Rapport interne LPO/13-14

UMR 6523 **Laboratoire de Physique des Océans**	**DELAYED MODE QUALITY CONTROL OF OVIDE ARGO DATA** **FLOAT WMO 5902305**	
Date : **28 mai 2013**	Auteurs : **Lagadec Catherine** **Thierry Virginie**	Archivage : **LPO**

Liste de diffusion :

LPO

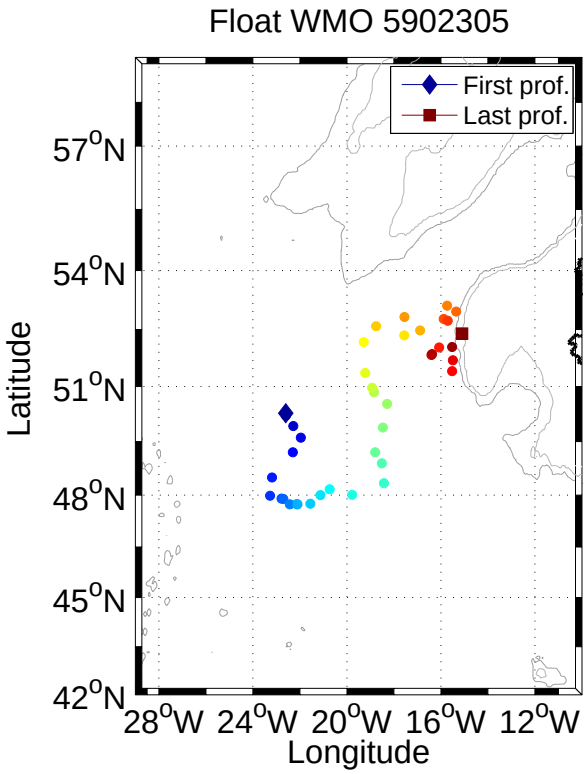
Carole Despinoy (ODE/LPO)

DELAYED MODE QUALITY CONTROL OF OVIDE ARGO DATA FLOAT WMO 5902305

Internal Report LPO 13-14

C. Lagadec - V. Thierry

28 mai 2013



1 Presentation and DMQC summary

Number	Deployment (cycle OD) cycle OD	Last cycle 38
Provor WMO 5902305	20/06/2010 14h29	
CTS3-DO 9	N 50.2766 W 22.602	
Date of control	Float status	Last cycle
Jan 2012- April 2013	DEAD	07/07/2011
Coriolis transmission		27/05/2013

Tab. 1: Status of the float

Warning : Note that all the figures are plotted with the latest QC flag values (the modifications mentionned table 2 are taken into account).

1.1 QC flag checks and interesting profiles

Cycle	Para-meter	Vertical level	Old flag	New flag	Comments	Coriolis transmission
21A	TEMP	1,2	4	1		23/04/13
32A	TEMP,PSAL	714 dbar	3	1		07/01/13
34A	TEMP,PSAL	763 to 1164 dbar	3	1		07/01/13
34A	PSAL	226 dbar	3	1		07/01/13
36A	PSAL	763,938 dbar	3	1		07/01/13

Tab. 2: Float 5902305. Summary of the modifications of the real-time QC flags and of the interesting or suspicous data.

The resolution is equal to 10 dbar from the surface to 500 dbar, then 25 dbar from 500 to 2000 dbar. Salinity data between 0 and 6 dbar are suspicious because they are acquired when the pump of the CTD is turned off.

1.2 Salinity correction from the OW method

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. Errors bars are maximum value between 0.01 and those determined from the OW method with parameters from the OW configuration 127 (selected data within 2 years of Argo profile date).

2 Data

OW CONFIGURATION	1	3	127	371
CONFIG_MAX_CASTS	250	250	250	250
MAP_USE_PV	1	1	1	250
MAP_USE_PV_ELLIPSE	1	1	1	1
MAP_USE_FACTEUR	1	1	1	1
MAPSCALE_LONGITUDE_LARGE	3.2	3.2	3.2	0.8
MAPSCALE_LONGITUDE_SMALL	0.8	0.8	0.8	0.8
MAPSCALE_LATITUDE_LARGE	2	2	2	0.5
MAPSCALE_LATITUDE_SMALL	0.5	0.5	0.5	0.5
MAPSCALE_PHI_LARGE	0.5	0.5	0.5	0.5
MAPSCALE_PHI_SMALL	0.1	0.1	0.1	0.1
MAPSCALE_AGE	0.69	0.69	0.69	0.69
MAP_P_EXCLUDE	500	500	500	500
MAP_P_DELTA	250	250	250	250
Reference data base	CTD only	CTD only	CTD+ARGO	CTD
Comments		no break point	no break point	no break point

Tab. 3: Parameters of the OW method.

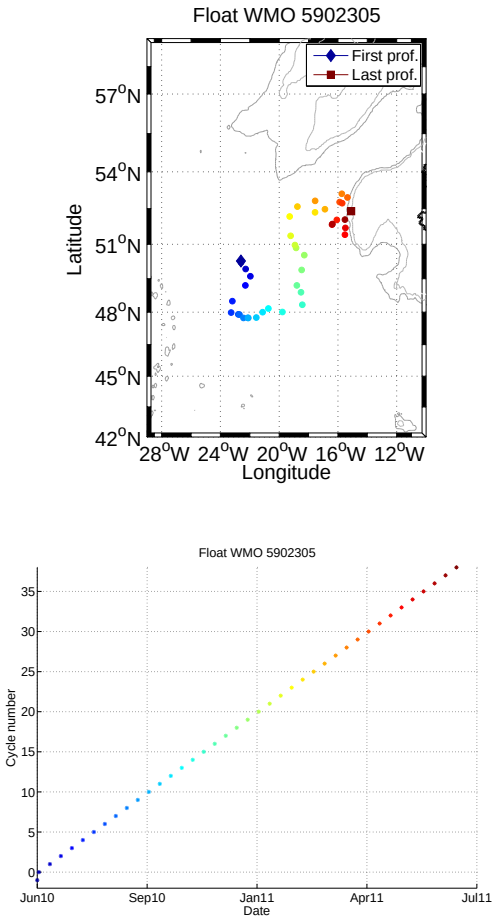


FIG. 1: Profiles position and relationship between cycle number, date and color.

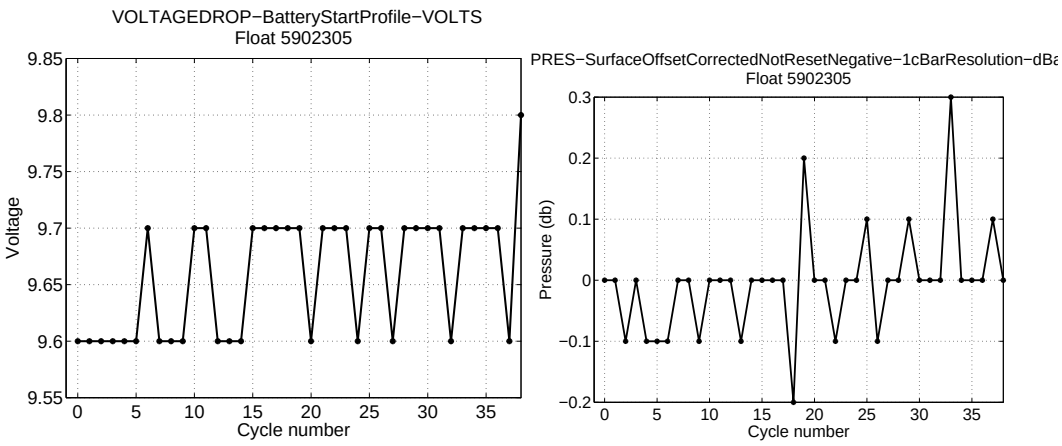


FIG. 2: Voltage battery - Surface pressure

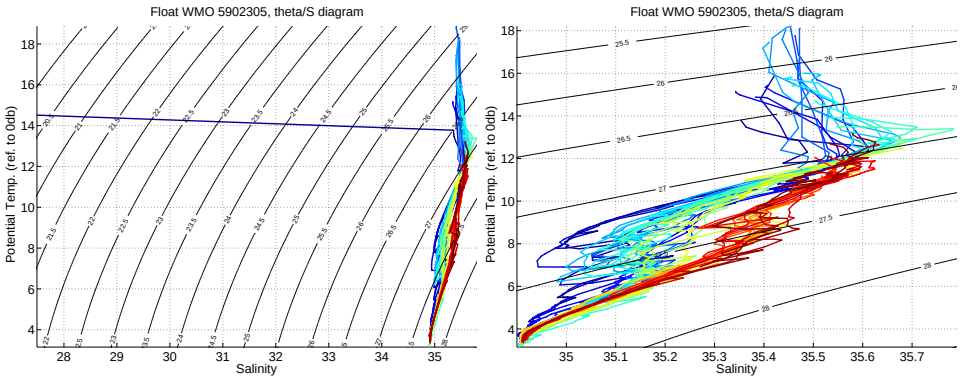


FIG. 3: θ/S diagrams. (Left panel) Flags are not taken into account. (Right panel) Quality flags are taken into account.

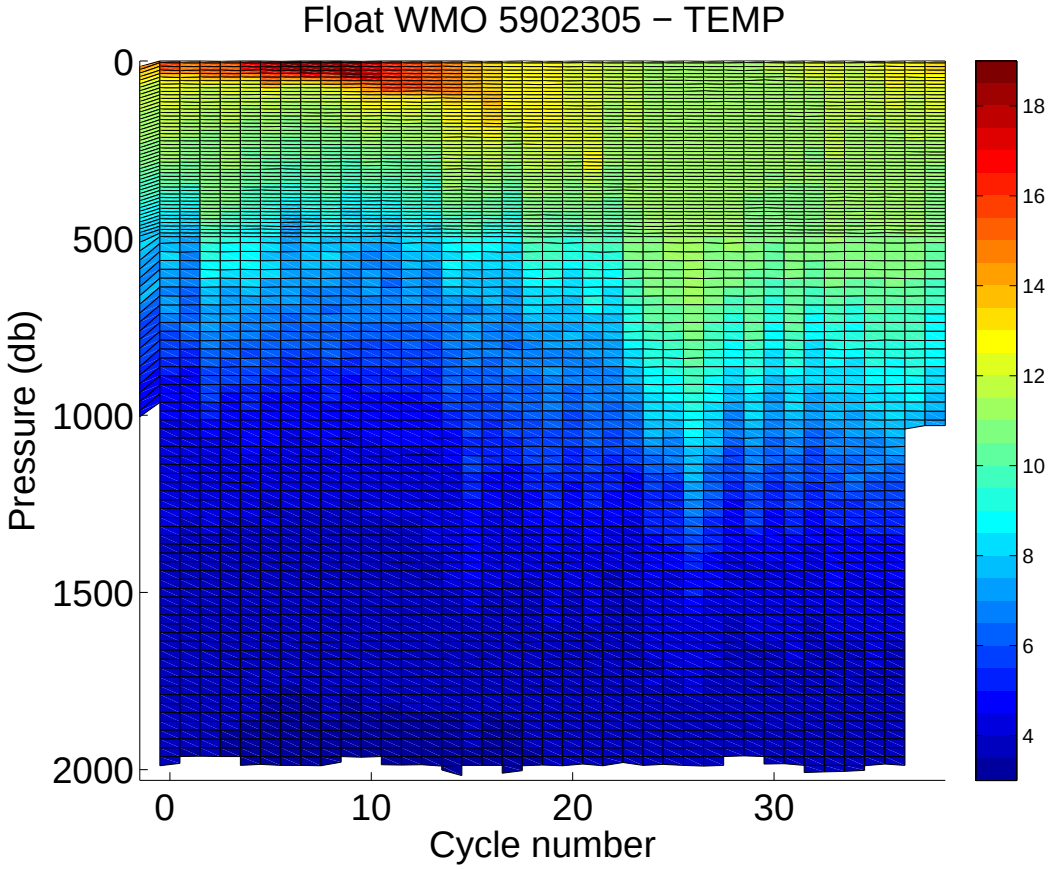


FIG. 4: Temperature section along the float trajectory. Quality flags are not taken into account.

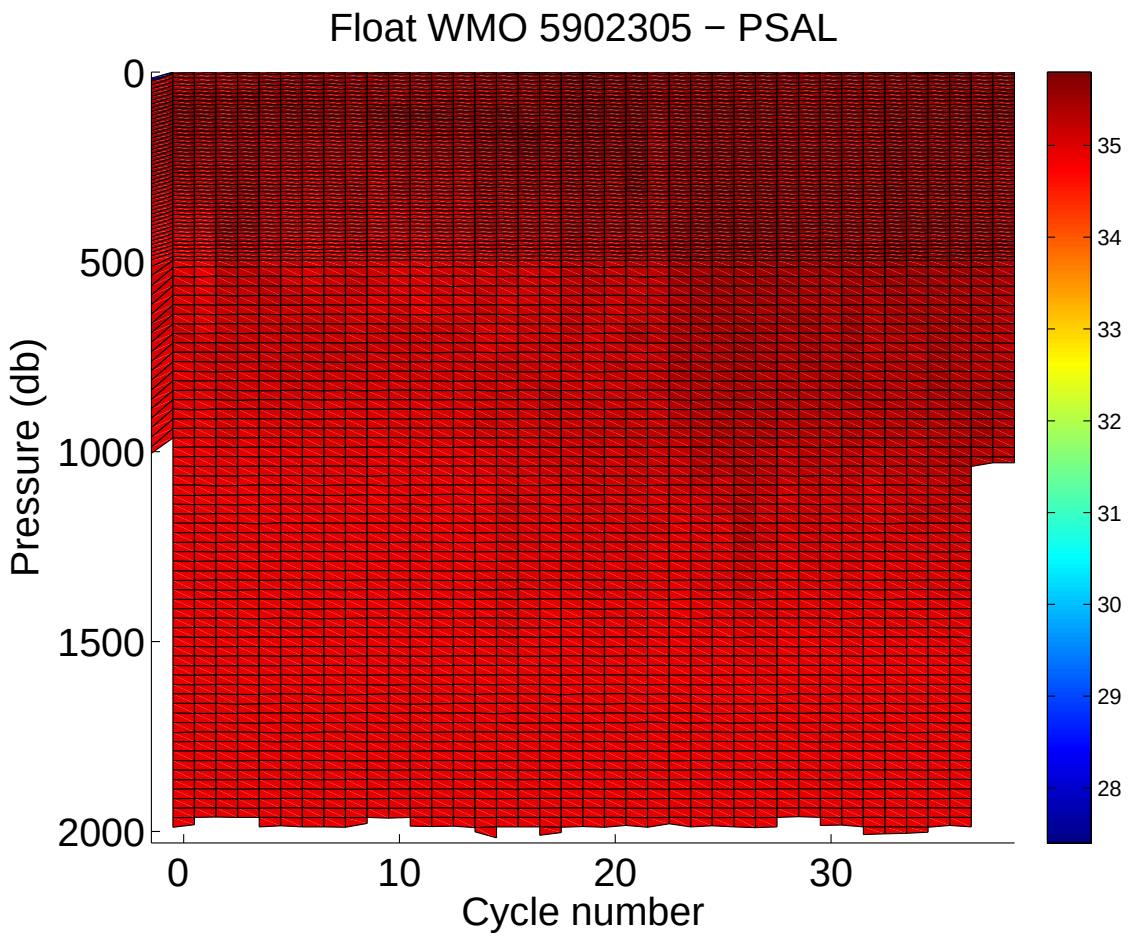


FIG. 5: Salinity section along the float trajectory. Quality flags are not taken into account.

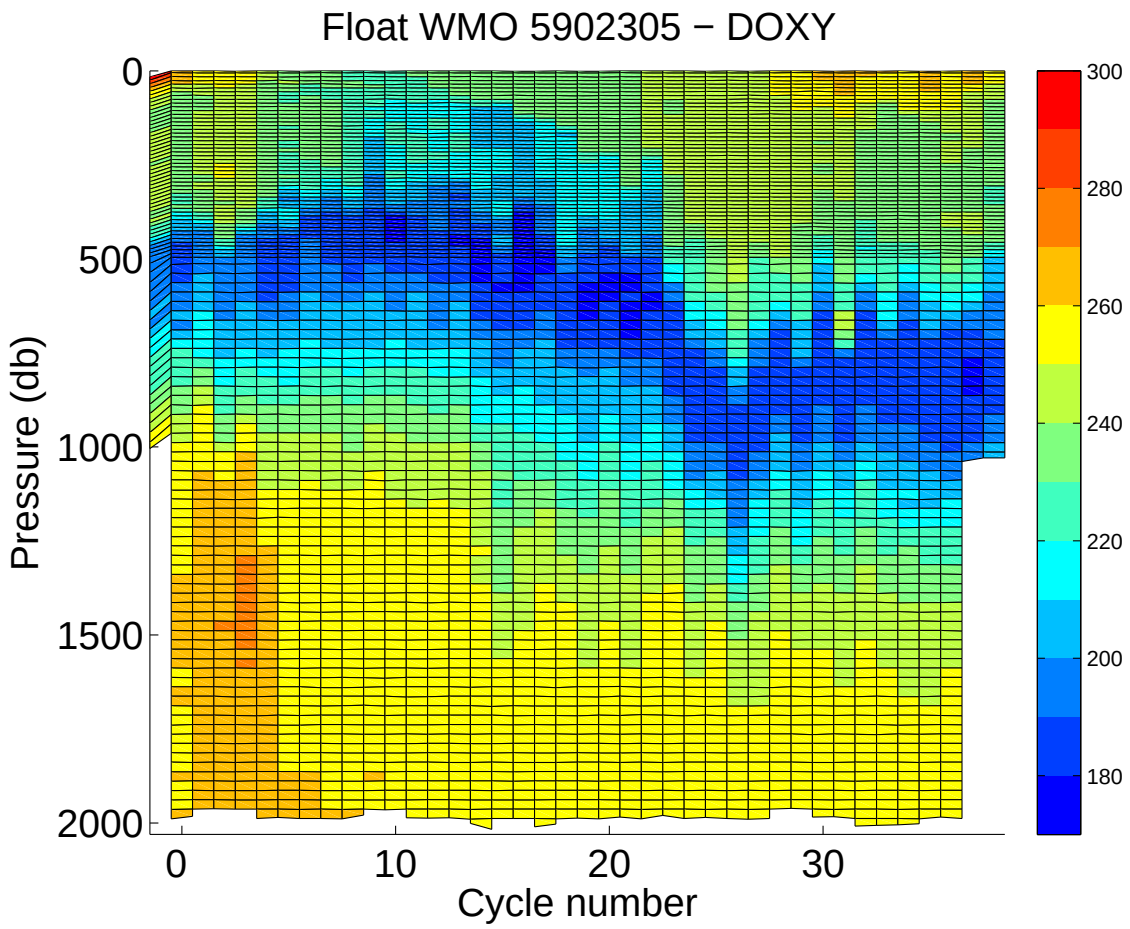


FIG. 6: Oxygen section along the float trajectory. Quality flags are not taken into account.

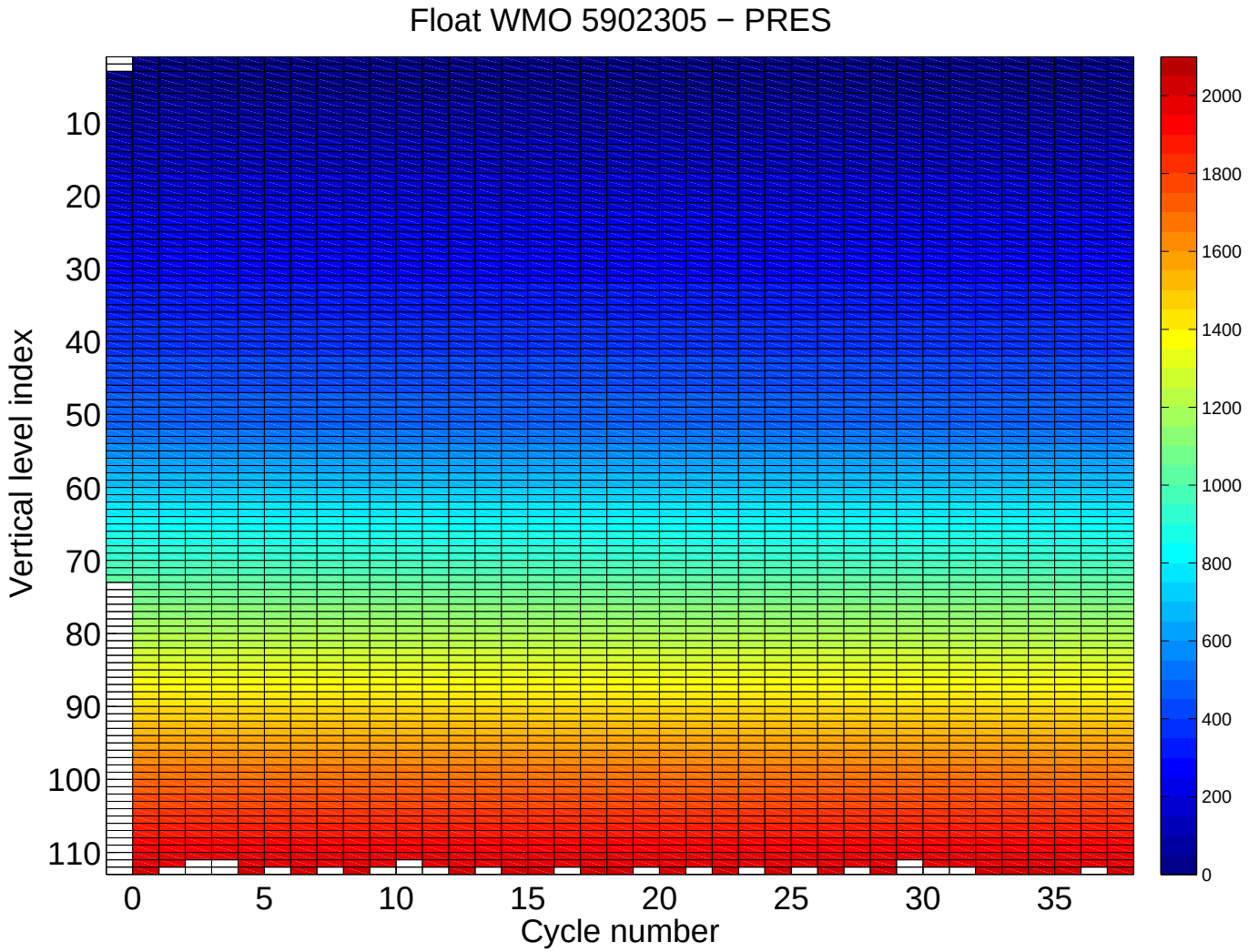


FIG. 7: Pression as fonction of cycle number and vertical level index along the float trajectory. Quality flags are taken into account.

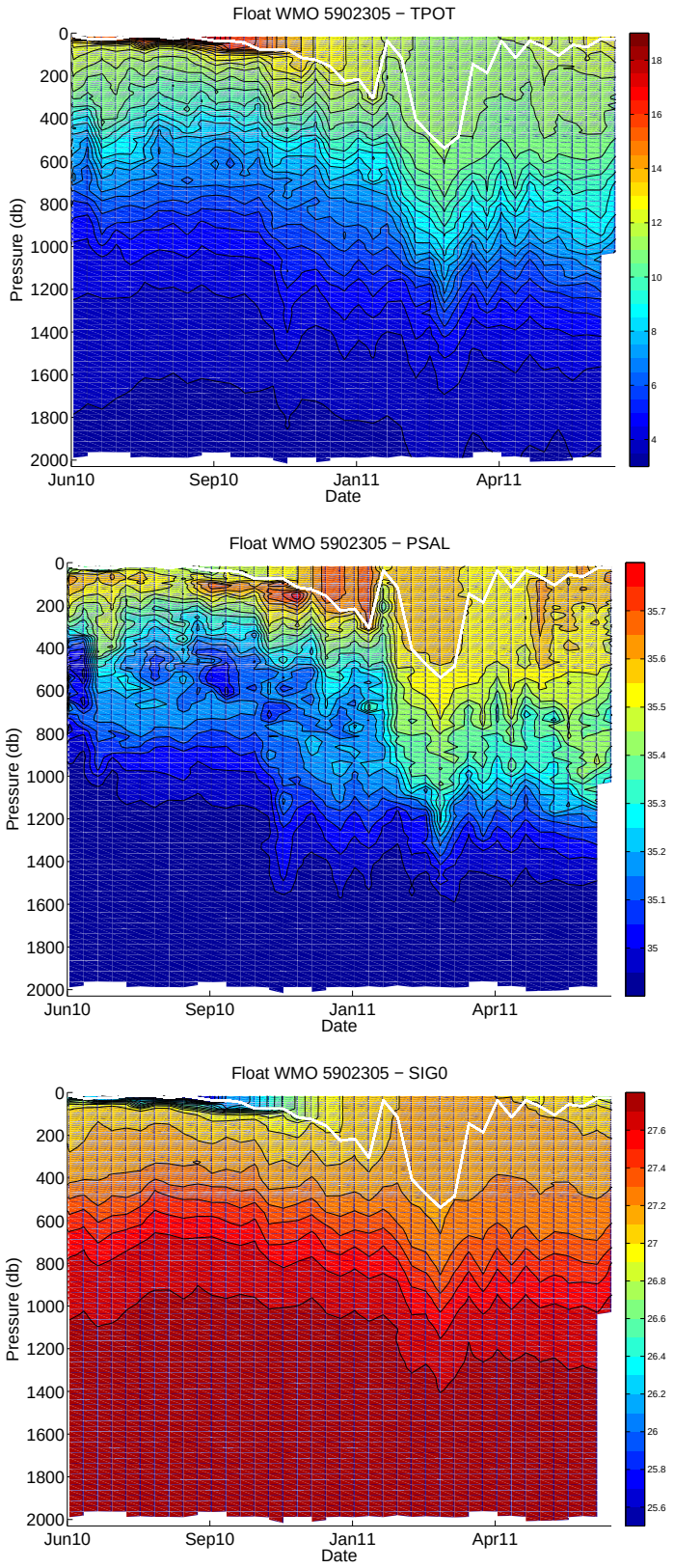


FIG. 8: Potential temperature, salinity and potential density sections along the float trajectory (interpolated on standard levels). Quality flags are taken into account.

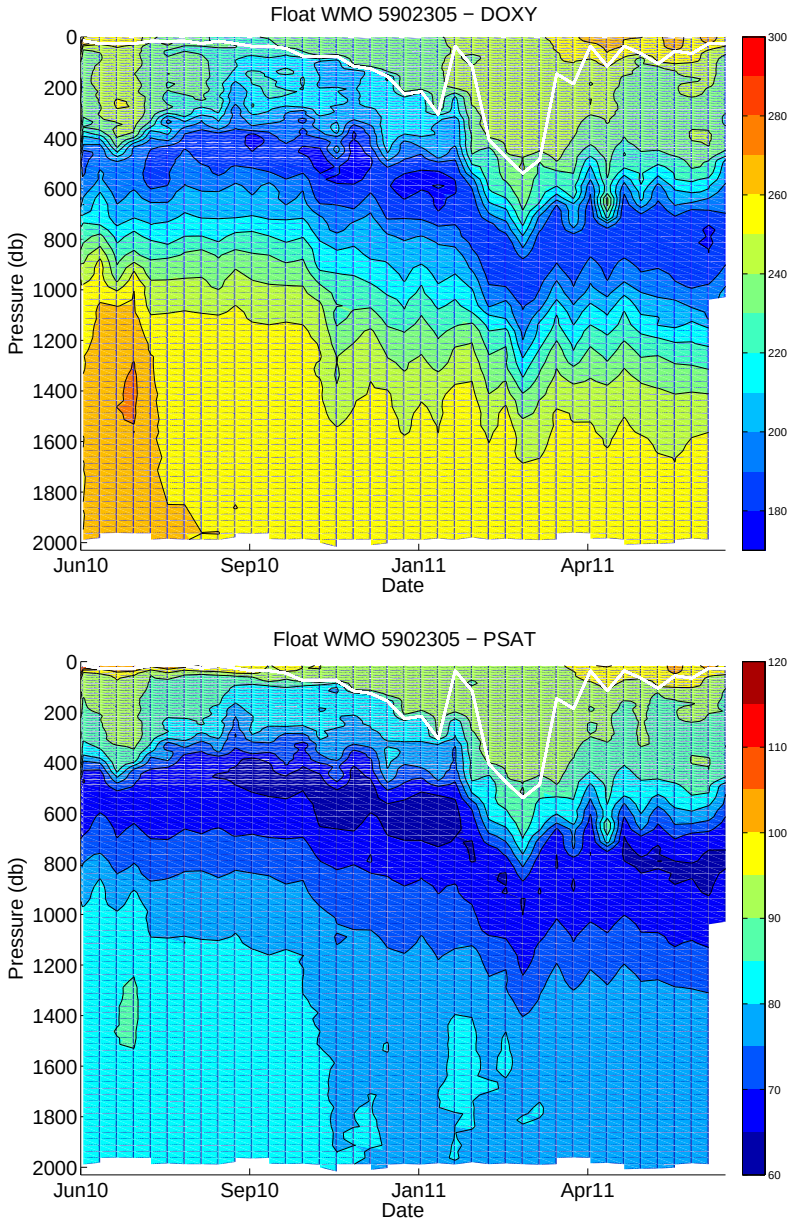


FIG. 9: Oxygen and Saturation Oxygen sections along the float trajectory (interpolated on standard levels). Quality flags are taken into account.

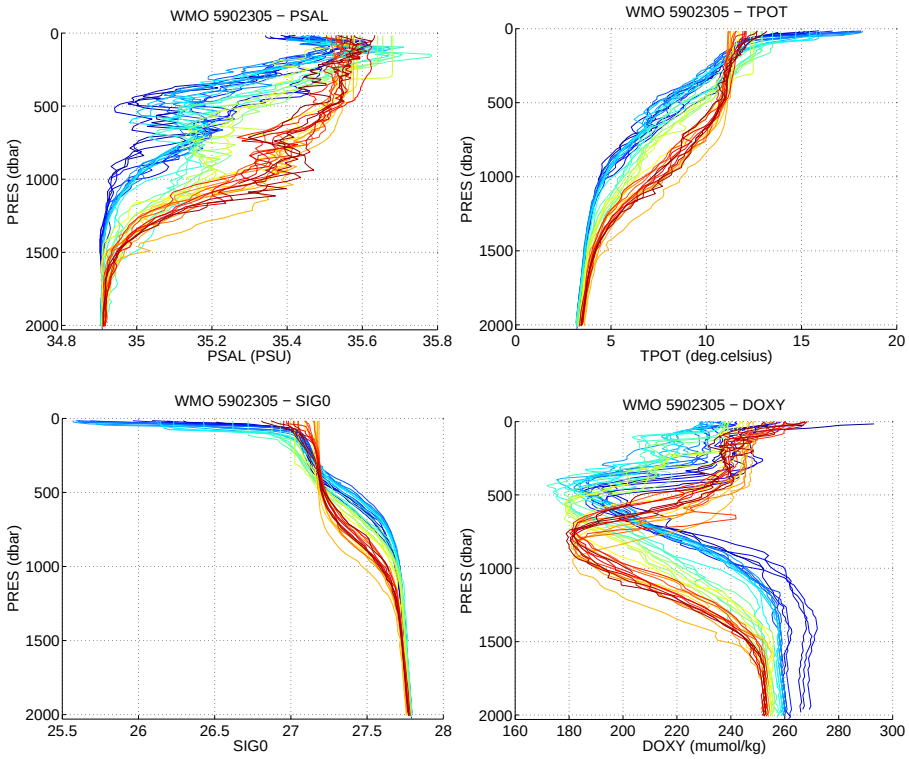


FIG. 10: Salinity, Potential Temperature, Potential Density and Oxygen profiles. Quality flags are taken into account.

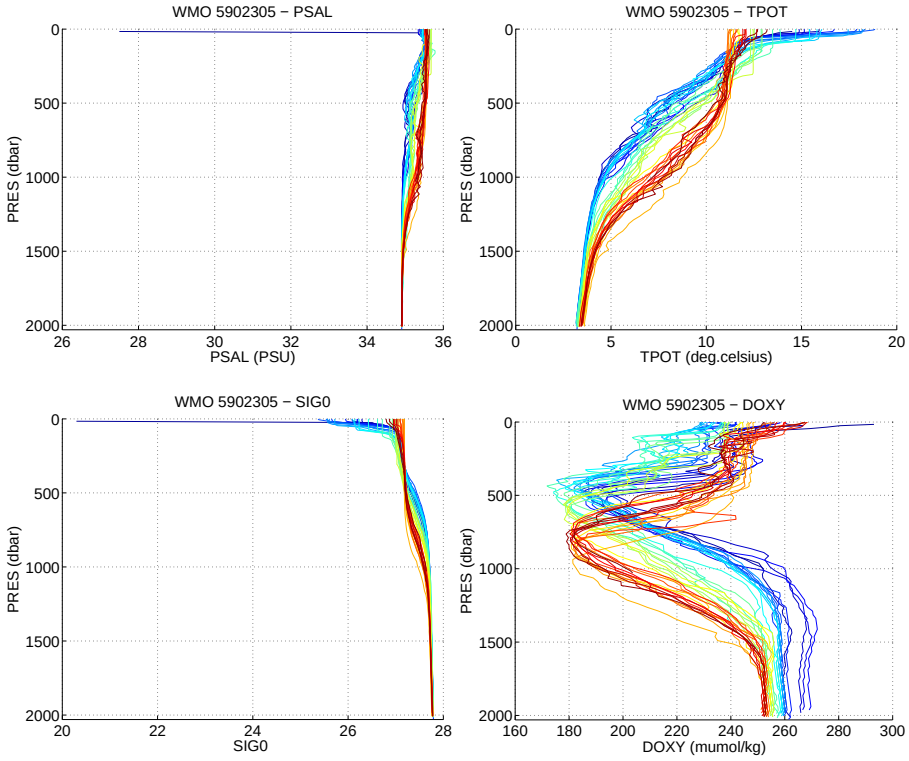


FIG. 11: Salinity, Potential Temperature, Potential Density and Oxygen profiles. Quality flags are not taken into account.

3 Comparison to the OVIDE 2010 nearest CTD profile

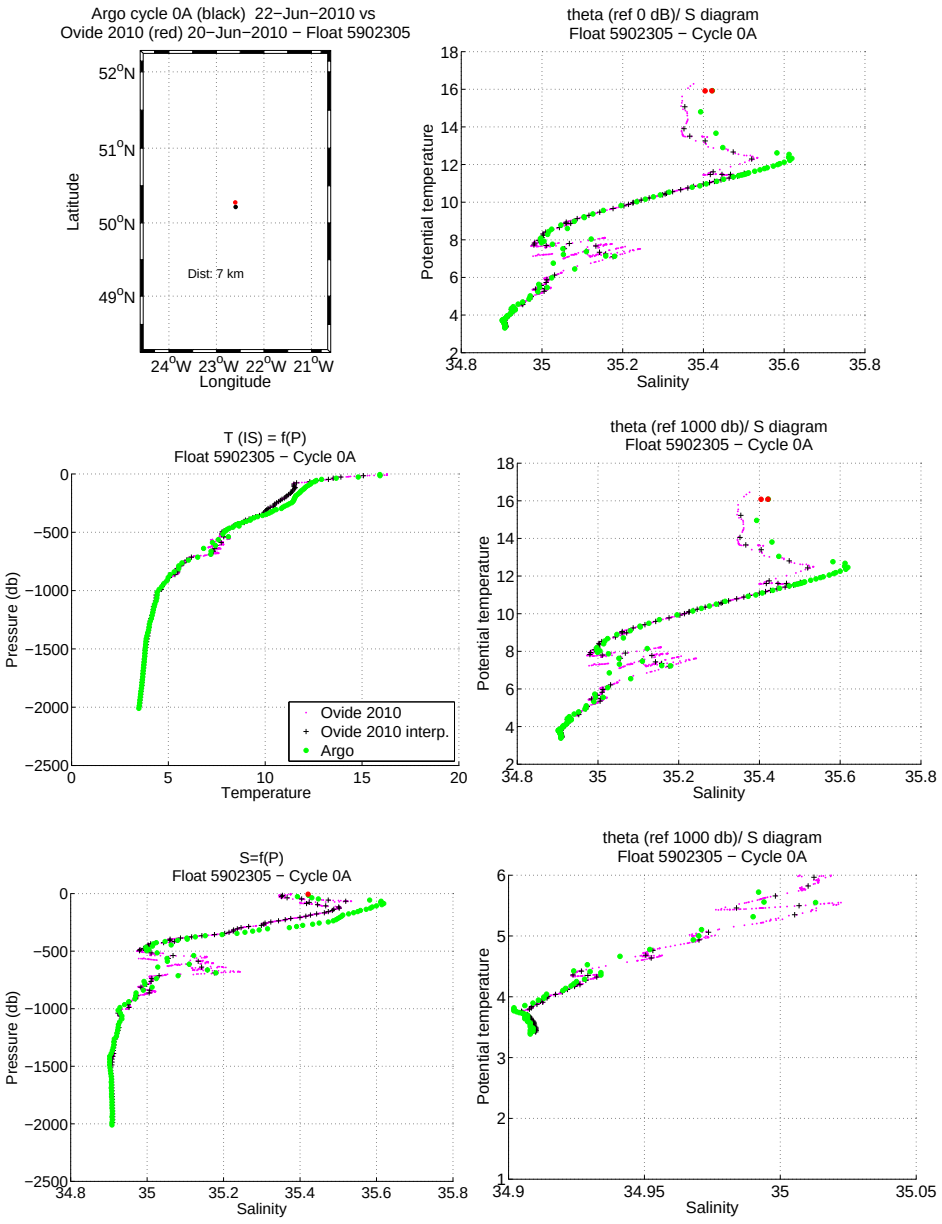


FIG. 12: Comparison of the cycle 0A with the nearest CTD profile done after the float deployment.

4 Cycle 21A - Comparaison to the nearest historical CTD profiles

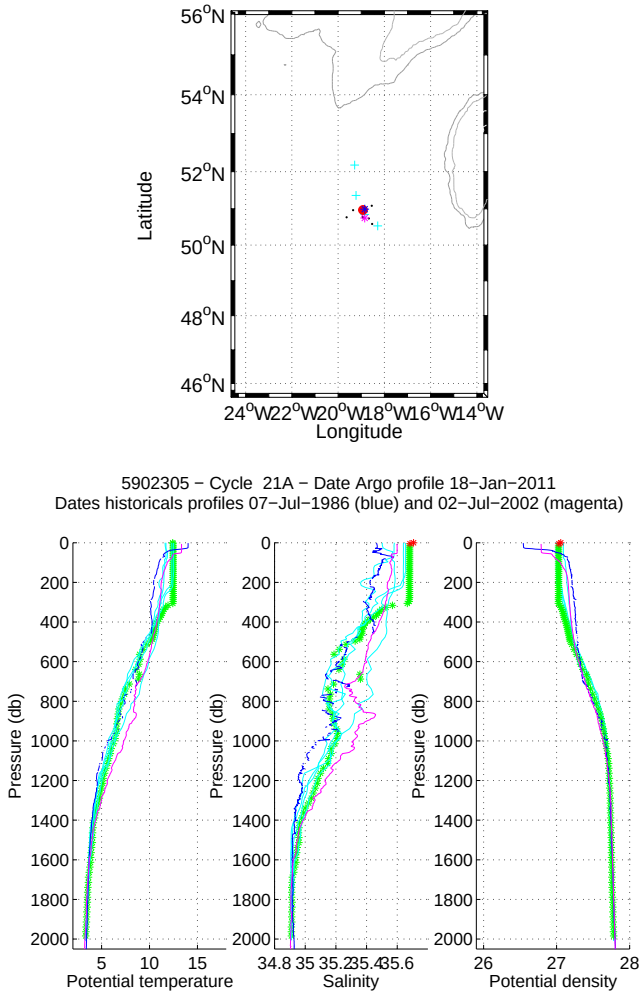


FIG. 13: Flotteur 5902305, cycle 21A. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the Argo profile (stars) and for the nearest CTD profile in time (magenta line) and for the nearest CTD 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).

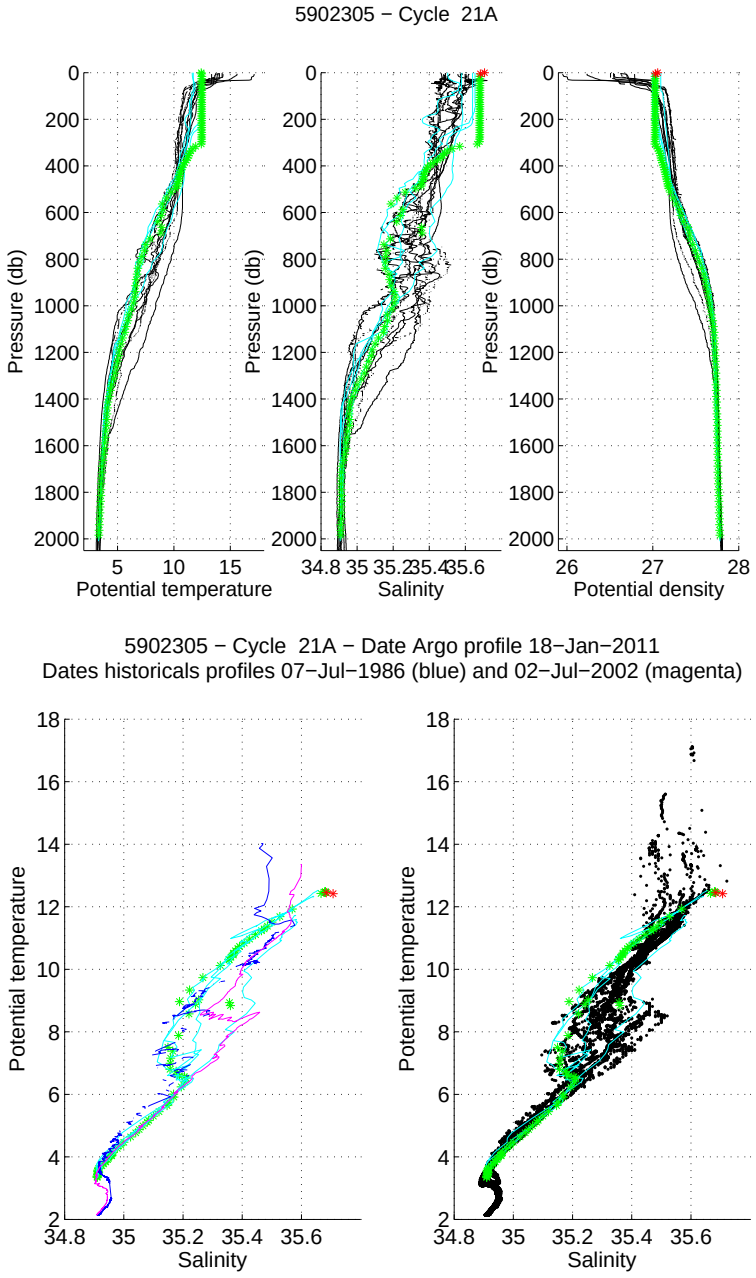


FIG. 14: Float 5902305, cycle 21A. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

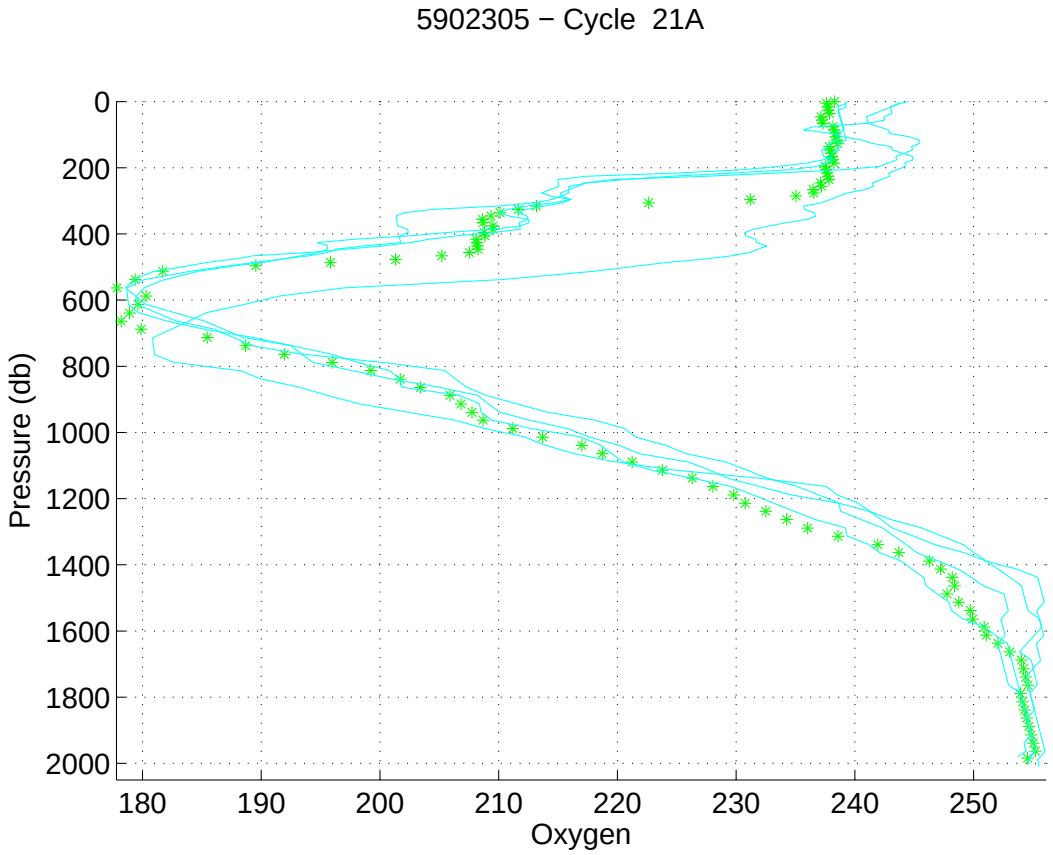


FIG. 15: Float 5902305, cycle 21A. Oxygen data.

5 Cycle 21A - Comparaison to the nearest ARGO profiles

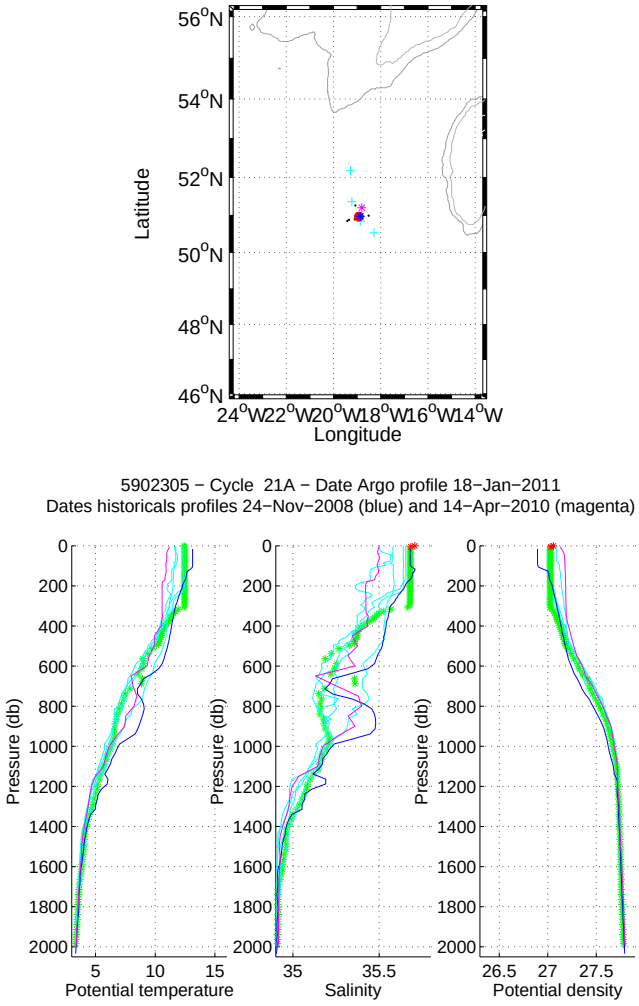


FIG. 16: Flotteur 5902305, cycle 21A. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the analysed 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 analysed 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).

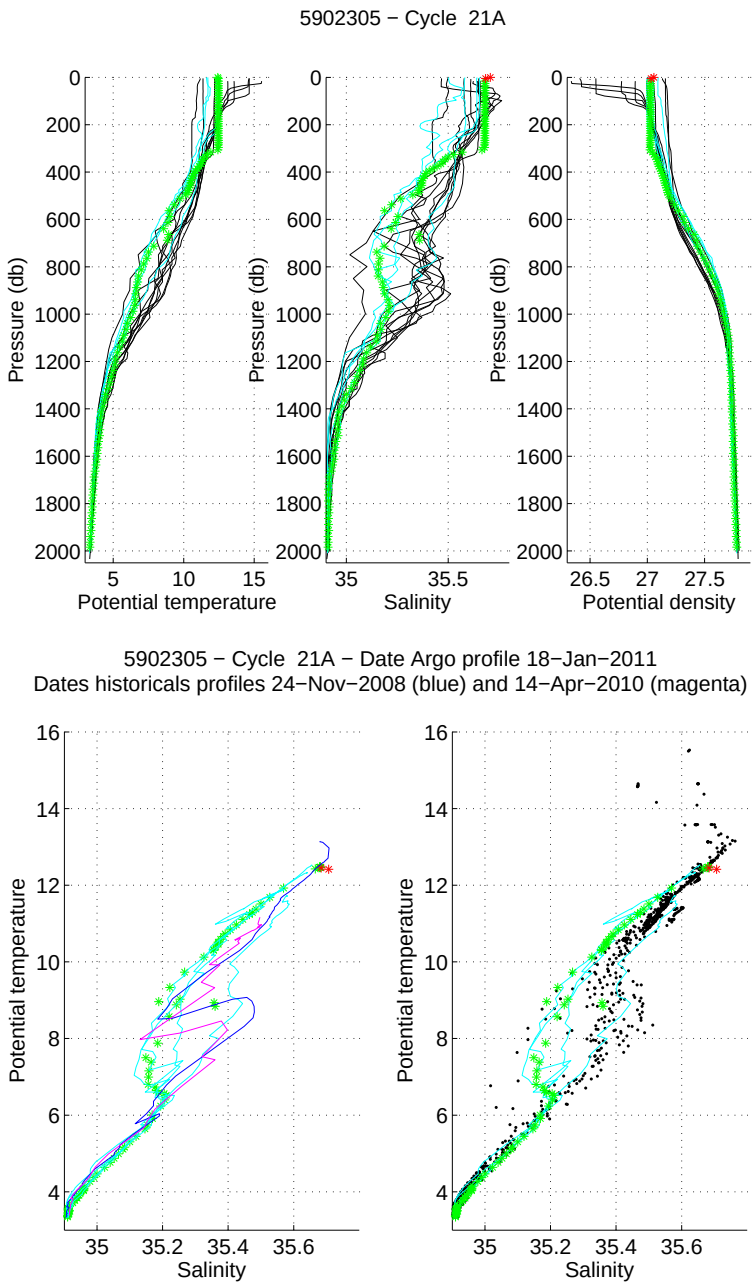


FIG. 17: Float 5902305, cycle 21A. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 32A - Comparaison to the nearest historical CTD profiles

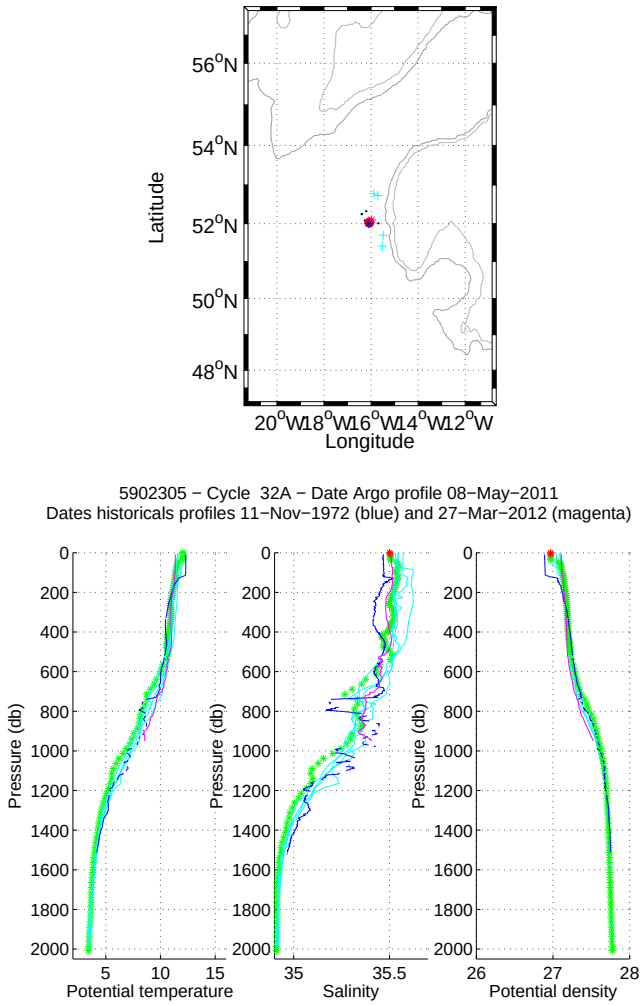


FIG. 18: Flotteur 5902305, cycle 32A. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the Argo profile (stars) and for the nearest CTD profile in time (magenta line) and for the nearest CTD 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).

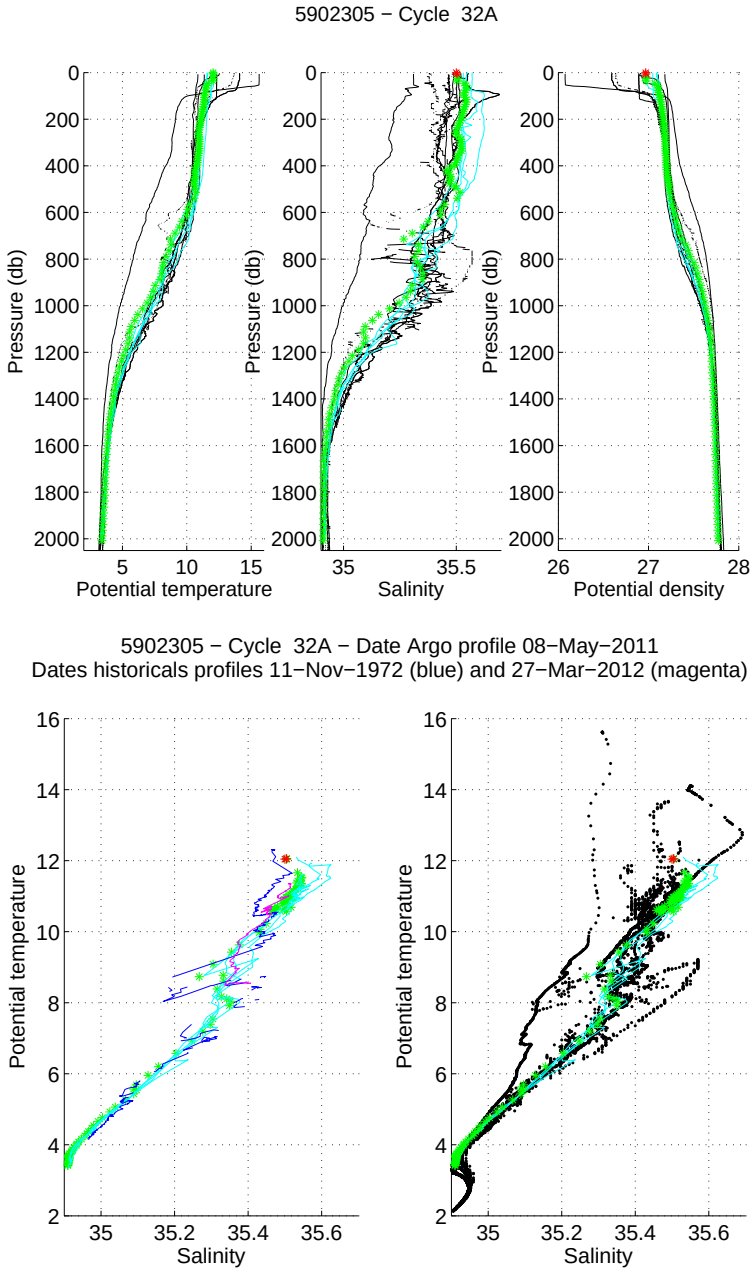


FIG. 19: Float 5902305, cycle 32A. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

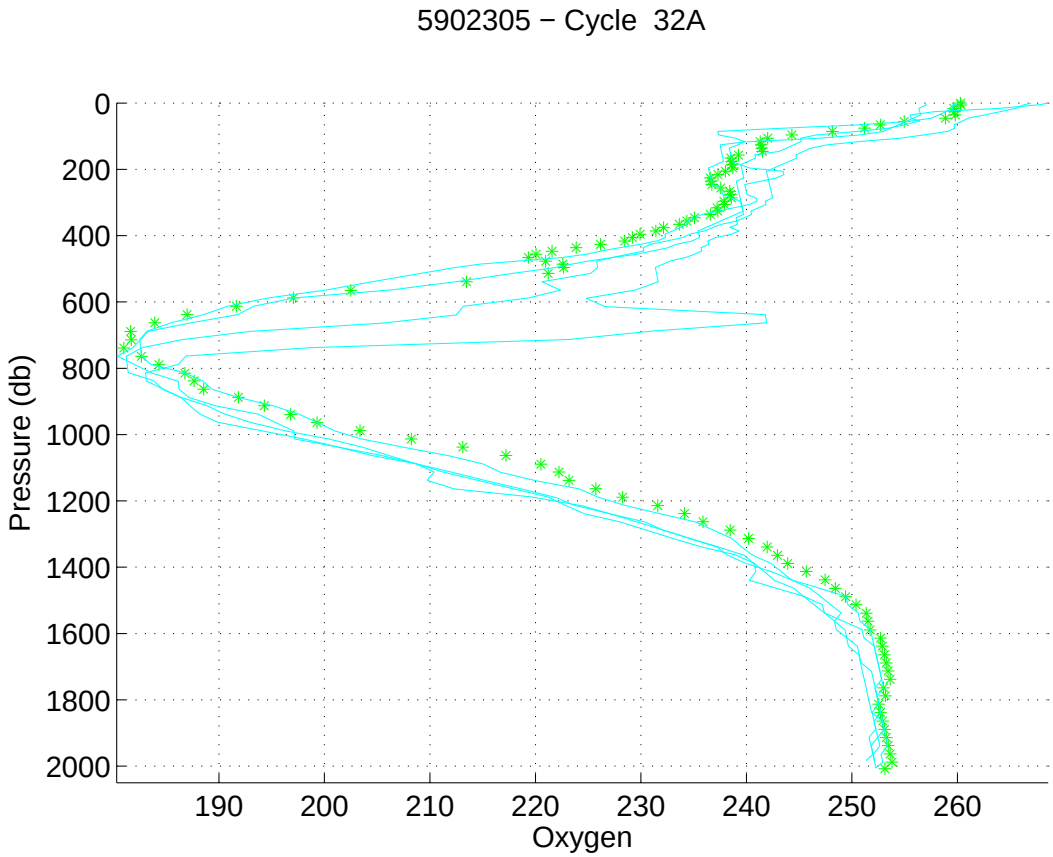


FIG. 20: Float 5902305, cycle 32A. Oxygen data.

7 Cycle 32A - Comparaison to the nearest ARGO profiles

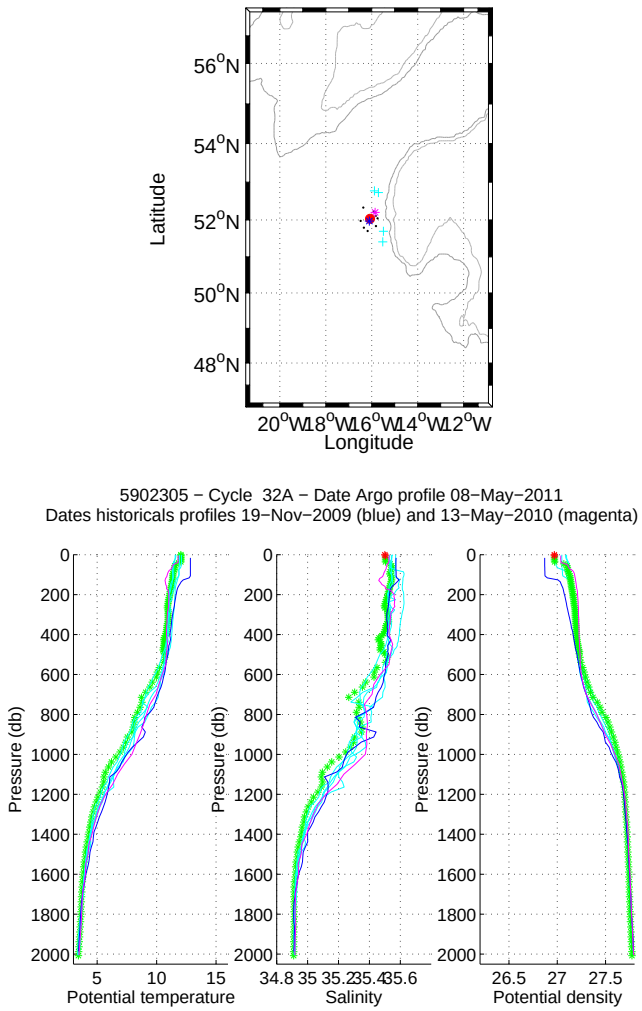


FIG. 21: Flotteur 5902305, cycle 32A. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the analysed 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 analysed 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).

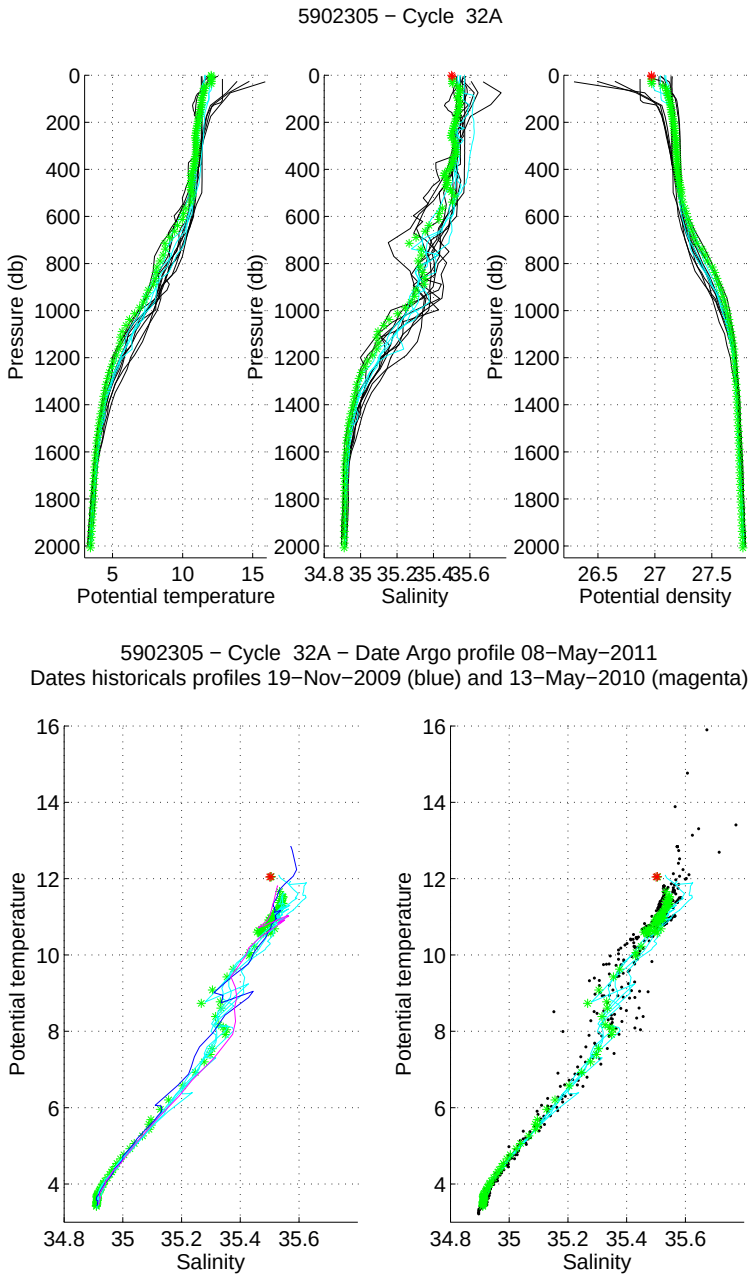


FIG. 22: Float 5902305, cycle 32A. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 34A - Comparaison to the nearest historical CTD profiles

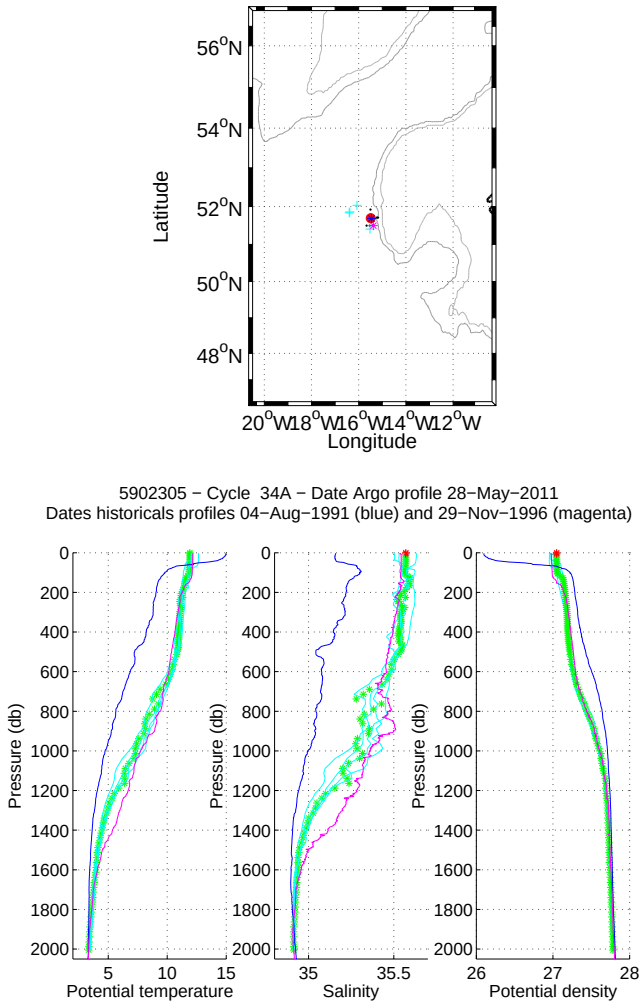


FIG. 23: Flotteur 5902305, cycle 34A. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the Argo profile (stars) and for the nearest CTD profile in time (magenta line) and for the nearest CTD 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).

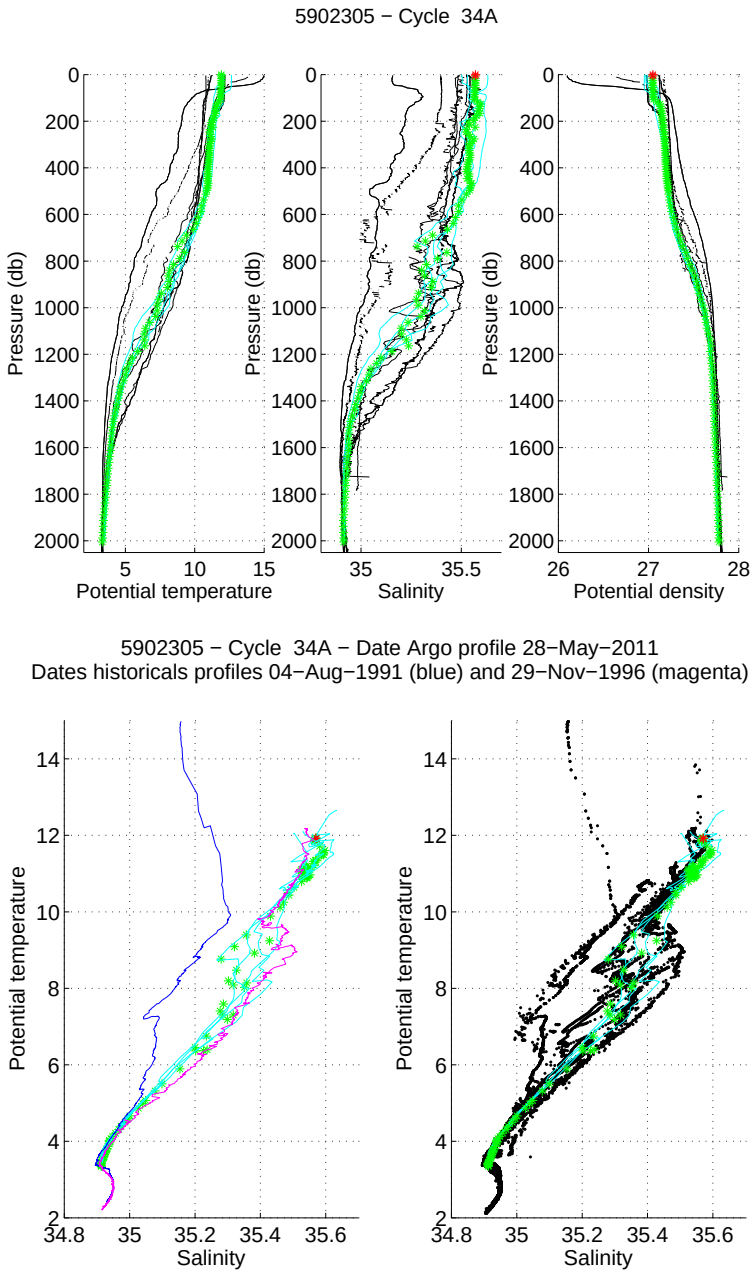


FIG. 24: Float 5902305, cycle 34A. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

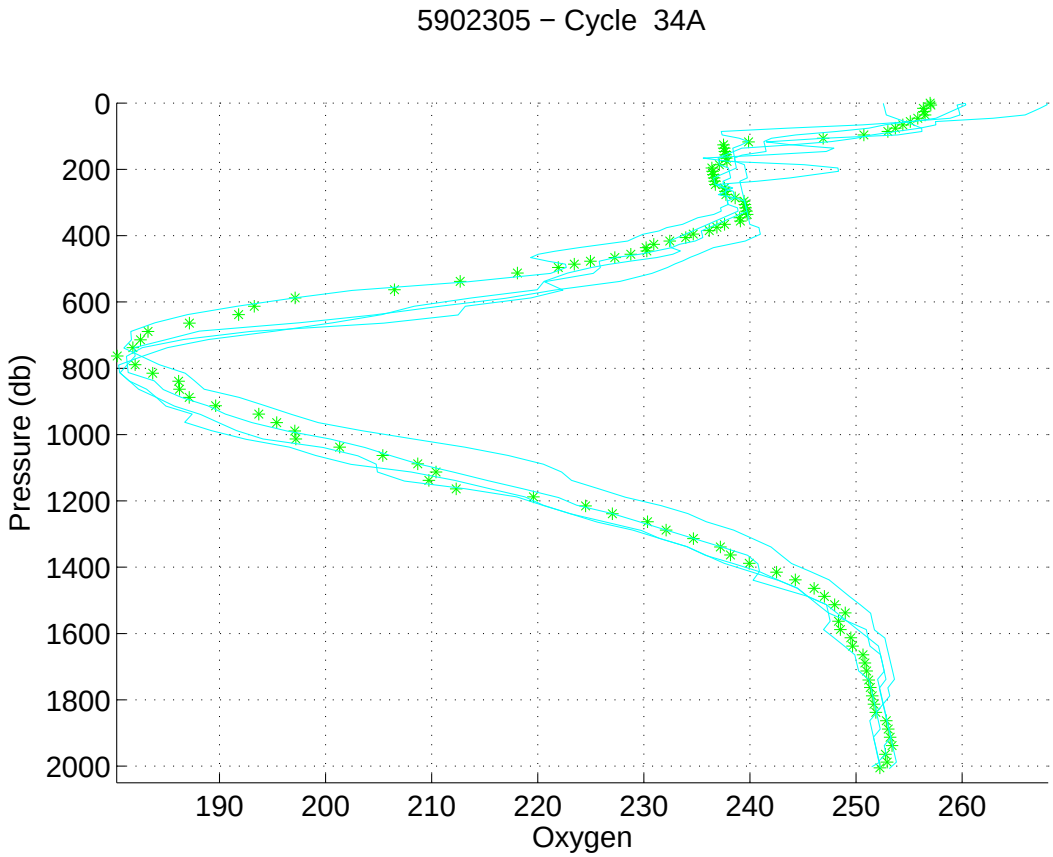


FIG. 25: Float 5902305, cycle 34A. Oxygen data.

9 Cycle 34A - Comparaison to the nearest ARGO profiles

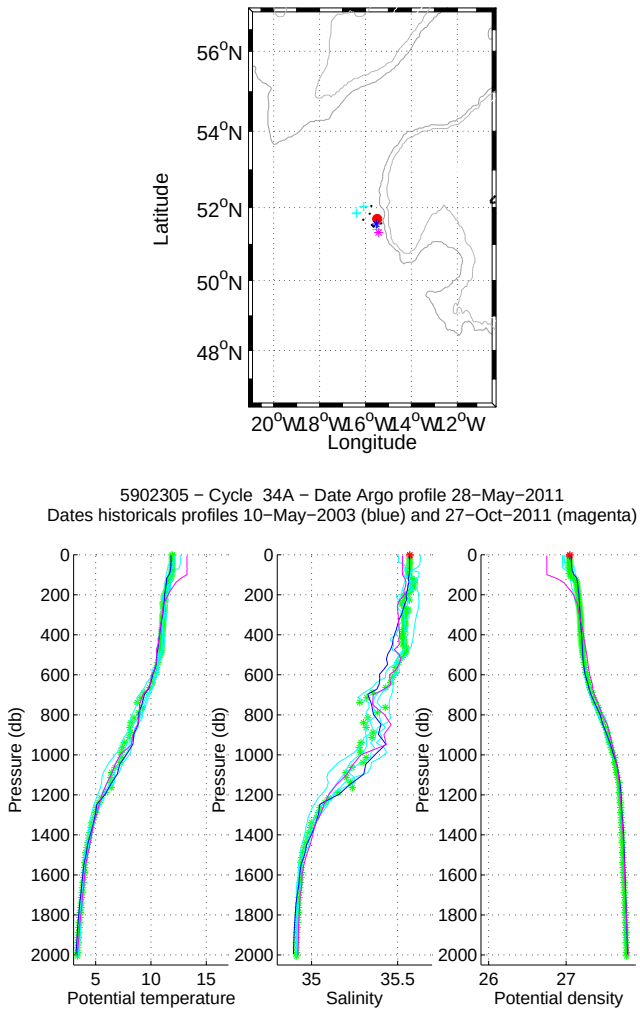


FIG. 26: Flotteur 5902305, cycle 34A. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the analysed 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 analysed 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).

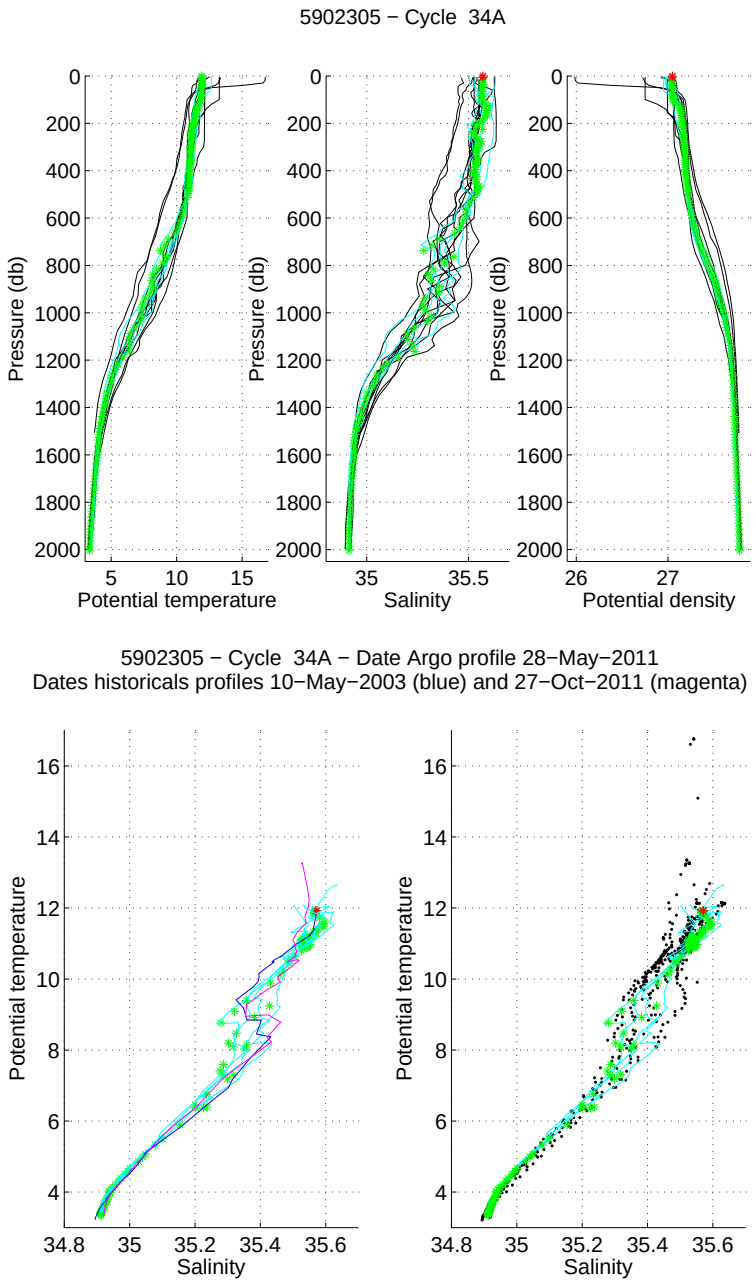


FIG. 27: Float 5902305, cycle 34A. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 Cycle 36A - Comparaison to the nearest historical CTD profiles

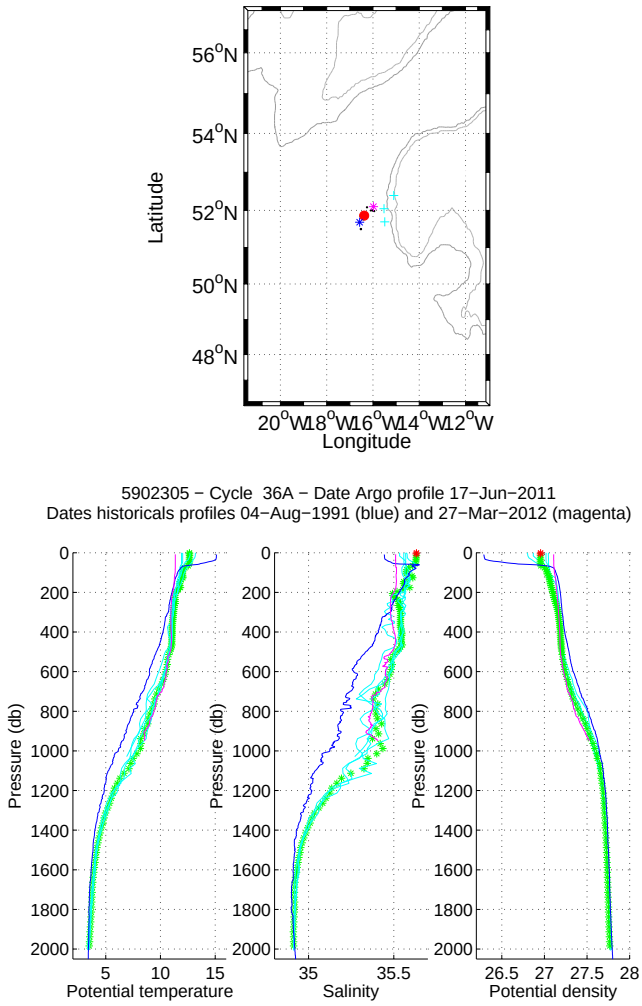


FIG. 28: Flotteur 5902305, cycle 36A. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the Argo profile (stars) and for the nearest CTD profile in time (magenta line) and for the nearest CTD 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).

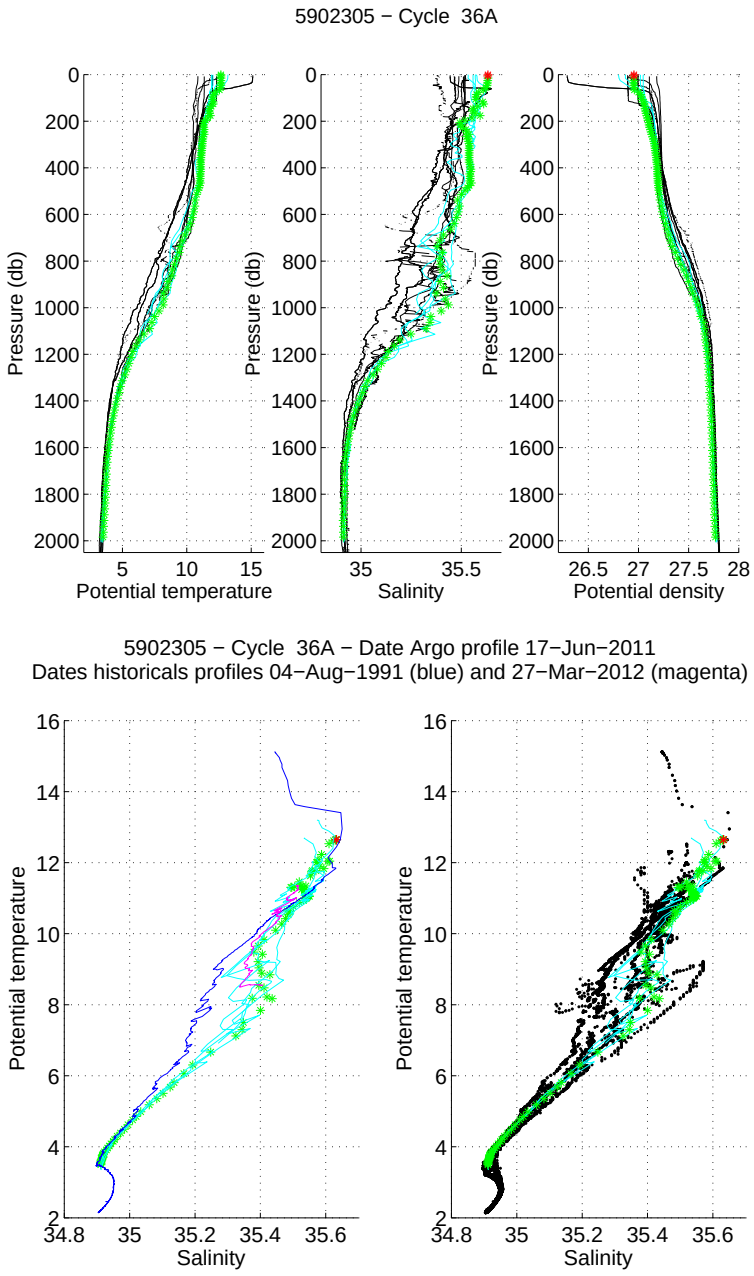


FIG. 29: Float 5902305, cycle 36A. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1 ; blue 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.

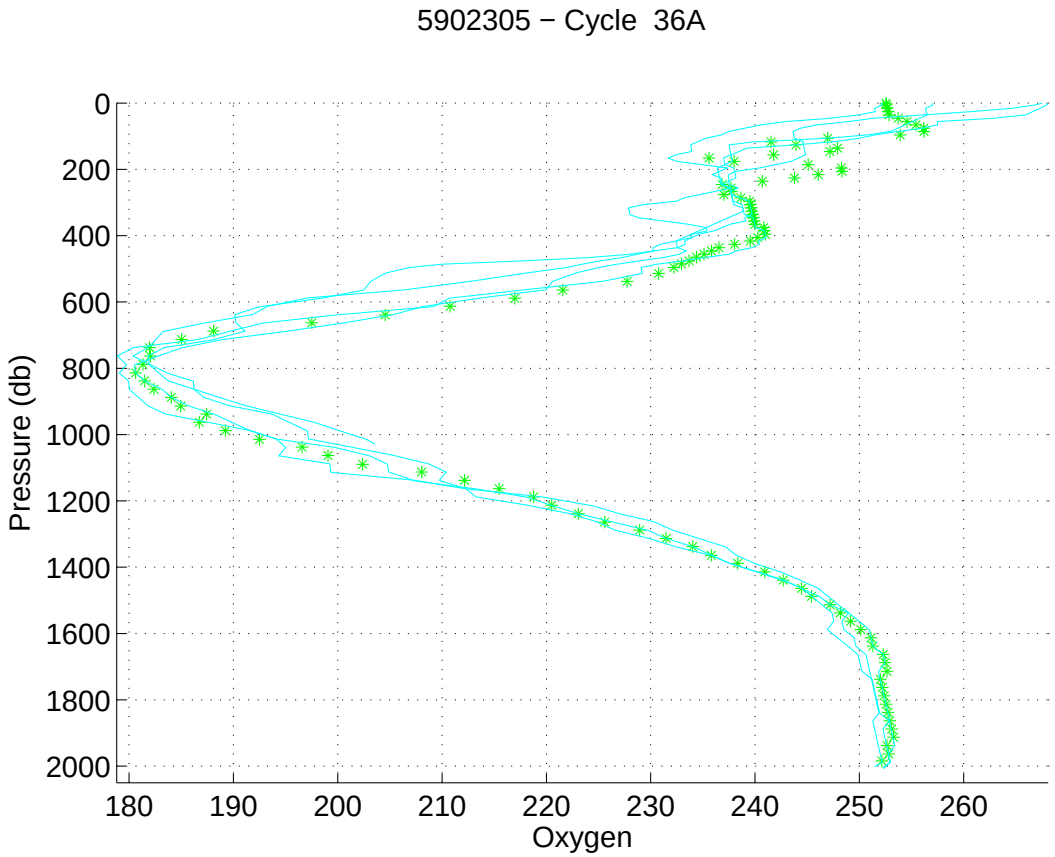


FIG. 30: Float 5902305, cycle 36A. Oxygen data.

11 Cycle 36A - Comparaison to the nearest ARGO profiles

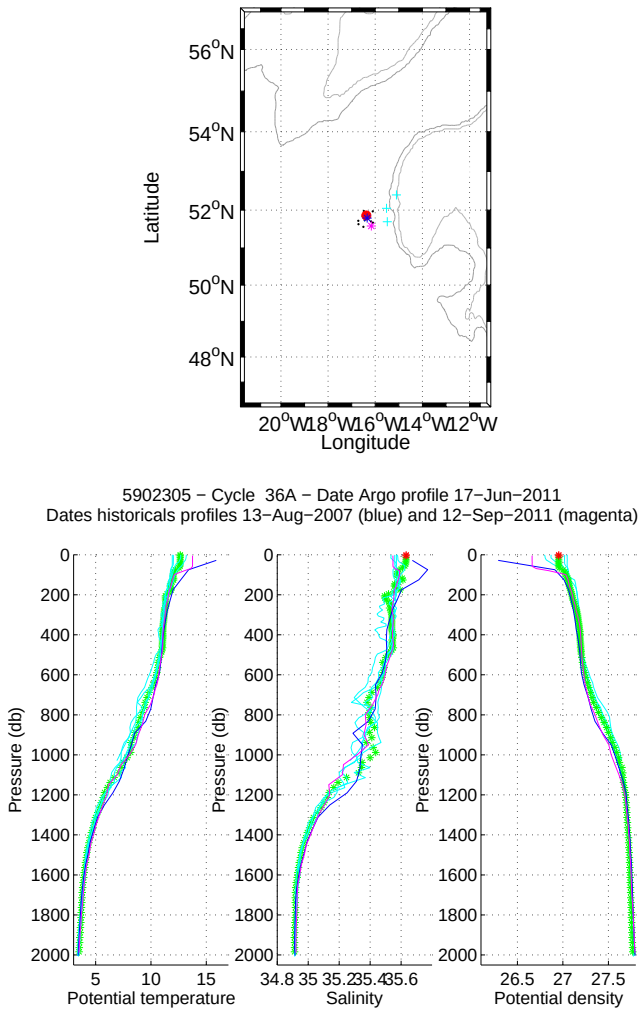


FIG. 31: Flotteur 5902305, cycle 36A. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure for the analysed 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 analysed 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).

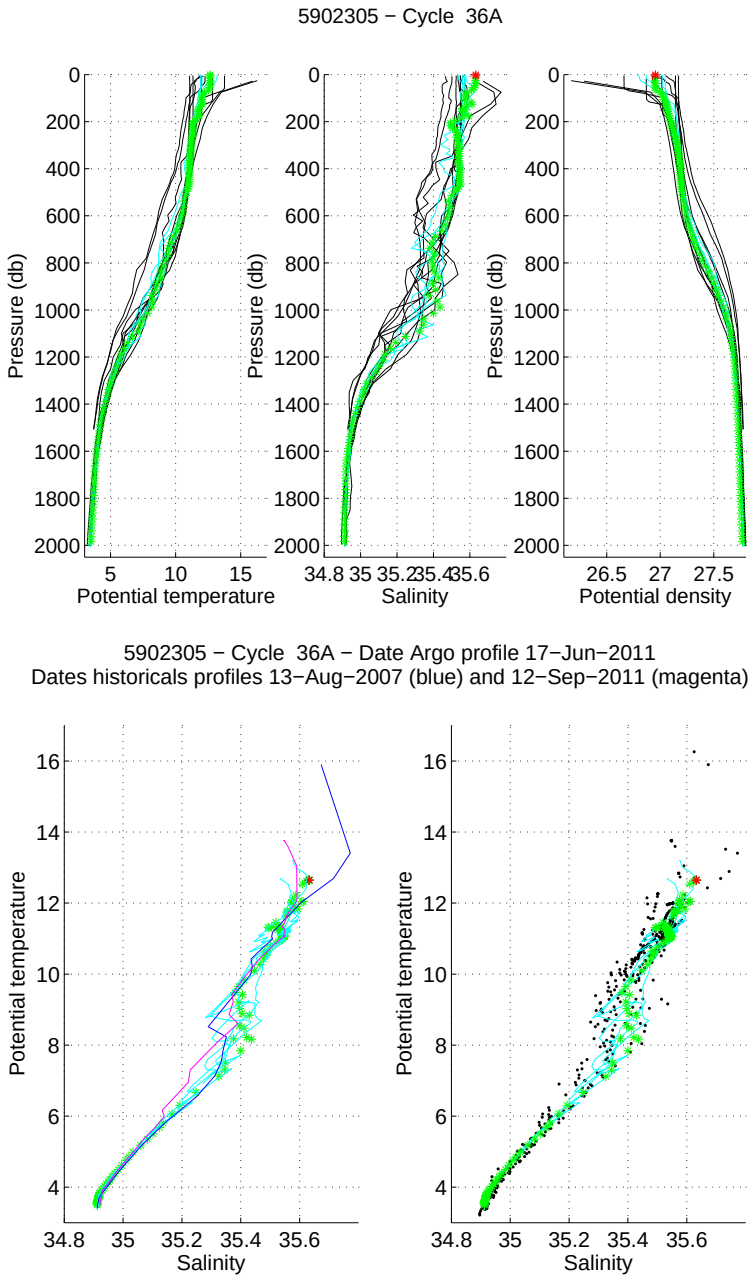


FIG. 32: Float 5902305, cycle 36A. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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.

12 OW method, CONFIGURATION # 1

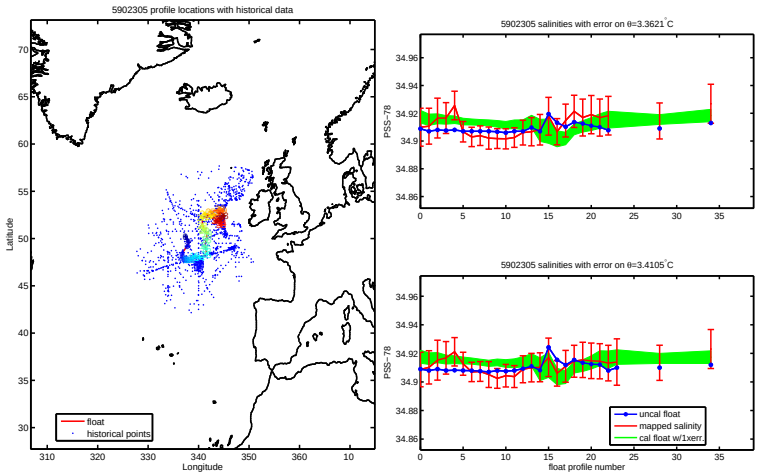


FIG. 33: Figures from the OW method. (Left) Position of the historical and float data. (Right) Comparison, on various θ levels, between the float data and the historical data interpolated at the float position.

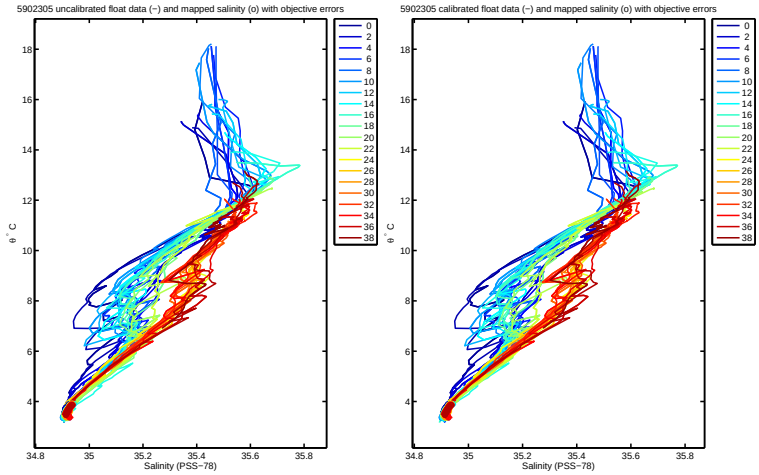


FIG. 34: Figures from the OW method. Compararison of the θ/S diagram of the float with the historial database. (left) raw data ; (right) corrected data using the OW correction.

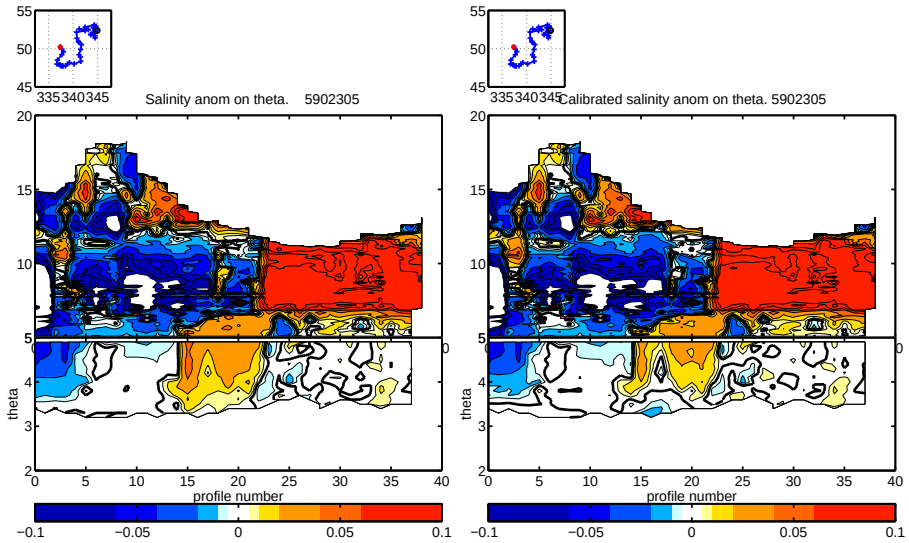


FIG. 35: Figures from the OW method. Salinity anomaly :(left) raw data ; (right) corrected data using the OW correction .

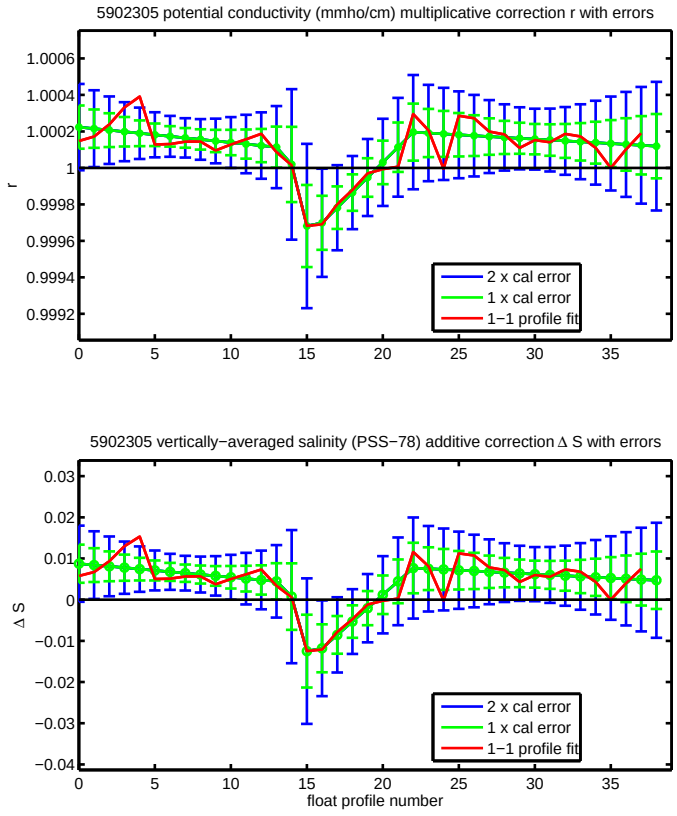


FIG. 36: Correction proposed by the OW method.

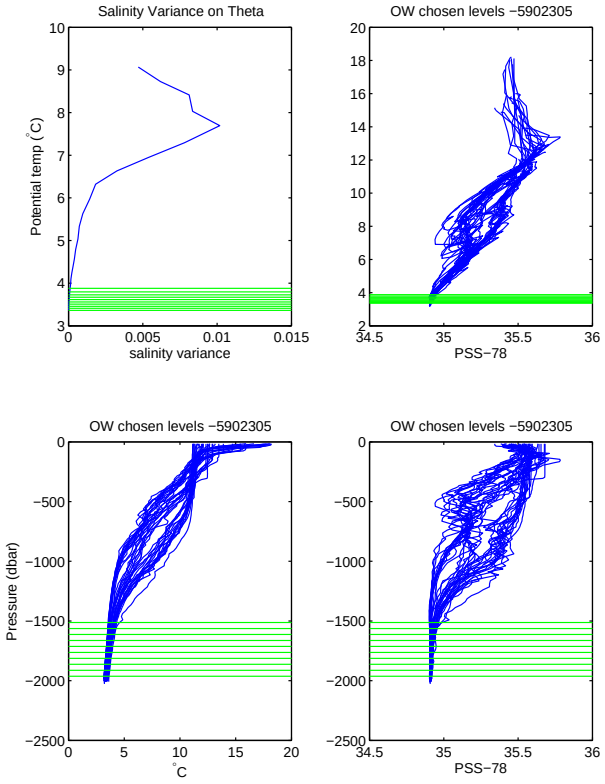


FIG. 37: Chosed levels by the OW method.

13 OW method, CONFIGURATION # 3

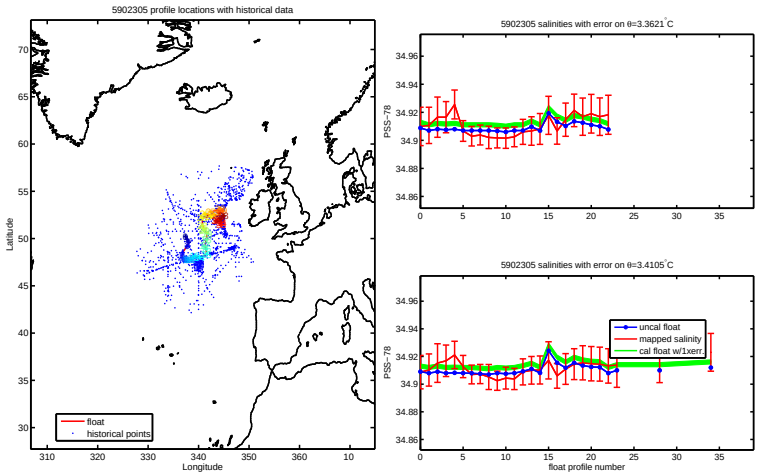


FIG. 38: Figures from the OW method. (Left) Position of the historical and float data. (Right) Comparison, on various θ levels, between the float data and the historical data interpolated at the float position.

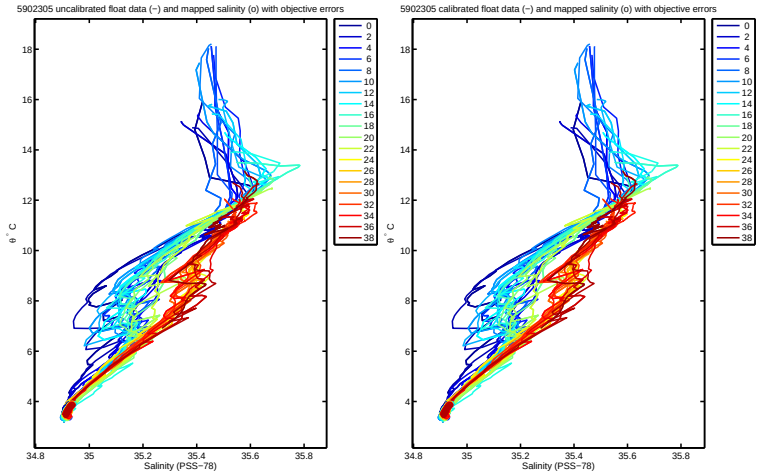


FIG. 39: Figures from the OW method. Compararison of the θ/S diagram of the float with the historial database. (left) raw data ; (right) corrected data using the OW correction.

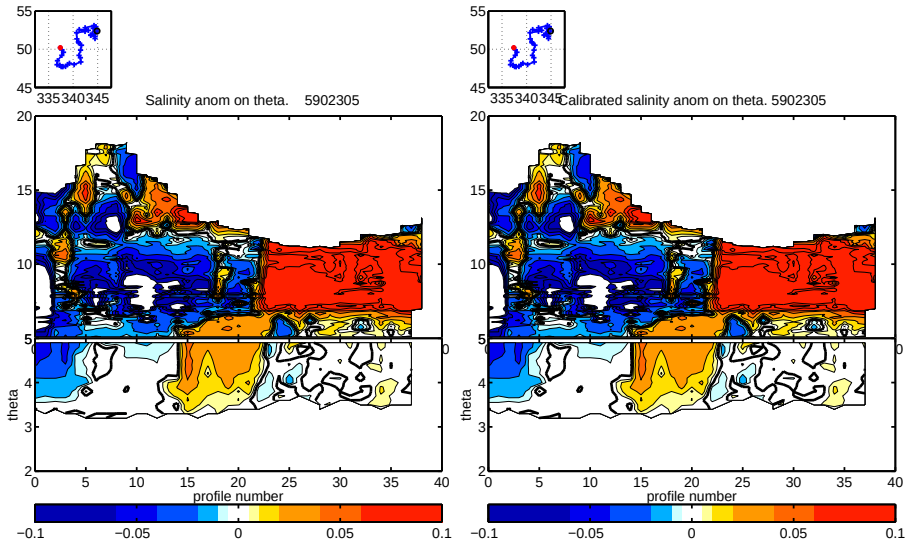


FIG. 40: Figures from the OW method. Salinity anomaly :(left) raw data ; (right) corrected data using the OW correction .

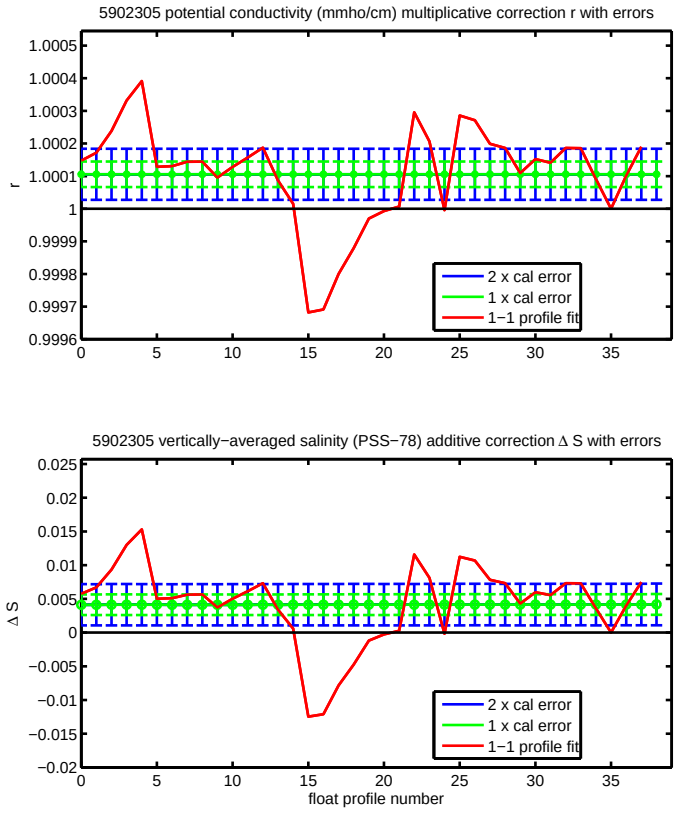


FIG. 41: Correction proposed by the OW method.

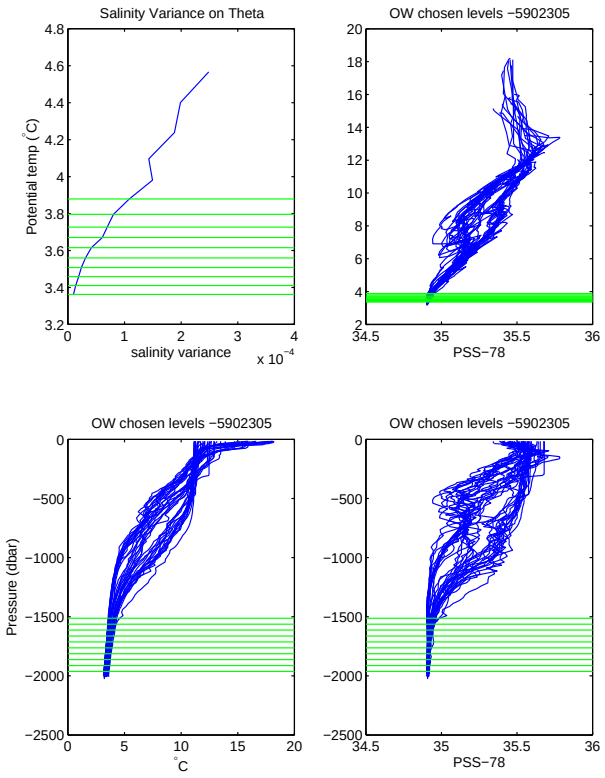


FIG. 42: Chosed levels by the OW method.

14 OW method, CONFIGURATION # 127

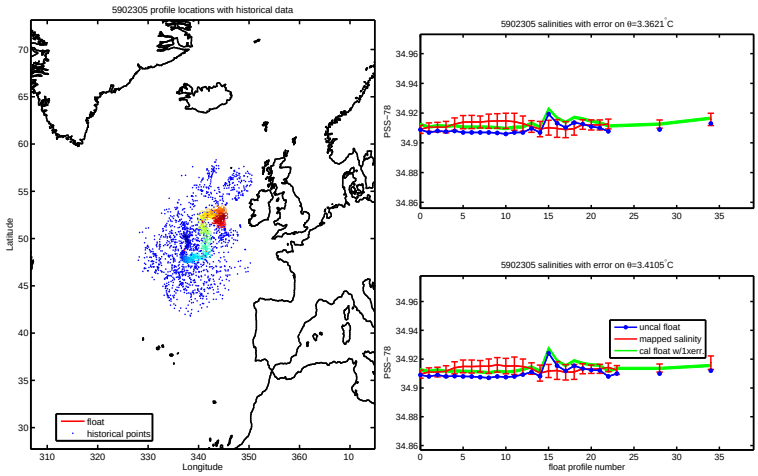


FIG. 43: Figures from the OW method. (Left) Position of the historical and float data. (Right) Comparison, on various θ levels, between the float data and the historical data interpolated at the float position.

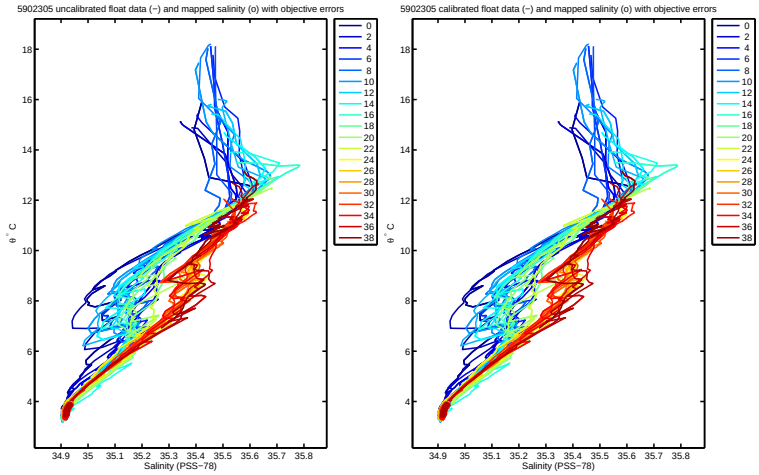


FIG. 44: Figures from the OW method. Compararison of the θ/S diagram of the float with the historial database. (left) raw data ; (right) corrected data using the OW correction.

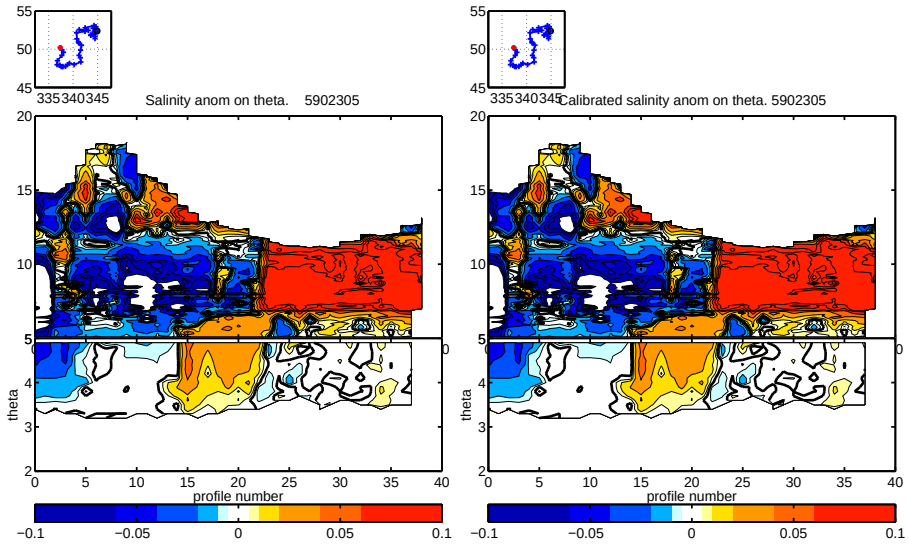


FIG. 45: Figures from the OW method. Salinity anomaly :(left) raw data ; (right) corrected data using the OW correction .

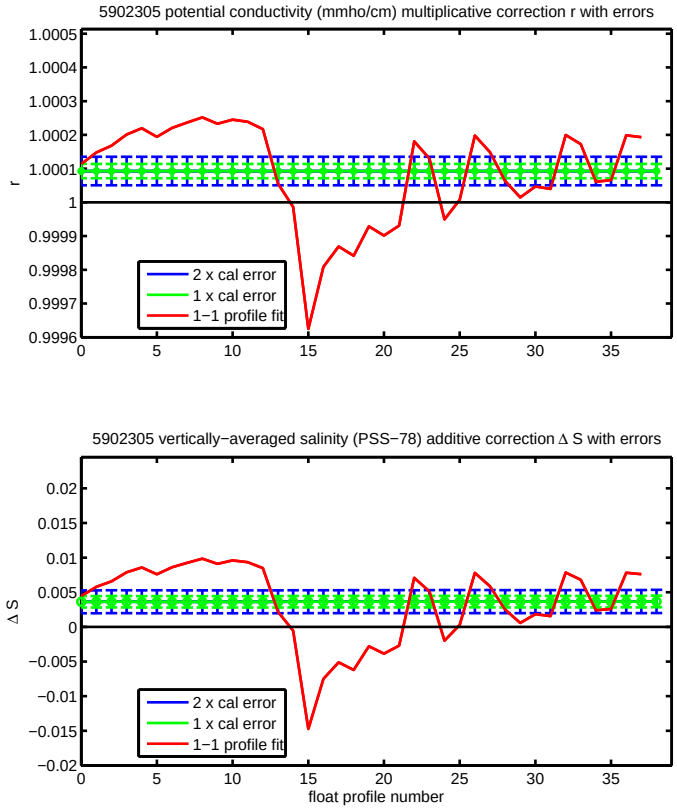


FIG. 46: Correction proposed by the OW method.

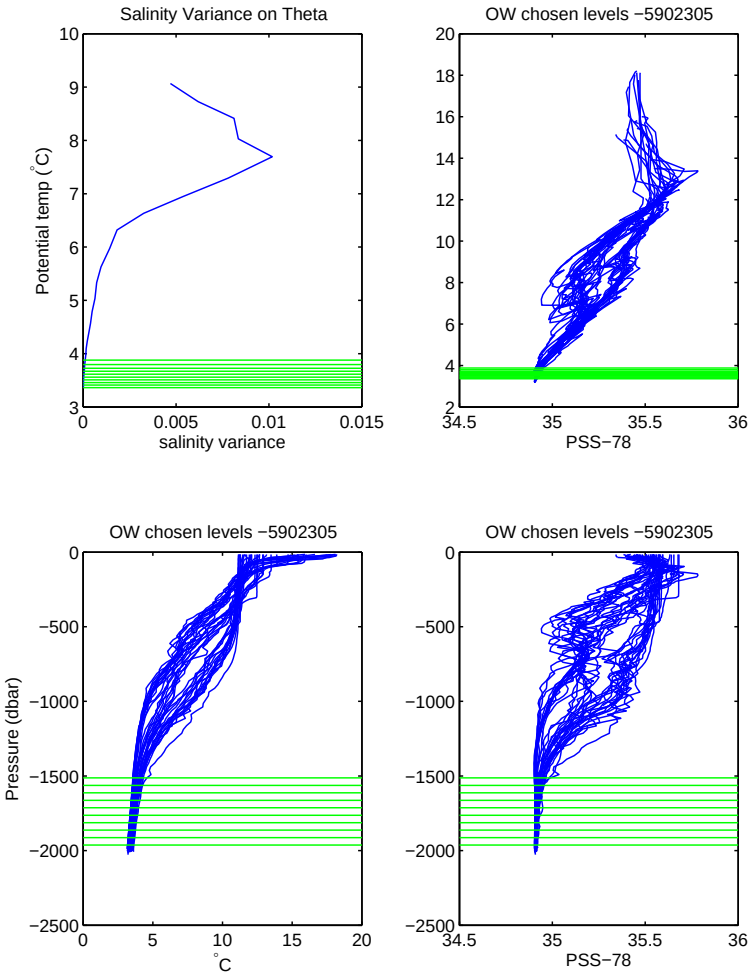


FIG. 47: Chosed levels by the OW method.

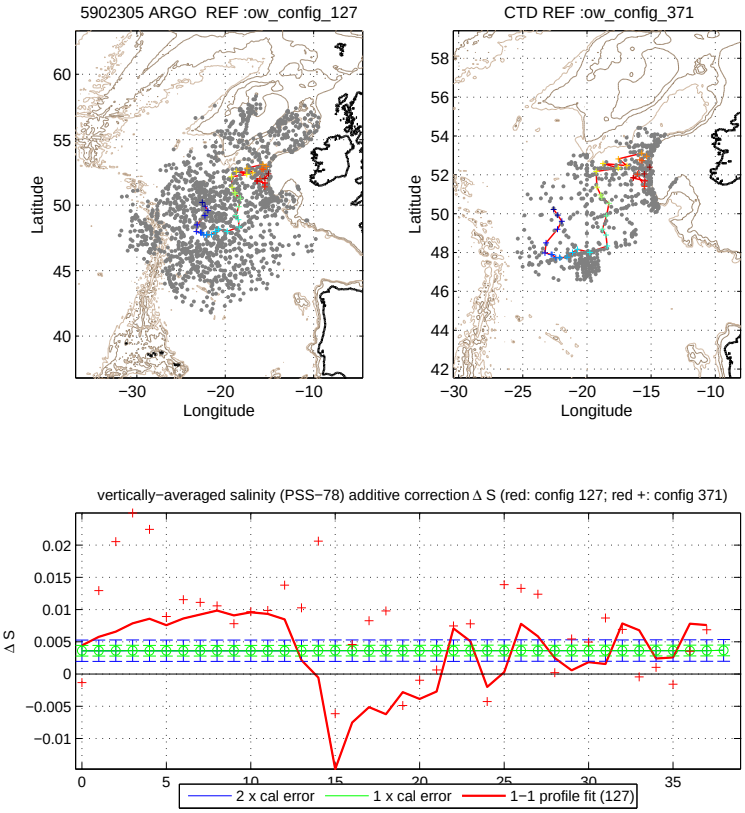


FIG. 48: Summary of the result obtained by the 2 OW methods. 127 : CTD+ARGO (left) ; 371 : CTD(right).