


Rapport interne LPO/09-13

UMR 6523 Laboratoire de Physique des Océans 	DELAYED MODE QUALITY CONTROL OF OVIDE ARGO DATA FLOAT WMO 6900401	
Date : 21 octobre 2009	Auteurs : Lagadec Catherine Thierry Virginie	Archivage : LPO

Liste de diffusion :

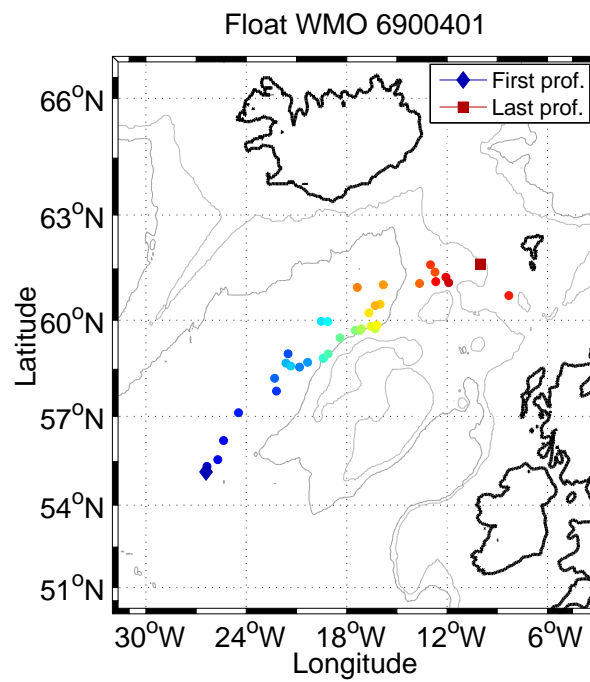
LPO

Carole Despinoy (ODE/LPO)

DELAYED MODE QUALITY CONTROL OF OVIDE ARGO DATA FLOAT WMO 6900401

C. Lagadec - V. Thierry

21 octobre 2009



1 Presentation and DMQC summary

Number	Deployment (cycle OD) cycle OD	Last cycle
Provor WMO 6900401	09/06/2006 10 h 03	35
CTS3 05-S3-32	55.15 N 26.41 W	
Date of control	Float status	Last cycle
August 2009	dead	28/05/2007
Coriolis rapport transmission		22/10/2009

TAB. 1: Status of the float

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

1.1 QC flag checks and interesting profiles

Cycle	Parameter	Vertical level	Old flag	New flag	Comments	Coriolis transmission
-1	SAL	first	1	4		July 2007
all cycles	SAL	surface	1	4		11-09-09
15A,18A, 20A-22A, 30A-34A	FLAG POSITION		4	1		11-09-09
28A	TEMP,SAL	surface	1	4	only one level	11-09-09
30A	TEMP	all	3	1	anomalies	11-09-09
32A	TEMP	all	3	1	anomalies	11-09-09
23A	TEMP-SAL	0-500m			interesting (mixed layer and interannual variability)	

TAB. 2: Float 6900401. Summary of the modifications of the real-time QC flags and of the interesting or suspicious data.

Warning : the resolution is equal to 50 dbar from the surface to 500 dbar, then 60 dbar from 500 to 2000 dbar. 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 3.

OW CONFIGURATION	3 no break
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	0.5
MAPSCALE_PHI_SMALL	0.1
MAPSCALE_AGE	0.69
MAP_P_EXCLUDE	500
MAP_P_DELTA	250
Reference data base	CTD only
Comments	

TAB. 3: Parameters of the OW method.

2 Data

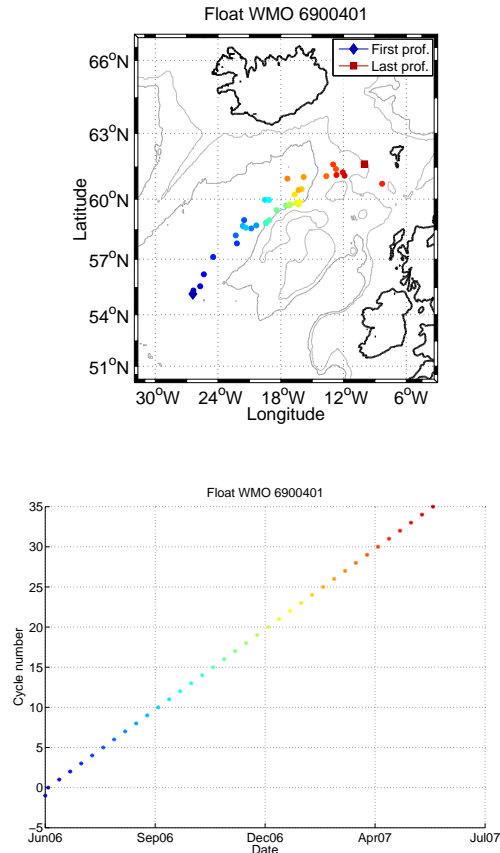


FIG. 1: Profiles position and relationship between cycle number, date and color.

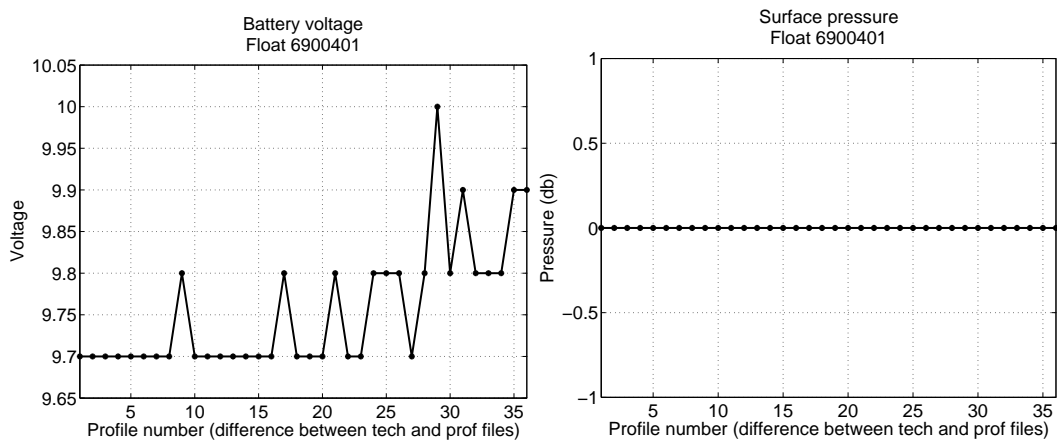


FIG. 2: Surface pressure

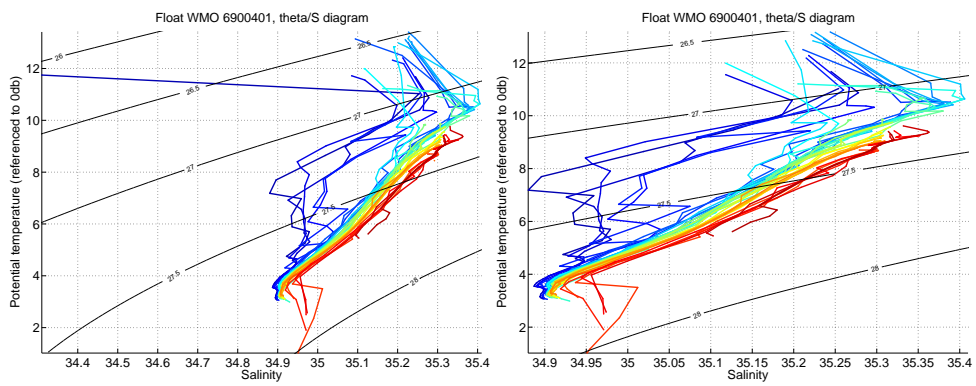


FIG. 3: θ/S diagrams. (Left panel) Flags are not taken into account. (Right panel) Quality flags are taken into account.

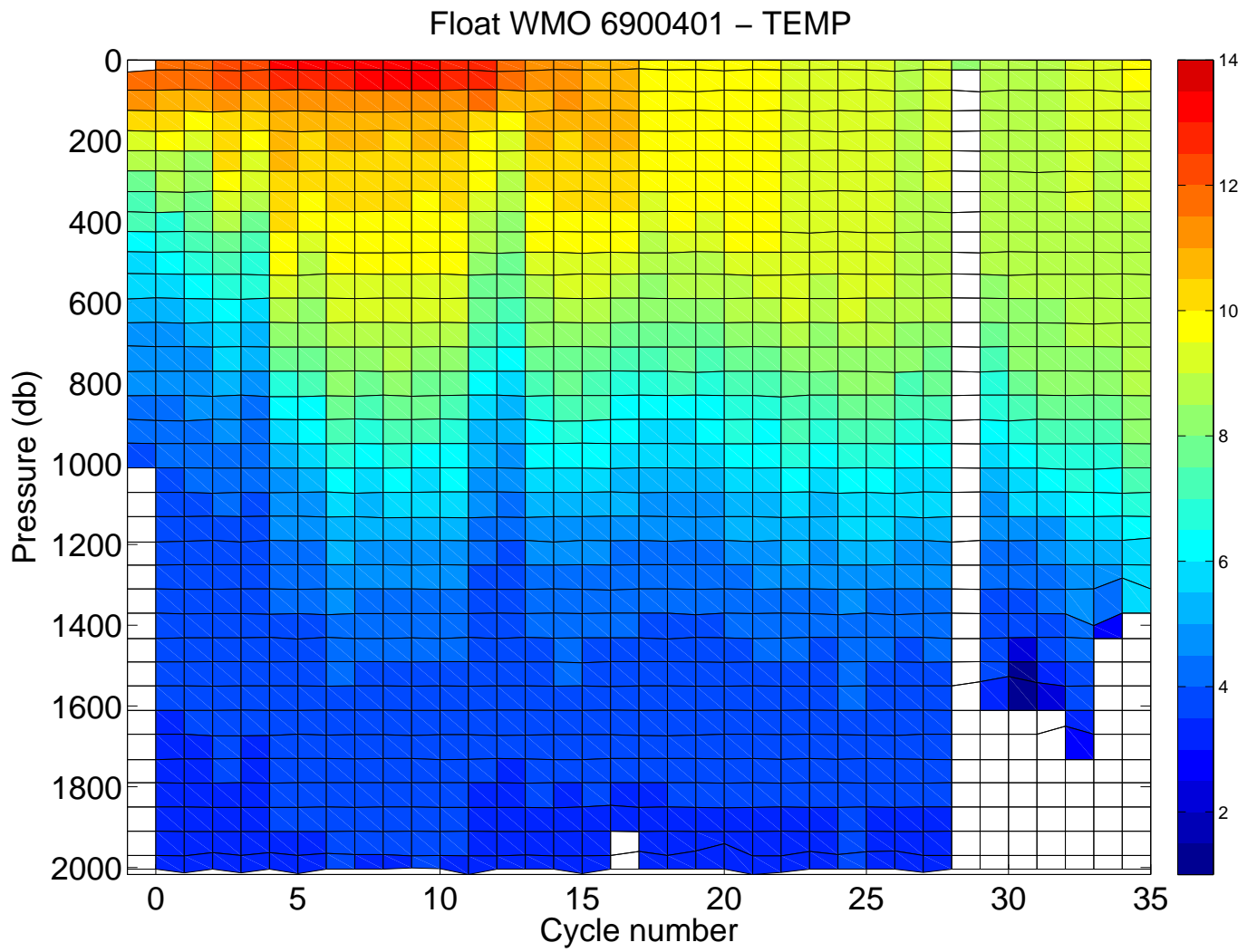


FIG. 4: Temperature section along the float trajectory. Quality flags are not taken into account.

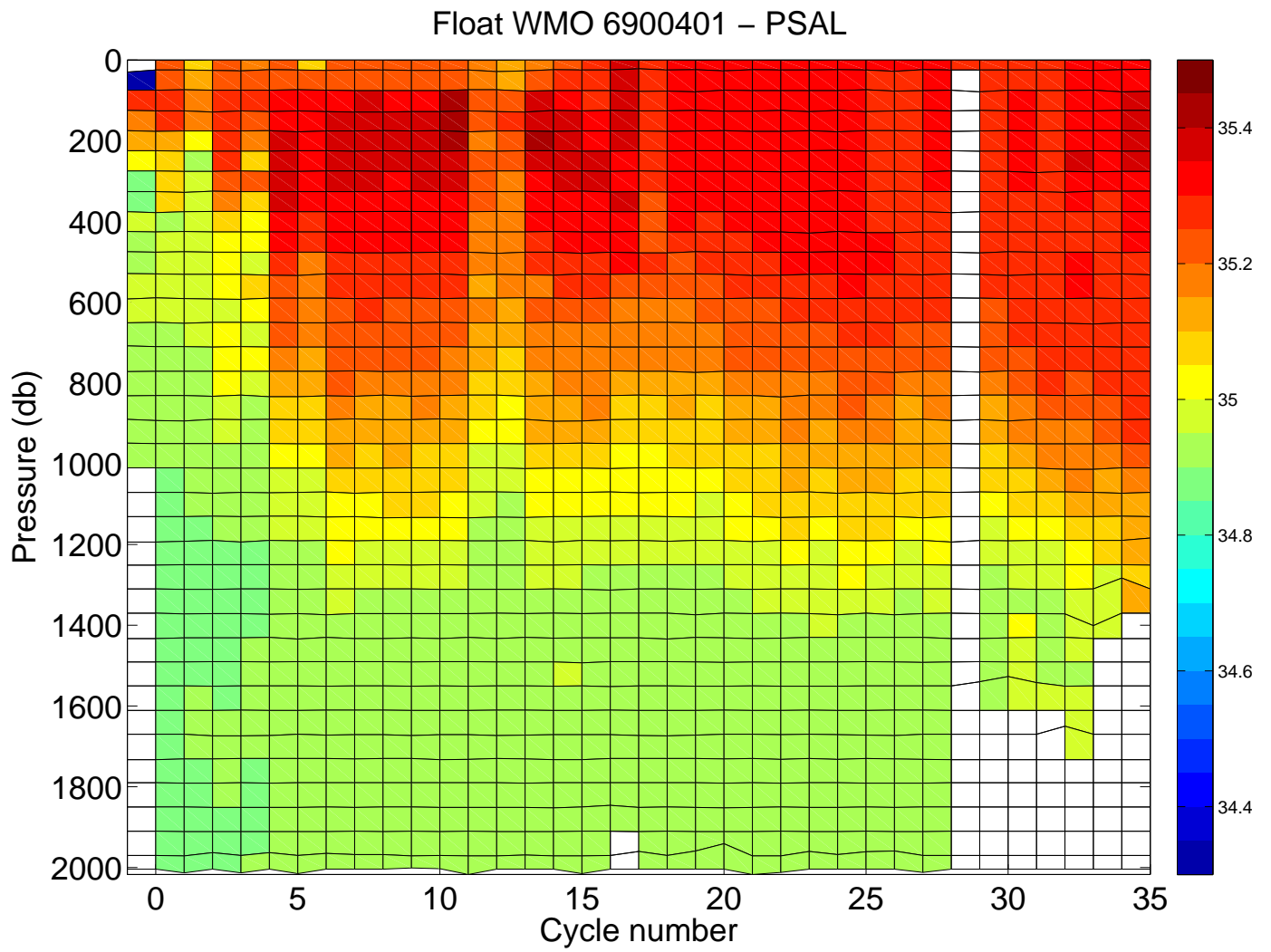


FIG. 5: Salinity section along the float trajectory. Quality flags are not taken into account.

Float WMO 6900401 – PRES

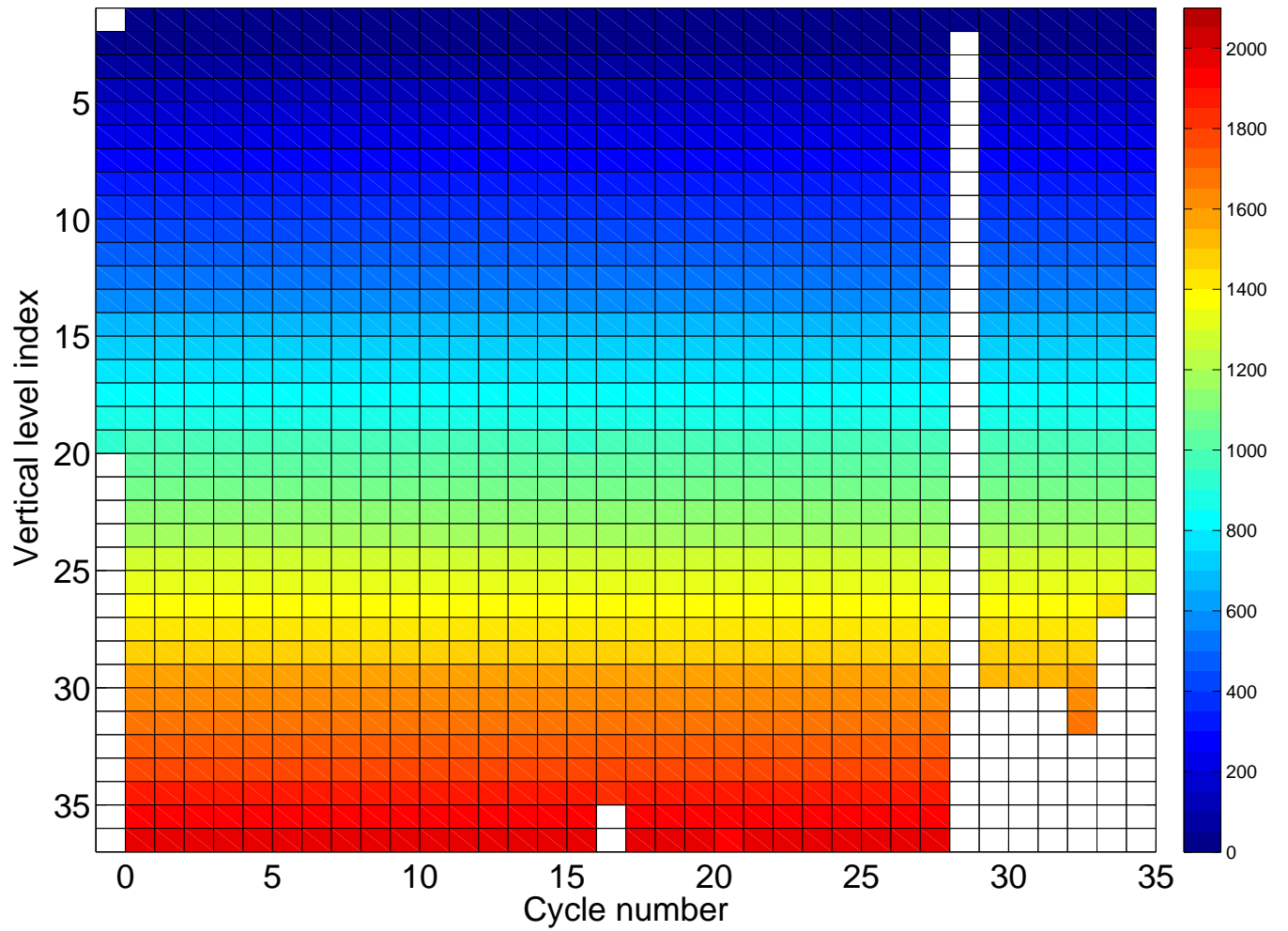


FIG. 6: Pression as fonction of cycle number and vertical level index along the float trajectory. Quality flags are taken into account.

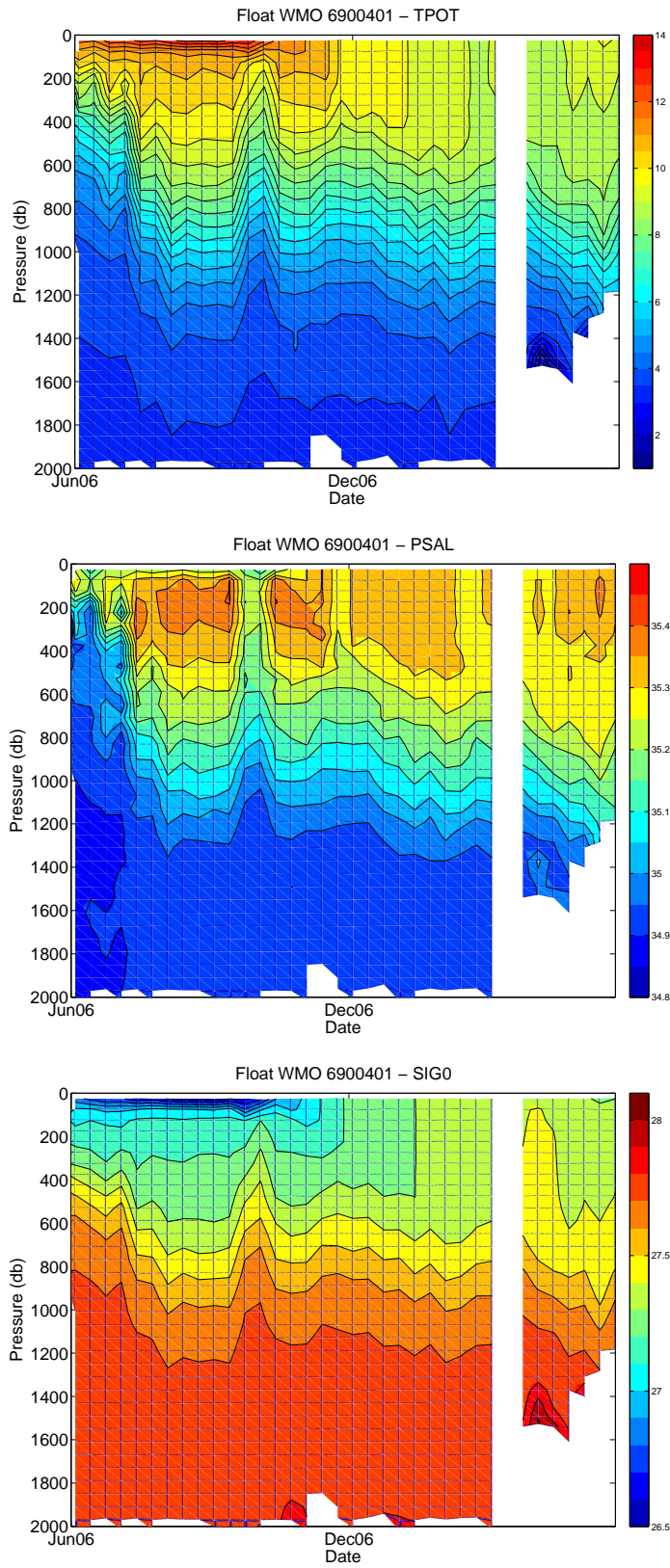


FIG. 7: Potential temperature, salinity and potential density sections along the float trajectory (interpolated on standard levels). Quality flags are taken into account.

3 Comparison to the OVIDE 2006 nearest CTD profile

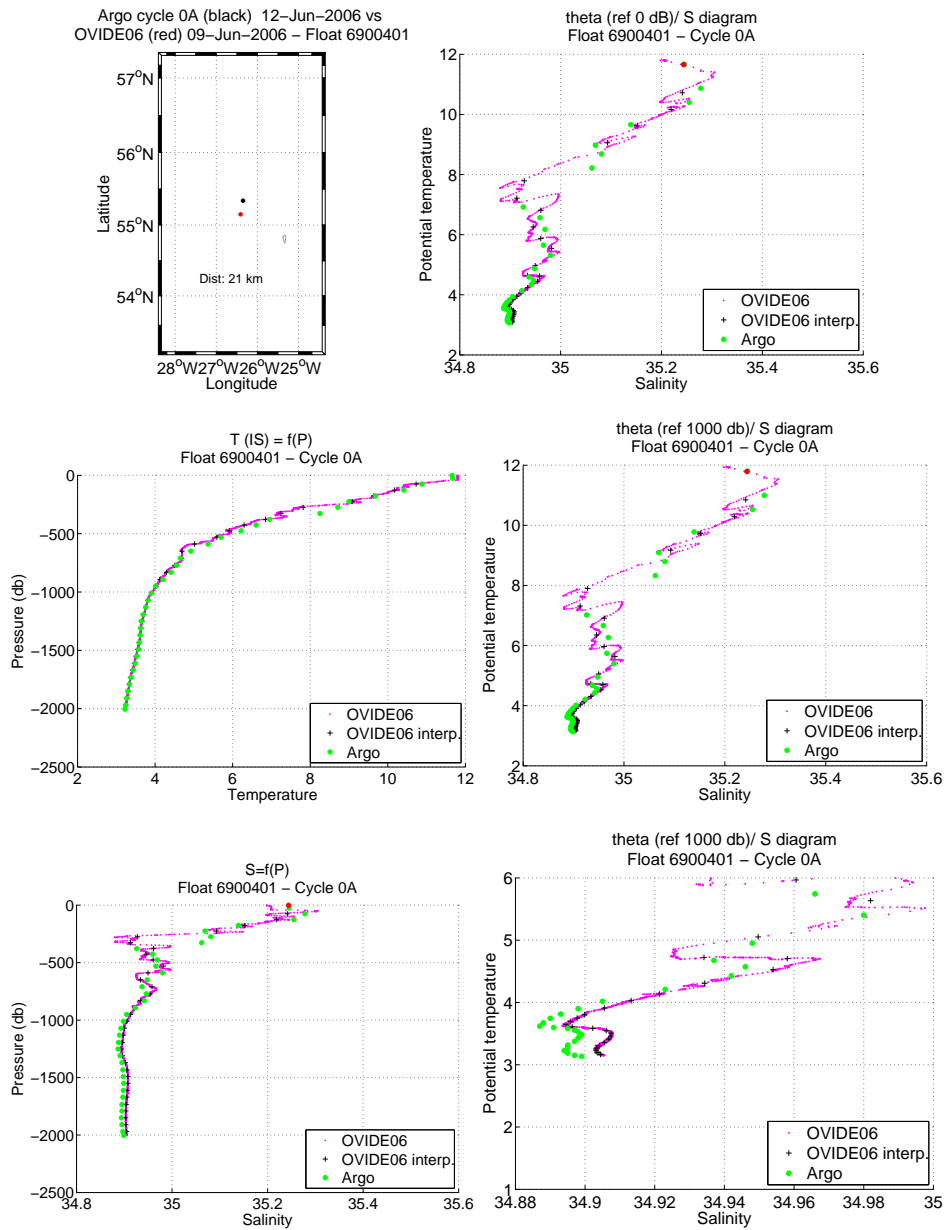


FIG. 8: Comparison of the cycle 0A with the nearest CTD profile done after the float deployment.

4 Cycle -1 - Comparison to the nearest historical CTD profiles

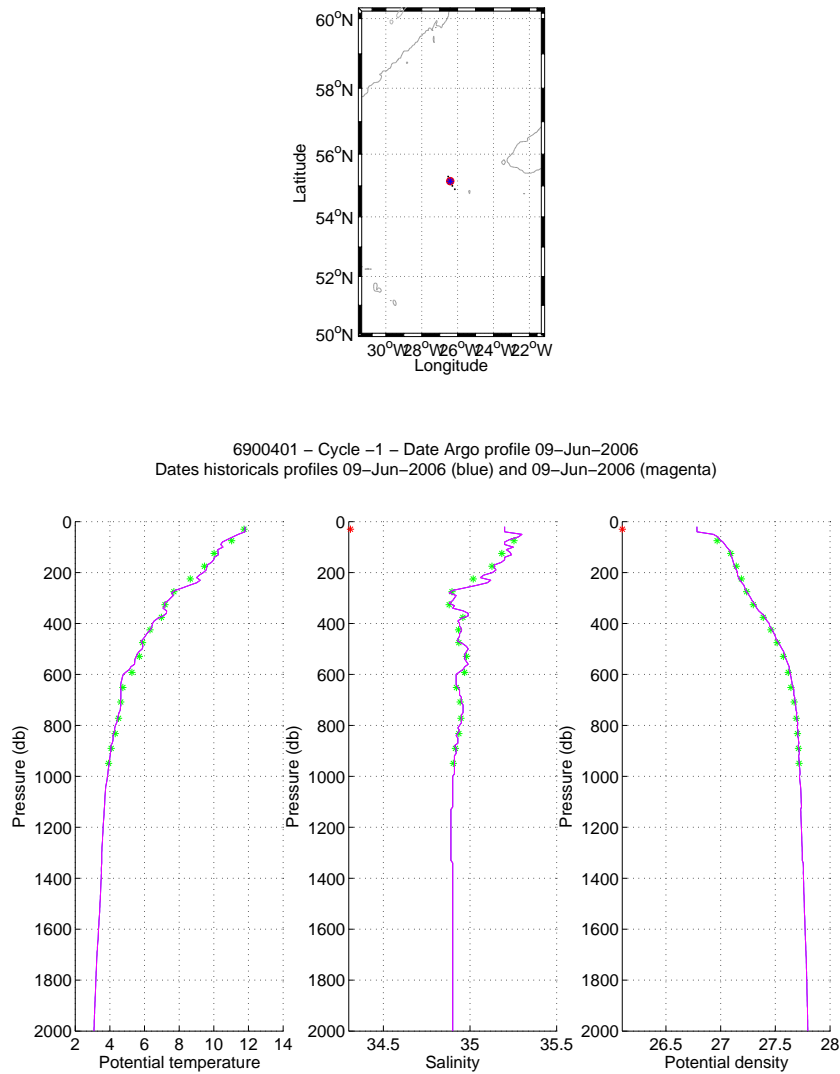
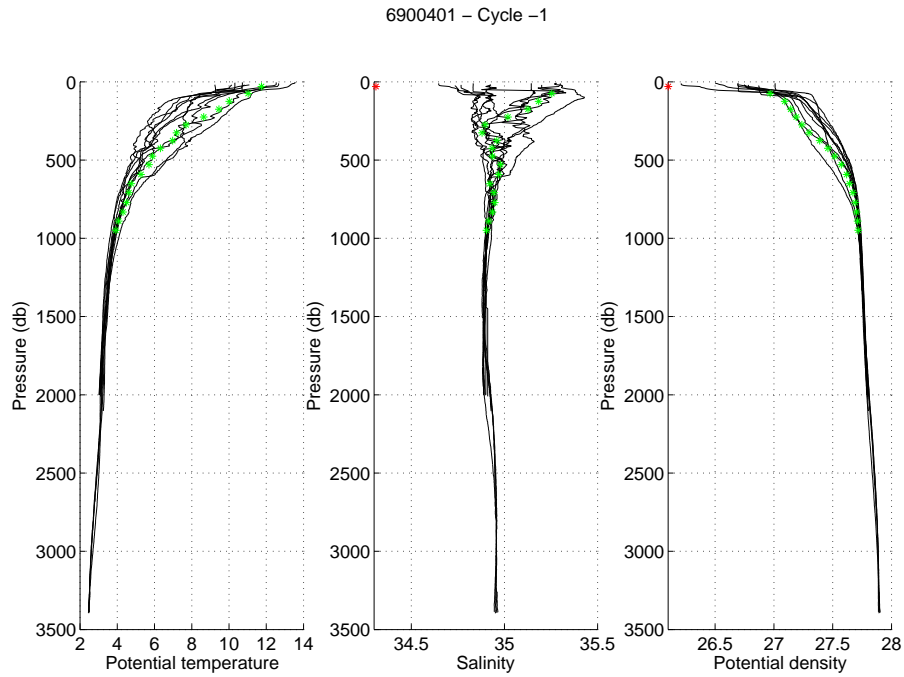


FIG. 9: Flotteur 6900401, cycle -1. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure 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).



6900401 – Cycle –1 – Date Argo profile 09–Jun–2006
 Dates historicals profiles 09–Jun–2006 (blue) and 09–Jun–2006 (magenta)

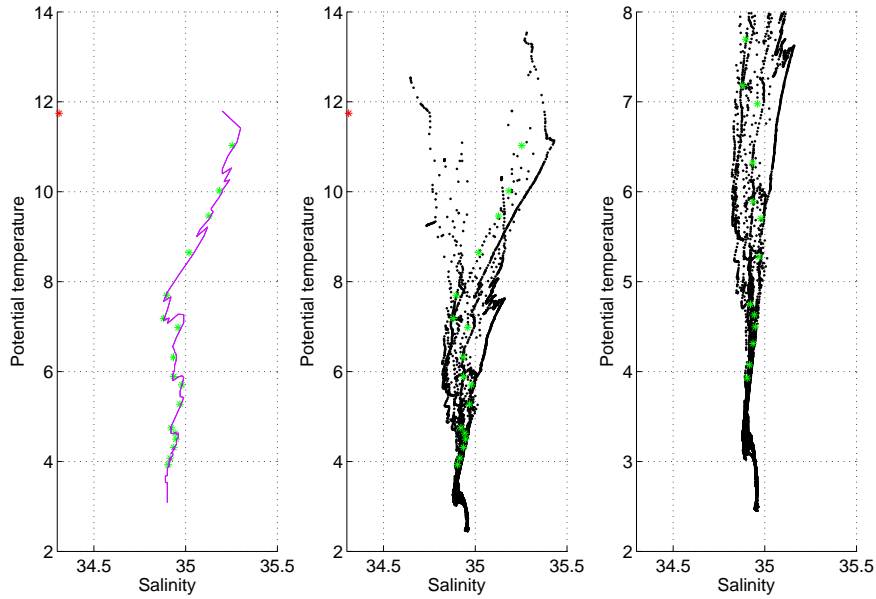


FIG. 10: Float 6900401, cycle -1. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1; blue for 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.

5 Cycle -1 - Comparaisn to the nearest ARGO profiles

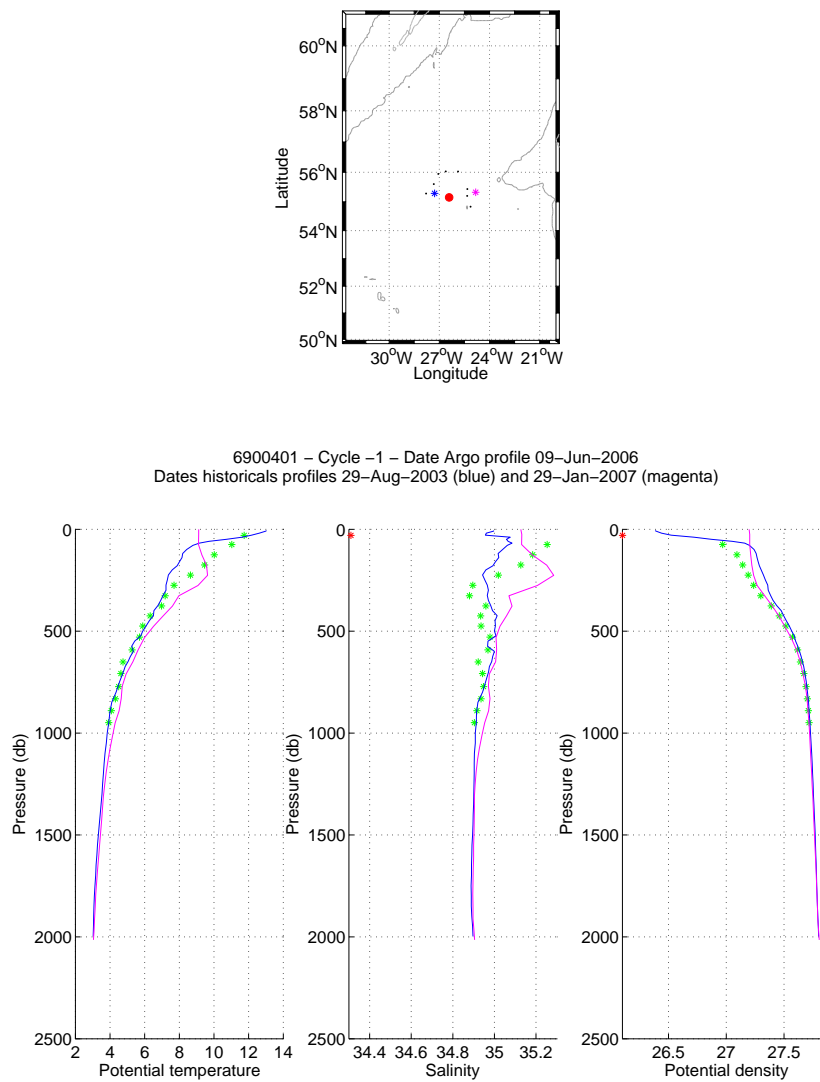
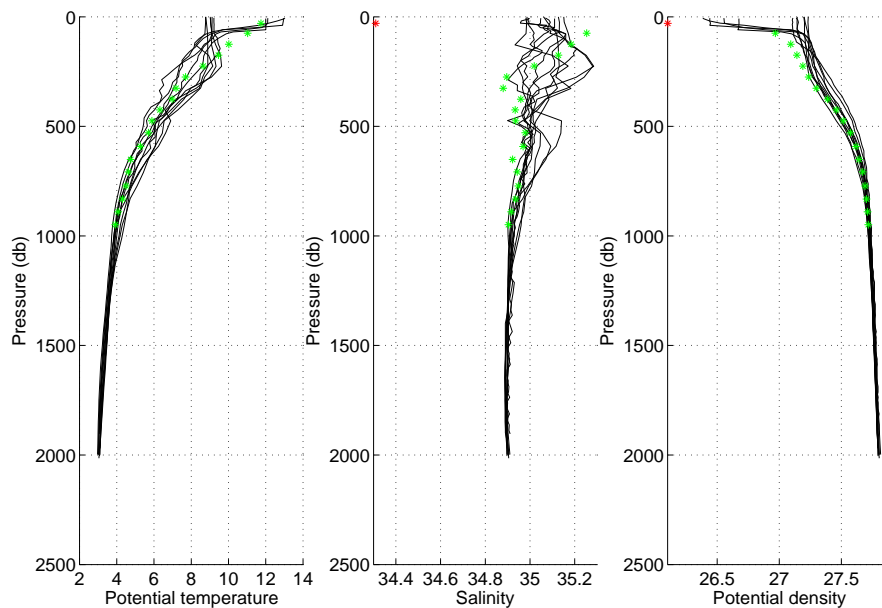


FIG. 11: Flotteur 6900401, cycle -1. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function 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).

6900401 – Cycle –1



6900401 – Cycle –1 – Date Argo profile 09–Jun–2006
 Dates historicals profiles 29–Aug–2003 (blue) and 29–Jan–2007 (magenta)

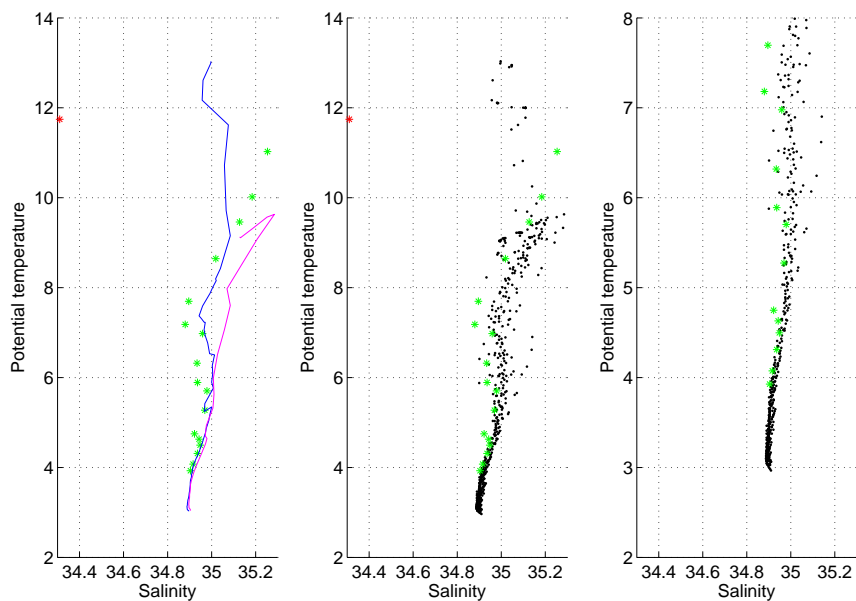


FIG. 12: Float 6900401, cycle -1. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 23 - Comparison to the nearest historical CTD profiles

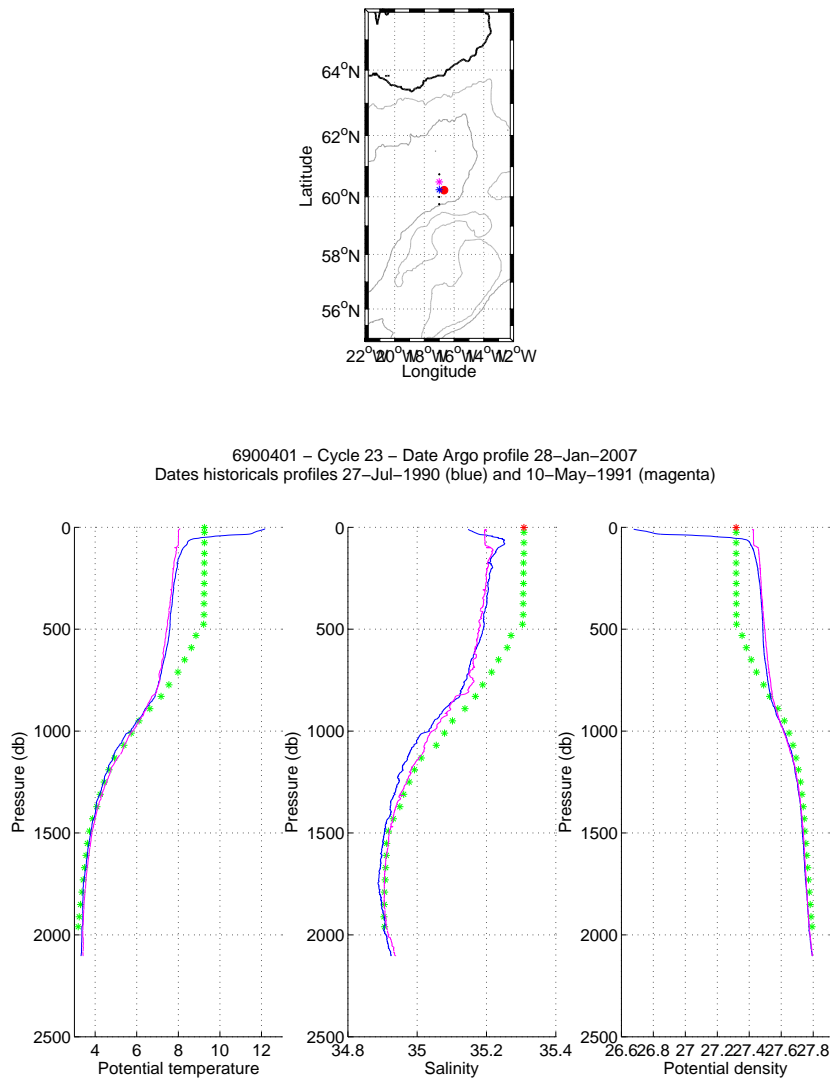
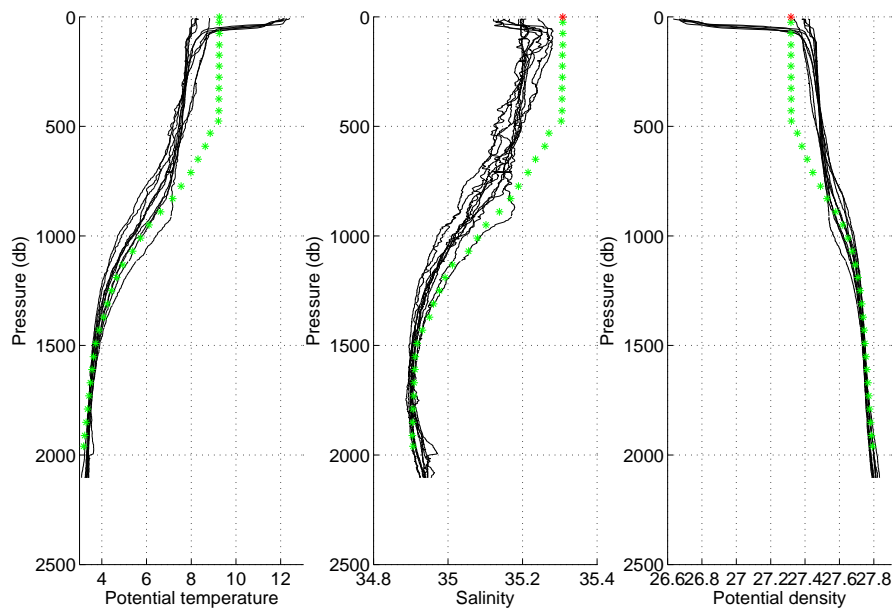


FIG. 13: Flotteur 6900401, cycle 23. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure 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).

6900401 – Cycle 23



6900401 – Cycle 23 – Date Argo profile 28–Jan–2007
 Dates historicals profiles 27–Jul–1990 (blue) and 10–May–1991 (magenta)

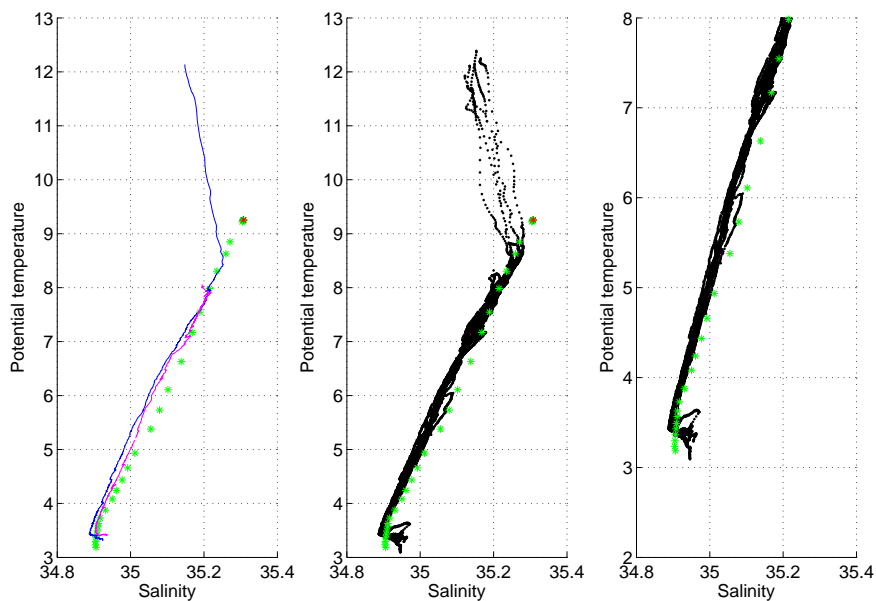


FIG. 14: Float 6900401, cycle 23. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1; blue for 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.

7 Cycle 23 - Comparison to the nearest ARGO profiles

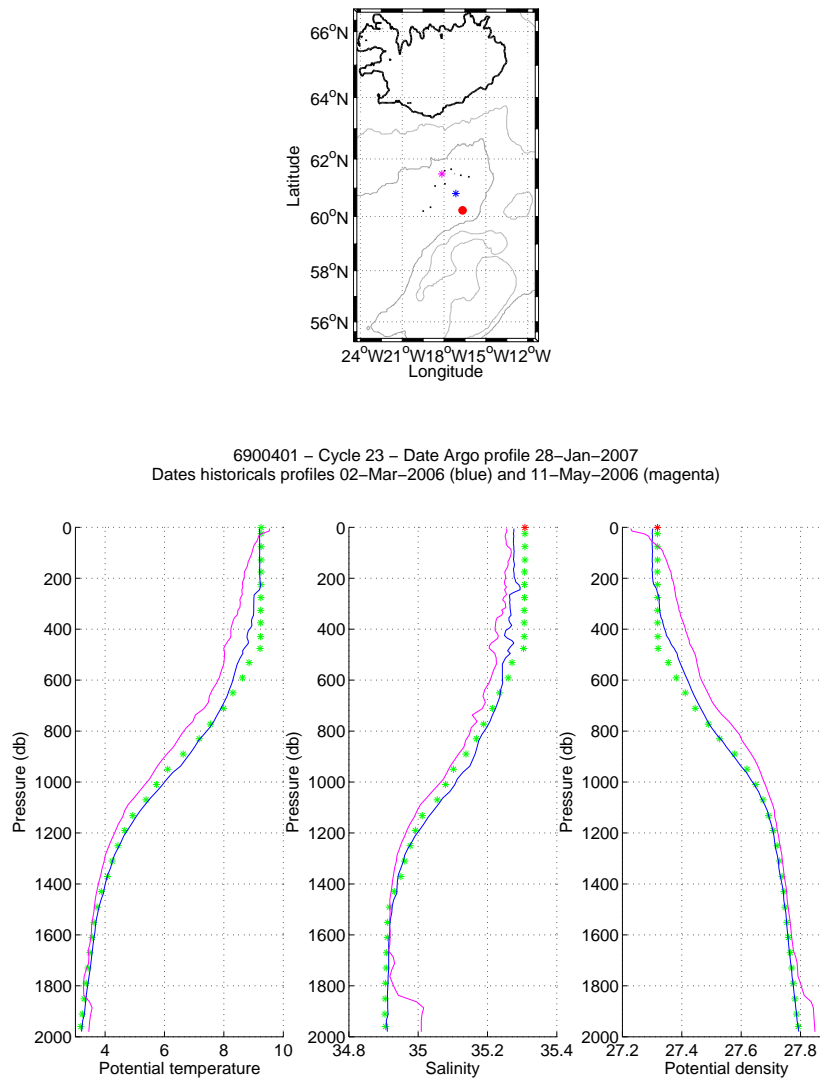
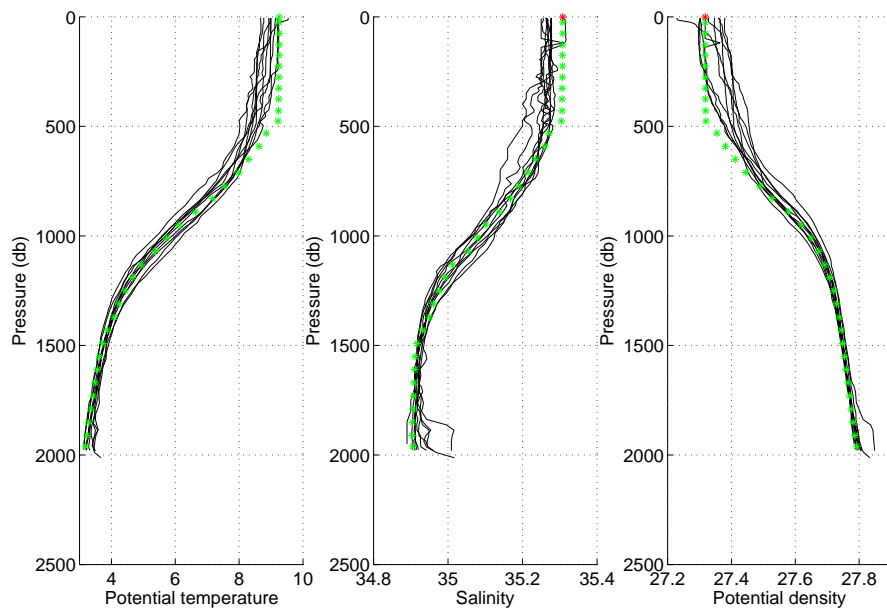


FIG. 15: Flotteur 6900401, cycle 23. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function 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).

6900401 – Cycle 23



6900401 – Cycle 23 – Date Argo profile 28–Jan–2007
 Dates historicals profiles 02–Mar–2006 (blue) and 11–May–2006 (magenta)

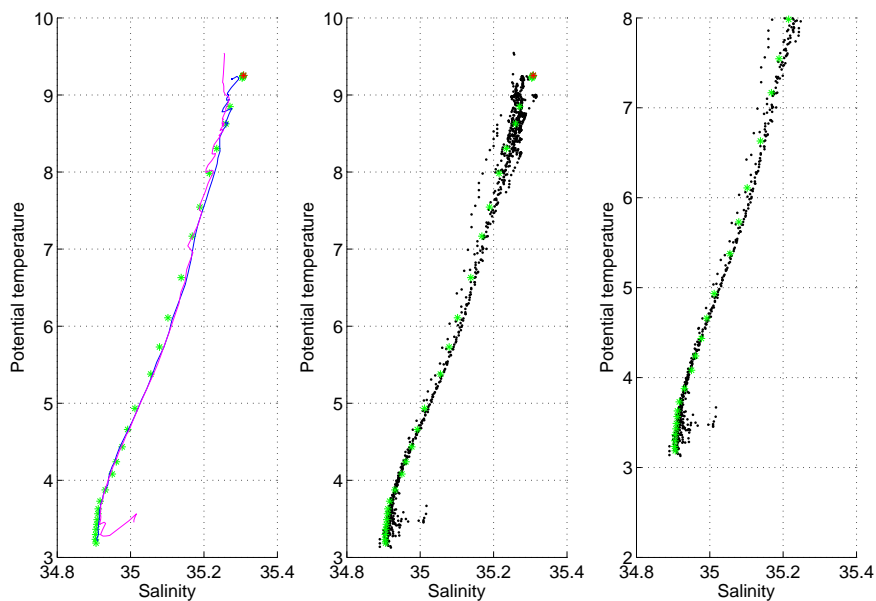


FIG. 16: Float 6900401, cycle 23. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 28 - Comparison to the nearest historical CTD profiles

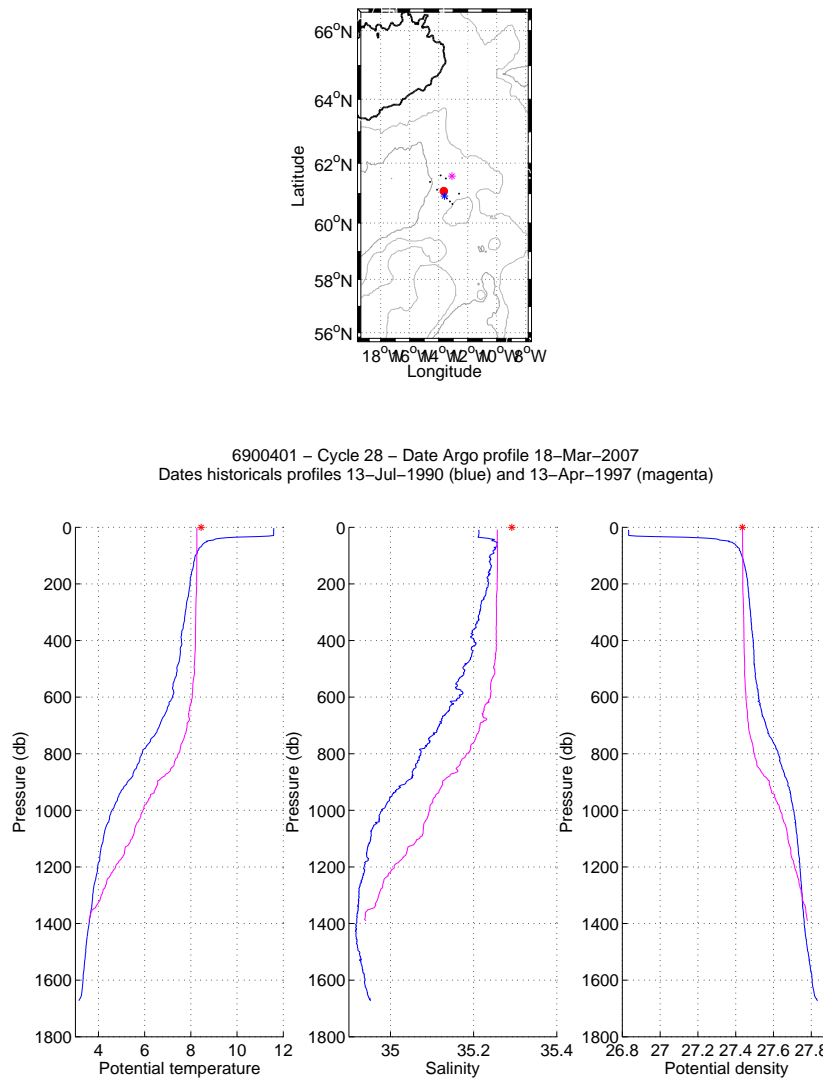
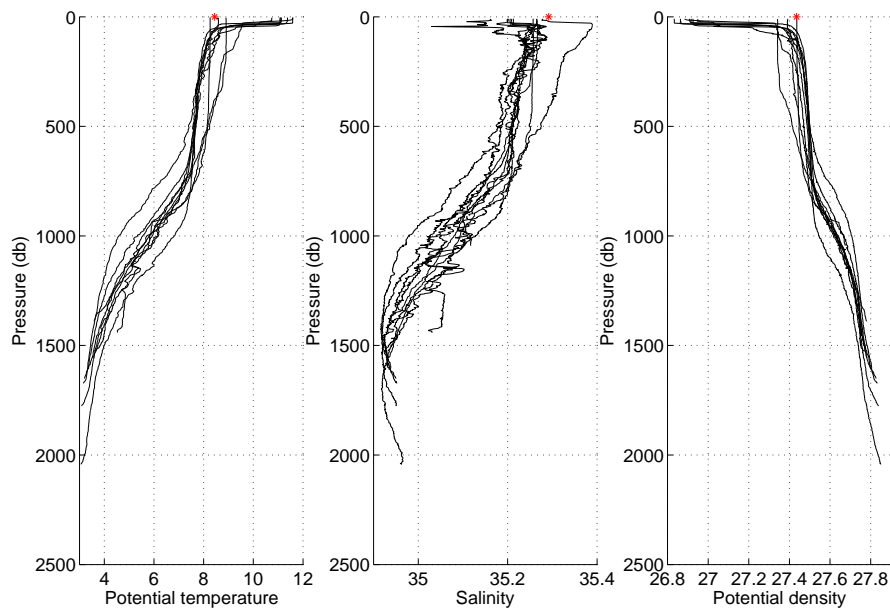


FIG. 17: Flotteur 6900401, cycle 28. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure 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).

6900401 – Cycle 28



6900401 – Cycle 28 – Date Argo profile 18-Mar-2007
 Dates historicals profiles 13-Jul-1990 (blue) and 13-Apr-1997 (magenta)

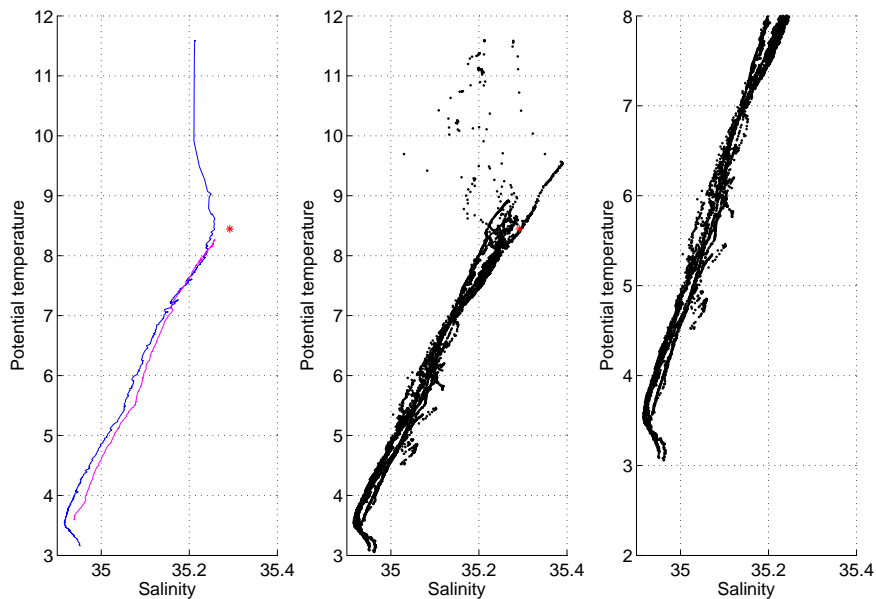


FIG. 18: Float 6900401, cycle 28. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1; blue for 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.

9 Cycle 28 - Comparaison to the nearest ARGO profiles

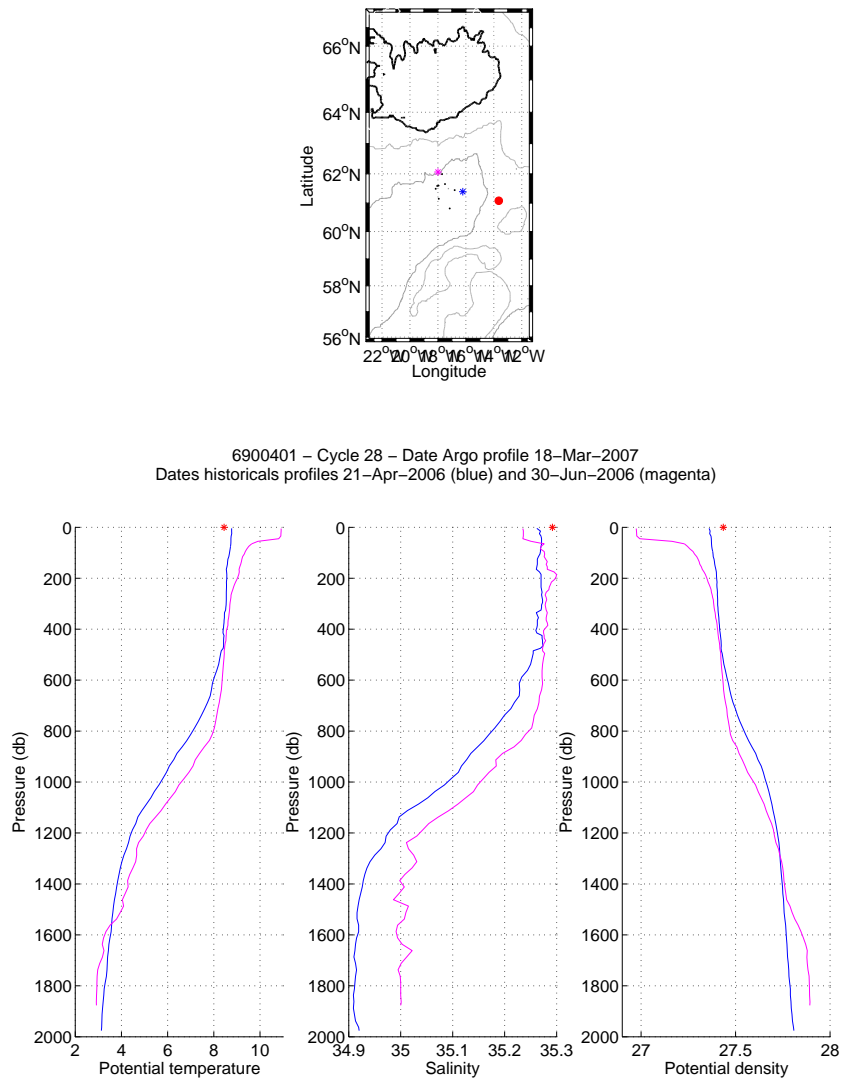
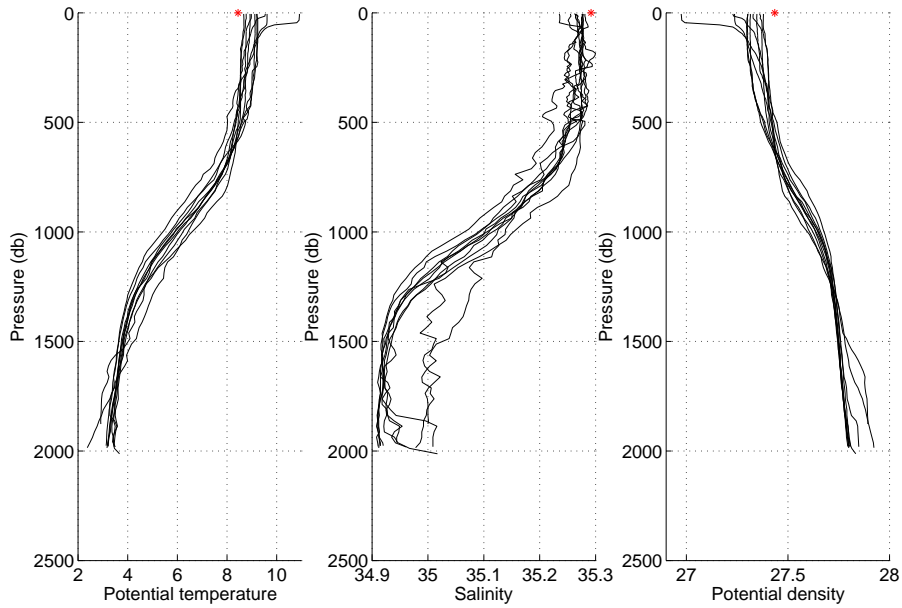


FIG. 19: Flotteur 6900401, cycle 28. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function 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).

6900401 – Cycle 28



6900401 – Cycle 28 – Date Argo profile 18-Mar-2007
Dates historical profiles 21-Apr-2006 (blue) and 30-Jun-2006 (magenta)

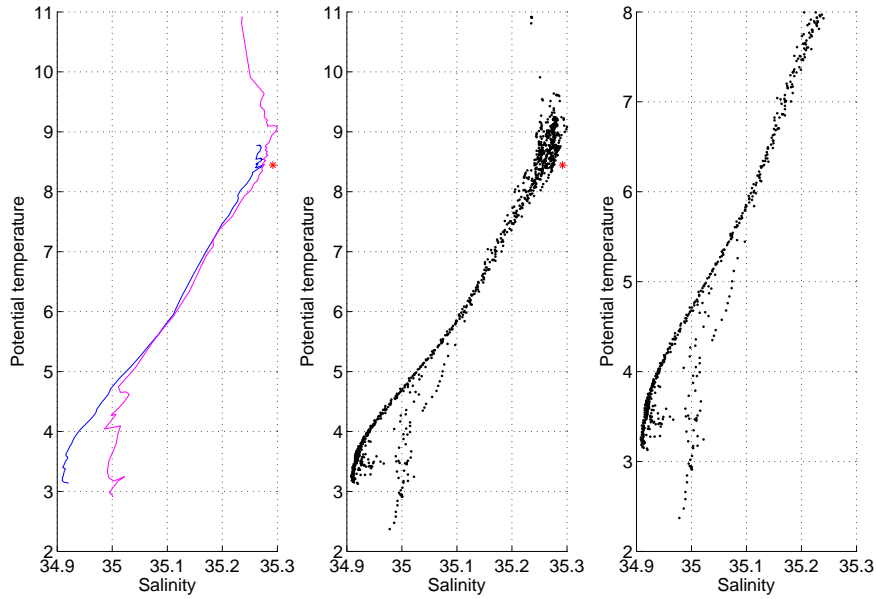


FIG. 20: Float 6900401, cycle 28. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 30 - Comparaison to the nearest historical CTD profiles

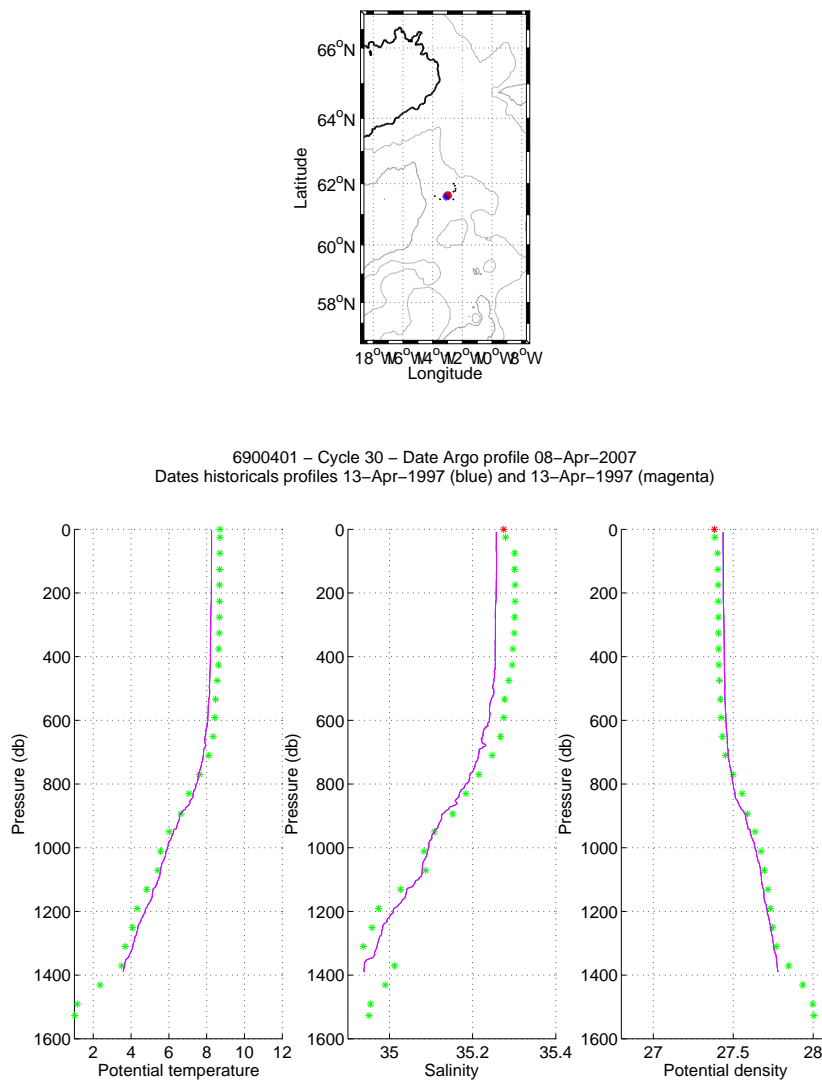
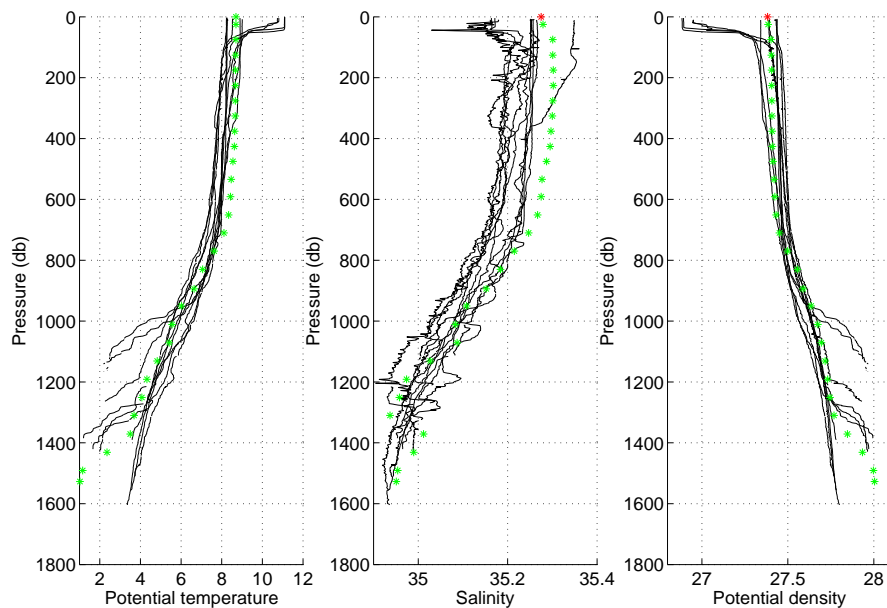


FIG. 21: Flotteur 6900401, cycle 30. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure 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).

6900401 – Cycle 30



6900401 – Cycle 30 – Date Argo profile 08-Apr-2007
 Dates historicals profiles 13-Apr-1997 (blue) and 13-Apr-1997 (magenta)

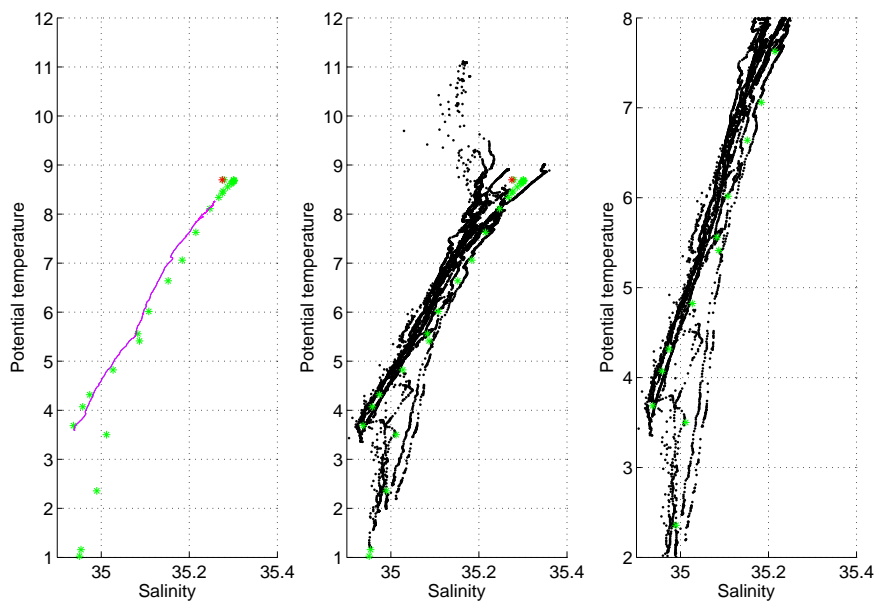


FIG. 22: Float 6900401, cycle 30. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1; blue for 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.

11 Cycle 30 - Comparison to the nearest ARGO profiles

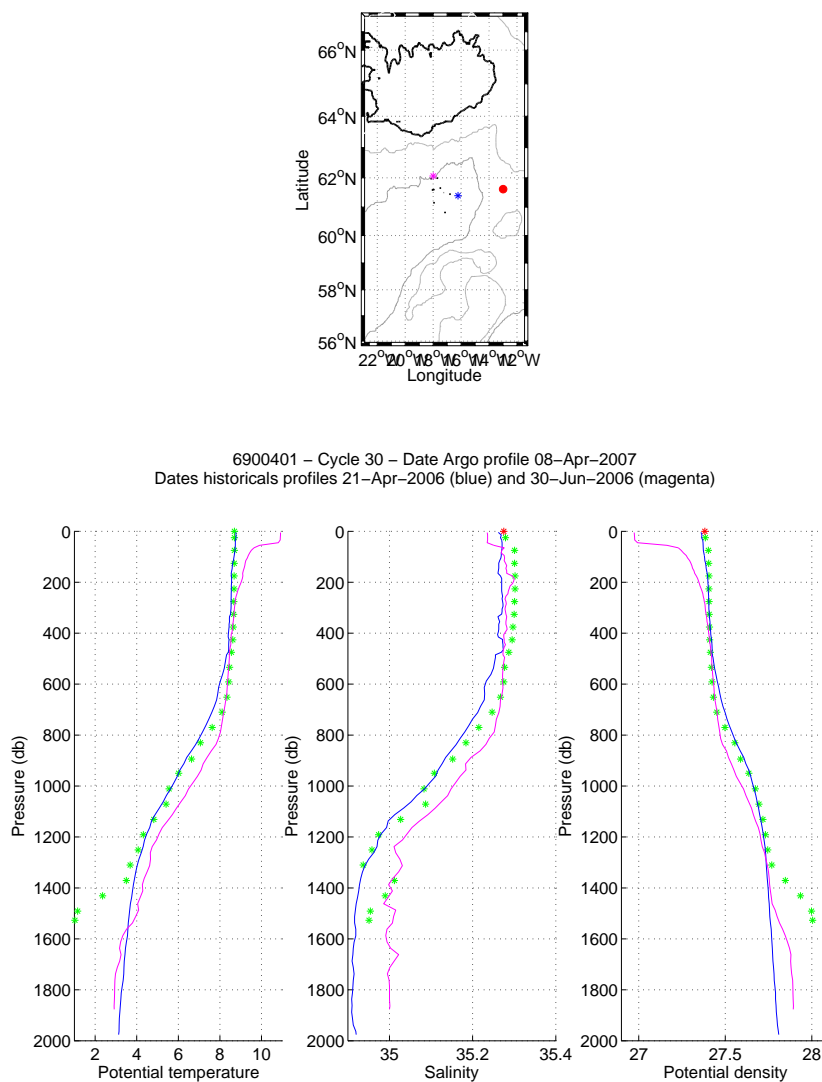
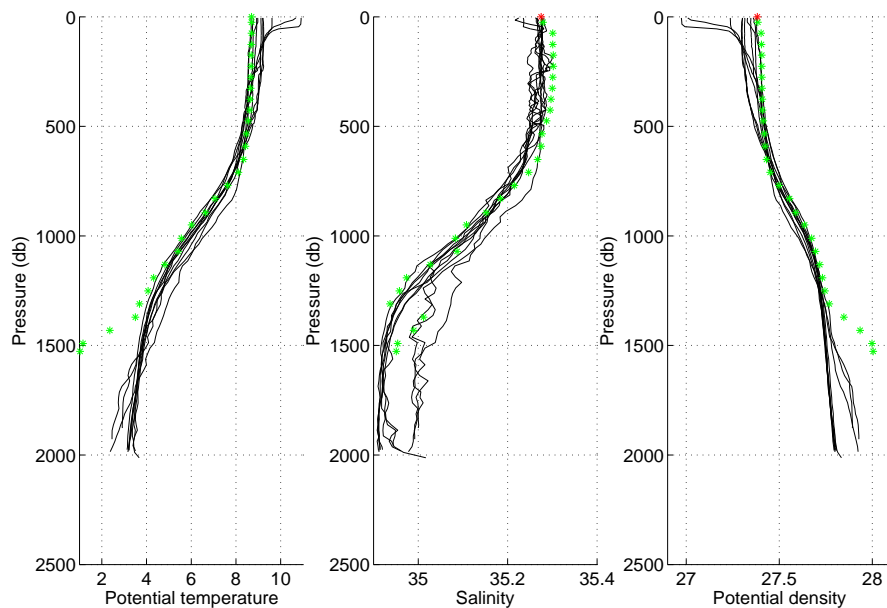


FIG. 23: Flotteur 6900401, cycle 30. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function 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).

6900401 – Cycle 30



6900401 – Cycle 30 – Date Argo profile 08–Apr–2007
 Dates historicals profiles 21–Apr–2006 (blue) and 30–Jun–2006 (magenta)

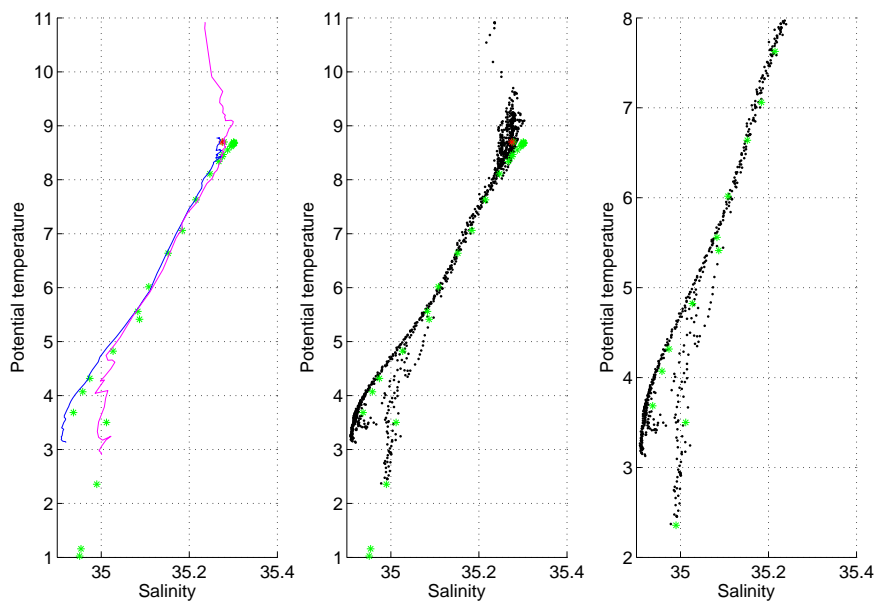


FIG. 24: Float 6900401, cycle 30. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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 Cycle 32 - Comparison to the nearest historical CTD profiles

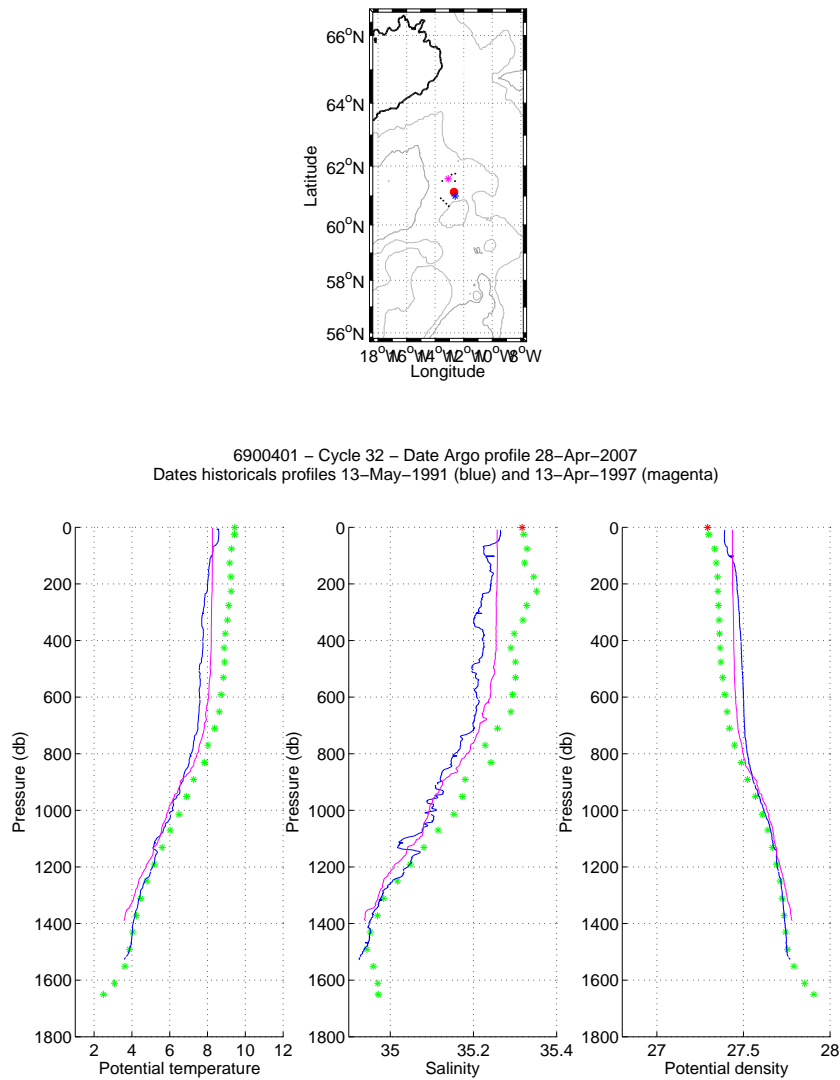
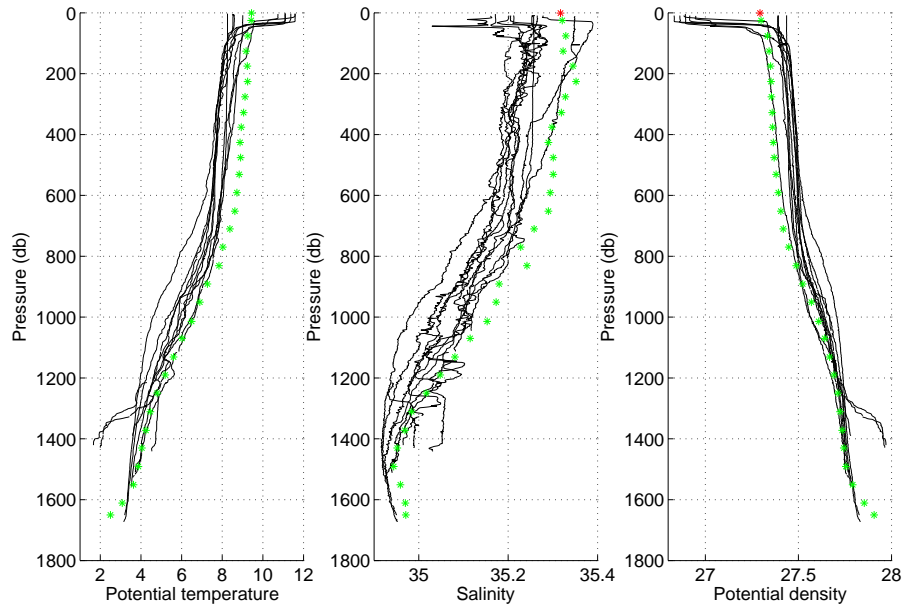


FIG. 25: Flotteur 6900401, cycle 32. Upper panel : Position of the Argo profile (red) and of the nearest CTD profiles (black). The nearest CTD profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function of pressure 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).

6900401 – Cycle 32



6900401 – Cycle 32 – Date Argo profile 28-Apr-2007
 Dates historical profiles 13-May-1991 (blue) and 13-Apr-1997 (magenta)

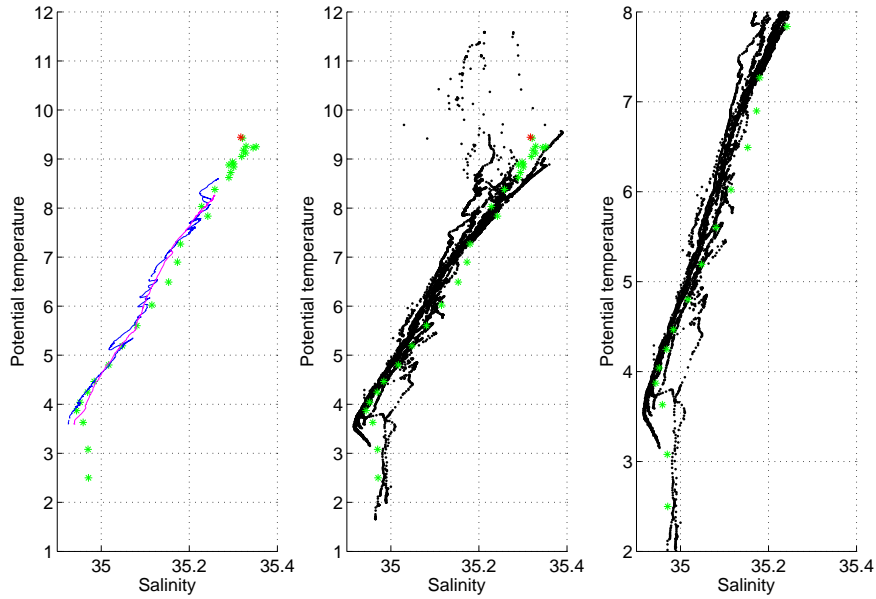


FIG. 26: Float 6900401, cycle 32. The Argo profile (stars) is compared to the nearest CTD profiles (black line) and to two specific profiles : the nearest profile in time (magenta) and the nearest profile in space (blue). The color of the Argo profile represents the QC flag (green for a QC=1; blue for 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.

13 Cycle 32 - Comparison to the nearest ARGO profiles

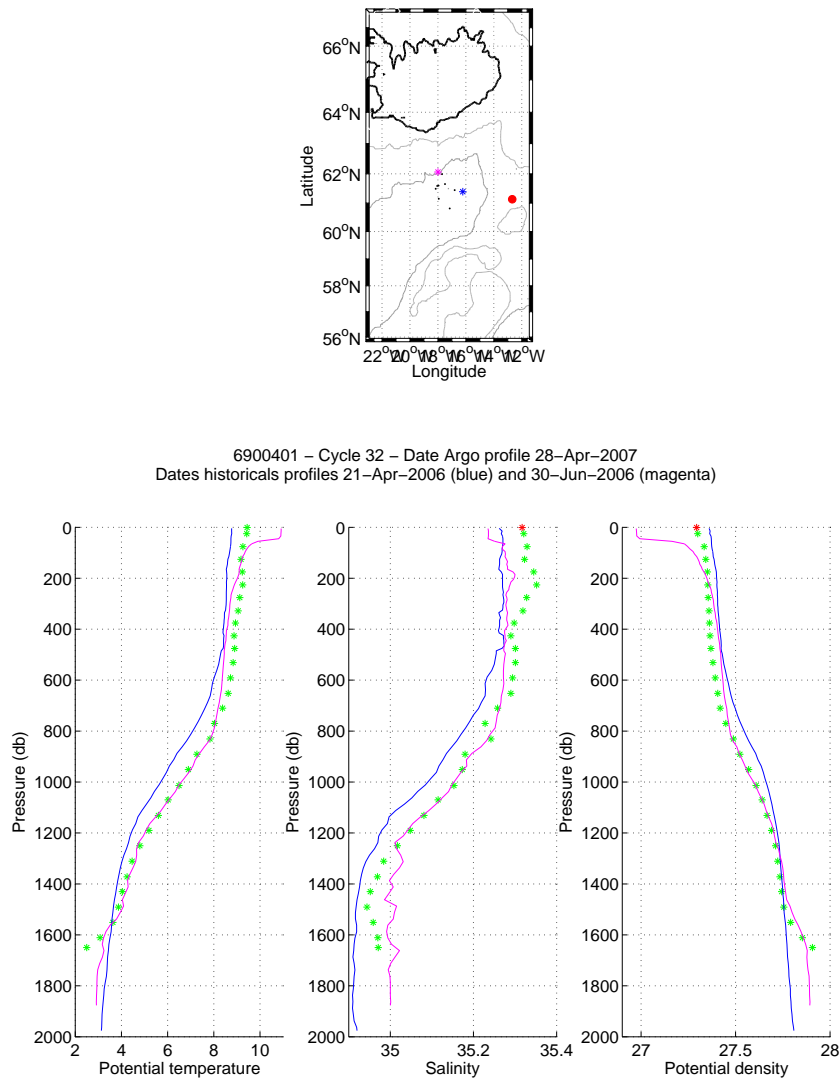
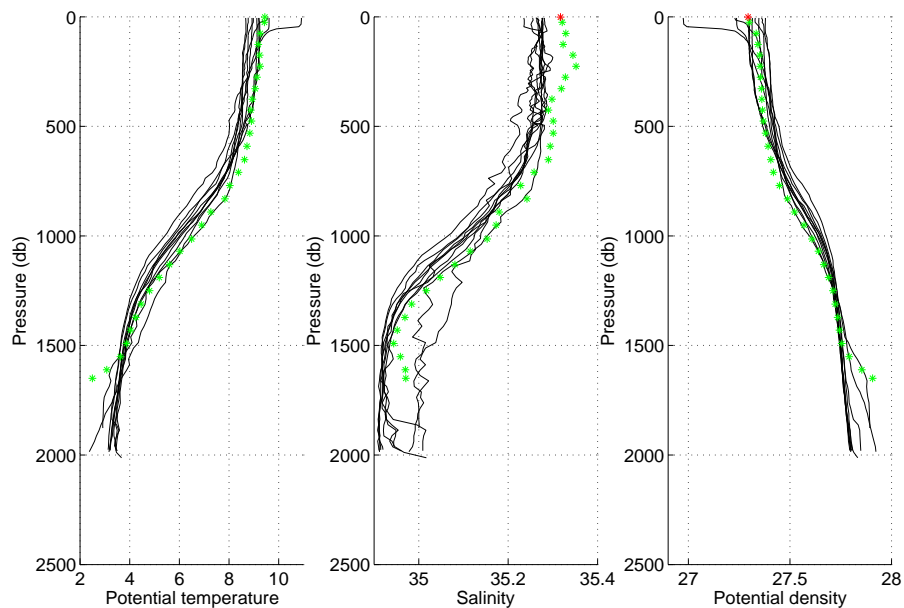


FIG. 27: Flotteur 6900401, cycle 32. Upper panel : Position of the analysed Argo profile (red) and of the nearest Argo profiles (black). The nearest Argo profile in time is in magenta while the nearest CTD profile in space is in blue. Lower panels : Temperature, salinity and potential density as function 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).

6900401 – Cycle 32



6900401 – Cycle 32 – Date Argo profile 28-Apr-2007
 Dates historicals profiles 21-Apr-2006 (blue) and 30-Jun-2006 (magenta)

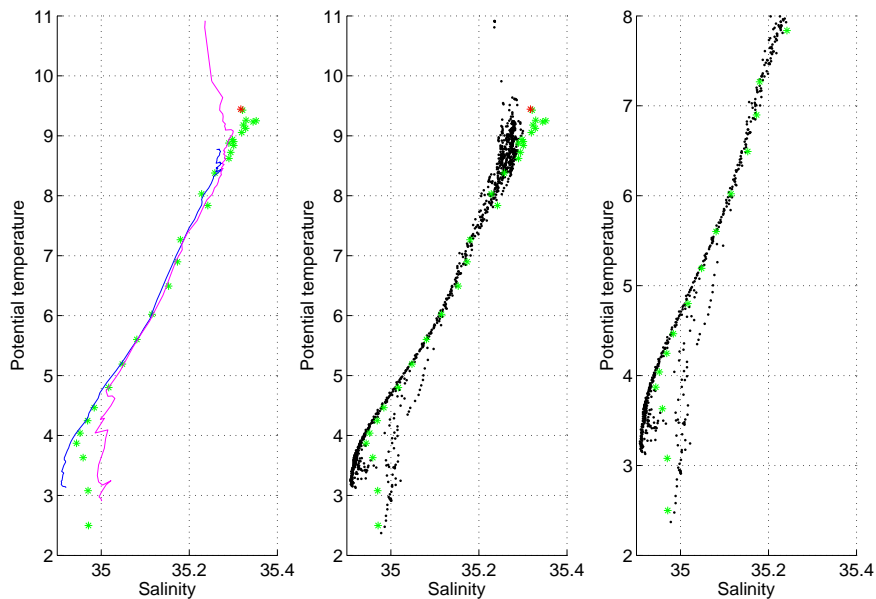


FIG. 28: Float 6900401, cycle 32. The analysed Argo profile (stars) is compared to the nearest Argo profiles (black line) and to two specific profiles : the nearest Argo profile in time (magenta) and the nearest Argo profile in space (blue). The color of the analysed Argo profile represents the QC flag (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.

14 OW method, CONFIGURATION # 3

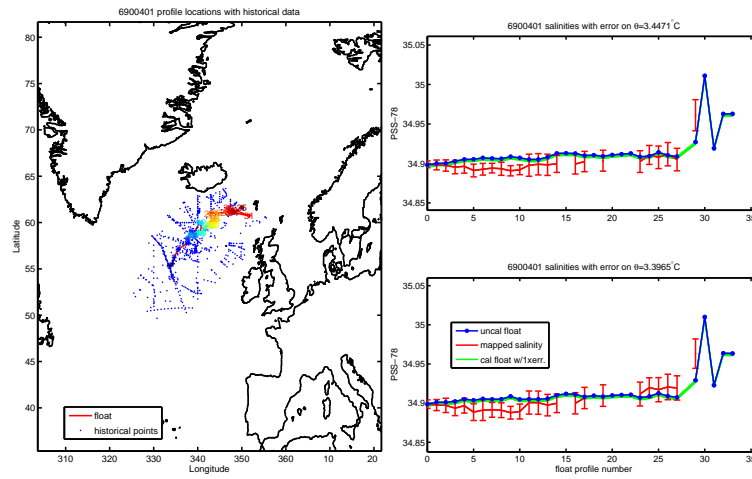


FIG. 29: Figures from the OW method. (Left) Position of the historical and float data. (Droite) Comparison, on various θ levels, between the float data and the historical data interpolated at the float position.

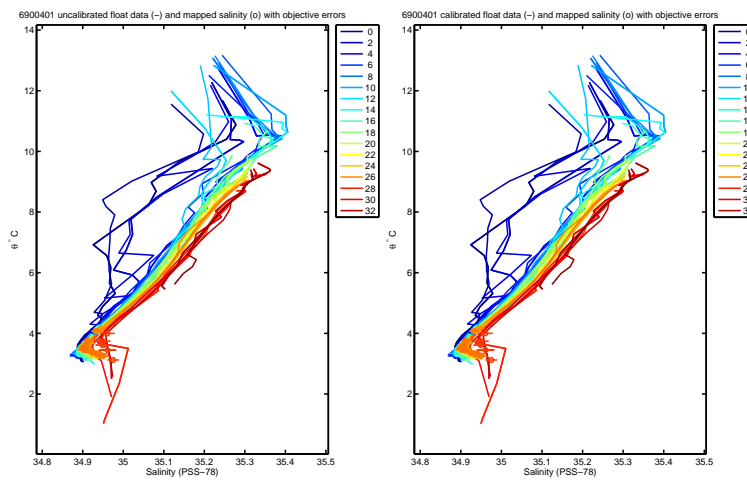


FIG. 30: Figures from the OW method. Comparison of the θ/S diagram of the float with the historical database. (left) raw data ; (right) corrected data using the OW correction.

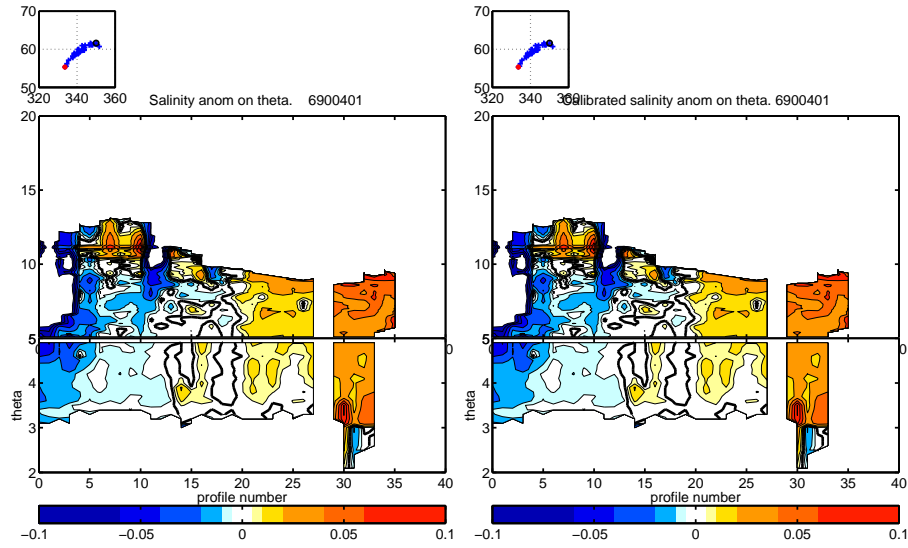


FIG. 31: Figures from the OW method. Salinity anomaly : (left) raw data ; (right) corrected data using the OW correction.

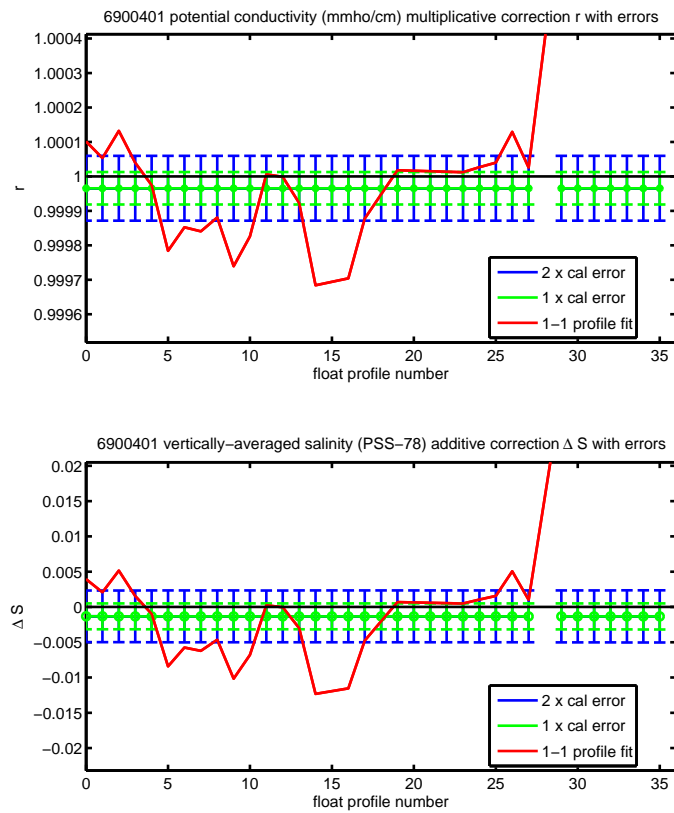


FIG. 32: Correction proposed by the OW method.

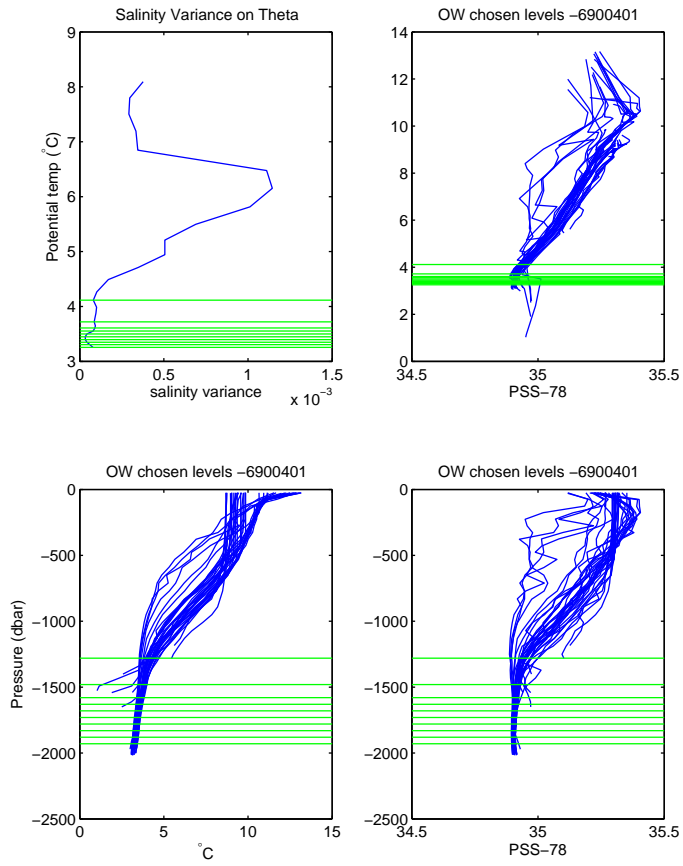


FIG. 33: Chosed levels by the OW method.