Surface T/S Data RV Polarstern PS104 (ANT-XXXII/3)

Data Processing Report

Contents

1 Introduction **1**

2 Sensor Details **1**

3 Processing Report **1**

4 Appendix **5**

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1 Introduction

This report describes the processing of raw data acquired by the thermosalinographs on board RV Polarstern during expedition PS104 to receive cleaned up and corrected salinity data. Detailed description of the processing of the data and the workflow is given in the general report “General Processing Report of Surface T/S Data RV Polarstern Cruises PS102, PS103, PS104 and PS105”.

Cruise details

Vessel name: RV Polarstern
Cruise name: PS104 (ANT-XXXII/3)
Cruise start: 2017-02-05
Cruise end: 2017-03-18
Cruise duration: 41 days
Working area: Amundsen Sea

2 Sensor Details

Following sensor was installed in Polarsterns keel compartment during cruise PS104.

	TSG Keel
Serial number	SBE21-3191
Installation	2016-11-15
Deinstallation	2017-11-01
Days installed	351
External temperature sensor	SBE38-110

3 Processing Report

Database Extraction

Data source	DSHIP database (dship.awi.de)
Start of raw file	2017-02-02T14:15:51
End of raw file	2017-03-18T16:14:30
Number of lines in hexadecimal raw file	3808720
First dataset	2017-02-06T18:26:23
Last dataset	2017-03-16T12:05:30
TSG valid data	709004

Calculation of 10min means

The calculation of 10min means included the removal of outliers outside a 2-times standard deviation for each data interval. The number of outliers for each parameter are given here.

Number of outliers >2*std	
Internal temperature	24351
Conductivity	20349
External temperature	25422
Salinity	31103
Result after outlier removal	
Number 10-min-means	4731

Manual flagging

After processing the 10min means were visually inspected. The whole data from a specific timestamp were deleted if there was only one parameter to be manually flagged. **3** data points were manually removed from the TSG Keel dataset of PS104.

Assigning navigation data

Data from the corrected mastertrack of cruise PS104 were assigned to the 10min means of TSG Keel. A speed filter of 0.5 knots minimum speed is applied to avoid redundant data. See Figure 1 and Figure 2 for the processed and corrected data of TSG Keel.

Number of speed flags: 1646
Number of data in final output file: 3079

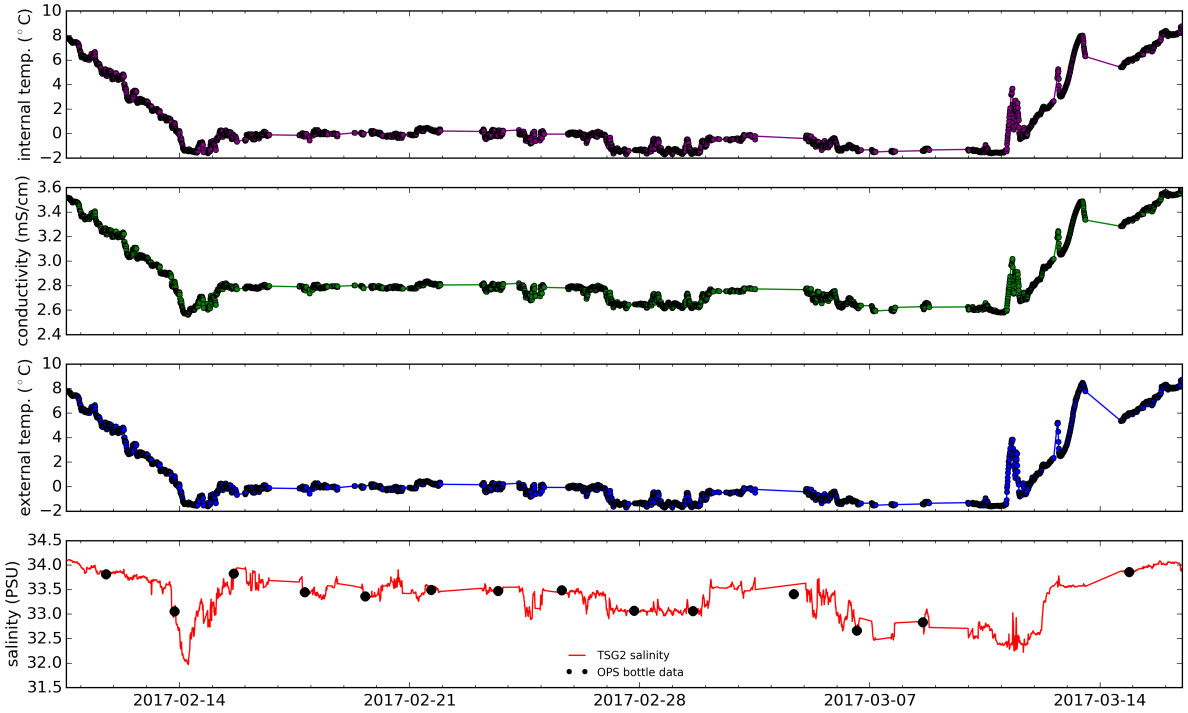

Figure 1: 10min means of data from TSG Keel

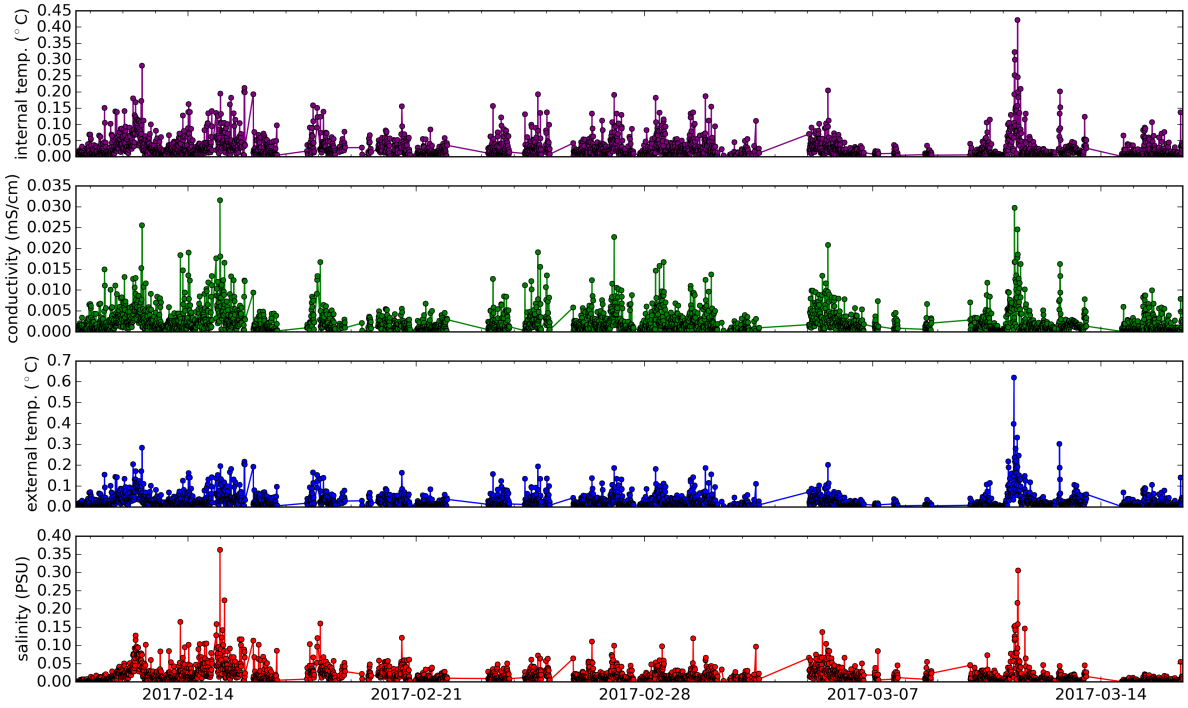

Figure 2: Standard deviations of 10min means of data from TSG Keel

Differences between internal and external temperature of TSG Keel temperature sensors

Temperature differences between the internal and the external temperature sensors have to be small under normal circulation conditions. Means and standard deviations for the temperature differences as well as the number of data with a difference larger than 1 °C are given in the following table and are shown in Figure 3.

	TSG Keel temperature difference	
	mean ± standard dev.	no. > 1°C
Spot values	0.0288 ± 0.1672°C	6237
10-min means	0.0290 ± 0.1666°C	43

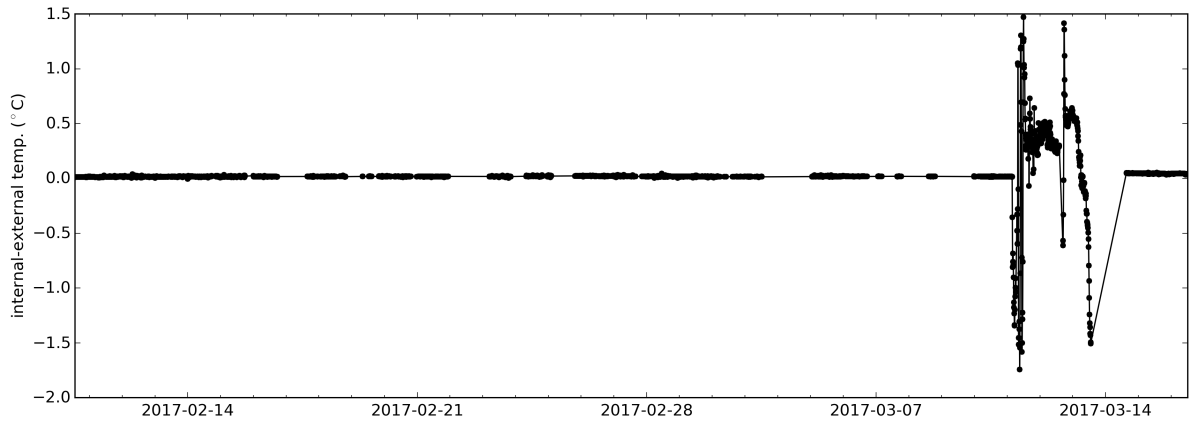

Figure 3: Differences between internal and external temperature sensors of 10min means from TSG Keel

Result file

The result file is a plain text (tab-delimited values) file named **PS104_surf_oce.tab** with one data row in 10-min interval. For further information on the result file see the General Processing Report.

4 Appendix

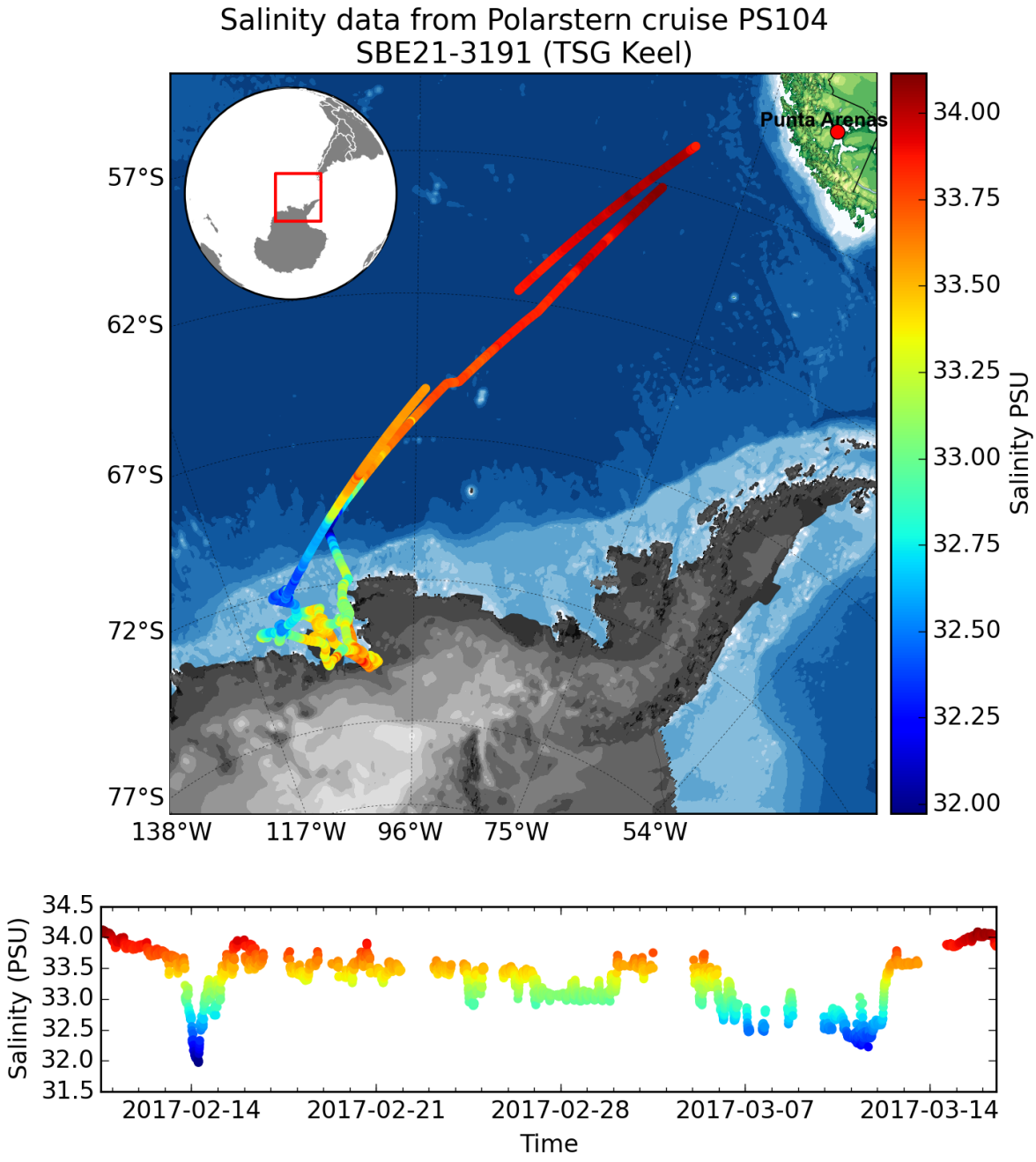

Figure 4: Salinity data from TSG Keel

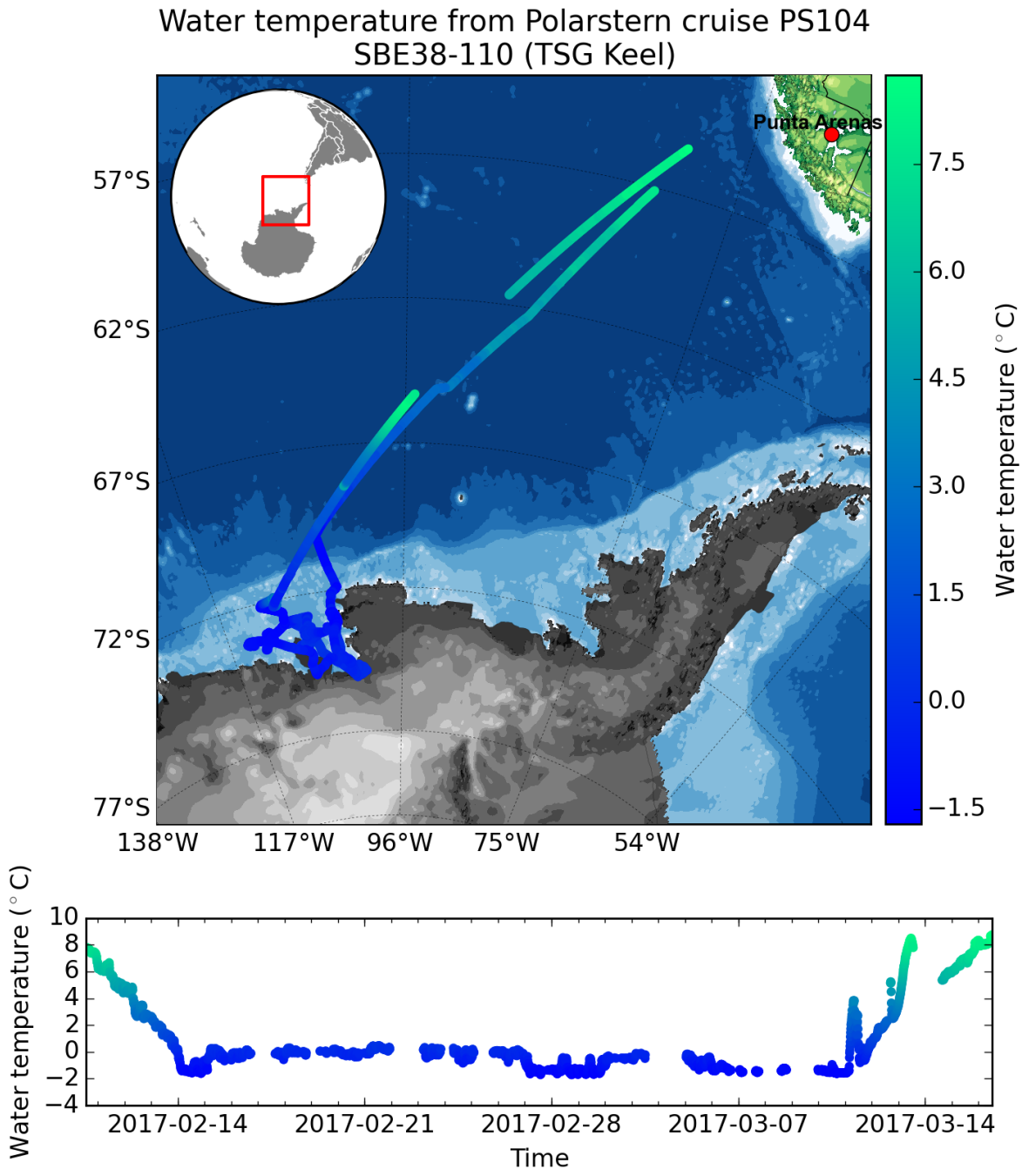

Figure 5: Temperature data from TSG Keel