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BERICHTE  
aus dem  
**INSTITUT FÜR MEERESKUNDE**  
an der  
**CHRISTIAN-ALBRECHTS-UNIVERSITÄT · KIEL**

Nr. 119

1 9 8 3

N O R D O S T A T L A N T I K ' 8 2

- Data Report -

by

Eberhard Fahrbach, Wolfgang Krauss, Jens Meincke and Alexander Sy

DOI 10.3289/IFM\_BER\_119

Copies of the report are available from  
Institut für Meereskunde an der Universität Kiel  
Abt. Theoretische Ozeanographie  
Düsternbrooker Weg 20  
D-2300 Kiel 1, FRG

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ISSN 0341-8561

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## Summary

The active field phase of the "Warmwassersphäre des Atlantiks" research project at the University of Kiel, which began in 1981 was continued during 1982. During four cruises with the research vessels "Anton Dohrn", "Poseidon" and "Walther Herwig" the CTD- and XBT-work on sections along the Mid-Atlantic Ridge north of the Azores and long-term current meter moorings could be carried on. A "hydrographic box" with CTD- and XBT-profiles was investigated between the Azores and 45° N. Satellite-tracked drifting buoys were launched and recovered. All the obtained data are presented in this report.

## Zusammenfassung

Die aktive Feldphase für den Sonderforschungsbereich "Warmwassersphäre des Atlantiks" der Universität Kiel, die im Sommer 1981 begann, wurde 1982 fortgesetzt. Während der vier Reisen mit FFS "Anton Dohrn" (AD117), FFS "Walther Herwig" (WH52) und FS "Poseidon" (P87/3 und P93/1,2) konnten weitere Aufnahmen der Hydrographie durch CTD- und XBT-Messungen auf Schnitten entlang des Mittelatlantischen Rückens nördlich der Azoren und in einer "Box" zwischen den Azoren und 45° N durchgeführt werden. Langzeitströmungsmessungen wurden fortgesetzt. Wie im Jahre davor kamen satellitengeortete Drifter zum Einsatz. Alle während des Jahres 1982 gewonnenen Daten werden in diesem Datenband präsentiert.

## 1. Introduction

In summer 1981 the active field phase of the research project "Warmwassersphäre des Atlantiks" began. This is a combined effort of physical oceanography groups at the University of Kiel to investigate the processes of heat transfer in the upper oceanic layers with temperatures exceeding 8 - 10 °C covering the depth range of 800 m and extending between the equator and the subarctic fronts of the ocean. The North Atlantic warmwatersphere is especially important for the European climate since the North Atlantic current system displaces it anomalously far poleward.

The field-work in 1981 had yielded an abundant data set of CTD- and XBT-profiles on sections along the Mid-Atlantic Ridge from the Azores to the subpolar front and within a "hydrographic box" located between 42° N and 46° N. It became evident, that the large-scale circulation patterns, i.e. the anticipated branches of the North Atlantic current system, are difficult to detect because of energetic perturbations superimposed on the mean field. Nevertheless evidence of the existence of those branches could be found in the data and it seemed as if the branches were influenced by topographic features like the fracture zones across the Mid-Atlantic Ridge. The perturbations could be identified by a combined study of CTD, XBT and satellite-tracked drifter data as eddies (KRAUSS & MEINCKE, 1982). There were indications of a nonisotropic distribution of eddies. The largest vertical deviations of the isotherms or isohalines from a larger scale mean appeared between 43° N and 50° N. The intensity decreased to the south and the north.

It was one of the aims of the field-work in 1982 to obtain further realisations of the sections from 1981 to allow the detection of large-scale patterns by averaging. Another "hydrographic box" should be investigated between the Azores and 45° N to allow for conclusions on the isotropic distribution of eddy intensity by intercomparison with the box of 1981. Furthermore the existence of a southern branch of the North Atlantic Current System, the Azores Current was to be studied. To support the hydrographic measurements by direct current data satellite-tracked drifting buoys were launched and the long-term mooring work was continued.

Ship	Cruise No.	Observation Period	Area	Activity
RV "Poseidon"	87/3	16-21 Apr.82	Mid-Atlantic Ridge	XBT, CTD
FRV "Anton Dohrn"	117	19-24 May 82	Mid-Atlantic Ridge Western European Basin	XBT, CTD Recovering and laying of mooring 265 and 280
FRV "Walther Herwig"	52	04-18 June 82	Mid-Atlantic Ridge Western European Basin	XBT
RV "Poseidon"	93/1,2	13 Sept. - 30 Oct.82	Mid-Atlantic Ridge	XBT, CTD Launching and recovery of satellite-tracked drifting buoys. Recovering and laying of mooring 266.

**Table 1: Cruises carried out during 1982.**

## 2. CTD measurements

The CTD-system used in this project consisted of a "Multisonde" which is manufactured by "Meereselektronik", Trappenkamp, West Germany. It is a commercialized version of a system which was developed in the Institute of Applied Physics at the University of Kiel (KROEBEL et al, 1976). Because the obtained raw data showed a high noise level, intensive despiking with objective methods and by hand was necessary. The applied data processing is documented in flow diagrammes (Fig. 1a-c). Further details, especially the use of the median filter is reported in SY (1983). Technical data of the "Multisonde" according to manufacturer's declaration and the quality of the final CTD data is shown in Table 2. The accuracy of the 1982 final data shows better results than in 1981 due to some technical improvements of the hardware system.

To check the laboratory calibrations reference measurements were carried out for possible instrumental drift during the use at sea. Due to the lack of a rosette water sampler during the cruises P87/3 and AD117, the water samples were collected by single Nansen bottles, mounted in various depths at the single-conductor-armoured cable, or by separate hydrographic casts. During the cruise P93/1,2 a "General Oceanic" rosette water sampler was used. The samples have been analysed with a "Guildline Autosal Laboratory Salinometer" and the corrections were applied after the recalibration of the in situ conductivity, except for small offset corrections. The calculation of salinity was done using the practical salinity formula (UNESCO, 1981). The in situ pressure comparison was restricted to a zero pressure level check. Temperature comparisons gave no significant deviations from the laboratory calibrations.

The data are presented in vertical sections of temperature, salinity and density in chapter 6.1 together with the maps and listings of the station locations. During the cruises sea surface temperature was continuously recorded by an analogue temperature recorder and salinity samples were taken at every station. From this data horizontal maps were drawn (Fig. 12, 13).

It was planned to repeat the measurements in the "hydrographic box" to obtain some information as function of time changes. Because of the limited

ship time this was not possible for the complete "box". Within that part of the area where temperature observations could be repeated a remarkable time change occurred. This local rate of change in  $10^{-6}$  K/s is shown in Figure 14. The observed mean value of 0.74 K/10 d compares well with the seasonal variation of 0.68 K/10 d described by NEUMANN (1940).

	According to manufacturer's declaration	Final data of cruise			
		P87/3	AD117	P93/1,2	
<b>employed Multisonde</b>		IAP	MS1	MS35	MS35
<b>Pressure:</b>					
Principle	Strain-Gauge Pressure Cell				
Range	0 - 6000 dbar				
Resolution	16 bit $\approx$ 0.2 dbar	1.0	1.0	1.0	1.0 dbar
Accuracy	0.35 % of range	3.5	3.5	3.5	3.5 %
<b>Temperature:</b>					
Principle	Platinum Resistance				
Range	-2 °C - +35 °C				
Time lag	60 ms (without protecting sheath)				
Resolution	16 bit $\approx$ 1 mK				
Long Term Stability (Accuracy)	$\pm$ 5 mK/0.5 y $\pm$ 5 mK)	$\pm$ 5	$\pm$ 15	$\pm$ 5	$\pm$ 10 mK
<b>Conductivity:</b>					
Principle	Symmetric Electrode Cell				
Range	5 - 55 mS/cm				
Resolution	16 bit $\approx$ 1 $\mu$ S/cm				
Long Term Stability (Accuracy)	$\pm$ 10 $\mu$ S/cm/0.5 y $\pm$ 5 $\mu$ S/cm)				
<b>Salinity:</b>					
Accuracy		$\pm$ 0.01	$\pm$ 0.05	$\pm$ 0.01	$\pm$ 0.01 $\cdot 10^{-3}$

Table 2: Technical data of the "Multisonde" and quality of the final CTD data

CTD Processing Cruise P87/3

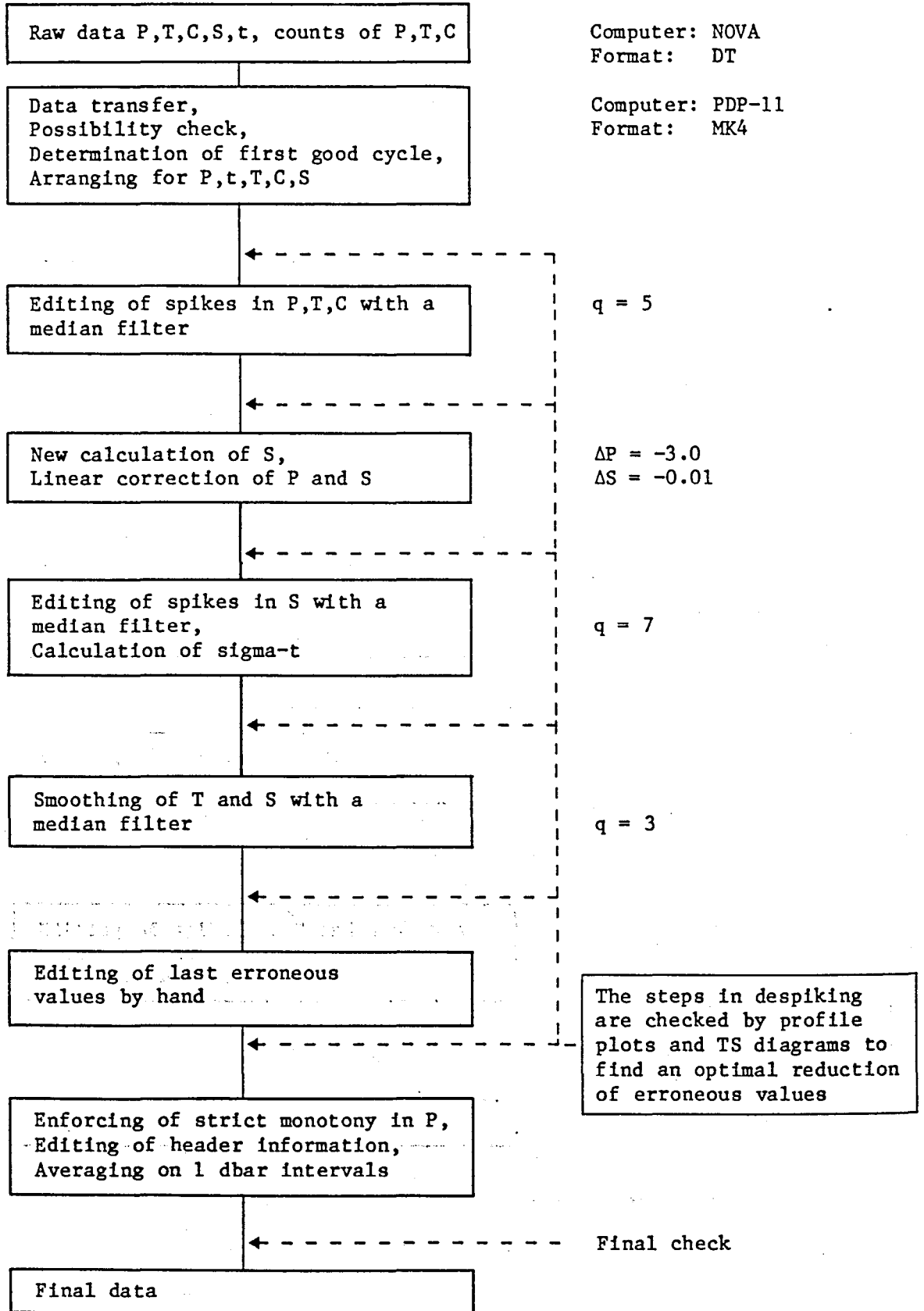


Fig. 1a - c: Flow diagramme of the processing of the "Multisonde" data



CTD Processing Cruise AD117

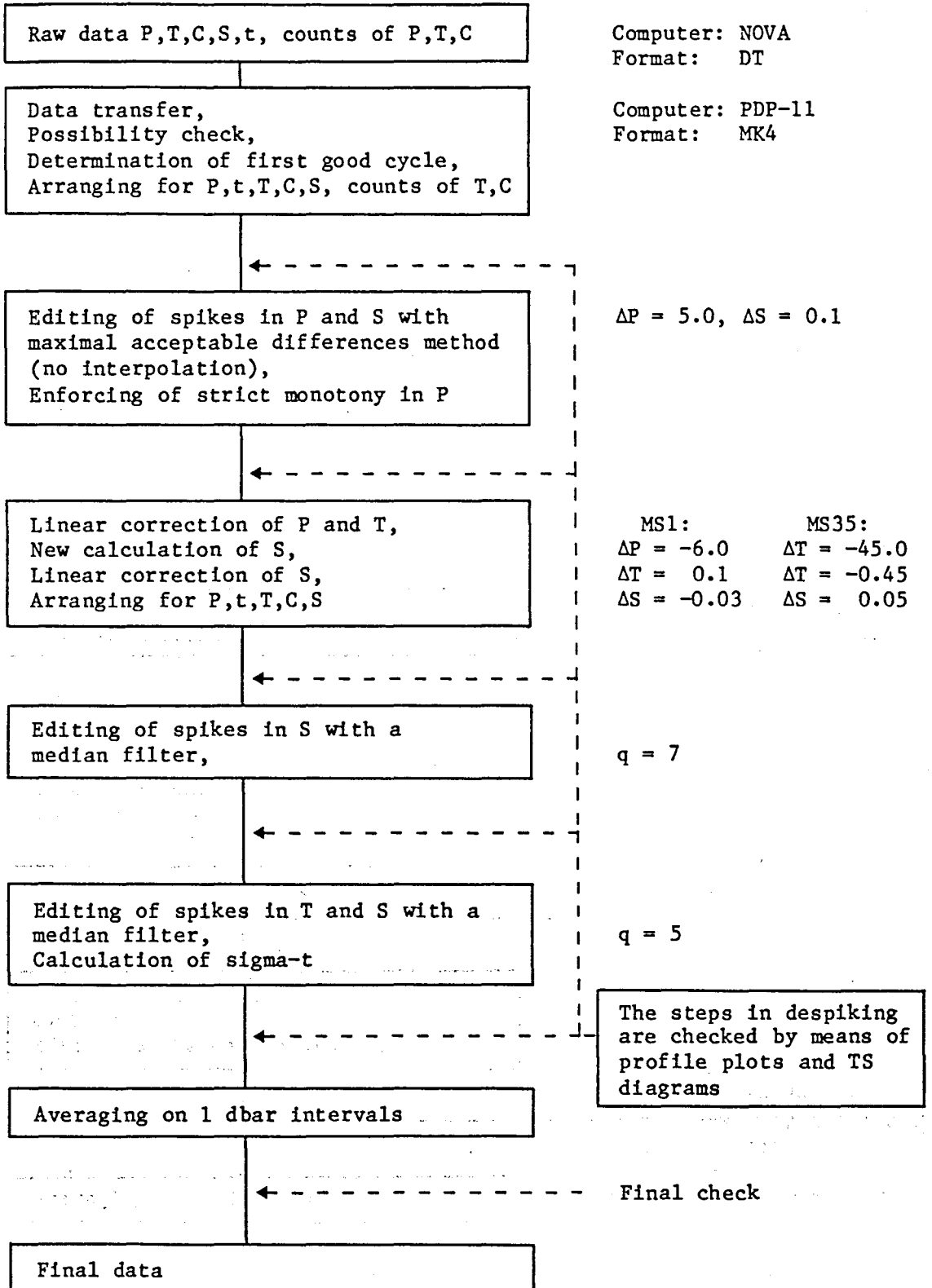


Fig. 1b

CTD Processing Cruise P93

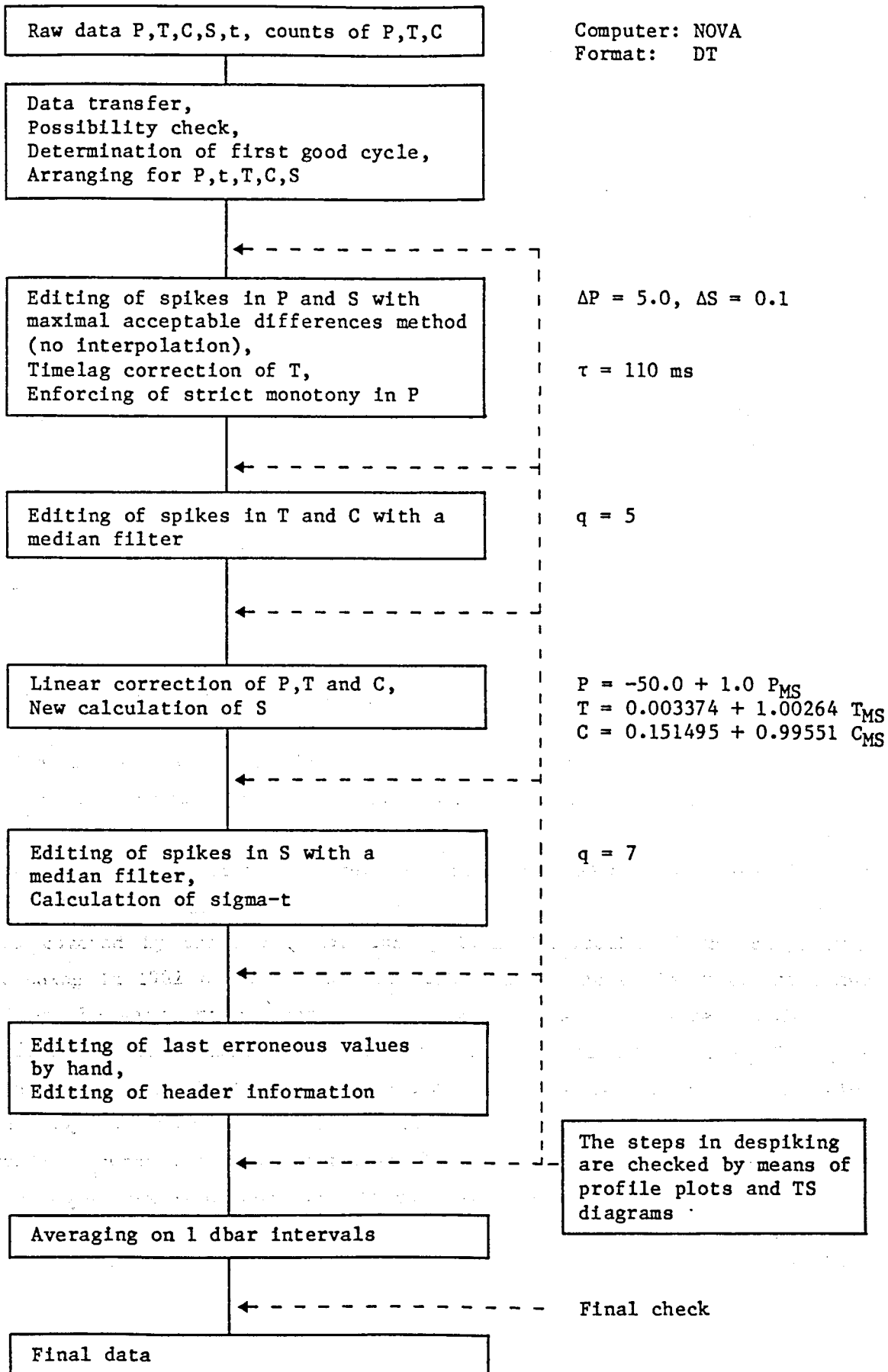


Fig. 1c

### 3. XBT measurements

During the cruise WH42 there was no time available to carry out CTD stations. Therefore only XBT's could be launched. During the other cruises XBT's were used to increase the horizontal resolution to 10 to 15 nm. A Sippican-Plessey analogue recorder was used. The probes reached down to about 800 m (T7). The accuracy of the data is given by the manufacturer with  $\pm 0.1$  K. Within this range the data correlate with the sea surface temperature measurements. The measurement depth is calculated from the vertical speed of the probe. The doubts on the accuracy of this method published by HEINMILLER et al. (1983) were confirmed by our data. Therefore 37 XBT and CTD profiles are compared by calculating the depth differences of 14 °C- and 10 °C-isotherms. The average differences and their standard deviations result as  $14 \pm 13$  m and  $36 \pm 17$  m respectively.

Because this error does not affect the present investigations no correction is applied. The location of the drops are shown in maps and station lists, the data are presented as vertical sections.

### 4. Drifting buoy measurements

The investigation of the large-scale surface current field requires appropriate current measurements. Satellite-tracked drifting buoys can yield this information. Therefore 41 drifting buoys were launched in 1982 (Table 3). Further data were acquired from three buoys which were launched by the Institute of Oceanographic Sciences, Wormley. In order to show the area covered by these drifters during 1982 the tracks of the buoys from launching in 1982 or from 1 January 1982 when launched in 1981, until the end of the year are presented in Figure 15. Some buoys were launched and recovered several times or the data transmission was interrupted. The buoys were manufactured by Hermes Electronics Ltd., Canada. For data transmission and buoy locations the ARGOS-system, Toulouse, France, was used. The present figures are drawn from about 3 to 4 hourly data which are delivered by ARGOS on magnetic tape and interpolated to 3 h intervals.

The drogues were located in 100 m. It should be noted that all buoys which were recovered during 1981 have had lost their drogues because the rust of the iron yards induced corrosion of the sail cloth. Consequently

drogues were built in the Institut für Meereskunde which were protected against corrosion. As there is no evident change in the characteristics of the tracks it must be assumed that the remaining yard and the rope provided enough drag to determine the drift of the buoys. On some of the buoys sea surface temperature and air pressure sensors were installed (see Table 3 in chapter 6.2.1).

## 5. Moored current meter measurements

The moored current meter measurements were planned with the objective to obtain long-term statistics at selected locations. Therefore three current meter moorings were laid along the Mid-Atlantic Ridge north of the Azores up to the Gibbs-Fracture-Zone. One mooring (265/2) represented the continuation of measurements which began in 1980 and consequently yield a two year long time series.

The resulting observations are summarized in chapter 6.2.2 (Table 4). Simple statistics of the time series are given in Table 5. Time series of the data are presented in Figures 17 to 19.

The time-series are filtered with a Lanczos square taper with 120 weights at a time interval of 1 h and a half power point of 40 h. By this filter tides and inertial movements should be suppressed. High frequency noise by mooring motions is not to be expected because subsurface mooring techniques were used. The influence of low frequency current fluctuations on the mooring can be shown by the pressure records or must be indirectly deduced by a method described by SCHRÖDER (1982). This was done by ROHARDT (1983) for mooring 265/1, which was identical to 265/2. He found, that during the most dramatic current event, which occurred in May 1981 the uppermost current meter was depressed less than 50 m.

Mooring 266 was depressed during a current event of about 10 days for more than 120 m (Figure 18d). During the rest of the observation period the vertical deviations were less than 40 m from the average depth.

The most intensive vertical displacements were observed in mooring 280. This can be explained by the crushing of the uppermost buoyancy element which lead to an important loss of buoyancy after the initial major depression. Depth fluctuations of more than 1000 m resulted (Figure 19d).

In the moorings Aanderaa current meters RCM 4 and RCM 5 were used. AANDERAA (1978) gives an accuracy in speed of  $1 \text{ cm s}^{-1}$  or 2 % at a speed from 6 to  $100 \text{ cm s}^{-1}$ . The records show, that the relatively large threshold of  $2.5 \text{ cm s}^{-1}$  (AANDERAA, 1978) did not affect the data even at the 2500 m levels. The accuracy of the thermistors mounted on the current meters is given as 0.05 K. At the deepest current meters the resolution was increased by introducing a smaller range from  $2.6 \text{ }^{\circ}\text{C}$  to  $5.9 \text{ }^{\circ}\text{C}$ . The accuracy of the pressure sensor is given with 1 % of the range. An accuracy of 3.5 m for 266201, 21 m for 280101 and 35 m for 280103 resulted.

Conductivity cells were mounted in various current meters. All records show strong nonlinear trends. The nonlinearity did not allow a satisfying correction, because only three shipborne reference measurements were available.

**6. Data Presentation**

**6.1 Hydrography**

**6.1.1 Cruise P87/3**

S T A T I O N   L I S T

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 87/3						
16.04.	1545		38°44.9'N	26°00.0'W		XBT1
"	1725		39°00.0'N	26°01.0'W		XBT2
"	1908		39°19.5'N	26°03.0'W		XBT3
"	2021		39°31.7'N	26°05.3'W		XBT4
"	2149		39°45.0'N	26°04.2'W		XBT5
"	2323-	347	40°00.0'N	26°05.0'W	3000	XBT6,MS
17.04.	0020					
"	0145		40°15.1'N	26°05.2'W		XBT7
"	0315-0415	348	40°30.0'N	26°05.0'W	2980	MS
"	0420		40°30.5'N	26°05.0'W		XBT8
"	0535		40°44.9'N	26°04.8'W		XBT9
"	0708-0757	349	41°00.0'N	26°05.0'W	3140	XBT10,MS
"	0922		41°15.0'N	26°05.1'W		XBT11
"	1051-1142	350	41°30.0'N	26°05.0'W	3100	XBT12,MS
"	1305		41°45.0'N	26°05.1'W		XBT13
"	1425-1515	351	42°00.0'N	26°05.0'W	1750	XBT14,MS
"	1635		42°15.0'N	26°04.9'W		XBT15
"	1750-1855	352	42°30.0'N	26°05.0'W	3490	XBT16,MS+1NB
"	2020		42°45.5'N	26°05.5'W		XBT17
"	2143-2234	353	42°59.8'N	26°05.0'W	3310	XBT18,MS
18.04.	0000		43°15.1'N	26°05.0'W		XBT19
"	0125-0215	354	43°30.0'N	26°05.0'W	3700	XBT20,MS
"	0335		43°44.9'N	26°05.0'W		XBT21
"	0505-0555	355	44°00.0'N	26°05.0'W	2900	XBT22,MS
"	0717		44°15.3'N	26°05.0'W		XBT23
"	0847-0950	356	44°29.0'N	26°05.0'W	3160	MS+1NB
"	0956		44°28.8'N	26°03.3'W		XBT24
"	1128		44°45.3'N	26°05.1'W		XBT25
"	1300-1430	357	45°00.0'N	26°05.0'W	3100	MS+1NB,NS
"	1435		44°59.9'N	26°03.9'W		XBT26
"	1605		45°15.1'N	26°05.0'W		XBT27
"	1730-1819	358	45°30.0'N	26°05.0'W	2700	XBT28,MS
"	1945		45°45.1'N	26°05.3'W		XBT29
"	2128-2220	359	46°00.0'N	26°05.0'W	3180	XBT30,MS
"	2352		46°15.2'N	26°05.3'W		XBT31

S T A T I O N   L I S T

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 87/3						
19.04.	0120-0215	360	46°30.0'N	26°05.0'W	3050	XBT32,MS
"	0340		46°45.2'N	26°05.0'W		XBT33
"	0505-0555	361	47°00.0'N	26°05.0'W	3200	MS
"	0600		46°59.9'N	26°04.0'W		XBT34
"	0726		47°16.0'N	26°05.2'W		XBT35
"	0856-0959	362	47°30.0'N	26°04.9'W	3300	MS+1NB
"	1004		47°31.1'N	26°05.2'W		XBT36
"	1124		47°45.3'N	26°04.8'W		XBT37
"	1255-1340	363	48°00.0'N	26°05.0'W	3250	MS
"	1345		48°00.5'N	26°04.5'W		XBT38
"	1505		48°15.1'N	26°05.1'W		XBT39
"	1635-1740	364	48°30.0'N	26°05.0'W	3450	XBT40,MS+1NB
"	1942		48°44.9'N	26°19.5'W		XBT41
"	2124-2221	365	48°56.8'N	26°32.6'W	3380	MS
"	2222		48°56.3'N	26°32.4'W		XBT42
"	2358		49°09.0'N	26°46.5'W		XBT43
20.04.	0130-0220	366	49°20.9'N	27°00.8'W	3350	MS
"	0225		49°21.0'N	27°01.0'W		XBT44
"	0345		49°33.1'N	27°15.1'W		XBT45
"	0530-0617	367	49°45.0'N	27°30.0'W	3500	MS
"	0619		49°45.2'N	27°30.6'W		XBT46
"	0738		49°56.8'N	27°41.8'W		XBT47
"	0915-1012	368	50°08.3'N	27°57.2'W	2500	MS+1NB
"	1017		50°09.0'N	27°57.8'W		XBT48
"	1141		50°21.1'N	28°10.4'W		XBT49
"	1315-1405	369	50°32.7'N	28°24.8'W	2900	MS
"	1410		50°33.3'N	28°23.8'W		XBT50
"	1535		50°45.1'N	28°39.0'W		XBT51
"	1715-1817	370	50°57.0'N	28°54.0'W	2800	MS+1NB
"	1824		50°57.5'N	28°55.2'W		XBT52
"	2007		51°09.5'N	29°08.6'W		XBT53
"	2144-2236	371	51°21.0'N	29°22.5'W	2700	MS
"	2238		51°21.1'N	29°23.4'W		XBT54
21.04.	0030		51°32.7'N	29°36.8'W		XBT55
"	0210-0255	372	51°45.0'N	29°51.0'W	1750	MS
"	0300		51°45.4'N	29°48.4'W		XBT56
22.04.	0805-0913	373	50°58.9'N	21°25.8'W	3400	MS



Cruise P87

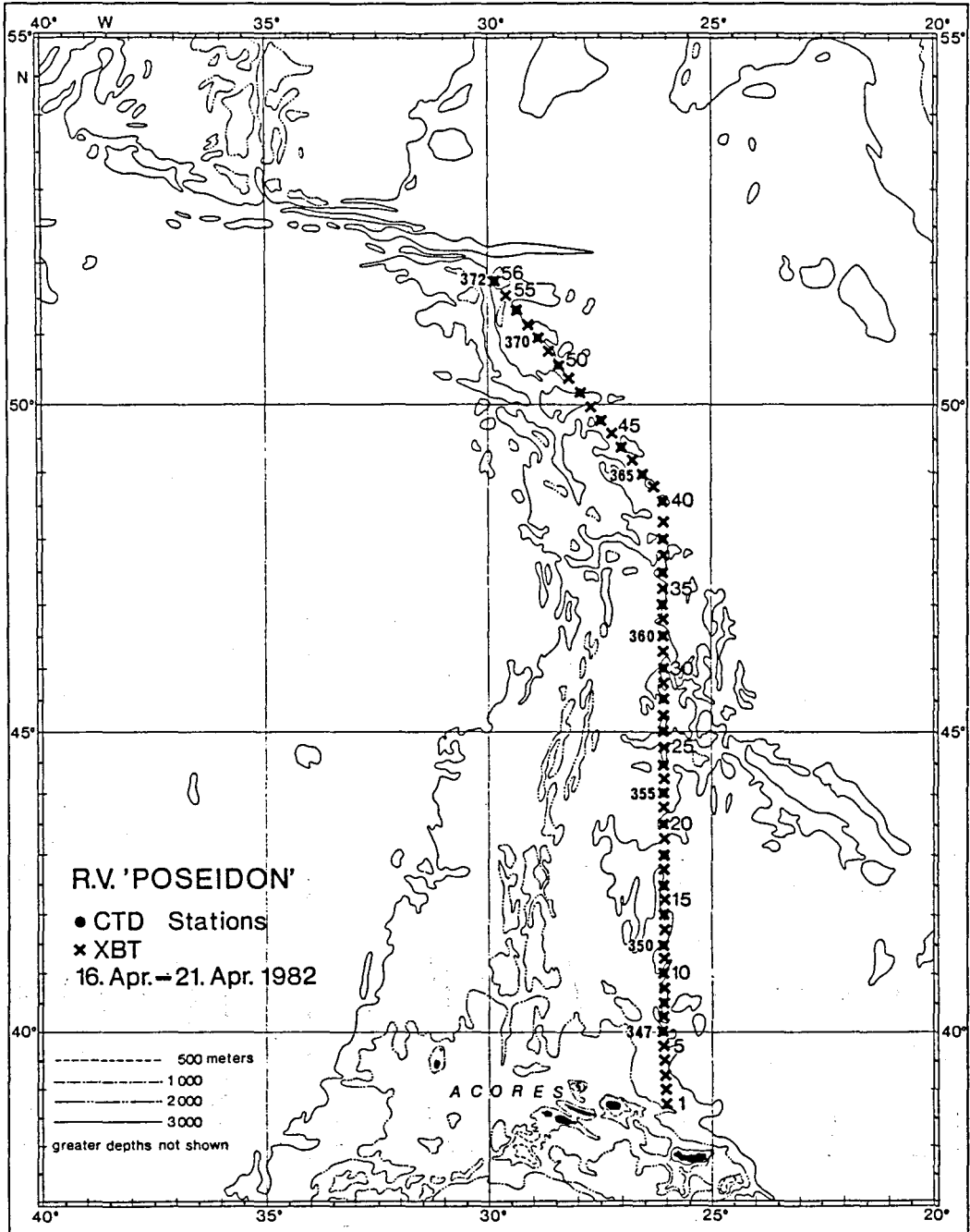


Fig. 2: Location of XBT and CTD stations during the cruise P87

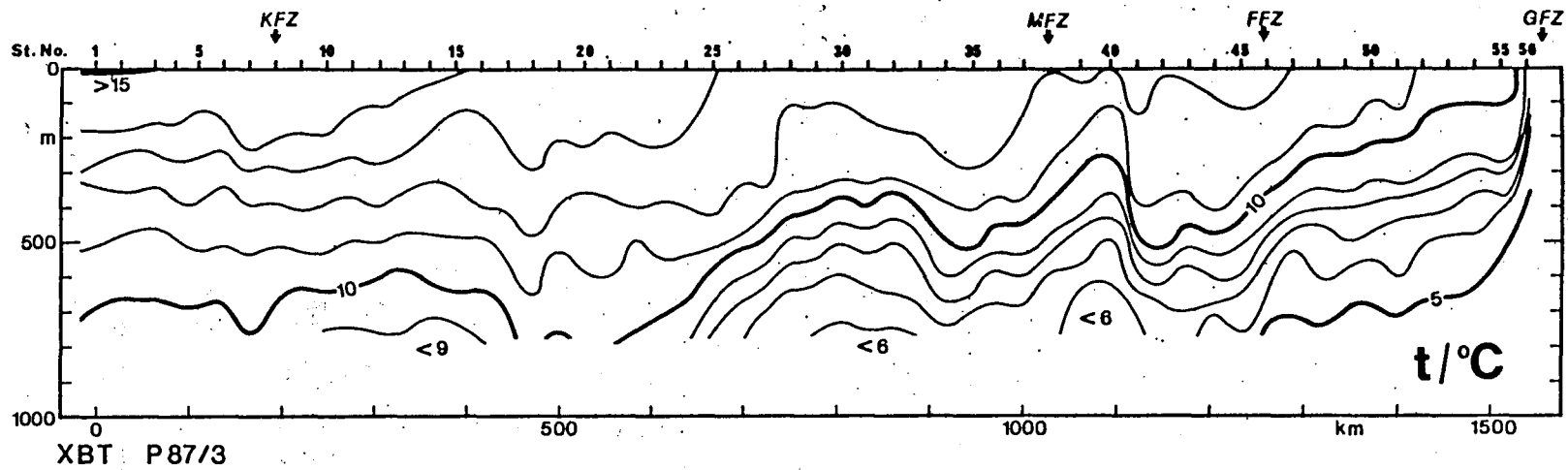


Fig. 3a

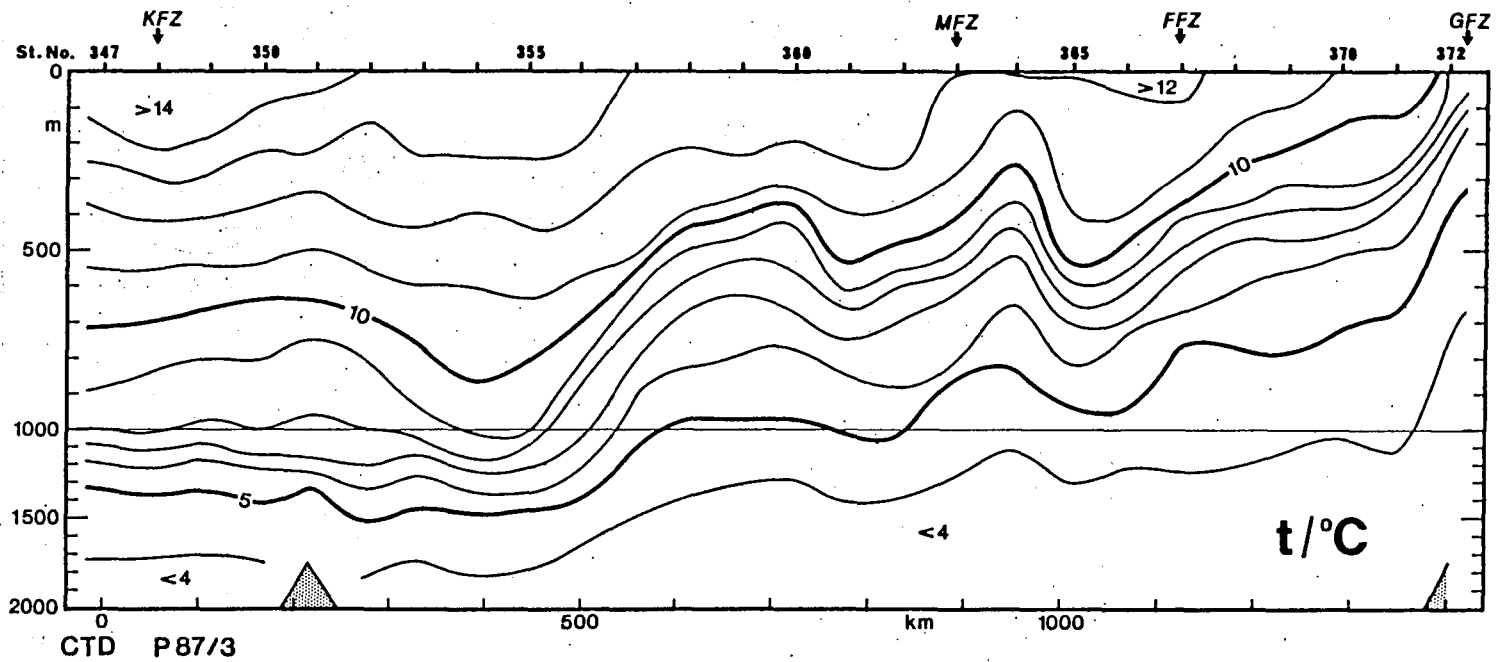


Fig. 3b

Fig. 3a-d: Vertical sections of temperature (XBT and CTD), salinity and density from the cruise P87

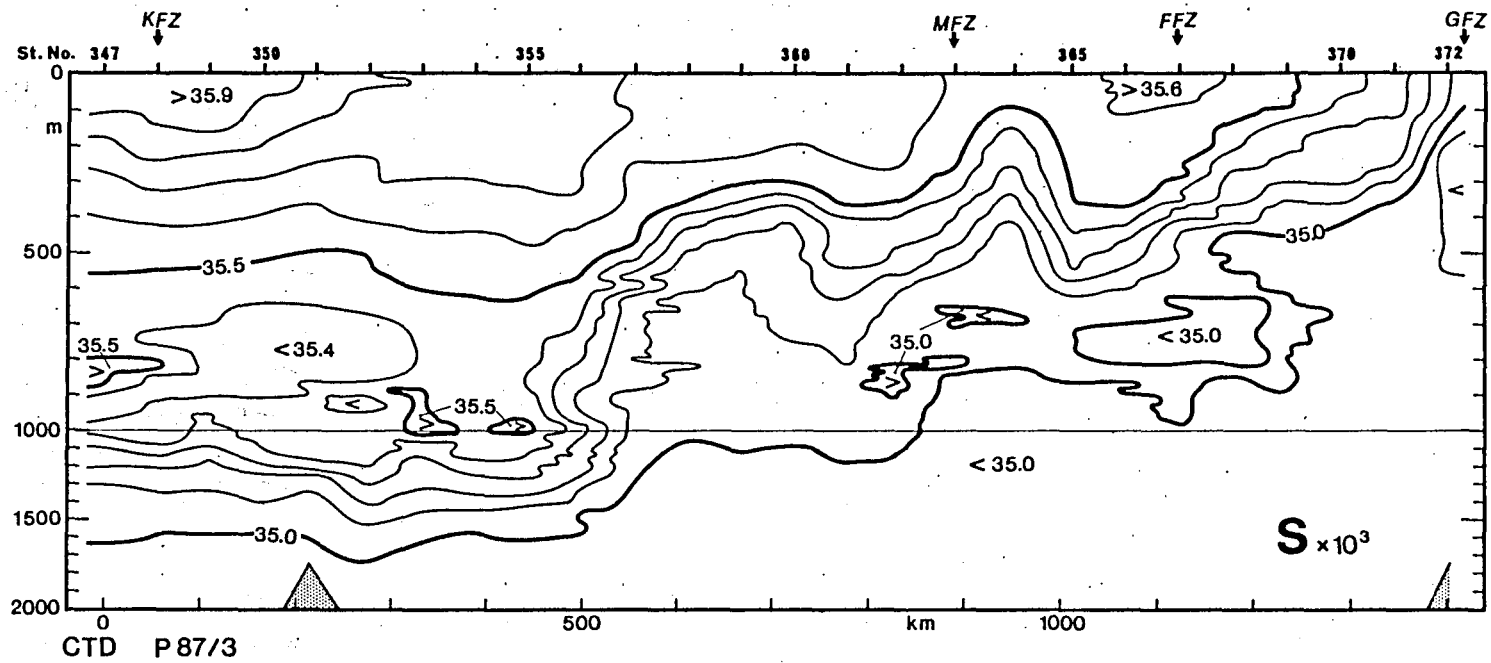


Fig. 3c

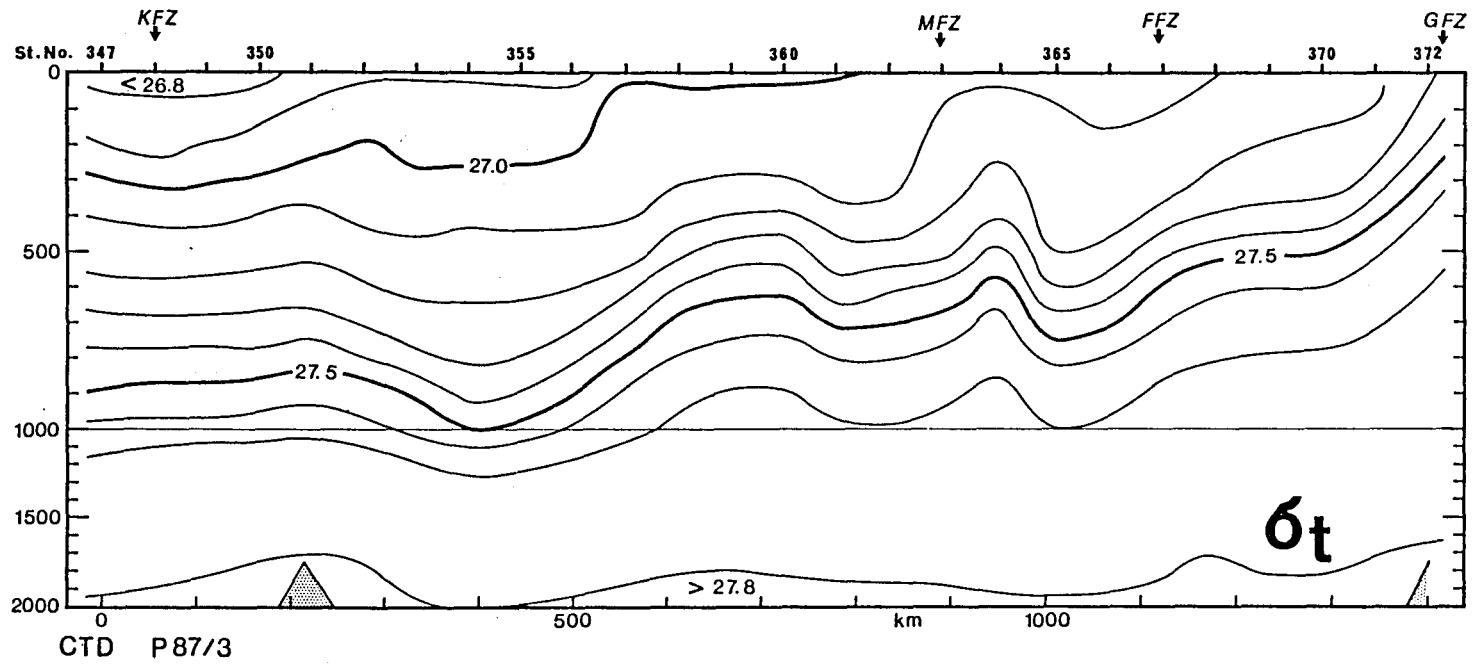


Fig. 3d

### 6.1.2 Cruise AD117

S T A T I O N L I S T

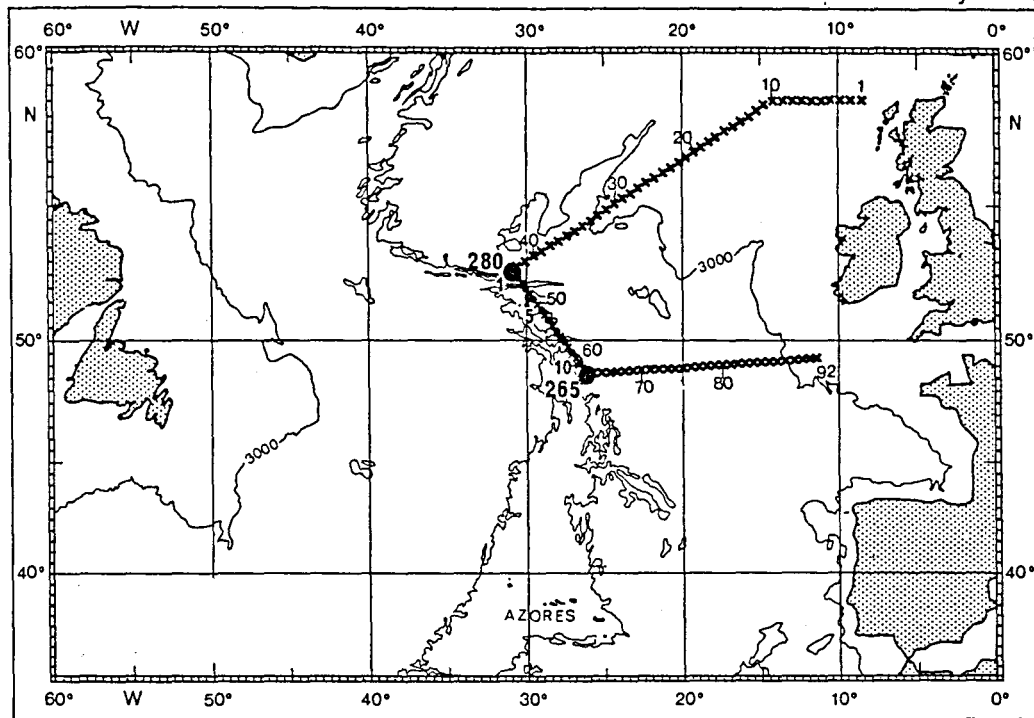
Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
"Anton Dohrn", Cruise No. 117						
15.05.	0128		58°35.0'N	08°29.0'W		XBT1
"	0324		58°35.0'N	09°08.0'W		XBT2
"	0510		58°35.0'N	09°47.0'W		XBT3
"	0655		58°35.0'N	10°26.0'W		XBT4
"	0841		58°35.0'N	11°05.0'W		XBT5
"	1037		58°35.0'N	11°44.0'W		XBT6
"	1229		58°35.0'N	12°23.0'W		XBT7
"	1425		58°35.0'N	13°02.0'W		XBT8
"	1615		58°35.0'N	13°45.0'W		XBT9
"	1808		58°35.0'N	14°18.0'W		XBT10
"	2000		58°24.0'N	14°51.0'W		XBT11
"	2150		58°14.0'N	15°22.0'W		XBT12
"	2350		58°03.0'N	15°55.0'W		XBT13
16.05.	0145		57°22.5'N	16°27.0'W		XBT14
"	0335		57°42.0'N	16°59.0'W		XBT15
"	0530		57°31.5'N	17°30.0'W		XBT16
"	0730		57°20.0'N	18°02.0'W		XBT17
"	0925		57°10.0'N	18°34.0'W		XBT18
"	1115		56°59.5'N	19°05.0'W		XBT19
"	1315		56°49.0'N	19°36.5'W		XBT20
"	1510		56°38.5'N	20°07.5'W		XBT21
"	1705		56°28.0'N	20°38.0'W		XBT22
"	1905		56°18.0'N	21°09.5'W		XBT23
"	2113		56°07.0'N	21°41.0'W		XBT24
"	2320		55°56.0'N	22°11.0'W		XBT25
17.05.	0130		55°45.0'N	22°41.5'W		XBT26
"	0340		55°34.0'N	23°12.5'W		XBT27
"	0542		55°23.0'N	23°42.5'W		XBT28
"	0805		55°12.5'N	24°13.0'W		XBT29
"	1002		55°02.5'N	24°43.0'W		XBT30
"	1210		54°52.0'N	25°12.5'W		XBT31
"	1417		54°41.5'N	25°42.0'W		XBT32
"	1630		54°29.5'N	26°12.5'W		XBT33
"	1852		54°18.5'N	26°42.5'W		XBT34
"	2112		54°08.5'N	27°12.5'W		XBT35
"	2320		53°57.5'N	27°41.5'W		XBT36
18.05.	0125		53°57.5'N	28°11.0'W		XBT37
"	0320		53°37.0'N	28°39.0'W		XBT38
"	0520		53°27.0'N	29°08.0'W		XBT39
"	0720		53°15.5'N	29°08.0'W		XBT40
"	0905		53°04.5'N	30°05.0'W		XBT41
"	1055		52°57.5'N	30°34.4'W		XBT42
"	1806-1915	1	52°57.5'N	30°34.0'W	3530	MS1
"	2030		52°30.5'N	30°44.0'W		XBT44
"	2203-2245	2	52°18.0'N	30°27.0'W	3220	MS1
"	2252		52°18.0'N	30°27.0'W		XBT45
19.05.	0007		52°05.5'N	30°13.5'W		XBT46
"	0207-0307	3	51°55.0'N	30°00.0'W	3358	MS35
"	0310		51°55.0'N	30°00.0'W		XBT47
"	0430		51°34.0'N	29°45.0'W		XBT48
"	0600-0658	4	51°30.0'N	29°29.0'W	2720	MS35

## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
"Anton Dohrn", Cruise No. 117						
"	0700		51°30.0'N	29°29.0'W		XBT49
"	0830		51°16.0'N	29°14.0'W		XBT50
"	1000-1100	5	51°10.0'N	29°00.0'W	3080	MS35
"	1104		51°10.0'N	29°00.0'W		XBT51
"	1225		50°53.0'N	28°46.0'W		XBT52
"	1353-1450	6	50°42.5'N	28°31.0'W	2850	MS35
"	1456		50°42.0'N	28°31.0'W		XBT53
"	1623		50°30.0'N	28°18.0'W		XBT54
"	1758		50°18.0'N	28°03.0'W		XBT55
"	1802-1902	7	50°17.5'N	28°03.0'W	3450	MS35
"	2025		50°06.0'N	27°49.0'W		XBT56
"	2154-2250	8	49°53.5'N	27°35.0'W	3200	MS35
"	2300		49°54.0'N	27°35.0'W		XBT57
20.05.	0027		49°42.0'N	27°21.0'W		XBT58
"	0155-0255	9	49°30.0'N	27°06.0'W	2960	MS35
"	0256		49°30.0'N	27°07.0'W		XBT59
"	0420		49°18.0'N	26°53.0'W		XBT60
"	0550-0655	10	49°05.5'N	26°38.0'W	3560	MS35
"	0705		49°06.0'N	26°28.0'W		XBT61
"	0823		48°53.0'N	26°25.0'W		XBT62
"	1950-2050	11	48°33.7'N	26°07.5'W	3680	MS35
"	2102		48°34.0'N	26°08.0'W		XBT63
"	2255		48°36.0'N	25°36.0'W		XBT64
21.05.	0040		48°38.0'N	25°05.0'W		XBT65
"	0230		48°39.0'N	24°35.0'W		XBT66
"	0415		48°42.0'N	24°04.0'W		XBT67
"	0555		48°43.0'N	23°35.0'W		XBT68
"	0730		48°44.0'N	23°05.0'W		XBT69
"	0910		48°46.0'N	22°36.0'W		XBT70
"	1045		48°47.0'N	22°07.0'W		XBT71
"	1230		48°49.0'N	21°35.0'W		XBT72
"	1401		48°51.0'N	21°05.0'W		XBT73
"	1535		48°52.0'N	20°34.0'W		XBT74
"	1710		48°54.0'N	20°02.0'W		XBT75
"	1845		48°57.0'N	19°30.0'W		XBT76
"	2032		48°58.0'N	19°00.0'W		XBT77
"	2225		48°59.0'N	18°29.0'W		XBT78
22.05.	0011		49°01.0'N	17°58.0'W		XBT79
"	0203		49°03.0'N	17°26.0'W		XBT80
"	0345		49°04.0'N	16°56.0'W		XBT81
"	0525		49°06.0'N	16°26.0'W		XBT82
"	0713		49°08.0'N	15°55.0'W		XBT83
"	0900		49°09.0'N	15°23.0'W		XBT84
"	1045		49°11.0'N	14°52.0'W		XBT85
"	1229		49°12.0'N	14°29.0'W		XBT86
"	1411		49°14.0'N	13°51.0'W		XBT87
"	1555		49°16.0'N	13°20.0'W		XBT88
"	1730		49°17.0'N	12°50.0'W		XBT89
"	1915		49°19.0'N	12°20.0'W		XBT90
"	2105		49°20.0'N	11°50.0'W		XBT91
"	2220		49°21.0'N	11°27.0'W		XBT92

F.R.V. 'ANTON DOHRN' Cruise AD117

15.— 22. May 1982



● Moored current meters      \*\* XBT-Stations      ●● CTD-Stations

Fig. 4a,b: Location of XBT and CTD stations during the cruise AD117



Cruise AD117

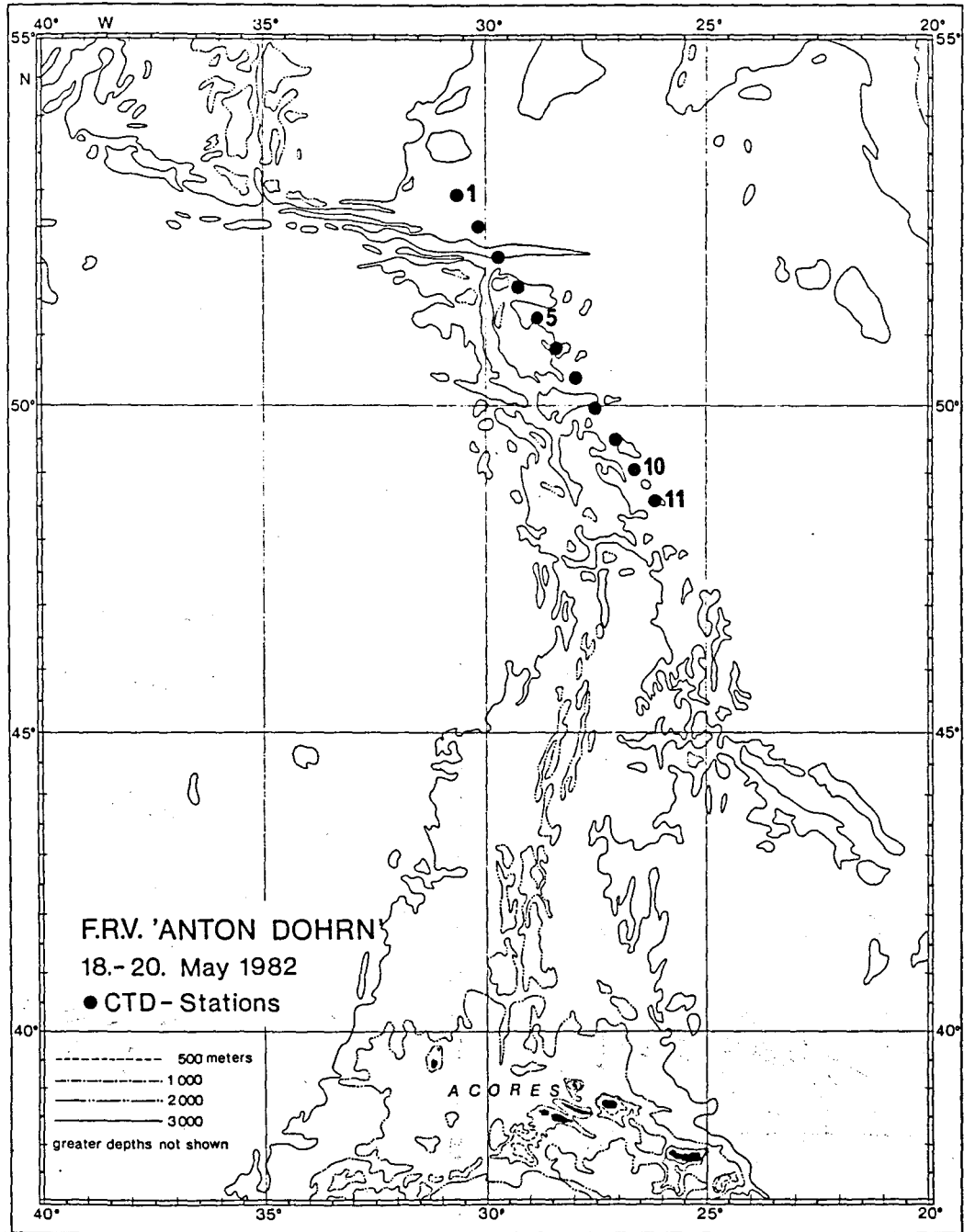


Fig. 4b

Fig. 5a

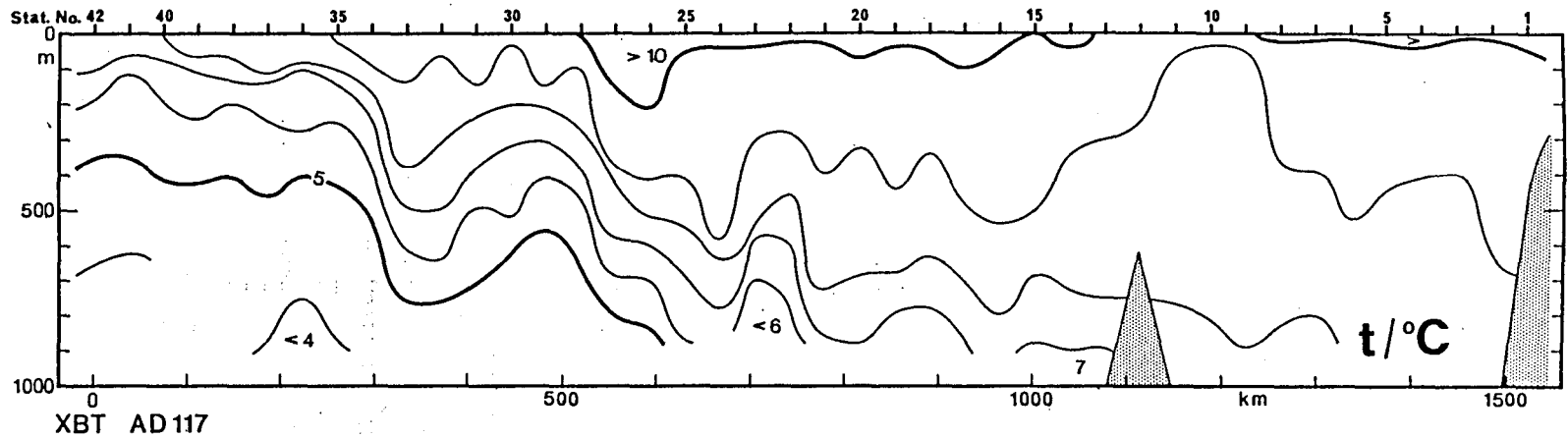
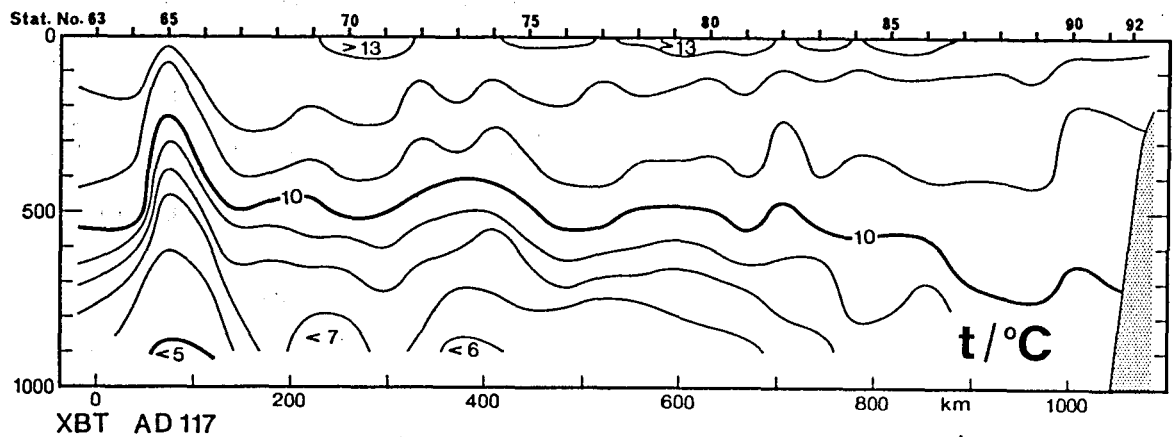


Fig. 5a-f: Vertical sections of temperature (XBT and CTD), salinity and density from the cruise AD117

Fig. 5b



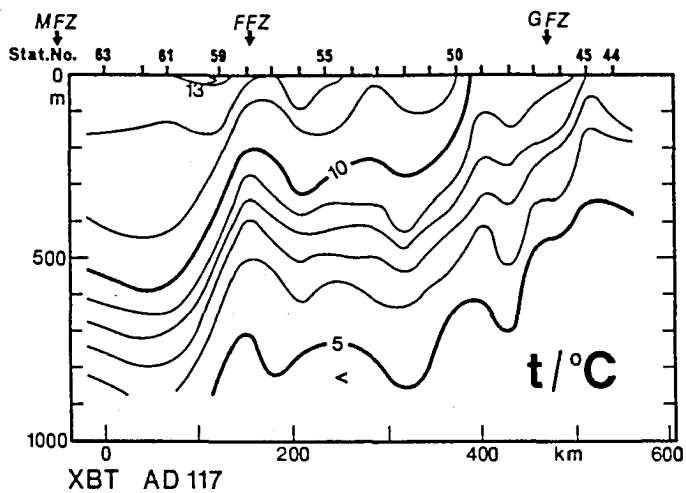


Fig. 5c

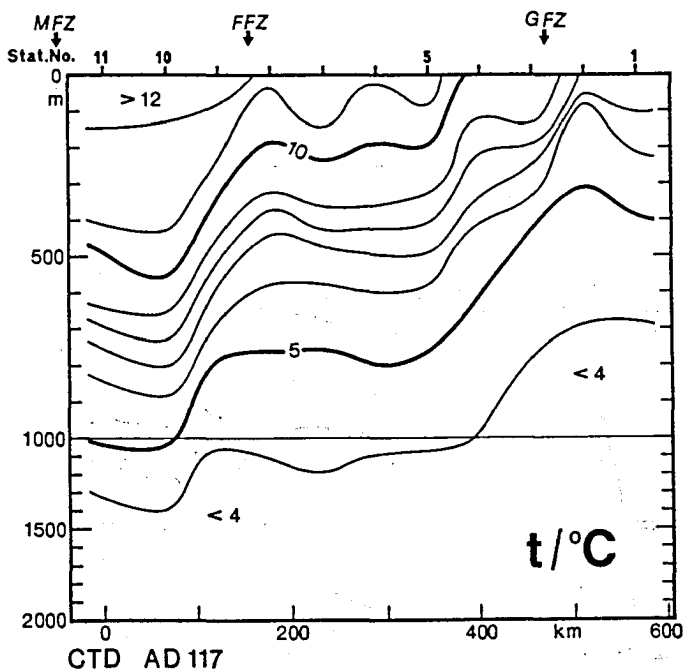


Fig. 5d

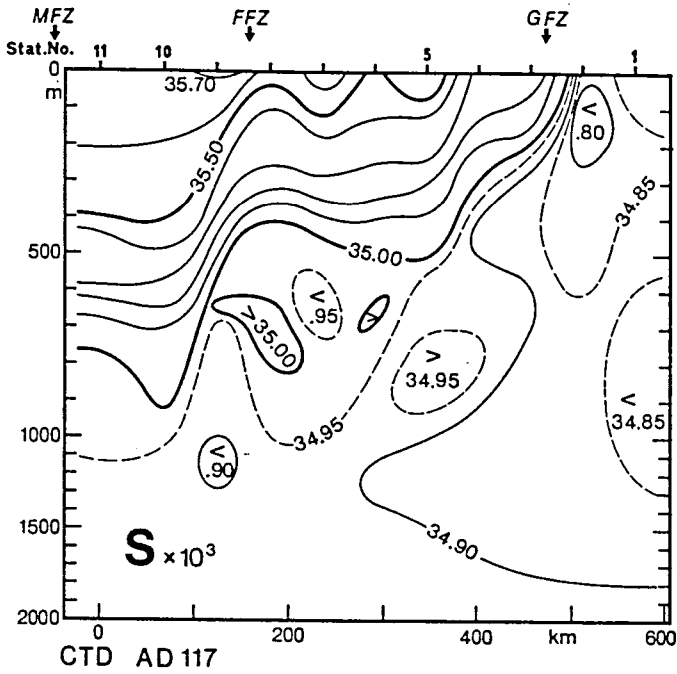


Fig. 5e

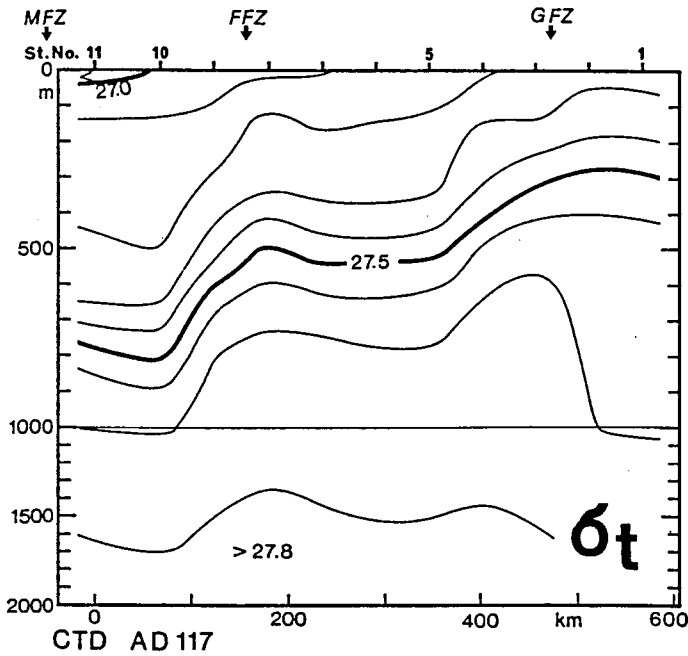


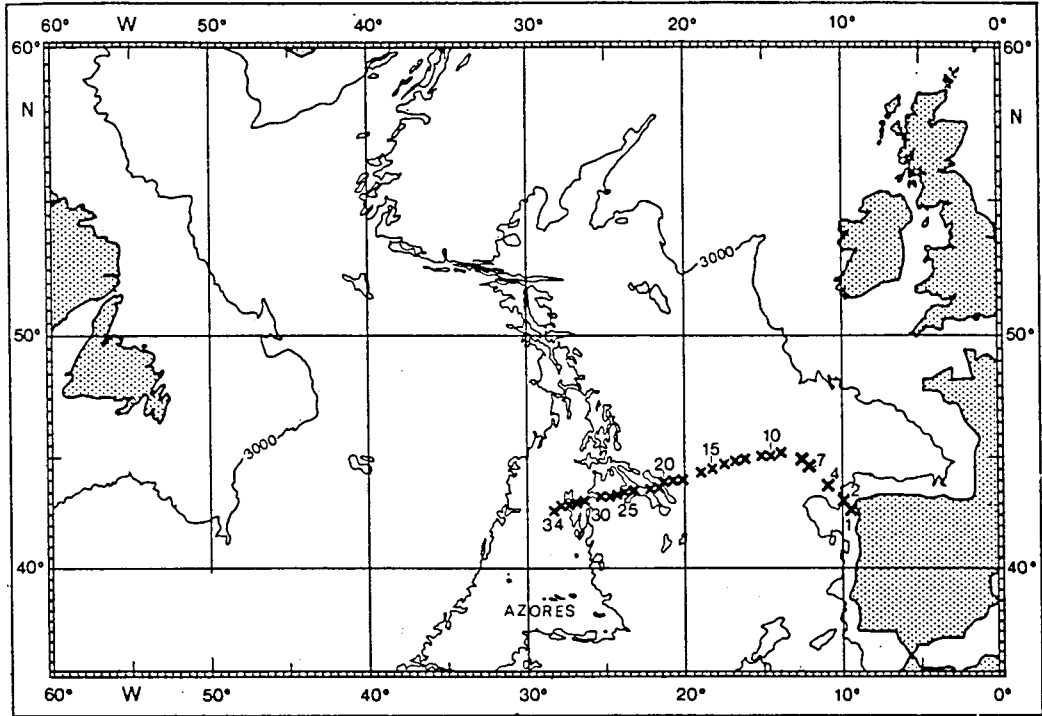
Fig. 5f

6.1.3 Cruise WH52

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F.R.V. 'WALTHER HERWIG' Cruise 52

4.-20. Jun. 1982



xx XBT - Stations

Fig. 6: Location of XBT stations during the cruise WH52

## STATION LIST

Date 1983	Time (GMT)	XBT-Nr.	Latitude	Longitude
F.S. "Walther Herwig" Cruise WH 52				
04.06.	0013	1	42°46.0'N	09°37.7'W
"	0230	2	43°08.0'N	10°07.8'W
"	0445	3	43°29.0'N	10°34.0'W
"	0653	4	43°46.4'N	11°10.0'W
"	0850	5	44°02.1'N	11°24.0'W
"	1000	6	44°19.3'N	11°50.3'W
"	1301	7	44°36.5'N	12°15.0'W
"	1505	8	44°53.0'N	12°42.5'W
"	1739	9	45°09.6'N	13°07.2'W
05.06.	2000	10	45°11.0'N	13°55.0'W
"	2231	11	45°06.2'N	14°38.2'W
06.06.	0103	12	45°03.5'N	15°15.0'W
"	1645	13	44°59.0'N	16°19.0'W
"	1915	14	44°48.0'N	16°59.0'W
"	2200	15	44°40.0'N	17°39.0'W
07.06.	0040	16	44°33.0'N	18°20.0'W
"	0341	17	44°24.0'N	19°03.0'W
"	0530	18	44°15.0'N	19°44.0'W
"	1045	19	44°07.0'N	20°16.0'W
"	1845	20	43°58.0'N	20°48.0'W
"	2044	21	43°58.0'N	21°17.0'W
"	2244	22	43°44.0'N	21°42.0'W
08.06.	0106	23	43°39.0'N	22°21.0'W
"	1845	24	43°38.0'N	22°55.0'W
"	2058	25	43°35.0'N	23°21.0'W
"	2313	26	43°13.0'N	23°54.0'W
09.06.	0129	27	43°25.0'N	24°29.0'W
"	0312	28	43°22.0'N	24°55.0'W
"	0511	29	43°21.0'N	25°23.0'W
"	1541	30	43°08.0'N	26°22.0'W
"	1741	31	43°03.0'N	26°53.0'W
"	1941	32	42°58.0'N	27°24.0'W
"	2239	33	42°53.0'N	27°59.0'W
10.06.	0119	34	42°46.0'N	28°29.0'W

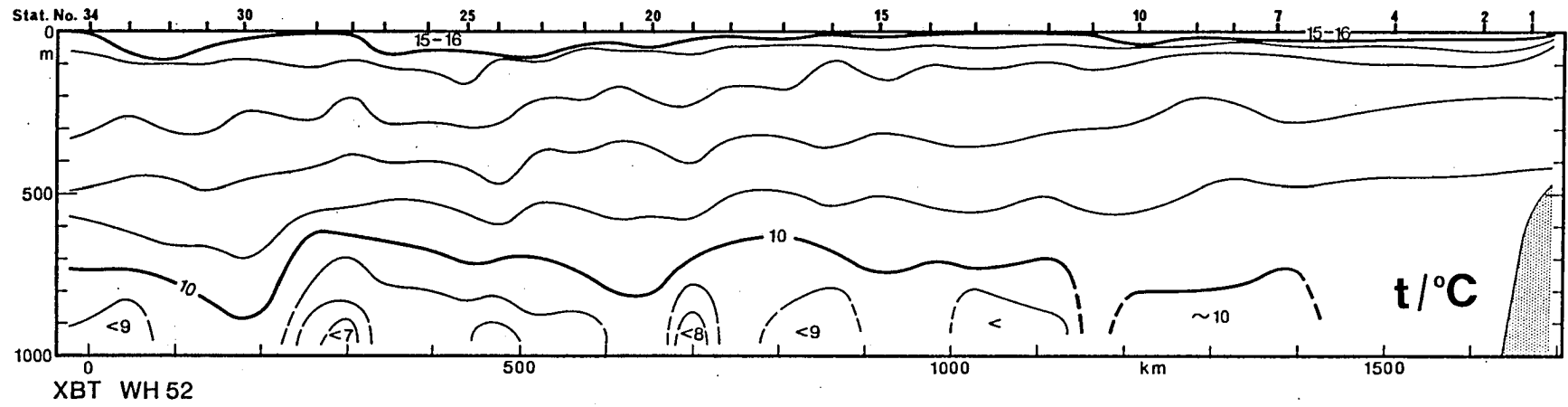


Fig. 7: Vertical section of temperature (XBT) from the cruise WH52



#### 6.1.4 Cruise P93/1,2

## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 93/1						
20.09.	0815-0955	720	44°26.4'N	26°05.0'W		V266/2 recovered
"	1217	"	44°26.0'N	26°08.1'W		V266/3 launched (begin)
"	1454	"	44°29.1'N	26°06.9'W	3161	--- (end)
"	1549	"	44°30.7'N	26°03.8'W	3159	Dr3540
"	1609	"	44°31.0'N	26°03.0'W		XBT
"	1817	721	44°15.9'N	26°00.1'W	2800	XBT
"	2021	722	44°00.1'N	26°00.0'W	2800	XBT
"	2224	723	43°44.1'N	25°59.9'W	3100	XBT
21.09.	0003	724	43°29.2'N	25°59.8'W	3000	Dr3543,XBT
"	0136	725	43°14.9'N	25°59.7'W	3180	XBT
"	0315	726	43°00.0'N	26°00.0'W	3350	XBT
"	0457	727	42°45.0'N	26°00.5'W	3509	XBT
"	0622	728	42°29.9'N	26°00.0'W	3484	Dr3548,XBT
"	0751	729	42°15.0'N	25°59.9'W	3336	XBT
"	0930	730	42°00.1'N	26°00.1'W	2430	XBT
"	1107	731	41°45.1'N	26°00.0'W	3170	XBT
"	1347-1524	732	41°25.5'N	26°01.1'W	3280	MS
"	1534-1720	"	41°29.0'N	26°03.4'W		NS
"	1725-1840	"	41°29.1'N	26°02.4'W	3300	MS
"	1840-2055	"	41°29.6'N	26°02.2'W		NS
"	2058	"	41°30.5'N	26°01.1'W		Dr3541
"	2100	"	41°30.6'N	26°01.4'W	3200	XBT
"	2319	733	41°30.0'N	26°30.0'W	2820	XBT
22.09.	0148	734	41°29.9'N	27°00.1'W	2750	Dr3547,XBT
"	0422	735	41°30.1'N	27°30.0'W	2550	XBT
"	0639	736	41°30.0'N	28°00.5'W	2197	Dr3515,XBT
"	0904	737	41°30.1'N	28°30.0'W	2370	XBT
"	1141	738	41°30.0'N	29°00.3'W	1510	Dr3517,XBT
"	1416	739	41°30.0'N	29°30.0'W	1600	XBT
"	1641	740	41°29.9'N	29°59.7'W	1800	Dr3544,XBT
"	1813	741	41°15.0'N	29°59.8'W	2300	XBT
"	1943	742	41°00.1'N	30°00.0'W	1750	XBT
"	2110	743	40°45.1'N	30°00.0'W	2140	XBT
"	2240	744	40°30.1'N	30°00.2'W	1510	XBT
23.09.	0009	745	40°14.9'N	30°00.5'W	1450	XBT
"	0135	746	40°00.0'N	30°00.0'W	1680	XBT
"	0354	747	40°00.0'N	29°30.0'W	1750	XBT
"	0537	748	40°15.0'N	29°29.6'W	1800	XBT
"	0712	749	40°30.2'N	29°30.0'W	2700	Dr3542,XBT
"	0856	750	40°44.9'N	29°30.0'W	1280	XBT
"	1032-1116	751	40°59.5'N	29°29.6'W	1480	MS
"	1118	"	40°58.8'N	29°29.8'W	1500	XBT
"	1302	752	41°14.9'N	29°29.9'W	1420	XBT
"	1450-1538	753	41°29.9'N	29°31.7'W	1870	MS,XBT
"	1724	754	41°45.1'N	29°30.4'W	1650	XBT
"	1914-2000	755	41°59.3'N	29°30.3'W	1350	MS,XBT
"	2156	756	42°15.2'N	29°30.2'W	2550	XBT
"	2350	757	42°30.3'N	29°30.0'W	2020	Dr3545,XBT

## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 93/1						
24.09.	0133	758	42°45.0'N	29°30.0'W	1750	XBT
"	0319	759	43°00.0'N	29°29.9'W	1550	XBT
"	0545	760	43°00.0'N	28°59.9'W	1700	XBT
"	0710	761	42°45.0'N	28°59.8'W	1800	XBT
"	0843	762	42°30.1'N	29°00.1'W	1500	XBT
"	1015	763	42°15.0'N	29°00.0'W	2020	XBT
"	1147	764	42°00.0'N	29°00.3'W	1600	XBT
"	1325-1420	765	41°45.6'N	29°01.0'W	2200	MS,XBT
"	1600	766	41°29.9'N	29°00.0'W	1550	XBT
"	1735-1833	767	41°15.4'N	29°00.5'W	1850	MS,XBT
"	2009	768	41°00.0'N	29°00.1'W	1600	XBT
"	2146	769	40°44.8'N	29°00.2'W	2220	XBT
"	2316	770	40°30.1'N	29°00.0'W	1300	XBT
25.09.	0051	771	40°15.0'N	29°00.4'W	1760	XBT
"	0226	772	40°00.0'N	29°00.1'W	1980	XBT
"	0504	773	40°00.1'N	28°30.0'W	2200	XBT
"	0657	774	40°15.1'N	28°30.5'W	2250	XBT
"	0902	775	40°29.8'N	28°30.3'W	2360	Dr3555,XBT
"	1058	776	40°45.1'N	28°30.1'W	1910	XBT
"	1253-1353	777	41°00.1'N	28°30.1'W	2100	MS,XBT
"	1528	778	41°15.1'N	28°30.0'W	2490	XBT
"	1732-1836	779	41°30.3'N	28°31.0'W	2400	MS,XBT
"	2010	780	41°45.0'N	28°29.9'W	2130	XBT
"	2203-2307	781	42°00.0'N	28°30.2'W	2540	MS,XBT
26.09.	0050	782	42°15.0'N	28°29.9'W	2520	XBT
"	0248	783	42°29.5'N	28°30.9'W	2450	DR3539,XBT
"	0454	784	42°44.8'N	28°29.8'W	2320	XBT
"	0719	785	42°44.8'N	27°59.8'W	2500	XBT
"	0907	786	42°29.5'N	28°00.1'W	2790	XBT
"	1039	787	42°15.0'N	28°00.0'W	2590	XBT
"	1218	788	42°59.9'N	28°00.7'W	2540	XBT
"	1400-1455	789	41°45.3'N	28°00.8'W	2640	MS,XBT
"	1638	790	41°29.8'N	28°00.2'W	2350	XBT
"	1816-1918	791	41°13.4'N	28°01.4'W	2550	MS,XBT
"	2025	792	41°04.0'N	28°00.4'W	2180	XBT
"	2104	793	41°00.0'N	27°59.9'W	2650	XBT
"	2234	794	40°45.1'N	28°00.0'W	2300	XBT
27.09.	0055	795	40°30.0'N	27°59.8'W	1942	XBT
"	0139	796	40°15.0'N	27°59.9'W	1990	XBT
"	0310	797	39°59.5'N	27°59.9'W	1940	XBT
"	0539	798	40°00.0'N	27°29.8'W	2000	XBT
"	0713	799	40°15.0'N	27°30.0'W	2200	XBT
"	0910	800	40°30.1'N	27°30.1'W	2310	Dr3506,XBT
"	1048	801	40°45.0'N	27°30.0'W	2010	XBT
"	1235-1325	802	40°59.9'N	27°31.9'W	1950	MS,XBT
"	1502	803	41°15.0'N	27°33.5'W	2568	XBT
"	1654-1757	804	41°29.9'N	27°30.3'W	2500	MS,XBT
"	1946	805	41°45.0'N	27°30.0'W	2450	XBT
"	2136-2233	806	41°59.2'N	27°30.8'W	2650	MS,XBT

## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 93/1						
28.09.	0010	807	42°15.0'N	27°30.0'W	2440	XBT
"	0200	808	42°30.5'N	27°30.4'W	3170	Dr3546, XBT
"	0404	809	42°45.1'N	27°29.3'W	3000	XBT
"	0611	810	42°44.8'N	27°00.1'W	3100	XBT
"	0735	811	42°29.7'N	26°59.8'W	3200	XBT
"	0906	812	42°14.7'N	27°00.2'W	3140	XBT
"	1030	813	42°00.0'N	27°00.1'W	2790	XBT
"	1208-1318	814	41°45.0'N	27°00.4'W	2950	MS, XBT
"	1456	815	41°29.6'N	27°00.6'W	2910	XBT
"	1619-1730	816	41°15.2'N	26°59.9'W	2700	MS, XBT
"	1905	817	41°00.1'N	27°00.0'W	2700	XBT
"	2030	818	40°44.9'N	27°00.6'W	2610	XBT
"	2207	819	40°30.1'N	27°00.0'W	1650	XBT
"	2337	820	40°15.0'N	27°00.0'W	2180	XBT
29.09.	0108	821	40°00.1'N	26°59.9'W	1168	XBT
"	0330	822	40°00.3'N	26°29.6'W	2710	XBT
"	0508	823	40°15.0'N	26°30.1'W	2800	XBT
"	0653	824	40°30.1'N	26°29.9'W	2900	Dr3551, XBT
"	0836	825	40°45.1'N	26°29.8'W	2820	XBT
"	1027-1137	826	40°59.1'N	26°30.3'W	2910	MS, XBT
"	1318	827	41°15.1'N	26°30.0'W	2580	XBT
"	1457-1605	828	41°29.6'N	26°30.4'W	2800	MS, XBT
"	1738	829	41°45.1'N	26°30.9'W	2950	Dr3557, XBT
"	1912-2024	830	41°59.8'N	26°30.1'W	3140	MS, XBT
"	2156	831	42°14.9'N	26°30.0'W	3120	XBT
"	2333	832	42°30.4'N	26°30.6'W	3210	DR3552, XBT
30.09.	0120	833	42°44.9'N	26°28.5'W	2920	XBT
"	0334	834	42°44.9'N	26°00.7'W	3510	XBT
"	0516	835	42°30.0'N	26°01.0'W	3480	XBT
"	0658	836	42°15.0'N	25°59.4'W	3340	XBT
"	0839	837	42°00.1'N	26°00.5'W	2400	XBT
"	1023-1204	838	41°45.3'N	26°00.3'W	2980	MS, NS, XBT
"	1346	839	41°30.0'N	26°00.4'W	3300	XBT
"	1546-1740	840	41°14.8'N	26°00.4'W	3250	MS, XBT
"	1936	841	40°59.9'N	26°00.2'W	3200	XBT
"	2106	842	40°45.0'N	26°00.1'W	2950	XBT
"	2237	843	40°30.0'N	26°00.0'W	3020	XBT
01.10.	0005	844	40°15.0'N	25°59.6'W	3040	XBT
"	0227	845	40°15.1'N	25°31.0'W	3020	XBT
"	0427	846	40°30.3'N	25°31.0'W	2930	XBT
"	0636	847	40°45.1'N	25°30.0'W	3400	XBT
"	0837-0949	848	40°59.7'N	25°30.0'W	3400	MS, XBT
"	1141	849	41°15.1'N	25°29.5'W	3490	XBT
"	1340-1452	850	41°30.2'N	25°30.2'W	3400	MS, XBT
"	1647	851	41°45.0'N	25°30.5'W	3480	XBT
"	1849-1955	852	41°59.4'N	25°30.4'W	3320	MS, XBT
"	2149	853	42°15.1'N	25°29.9'W	3200	XBT

## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 93/1						
02.10.	0008	854	42°15.0'N	25°00.0'W	3560	XBT
"	0142	855	42°00.2'N	24°59.8'W	3230	XBT
"	0317	856	41°45.5'N	25°00.1'W	3580	XBT
"	0511	857	41°29.9'N	25°00.2'W	3400	XBT
"	0649	858	41°14.9'N	24°59.7'W	3550	XBT
"	0828	859	41°00.0'N	25°00.4'W	3600	XBT
"	1005	860	40°45.0'N	25°00.0'W	3350	XBT
"	1142	861	40°30.0'N	25°00.2'W	3400	XBT
"	1315	862	40°15.0'N	25°01.5'W	3400	XBT
"	1500	863	40°00.0'N	25°00.0'W	3500	XBT
"	1618	864	39°45.0'N	24°59.5'W	3500	XBT
"	1750	865	39°30.0'N	25°00.3'W	3450	XBT
"	1918	866	39°15.0'N	25°00.0'W	3500	XBT
"	2052	867	39°00.0'N	25°00.0'W	3180	XBT
"	2228	868	38°45.0'N	25°00.4'W	2490	XBT
03.10.	0000	869	38°30.0'N	25°00.5'W	3300	XBT
"	0139	870	38°15.0'N	24°59.8'W	3100	XBT
"	0320	871	38°00.0'N	25°00.4'W	1600	XBT

## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 93/2						
11.10.	1015-1116	872	39°49.9'N	26°09.6'W	2930	MS, XBT
"	1356	873	39°57.0'N	25°52.6'W		XBT
"	1600	874	40°04.3'N	25°34.7'W		XBT
"	1730	875	40°12.2'N	25°17.3'W		XBT
"	1958-2102	876	40°18.4'N	24°59.5'W	3300	MS, XBT
"	2215	877	40°29.9'N	25°00.0'W		XBT
"	2343	878	40°45.0'N	25°00.1'W		XBT
12.10.	0118	879	41°00.2'N	25°00.4'W		XBT
"	0242	880	41°15.3'N	25°00.0'W		XBT
"	0410	881	41°30.2'N	25°00.1'W		XBT
"	0540	882	41°45.0'N	25°00.2'W		XBT
"	0708	883	42°00.0'N	25°00.3'W		XBT
"	0843	884	42°15.0'N	25°00.4'W		XBT
"	1023	885	42°30.0'N	25°00.3'W		XBT
"	1208	886	42°45.0'N	25°00.1'W		XBT
"	1400-1440	887	43°00.1'N	25°00.0'W	2622	MS, XBT
"	1632	888	43°15.0'N	25°00.3'W		XBT
"	1812	889	43°30.0'N	25°00.2'W		XBT
"	2010	890	43°45.0'N	25°02.8'W		XBT
"	2202-2305	891	44°01.3'N	24°59.4'W	3400	MS, XBT
13.10.	0120	892	44°14.9'N	24°59.9'W		XBT
"	0402	893	44°29.9'N	25°00.4'W		XBT
"	0734	894	44°29.9'N	25°33.1'W		XBT
"	0926	895	44°14.8'N	25°30.0'W		XBT
"	1118-1206	896	44°00.2'N	25°30.2'W	3000	MS, XBT
"	1400	897	43°45.0'N	25°30.3'W		XBT
"	1533	898	43°30.0'N	25°30.3'W		XBT
"	1710	899	43°14.9'N	25°29.9'W		XBT
"	1845	900	43°00.0'N	25°30.3'W		XBT
"	2126	901	43°00.0'N	26°00.0'W		XBT
"	2348-	902	43°00.0'N	26°29.9'W	3350	MS, XBT
14.10.	0040					
"	0220	903	43°15.1'N	26°30.2'W		XBT
"	0405	904	43°30.0'N	26°30.4'W		XBT
"	0533	905	43°45.1'N	26°30.3'W		XBT
"	0657	906	44°00.0'N	26°30.2'W		XBT
"	0830	907	44°15.0'N	26°29.5'W		XBT
"	1031-1125	908	44°30.1'N	26°29.9'W	3025	MS, XBT
"	1250	909	44°45.1'N	26°30.1'W		XBT
"	1415	910	45°00.1'N	26°30.8'W		XBT
"	1632	911	44°59.9'N	27°00.2'W		Dr3520, XBT
"	1853-1938	912	44°59.8'N	27°30.1'W	2350	MS, XBT
"	2129	913	44°45.0'N	27°30.2'W		XBT
"	2316	914	44°30.0'N	27°30.1'W		XBT
15.10.	0112	915	44°15.0'N	27°30.2'W		XBT
"	0328	916	44°00.0'N	27°30.0'W		XBT
"	0536	917	43°44.9'N	27°31.6'W		XBT
"	0818	918	43°30.0'N	27°30.6'W		XBT

## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 93/2						
16.10.	0653	919	43°24.2'N	27°17.1'W		XBT
"	0901	920	43°14.8'N	27°29.7'W		XBT
"	1043-1058	921	43°00.0'N	27°30.4'W		XBT
"	1228	922	42°44.8'N	27°30.4'W		XBT
"	1403	923	42°28.9'N	27°30.5'W		XBT
"	1520	924	42°15.0'N	27°30.2'W		XBT
"	1655	925	42°00.5'N	27°30.5'W		XBT
"	1926-2011	926	42°00.1'N	27°59.9'W	2230	MS, XBT
"	2142	927	42°15.3'N	28°00.1'W		XBT
"	2311	928	42°30.0'N	28°00.1'W		XBT
17.10.	0108	929	42°45.0'N	28°00.1'W		XBT
"	0250	930	43°00.0'N	28°00.1'W		XBT
"	0726-0815	931	42°59.9'N	28°29.8'W	1900	MS, XBT
"	1200	932	42°46.1'N	28°21.6'W		XBT
"	1423	933	42°30.0'N	28°30.2'W		XBT
"	1554	934	42°14.9'N	28°30.1'W		XBT
"	1735	935	42°00.1'N	28°30.3'W		XBT
"	1859	936	41°44.3'N	28°30.5'W		XBT
"	2033	937	41°29.7'N	28°30.4'W		XBT
"	2156-2249	938	41°15.0'N	28°30.0'W	2600	MS, XBT
18.10.	0105	939	40°52.0'N	28°30.4'W		XBT
"	0145	940	40°45.0'N	28°30.4'W		XBT
"	0315	941	40°30.0'N	28°30.1'W		XBT
"	0442	942	40°15.0'N	28°30.6'W		XBT
"	0609	943	40°00.0'N	28°30.8'W		XBT
"	0838	944	40°00.4'N	27°59.5'W		XBT
"	1017	945	40°15.0'N	28°00.1'W		XBT
"	1137	946	40°30.0'N	28°00.0'W		XBT
"	1303	947	40°45.0'N	27°59.9'W		XBT
"	1429	948	41°00.1'N	27°59.3'W		XBT
"	1616-1635	949	41°14.9'N	27°59.9'W	2500	XBT
"	1758	950	41°30.1'N	28°00.1'W		XBT
"	1950-2033	951	41°45.0'N	28°00.2'W	2680	MS, XBT
"	2254	952	41°45.2'N	27°29.1'W		XBT
19.10.	0035	953	41°29.9'N	27°30.2'W		XBT
"	0212	954	41°14.9'N	27°30.1'W		XBT
"	0340	955	41°00.0'N	27°30.2'W		XBT
"	0510	956	40°44.9'N	27°30.2'W		XBT
"	0646	957	40°30.0'N	27°30.1'W		XBT
"	0827	958	40°15.2'N	27°30.5'W		XBT
"	0959-1049	959	40°00.1'N	27°30.9'W	2030	MS, XBT
"	1303	960	40°00.2'N	27°00.0'W		XBT
"	1420	961	40°14.9'N	27°00.2'W		XBT
"	1615	962	40°30.1'N	27°00.2'W		XBT
"	1752	963	40°44.9'N	27°01.0'W		XBT
"	1924	964	41°00.0'N	27°00.4'W		XBT
"	2148	965	40°59.8'N	26°30.0'W		XBT
"	2317	966	40°45.0'N	26°30.0'W		XBT

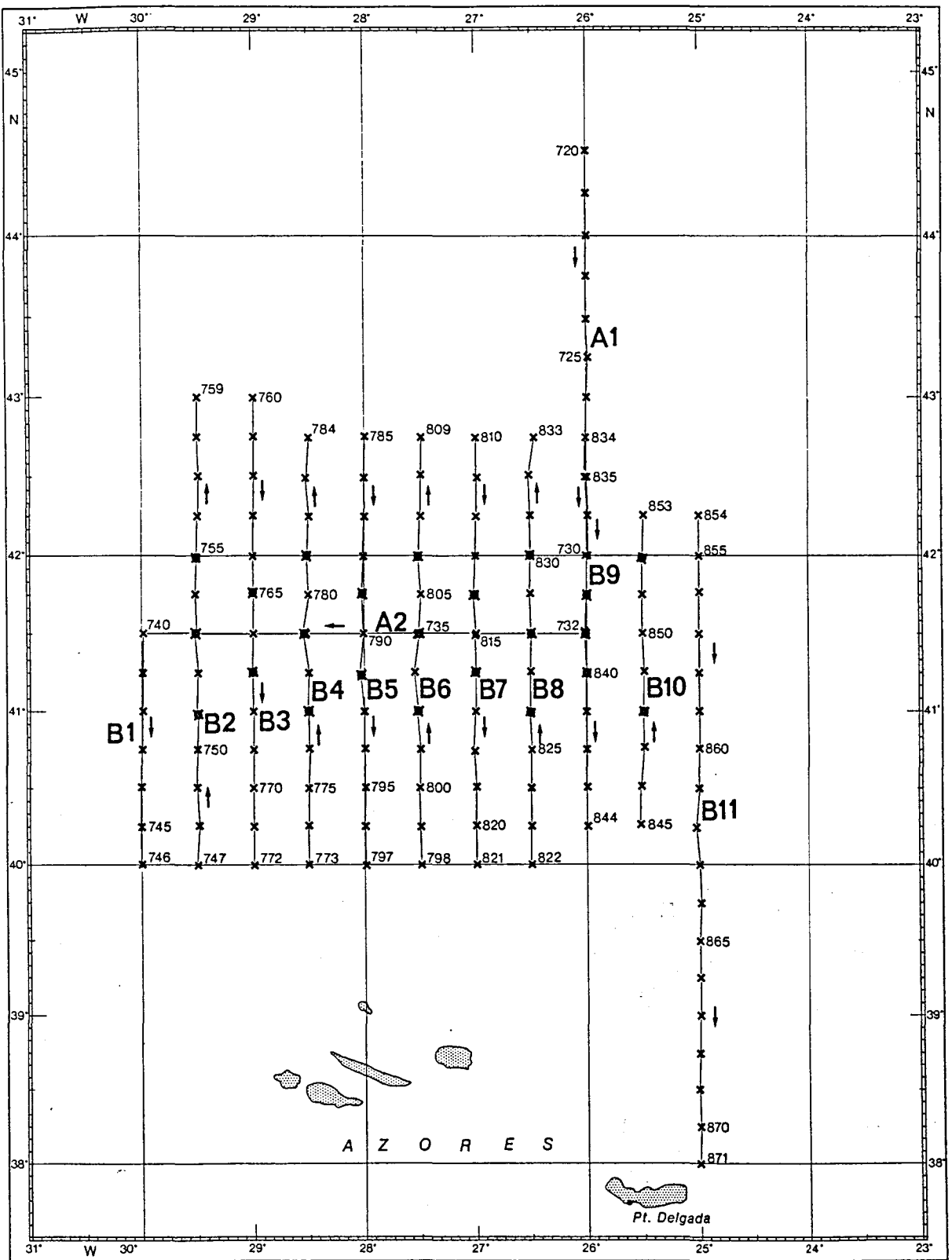
## STATION LIST

Date 1982	Time (GMT)	Station	Latitude	Longitude	Depth (m)	Remarks
F.S. "Poseidon" Cruise P 93/2						
20.10.	0057	967	40°30.0'N	26°30.5'W		XBT
"	0230	968	40°15.0'N	26°30.3'W		XBT
"	0400	969	40°00.0'N	26°30.0'W		XBT
"	0535	970	39°46.0'N	26°21.2'W		XBT
"	0701	971	39°32.0'N	26°11.9'W		XBT
"	0857-0958	972	39°15.0'N	25°58.6'W	3020	MS, XBT
"	1115		39°19.8'N	25°47.3'W		Dr3506
"	1143	973	39°22.9'N	25°43.5'W		XBT
"	1315-1405	974	39°30.5'N	25°26.5'W	3300	MS, XBT
"	1537	975	39°38.0'N	25°10.5'W		XBT
"	1921	976	39°47.2'N	24°53.6'W		XBT
"	2225-2320	977	39°55.2'N	24°35.9'W	3700	MS, XBT
21.10.	0047	978	39°46.0'N	24°22.0'W		XBT
"	0240	979	39°35.0'N	24°03.0'W		XBT
"	0408	980	39°28.0'N	24°18.0'W		XBT
"	0545	981	39°20.0'N	24°34.5'W		XBT
"	0732	982	39°12.7'N	24°52.1'W		XBT
"	1105		39°31.9'N	24°58.7'W		Dr3541
"	1310		39°43.7'N	25°08.1'W		Dr3547
"	1927	983	39°05.6'N	25°08.2'W		XBT
"	2052	984	38°57.8'N	25°25.5'W		XBT
"	2135	985	38°54.5'N	25°33.2'W		XBT
"	2221	986	38°50.3'N	25°41.4'W		XBT
"	2347	987	38°42.9'N	25°58.0'W		XBT
23.10.	1215	988	37°58.1'N	25°53.4'W		XBT
"	1312	989	38°03.5'N	25°43.0'W		XBT
"	1412	990	38°09.5'N	25°33.0'W		XBT
"	1503	991	38°15.0'N	25°22.4'W		XBT
"	1555	992	38°21.0'N	25°12.5'W		XBT
"	1650	993	38°26.1'N	25°02.0'W		XBT
"	1751	994	38°32.0'N	24°52.0'W		XBT
"	1848	995	38°37.9'N	24°42.2'W		XBT
"	1943	996	38°43.4'N	24°31.0'W		XBT
"	2038	997	38°49.1'N	24°21.0'W		XBT
"	2132	998	38°54.9'N	24°11.0'W		XBT
"	2233	999	39°01.4'N	24°00.0'W		XBT
"	2335	1000	39°06.8'N	23°49.5'W		XBT



R.V. 'POSEIDON' Cruise No. 93/2

20. Sep- 3. Oct. 1982



• CTD-Stations, x XBT-Stations

Fig. 8a: Location of XBT and CTD stations during the cruise P93/1



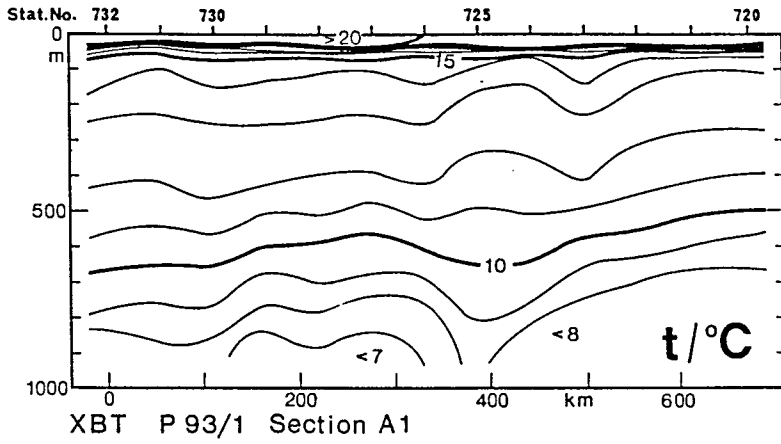


Fig. 9a

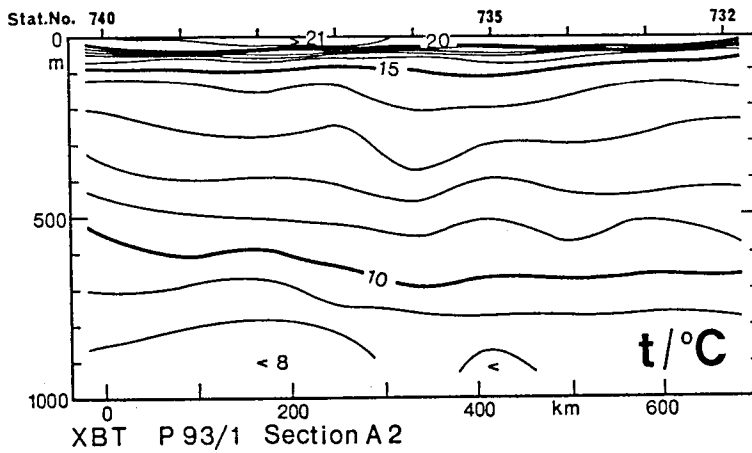


Fig. 9b

Fig. 9a,b: Vertical sections of temperature (XBT) along sections A1 and A2 from the cruise P93/1

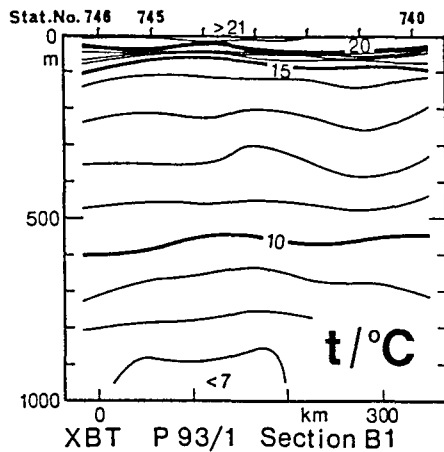


Fig. 10a

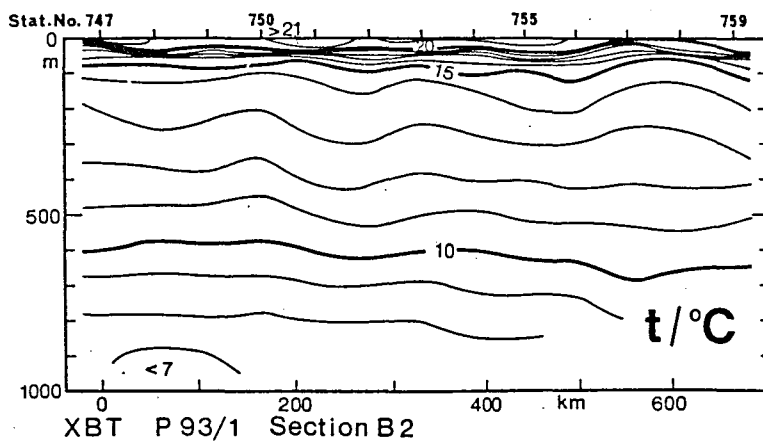


Fig. 10b

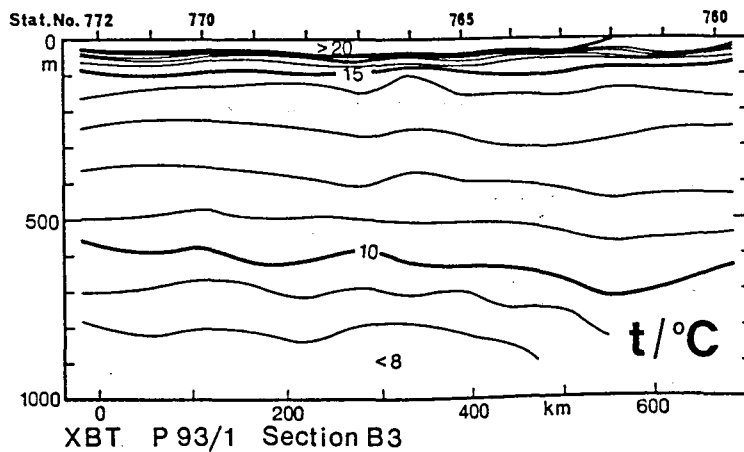


Fig. 10c

Fig. 10a-k: Vertical sections of temperature (XBT) along section B1 - B11 from the cruise P93/1

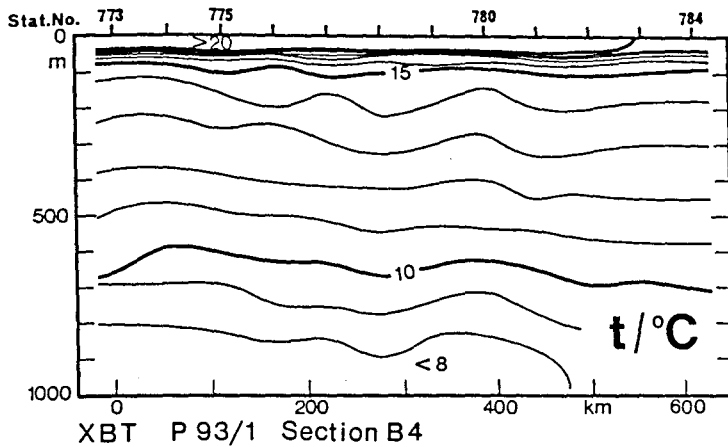


Fig. 10d

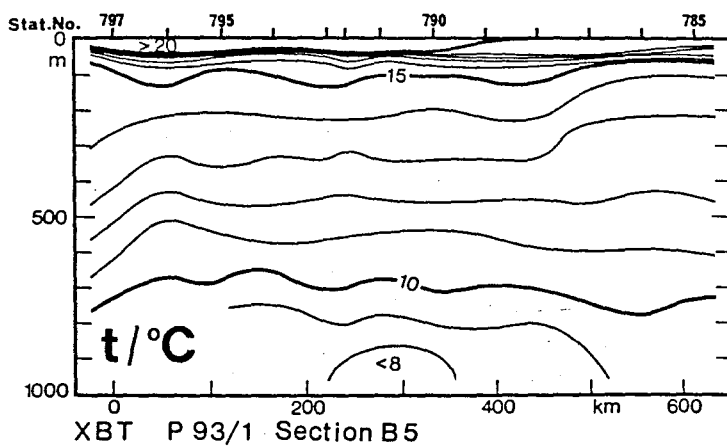


Fig. 10e

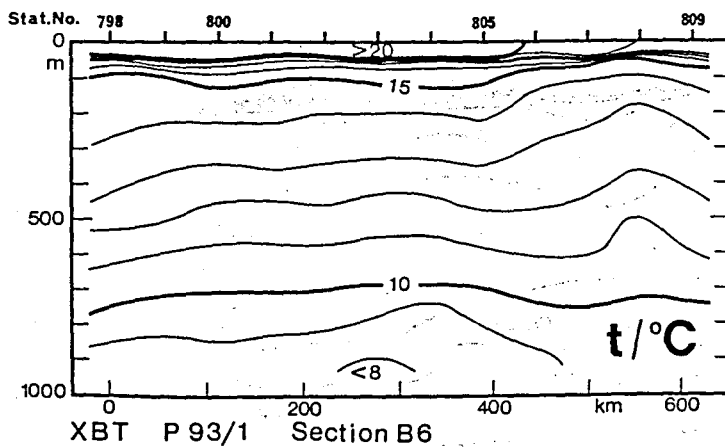


Fig. 10f

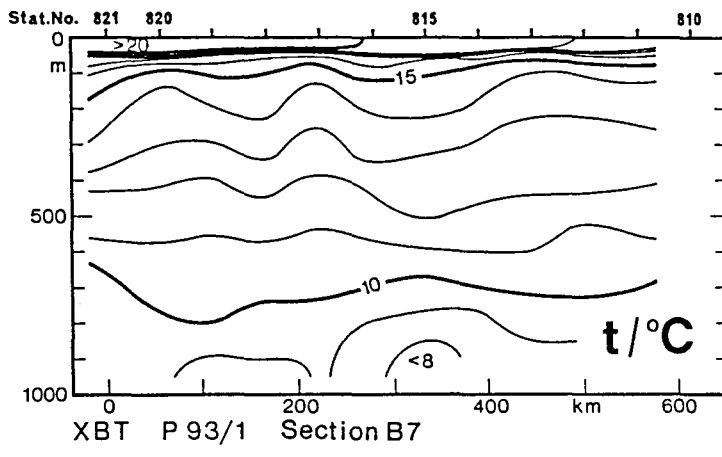


Fig. 10g

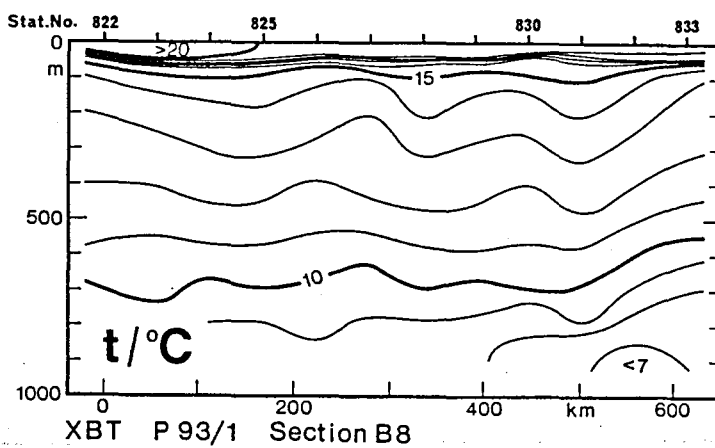


Fig. 10h

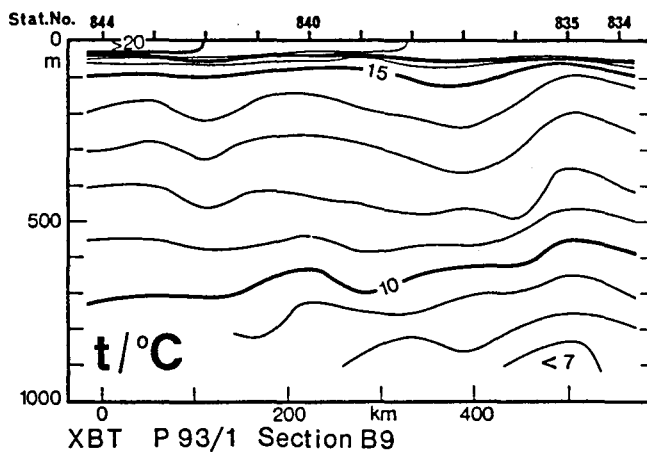


Fig. 10i

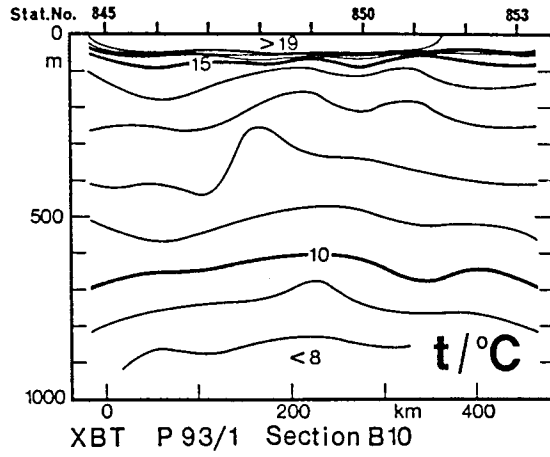


Fig. 10j

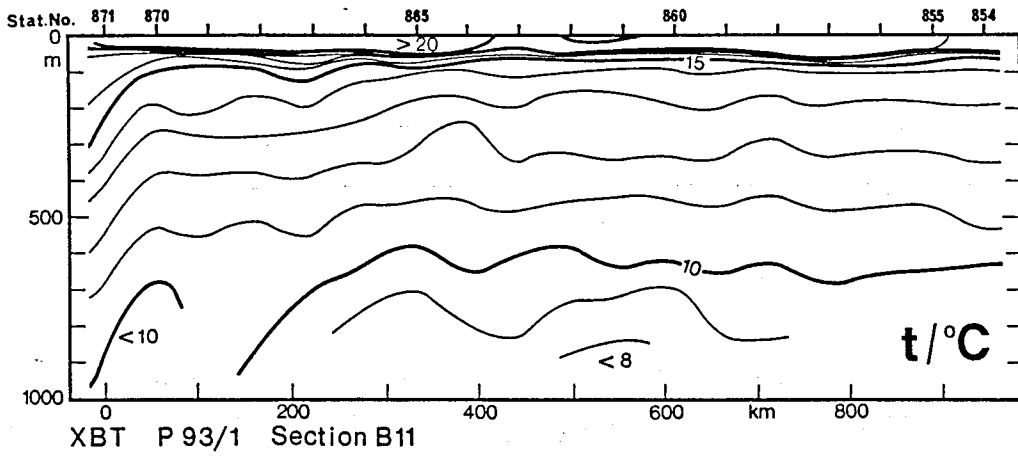


Fig. 10k

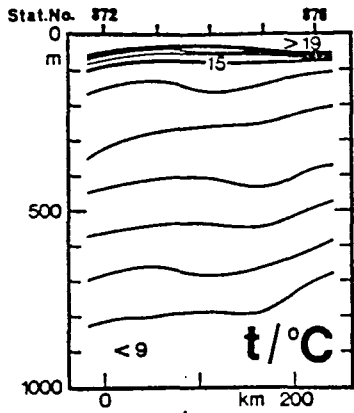


Fig. 11a

XBT P 93/2 Section C1

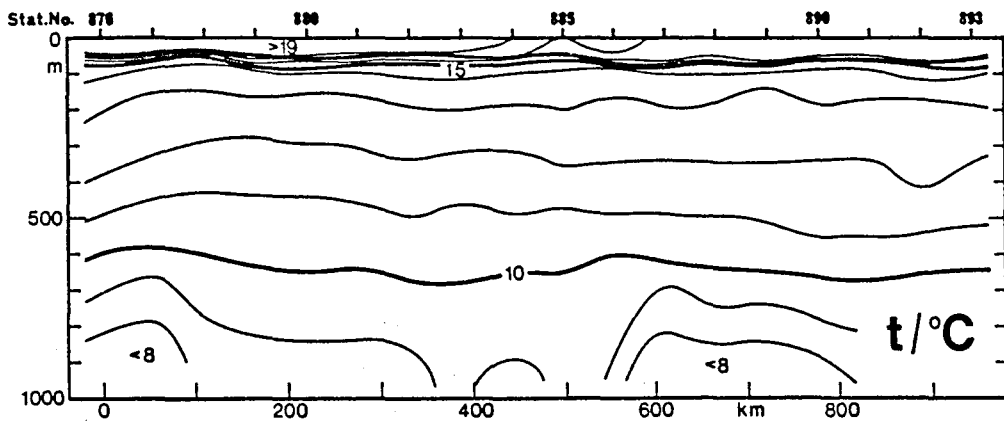


Fig. 11b

XBT P 93/2 Section C2

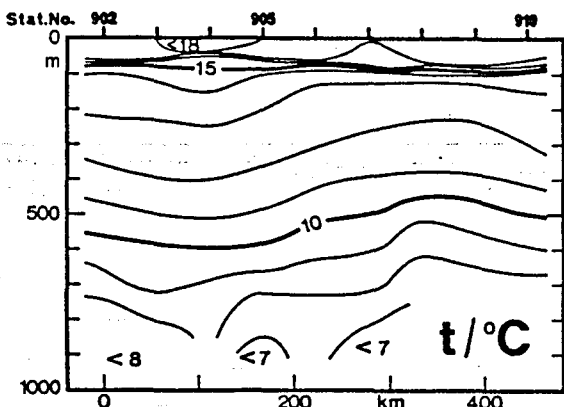


Fig. 11c

XBT P 93/2 Section C4

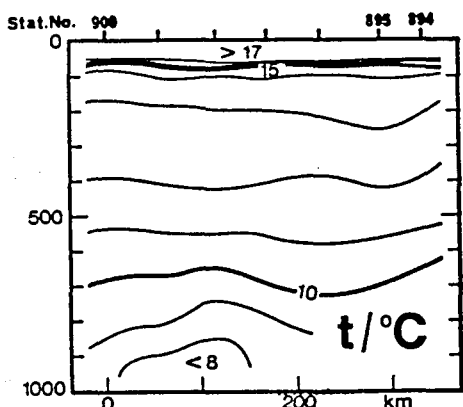


Fig. 11d

XBT P 93/2 Section C3

Fig. 11a-1: Vertical sections of temperature (XBT) along section C1-C12 from the cruise P93/2.



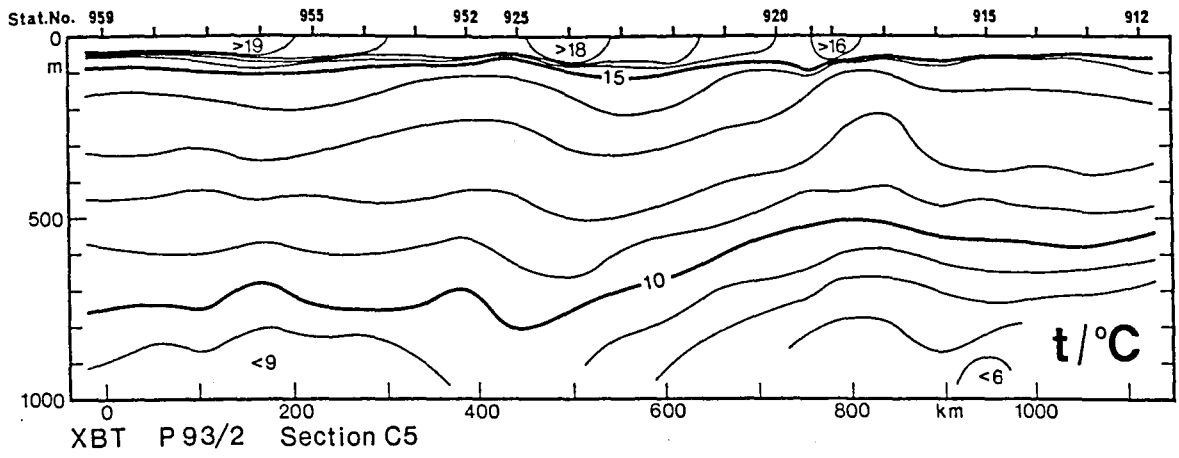


Fig. 11e

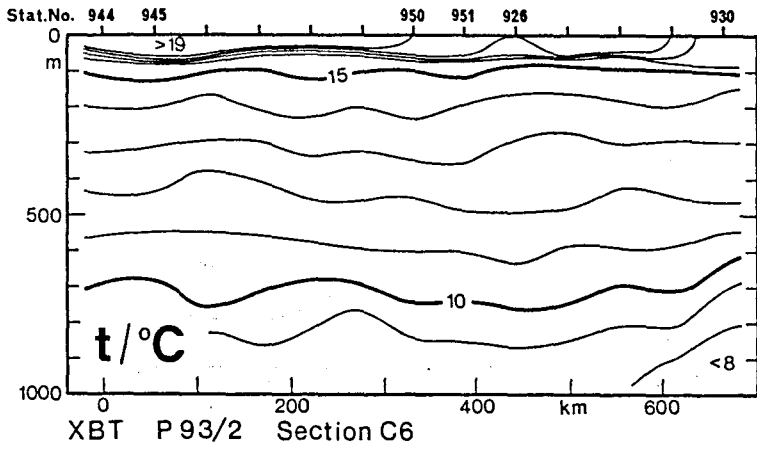


Fig. 11f

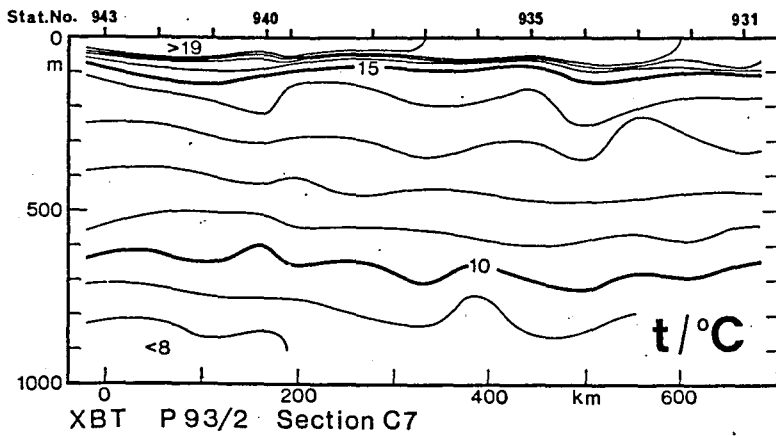


Fig. 11g

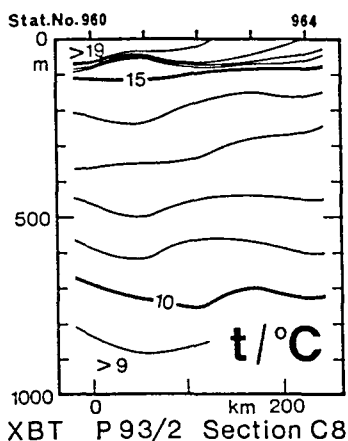


Fig. 11h

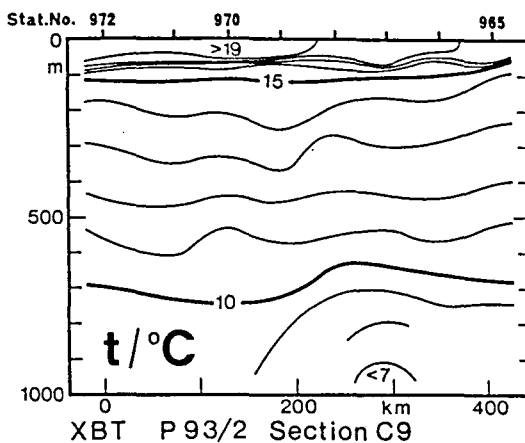


Fig. 11i

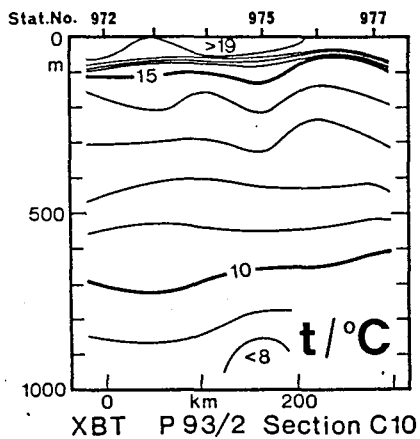


Fig. 11j

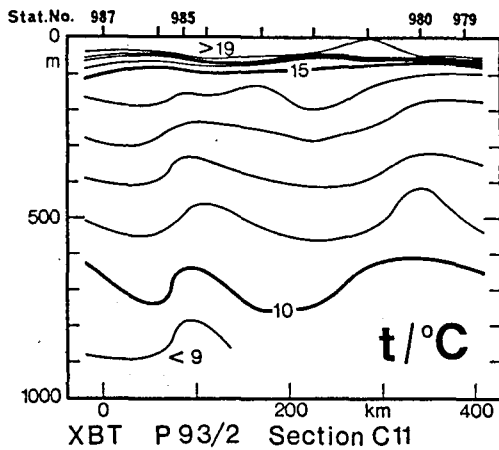


Fig. 11k

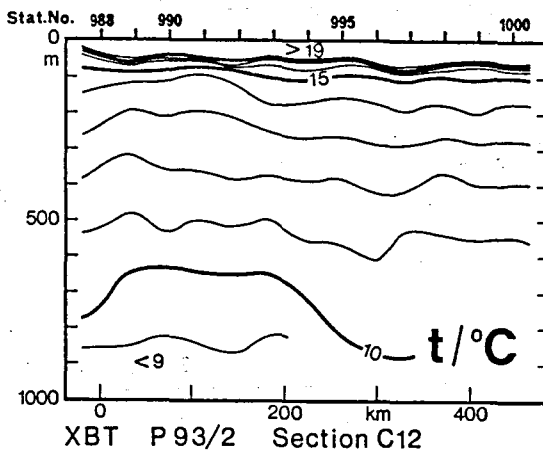


Fig. 11l

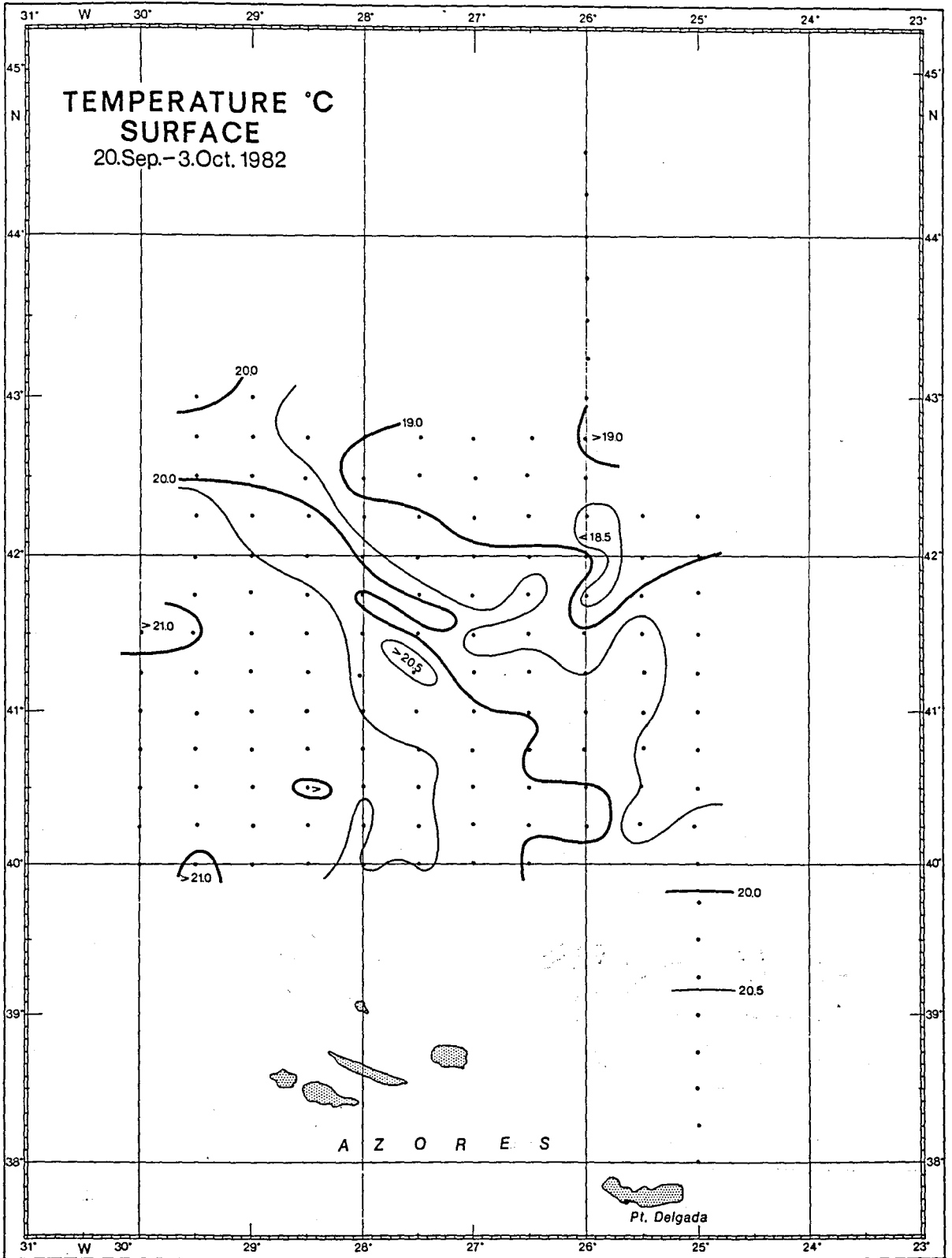


Fig. 12a,b: Horizontal distribution of temperature in 4 m depth during the cruise P93/1 and P93/2

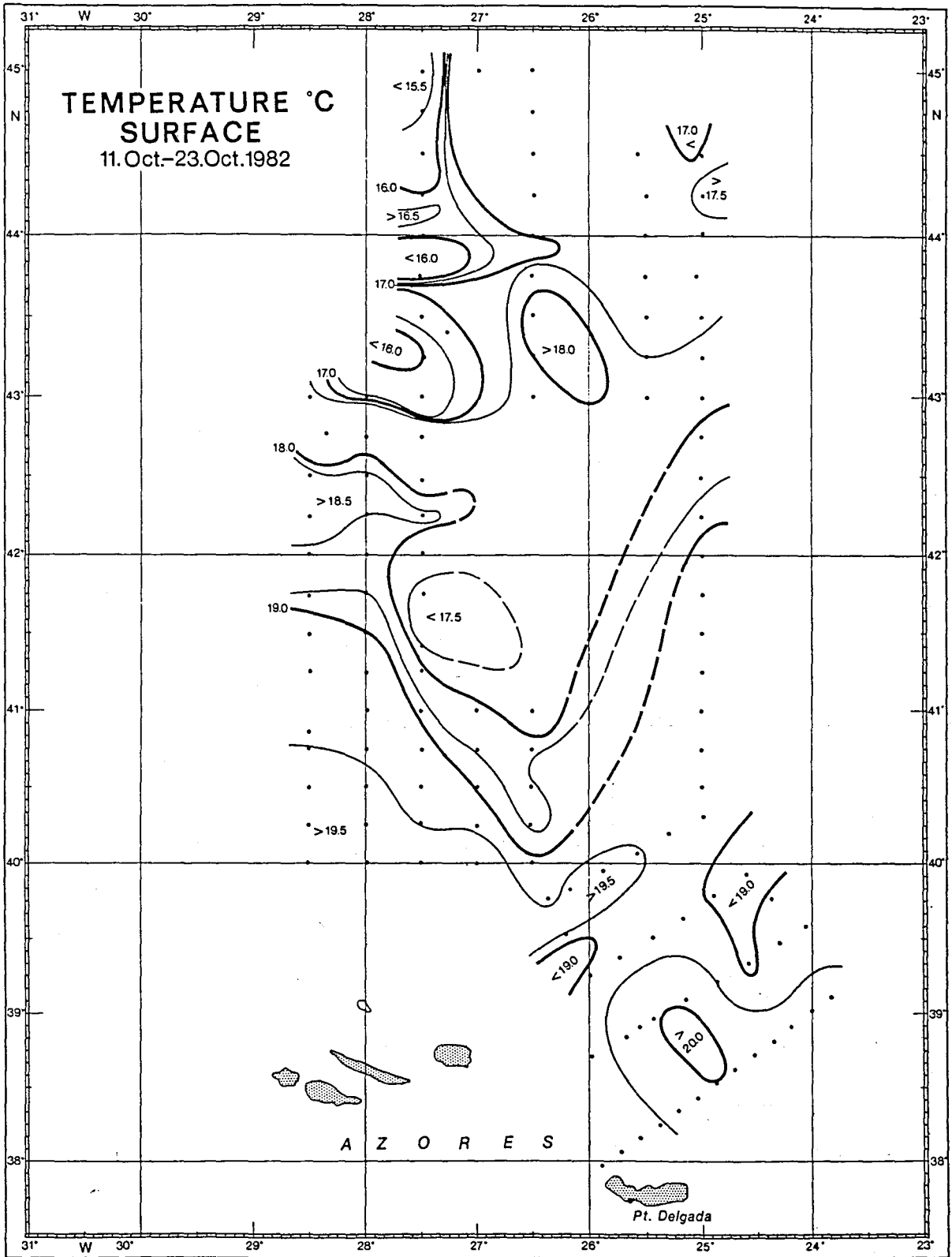


Fig. 12b

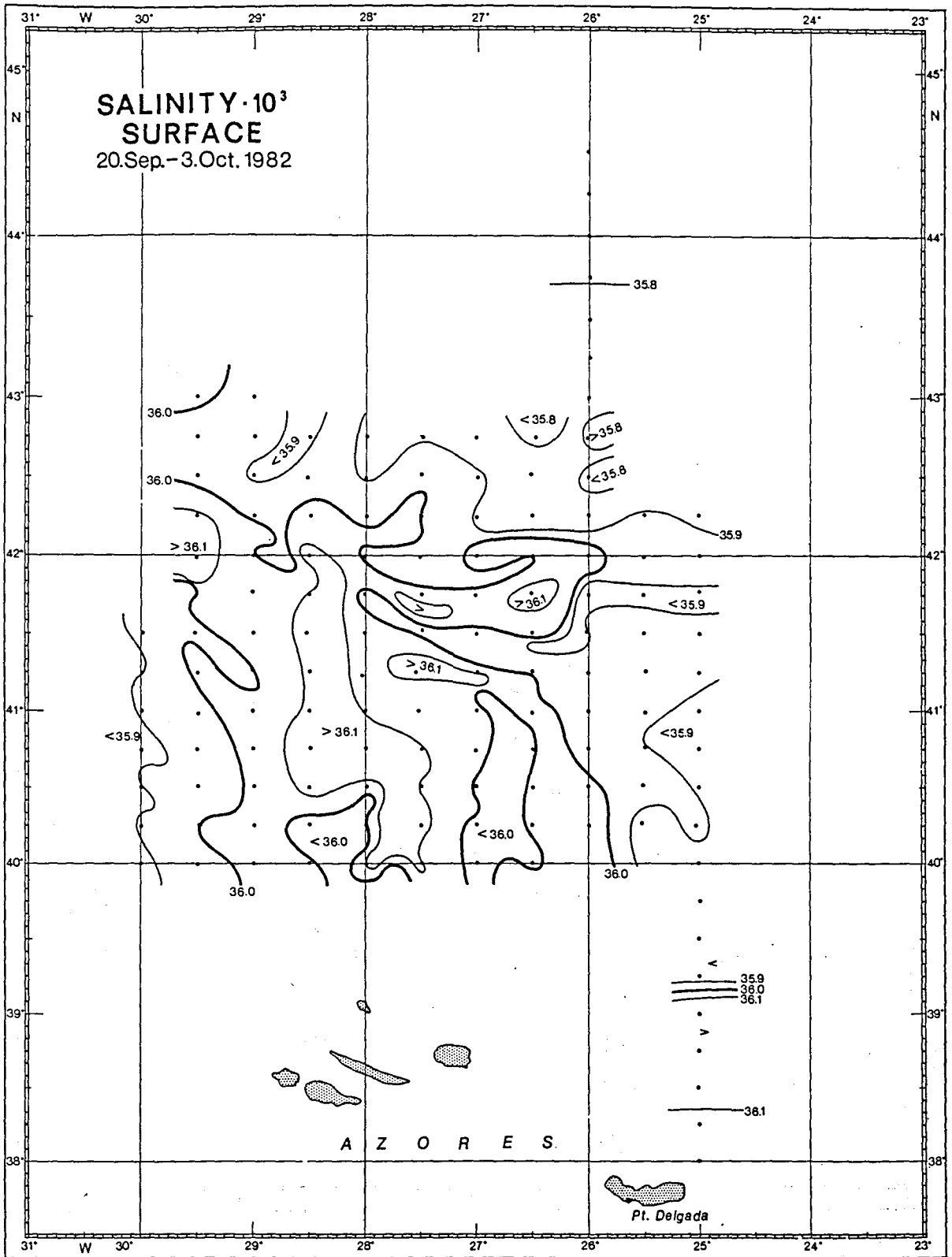


Fig. 13a,b: Horizontal distribution of salinity in 4 m depth during the cruise P93/1 and P93/2

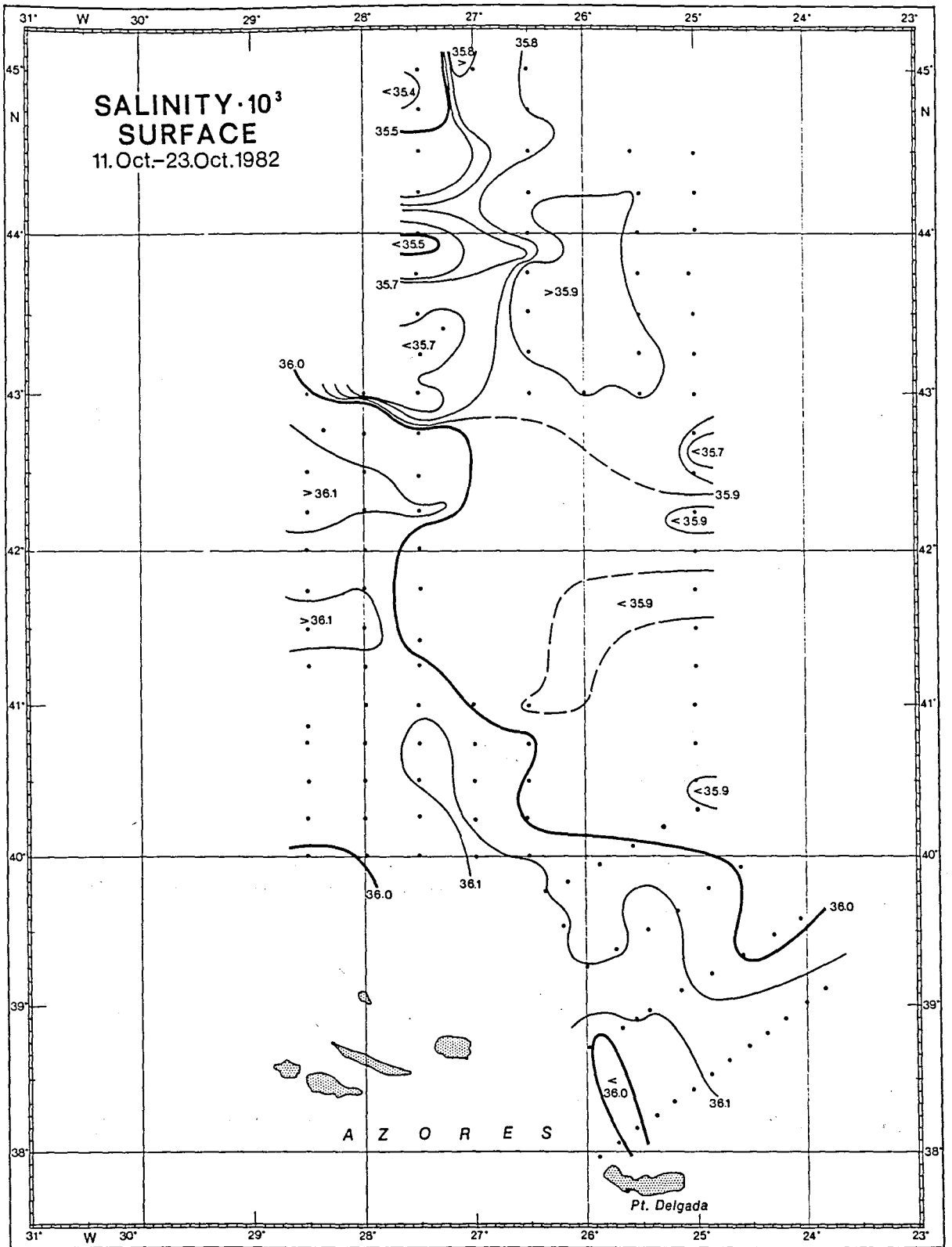


Fig. 13b

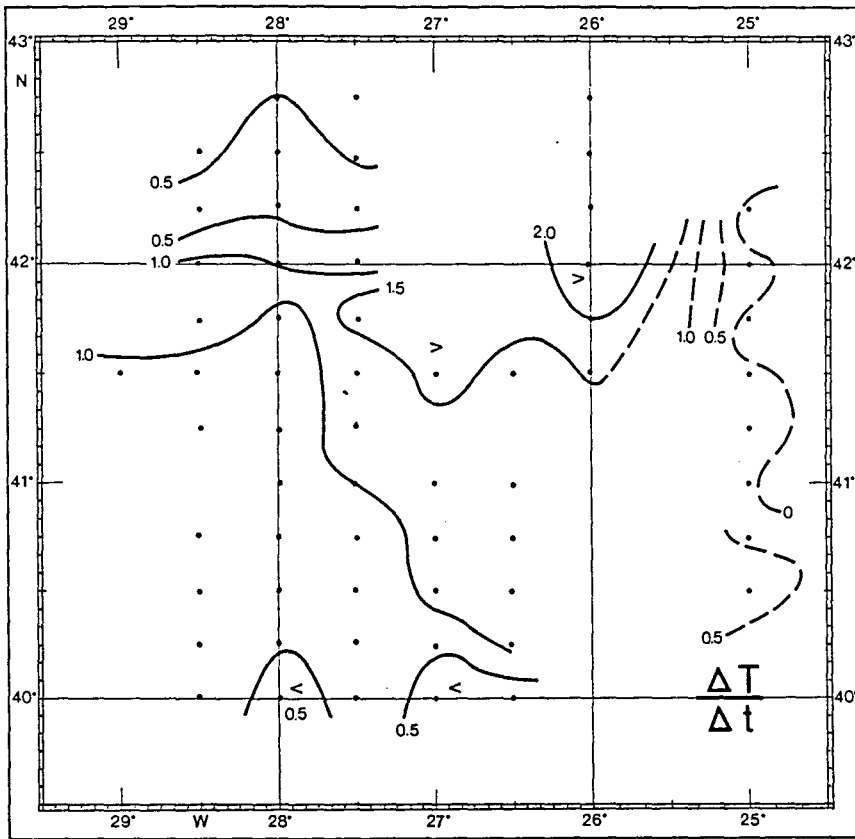


Fig. 14: Local time change of temperature in 4 m depth in  $10^{-6} \text{ K/s}$  calculated from the data presented in figures 12.

6.2 Currents

6.2.1 Drifting buoy tracks

6.2.2 Current meter time series



Drifter No.	Date	Begin Latitude (N)	Longitude (W)	Date	End Latitude (N)	Longitude (W)	Sensor	Drogue depth (m)
1304	05.03.82	25°59.3	38°11.1	18.03.83	18°15.2	63°19.2	T	100
1811	27.05.82	29°30.0	34°36.0	27.07.83	29°40.5	35°07.5	T	"
1812	27.05.82	28°30.0	24°12.0	-	-	-	T	"
1814	27.05.82	32°30.0	34°30.0	19.06.83	28°32.6	28°52.9	T	"
3506	27.09.82	40°30.7	27°30.0	20.10.82	39°20.6	25°49.1	-	"
3512	01.08.82	46°10.9	42°45.5	30.06.83	41°49.9	36°14.2	T	"
3513	12.04.82	34°57.2	24°25.0	30.06.83	30°31.6	35°29.2	T	"
3515	22.09.82	41°30.1	27°59.8	28.11.82	38°19.1	26°31.4	-	"
3517	22.09.82	41°30.3	29°00.1	04.04.83	45°18.8	23°51.1	-	"
3518	12.03.82	33°59.0	21°45.2	02.10.82	33°16.5	16°42.5	T	"
3519	05.03.82	33°12.5	21°52.9	18.07.82	28°32.7	25°39.7	T	"
3520	11.03.82	33°25.1	22°01.5	21.06.82	32°55.1	16°03.4	T	"
3520	14.10.82	45°00.4	27°00.7	22.02.83	48°13.7	23°51.7	T	"
3521	11.03.82	33°02.2	21°40.0	21.02.83	28°03.6	29°31.8	T	"
3522	01.08.82	46°10.7	42°45.5	30.06.83	44°32.3	14°50.7	T,P	"
3523	01.08.82	46°10.6	42°46.4	07.03.83	54°18.8	26°55.7	T,P	"
3524	01.08.82	46°05.3	42°54.6	30.06.83	44°43.7	18°56.6	T,P	"
3525	01.08.82	46°10.6	42°45.3	22.04.83	45°54.4	08°43.1	T,P	"
3526	11.11.82	48°21.8	43°18.5	30.06.83	53°41.1	18°43.3	T,P	"
3527	19.11.82	48°20.3	43°45.5	28.02.83	54°28.6	26°14.6	T,P	"
3528	19.11.82	48°21.2	43°18.0	30.06.83	57°16.6	15°57.2	T	"
3529	11.11.82	48°23.6	43°07.0	30.06.83	48°42.7	16°39.1	T	"
3530	20.11.82	48°20.4	42°57.3	30.06.83	51°25.8	30°47.2	T	"
3532	11.11.82	48°22.1	43°12.3	30.06.83	48°22.3	34°57.5	T	"
3533	20.11.82	48°20.2	42°49.8	30.06.83	55°52.3	20°06.5	T	"
3534	11.11.82	48°21.3	42°55.3	29.06.83	45°42.0	22°13.4	T	"
3535	20.11.82	48°22.1	43°09.4	30.06.83	58°19.0	23°02.8	T	"
3536	11.11.82	48°20.6	43°01.0	30.06.83	53°16.6	22°47.4	T	"
3537	19.11.82	48°19.7	43°26.6	30.06.83	52°15.9	20°50.6	T	"
3538	18.11.82	48°20.1	42°07.4	30.06.83	46°37.7	25°15.2	T	"
3539	26.09.82	42°29.3	28°28.7	25.12.82	39°36.3	21°33.8	T	"
3540	20.09.82	44°31.6	26°03.5	30.06.83	38°26.3	20°25.9	T	"
3541	22.09.82	41°29.4	26°01.4	21.10.82	39°33.1	24°59.2	T	"
3542	23.09.82	40°29.6	29°29.6	30.06.83	43°28.3	21°41.6	T	"
3543	21.09.82	43°30.4	25°59.6	22.06.83	38°26.8	16°49.0	T	"
3544	23.09.82	41°29.2	30°01.1	06.10.82	41°39.2	30°05.9	T	"
3545	24.09.82	42°30.1	29°30.1	30.06.83	35°57.0	24°29.8	T	"
3546	28.09.82	42°28.5	27°29.4	09.12.82	39°04.3	27°33.1	T	"
3547	22.09.82	41°29.9	27°00.1	21.10.82	39°43.6	25°07.6	T	"
3548	21.09.82	42°30.8	25°59.8	25.10.82	44°38.4	24°47.3	T	"
3551	29.09.82	40°28.7	26°28.7	21.10.82	39°17.8	24°58.0	-	"
3555	25.09.82	40°29.6	28°29.7	30.12.82	41°20.3	29°22.6	T	"
3556	30.09.82	42°27.2	26°22.8	31.05.83	38°11.2	22°13.8	T,P	"
3557	29.09.82	41°45.8	26°29.6	08.10.82	41°13.8	26°29.6	-	"

Table 3: Date and location of the beginning and the end of the tracks of satellite-tracked drifting buoys launched in 1982. The sensor column indicates if there was a sea surface temperature (T) or air pressure (P) sensor mounted.

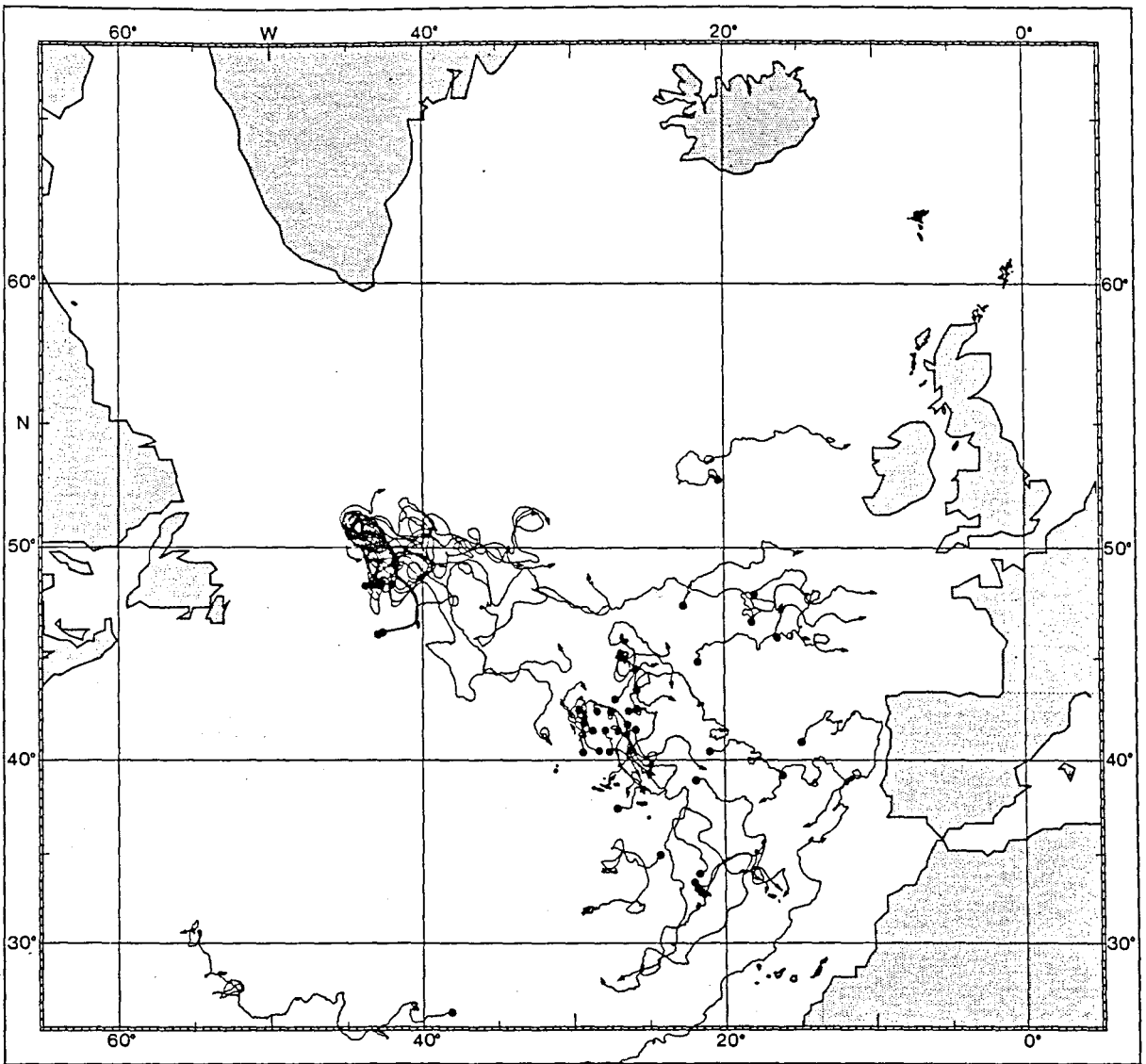


Fig. 15: The drifting buoy trajectories during 1982.

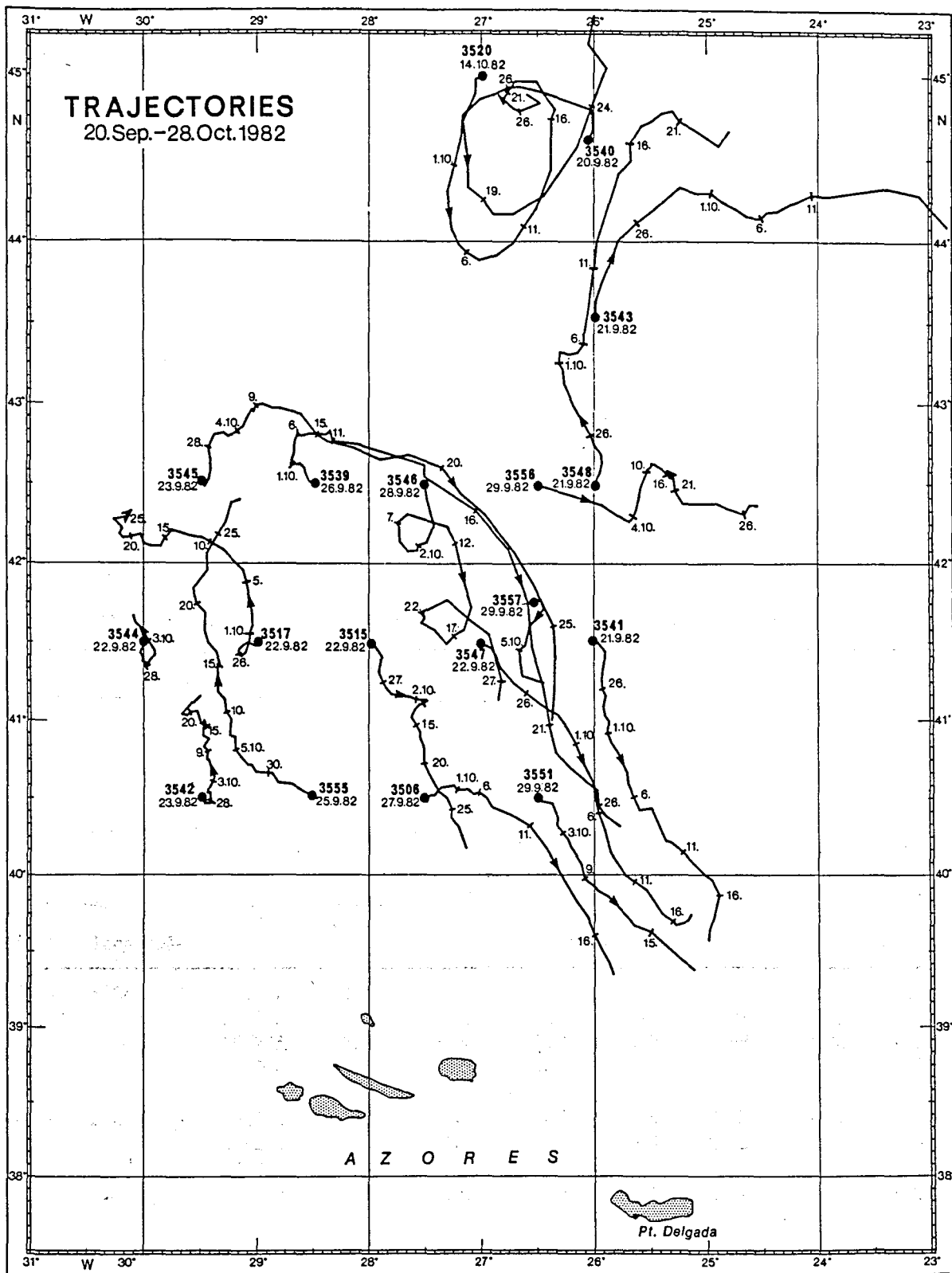


Fig. 16: The drifting buoy trajectories in the "hydrographic box" during the cruise P93/1,2.

Position		Water depth m	Mooring No.	Type of instrument	Instr. depth m	First value date & time	Last value date & time	Duration d	Record interval Δt min
48°33.3'N 26°04.5'W	3732	265201	265201	AVT	223	28.08.81 14.00	20.05.82 10.00	264.87	60 *
			265202	AVT	426	"	"	"	60
			265203	AVT	830	"	"	"	60
			265204	AVIT	2521	"	"	"	60
44°26.4'N 26°05.0'W	3167	266201	266201	AVIP	199	15.08.81 22.00	20.09.82 08.00	400.46	60
			266202	AV	402	"	"	"	60 **
			266203	AVT	806	"	"	"	60
			266204	AVIT	2497	"	"	"	60
52°41.8'N 31°01.1'W	3517	280101	280101	AVIP	229	11.08.81 10.00	18.05.82 12.00	280.13	60
			280102	AVT	432	"	"	"	60
			280103	AVIP	836	"	25.09.81 12.00	41.13	60

\* Rotor lost when mooring was laid

\*\* Rotor lost 6.10.81, 13.00

AVT = Aanderaa Current meter with thermistor  
 AVIT = Aanderaa current meter with thermistor with two ranges  
 AVIP = Aanderaa current meter with thermistor and pressure sensor

Table 4: Observation periods of current meter moorings

Position		Mooring No.	Instrument depth m	U	$\sigma_U$	V	$\sigma_V$	T	$\sigma_T$
Latitude	Longitude				cm s <sup>-1</sup>			°C	
48°33.3' N	26°04.5' W	265201	223	-	-	-	-	11.97	0.62
		265202	426	-0.10	10.07	1.77	8.36	10.49	0.58
		265203	830	-0.47	5.44	1.55	4.98	5.98	0.57
		265204	2521	-1.38	2.28	0.47	3.04	3.18	0.37
44°26.4' N	26°05.0' W	266201	199	2.61	11.91	1.79	12.82	12.91	0.36
		266202	402	-2.49	2.72	-0.09	2.62	-	-
		266203	806	1.18	6.95	1.77	8.96	8.01	1.17
		266204	2497	-0.67	2.98	0.45	2.89	3.14	0.06
52°41.8' N	31°01.1' W	280101	229	13.35	8.05	1.12	6.33	4.75	0.74
		280102	432	12.42	7.44	0.96	5.22	4.10	0.35
		280103	836	9.89	4.94	-0.31	4.66	3.82	0.15

Table 5: Simple statistics of moored instruments time series

Fig. 17a

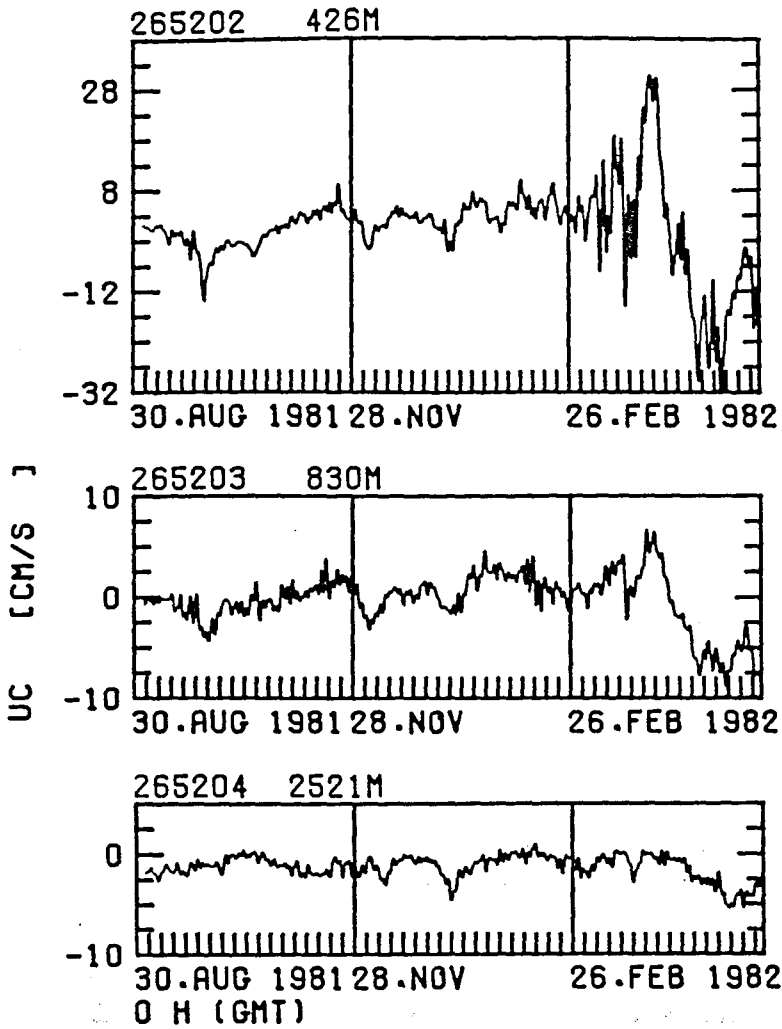


Fig. 17b

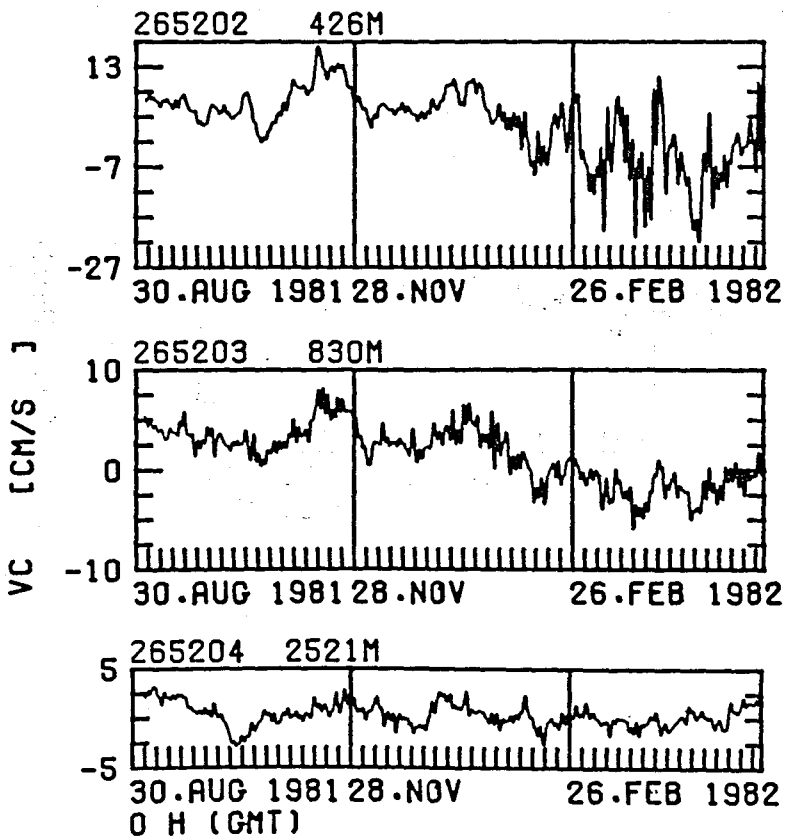


Fig. 17a-c: Time series of the U-component (positive to the east), the V-component (positive to the north) and the temperature of the current meter array 265/2.

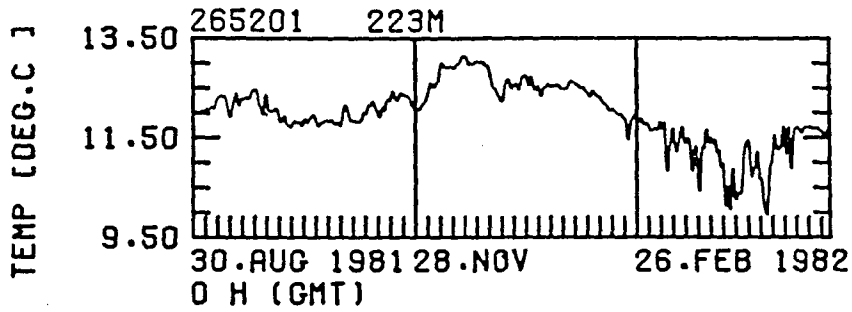


Fig. 17c

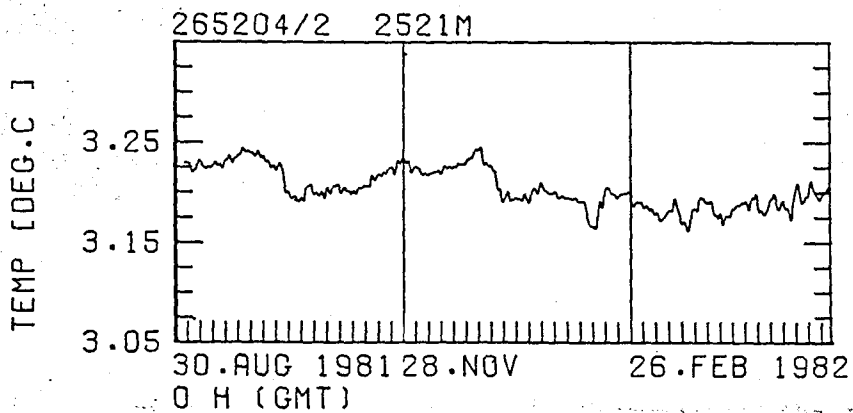
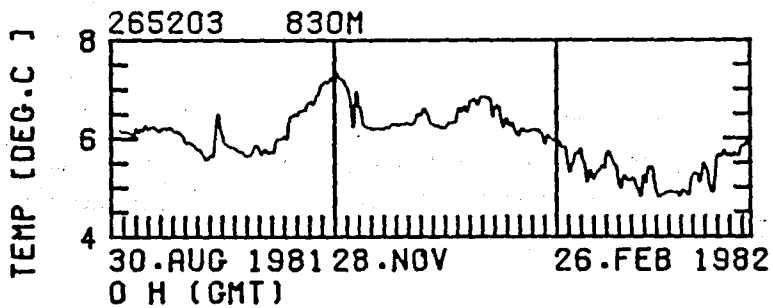
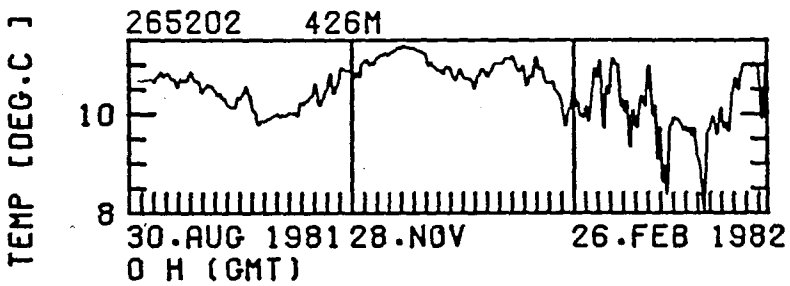


Fig. 18a

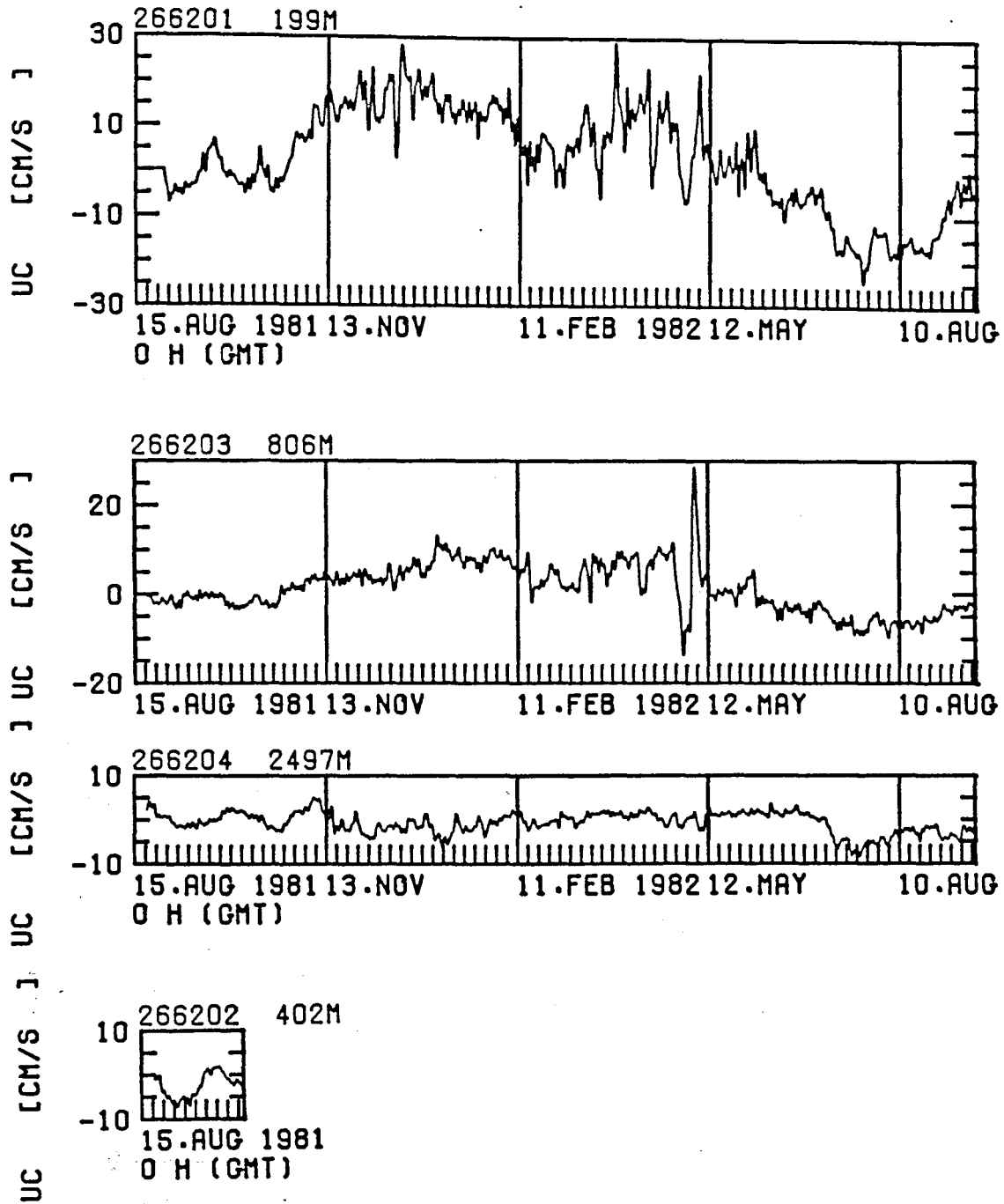


Fig. 18a-d: Time series of the U-component, the V-component, the temperature and the pressure of the current meter array 266/2.

Fig. 18b

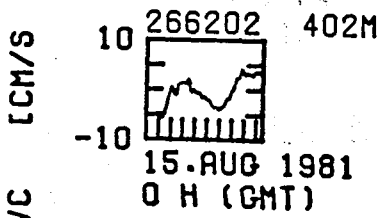
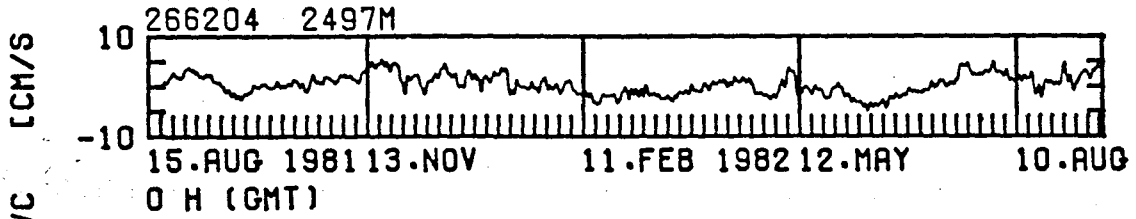
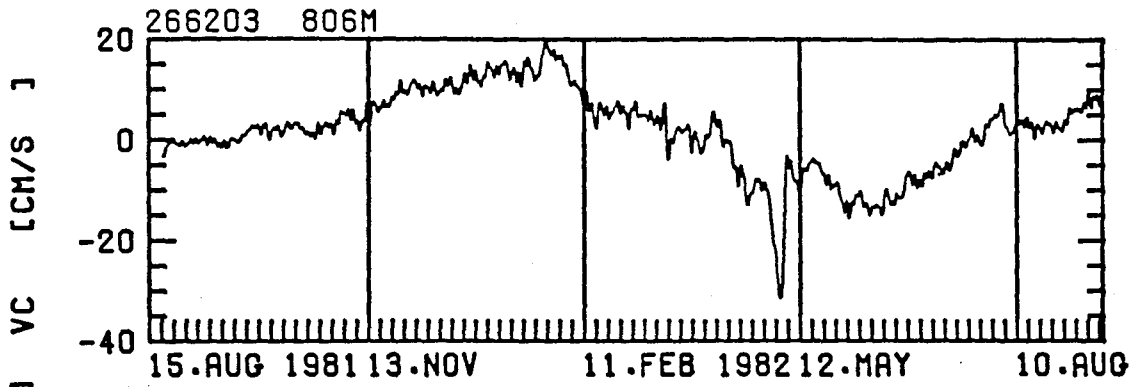
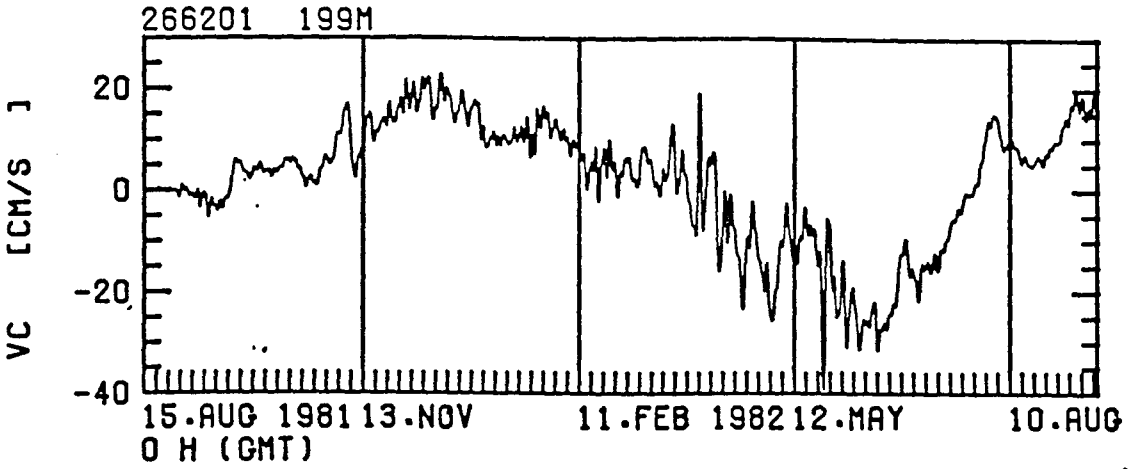




Fig. 18

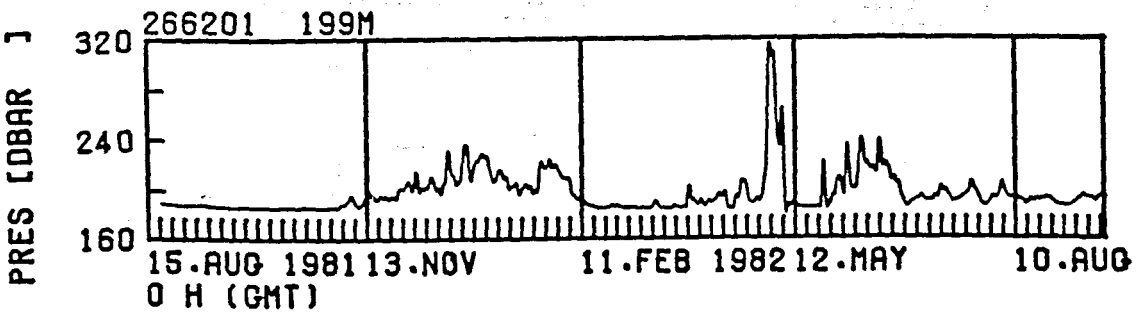
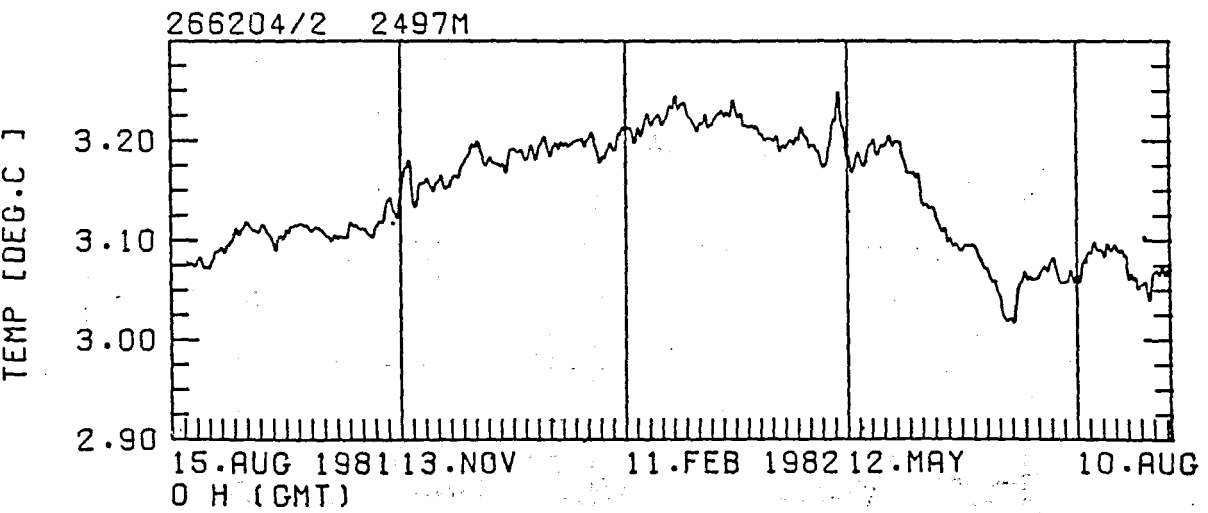
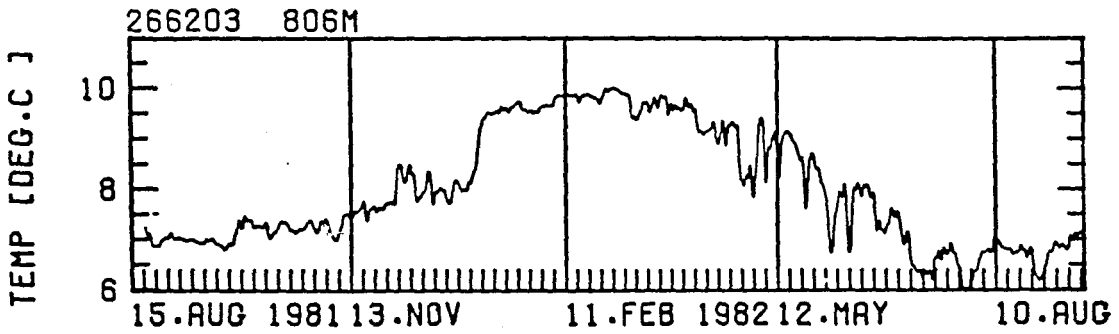
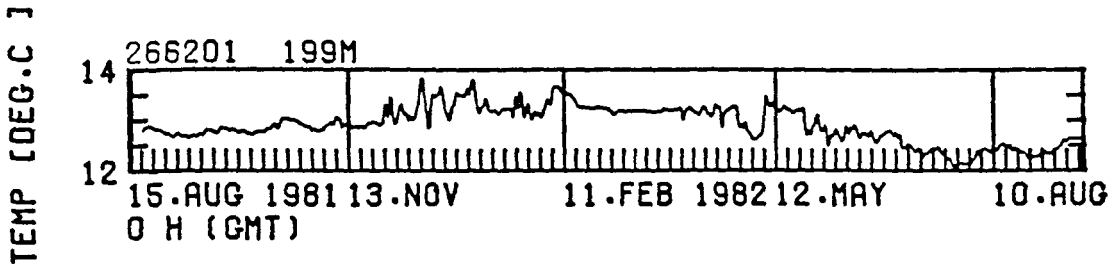


Fig. 1

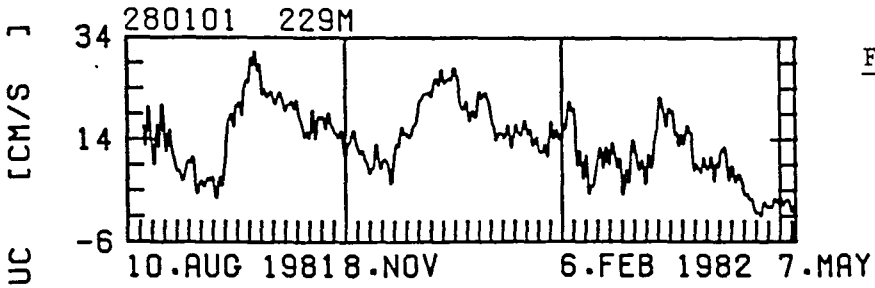


Fig. 19a

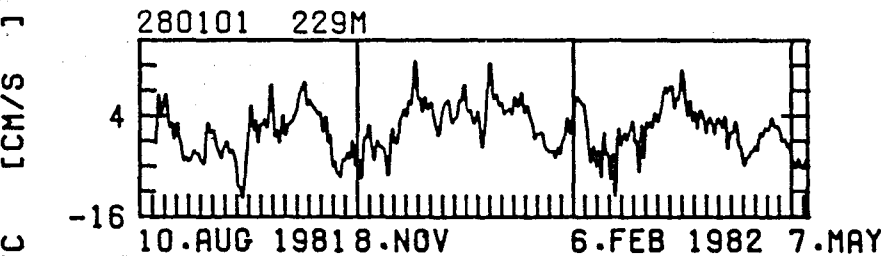
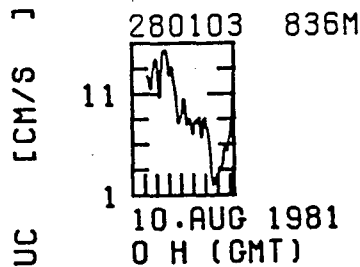
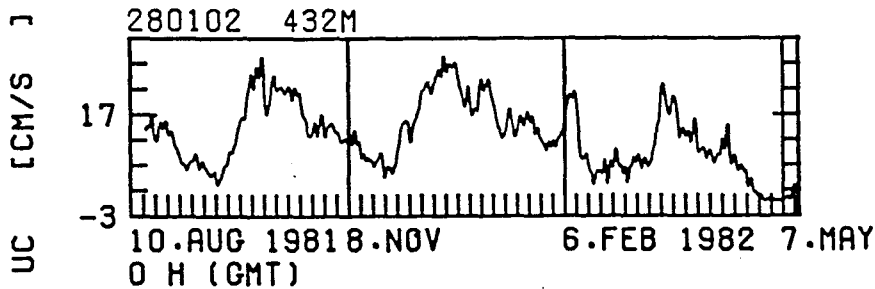


Fig. 19b

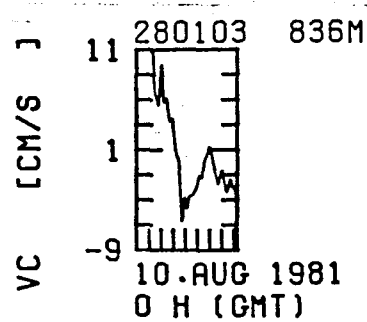
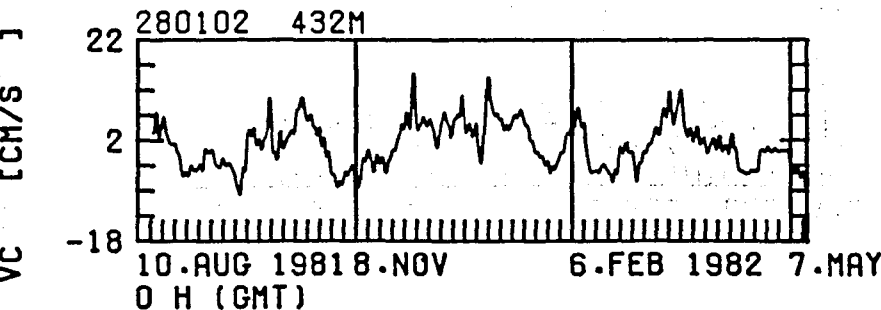


Fig. 19a-d: Time series of the U-component, the V-component, the temperature and the pressure of the current meter array 280/1

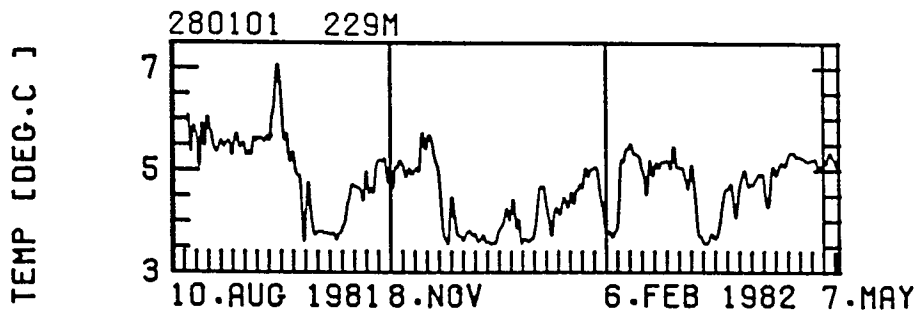


Fig. 19c

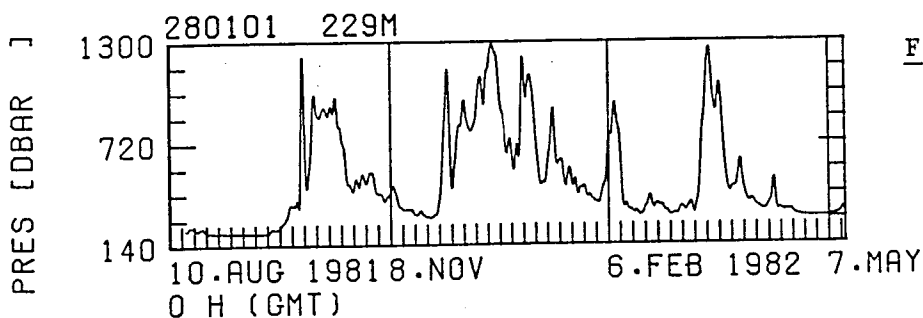
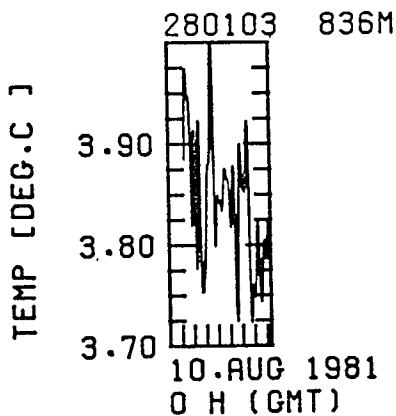
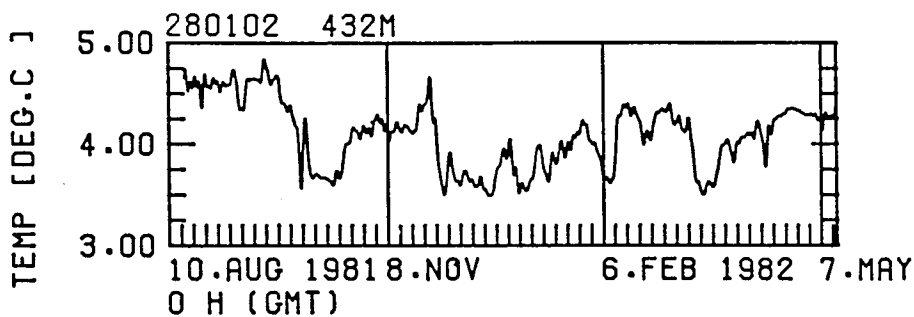
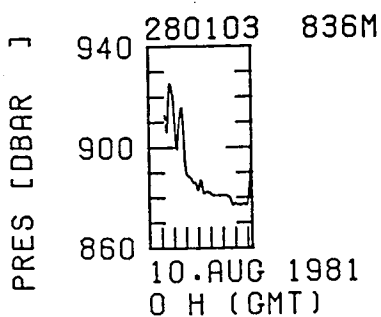


Fig. 19d



## 7. Abbreviations

### Code used in station lists

MS	Multisonde-CTD
IAP	Multisonde CTD of the Institute of Applied Physics, Kiel
V xyz	Current meter mooring "xyz"
NS	Nansen cast series
NB	Nansen bottle
Dr	Satellite-tracked drifting buoy

### Code used in vertical sections and time series

GFZ	Gibbs fracture zone
FFZ	Faraday fracture zone
MFZ	Maxwell fracture zone
KFZ	Kurchatov fracture zone
UC	U-component (positive to the east)
VC	V-component (positive to the north)

## 8. Acknowledgements

Numerous people have contributed to the results presented in this report. We appreciate their help even if it is not possible to mention everyone.

We are very grateful to the masters and their crews on the various ships which participated in this programme.

D. Carlsen, G. Dorn and U. Hueninghaus prepared all the moorings, P. Meier the various Multisonde systems. On board RV "Poseidon" J. Holtorff ran the computer system. K.H. Prien and D. Sperling supported the work at sea and H.H. Hinrichsen analysed the water samples. Frau Trier and G. Rohardt helped us with the data processing. Frau Oelrichs, Frau Petersen, and Herr Eisele provided the drawings. Frau Mempel carried out the photographic work. Frau Schuster typed the manuscript.

The work was supported by the Deutsche Forschungsgemeinschaft.

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