Rapport interne LPO/15-12

UMR 6523 **Laboratoire de Physique des Océans**	**DELAYED MODE QUALITY CONTROL OF OVIDE ARGO DATA** **FLOAT WMO 6900395**	
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Carole Despinoy (ODE/LPO)

DELAYED MODE QUALITY CONTROL OF OVIDE ARGO DATA FLOAT WMO 6900395

Internal Report LPO 15-12

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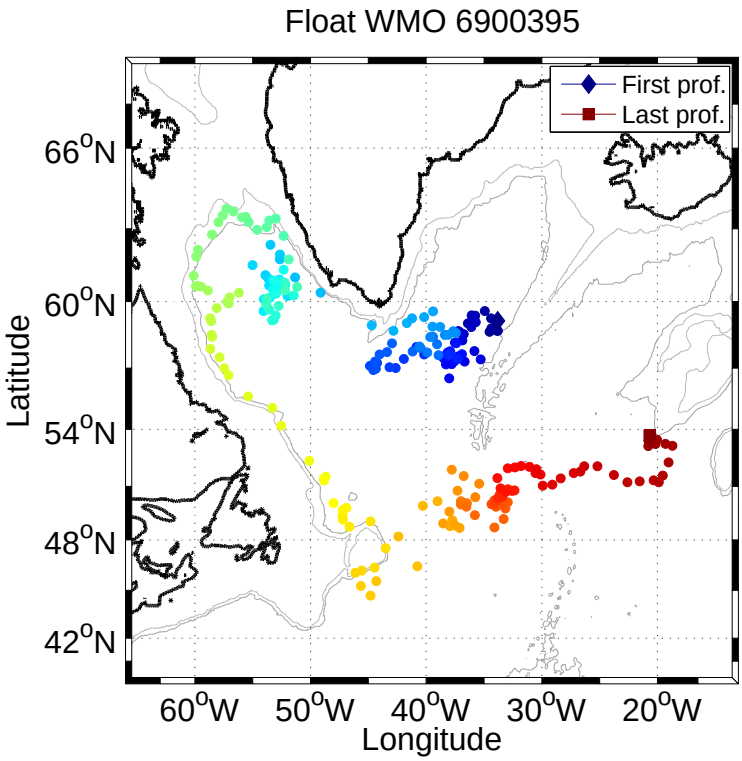
January 4, 2016



1 Presentation and DMQC summary

Number	Deployment (cycle OD) cycle OD	Last cycle 228
Provor WMO 6900395	13/06/2006 6h 30	
CTS3 05-S3-26	59.112 N 33.855 W	
Date of control	Float status	Last cycle
May 2010	Active	06/05/2010 (142)
Coriolis transmission		17/05/2010
Date of last control	Float status	Last cycle
October 2015	DEAD	12/09/2012
Coriolis transmission		28/10/2015

Table 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 transmissio
0D-28A,45A,52A	PRES	all	0	1		30/07/08
19A,21A,28A,30A	TEMP,PSAL	first leve	1	4	density inversion	30/07/08
85A	PSAL	all	3	1		06/05/2010
121A	TEMP	the 5 last levels	3	1		06/05/2010
all cycles (except 0D,15A, 78A,89A,136A)	PSAL	surface (Pres inf. 5)	1	4	untrustable data	06/05/2010
147A,179A	PSAL,TEMP	differences with historical profiles				oct. 2015

Table 2: Float 6900395. Summary of the modifications of the real-time QC flags and of the interesting or suspicous data.

Warning : the resolution is equal to 50 dbar from the surface to 500 dbar, then 60 dbar from 500 to 2000 dbar. Salinity data between 0 and 5 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 measurement. 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 129.

OW CONFIGURATION	129
CONFIG_MAX_CASTS	250
MAP_USE_PV	1
MAP_USE_PV_ELLIPSE	1
MAP_USE_FACTEUR	1
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
MAP_P_EXCLUDE	500
MAP_P_DELTA	250
Reference data base	CTD and ARGO

Table 3: Parameters of the OW method.

2 Data

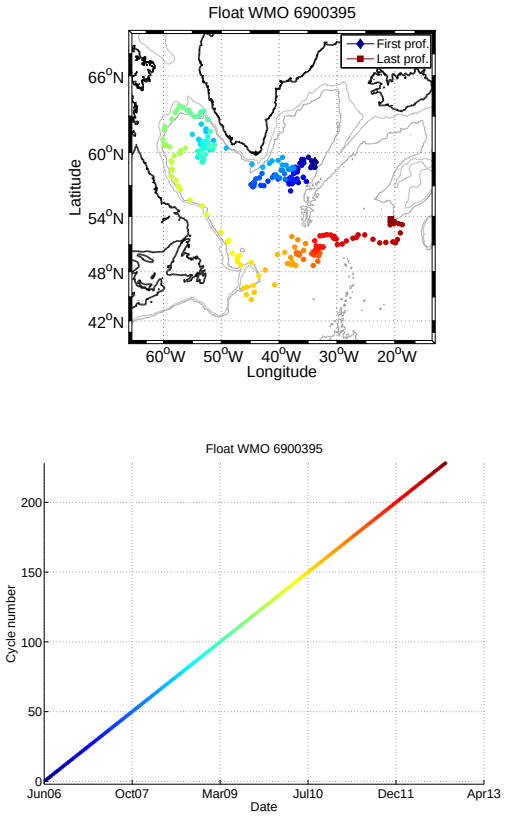


Figure 1: Profiles position and relationship between cycle number, date and color.

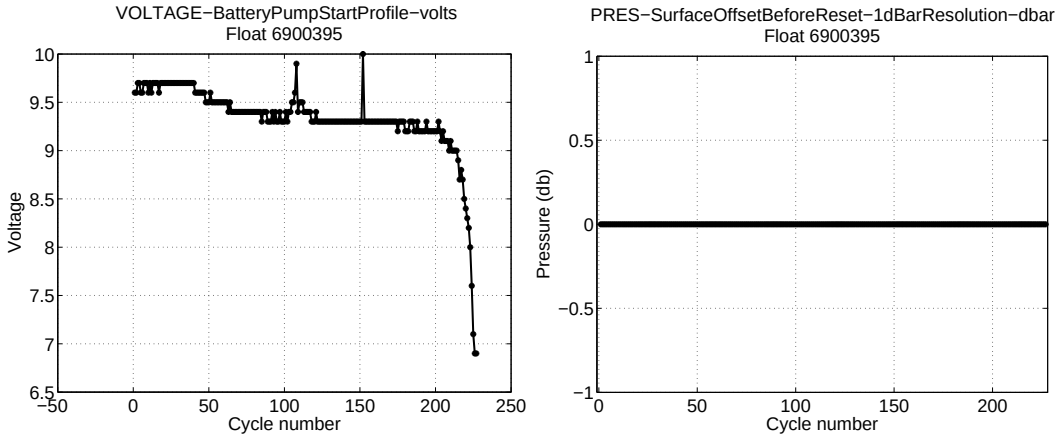


Figure 2: Battery Voltage and Surface Pressure

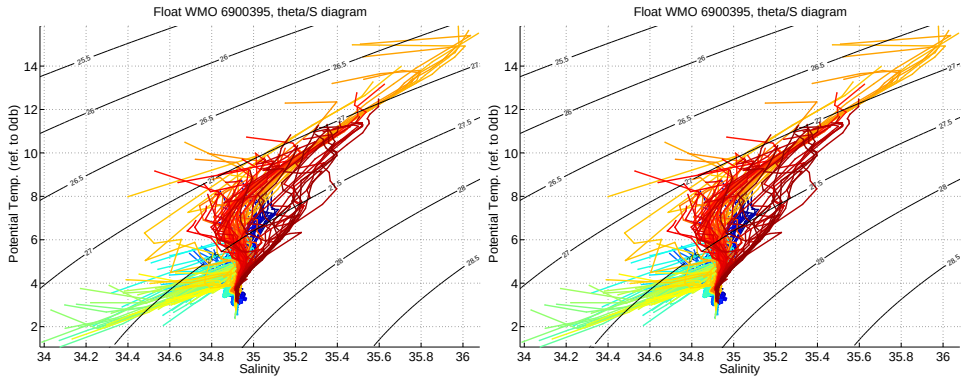


Figure 3: θ/S diagrams. (Left panel) Flags are not taken into account. (Right panel) Quality flags are taken into account.

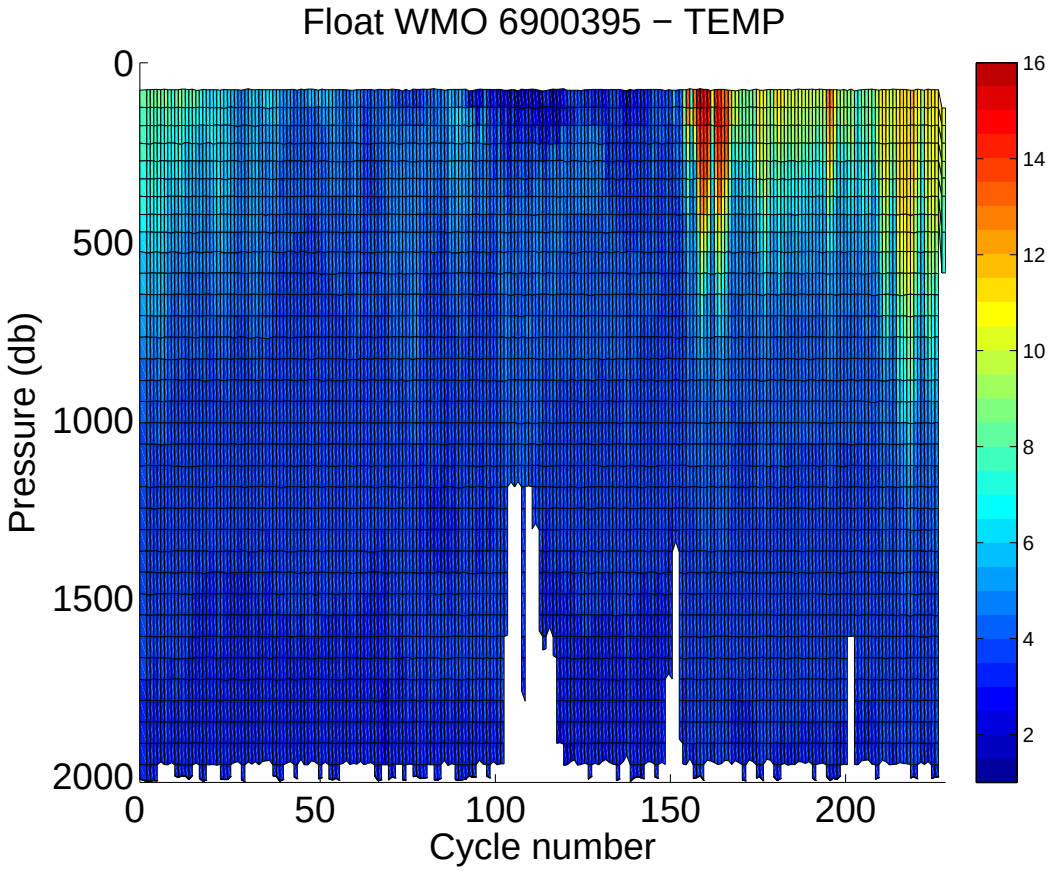


Figure 4: Temperature section along the float trajectory. Quality flags are not taken into account.

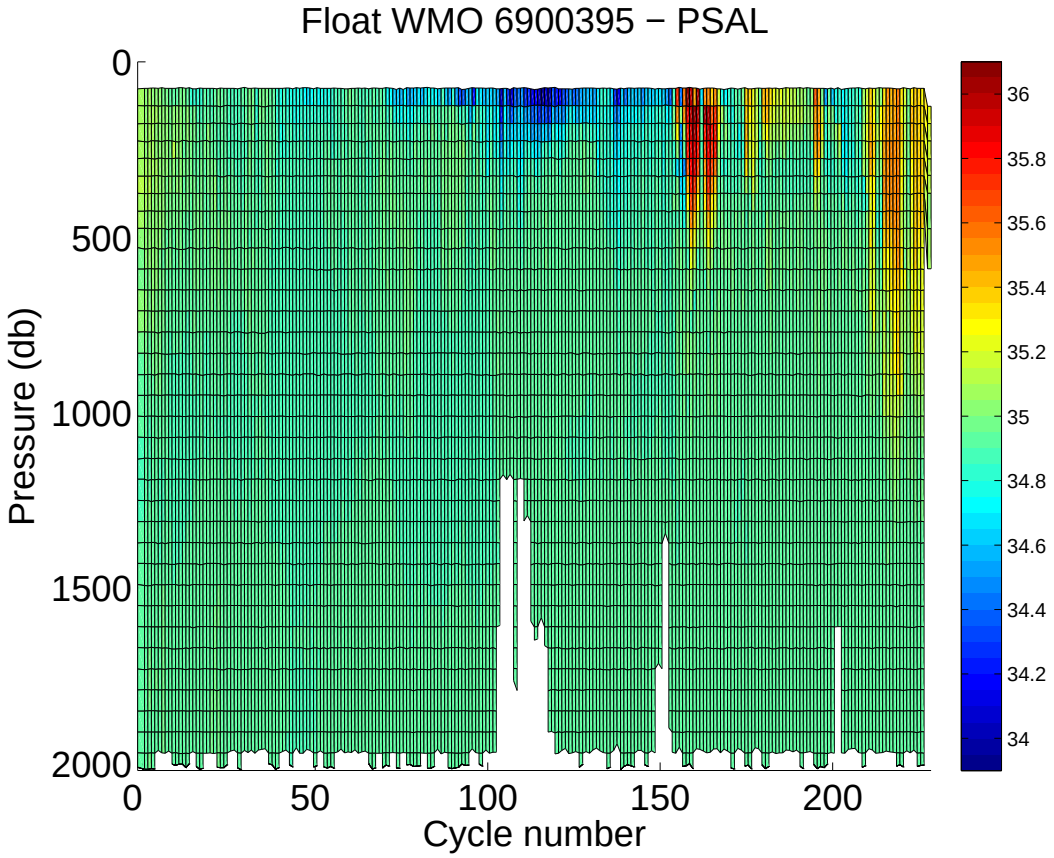


Figure 5: Salinity section along the float trajectory. Quality flags are not taken into account.

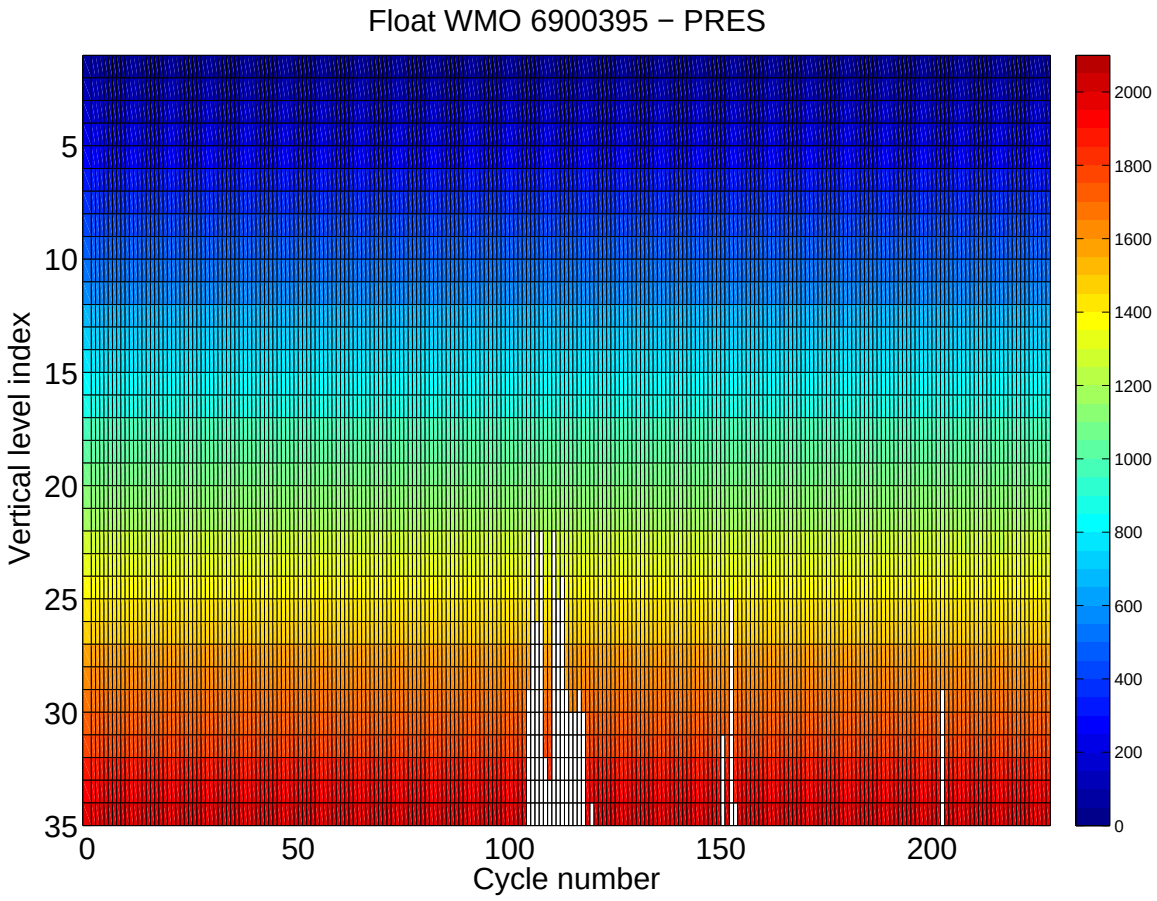


Figure 6: Pression as fonction of cycle number and vertical level index along the float trajectory. Quality flags are taken into account.

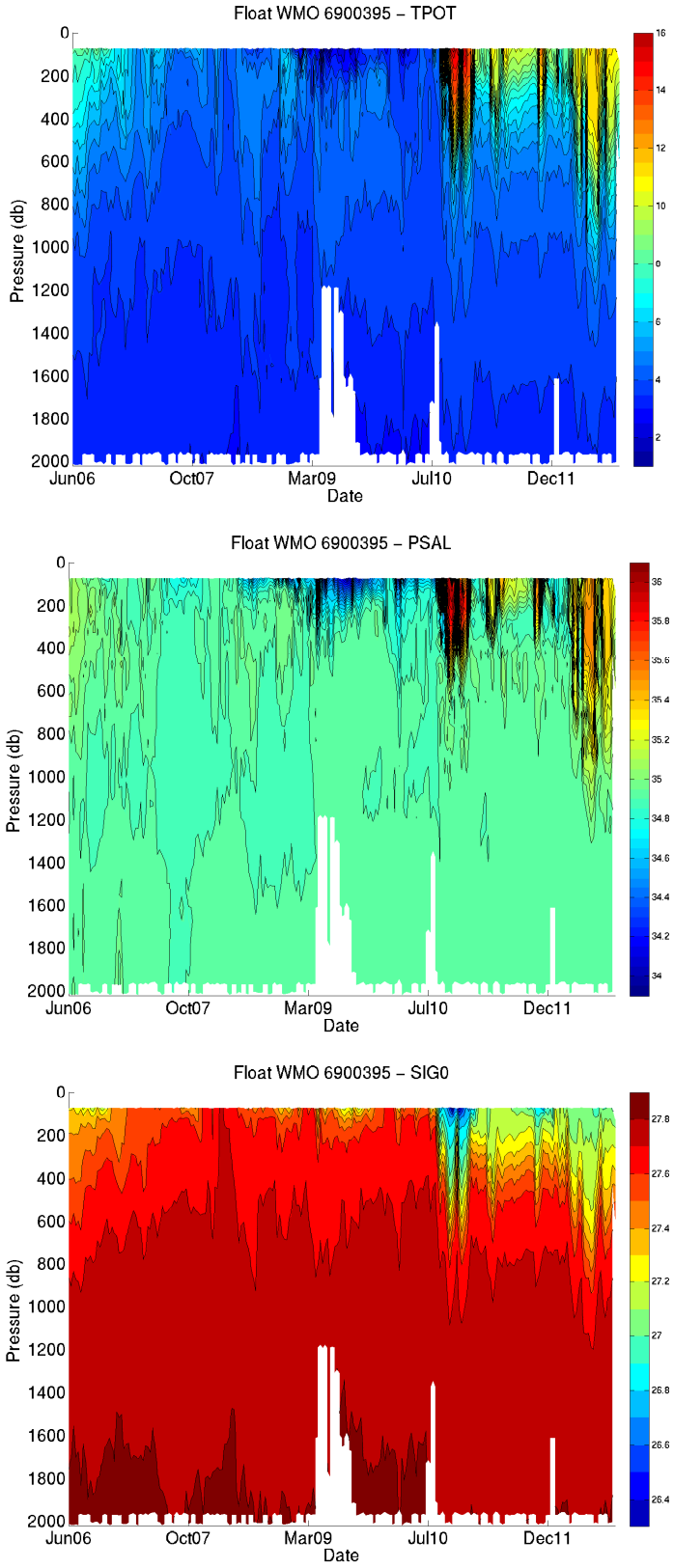


Figure 7: Potential temperature, salinity and potential density sections along the float trajectory (interpolated on standard levels). Quality flags are taken into account.

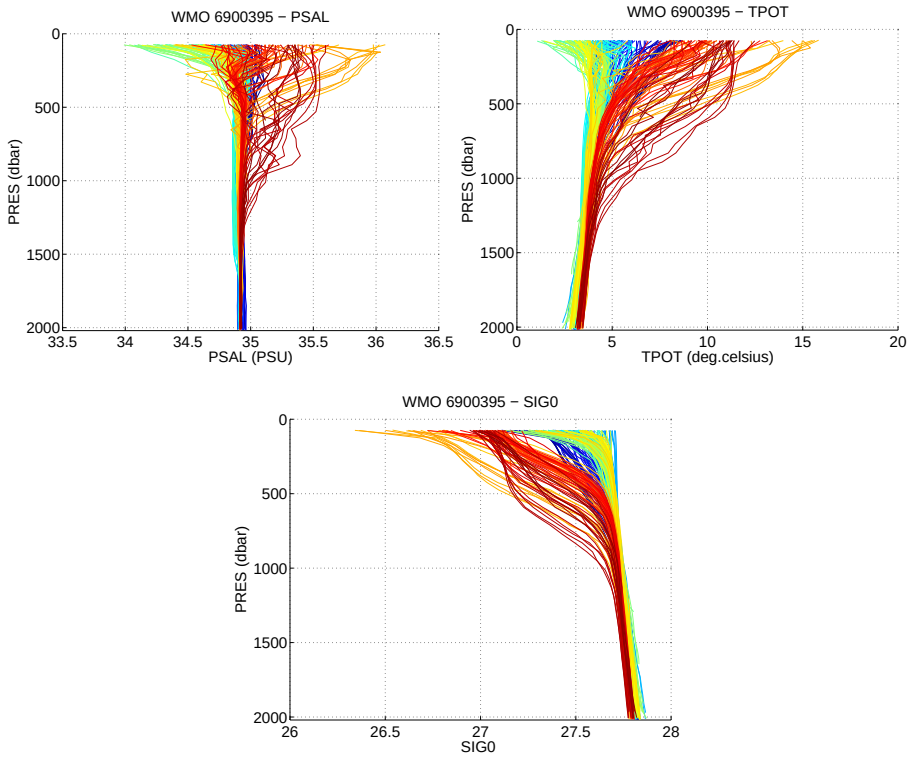


Figure 8: Salinity, Potential Temperature and Potential Density profiles. Quality flags are taken into account.

3 Comparison to the OVIDE 2006 nearest CTD profile

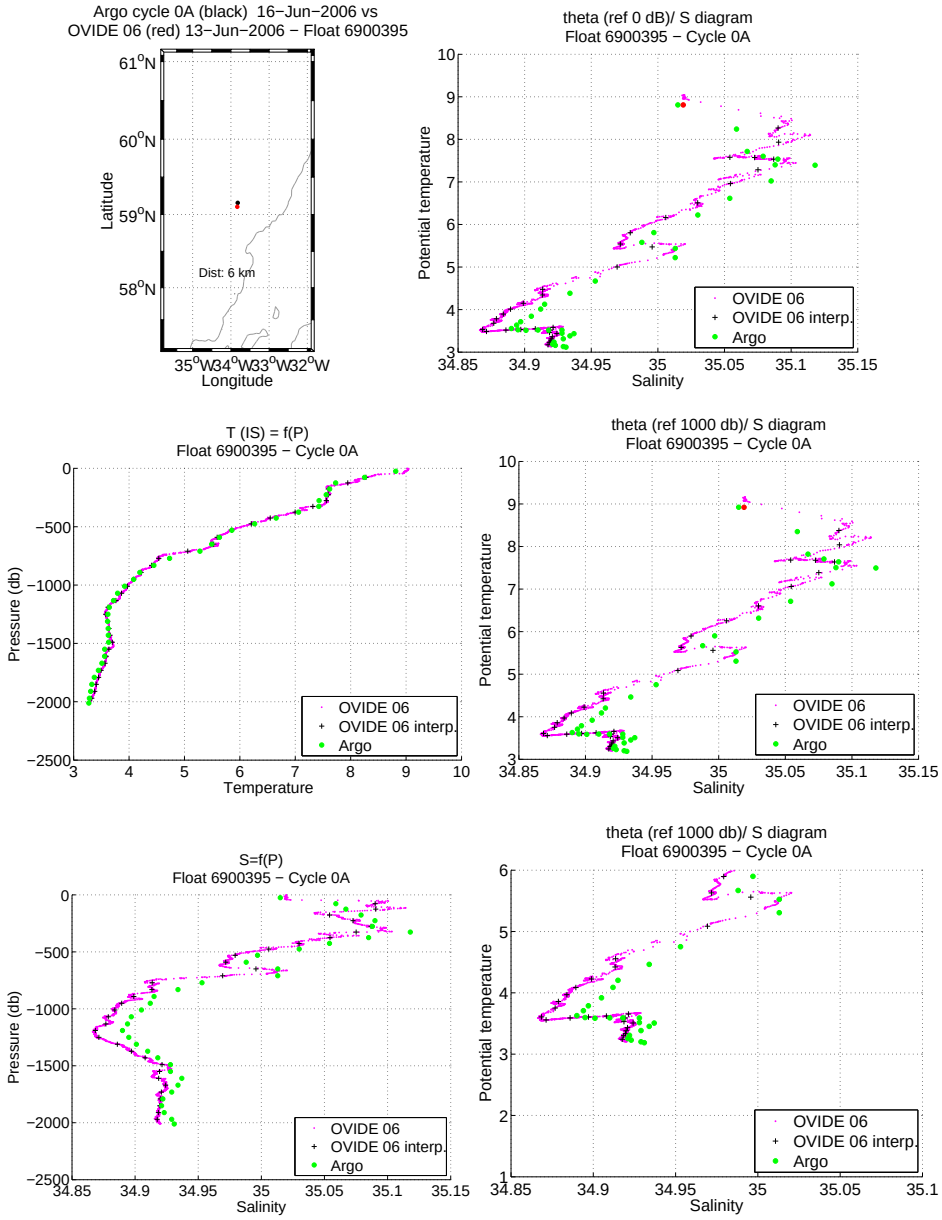


Figure 9: Comparison of the cycle 0A with the nearest CTD profile done after the float deployment.

4 Cycle 85 - Comparaison to the nearest historical CTD profiles

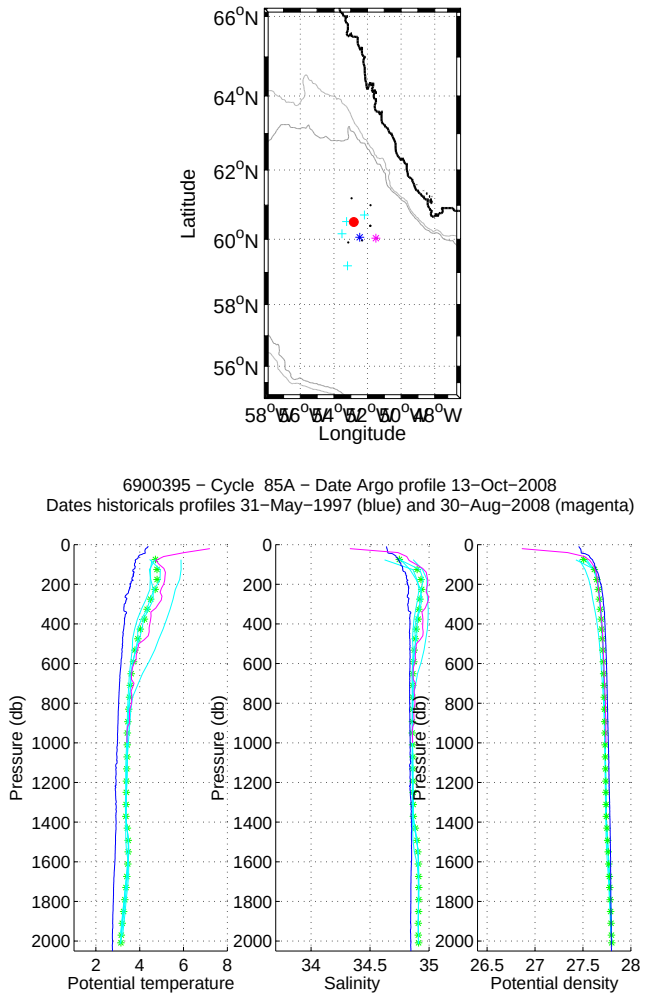


Figure 10: Flotteur 6900395, cycle 85. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

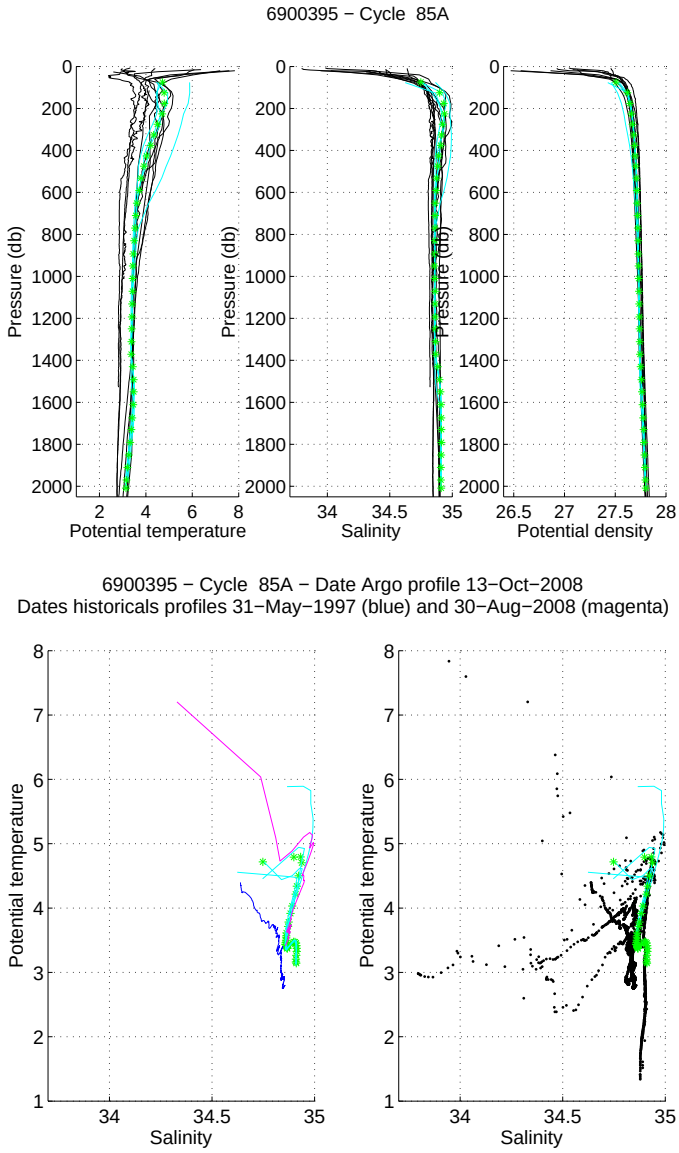


Figure 11: Float 6900395, cycle 85. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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.

5 Cycle 85 - Comparaison to the nearest ARGO profiles

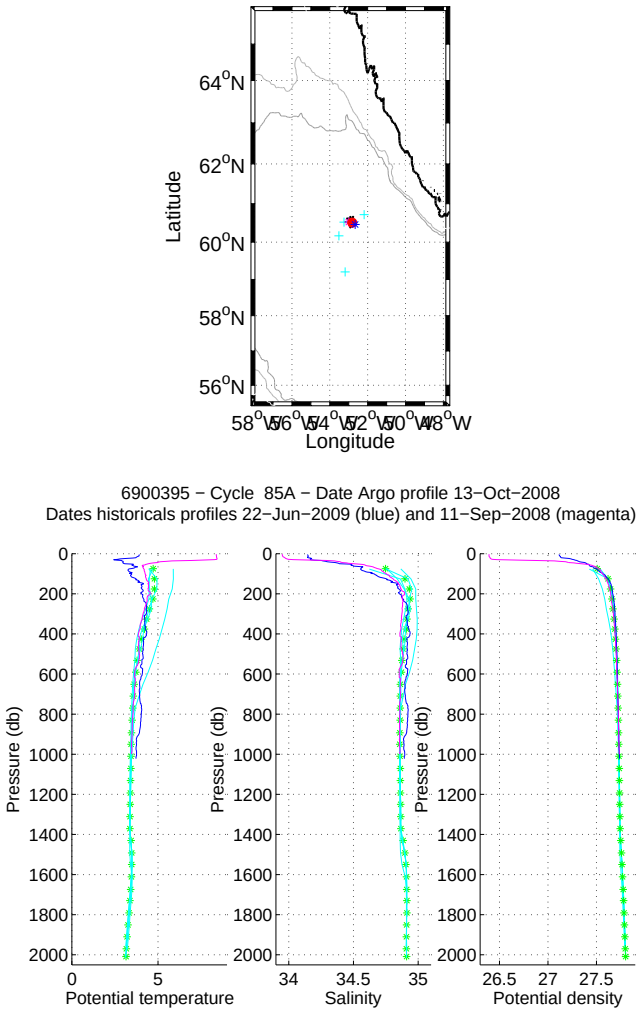


Figure 12: Flotteur 6900395, cycle 85. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

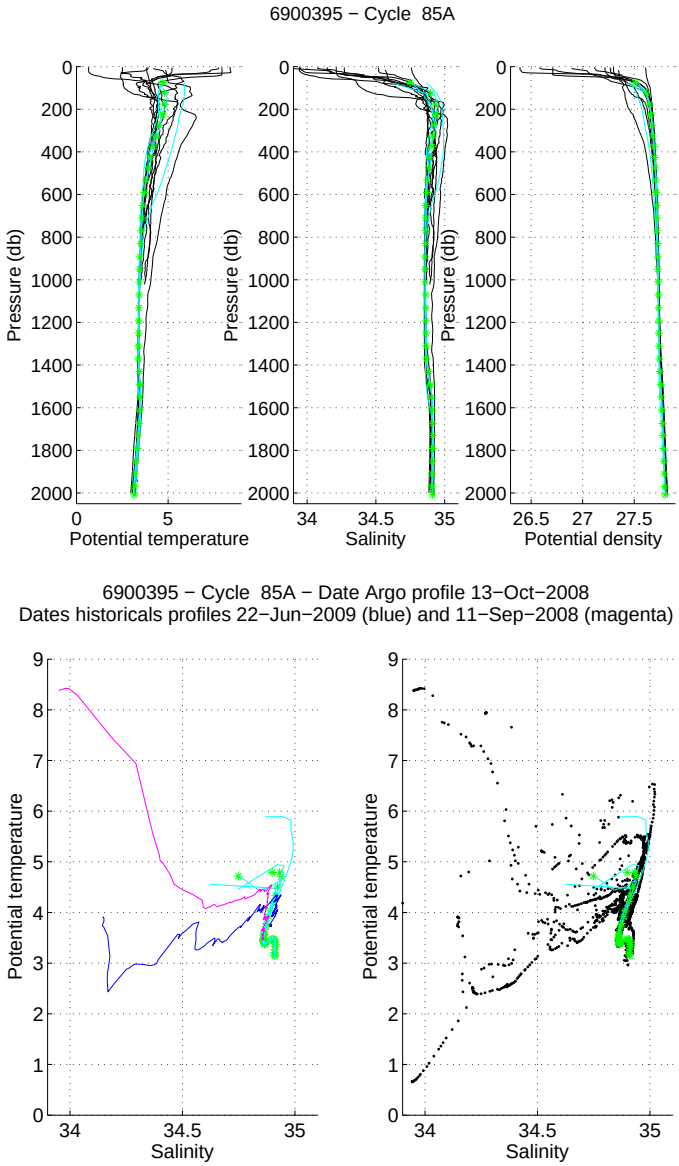


Figure 13: Float 6900395, cycle 85. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 121 - Comparaison to the nearest historical CTD profiles

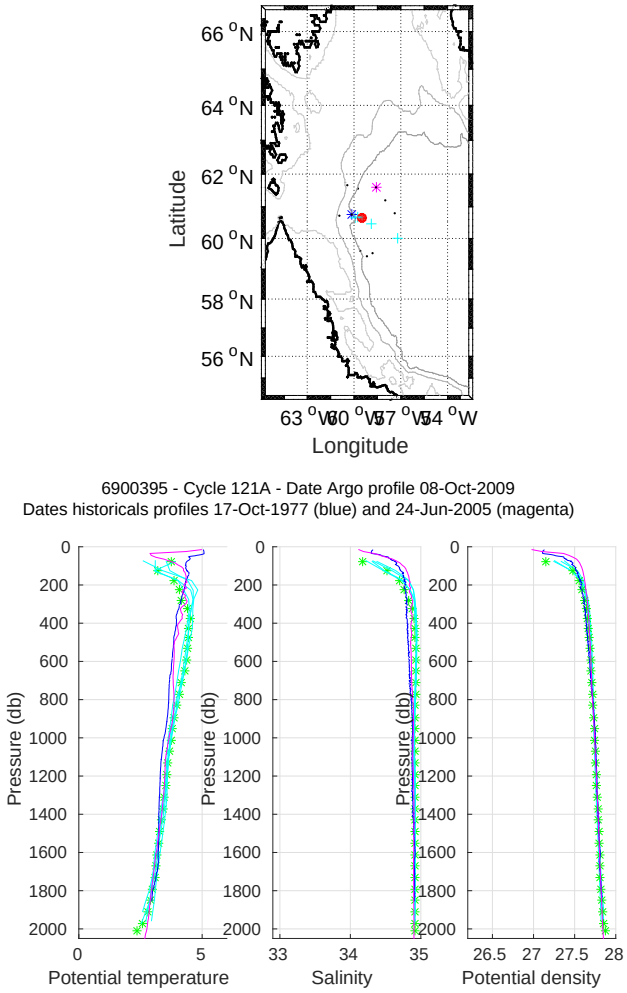


Figure 14: Flotteur 6900395, cycle 121. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

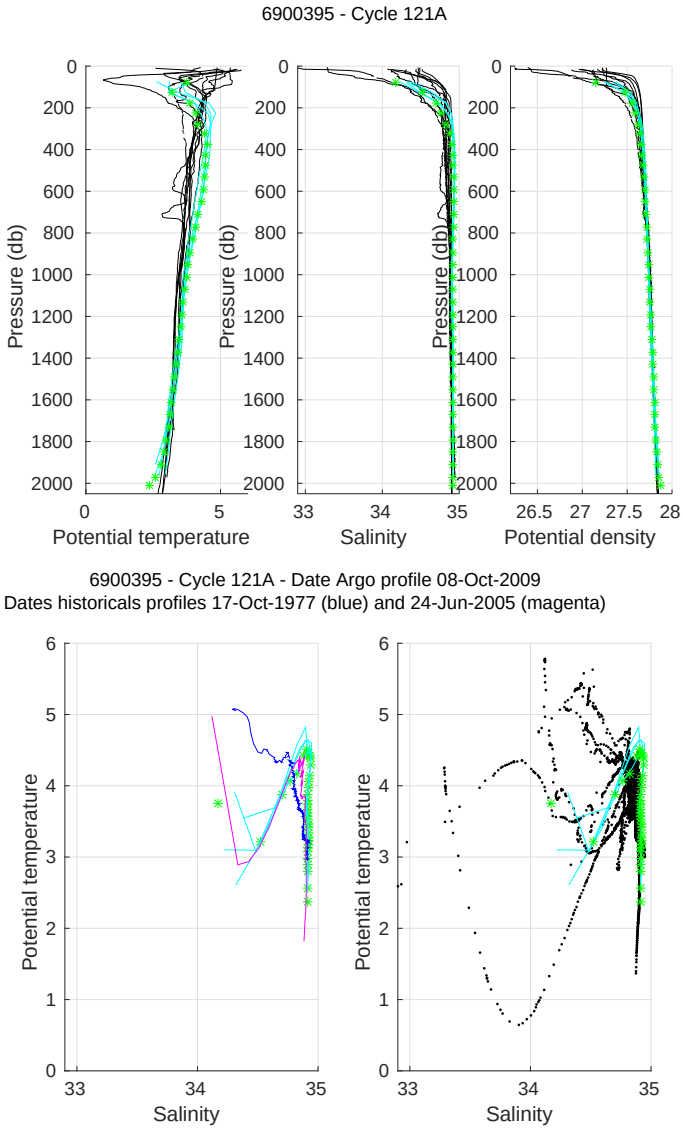


Figure 15: Float 6900395, cycle 121. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC 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.

7 Cycle 121 - Comparaison to the nearest ARGO profiles

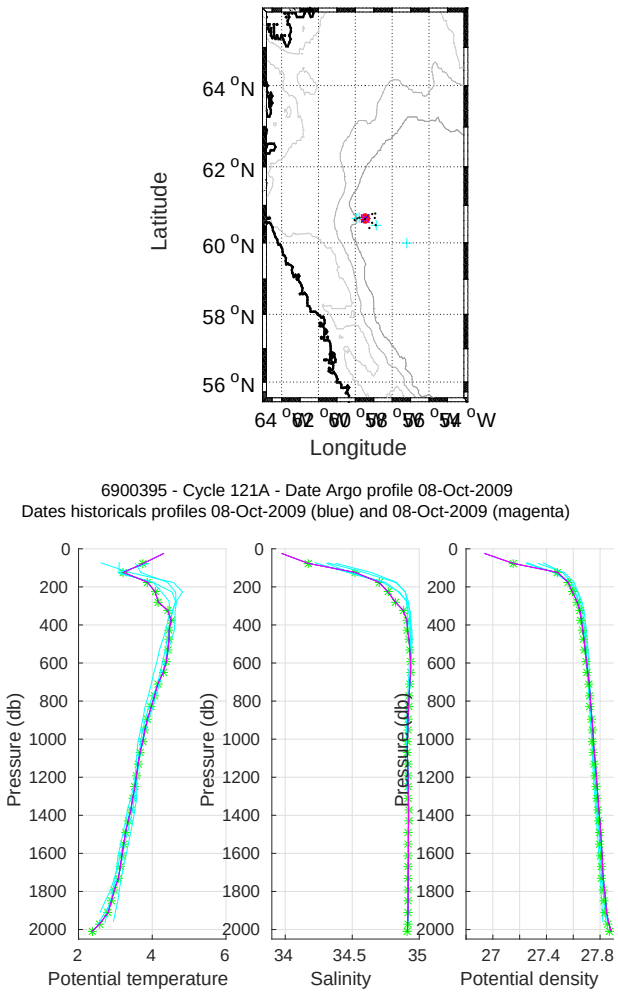


Figure 16: Flotteur 6900395, cycle 121. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

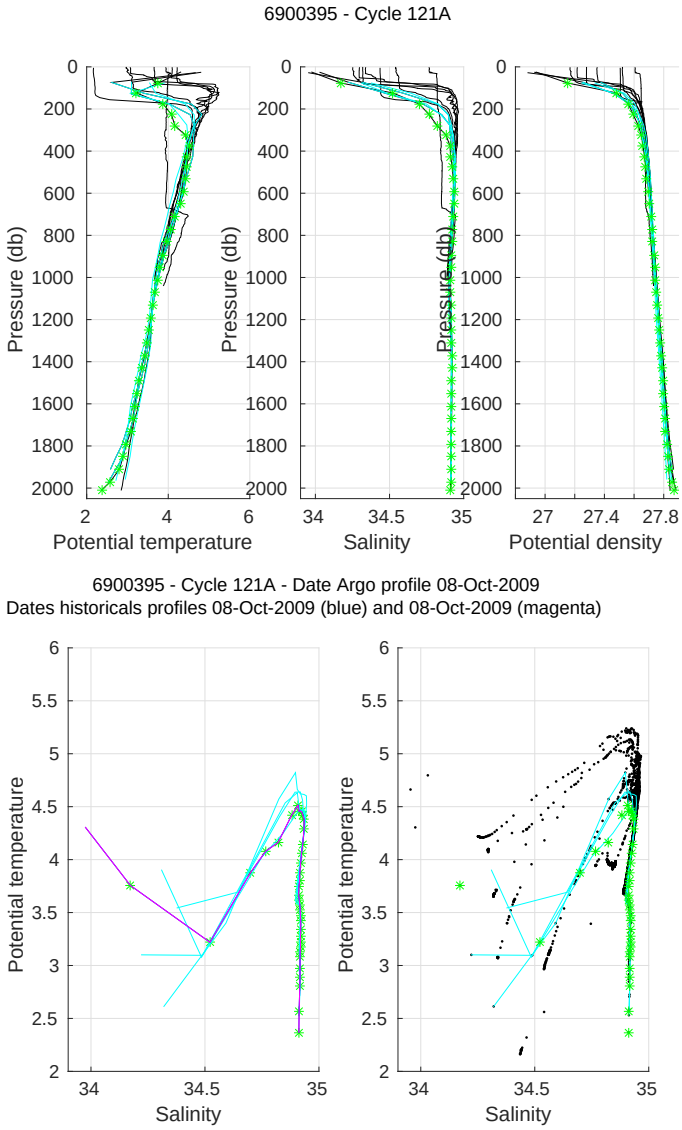


Figure 17: Float 6900395, cycle 121. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC 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 147 - Comparaison to the nearest historical CTD profiles

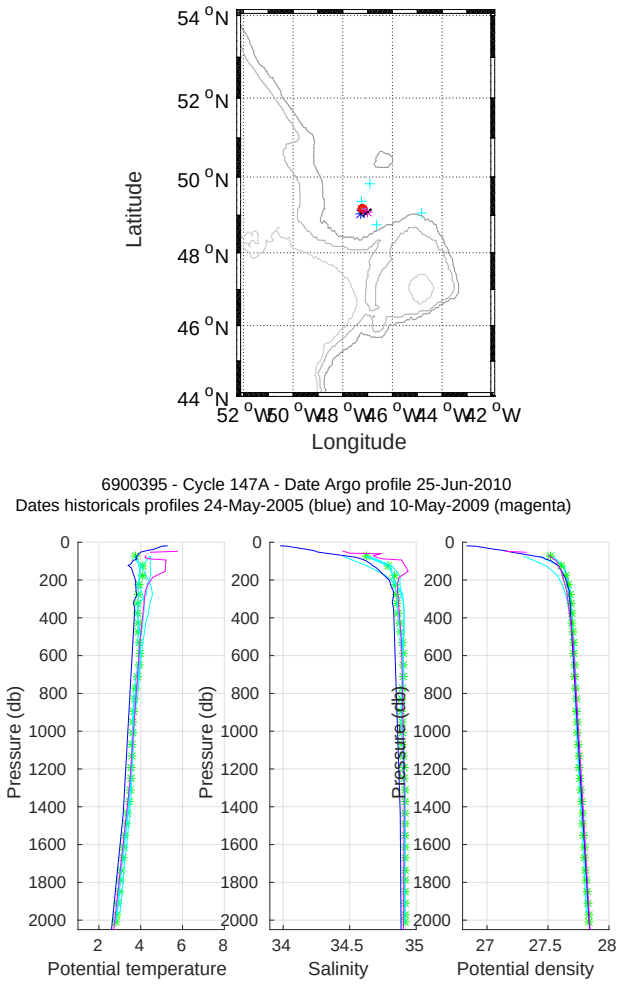


Figure 18: Flotteur 6900395, cycle 147. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

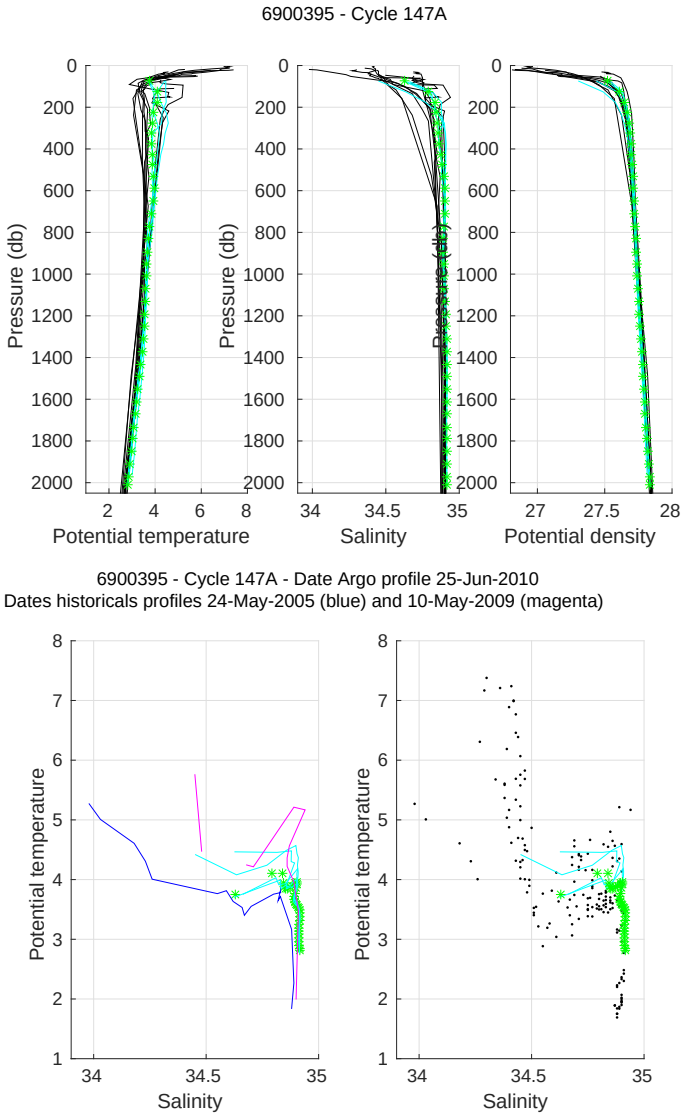


Figure 19: Float 6900395, cycle 147. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC 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.

9 Cycle 147 - Comparaison to the nearest ARGO profiles

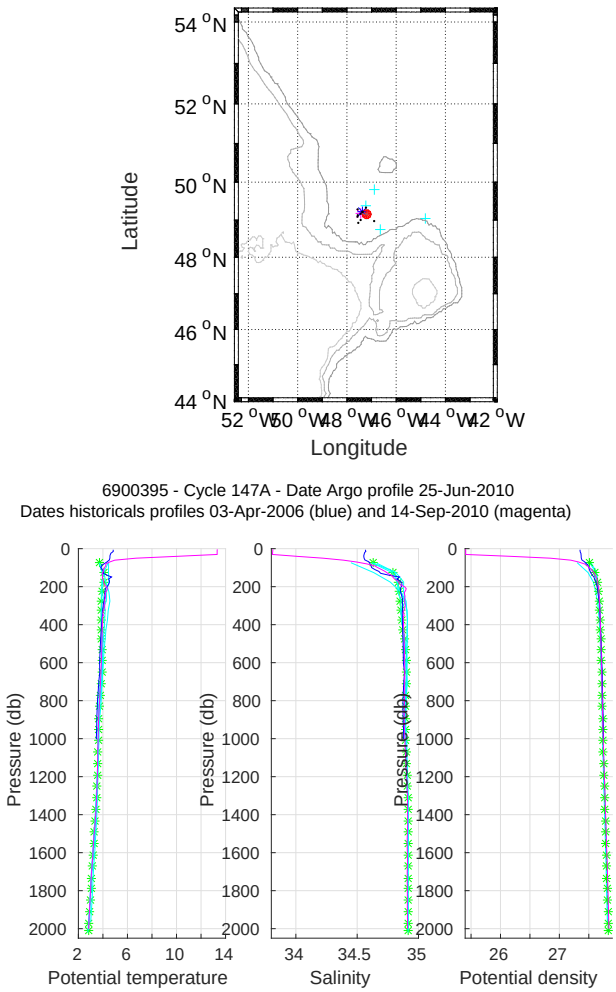


Figure 20: Flotteur 6900395, cycle 147. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

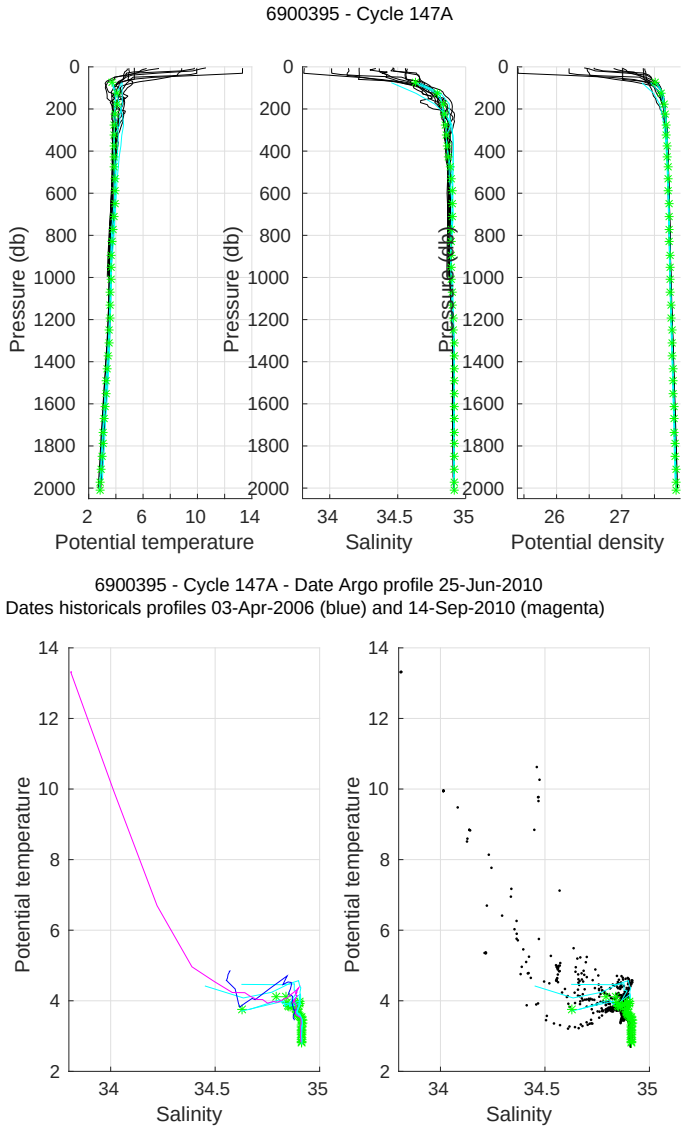


Figure 21: Float 6900395, cycle 147. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC 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 179 - Comparaison to the nearest historical CTD profiles

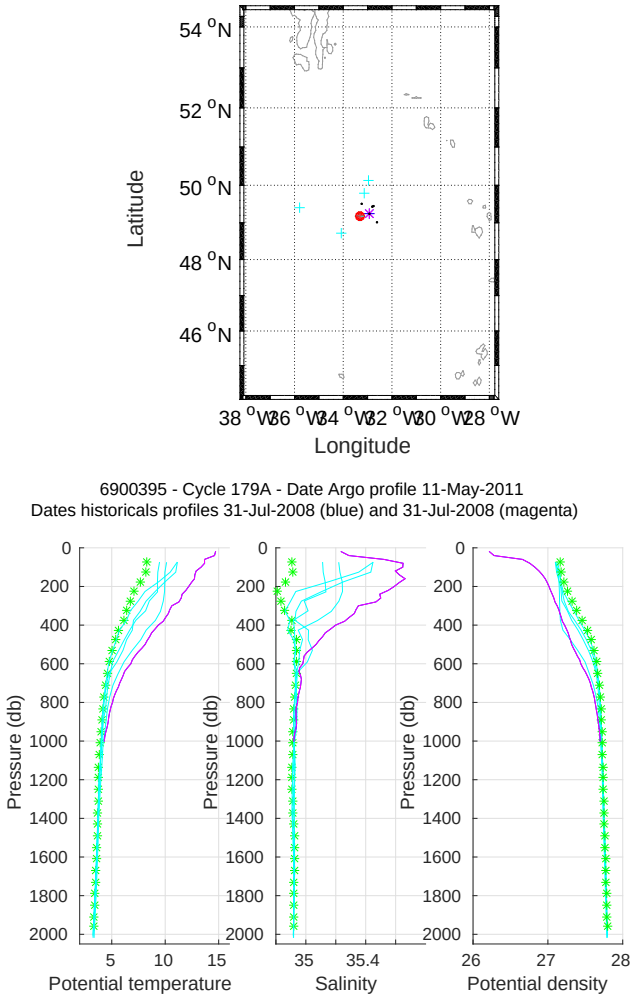


Figure 22: Flotteur 6900395, cycle 179. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

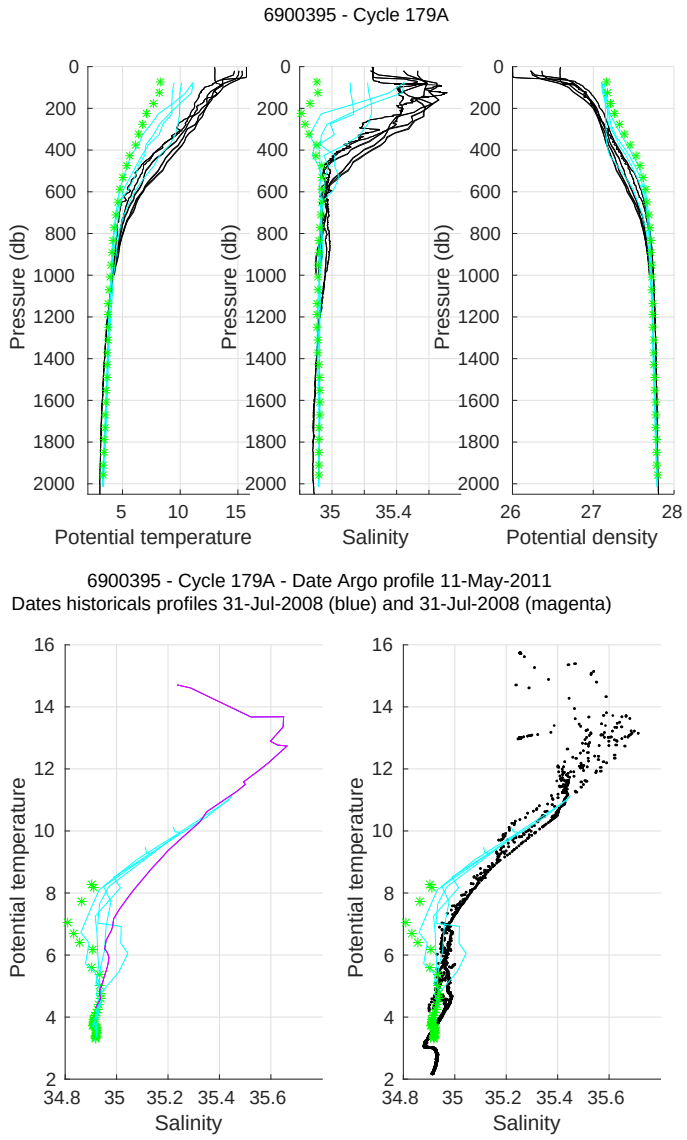


Figure 23: Float 6900395, cycle 179. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC 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.

11 Cycle 179 - Comparaison to the nearest ARGO profiles

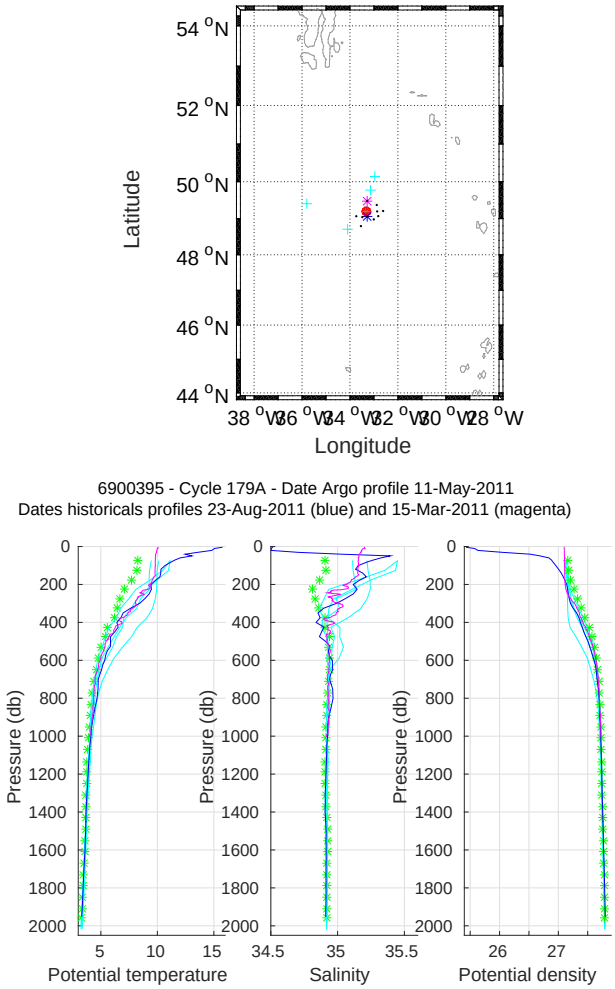


Figure 24: Flotteur 6900395, cycle 179. Upper panel: Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels: Temperature, salinity and potential density as function 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).

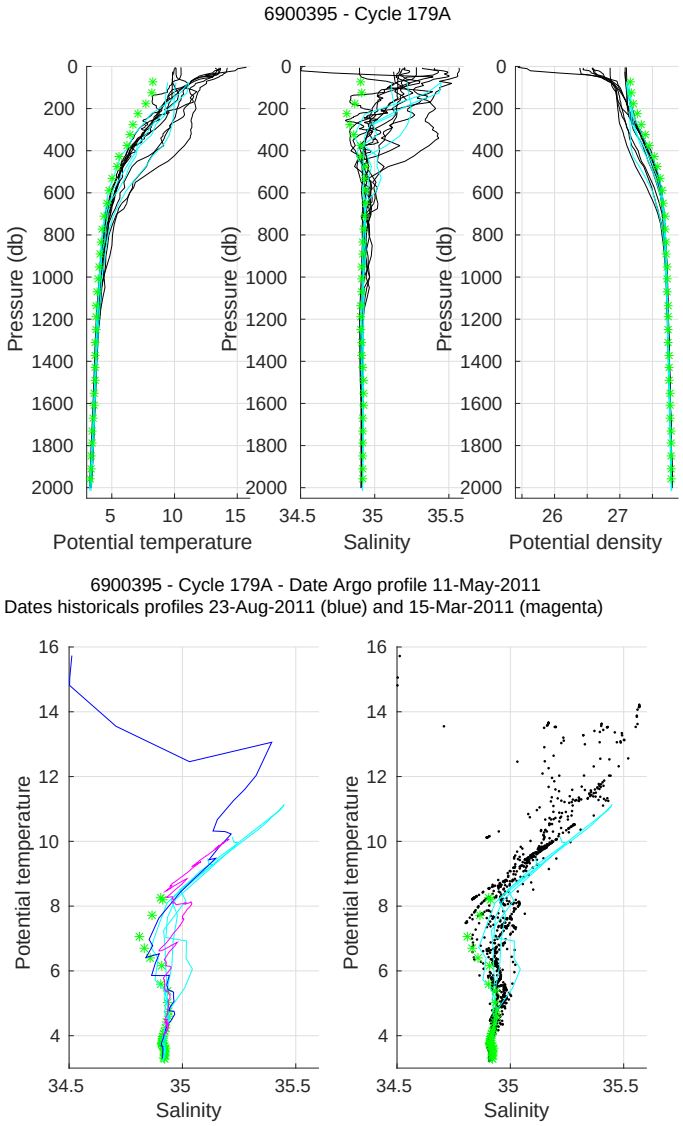


Figure 25: Float 6900395, cycle 179. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles: the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC 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 # 129

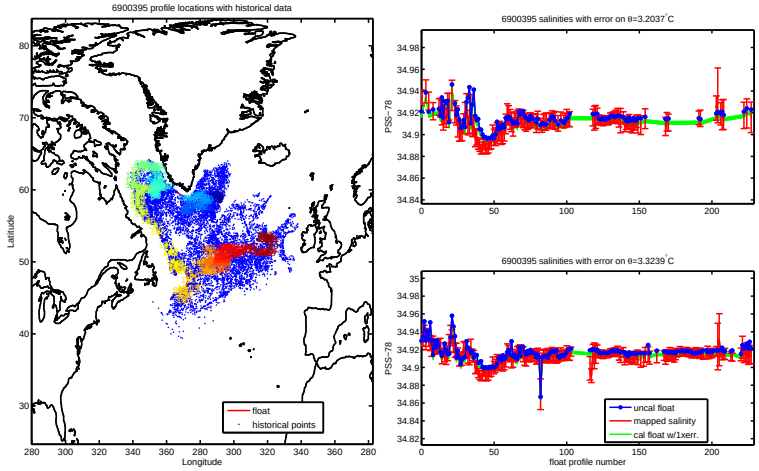


Figure 26: Figures from the OW method. (Left) Position of the historical and float data. (Right) Comparison, on various θ levels, between the float data and the historical data interpolated at the float position.

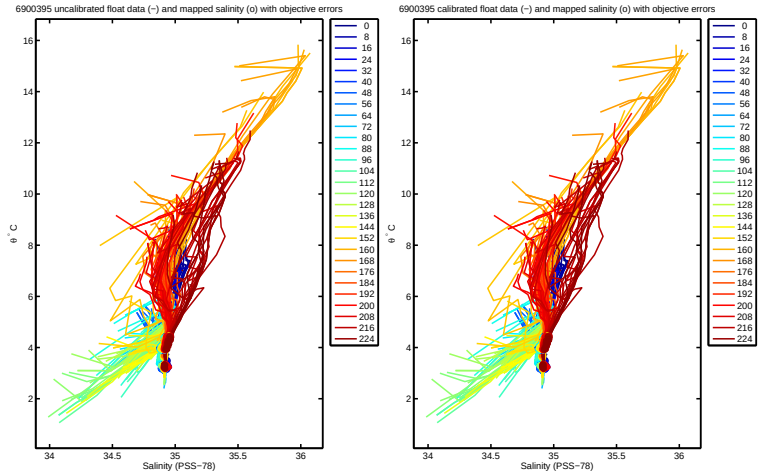


Figure 27: Figures from the OW method. Compararison of the θ/S diagram of the float with the historial database. (left) raw data; (right) corrected data using the OW correction.

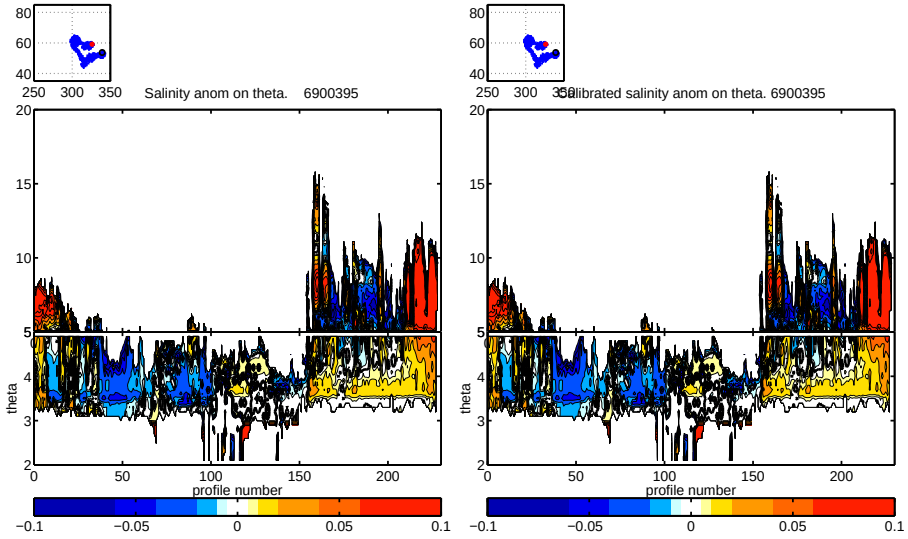


Figure 28: Figures from the OW method. Salinity anomaly:(left) raw data; (right) corrected data using the OW correction.

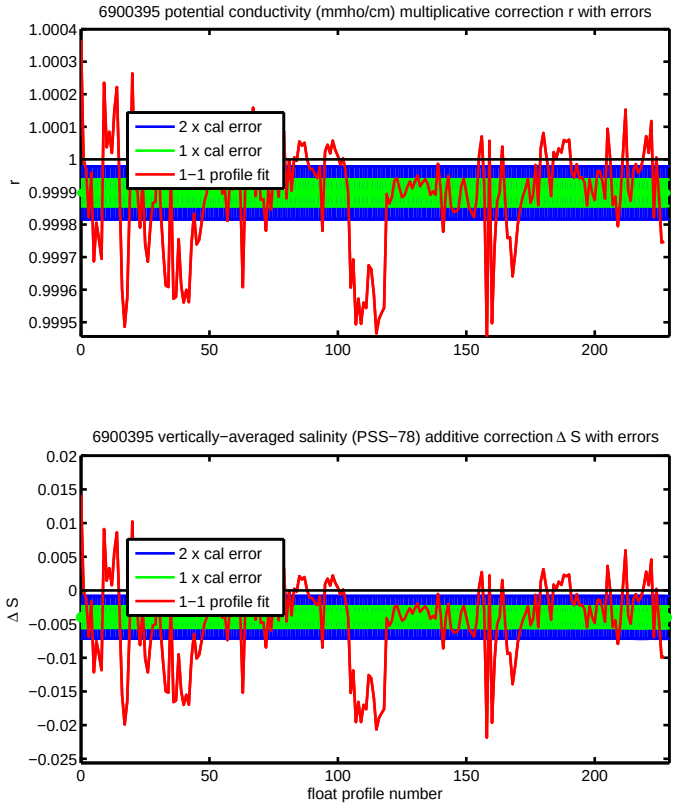


Figure 29: Correction proposed by the OW method.

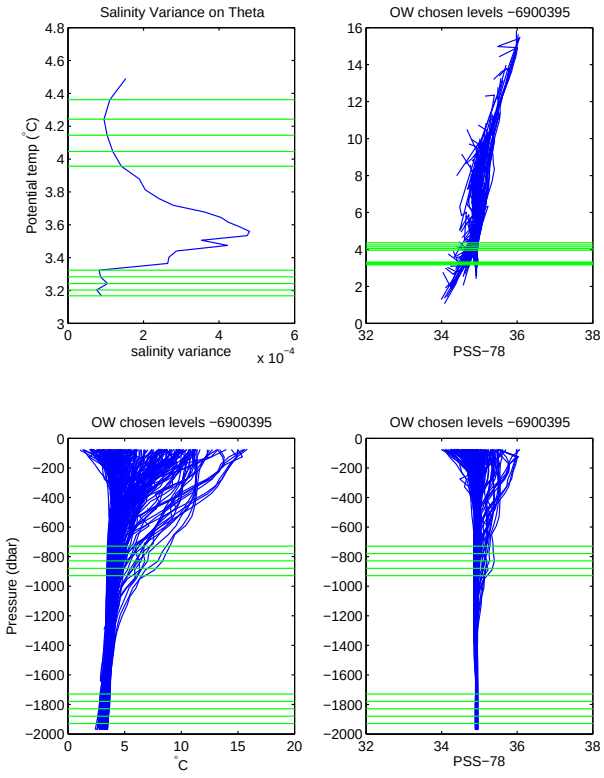


Figure 30: Chosed levels by the OW method.