Delayed mode quality control of MOCCA Argo float 3901913

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Summary

Profiles from cycle 1 to 55 showed drift. The OWC correction was applied QC=1, error=0.01. Further cycles 56 to 143 are not adjustable with QC=4.

WMO number	DM correction
3901913	Drift detected

Table 1: Correction applied in delayed mode.

Contents

1 Introduction

Delayed mode analysis was performed for float number 360320i (3901913) where salinity and temperature values were separately compared to nearby historical CTD profiles and nearby Argo profiles as a reference database. The OWC (Cabanes et al., 2016) method was run to estimate a salinity offset and/or a salinity drift. For more information about float 360320i (3901913) click on the following link: http://www.ifremer.fr/argoMonitoring/float/3901913

2 Quality Check of Argo Float Data

2.1 Time Series of Vertical Distribution of Data

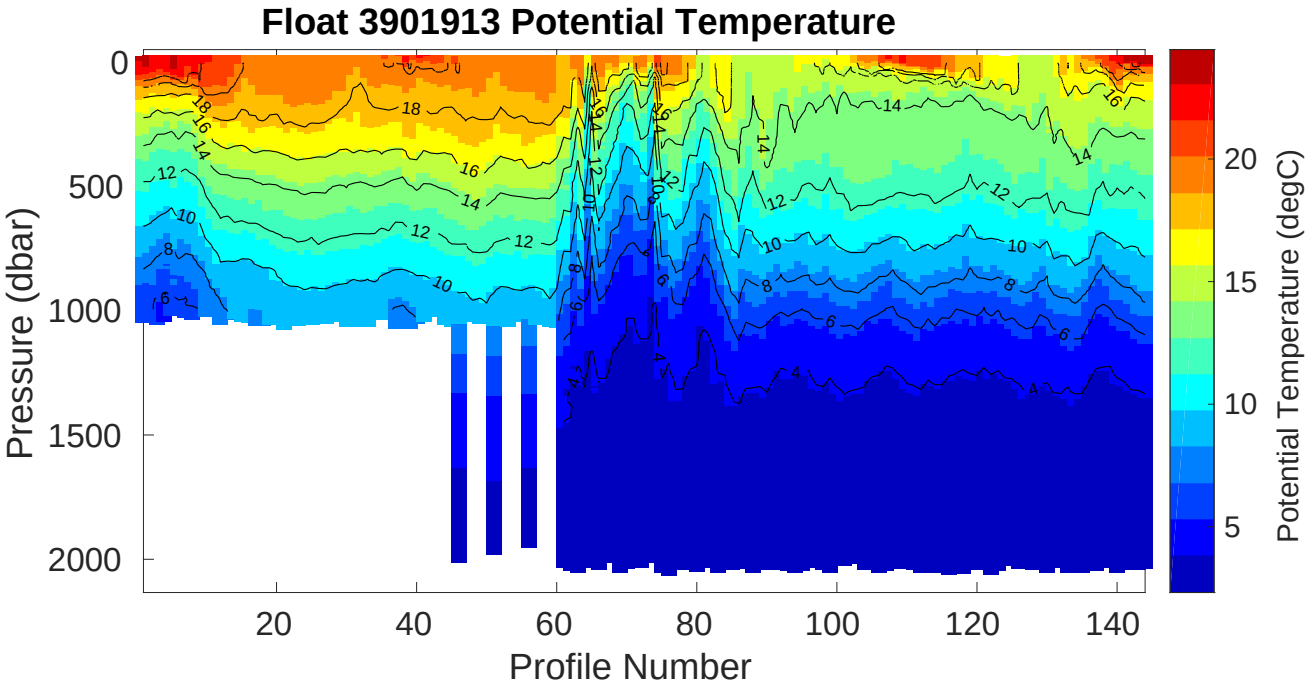

Figure 1: Float 3901913. Time series of the vertical distribution of potential temperature (°C).

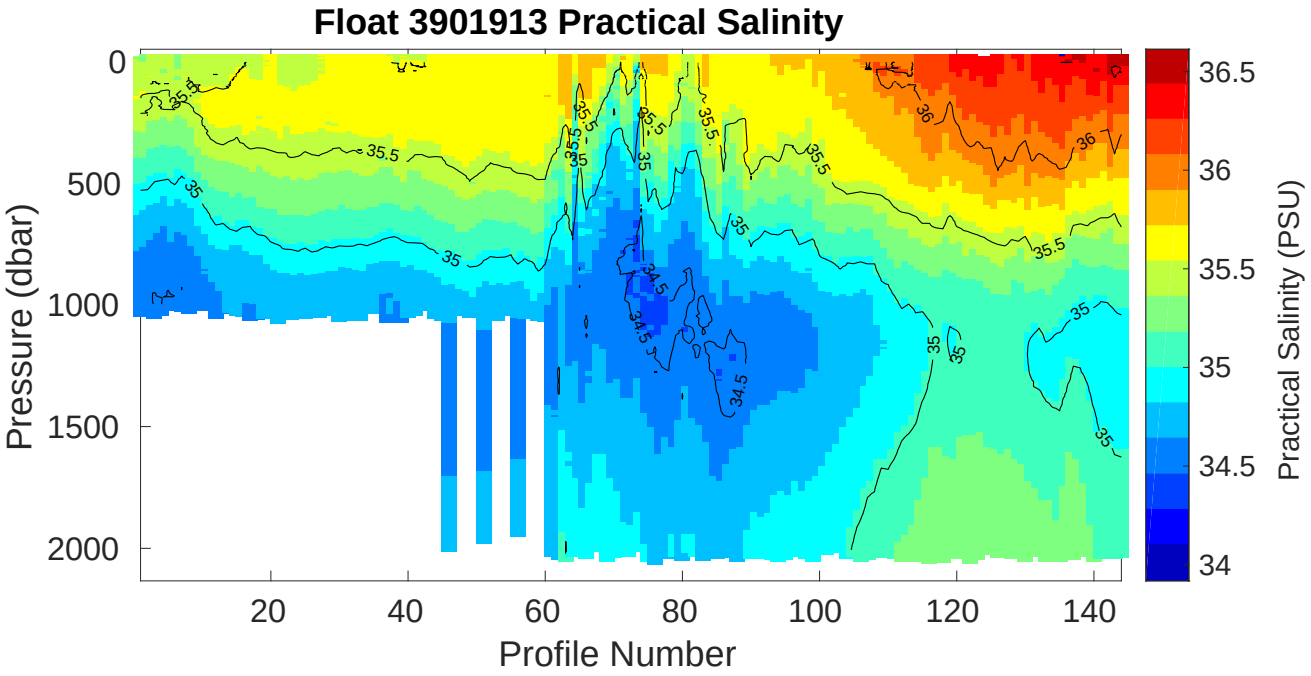

Figure 2: Float 3901913. Time series of the vertical distribution of practical salinity (PSU).

2.2 Comparison between Argo Float and Climatology

The comparison between float 3901913 and data from WMO boxes +/- 10°of latitude and longitude shows that the Argo profiles fit within the expected ranges (Figures 3, 4 and 5). This result confirms that float 3901913 represents relatively stable and consistent with the expected physical conditions in this region.

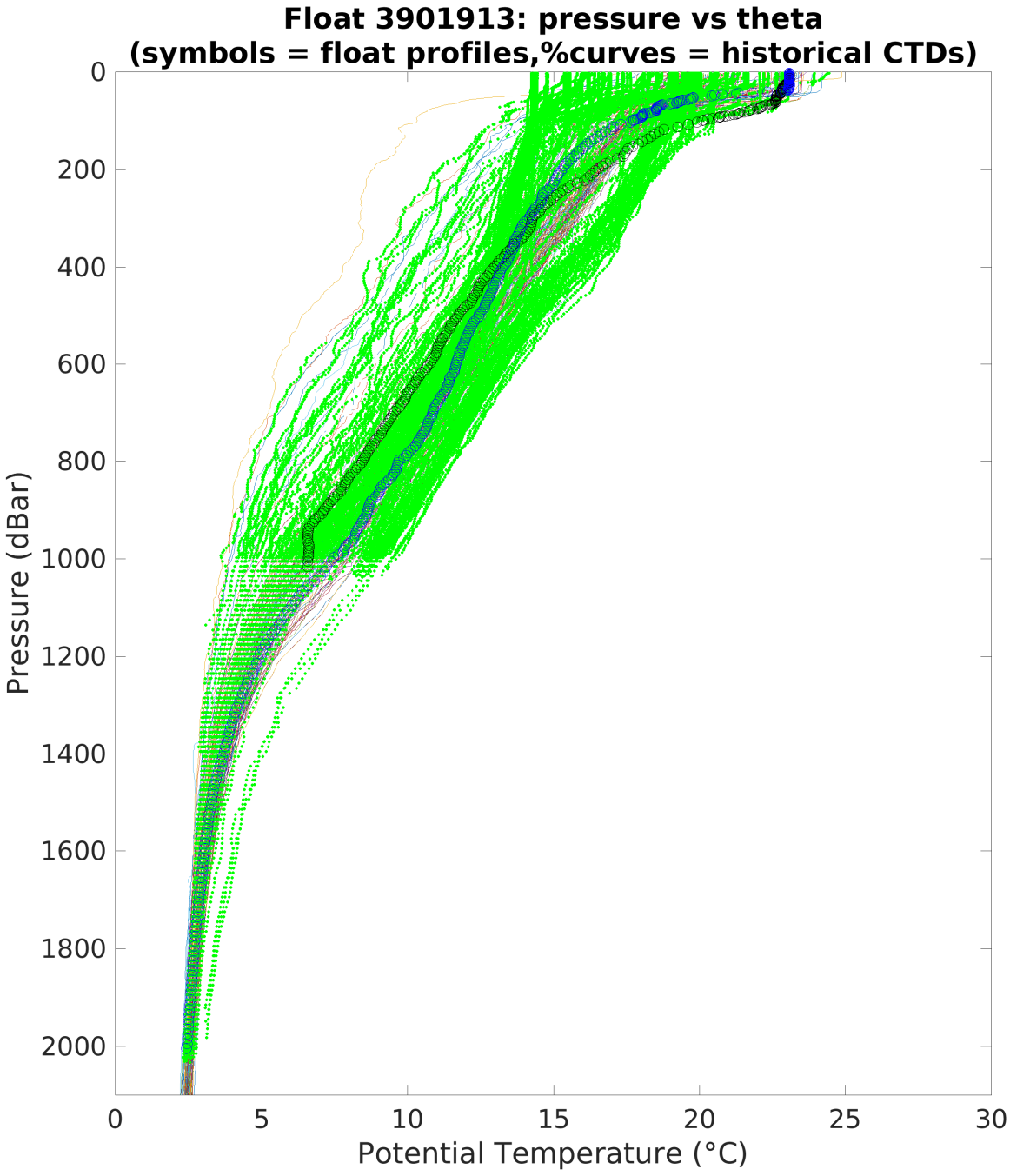

Figure 3: Float 3901913. Float profile of potential temperature (°C) plotted with climatology from the spatial range of 10 °. The black and blue cycles indicates the first and the last Argo profile, respectively. Green symbols represent other Argo profiles from this float.

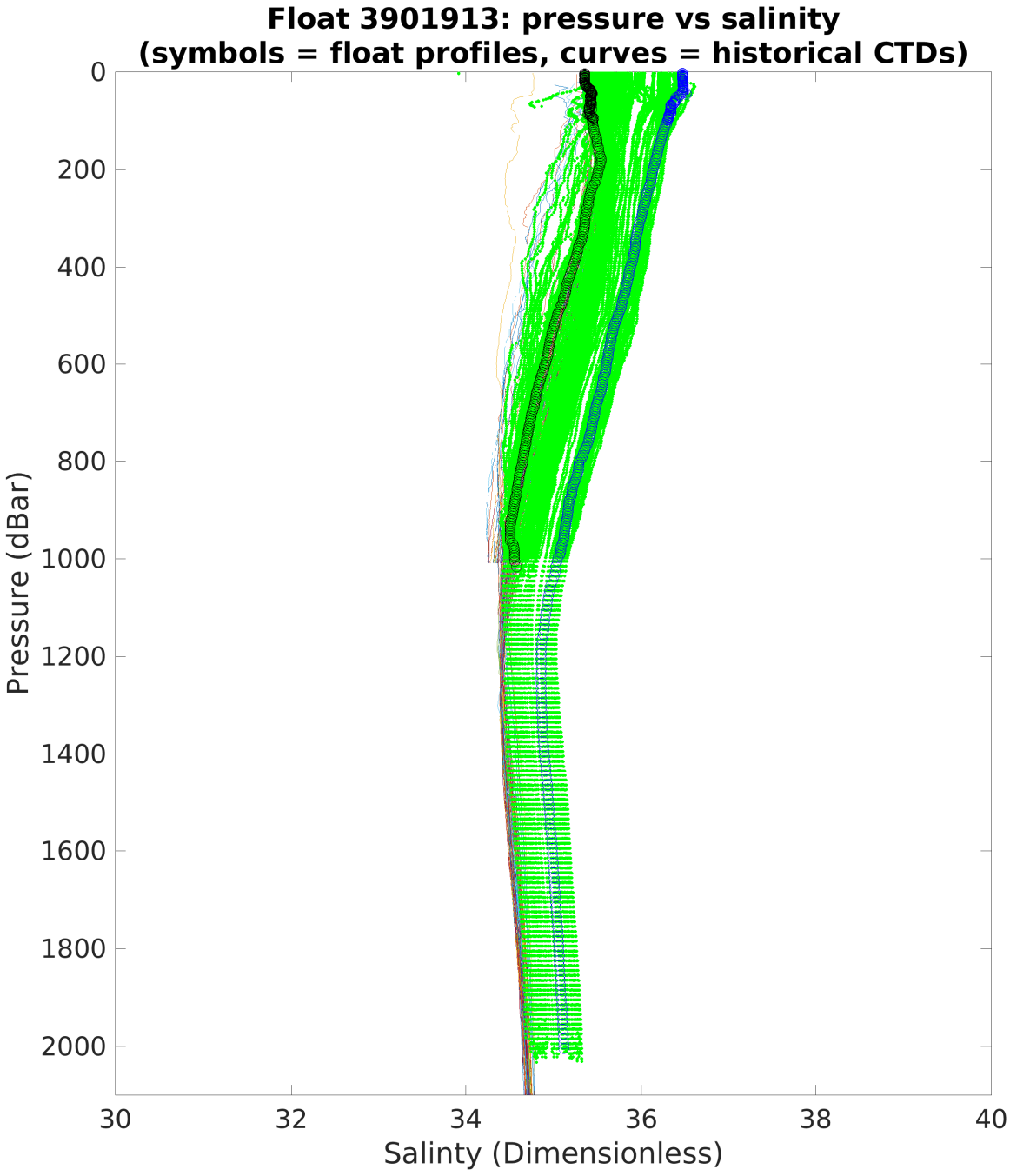

Figure 4: Float 3901913. Float profile of salinity (dimensionless) plotted with climatology from the spatial range of 10 ˚. The black and blue cycles indicates the first and the last Argo profile, respectively. Green symbols represent other Argo profiles from this float.

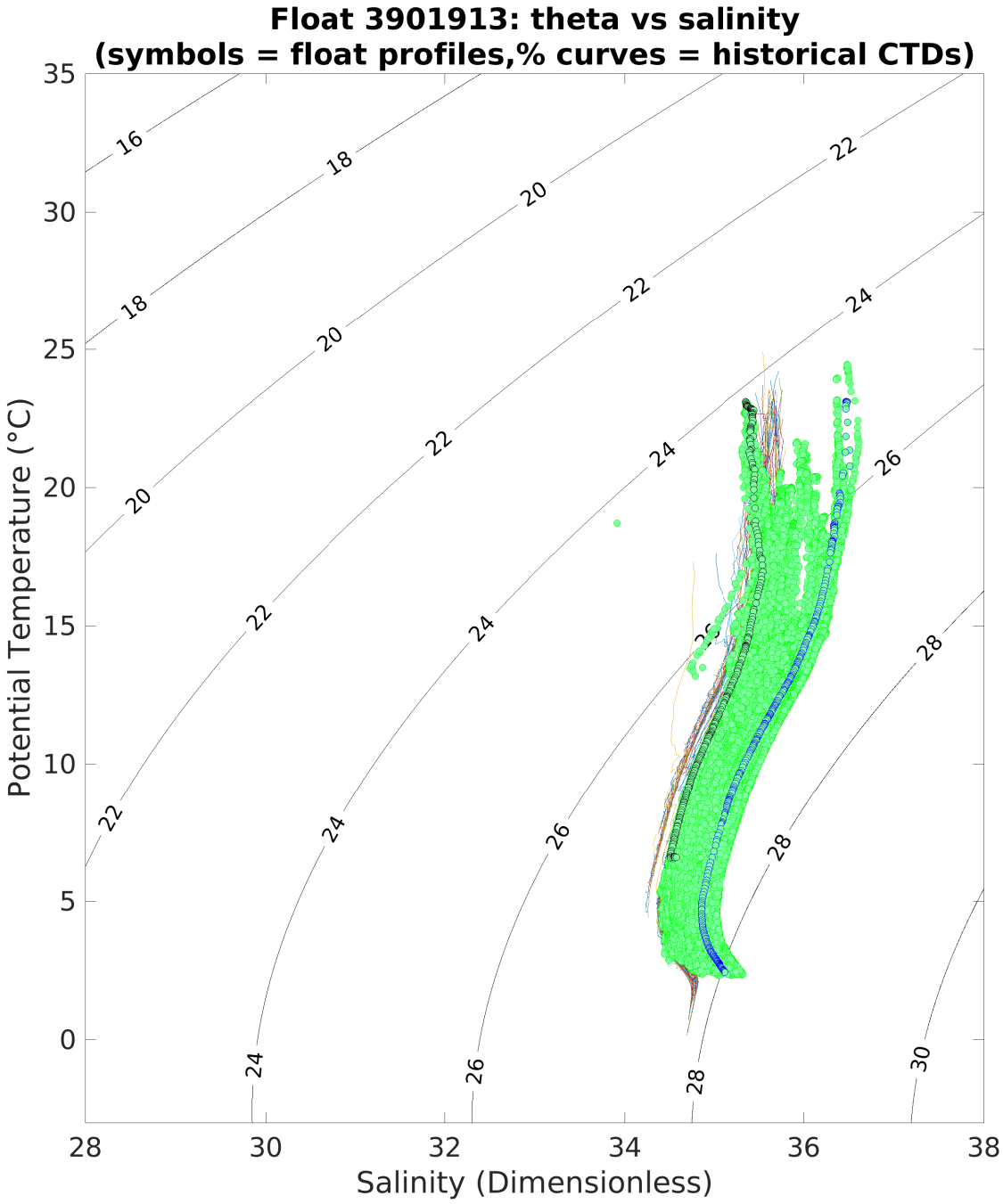

Figure 5: Float 3901913. Theta/S plotted with climatology from the spatial range of 10 °. The black and blue cycles indicates the first and the last Argo profile, respectively. Green symbols represent other Argo profiles from this float.

2.3 Satellite Altimeter comparison

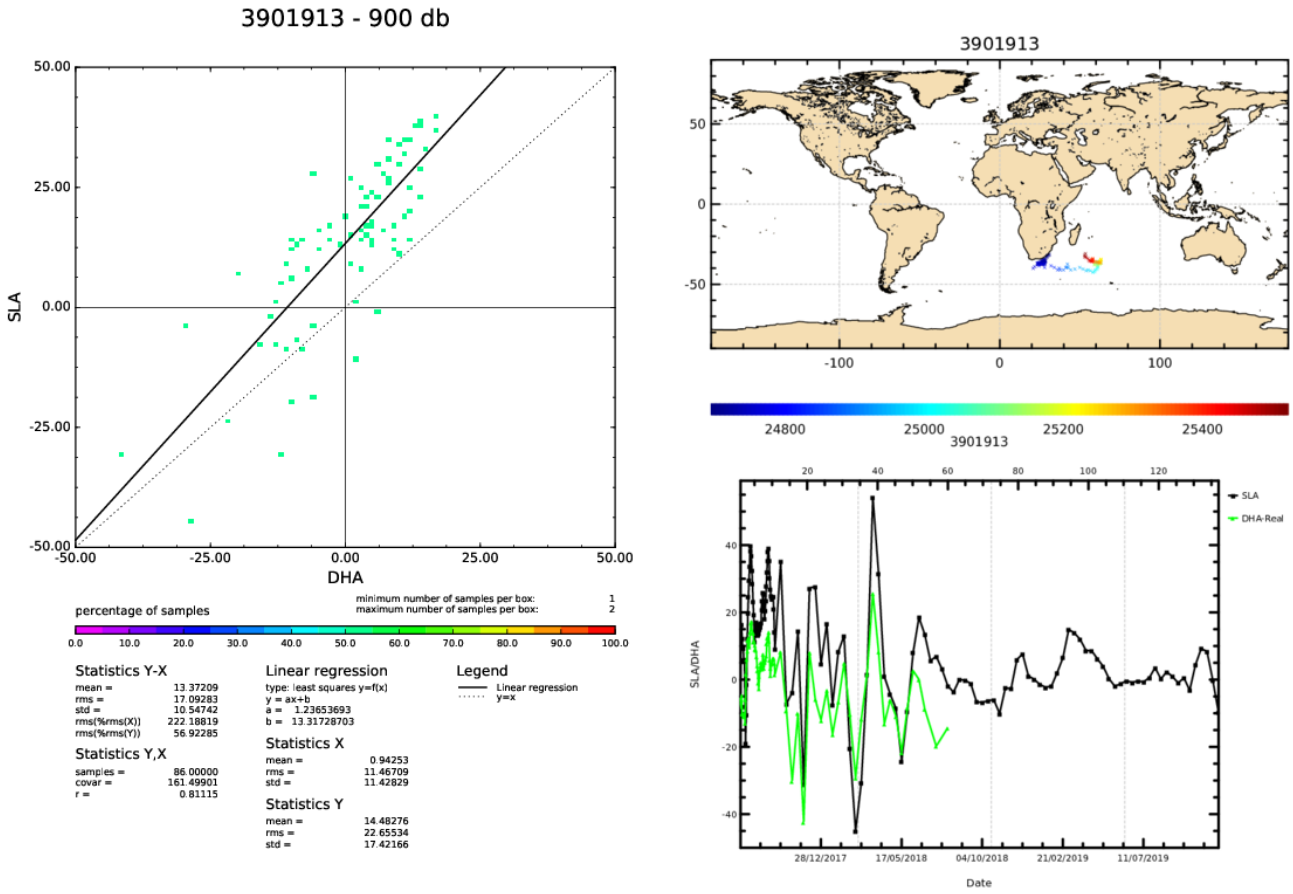

Figure 6: Float 3901913. The comparison betweeen the Sea Surface Height(SSH) from the satellite altimetry and Dynamic Height Anomaly(DHA)extracted from the Argo float temperature and salinity data

3 Correction of Salinity Data

3.1 Comparison between Argo floats and CTD Climatlogy

3.1.1 Configuration

3.1.2 Results

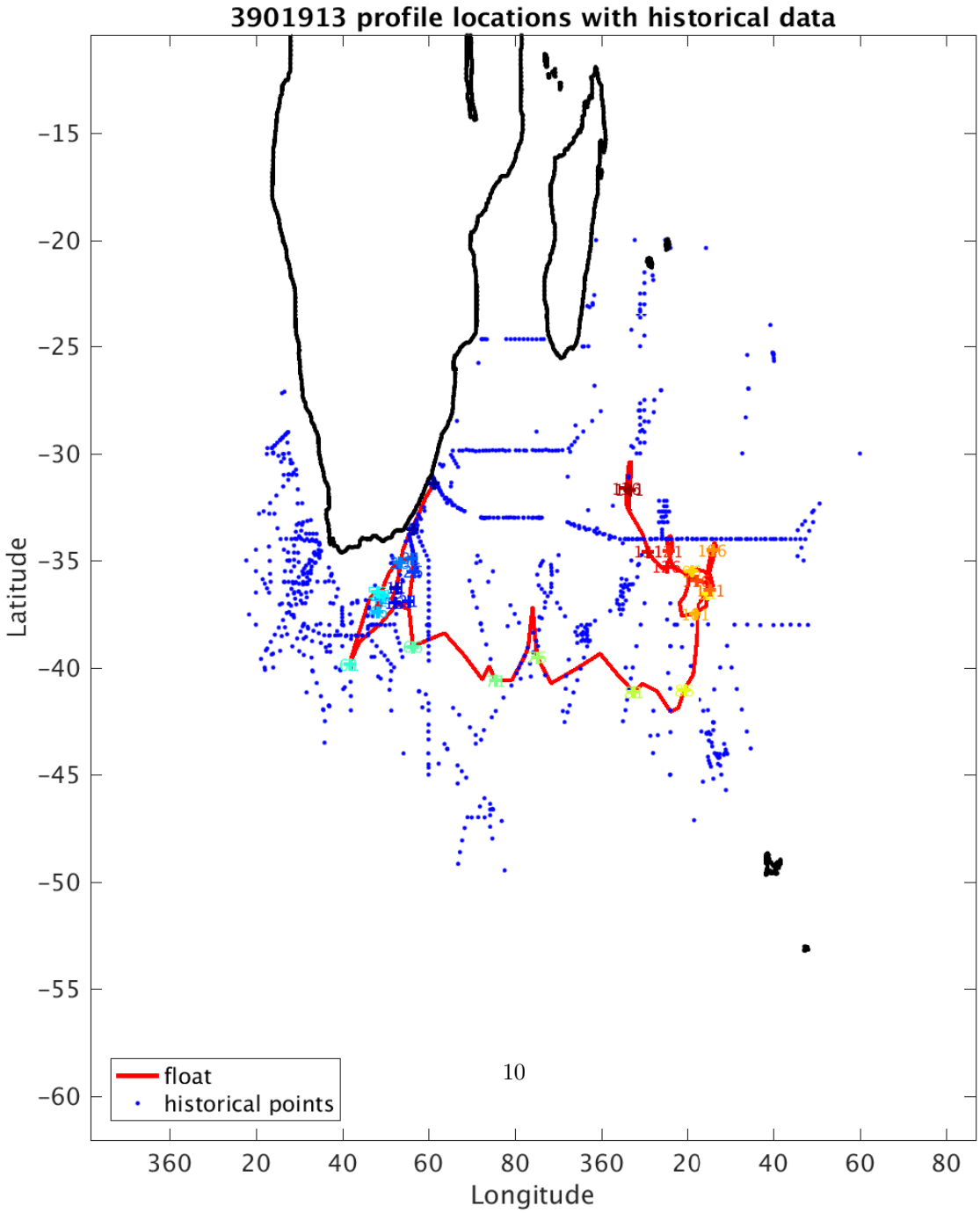

Figure 7: Float 3901913. Trajectory of the float with historical CTD data. The black contours indicate the bathymetry at 0, 200, 1000 and 2000 m.

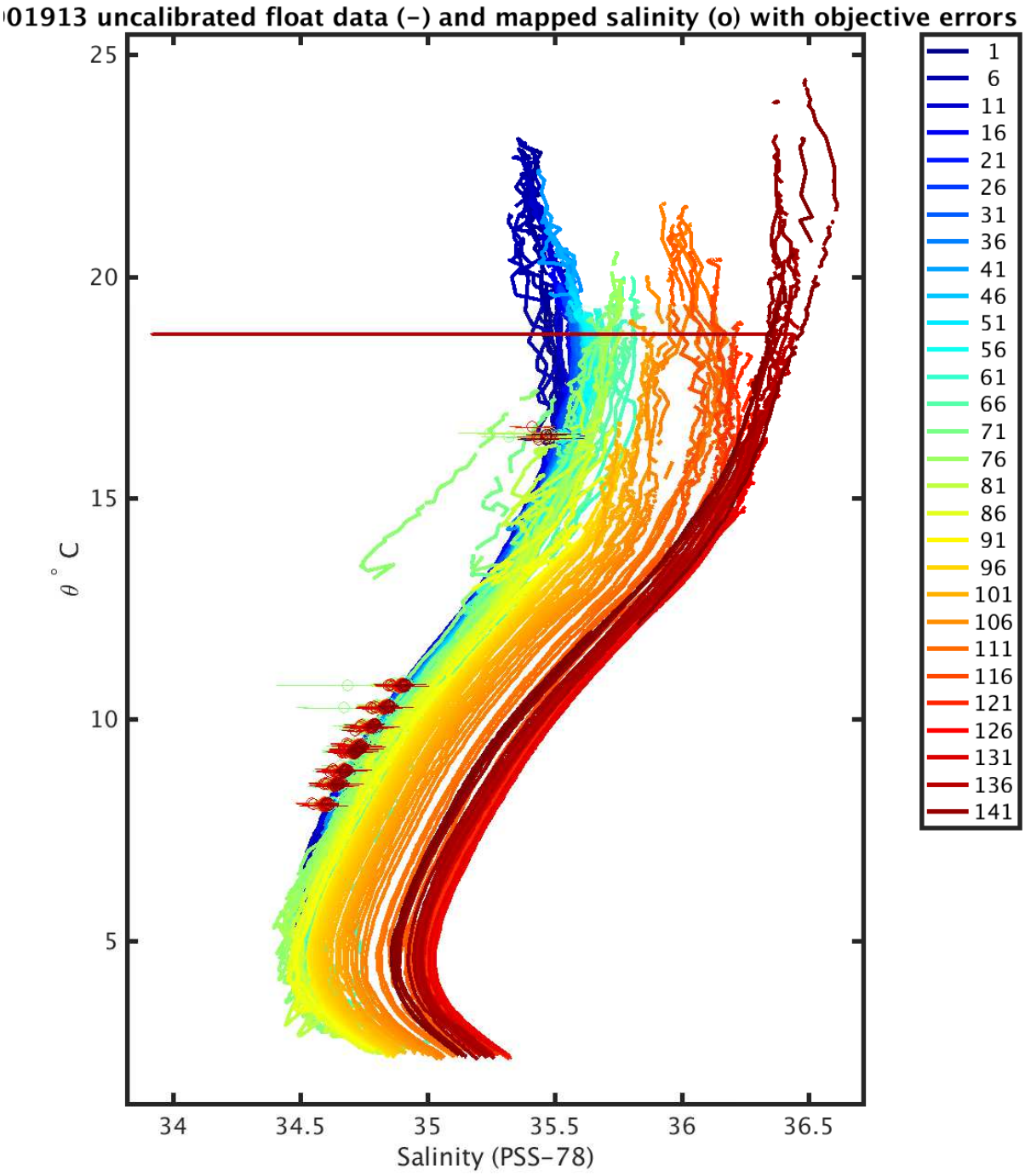

Figure 8: Float 3901913. Uncalibrated float data and mapped salinity.

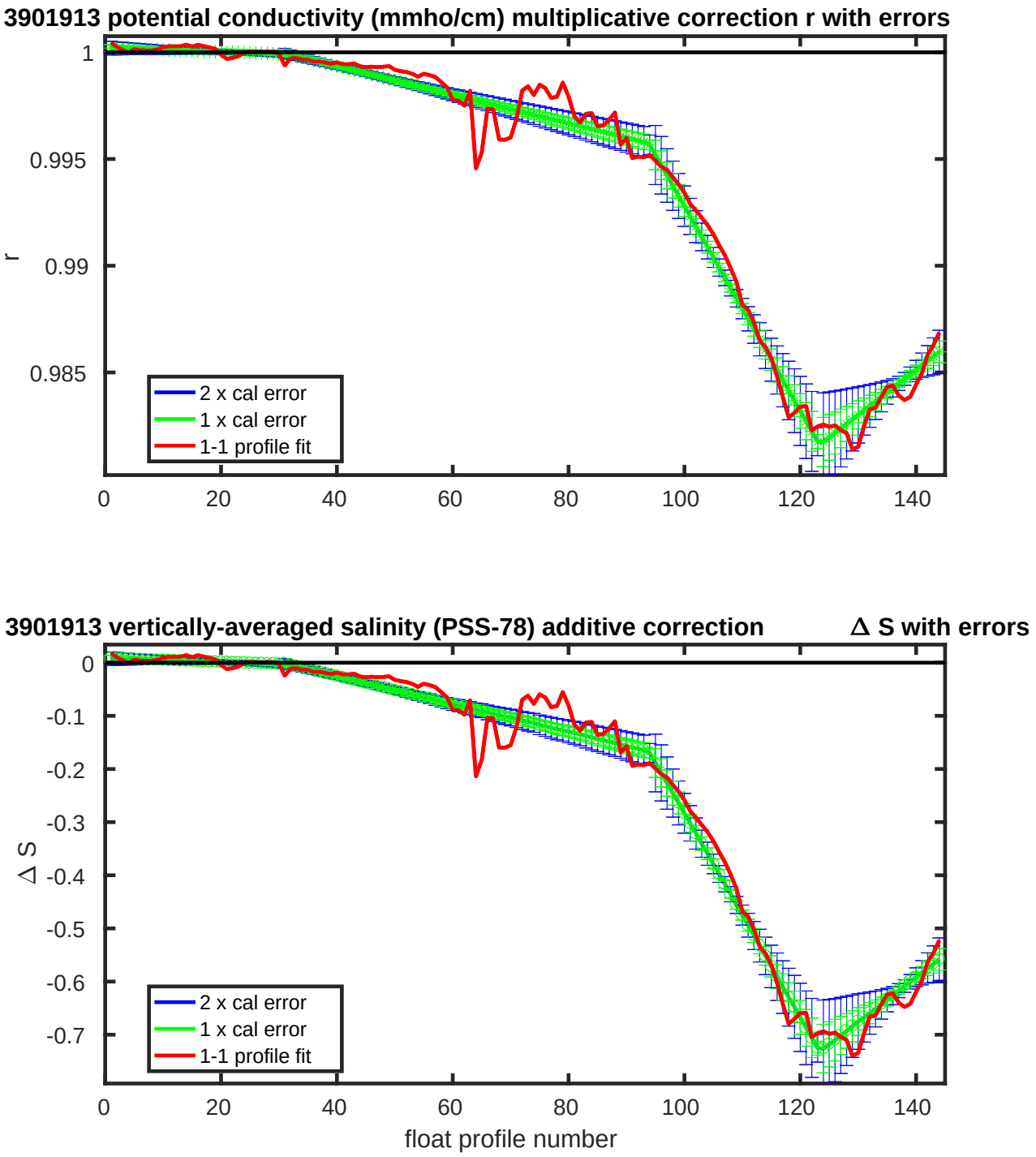

Figure 9: Float 3901913. Potential conductivity (top) and vertically averaged salinity (bottom) with errors.

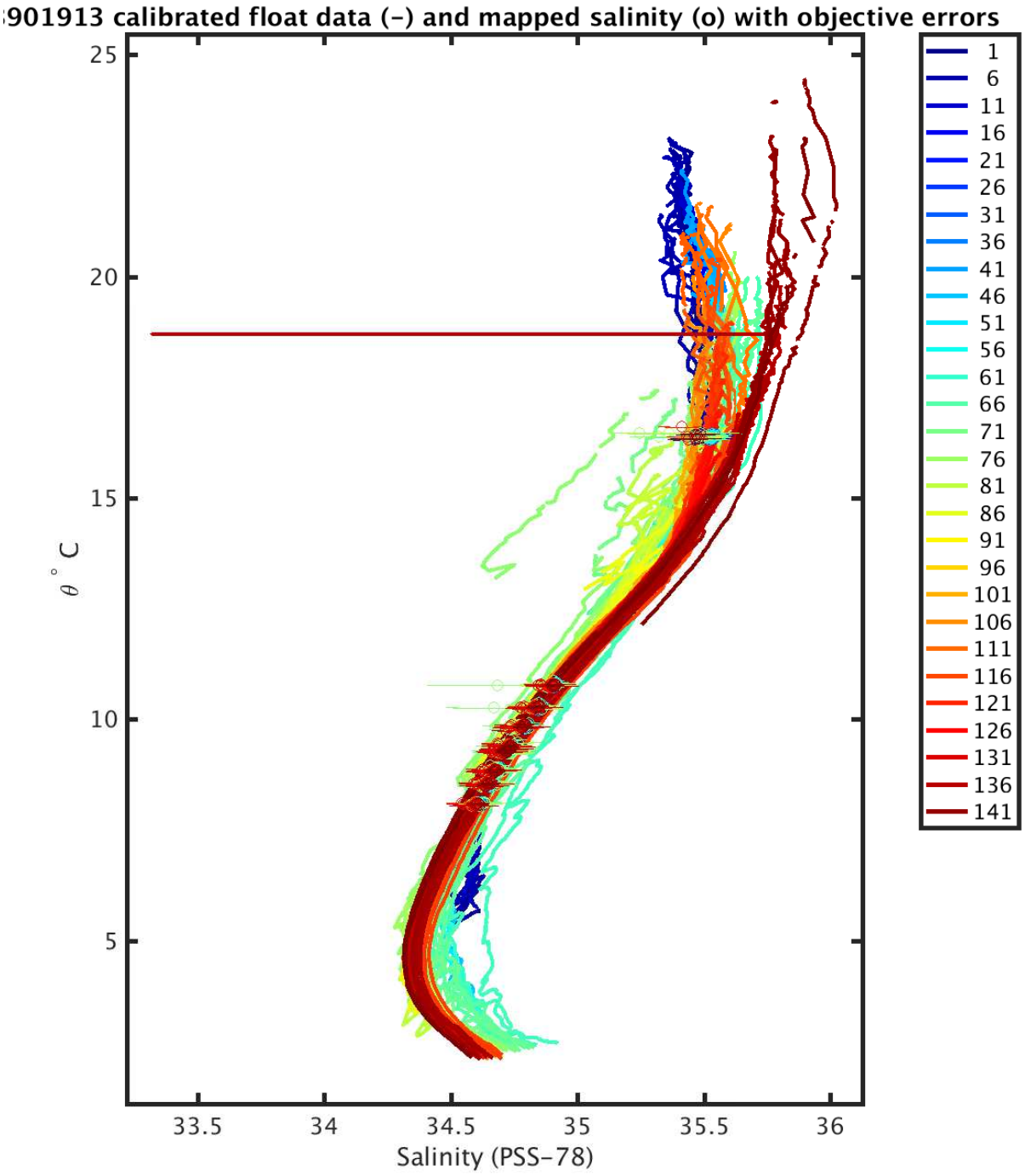

Figure 10: Float 3901913. Calibrated float data and mapped salinity.

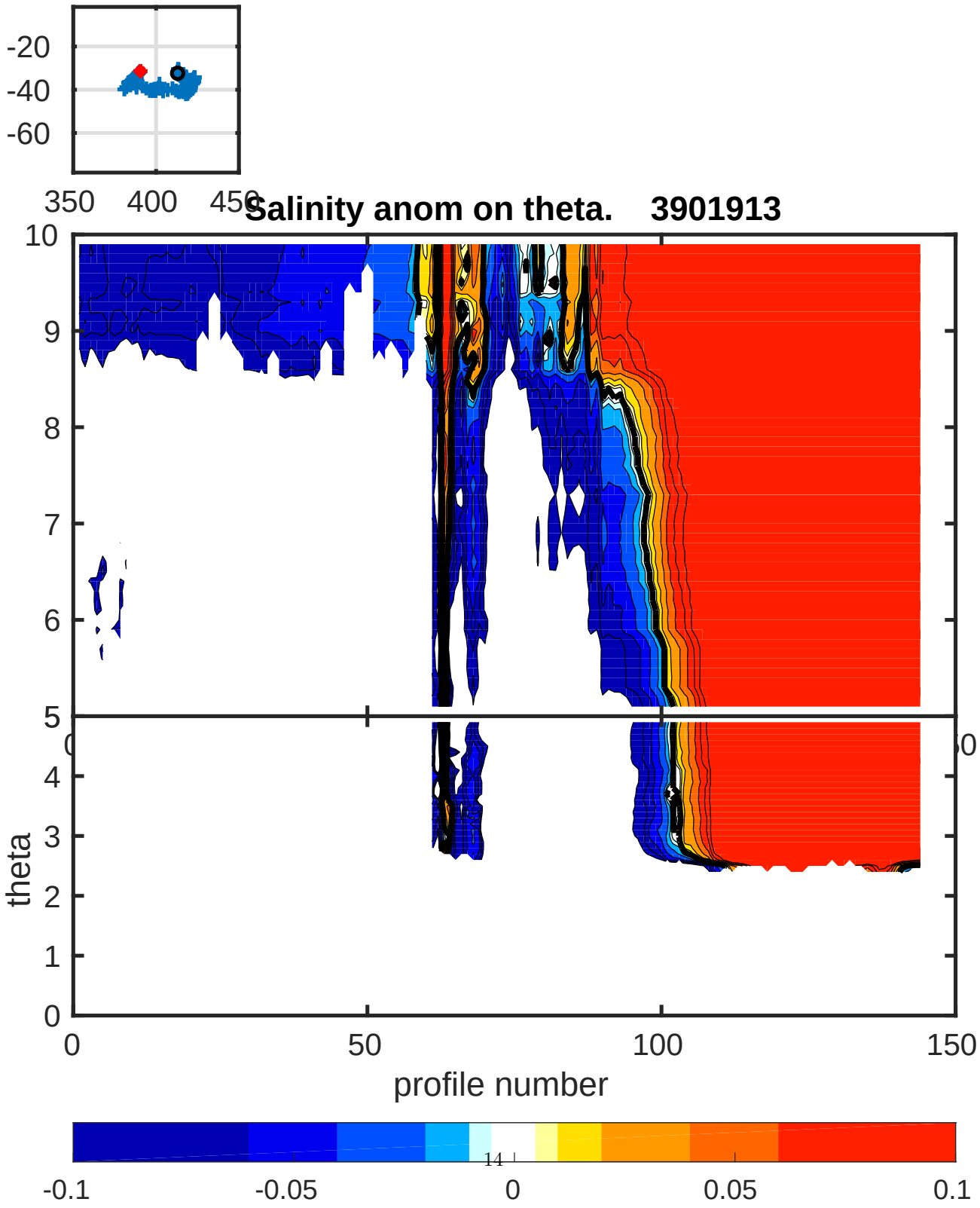

Figure 11: Float 3901913. Salinity anomaly on θ levels.

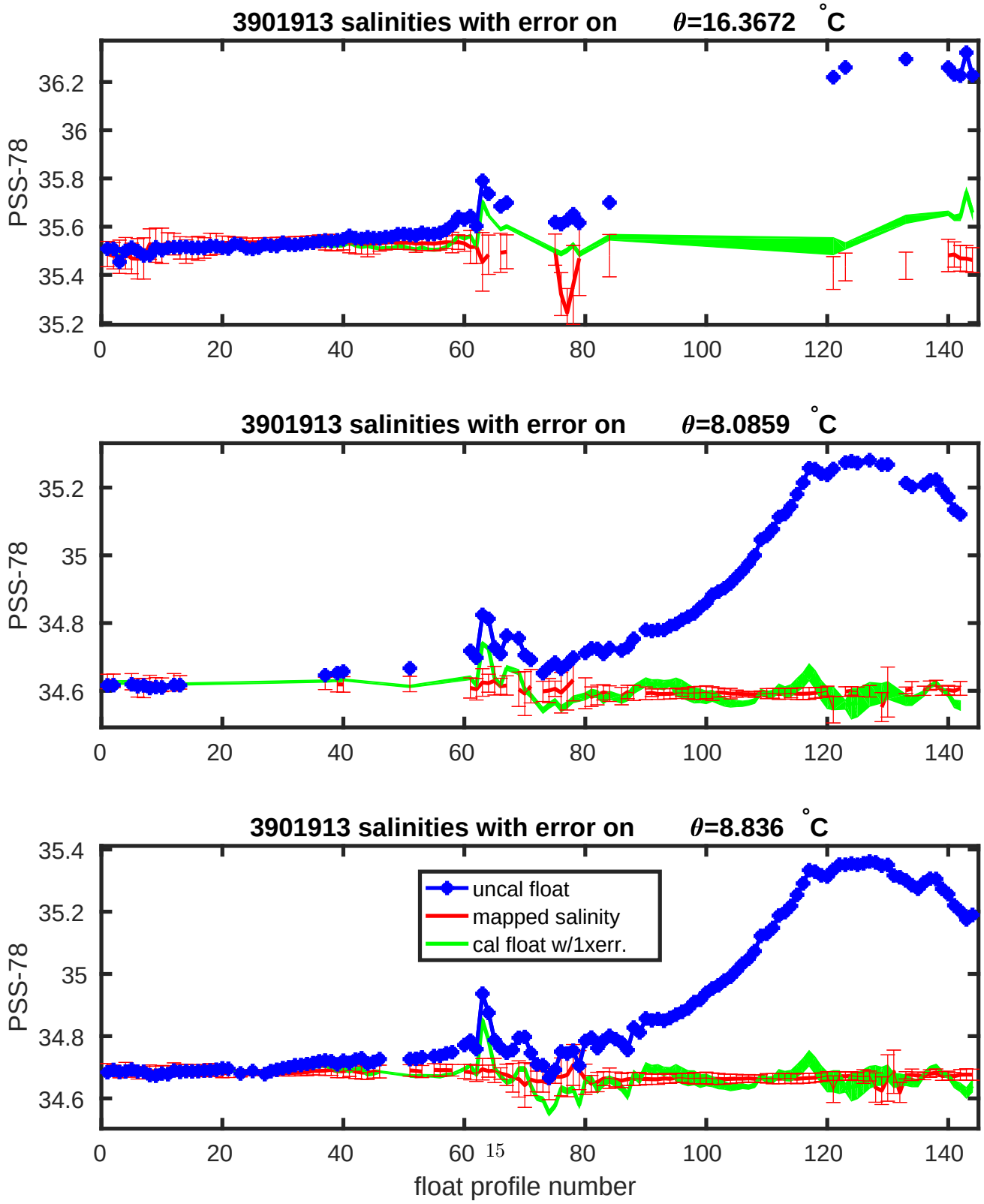

Figure 12: Float 3901913. Salinities with errors on θ levels.

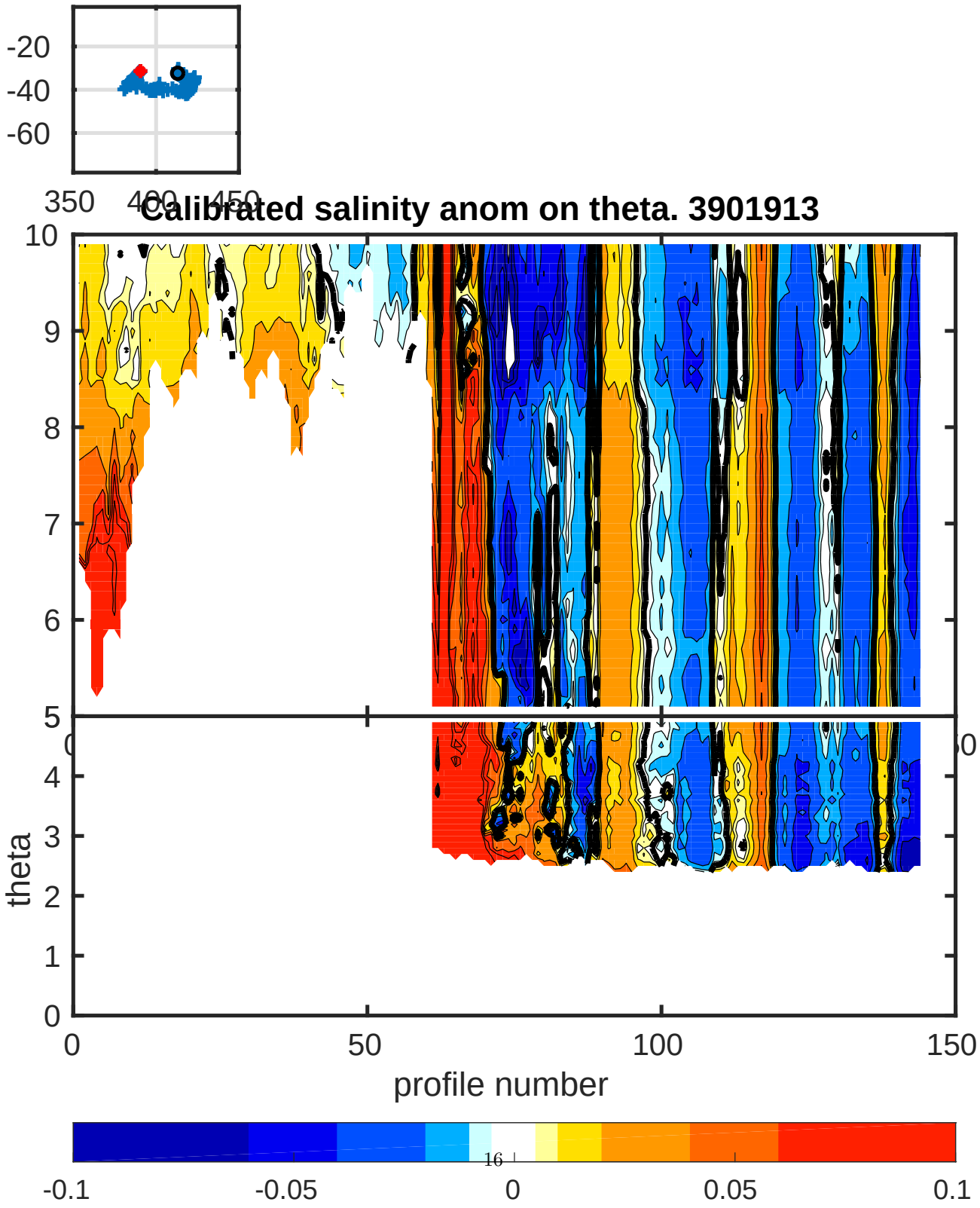

Figure 13: Float 3901913. Calibrated salinity anomaly on θ levels.

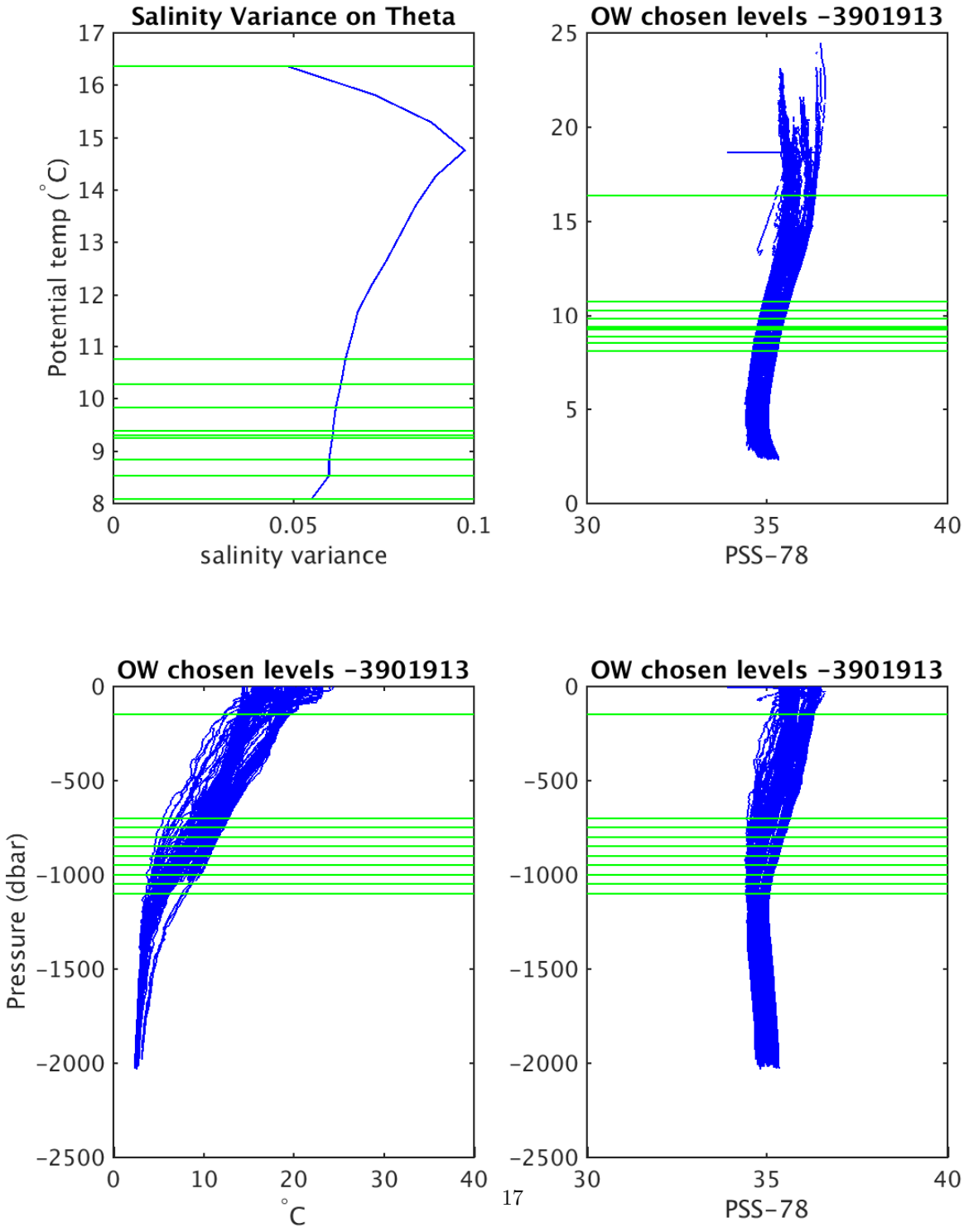

Figure 14: Float 3901913. Salinity, salinity variance on theta and OW chosen levels.

3.2 Comparison between Argo floats and Argo Climatlogy

3.2.1 Configuration

3.2.2 Results

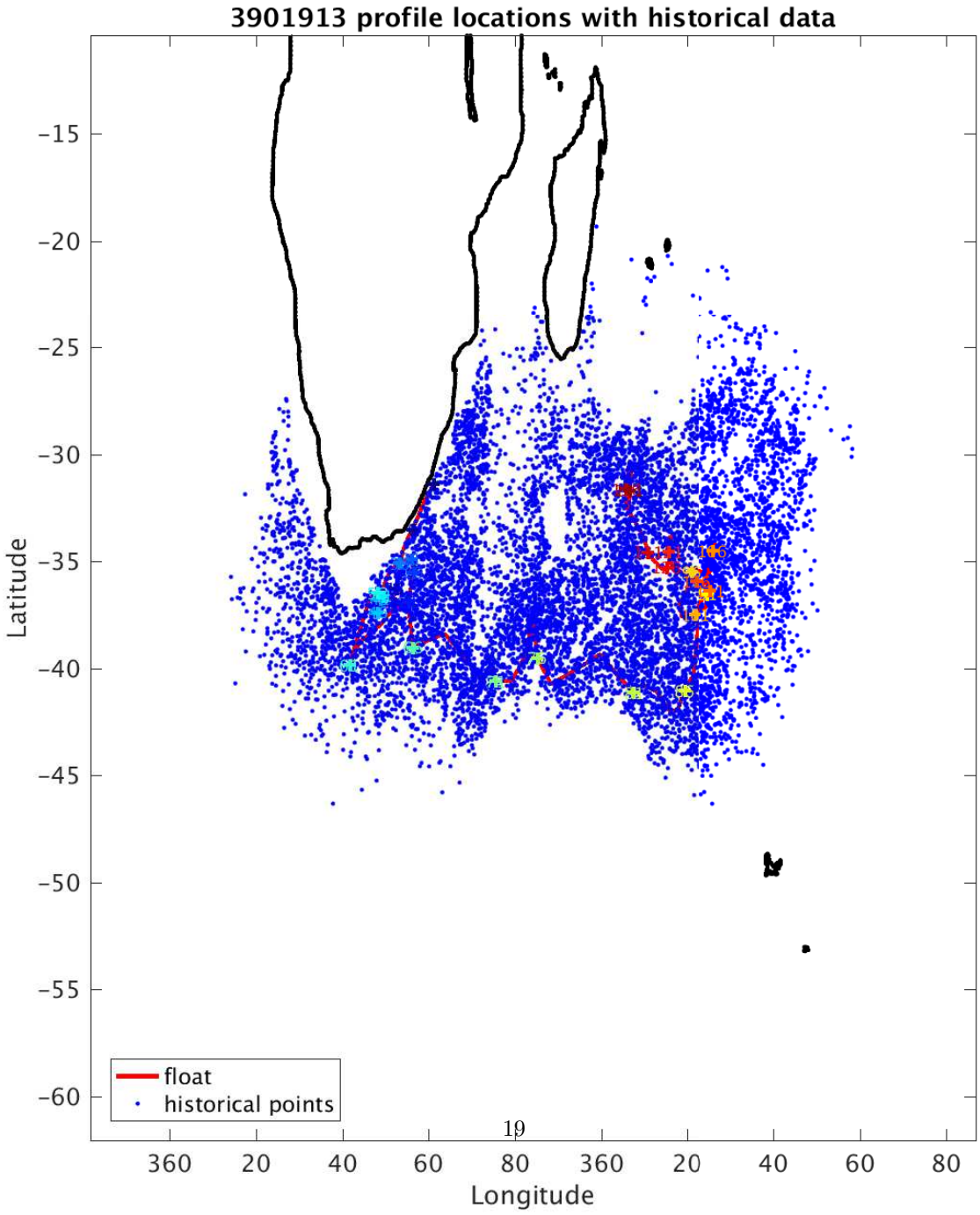

Figure 15: Float 3901913. Trajectory of the float with historical CTD data. The black contours indicate the bathymetry at 0, 200, 1000 and 2000 m.

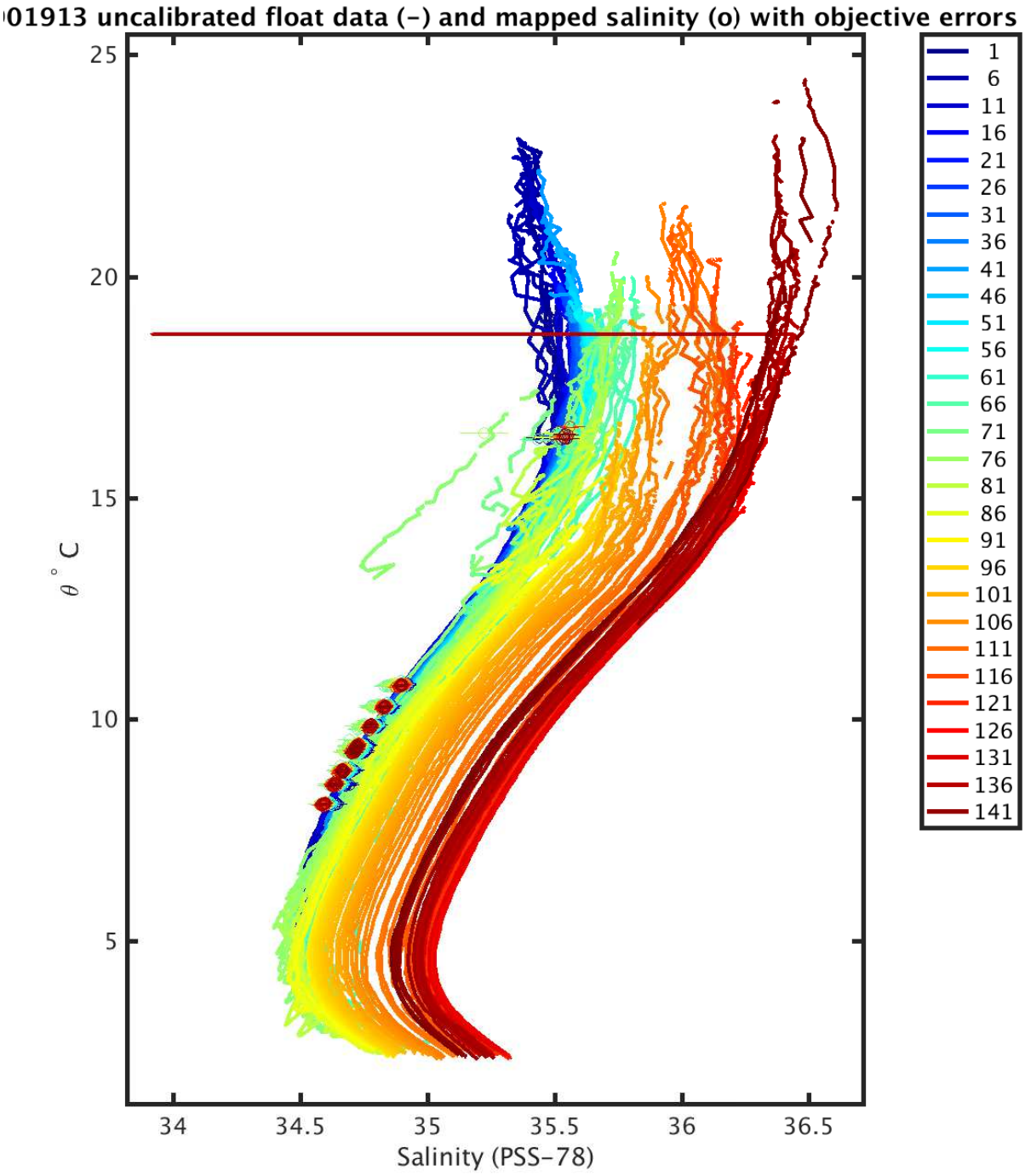

Figure 16: Float 3901913. Uncalibrated float data and mapped salinity.

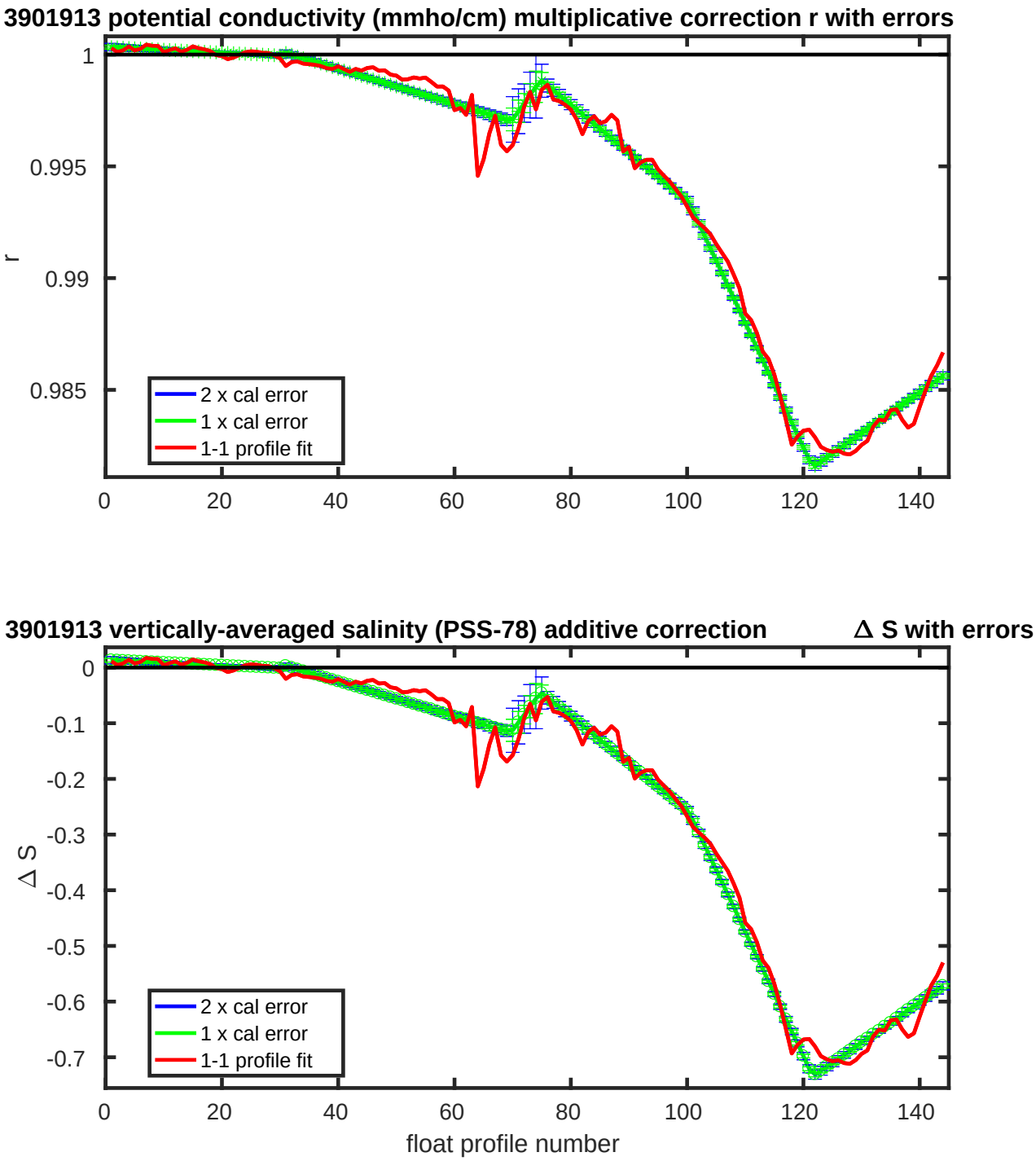

Figure 17: Float 3901913. Potential conductivity (top) and vertically averaged salinity (bottom) with errors.

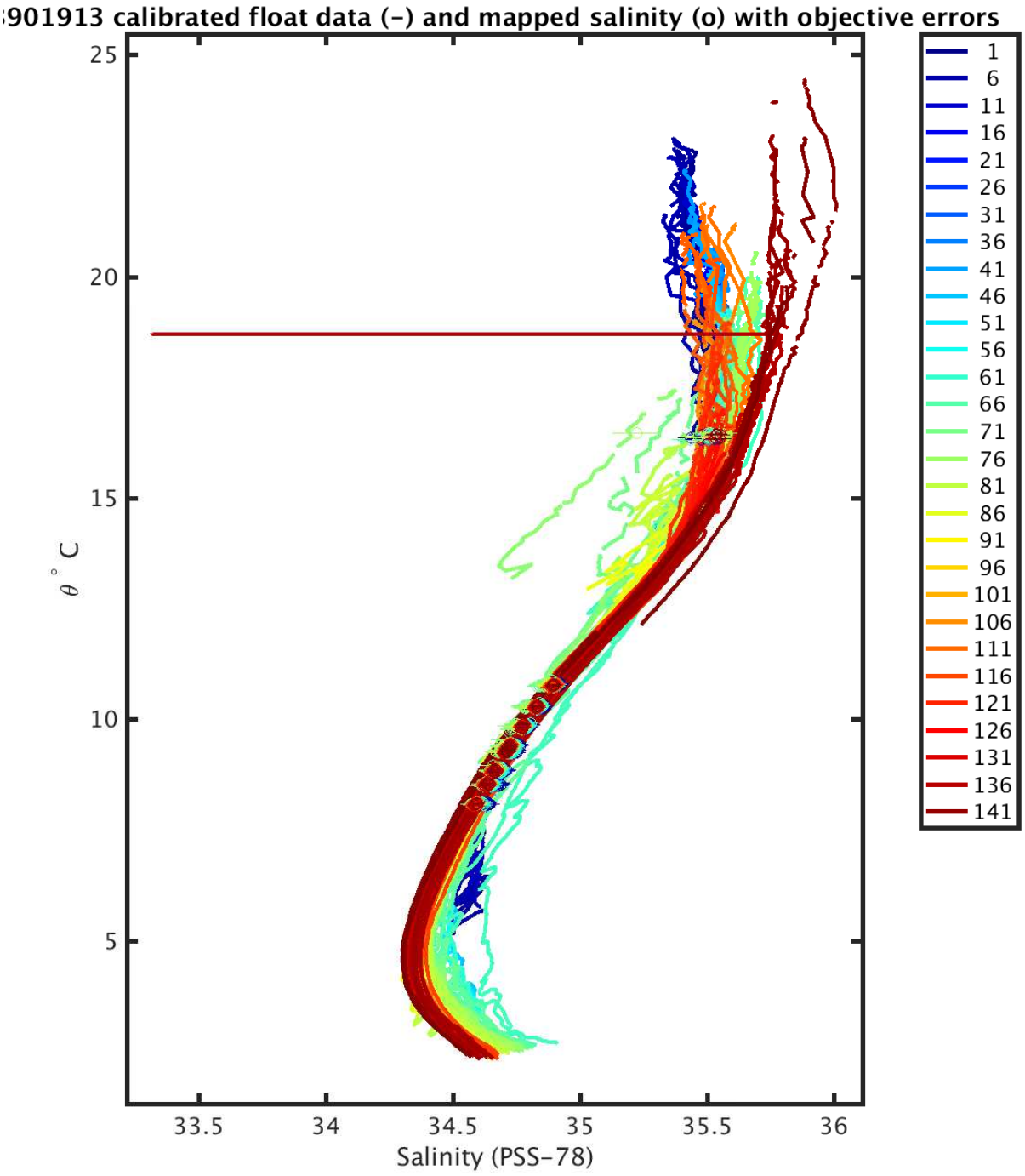

Figure 18: Float 3901913. Calibrated float data and mapped salinity.

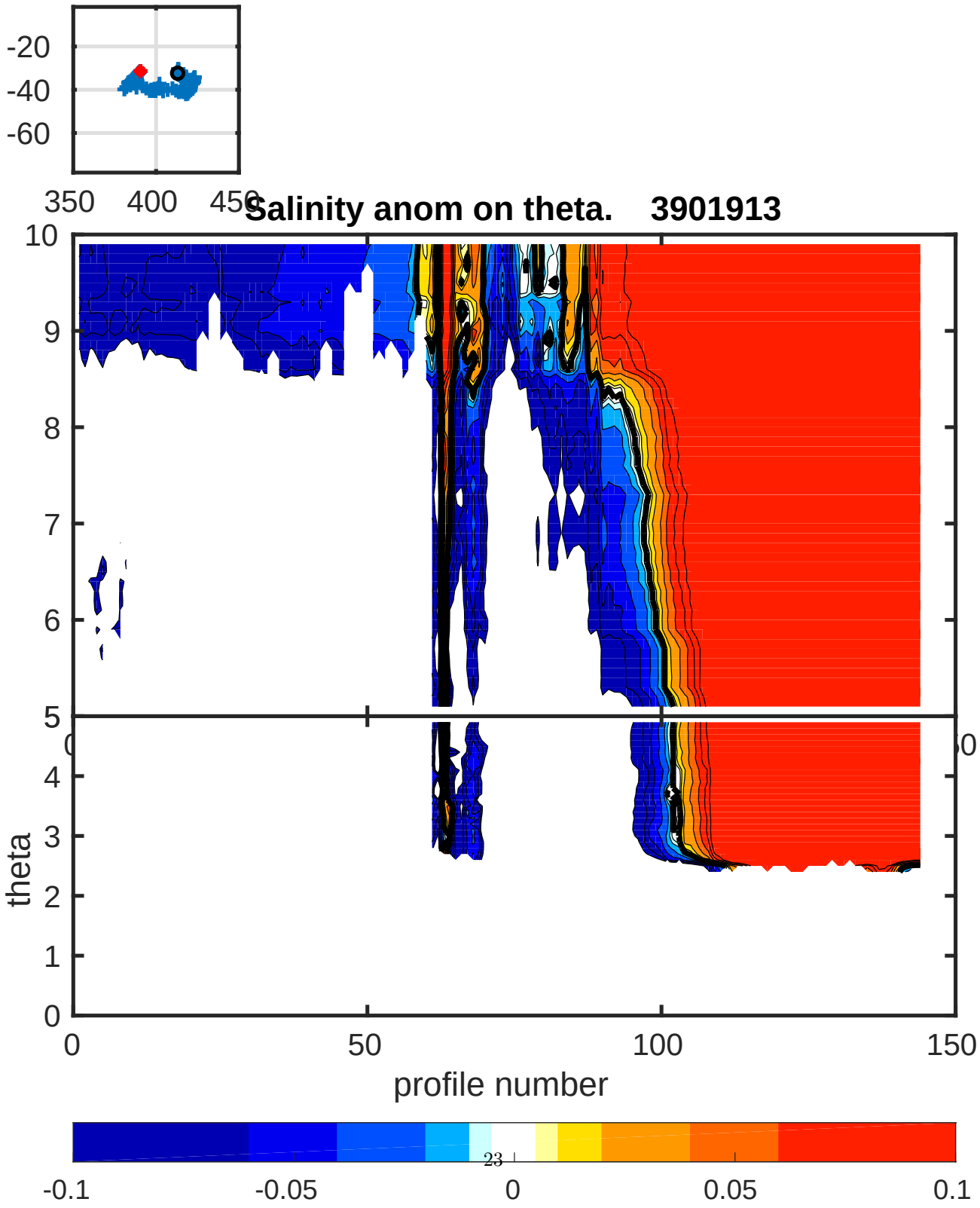

Figure 19: Float 3901913. Salinity anomaly on Theta

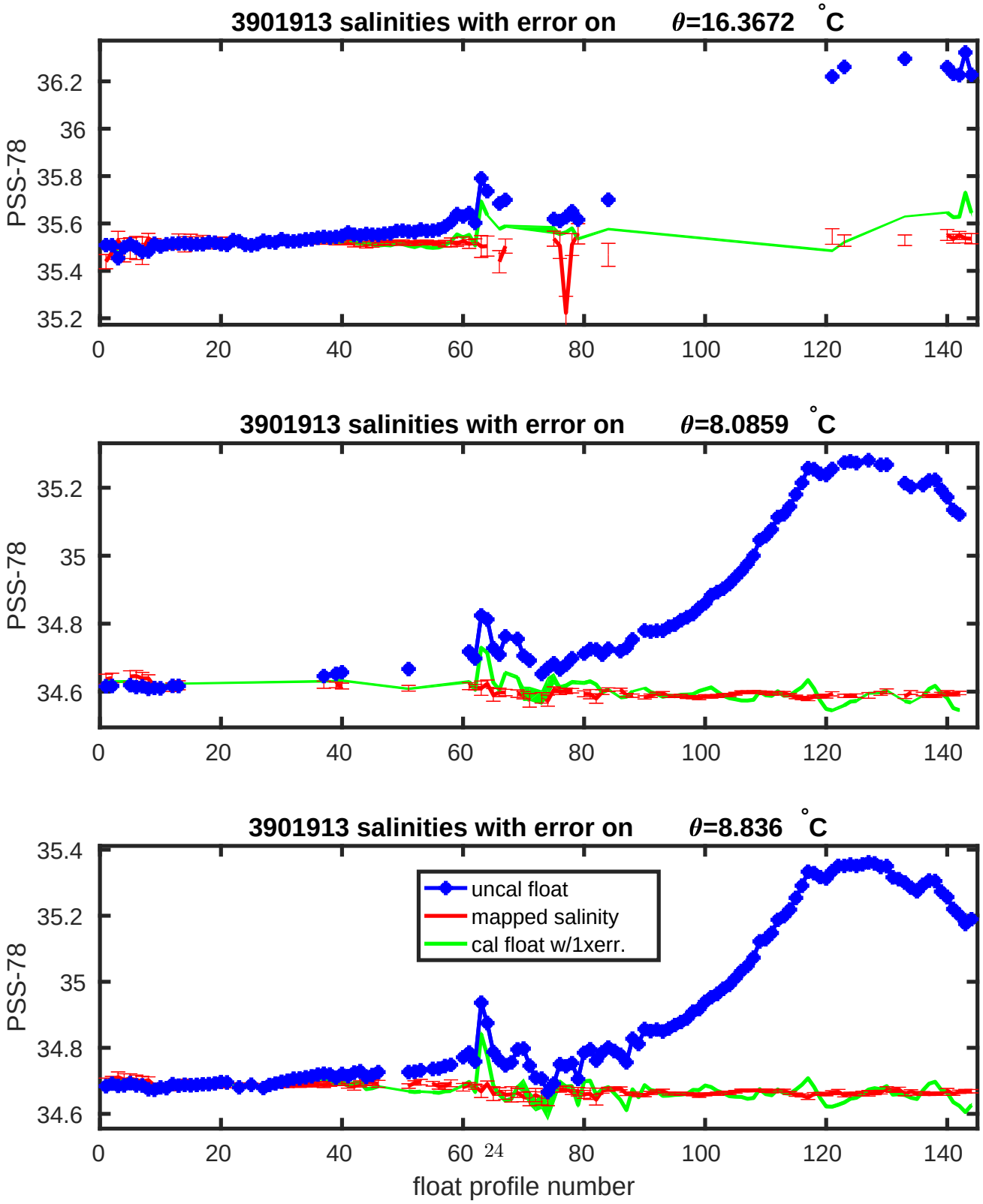

Figure 20: Float 3901913. Salinities with errors on θ.

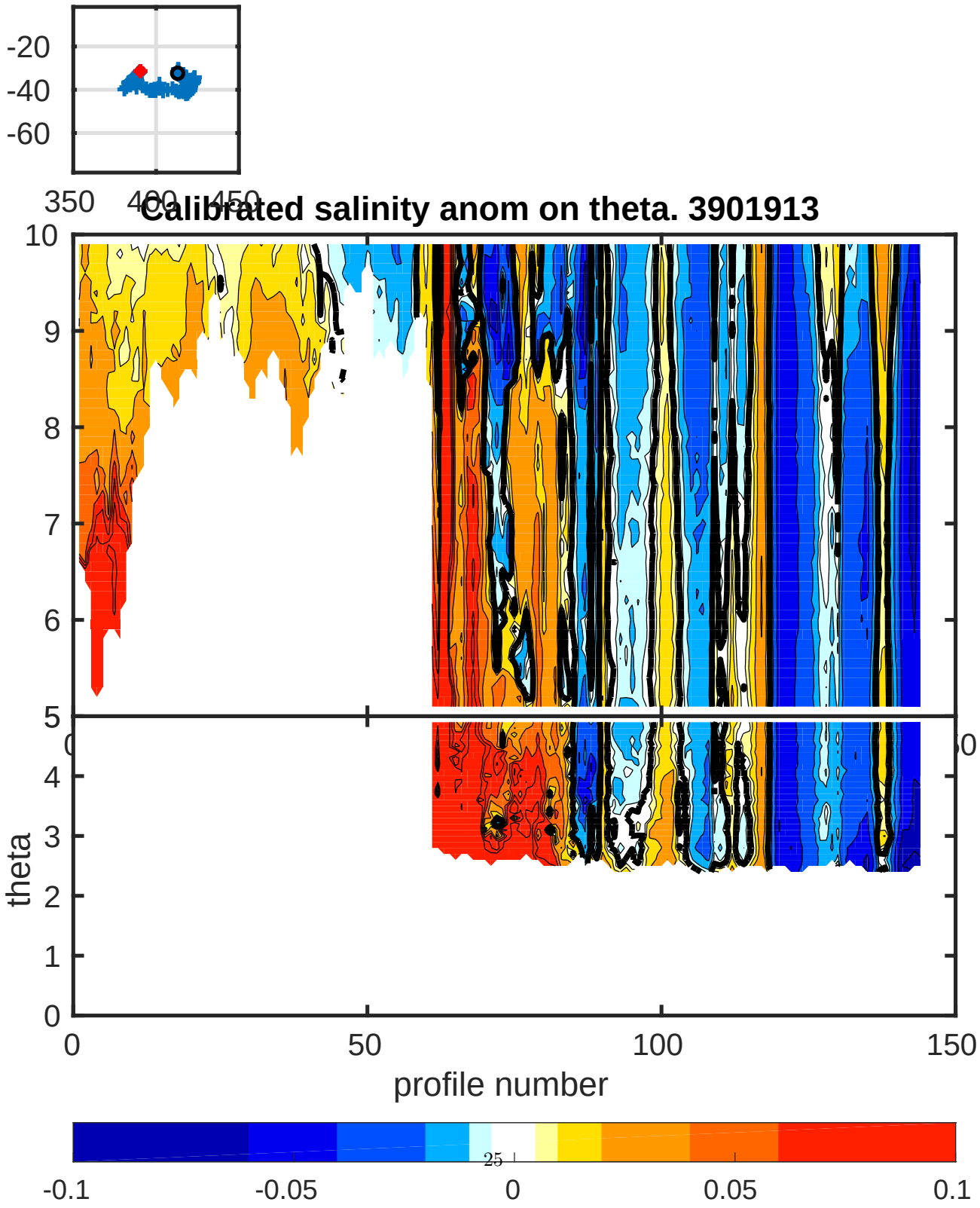

Figure 21: Float 3901913. Calibrated salinity anomaly on θ.

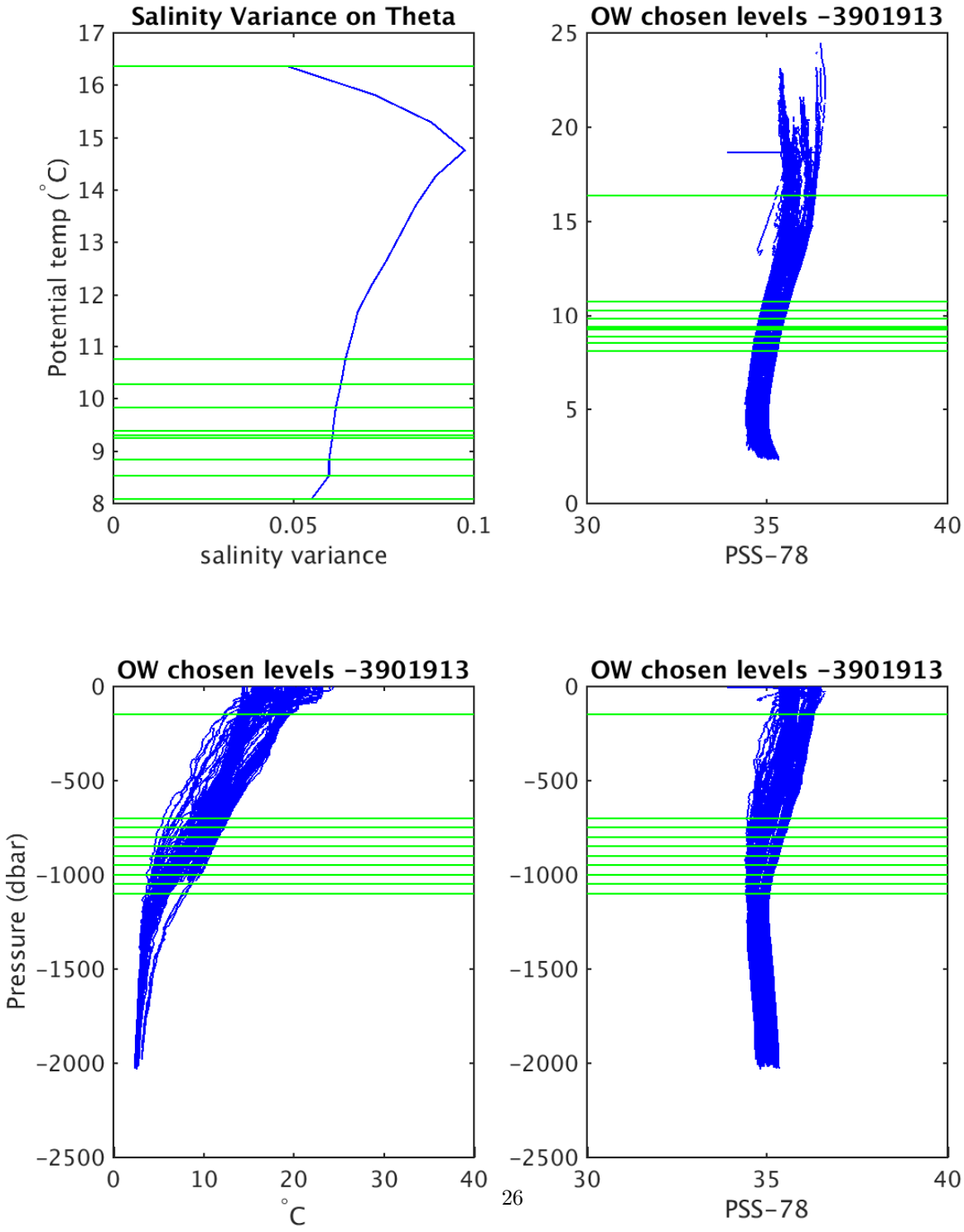

Figure 22: Float 3901913. Salinity, salinity variance on theta and OW chosen levels.

3.3 Summary and Conclusions

Data from cycle 1 to 55 are drifting, but are still adjustable. The associated QC=1 and error 0.01. Float showed a strong and not adjustable drift after cycle 55.

4 Final Checks

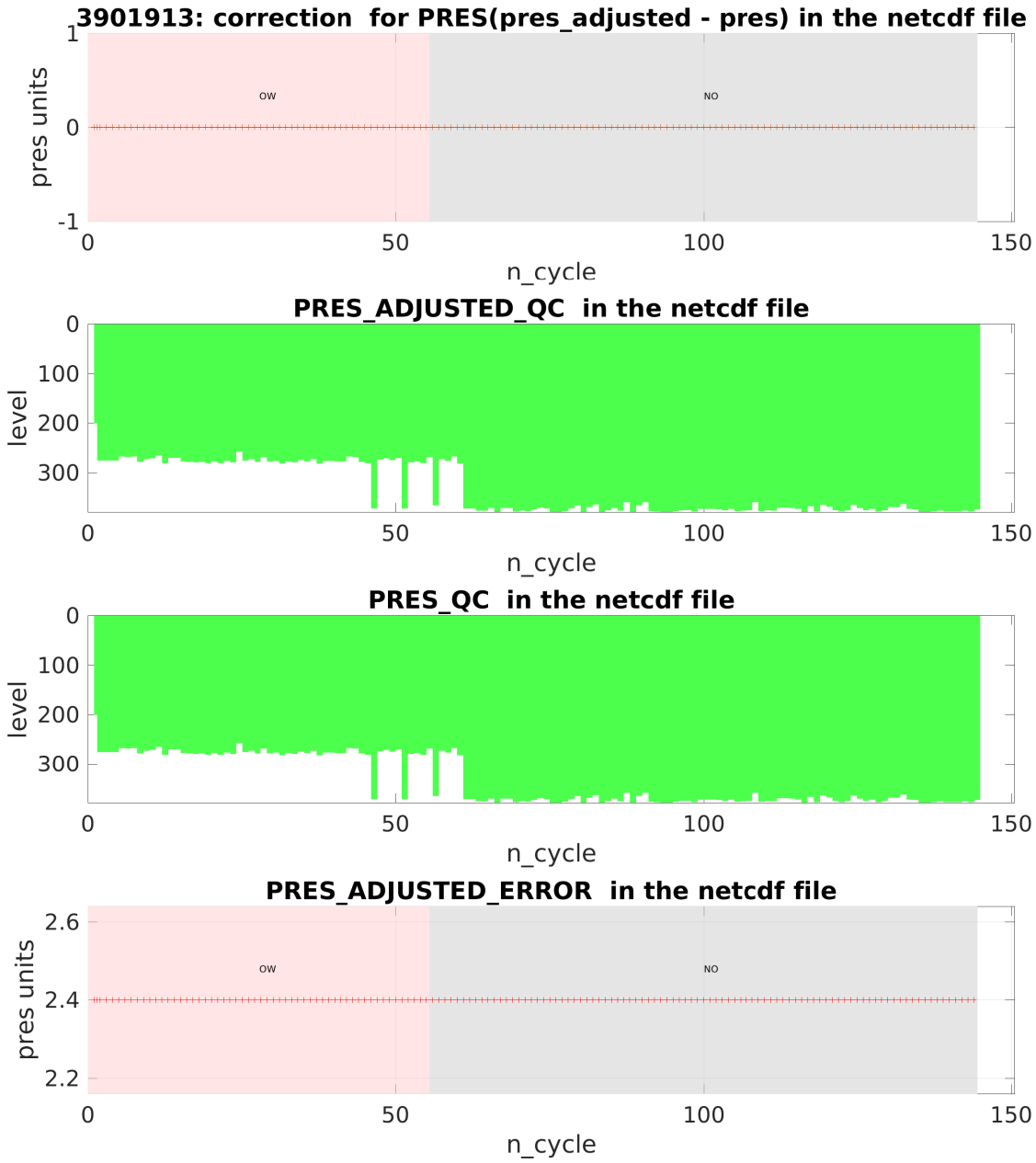

Figure 23: Float 3901913. Time series of applied pressure corrections.

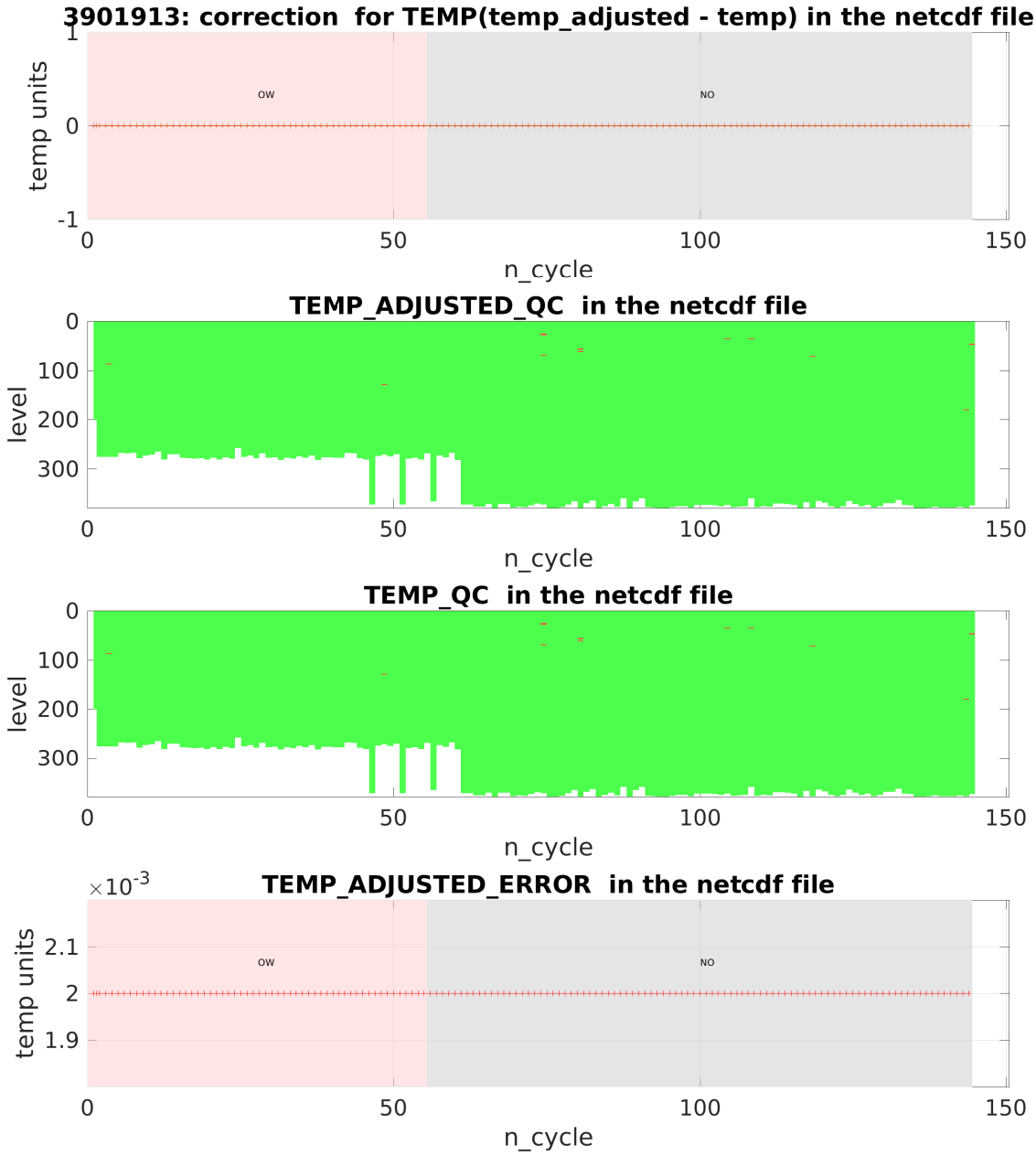

Figure 24: Float 3901913. Time series of applied temperature corrections.

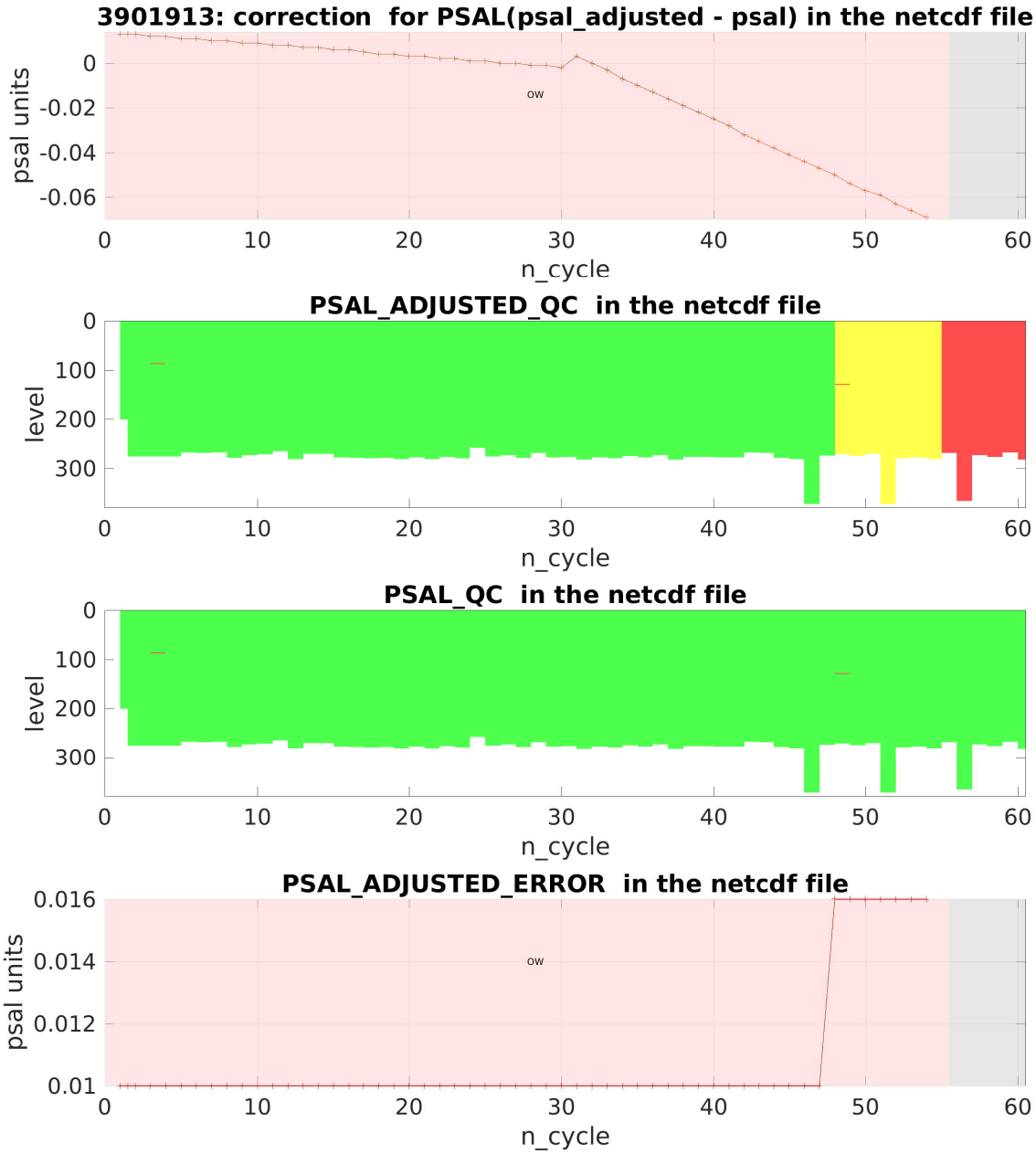

Figure 25: Float 3901913. Time series of applied salinity corrections.