Argo-España

Parte de la estrategia global de observación del océano

Report on Delayed Mode for Argo float WMO 6901241

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Delayed Mode Quality Control for Argo float WMO 6901241

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A. González-Santana - P. Vélez-Belchí
Instituto Español de Oceanografía

1 Introduction

The Delayed Mode Quality Control (DMQC) has been developed for float WMO 6901241 and delivered on 09/01/2017 to ifremer. No anomalous profiles were detected during its initial analysis in any of the measured variables in the 104 profiles carried out.

Transmision system	ARGOS
Transmission ID	118190 2685
Platform Model	APEX APF9A 7940
Platform ID	6314-7940
Sensors	SBE41CP SBE41CP SBE41CP
Sensores s/n	n/a n/a n/a
Data Centre (Format Version)	IF (3.1)
Project Name	ARGO SPAIN (Raprocan)
Data Centre (Format Version)	IF (3.1)
Project Name	ARGO SPAIN (Raprocan)
Float Owner	
PI Name	Pedro Joaquin VELEZ BELCHI
Parking Depth (dbar)	1000
Profile depth (dbar)	2000
Number of Profiles	104
Status	Inactive
Deployment Date	10-Dec-2012 00:00:00
Deployment Position	Lat 27.65 Lon -17.91
Last Surfacing Date	06-Oct-2015 23:10:50
Deployed Position	Lat 25.78 Lon -27.00
Age (years)	2.8
Voltage (v)	12.575
Positioning System	
Sensors	CTD-PRES,CTD-TEMP,CTD-CNDC

Table 1. Technical information of the float.

Several checks were performed: Pressure values were studied to avoid possible TNDP anomalies. The Thermal Mass Error was also calculated in order to avoid possible errors due to the temperature gradients. The Owens and Wong Objective Mapping Analysis (2003) was applied to achieve an optimum calibration of the salinity.

2 Salinity correction from the OW method

Owens and Wong Objective Mapping Analysis (2003):

This calibration model assumes that salinity measurements drift slowly over time. To correct possible salinity drifts, the model makes use of adjacent profiles (a time series) to estimate a time-varying multiplicative correction term "r" by fitting to the estimated climatological potential conductivities on theta surfaces. The inclusion of contemporary high quality calibrated hydrographic data with regional temperature - salinity relationships (by using nearby historical hydrographic data) helps to determine whether a measured trend is due to sensor drift or due to natural variability.

Drift or bias evidence cannot be seen in the salinity measurement for WMO 6901241 float. Therefore after the manual evaluation and inspection, no adjustment is needed according to Argo Quality Control Manual: PSAL ADJUSTED = PSAL (original value), PSAL ADJUSTED ERROR = Uncertainty provided by PI, PSAL ADJUSTED QC = 1, 2 or 3.

The following parameters has been set up for the Owens and Wong Objective Mapping Analysis method:

Config_max_casts	126
use_pv	0
scale_long_large	2
scale_lat_large	2
scale_long_small	1
scale_lat_small	1
scale_phi_small	0
scale_phi_large	0
scale_age	10
p_delta	250
p_exclude	200

Table 2. Owens and Wong Objective Mapping Analysis method parameters .

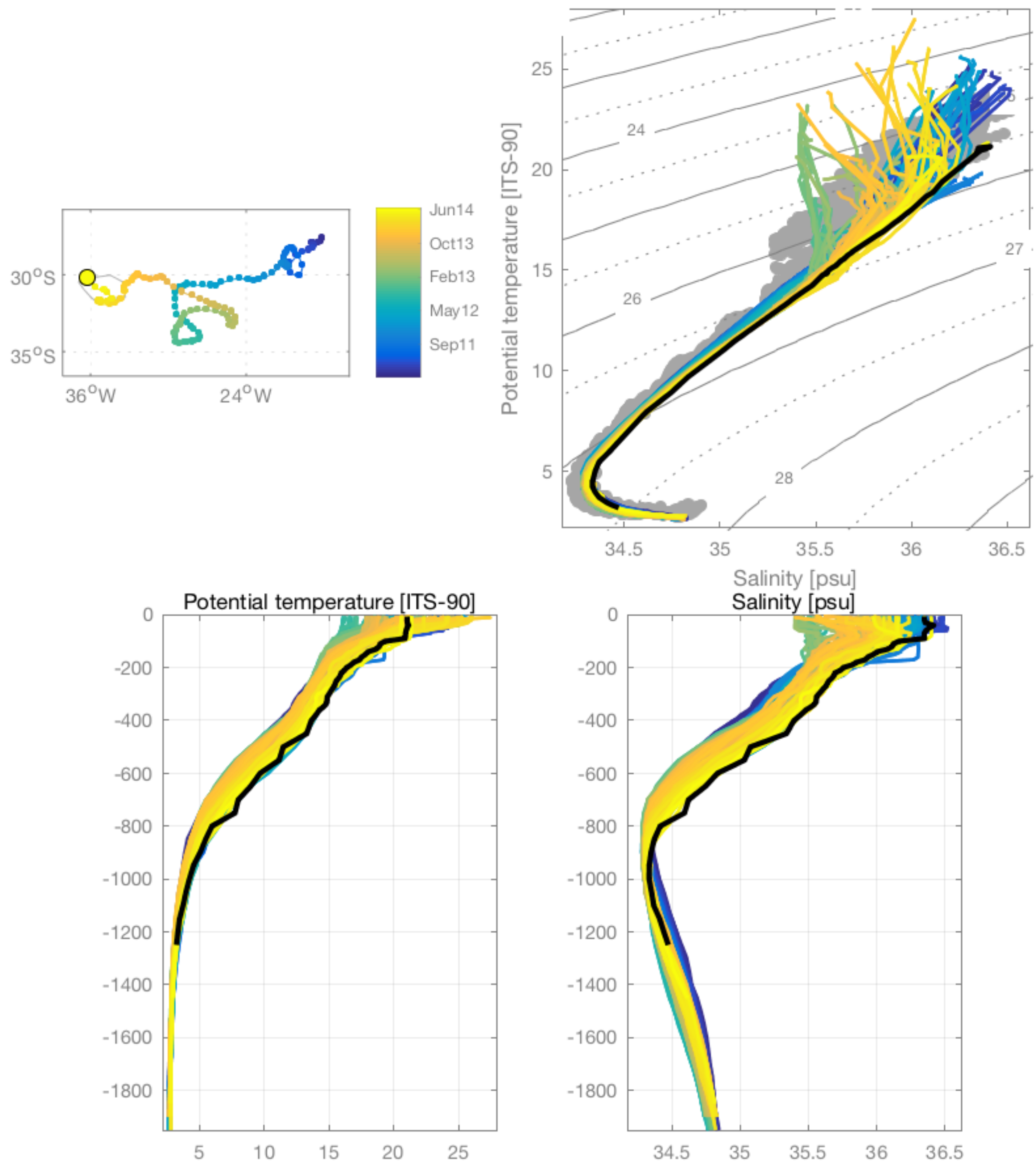


Figure 1: Argo float trajectory (a). T-S Diagram (b). Potential Temperature profiles (c). Salinity profiles (d).

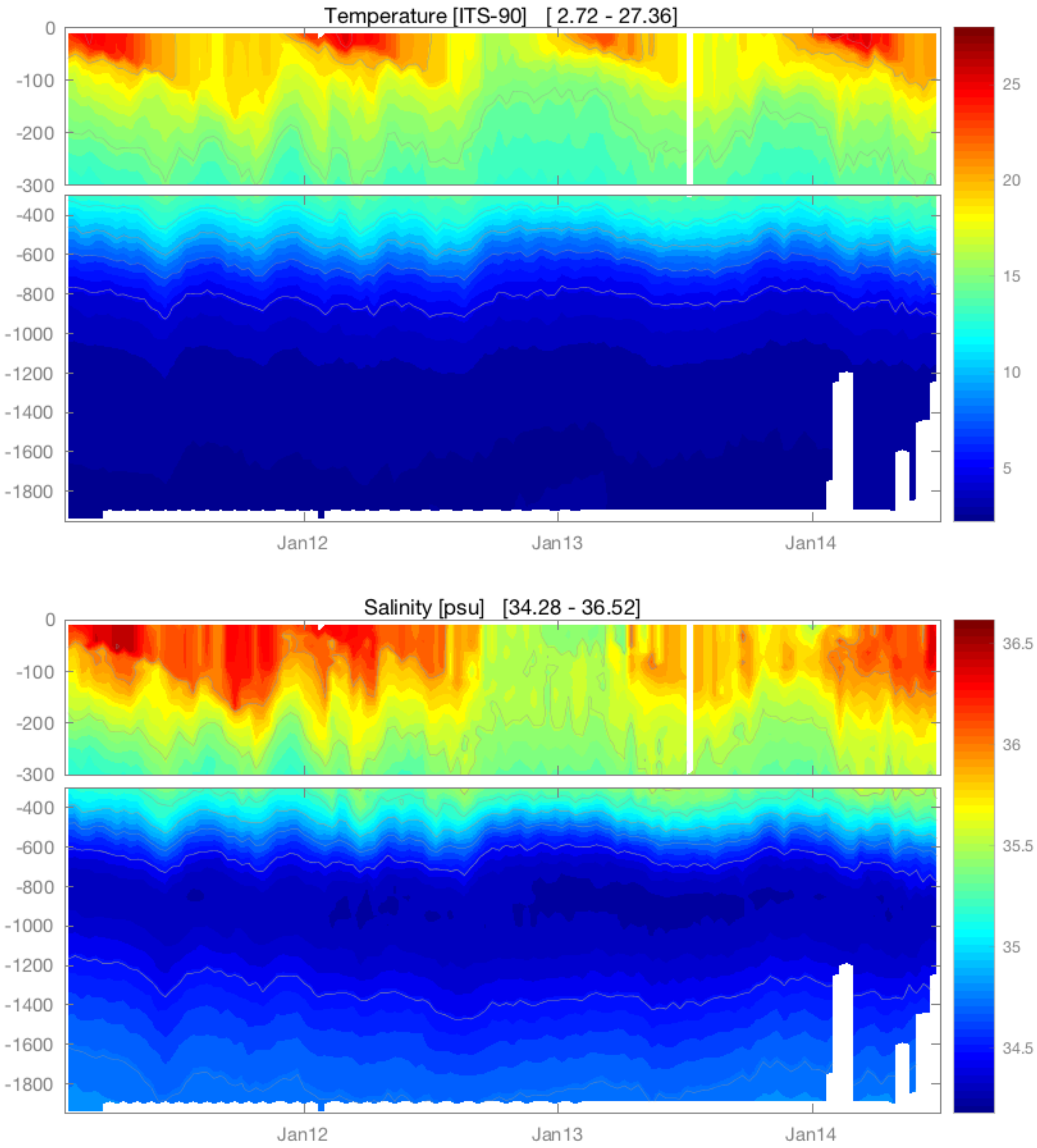


Figure 2: Potential temperature and salinity sections.

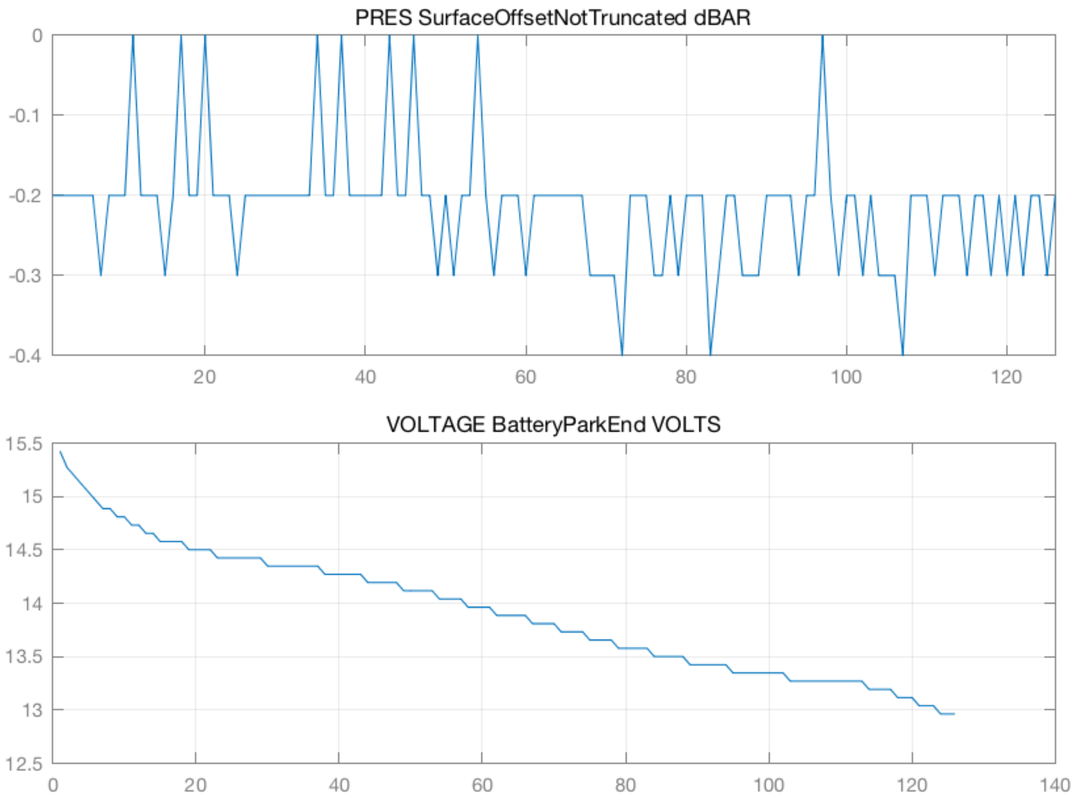


Figure 3: Pressure record (a). Voltage record (b).

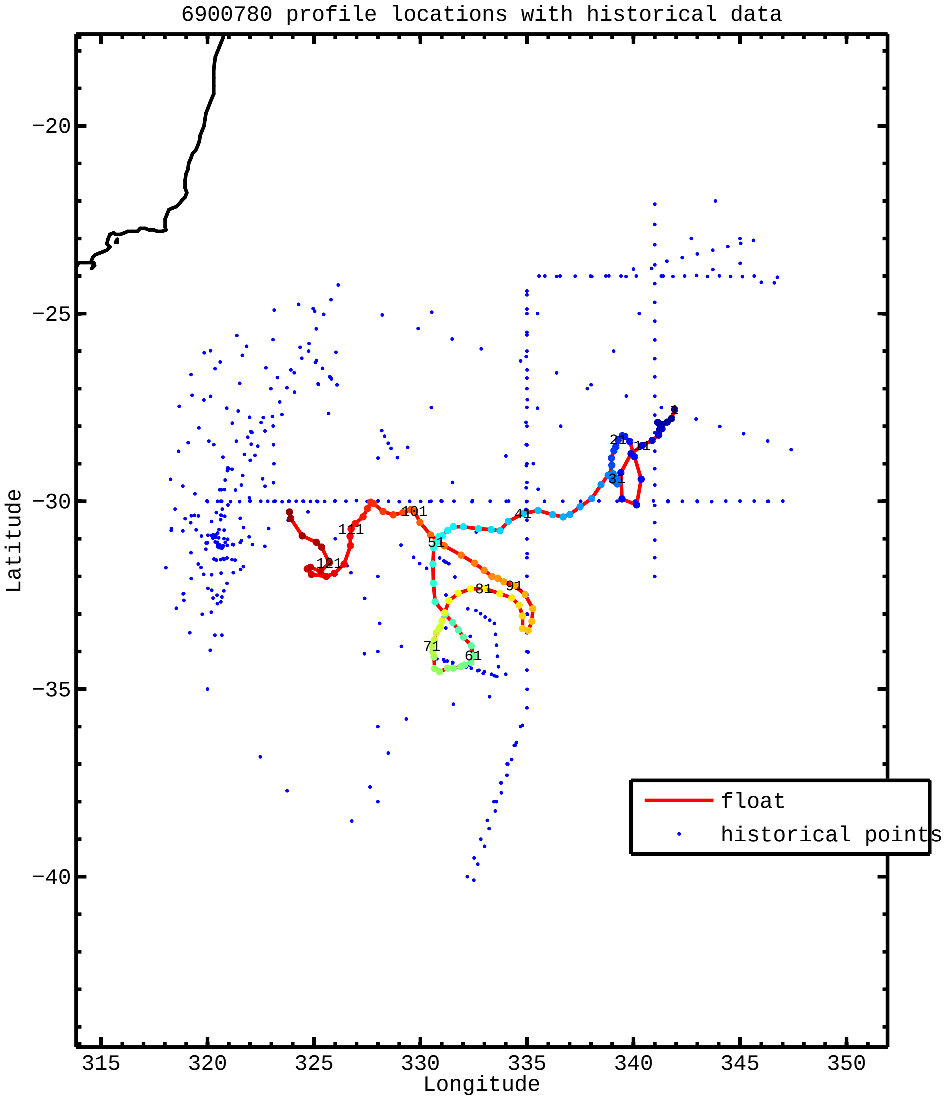
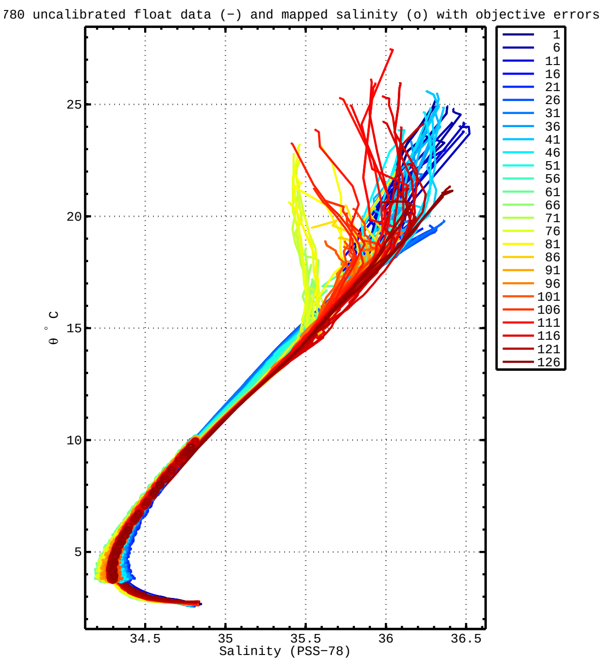
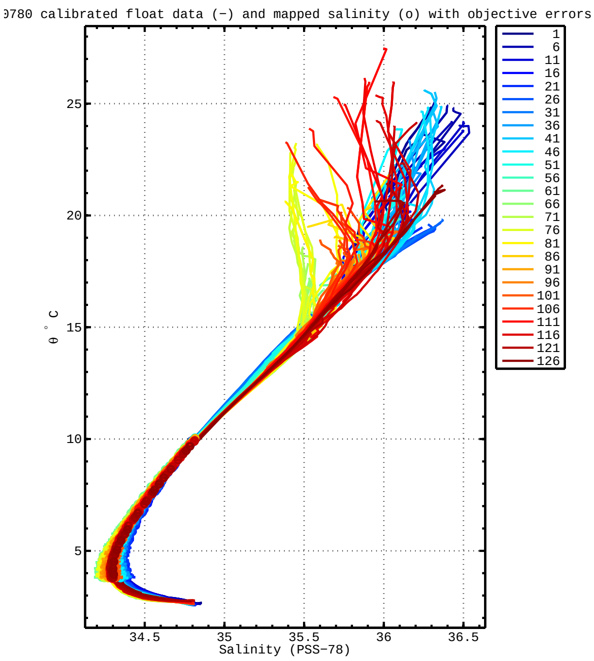


Figure 4: Historical points around the current ARGO float trajectory. These historical points are used by Owens and Wong Objective Mapping Analysis to make a model for an ARGO float data calibration.



(a) T-S Diagram



(b) T-S Diagram after a potential calibration

Figure 5: Both graphs show T-S diagrams before and after a potential calibration. This is useful to identify water masses, to detect some possible offsets or to identify some anomalous profiles.

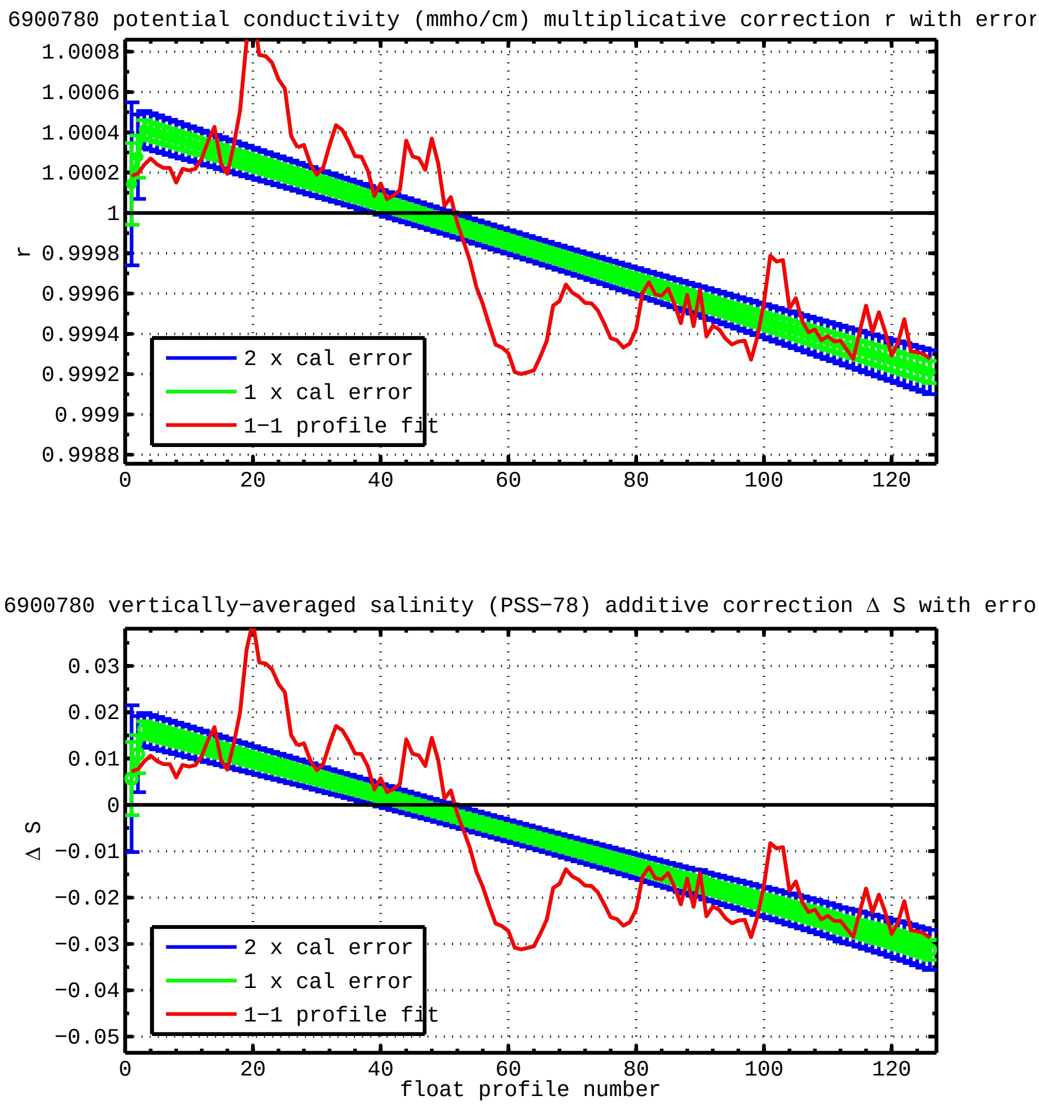


Figure 6: Salinity variation between each profile. Owens and Wong Objective Mapping Analysis builds its model based in a programmed number of break points.

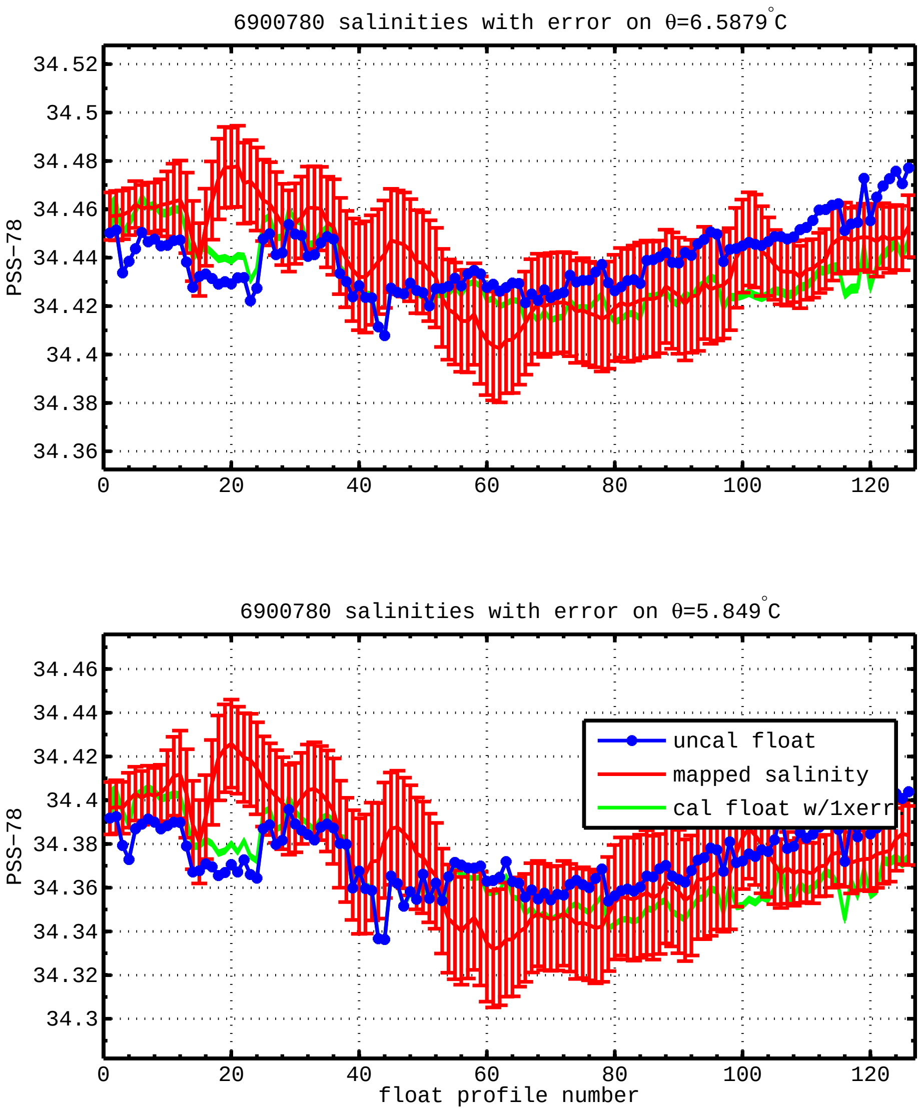
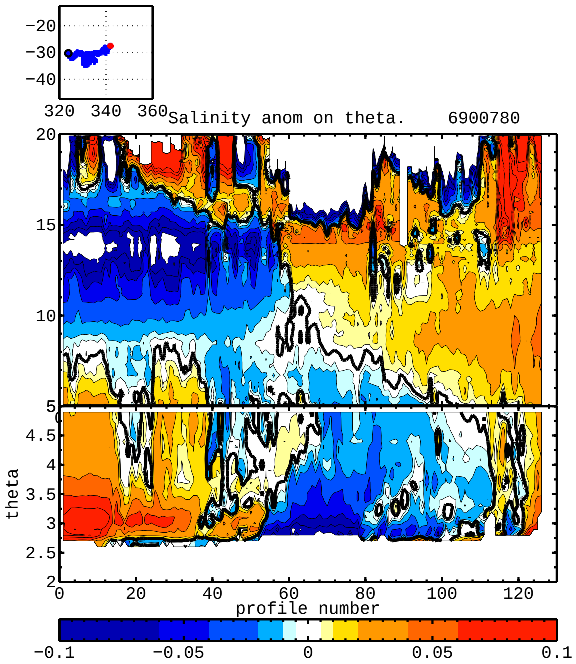
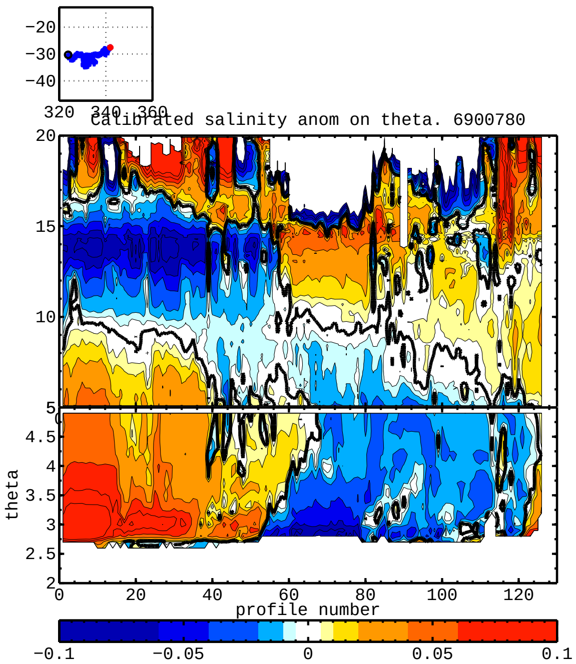


Figure 7: This figure gives a rough idea how uncalibrated (blue line) and calibrated (green line) signals fit each other. Bear in mind that mapped salinity depends on the historical hydrographic points of the area (Figure 1). The less historical points, the less approximated is the model.



(a) Original salinity variation



(b) Calibrated salinity variation

Figure 8: Brians King plots. Both show the salinity variation for an each level of theta per profile. A colored scale indicates the salinity variation (white color indicates no varation). Comparing both uncalibrated and calibrated plots, significant salinity variations can be identified.

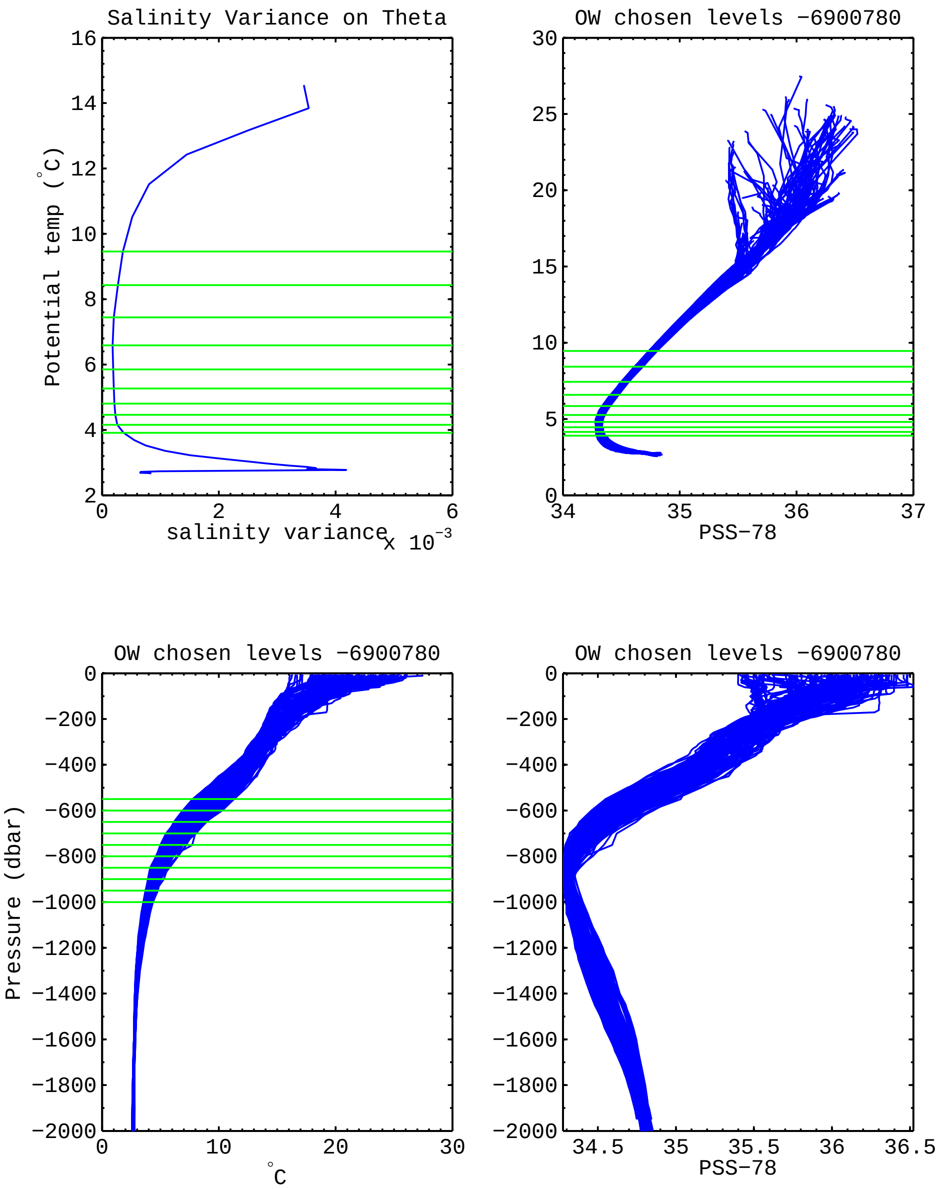


Figure 9: Theta levels are chosen by Owens and Wong Objective Mapping Analysis. The model identifies automatically the theta levels where the salinity variations are smaller.