Delayed mode quality control of MOCCA Argo float 3901913

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Summary

Profiles from cycle 1 to 47 showed salty drift. The OWC correction was applied QC=1, error=0.01. Further cycles 48 to 168 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

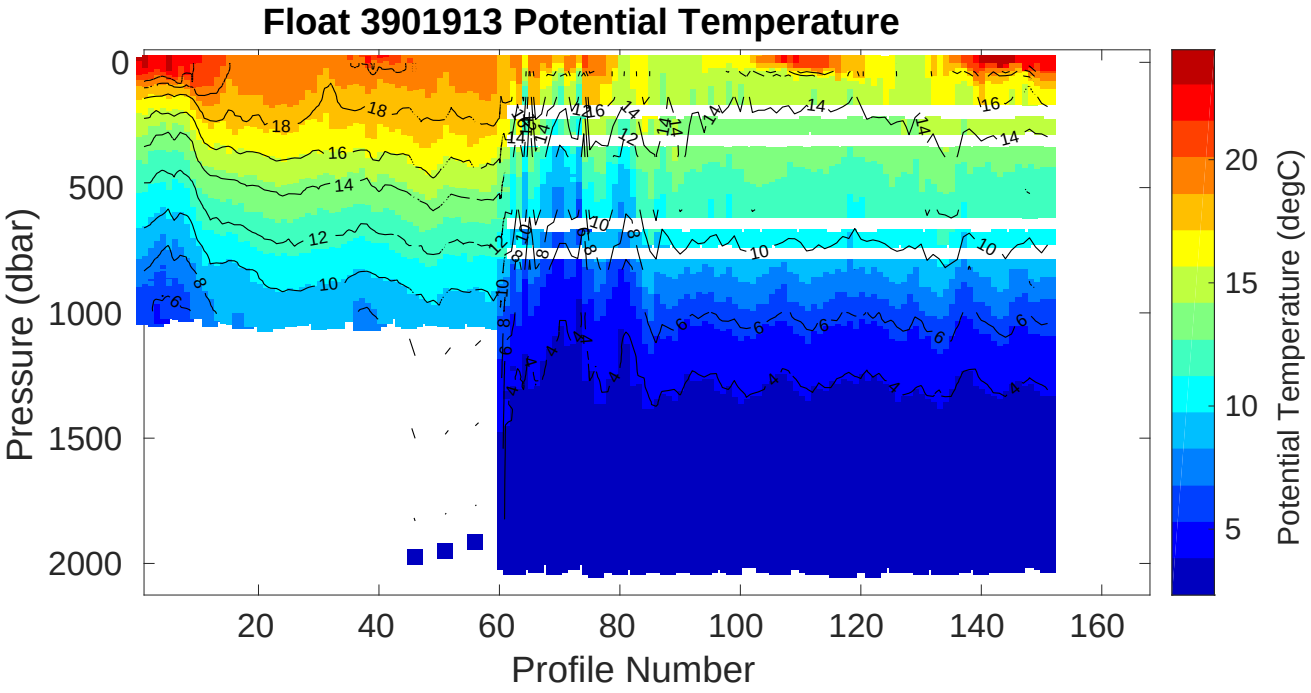

Figure 1: Float 3901913. Time series of the vertical distribution of potential temperature (°C).

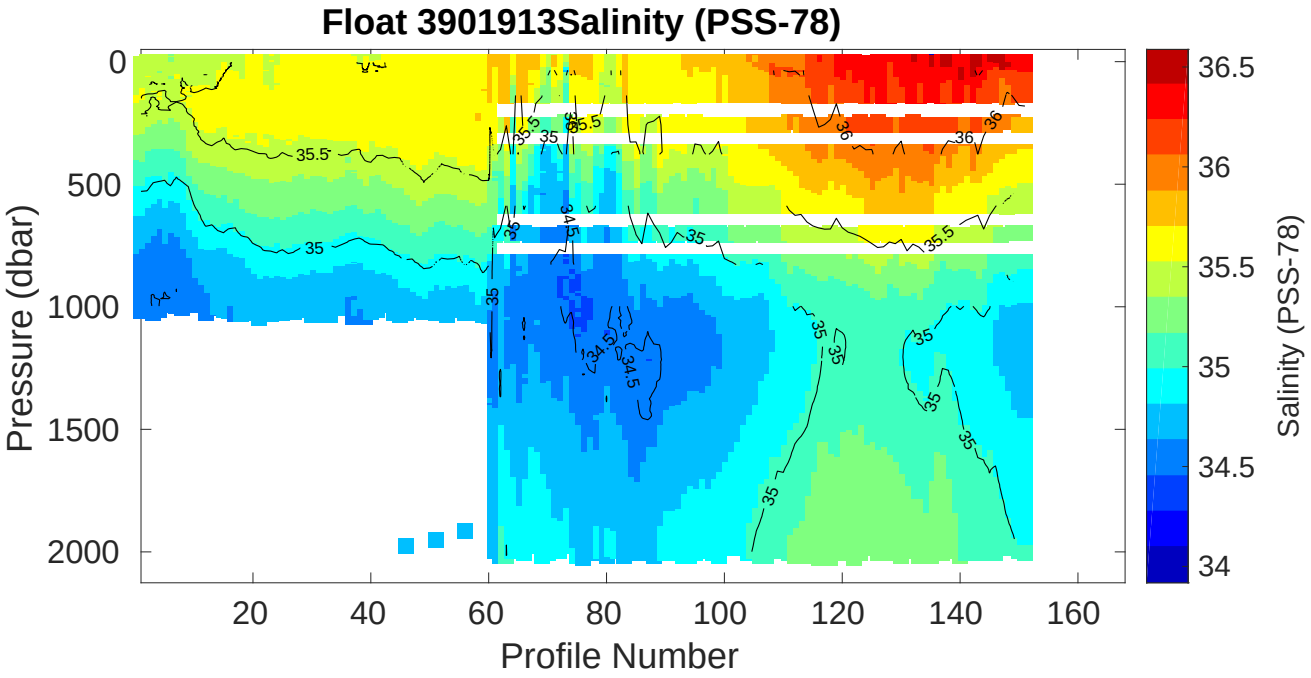

Figure 2: Float 3901913. Time series of the vertical distribution of practical salinity (PSU).

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.

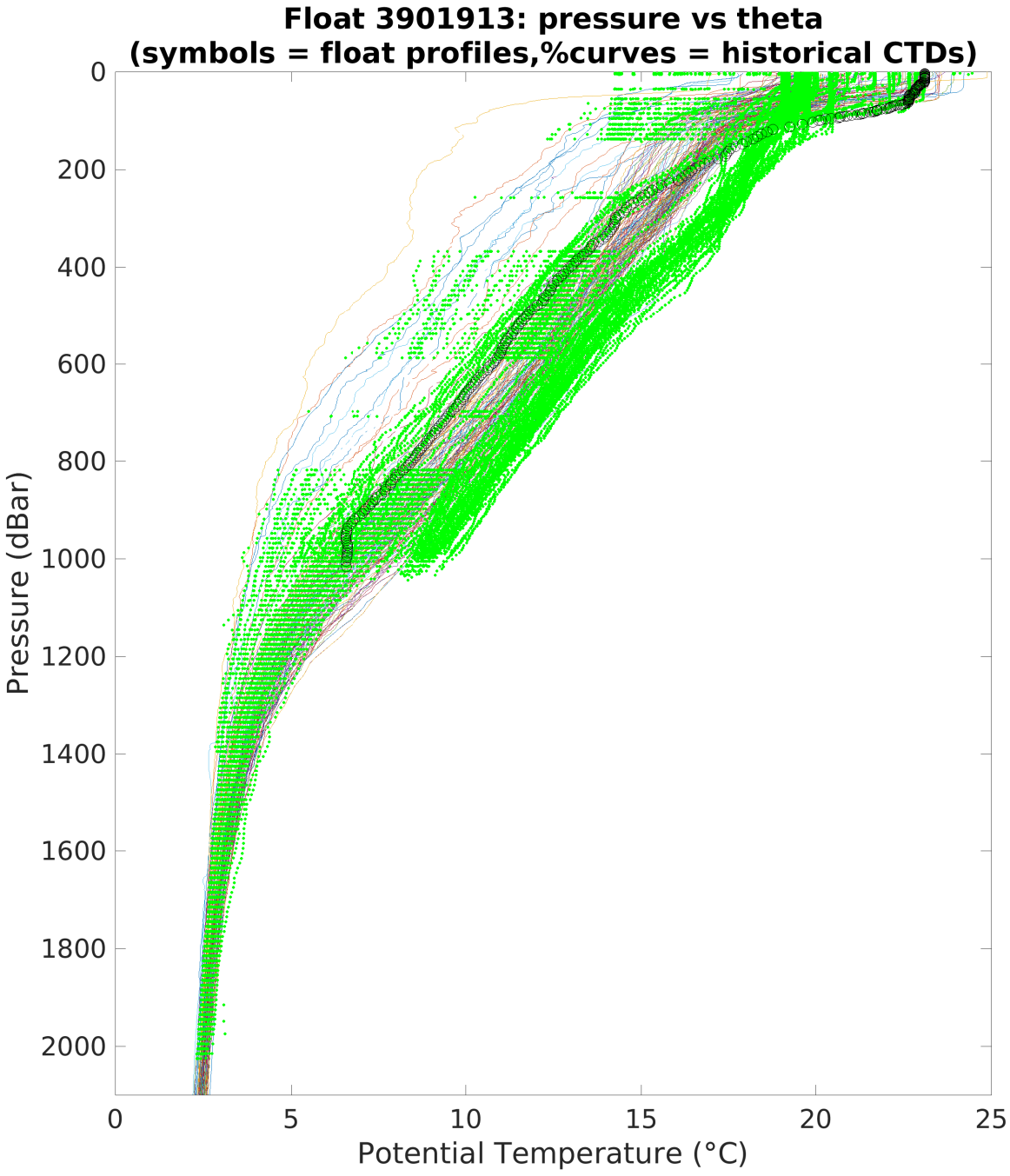

Figure 3: Float 3901913. Float profile of potential temperature (˚C) plotted with climatology from the spatial range of 10 ˚. The black and blue cycles indicates the first and the last Argo profile, respectively. Green symbols represent other Argo profiles from this float.

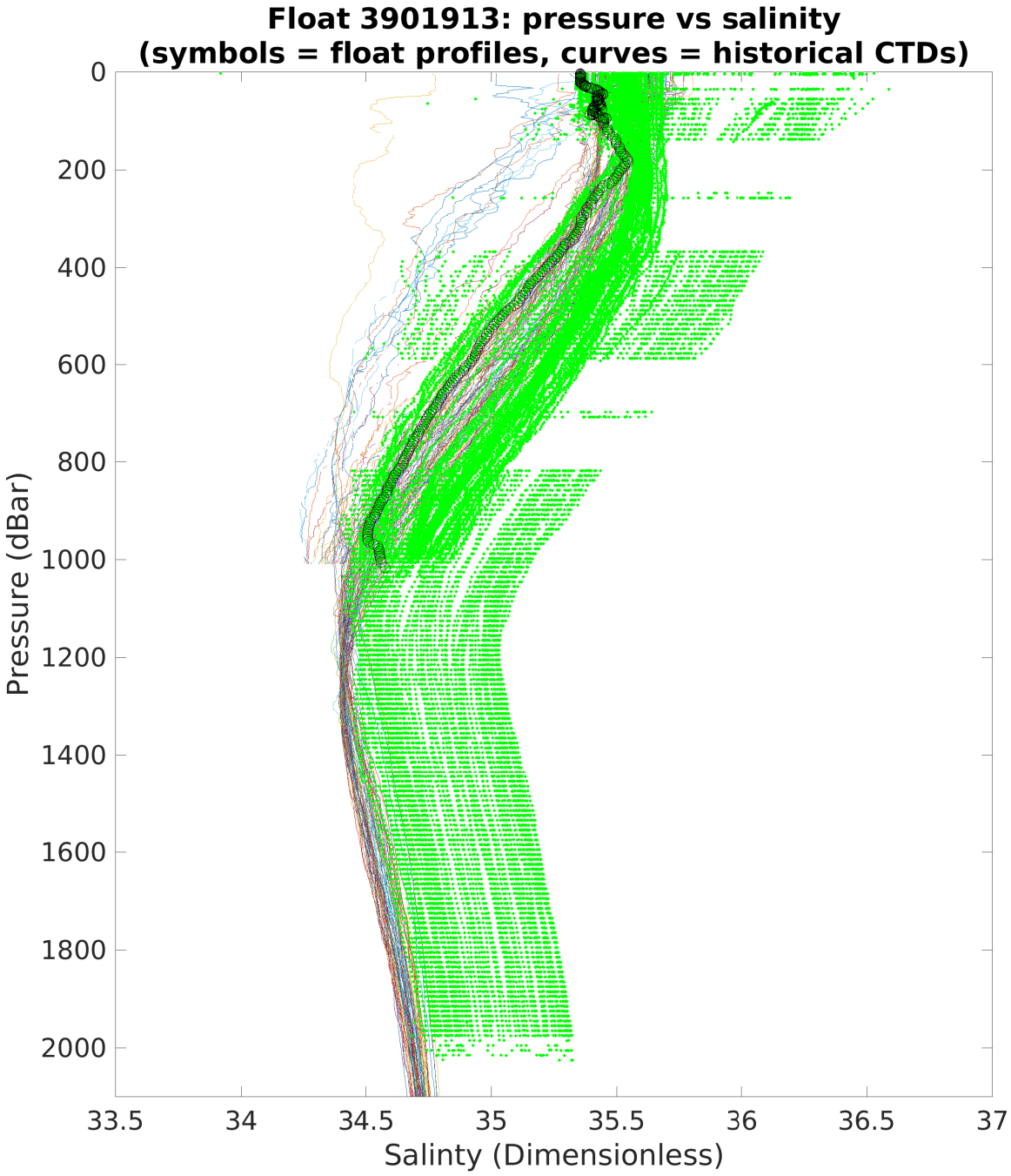

Figure 4: Float 3901913. Float profile of salinity (dimensionless) plotted with climatology from the spatial range of 10 ˚. The black and blue cycles indicates the first and the last Argo profile, respectively. Green symbols represent other Argo profiles from this float.

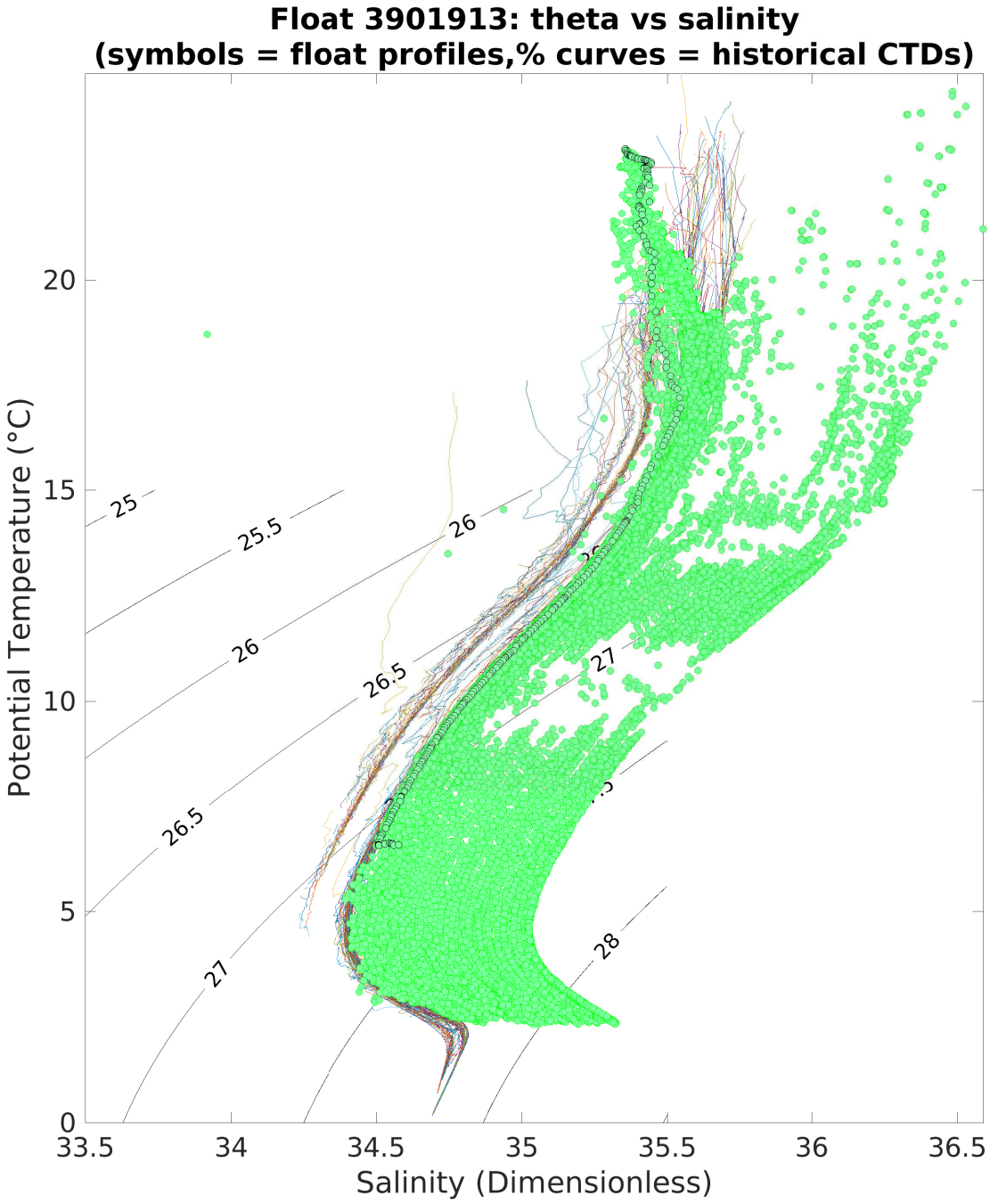

Figure 5: Float 3901913. Theta/S plotted with climatology from the spatial range of 10 °. The black and blue cycles indicates the first and the last Argo profile, respectively. Green symbols represent other Argo profiles from this float.

2.3 Satellite Altimeter comparison

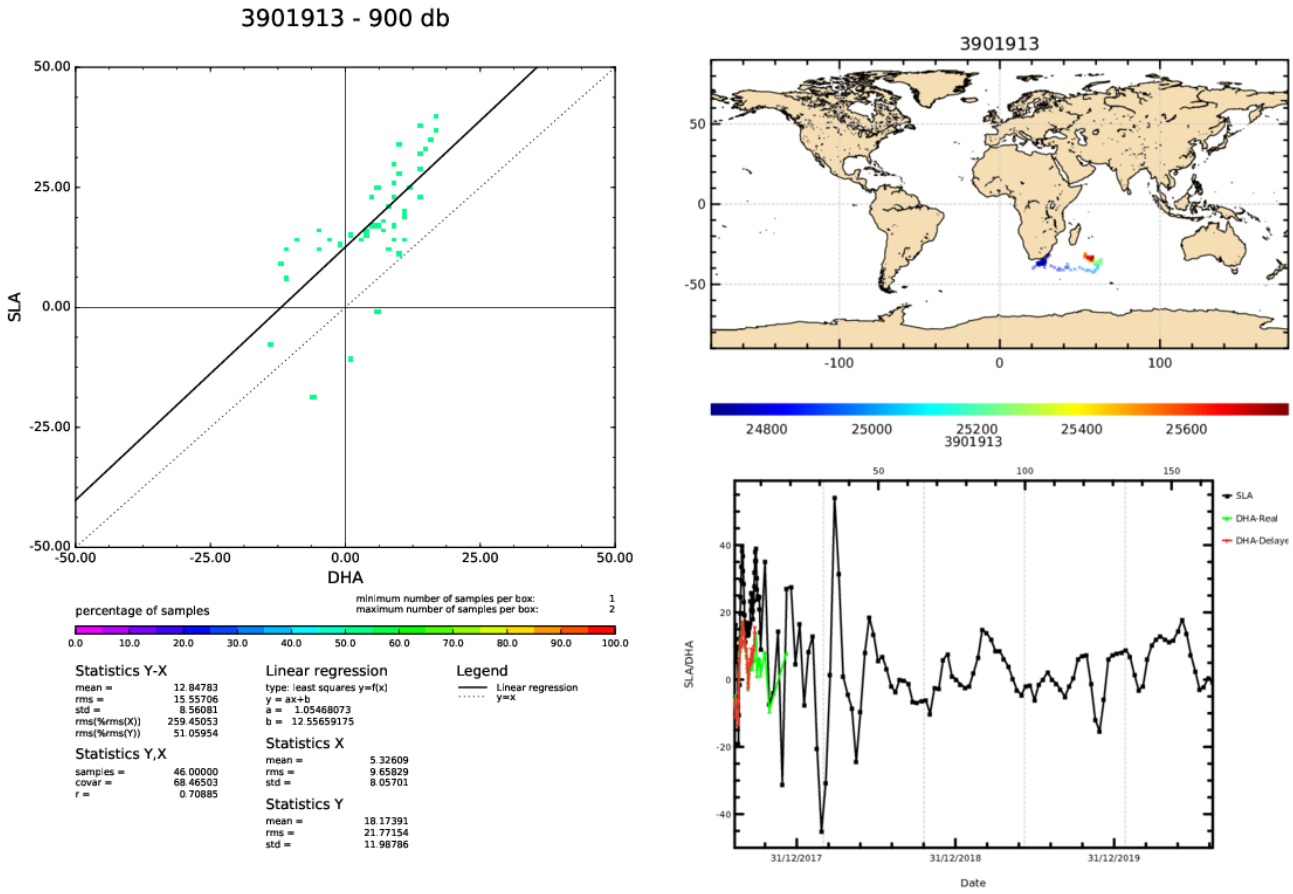

Figure 6: Float 3901913. The comparison betweeen the Sea Surface Height(SSH) from the satellite altimetry and Dynamic Height Anomaly(DHA)extracted from the Argo float temperature and salinity data

3 Correction of Salinity Data

3.1 Comparison between Argo floats and CTD Climatlogy

3.1.1 Configuration

3.1.2 Results

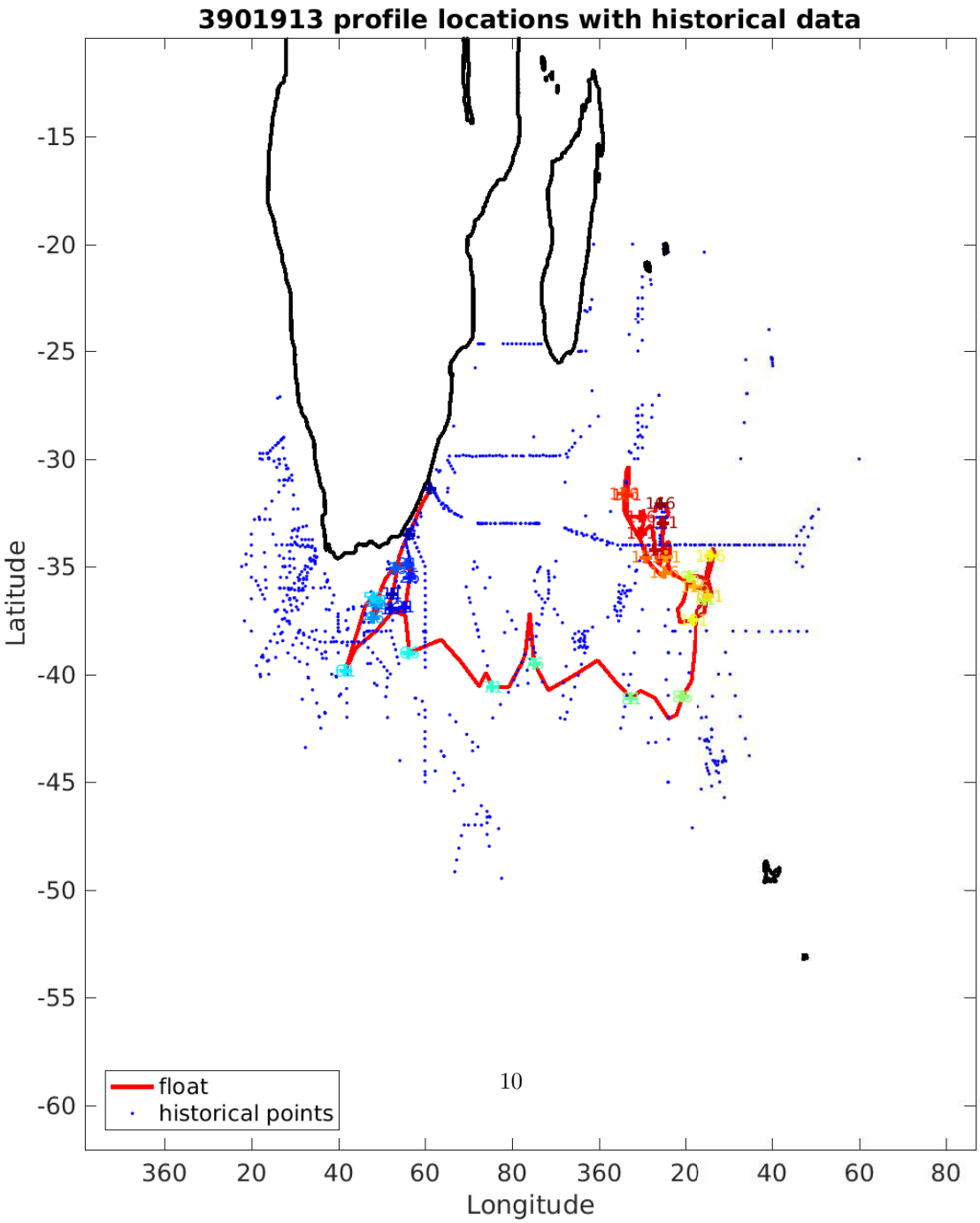

Figure 7: Float 3901913. Trajectory of the float with historical CTD data. The black contours indicate the bathymetry at 0, 200, 1000 and 2000 m.

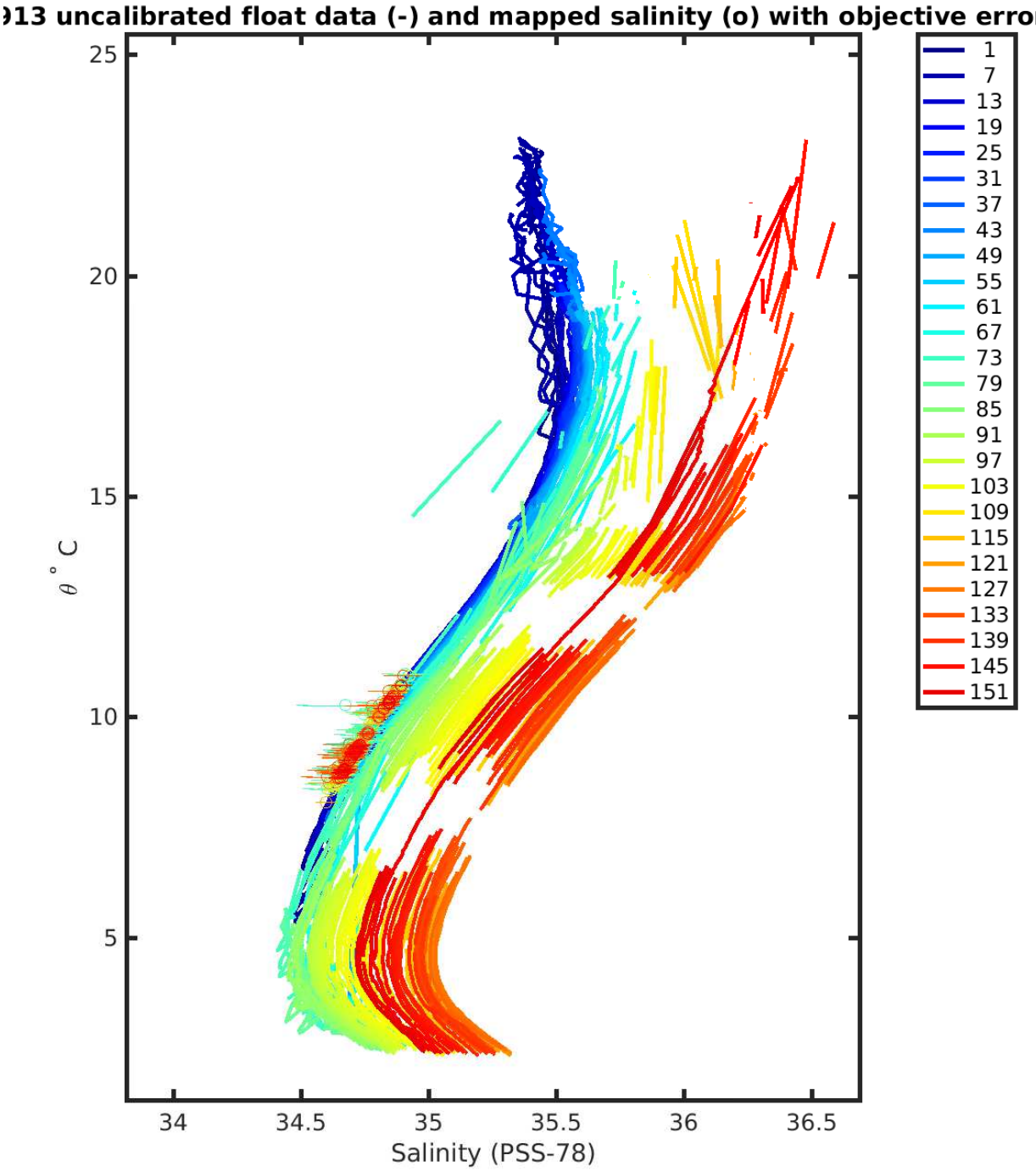

Figure 8: Float 3901913. Uncalibrated float data and mapped salinity.

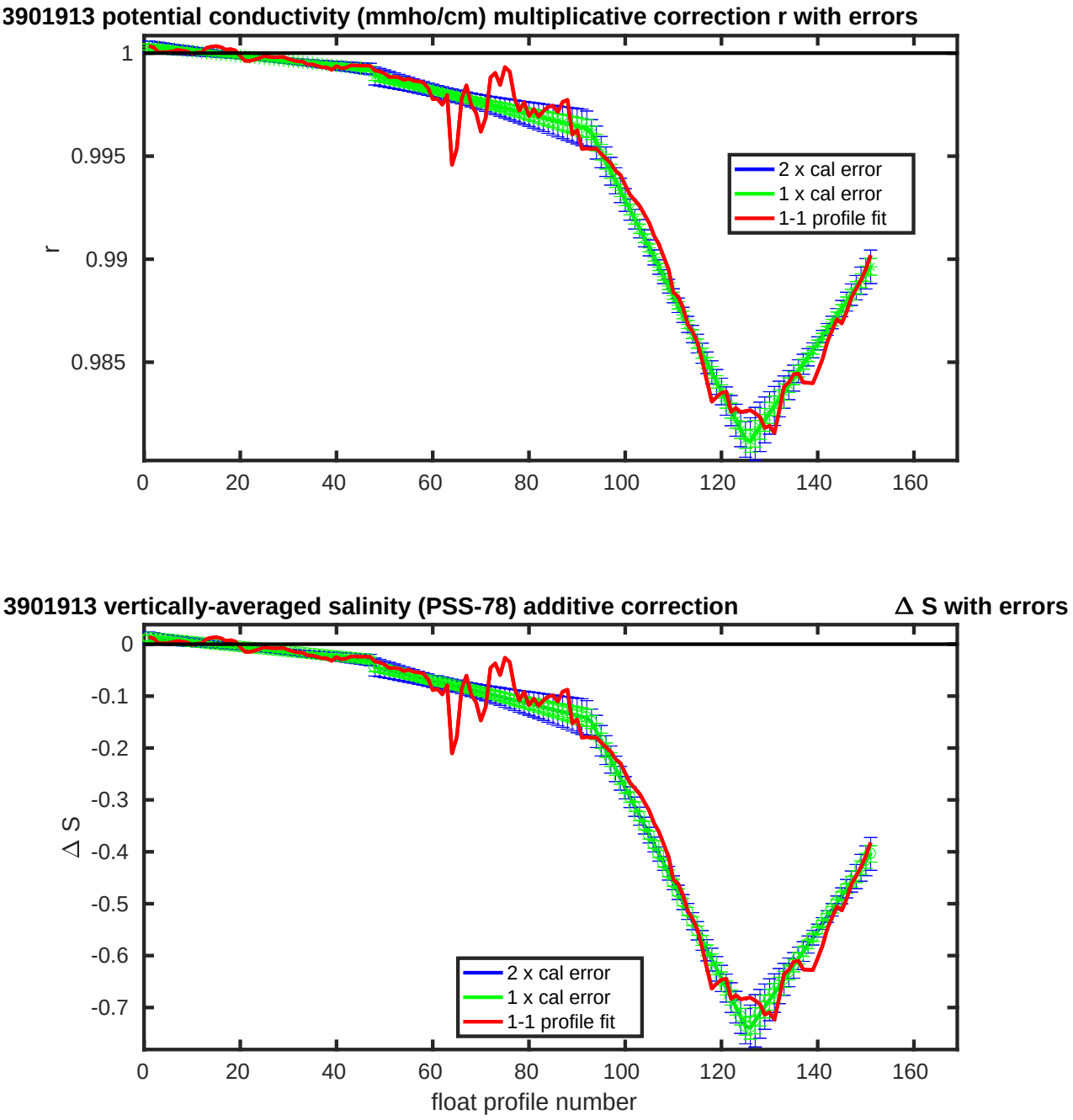

Figure 9: Float 3901913. Potential conductivity (top) and vertically averaged salinity (bottom) with errors.

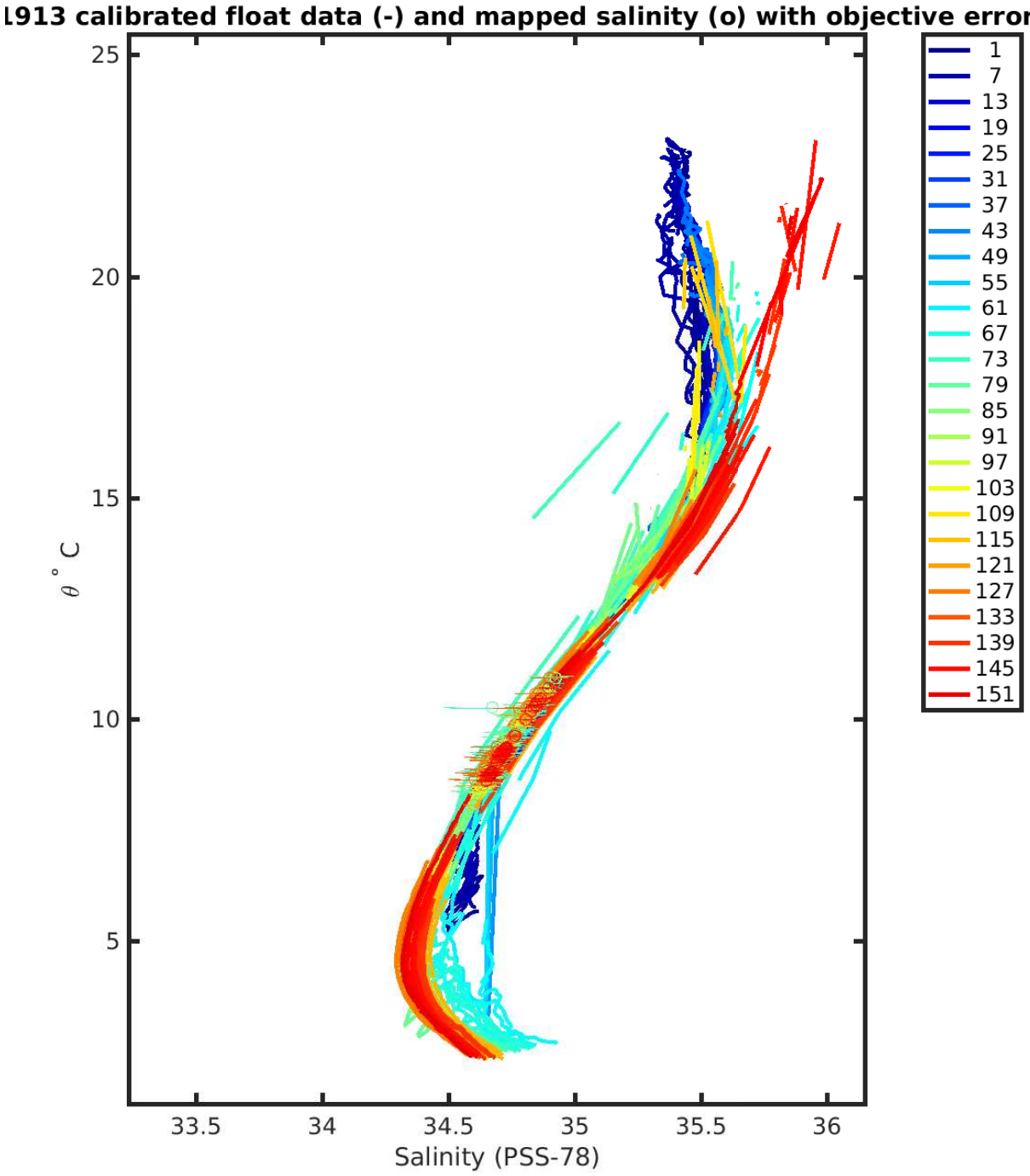

Figure 10: Float 3901913. Calibrated float data and mapped salinity.

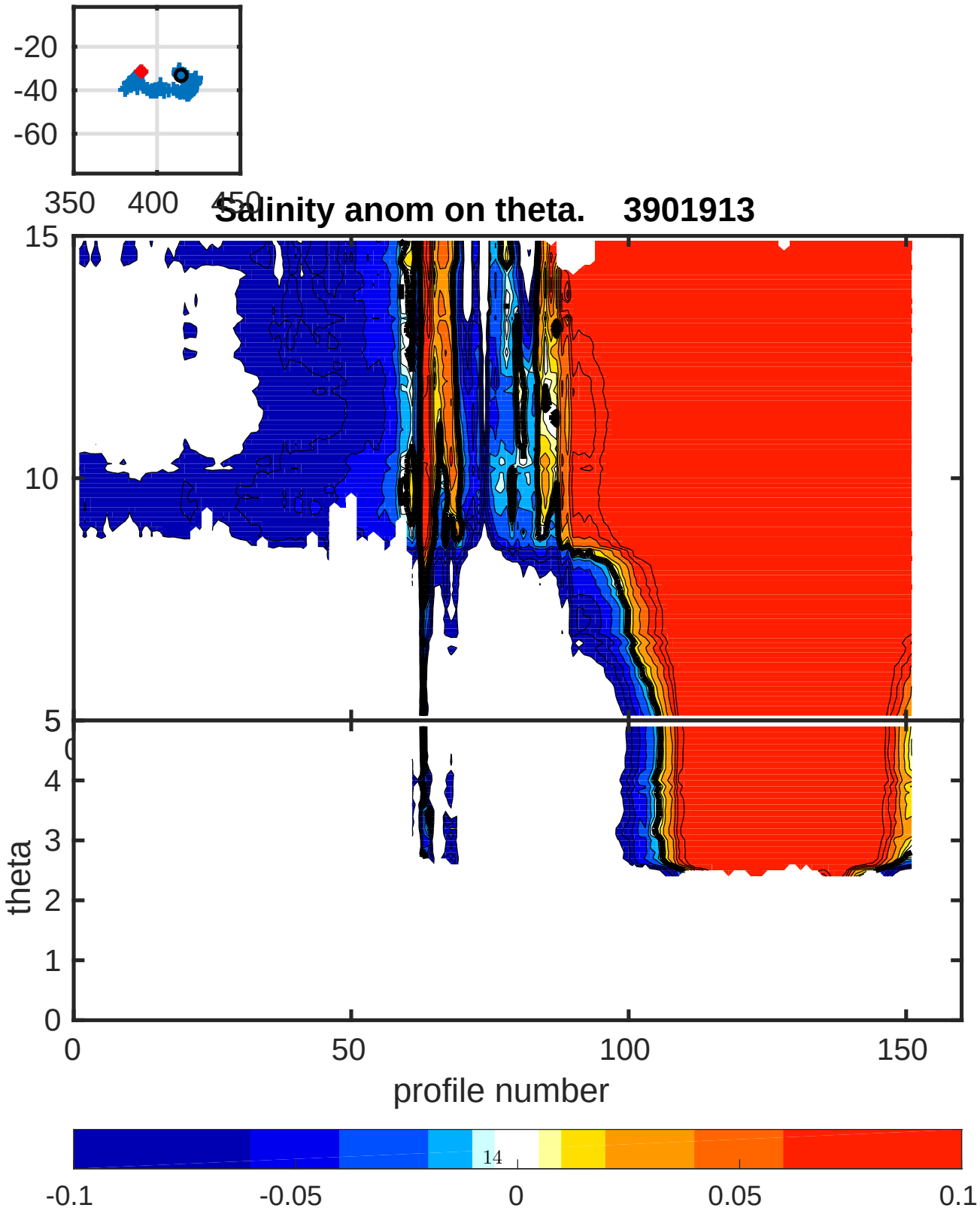

Figure 11: Float 3901913. Salinity anomaly on θ levels.

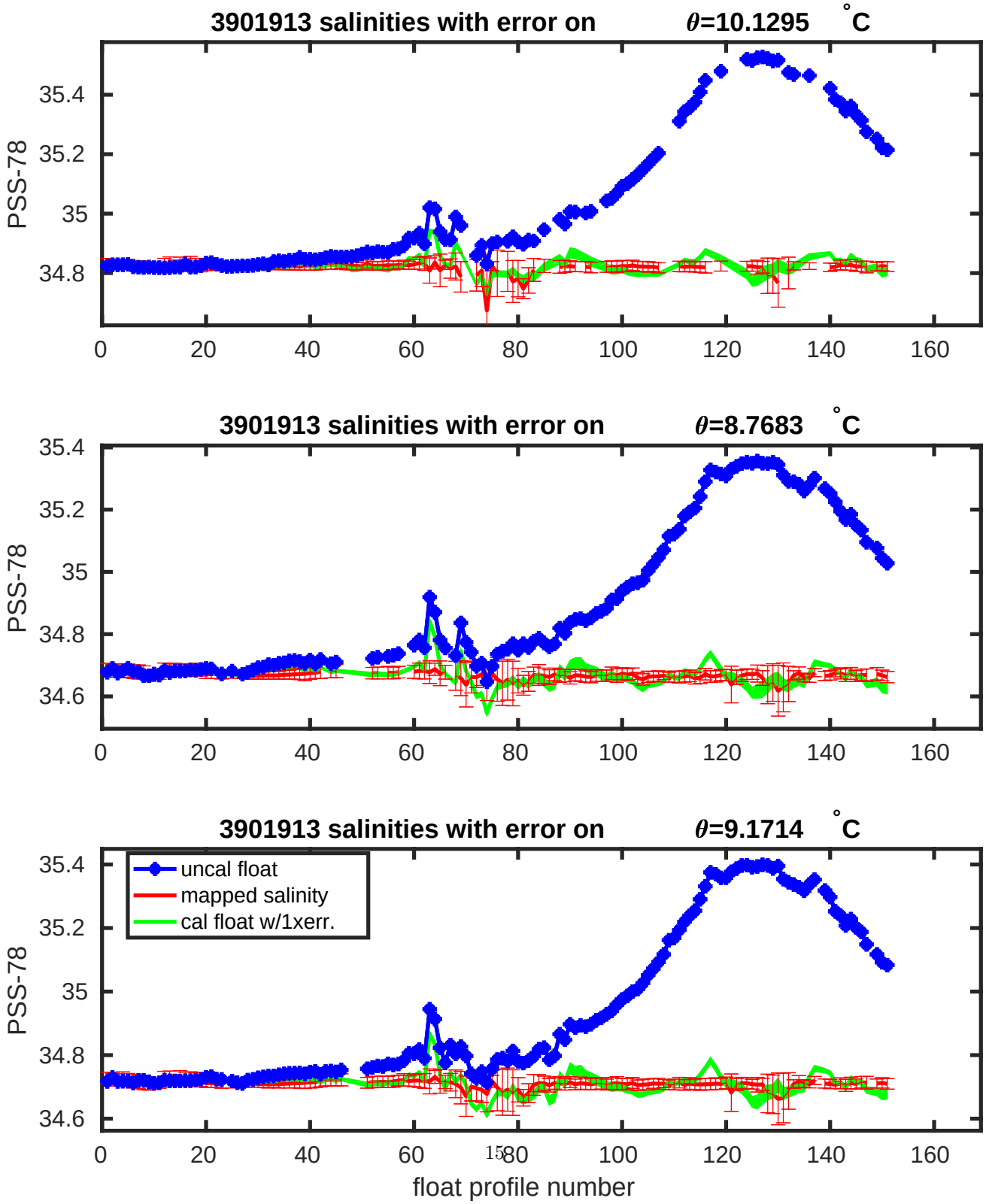

Figure 12: Float 3901913. Salinities with errors on θ levels.

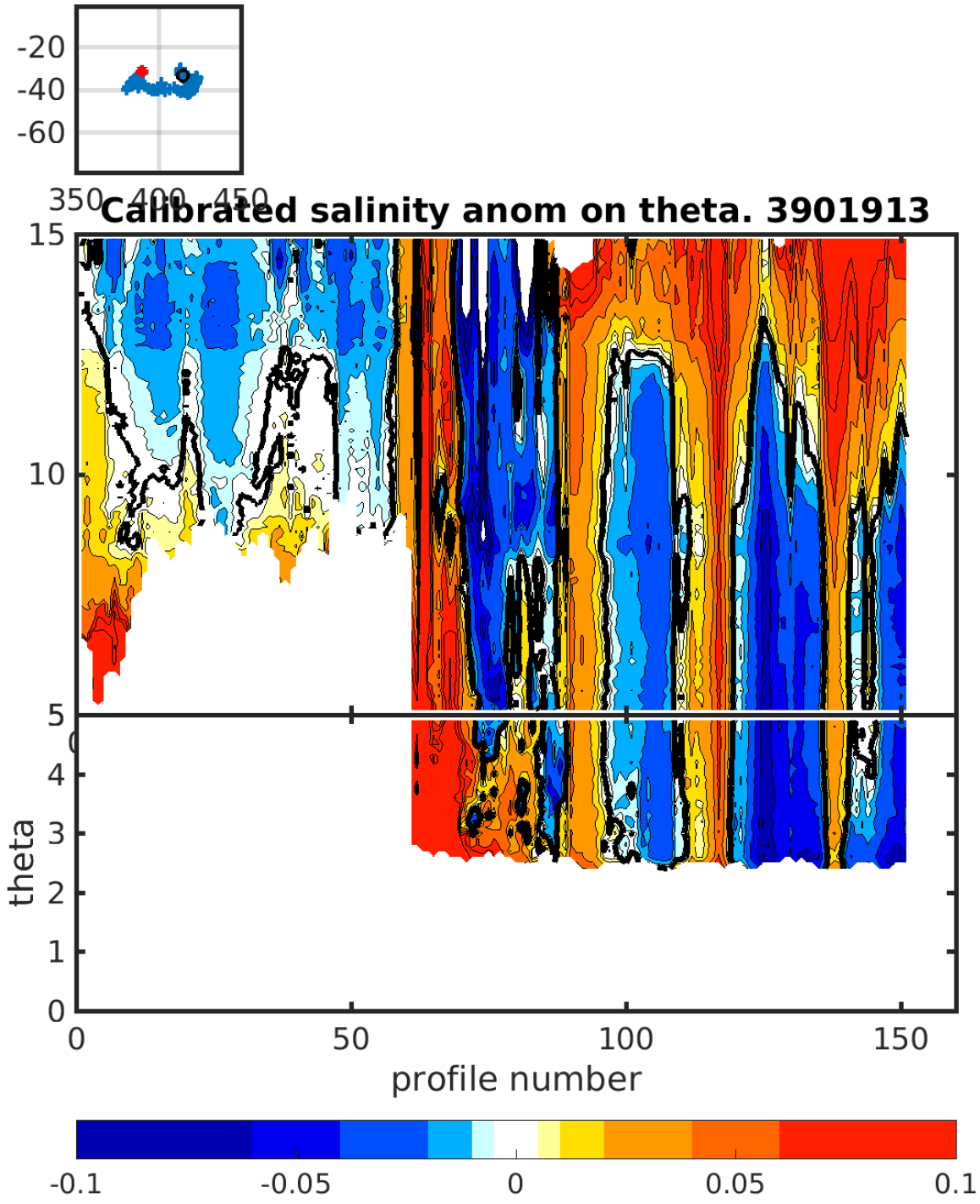

Figure 13: Float 3901913. Calibrated salinity anomaly on θ levels.

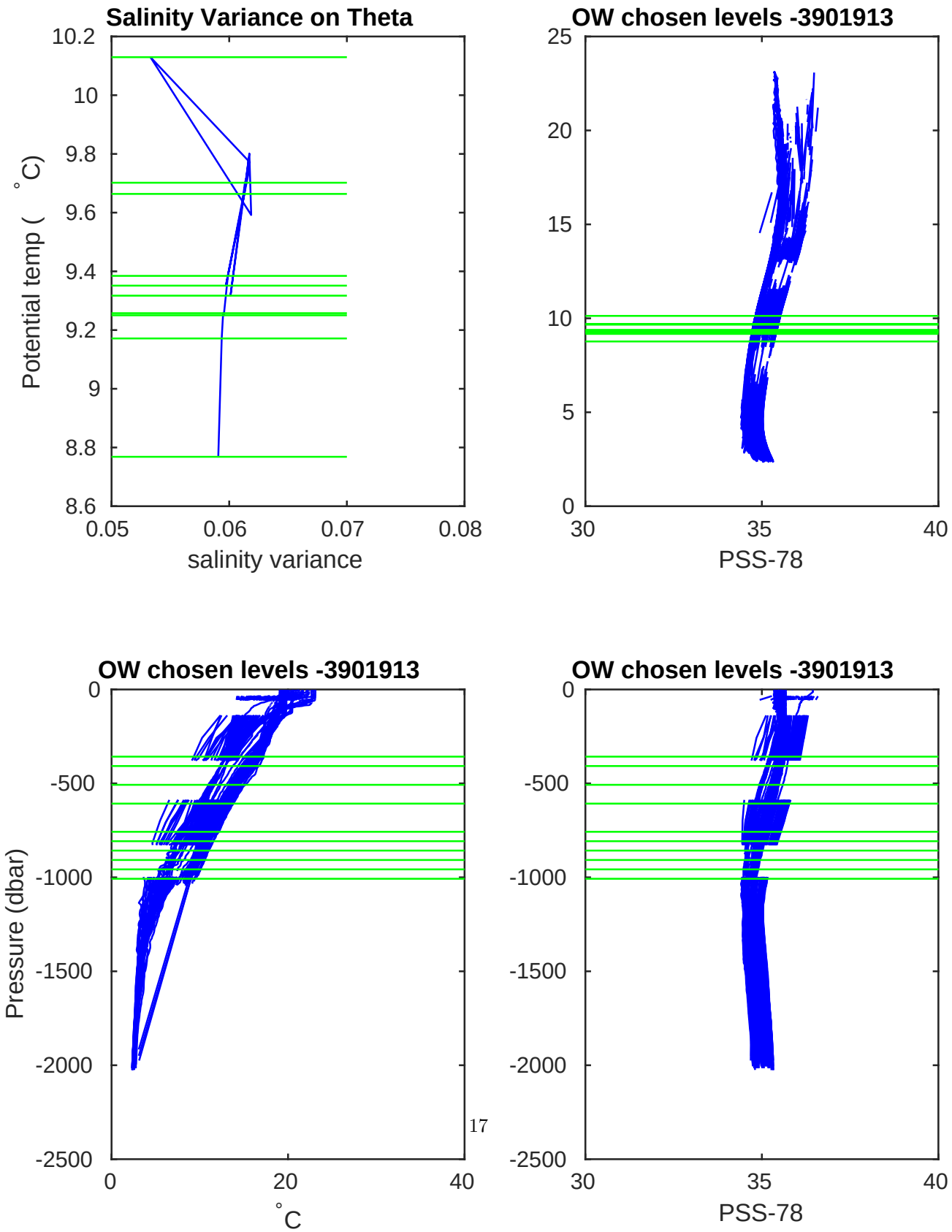

Figure 14: Float 3901913. Salinity, salinity variance on theta and OW chosen levels.

3.2 Comparison between Argo floats and Argo Climatlogy

3.2.1 Configuration

3.2.2 Results

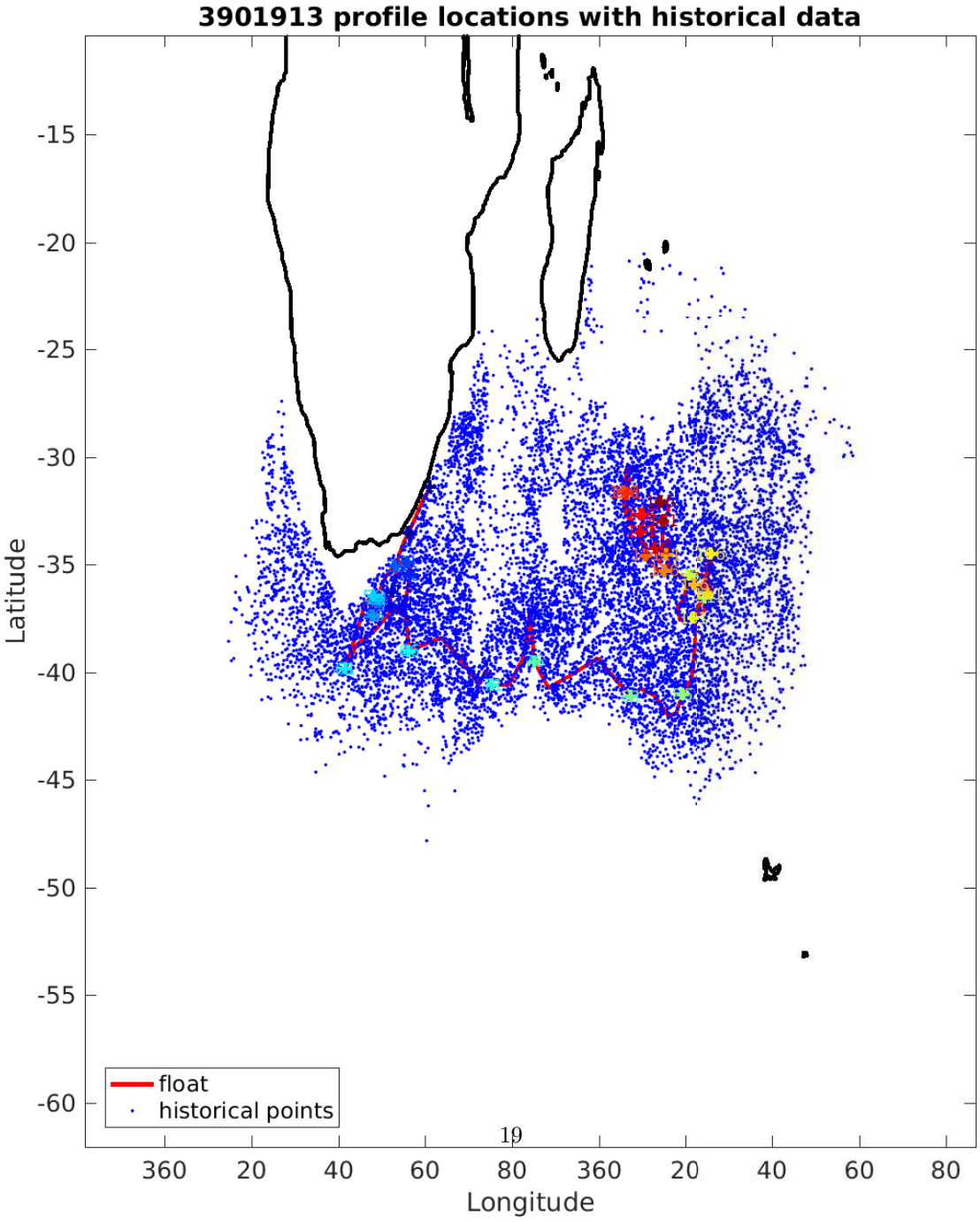

Figure 15: Float 3901913. Trajectory of the float with historical CTD data. The black contours indicate the bathymetry at 0, 200, 1000 and 2000 m.

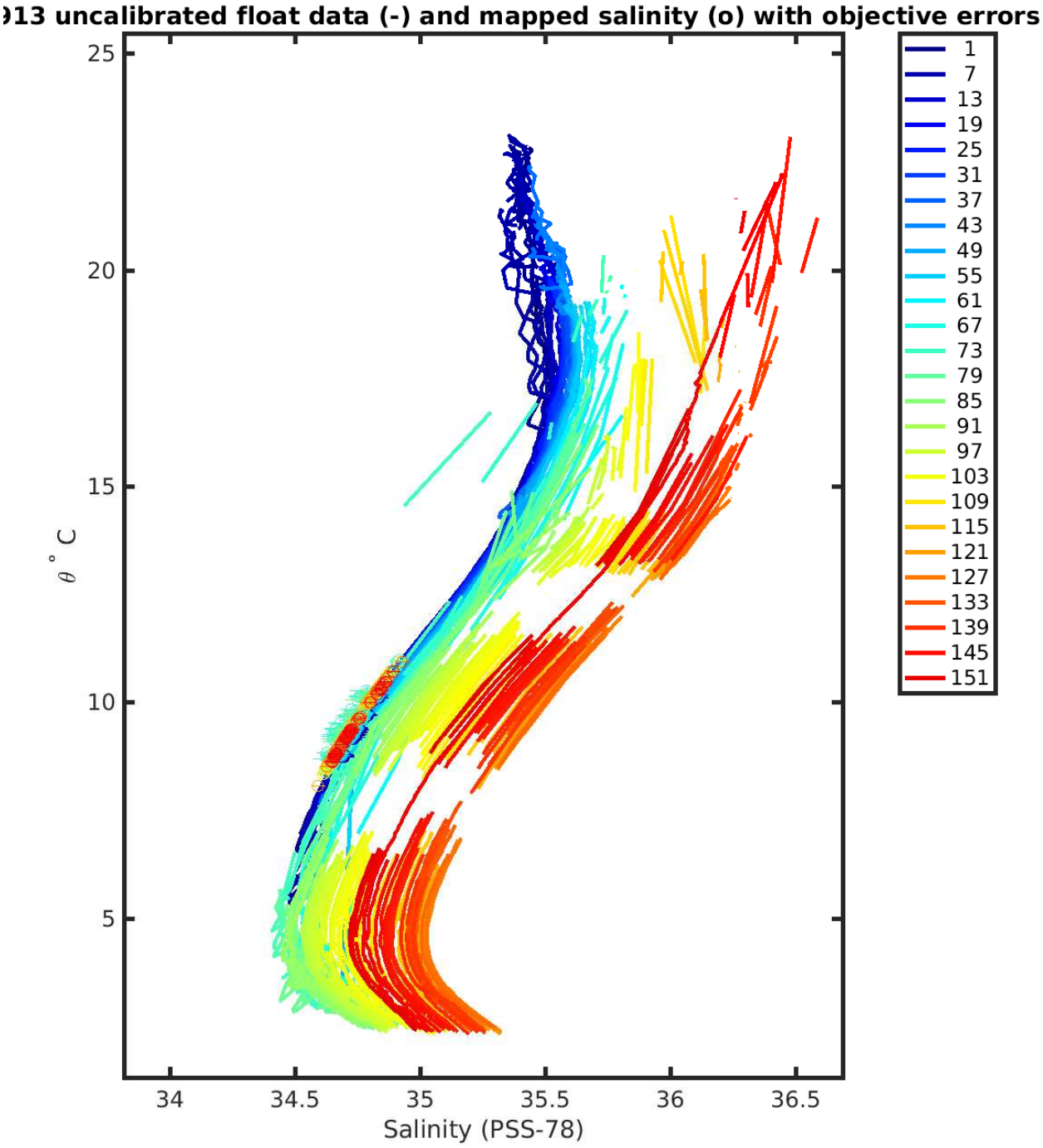

Figure 16: Float 3901913. Uncalibrated float data and mapped salinity.

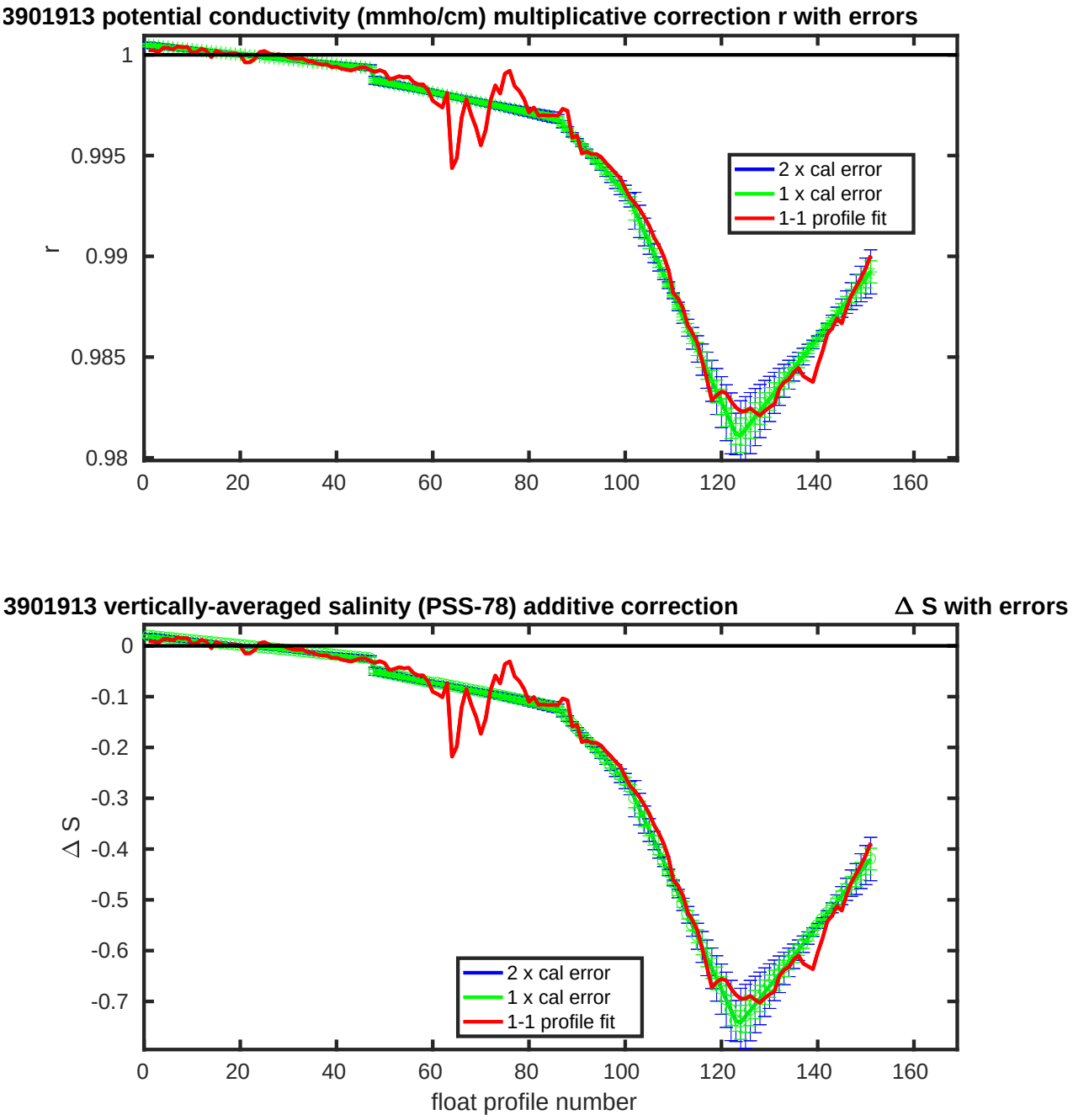

Figure 17: Float 3901913. Potential conductivity (top) and vertically averaged salinity (bottom) with errors.

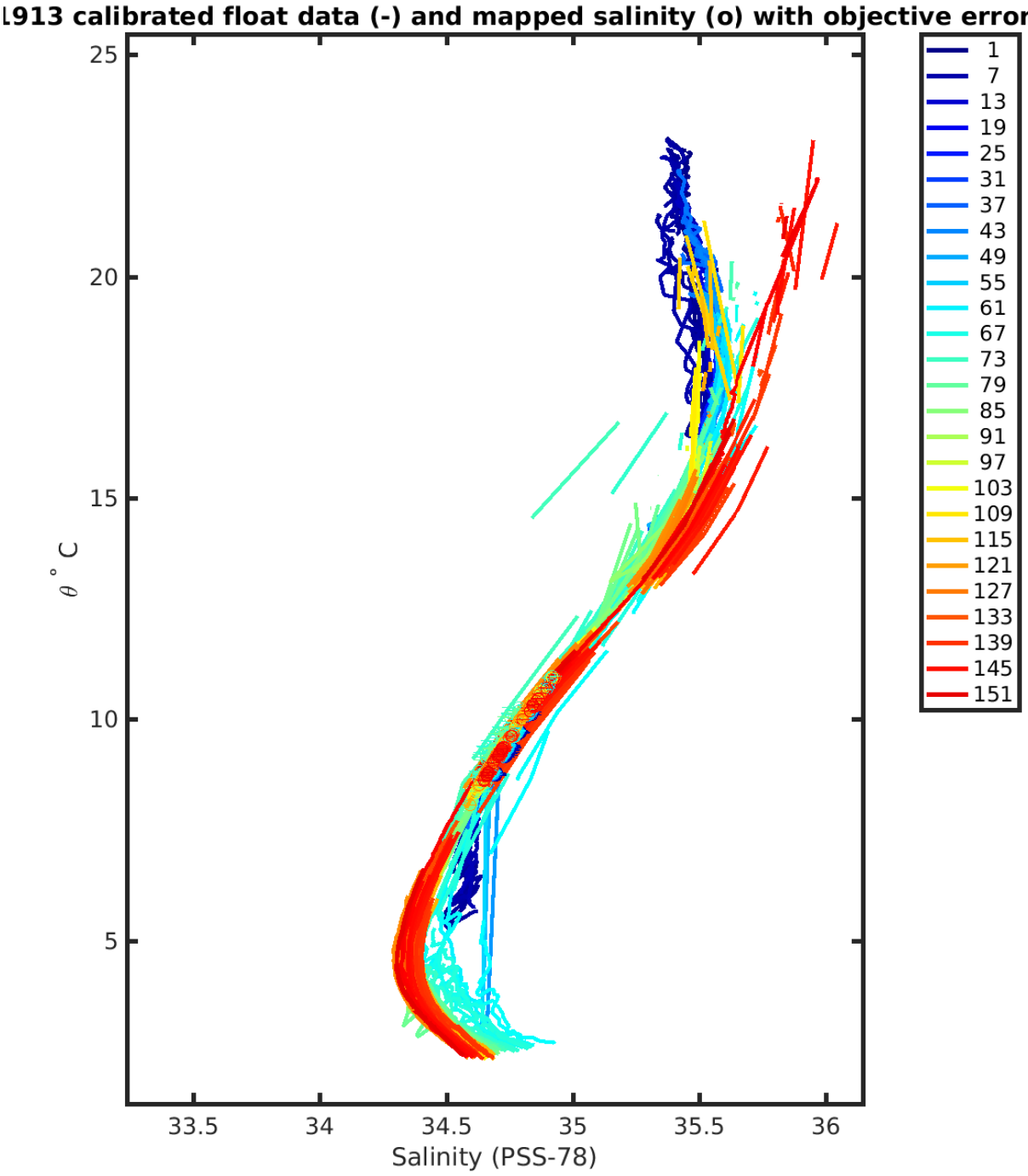

Figure 18: Float 3901913. Calibrated float data and mapped salinity.

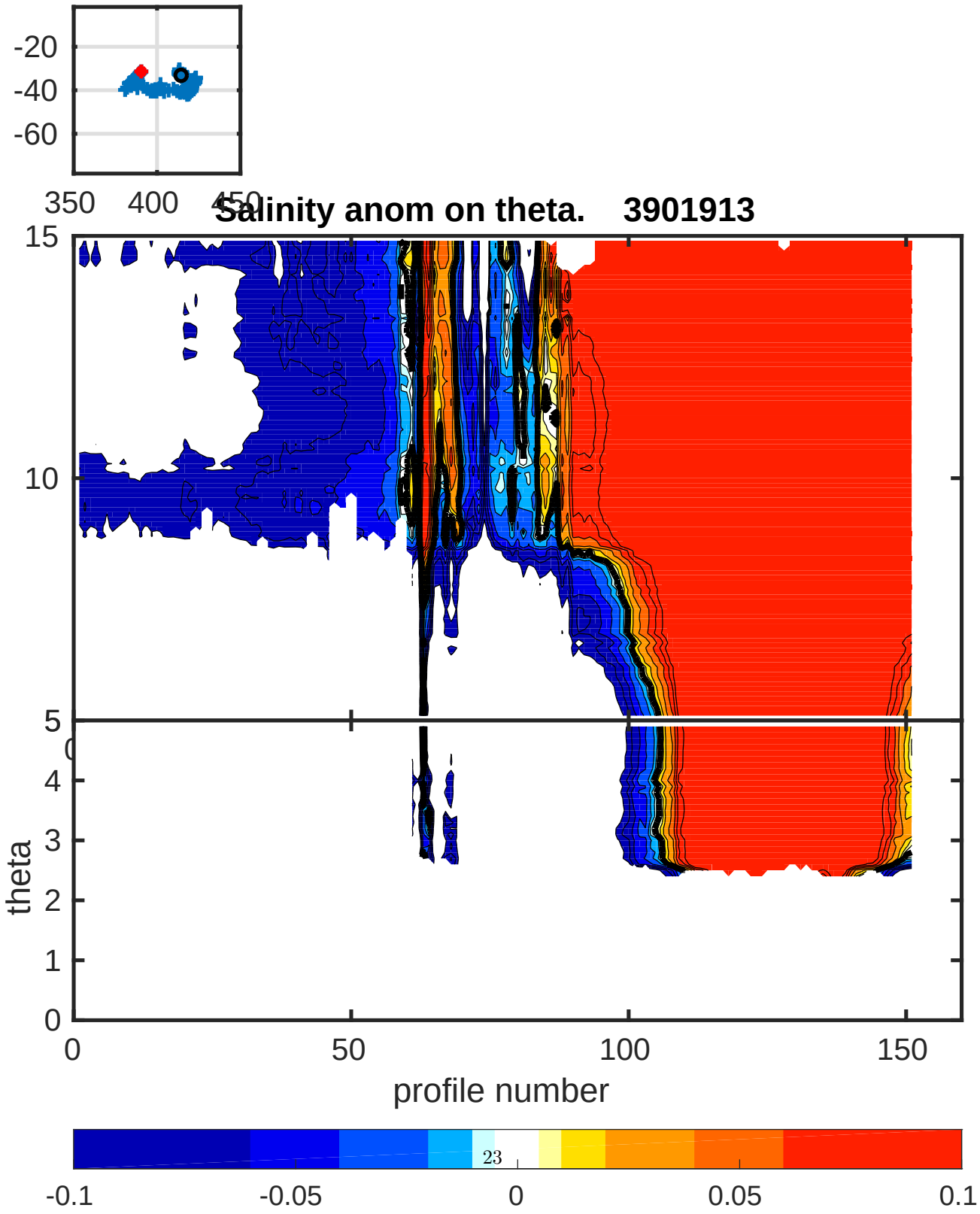

Figure 19: Float 3901913. Salinity anomaly on Theta

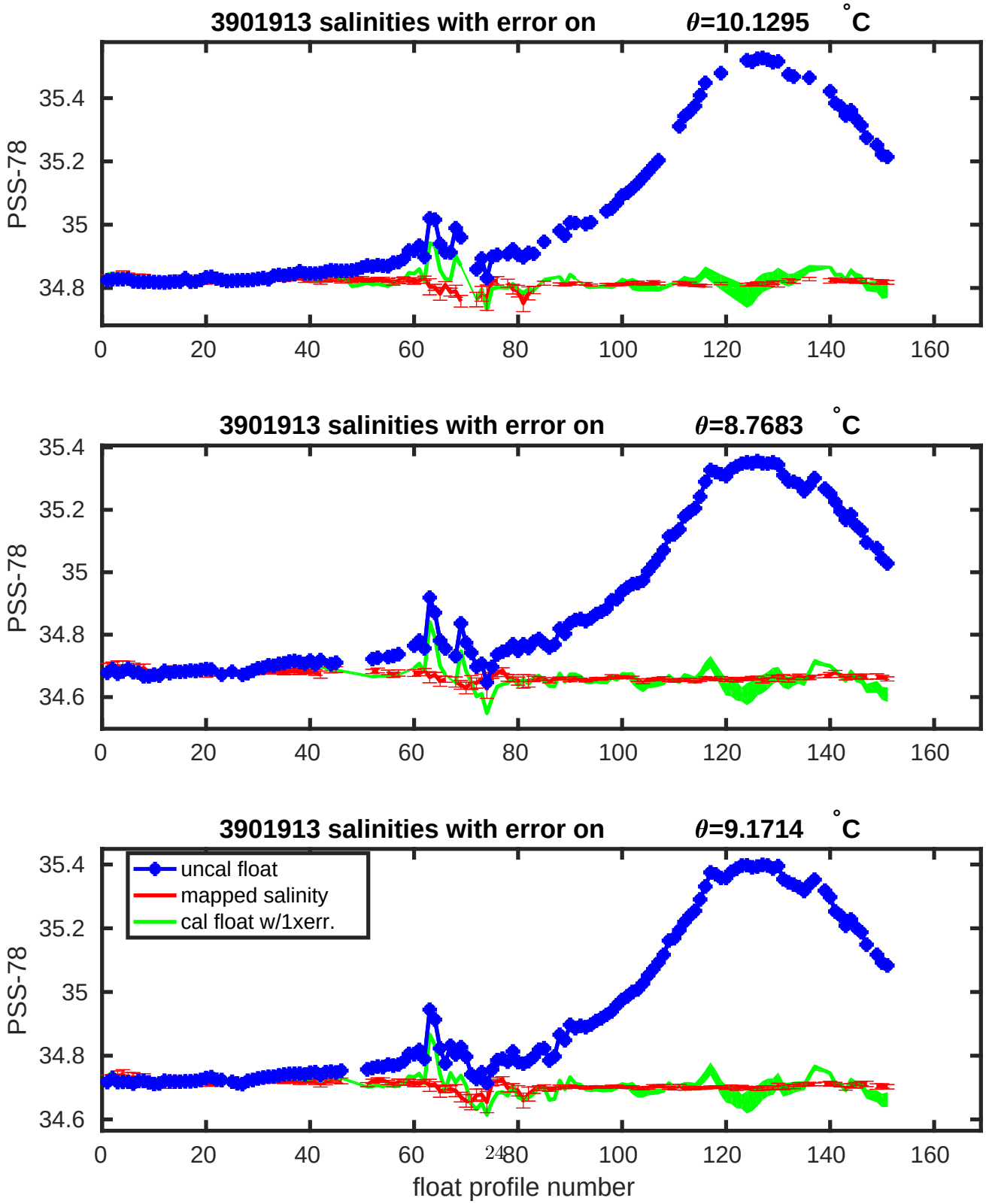

Figure 20: Float 3901913. Salinities with errors on θ.

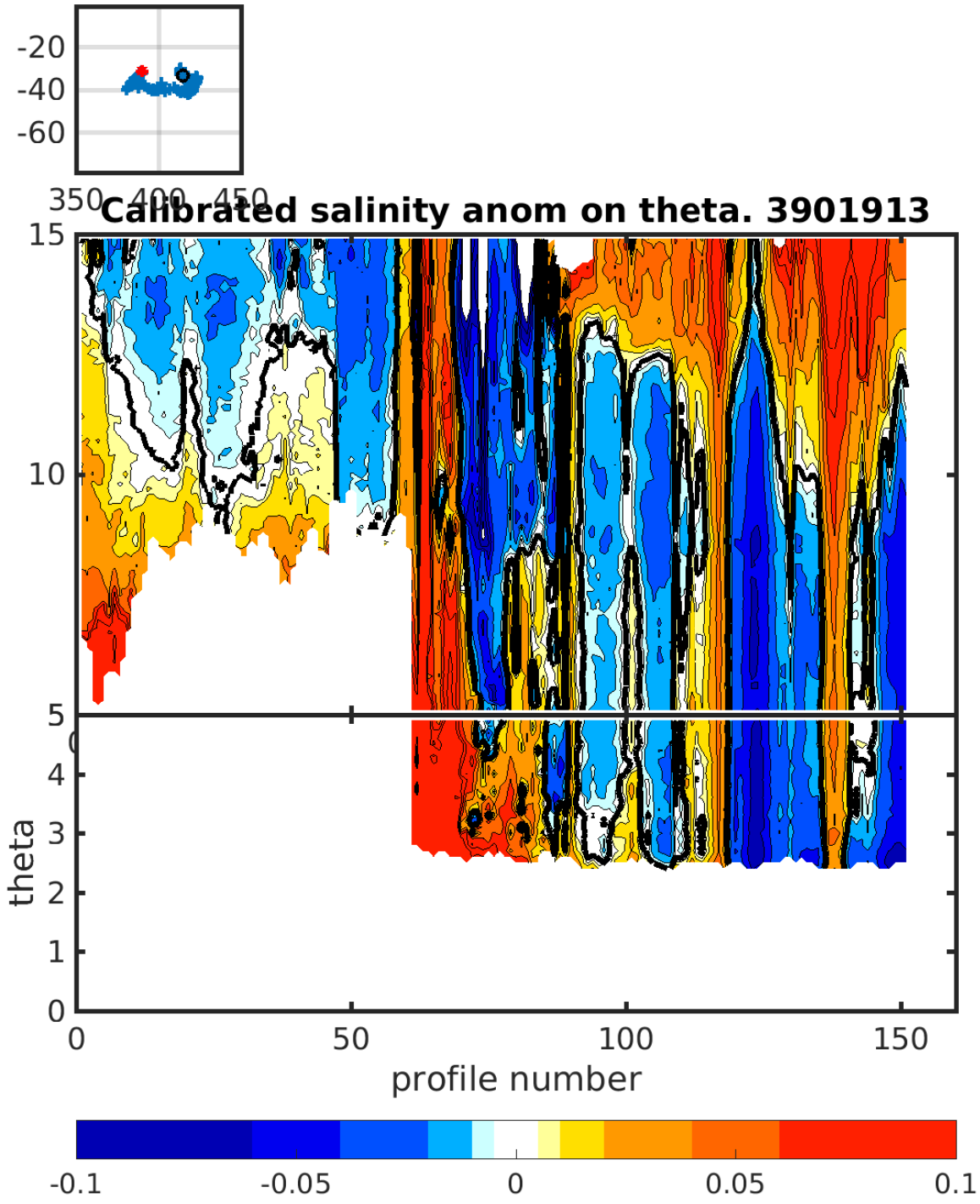

Figure 21: Float 3901913. Calibrated salinity anomaly on θ.

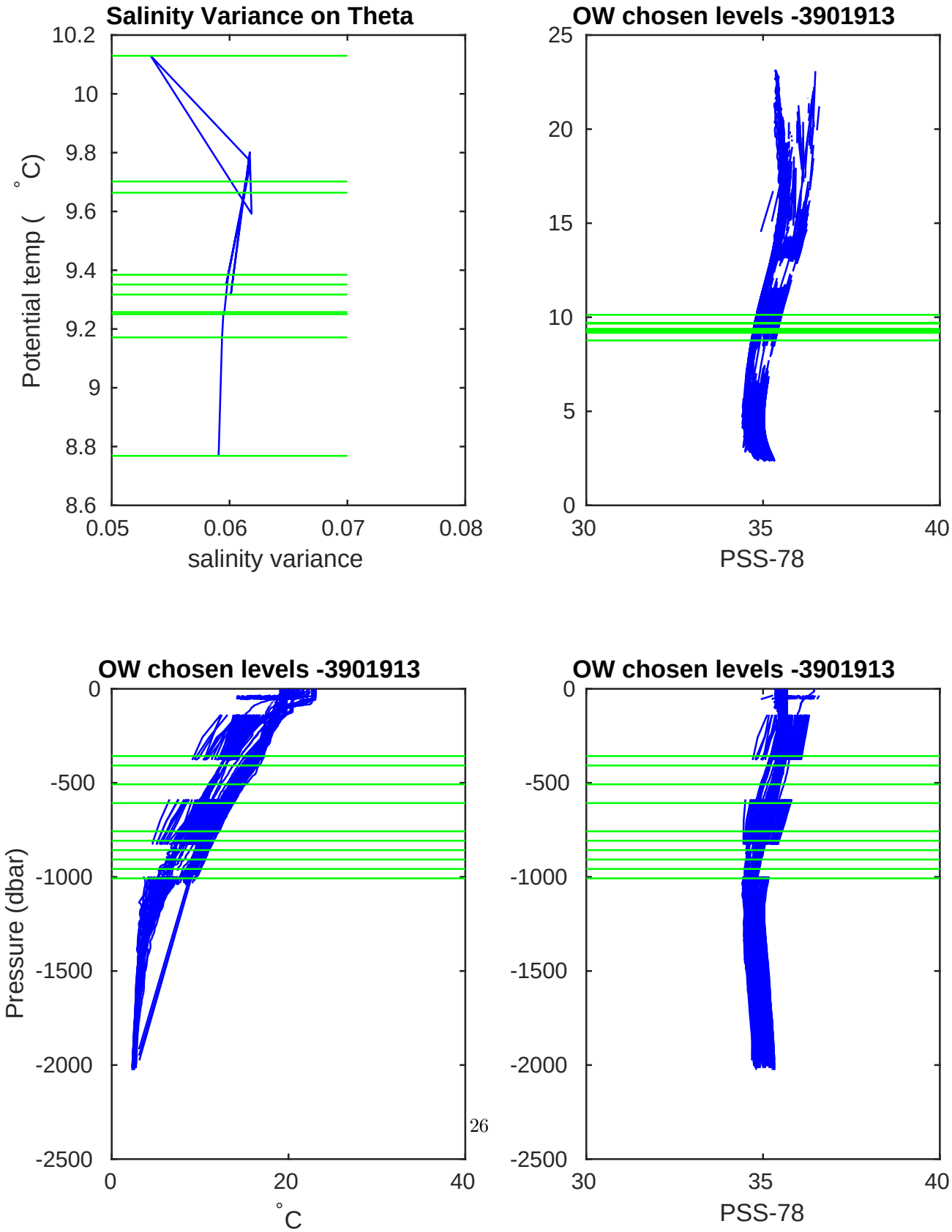

Figure 22: Float 3901913. Salinity, salinity variance on theta and OW chosen levels.

3.3 Summary and Conclusions

Float was deployed in the region of the Cape of Good Hope and was driven eastward by the retroflection of the Aghulhas Current. From the beginning of the float life we float showed evidences of salty drift. In the set calseries we set the theta levels to be between 8 and 11 degrees that represent the intermediate waters. The first 47 profiles was still able to correct using the corrections suggested by OWC. Further profiles from 48 to 168 are not adjustable and the QC =4.

4 Final Checks

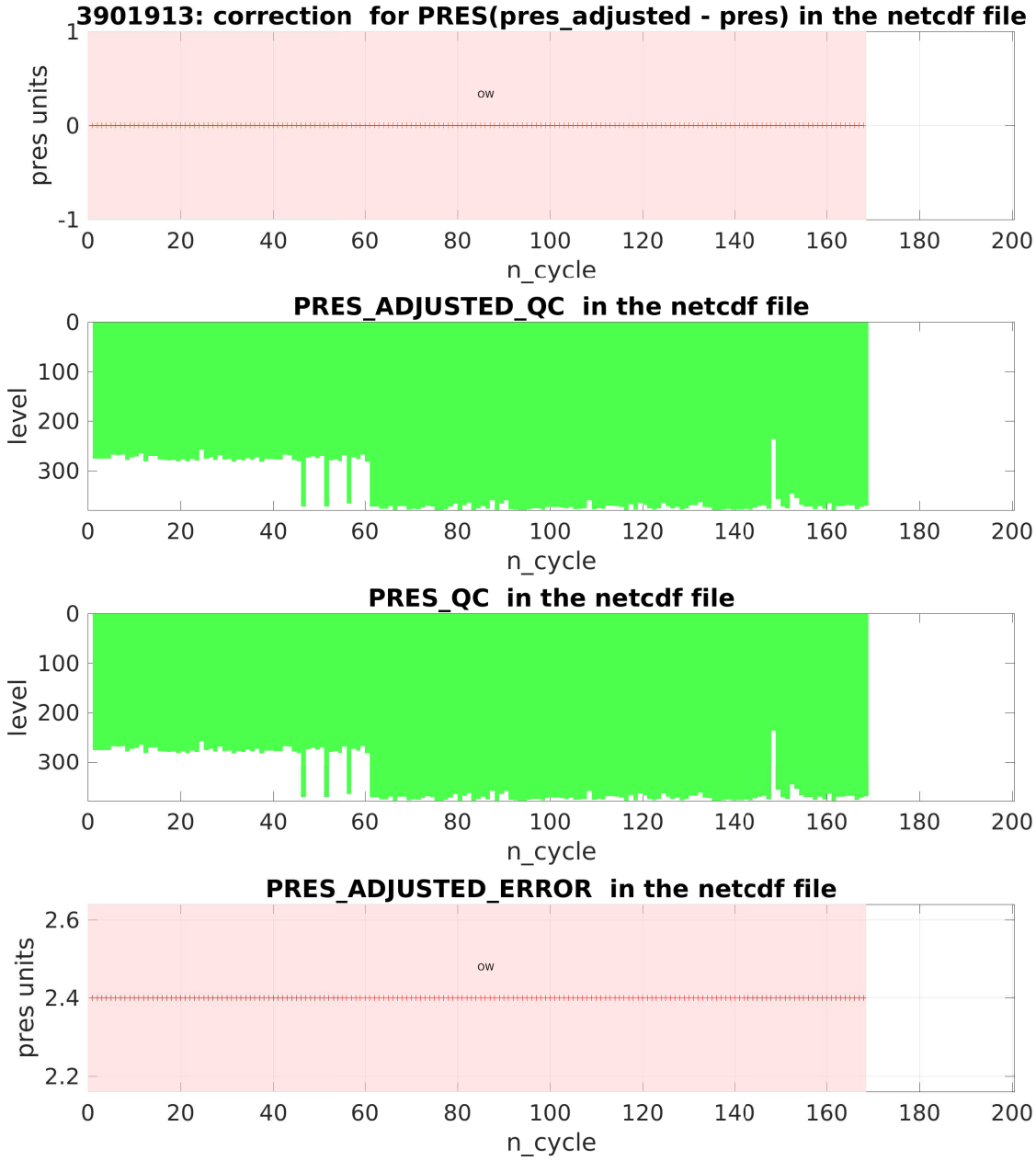

Figure 23: Float 3901913. Time series of applied pressure corrections.

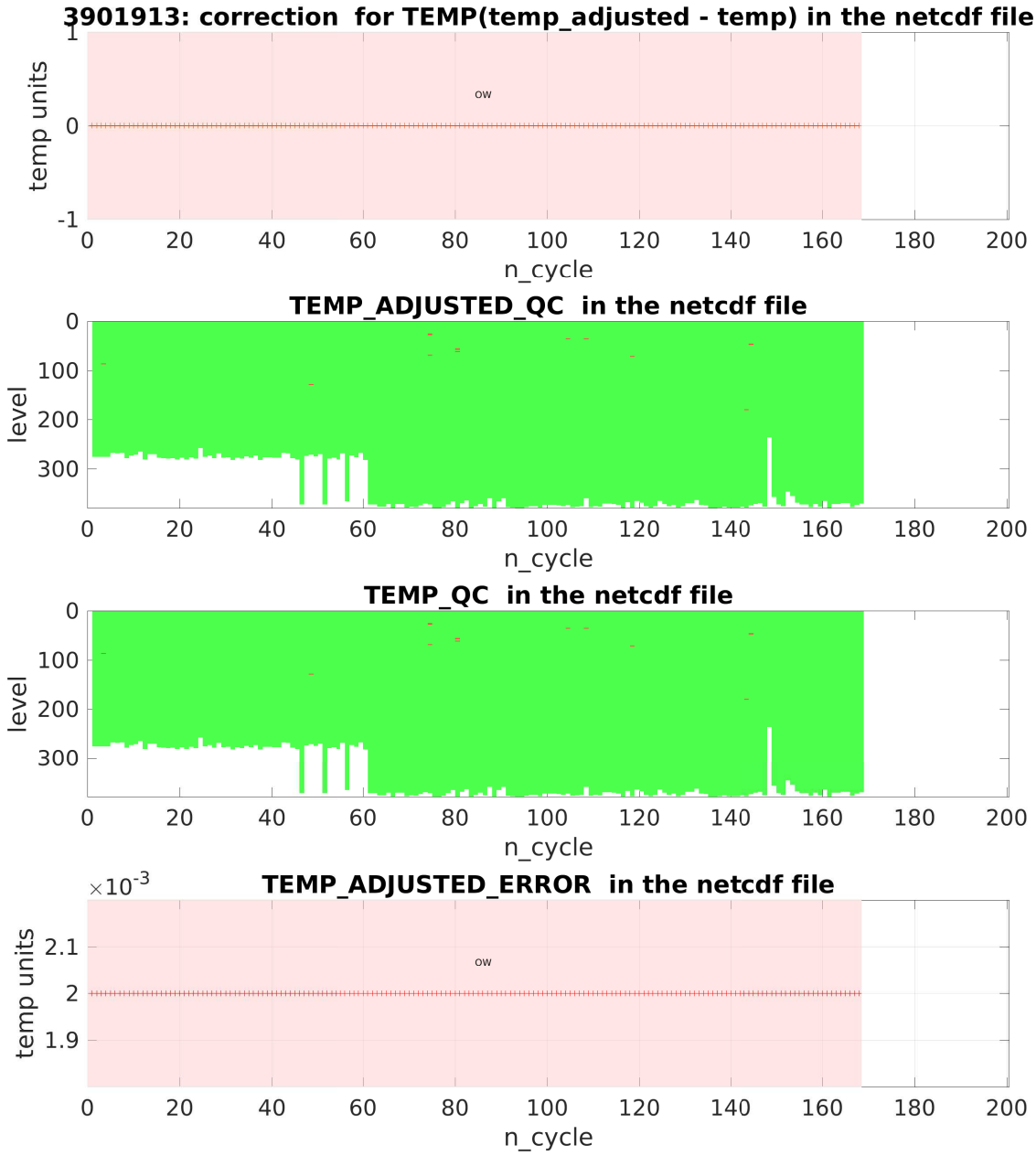

Figure 24: Float 3901913. Time series of applied temperature corrections.

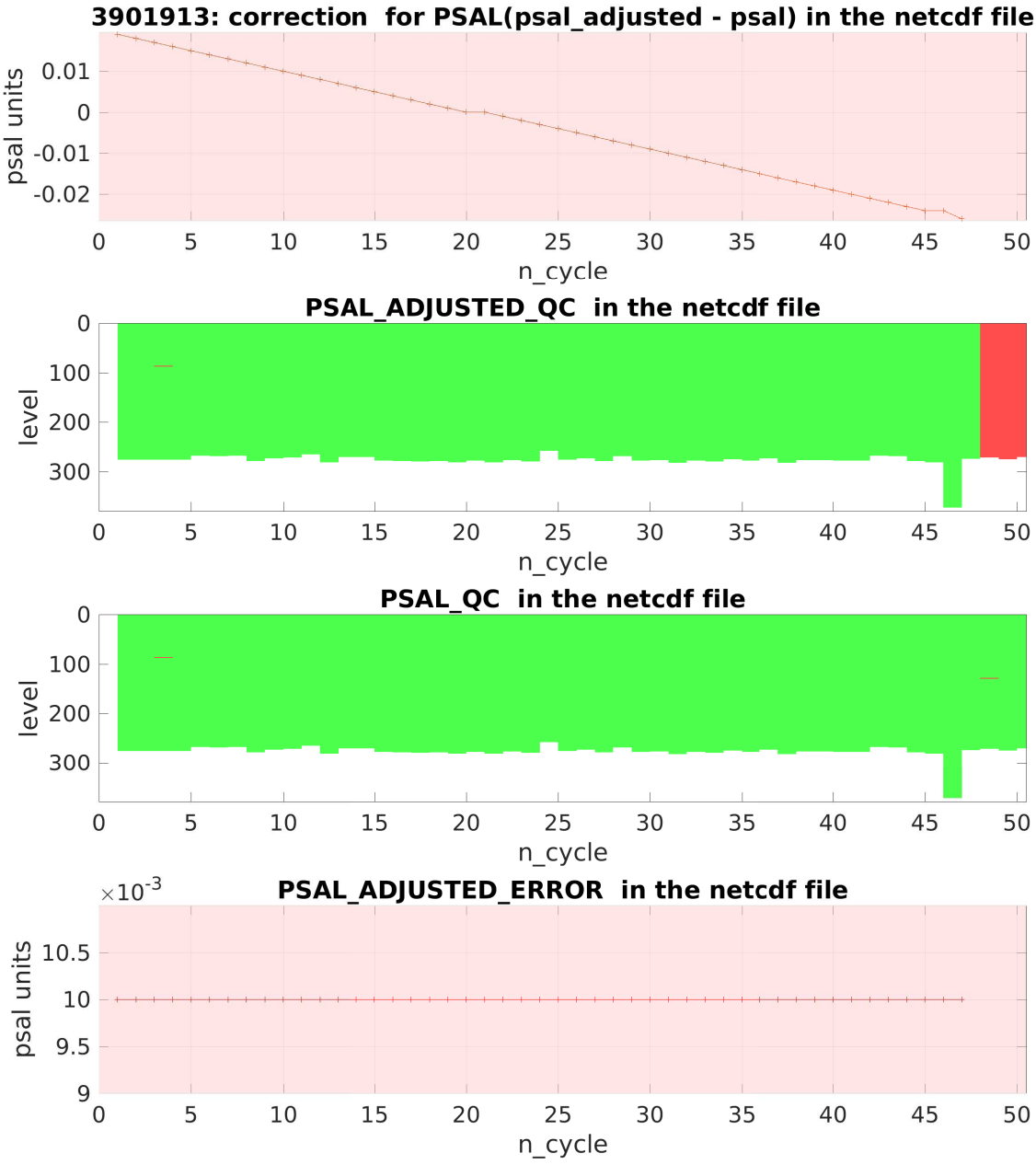

Figure 25: Float 3901913. Time series of applied salinity corrections.