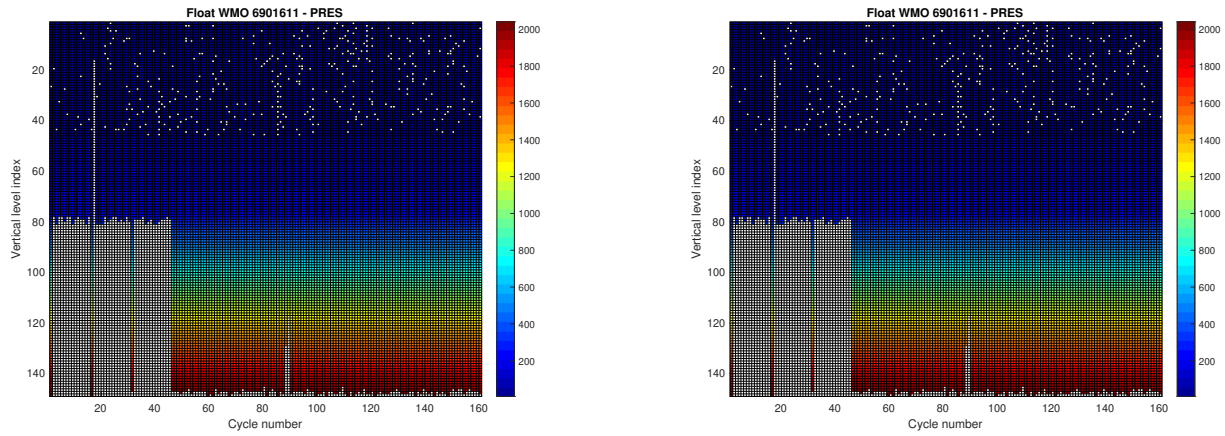


Figure 5: Pression as function of cycle number and vertical level index along the float trajectory.
 (left panel) : Quality flags are not taken into account.
 (right panel) : Quality flags are taken into account.

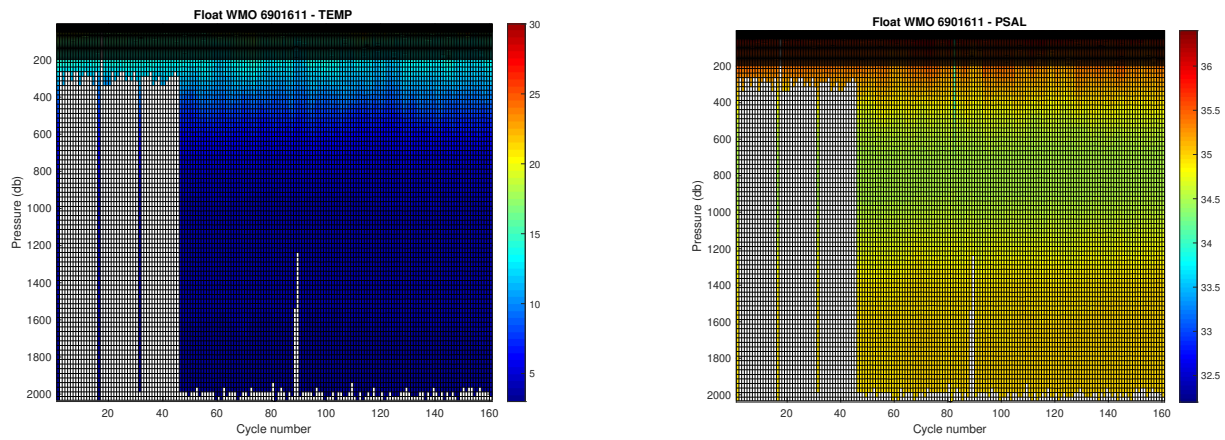


Figure 6: Temperature (left panel) and salinity (right panel) section along the float trajectory. Quality flags are not taken into account.

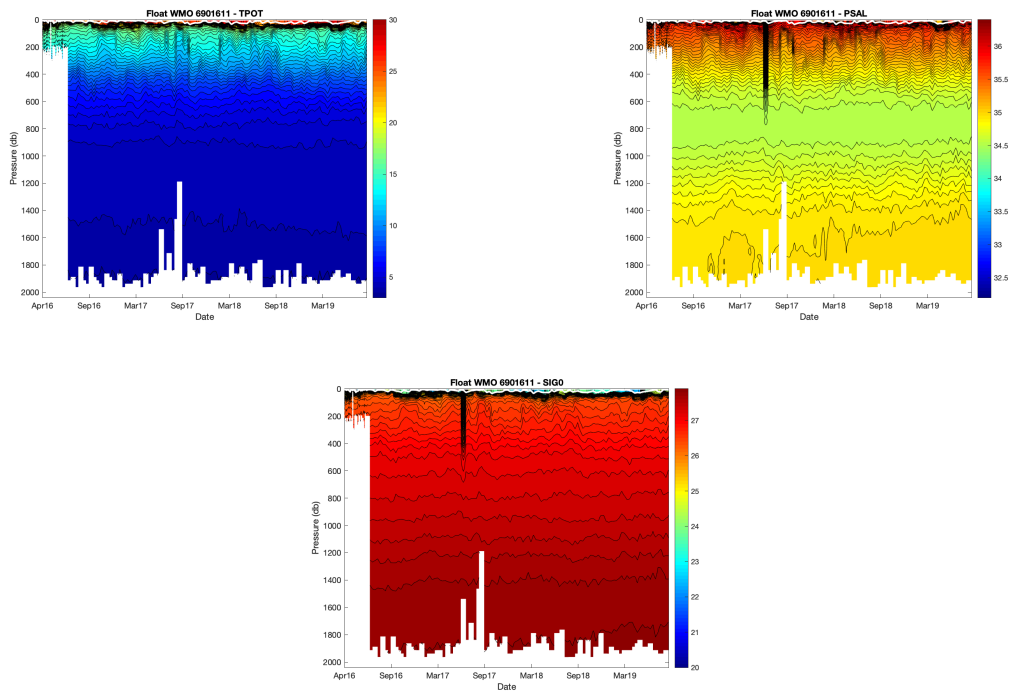


Figure 7: Sections along the float trajectory, interpolated on standard levels, with quality flags taken into account.

(Top panel) : for temperature and salinity.

(Bottom panel) : for potential density.

5 DMQC summary:

Cycle	Parameter	Vertical level	Old flag	New flag	Comments
82	T/S	13-34 dbar	4	put all $Q_c(T)=1$ and $Q_c(S)=4$ from 0 to 713 dbar	bad S and θ -S profiles

Table 4: Profiles 0 to 161 for float #WMO 6901611 with flags 3 or 4, and proposition of modifications.

6 Cycle 82 : comparison to the nearest Argo (OW) profiles.

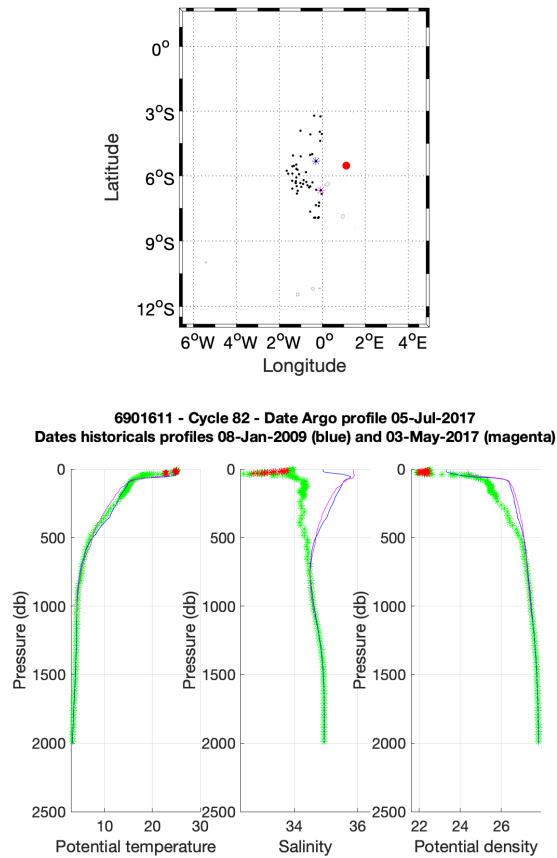


Figure 8: Float 6901611, cycle 82 - **(Upper panel)** Position of the Argo profile (red) and of the nearest ARGO profiles (black). The nearest ARGO profile in time is in magenta while the nearest ARGO profile in space is in blue. **(Lower panels)** Temperature, salinity and potential density as function of pressure for the Argo profile (stars) and for the nearest ARGO profile in time (magenta line) and for the nearest ARGO profile in space (blue line). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue for a QC=2 ; orange for a QC=3 and red for a QC=4).

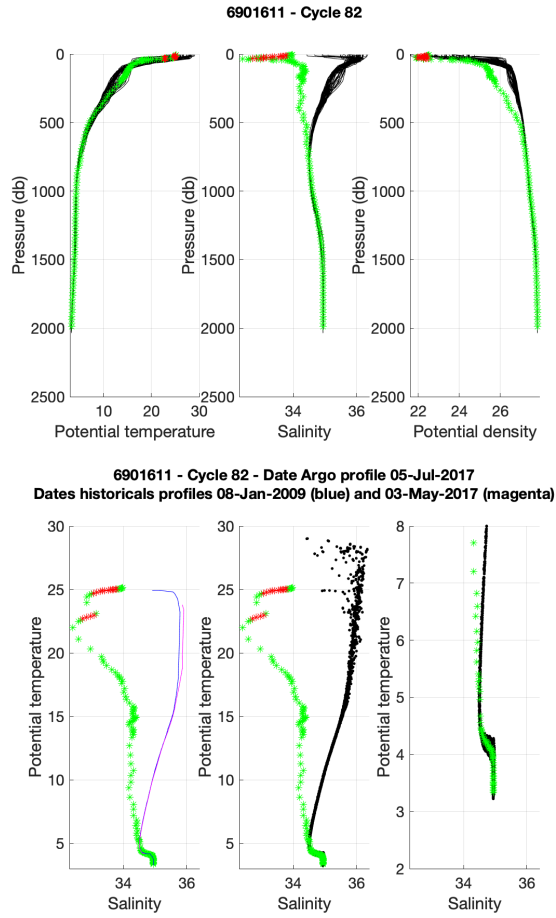


Figure 9: Float 6901611, cycle 82 : The Argo profile (stars) is compared to the nearest ARGO profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue for a QC=2 ; orange for a QC=3 and red for a QC=4). **(Upper panels)** Temperature (left panel), salinity (middle panel) and potential density (right panel) as function of pressure. **(Lower panels)** θ/S diagrams.

7 Pressure Calibration :

ARVOR float with *PRES_SurfaceOffsetCorrectedNotResetNegative_1cBarResolution_dBar*
 i.e. correction on-board, no need to do DM adjustment in pressure.

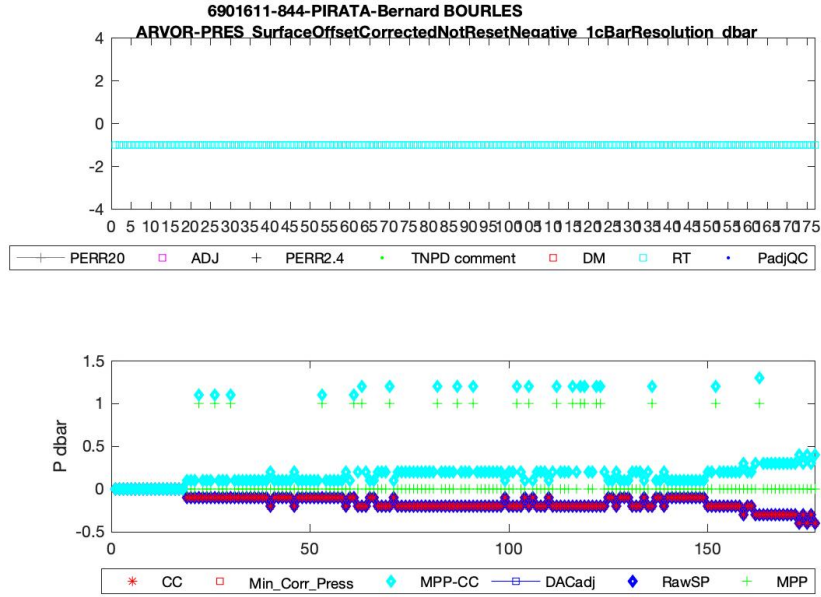


Figure 10: Surface pressure time serie for float 6901611. Legend : blue diamonds : Raw Surface Pressure ; blue squares : DAC adjustment (if DM exist) ; red points : calculated correction CC ; green diamonds with the minimal profile pressure value (MPP) ; pink squares : corrected minimal surface pressure ; cyan diamonds : $MPP - CC$

8 OW method, CONFIGURATION #NA_ARGO

We use OW method adjusted by Cabanes et al., 2016. The method excludes profiles flagged at 4 in real-time. Input salinities are raw float profiles measurements.

We cannot see any evidence of a drift or bias in the salinity measurements. We thus conclude that it is not necessary to correct the salinity data.

ARGO CLIMATOLOGY	2019V03
CTD CLIMATOLOGY	2019V01
CONFIG_MAX_CASTS	250
MAP_USE_PV	1
MAP_USE_SAF	0
MAPSCALE_LONGITUDE_LARGE	3.2
MAPSCALE_LONGITUDE_SMALL	0.8
MAPSCALE_LATITUDE_LARGE	2
MAPSCALE_LATITUDE_SMALL	0.5
MAPSCALE_PHI_LARGE	0.1
MAPSCALE_PHI_SMALL	0.02
MAPSCALE_AGE	0.69
MAPSCALE_AGE_LARGE	2
MAP_P_EXCLUDE	0
MAP_P_DELTA	250

Table 5: Mapping parameters.

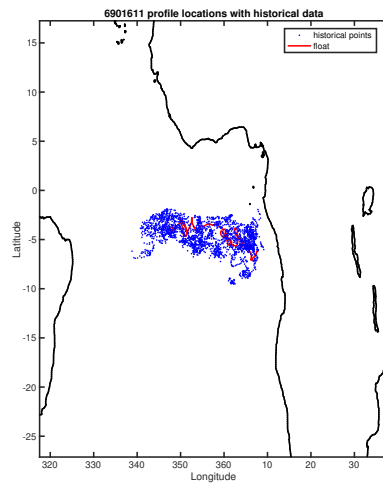


Figure 11: Position of the historical and float data.

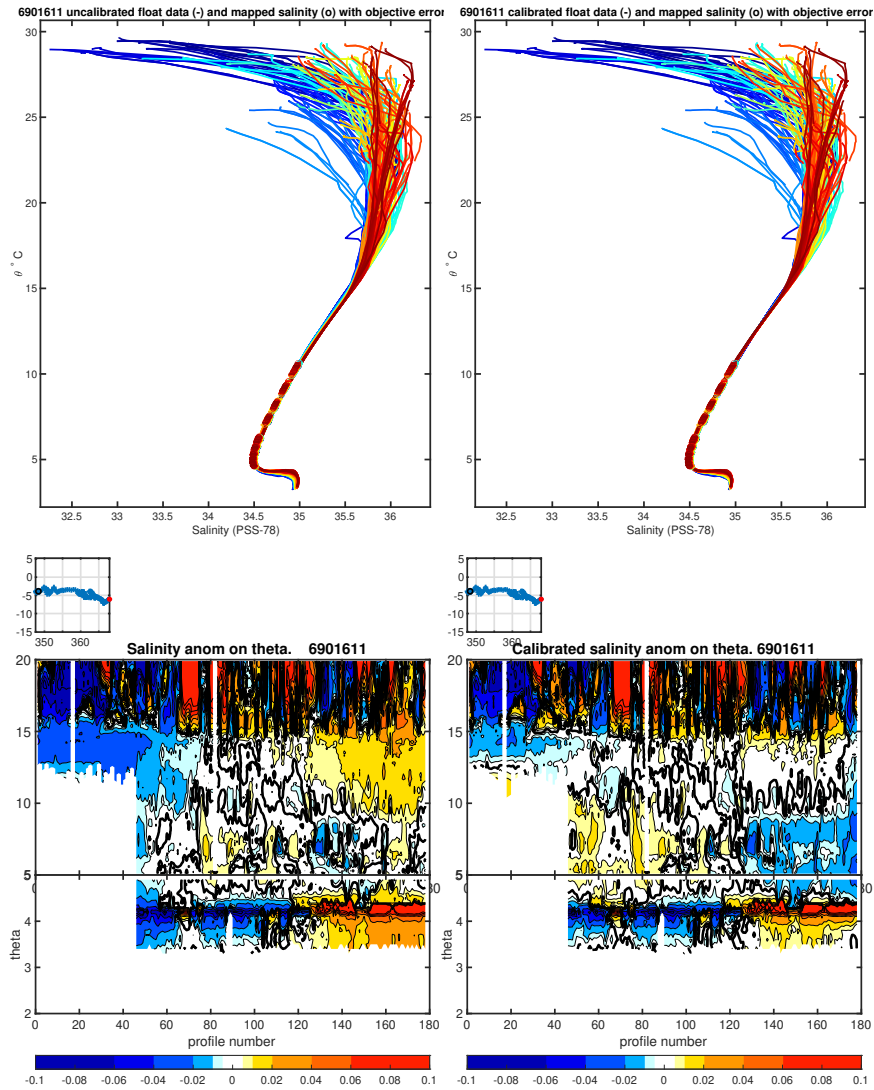


Figure 12: **(top panel)** : Comparison of the θ/S diagram of the float with the historial database. (left) raw data. (right) corrected data using the OW correction.
(bottom panel) : Salinity anomaly. (left) raw data. (right) corrected data using the OW correction.

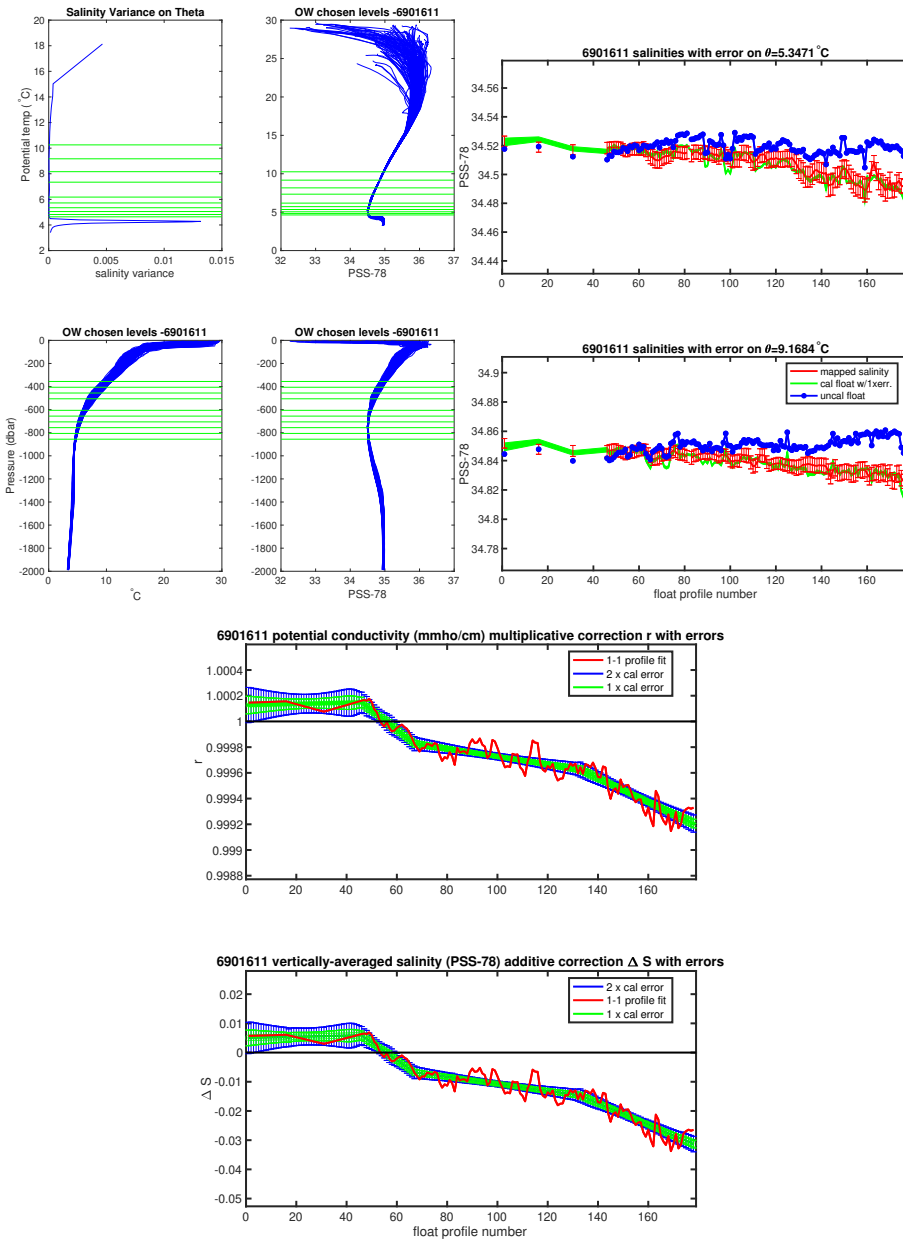


Figure 13: (top left) : θ - levels chosen for the calibration. (top right) : comparison, on various θ levels, between the float data and the historical data interpolated at the float position. (bottom): Correction proposed by the OW method.