



FIELAX Gesellschaft für wissenschaftliche Datenverarbeitung mbH
Schleusenstr. 14, D-27568 Bremerhaven, GERMANY
Phone: +49 (0) 471 30015 0, Fax: +49 (0) 471 30015 22
Mail: info@fielax.de

Salinity Data RV "Polarstern" ANT-XXIX/10 (PS83) Data Management Documentation

Contents

1	Cruise Summary	1
2	File Description	2
3	Statistical Analysis	3
4	Data Processing	4
4.1	Workflow	4
4.2	Offset Calculation	5

Contact:

FIELAX Gesellschaft für wissenschaftliche Datenverarbeitung mbH
Schleusenstr. 14, D-27568 Bremerhaven, GERMANY
Phone: +49 (0) 471 30015 0, Fax: +49 (0) 471 30015 22
Mail: info@fielax.de

Ref.: TSG-Report_PS83.pdf	Vers.: 1	Date: 2014/10/08	Status: final
---------------------------	----------	------------------	---------------



1 Cruise Summary

Cruise specifications

Cruisename: ANT-XXIX/10 (PS83)
Start of cruise: 08.03.2014 Cape Town
End of cruise: 13.04.2014 Bremerhaven

TSG Sensor specifications

Time period of TS data: 37 days
First dataset: 07.03.2014, 00:00 UTC
Last dataset: 13.04.2014, 00:00 UTC
TS Bow Sensor SBE 21 Serial Number: 3189
TS Keel Sensor SBE 21 Serial Number: 3354

System diary

no special occurrences

Comments

TS Bow

10.03.2014, 06:57 UTC, Water sample deleted by spike filter
02.04.2014, 07:24 UTC, Water sample deleted by spike filter

TS Keel

None



2 File Description

Salinometer

***.txt** Salinometer measurement of water samples, divided into processing sections (ASCII format)

***.cor** Correction of salinometer measurement of water samples, divided into processing sections (ASCII format)

Thermosal

MIW-Daten_DWD/PS83.miw.dat TSG data of entire cruise, 10 minutes interval (ASCII format, DSHIP extraction)

Calib/PS83_[sensor]_DsNr[series]-[nr].dat Filtered TSG data for calibration with water sample, 5 sec interval, 2 min period; data set number (DsNr) consists of series and number in salinometer data set (ASCII format)

Calib/PS83_[sensor]_DsNr[series]-[nr].png Diagram of filtering and averaging of TSG data for calibration with water sample; data set number (DsNr) consists of series and number in salinometer data set (Matlab graph, PNG format)

PS83_ConReportTSB[sensor].txt Configuration report for SBE 21 TSG Bow (ASCII format)

PS83_ConReportTSK[sensor].txt Configuration report for SBE 21 TSG Keel (ASCII format)

Processing

Salzkorrektur_PS83_[sensor].txt Composition of salinometer measurements (ASCII format)

Filtering_PS83_[sensor].txt Offset calculation and filtering (ASCII format)

PS83.cal Offset information for correction of TSG data, product of salinometer calibration (ASCII format, MATLAB code)

PS83_miw.mat TS data (10 minutes interval), offset corrected (MAT format)

PS83_miw_despiked.mat TSG data (10 min interval), final product (offset corrected and despiked, MAT format)

Documentation

TSG-Report_PS83.pdf Report about data processing (PDF format)

Statistik.txt Statistic analysis of the processed and despiked TS data (ASCII format)



3 Statistical Analysis

Summary Cruisename: PS83

Filename: PS83_miw

Number of Values: 5329

Speed Minimum for Data Filter: 0.5 kn

NaN Values TS Bow Temperature: 545 (10.2%)

Salinity: 545 (10.2%)

Conductivity: 545 (10.2%)

NaN Values TS Keel Temperature: 545 (10.2%)

Salinity: 545 (10.2%)

Conductivity: 545 (10.2%)

Offset Correction TS Bow Temperature: not corrected Value: 0°C

Salinity: corrected Value: 0.0222 psu

TS Keel Temperature: not corrected Value: 0°C

Salinity: corrected Value: 0.0403 psu

Flags TS Bow Temperature Conductivity

Bit 1: # 468 Bit 1: # 468

Bit 2: # 1 Bit 2: # 1

Bit 3: # 388 Bit 3: # 388

Bit 4: # 1 Bit 4: # 1

Bit 5: # 1 Bit 5: # 1

Bit 6: # 1 Bit 6: # 1

Bit 7: # 4170 Bit 7: # 4170

Flags TS Keel Temperature Conductivity

Bit 1: # 468 Bit 1: # 468

Bit 2: # 1 Bit 2: # 1

Bit 3: # 388 Bit 3: # 388

Bit 4: # 1 Bit 4: # 1

Bit 5: # 1 Bit 5: # 1

Bit 6: # 1 Bit 6: # 1

Bit 7: # 4170 Bit 7: # 4170

Legend Offset Correction Temperature: Sensor Calibration

Offset Correction Salinity: Autosal Calibration

Flags

BIT 1: NULL weil keine Messung

BIT 2: Wert auf NULL gesetzt weil Korrektur nicht moeglich

BIT 3: Wert auf NULL gesetzt weil speed < 0.5 kn

BIT 4: Wert auf NULL gesetzt weil Guete-Kriterium nicht erfuehlt

BIT 5: Wert interpoliert weil Guete-Kriterium nicht erfuehlt oder BIT 1

BIT 6: Wert suspekt weil T<T_Gefrierpunkt

BIT 7: Wert suspekt weil Dichte(TSK) < Dichte(TSB)



4 Data Processing

4.1 Workflow

The different steps of gathering and processing the data is visualized in fig. 1. While the TSG SBE21 sensors, which are situated in the vessel's keel and bow, measure the sea water temperature and conductivity (b), samples of the sea water in time intervals of one or two days are taken (a). The conductivity of these water samples is measured with the Optimare Precision Salinometer (c). By comparing the salinometer with the TSG SBE21 measurement, which is extracted from the DAVIS SHIP data base (d), the drifts of the TSG SBE21 sensors are calculated (e). To correct the sensor drifts of TSG SBE21 data, a constant offset is added to the data in the next processing step (f). Visual control and, if necessary, manual correction of the TSG SBE21 data (g) finalizes the processing.

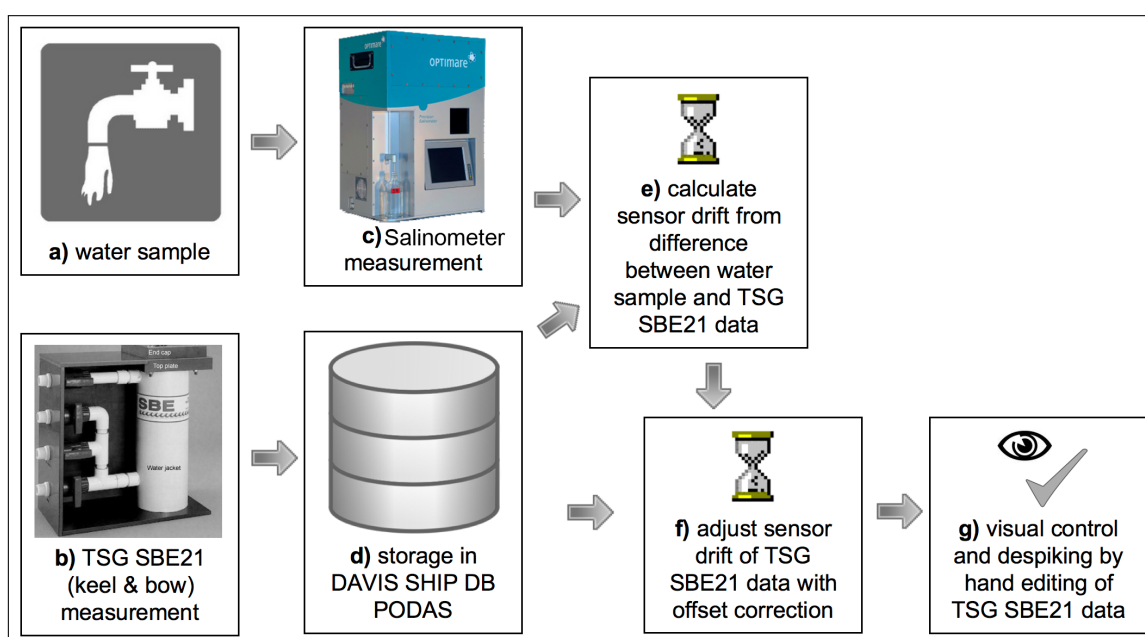


Figure 1: Workflow of TSG data processing



4.2 Offset Calculation

TS Bow SBE21-3189

Number of water samples:	15
1 st Filtering - number of samples dropped out:	2
2 nd Filtering - number of samples dropped out:	0
Final offset:	0.0222 psu
Final standard deviation:	± 0.00551 psu

Full calculation is given in file 'Filtering_PS83_SBE21-3189-bow.txt' and shown in fig. 2.

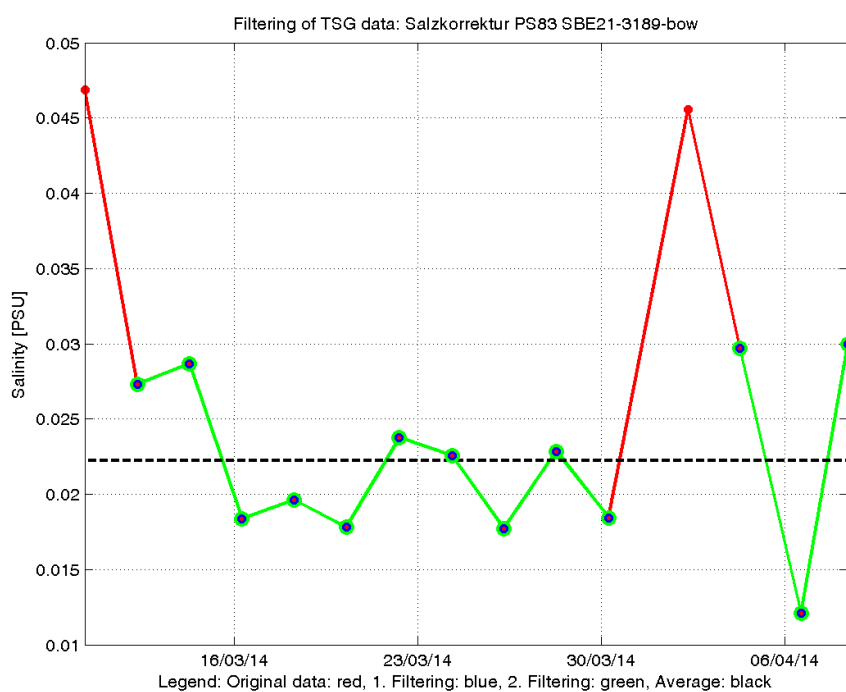


Figure 2: Filtering and Averaging of TSG Offset Bow Sensor



TS Keel SBE21-3354

Number of water samples: 15
1st Filtering - number of samples dropped out: 0
2nd Filtering - number of samples dropped out: 0
Final offset: 0.0403 psu
Final standard deviation: ± 0.00704 psu

Full calculation is given in file 'Filtering_PS83_SBE21-3354-keel.txt' and shown in fig. 3.

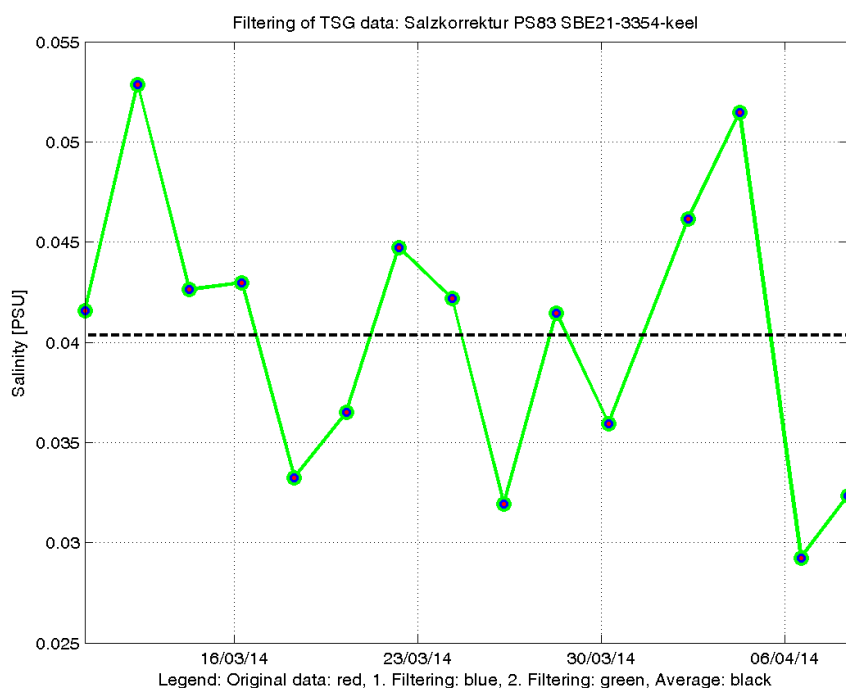


Figure 3: Filtering and Averaging of TSG Offset Keel Sensor