

Description of the CTD data set from the Arctic Ocean 2001 (AO-01) expedition with the Swedish icebreaker Oden, 2001-06-26 to 2001-09-21.

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The CTD used during AO-01 was a new Seabird 911 plus CTD with a 24-bottle rosette. Pre- and post calibrations of the sensors were done by the manufacturer Seabird (in Seattle USA). Salinity samples were analyzed on a Guildline 8400B Autosol salinometer onboard the ship. Post processing was done using Seabirds data processing program and according to their standard recommendations for pumped sensors.

Data files

Files of the type AO_2001_010_ct1.csv contain the CTD-data averaged in 1 dbar bins in WOCE exchange format. The last three digits in the file name represent the station number.

Calibration procedure

The room on icebreaker Oden where the Autosol salinometer was located was not ideal due to fluctuating temperature and this resulted in somewhat noisy readings for the bottle salinities. It was therefore decided to use the post-cruise calibration from the manufacturer (Seabird) for the final correction of the data. Four deep-water samples that were sent to General Oceanics (in England) for analyse has been used as an independent check of the data. The pre- cruise calibration was performed Jan 27, 2001 and the post-cruise calibration Sep 25, 2001. The post-cruise calibration occurred about 2 month after the last station compared to about 7 month between the pre-calibration and the first station. The post-cruise calibration was used for all data during the expedition. A comparison of the post-cruise calibrated CTD data with the deep-water samples analysed by General Oceanics is shown in figure 1. There is a very good correspondence between the post-cruise calibrated CTD salinities and the samples analysed by General Oceanics. The CTD data should therefore be correct within +/- 0.002 psu.

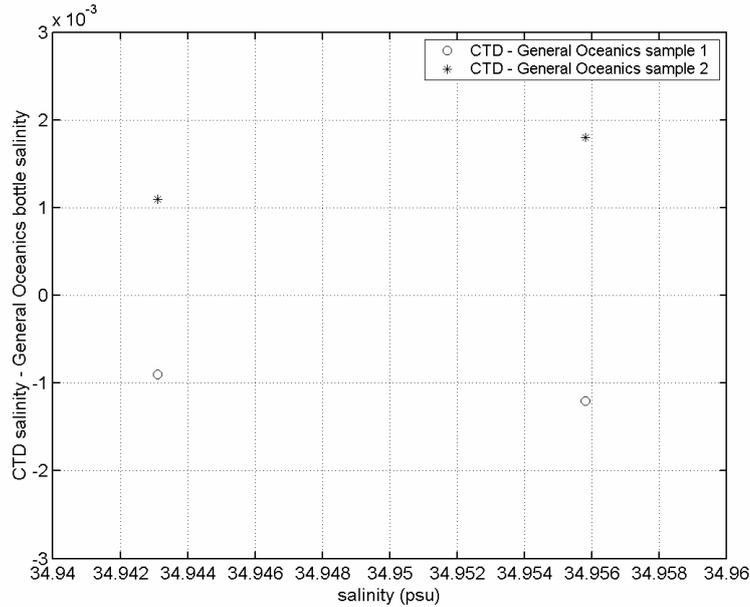


Figure 1. Difference between CTD salinity and bottle salinities from samples analysed by General Oceanics. The salinity samples were a duplicate (sample 1 and sample 2) from about 3900 m depth in the Amundsen basin (left two markers, id. No 234423, stn 36) and a duplicate from about 3500 m depth in the Makarov basin (right two markers id. No 34227, stn 43)

A comparison of the post-cruise calibrated CTD data with onboard Autosal bottle data for pressures larger than 900 dbar is shown in figure 2. This figure is shown in order to show the scatter and offset of the onboard Autosal salinities. The salinities analysed onboard the ship has a general offset and is about 0.009 psu to low compared to the CTD salinity. The exact reason for this offset is unknown but it is likely due to the difficulties to get stable readings from the Autosal. The bottle salinities from the expedition should therefore be used with caution for applications where accuracy better than 0.01 psu is needed.

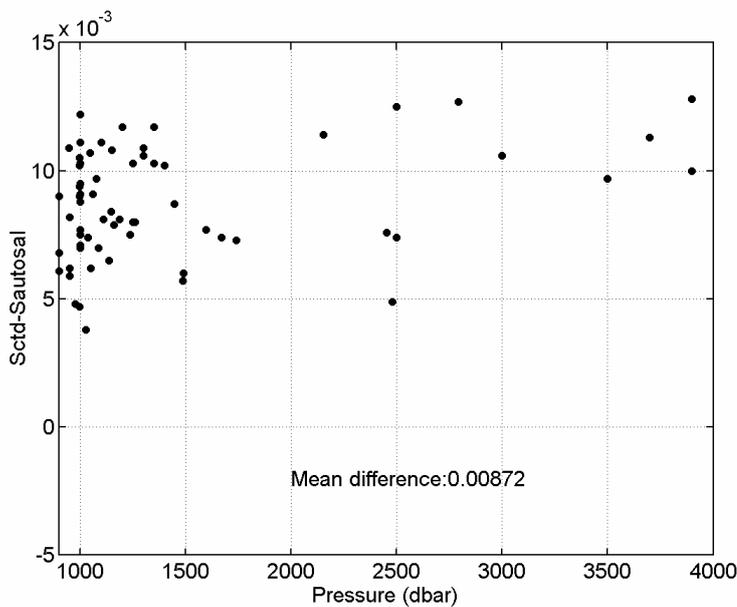


Figure 2. Difference between CTD salinity and Autosol bottle salinity analysed onboard the ship for samples deeper than 900 dbar. The CTD data are based on the post– cruise calibration.

Extrapolation

The upper few meters are usually missing in the CTD data. The values of the uppermost bin with data has been extrapolated to 0 dbar according to the following table:

Station number	First useful scan	Number of extrapolated surface bins	Station number	First useful scan	Number of extrapolated surface bins	Station number	First useful scan	Number of extrapolated surface bins
002	7177	1	023	2598	2	xxx	xxx	x
003	1121	1	024	2679	2	045	8485	2
004	1768	1	025	3985	2	046	1983	1
005	940	2	026	7935	2	047	4920	2
006	5150	1	027	5444	2	048	5646	2
007	3392	1	028	7516	2	049	3337	2
008	4530	2	029	2990	2	050	6489	2
009	4245	1	030	2128	2	051	2380	2
010	4245	2	031	7911	2	052	2304	2
011	4069	2	032	4162	3	053	9182	2
012	2669	2	033	6090	2	054	5110	2
013	3743	4	034	6647	2	055	10998	1
xxx	xxxx	x	035	6925	2	056	5367	2
xxx	xxxx	x	036	3912	2	057	3910	2
016	3894	1	037	9967	2	058	2775	2
017	4148	2	038	8097	2	059	2726	2
018	3471	2	039	2990	1	060	6865	2
019	935	1	040	10490	2	061	3637	1
020	4430	2	041	8178	2	062	7413	2
021	5907	1	xxx	xxx	x	063	5275	2
022	4555	2	043	7900	2			