

Mooring SA – Data processing

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1. Start of records

While the mooring was deployed 2/1 2013 most instruments were set to start record 4/1 2013 at 11h UTC.

2. Depth at the mooring site

The CTD/LADCP-profile occupied in the vicinity of the mooring location at recovery indicated a depth of 715m

The SBE39 placed 100 mab showed a mean/median pressure of 585 dbar = 578 m, suggesting a total depth of 678 m.

The pressure sensor on the Seaguard placed 300 mab gave mean/median value of 385 dbar = 380 m , also suggesting a total depth of 680 m.

There is a 35 m mis-match between the depth indicated by the CTD/LADCP profile and that obtained when combining mooring design and pressure records.

The most reasonable explanation is that the line below the SBE 39 is longer than 100 m, i.e. that it and instruments above it are higher above the bottom than what is indicated in the mooring drawings.

The data set give a bottom depth of 700 ± 20 m. The uncertainty in the depth of the instruments (with the exception of the lowermost RCM and SBE37) is smaller, since they are constrained by the pressure records at 380 m and 578 m depth.

The height above bottom for instruments above the SBE37 sn 4445 have been increased by 20 m compared to the drawings in the cruise report.

3. Movement of the instruments along the line

When the mooring was recovered, the upper SBE37 sn 9945, SBE56 sn 1946 and the Aqualogger sn 380 were all found at the top of the mooring, and it was evident that the clamped on instruments had been moved along the mooring line. The temperature records from SBE37 sn 9945 (200 mab) suggest that this happened in May, 2014 (See cruise report).

After 17/5 2014, temperature records from SBE37 sn 9945 are used for 320 mab and the height about bottom for SBE37 sn 9945, SBE56 sn 1946 and the Aqualogger sn 380 are set to 320 mab.

The SBE37 was surrounded by ice in the period 8 – 17/5; data from this period have been disregarded.

On mooring recovery, the SBE37 s/n 4445 was found just above the spheres at the bottom of the mooring i.e. at about 30 m depth. There were no pressure sensor on the instrument and it cannot be determined when it slid down.

4. Salinity

The salinity measurements requires further data processing and calibration and will be published separately at a later stage.

5. Temperature

From 17 May 2014 the records from the upper four instruments (SBE37 sn 9945, SBE56 sn 1946, AL sn 380 and Seaguard sn 1050) ought to agree closely since they were measuring at almost the same depth (less than 5 m interval). The temperature difference compared to SBE37 sn 9945 and the applied correction is given below. The observations from the different instruments were linearly interpolated in time to a common time: 17/5 2014 - 1/3 2015*. After this date, the mean temperatures were lower and the signal more noisy. When also the last part of the record is included, the results differ by $O(10^{-4})$ compared to when the last part of the record is omitted.

	Mean temperature difference	Median temperature difference	Applied correction
SBE56 1946	-0.0021C	-0.0021C	0C
AL 380	0.0087C	0.0087C	0.0087C
Seaguard 1050	-0.0021C	-0.0018C	0C

SBE39 sn 3282 and RCM7 sn 9758 was next to each other on the mooring line. While the temperature sensor on SBE39 is considered more confident and has a higher resolution, the RCM 7 run for a longer time. The temperature record from the RCM7 is corrected by the offset found when compared with the SBE39 for the period when the SBE39 was functioning.

	Mean temperature difference	Median temperature difference	Applied correction
RCM 9758	0.0155C	0.0153C	0.0153

6. RCM 9758

Instrument was started 30/12 2012 @22:00 UTC. First data was logged 30/12 21:58. Time stamp is corrected by two minutes.

The data records contains numerous (15%) rows where velocity and speed channels show "000". These have been replaced by "nan".

7. RCM 12446

Instrument was started 30/12 2012 @22:00 UTC. First data was logged 30/12 21:59. The time stamp is corrected by one minute.

8. Seaguard 1050

The data records were cut 15/3 2016 since the last days of the records contain no tidal signal and were considered unreliable.

9. Magnetic declination

The magnetic declination for the period of deployment was obtained from:

www.ngdc.noaa.gov/geomag-web/#declination

Model Used:	IGRF12
Latitude:	77.9177° S
Longitude:	42.1576° W
Date	Declination
2013-01-04	9.44° E changing by 0.07° W per year

Model Used:	IGRF12
Latitude:	77.9177° S
Longitude:	42.1576° W
Date	Declination
2017-02-27	9.11° E changing by 0.09° W per year

All velocities are corrected for a deployment mean magnetic declination of 9.27E.