Berichte aus dem
Institut für Meereskunde
an der
Christian-Albrechts-Universität Kiel
Nr. 23

Overflow '73 - Data report "Meteor" and "Meerkatze 2"

by

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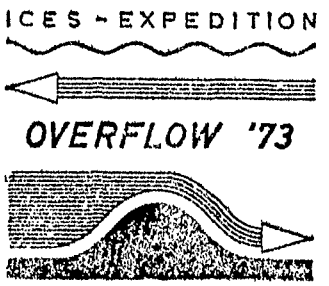
DOI 10.3289/IFM_BER_23



Overflow '73-Expedition Contribution No. 11

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1. Introduction

This report is a graphical presentation of selected oceanographical data which were obtained by the German research vessel "Meteor" and the fishery protection vessel "Meerkatze 2" during the international ICES-Overflow '73 expedition in August/September 1973. Only those data were selected that could be combined into meaningful sections or time-series to elucidate the spatial scales and the time scales of the hydrographic field in the area between Iceland and the Faroes. A full account of the type and the number of observations is given in the "Overflow '73 Inventory" - ICES Oceanographic Data Lists and Inventories No. 29, 1976. The data itself can be made available by: Deutsches Ozeanographisches Datenzentrum (DOD), Bernhard-Nocht-Straße 78, 2000 Hamburg 4, or by the authors.

2. Data Reduction

2.1 CTD-Data

The instrument used on board R.V. "Meteor" was the Kieler Multisonde (KROEBEL, 1973) which measured pressure P, temperature T and conductivity C, sound velocity V and light attenuation A at a sampling rate of 1 sec. A total of 253 profiles of T, S, C and V interpolated to 5 dbar intervals are available. Light attenuation A is only available for part of the profiles due to calibration problems. Some information about the quality of the data is given in table 1. For more details see the following sections 2.1.1 and 2.1.2.

2.1.1 Measuring procedure

The Multisonde was lowered at a minimum speed of 1 m/s and a maximum speed of 10 m/s. All data including real time calculated salinity were digitally stored on magnetic tape and/or papertape; for a quick look on board, profiles of T and S were plotted. In order to obtain data for an in-situ calibration of the Multisonde a Nansen-bottle was put 1 1/2 m above the Multisonde on some stations during the first cruise leg. From the second leg calibration data are available from hydrocasts taken immediately after the Multisonde-profile.

2.1.2 Processing and Calibration

i) Due to failures of the magnetic tape unit the following 19 stations are only available as plots of T and S versus pressure P: 51, 70, 86, 88, 90, 96, 97, 98, 99, 99A, 100, 101, 102, 104, 105, 110, 111, 156, 201. Those plots were digitized half-automatically with a sampling rate of about 4 dbar ± 1 dbar and statistical errors in T and S of ± 0.03°C and ± 0.01°/oo respectively. As a next step the data were interpolated linearly to 5 dbar intervals, errors in digitization were removed and each profile was linearly corrected to fit the one-point Nansen-bottle data.

ii) In a first treatment of the other 234 profiles, T and C were calibrated linearly by the method explained in iii), while P, S, V and A remained unchanged. Next, spikes in P and T were recognized by hand as well as automatically (single spikes). The discrimination-intervals were 5 dbar and 0.1°C. Cycles with a T-spike were linearly interpolated and cycles with a P-spike were omitted. Since the time constant of the assumingly linear response of the temperature sensor is much larger than that of the conductivity sensor a linear correction to T was applied for the i-th cycle using a difference-scheme for Newton's law:

$$T_{i\ corr} = T_i + (T_i - T_{i-1}) * K / \Delta t$$

The calculation started with i = 2 and $T_{1\ corr} = T_1$ and used $\Delta t = 1$ s as the sampling-interval and K = 150 ms as the time-constant. In a second run, once more cycles with single spikes in P or T were removed or interpolated (discrimination-intervals now 5 dbar, 0.05°C). Then S was recalculated according to a method described by FOFONOFF et. al. (1974) and cycles with single spikes in S (discrimination-interval 0.05°/oo) were

omitted. In a third treatment Sigma-T was calculated optionally and a running mean over approximately twice the chosen P-interval was applied before interpolating linearly to this interval.

iii) The method of calibrating T and C was to take pairs of "true" calibration points (P, T) and (P, C) from Nansen-bottles and to compare them with corresponding pairs (P_M, T_M) and (P_M, C_M) from the Multisonde. P was found by combining protected and unprotected reversing thermometers on the Nansen-bottle; C was recalculated from P, T and salinometer-measured S. Assuming P and P_M to be correct it turned out that for both temperature and conductivity there exist 3 point clusters with a total of 80 pairs (T, T_M) and 48 pairs (C, C_M) for calibration. They represent the homogeneous surface layer, the North Atlantic Deep Water with weak gradients in T and S and Norwegian Sea Deep Water with very weak gradients in T and S. The point clusters were reduced to 3 points by calculating means. A least square fit for these values then resulted in:

$$T_{corr} = 1.00008\ T_M - 0.019^{\circ}C$$

$$C_{corr} = 1.00096\ C_M - 0.080\ mmho/cm$$

For calibration errors see table 1.

2.2 Hydrographic casts

Whenever hydrographic casts were carried out, non-metal reversing bottles were used (TPN-Water Sampler). Temperatures were determined by standard reversing thermometers, applying the standard corrections. Salinity was determined onboard from one sample each using a Beckmann RS 7B inductive salinometer. The measurements were referred to Copenhagen Standard Sea Water and converted by means of the UNESCO-Tables. Nutrient analysis (only "Meteor") was carried out on board by feeding the samples into an auto-analyser. Sugawara standards were used as reference. With respect to the methodology reference is given to the "New

Baltic Manual" - ICES Cooperative Research Report, Ser. A, No. 29.

2.3 Expandable Bathythermograph

Temperature soundings were obtained using the Plessey-XBT system with probes for a depth range from 0 to 750 meters. The depths of each 0.5°C-Isotherme was read from the analogue-record immediately after each drop. No corrections were applied since several comparisons with a shipmounted, calibrated thermograph did not reveal any systematic temperature deviations.

2.4 Current meters and temperature recorders

Two types of current meters were used: The Geodyne Model 102 film-recording instrument and the Bergen RCM-4 (Aanderaa) instrument. The 11-channel temperature recorders (TR 4) used in several moorings are those manufactured by Aanderaa, Bergen/ Norway. All instruments were deployed from subsurface floats to avoid noise induced by sea surface motions. The data transfer onto computer-compatible magnetic tape was achieved in the following way: The Geodyne films were read by the data service of the manufacturer. The product, a listing of calibrated current speed and direction, was hand-edited and punched at the German Hydrographic Institute. A subsequent handling on the computer consisted of correcting the direction for the local magnetic anomaly, of east-west component decomposition and of linear interpolation for an exact 10.0 minute interval. The last procedure was necessary to account for the (known) deviations of the mechanical timer clock from a pre-set 10 minutes interval. The magnetic tapes from the Aanderaa-instuments were read onto punched paper tape and re-read onto computer-magnetic tape, including calibration, raw-editing and component decomposition. No interpolation for exact 10 minute intervals were necessary since all instruments were equipped with crystal clocks and the actual number of data cycles on full-length recordings did not deviate by more than $\pm$ 1 from the expected amount. Obvious errors in the recordings, like e.g. spikes within the speed range or the temperature range set for raw-editing, were removed by hand after inspection of time-series plots.

In general, the data-return from the Bergen instruments was

not too good. One reason was a batch of unsuitable magnetic tapes, that tended to stick to the head of the instrument's tape recorder. No attempt was made to evaluate those records where the tape transport was incorrect.

2.5 Acknowledgement

The authors acknowledge the financial support of the Deutsche Forschungsgemeinschaft to compile this data report. Thanks are due to several members of the graphical staff at the Institut für Meereskunde for the final drawing and the reproduction of the figures.

2.6 References

FOFONOFF, N.P., S.P. HAYES and R.C. MILLARD (1974): W.H.O.I./Brown CTD Microprofiler: Methods of Calibration and Data Handling. W.H.O.I. Technical Report Ref. No. 74-89 (Unpublished manuscript)

KROEBEL, W. (1973): Die Kieler Multimeeressonde - Ein Gerät zur in situ-Messung von Temperatur, Leitfähigkeit, Salzgehalt, Schallgeschwindigkeitsgradient und lichtoptischer Attenuation mit ersten Ergebnissen der "Meteor"-Fahrt Nr. 23 (1971) westlich von Gibraltar. Meteor Forsch.-Ergebn. A, 12, 53-57

Type of error	Temperatur °C	Errors in Conductivity mmho/cm	Pressure/ dbar	Salinity/ °/oo	Sigma-T
a) instrumental					
- sensor noise	± 0.01	± 0.01	± 2.5		
- digitization noise	± 0.01	± 0.01	± 1		
- systematic	removed by calibration		unknown	unknown	unknown
b) calibration sensor					
- noise	removed by mean values in clusters				
- systematic	less | ± 0.002 |[4]	less | - 0.02 |[2]	no calibration		
c) calibration					
- mean error	- 0.005	- 0.005		- 0.003	
- standard deviation of mean error	± 0.003	± 0.003		± 0.004	
d) error after calibration					
- noise	± 0.014	± 0.014	± 2.5	± 0.03	± 0.045
- systematic	less | ± 0.002 |	less | - 0.02 |	unknown		
e) final data after 9-time running mean					
- noise	± 0.005	± 0.005	± 0.6	± 0.01	± 0.005
- systematic	less | ± 0.002 |	less | - 0.02 |	unknown		

1) 10 different thermometers were used and in most cases two of them represent one value of a total of 80 calibration points

2) 48 calibration points were obtained using one salinometer

Table 1: Quality of Multisonde-data during Overflow '73

3. Graphical presentation of data

This part consists of four sections: A series of hydrographic sections that cover the total area of investigation, a series of small scale hydrographic sections from the central crest zone of the Iceland-Faroe ridge, a number of XBT-sections and a part displaying the time series of currents and temperatures obtained from moored instruments. Each section and its subsections are preceded by a page containing the technical information pertinent to the following graphs. -

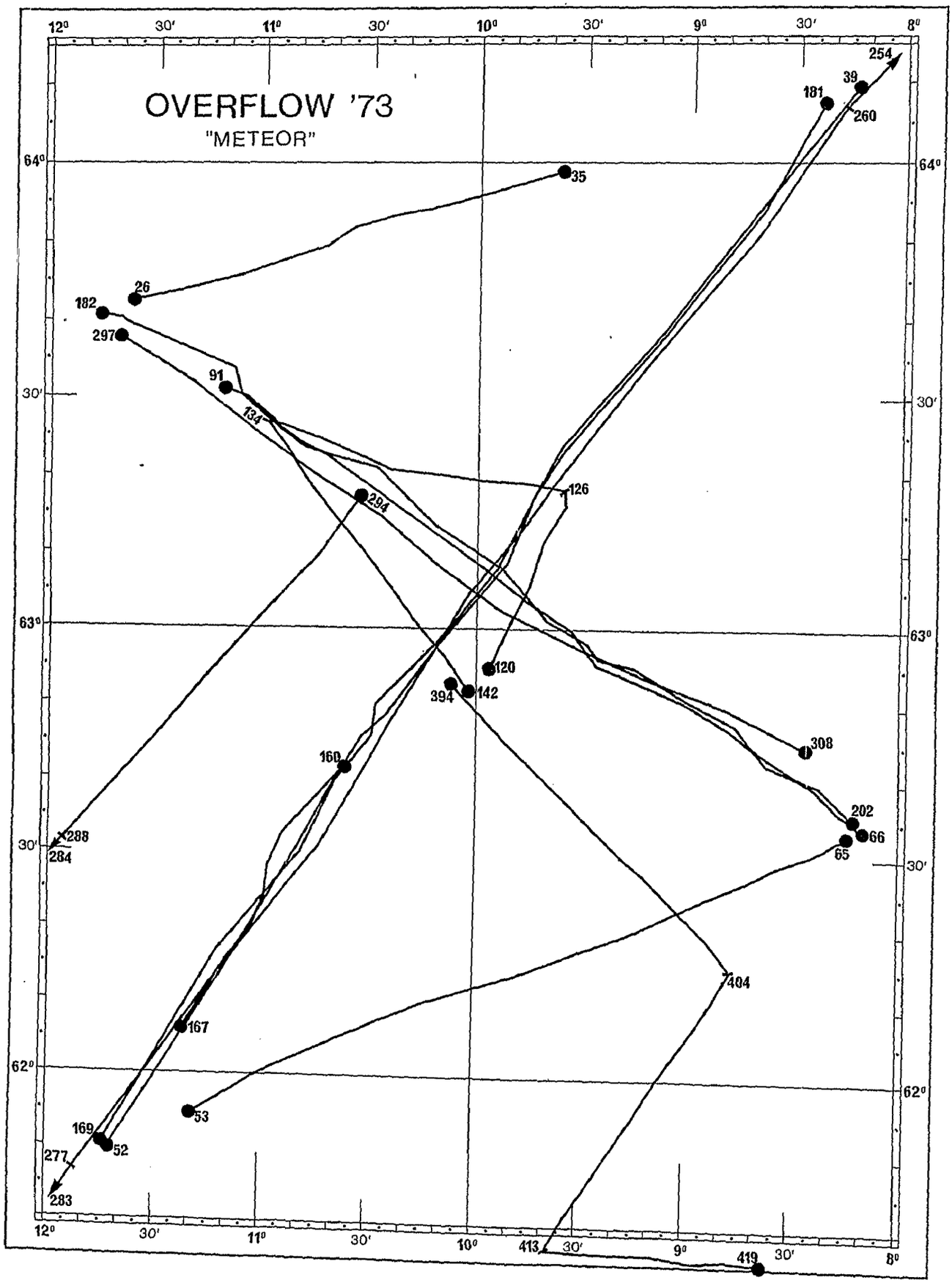
3.1 Hydrographic Sections (large scale)

The sections are preceded by three maps giving information on the depth distribution and on the orientation of the sections. The order of the sections is geographical and chronological. The sections were obtained by R.V. "Meteor" using the Multisonde-data to construct the distributions of physical parameters and using hydrocast data for the sections of chemical parameters.

Key to symbols

$T^{o}C$	=	Temperature
S^{o}/oo	=	Salinity
σt	=	Density
NI/AI %	=	Fraction of water representing a mixture of North Icelandic Winter Water and Arctic Intermediate Water. Definition: $T \geq 2.5^{o}C$, $S \leq 34.88^{o}/oo$
NS %	=	Fraction of water representing the Norwegian Sea Deep Water. Definition: $T \leq -0.5^{o}C$, $S = 34.92^{o}/oo$
NA %	=	Fraction of water representing the North Atlantic Water. Definition: $T \geq 8.5^{o}C$, $S \geq 35.25^{o}/oo$
A %	=	Light attenuation (0.67 μ) per meter
O_2Sat	=	Oxygen saturation values (UNESCO-Tables)
Si μgat/l	=	Silicate
NO_2	=	Nitrite
NO_3	=	Nitrate
PO_4	=	Phosphate
NH_3	=	Ammonia

NORDATLANTISCHER OZEAN
GEWÄSSER ZWISCHEN
ISLAND UND FÄRÖER
Mercator-Abbildung
Bezugsbreite 65°00' N
1 : 500 000
Merkury-Datum
Fischer Sphäroid


OVERFLOW '73
"METEOR"
12° 30′ 11° 30′ 10° 30′ 9° 30′ 8°
64°
63°
62°
30′
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260
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297
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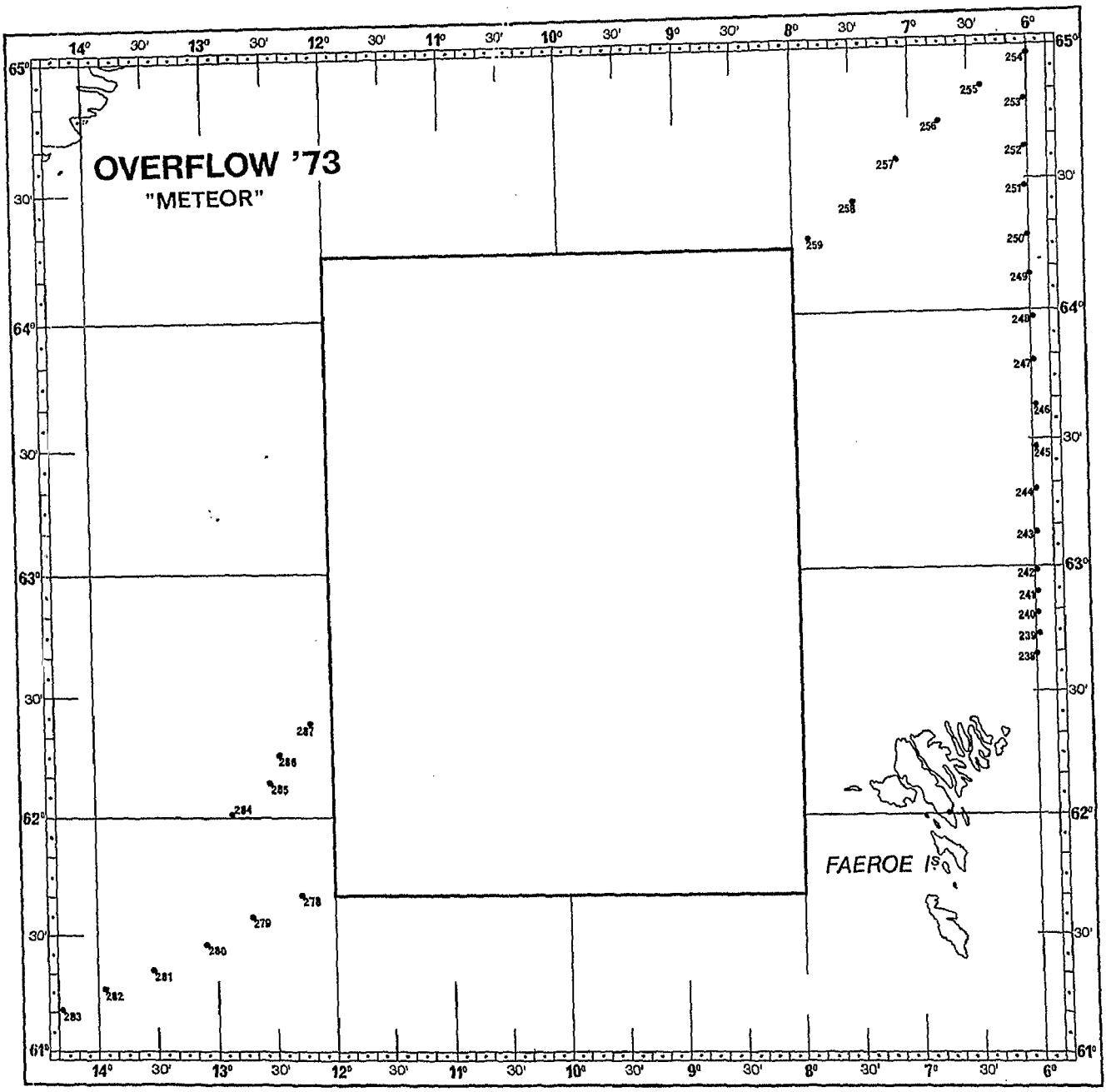
OVERFLOW '73
"METEOR"
FAEROE Is.
14° 30' 13° 30' 12° 30' 11° 30' 10° 30' 9° 30' 8° 30' 7° 30' 6°
65° 64° 63° 62° 61°
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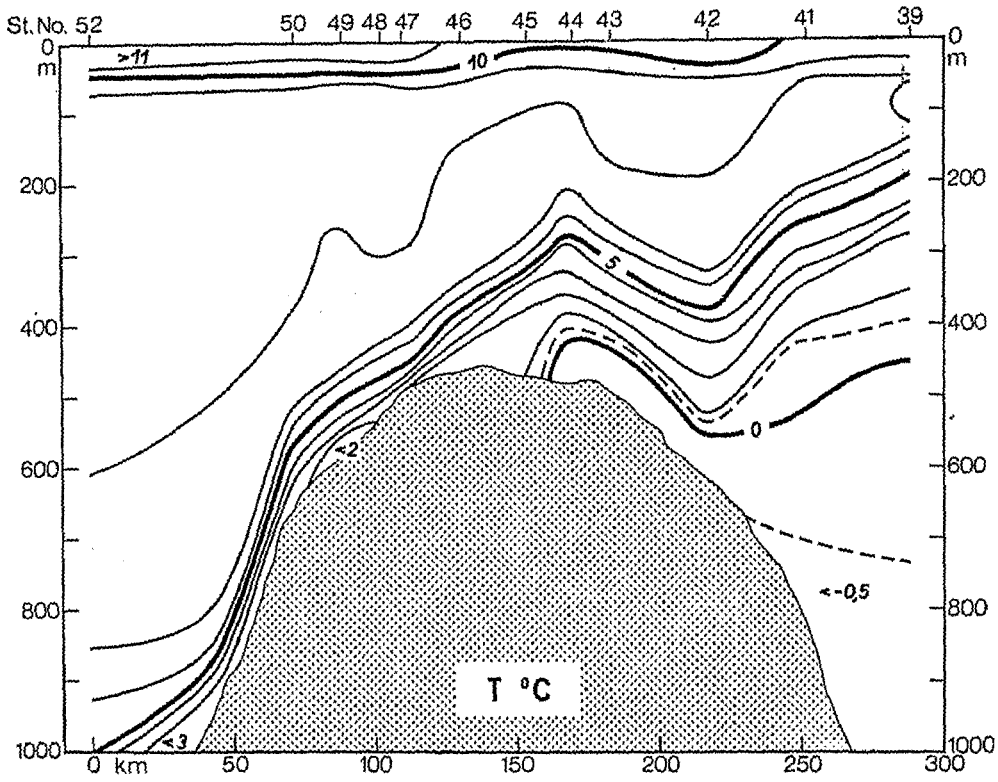
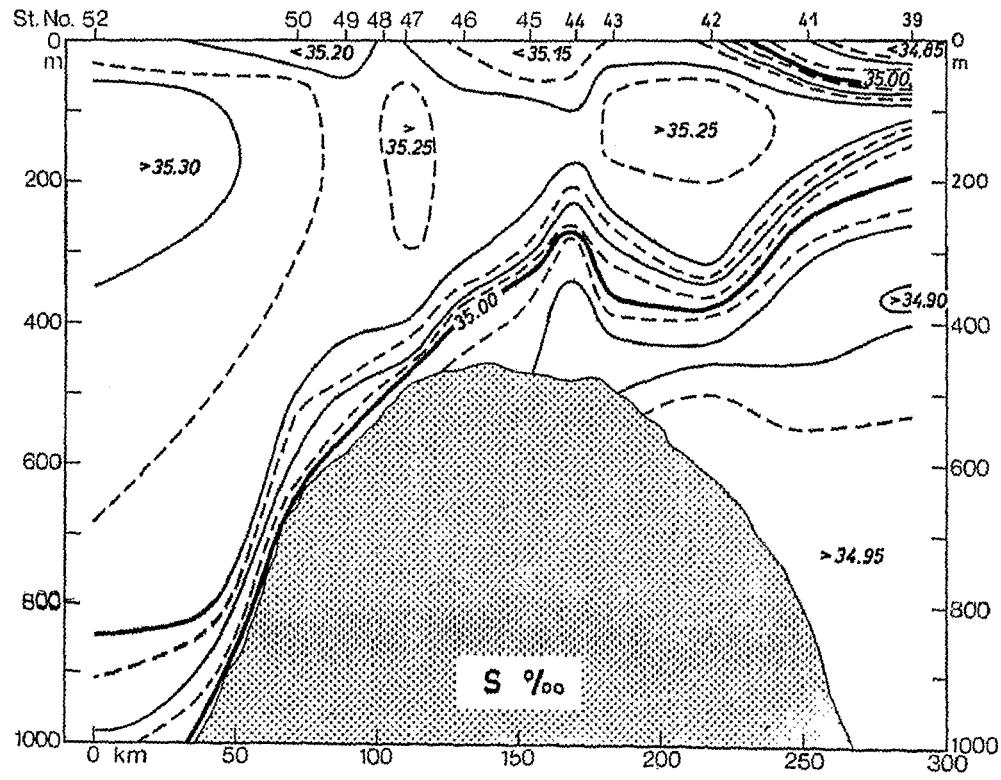
287 286 285 284 278 279 280 281 282 283





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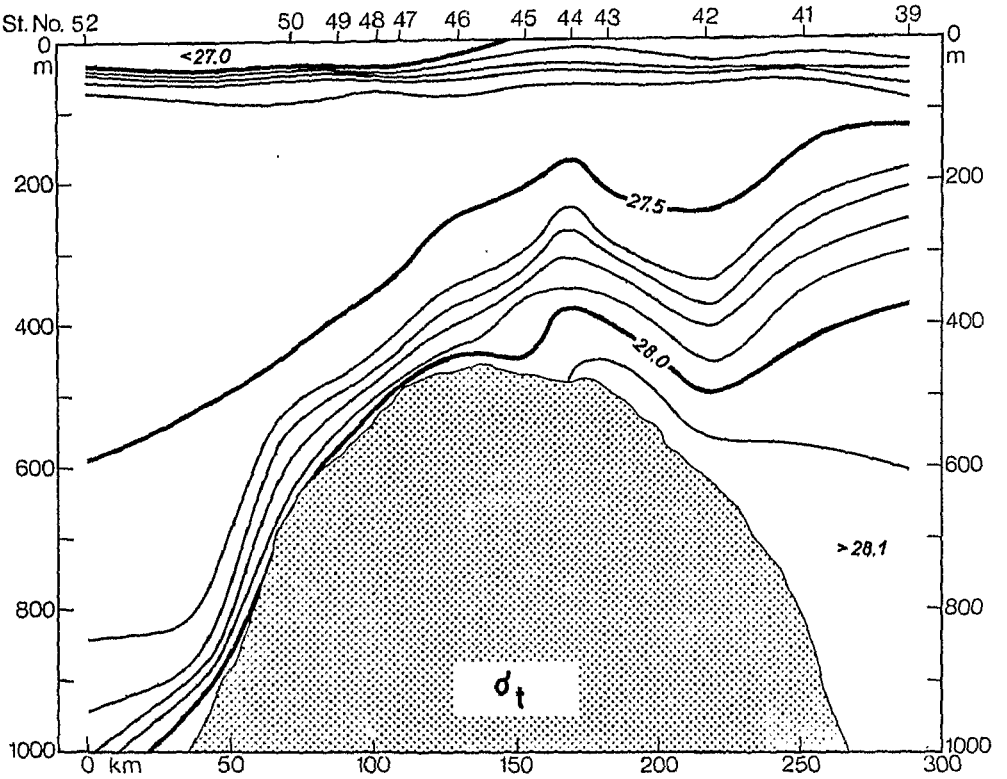

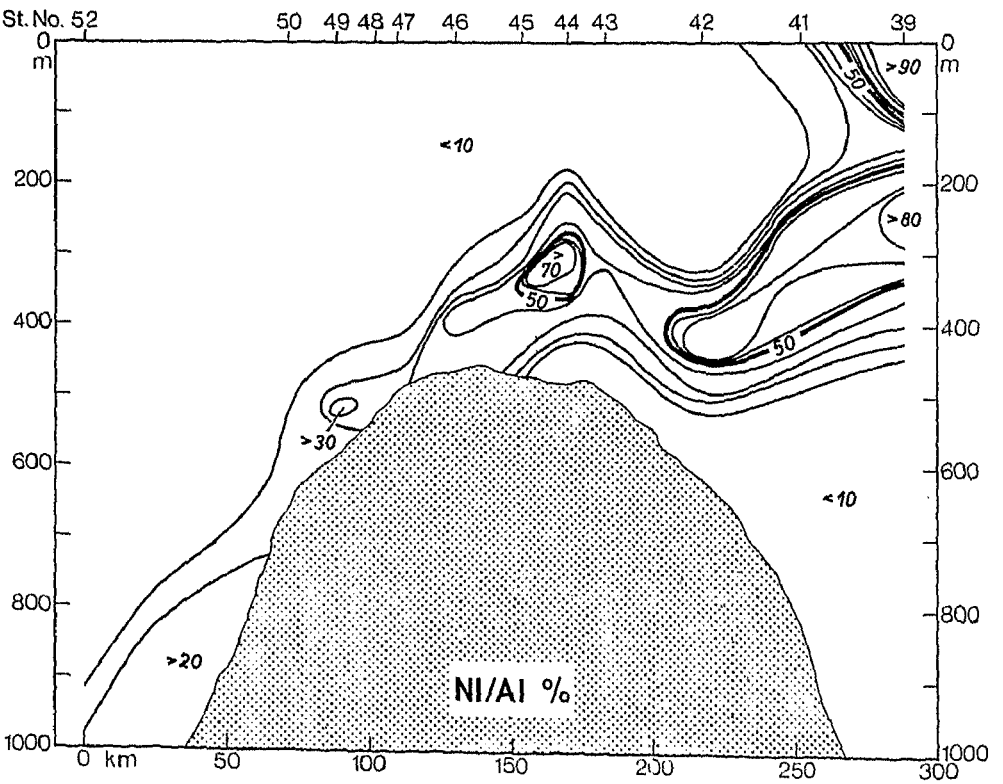

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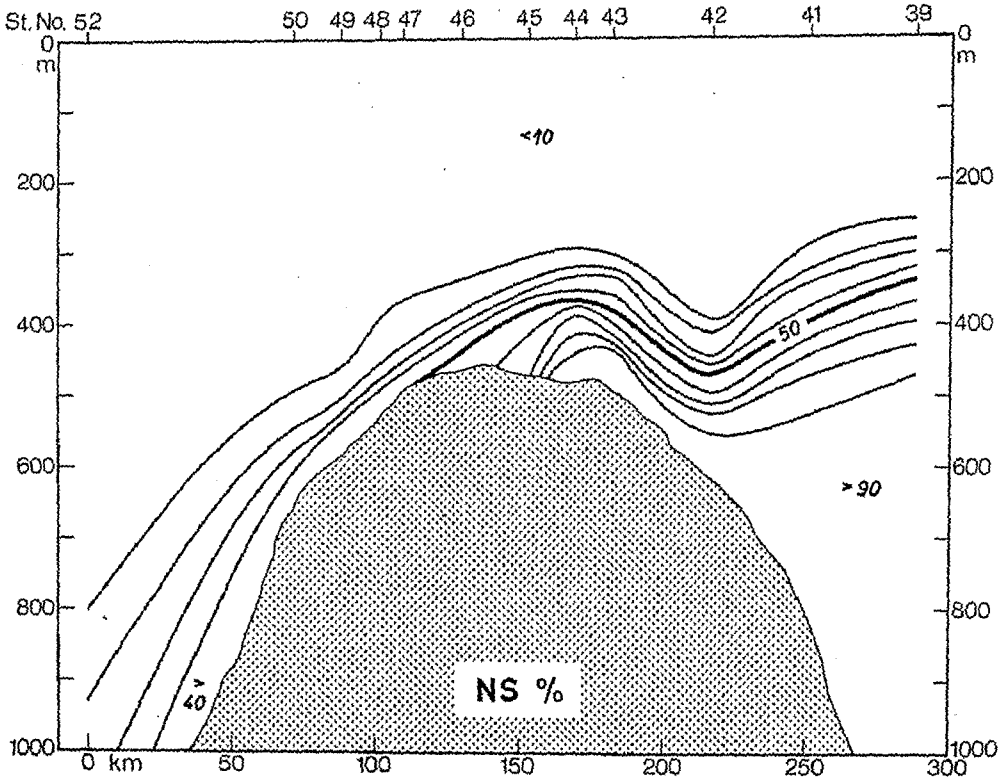
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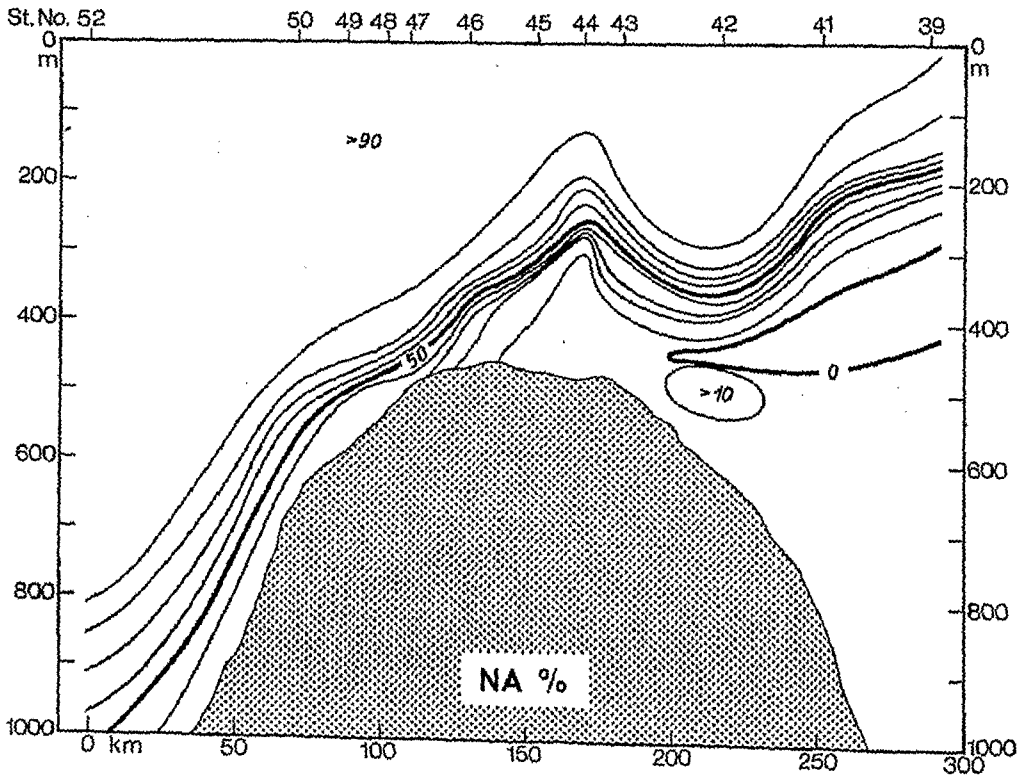
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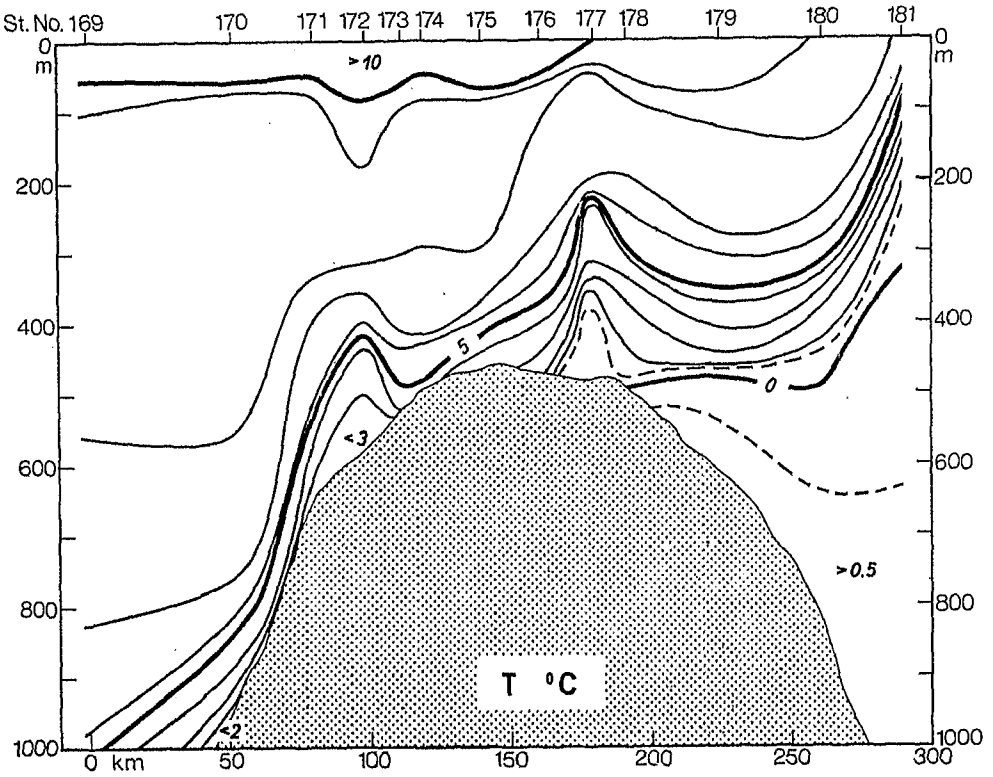

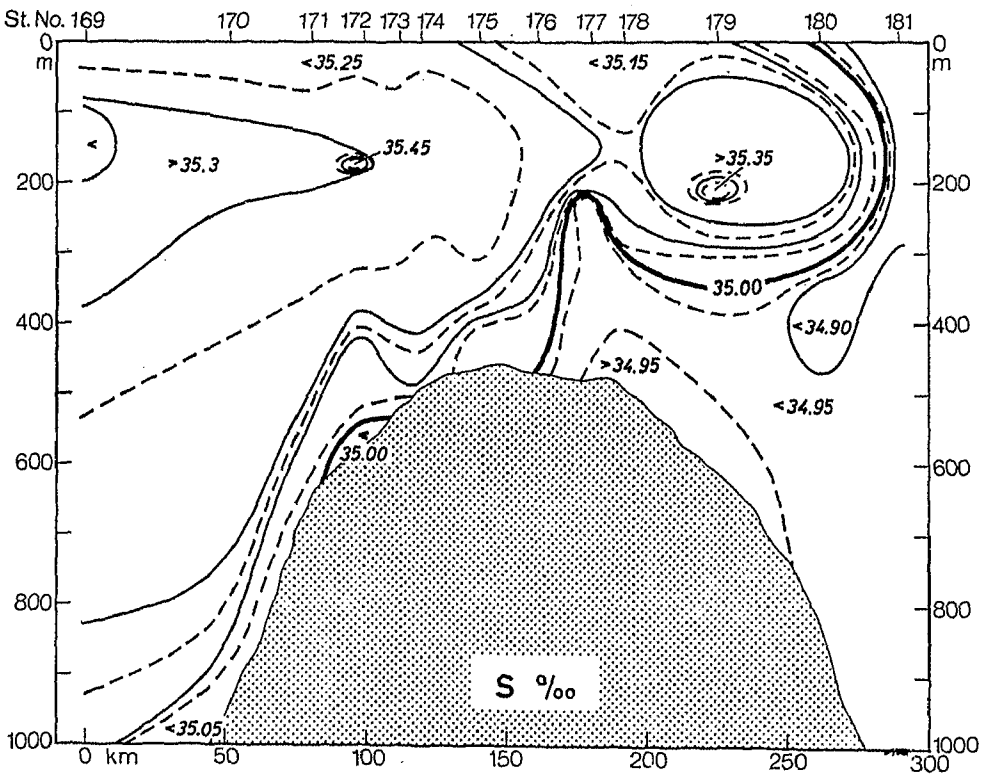

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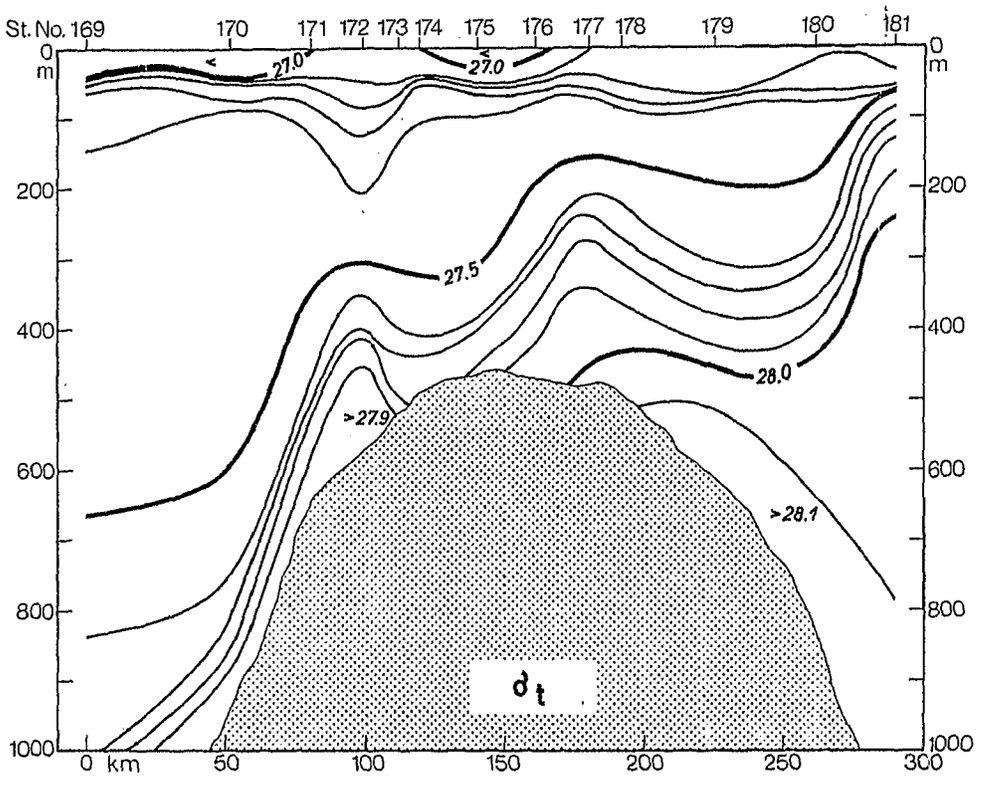

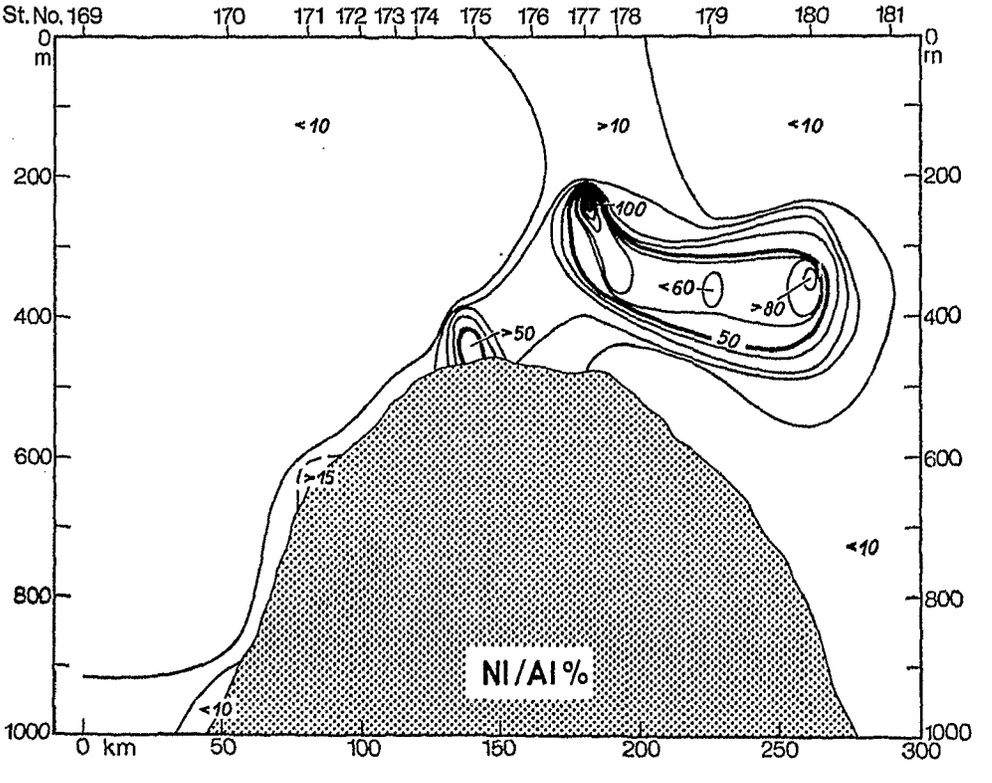

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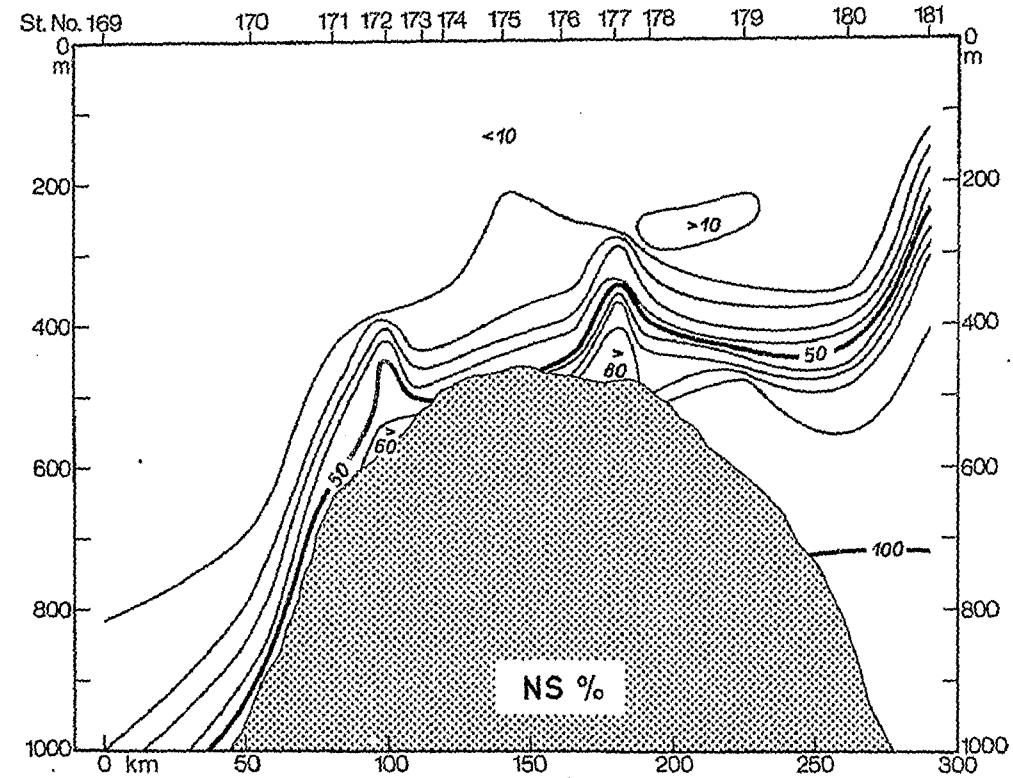

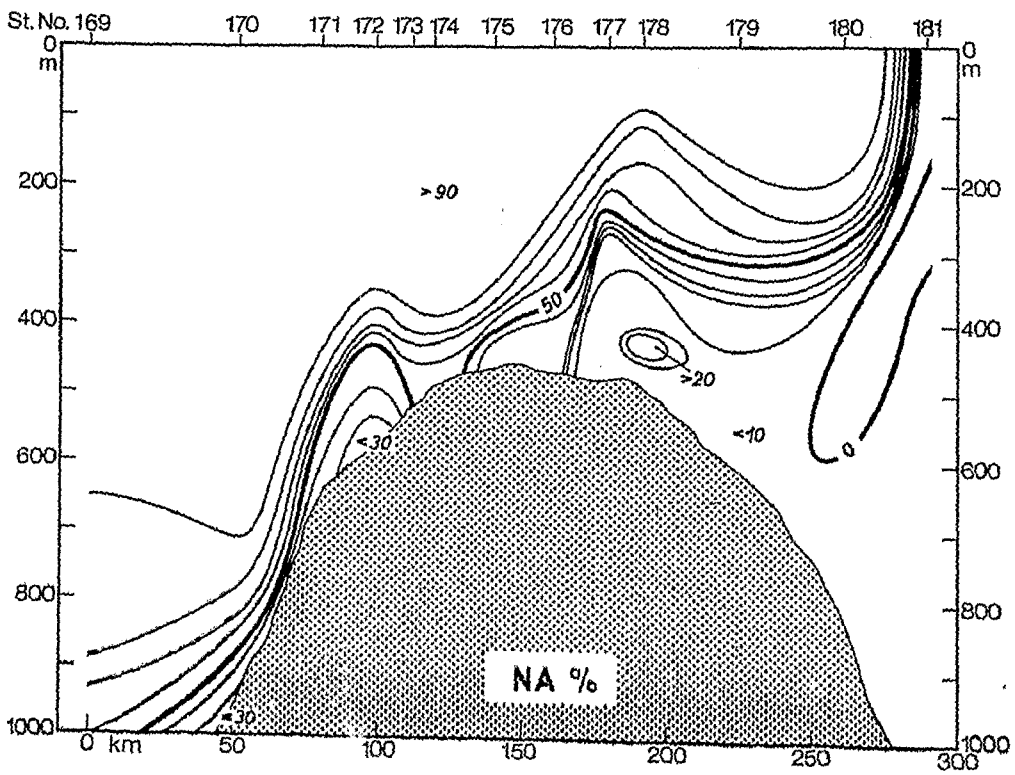

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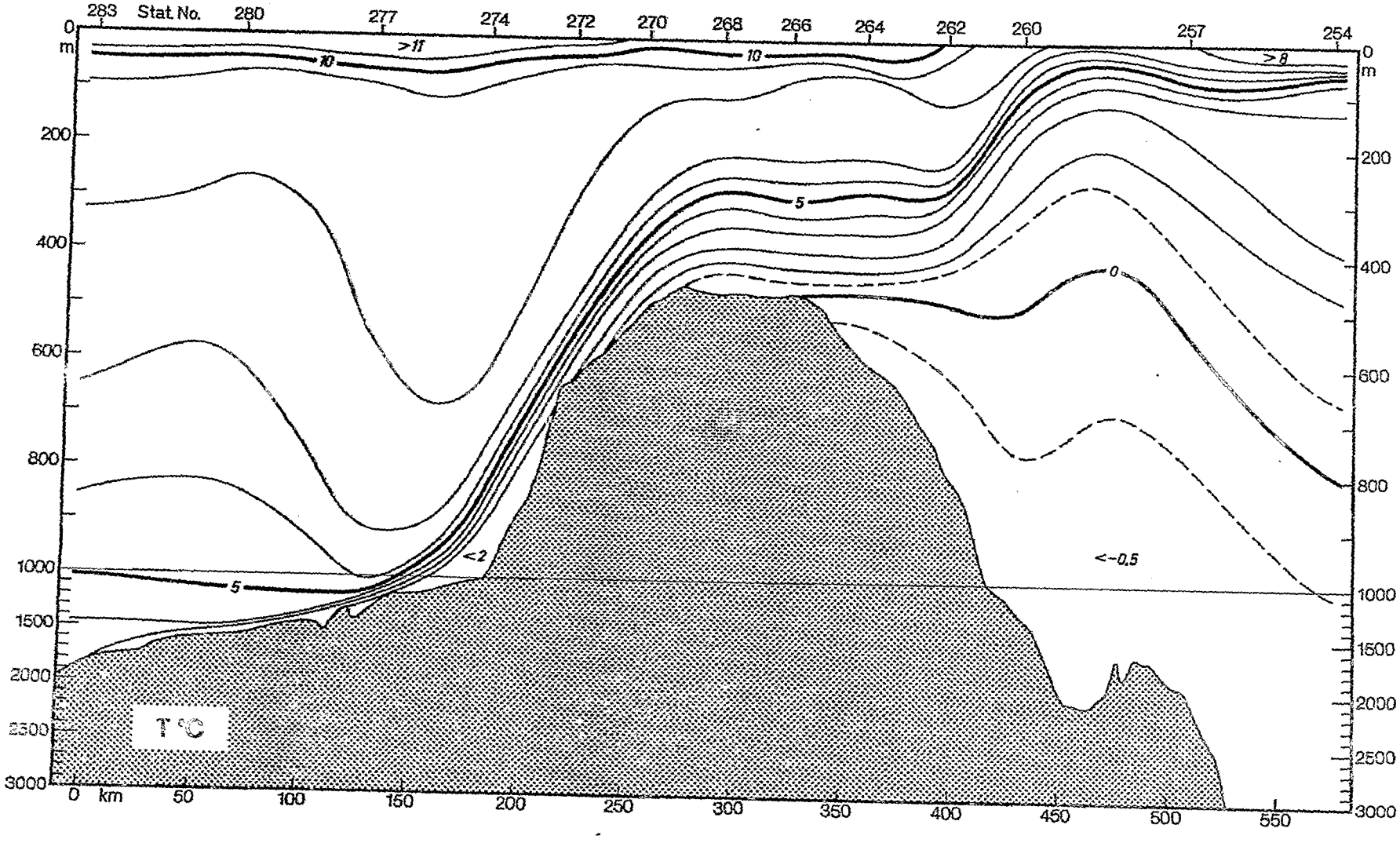

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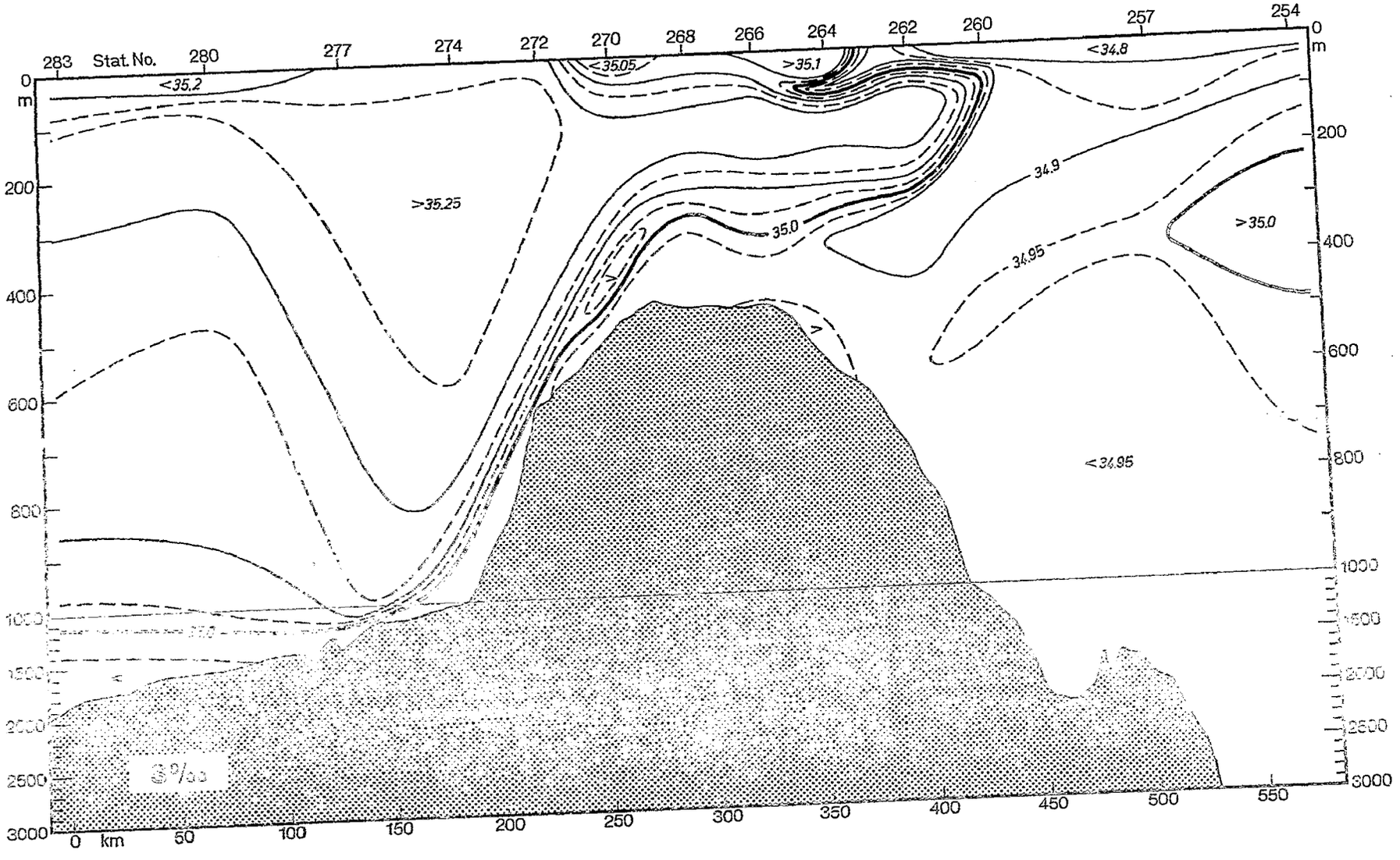

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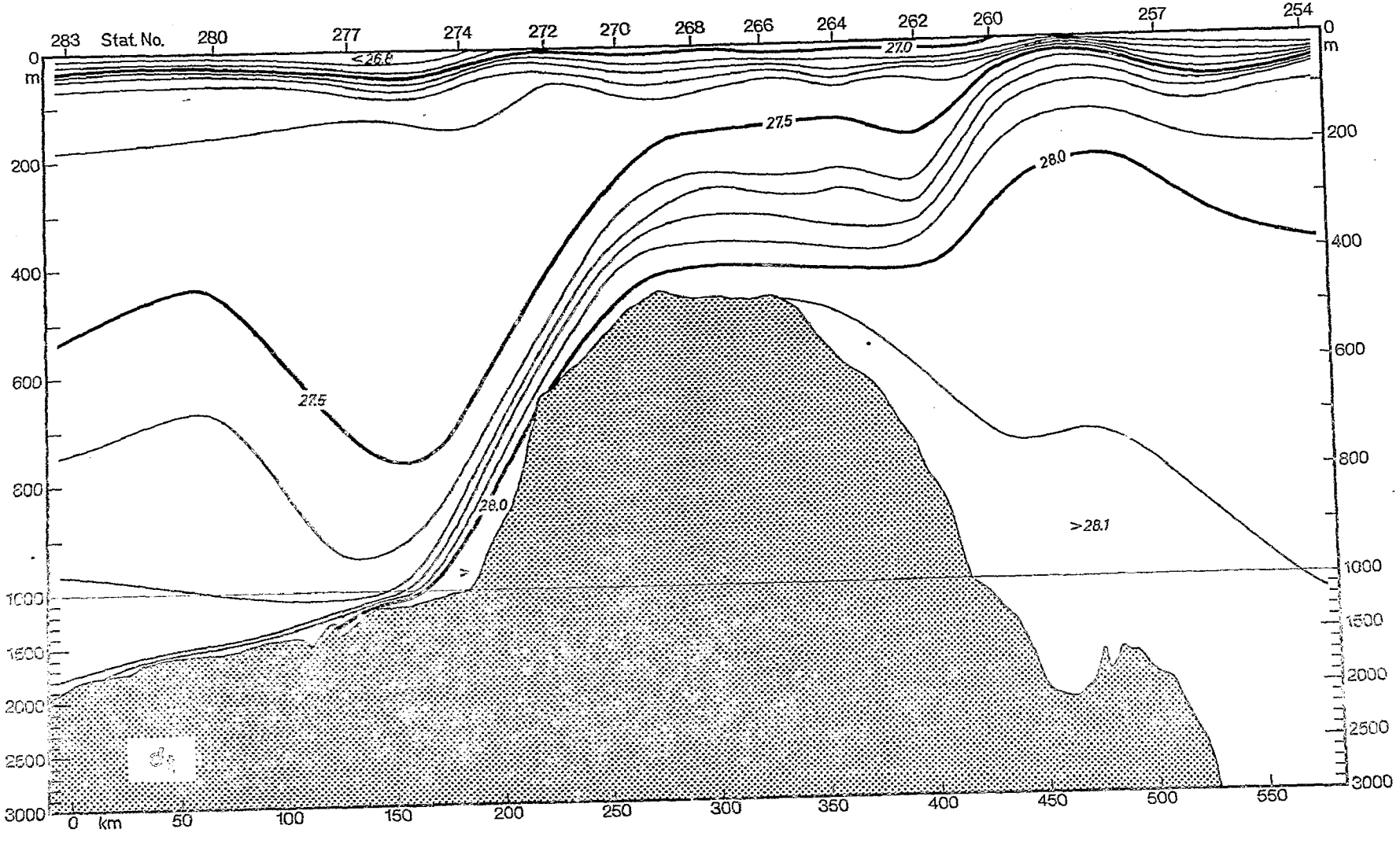

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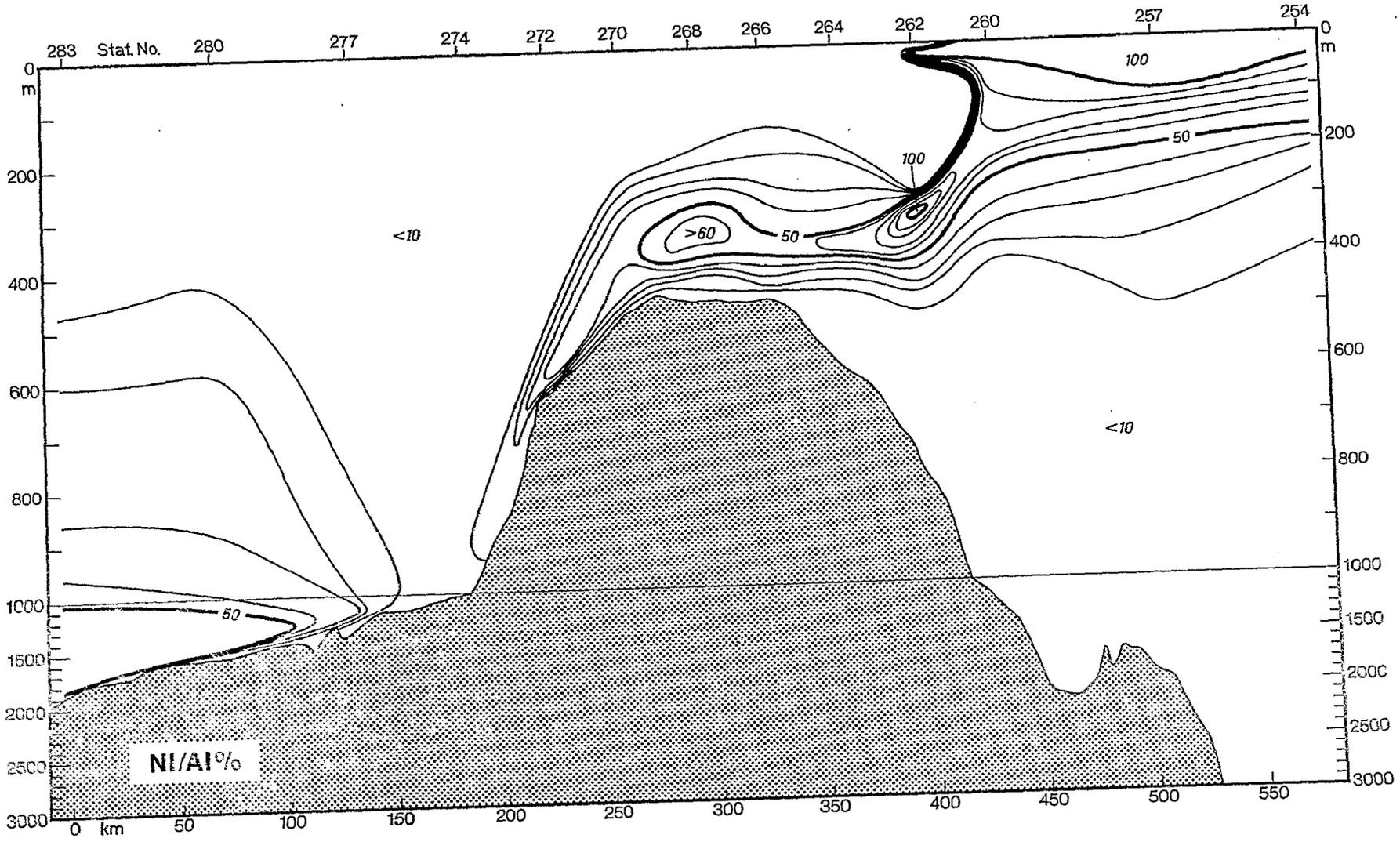

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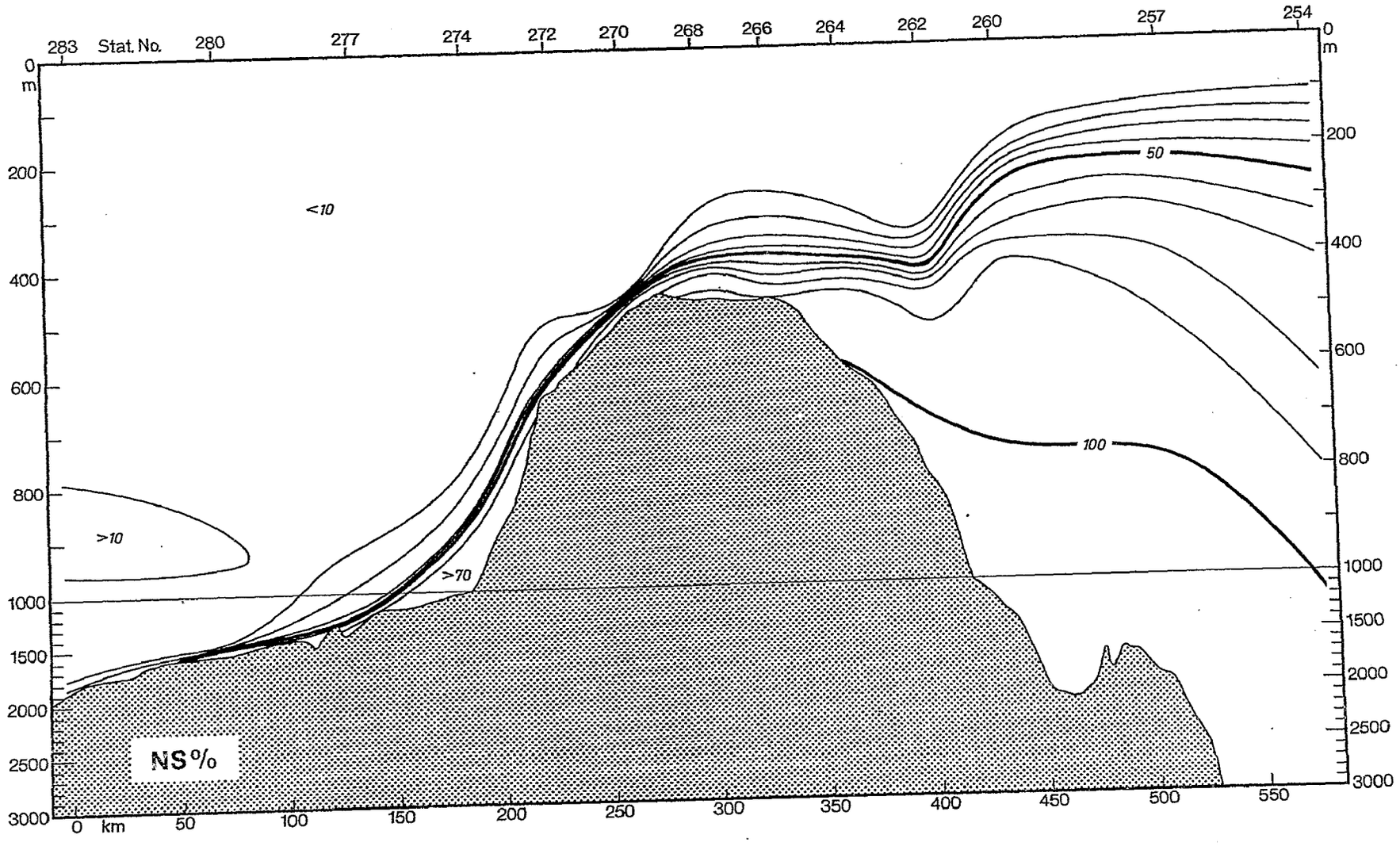

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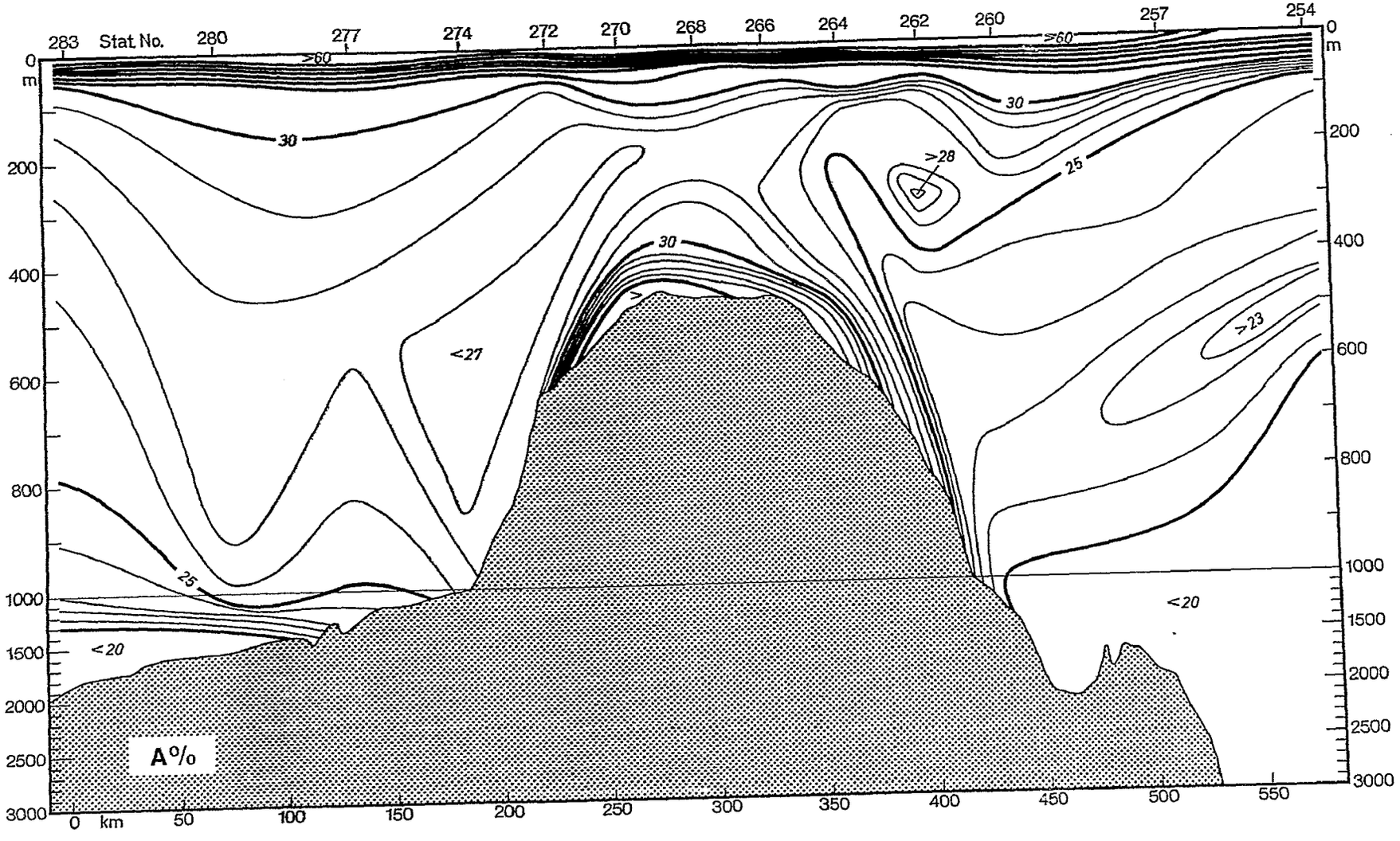

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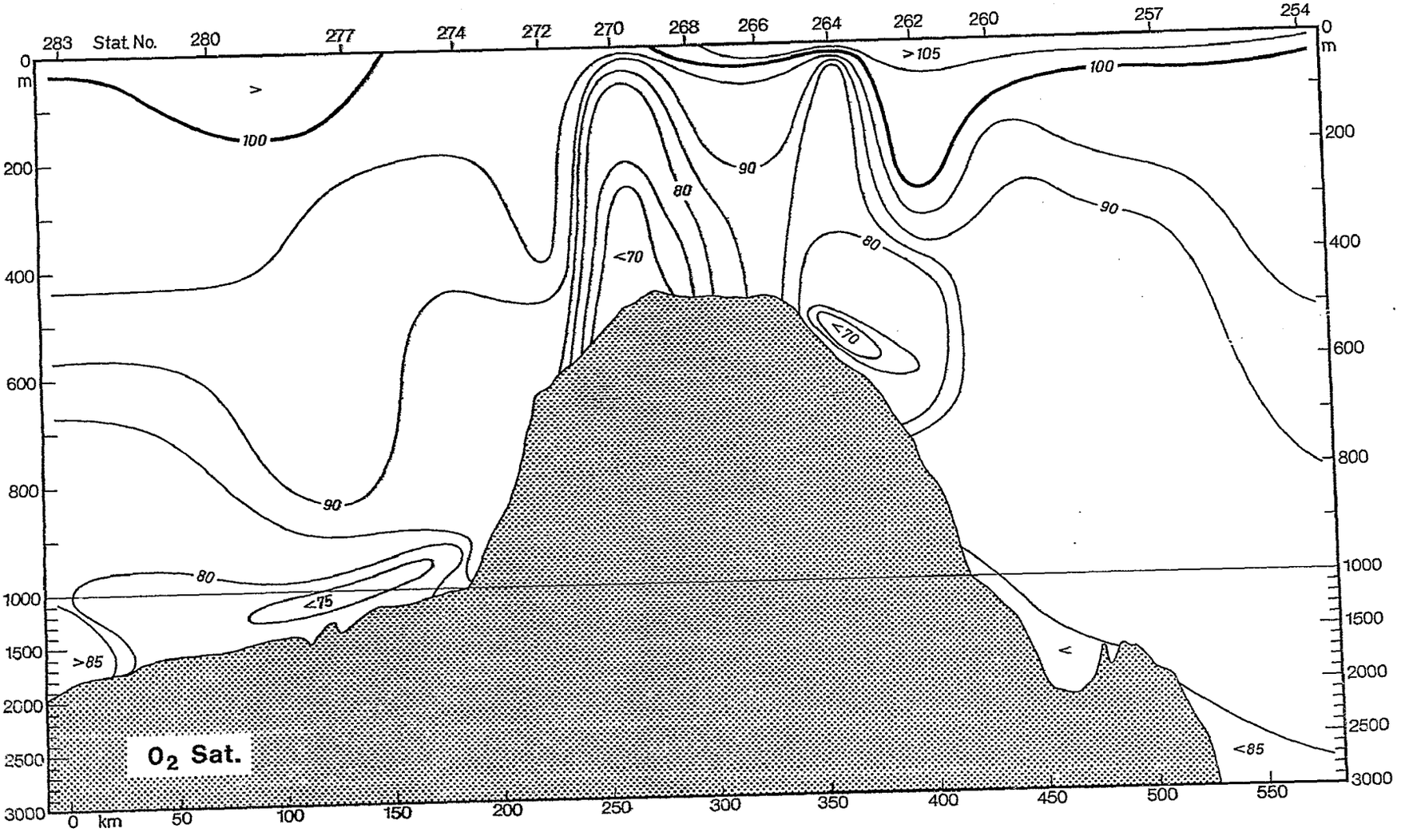

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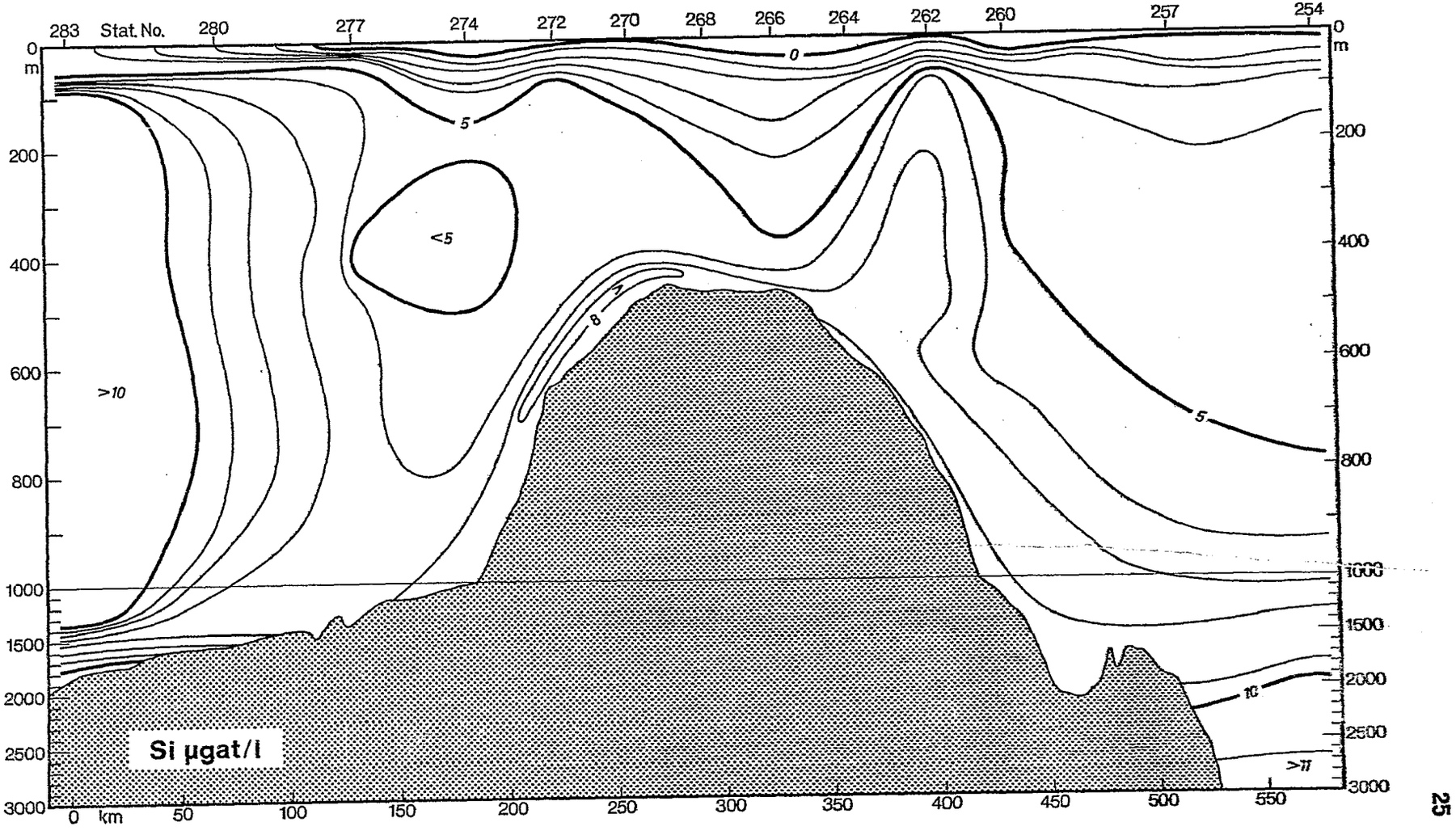

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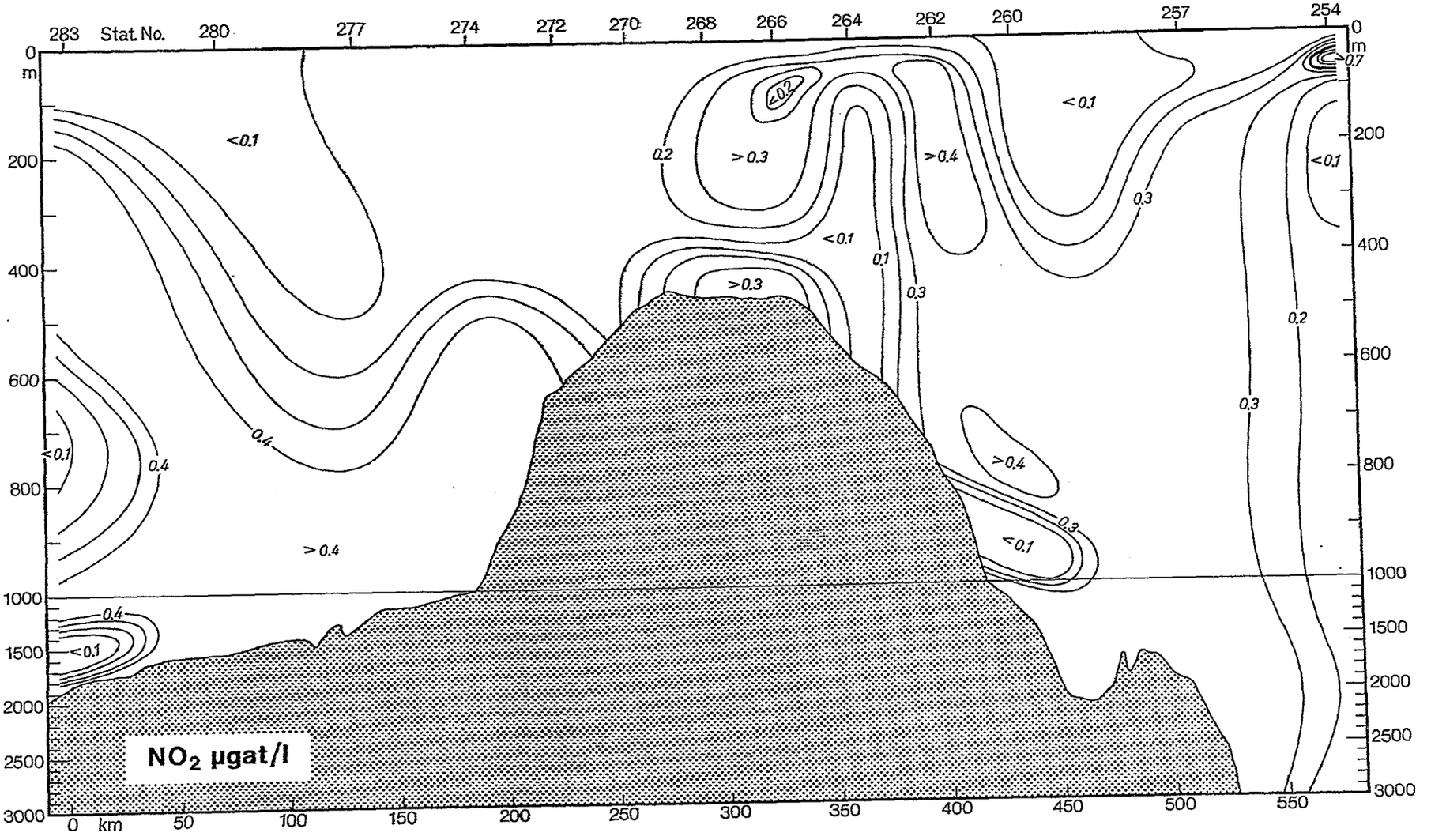

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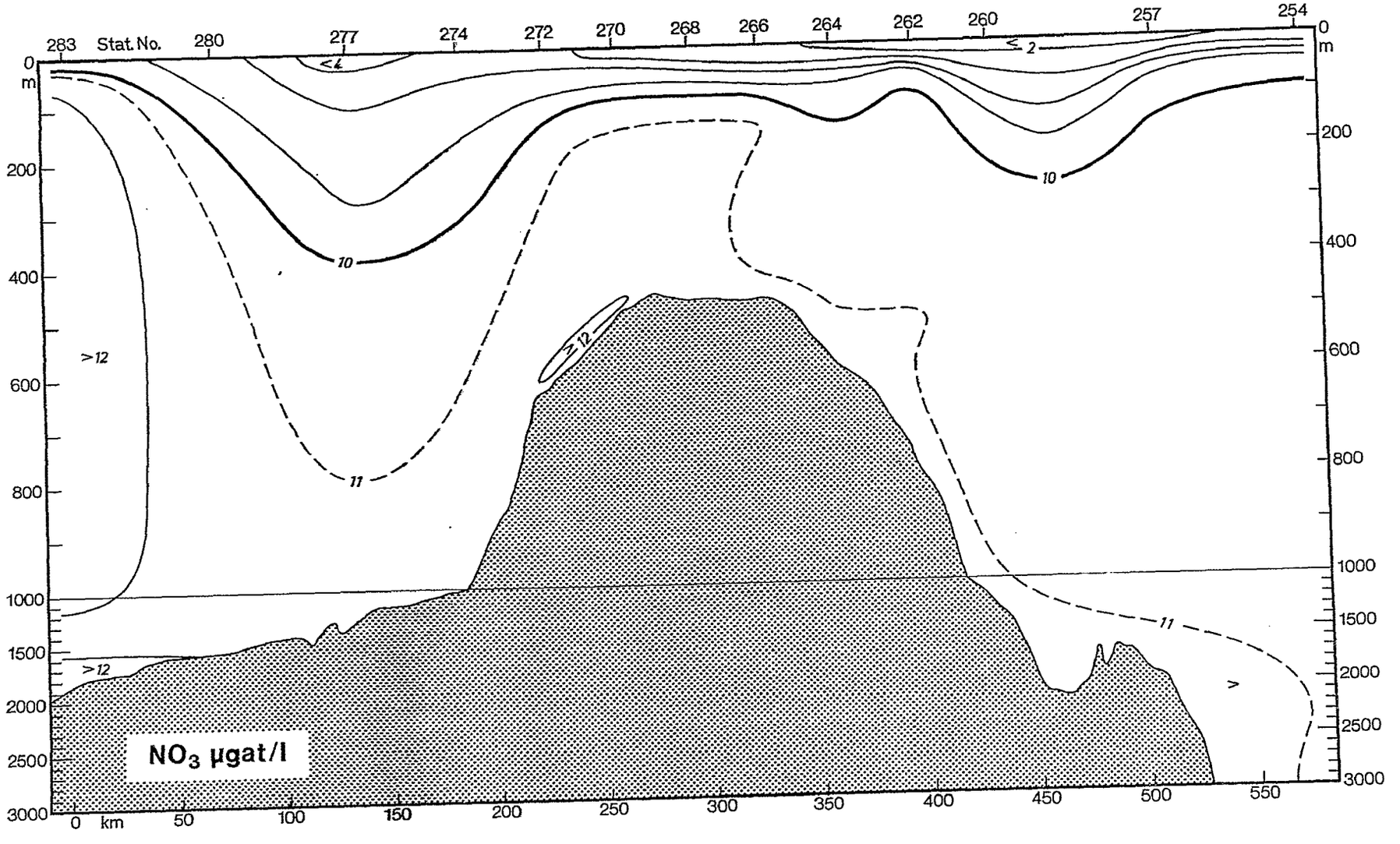

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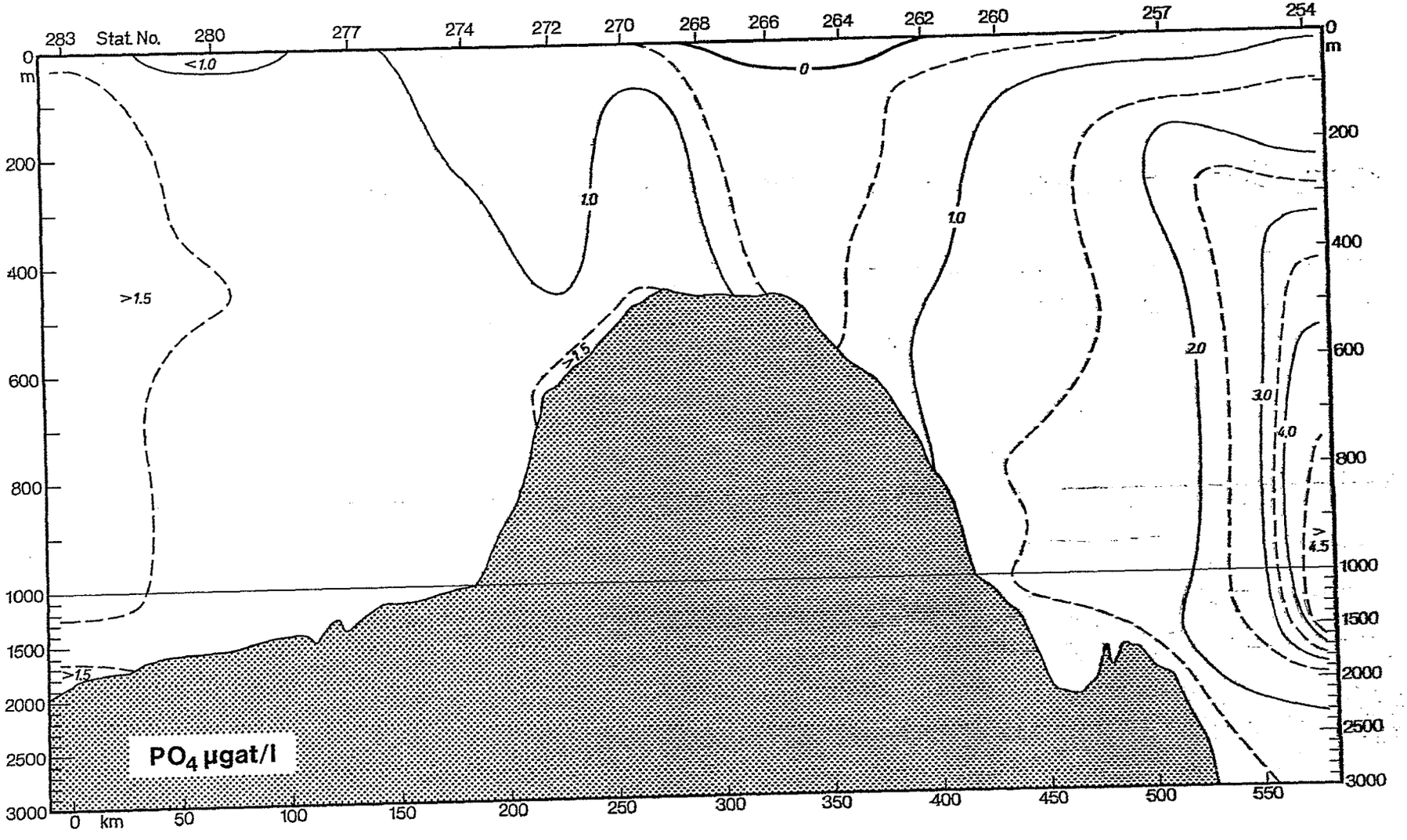

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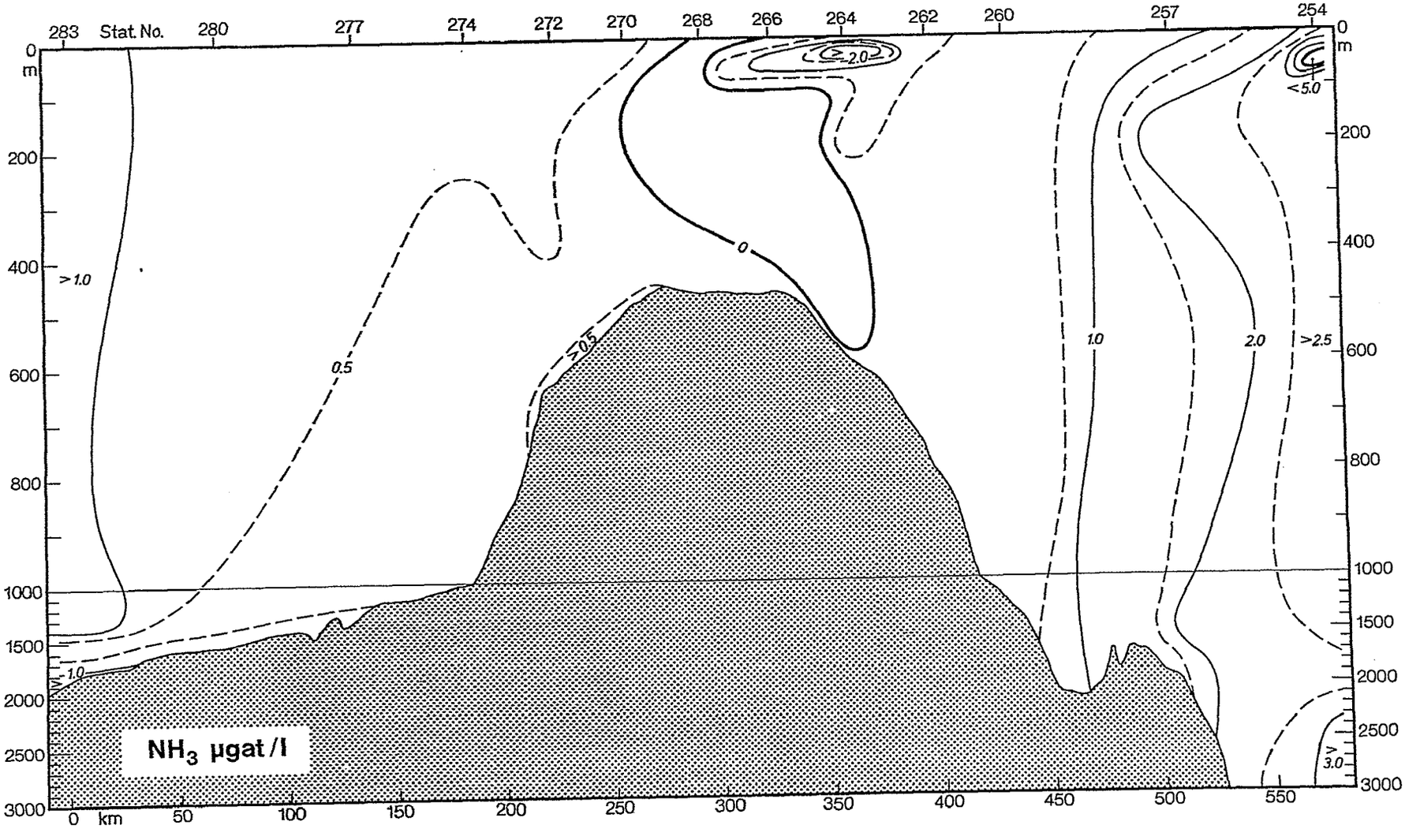

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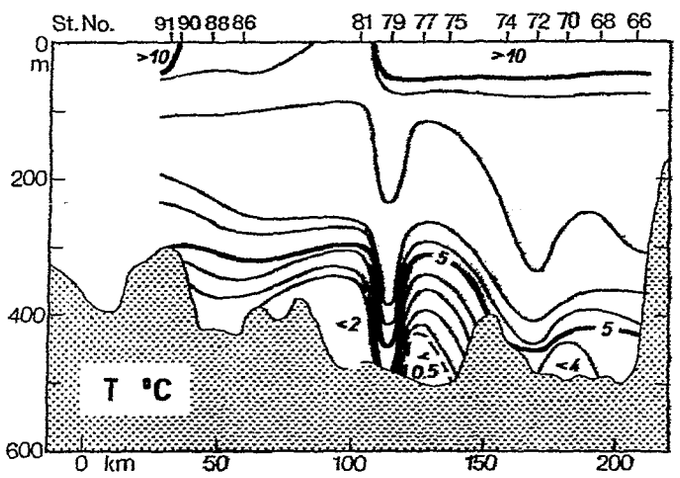

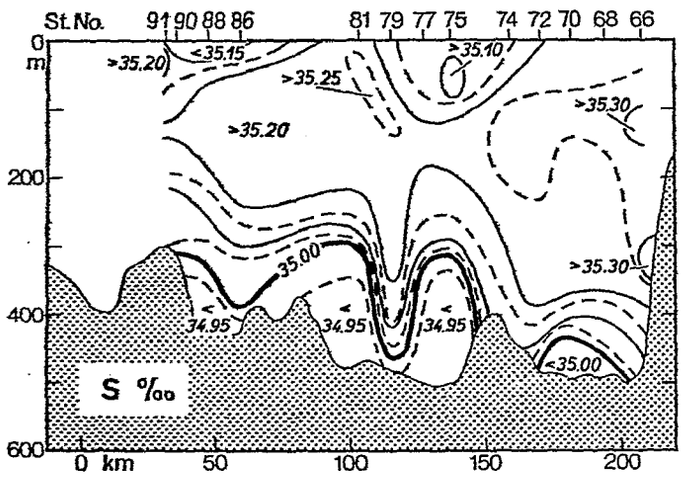

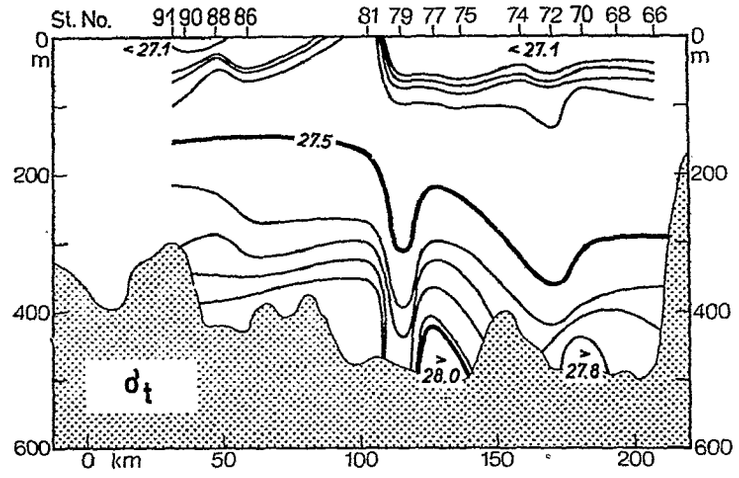

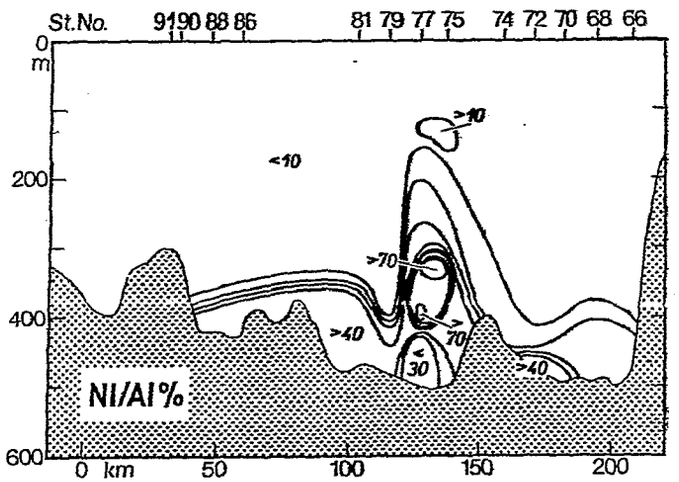

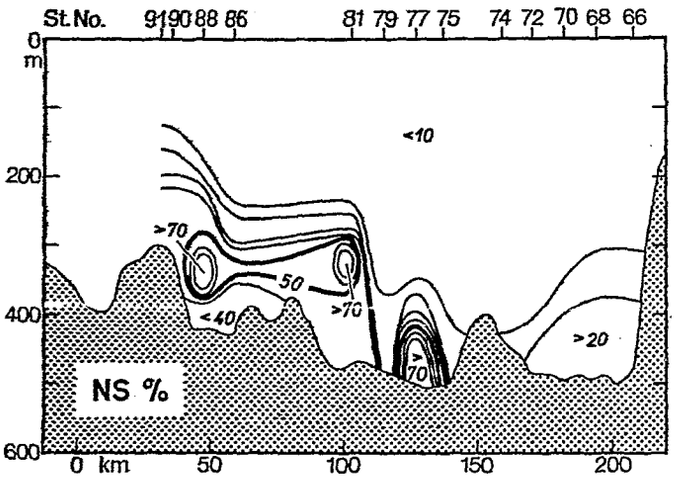

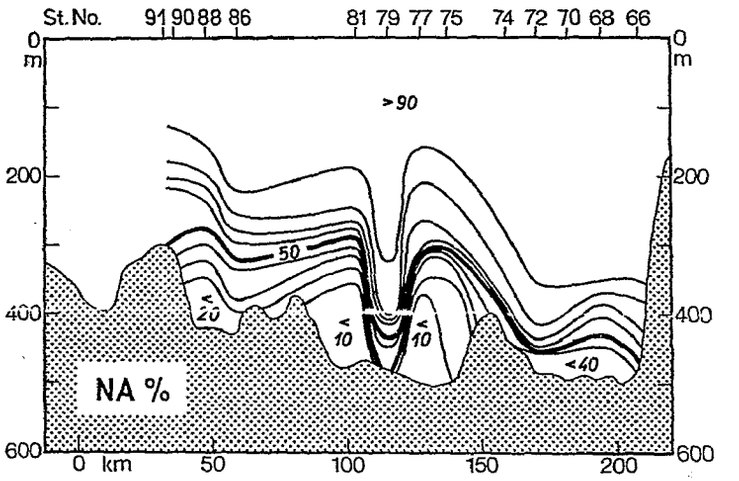

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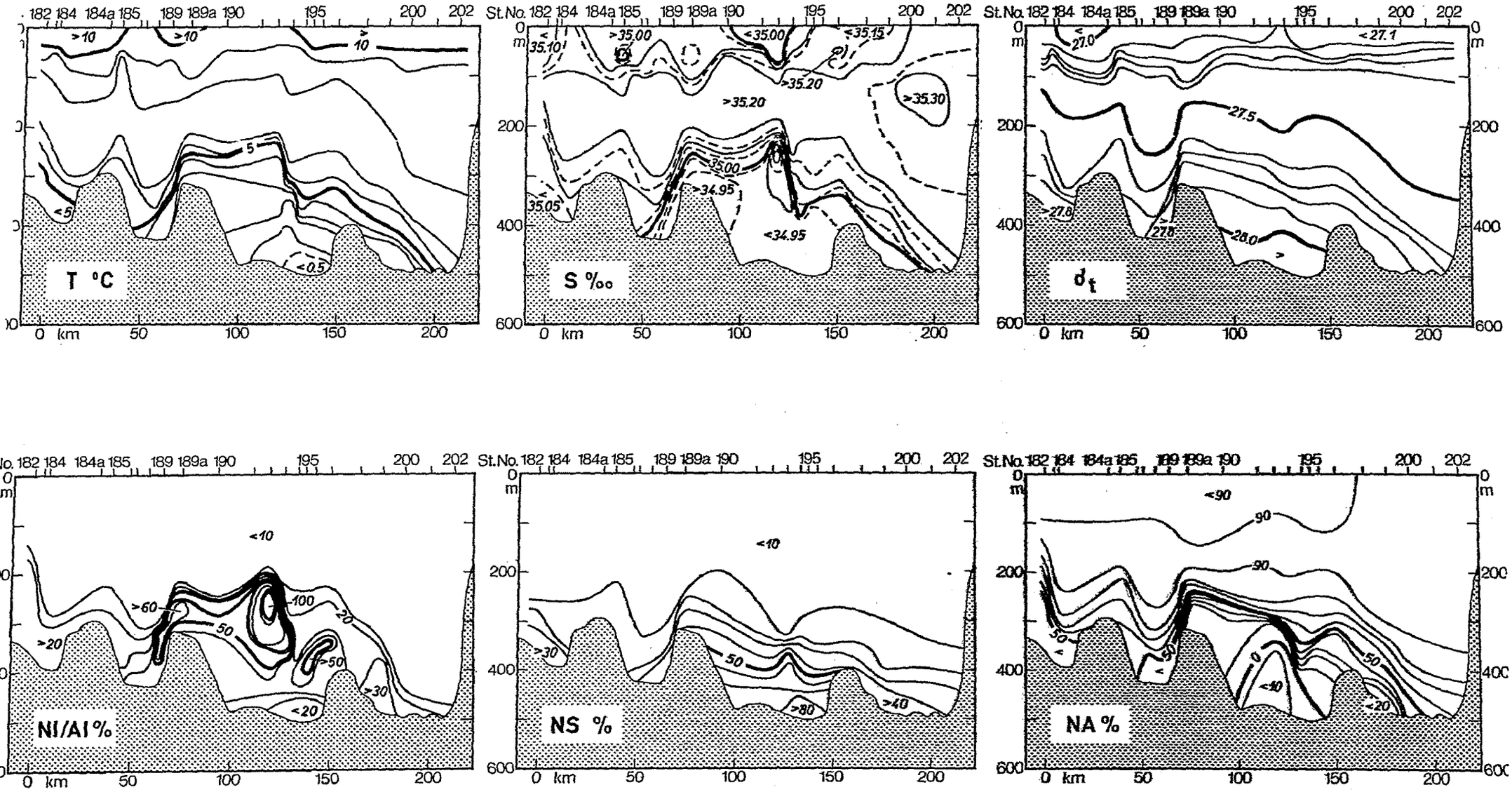

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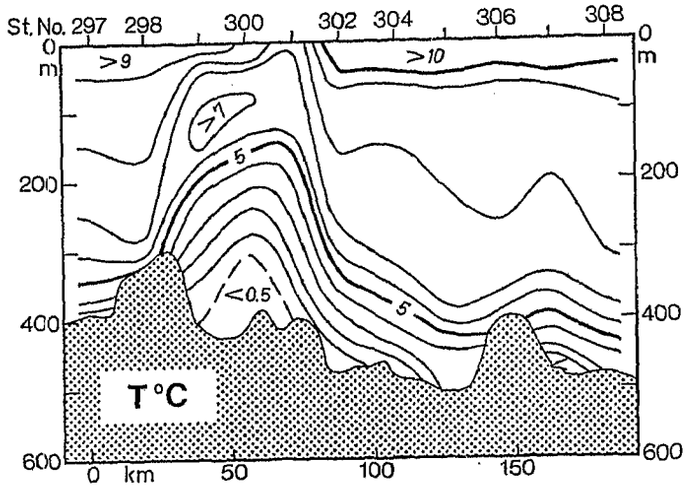

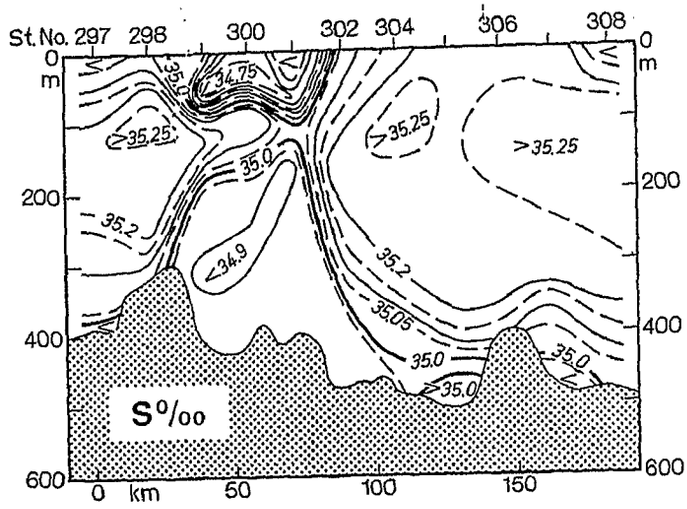

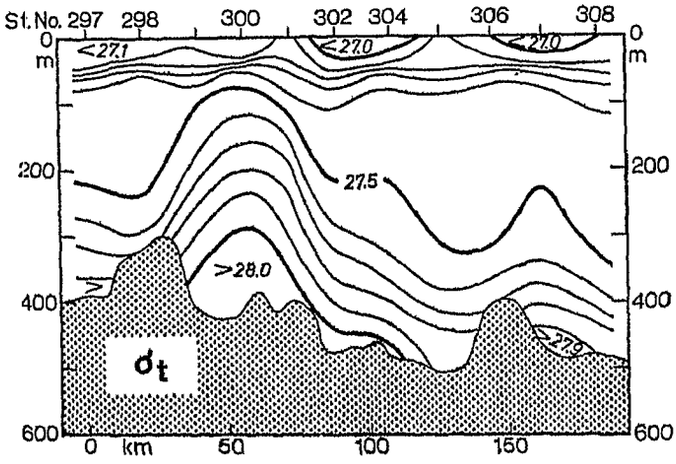

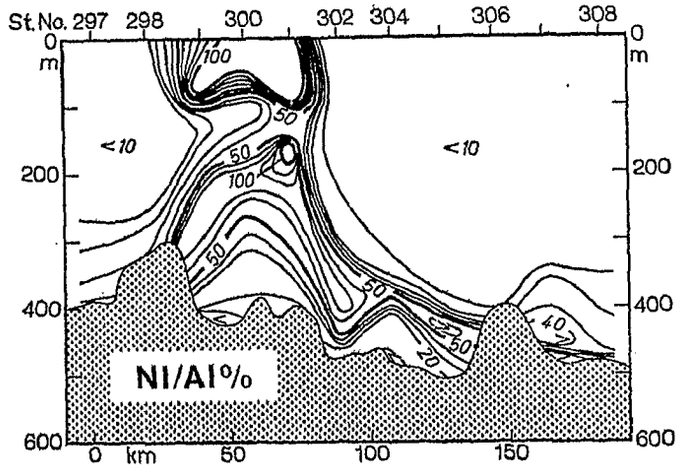

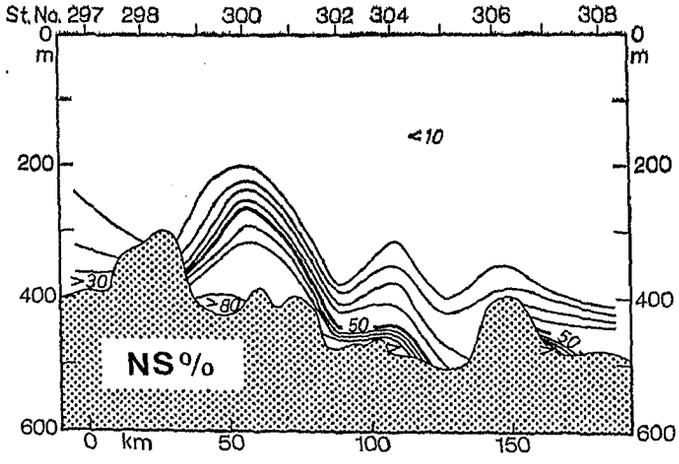

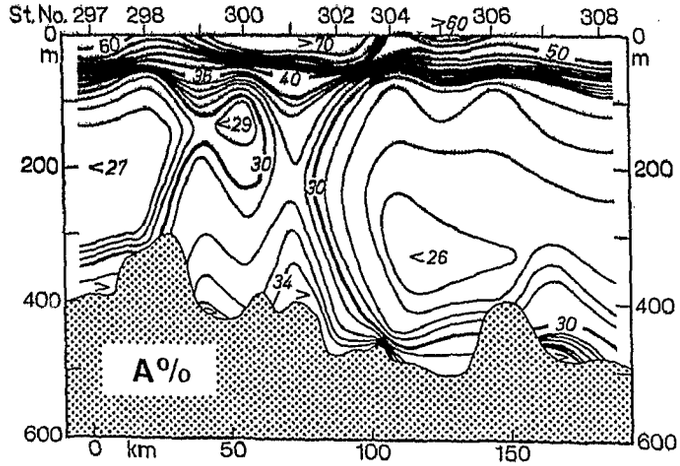

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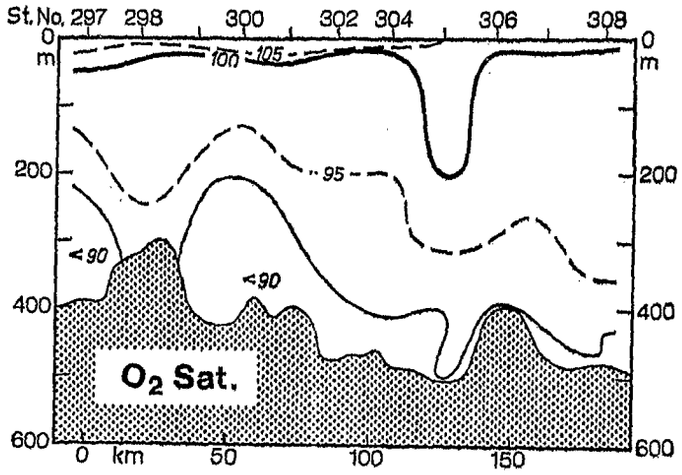

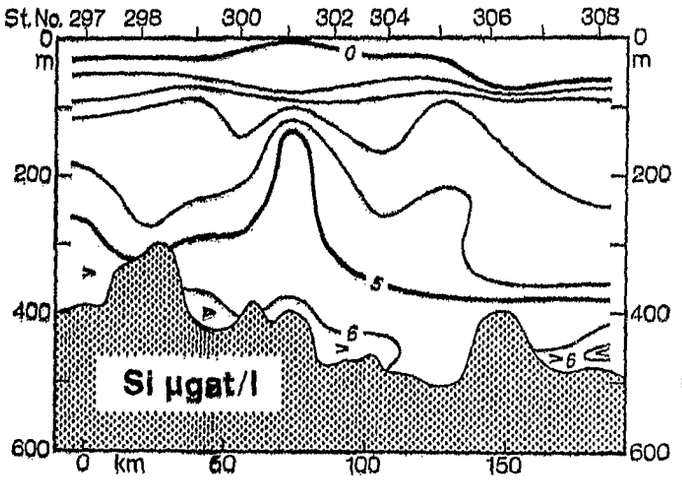

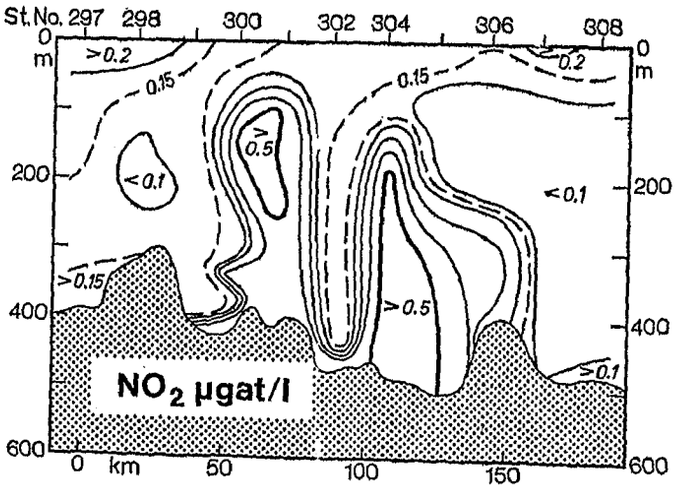

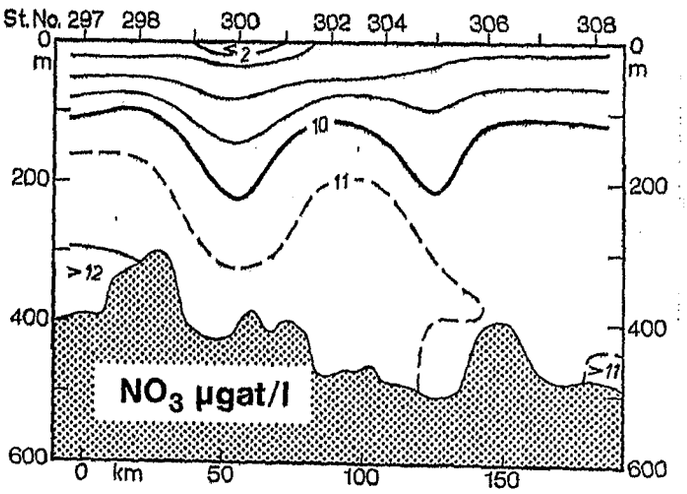

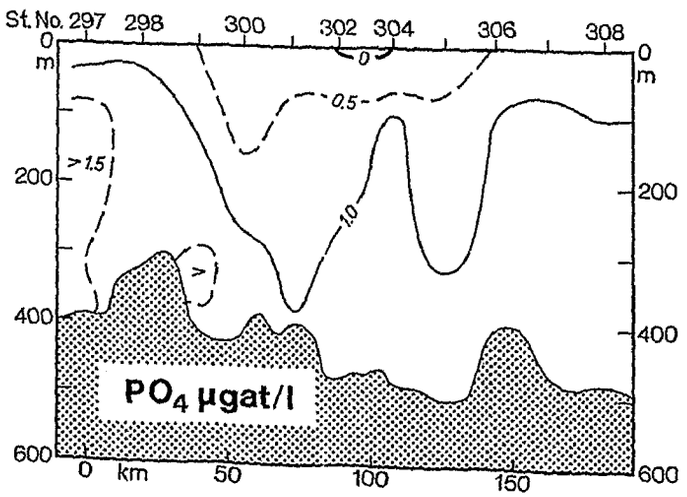

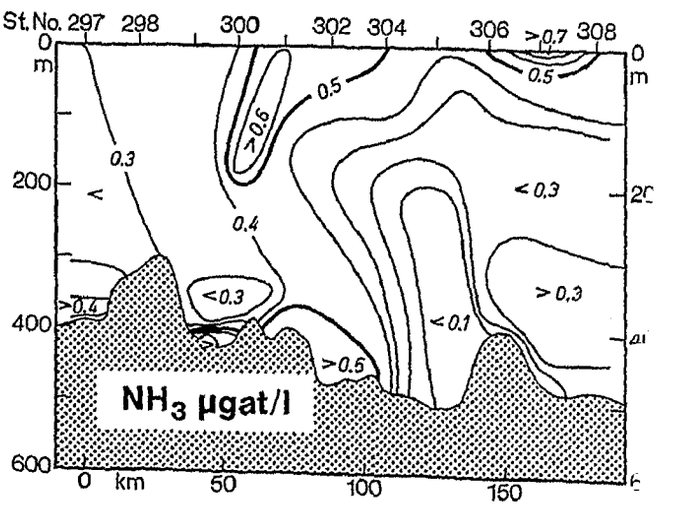

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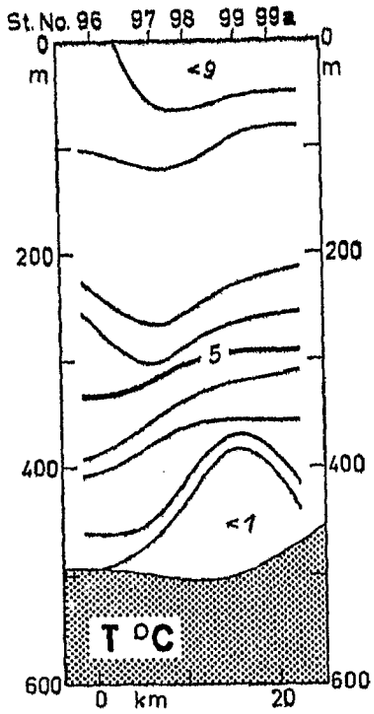
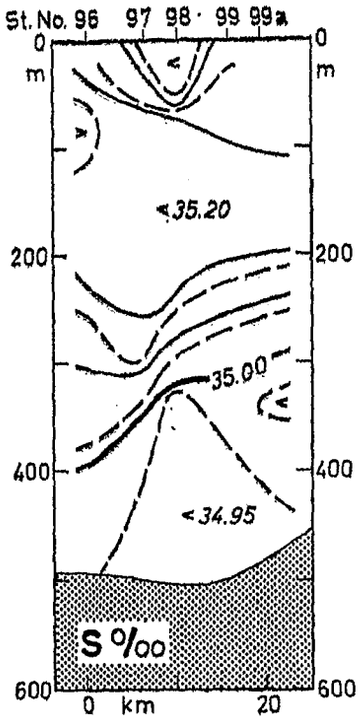
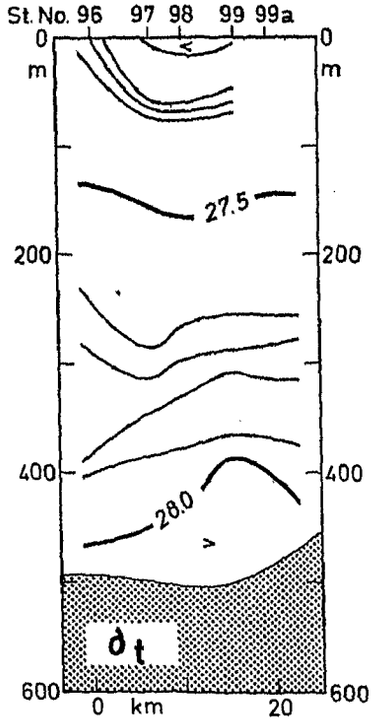
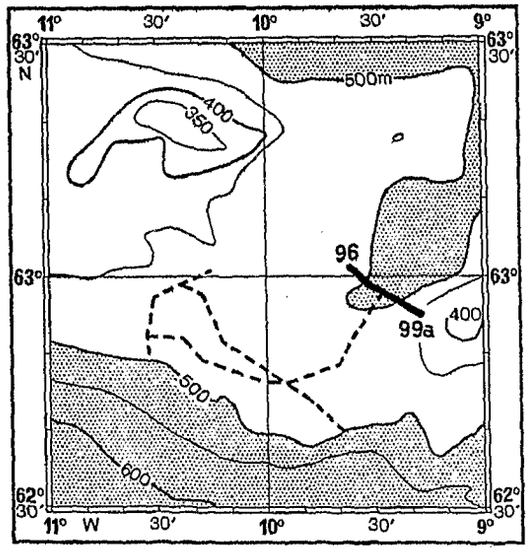
3.2 Hydrographic Sections (small scale)

These sections were obtained by R.V. "Meteor" using the Multisonde. They were intended to give details on the hydrographic situation in one of the depressions along the summit of the Iceland-Faroe ridge.









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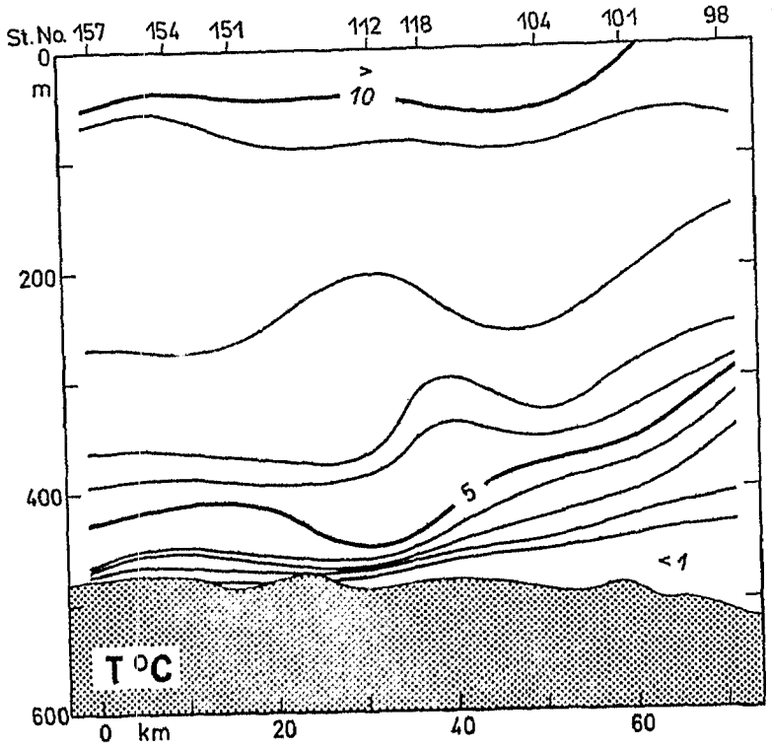

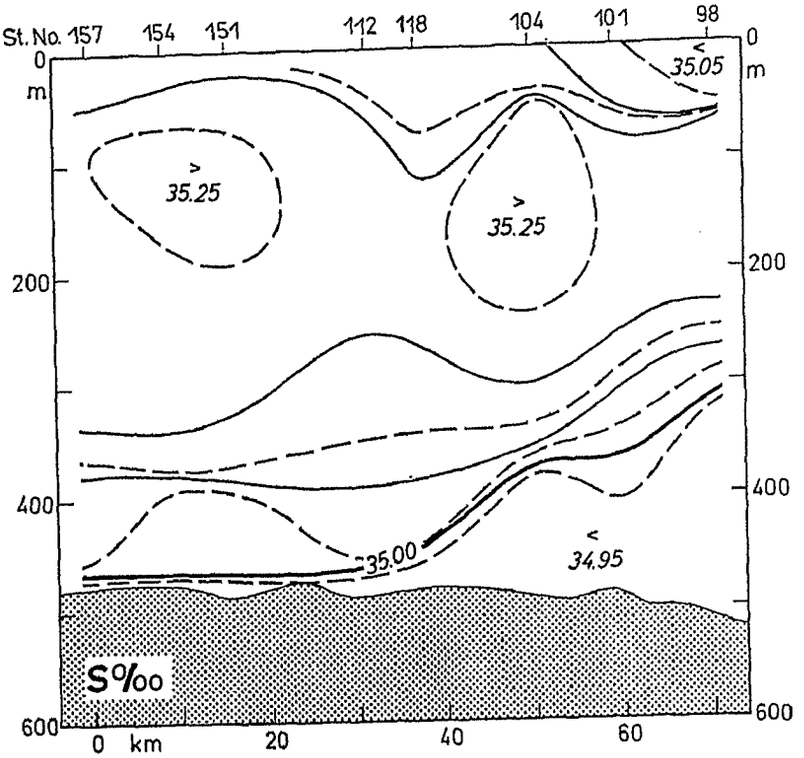

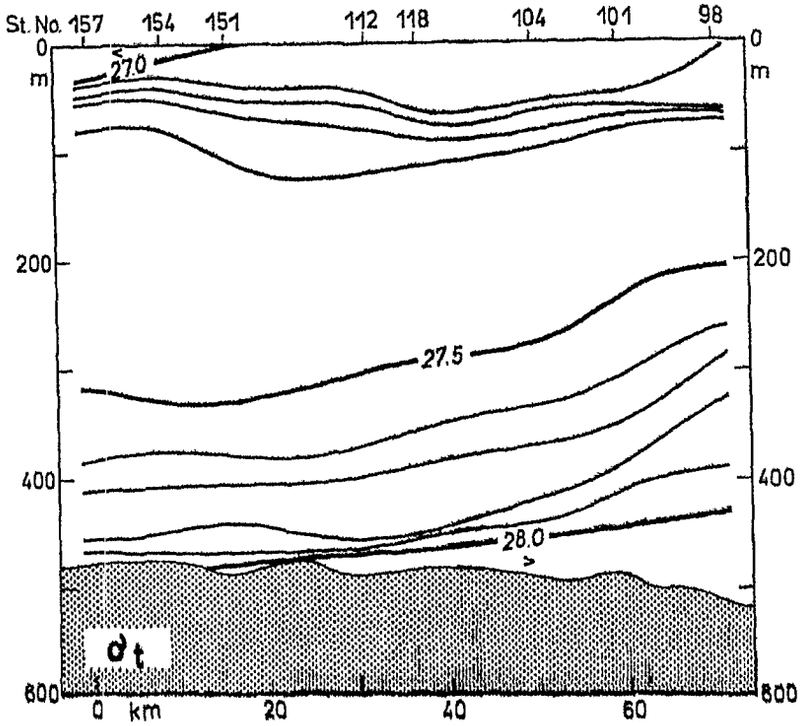

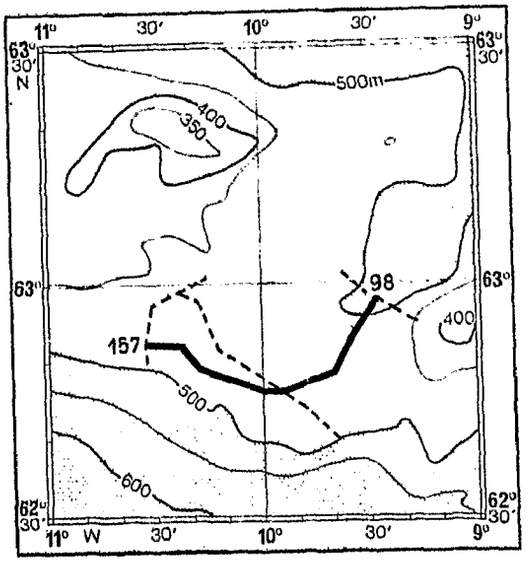

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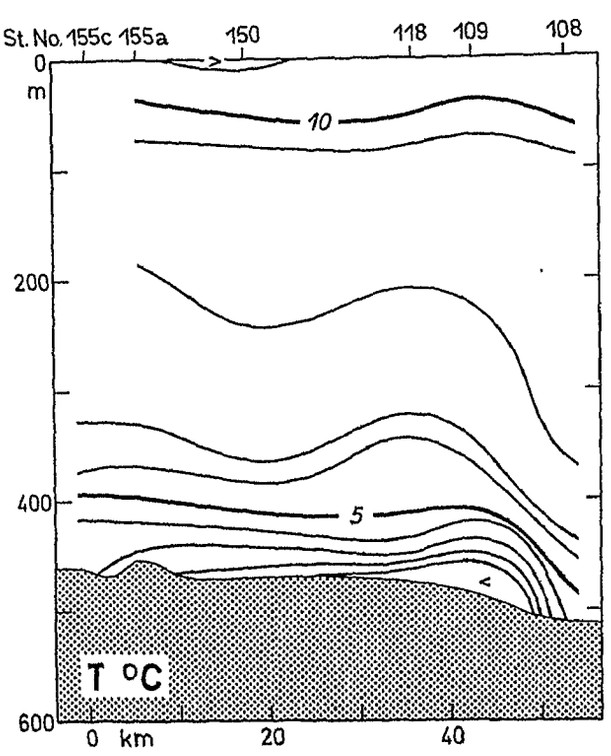

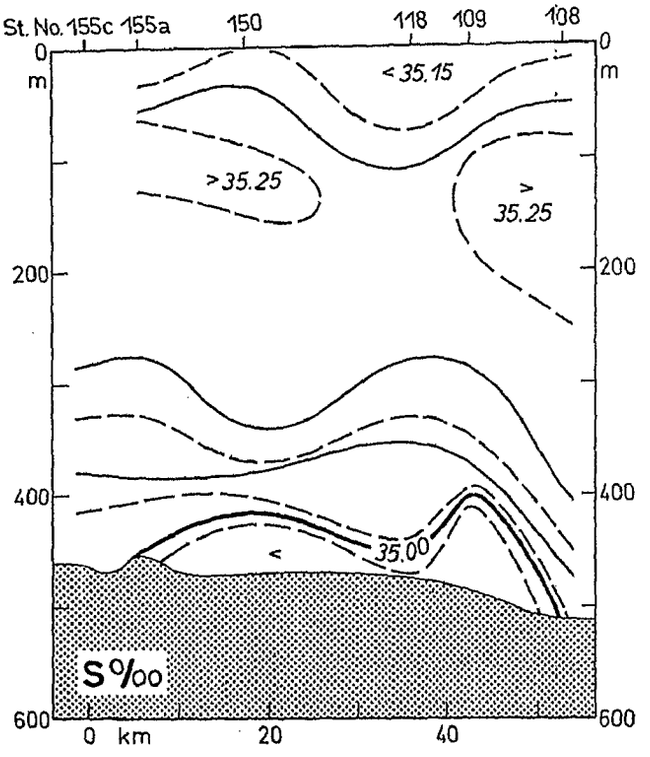

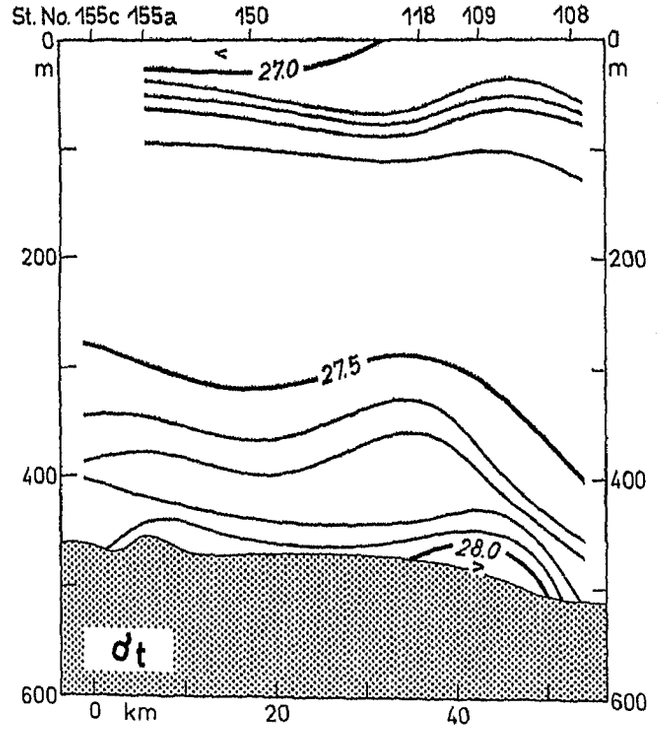

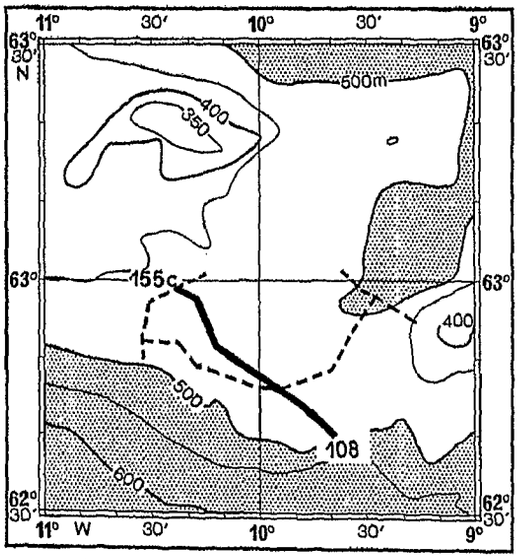

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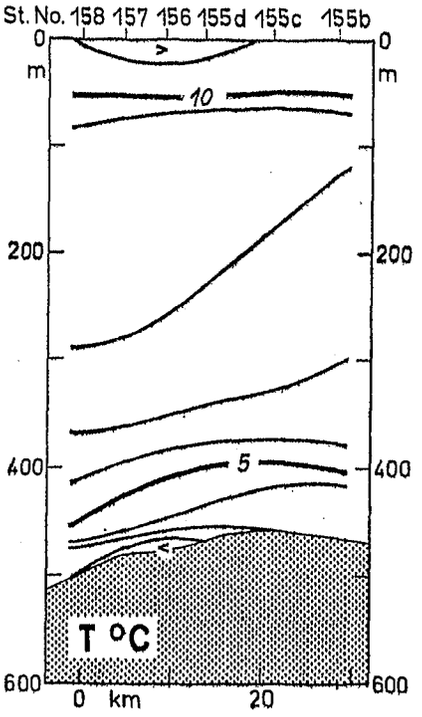

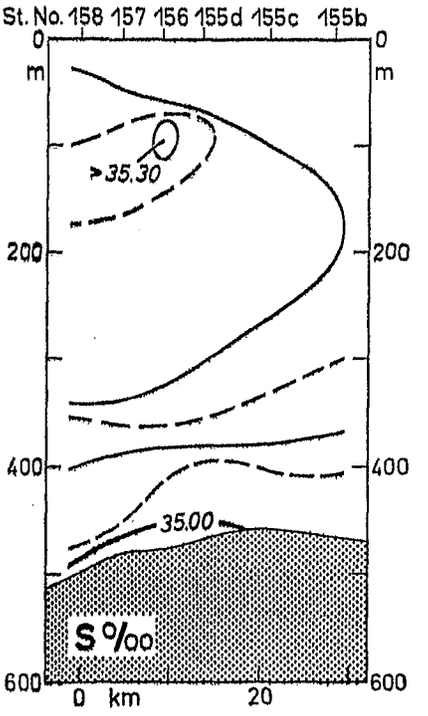

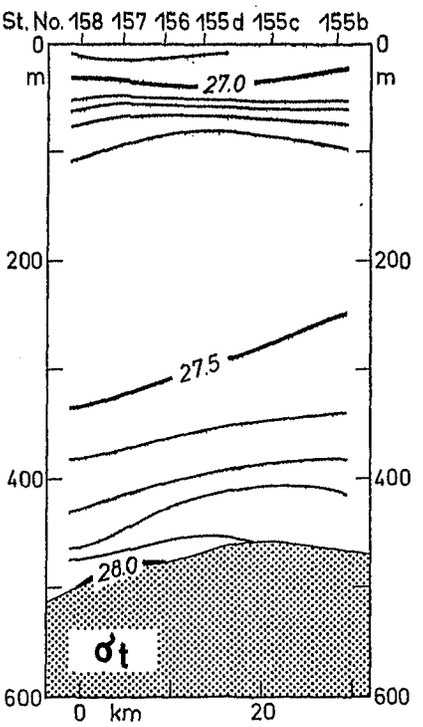

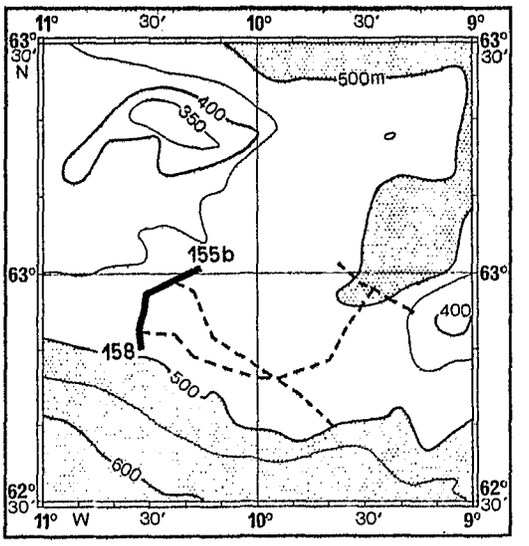

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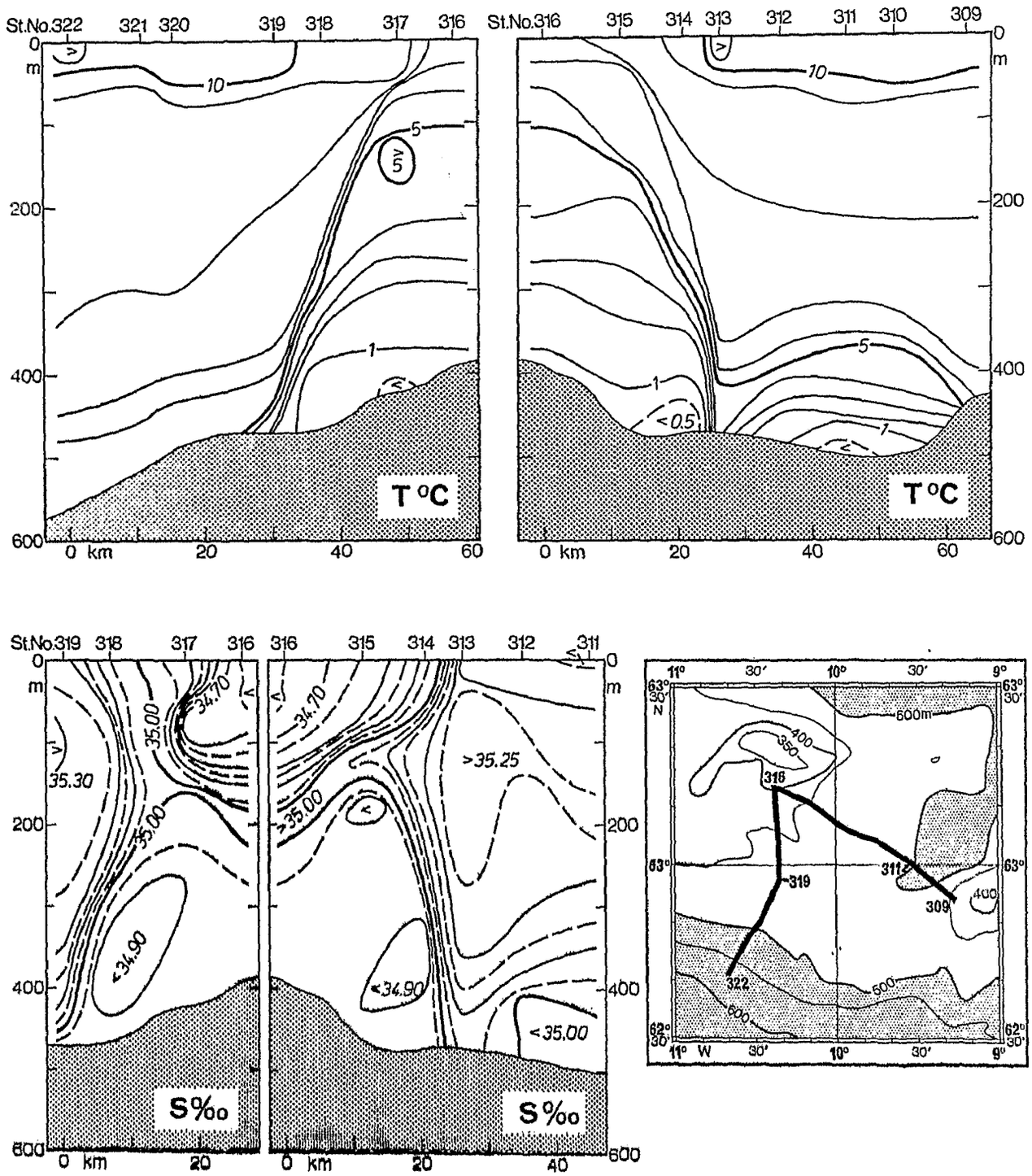

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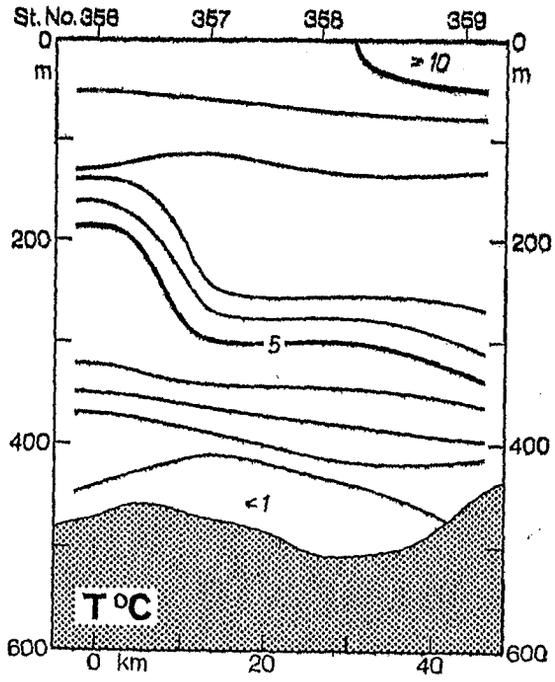

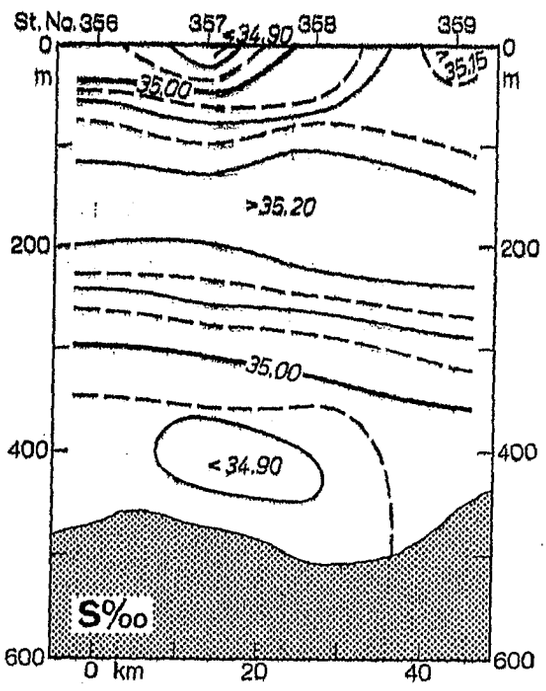

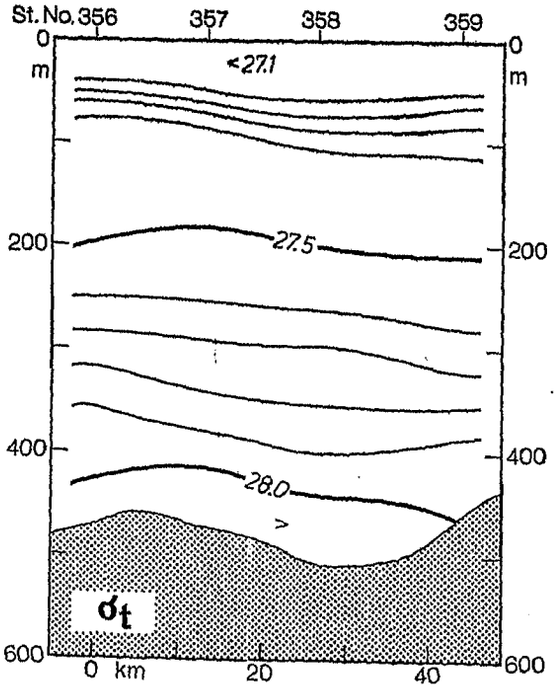

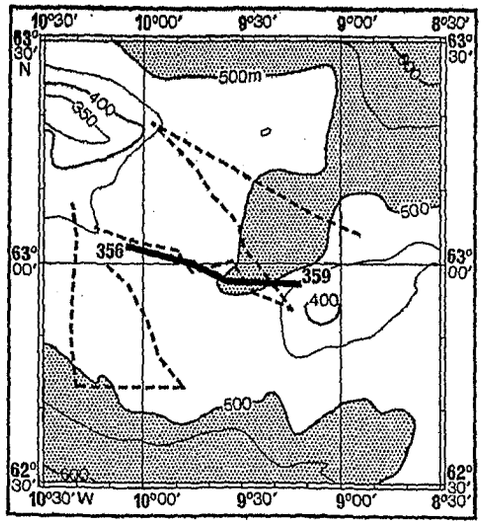

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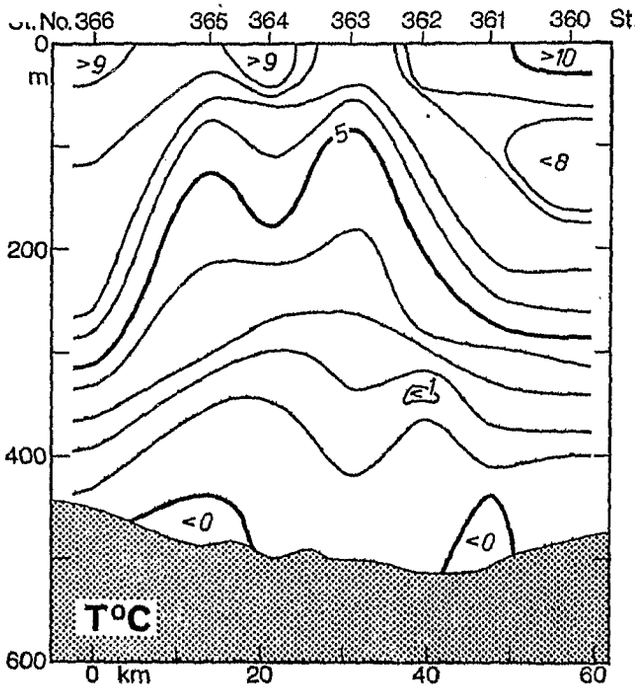

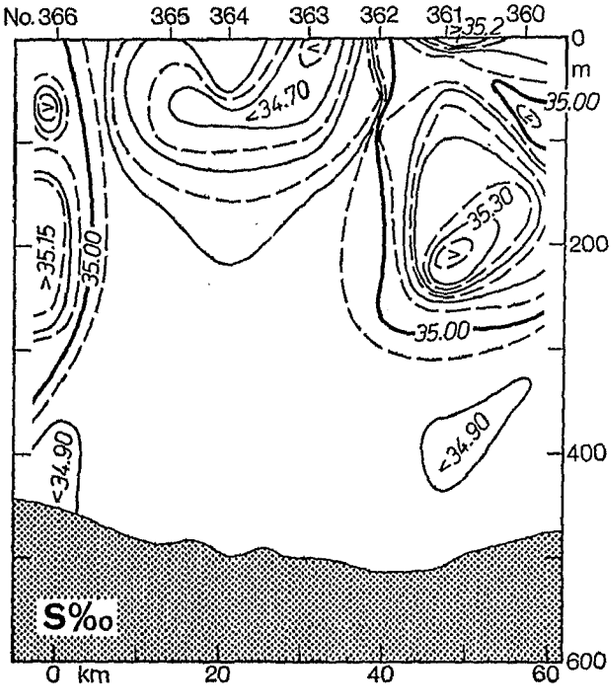

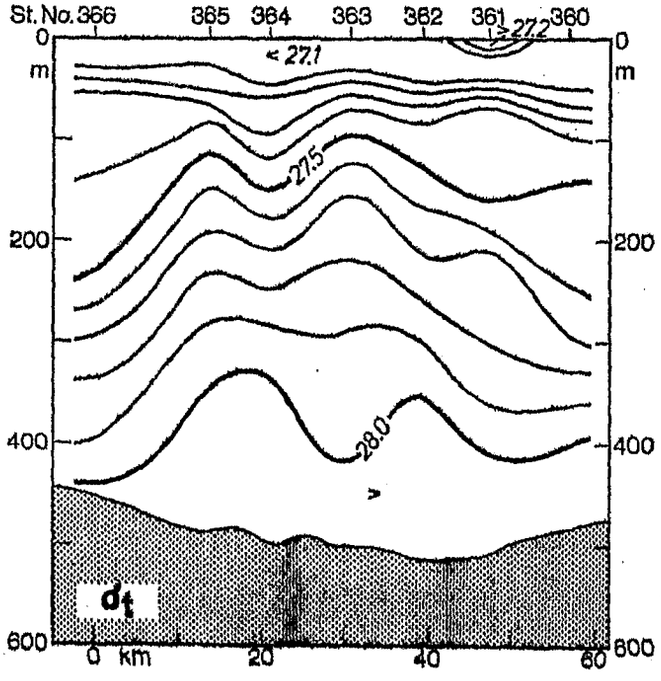

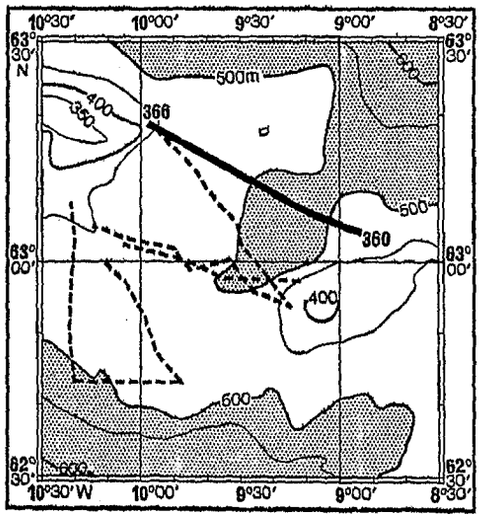

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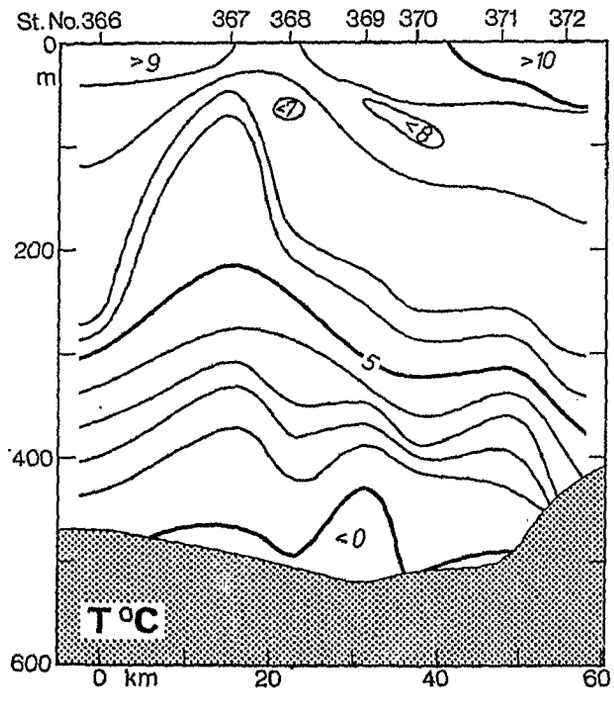

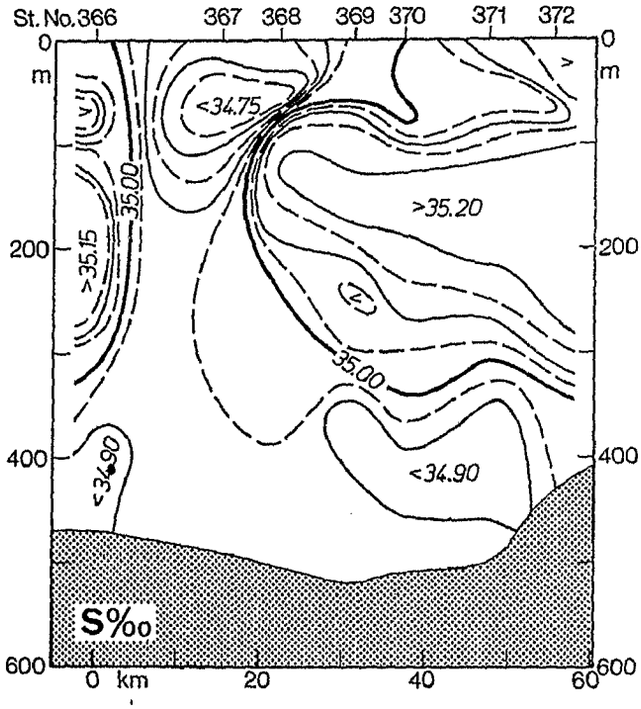

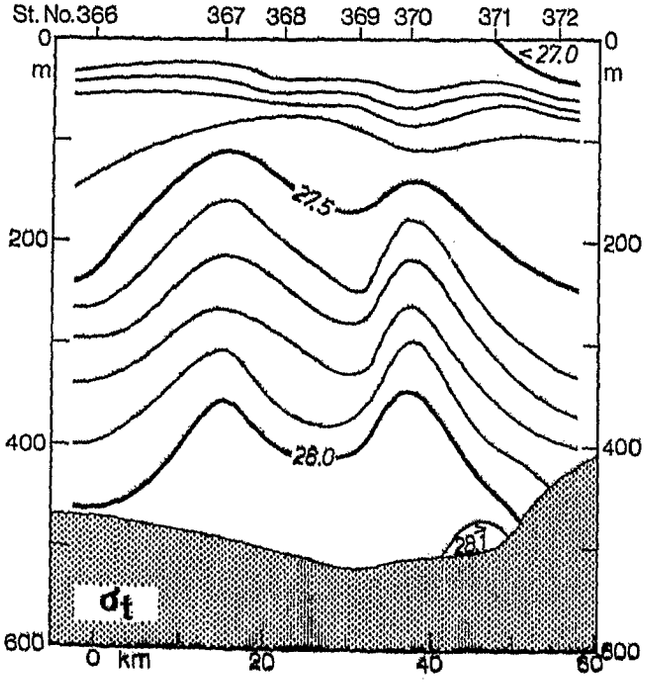

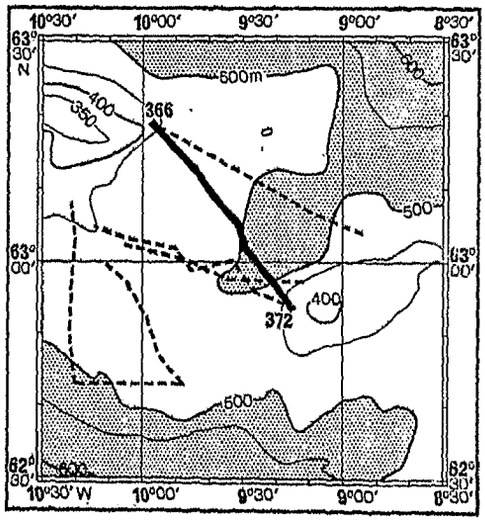

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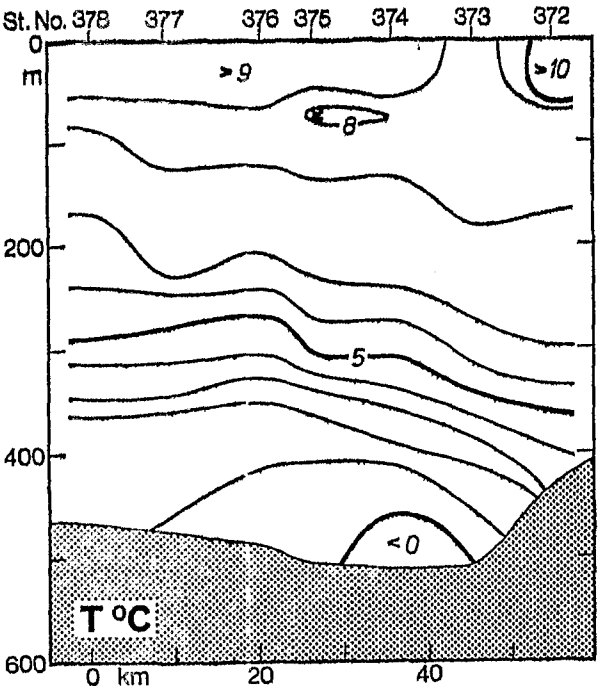

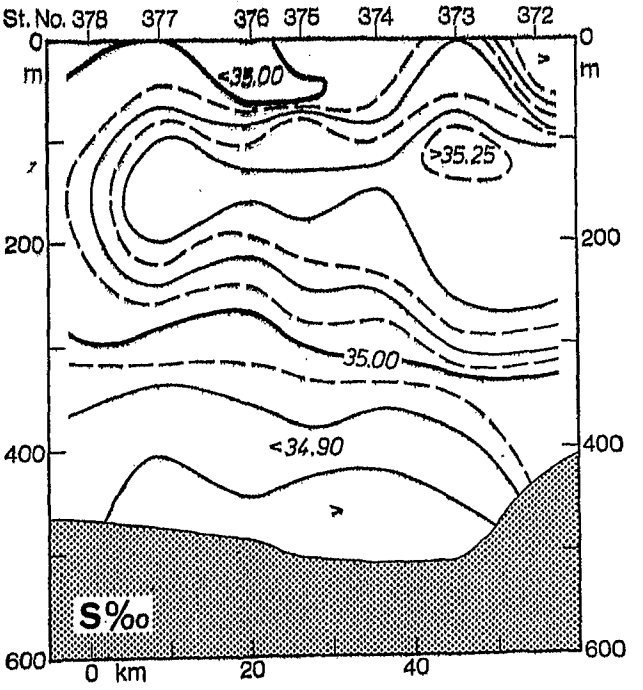

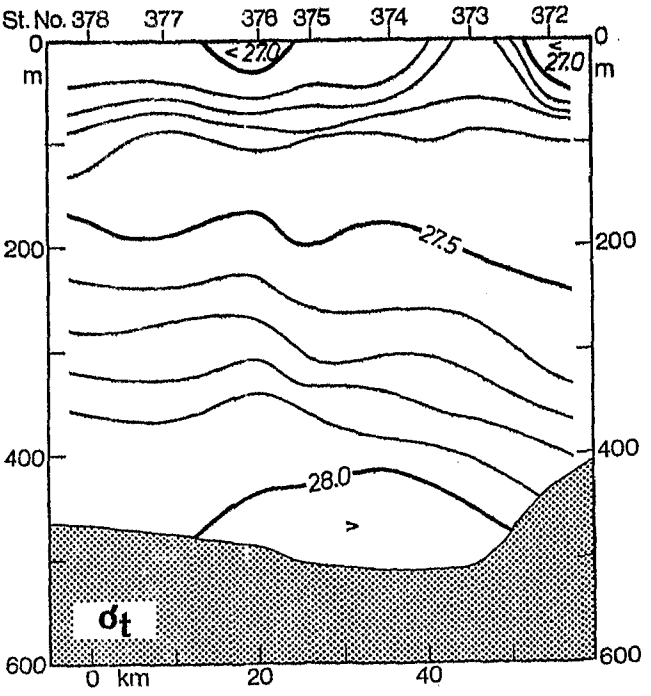

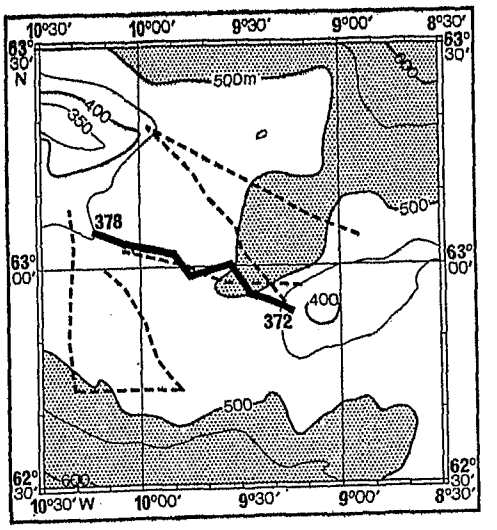

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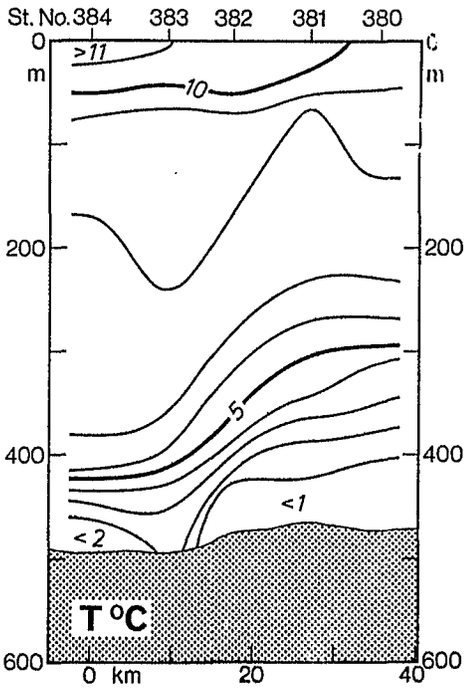
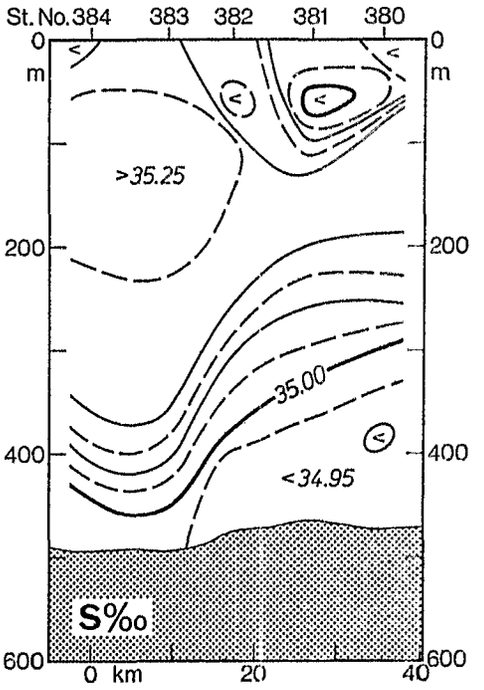
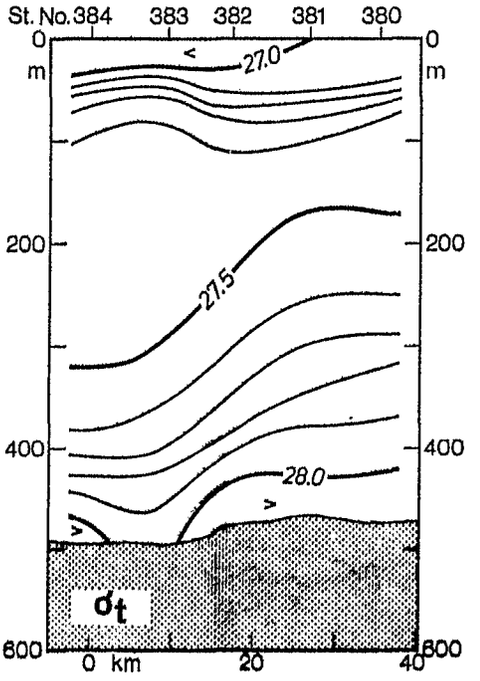
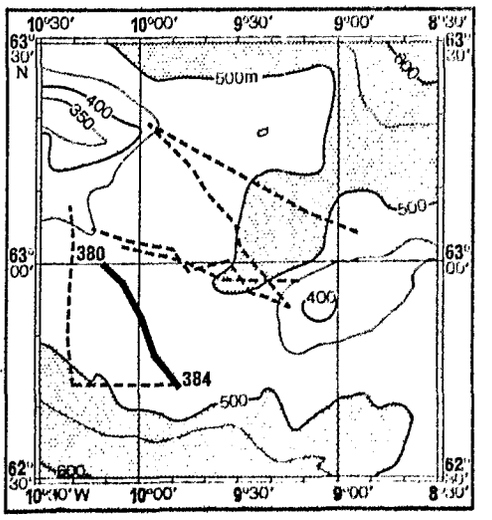
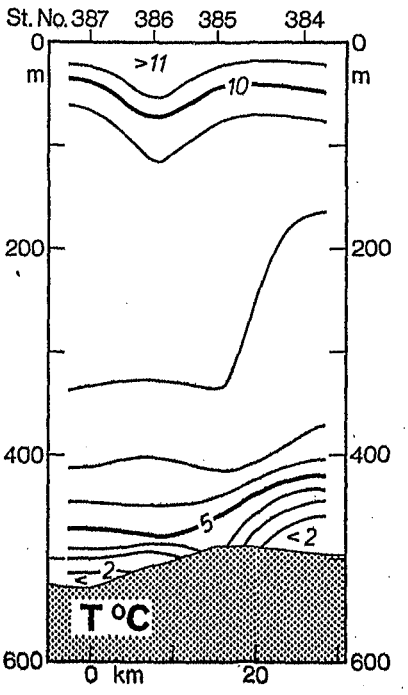


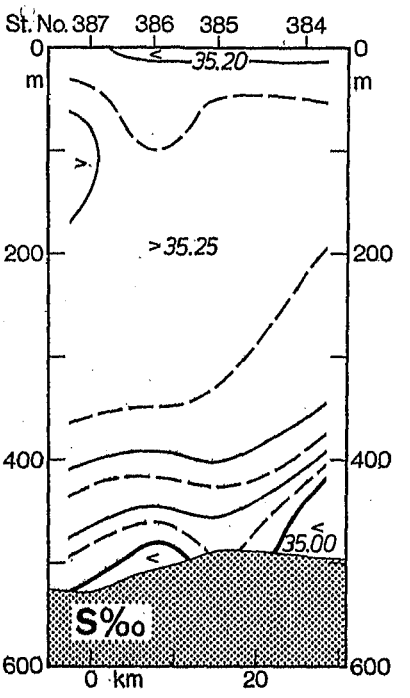


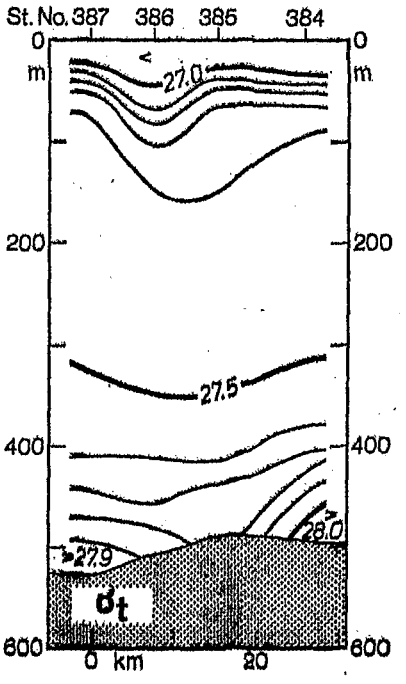


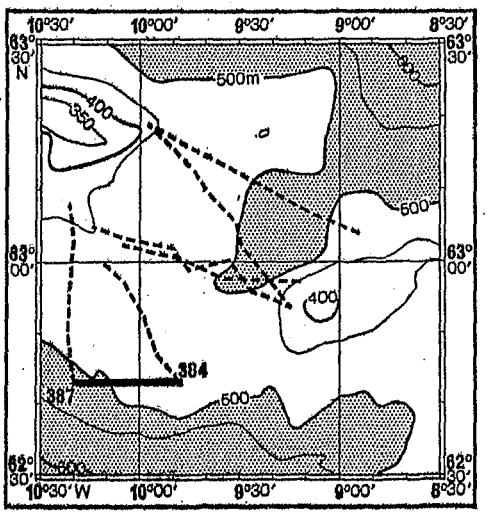


1973, September 19

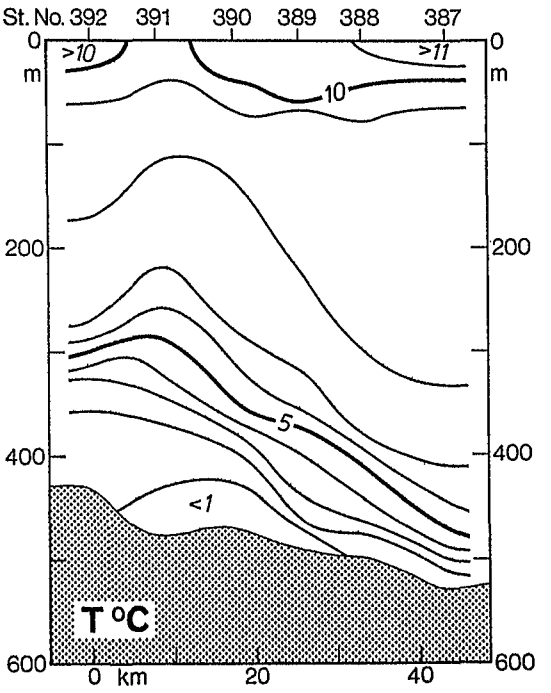


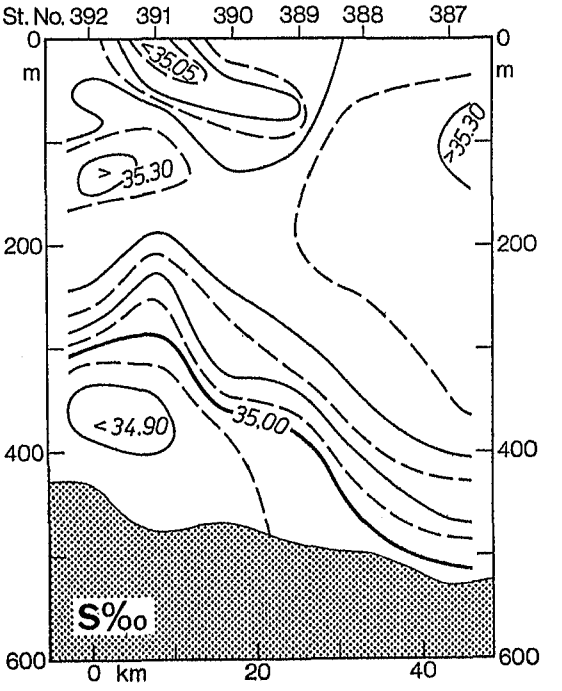


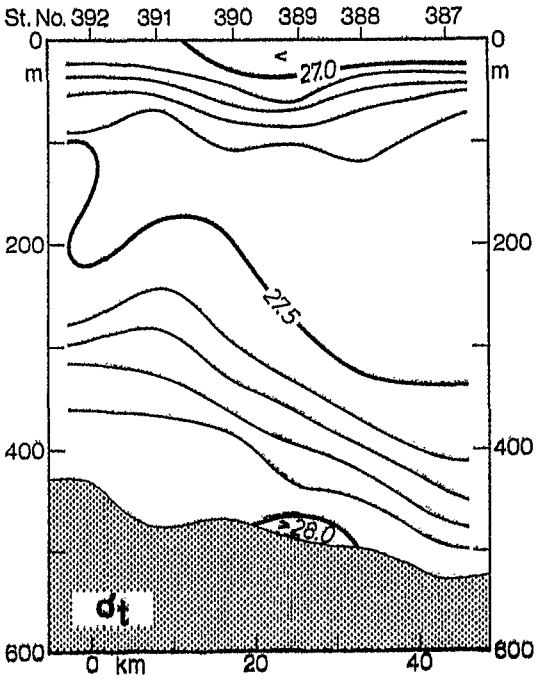


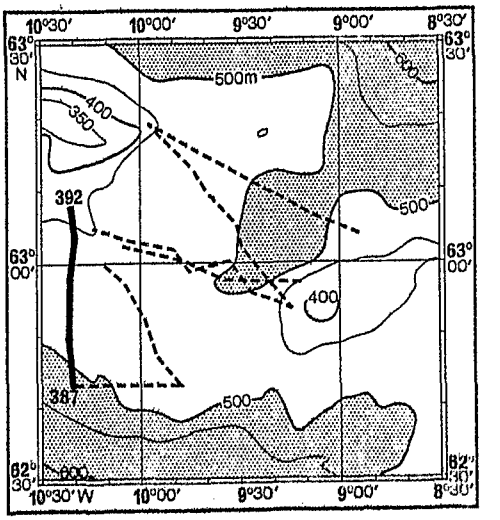


1973, September 19





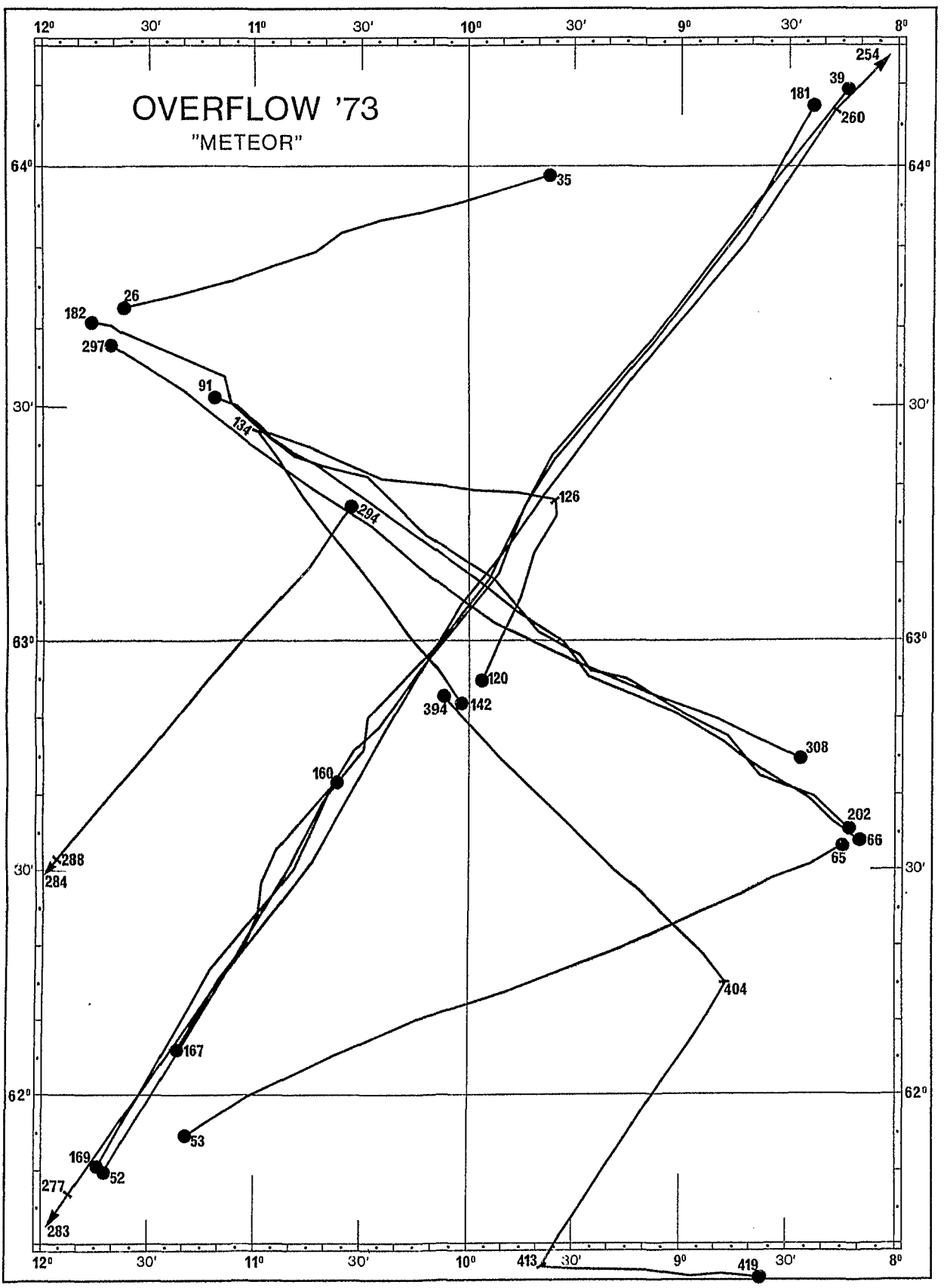


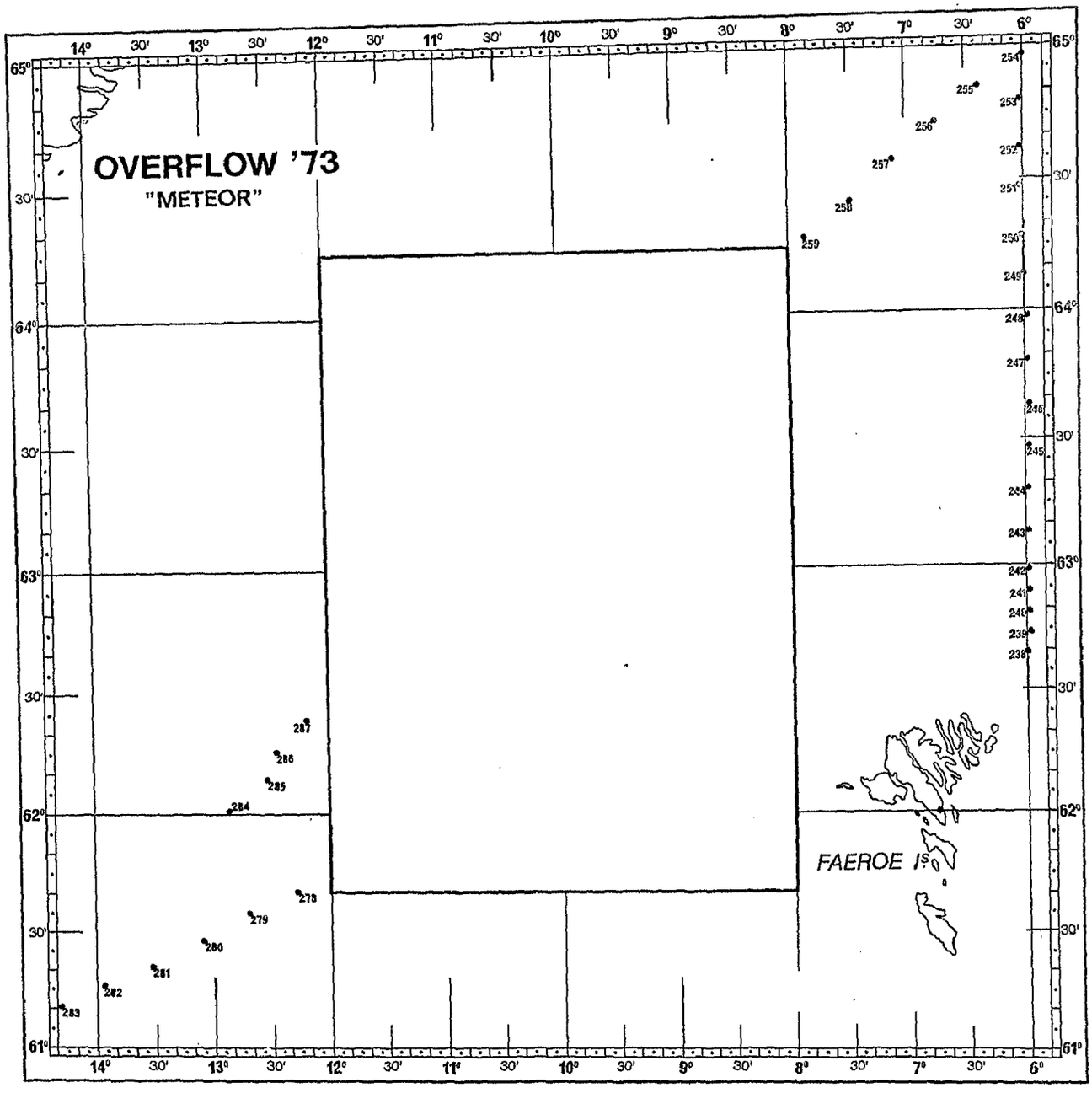


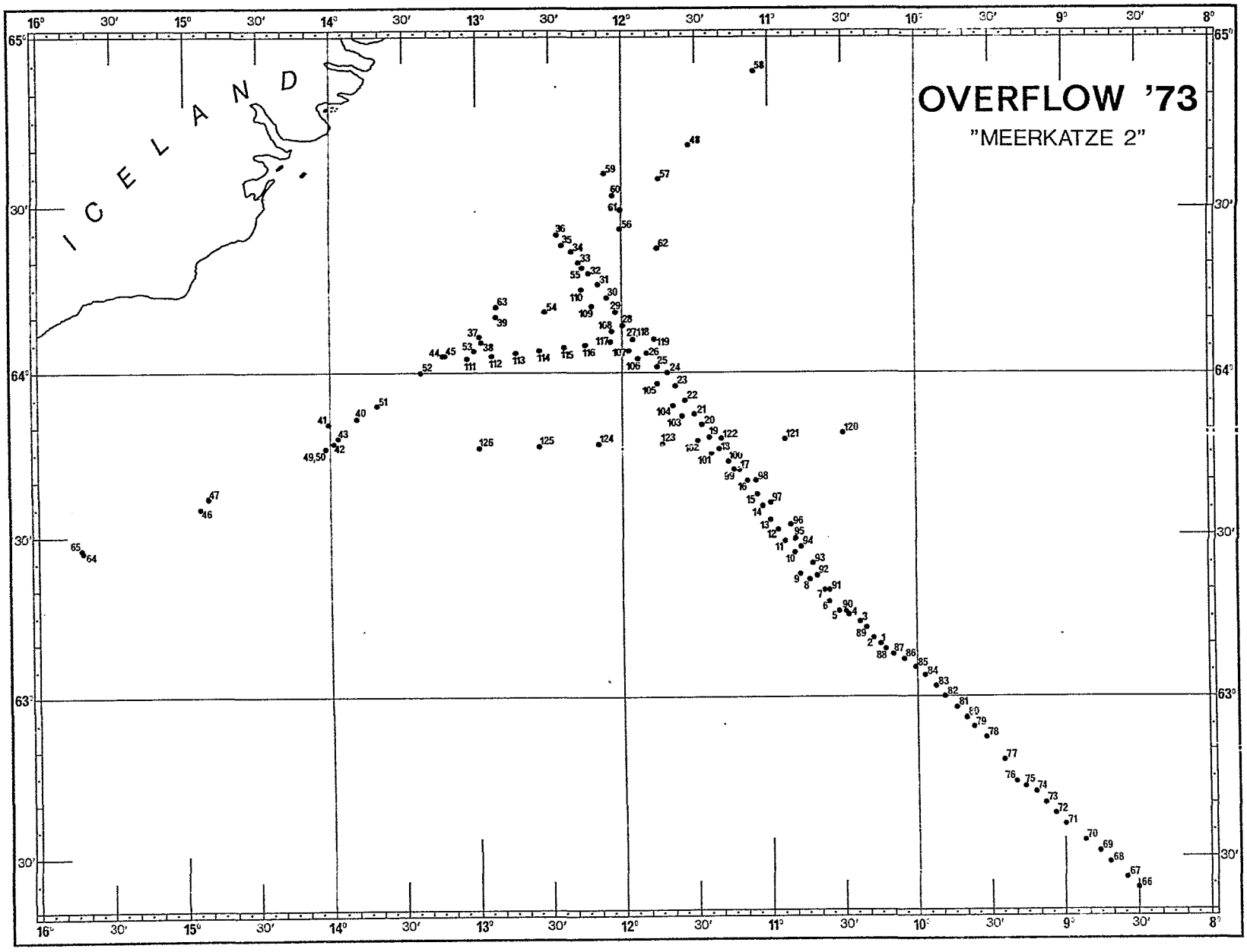
1973, September 19-20

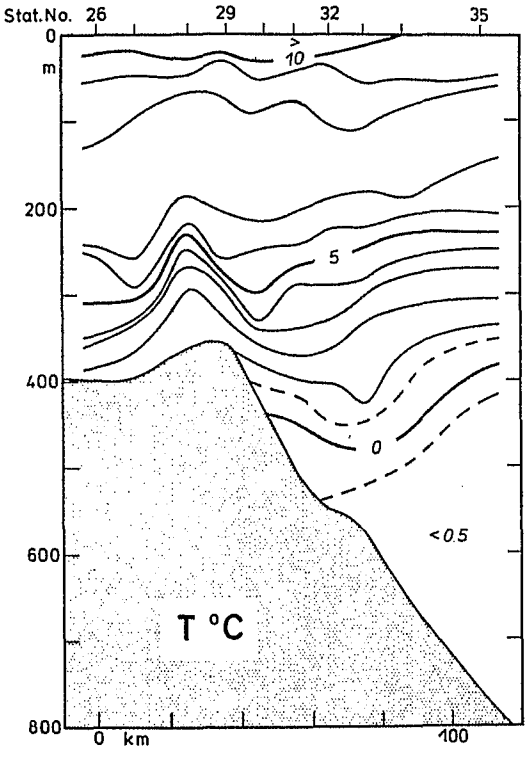
3.3 XBT-sections

The graphs are preceded by three maps showing the orientation of the XBT-sections which were obtained by R.V. "Meteor" and by F.R.V. "Meerkatze 2" (the Meteor-maps are identical with the ones used in 3.1).

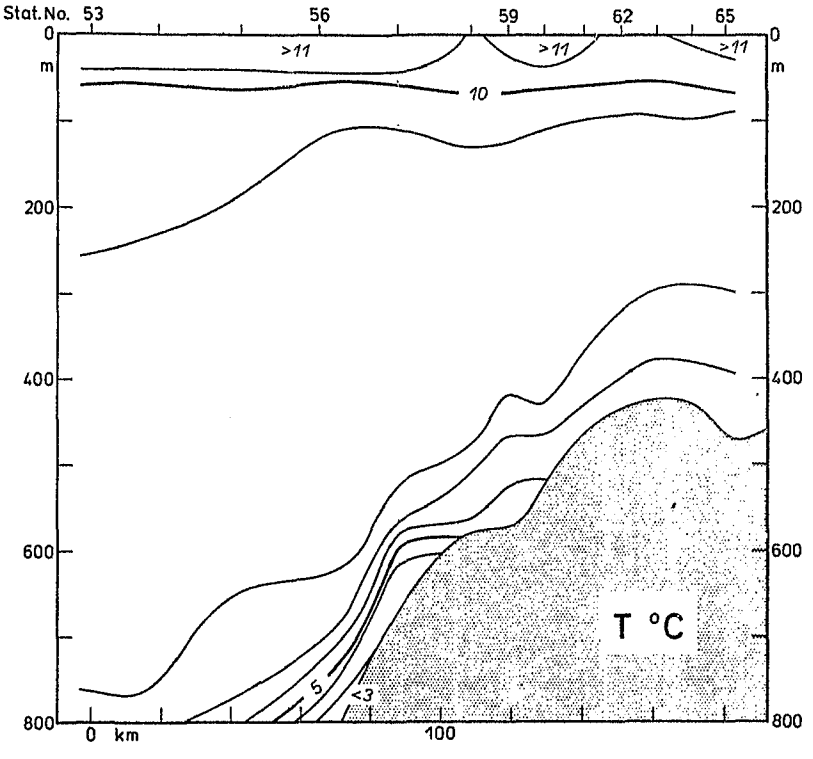

OVERFLOW '73
"METEOR"
12°
30'
11°
30'
10°
30'
9°
30'
8°
64°
63°
62°
254
39
181
260
35
26
182
297
91
134
126
294
120
394
142
308
160
202
66
65
288
284
404
167
53
169
52
277
283
413
419


OVERFLOW '73
"METEOR"
FAEROE Is.
14° 30' 13° 30' 12° 30' 11° 30' 10° 30' 9° 30' 8° 30' 7° 30' 6°
65° 64° 63° 62° 61°
254 255 253 256 252 257 251 258 250 259 249 248 247 246 245 244 243 242 241 240 239 238
287 286 285 284 278 279 280 281 282 283

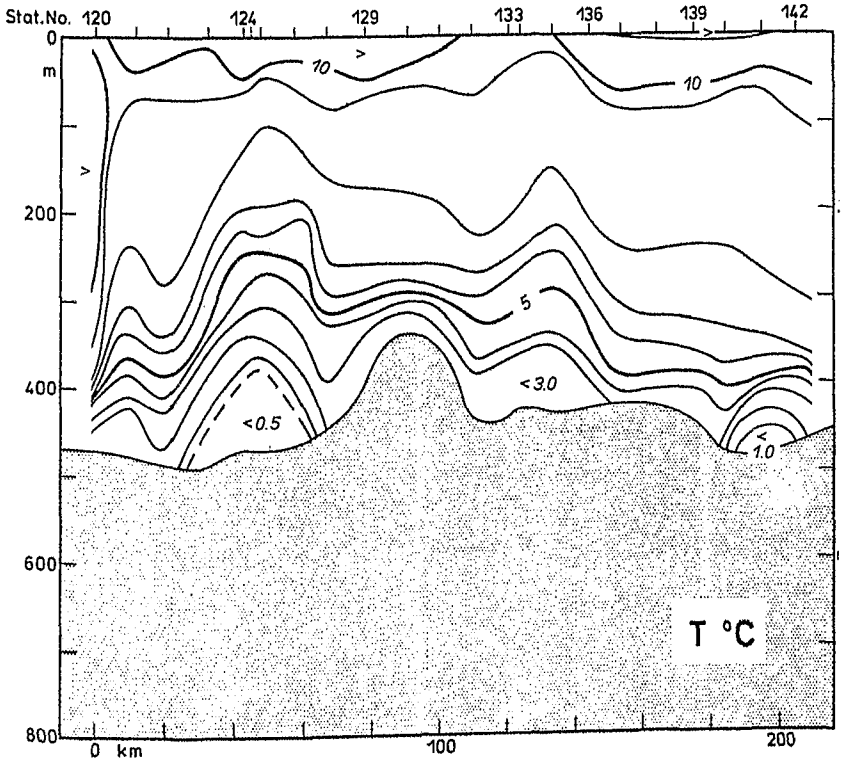

OVERFLOW '73
"MEERKATZE 2"
ICELAND
16°
30'
15°
14°
13°
12°
11°
10°
9°
8°
65°
64°
63°



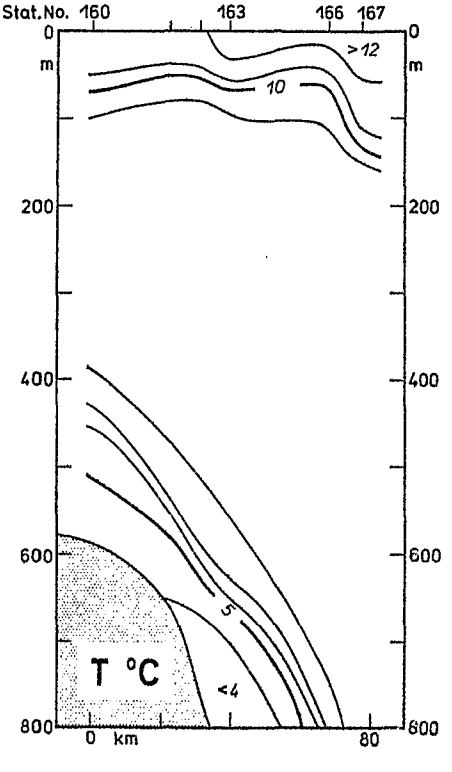
1973, August 15 (Meteor)



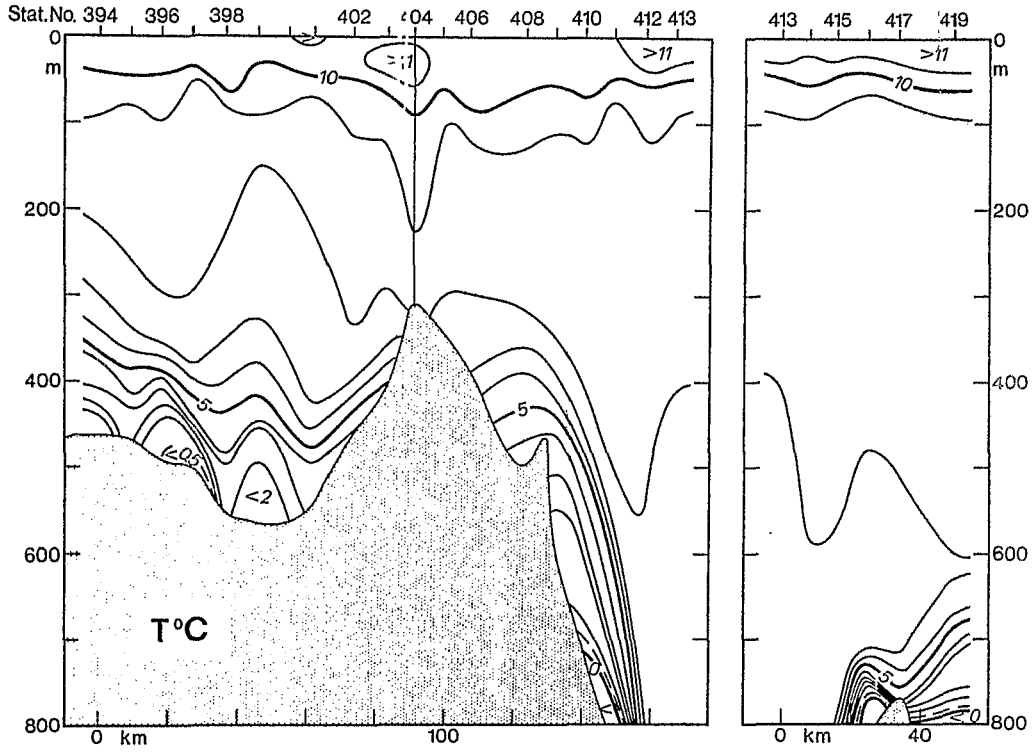
1973, August 17-18 (Meteor)



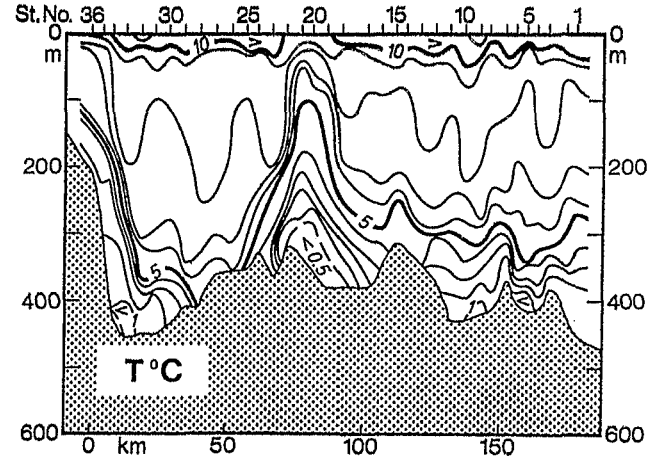
1973, August 22 (Meteor)



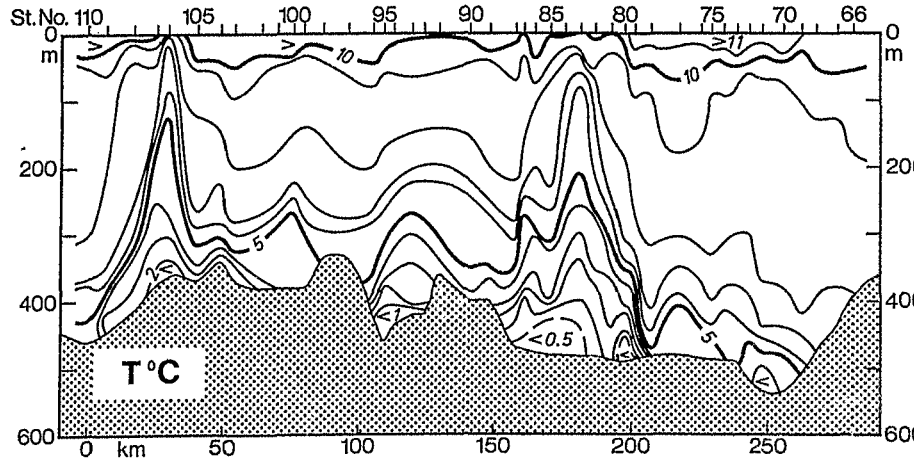
1973, August 24 (Meteor)



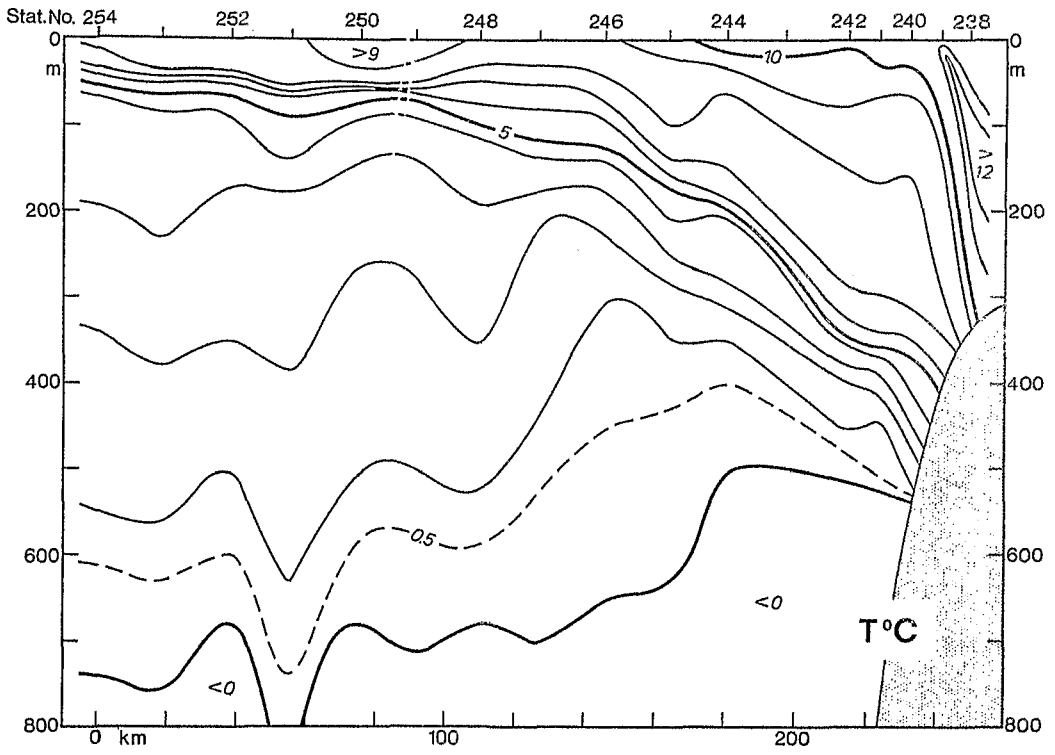
1973, September 20 (Meteor)



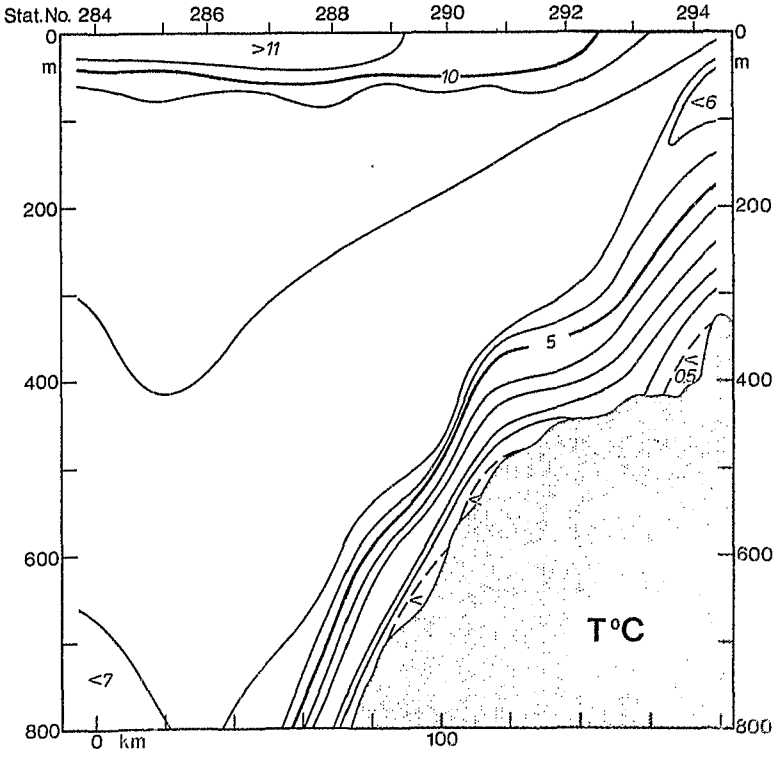
1973, August 12-13 (Meerkatze 2)



1973, September 02-03 (Meerkatze 2)



1973, September 03-04 (Meteor)



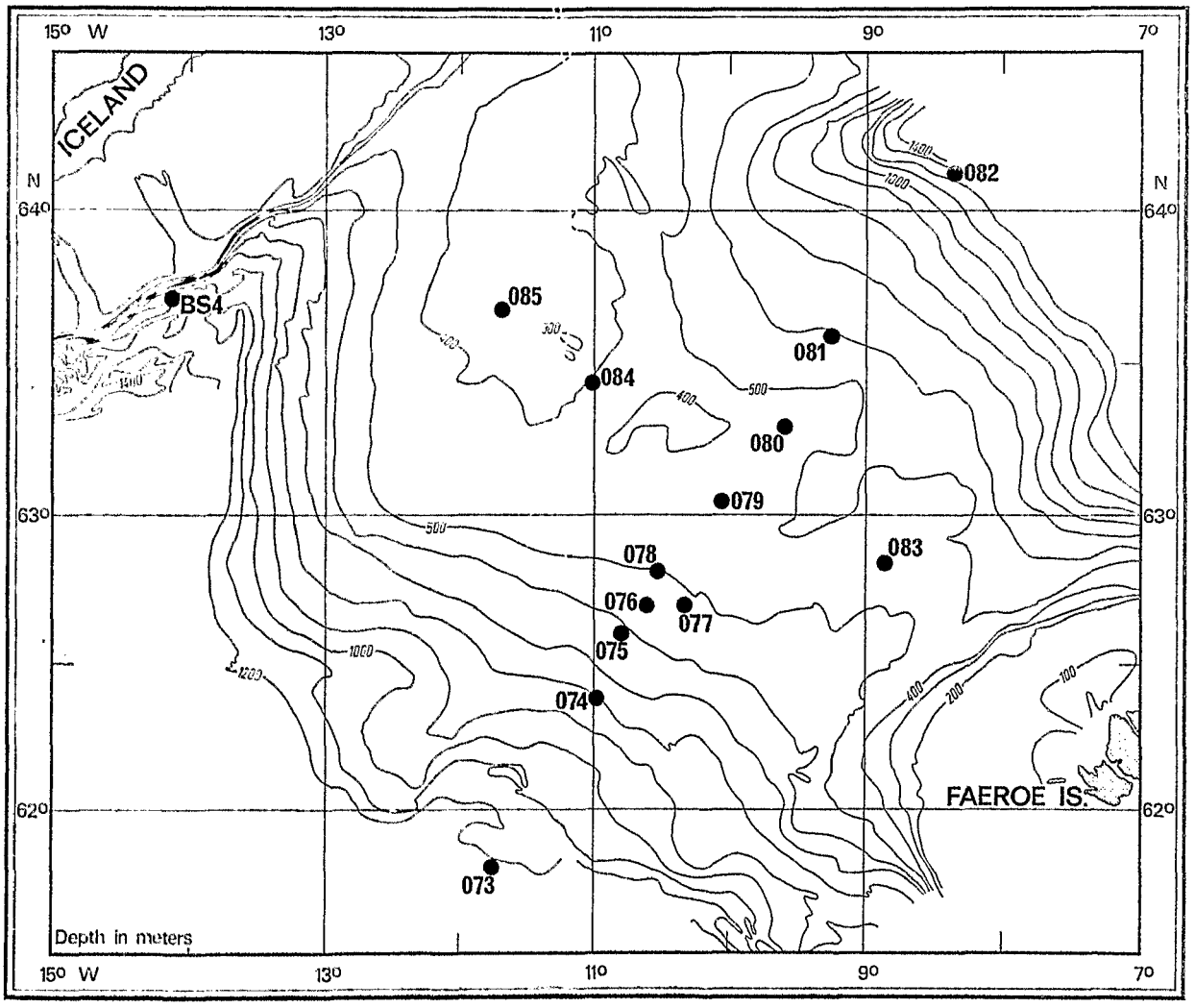
1973, September 09 (Meteor)

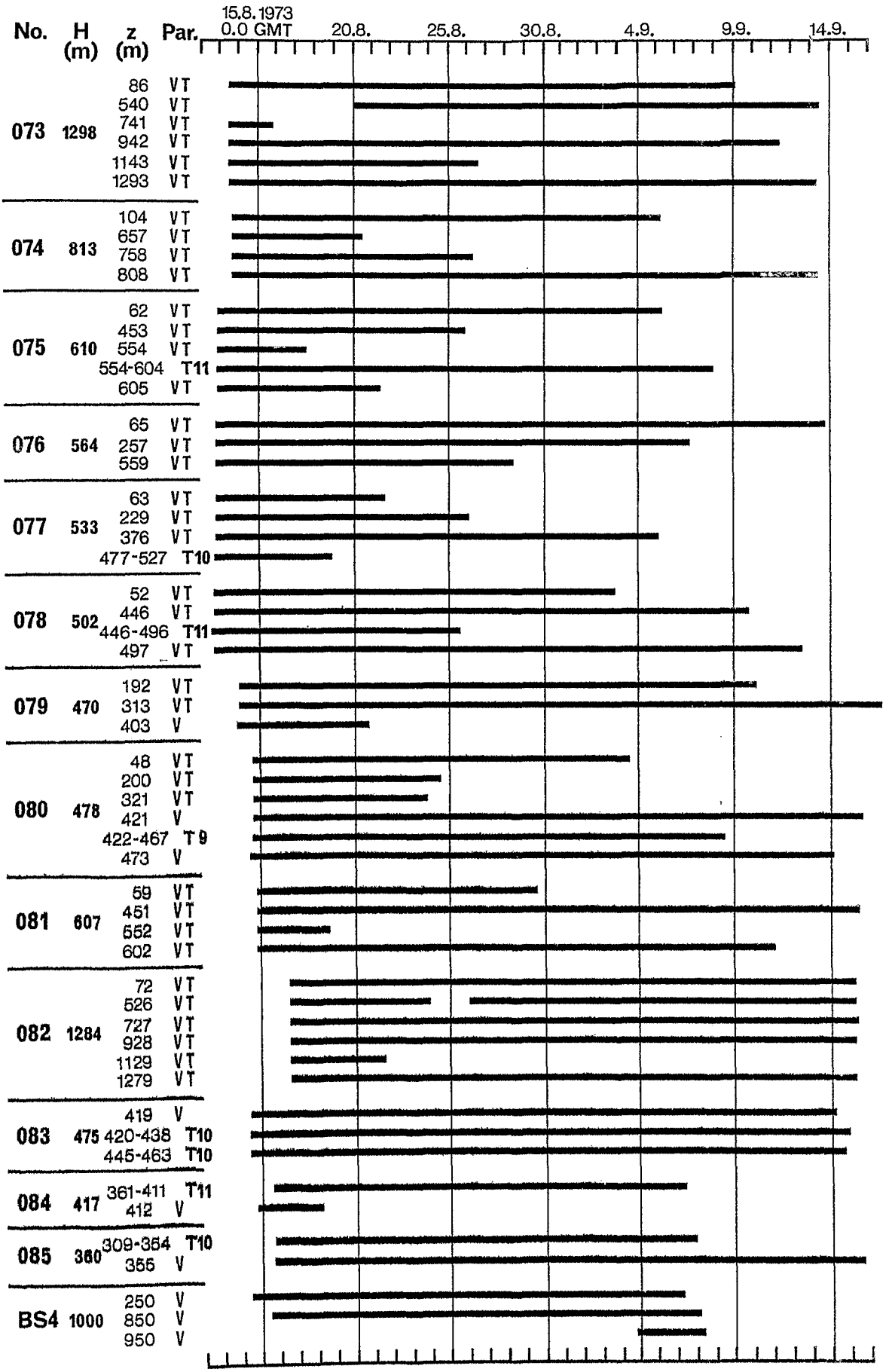
3.4 Time series from moored instruments

The time series plots are preceded by a map showing the location and the identification of the moored arrays and by a diagramme giving the length of usable records from each instrument. The moorings were deployed by R.V. "Meteor" (mooring numbers 073 to 085) and by R.V. "Bjarni Saemundsson" (mooring number BS 4).

Key to symbols

No.	=	mooring identification number
H (m)	=	Depth to bottom
z (m)	=	Depth of sensor
V	=	Record of speed and direction
T	=	Record of temperature (simultaneous with V)
T_n	=	Record of thermistor cable with n thermistors equally spaced over the z-interval given


15° W
13°
11°
9°
7°
ICELAND
N
64°
63°
62°
BS4
085
084
082
081
080
079
078
083
076
077
075
074
073
FAEROE IS.
Depth in meters

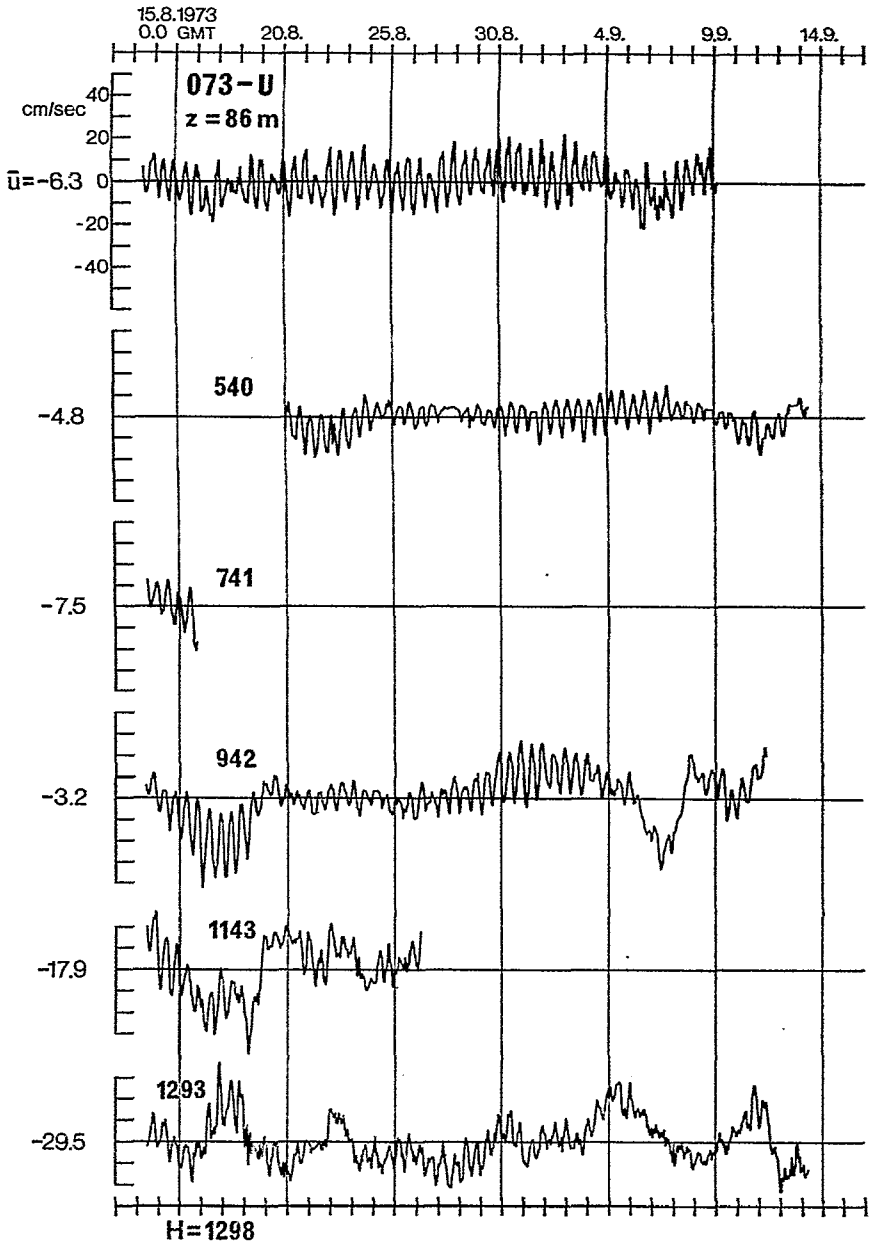

No.
H (m)
z (m)
Par.
15.8.1973 0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
073 1298 86 VT
540 VT
741 VT
942 VT
1143 VT
1293 VT
074 813 104 VT
657 VT
758 VT
808 VT
075 610 62 VT
453 VT
554 VT
554-604 T11
605 VT
076 564 65 VT
257 VT
559 VT
077 533 63 VT
229 VT
376 VT
477-527 T10
078 502 52 VT
446 VT
446-496 T11
497 VT
079 470 192 VT
313 VT
403 V
080 478 48 VT
200 VT
321 VT
421 V
422-467 T 9
473 V
081 607 59 VT
451 VT
552 VT
602 VT
082 1284 72 VT
526 VT
727 VT
928 VT
1129 VT
1279 VT
083 475 419 V
420-438 T10
445-463 T10
084 417 361-411 T11
412 V
085 360 309-364 T10
355 V
BS4 1000 250 V
850 V
950 V

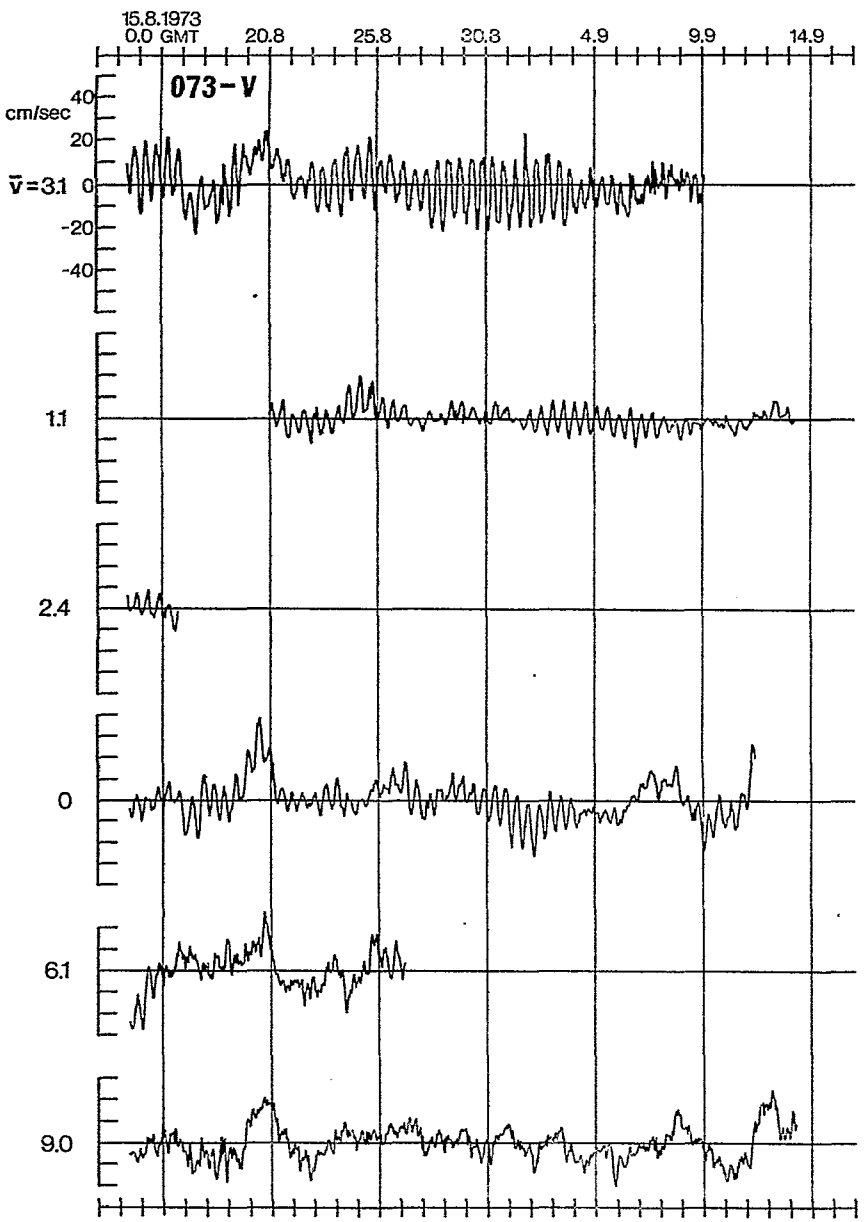
3.4.1 Time series of current-components

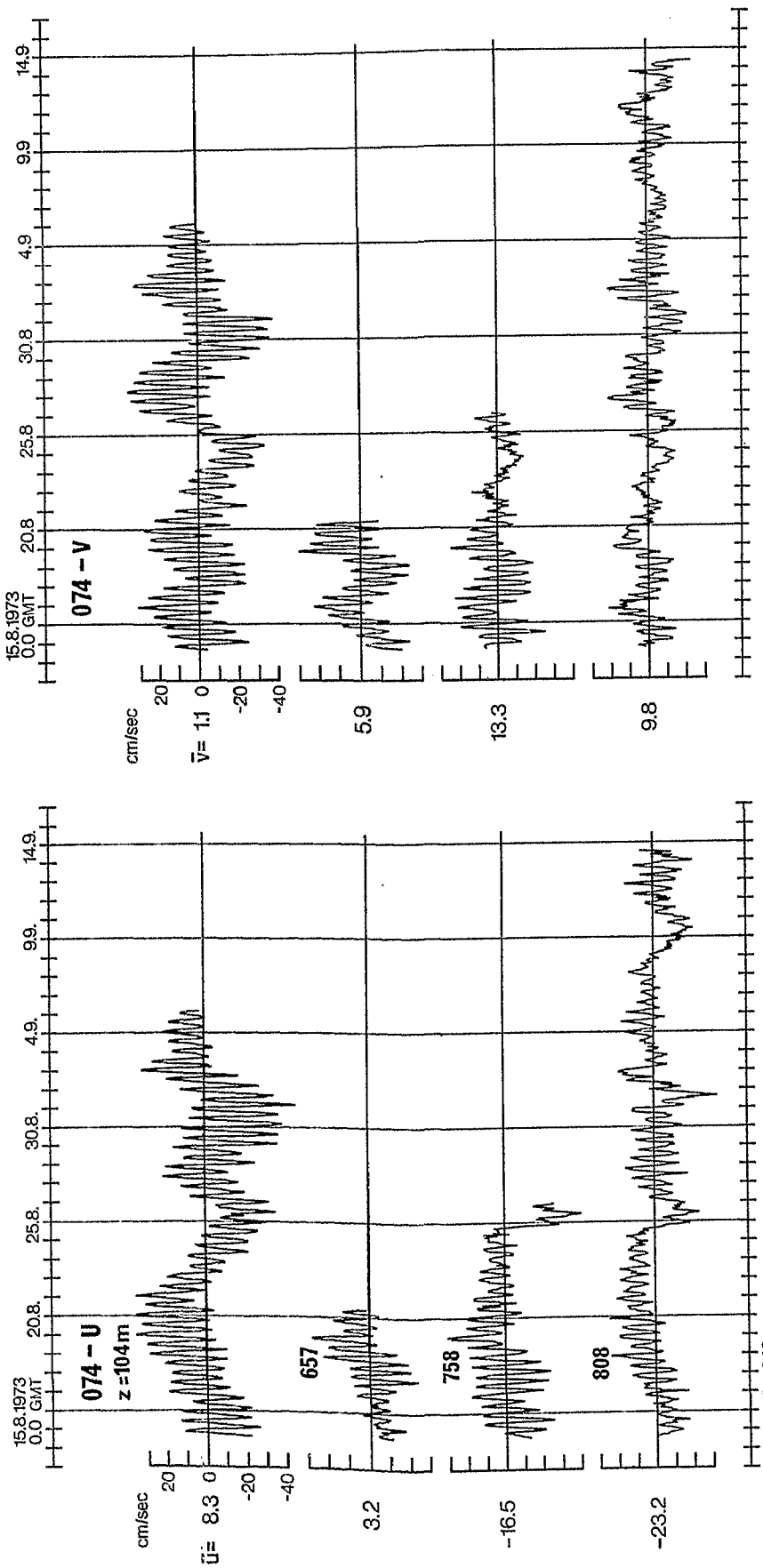
The plots are based on hourly averages with the overall mean value subtracted.

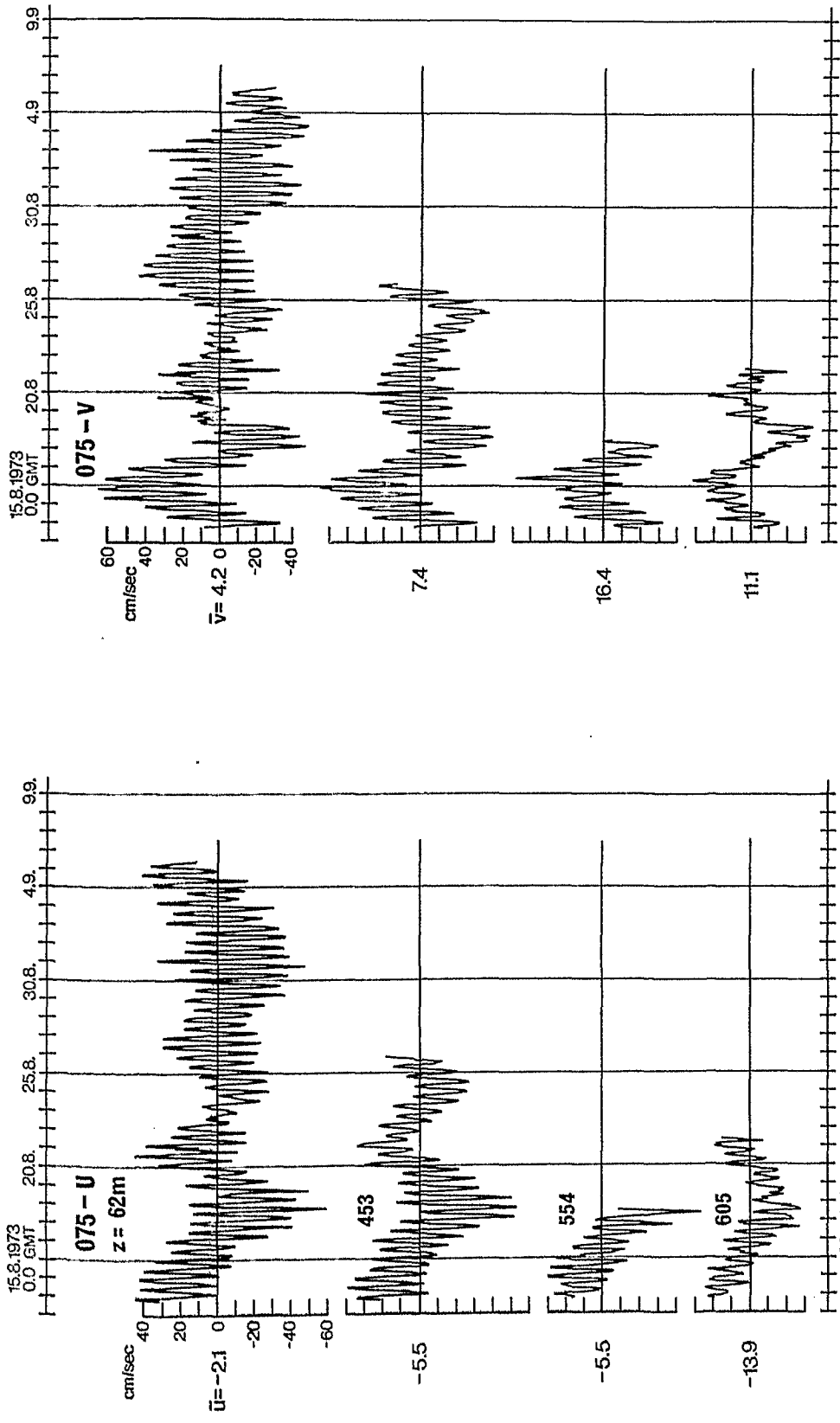
Key to symbols

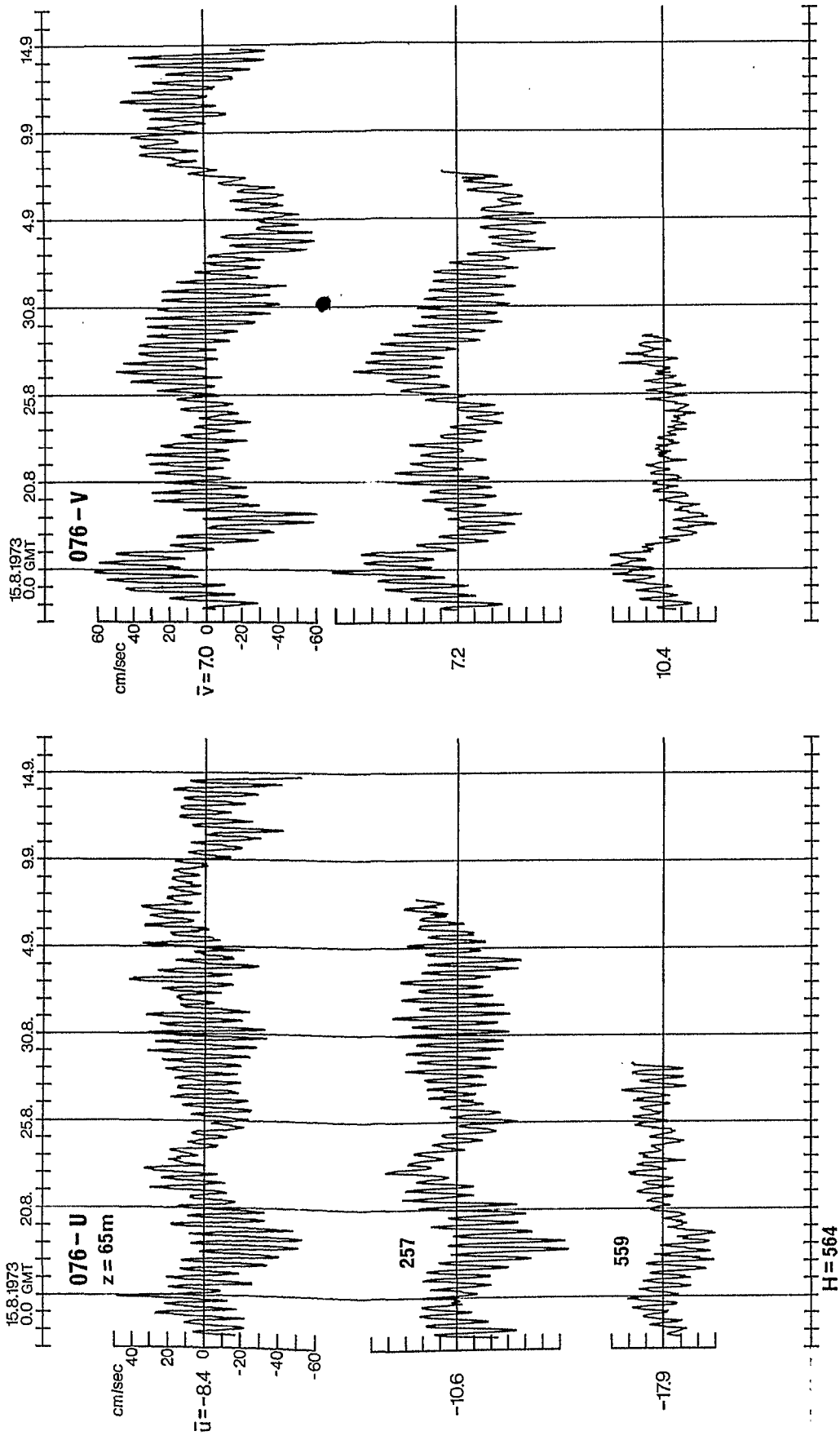
U	=	East-component positive towards east
V	=	North-component positive towards north
$\bar{u},\bar{v}$	=	Overall mean values
z	=	Instrument depth
H	=	Bottom depth

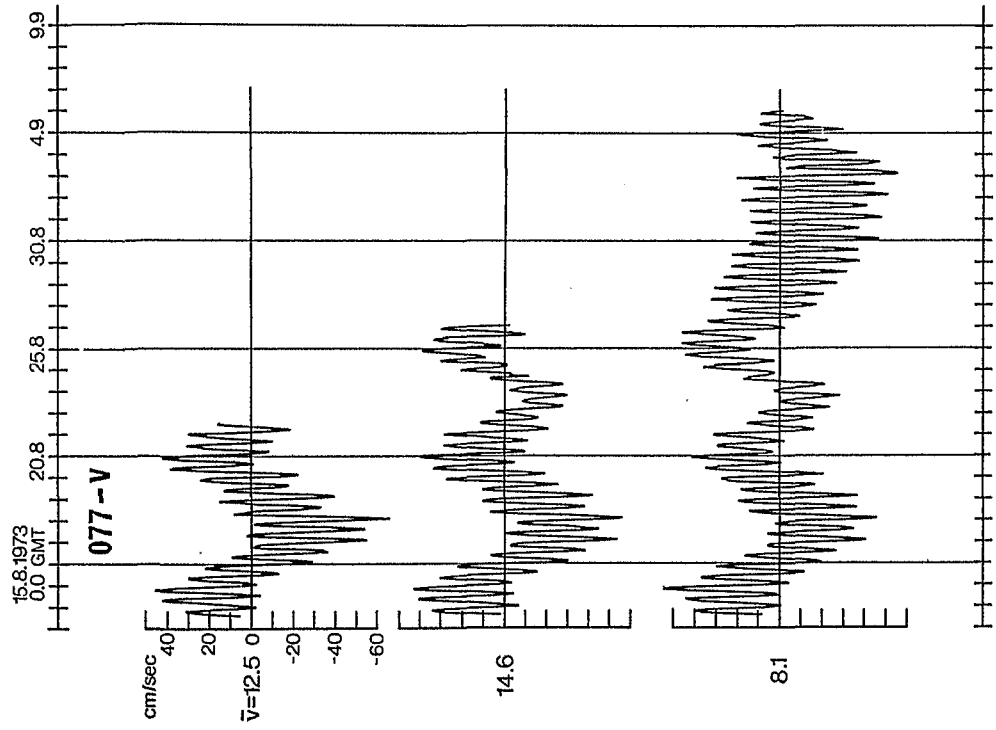

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
073-U
z = 86 m
cm/sec
40
20
0
-20
-40
ū=-6.3
540
-4.8
741
-7.5
942
-3.2
1143
-17.9
1293
-29.5
H=1298

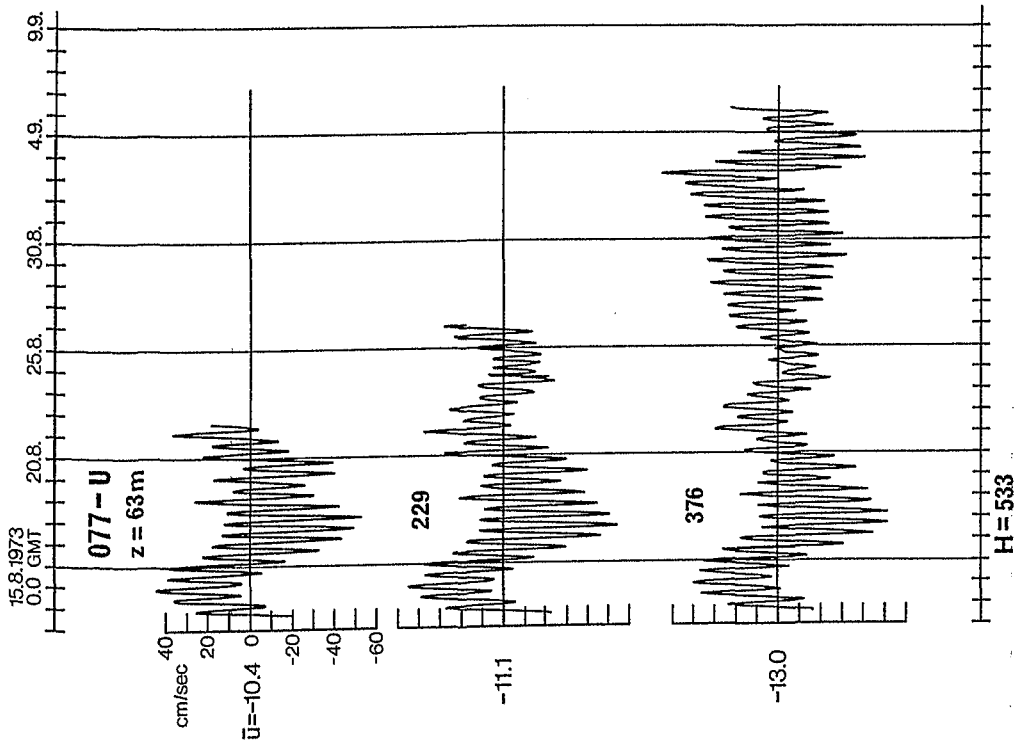

15.8.1973
0.0 GMT
20.8
25.8
30.8
4.9
9.9
14.9
073-V
cm/sec
40
20
0
-20
-40
v̄=3.1
1.1
2.4
0
6.1
9.0

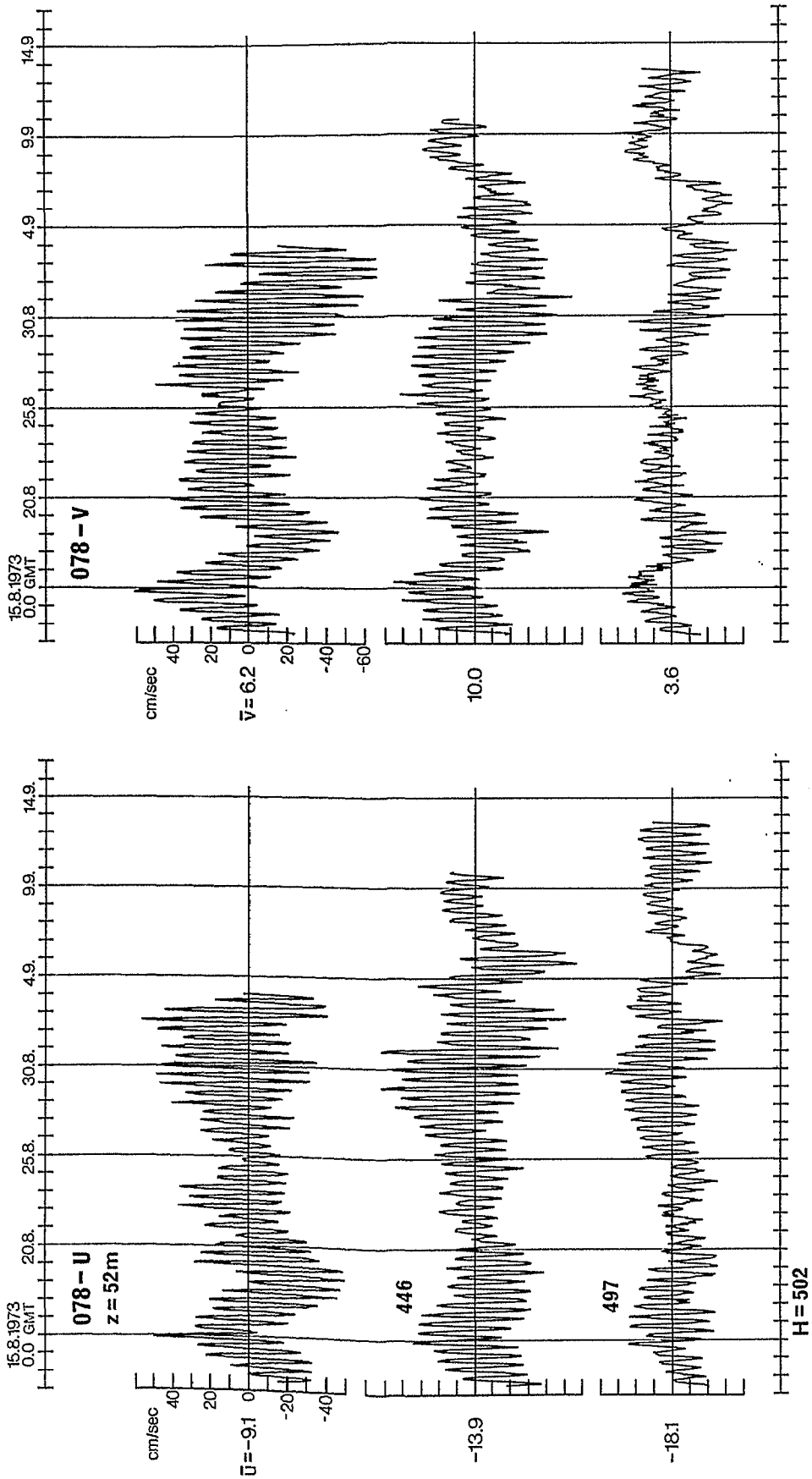

15.8.1973
0.0 GMT
074 – V
20.8
25.8
30.8
4.9
9.9
14.9
cm/sec
20
0
-20
-40
v̄= 1.1
5.9
13.3
9.8
074 – U
z=104m
657
758
808
H=813
ū= 8.3
3.2
-16.5
-23.2

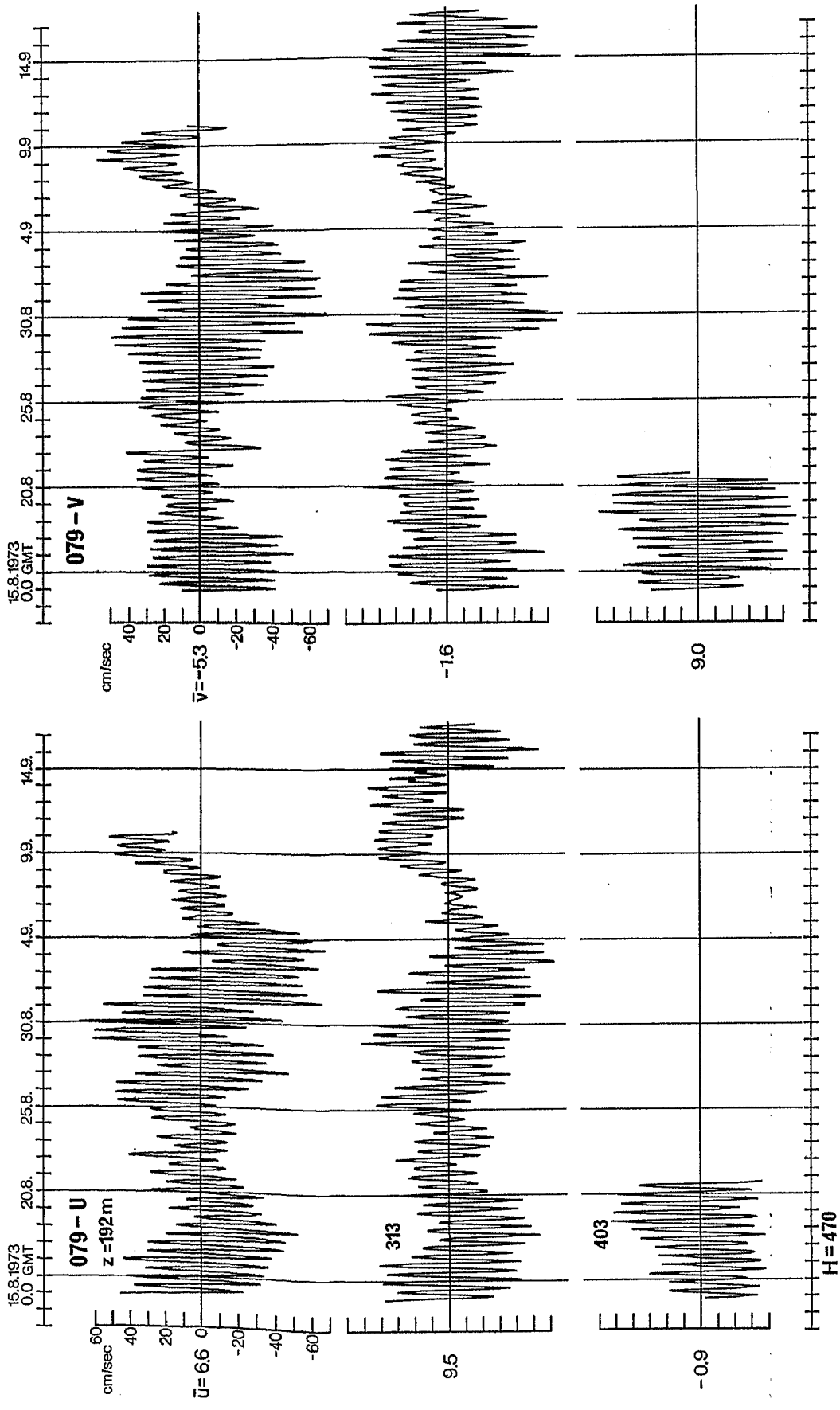

15.8.1973
0.0 GMT
075 – V
cm/sec
60
40
20
0
-20
-40
v̄= 4.2
7.4
16.4
11.1
075 – U
z = 62m
ū=-2.1
-60
453
554
605
-5.5
-5.5
-13.9
H=610
20.8.
25.8.
30.8.
4.9.
9.9.

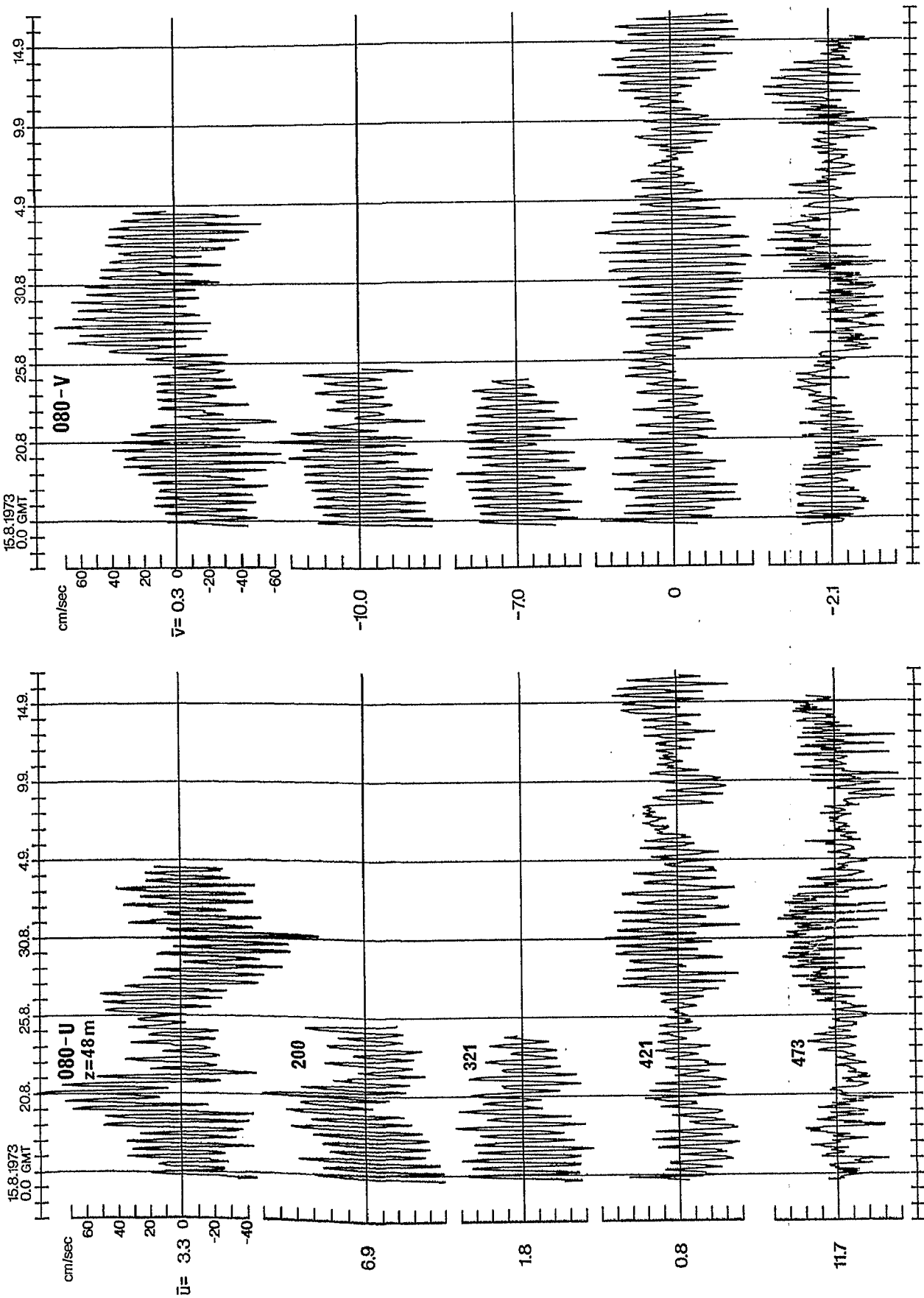

076 – U
z = 65m
076 – V
15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
cm/sec
60
40
20
0
-20
-40
-60
ū = -8.4
v̄ = 7.0
257
559
-10.6
-17.9
7.2
10.4
H = 564

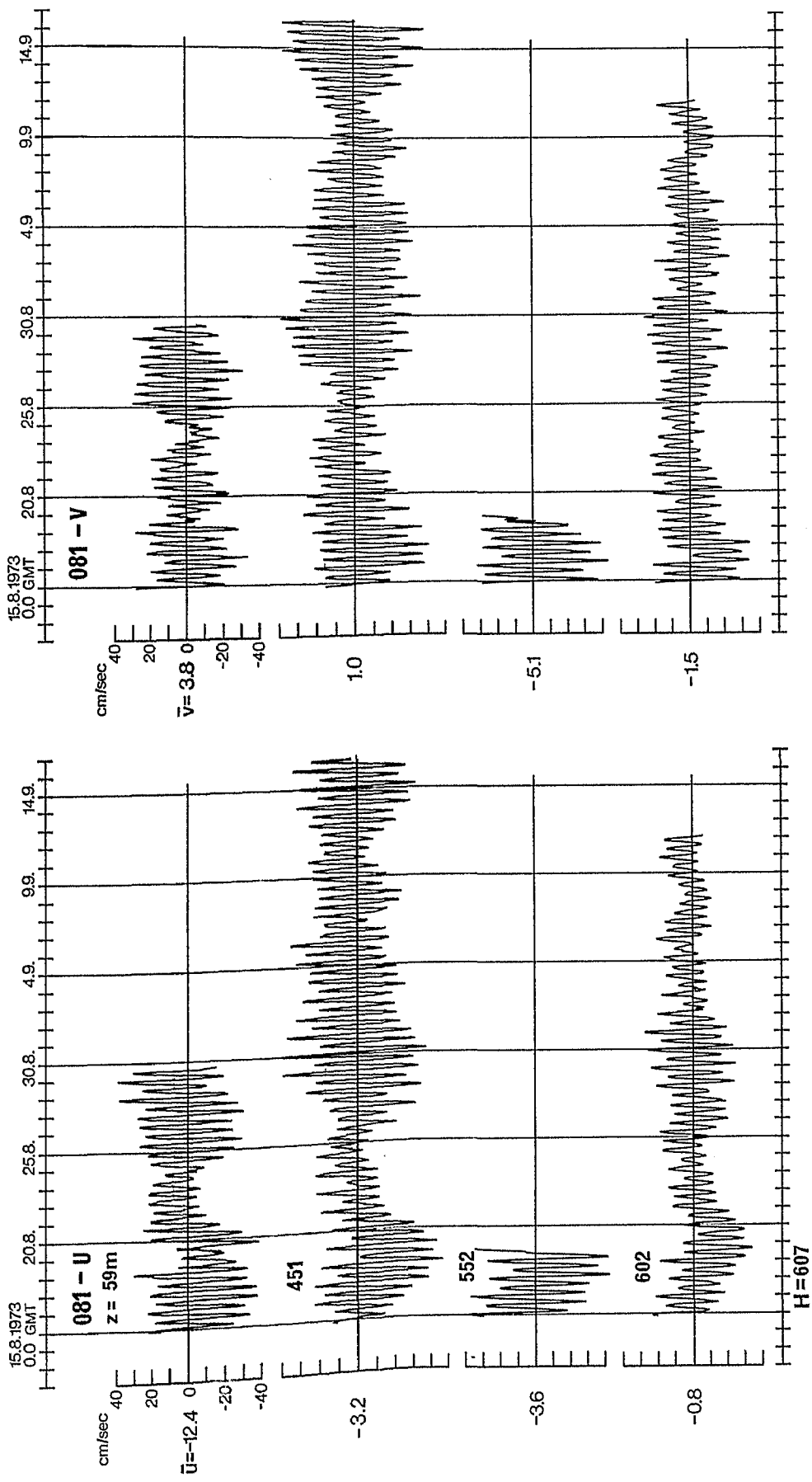

15.8.1973
0.0 GMT
20.8
25.8
30.8
4.9
9.9
077 - V
cm/sec
40
20
0
-20
-40
-60
v̄=12.5
14.6
8.1

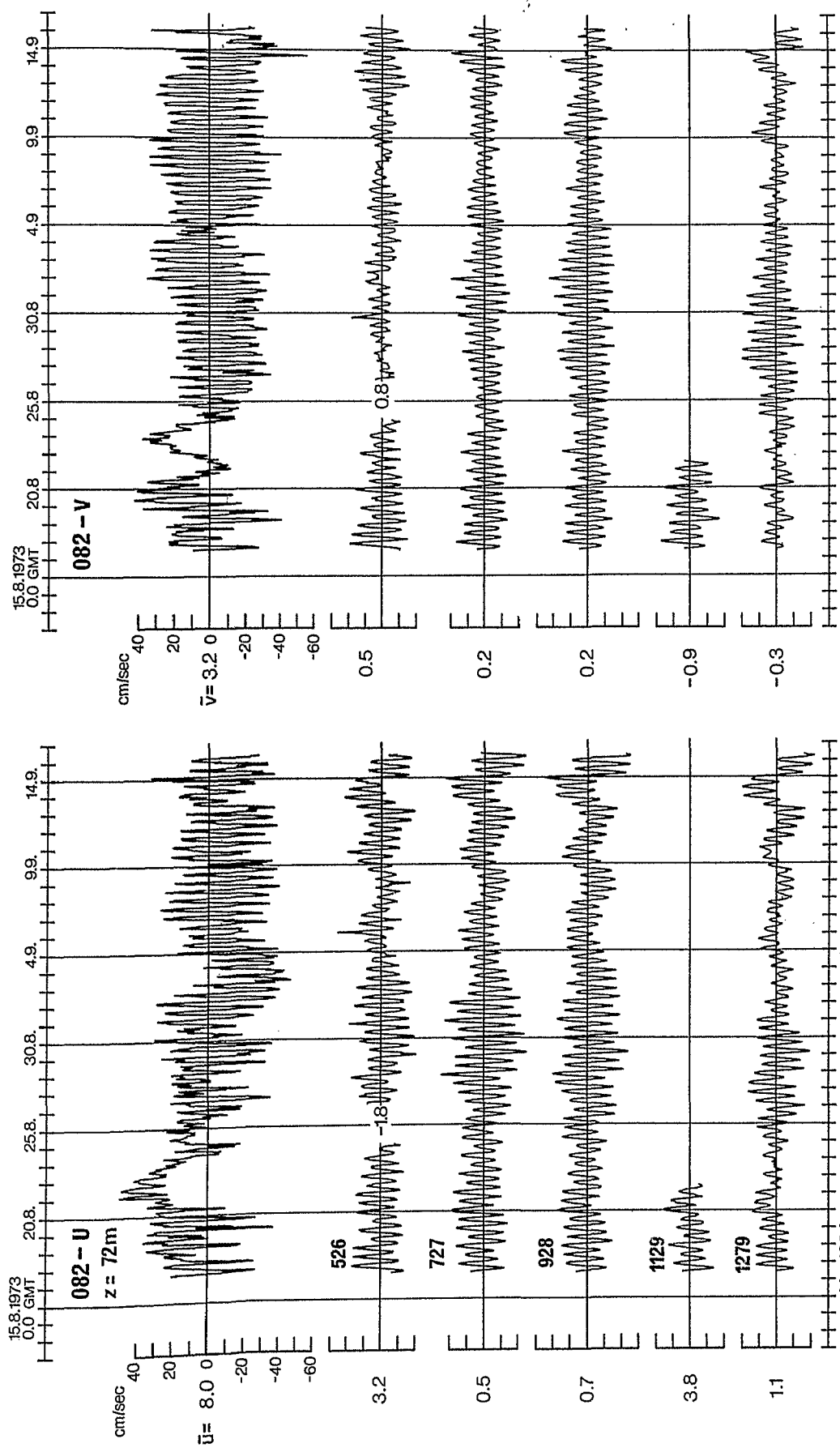

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
077 - U
z = 63m
cm/sec
40
20
0
-20
-40
-60
ū=-10.4
229
-11.1
376
-13.0
H = 533

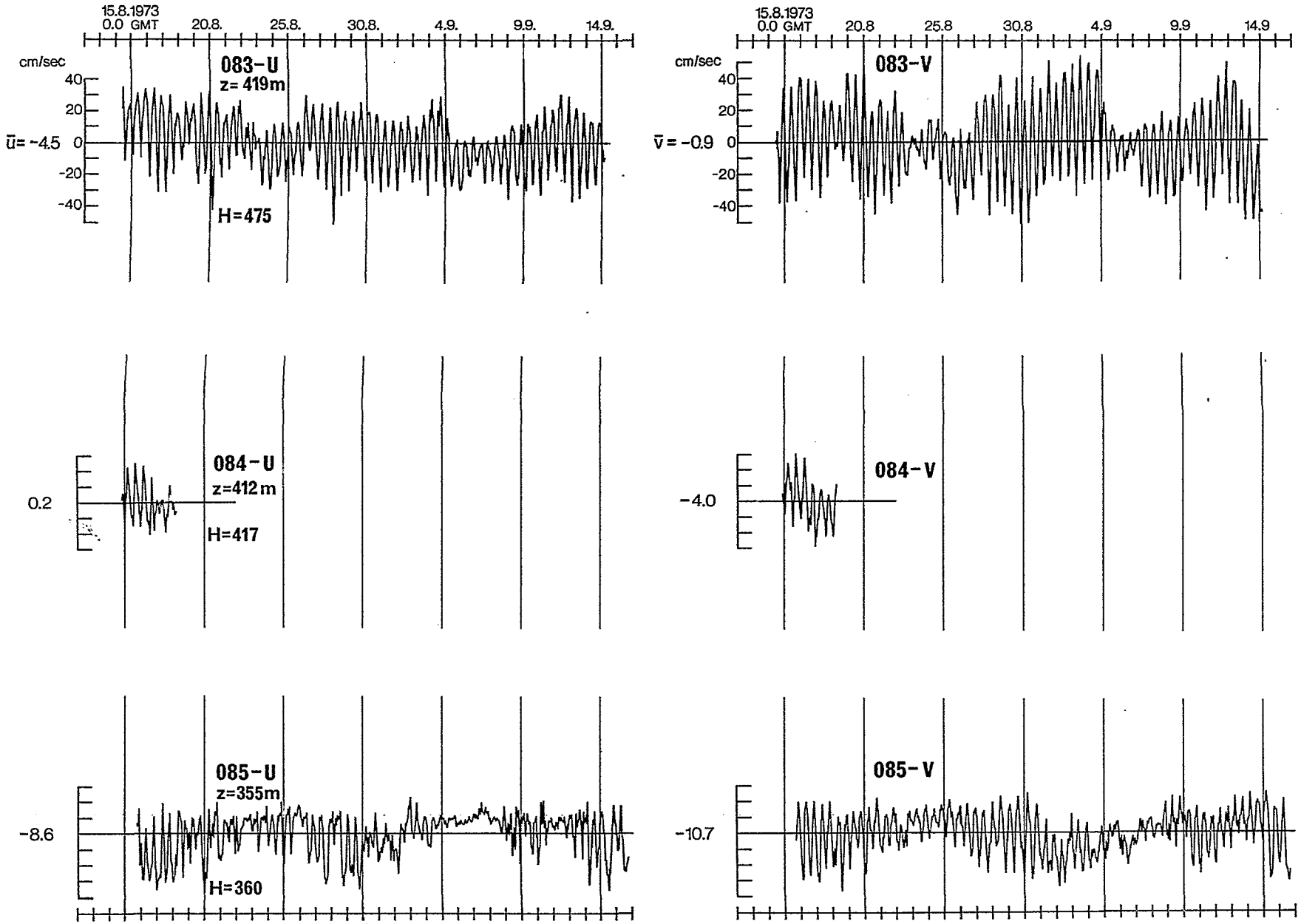

078 – U
z = 52m
15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
cm/sec
40
20
0
-20
-40
ū = -9.1
446
-13.9
497
-18.1
H = 502
078 – V
15.8.1973
0.0 GMT
20.8
25.8
30.8
4.9
9.9
14.9
cm/sec
40
20
0
20
-40
-60
v̄ = 6.2
10.0
3.6

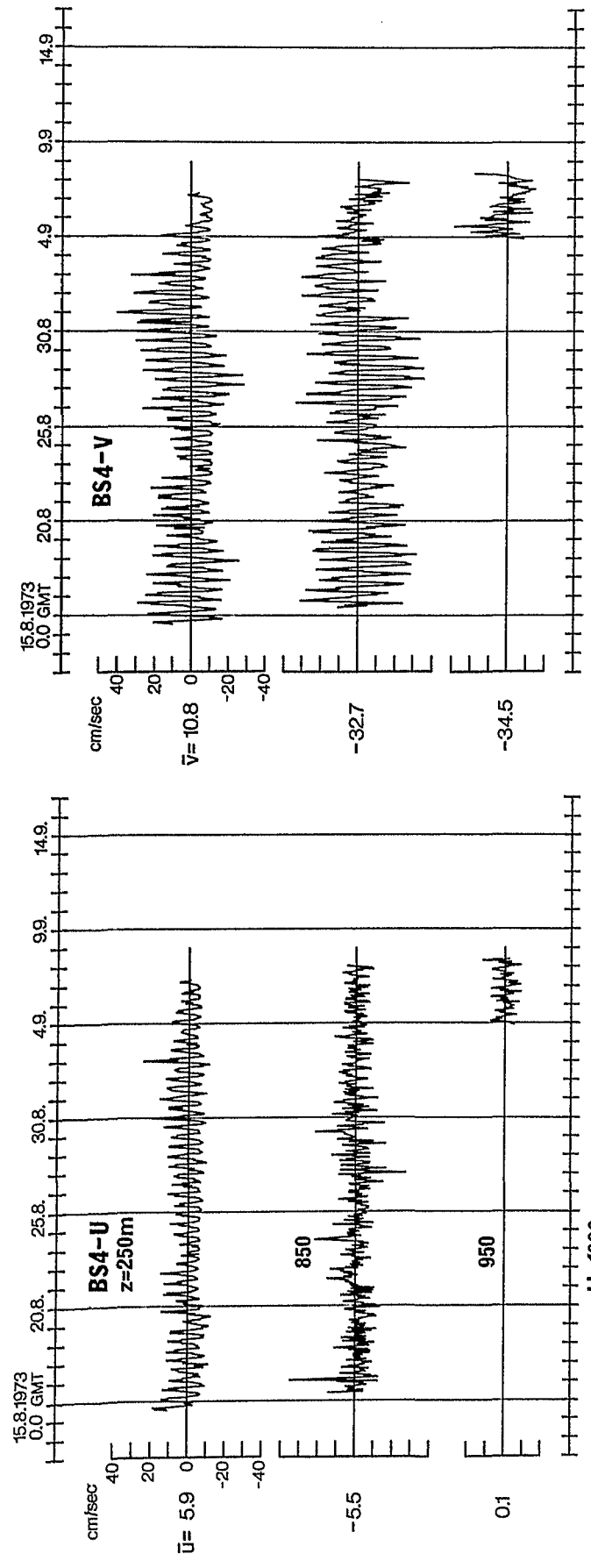

079 – U
z = 192m
079 – V
15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
cm/sec
60
40
20
0
-20
-40
-60
ū = 6.6
313
9.5
403
-0.9
H = 470
v̄ = -5.3
-1.6
9.0


080-U
z=48m
080-V
15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
cm/sec
60
40
20
0
-20
-40
-60
ū= 3.3
v̄= 0.3
200
321
421
473
6.9
1.8
0.8
11.7
-10.0
-7.0
0
-2.1
H=478


15.8.1973
0.0 GMT
081 – V
cm/sec
40
20
0
-20
-40
v̄= 3.8
1.0
-5.1
-1.5
15.8.1973
0.0 GMT
081 – U
z = 59m
cm/sec
40
20
0
-20
-40
ū=-12.4
451
552
602
-3.2
-3.6
-0.8
H=607

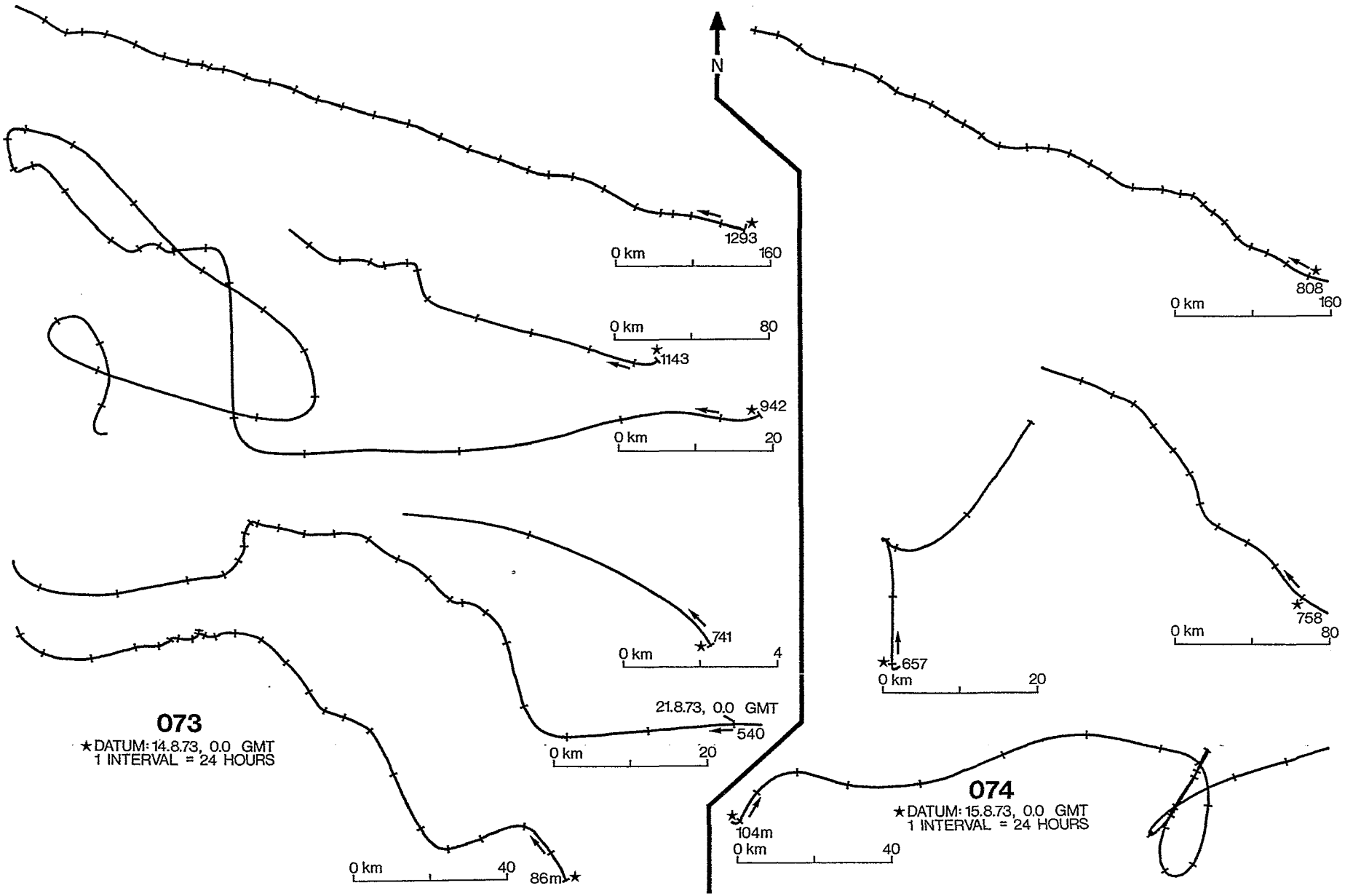

15.8.1973
0.0 GMT
082 – U
z = 72m
cm/sec
40
20
0
-20
-40
-60
ū= 8.0
3.2
526
-1.8
0.5
727
0.7
928
3.8
1129
1.1
1279
H=1284
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
082 – V
v̄= 3.2
0.5
0.8
0.2
0.2
-0.9
-0.3

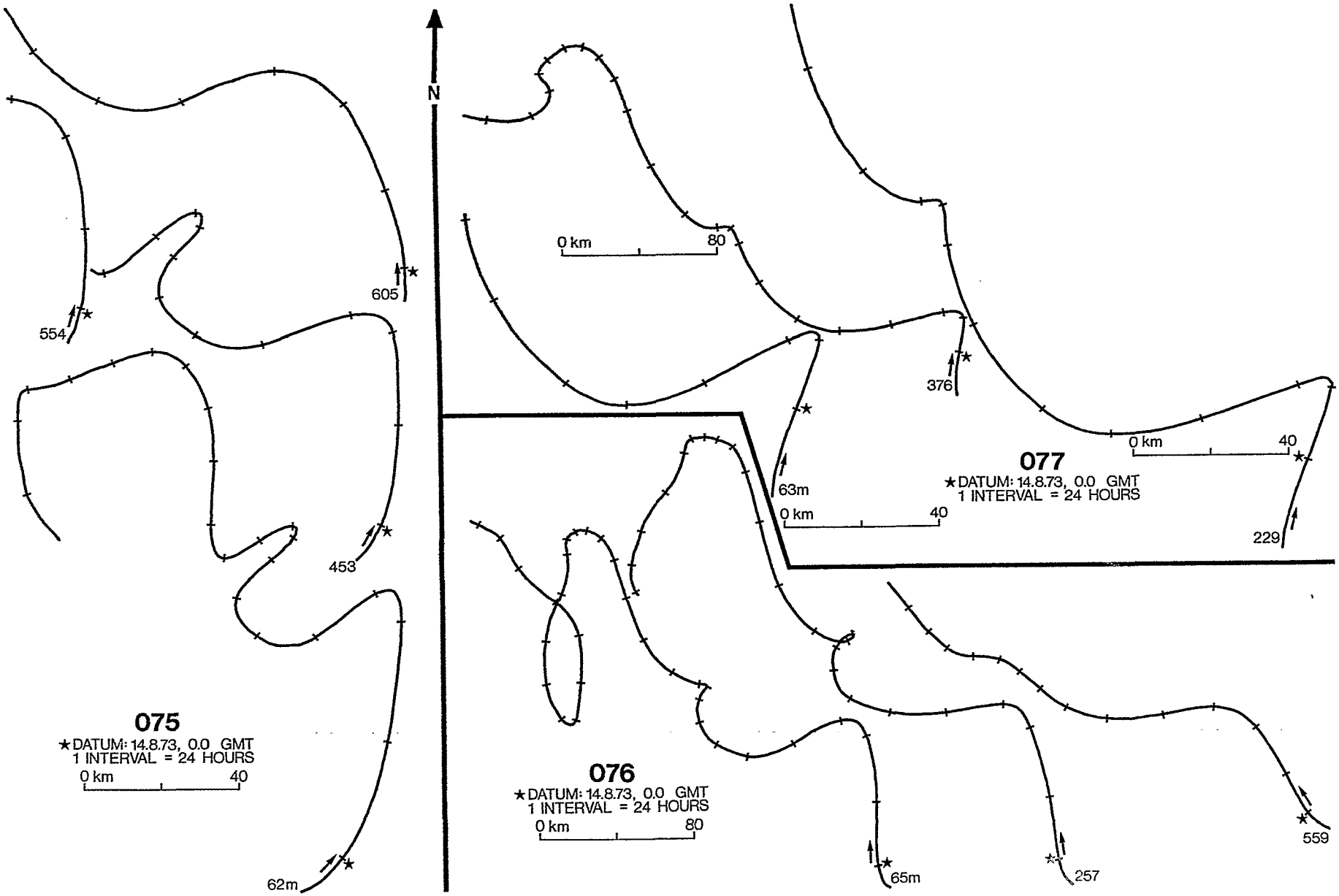

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
cm/sec
083-U
z= 419m
40
20
ū= -4.5 0
-20
-40
H=475
15.8.1973
0.0 GMT
20.8
25.8
30.8
4.9
9.9
14.9
cm/sec
083-V
40
20
v̄ = -0.9 0
-20
-40
084-U
z=412 m
0.2
H=417
084-V
-4.0
085-U
z=355m
-8.6
H=360
085-V
-10.7

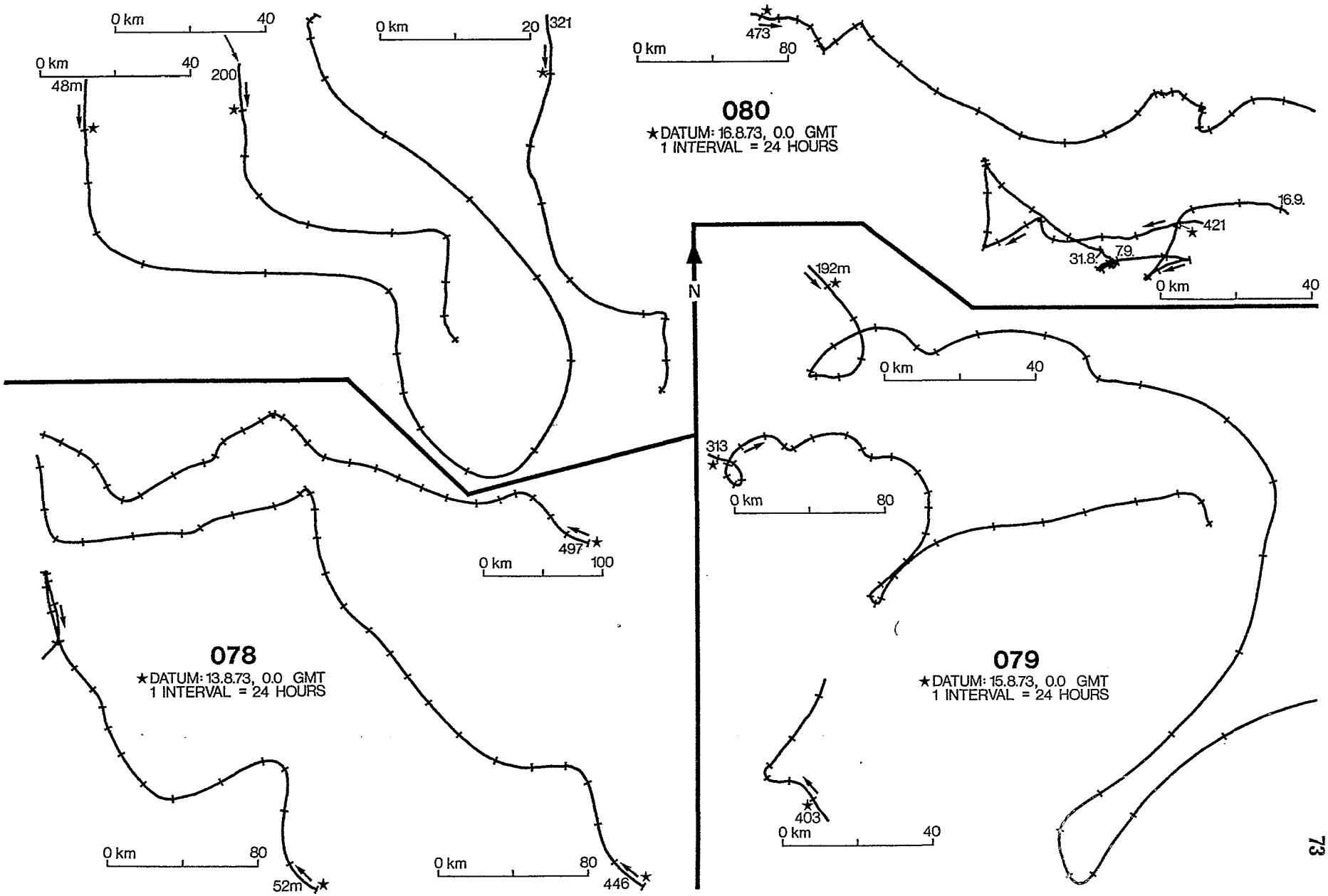

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
BS4-U
z=250m
BS4-V
cm/sec
40
20
0
-20
-40
ū= 5.9
v̄= 10.8
850
950
-5.5
-32.7
-34.5
0.1
H=1000

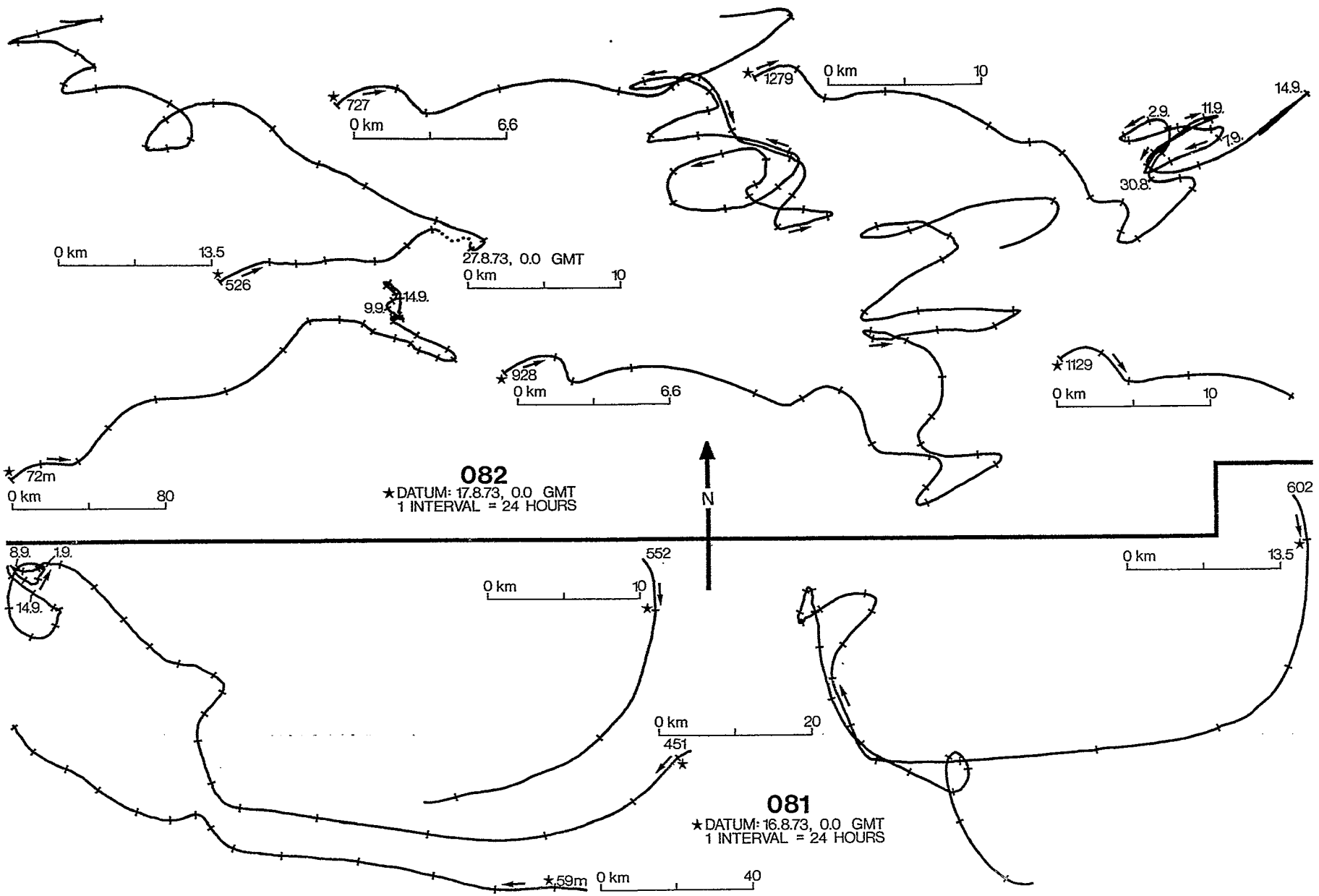
3.4.2 Current-time series presented as progressive vector diagrams

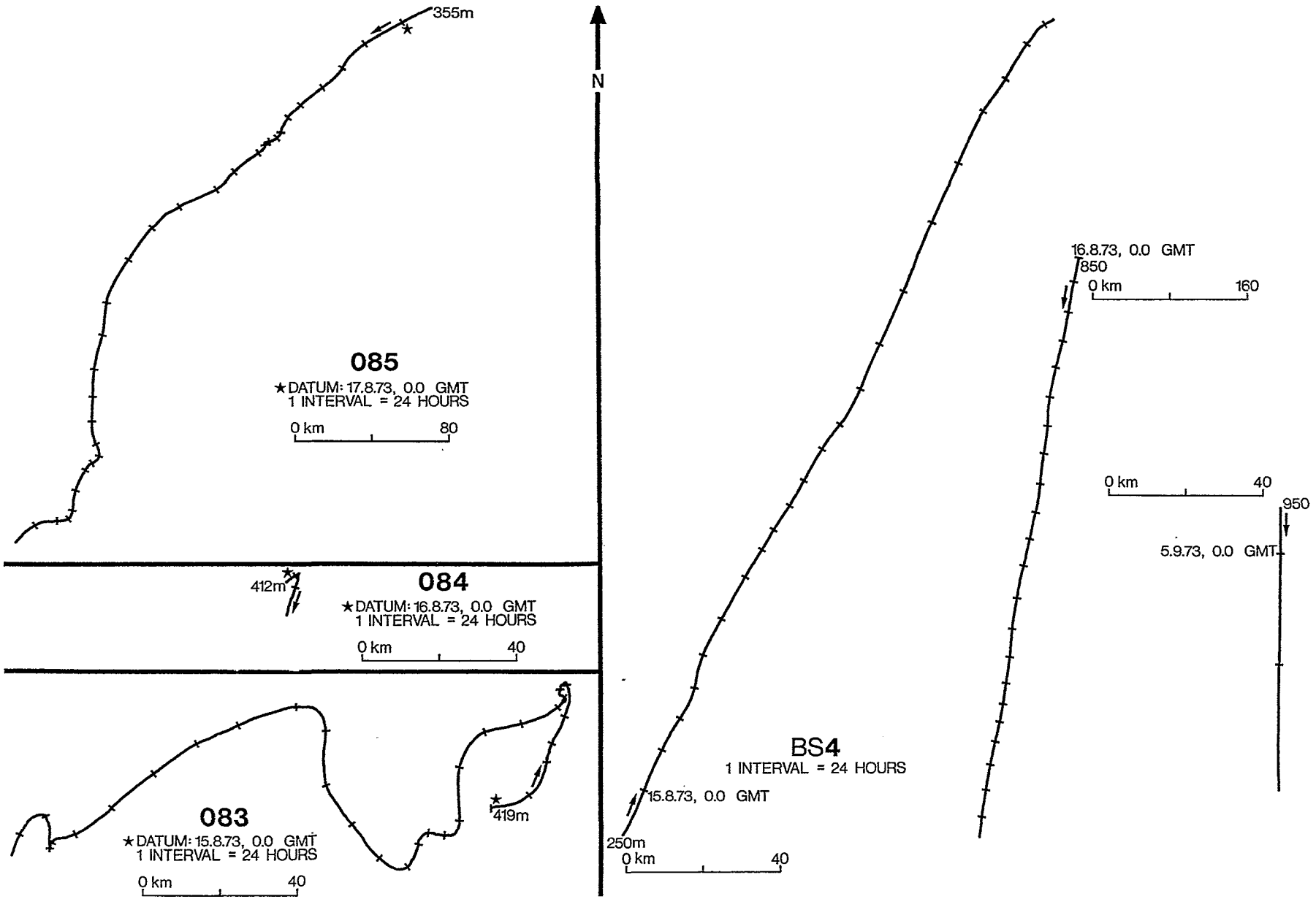
Sliding averages over 25 hourly mean values were used to construct the progressive vector diagrams with a minimum of tidal aliasing. The depth of the instrument, the date of the first time-mark as well as the length scale are given for each diagram separately. The directional orientation of the diagrams refers to the arrow pointing north for each page.


N
1293
0 km
160
1143
0 km
80
942
0 km
20
741
0 km
4
21.8.73, 0.0 GMT
540
0 km
20
0 km
40
86m
073
★DATUM: 14.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
808
0 km
160
758
0 km
80
657
0 km
20
104m
0 km
40
074
★DATUM: 15.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS


N
0 km 80
605
554
453
62m
075
★DATUM: 14.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
0 km 40
376
63m
0 km 40
077
★DATUM: 14.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
0 km 40
229
076
★DATUM: 14.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
0 km 80
65m
257
559


0 km 40
0 km 40
48m
200
0 km 20
321
080
★DATUM: 16.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
473
0 km 80
16.9.
421
31.8.
7.9.
0 km 40
N
192m
0 km 40
313
0 km 80
497
0 km 100
078
★DATUM: 13.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
079
★DATUM: 15.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
403
0 km 40
0 km 80
52m
0 km 80
446


727
0 km 6.6
1279
0 km 10
14.9.
2.9.
11.9.
1.9.
30.8.
0 km 13.5
526
27.8.73, 0.0 GMT
0 km 10
14.9.
9.9.
928
0 km 6.6
1129
0 km 10
72m
0 km 80
082
★DATUM: 17.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
N
602
0 km 13.5
8.9.
1.9.
14.9.
552
0 km 10
0 km 20
451
081
★DATUM: 16.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
59m 0 km 40

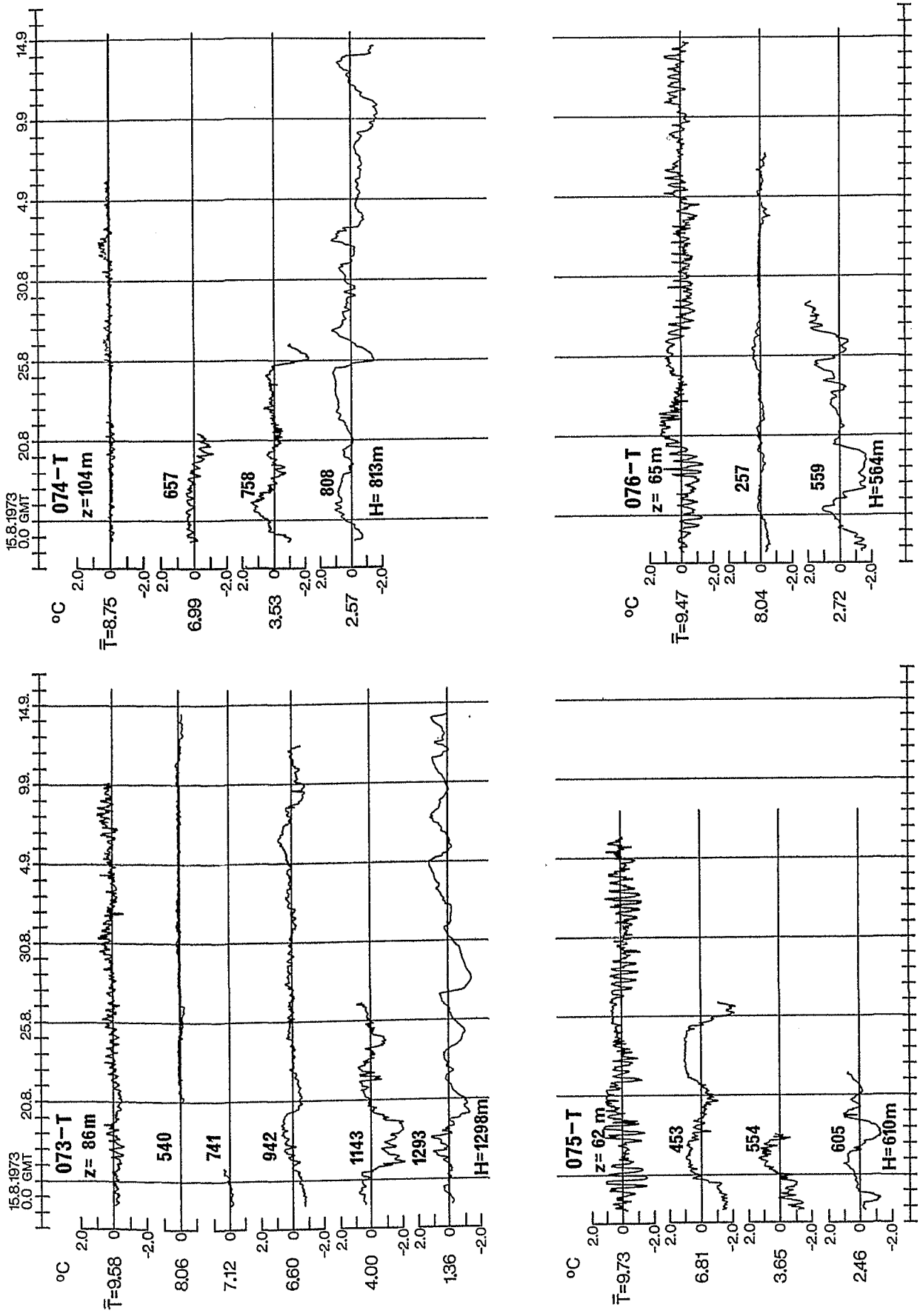

355m
085
★DATUM: 17.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
0 km 80
N
412m
084
★DATUM: 16.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
0 km 40
083
★DATUM: 15.8.73, 0.0 GMT
1 INTERVAL = 24 HOURS
0 km 40
419m
BS4
1 INTERVAL = 24 HOURS
15.8.73, 0.0 GMT
250m
0 km 40
16.8.73, 0.0 GMT
850
0 km 160
0 km 40
950
5.9.73, 0.0 GMT

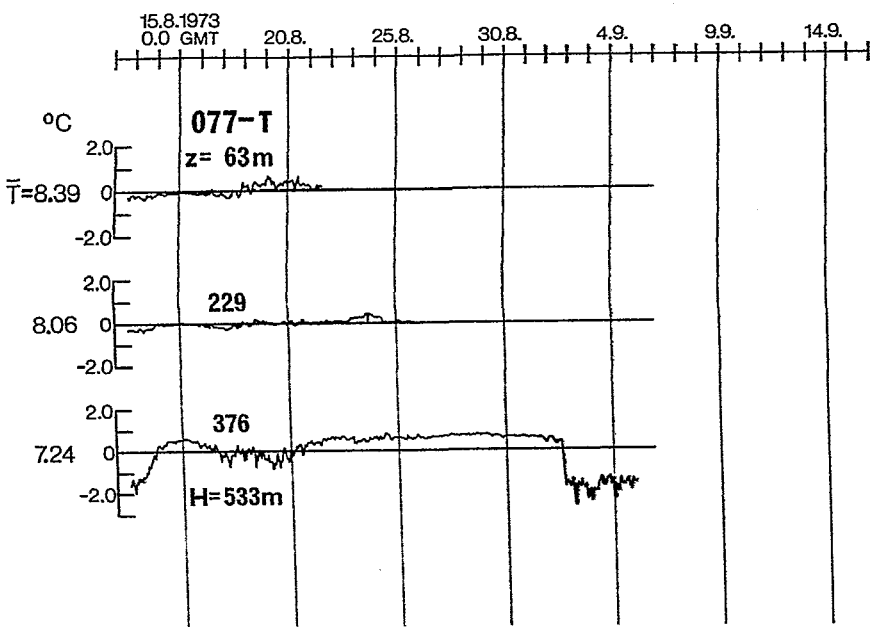
3.4.3 Time series of temperatures measured simultaneously with currents

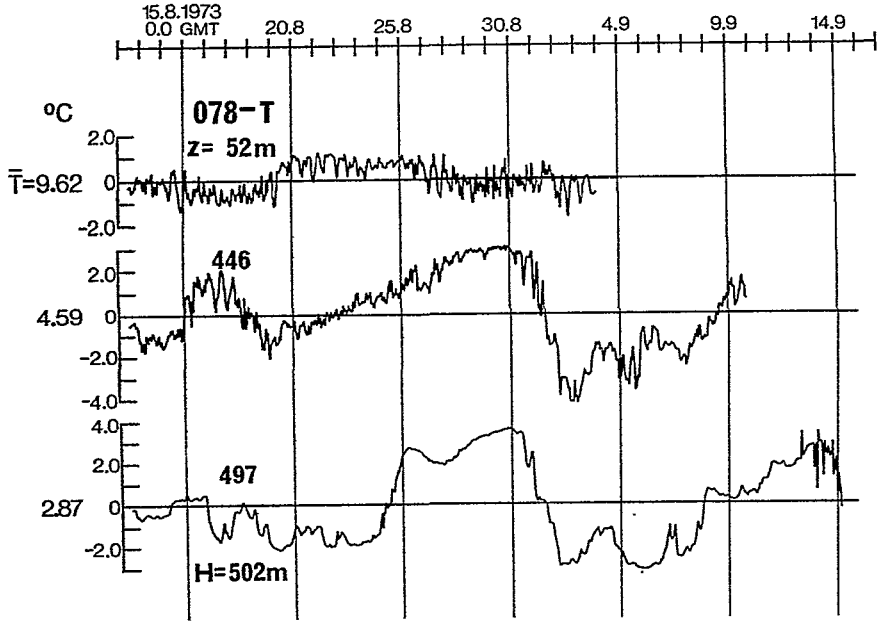
The plots are based on hourly averages with the overall mean value subtracted.

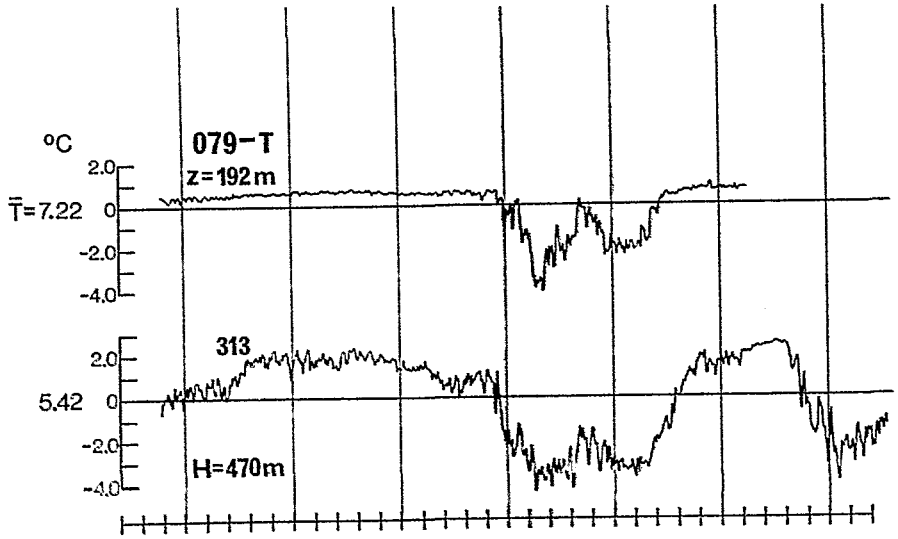
Key to symbols

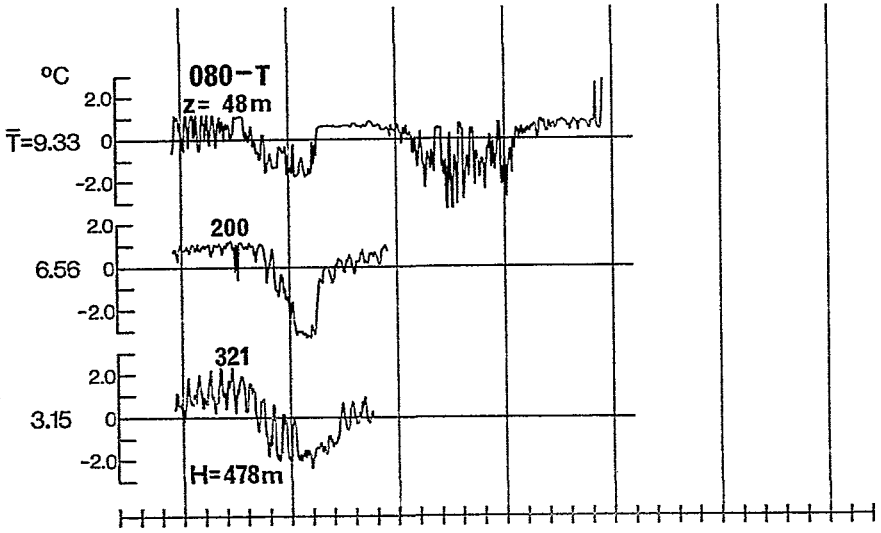
T	=	Temperature
$\bar{T}$	=	Overall mean value
z	=	Instrument depth
H	=	Bottom depth

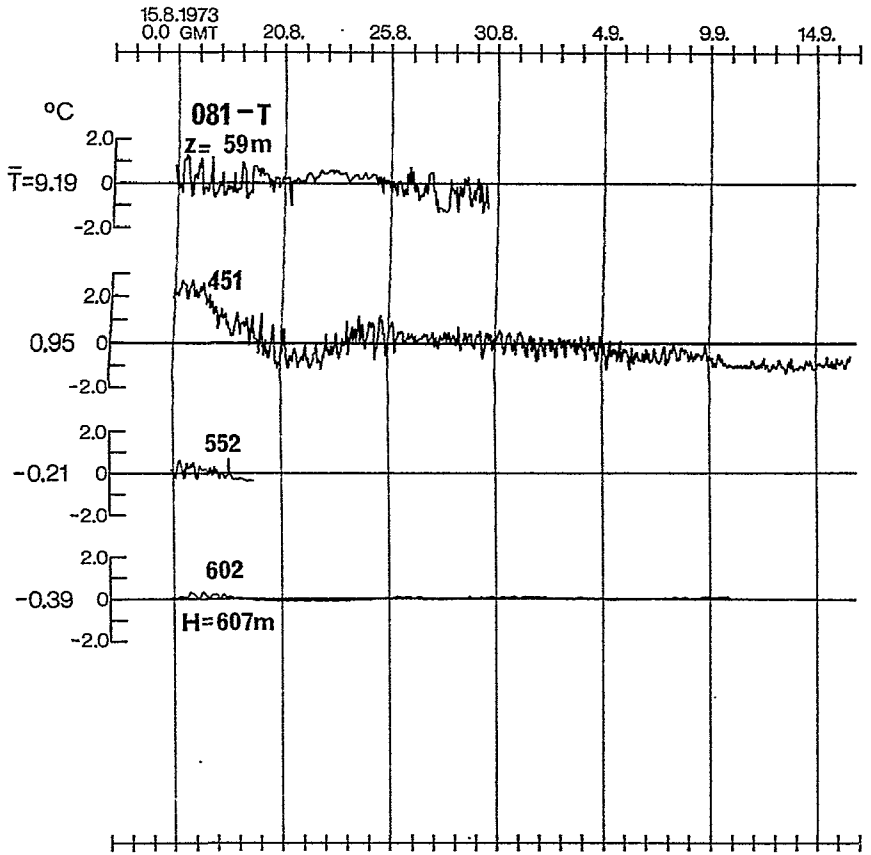

15.8.1973
0.0 GMT
073-T
z= 86m
540
741
942
1143
1293
H=1298m
°C
T̄=9.58
8.06
7.12
6.60
4.00
1.36
074-T
z=104m
657
758
808
H= 813m
T̄=8.75
6.99
3.53
2.57
076-T
z= 65m
257
559
H=564m
T̄=9.47
8.04
2.72
075-T
z= 62 m
453
554
605
H=610m
T̄=9.73
6.81
3.65
2.46

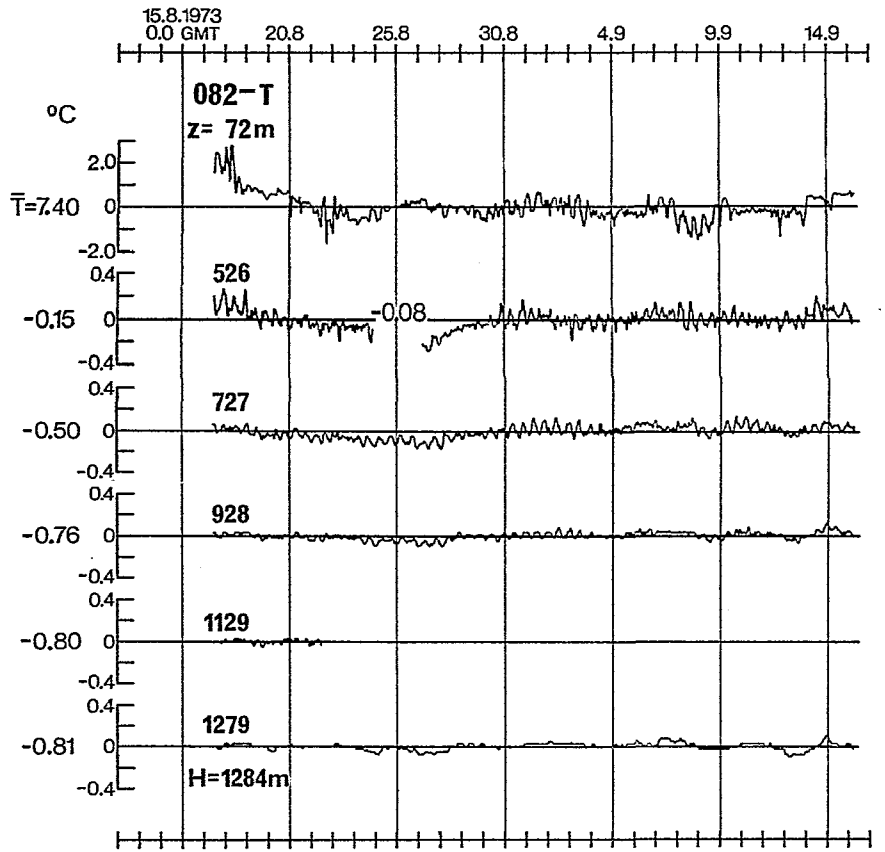

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
°C
077-T
z= 63m
T̄=8.39
229
8.06
376
7.24
H=533m


15.8.1973
0.0 GMT
20.8
25.8
30.8
4.9
9.9
14.9
°C
078-T
z= 52m
T̄=9.62
446
4.59
497
2.87
H=502m


°C
079-T
z=192m
T̄=7.22
313
5.42
H=470m


°C
080-T
z= 48m
T̄=9.33
200
6.56
321
3.15
H=478m


15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
°C
081 – T
z= 59m
T̄=9.19
2.0
0
-2.0
451
0.95
552
-0.21
602
-0.39
H=607m

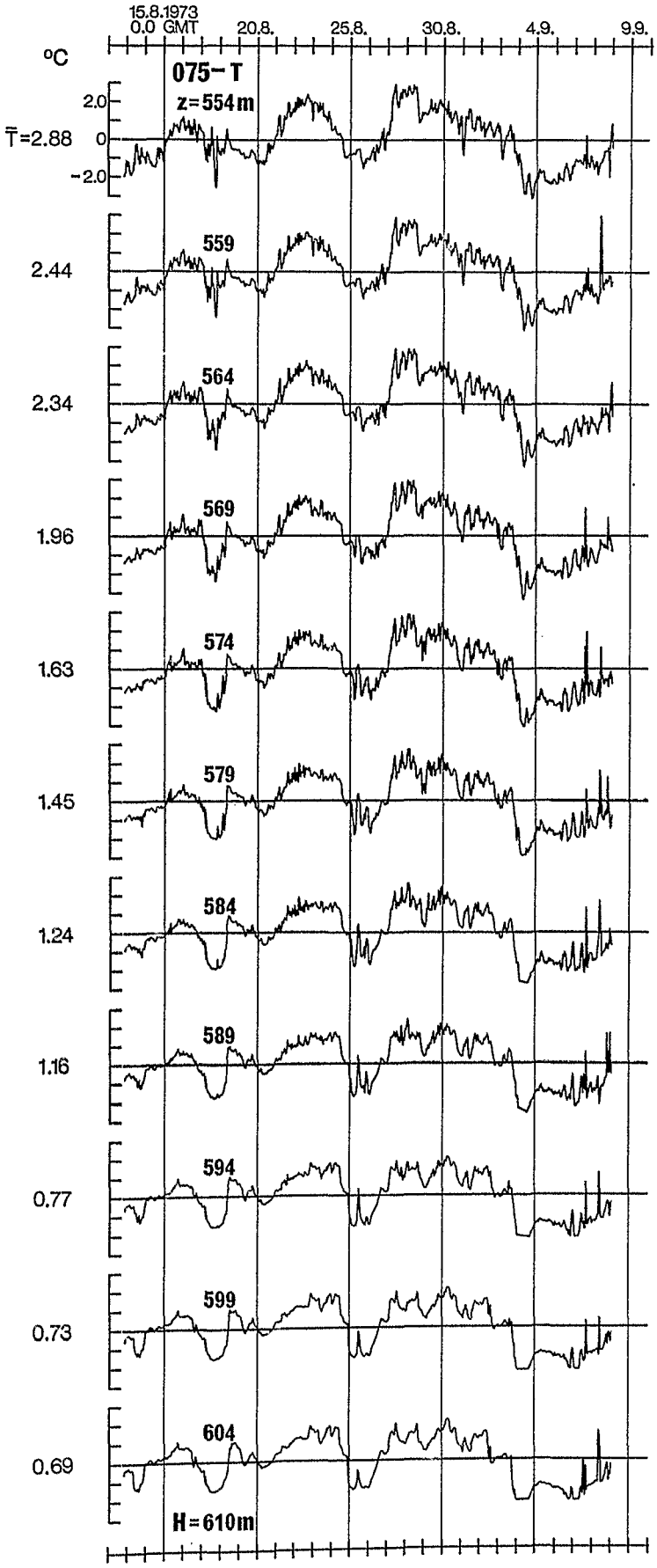

15.8.1973
0.0 GMT
20.8
25.8
30.8
4.9
9.9
14.9
°C
082 – T
z= 72m
T̄=7.40
2.0
0
-2.0
526
-0.15
-0.08
0.4
-0.4
727
-0.50
928
-0.76
1129
-0.80
1279
-0.81
H=1284m

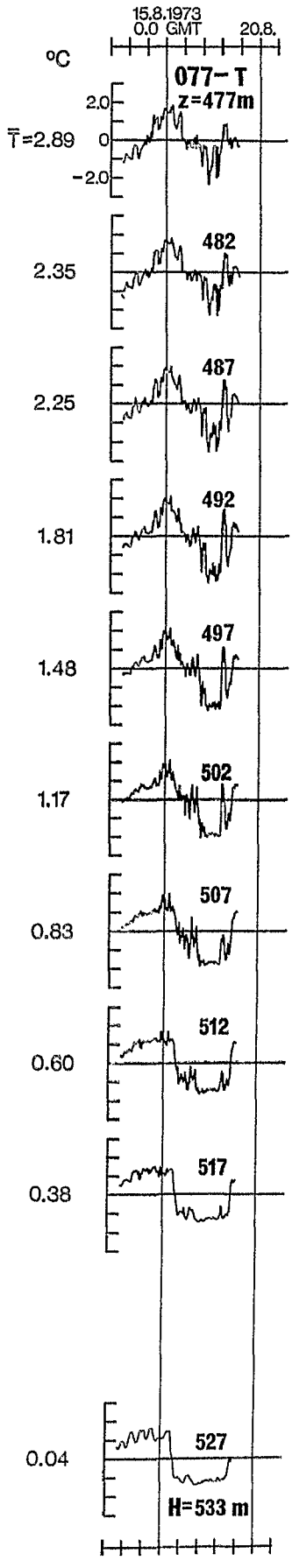
3.4.4 Time series of temperatures measured by thermistor cables

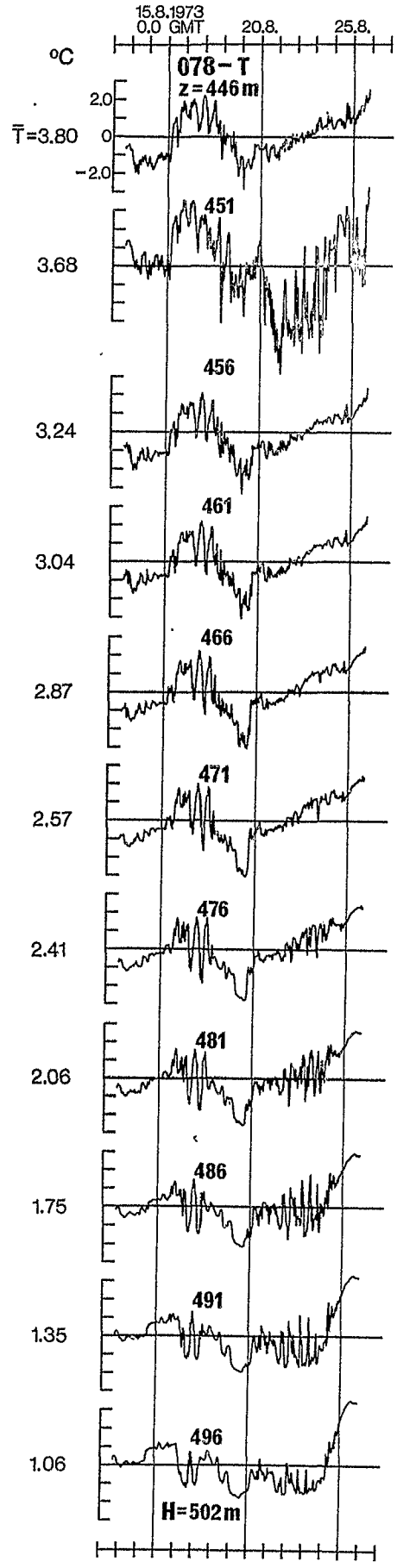
The plots are based on hourly averages with the overall mean value subtracted.

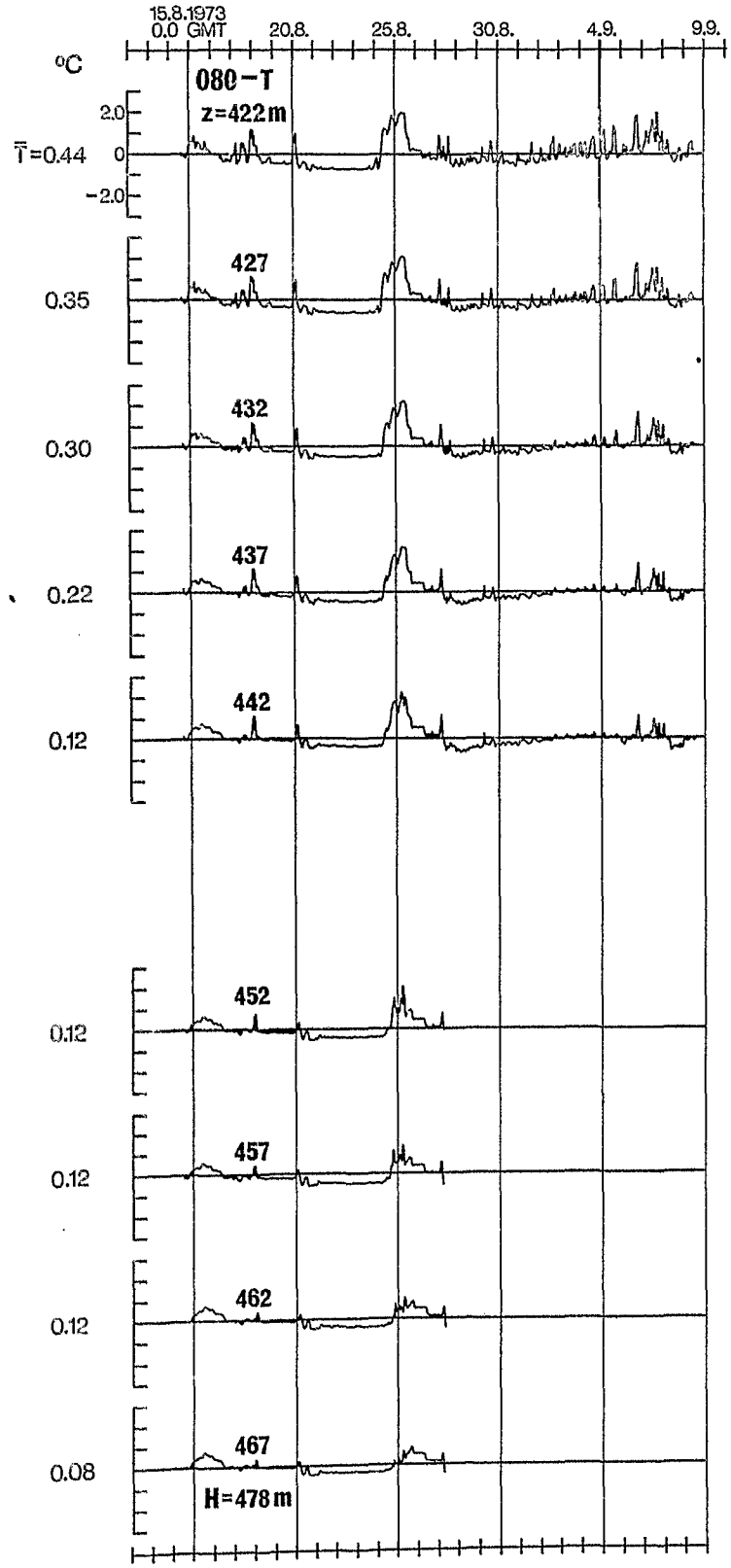
Key to symbols

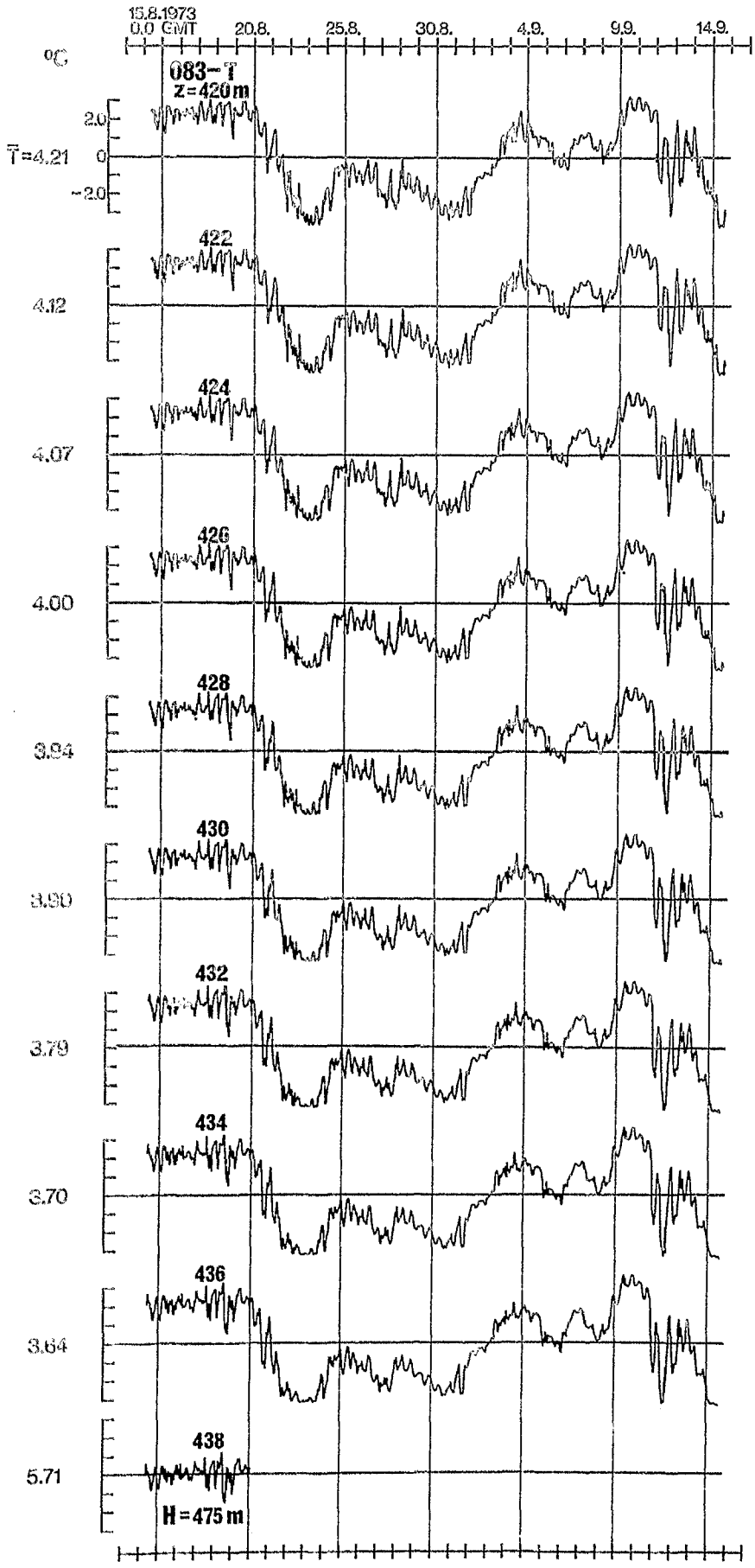
T	=	Temperature
$\bar{T}$	=	Overall mean value
z	=	Thermistor depth
H	=	Bottom depth

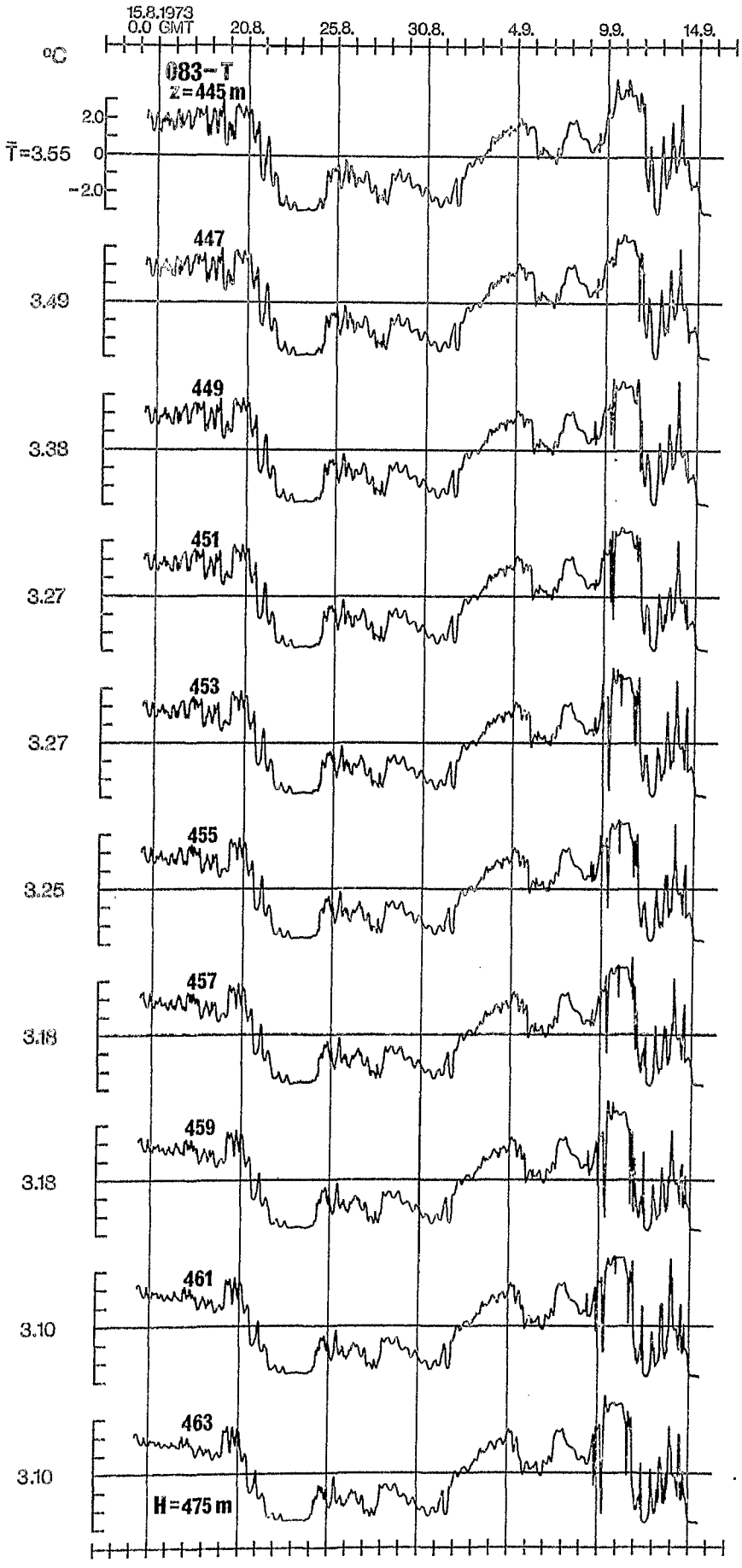

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
°C
075–T
z=554m
2.0
T̄=2.88
0
-2.0
559
2.44
564
2.34
569
1.96
574
1.63
579
1.45
584
1.24
589
1.16
594
0.77
599
0.73
604
0.69
H=610m


15.8.1973
0.0 GMT
20.8.
°C
077-T
z=477m
2.0
0
-2.0
T̄=2.89
482
2.35
487
2.25
492
1.81
497
1.48
502
1.17
507
0.83
512
0.60
517
0.38
527
0.04
H=533 m


15.8.1973
0.0 GMT
20.8.
25.8.
°C
078-T
z=446m
2.0
0
-2.0
T̄=3.80
451
3.68
456
3.24
461
3.04
466
2.87
471
2.57
476
2.41
481
2.06
486
1.75
491
1.35
496
1.06
H=502m

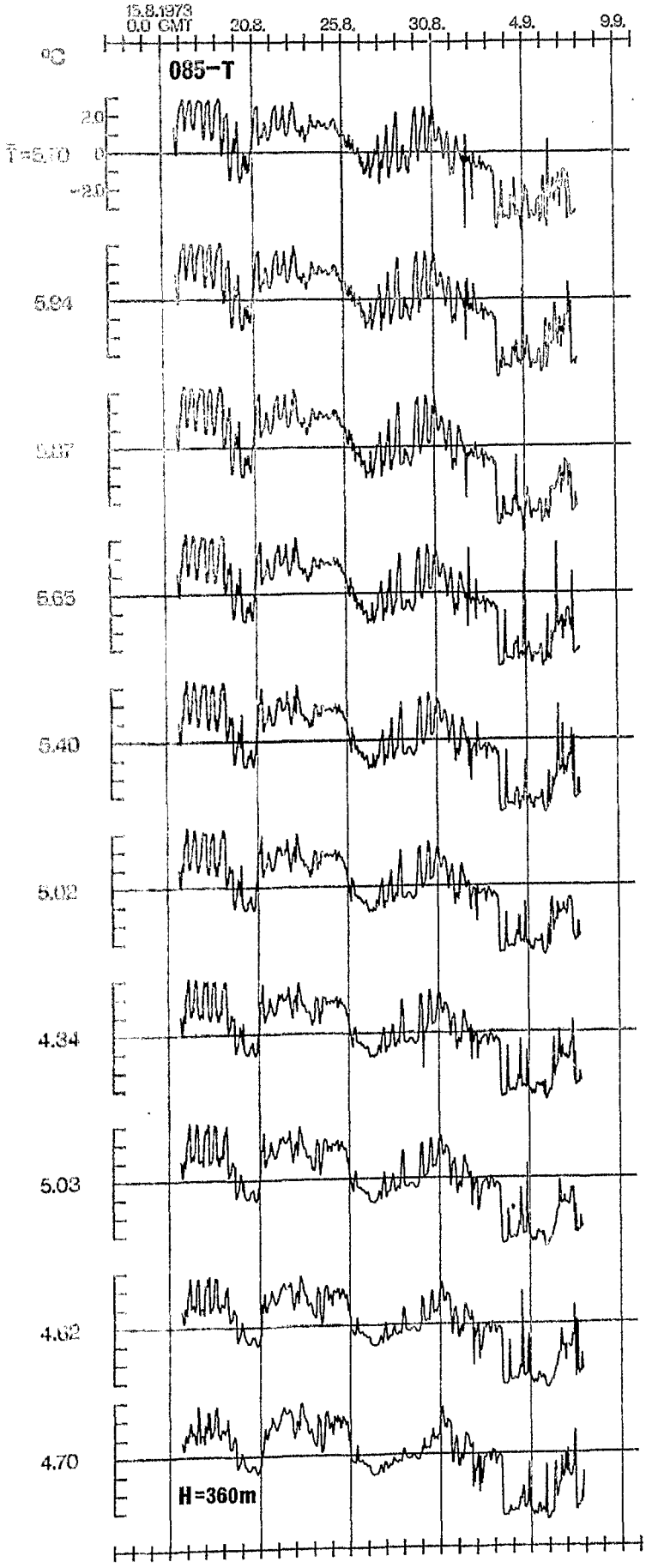

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
°C
080 – T
z=422 m
2.0
0
-2.0
T̄=0.44
427
0.35
432
0.30
437
0.22
442
0.12
452
0.12
457
0.12
462
0.12
467
0.08
H=478 m

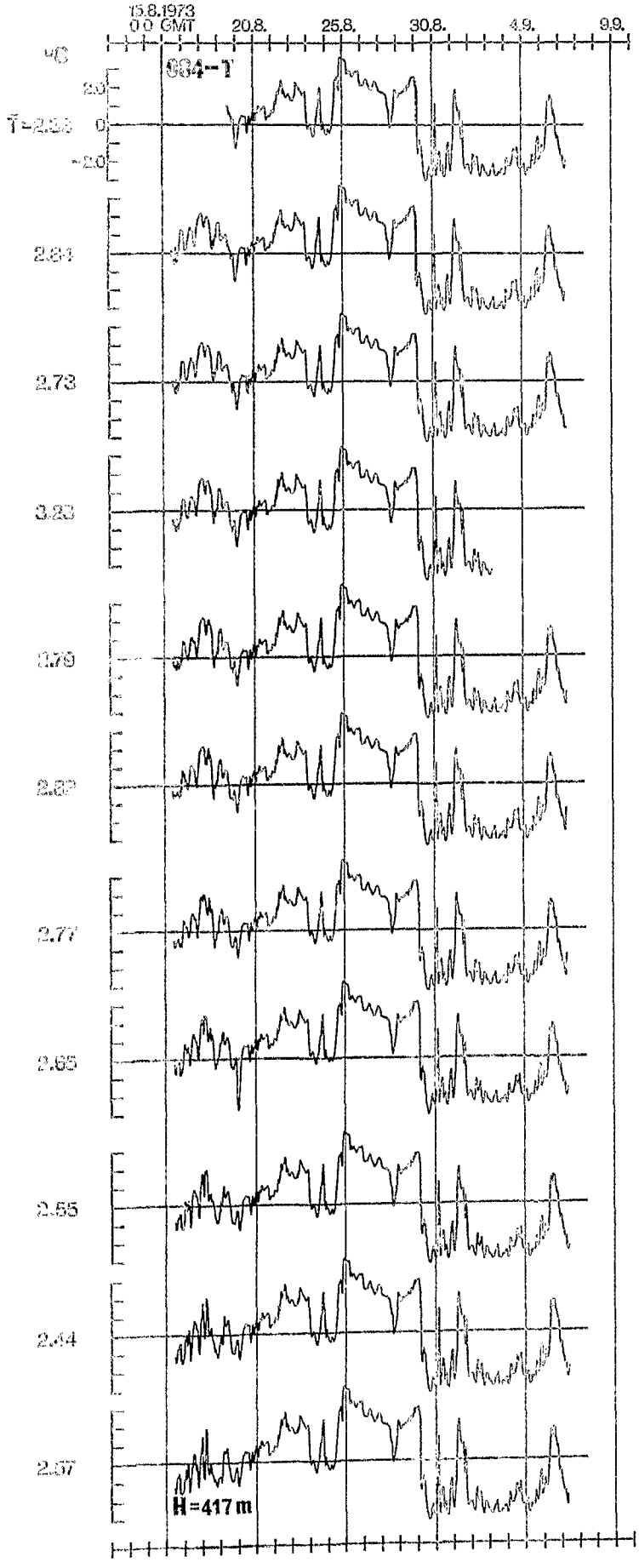

15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
°C
083-T
z=420m
2.0
0
-2.0
T̄=4.21
422
4.12
424
4.07
426
4.00
428
3.94
430
3.90
432
3.79
434
3.70
436
3.64
438
5.71
H=475 m


15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
14.9.
°C
083-T
z=445 m
2.0
0
-2.0
T̄=3.55
447
3.49
449
3.38
451
3.27
453
3.27
455
3.25
457
3.18
459
3.18
461
3.10
463
3.10
H=475 m

3.4.5 The series of temperatures measured by thermistor cables

The plots are based on hourly averages with the overall mean value subtracted. No depths of the individual thermistors can be given, since the moorings were damaged by trawlers at some date and the thermistor cables got partly separated from the supporting mooring line. Therefore the time series are not representing the temperature at a fixed depth, the record however is still useful to some degree for time series analysis.


15.8.1973
0.0 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
°C
085-T
2.0
0
-2.0
T=5.70
5.94
5.87
5.65
5.40
5.02
4.34
5.03
4.62
4.70
H=360m


15.8.1973
00 GMT
20.8.
25.8.
30.8.
4.9.
9.9.
°C
984-T
2.5
T=2.3
0
-2.0
2.84
2.73
3.23
3.79
2.82
2.77
2.65
2.55
2.44
2.57
H=417 m