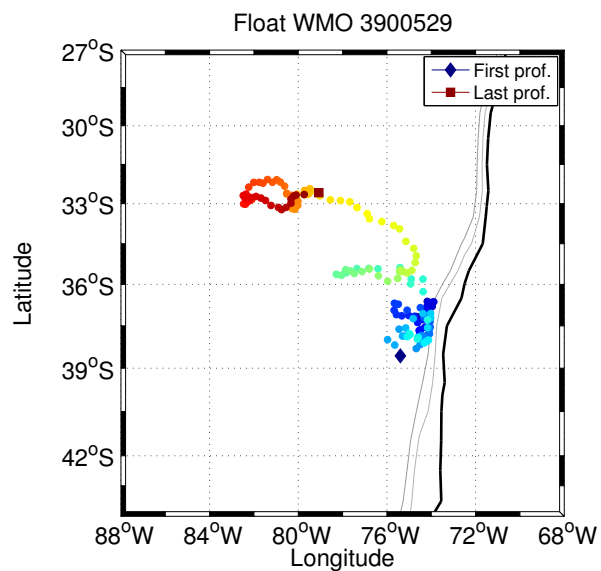


Delayed Mode Quality Control Float #WMO 3900529 - DAC Coriolis

by Carole Saout-Grit - **GlazeO**¹

update : **January 19, 2013**



¹GlazeO Company, 22 rue Lanoué Bras de Fer - 44200 Nantes
Phone : +33 (0)2 40 74 29 45 or +33 (0)6 30 33 81 63 - email : carole.saout@glazeo.net

1 Presentation :

Platform Number	3900529
DAC	IF-CORIOLIS
Float Status	Active
Project	CORIOLIS-FLOPS
Deployment Platform	XXXX
Institution	IFREMER, France
Name of the PI	G.Eldin
Platform Model	PROVOR CTS-3 (841)
Serial number	OIN-06-S3-18
Sensor type	SeaBird
Positioning System	ARGOS

Table 1: Float characteristics.

Deepest pressure in ascending profile (m)	2000
Parking depth (m)	1000
Cycle time (hours)	240
Deployment date	2008/03/26
Deployment position	long = -74.83 , lat = -37.13
Last studied cycle number	161
last studied cycle date	2012/08/26
last studied cycle position	long = -79.07 , lat = -33

Table 2: Programming and evolution.

2 Trajectory, positions and dates :

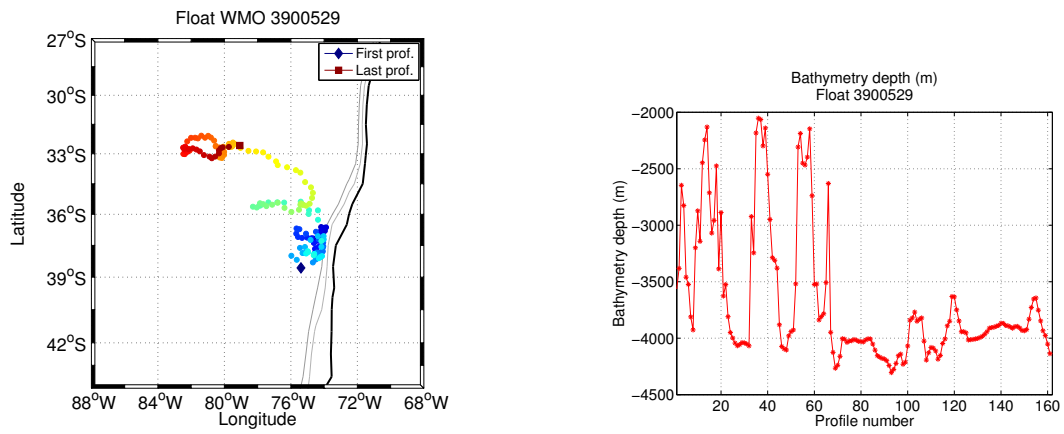


Figure 1: (left) : Profiles position, (right) : bathymetry depth function of cycle number.

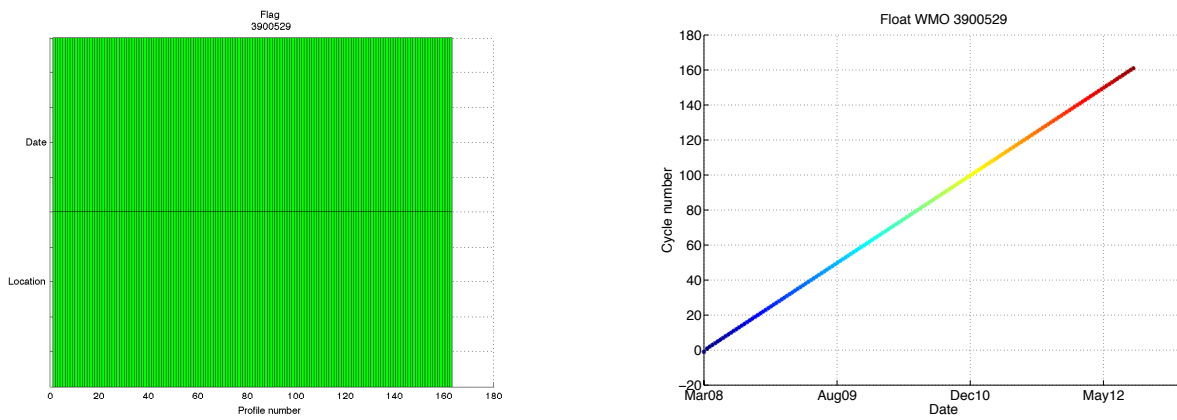


Figure 2: (left) : flags on profiles positions and dates.
(right) : relationship between cycle number, date and color.

3 Quality check on basic parameters :

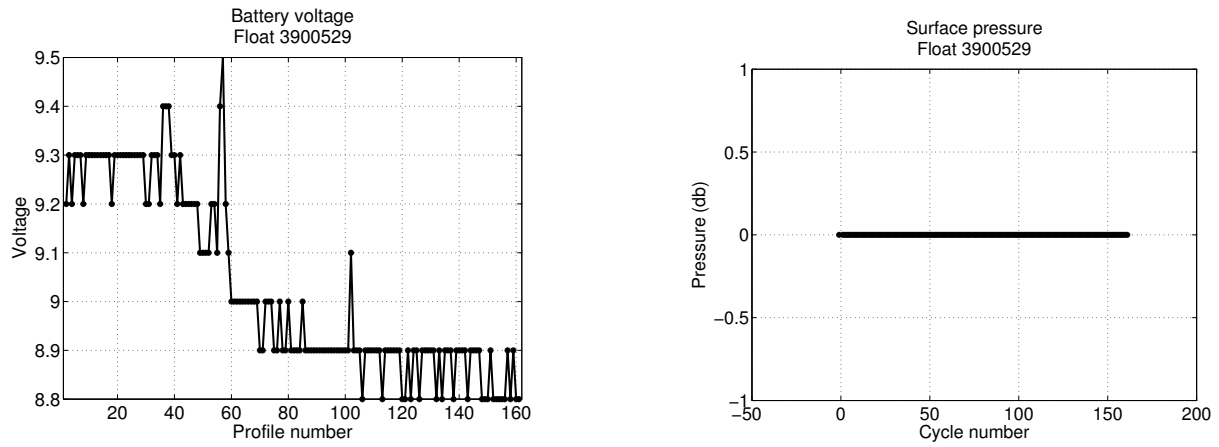


Figure 3: (left) : battery voltage - (right) : surface pressure from technical files.

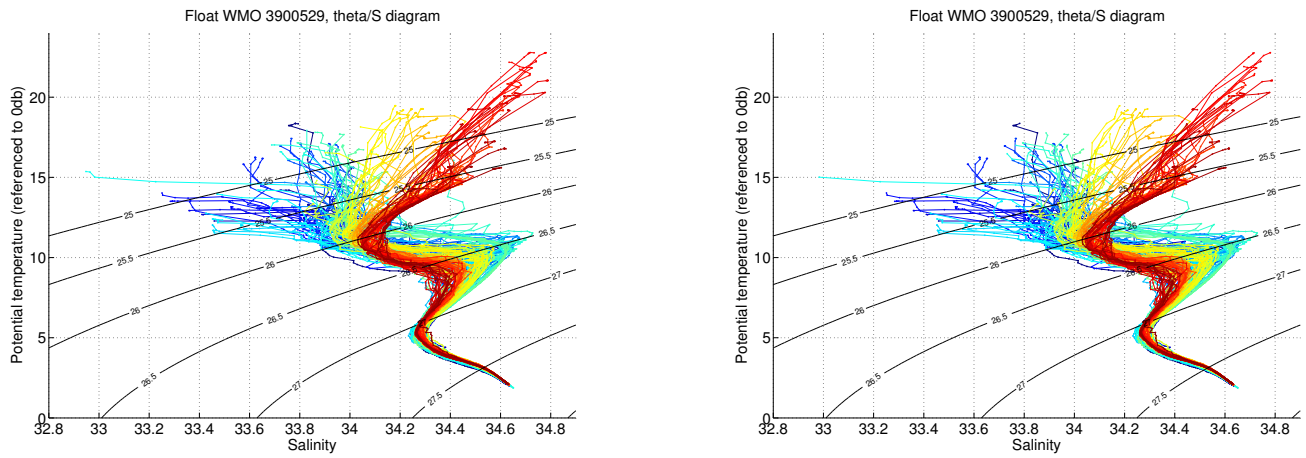


Figure 4: θ/S diagrams.
(left panel) Flags are not taken into account.
(right panel) Quality flags are taken into account.

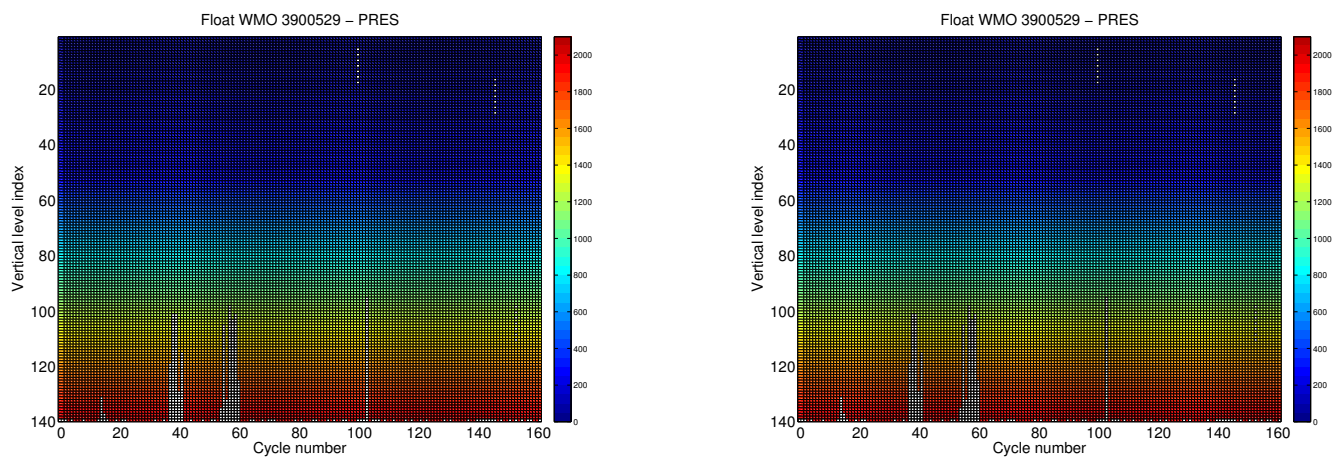


Figure 5: Pression as fonction of cycle number and vertical level index along the float trajectory.
 (left panel) : Quality flags are not taken into account.
 (right panel) : Quality flags are taken into account.

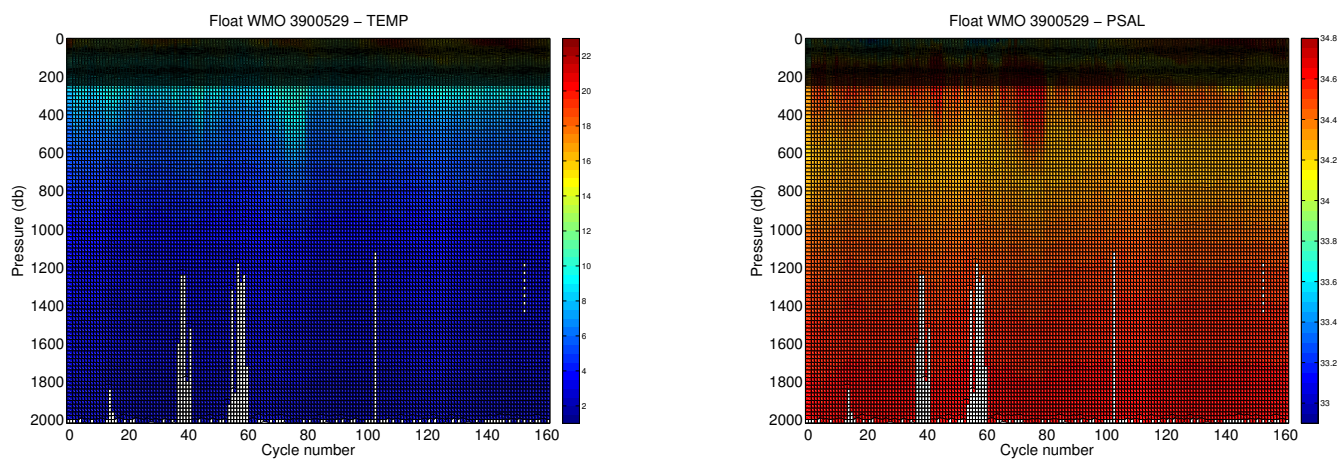


Figure 6: Temperature (left panel) and salinity (right panel) section along the float trajectory. Quality flags are not taken into account.

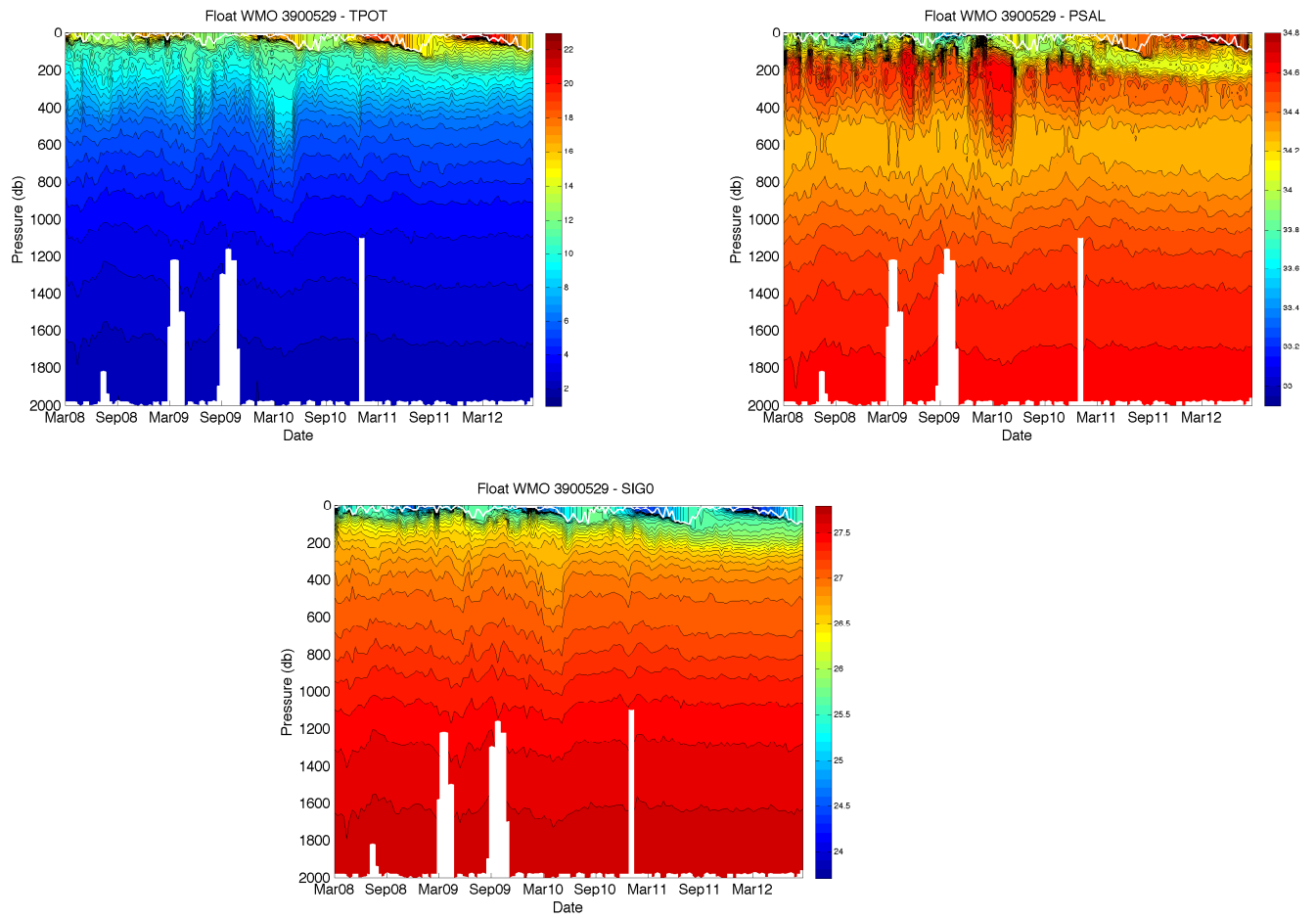


Figure 7: Sections along the float trajectory, interpolated on standard levels, with quality flags taken into account.

(Top panel) : for temperature and salinity.
 (Bottom panel) : for potential density.

4 DMQC summary:

Cycle	Parameter	Vertical level	Old flag	New flag	Comments
0	TEMP/ PSAL	0-9 dbar	4	4	density inversion
1	TEMP/ PSAL	134 and 139 dbar	4	4	density inversion
4	TEMP/ PSAL	134 and 138 dbar	4	4	density inversion
13	TEMP/PSAL	207 dbar	4	4	density inversion
18	PSAL	0-19 dbar	4	4	density inversion
33	TEMP/PSAL	64 dbar	4	4	density inversion
	PSAL	108 dbar	4	4	density inversion
41	PSAL	58,73 and 103 dbar	4	4	density inversions
45	TEMP/PSAL	243 and 248 dbar	4	4	density inversion
47	TEMP/PSAL	168,174, 204-214 dbar	4	4	density inversions
50	PSAL	159-169 dbar	4	4	density inversion
59	PSAL	0 dbar and 84-103 dbar	4	4	density inversions
63-161 (excepted cycles 132,141,144,150)	PSAL	levels 1 and 2	4	4	untrustable data
118	PSAL	193-199 dbar	3	1	density is ok
118	TEMP	204-208 dbar	3	1	density is ok
118	TEMP	244-249 dbar	3	1	density is ok
132	TEMP/PSAL	0 and 3 dbar	4	restore $Q_c(T)=1$	temp.ok
141	TEMP/PSAL	1 and 4 dbar	4	4	untrustable data
144	TEMP/PSAL	0 and 4 dbar	4	4	untrustable data
150	TEMP/PSAL	0 and 3 dbar	4	4	untrustable data
	TEMP/PSAL	48 and 53 dbar	4	put $Q_c(T,S)= 4$ at 48 dbar only	

Table 3: Profiles 0 to 161 for float #WMO 3900529 with flags 3 or 4, and proposition of modifications.

Comments :

This float has been controled in delayed-mode in 2010 for its profiles from 0 to 66, and flags on its profiles 0, 4, 13, 18, 33, 41, 45, 47, 50 and 59 have been yet modified.

For this Provor-CTS3, the resolution is equal to 10 dbar from the surface to 800 dbar, then 25 dbar from 800 to 2000 dbar. Salinity data between 0 and 10 dbar are acquired when the pump of the CTD is turned off, and may be thus suspicious.

5 Cycle 118 : comparison to the nearest Argo (OW) profiles.

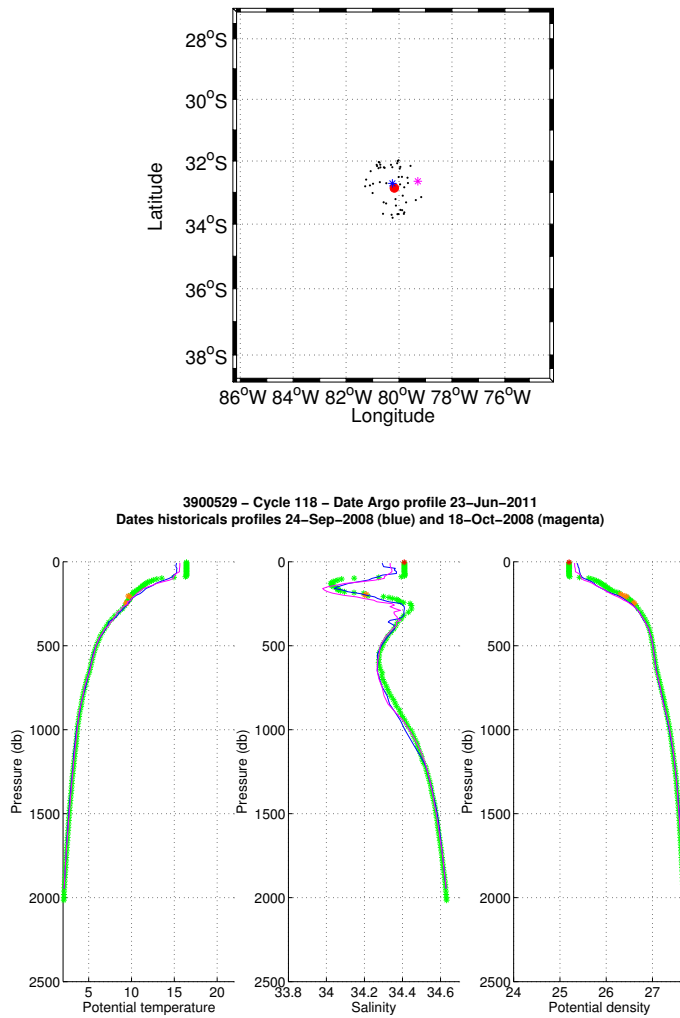


Figure 8: Float 3900529, cycle 118 - **(Upper panel)** Position of the Argo profile (red) and of the nearest ARGO profiles (black). The nearest ARGO profile in time is in magenta while the nearest ARGO profile in space is in blue. **(Lower panels)** Temperature, salinity and potential density as function 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).

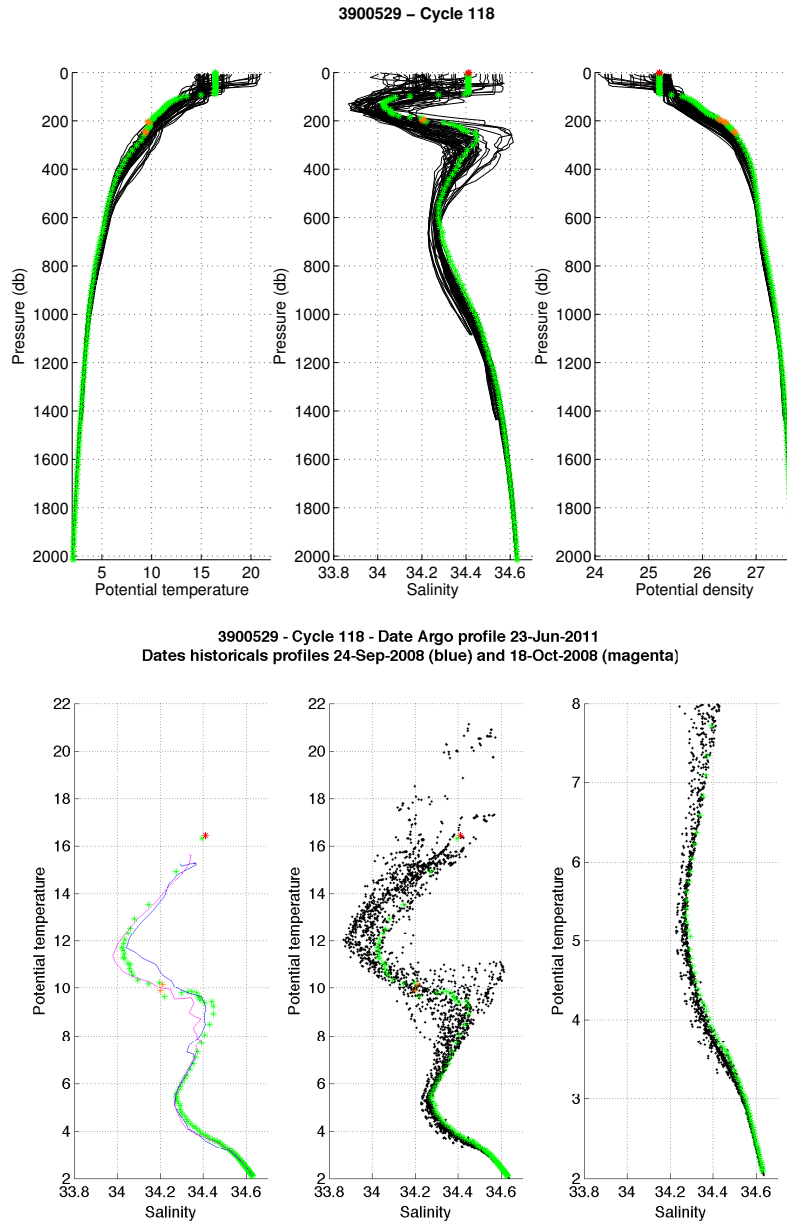


Figure 9: Float 3900529, cycle 118 : The Argo profile (stars) is compared to the nearest ARGO profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

6 Cycle 132 : comparison to the nearest Argo (OW) profiles.

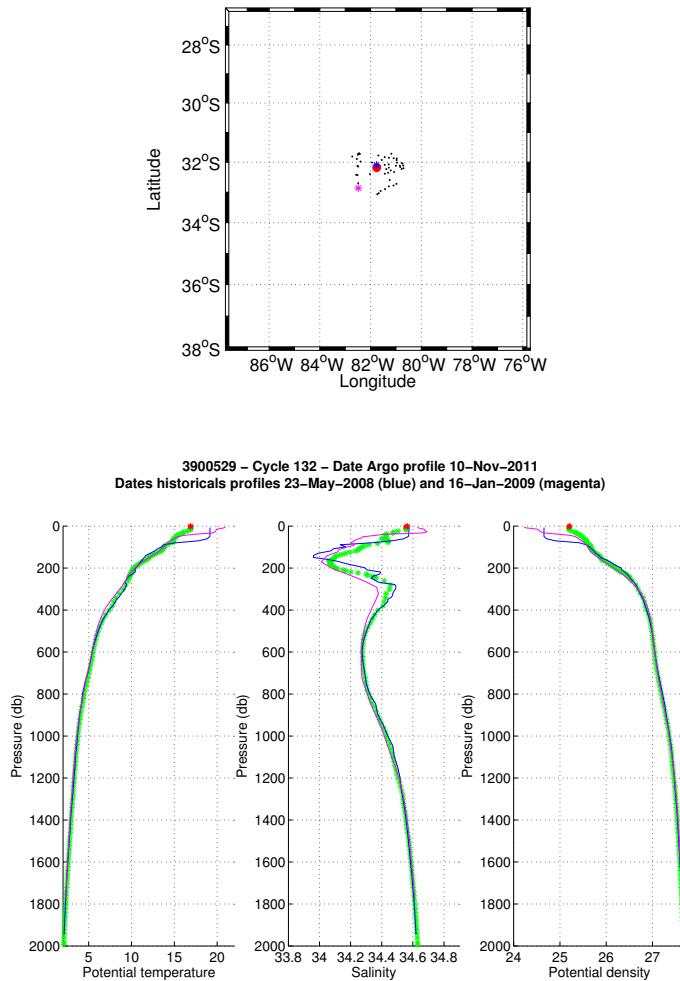


Figure 10: Float 3900529, cycle 132 - **(Upper panel)** Position of the Argo profile (red) and of the nearest ARGO profiles (black). The nearest ARGO profile in time is in magenta while the nearest ARGO profile in space is in blue. **(Lower panels)** Temperature, salinity and potential density as function 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).

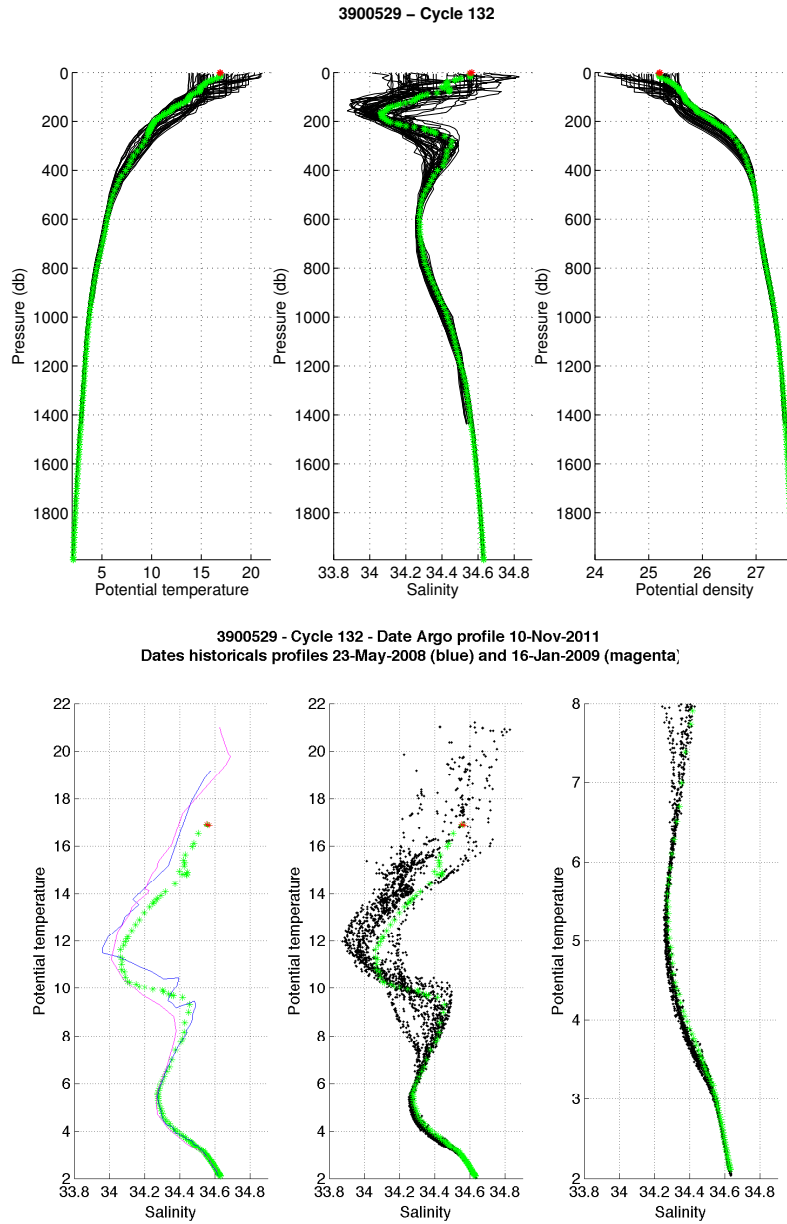


Figure 11: Float 3900529, cycle 132 : The Argo profile (stars) is compared to the nearest ARGO profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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 Cycle 141 : comparison to the nearest Argo (OW) profiles.

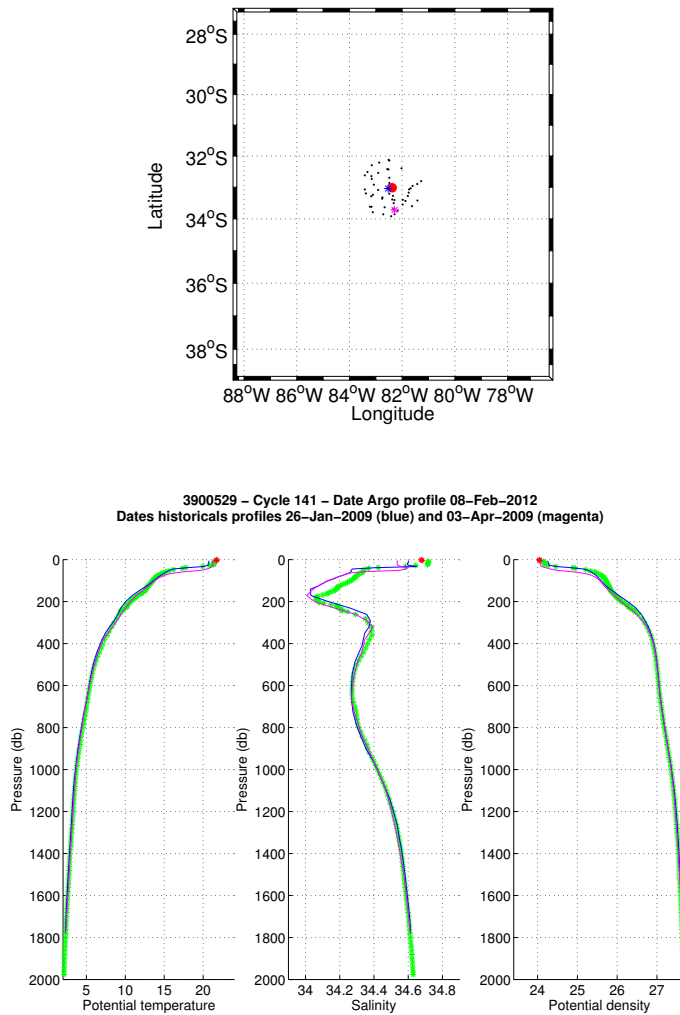


Figure 12: Float 3900529, cycle 141 - **(Upper panel)** Position of the Argo profile (red) and of the nearest ARGO profiles (black). The nearest ARGO profile in time is in magenta while the nearest ARGO profile in space is in blue. **(Lower panels)** Temperature, salinity and potential density as function 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).

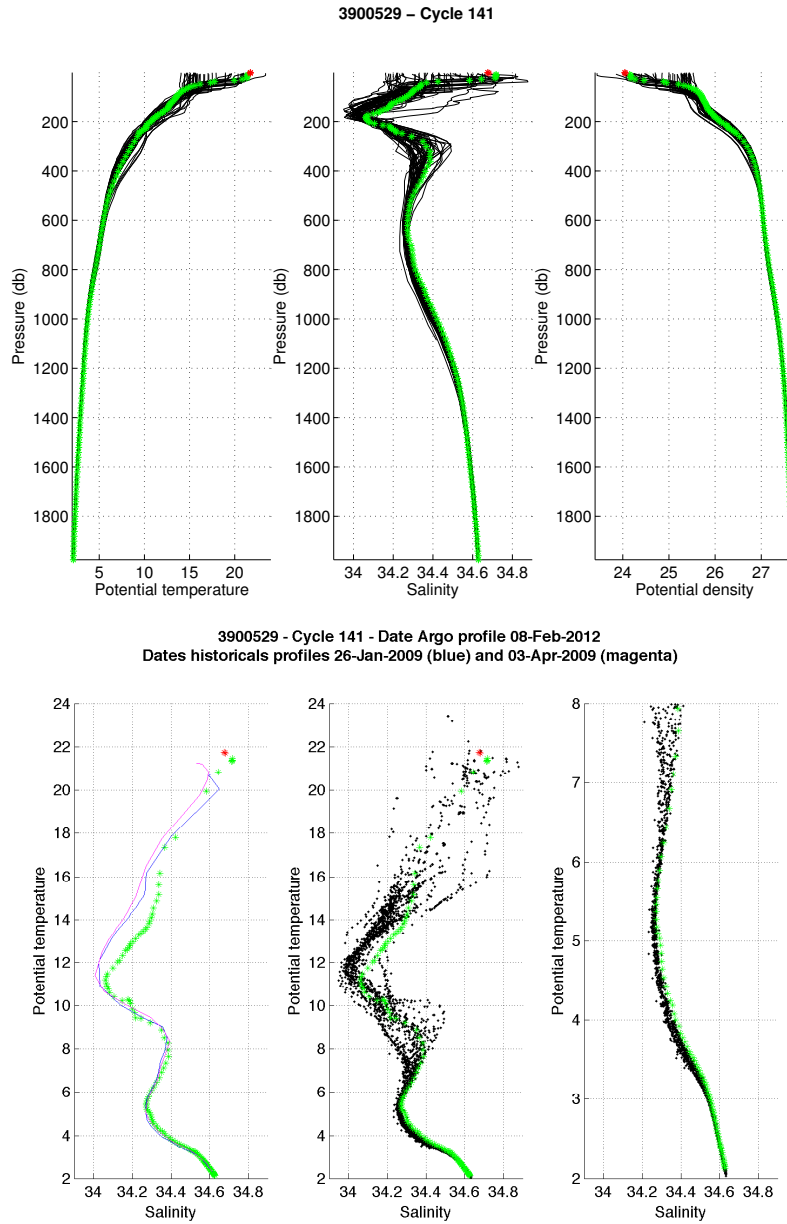


Figure 13: Float 3900529, cycle 141 : The Argo profile (stars) is compared to the nearest ARGO profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

8 Cycle 144 : comparison to the nearest Argo (OW) profiles.

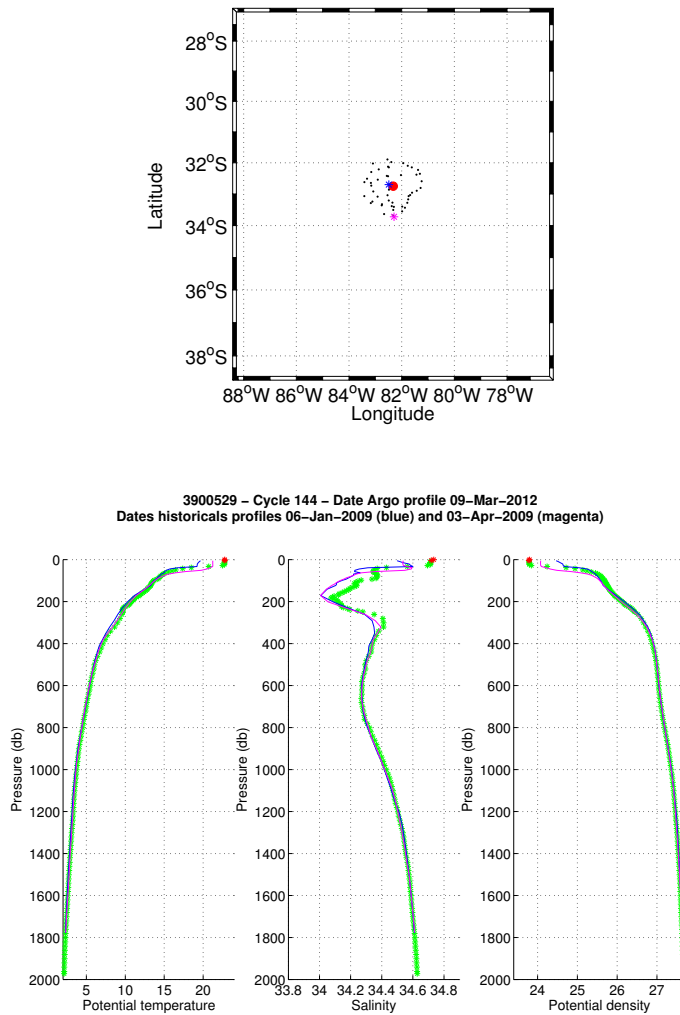


Figure 14: Float 3900529, cycle 144 - **(Upper panel)** Position of the Argo profile (red) and of the nearest ARGO profiles (black). The nearest ARGO profile in time is in magenta while the nearest ARGO profile in space is in blue. **(Lower panels)** Temperature, salinity and potential density as function 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).

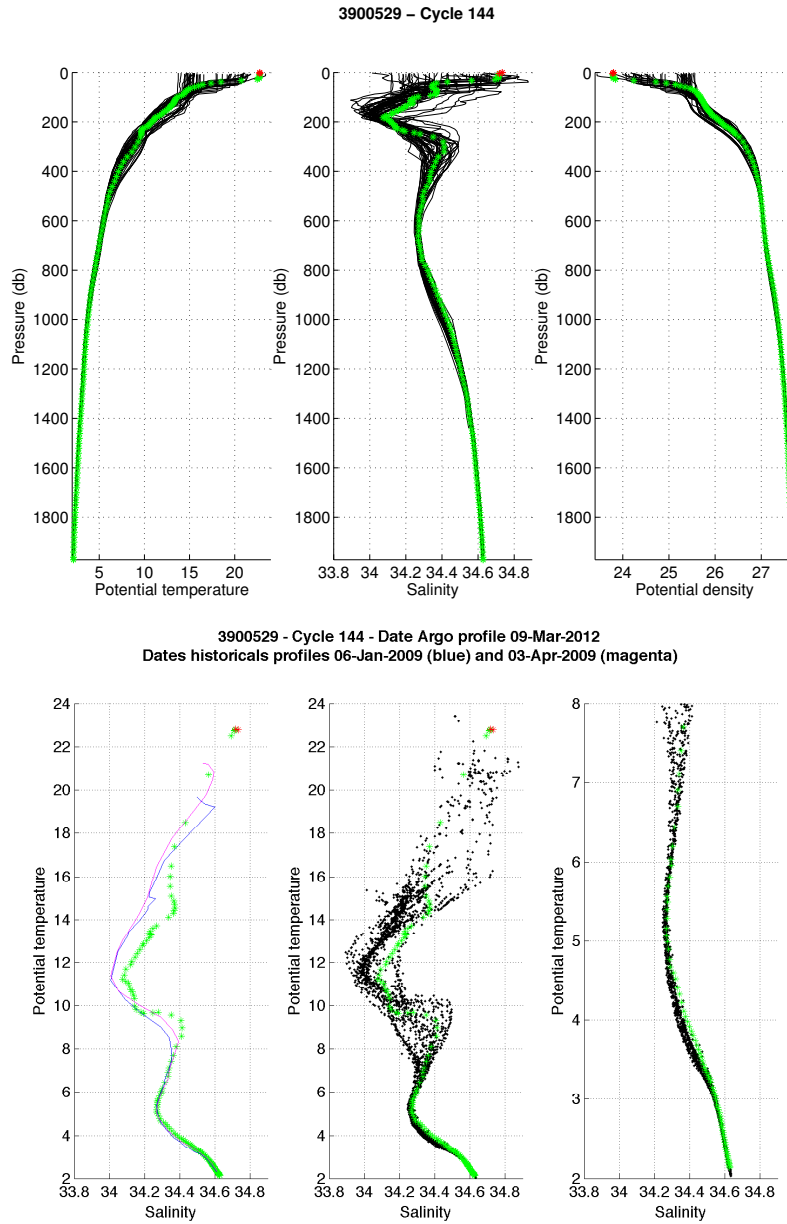


Figure 15: Float 3900529, cycle 144 : The Argo profile (stars) is compared to the nearest ARGO profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

9 Cycle 150 : comparison to the nearest Argo (OW) profiles.

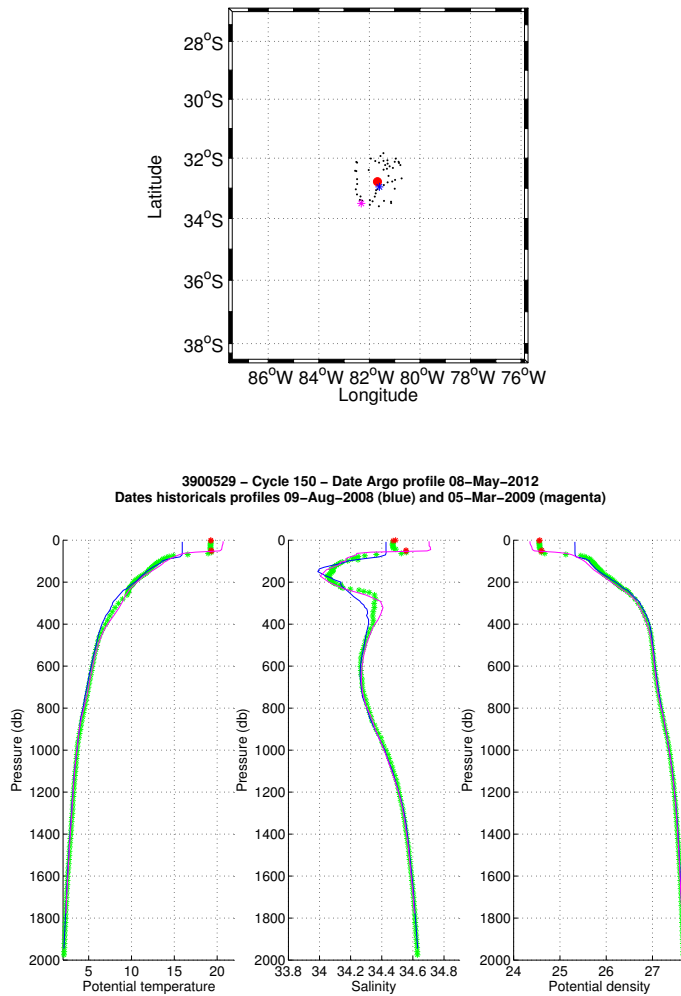


Figure 16: Float 3900529, cycle 150 - (**Upper panel**) Position of the Argo profile (red) and of the nearest ARGO profiles (black). The nearest ARGO profile in time is in magenta while the nearest ARGO profile in space is in blue. (**Lower panels**) Temperature, salinity and potential density as function 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).

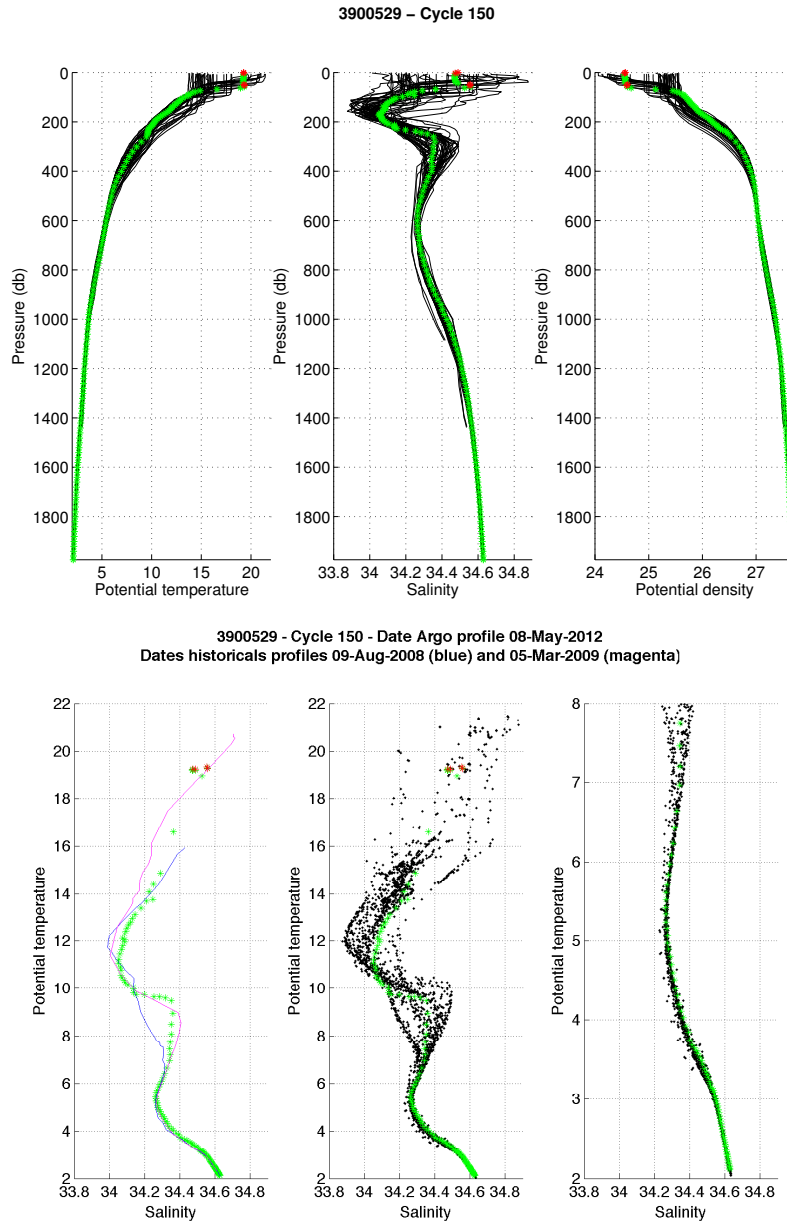


Figure 17: Float 3900529, cycle 150 : The Argo profile (stars) is compared to the nearest ARGO profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

10 Salinity correction from OW method :

CONFIG_MAX_CASTS	300
MAP_USE_PV	1
MAP_USE_SAF	0
MAPSCALE_LONGITUDE_LARGE	3
MAPSCALE_LONGITUDE_SMALL	2
MAPSCALE_LATITUDE_LARGE	2
MAPSCALE_LATITUDE_SMALL	1
MAPSCALE_PHI_LARGE	0.25
MAPSCALE_PHI_SMALL	0.05
MAPSCALE_AGE	10
MAP_P_EXCLUDE	1000
MAP_P_DELTA	250

breaks	none
max_breaks	0
use_percent_gt	0.5

Table 5: Calibration parameters.

Table 4: Mapping parameters.

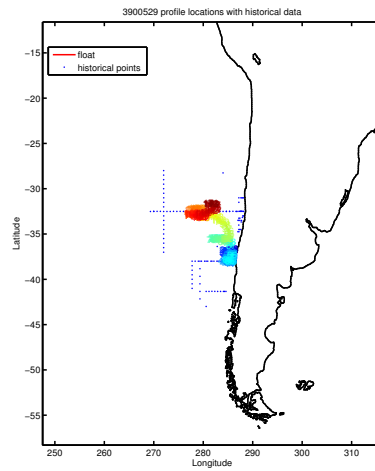


Figure 18: Position of the historical and float data.

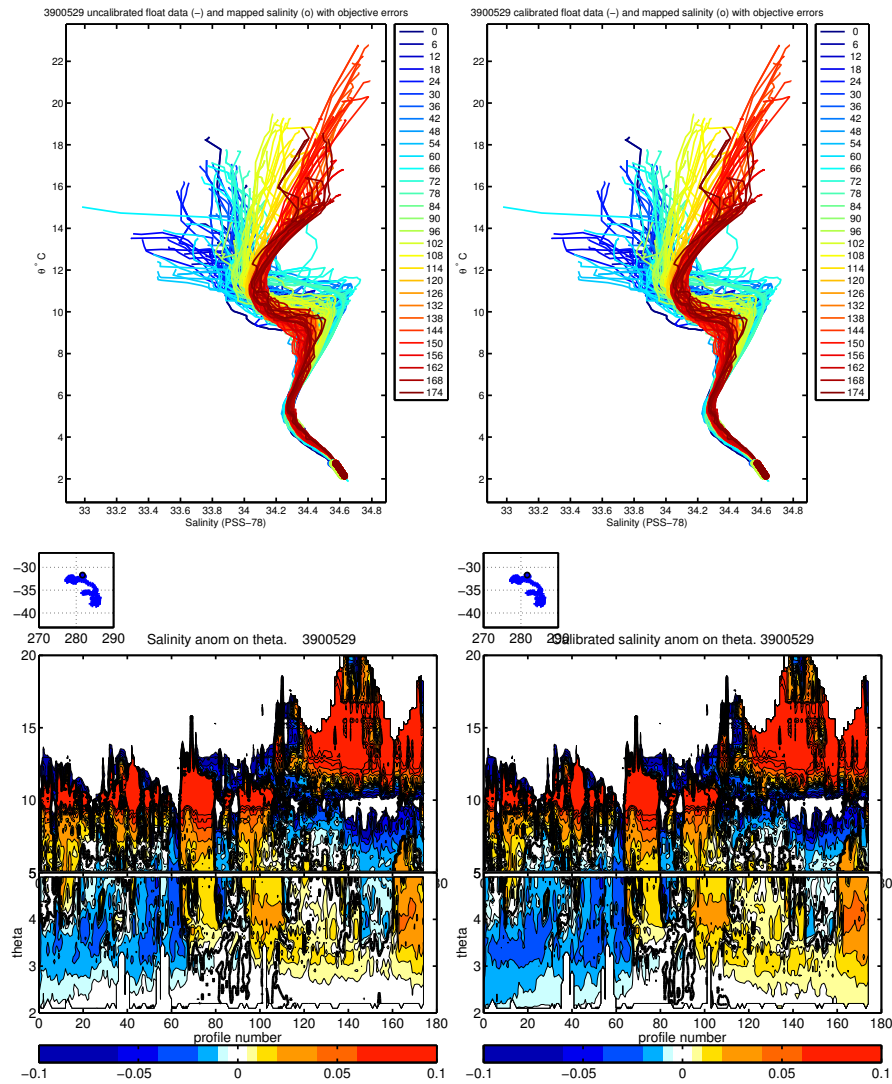


Figure 19: **(top panel)** : Comparison of the θ/S diagram of the float with the historial database. (left) raw data. (right) corrected data using the OW correction.
(bottom panel) : Salinity anomaly. (left) raw data. (right) corrected data using the OW correction.

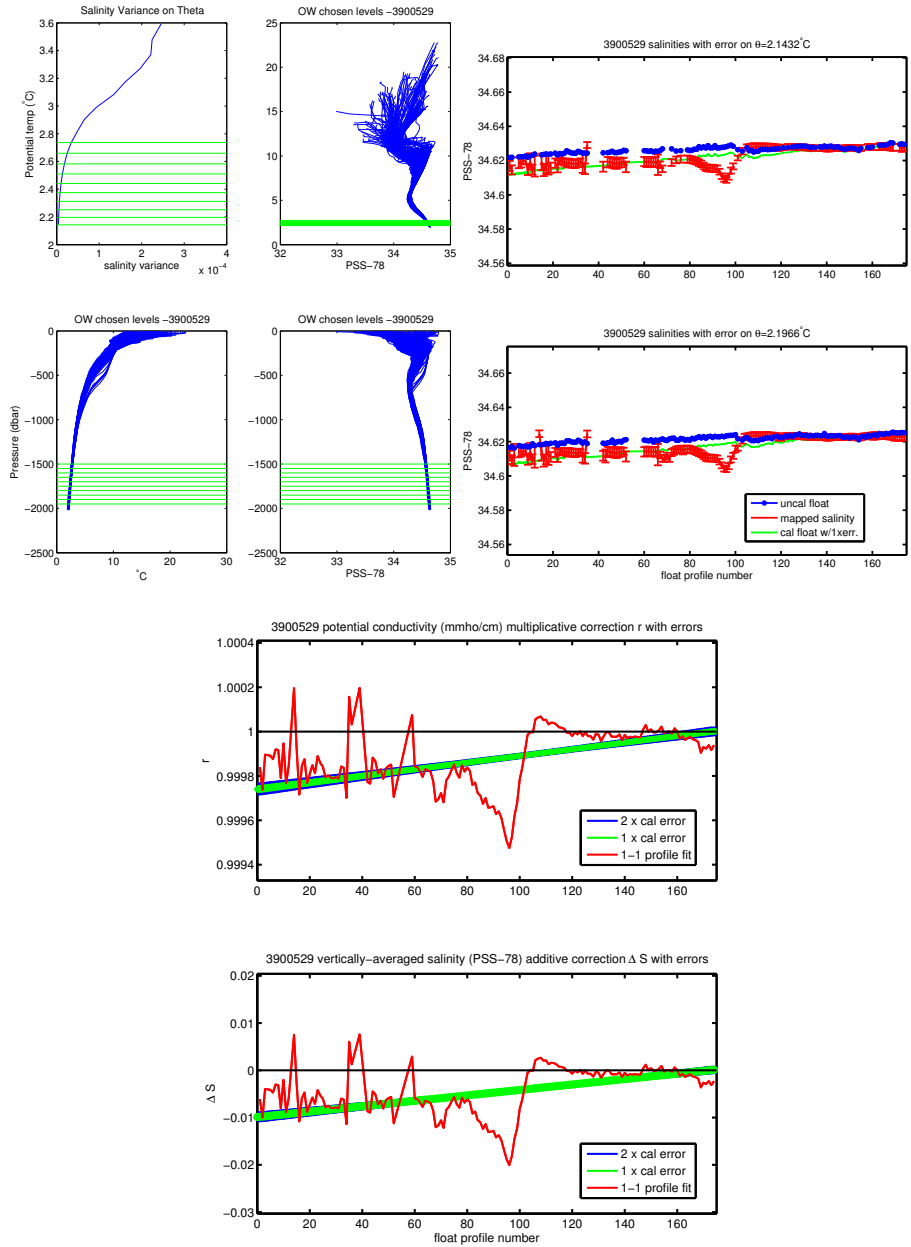


Figure 20: (top left) : θ - levels chosen for the calibration. (top right) : comparison, on various θ levels, between the float data and the historical data interpolated at the float position. (bottom): Correction proposed by the OW method.