

Note of Delayed Mode Quality Control of Argo float WMO 6902722

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This note includes the results of OWC performed for the WMO 6902722 float. The reference dataset used is composed of the following CTD and Argo historical datasets:

CTD:

CMEMS:

- INSITU_MED_PHYBGCWAV_DISCRETE_MYNRT_013_035
- Coriolis: CTD_for_DMQC_2024V01
- Historical CTD profiles provided through personal contact

Argo:

- ARGO_for_DMQC_2025V03

Float 6902722 is the Arvor float, where the pressure sensor is auto corrected and no adjustment is required. The OWC was run to estimate a salinity offset and a salinity drift (Cabanès et al., 2016).

Configurations

Parameters	Value
CONFIG_MAX_CASTS	300
MAP_USE_PV	1
MAP_USE_SAF	0
MAPSCALE_LONGITUDE_LARGE	4
MAPSCALE_LONGITUDE_SMALL	1.33
MAPSCALE_LATITUDE_LARGE	4
MAPSCALE_LATITUDE_SMALL	1.33
MAPSCALE_PHI_LARGE	0.5
MAPSCALE_PHI_SMALL	0.1
MAPSCALE_AGE	10
MAP_P_EXCLUDE	400
MAP_P_DELTA	250

OWC Results

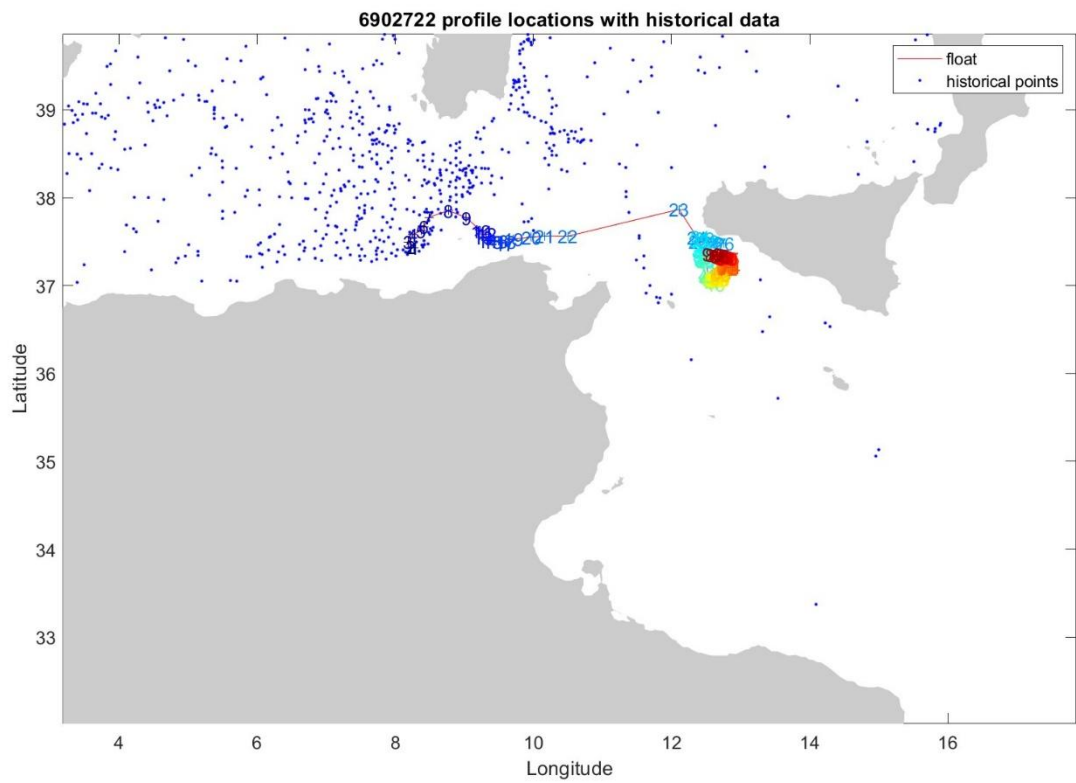


Figure 1: Location of the float profiles (red line with colored numbers) and the reference data selected for mapping (blue dots).

6902722 uncalibrated float data (-) and mapped salinity (o) with objective errors

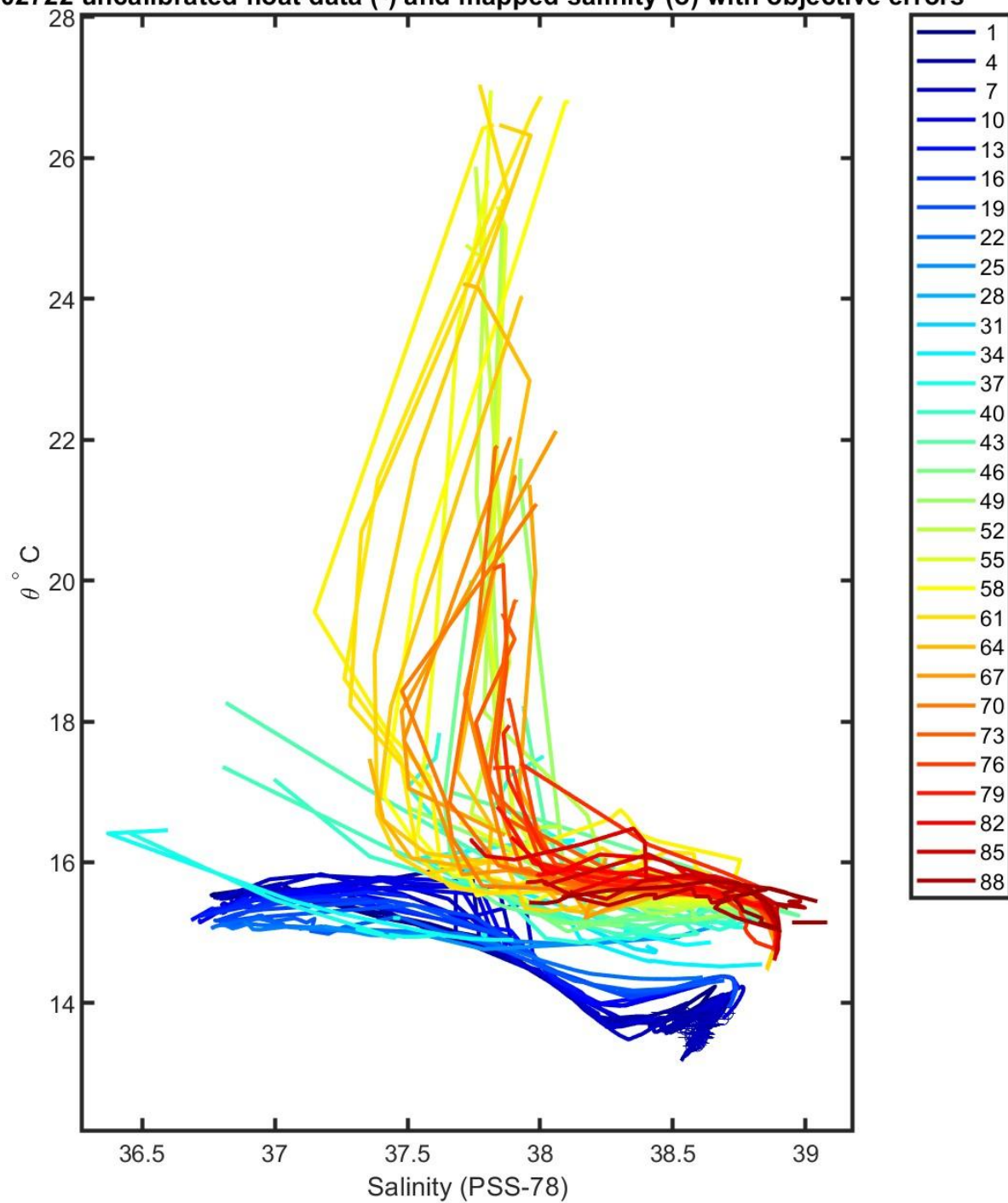


Figure 2: Plot the original float salinity and the objectively estimated reference salinity at the 10 float theta levels that are used in calibration.

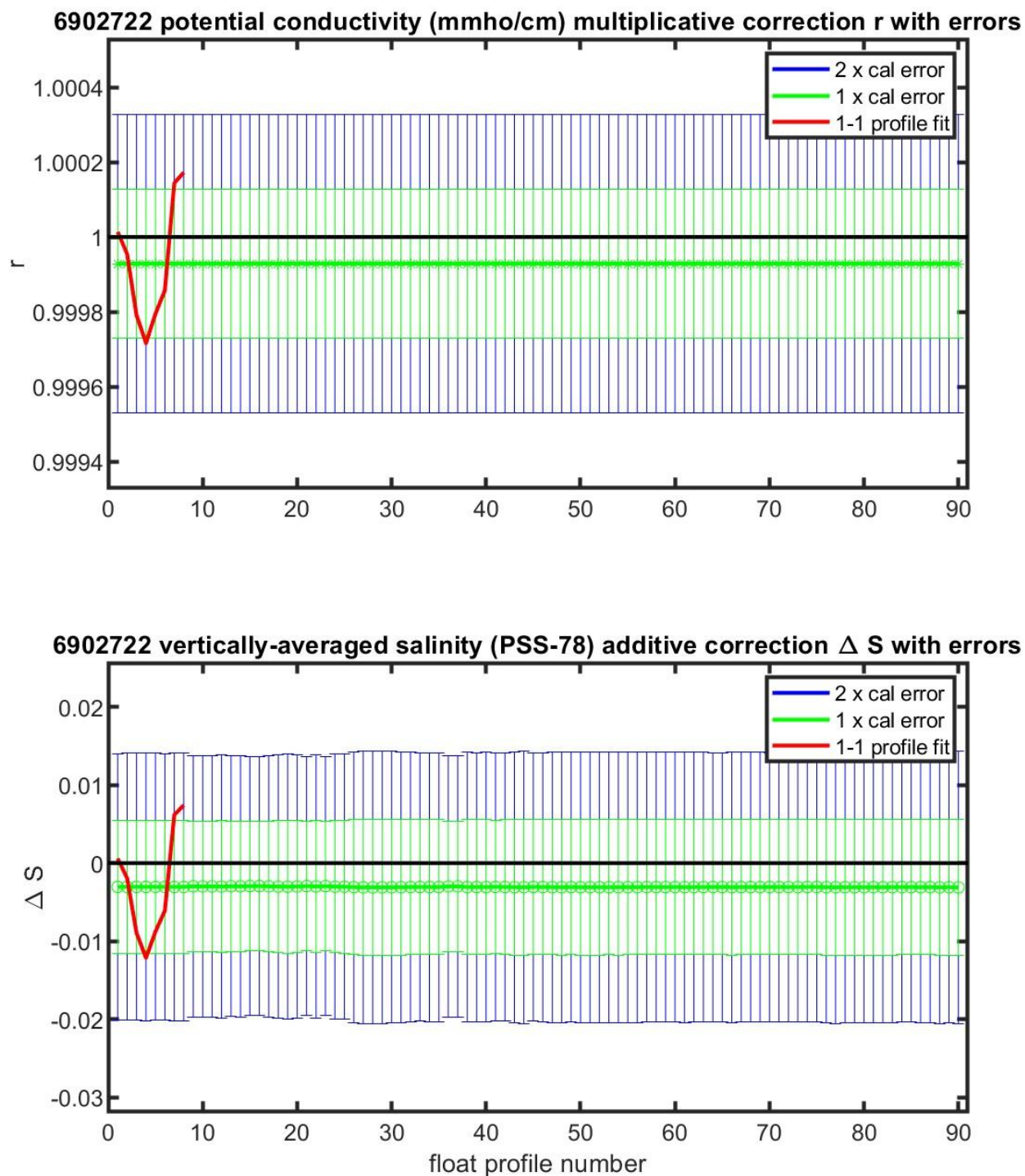


Figure 3: Evolution of the suggested adjustment with time. The top panel plots the potential conductivity multiplicative adjustment. The bottom panel plots the equivalent salinity additive adjustment. The red line denotes one-to-one profile fit that uses the vertically weighted mean of each profile. The red line can be used to check for anomalous profiles relative to the optimal fit.

6902722 calibrated float data (-) and mapped salinity (o) with objective errors

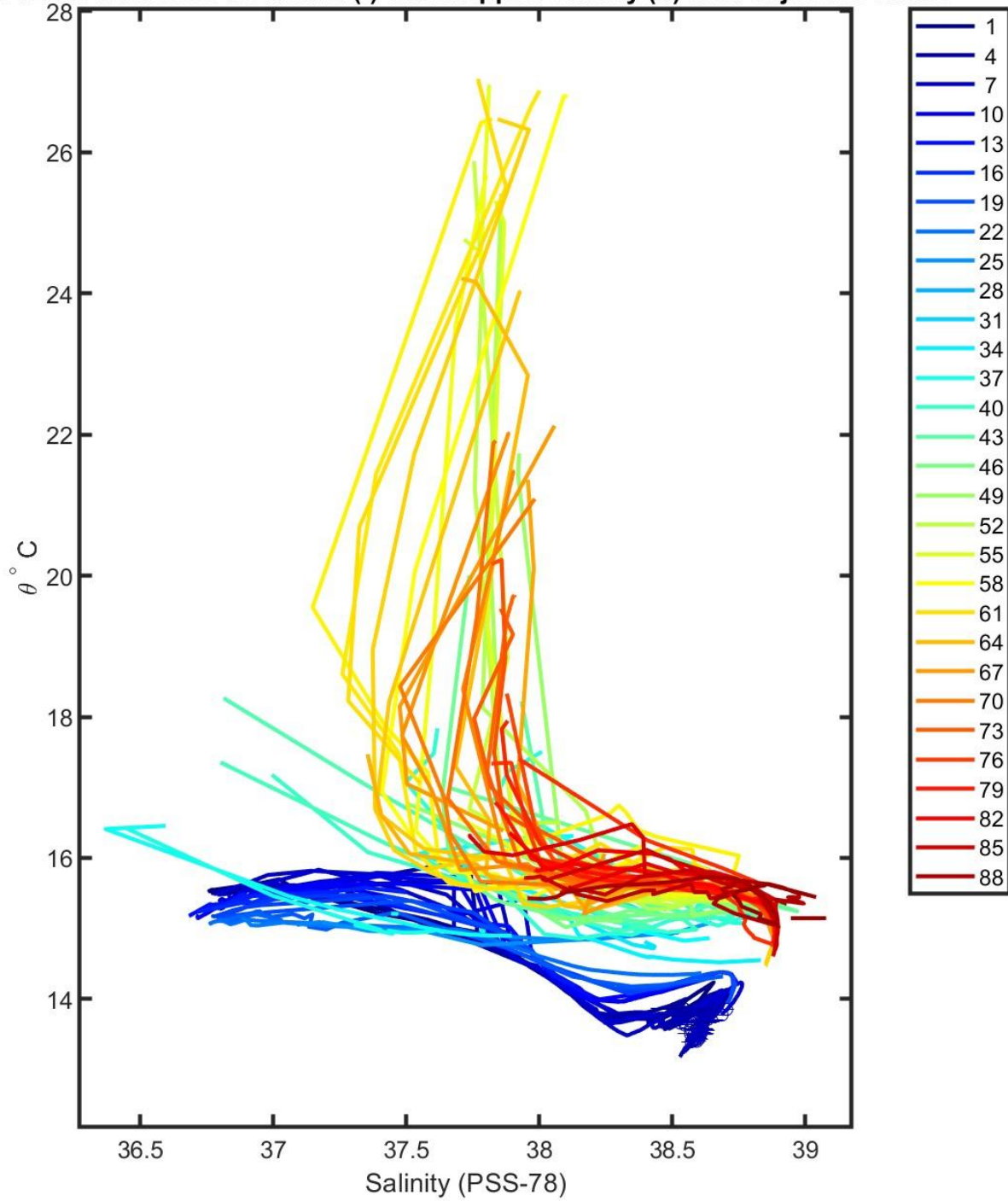


Figure 4: The plot of calibrated float salinity and the objectively estimated reference salinity at the 10 float theta levels that are used in calibration.

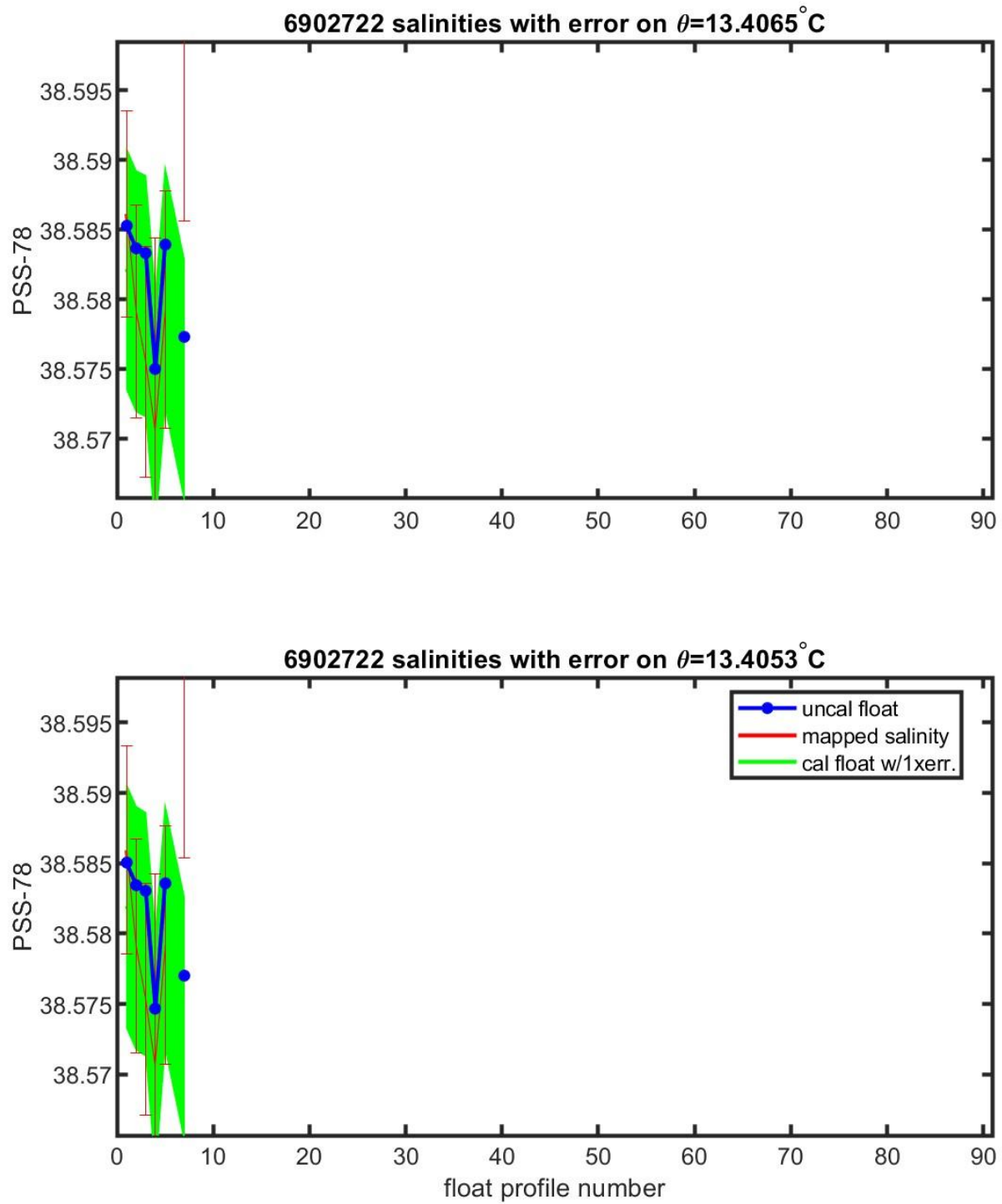


Figure 5: Plots of the evolution of salinity with time along with selected theta levels with minimum salinity variance.

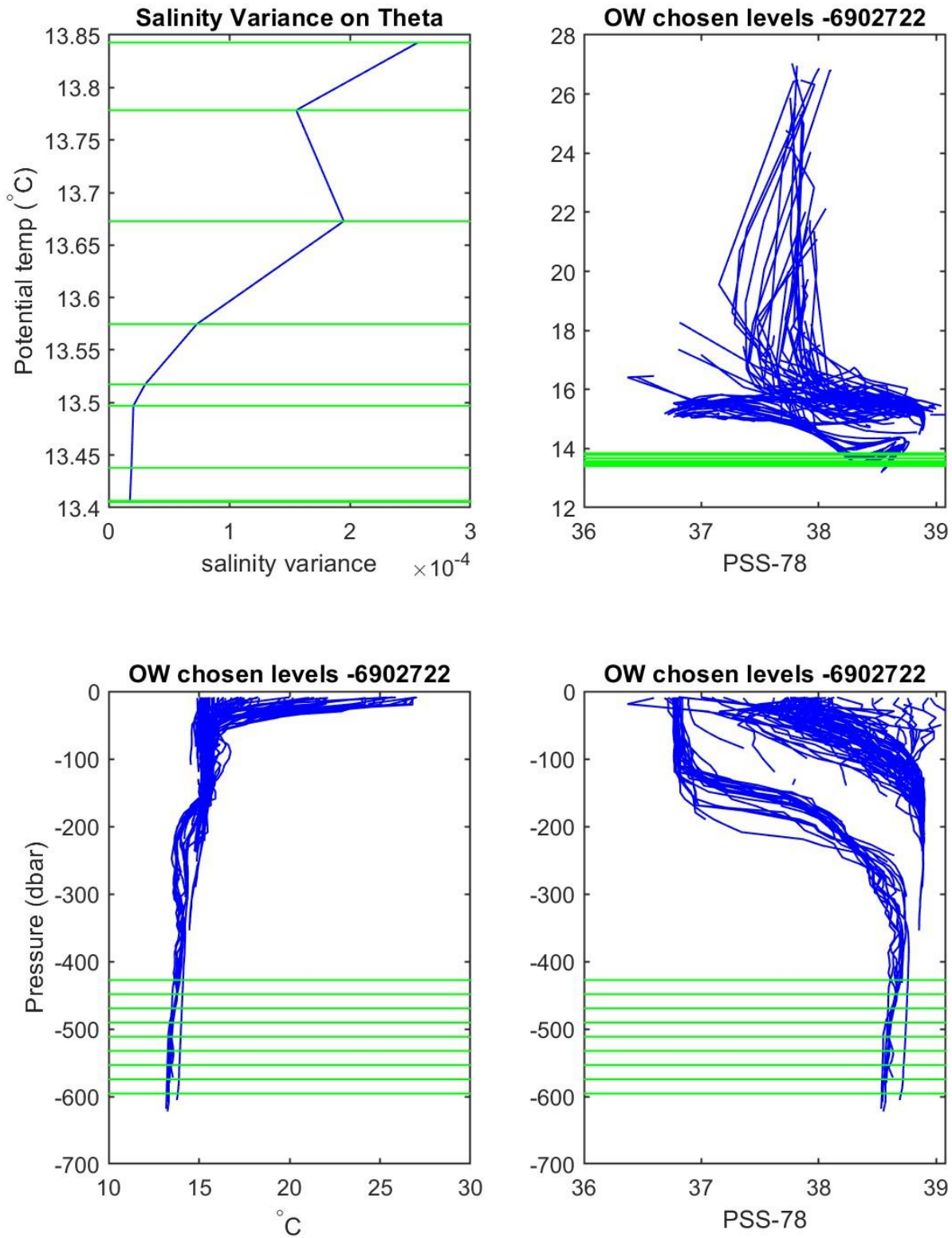


Figure 6: Plots include the theta levels chosen for calibration: Top left: Salinity variance at theta levels. Top right: T/S diagram of all profiles of Argo float. Bottom left: potential temperature plotted against pressure. Bottom right: salinity plotted against pressure.

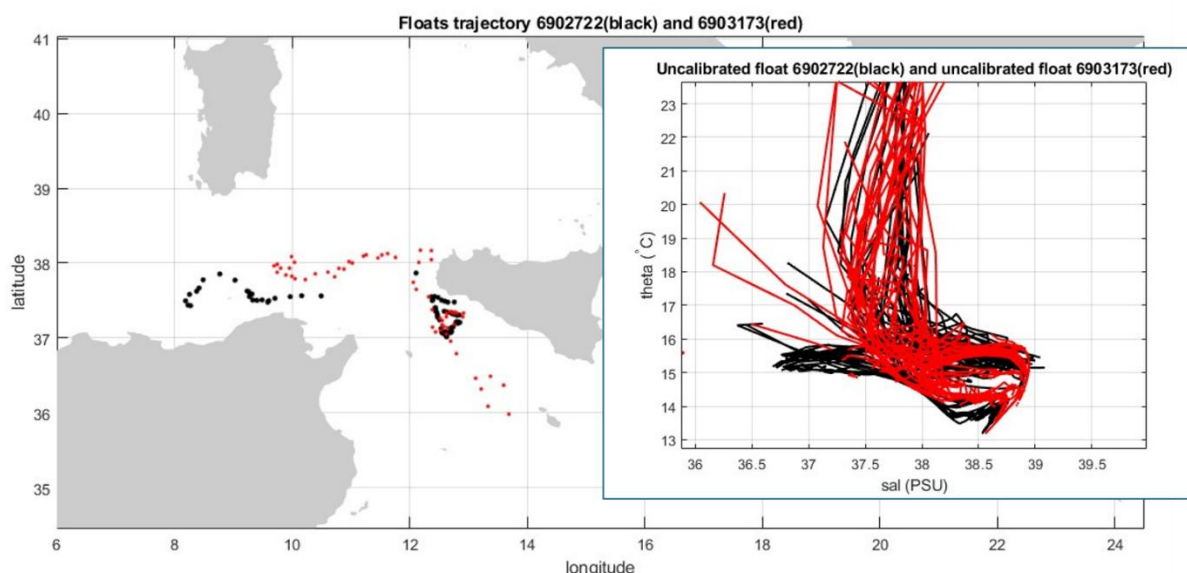


Figure 7: Comparison between float 6902722 and DMQCed float 6903173.

Summary

Float WMO 6902722 was deployed in the Algerian sub-basin of the Mediterranean Sea; during its operational life, it subsequently traversed the Tyrrhenian and Sicilian sub-basins. This float had not previously undergone delayed-mode quality control (DMQC). Although the profiles were shallow, we attempted to apply the OWC method by considering the deepest profiles; however, the analysis proved unreliable. Further analyses—including visual inspection of the deepest section of the θ -S diagram and a comparison between selected salinity profiles from the float and historical CTD profiles from the surrounding area—were conducted to complement the OWC method and provide the best possible quality control assessment. Additionally, we compared the float with another float that had performed well in the same area. The last decision is that the salinity data of float WMO 6902722 doesn't need a delayed mode correction applied to all cycles. QC 1 is applied.

PSAL_ADJUSTED=PSAL from cycle 1 to 90

The quality flags applied are the following:

PSAL_ADJUSTED_QC='1' from cycle 1 to 90

The delayed-mode files (Dfiles) have been created accordingly and sent to the Coriolis GDAC.

References

Cabanes, C., Thierry, V., & Lagadec, C. (2016). Improvement of bias detection in Argo float conductivity sensors and its application in the North Atlantic. *Deep-Sea Research Part I: Oceanographic Research Papers*, 114, 128–136. <https://doi.org/10.1016/j.dsr.2016.05.007>