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THE GATE LAGRANGIAN BATFISH EXPERIMENT

Data Report, Part 11

Map 3L2

by

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SUMMARY

This data report presents selected standard products derived by computer processing of a data set obtained during the second survey of the third Lagrangian time series in the Batfish experiment carried out on board RRS "Discovery" during GATE (the Atlantic Tropical Experiment of the Global Atmospheric Research Programme) in 1974. The data report is part 11 of a thirteen-part set; each part contains the data products from one survey in the Batfish experiment. The raw data set for the survey 3L2 presented here comprises a time series of samples of temperature, conductivity and pressure from a Neil Brown CTD mounted in a Batfish that undulated between 0 and 70 metres depth as it was towed at 8 to 10 knots around a survey pattern comprising 9 parallel legs each 7 miles long and spaced 1 mile apart. The Batfish undulations gave profiles through the upper tropical thermocline including the salinity maximum. The products presented in this report reveal the variation of temperature, salinity and density structure on horizontal scales of 2 to 13 km. Extensive use has been made of interpolation onto isopycnals, which has helped to reveal the separate contributions of (1) internal waves and (2) quasi-geostrophic turbulence. The products include (1) profiles, (2) sections, (3) maps and (4) statistics.

ZUSAMMENFASSUNG

In dem vorliegenden Datenbericht werden Ergebnisse des während GATE (1974) an Bord des RRS "Discovery" durchgeführten Batfish-Experiments präsentiert. Die hier gezeigten Darstellungen wurden aus einem Datensatz hergeleitet, der im zweiten Teilabschnitt der dritten Lagrange'schen Zeitreihe zusammengestellt wurde. Der vorliegende Bericht ist der elfte Band einer dreizehnteiligen Serie. Jeder Band enthält Resultate eines Teilabschnitts des Batfish-Experiments. Der Rohdatensatz für den hier dargestellten Teilabschnitt (Map 3L2) besteht aus einer Zeitreihe, die sich aus Meßwerten von Temperatur, Leitfähigkeit und Druck zusammensetzt. Eine im Batfish montierte Neil-Brown-CTD-Sonde lieferte diese Daten. Der Batfish folgte einer Sägezahnkurve mit Umkehrpunkten an der Wasseroberfläche und in 70 m Tiefe, während er mit 8 - 10 kn Geschwindigkeit von dem RRS "Discovery" geschleppt wurde, das in dem Meßgebiet 9 parallele Bahnen, mit je einer Länge von 7 sm und 1 sm Entfernung zueinander, abfuhr. Die Messungen ergaben Profile in der oberen tropischen Temperatursprungschicht, in der sich auch das Salzgehaltsmaximum befand. Die in diesem Bericht veröffentlichten Ergebnisse zeigen die Veränderungen von Temperatur-, Salzgehalts- und Dichtestrukturen in horizontalen Skalen zwischen 2 km und 13 km. Es wurde in diesem Datenbericht weitgehend von dem Verfahren der Interpolation auf Dichteflächen Gebrauch gemacht. Auf diese Weise können Strukturen der quasi-geostrophischen Turbulenz von denen der internen Wellen getrennt werden. Die Darstellungen beinhalten Profile, vertikale Schnitte (sections), Dichte- und Druckflächen (maps) und Statistiken.

ACKNOWLEDGEMENTS

The fieldwork of the GATE Lagrangian batfish experiment was carried out on board RRS "Discovery" as a collaborative research project of the Department of Oceanography, University of Southampton and the Institute of Oceanographic Sciences, Wormley. Data analysis was started at the University of Southampton and completed at the Institut für Meereskunde an der Universität Kiel.

We thank our colleagues at IOS Wormley and the Captain and crew of RRS "Discovery" for their contributions which made the fieldwork possible.

The data were processed using software based on a system devised by Raymond Pollard and Gill Lawrence at the Atlas Computer Laboratory, Chilton and the Regionales Rechenzentrum für Niedersachsen, Hannover.

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The following members of the research team at Southampton and Kiel contributed to the production of this report:

Wolfgang Barkmann	Gordon Blanchard	Bernd Burkert
Mike Butterfield	Jürgen Fischer	Bernd Frantz
Dieter Helm	Stefan Hesse	George Kimber
Harry Leach	Manfred Lüdtke	Peter Minnett
Beryl Noyce	Bernd Reklies	Linda Warren
Jan Wenzel	John Woods	

SYMBOLS, UNITS AND NOMENCLATURE

The data processing that led to the products in this report was largely completed before the publication of the IAPSO SUN Working Group report on the use of SI units in physical oceanography. In some computer plots reproduced in the report Roman capitals replace the recommended symbols. The main deviations are listed below:

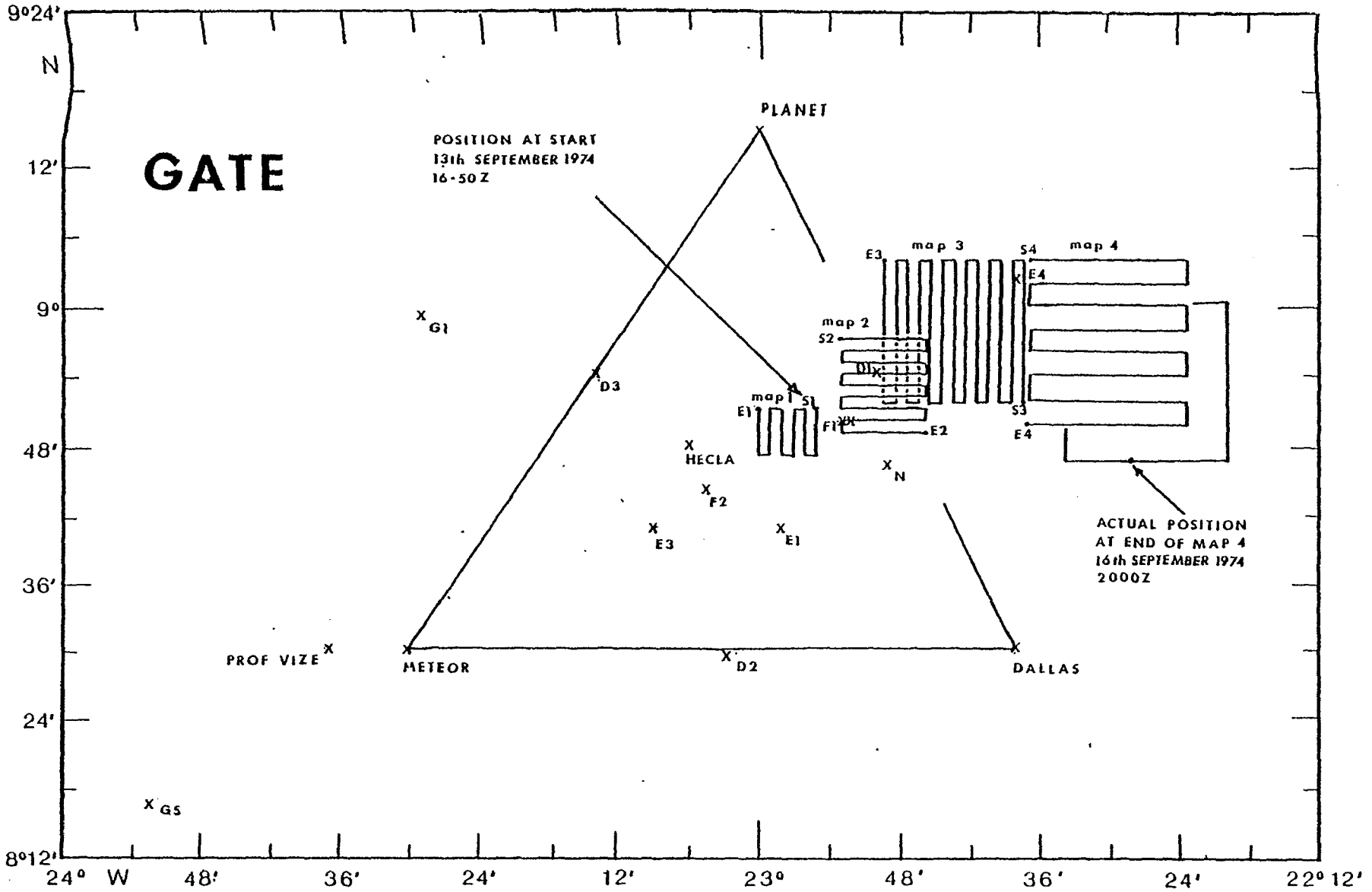
Quantity	Units in Report	Recommendations
Atmospheric pressure	millibar (mbar,mb)	10^2 Pa
Oceanic hydrostatic pressure	decibar (dbar,db)	10^4 Pa
Thickness between two surfaces	decibar (dbar,db)	10^4 Pa
Salinity	ppt	10^{-3}
Density	Sigma-T (σ_t)	kg/m^3
Ship's speed	Knots	0,51 m/s

SECTION I INTRODUCTION

This part of the GATE Lagrangian Batfish Experiment Data Report shows the data from Map 3L2. A detailed discussion of the whole experiment including data collection, data processing, estimation of errors and interpretation of the data is to be found in the GATE Lagrangian Batfish Experiment Summary Report (IfM Berichte Nr. 88). Map 3L2 is the second Map of the third Lagrangian Batfish Experiment and the data were collected between 2236 on 14.9.74 and 0843 on 15.9.74 in the position shown in the following diagram and comprises 9 legs.

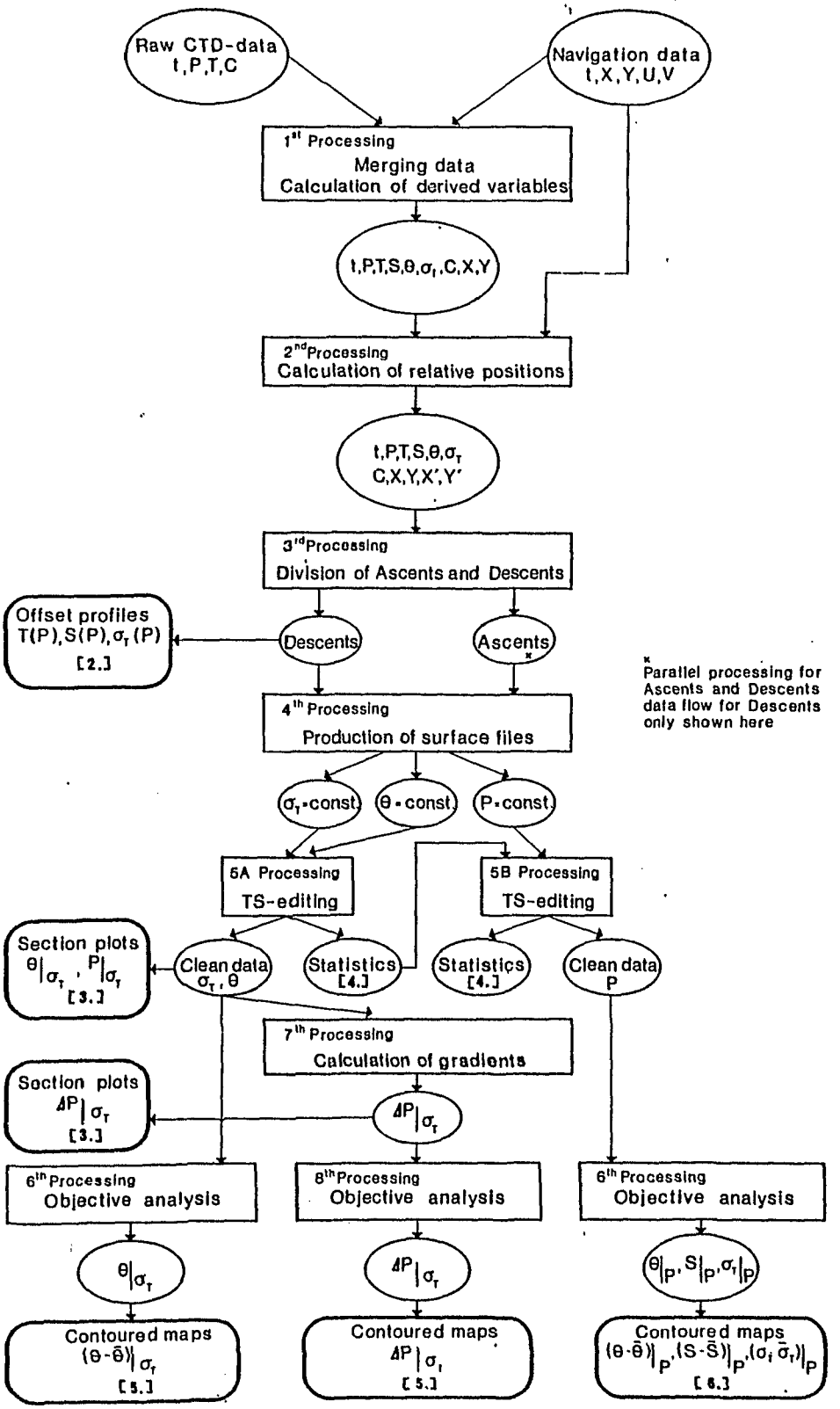
Section II contains offset profiles of potential temperature, salinity and σ_t as functions of pressure. These are the products of the third processing stage (see Data Processing Flow Diagram) where the navigation data have been merged with the CTD data and the ascents and descents separated. Section III contains section plots of the data along the individual legs of the Map after the data have been interpolated onto standard surfaces (fourth processing) and the removal of bad data (fifth processing).

Section IV shows statistis of the data on standard surfaces, these are by-products of the fifth processing stage. Section V contains contoured maps of the distribution of potential temperature and of thickness (the spacing between isopycnic surfaces) on isopycnic surfaces; these are the products of the objective analysis (sixth and eighth processing stages). Section VI contains contoured maps of the distribution of potential temperature, salinity and density on isobaric surfaces. These are also products of the objective analysis (sixth processing stage).

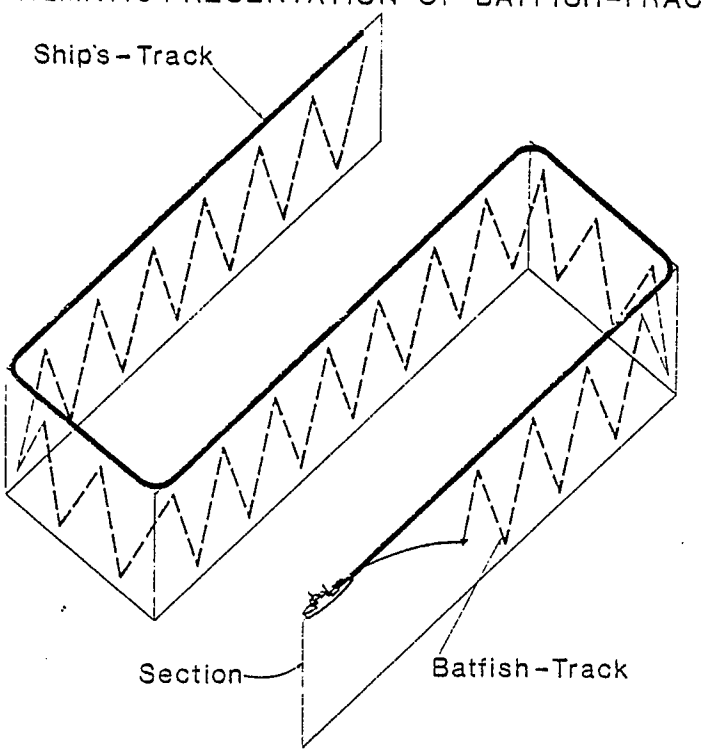


3rd LAGRANGIAN BATFISH EXPERIMENT

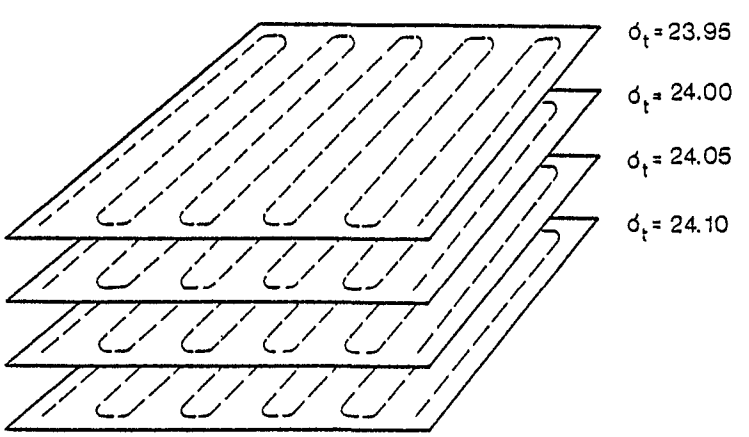
DATA PROCESSING FLOW DIAGRAM



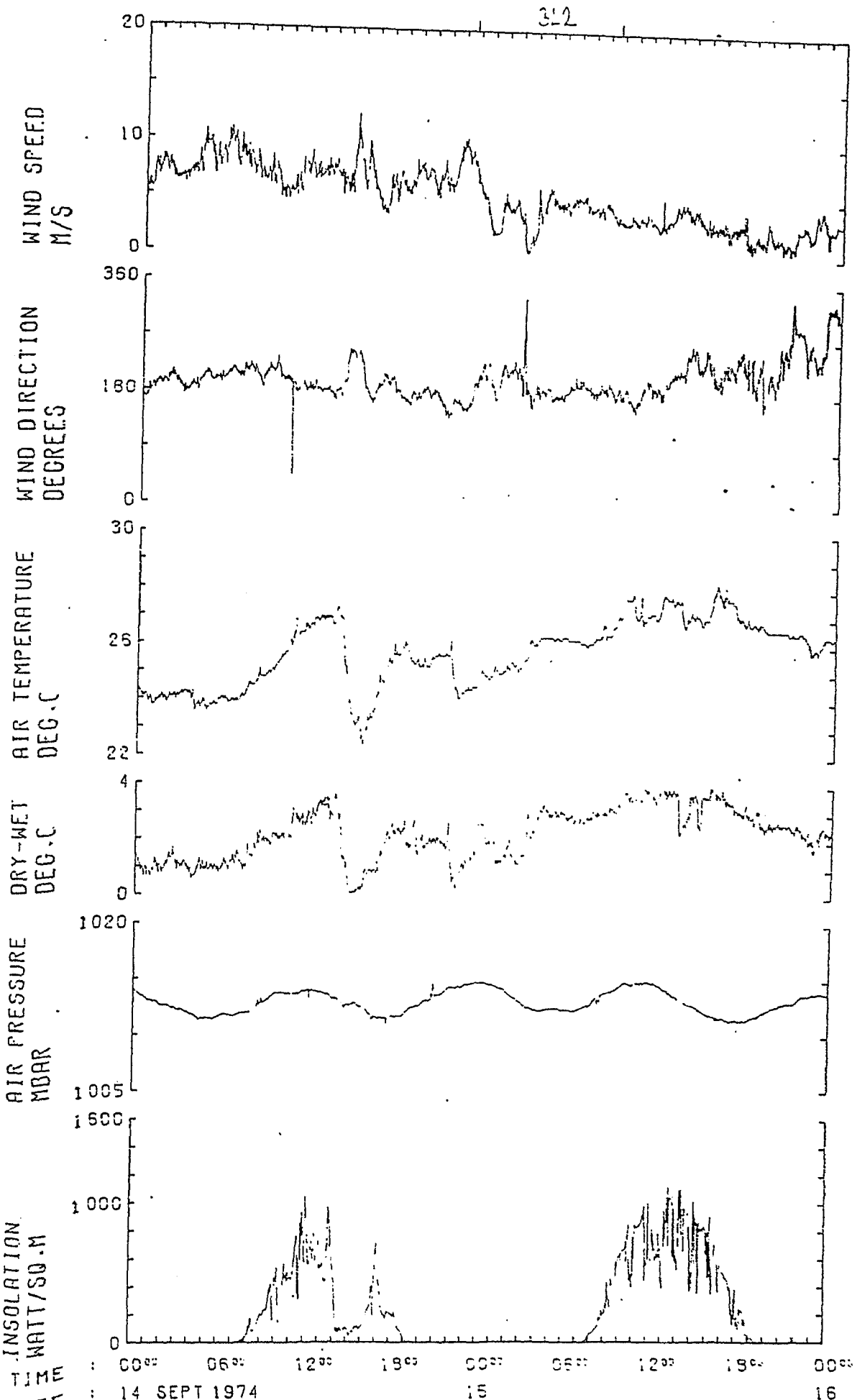
SCHEMATIC PRESENTATION OF BATFISH-TRACK



INTERPOLATION ON TO SURFACES

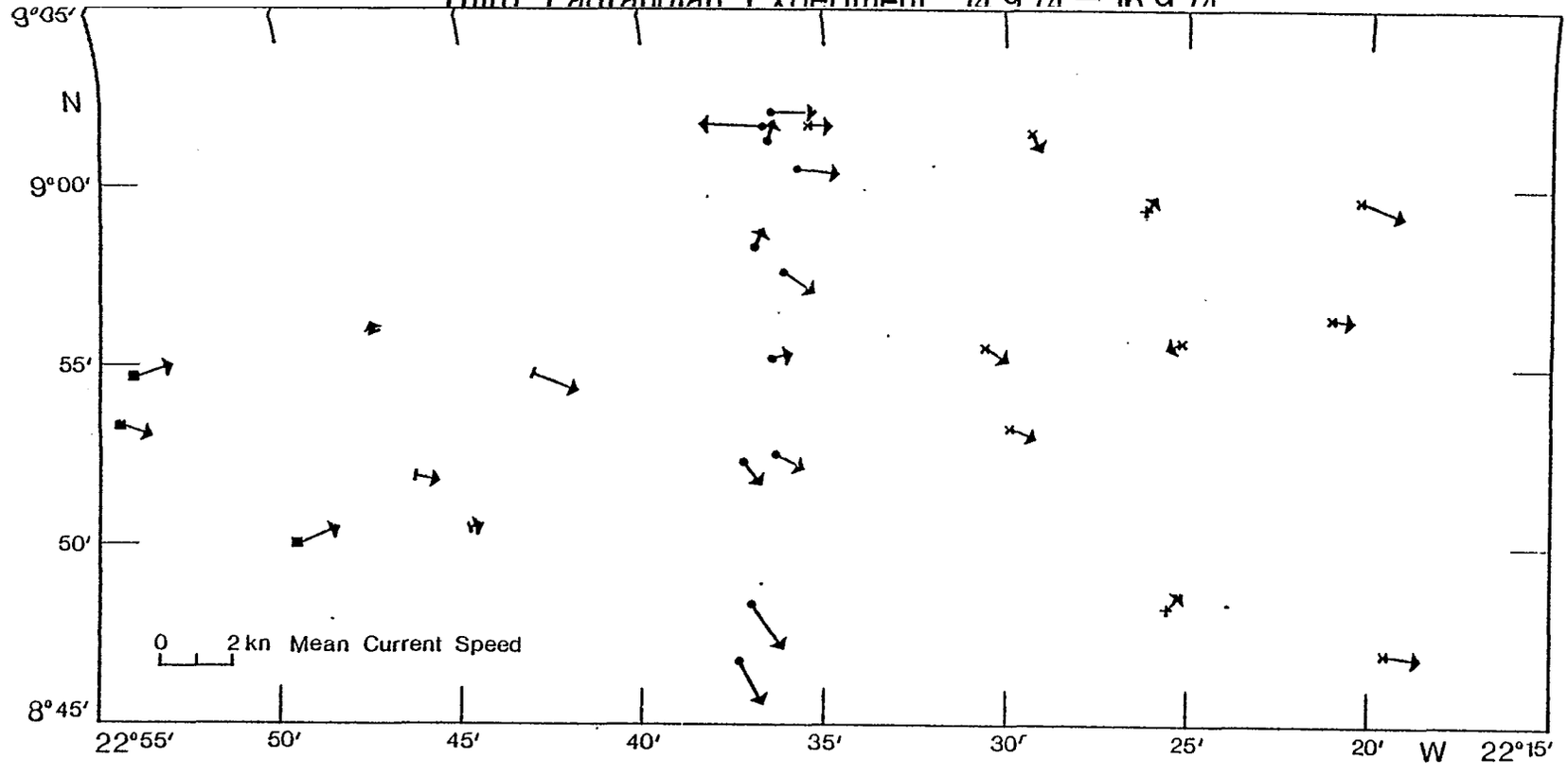


3L2


3L2
WIND SPEED M/S
20
10
0
WIND DIRECTION DEGREES
360
180
0
AIR TEMPERATURE DEG.C
30
26
22
DRY-WET DEG.C
4
0
AIR PRESSURE MBAR
1020
1005
INSOLATION WATT/SQ.M
1600
1000
0
TIME : 00 06 12 18 00 06 12 18 00
DATE : 14 SEPT 1974 15 16

SURFACE CURRENTS IN GATE AREA

Third Lagrangian Experiment 14.9.74 — 16.9.74



Legend

- ■ Experiment 3L1 14.9.74, 16^{50h} — 14.9.74, 22^{29h}
- ⊢ Experiment 3L2 14.9.74, 22^{40h} — 15.9.74, 08^{42h}
- • Experiment 3L3 15.9.74, 08^{50h} — 16.9.74, 06^{33h}
- × Experiment 3L4 16.9.74, 06^{38h} — 16.9.74, 20^{00h}

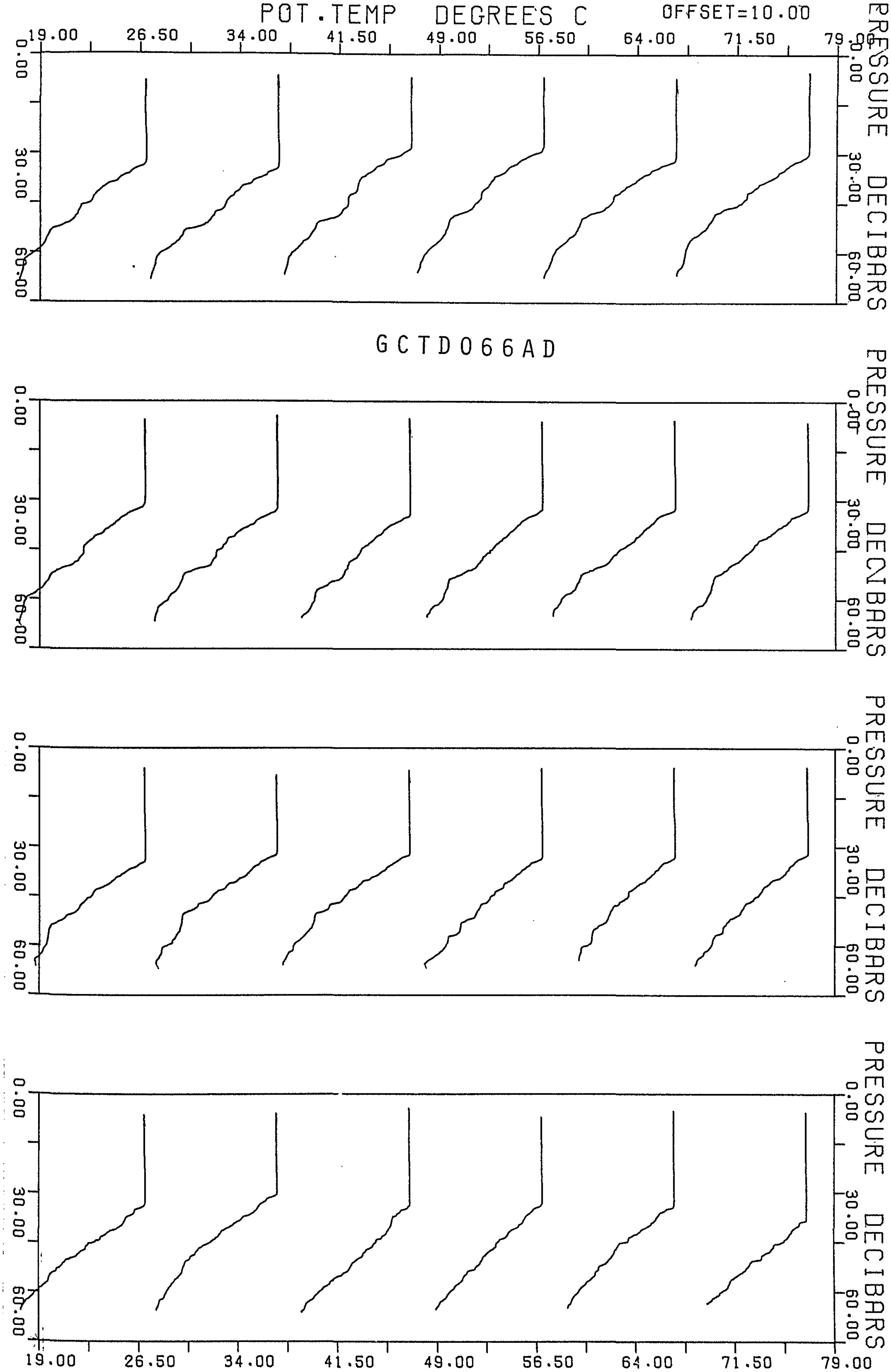
The surface currents were calculated from the difference in the positions of the ship obtained using a satellite fix and dead-reckoning using the ship's log signal integrated since the previous satellite fix.

SECTION II OFFSET PROFILES

In this Section profiles of potential temperature, salinity and σ_t as functions of pressure are shown. These are the data in time-series form prior to the interpolation onto standard surfaces and prior to the removal of bad data (see Data Processing Flow Diagram in Section I). The data are shown in the order potential temperature, salinity and σ_t for each of the 9 legs of the Map*. The individual diagrams are labelled with the file name of the data which is related to the leg number. The following table shows the start and end times and the filename for each leg.

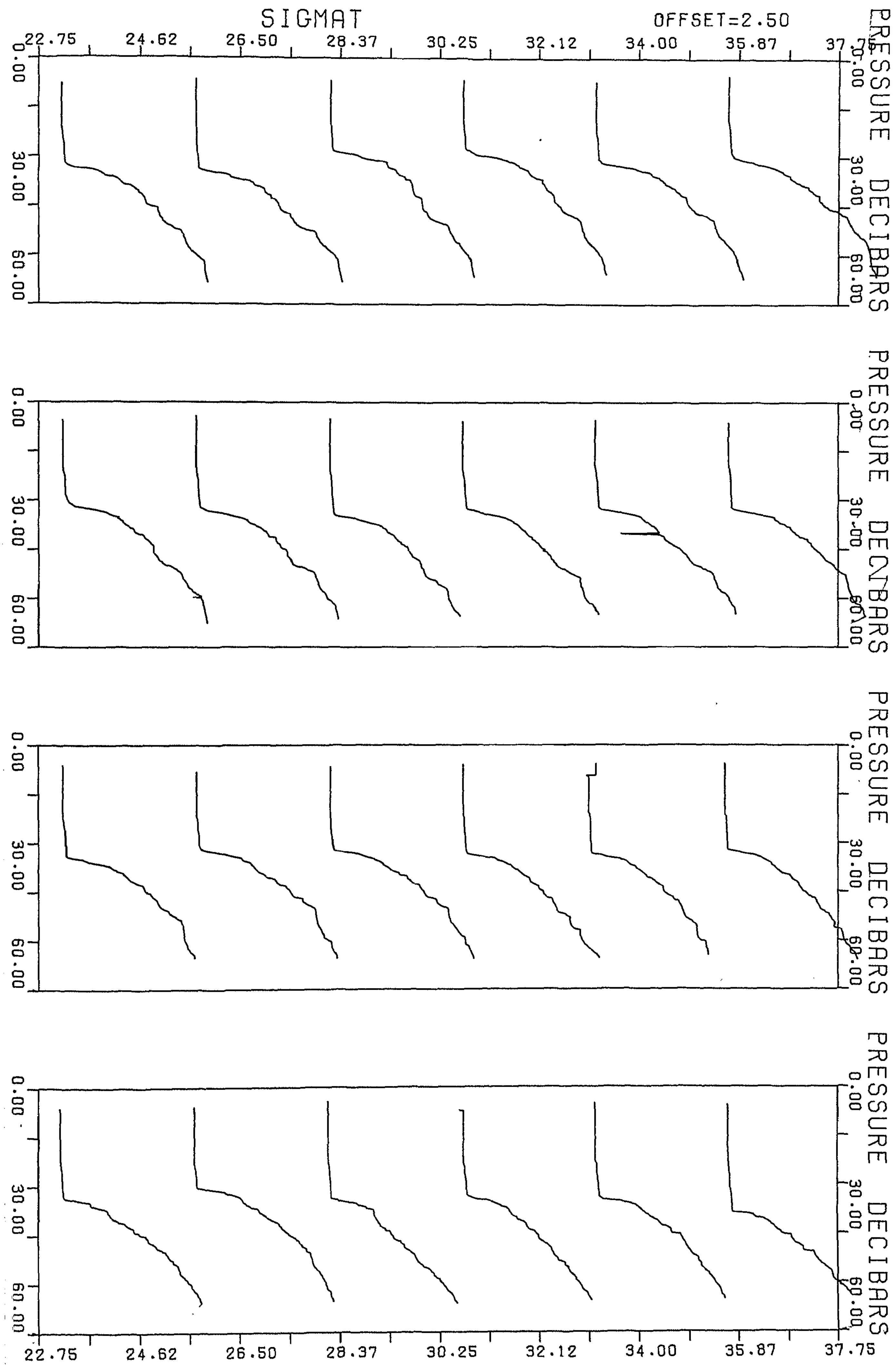
		Start		End	
Leg number	Filename	date	time (GMT)	date	time (GMT)
1	GCTD066AD	14.9	2236	14.9.	2337
2	GCTD067AD		2337	15.9.	0050
3	GCTD068AD		0050		0154
4	GCTD069AD		0154		0304
5	GCTD070AD		0304		0412
6	GCTD071AD		0412		0521
7	GCTD072AD		0521		0631
8	GCTD073AD		0631		0744
9	GCTD074AD		0744		0843

*For the sake of clarity it was found necessary to keep the scale of diagrams variable.



-Offset Profiles LEG 1-

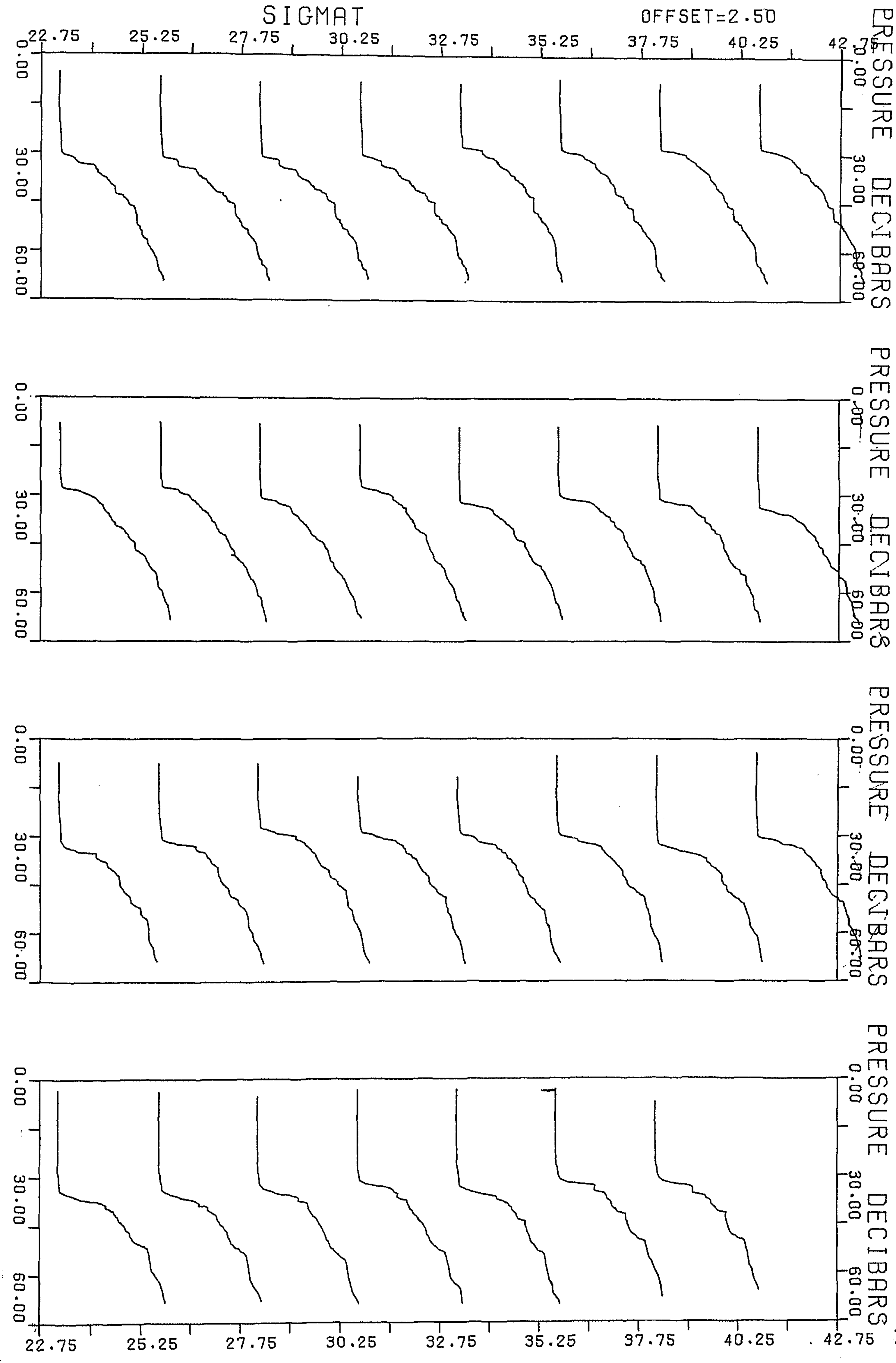
-Offset Profiles LEG 1-



-Offset Profiles LEG 1-

-2 GET selifford testfo-

-Offset Profiles LEG 2-



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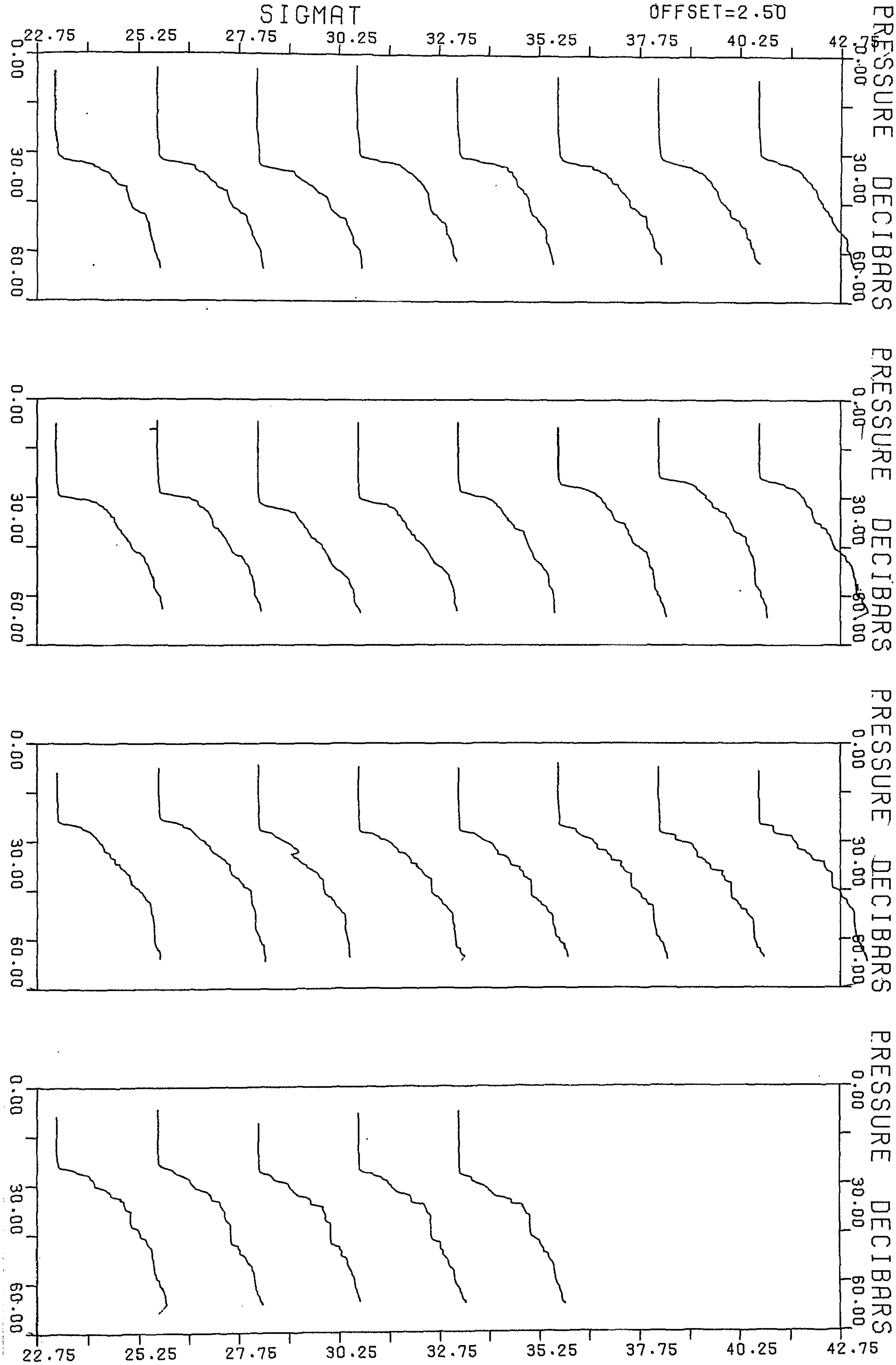
-Offset Profiles LEG 3-

-Offset Profiles LEG 3-



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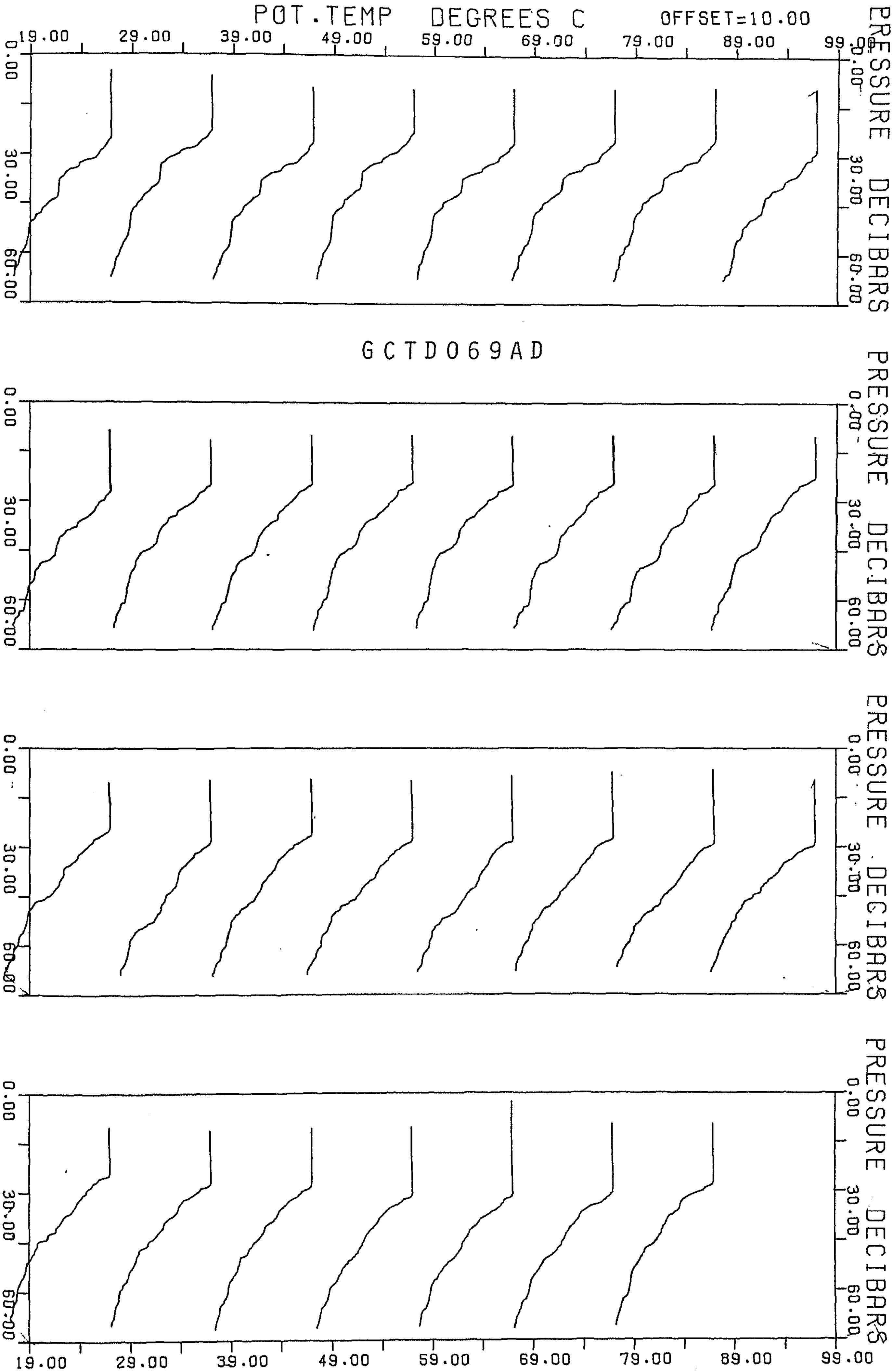

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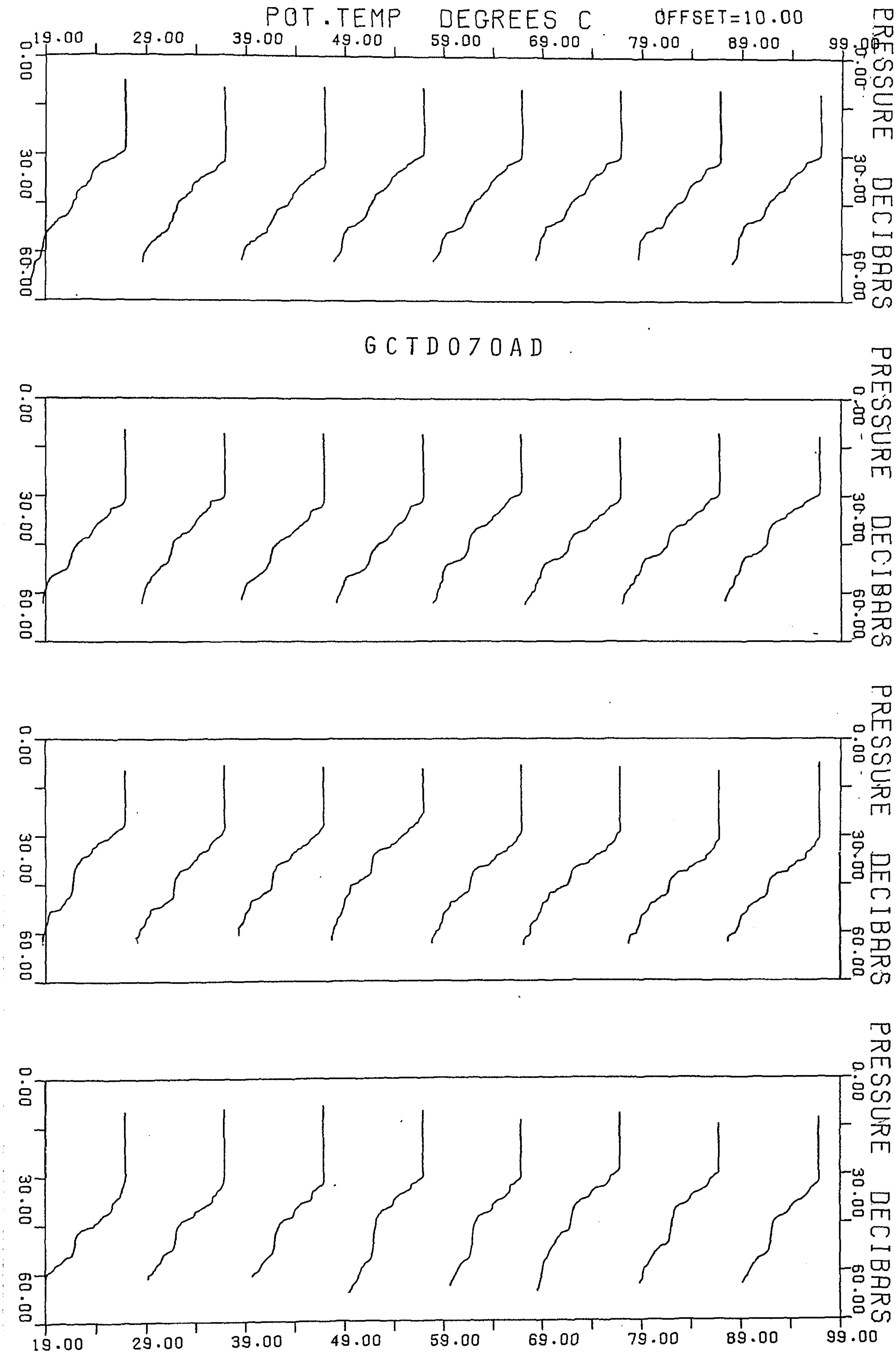

-Offset Profiles LEG 5-

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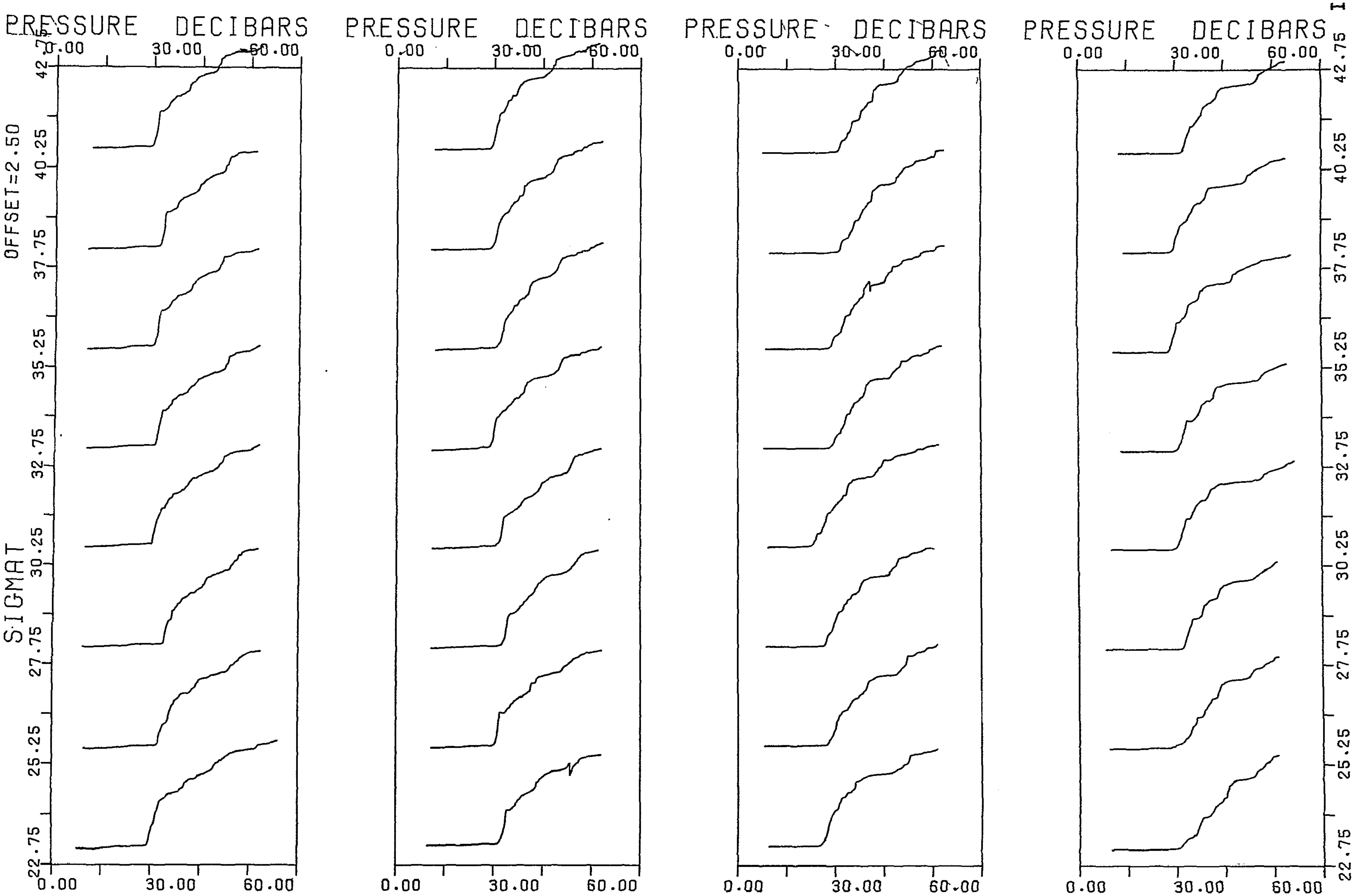

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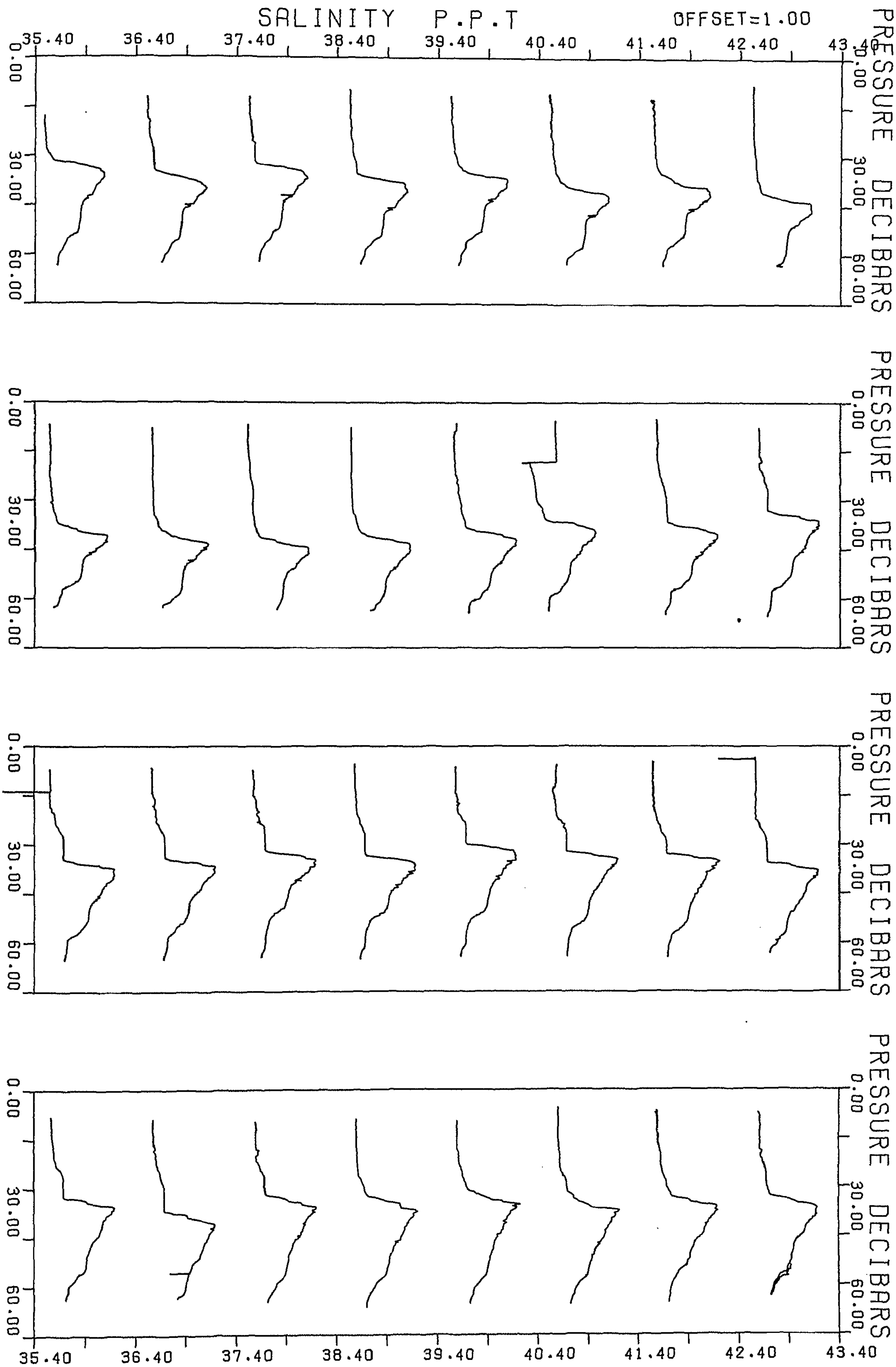
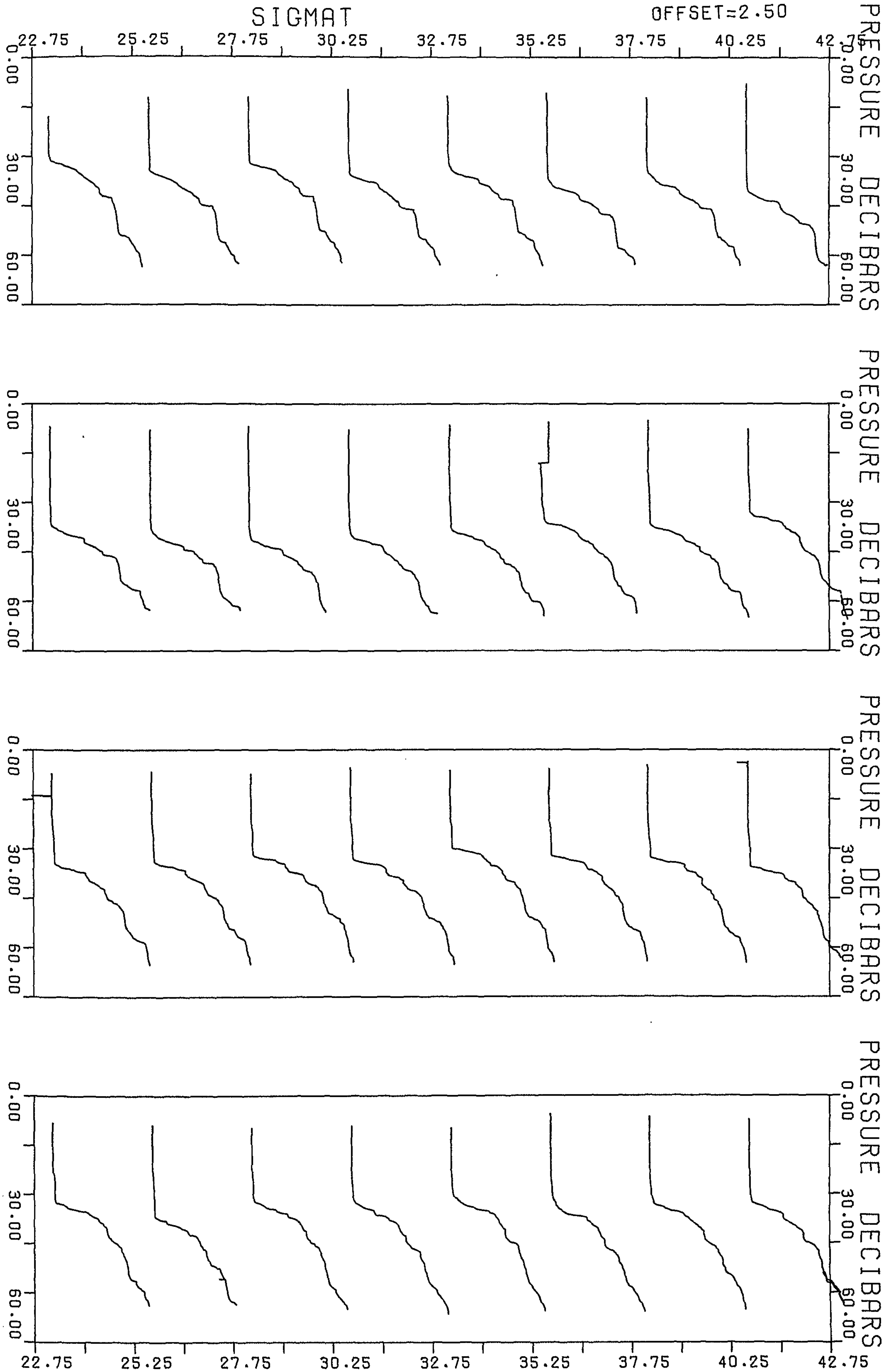


-Offset Profiles LEG 6-

-Offset Profiles LEG 6-



GCTD072AD

-7 037 salinity test-

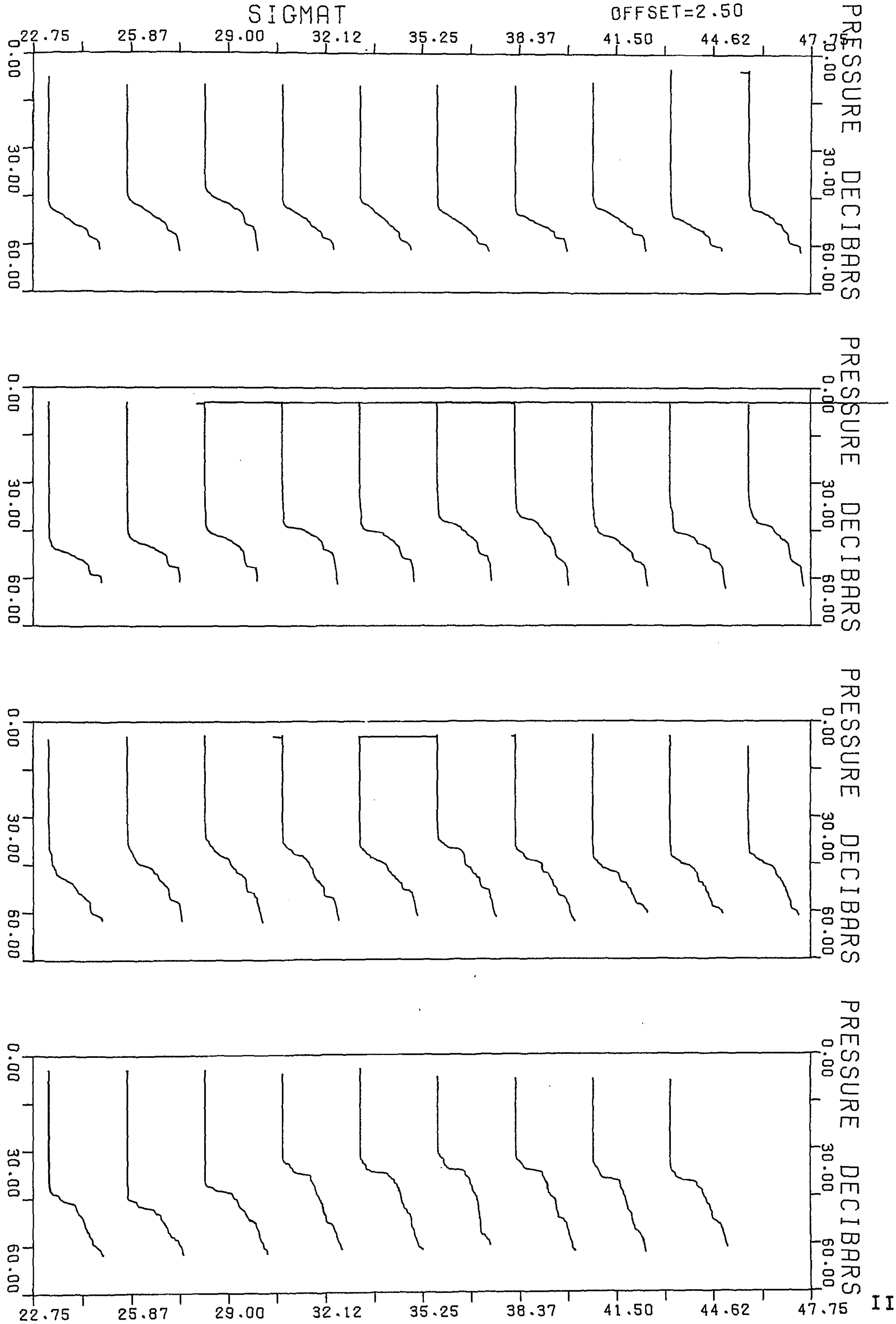
-7 037 Salinity test-

-Offset Profiles LEG 7-

GCTD073AD

-8 GET Milford test0-

-Offset Profiles LEG 8-



-Offset Profiles LEG 8-

-6 037 profile test-

-Offset Profiles LEG 6-

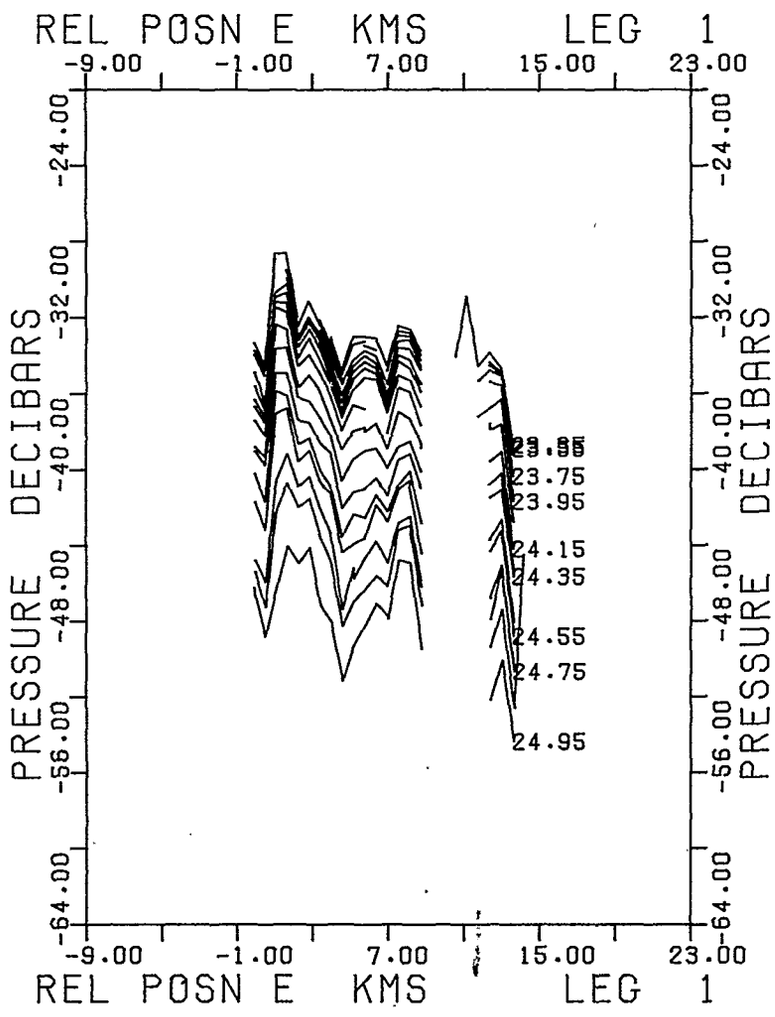
-Offset Profiles LEG 9-

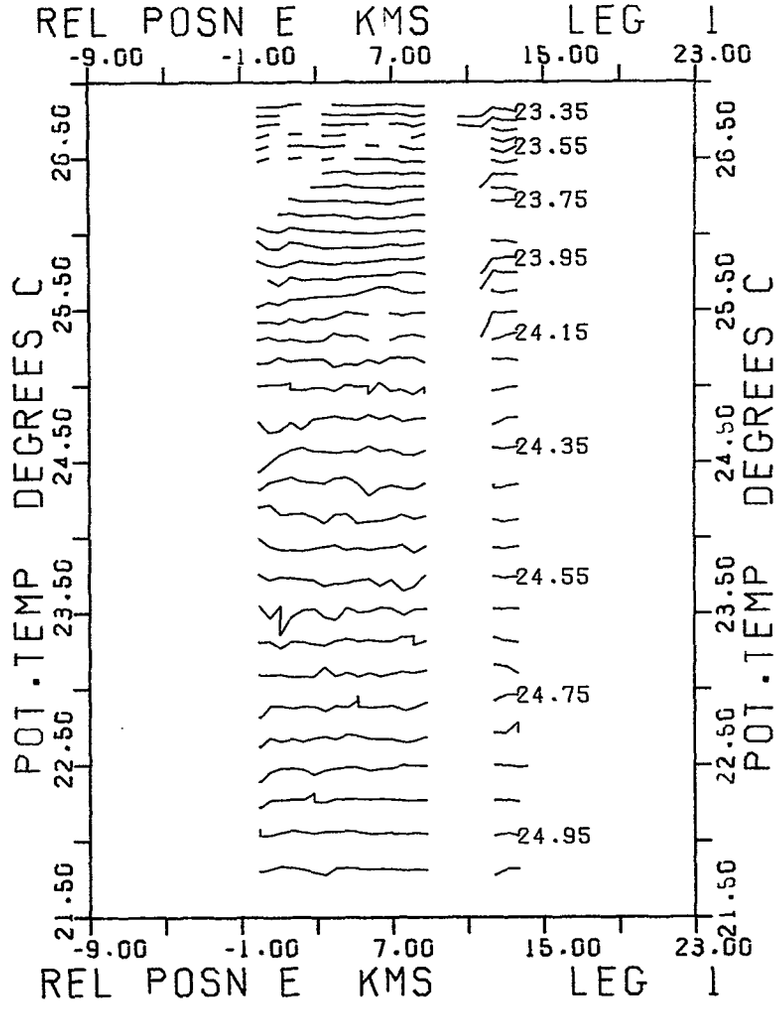
SECTION III SECTION PLOTS

This Section shows plots of sections alont the 9 legs of the survey handled in this volume. These are the data after interpolation onto standard surfaces of σ_t and after removal of bad data (stage 5 and 7 of data processing; see the flow diagram in Section I). The start and end times for each leg are shown in Section II.

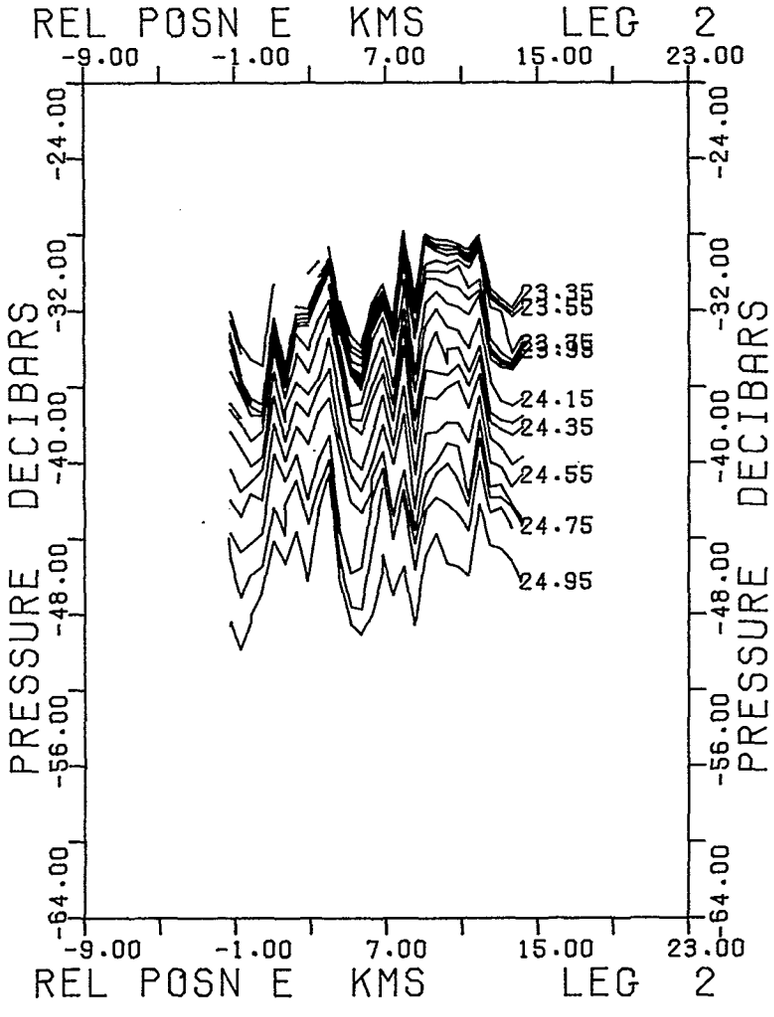
1. Potential temperature and pressure on surfaces of constant σ_t in the range σ_t = 23.35 - 25.00.

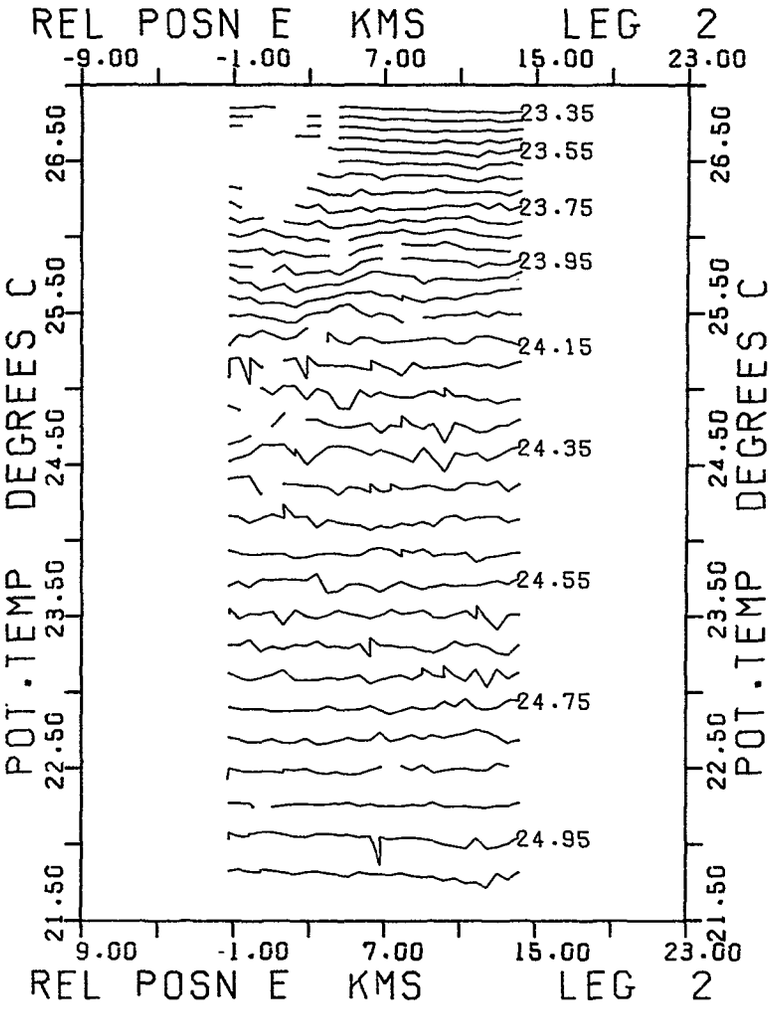
   Contour interval
   for potential temperature on isopycnals 0.05 σ_t,
   for pressure on isopycnals 0.10 σ_t.





-P and T on Isopycnals-





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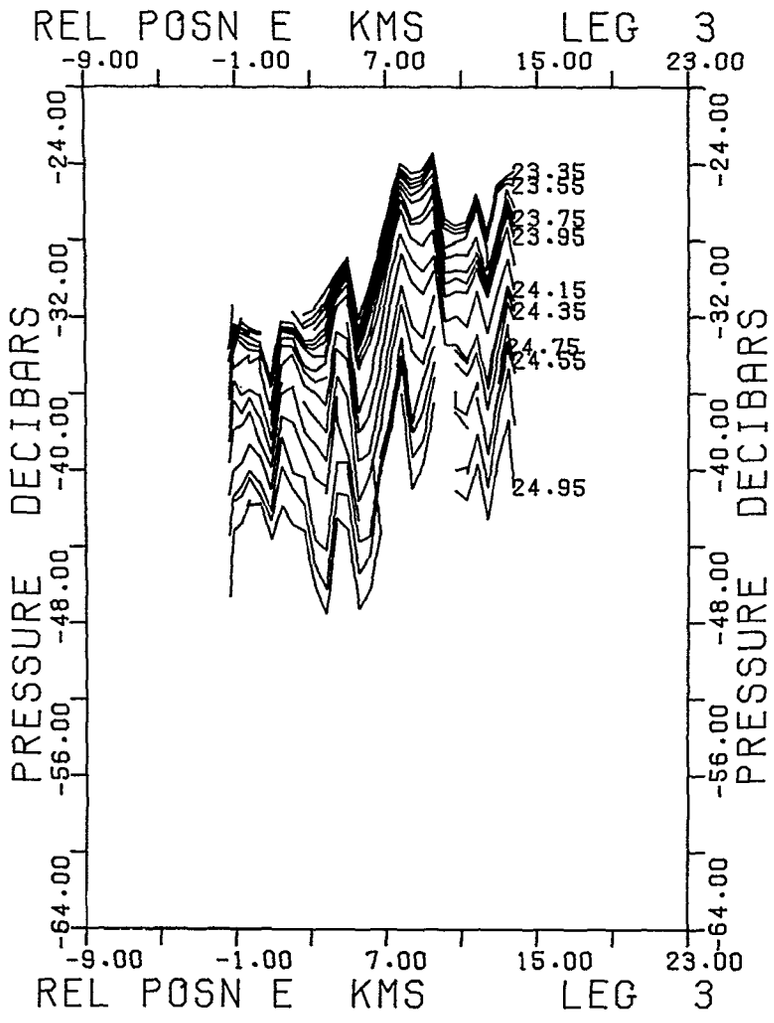

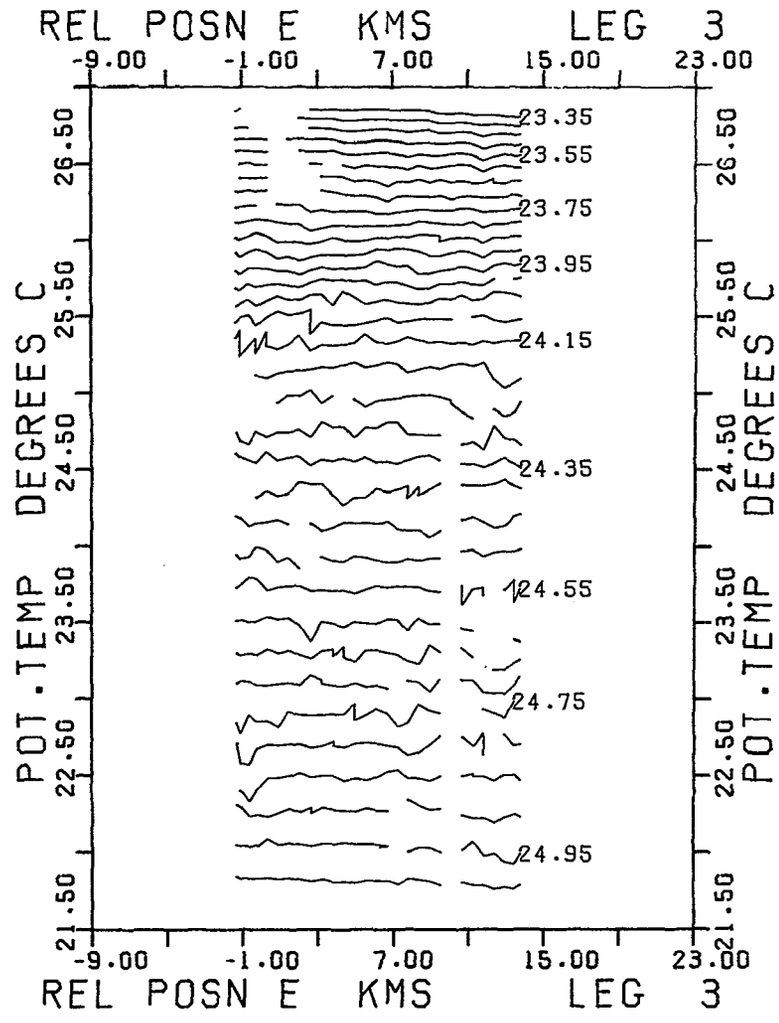

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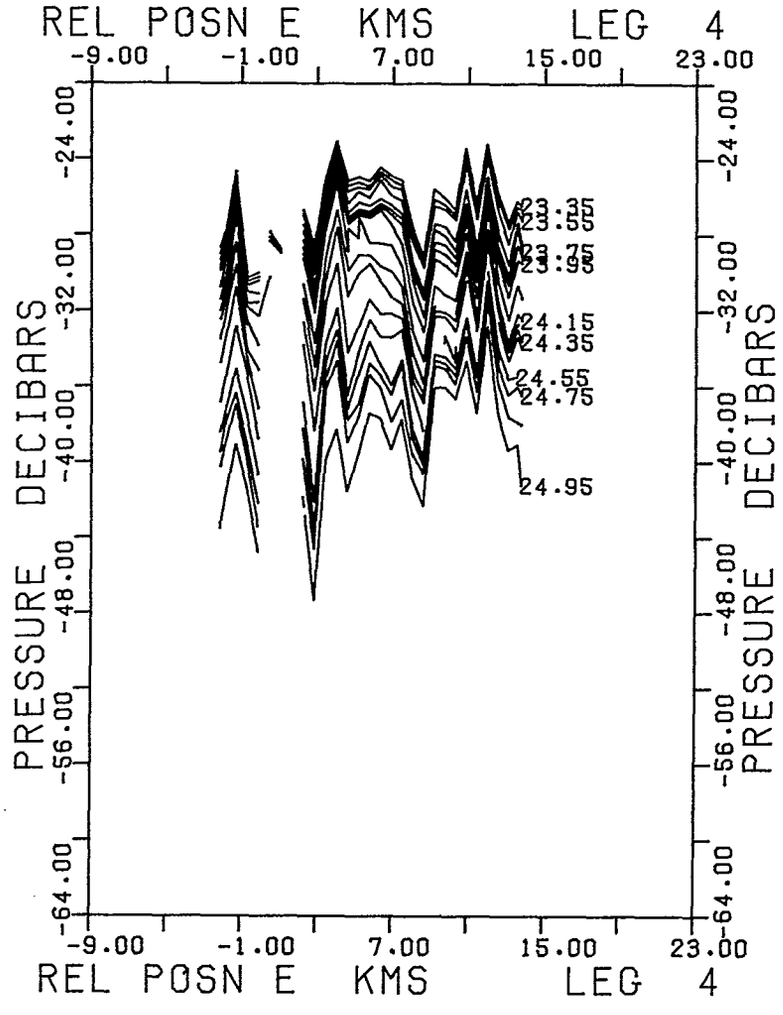
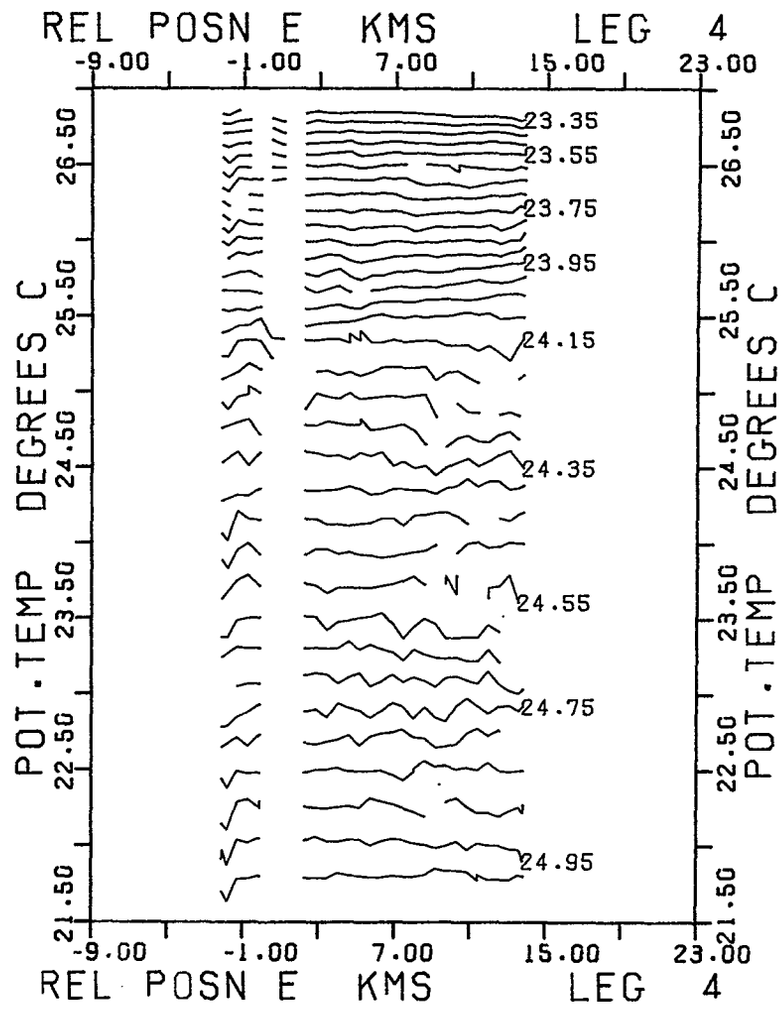
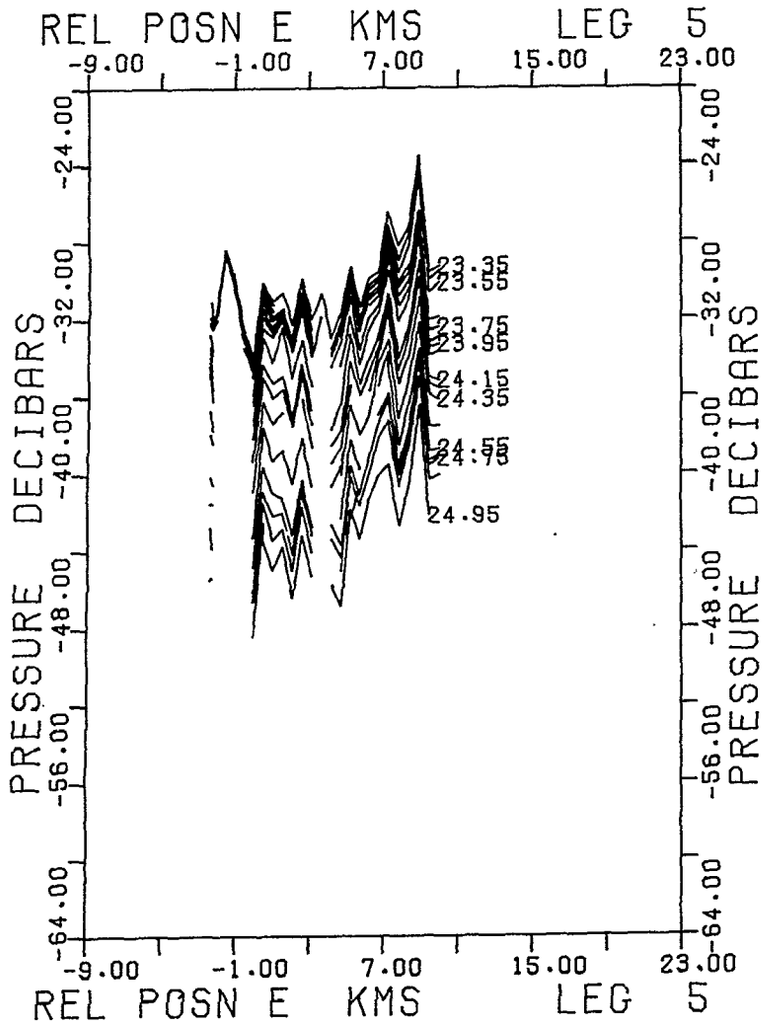
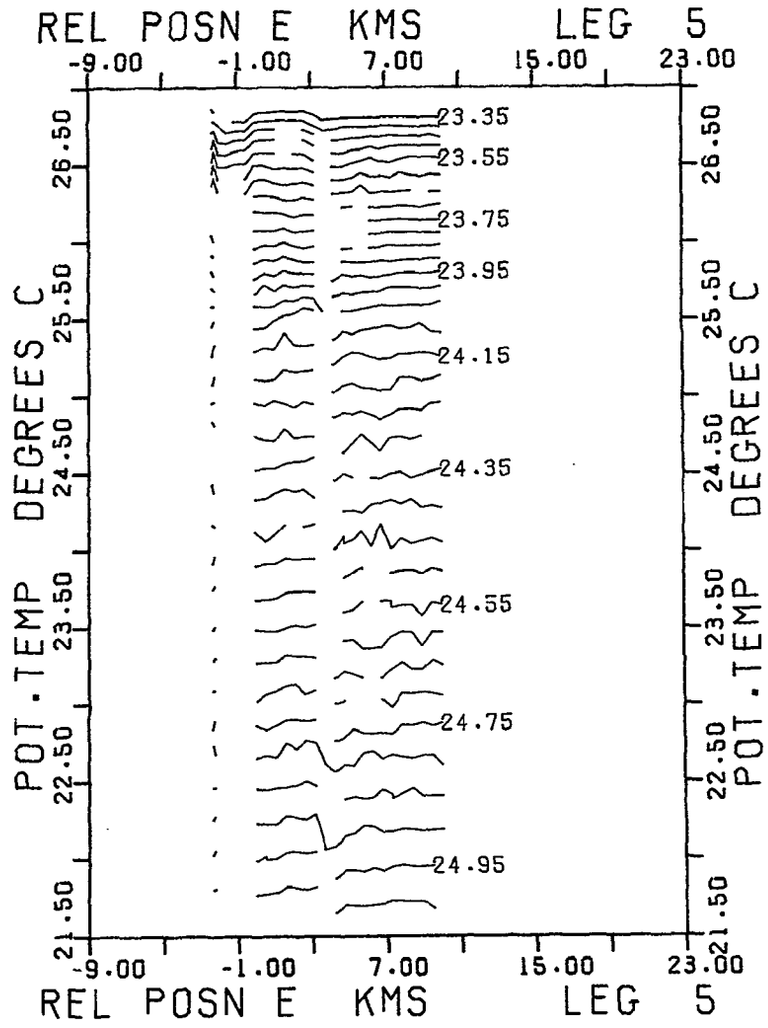




9 -III

-P and T on Isopycnals-





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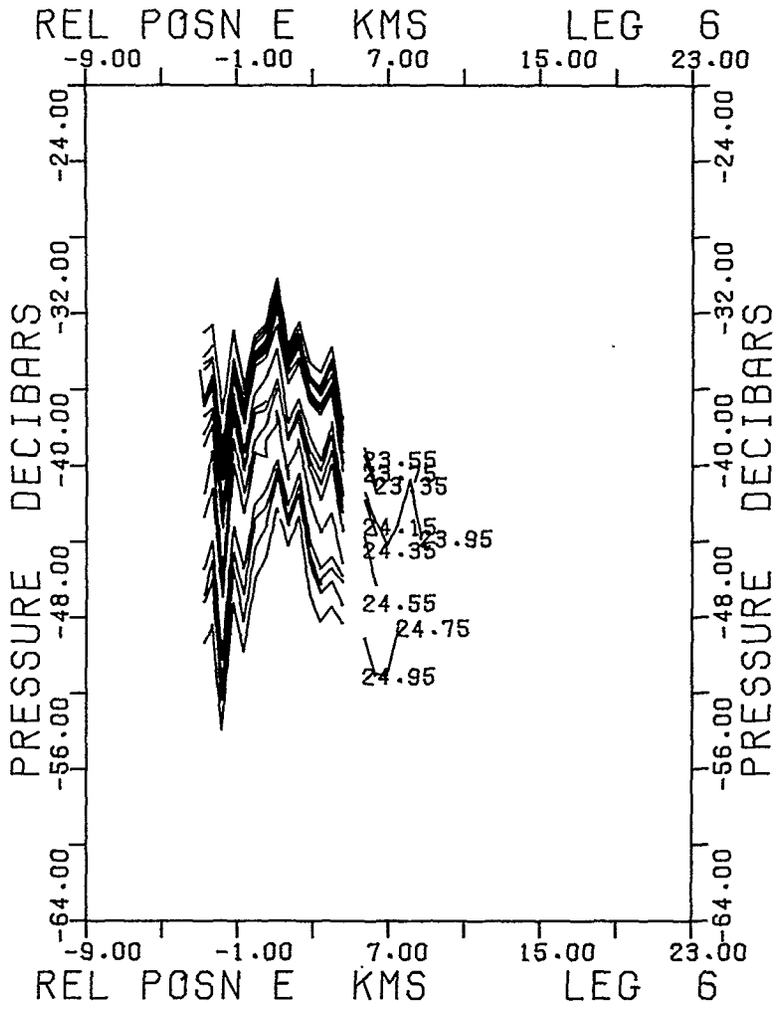

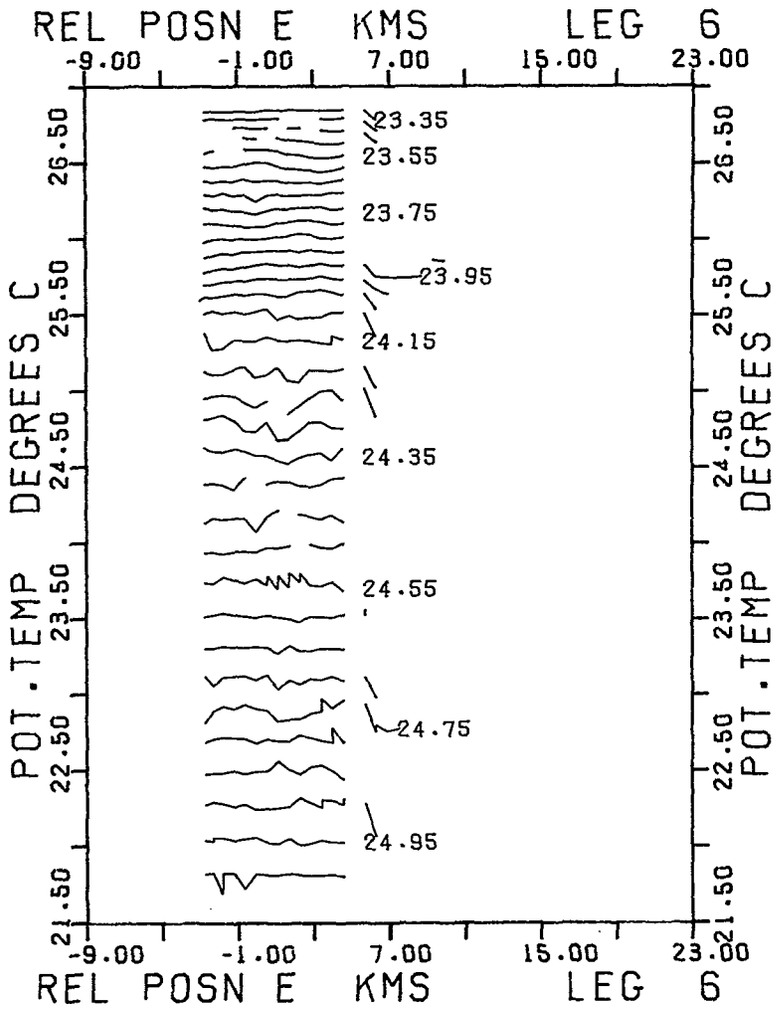

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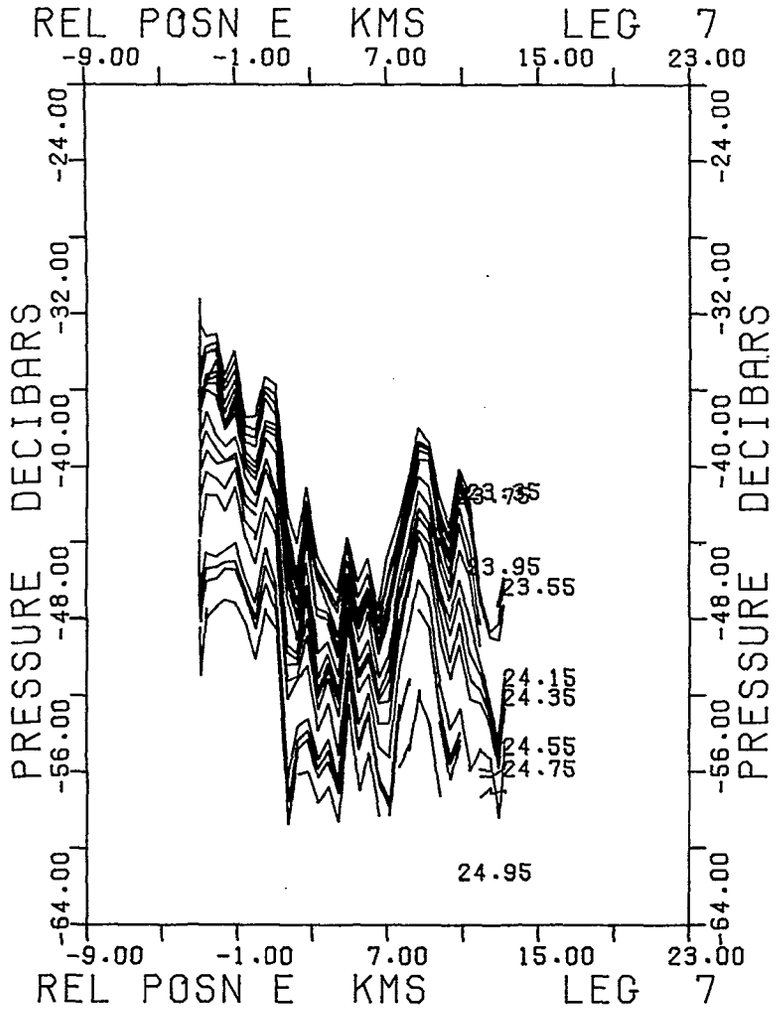

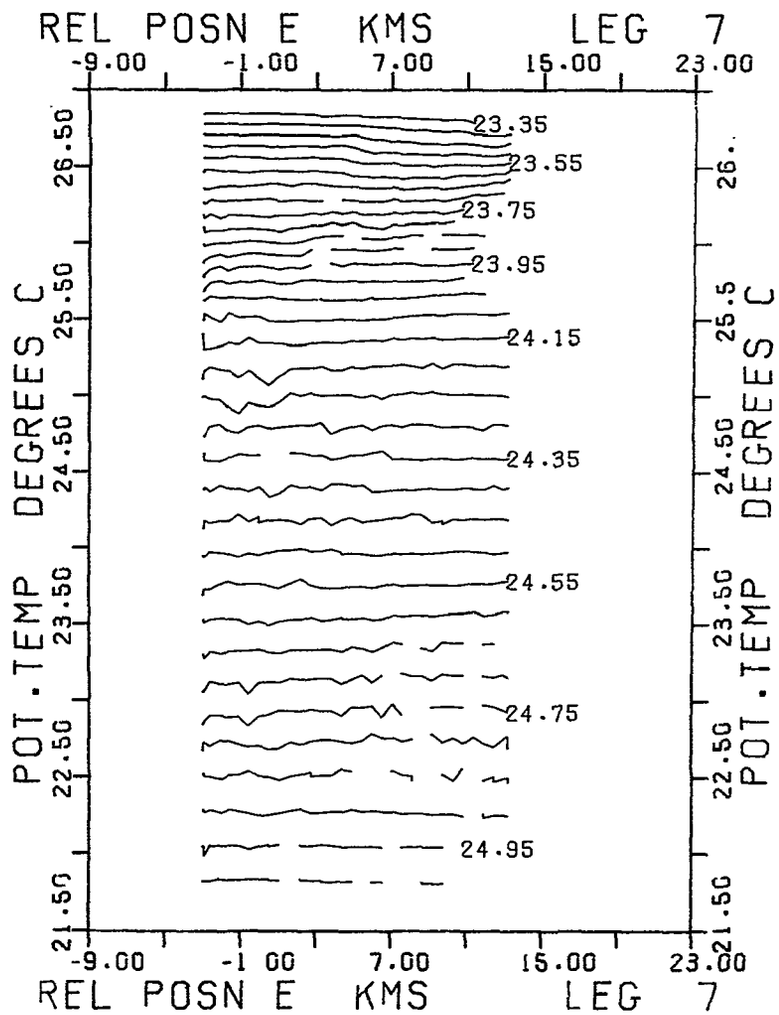

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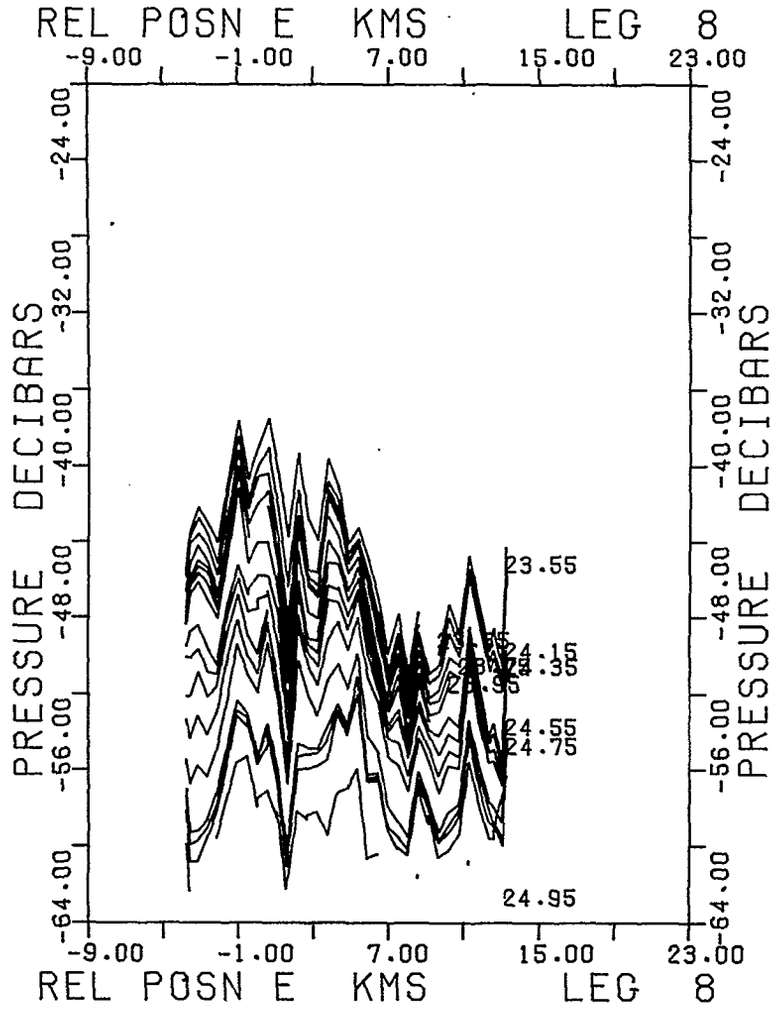
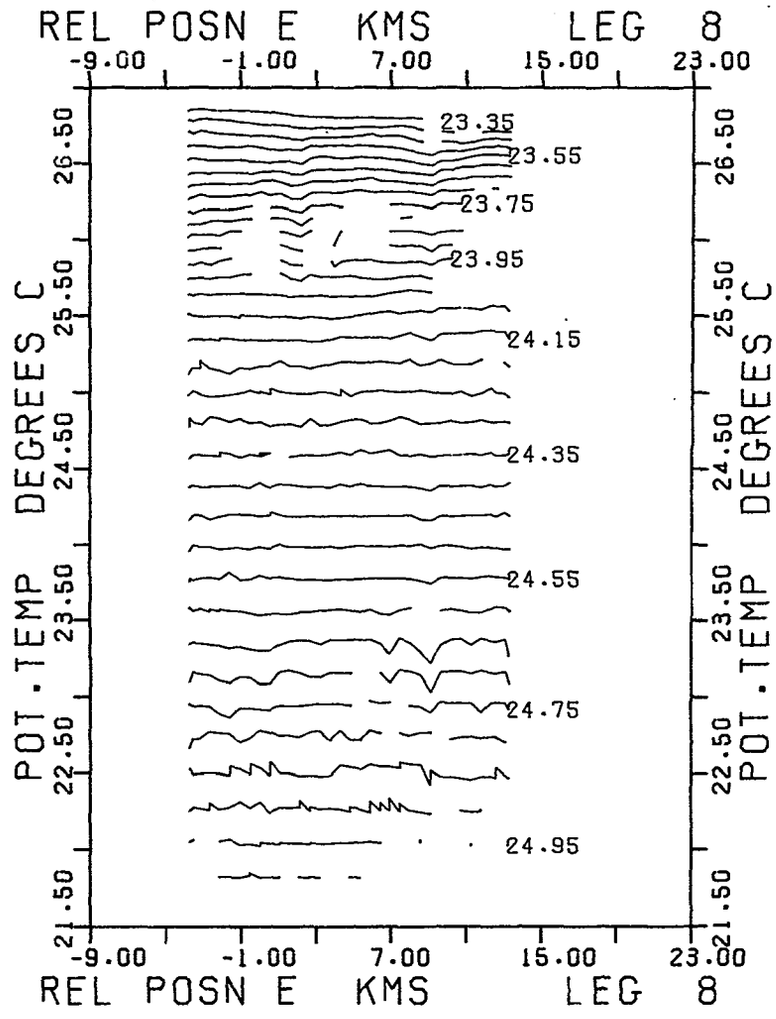
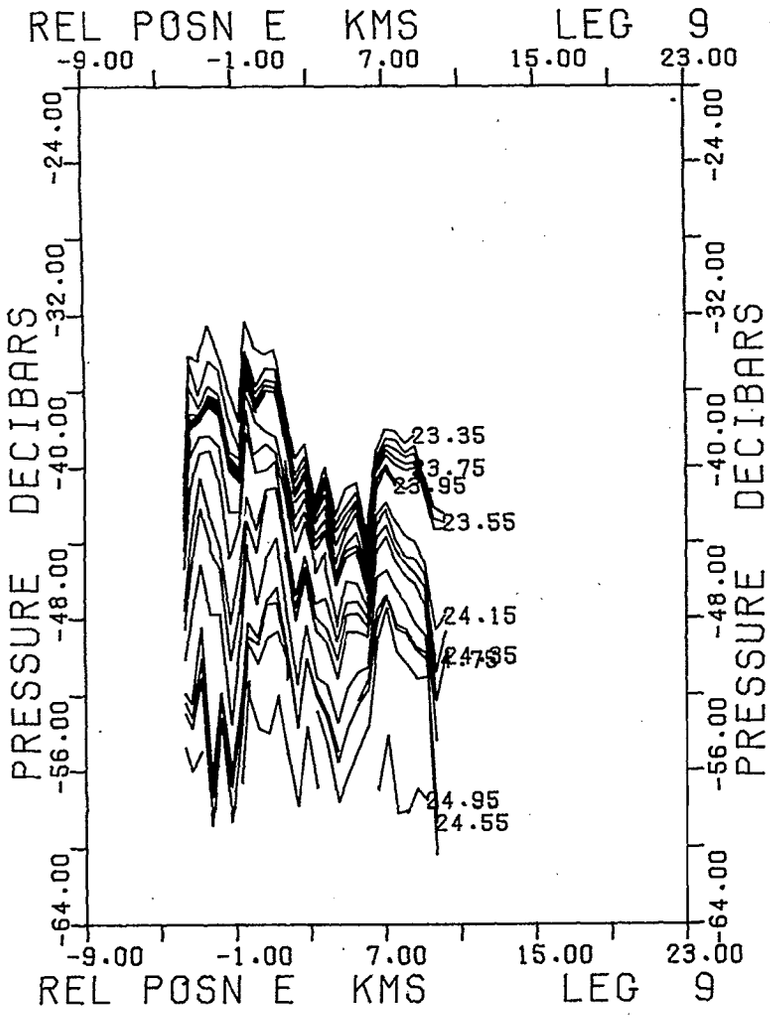
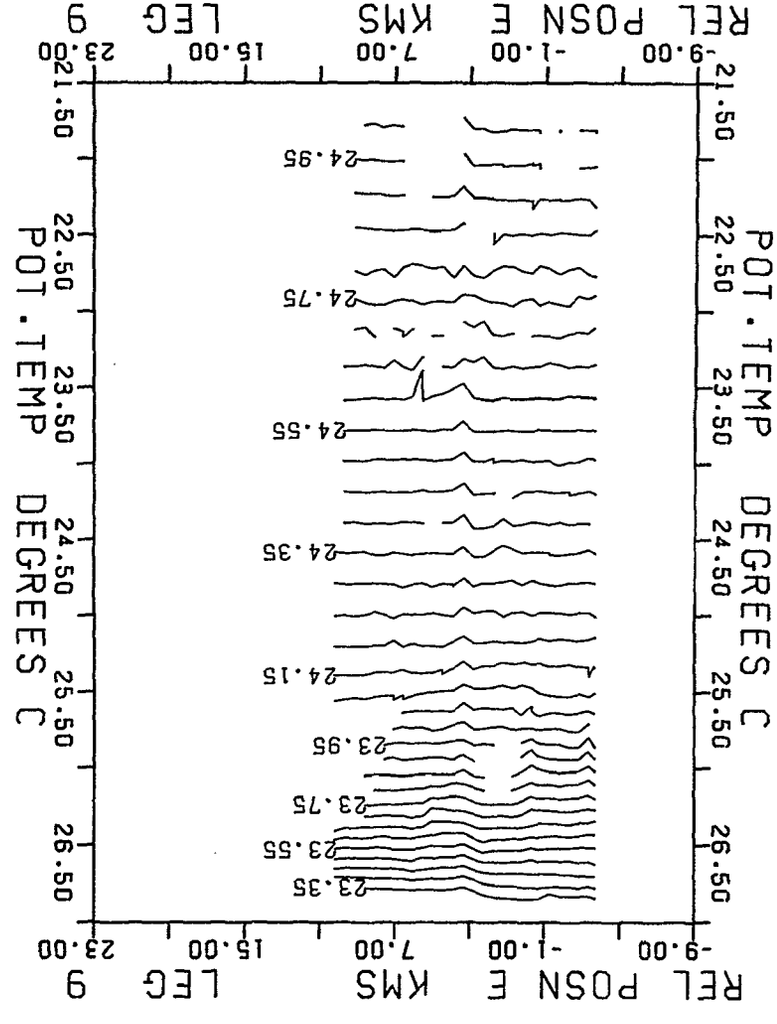




ØI -III

-P and T on Isopycnals-

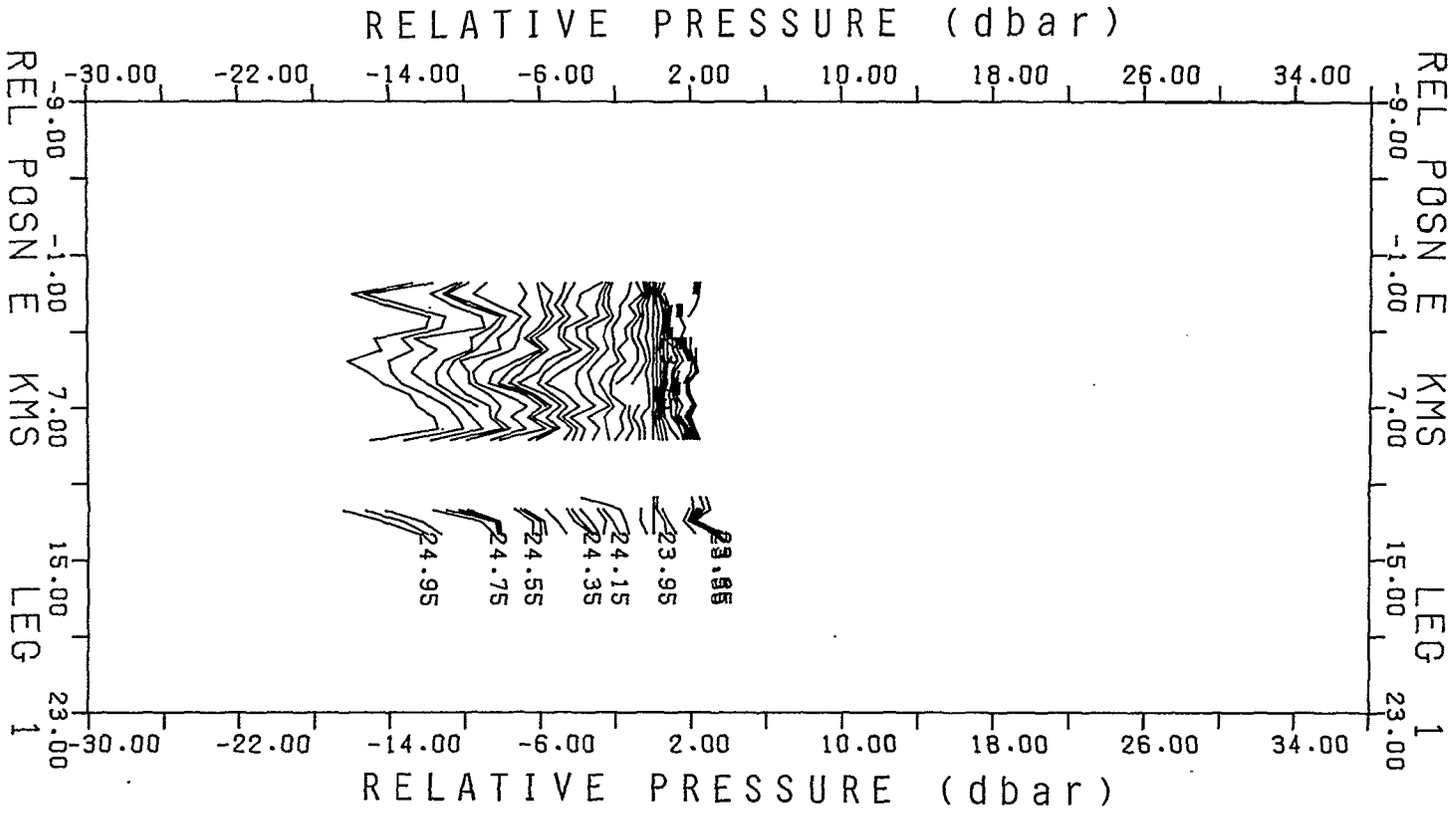




-P and T on Isopycnals-

2. Pressure, relative to the pressure on σ_t = 24.00, on surfaces of constant on σ_t in the range σ_t = 23.35 - 24.95.

   Contour interval 0.05 σ_t.



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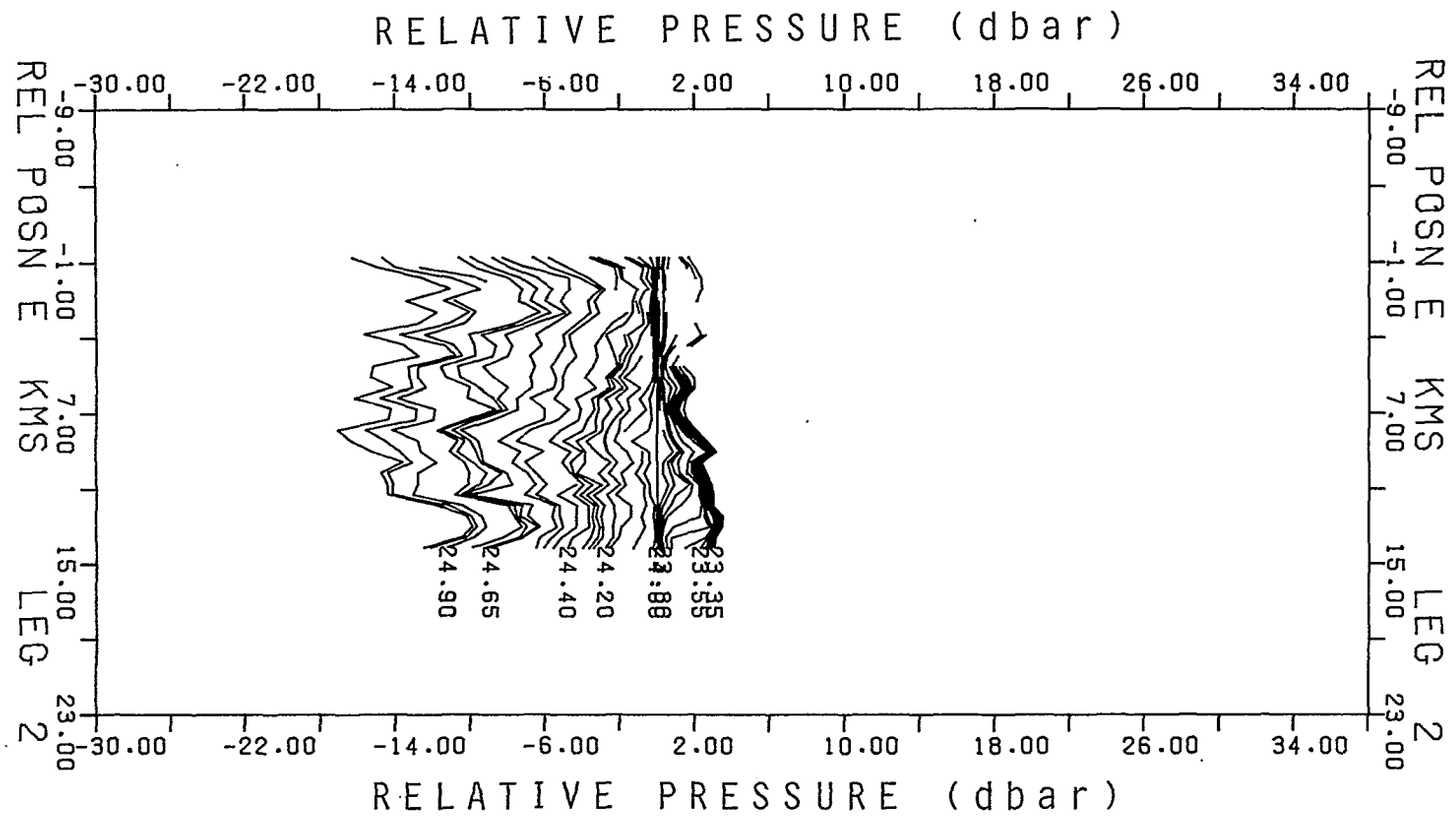
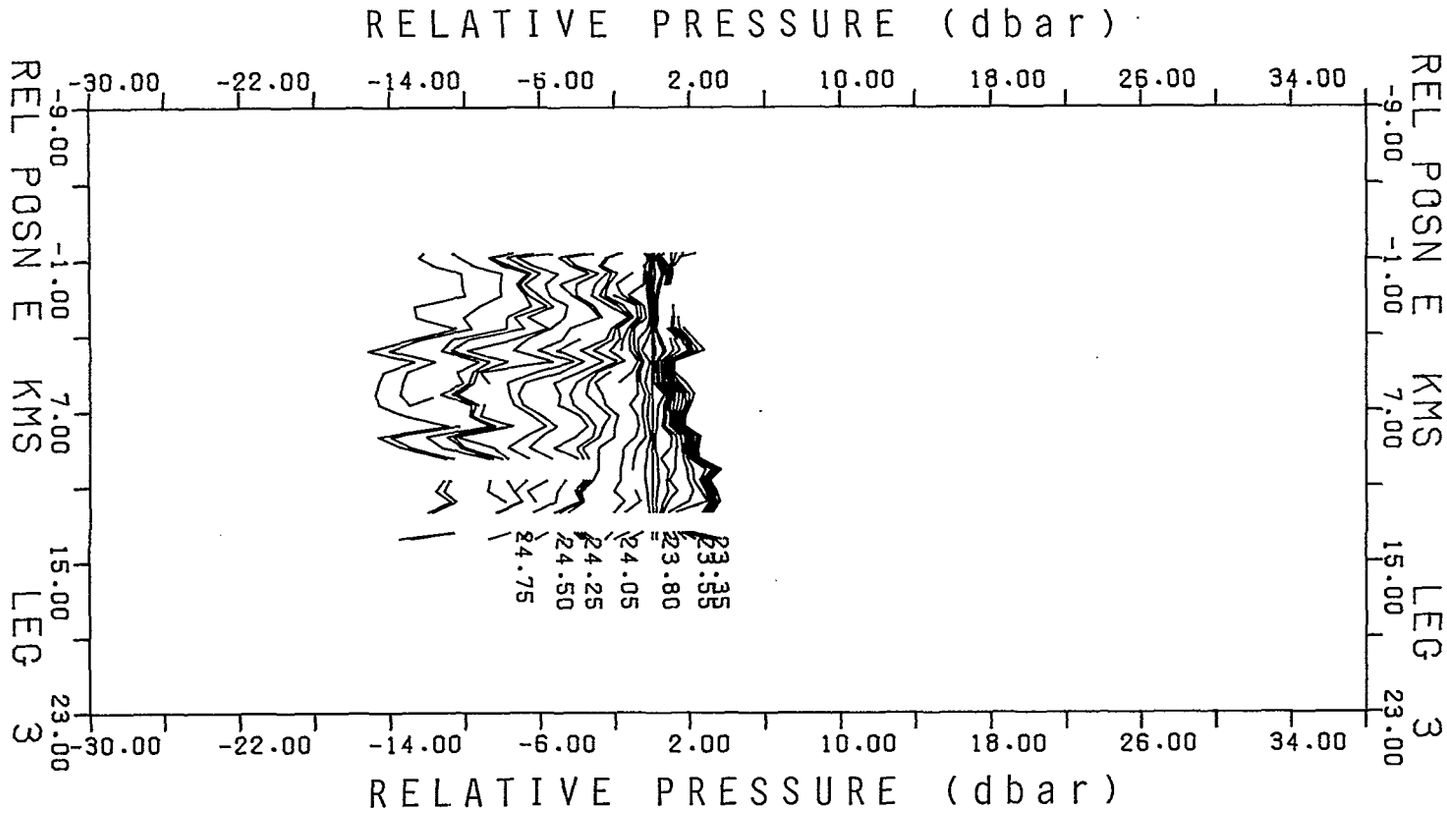
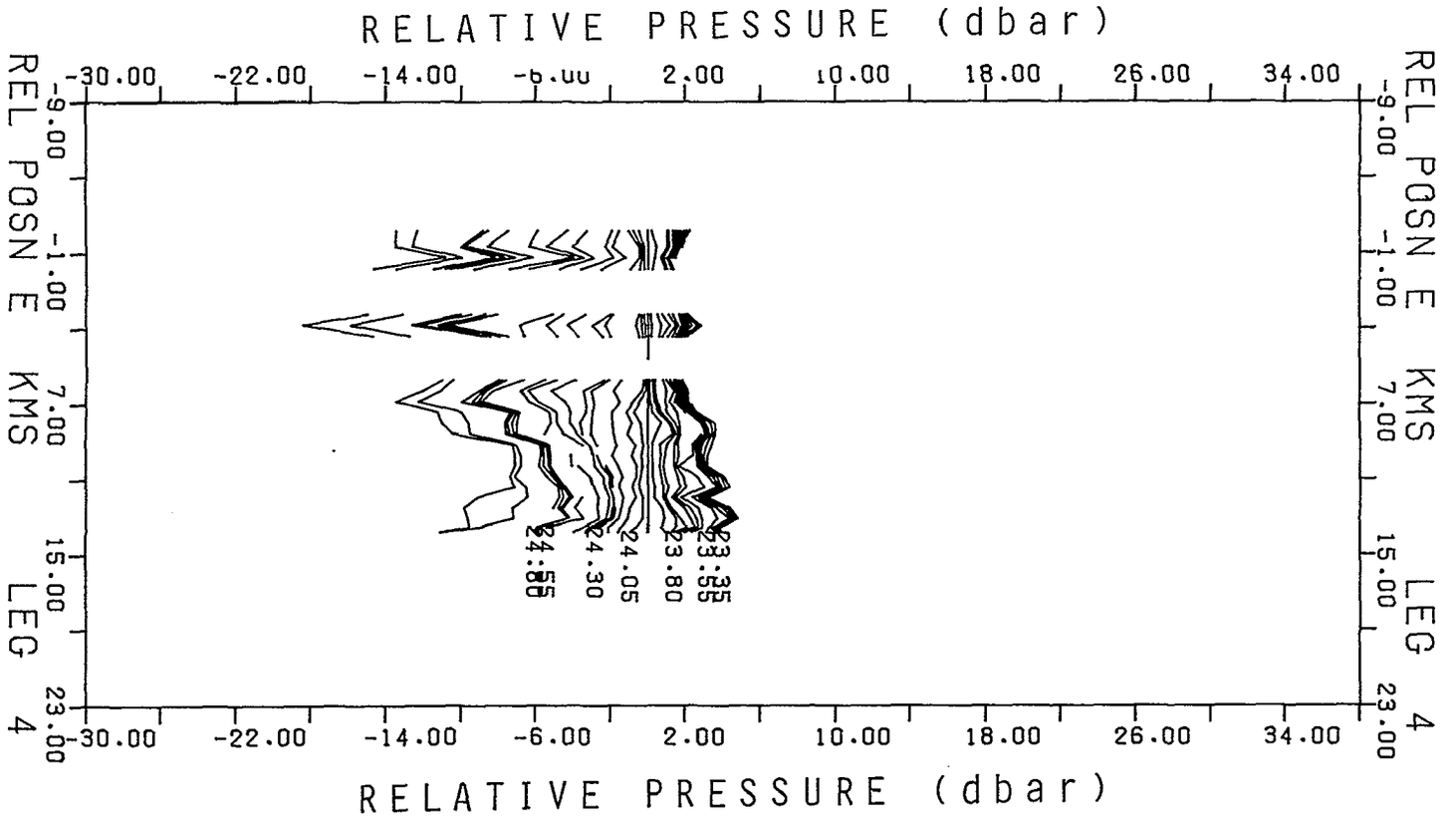


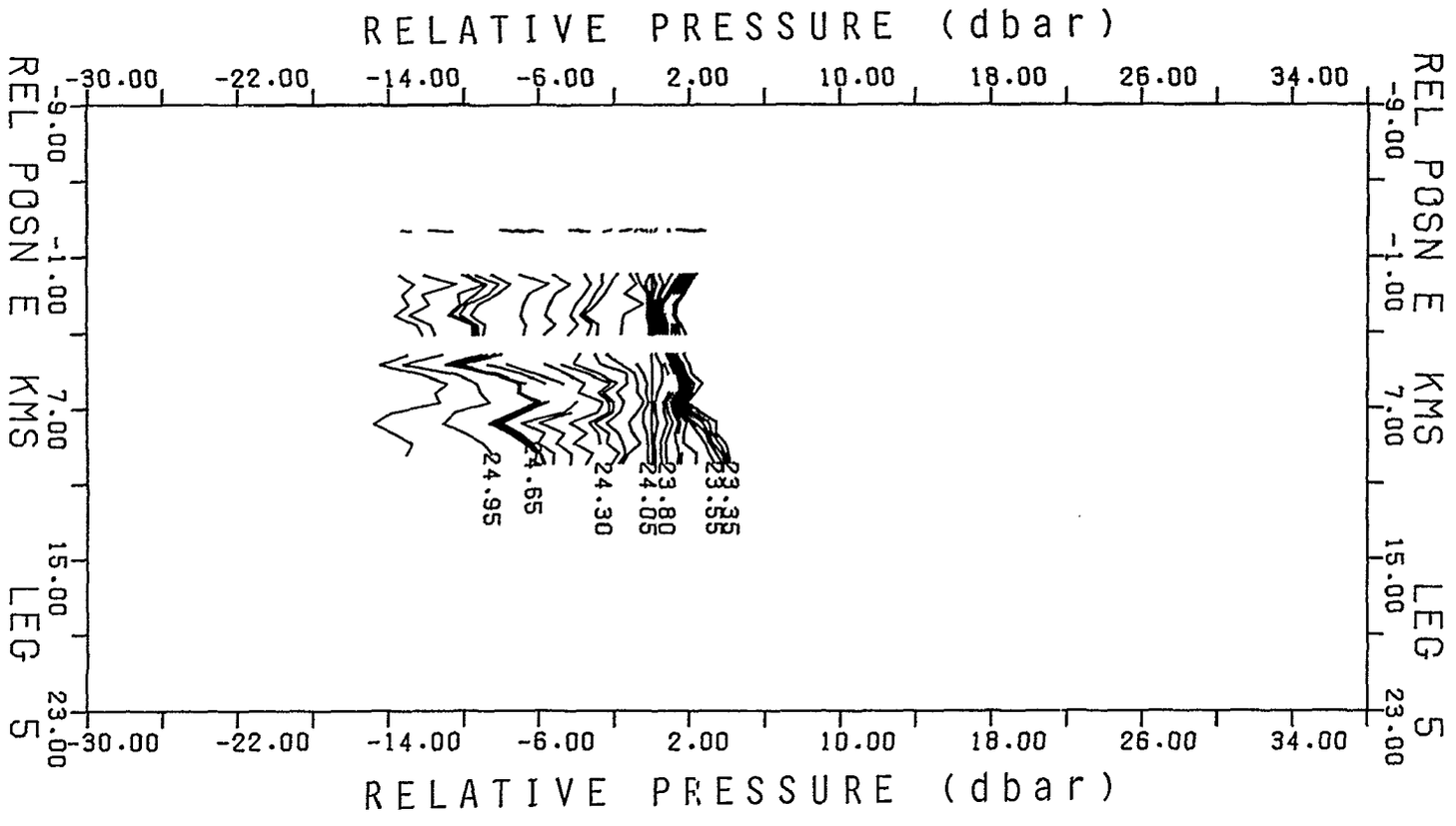
-Relative Pressure on Isopycnals-



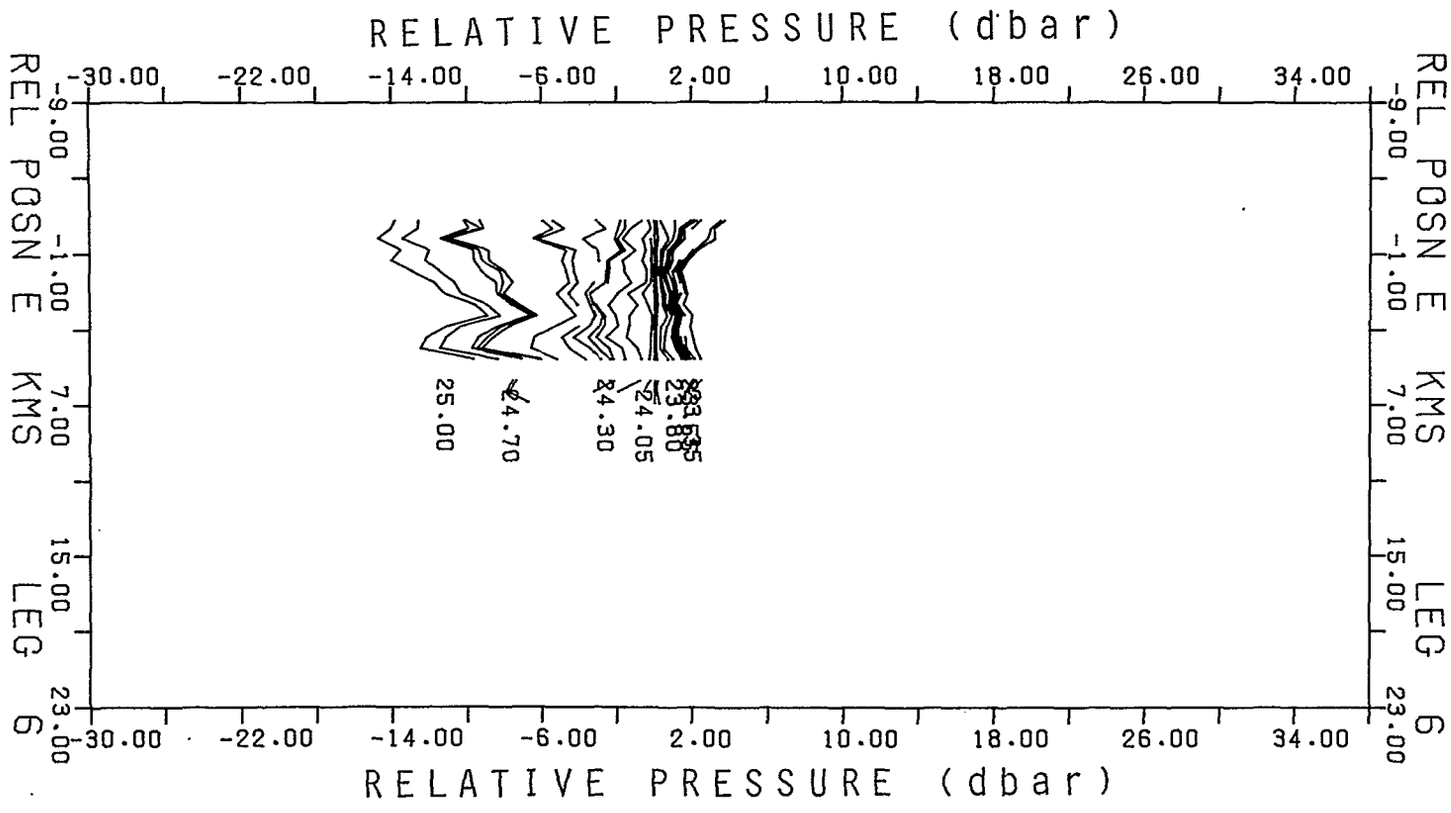
-Relative Pressure on Isopycnals-



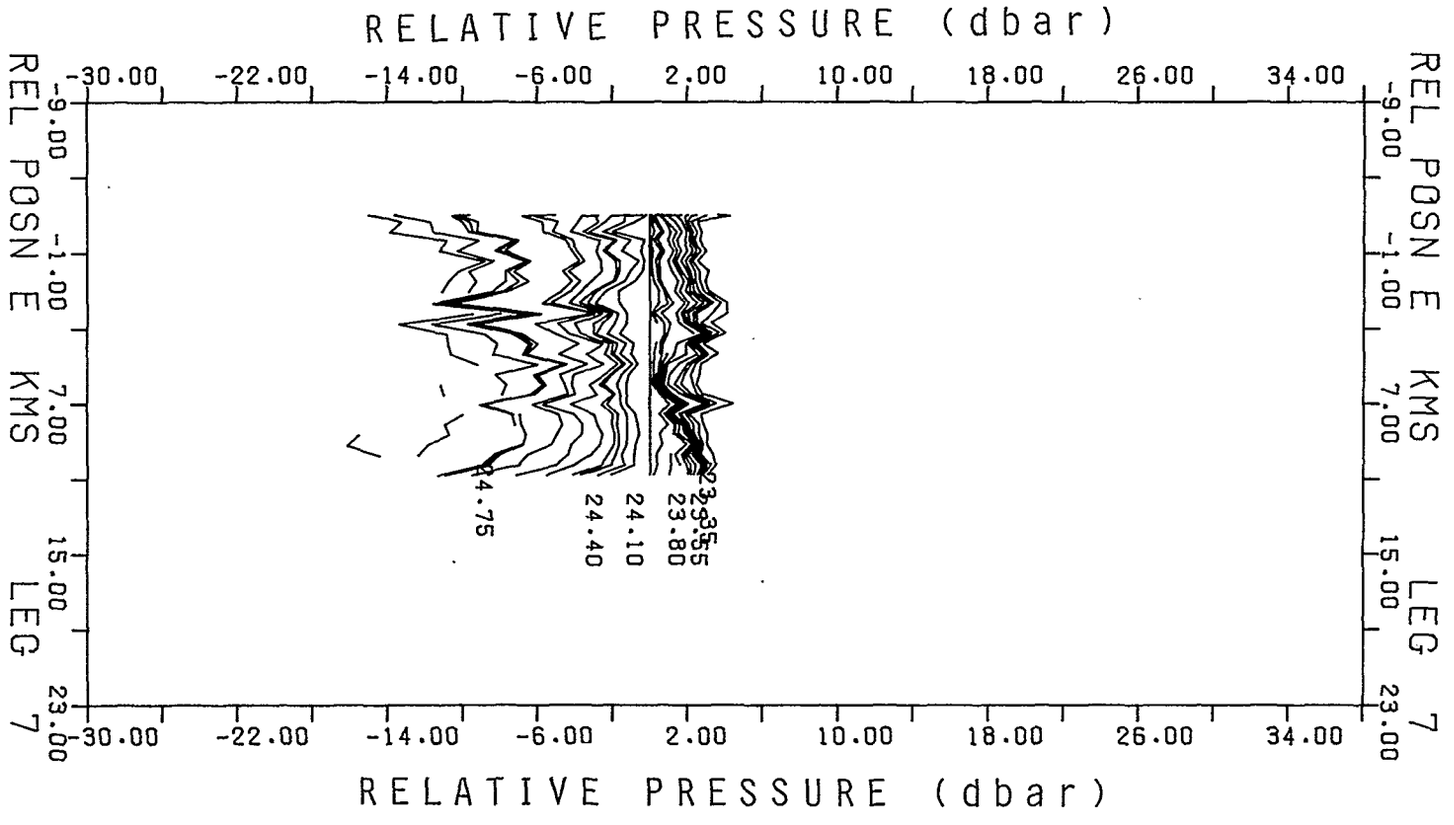
-Relative Pressure on Isopycnals-



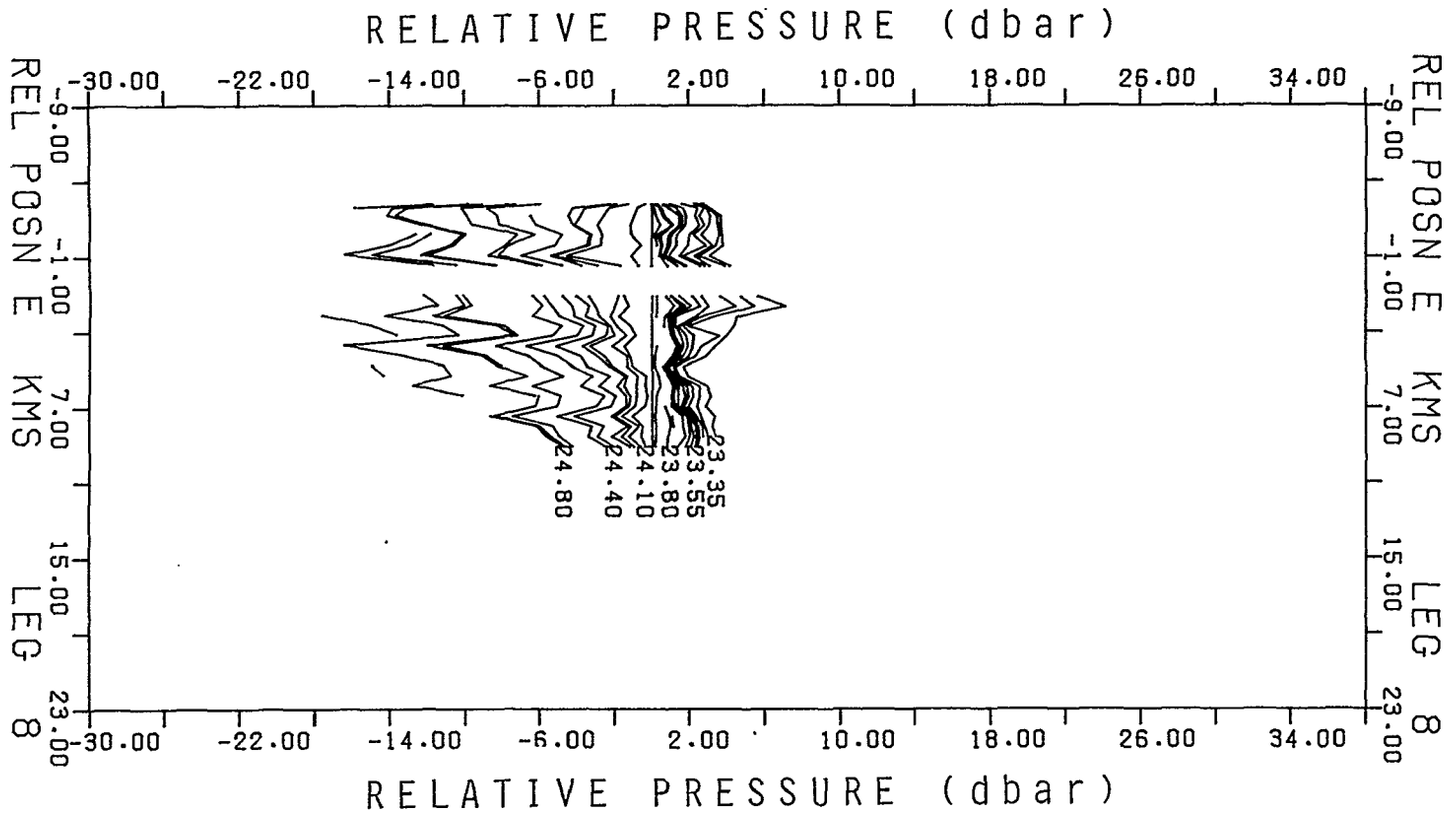
-Relative Pressure on Isopycnals-



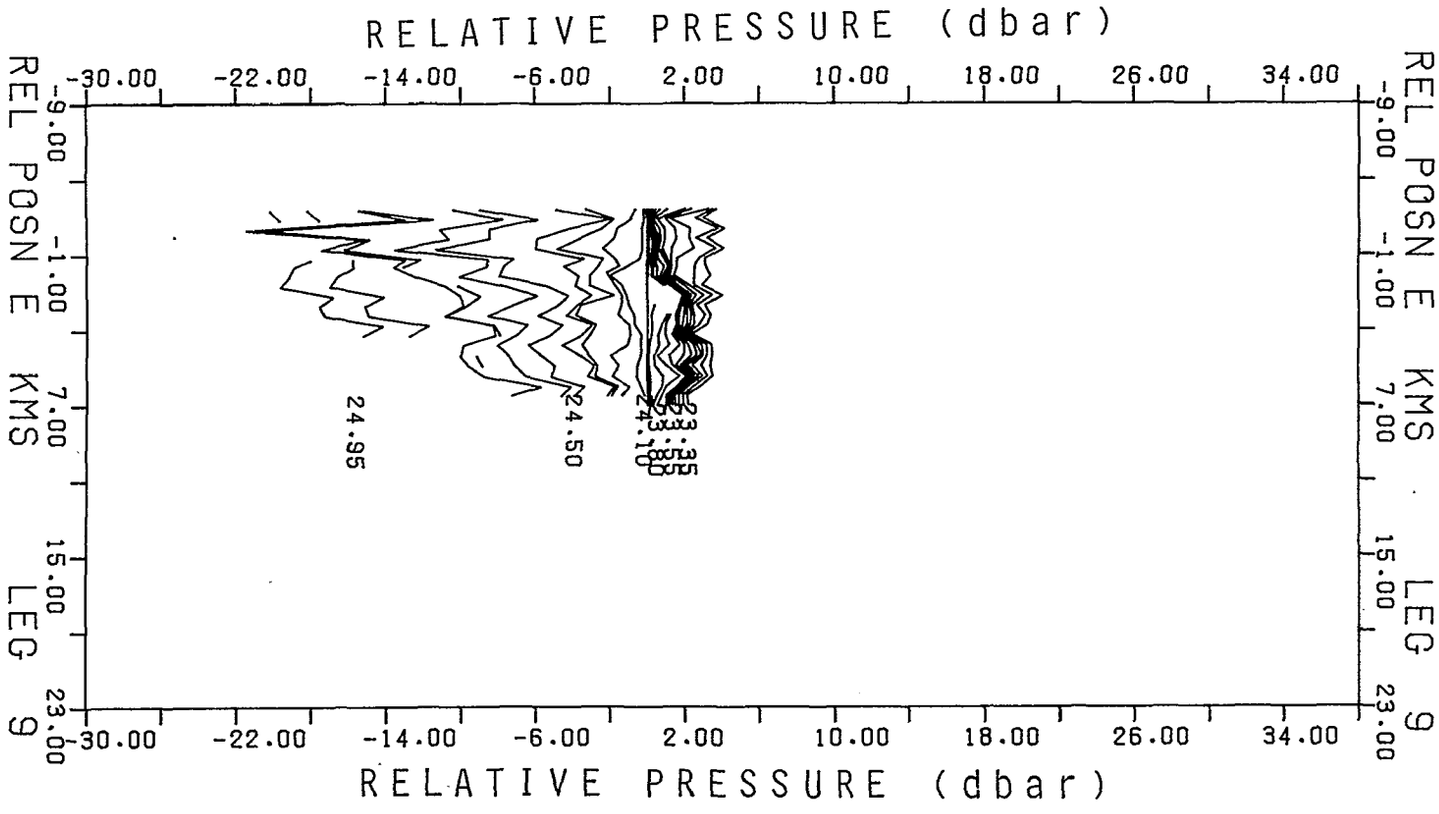
-Relative Pressure on Isopycnals-



-Relative Pressure on Isopycnals-



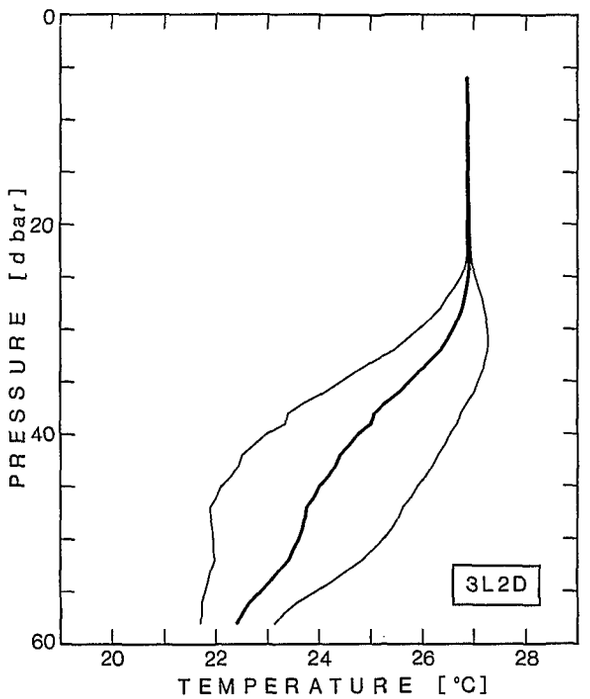
-Relative Pressure on Isopycnals-

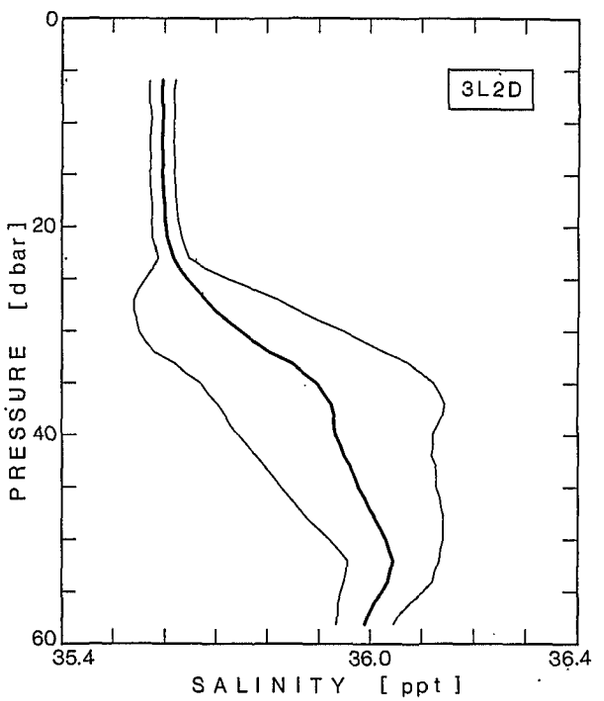


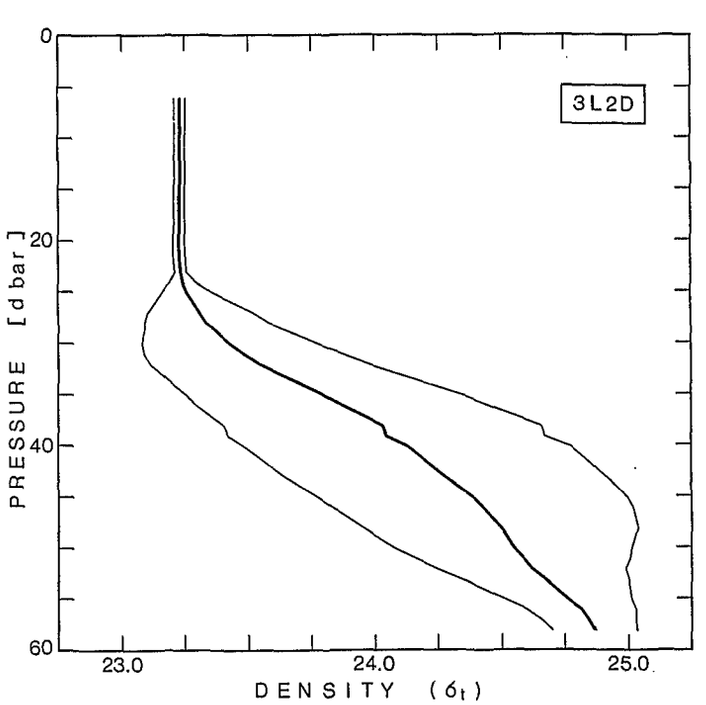
-Relative Pressure on Isopycnals-

SECTION IV STATISTICS OF THE DATA

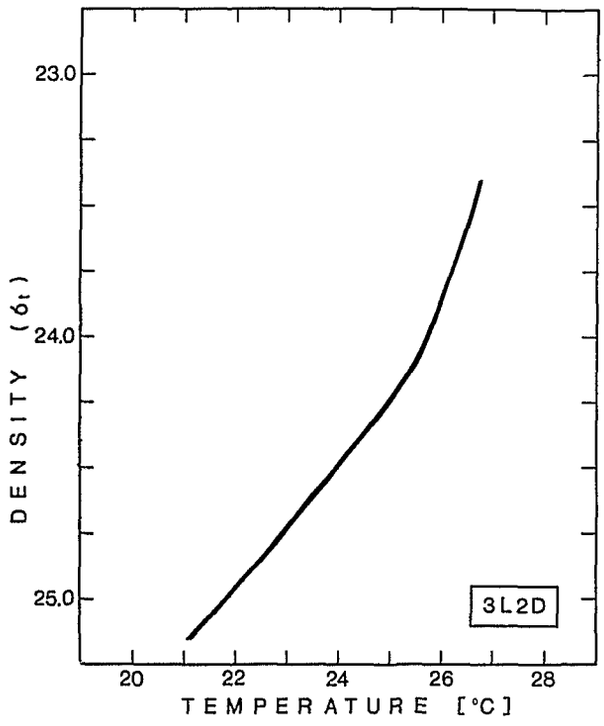
In this Section appear diagrams of the mean and standard deviations of the data on surfaces of constant pressure, constant σ_t and constant potential temperature. In addition the profiles of potential temperature and salinity as functions of σ_t are for the sake of comparison redrawn as functions of pressure making use of the mean relationship between pressure and σ_t. The standard deviations of potential temperature and salinity on pressure surfaces and on σ_t surfaces (converted back to pressure coordinates) are drawn together to show the difference between the signal due to internal waves and the signal due to thermohaline variability. Histograms of salinity and normalized thickness on surfaces of constant σ_t are also shown. Profiles of the residual left after the objective analysis onto regular grids of the date on surfaces of constant σ_t or constant pressure are shown together with profiles of the standard deviation of the input data for the objective analysis.

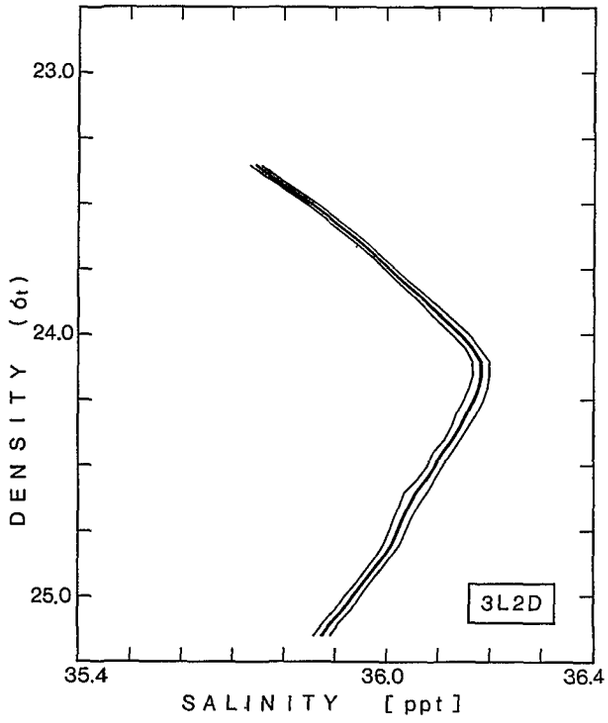


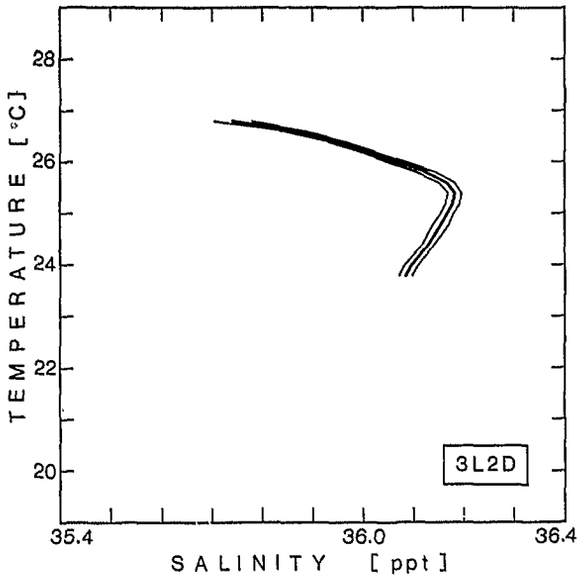




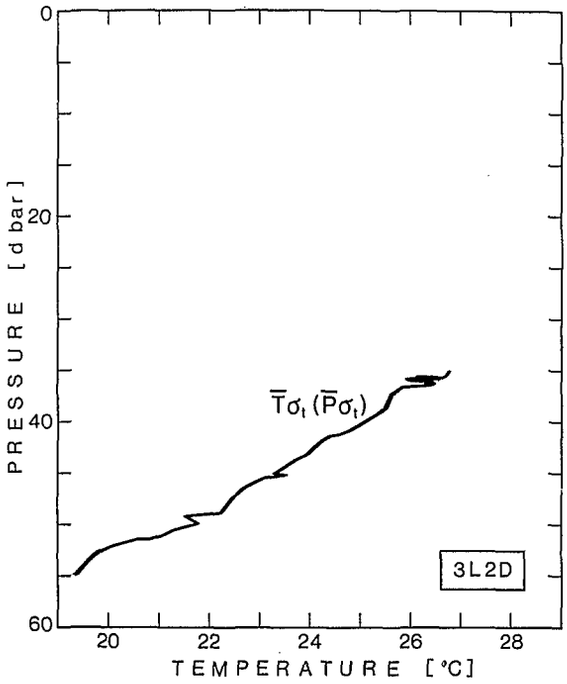
Profiles of the mean and standard deviation of potential temperature, salinity and density on surfaces of constant pressure.

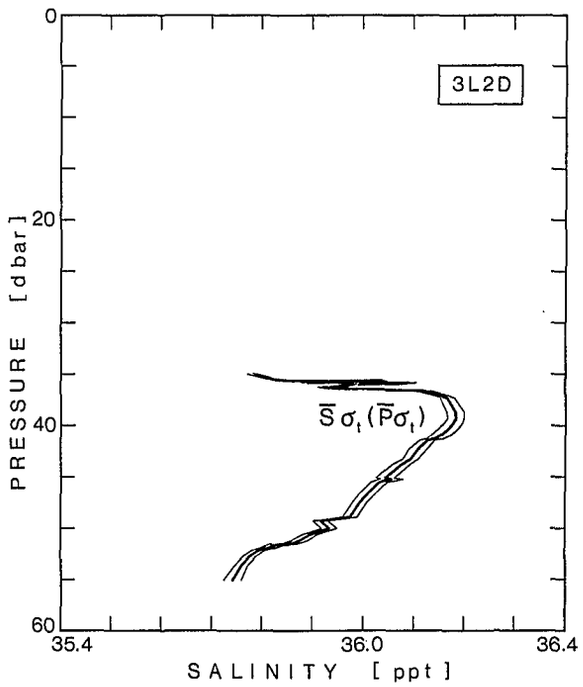




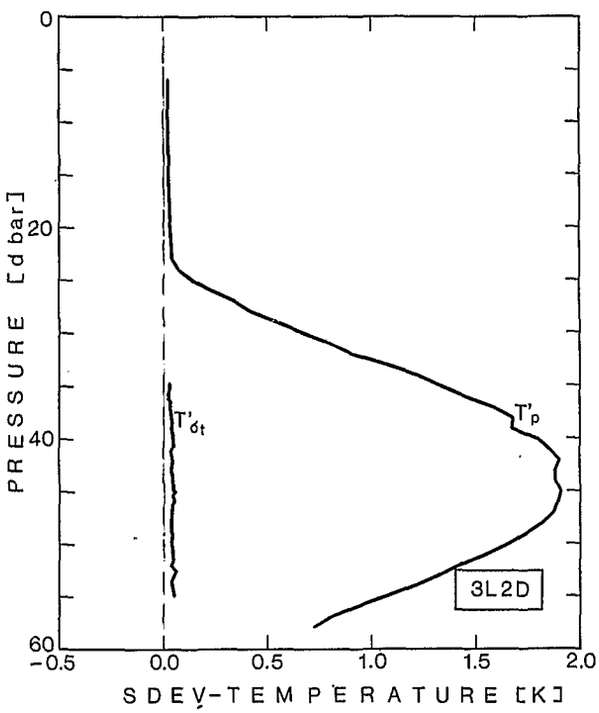


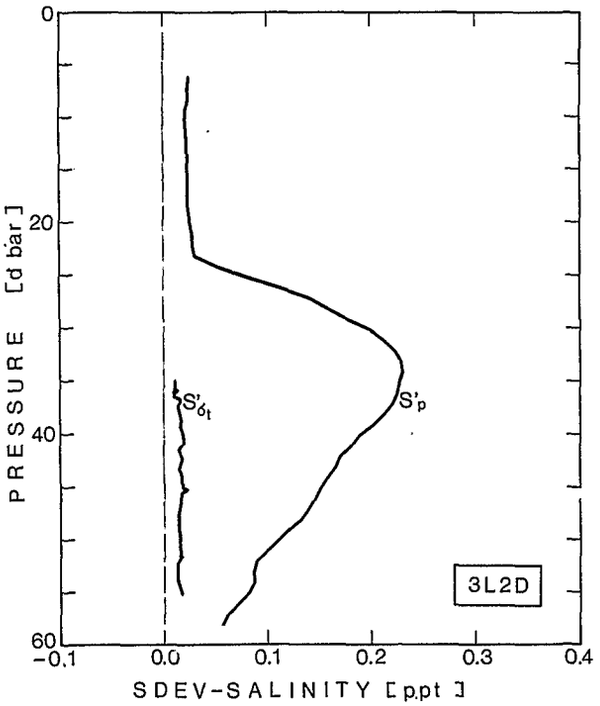
Profiles of the mean and standard deviation of potential temperature and salinity on surfaces of constant σ_t (upper figures) and also salinity on surfaces of constant potential temperature (mean T-S diagram, lower figure).



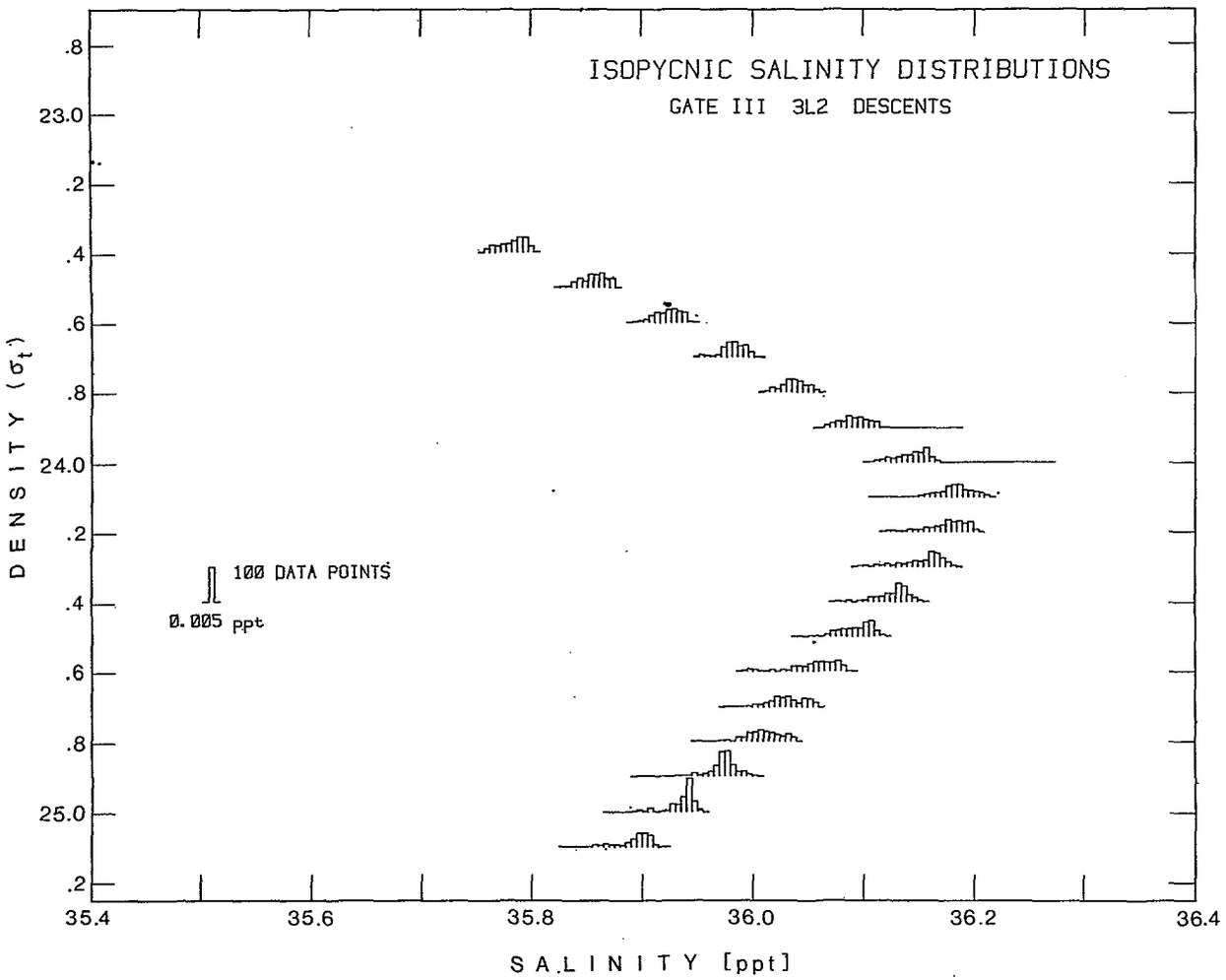


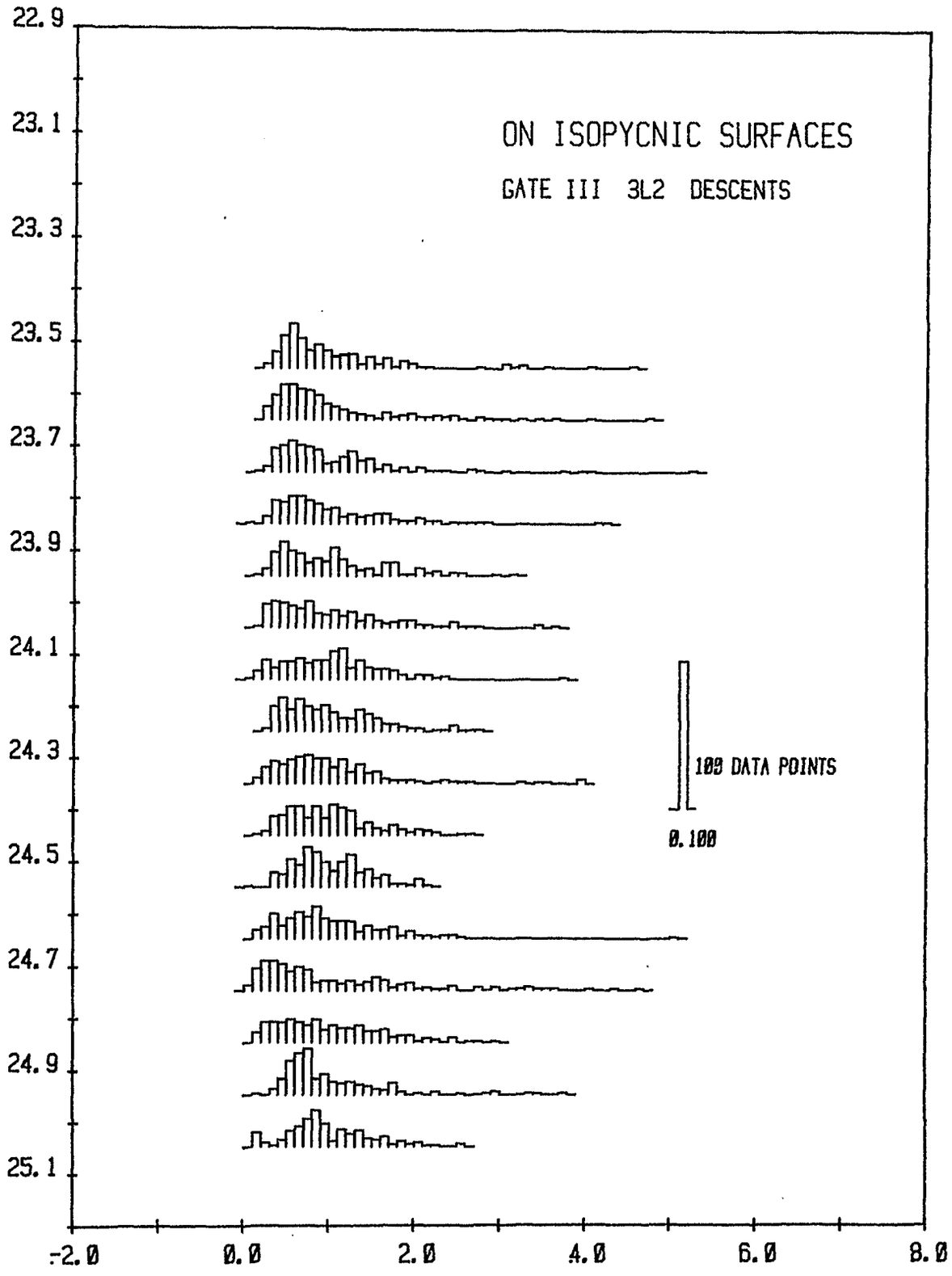
Profiles of the mean and standard deviation of potential temperature and salinity on surfaces of constant σ_t redrawn as functions of pressure using the mean relationship of σ_t to pressure.





Profiles of the standard deviation of potential temperature and salinity on surfaces of constant pressure and constant σ_t for comparison.

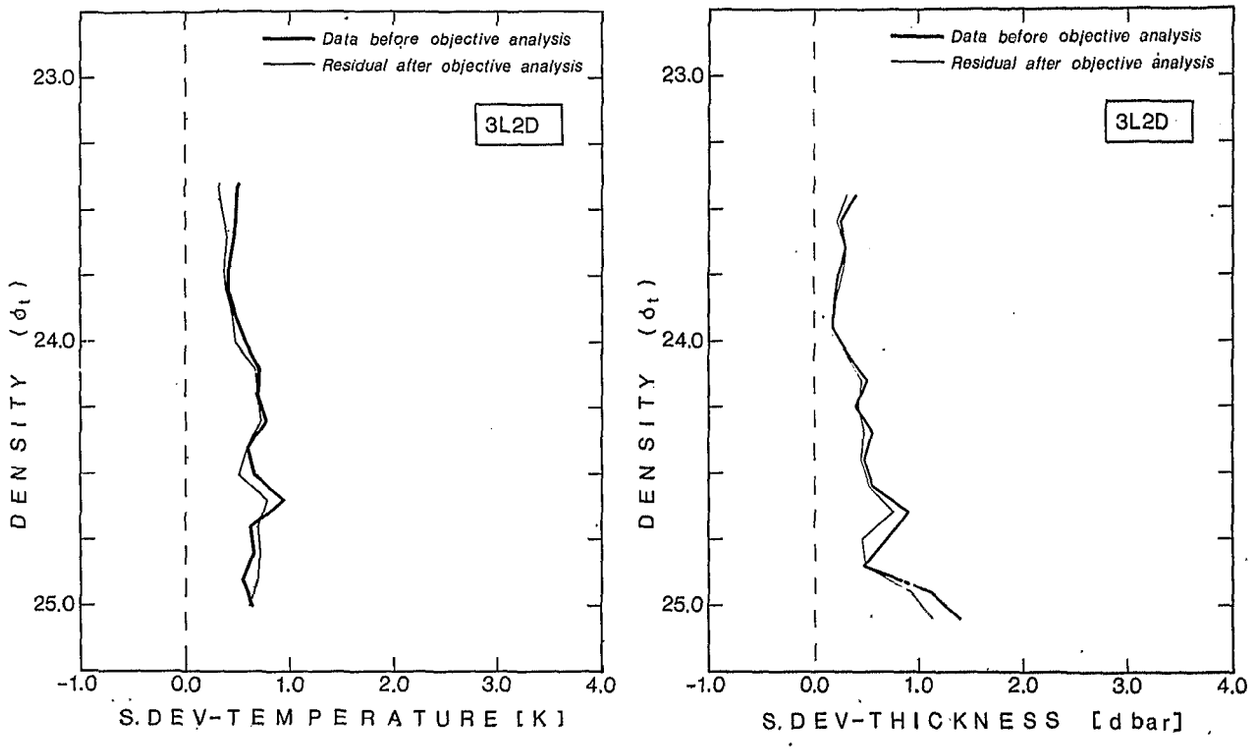

ISOPYCNIC SALINITY DISTRIBUTIONS
GATE III 3L2 DESCENTS
100 DATA POINTS
0.005 ppt
DENSITY (σ_t)
.8
23.0
.2
.4
.6
.8
24.0
.2
.4
.6
.8
25.0
.2
35.4
35.6
35.8
36.0
36.2
36.4
SALINITY [ppt]



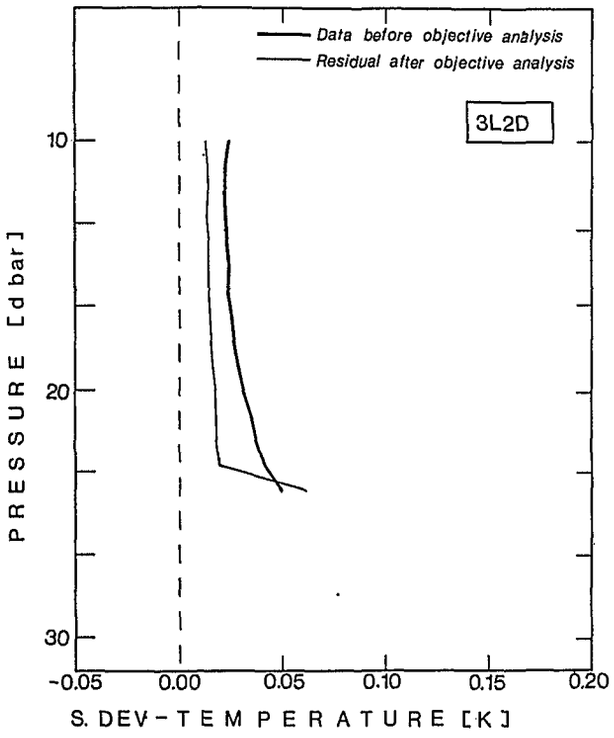
Histograms of normalized thickness on surfaces of constant σ_t. The thicknesses are normalized by the mean thickness on their surface to remove the effect of changes in the mean density gradient. The mean, standard deviation, skewness and kurtosis of the thickness on each surface is shown in the accompanying table.

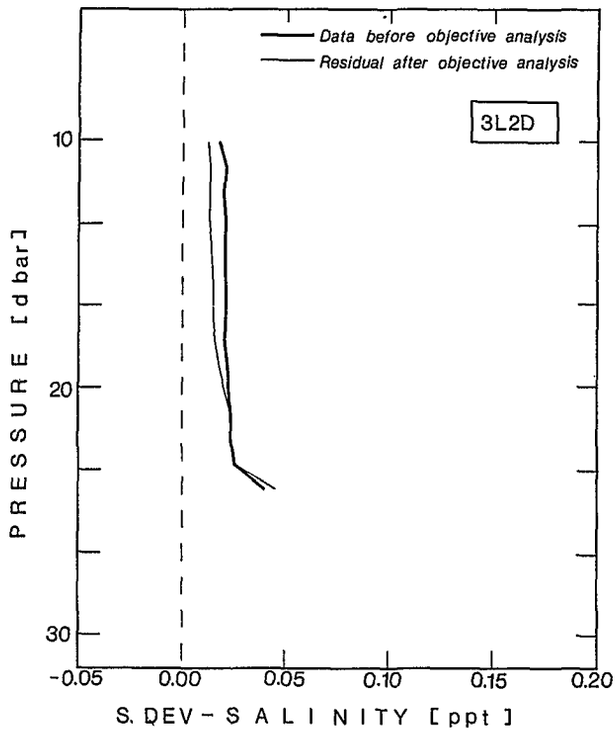
Thickness on Surfaces of Constant Sigma-T: Statistics
Map 3L2
Filename GLB6D372R6

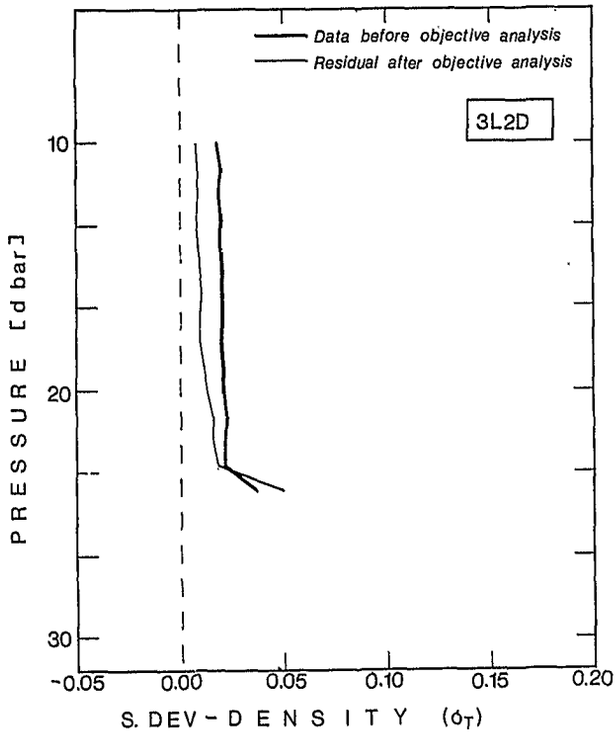
Surface Value	Mean	St. Deviation	Skewness	Kurtosis
23.55	0.417889	0.2968	2.216	8.948
23.65	0.484899	0.3693	1.963	7.378
23.75	0.417989	0.2992	2.559	12.290
23.85	0.372324	0.2452	1.799	7.826
23.95	0.363391	0.2149	1.044	3.733
24.05	0.539726	0.3603	1.325	5.020
24.15	1.096460	0.5934	0.883	5.230
24.25	0.921016	0.4818	0.973	3.718
24.35	0.885214	0.5907	2.056	8.760
24.45	1.101889	0.5361	0.817	3.427
24.55	1.623691	0.6619	0.537	2.890
24.65	1.728614	1.0420	1.829	11.180
24.75	0.879806	0.7752	1.643	5.772
24.85	0.957922	0.5649	0.746	3.119
24.95	2.248887	1.3070	2.122	8.570
25.05	3.094261	1.5140	0.643	3.351
25.15	2.029444	1.3810	0.890	3.043
25.25	1.214695	0.5837	1.188	4.098
25.35	1.102763	0.5129	0.996	5.642
25.45	2.026323	1.2490	0.674	3.329
25.55	2.451912	1.1830	1.004	3.732
25.65	4.499555	1.7550	0.202	2.530
25.75	2.853577	1.1440	0.716	3.192
25.85	3.653375	1.2920	0.507	2.371
25.95	4.363484	0.7842	0.162	1.815



Profiles of the residual (rms error) after objective analysis onto regular grids and the standard deviation before objective analysis of potential temperature and thickness on constant σ_t = 23.20 - 25.00 for potential temperature and σ_t = 23.40 - 24.65 for thickness.







Profiles of the residual after objective analysis onto regular grids and the standard deviations before objective analysis of potential temperature, salinity and σ_t on constant pressure in the range p = 10.00 - 24.00 dbar.

SECTION V ISOPYCNIC MAPS

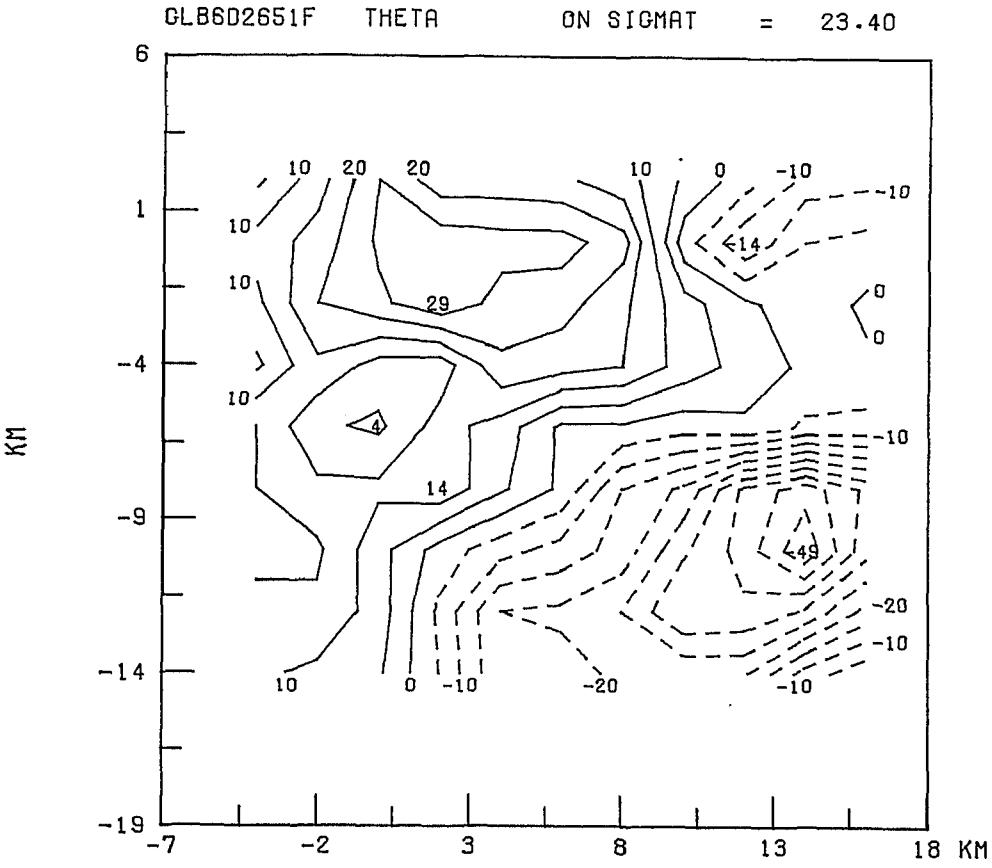
This Section shows contoured maps of potential temperature and thickness (the spacing between successive isopycnal surfaces) on surfaces of constant σ_t in the range 23.40 - 25.00 σ_t and 23.45 - 24.75 σ_t, respectively.

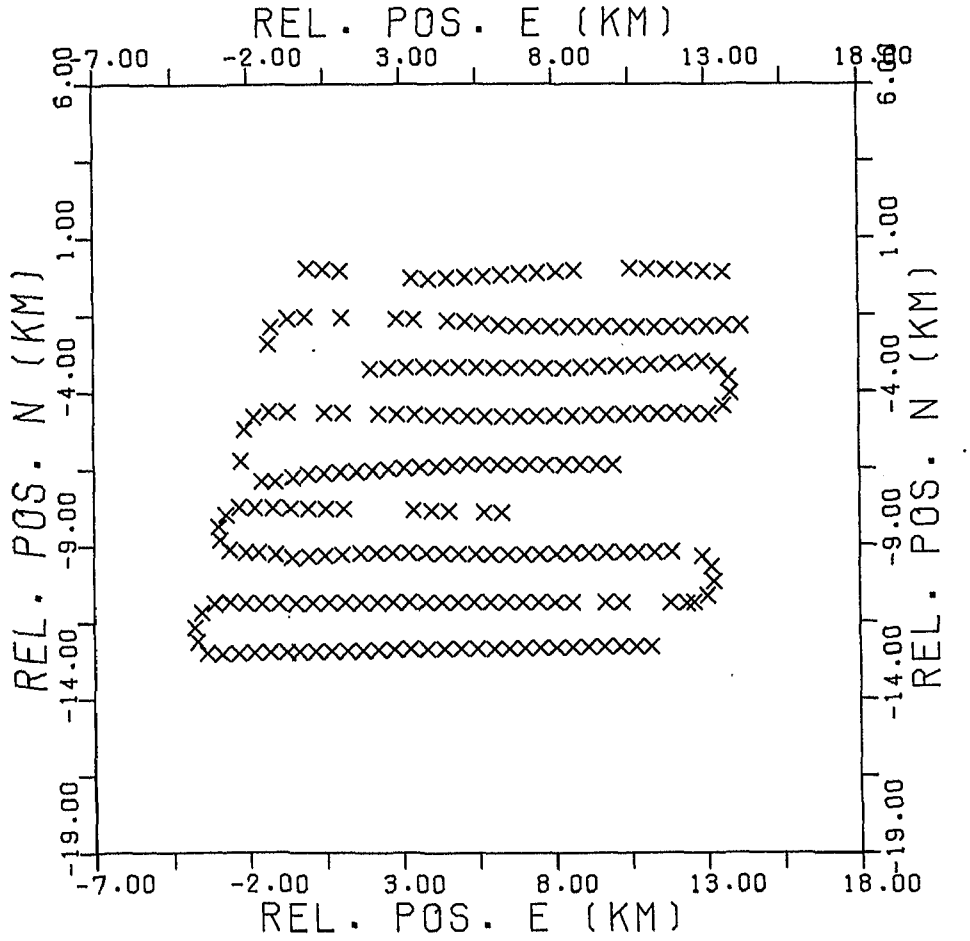
The data are the product of the objective analysis, the data being interpolated onto a regular east-west, north-south grid. The positions of data (relative to the origin of the map) used in the objective analysis are shown together with each surface. These maps are mainly in the layer of strong density gradient (see Section II).

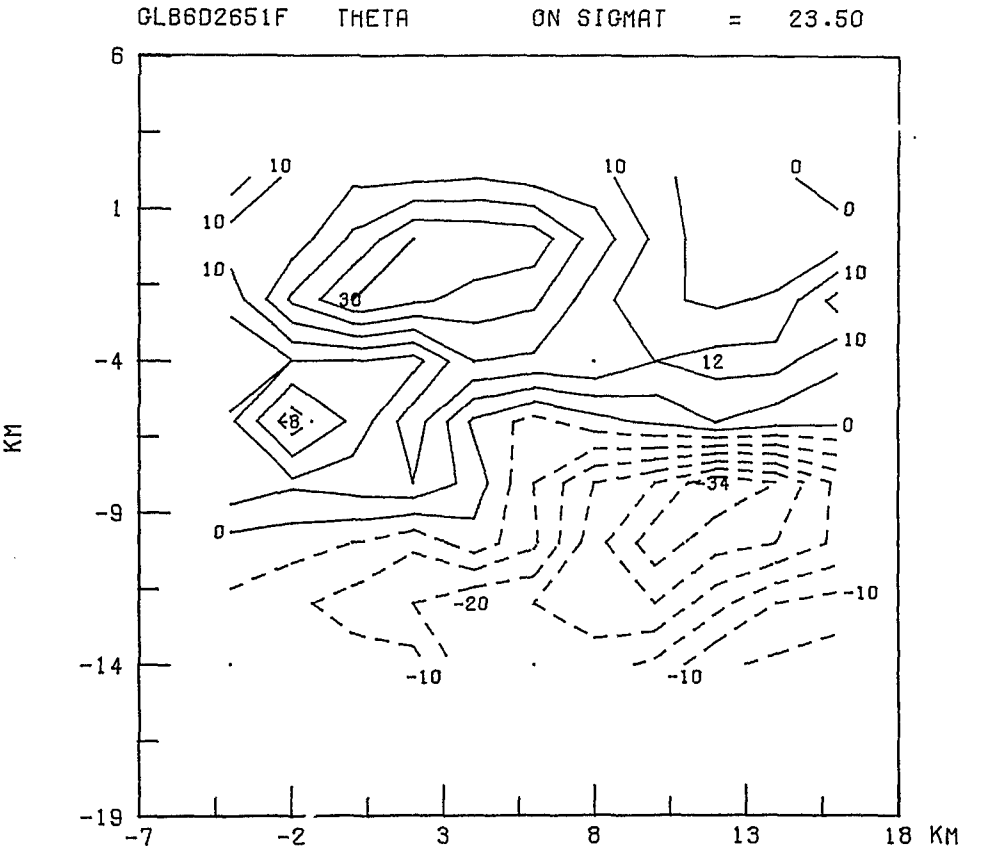
1. Contoured maps of potential temperature on surfaces of constant σ_t. The range of σ_t covers from 23.40 to 25.00. The contours are of the temperature deviation (units mK) from the mean temperature on the surface. The mean temperature on each surface is given in the following table. The contour interval is 5 mK, the surface interval is 0.1 σ_t, and the grid spacing used in the objective analysis was 2 km. These maps have a scale of 1 : 250 000.

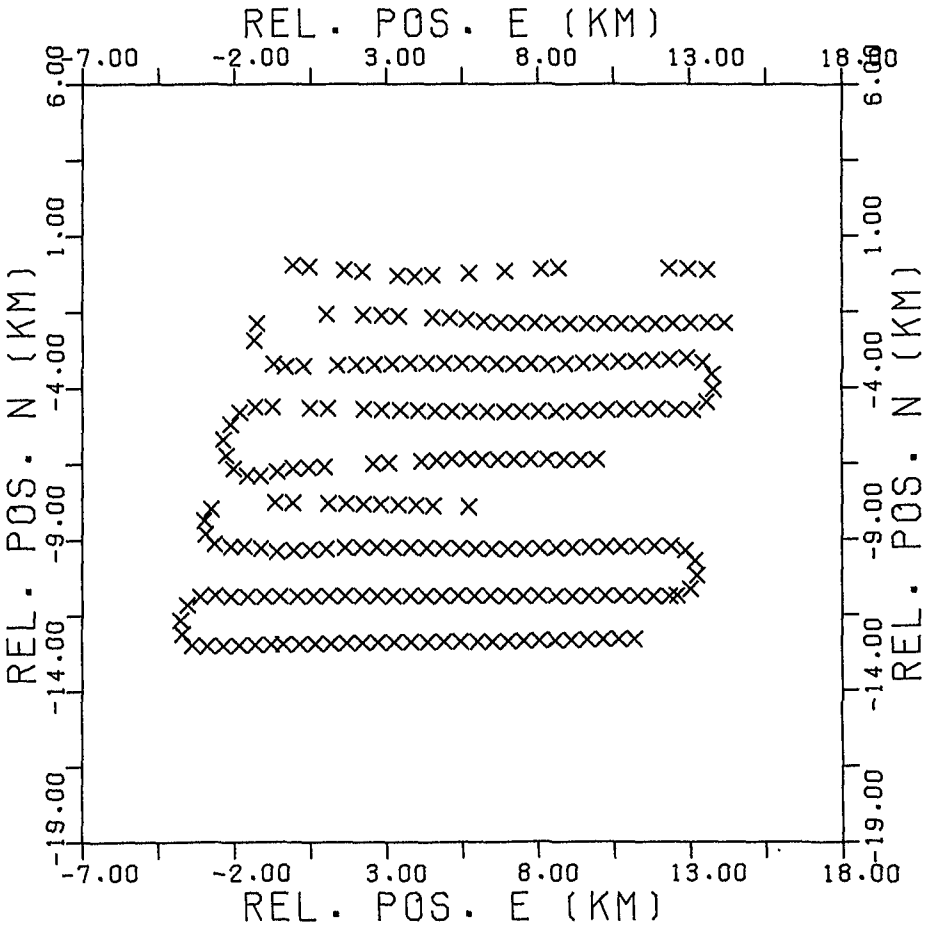
Table of subtracted mean values

Filename	Surface value (σ_t)	Subtracted mean value (°C)
GLB6D2651F	23.40	26.760
	23.50	26.624
GLB6D1651F	23.60	26.469
	23.70	26.293
	23.80	26.109
	23.90	25.920
	24.00	25.726
	24.10	25.491
	24.20	25.154
	24.30	24.770
	24.40	24.372
	24.50	23.949
	24.60	23.514
	24.70	23.109
	24.80	22.705
	24.90	22.257
	25.00	21.799

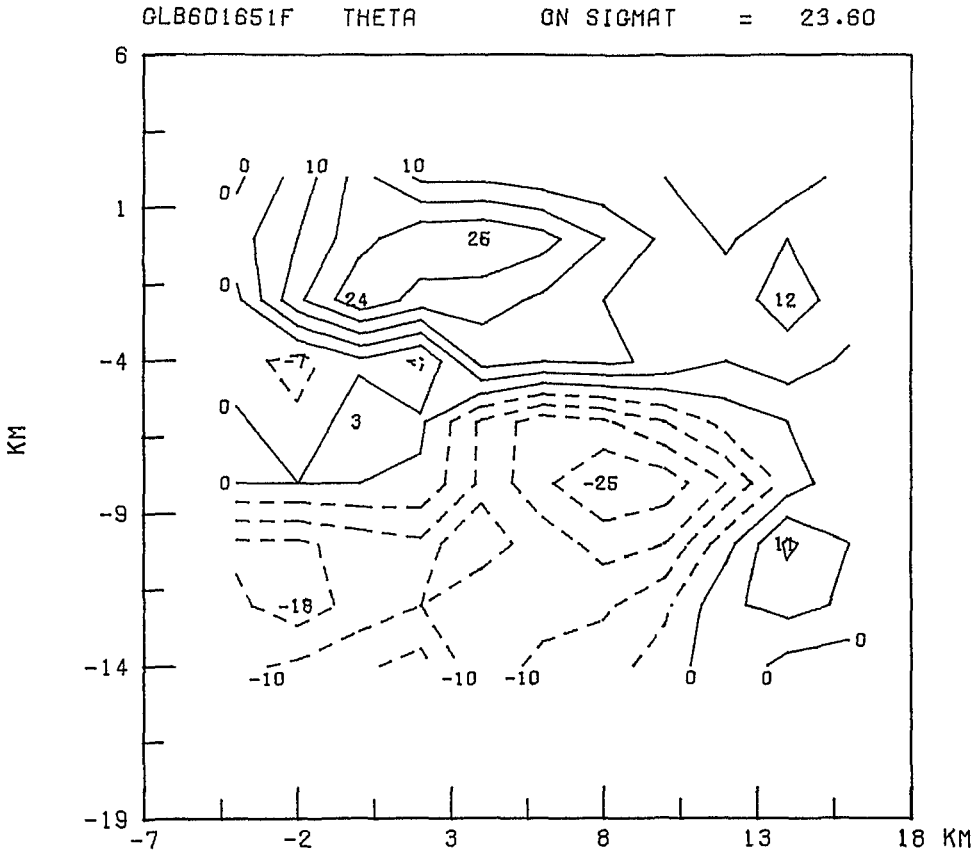

GLB6D2651F THETA ON SIGMAT = 23.40
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
10
20
20
10
0
-10
-10
-14
29
0
0
10
10
10
4
14
-10
-49
-20
-10
10
0
-10
-20
-10

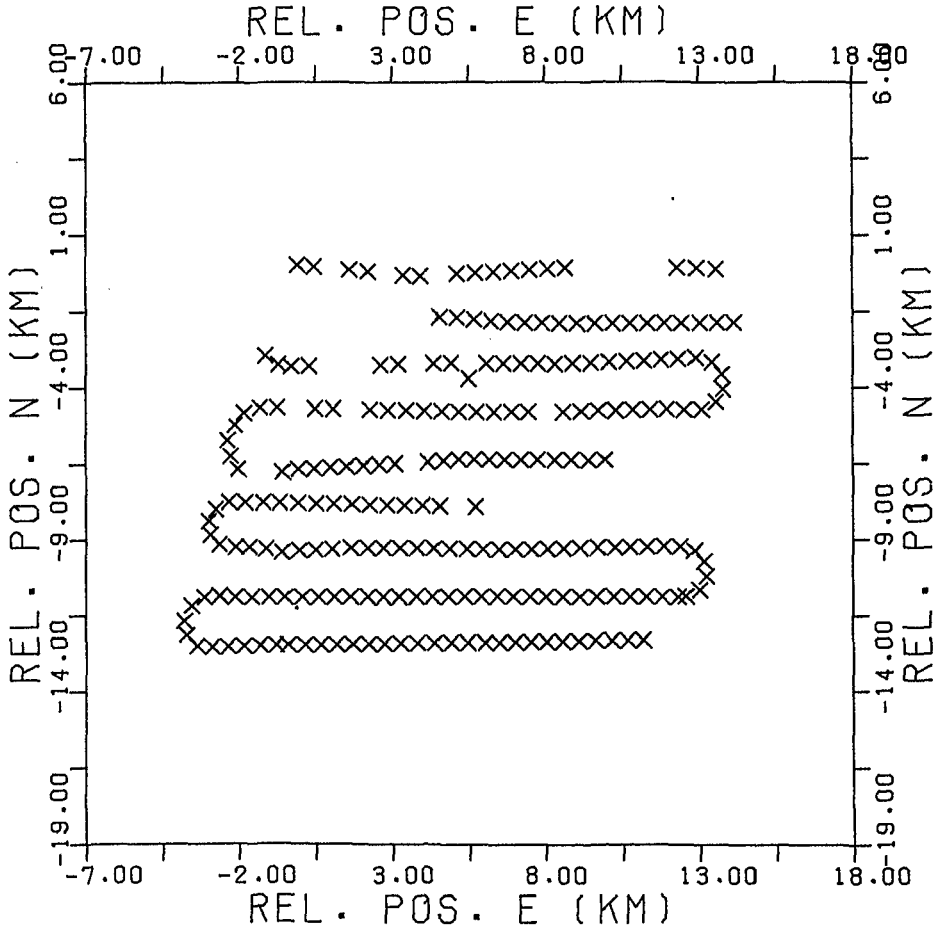

REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00





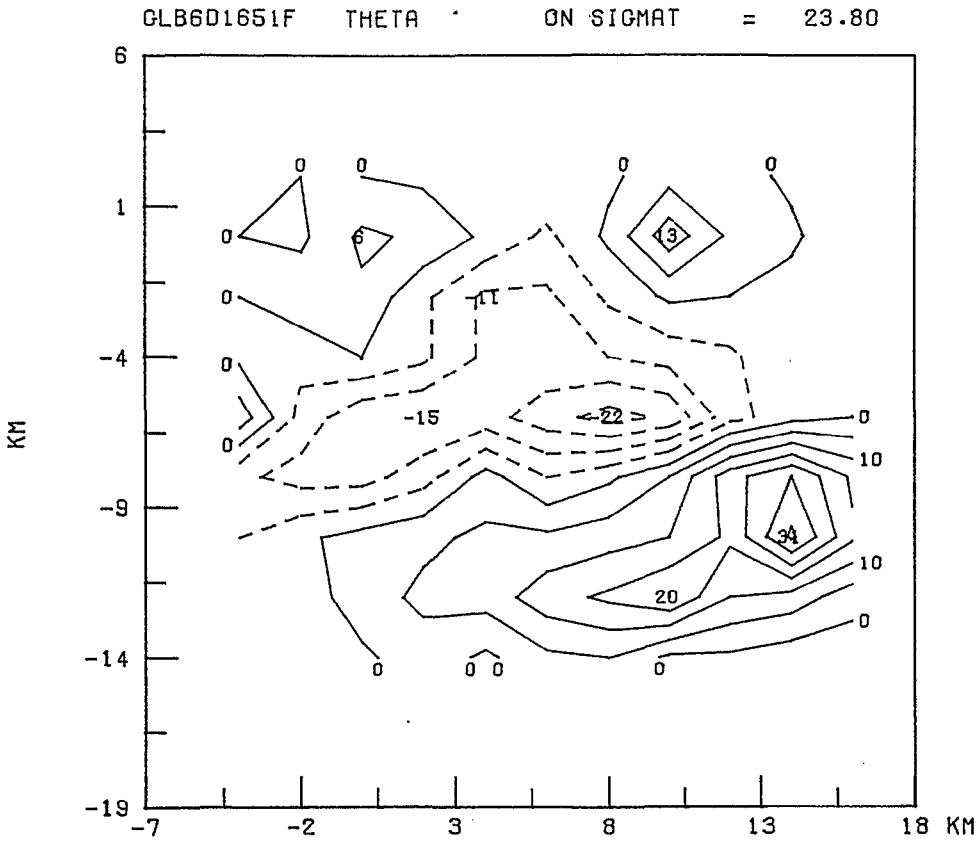
-Potential Temperature on Isopycnic Surfaces-

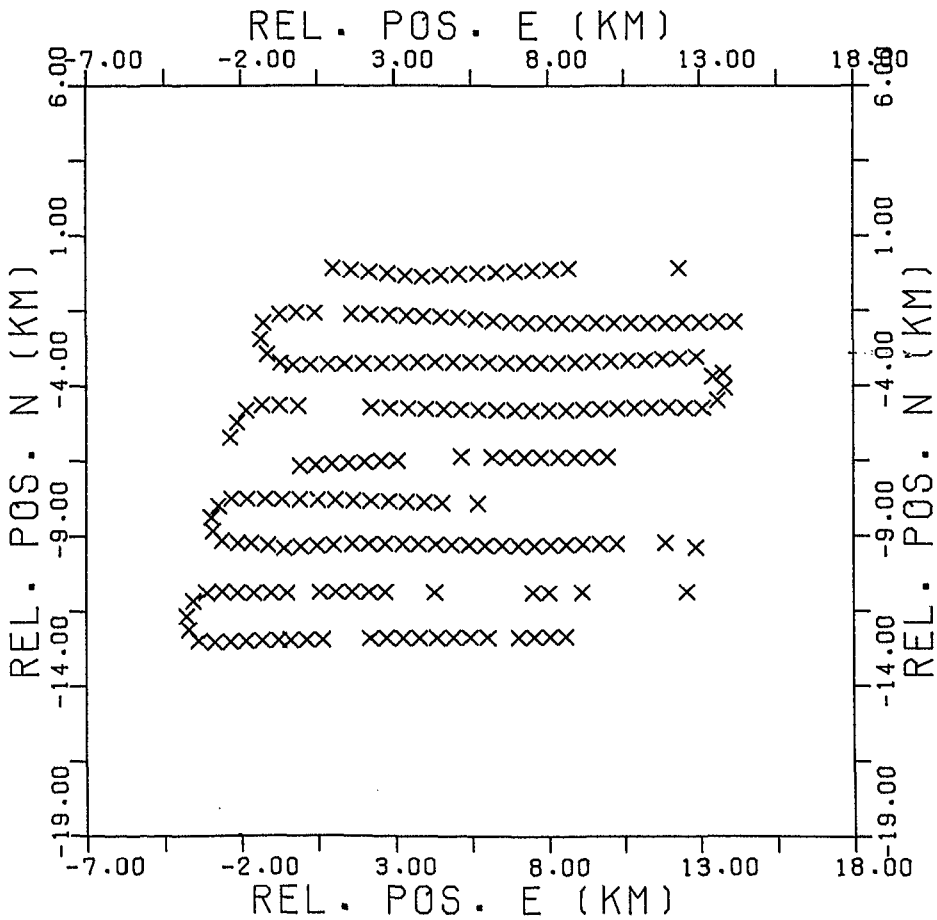




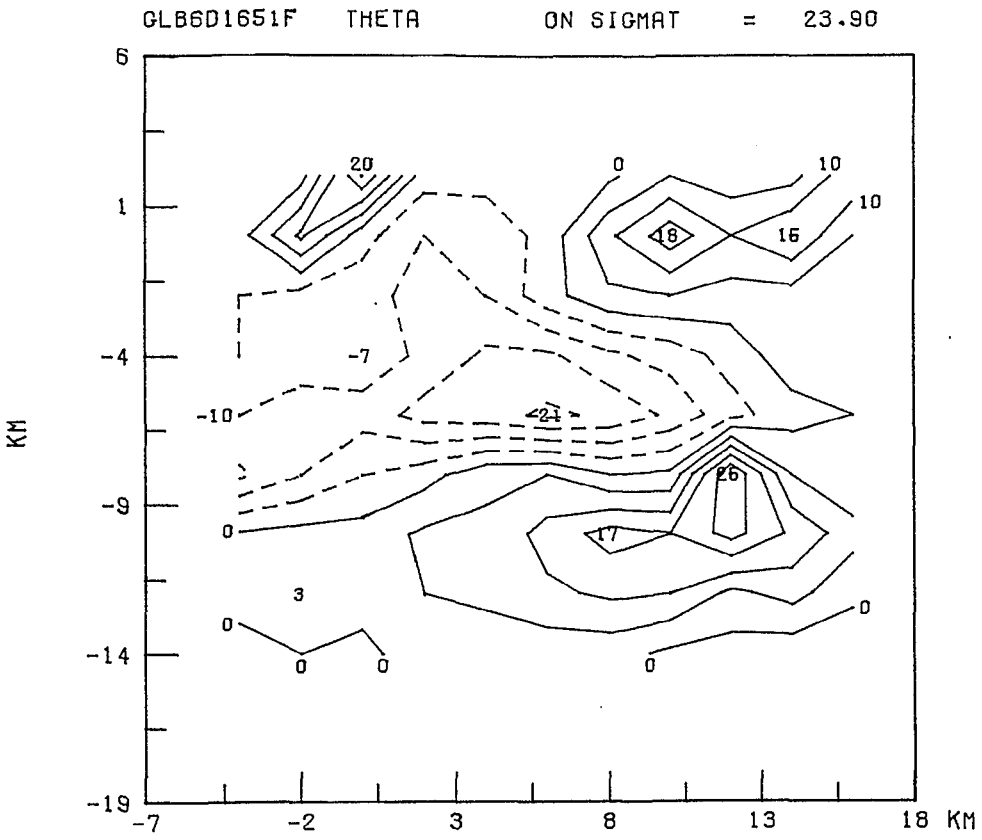
-Potential Temperature on Isopycnic Surfaces-

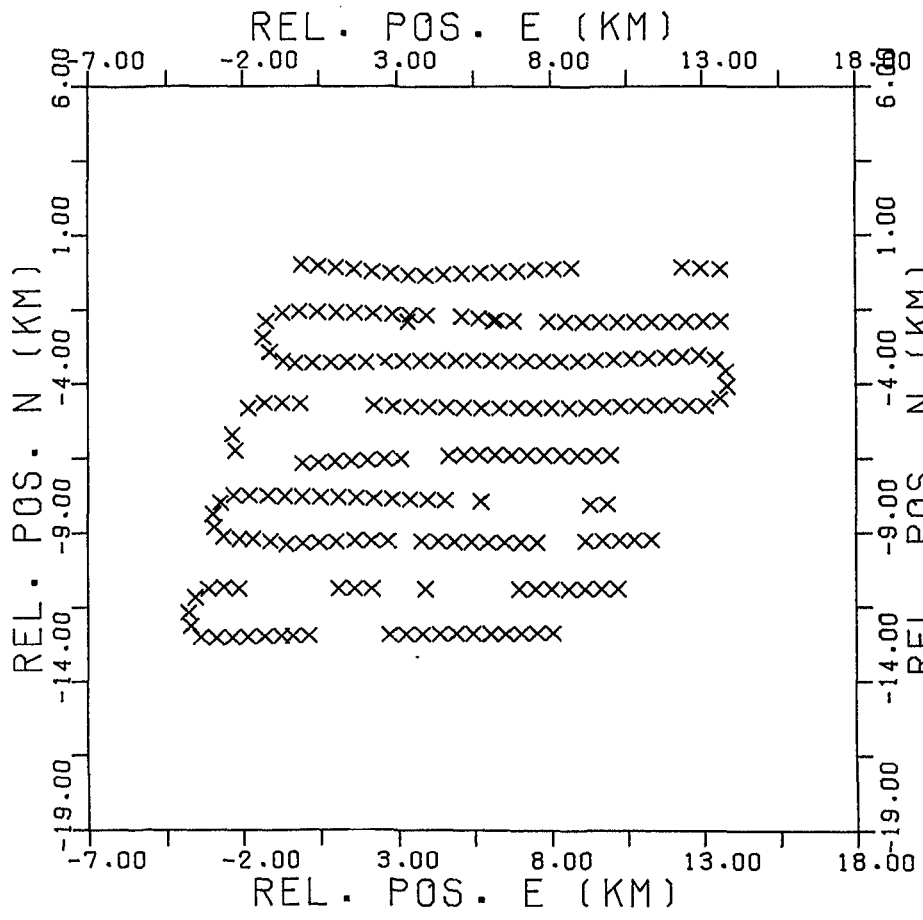
-Potential Temperature on Isopycnic Surfaces-

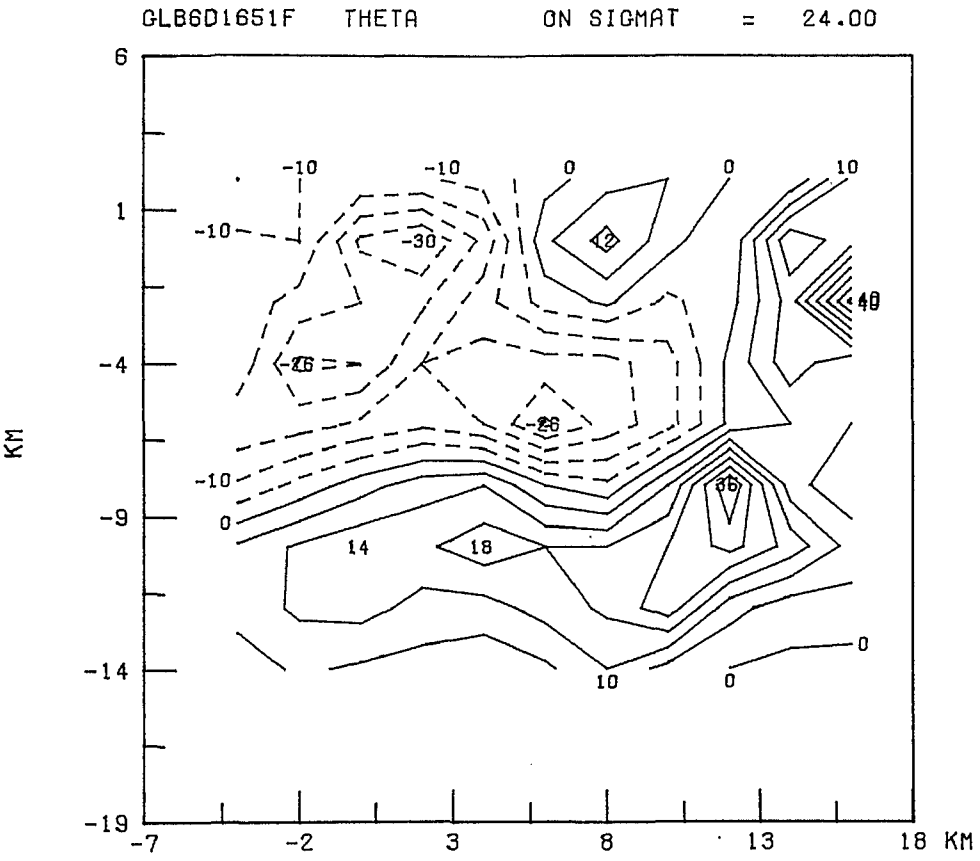


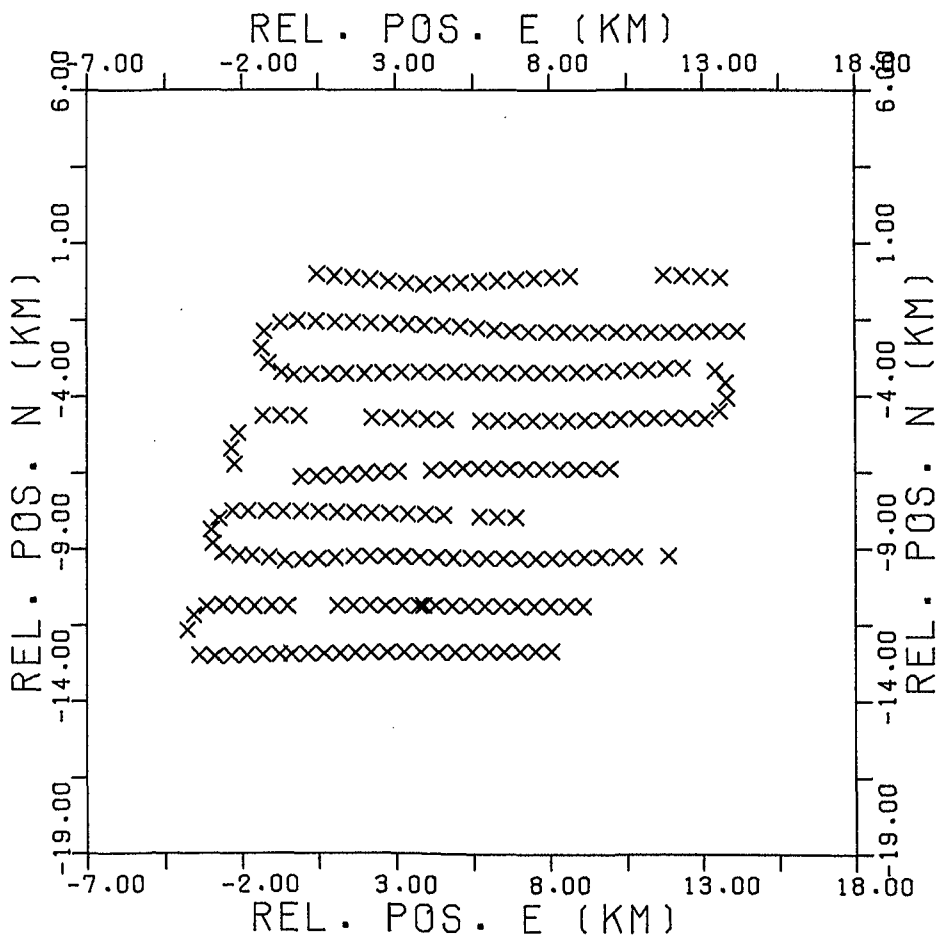


-Potential Temperature on Isopycnic Surfaces-

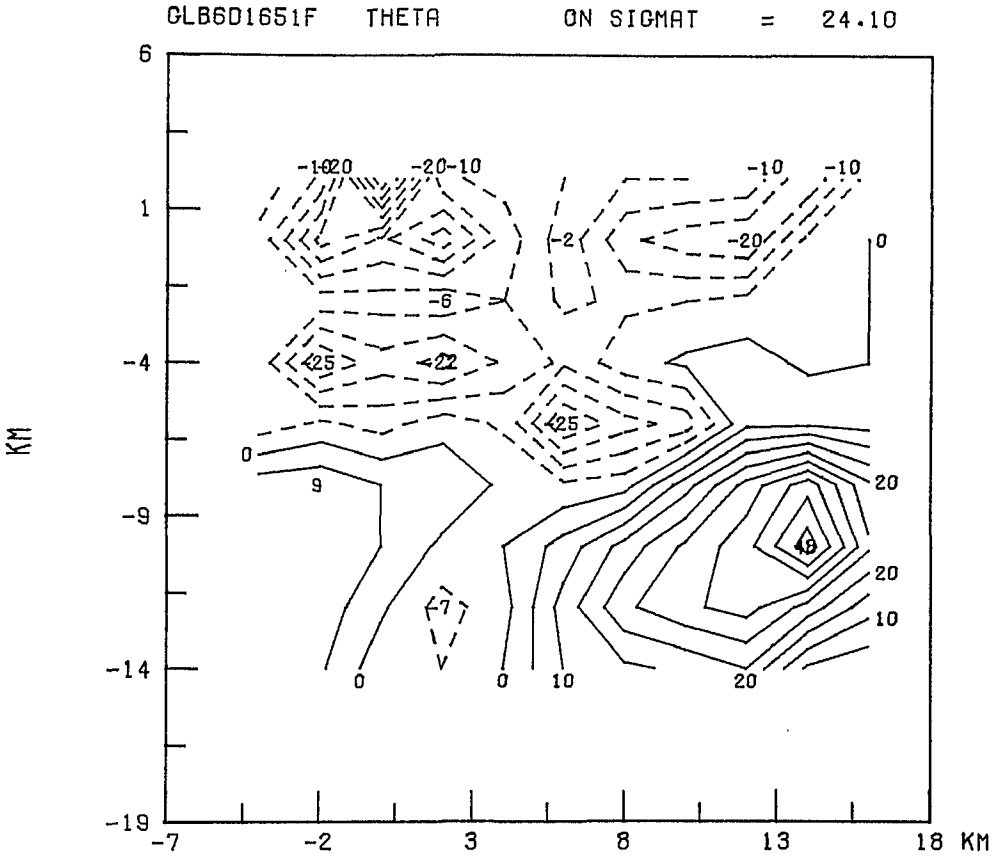

GLB6D1651F THETA ON SIGMAT = 23.90
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
20
0
10
10
18
16
-7
-10
21
26
17
0
3
0
0
0
0
0

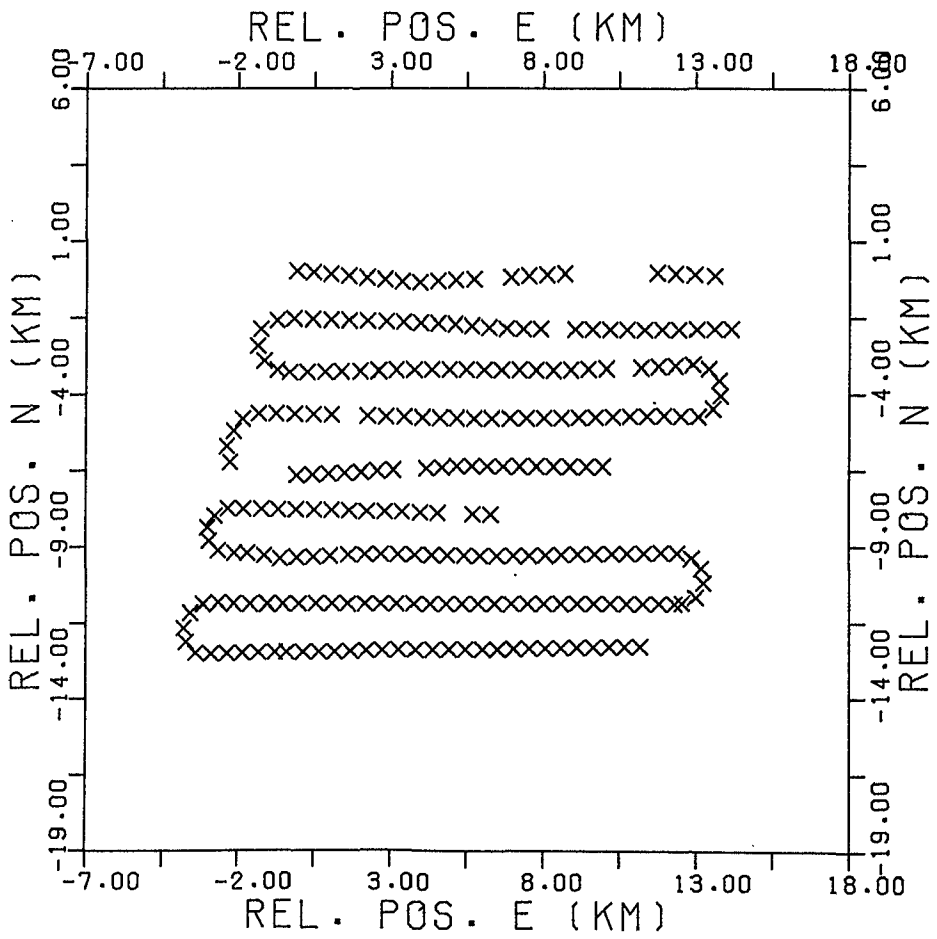

REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00



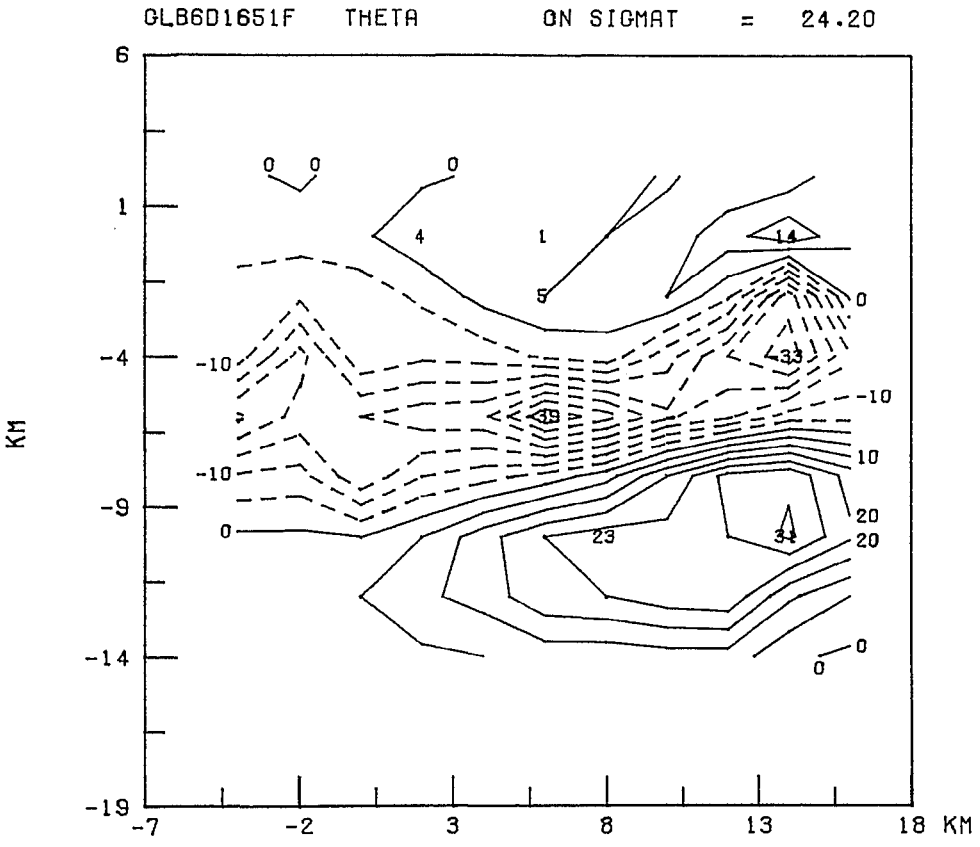


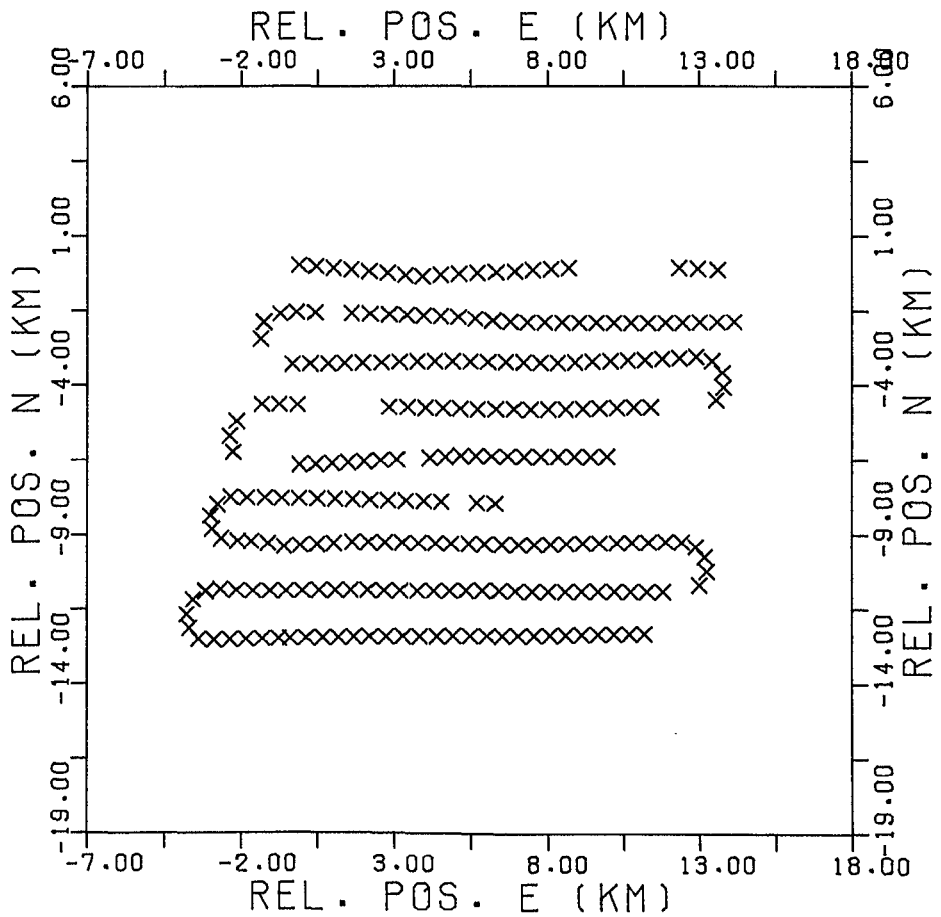
-Potential Temperature on Isopycnic Surfaces-



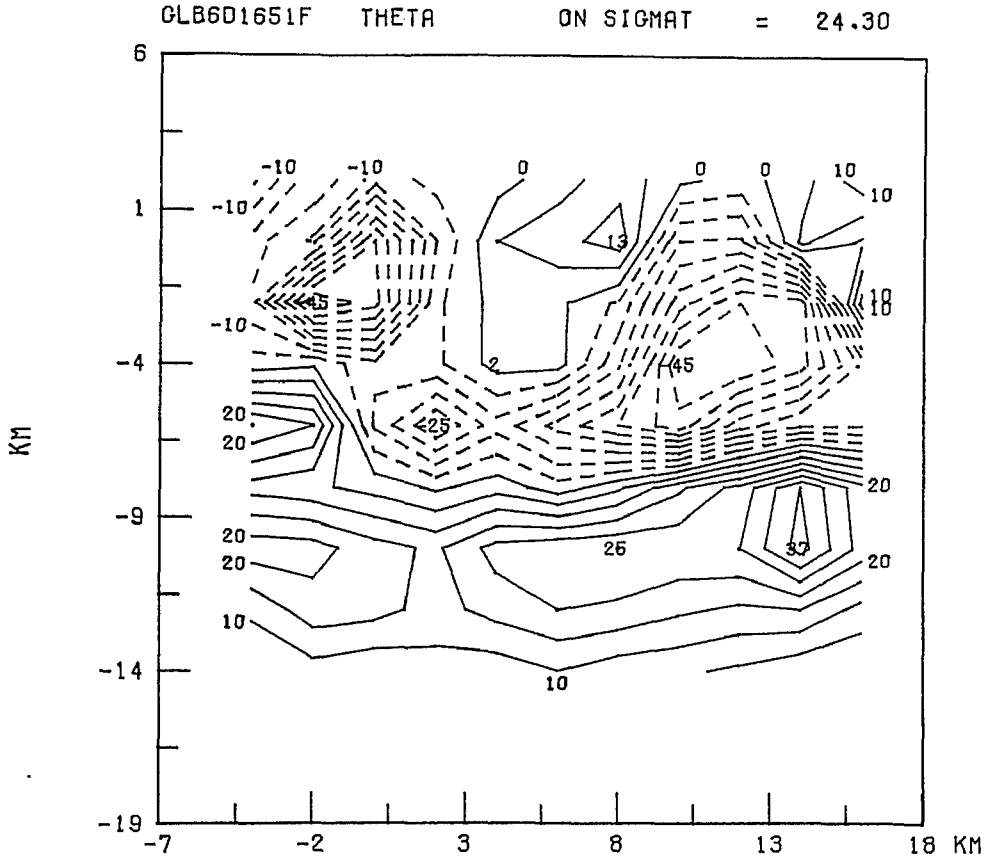


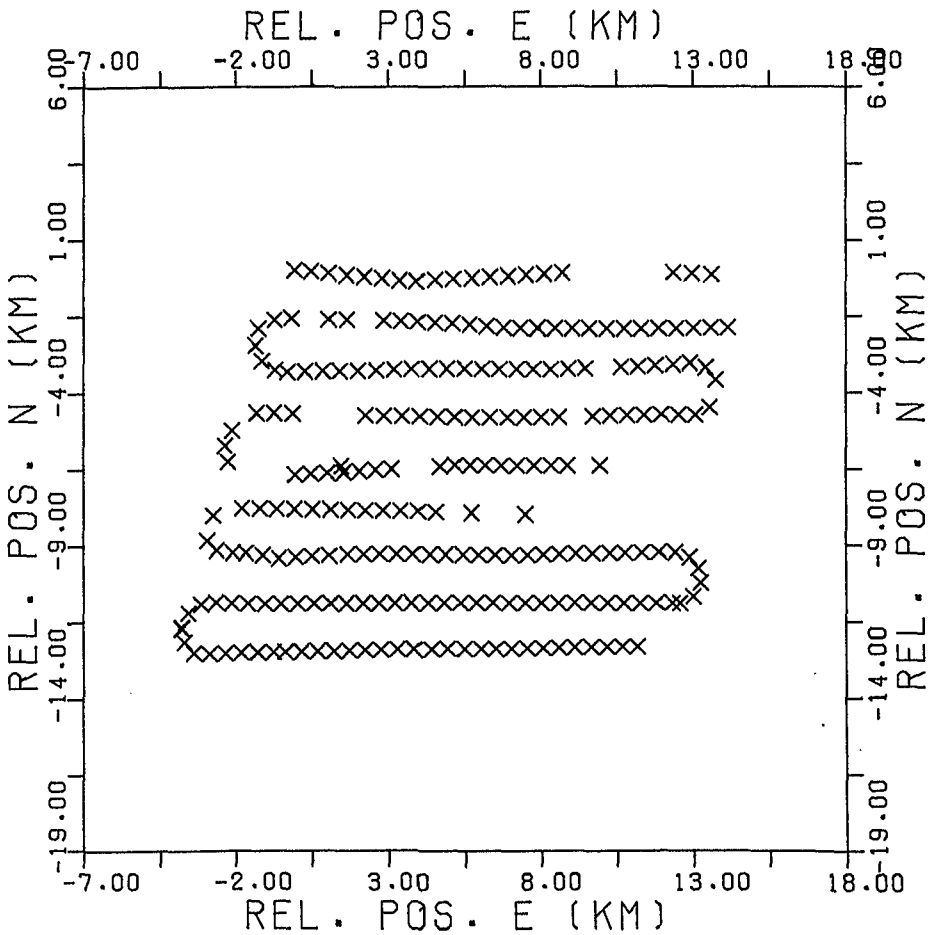
-Potential Temperature on Isopycnic Surfaces-

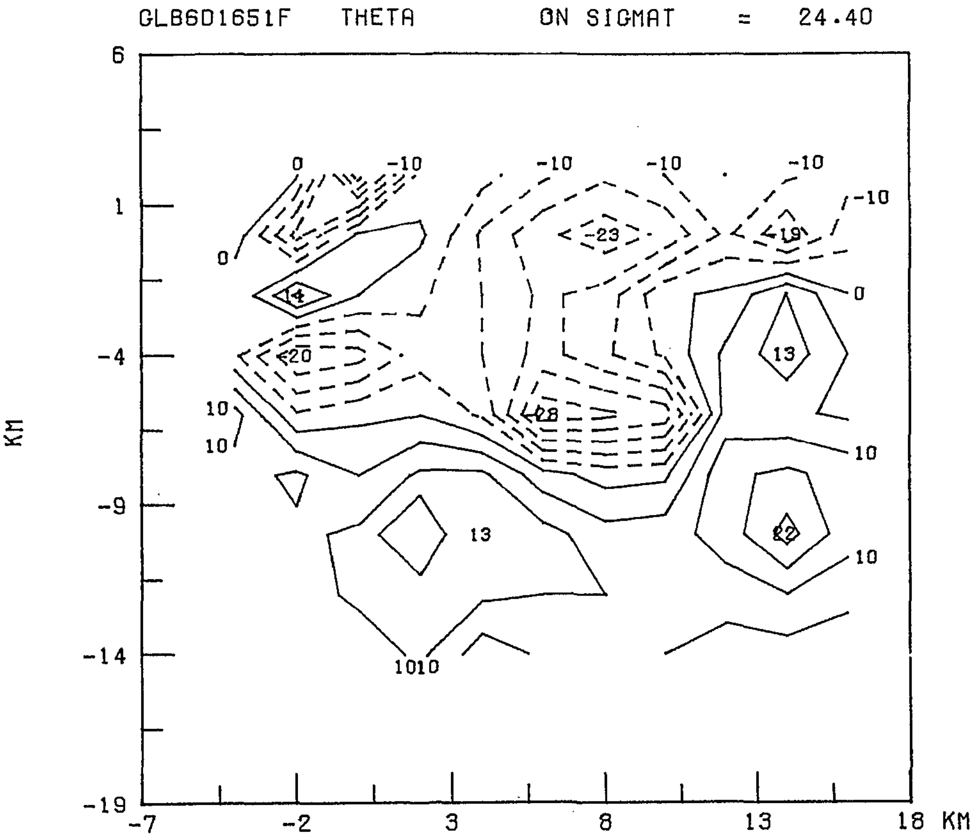


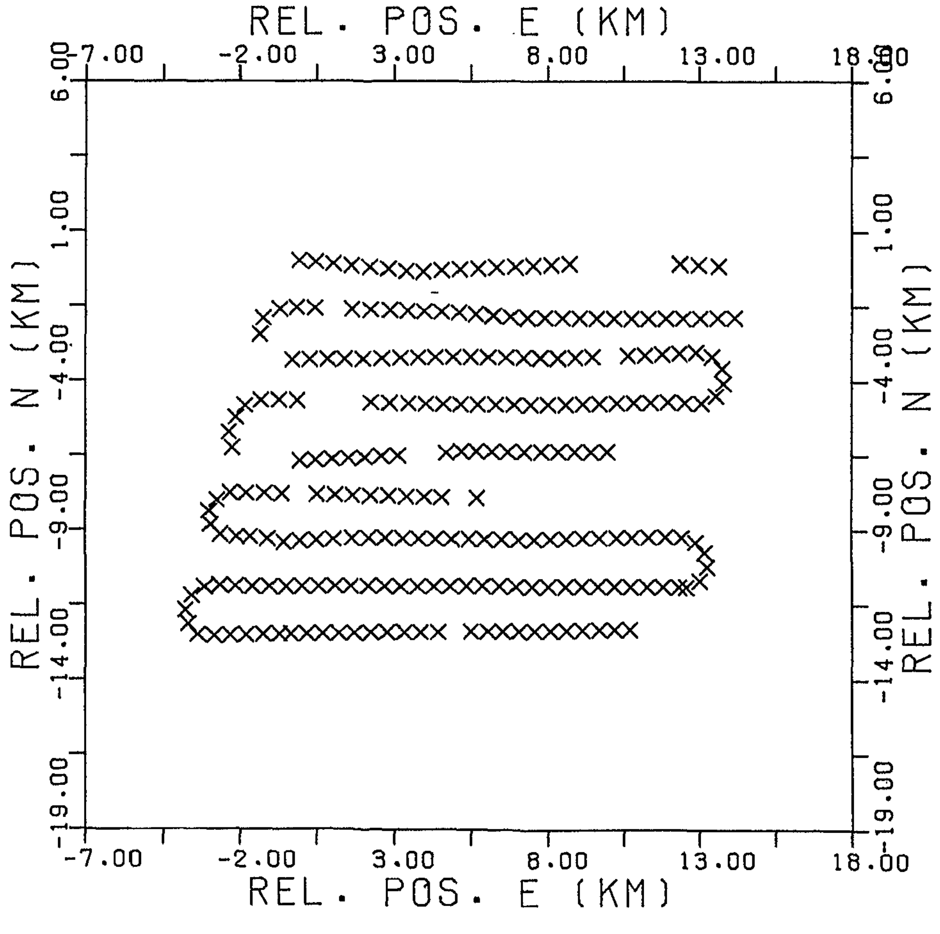


-Potential Temperature on Isopycnic Surfaces-

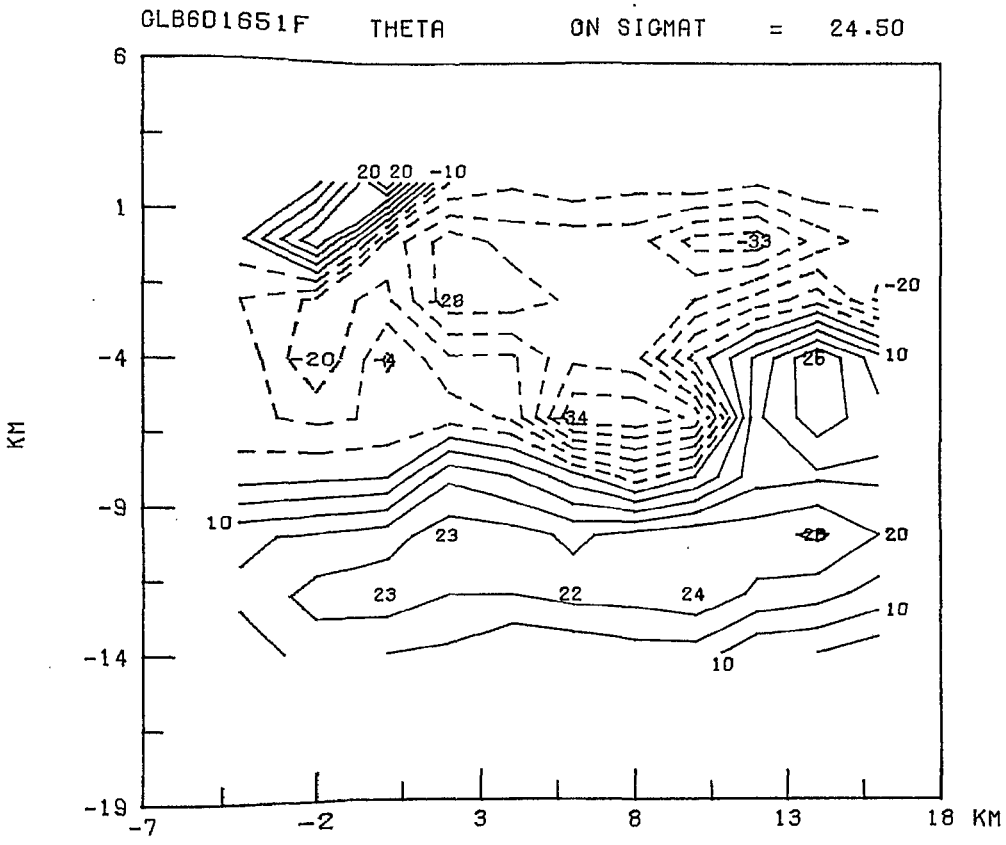

GLB6D1651F THETA ON SIGMAT = 24.30
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM

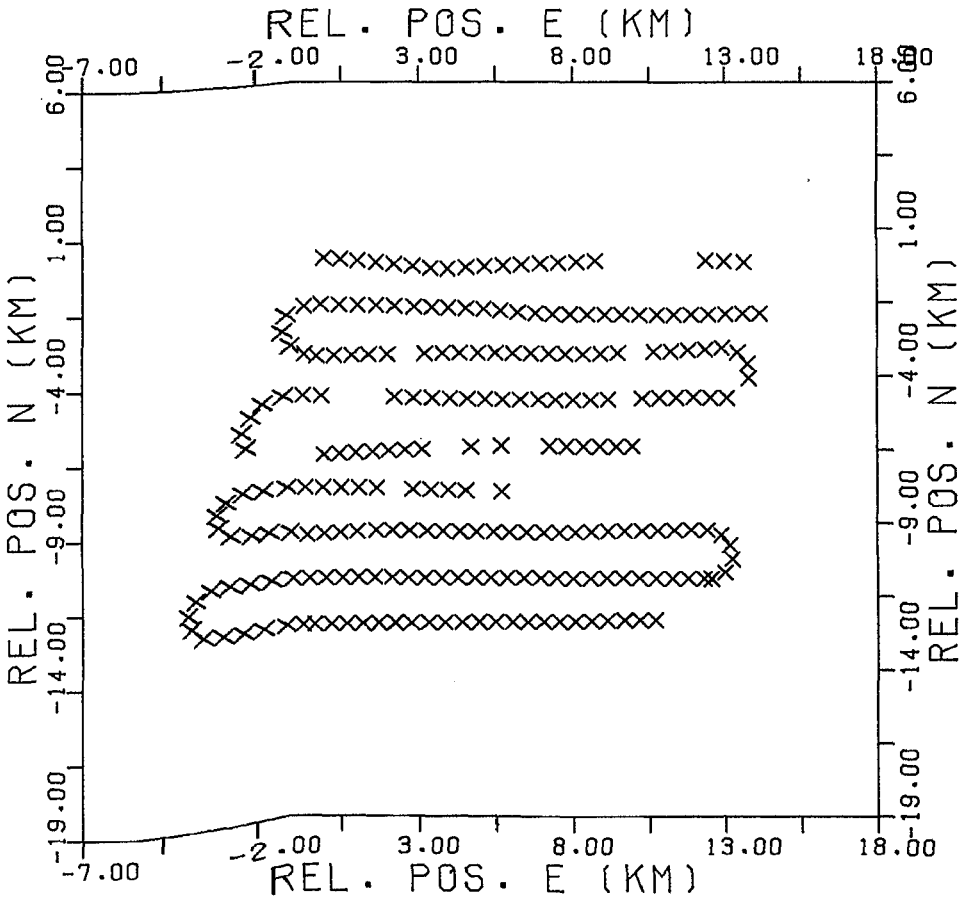

REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00

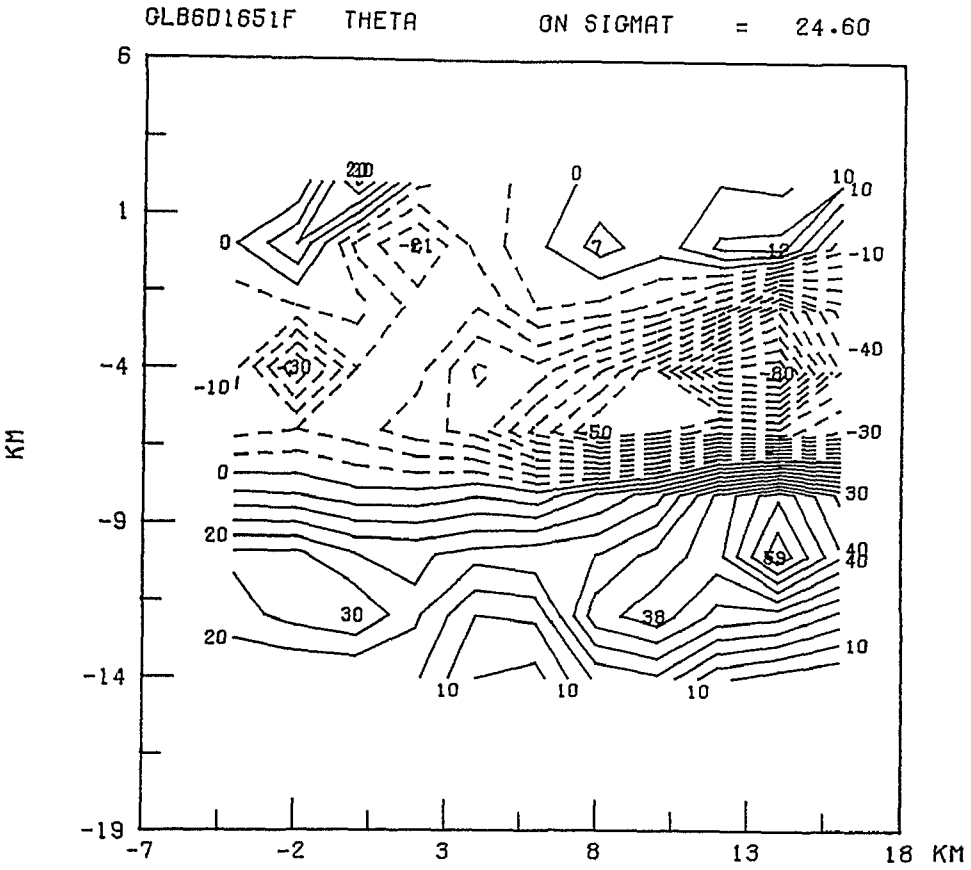


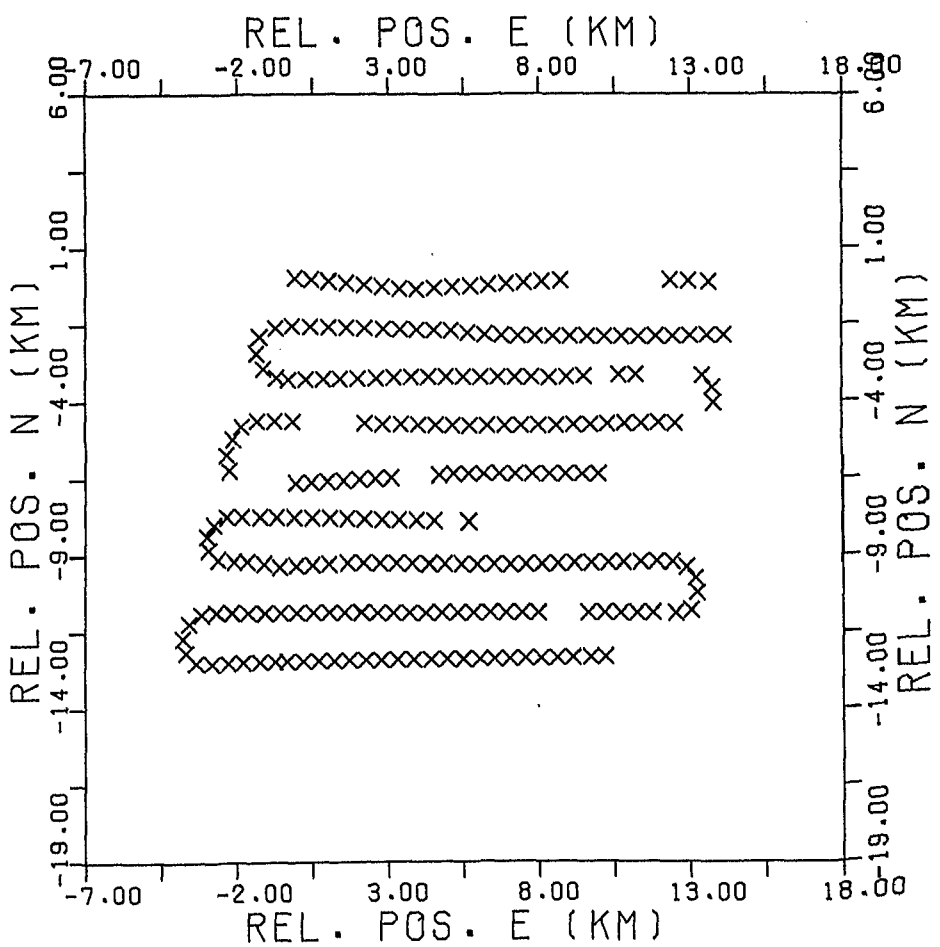


-Potential Temperature on Isopycnic Surfaces-

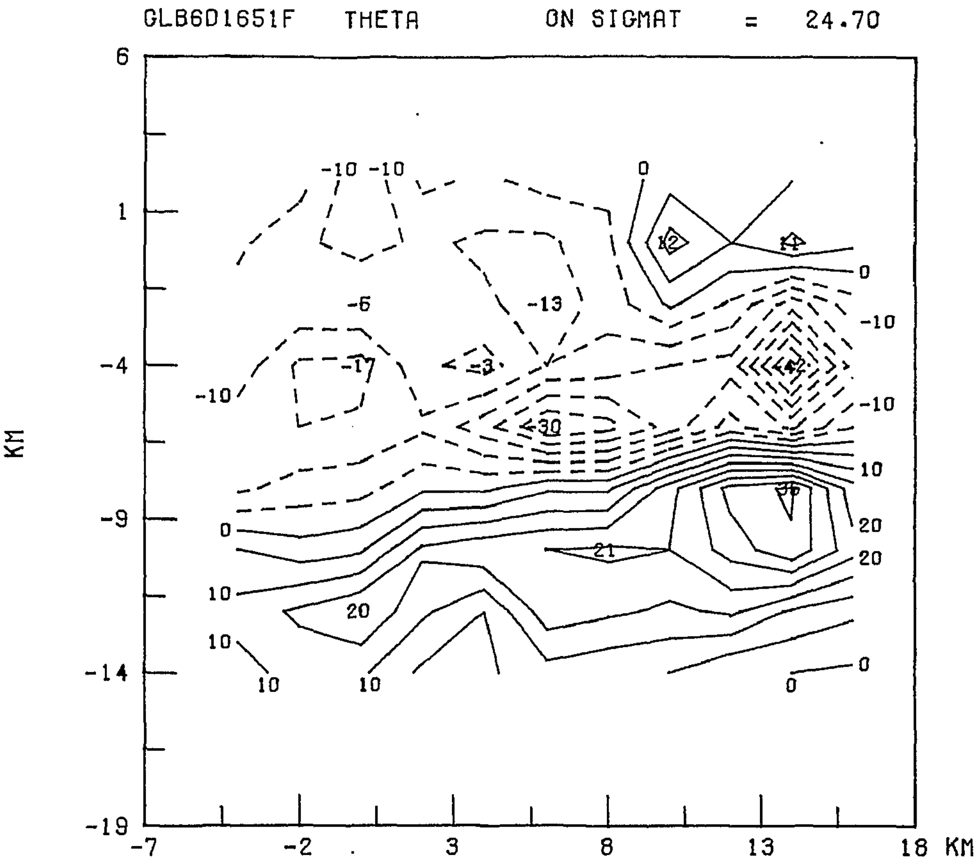

GLB6D1651F THETA ON SIGMAT = 24.50
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
20 20 -10
-33
-20
28
20
4
26
10
34
10
23
20
23
22
24
10
10

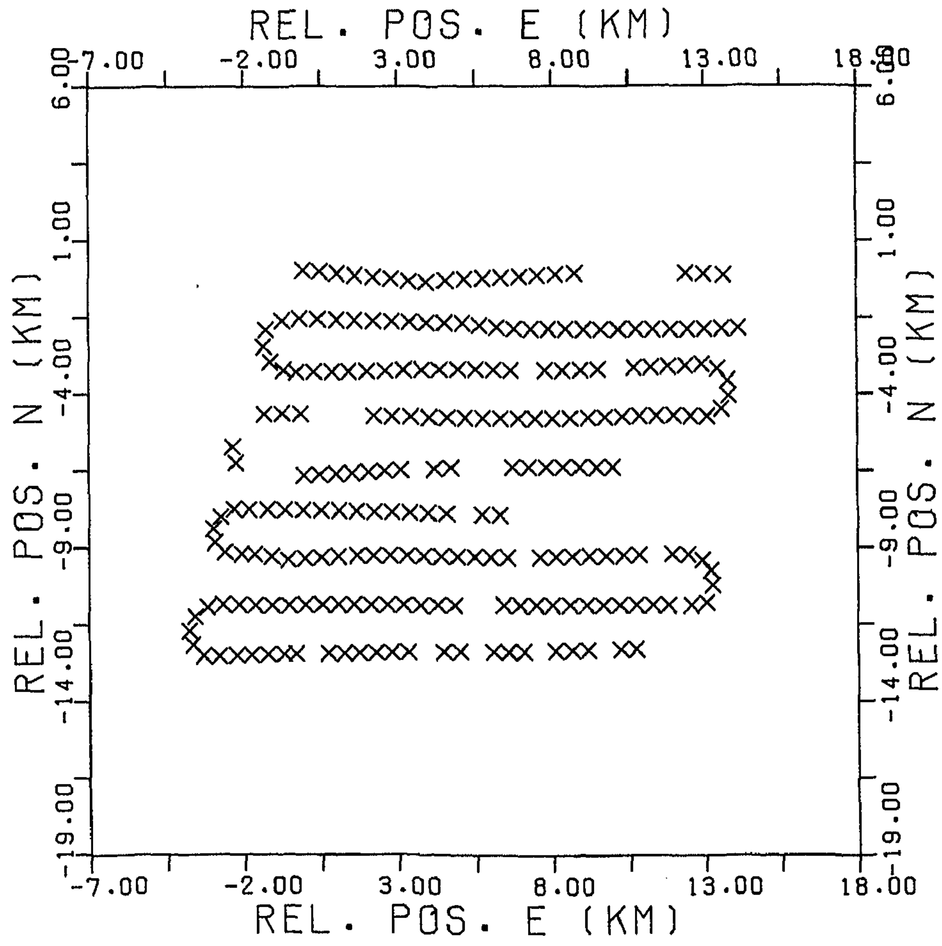

REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00



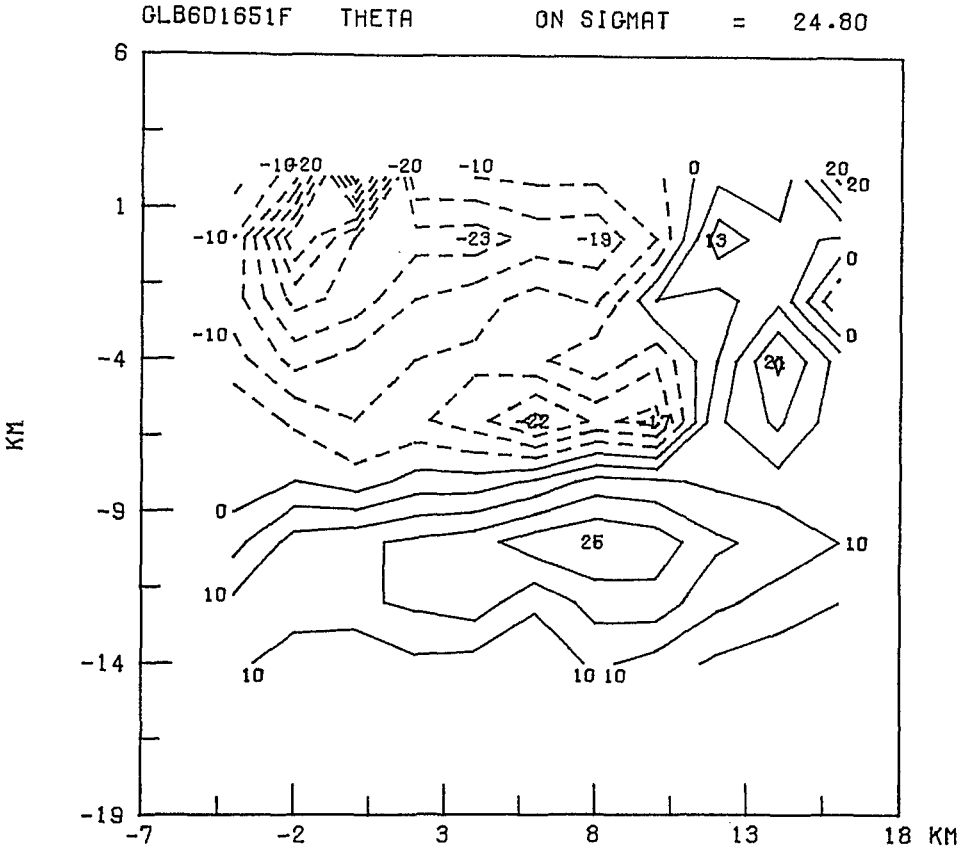


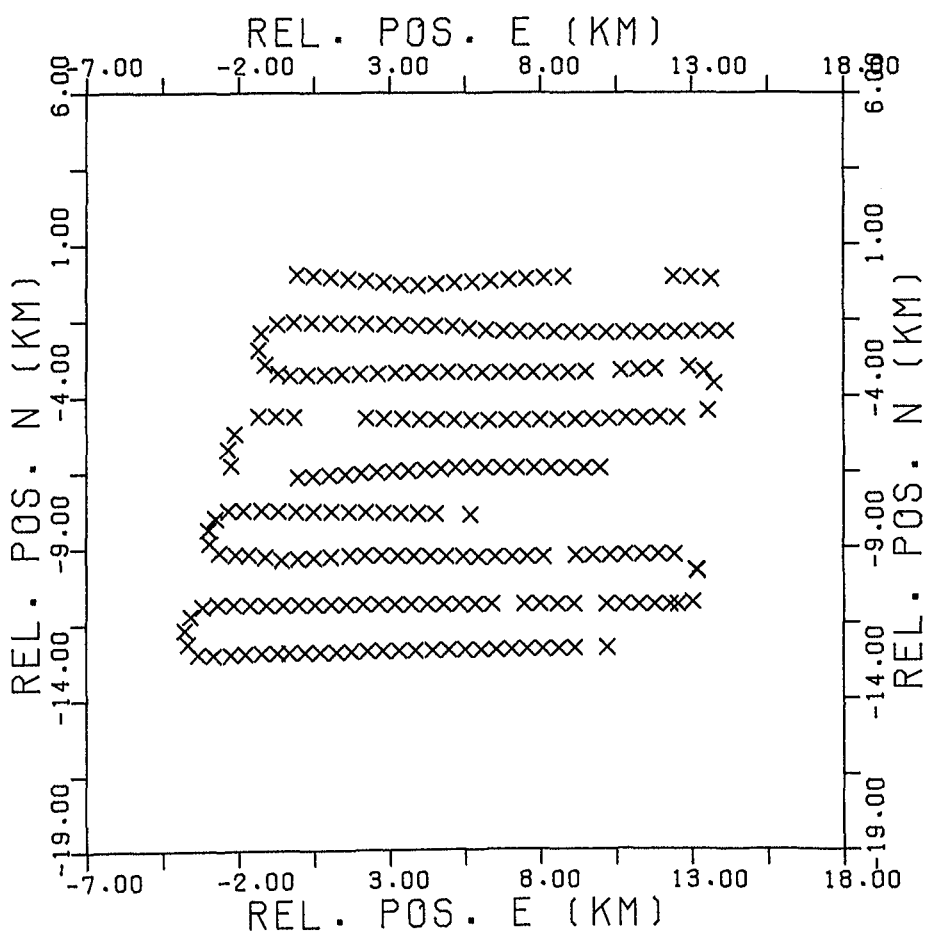
-Potential Temperature on Isopycnic Surfaces-



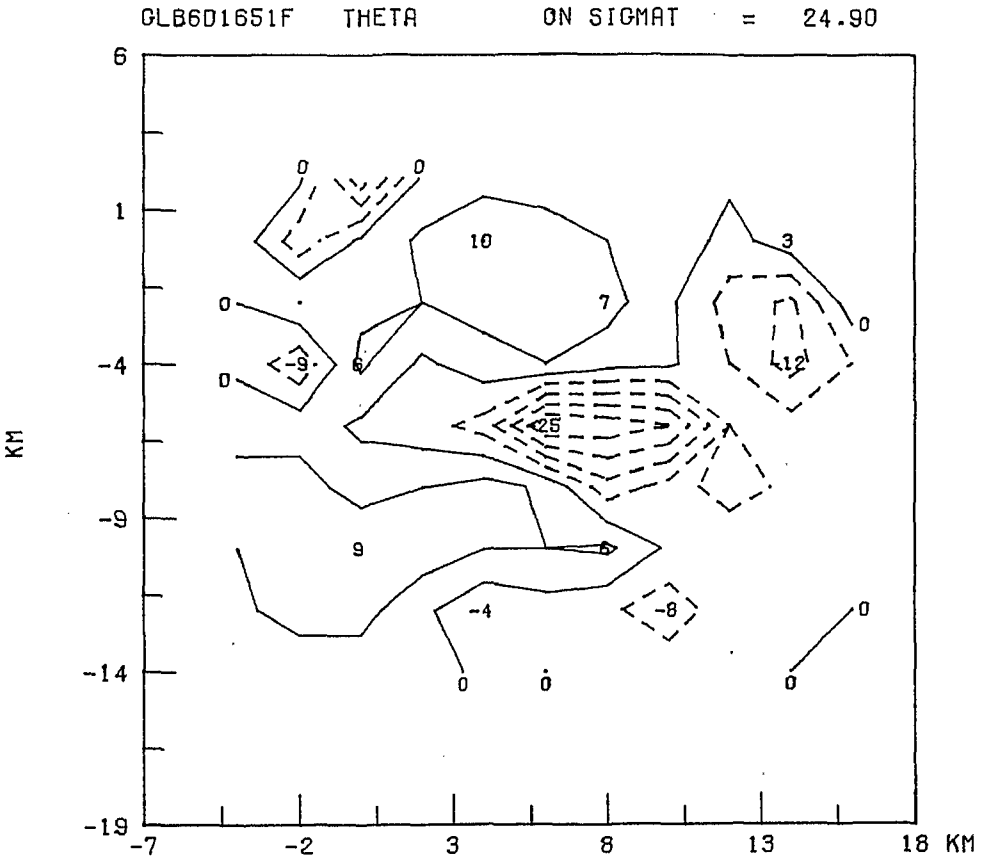


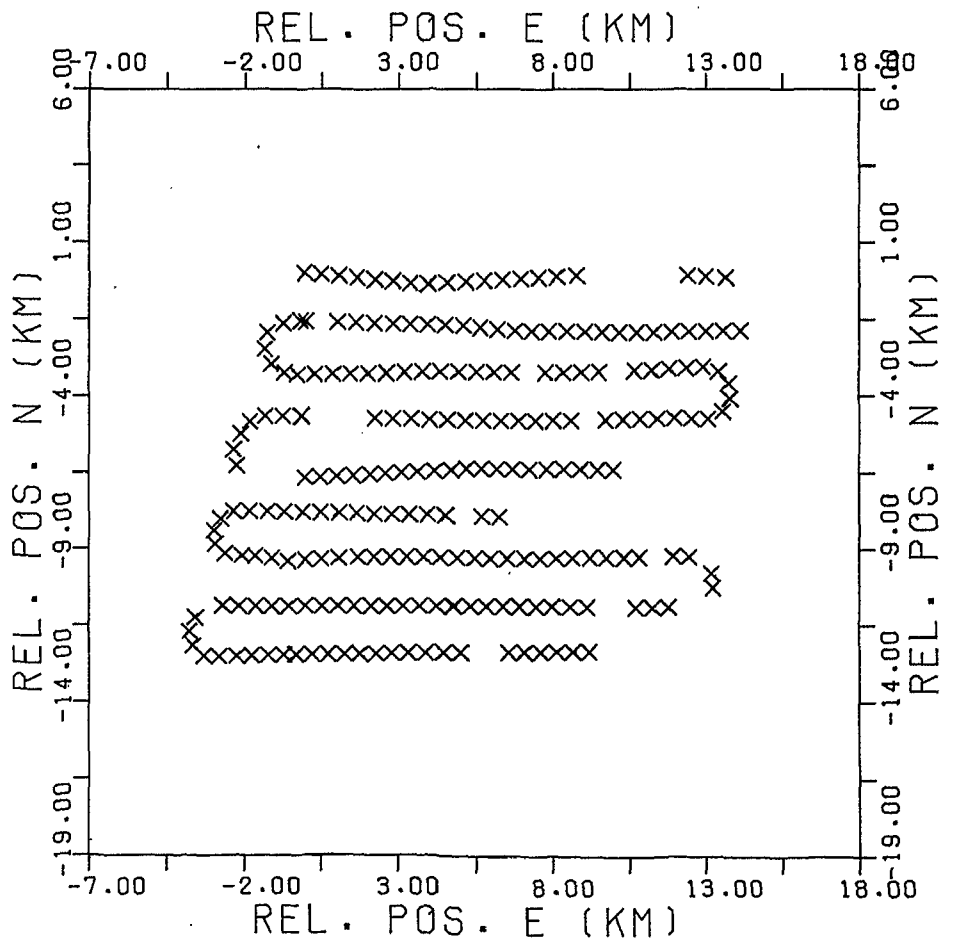
-Potential Temperature on Isopycnic Surfaces-

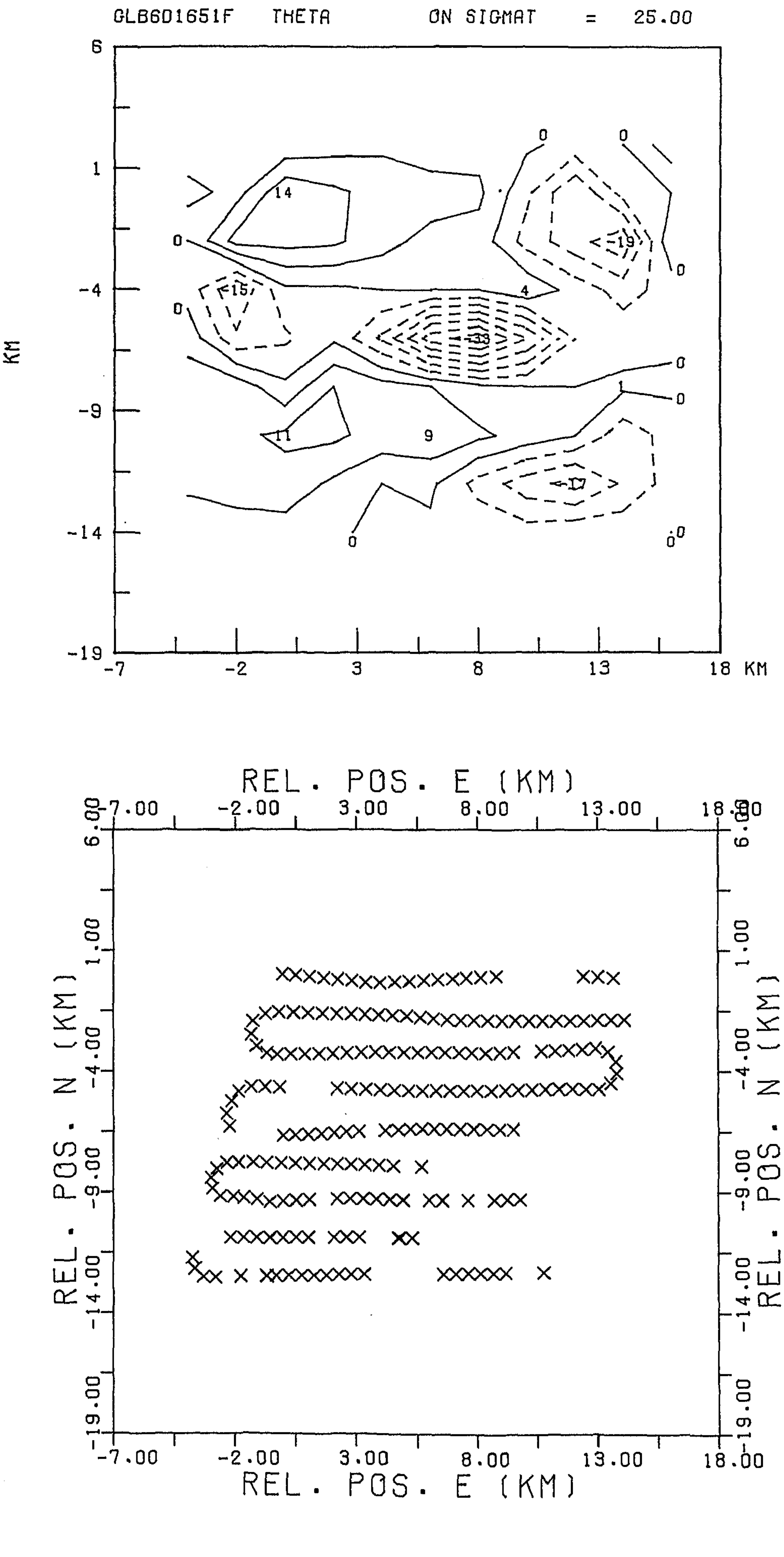




-Potential Temperature on Isopycnic Surfaces-


GLB6D1651F THETA ON SIGMAT = 24.90
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
0
10
7
3
-9
6
12
25
9
-4
-8


REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00

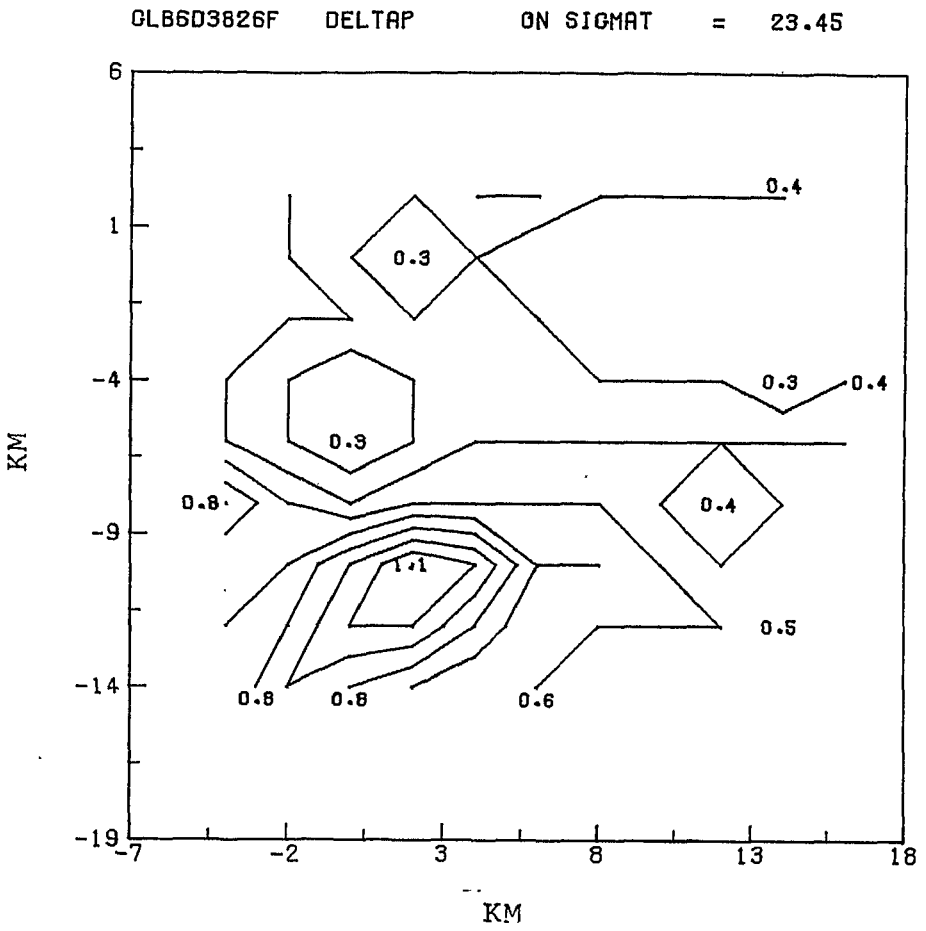


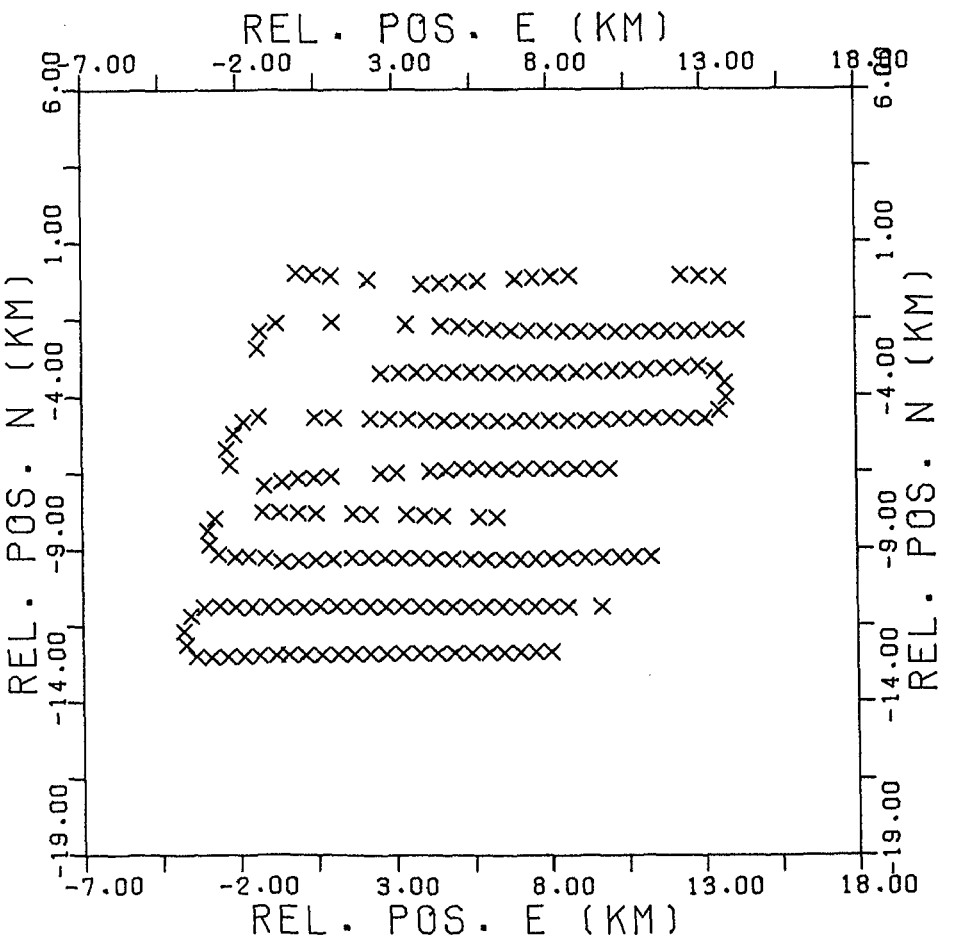
-Potential Temperature on Isopycnic Surfaces-

2. Contoured maps of thickness (the spacing between a pair of isopycnals; units in dbar).

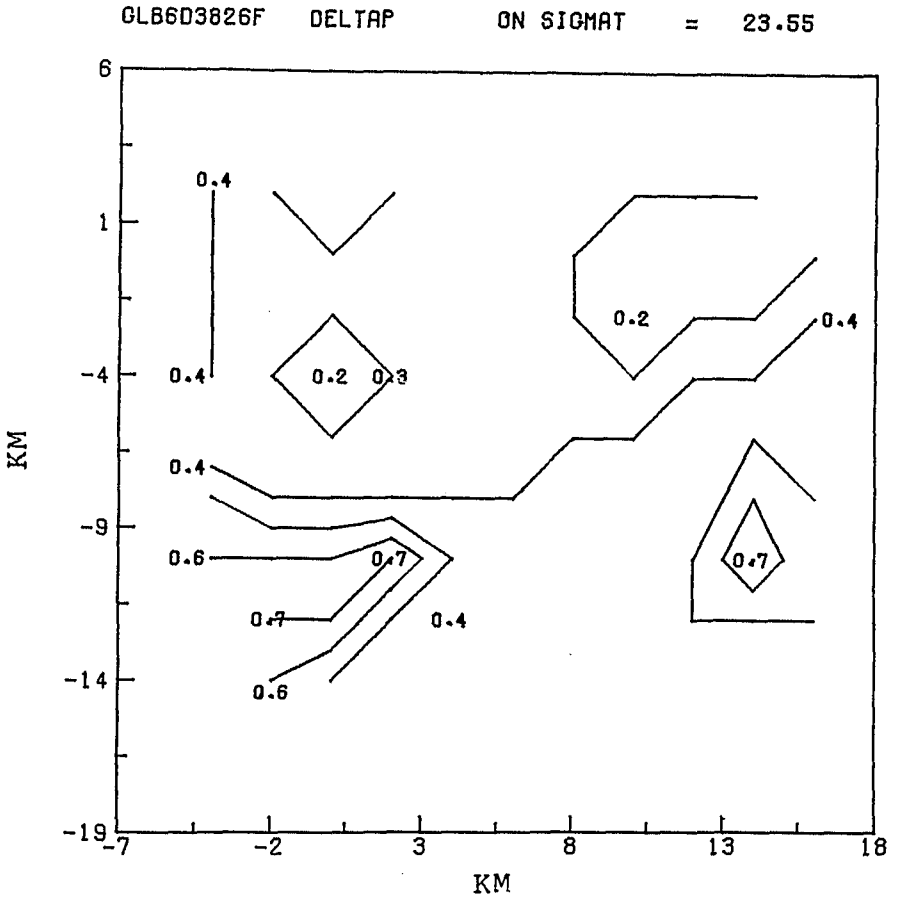
   The indicated surface in each map is the lower one; the upper surface has a density 0.10 σ_t less. The maps are plotted for intervals of 0.1 σ_t, over the range 23.45 to 24.75 σ_t. The contours are related to fine-structure of N^2 (where N is the Brunt-Väisäla frequency).

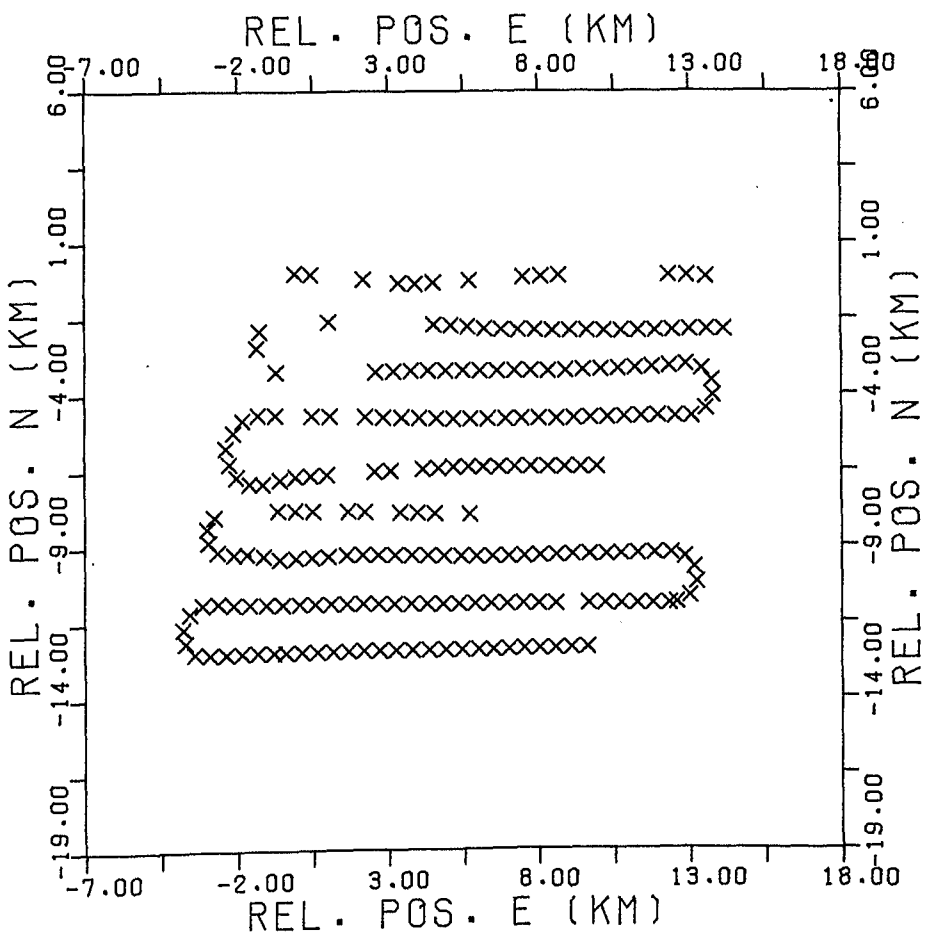
   The contour interval is 0.1 dbar and the grid spacing used in the object analysis was 2.0 km. These maps have a scale of 1 : 250 000.



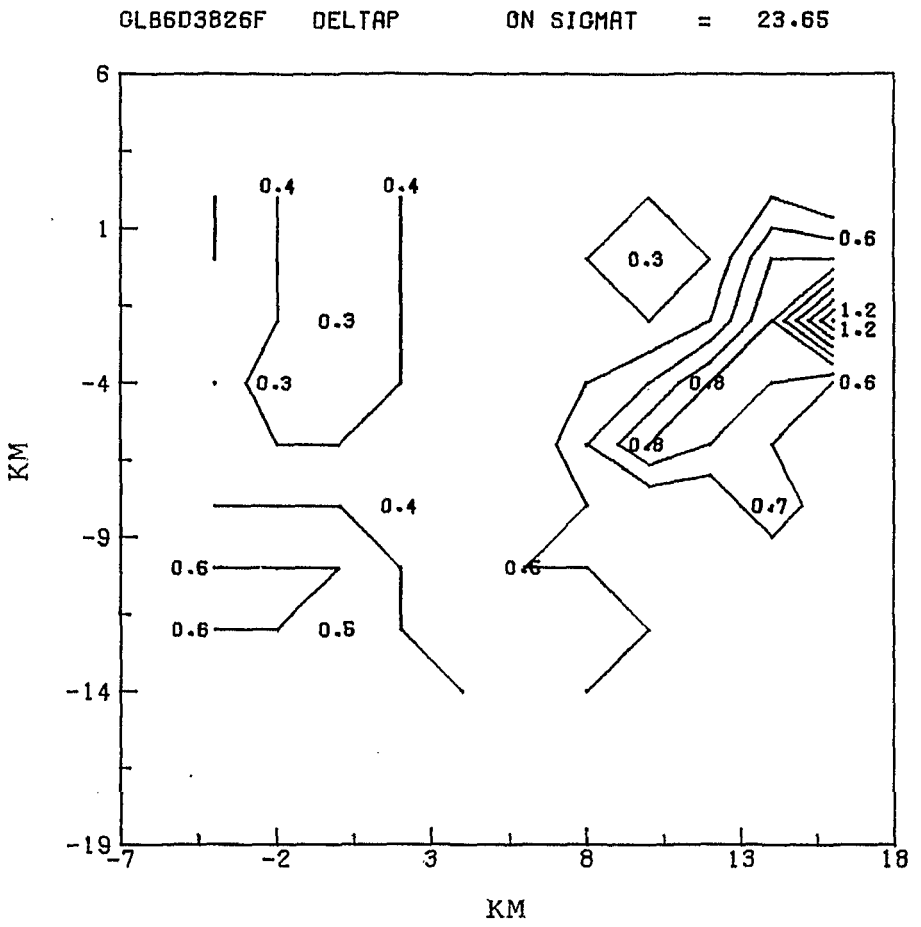


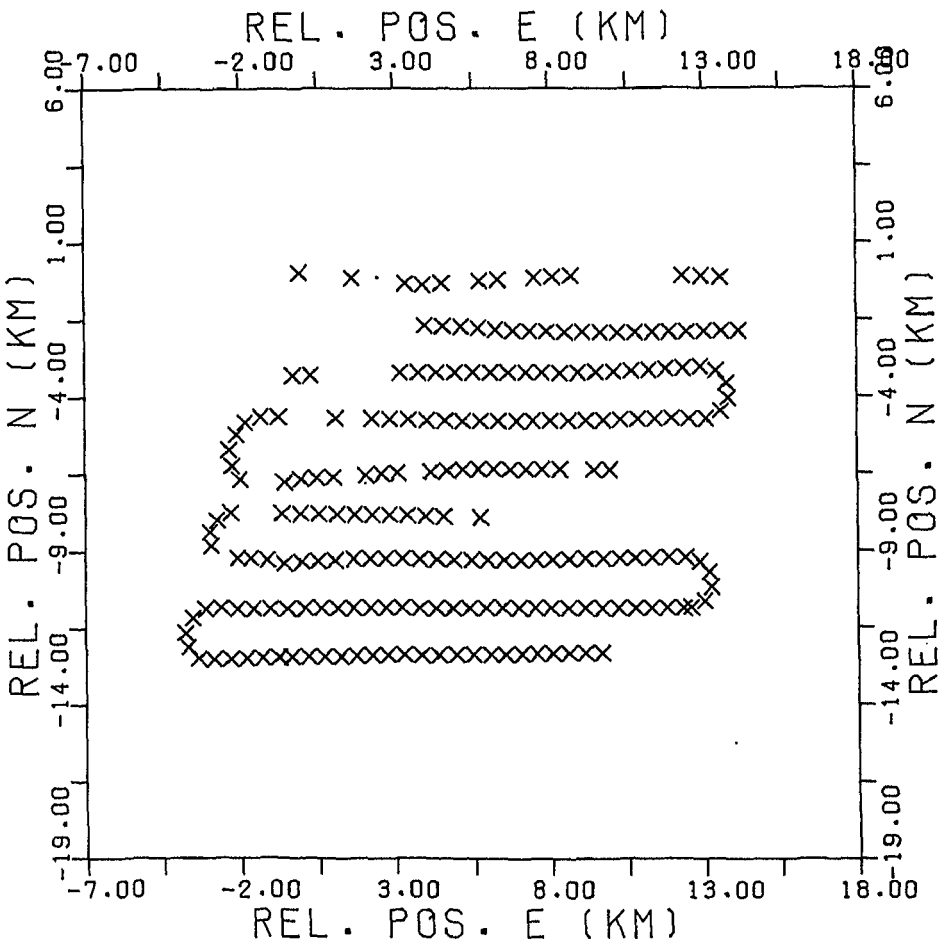
- Thickness between Isopycnic Surfaces -



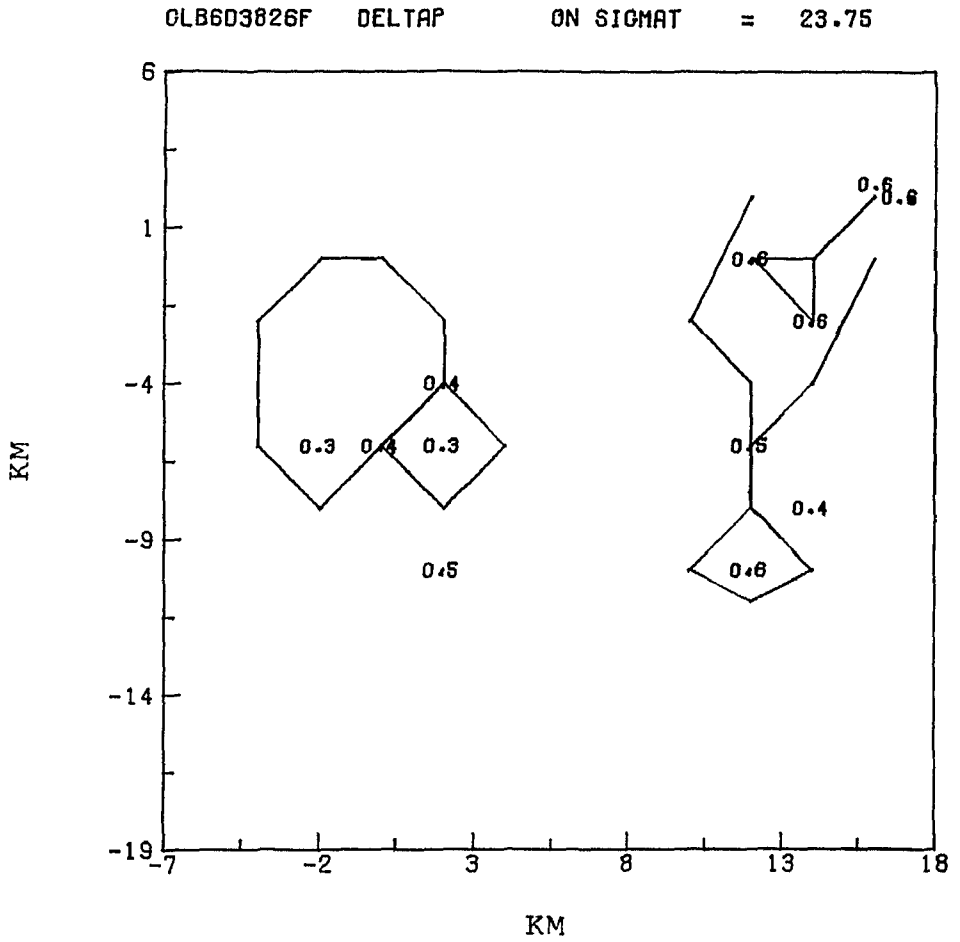


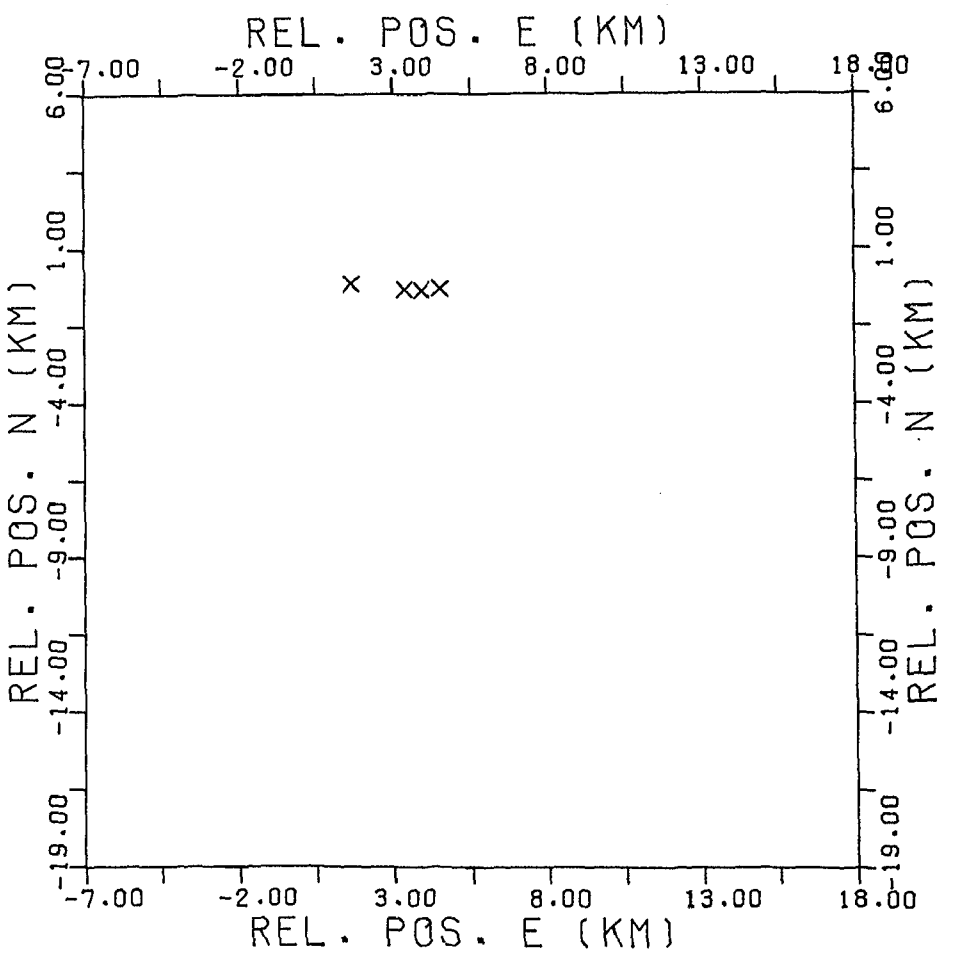
-Thickness between Isopycnic Surfaces-



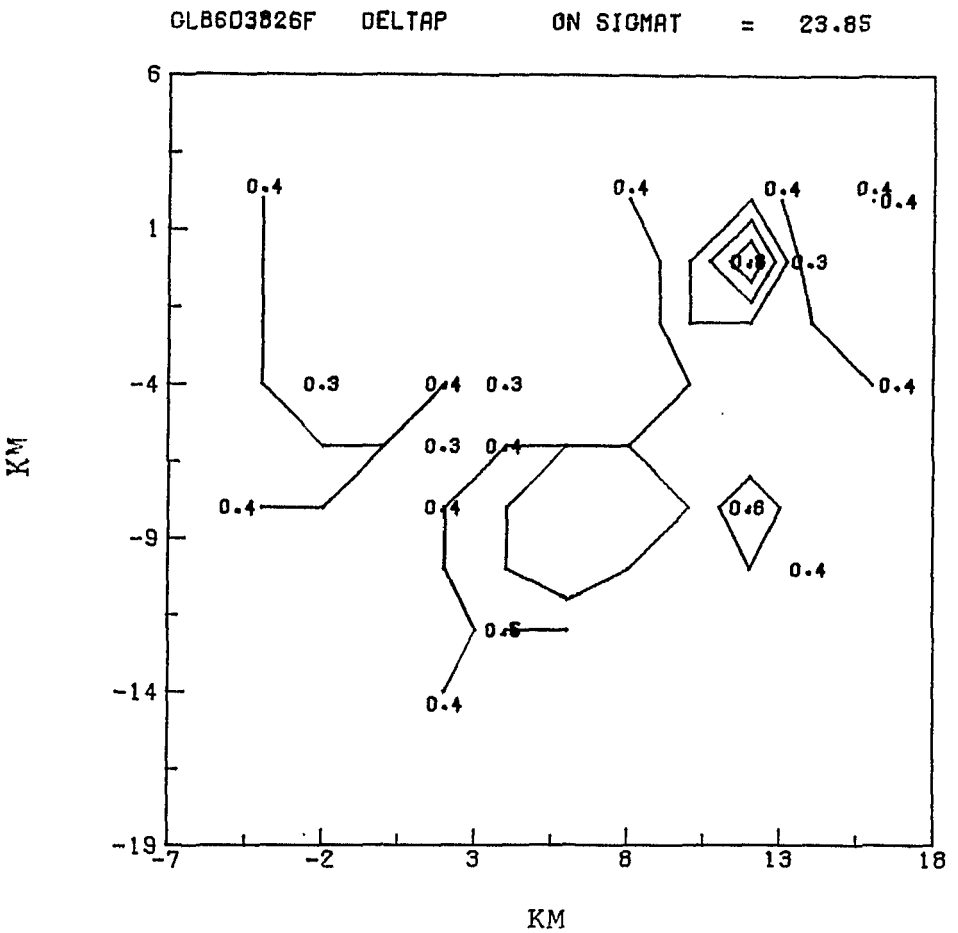


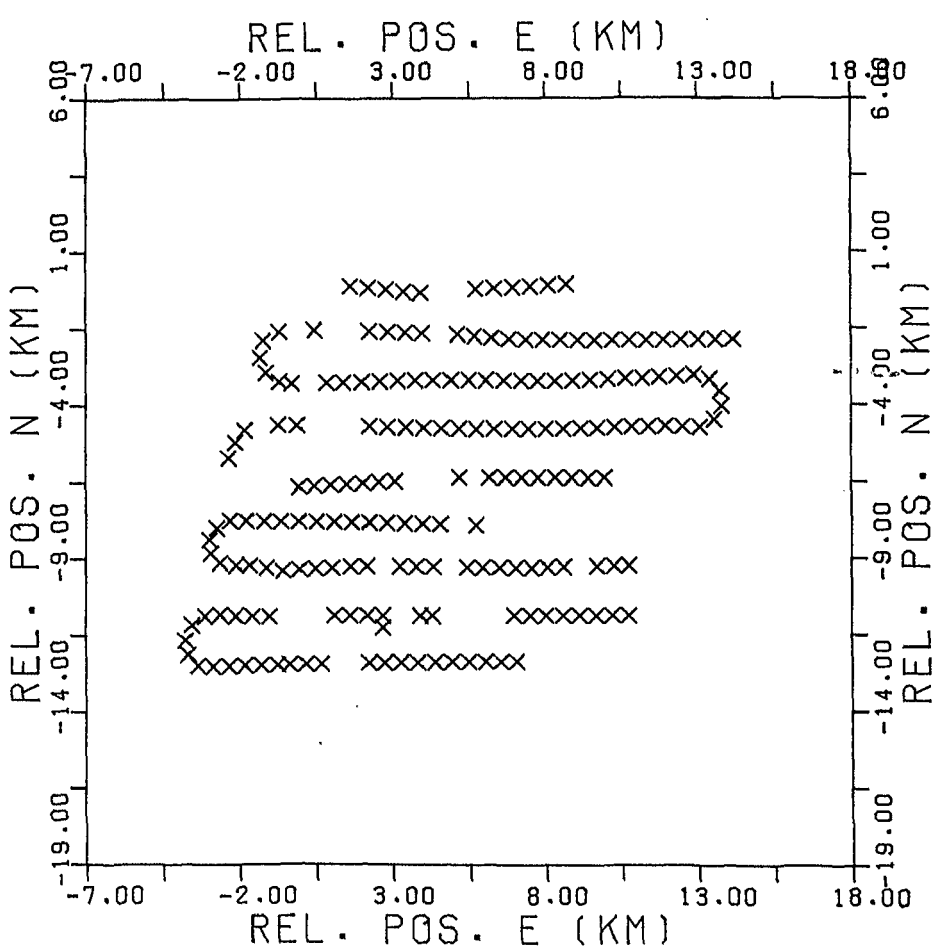
-Thickness between Isopycnic Surfaces-



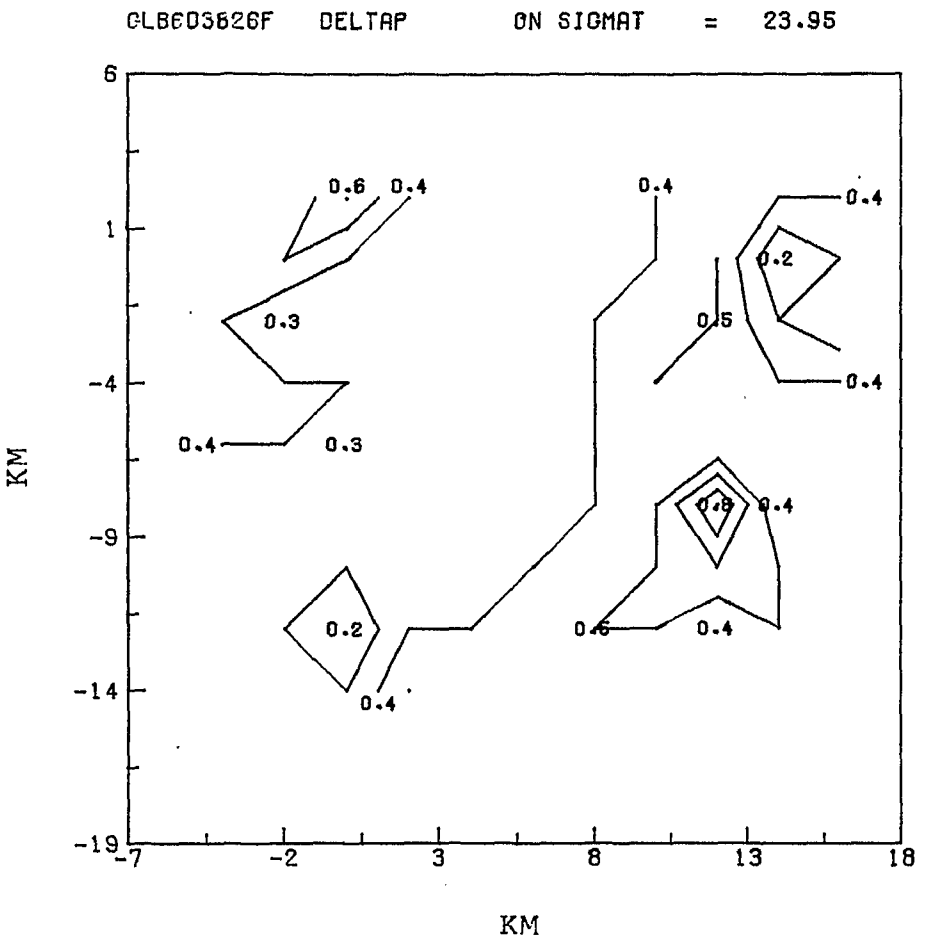


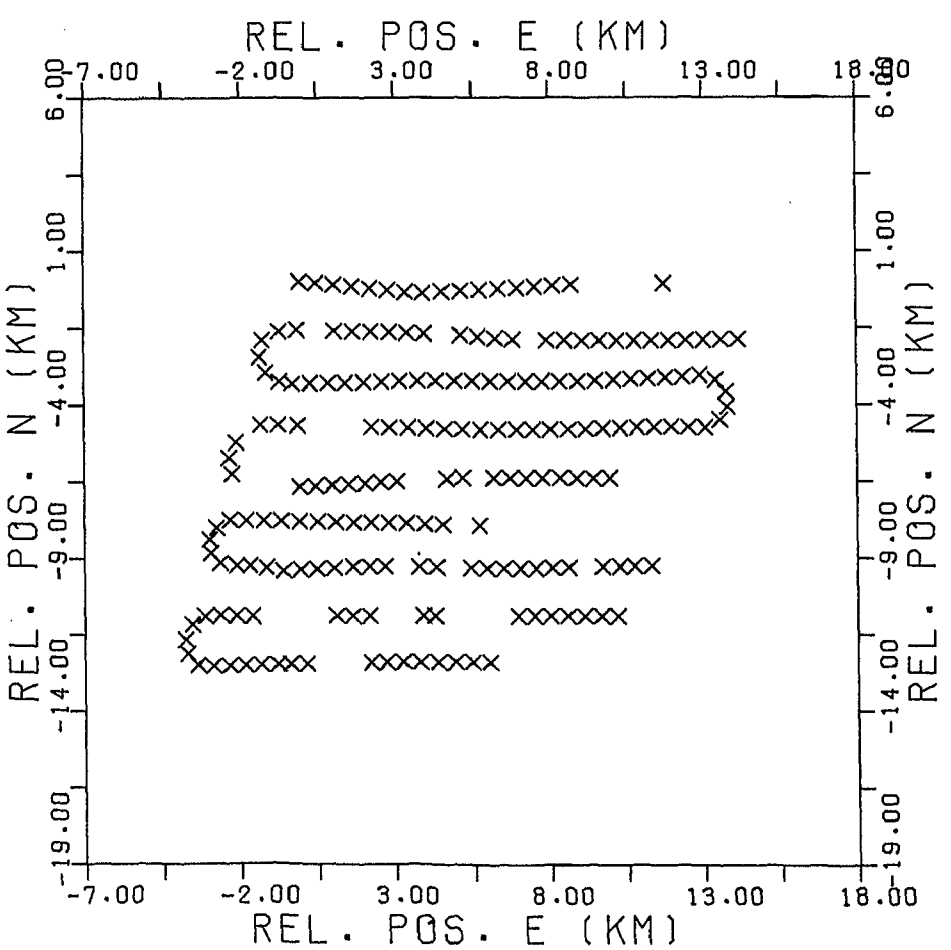
-Thickness between Isopycnic Surfaces-



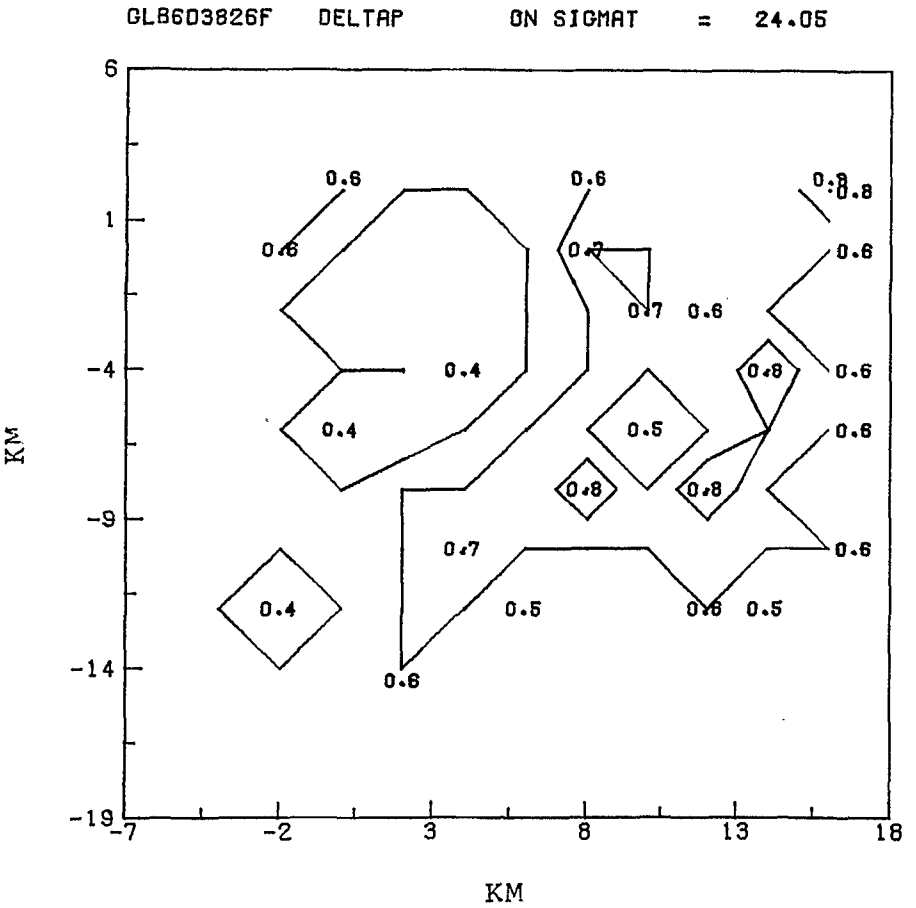


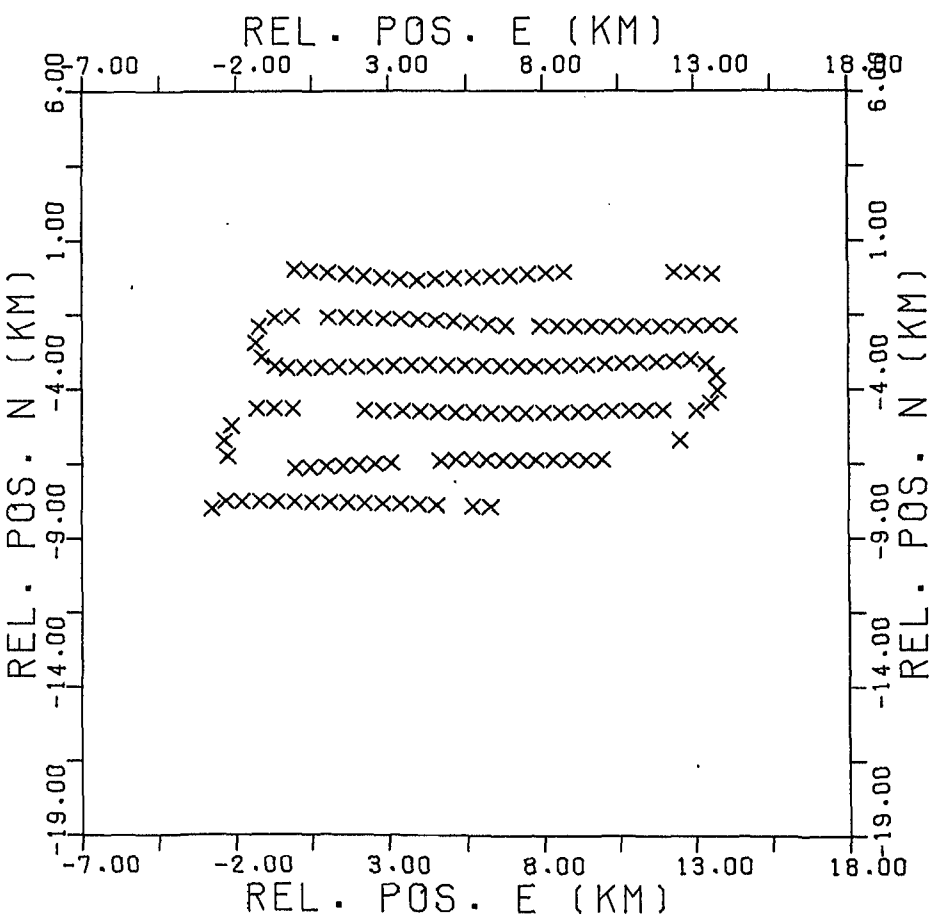
-Thickness between Isopycnic Surfaces-



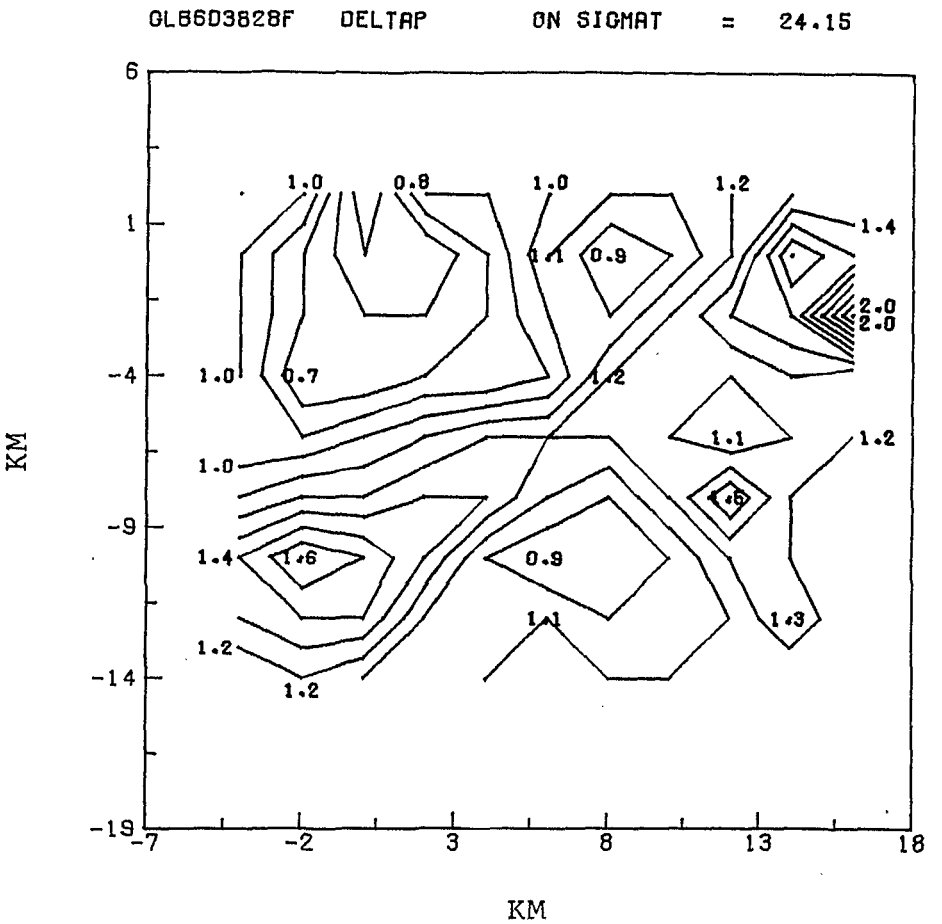


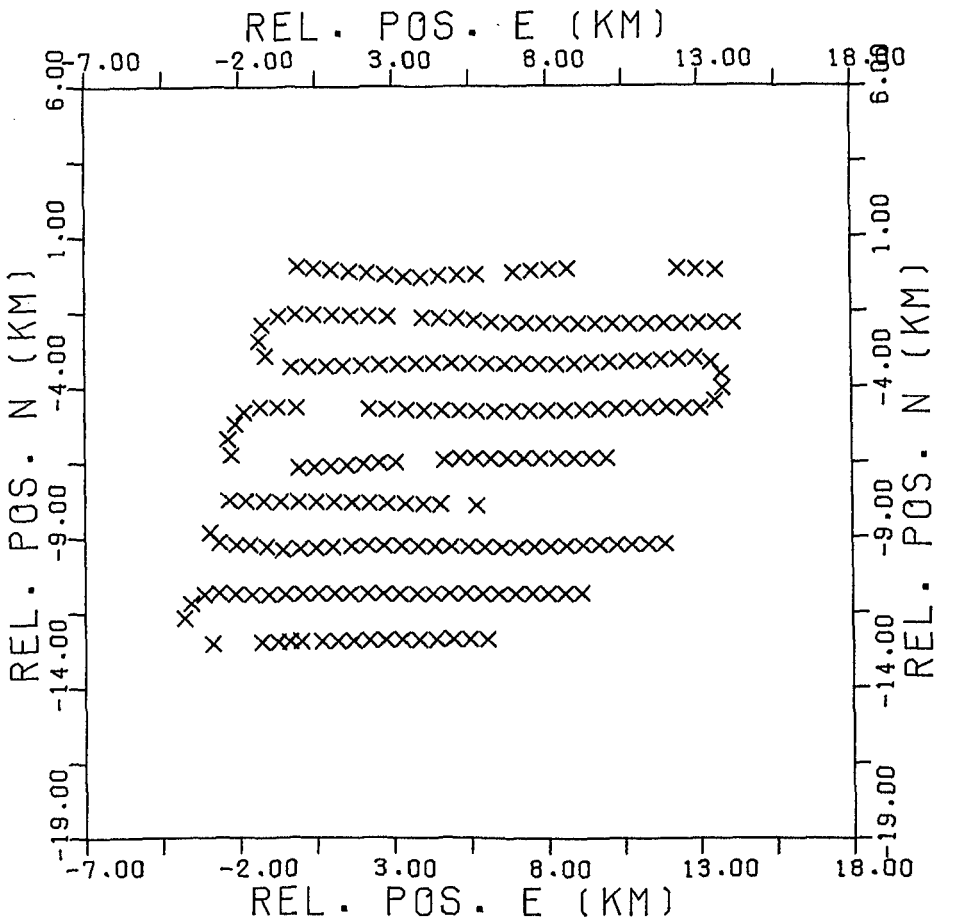
-Thickness between Isopycnic Surfaces-



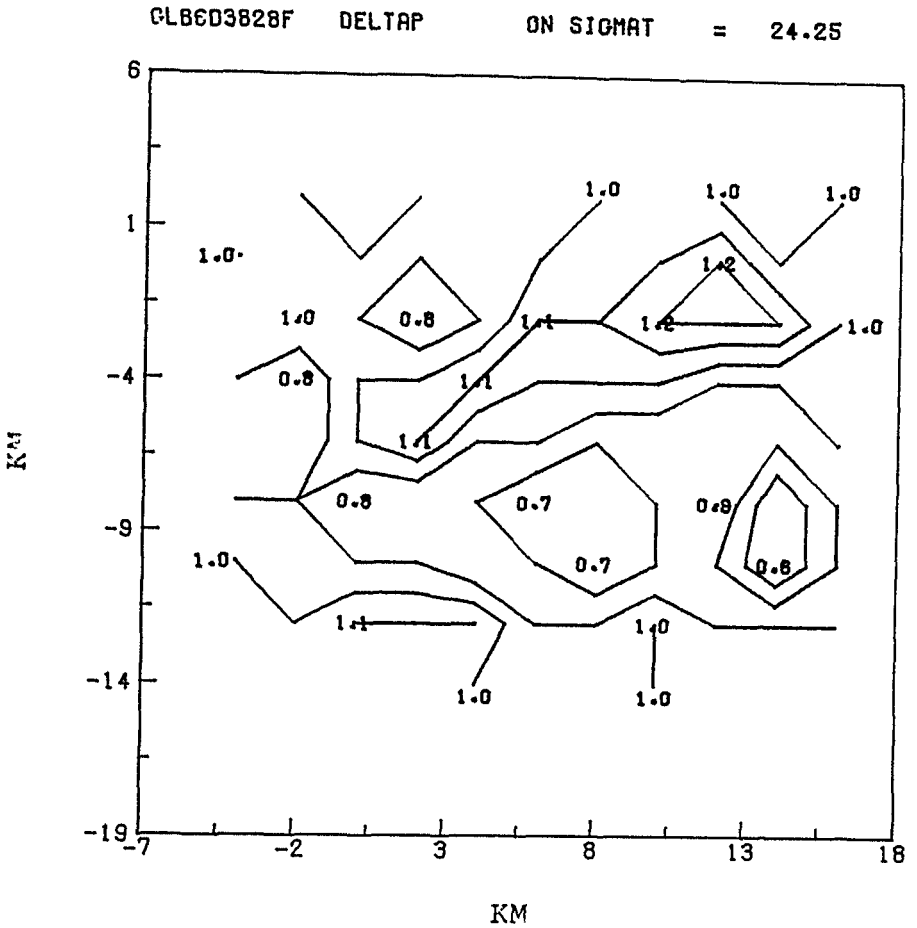


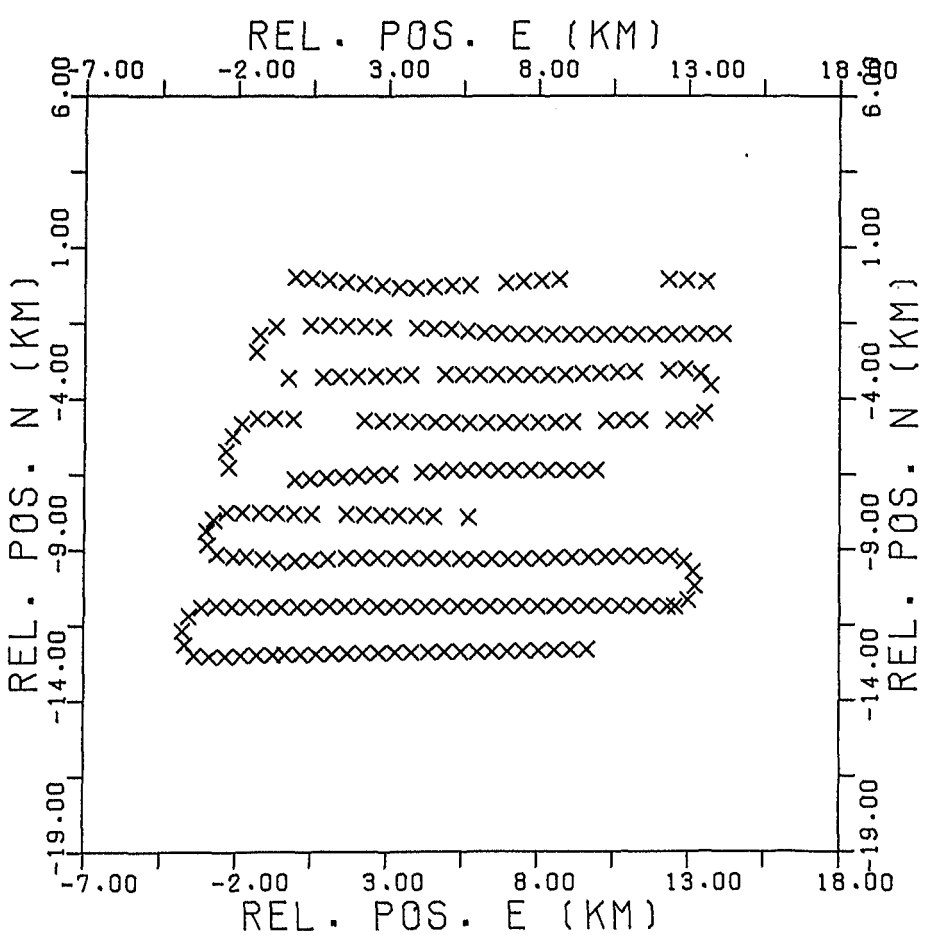
-Thickness between Isopycnic Surfaces-



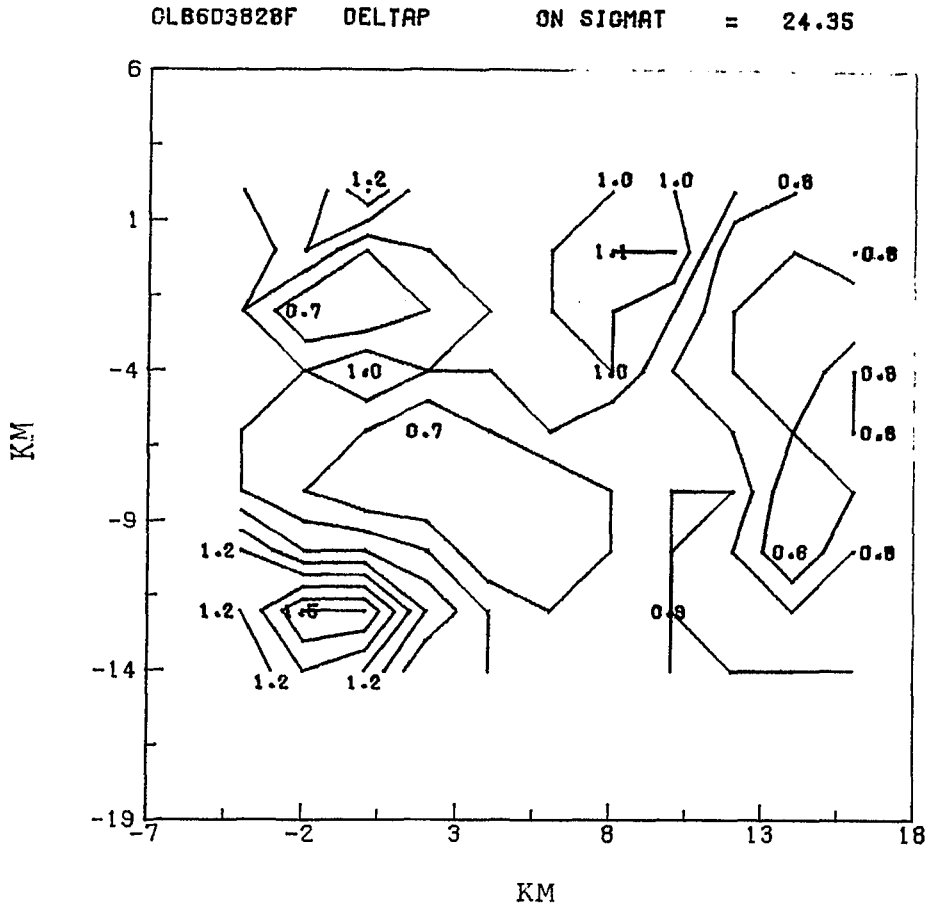


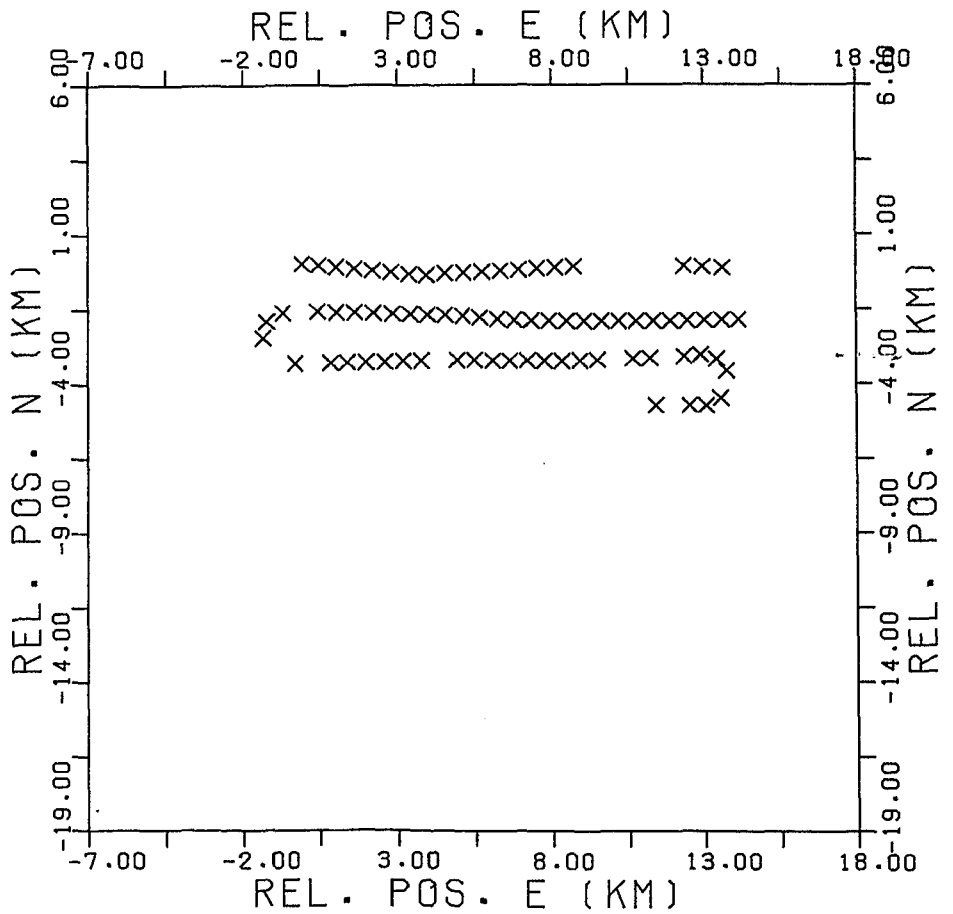
-Thickness between Isopycnic Surfaces-



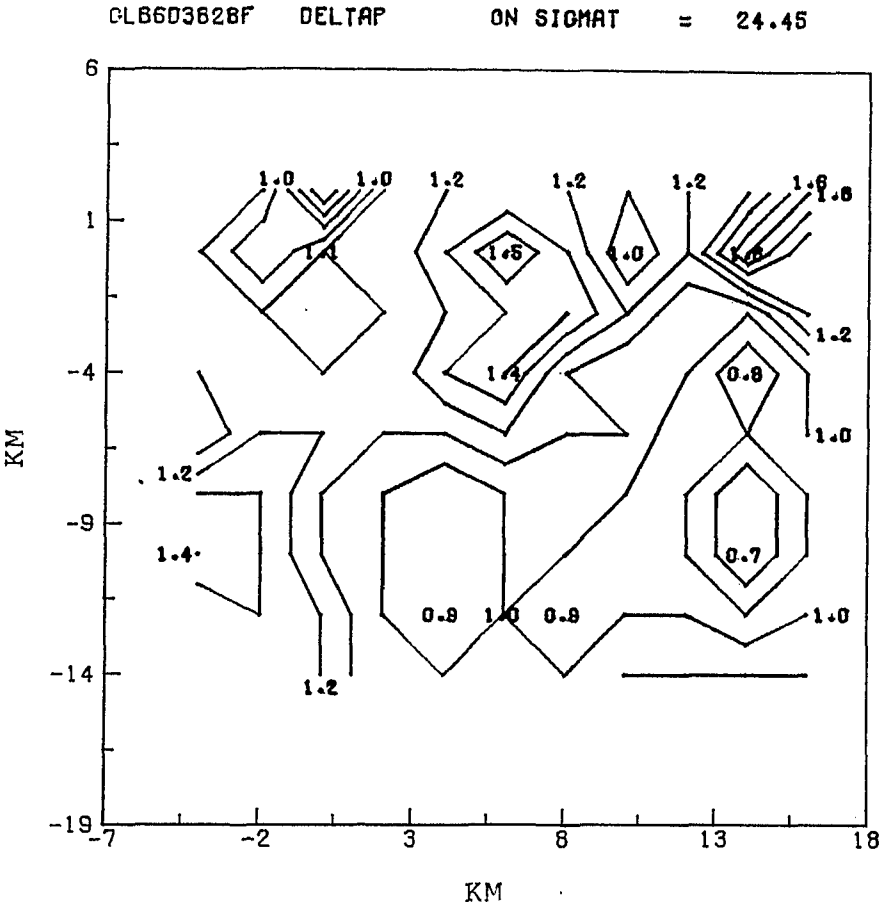


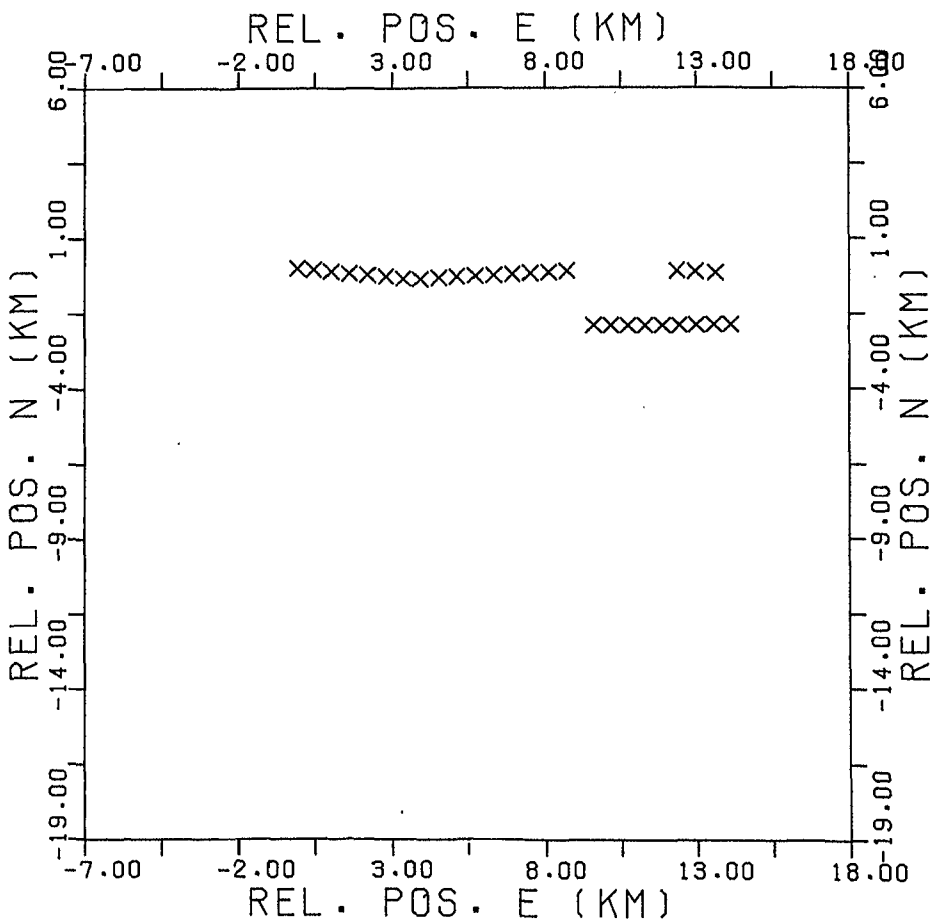
-Thickness between Isopycnic Surfaces-



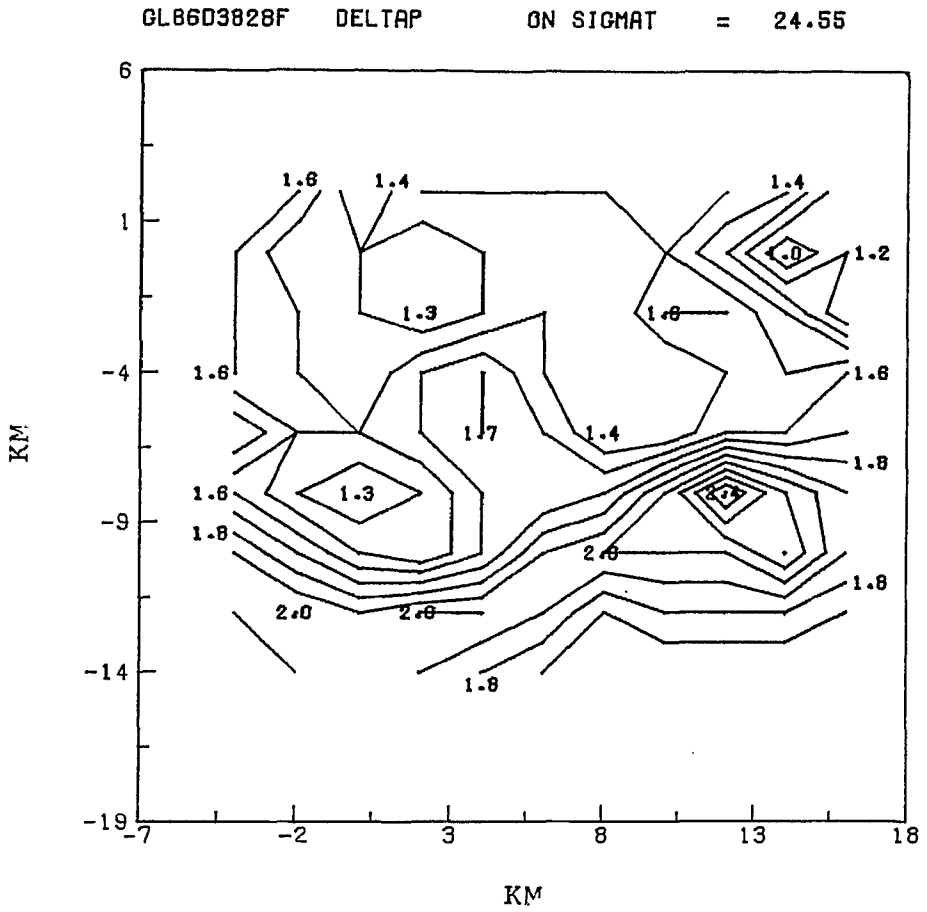


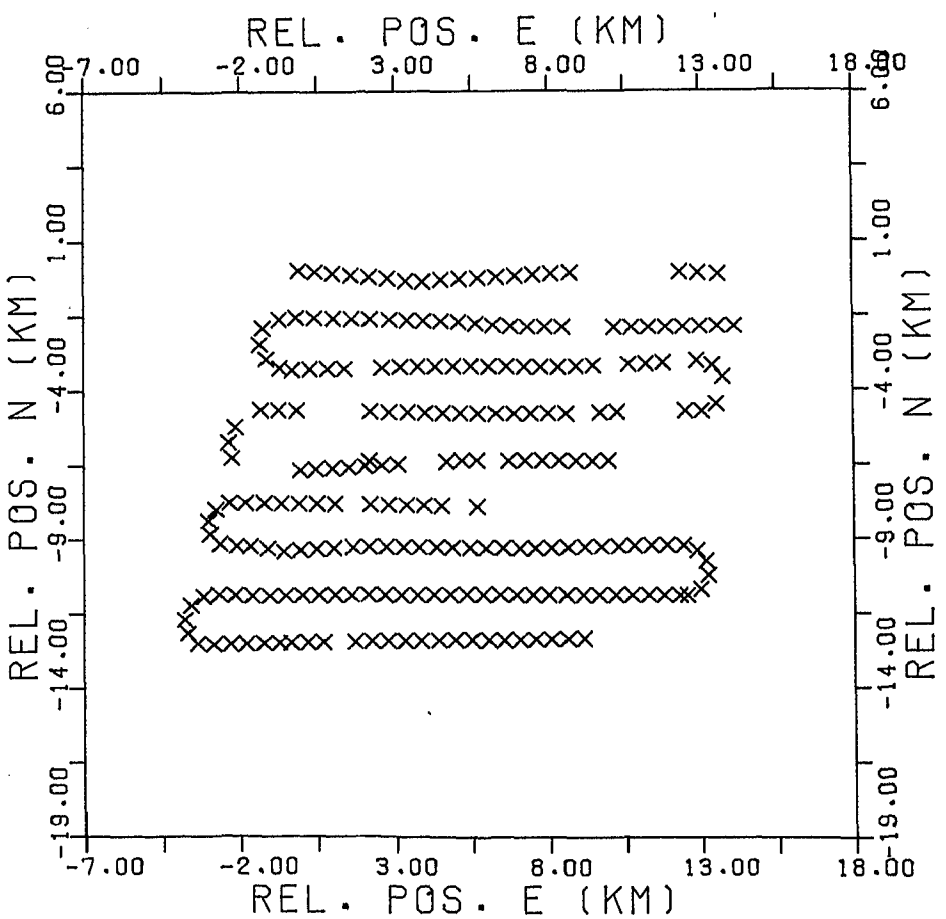
-Thickness between Isopycnic Surfaces-



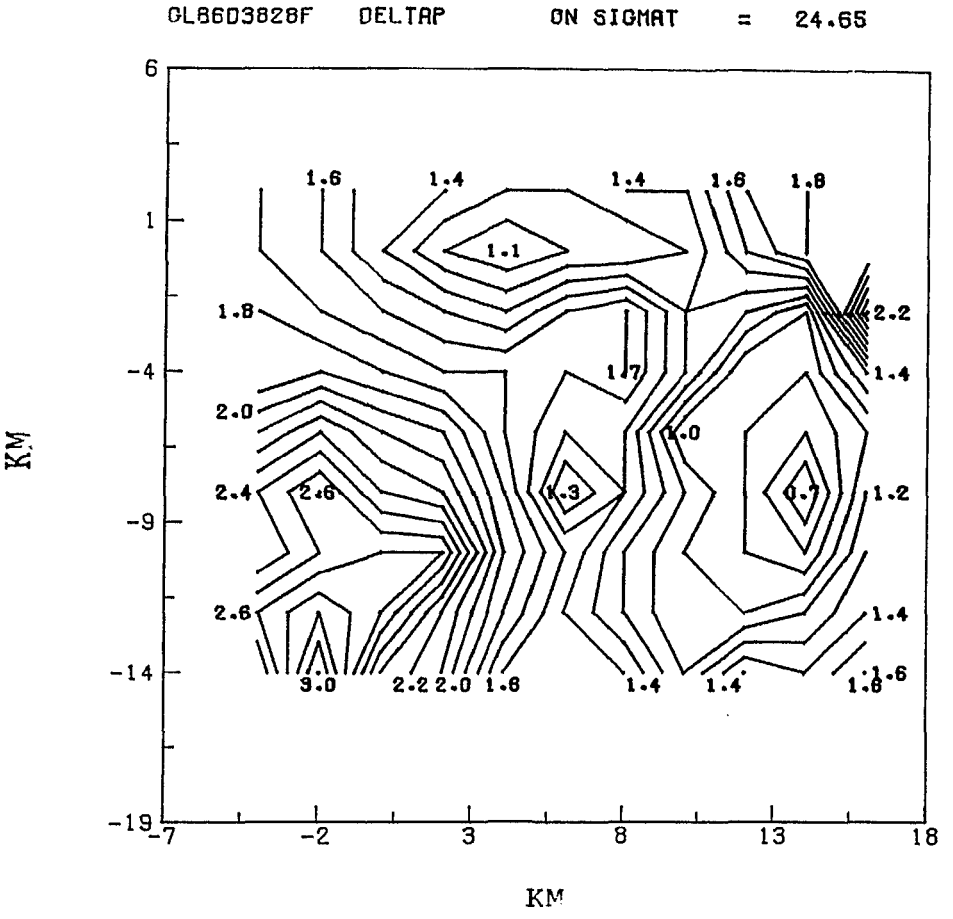


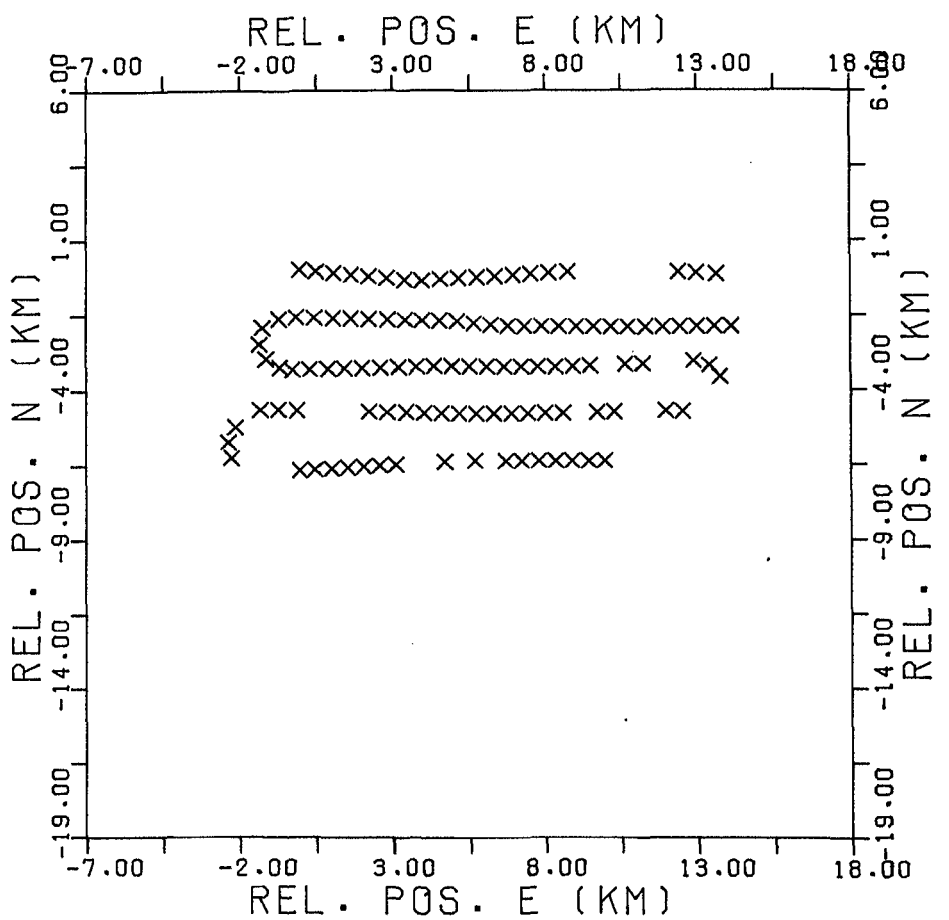
-Thickness between Isopycnic Surfaces-





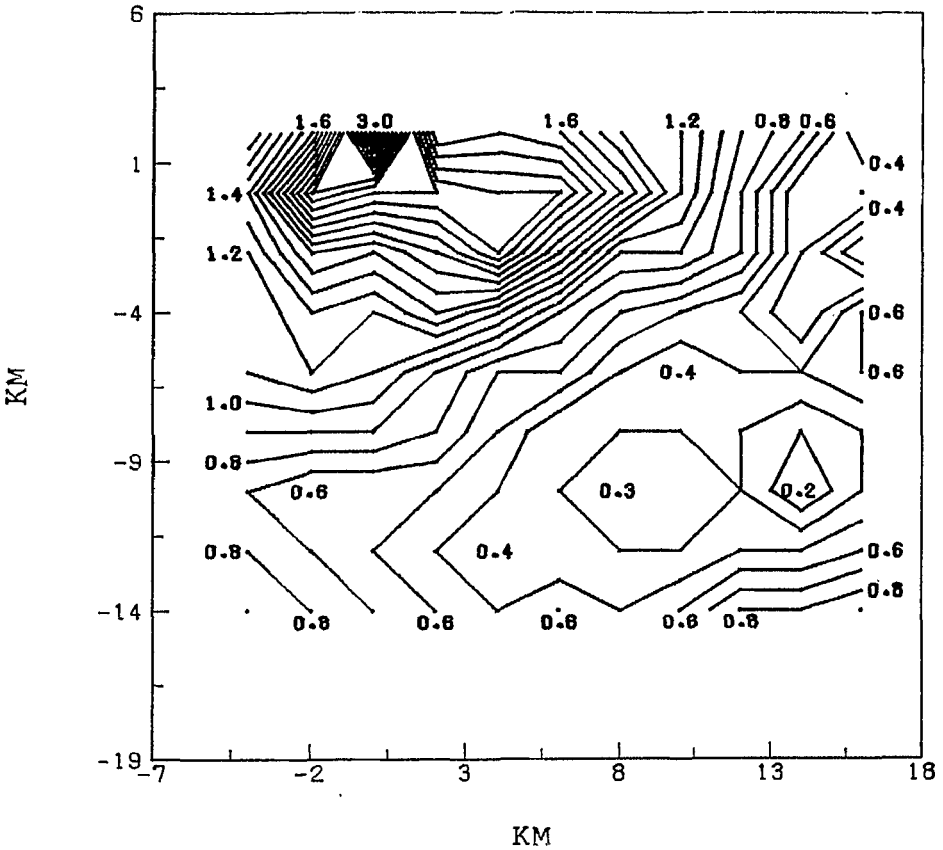
-Thickness between Isopycnic Surfaces-

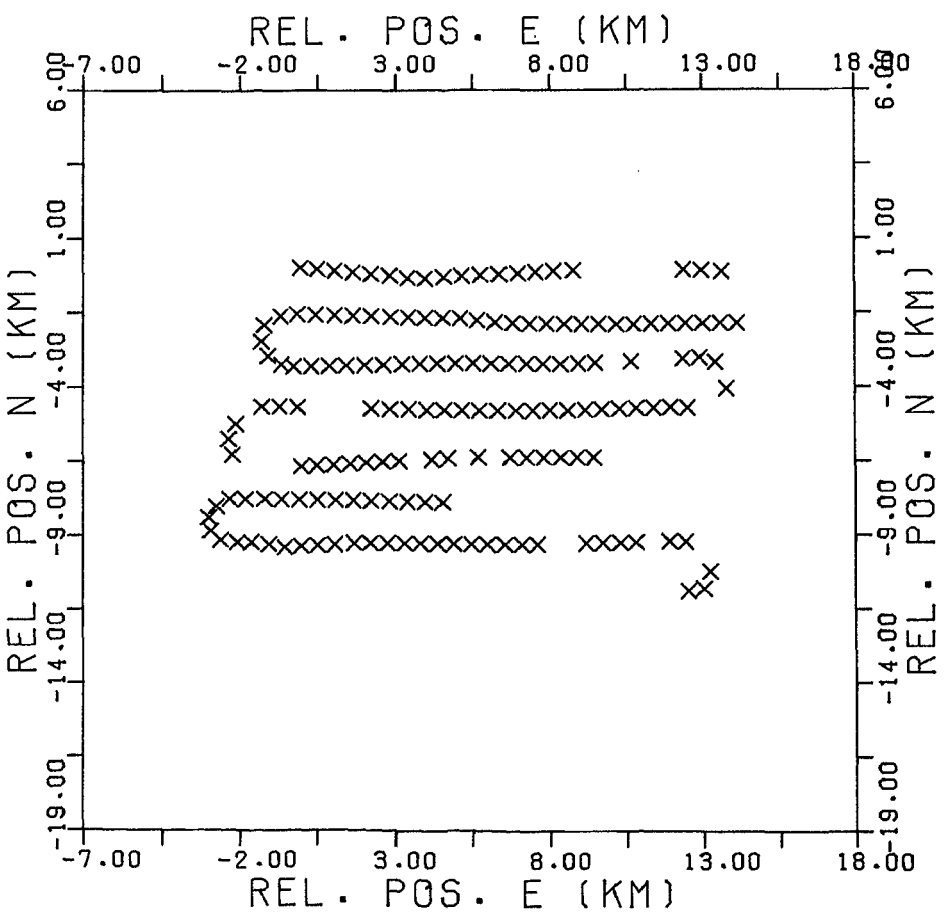




-Thickness between Isopycnic Surfaces-

GLB6D3828F DELTAP ON SIGMAT = 24.75





SECTION VI ISOBARIC MAPS

This section shows contoured maps of potential temperature, salinity and density (σ_t) on surfaces of constant pressure in the range 10.00 to 24.00 dbar.

The data are the product of the objective analysis, the data being interpolated onto a regular east-west, north-south grid. The positions of the data (relative to the origin of the map) in the objective analysis are shown together with each surface. These maps are mainly in the upper layer of weak density gradient, often called the mixed layer.

The contours of the maps are of the

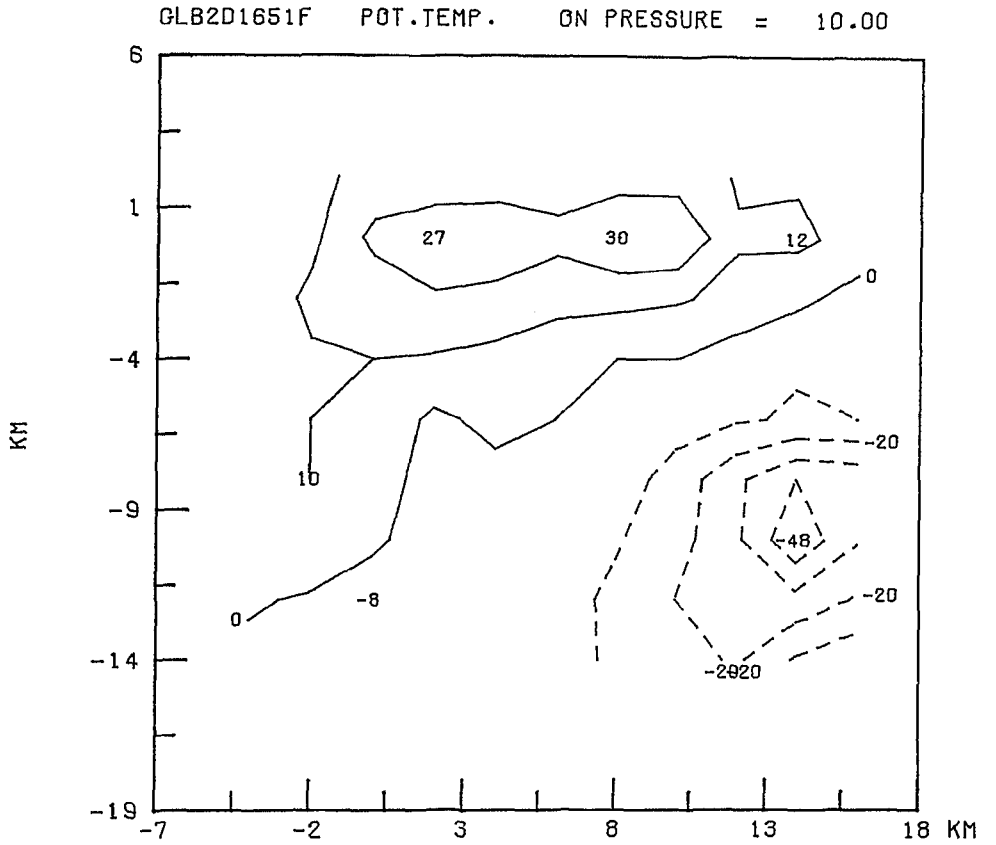
- temperature deviation (units in mK, contour interval 10 mK) from the mean temperature,
- salinity deviation (units in ppm, contour interval 10 ppm) from the mean salinity and
- density deviation (units in 10^{-3} σ_t, contour interval $10 \cdot 10^{-3}$ σ_t units) from the mean σ_t value on each surface.

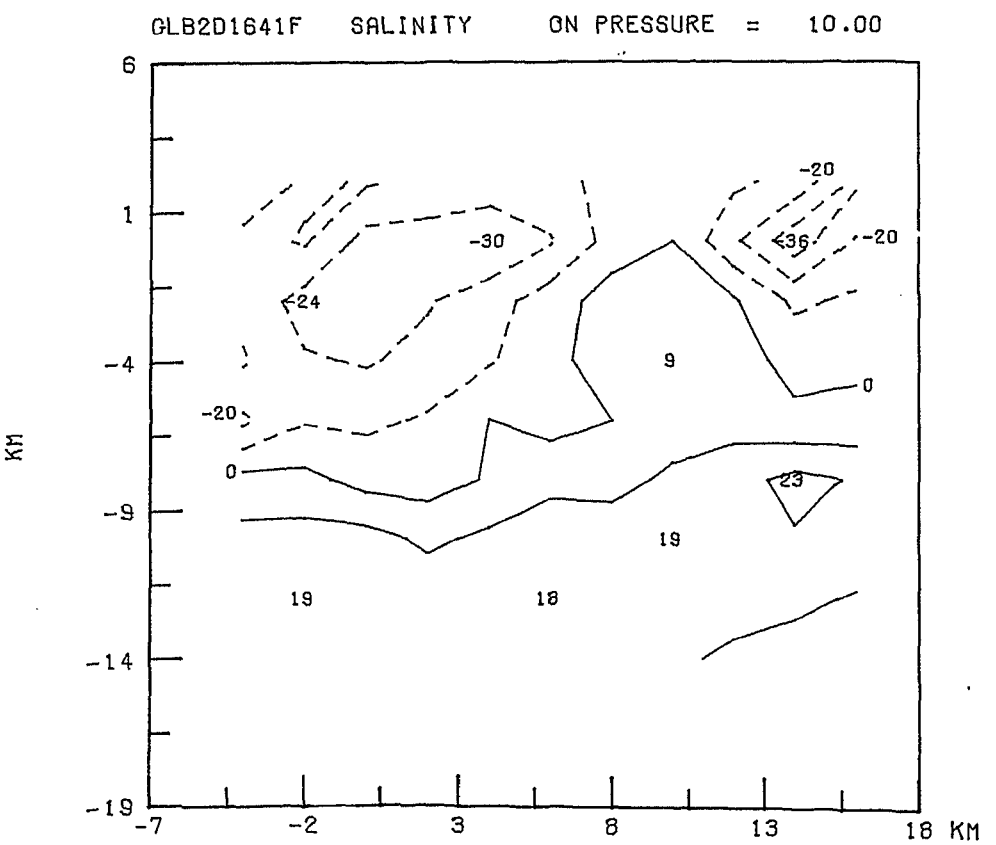
The surface interval is 1 dbar and the grid spacing in the objective analysis was 2 km. The maps have a scale of 1 : 250 000.

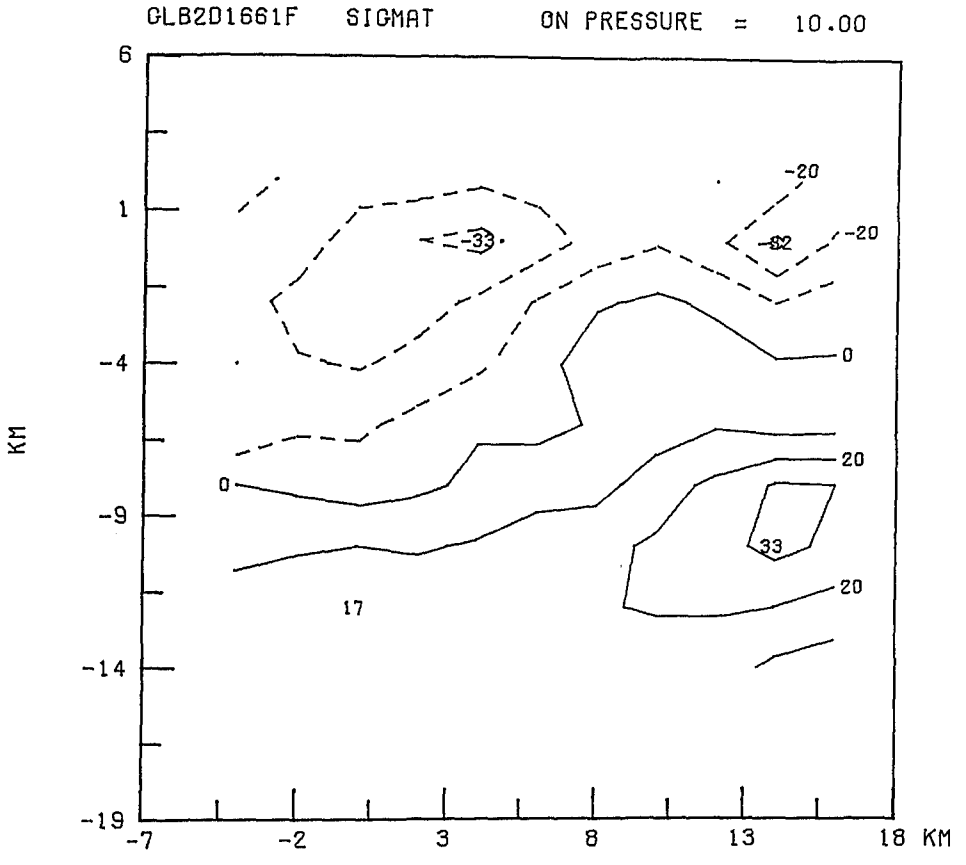
The mean values are given in the following table.

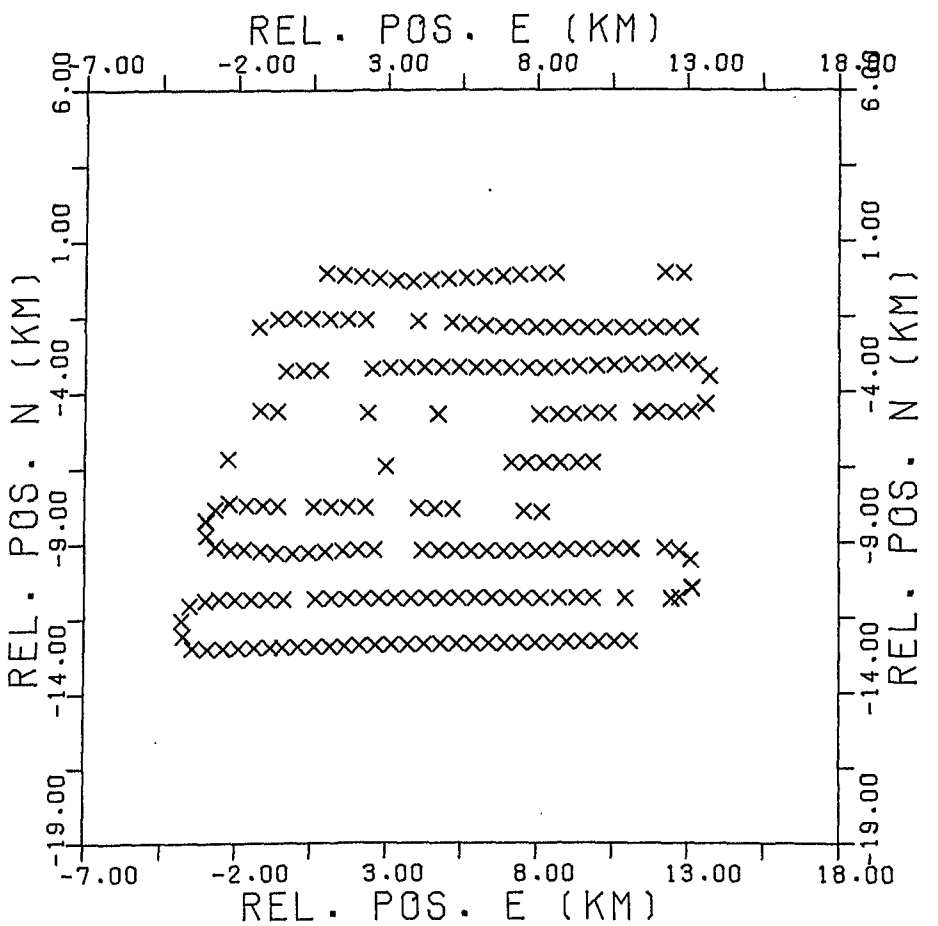
Table of subtracted mean values

Filename:	GLB2D1651F	GLB2D1641F	GLB2D1661F
Pressure dbar	$\bar{\theta}$ [°C]	$\bar{s}$ [ppt]	$\bar{\sigma}_t$
10	26.865	35.591	23.225
11	26.865	35.592	23.226
12	26.866	35.591	23.225
13	26.867	35.591	23.225
14	26.868	35.592	23.225
15	26.870	35.592	23.224
16	26.872	35.593	23.224
17	26.875	35.594	23.224
18	26.878	35.596	23.225
19	26.881	35.597	23.224
20	26.884	35.599	23.224
21	26.889	35.602	23.225
22	26.894	35.607	23.227
23	26.899	35.613	23.230
24	26.897	35.623	23.238

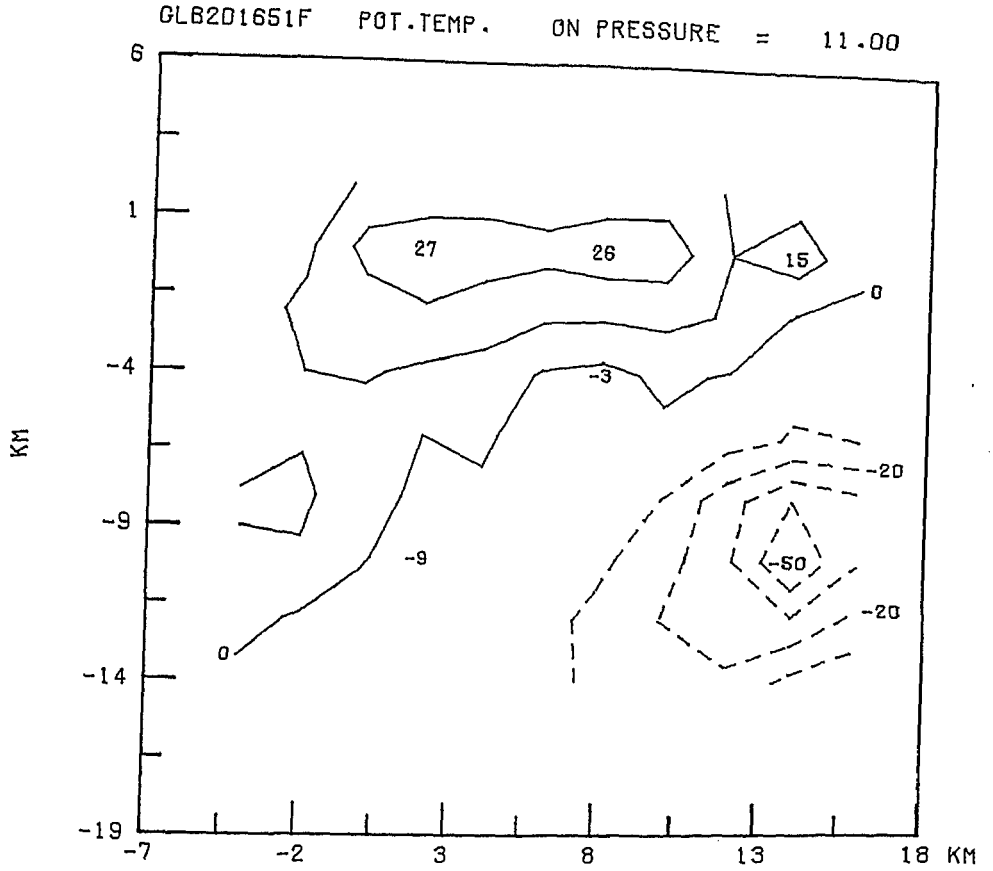

GLB2D1651F POT.TEMP. ON PRESSURE = 10.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
27
30
12
0
10
-8
0
-20
-48
-20
-20
-20

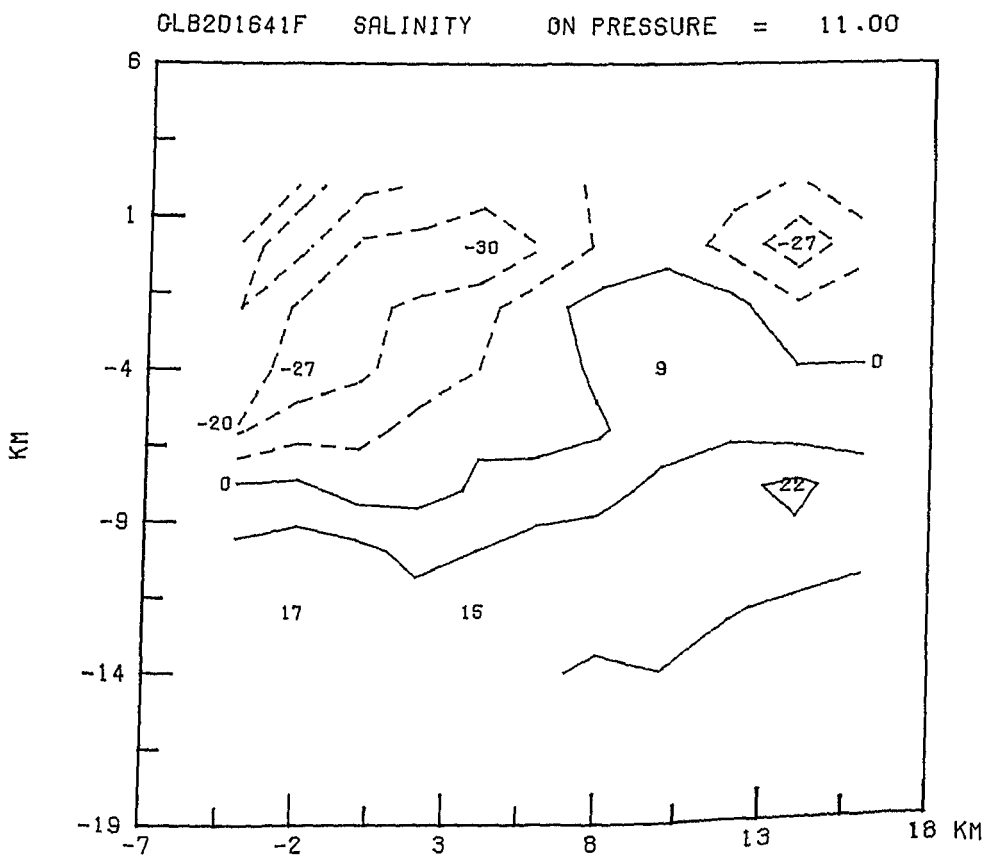

GLB2D1641F SALINITY ON PRESSURE = 10.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-30
-36
-20
-24
9
0
-20
0
23
19
19
18



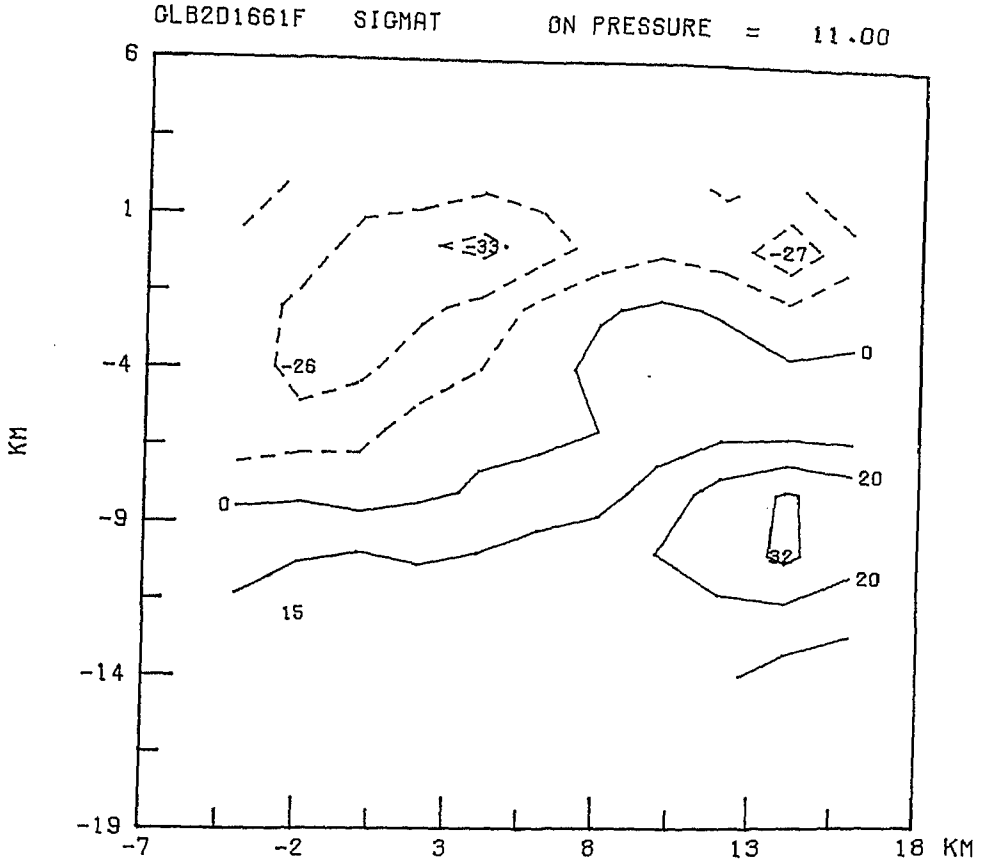


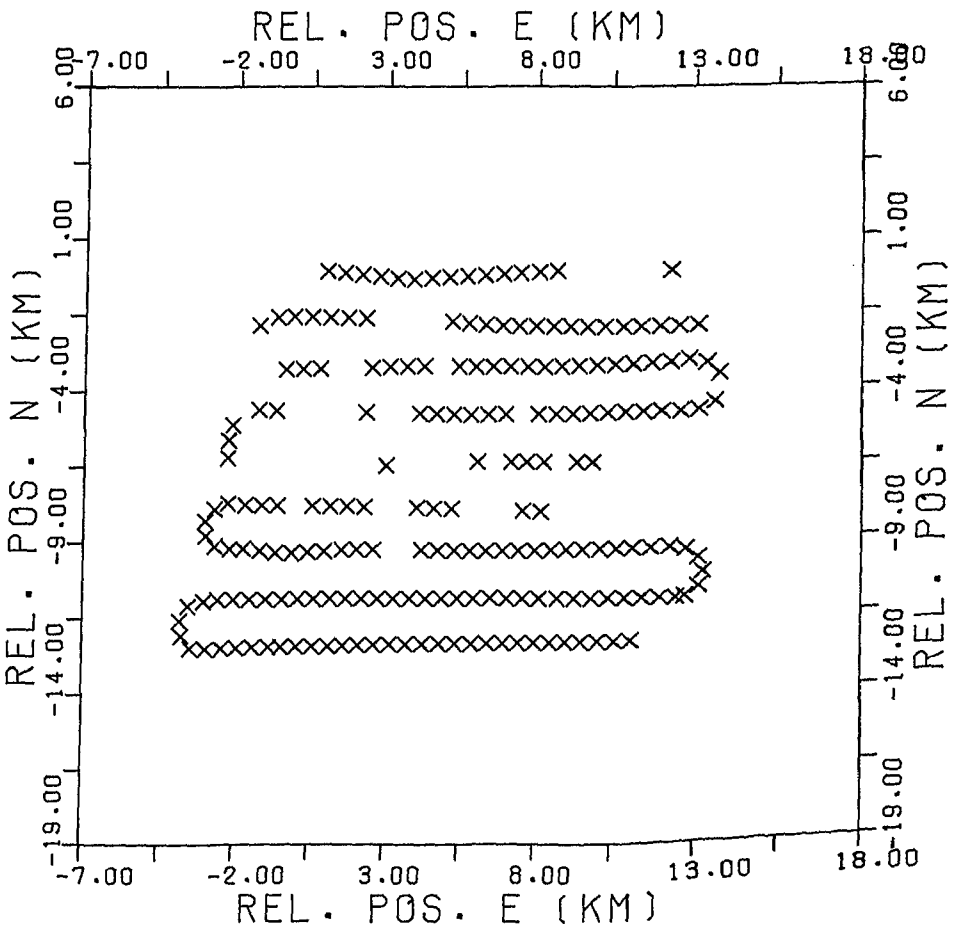
-Isobaric Maps (Density and Positions) -



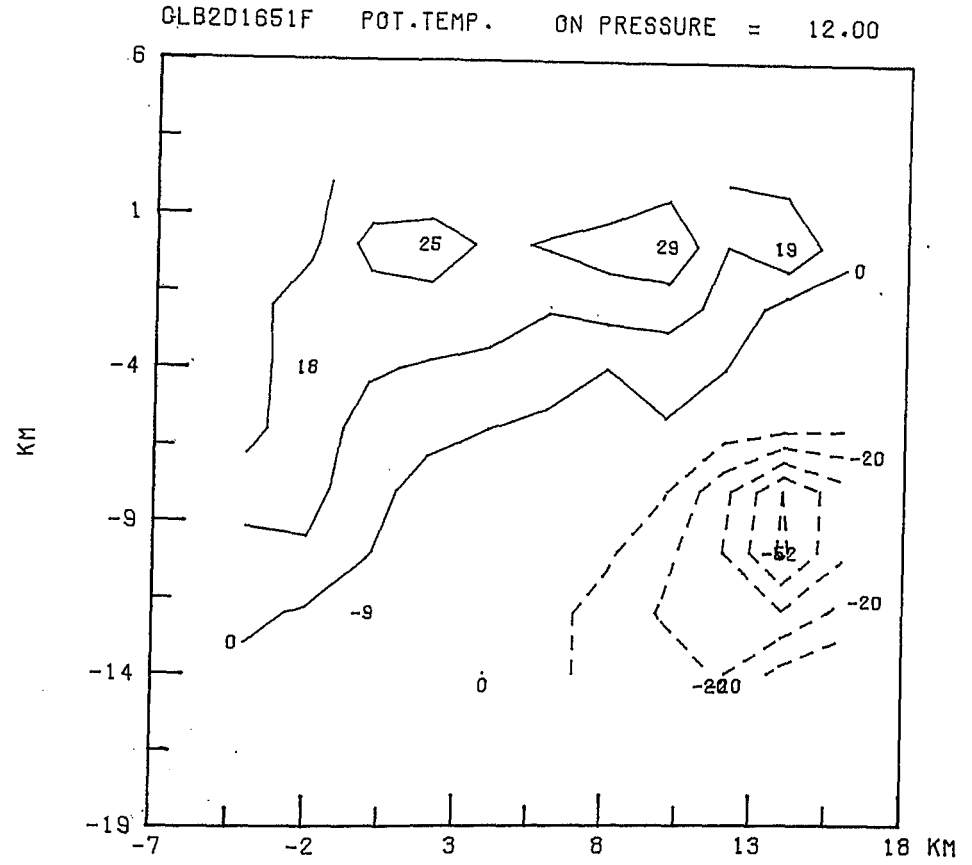


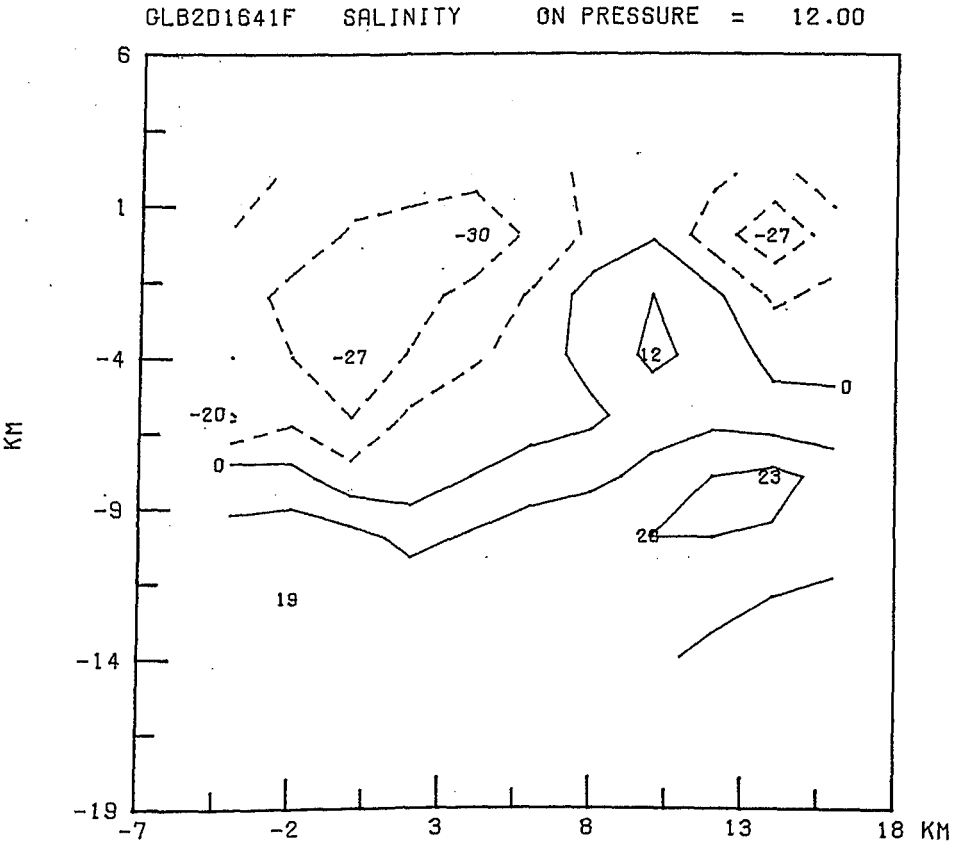
-Isobaric Maps (Pot. Temp. and Salinity) -

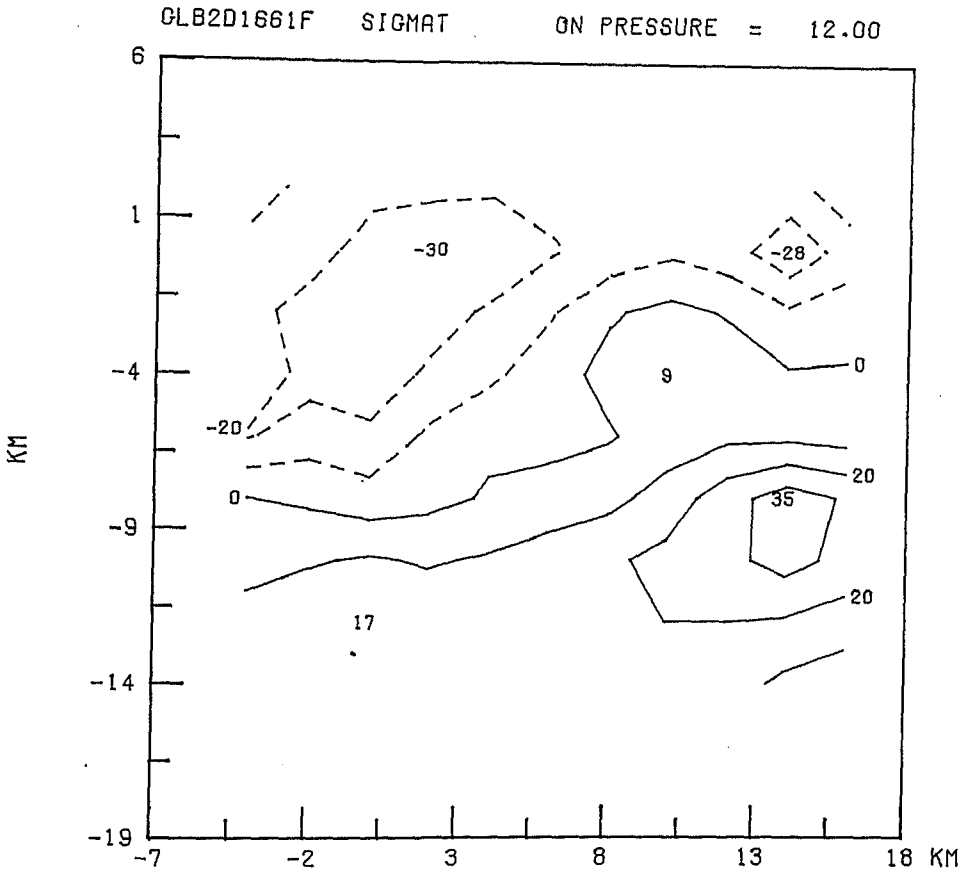


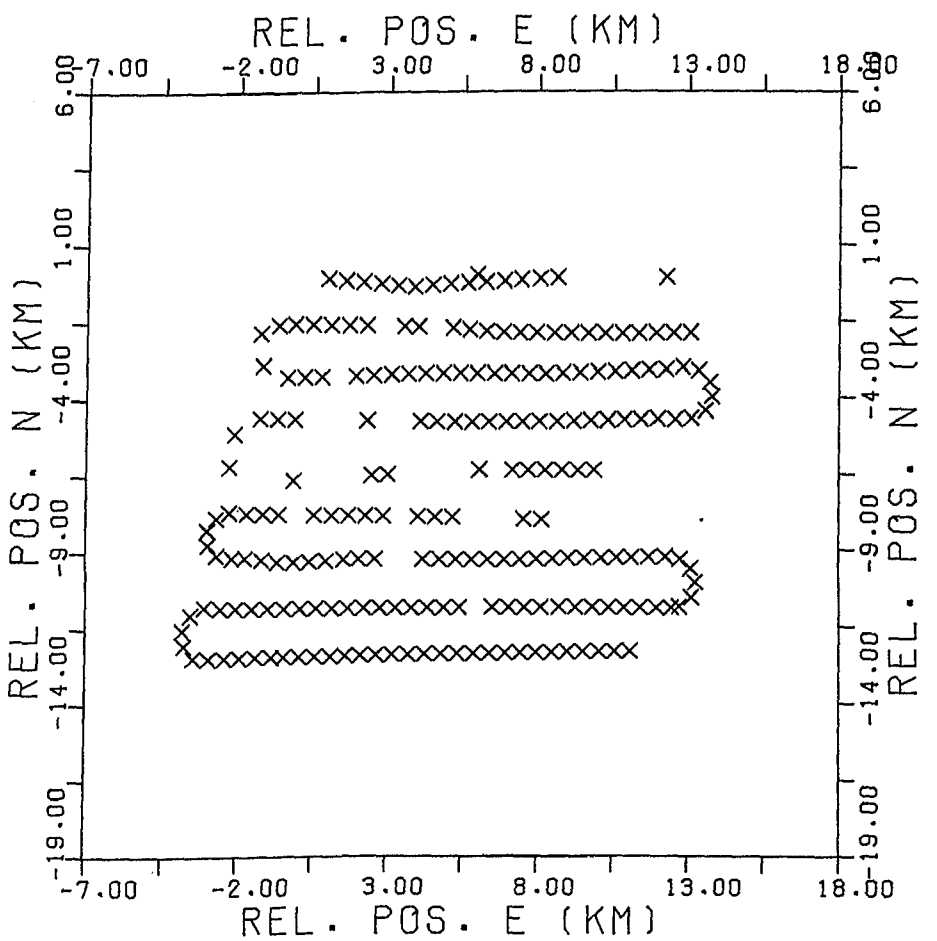


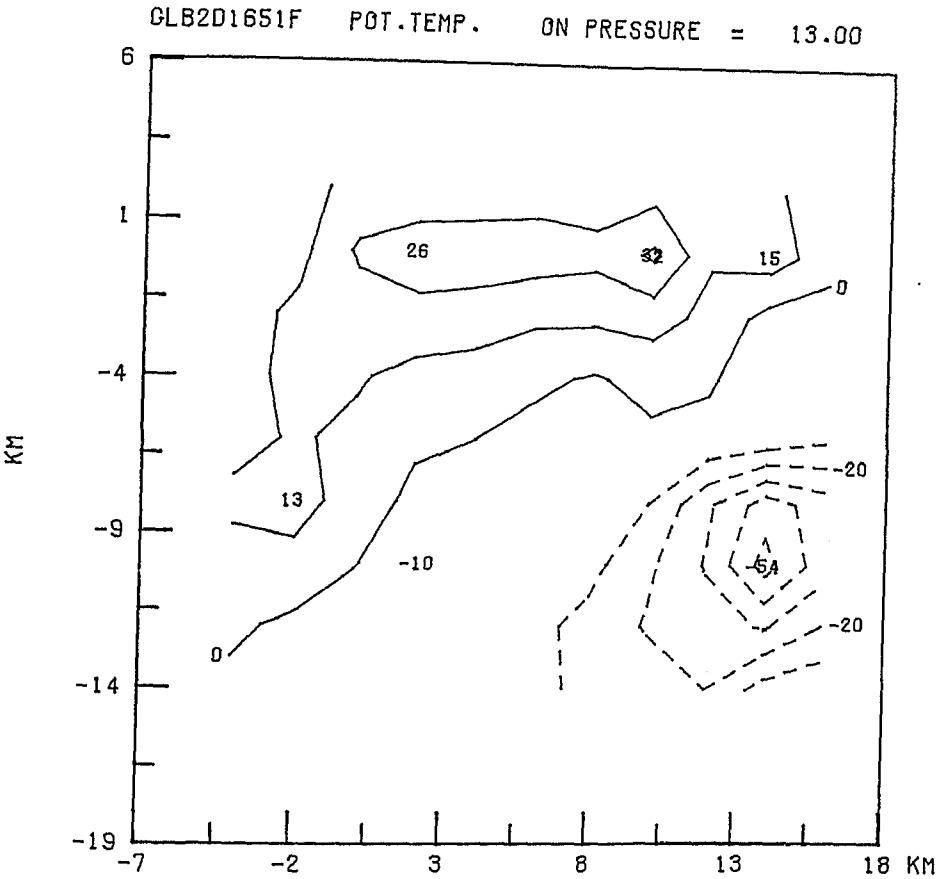
-Isobaric Maps (Density and Positions) -

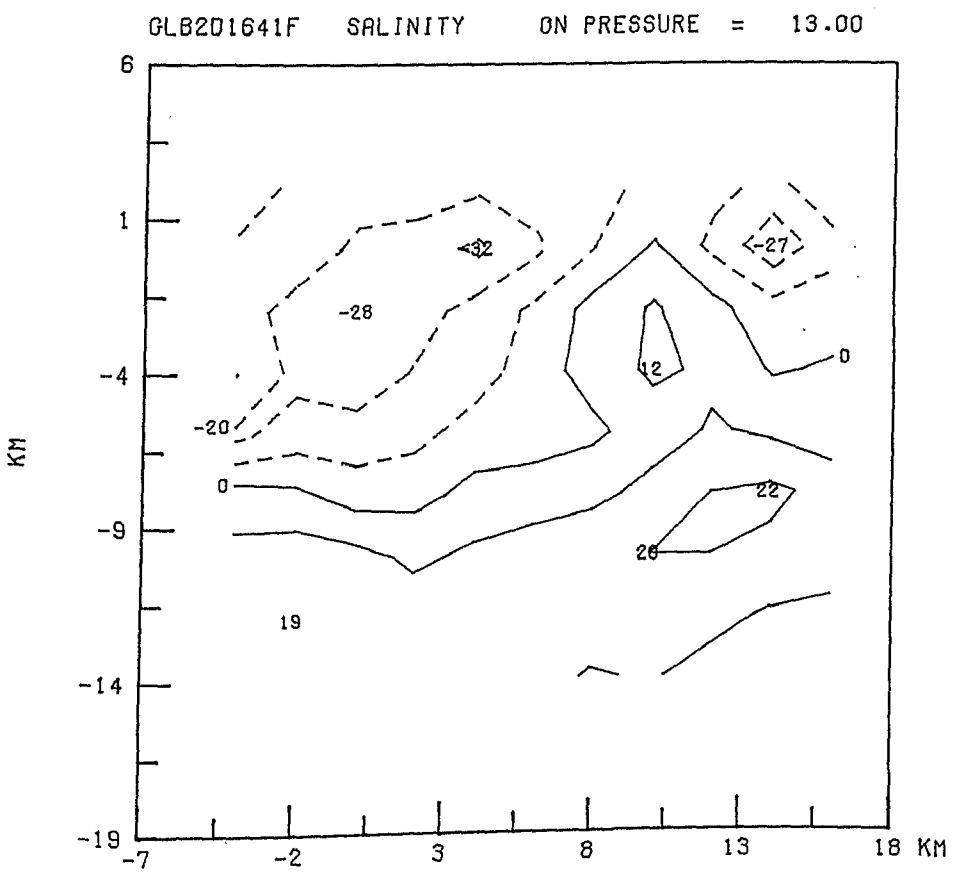

GLB2D1651F POT.TEMP. ON PRESSURE = 12.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
25
29
19
0
18
-20
-9
-20
0
-20


GLB2D1641F SALINITY ON PRESSURE = 12.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-30
-27
-27
12
0
-20
0
23
19

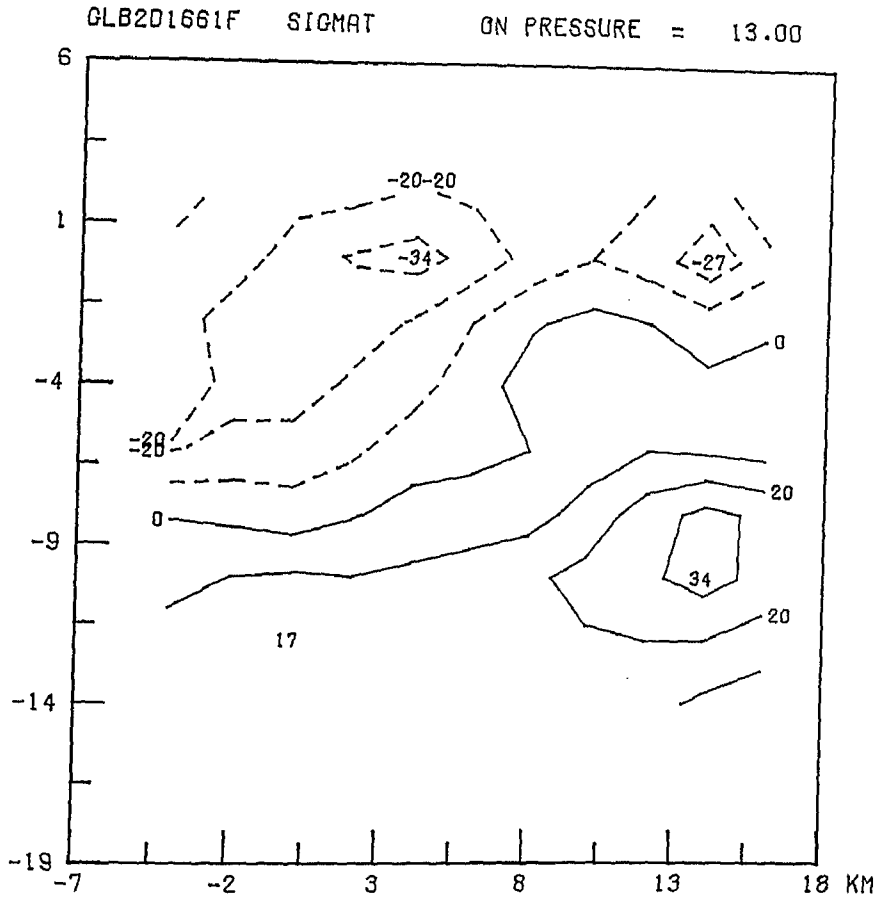

CLB2D1661F SIGMAT ON PRESSURE = 12.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-30
-28
-20
0
9
0
20
35
20
17

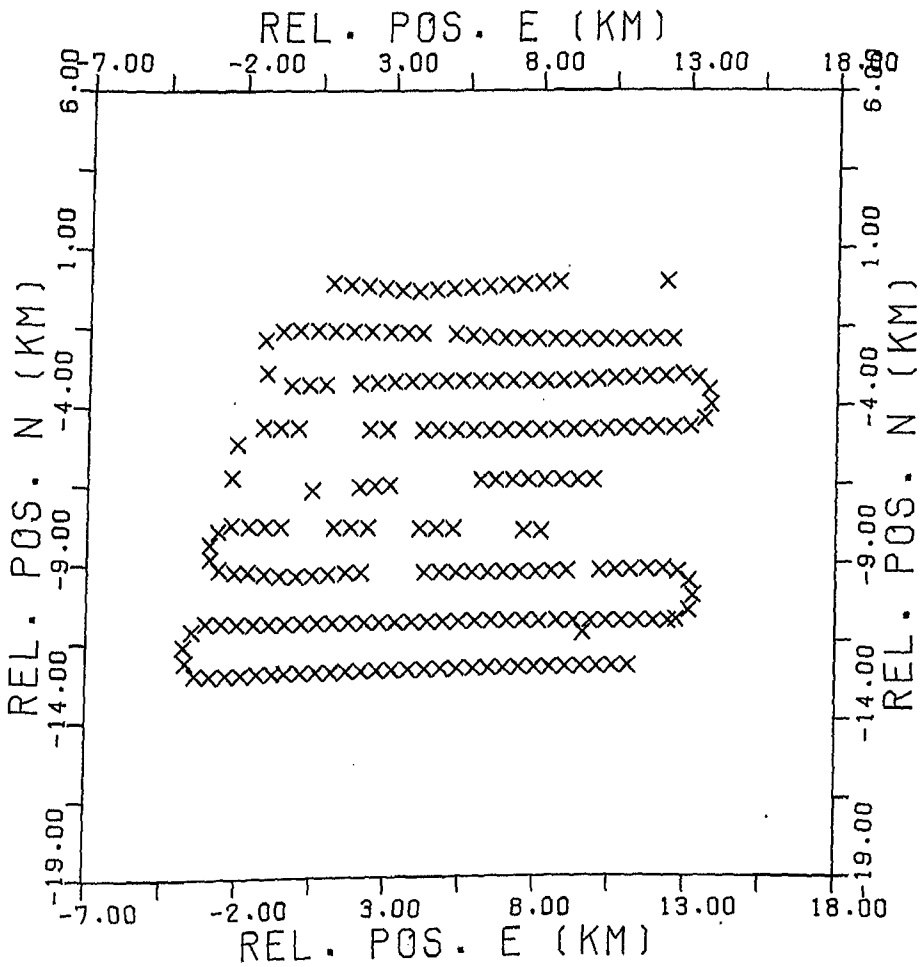

REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00



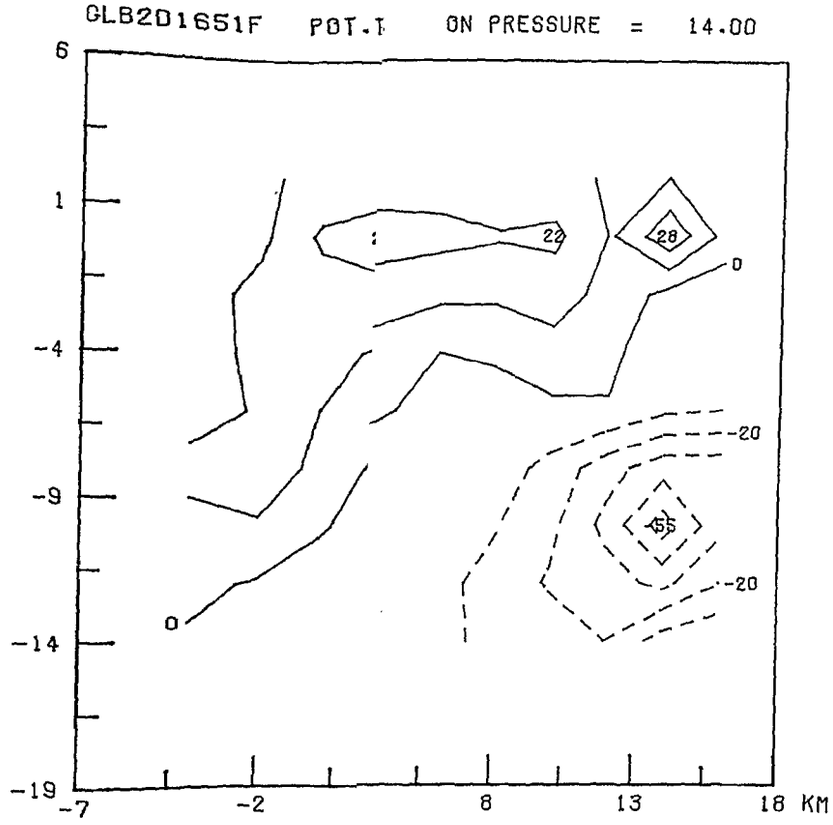


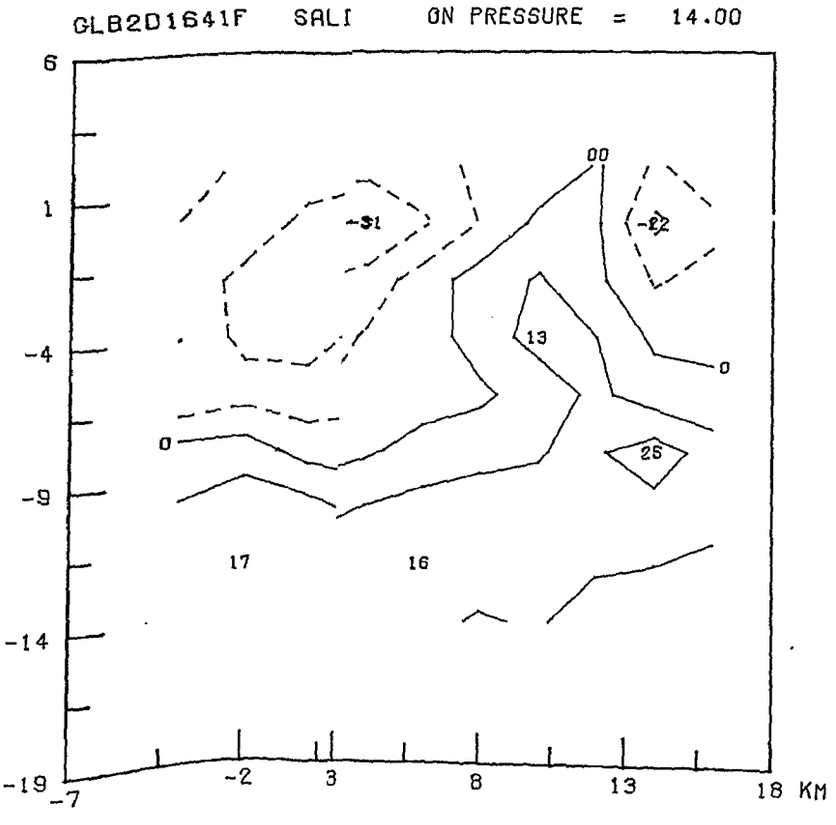
-Isobaric Maps (Pot. Temp. and Salinity)-



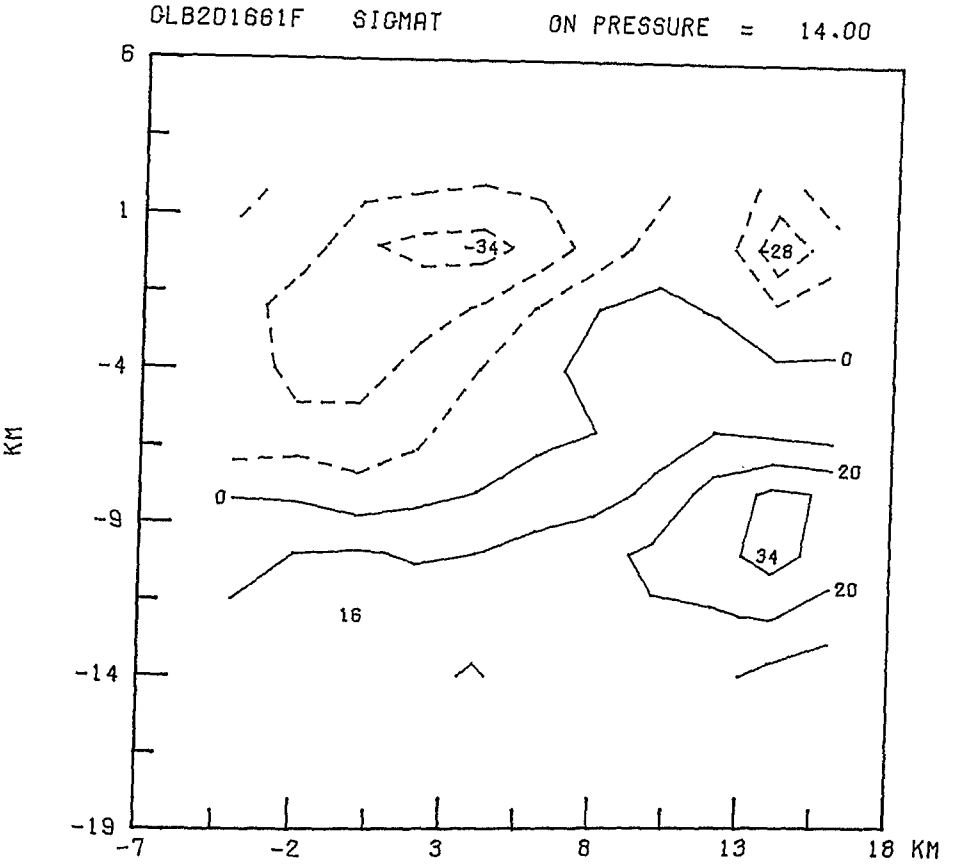


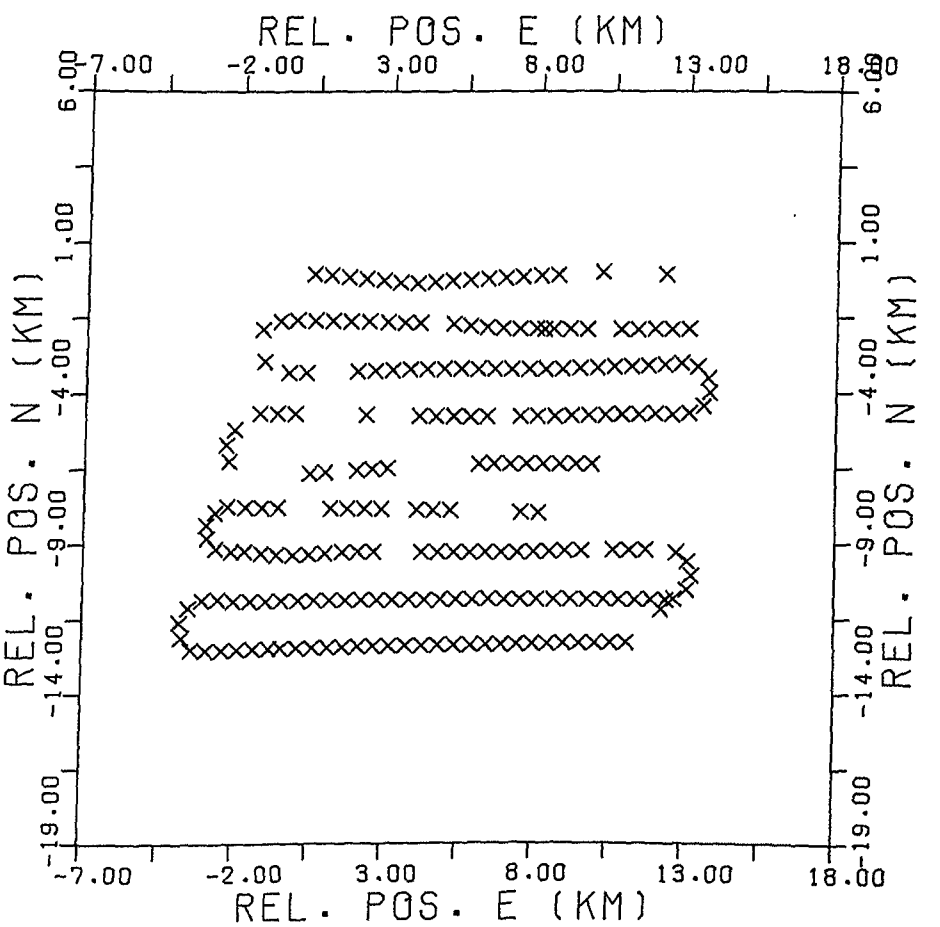
- Isobaric Maps (Density and Positions) -



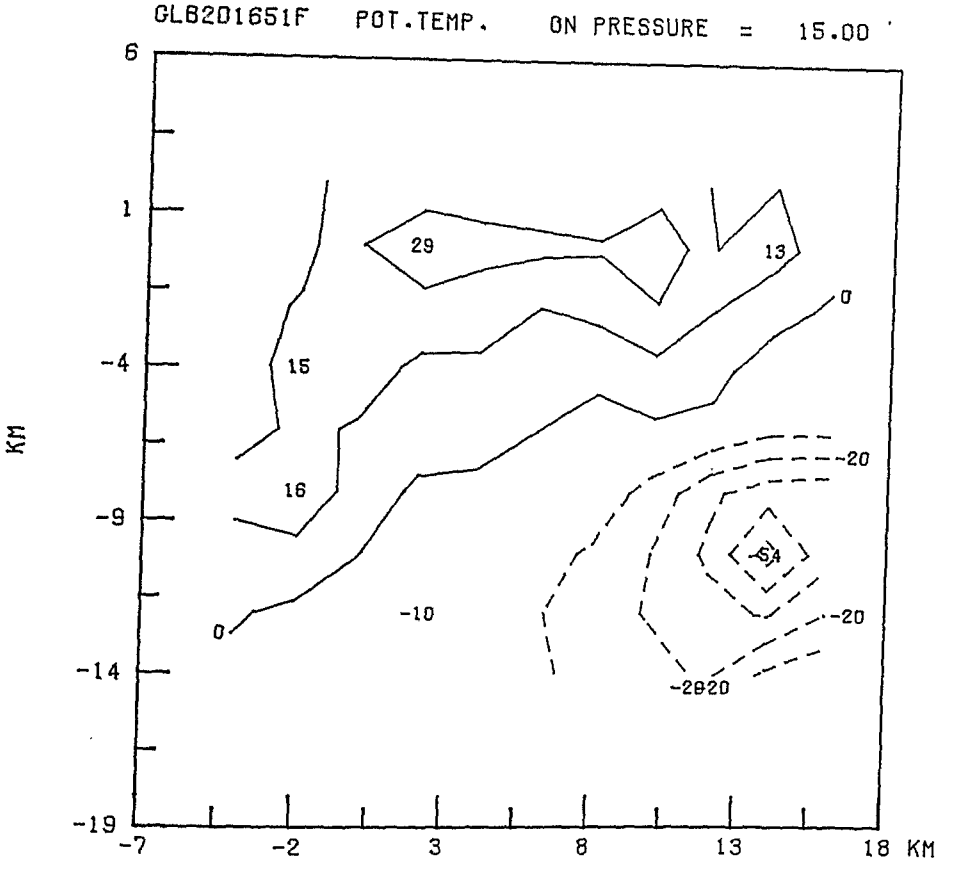


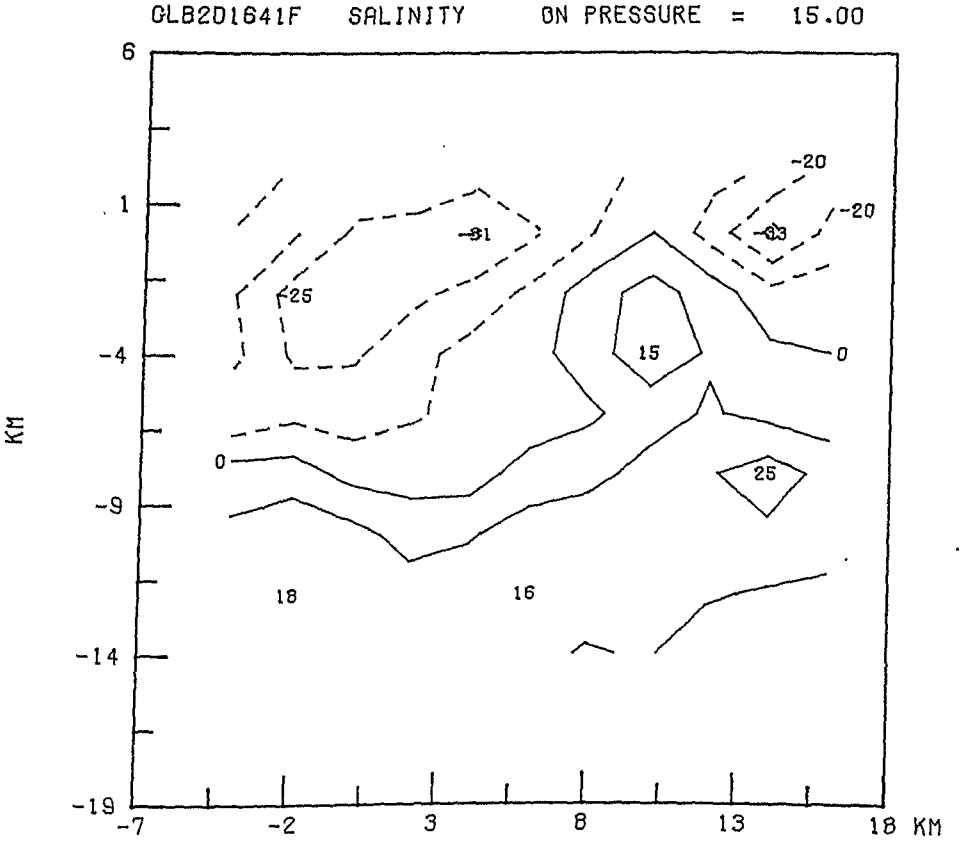
-Isobaric Maps (Pot. Temp. and Salinity)-



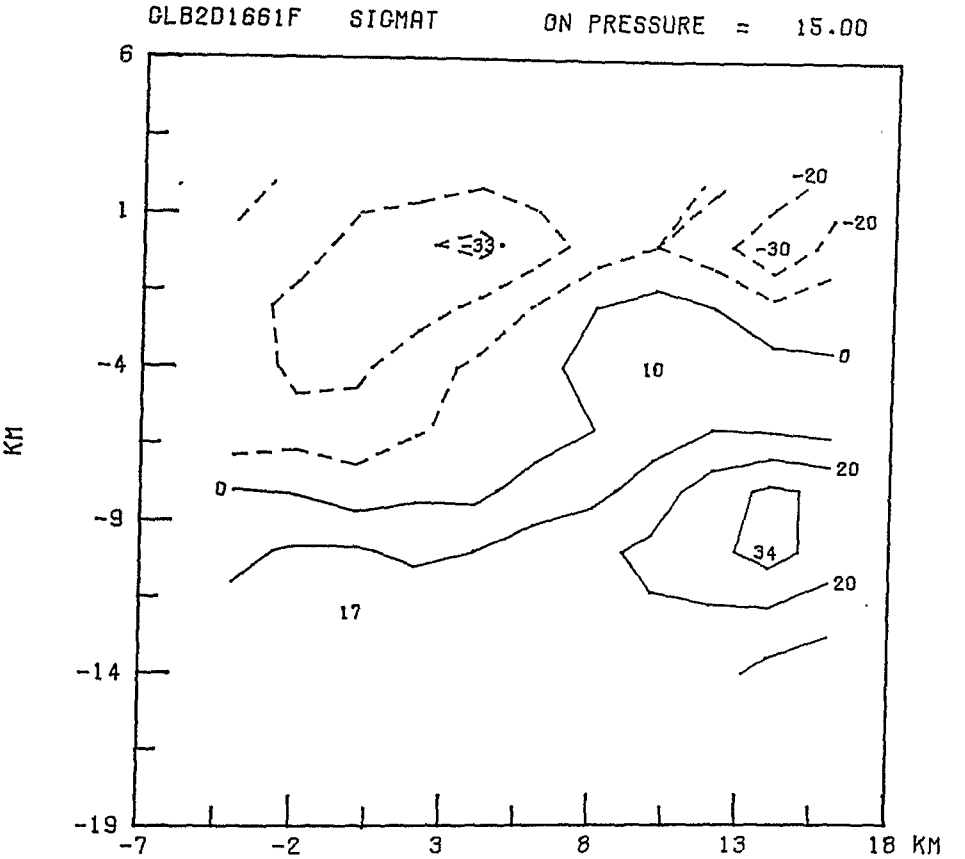


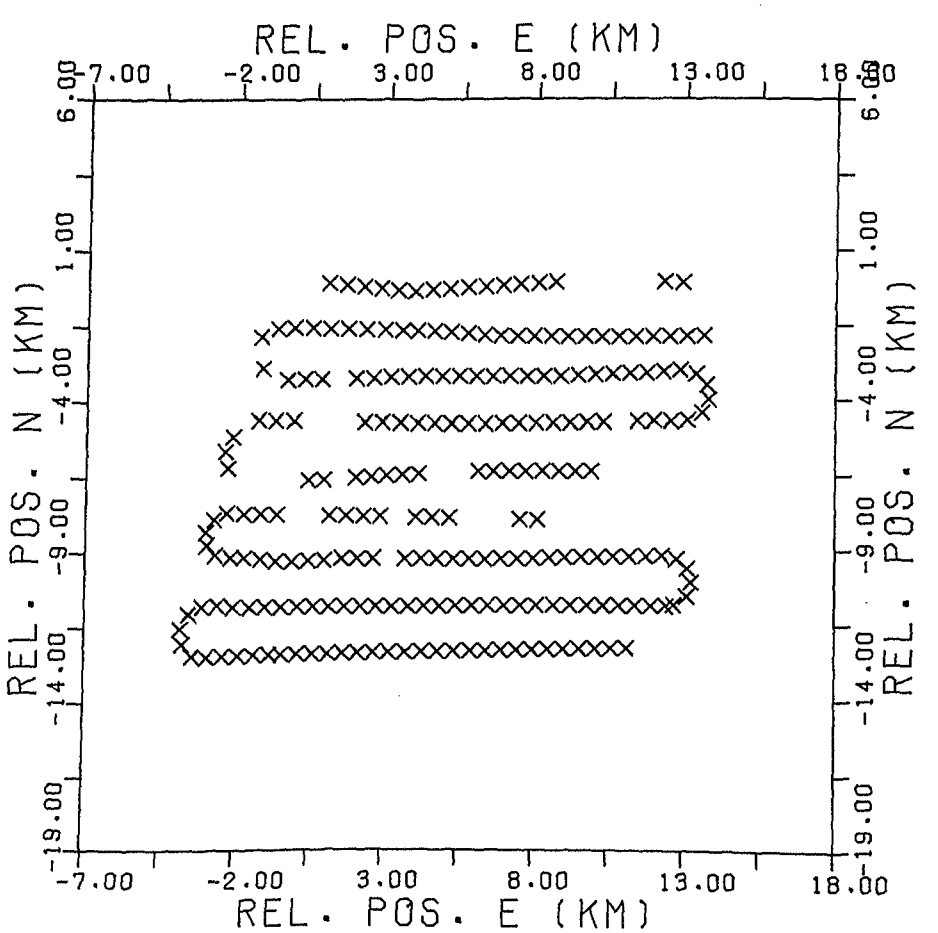
- Isobaric Maps (Density and Positions) -

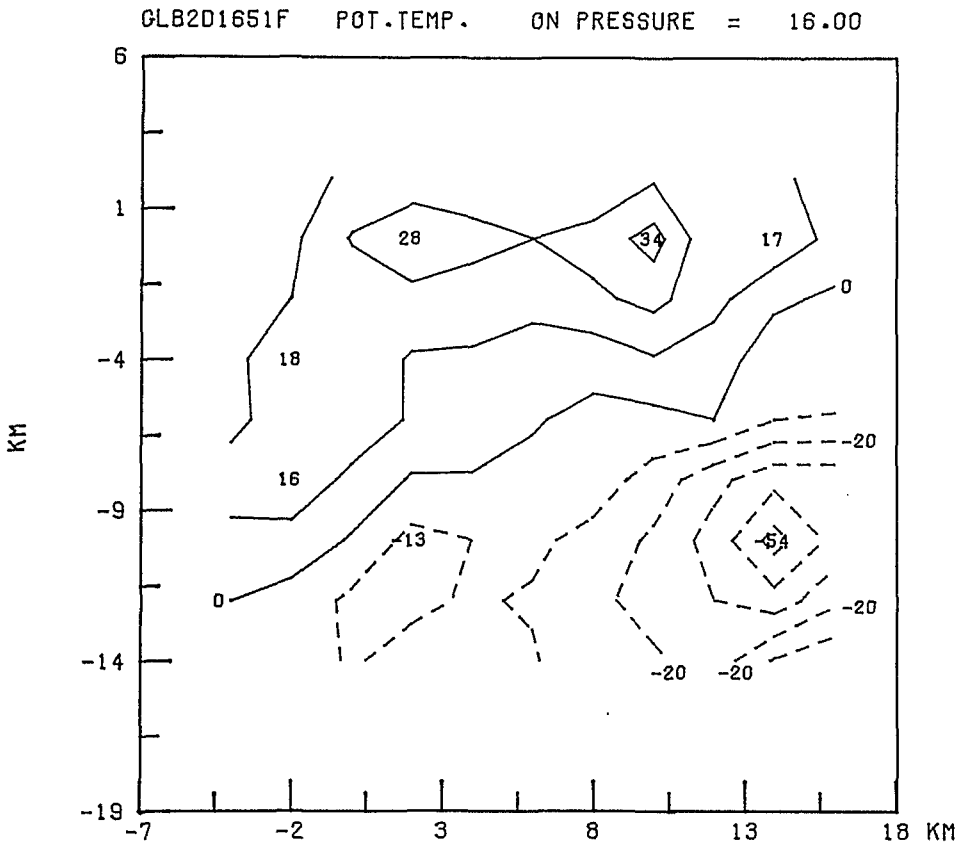


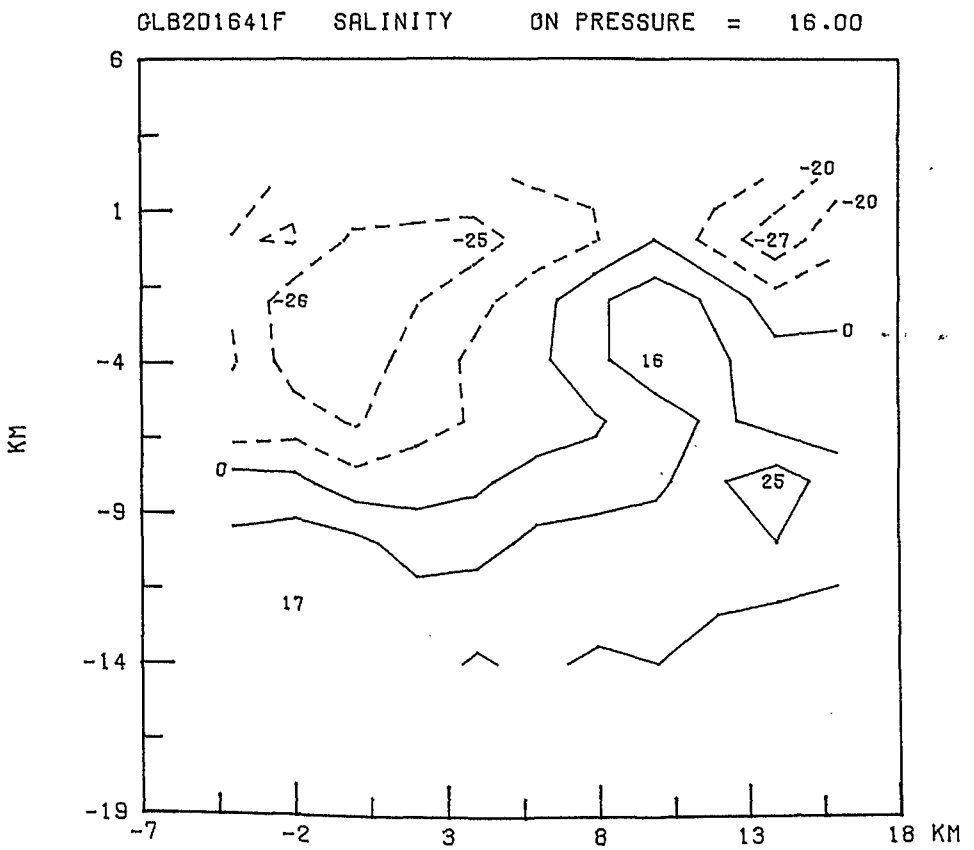


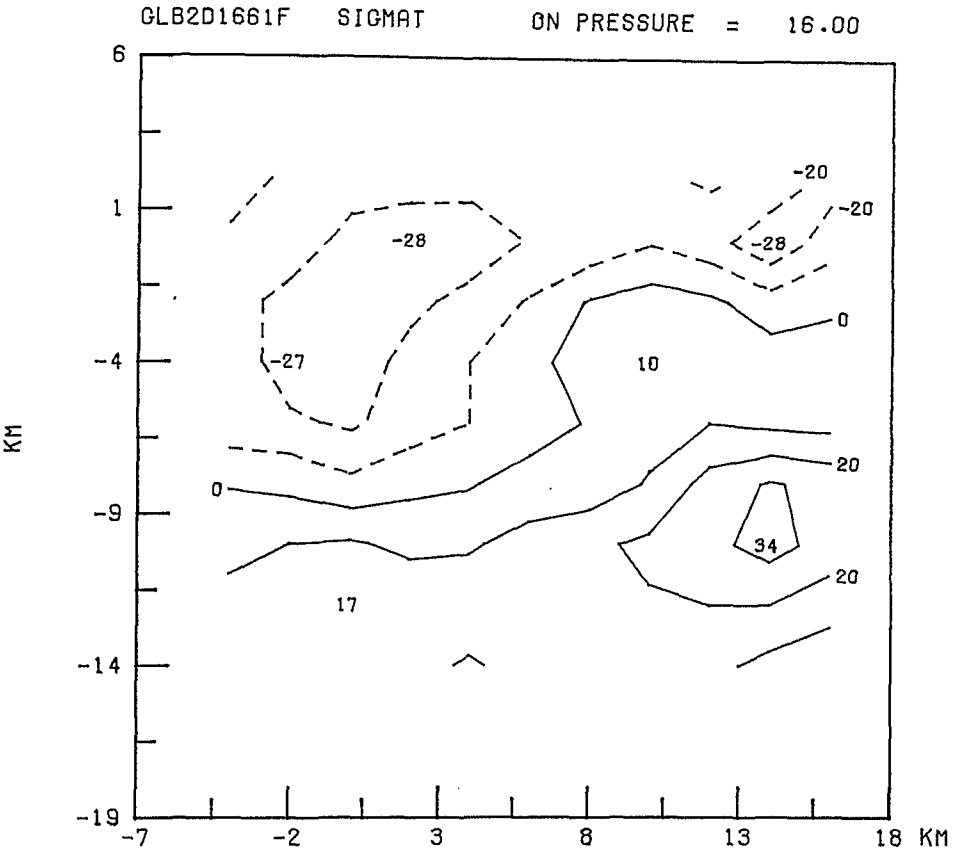
-Isobaric Maps (Pot. Temp. and Salinity) -

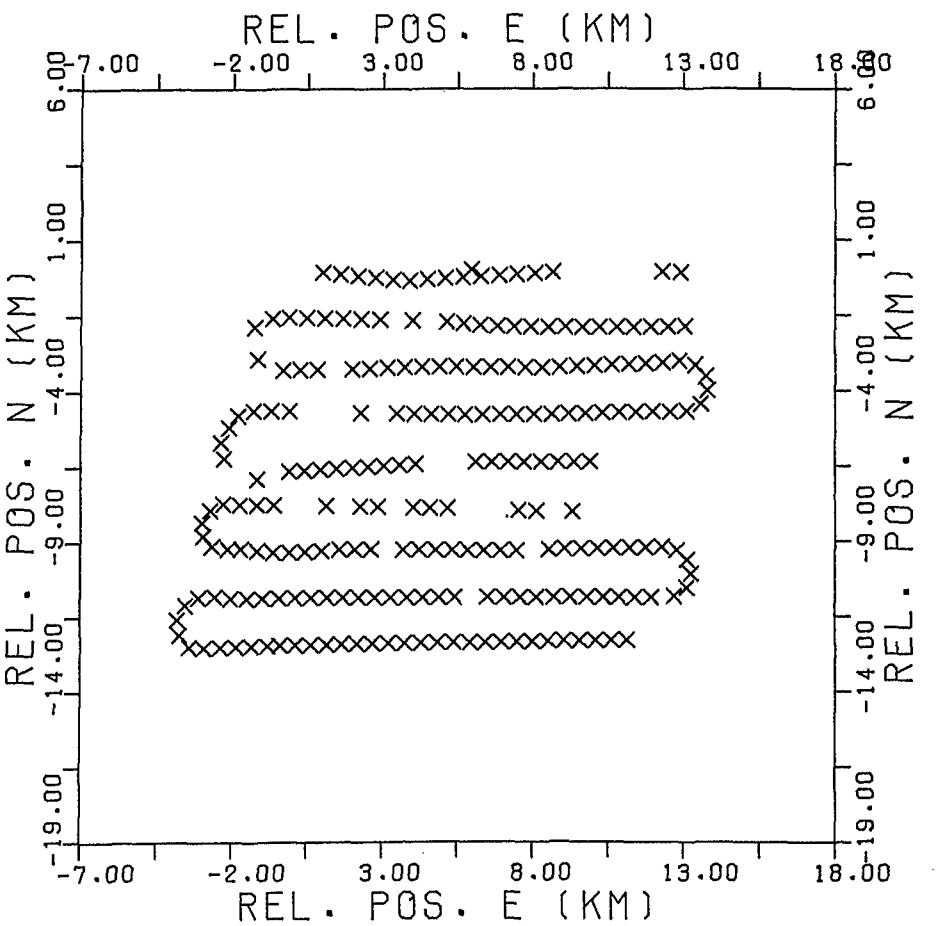

GLB2D1661F SIGMAT ON PRESSURE = 15.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-20
-30
-33
0
10
0
20
34
20
17


REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00


GLB2D1651F POT.TEMP. ON PRESSURE = 16.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
28
34
17
0
18
16
-20
-13
-54
0
-20
-20
-20


GLB2D1641F SALINITY ON PRESSURE = 16.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-20
-25
-27
-26
0
16
0
25
17


GLB2D1661F SIGMAT ON PRESSURE = 16.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-20
-28
-28
-27
0
10
20
0
34
20
17


REL. POS. E (KM)
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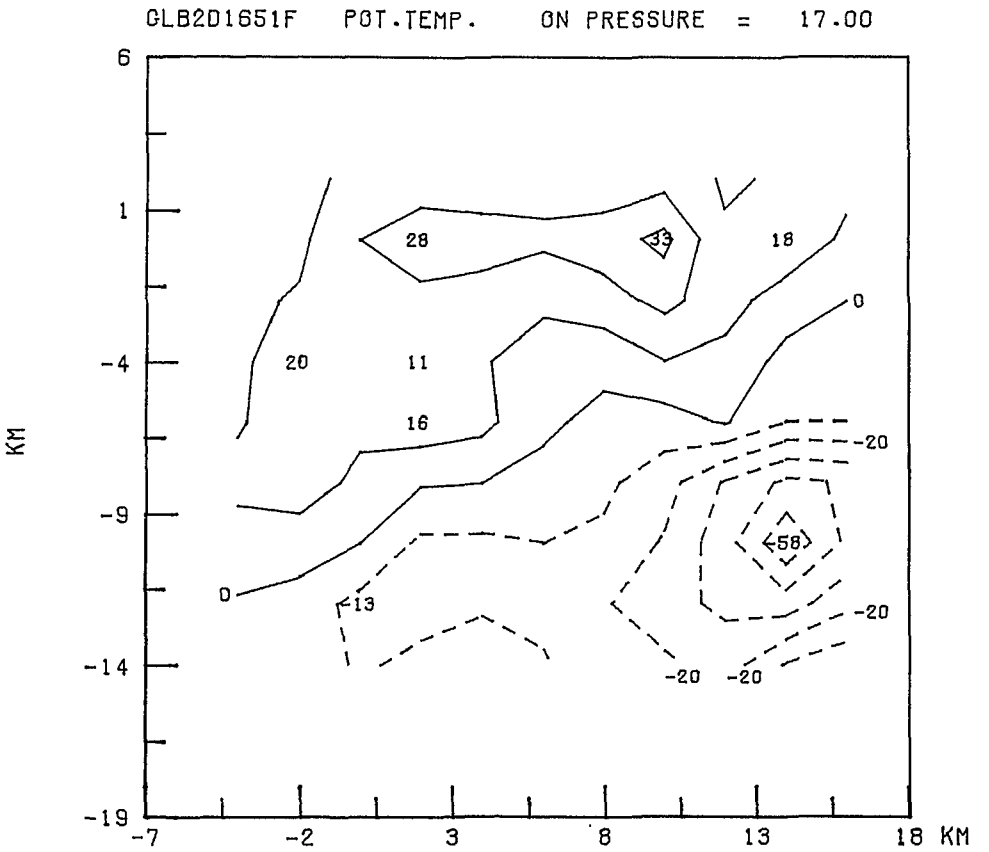
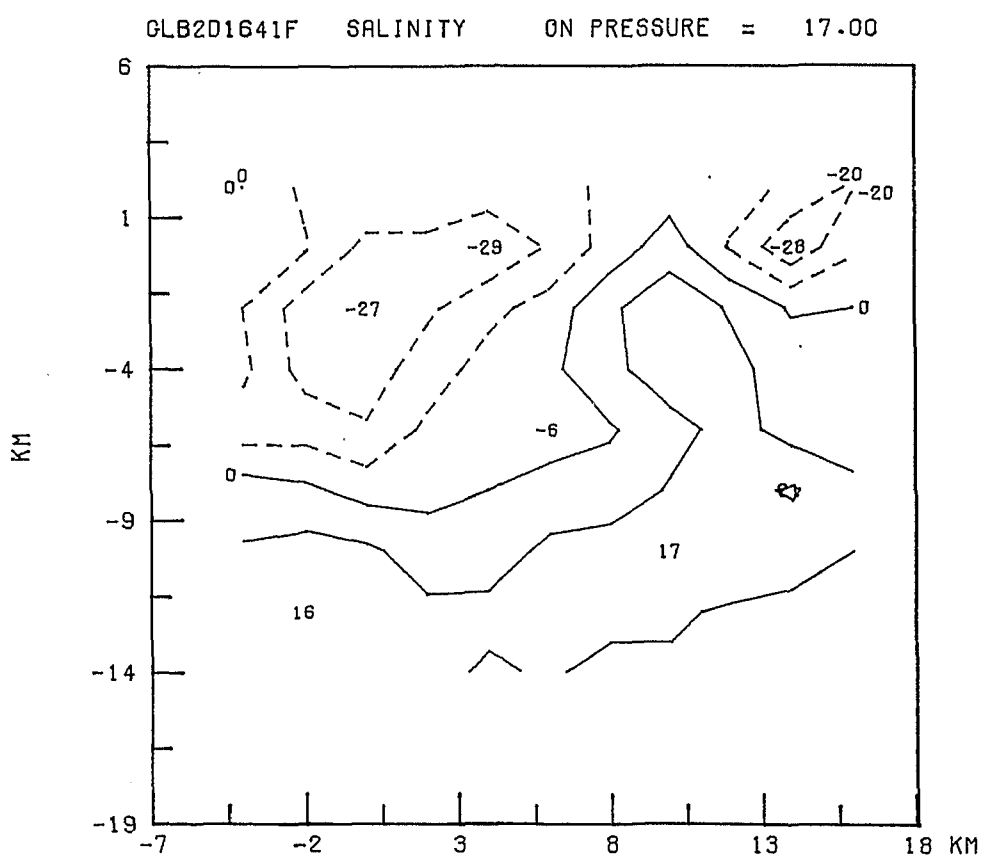
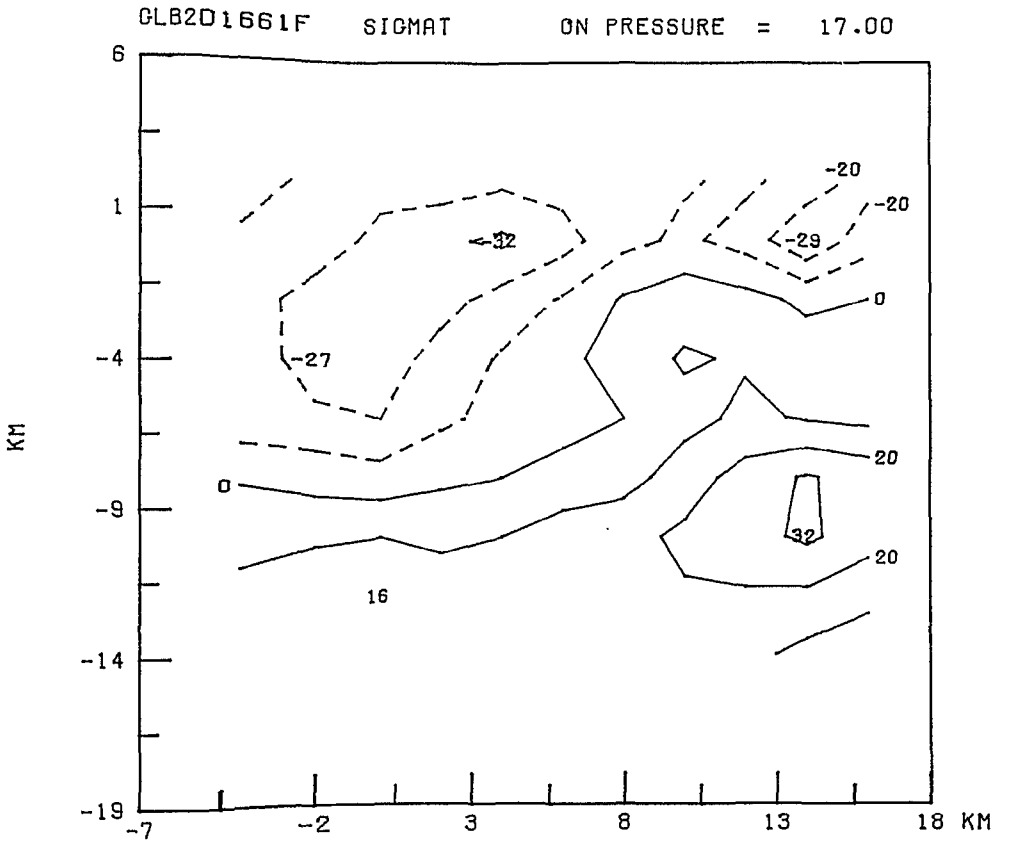
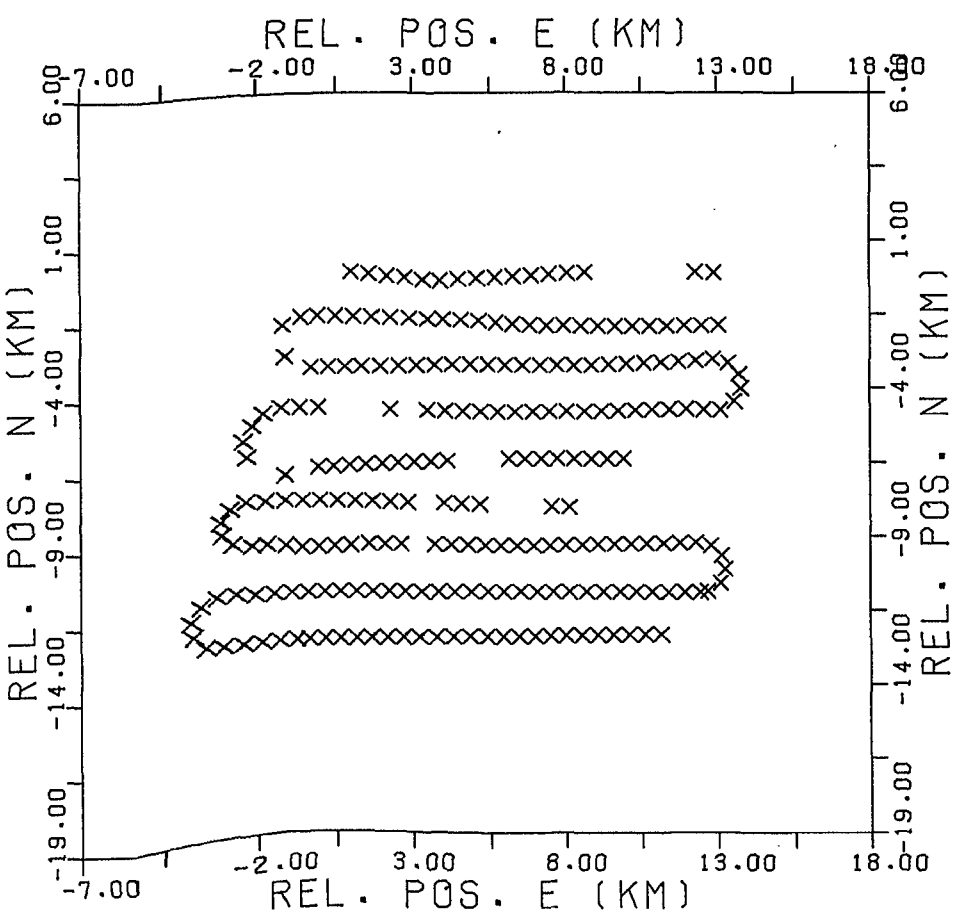
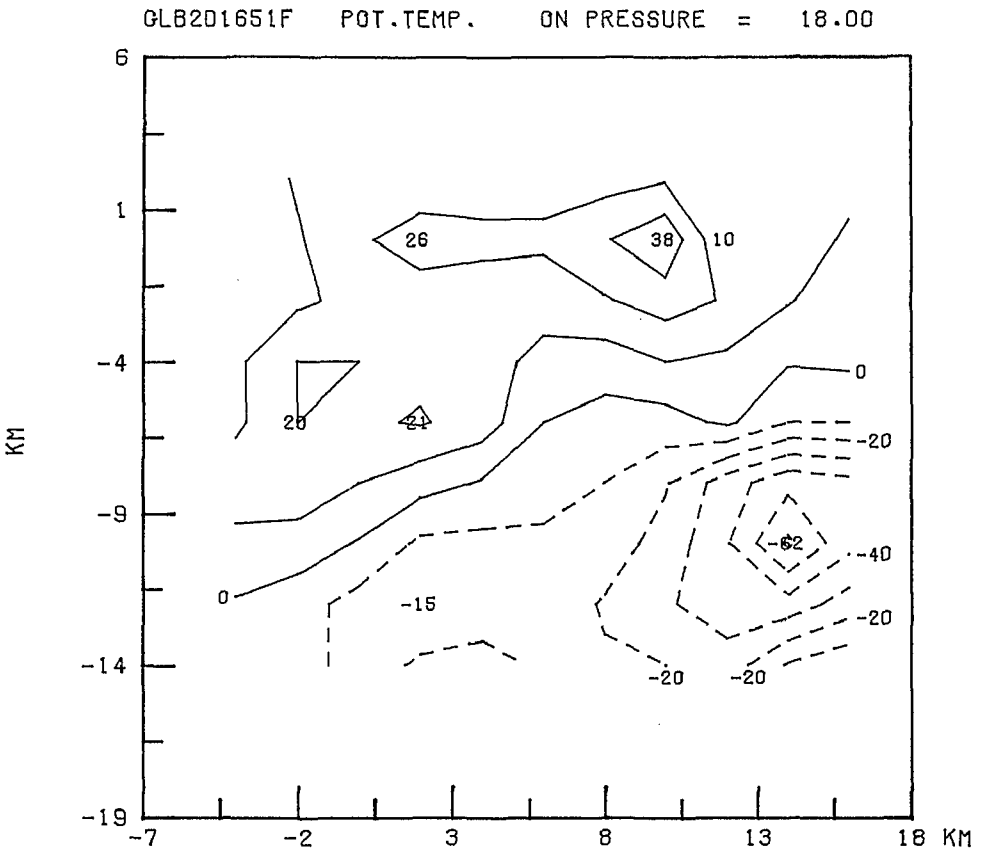
3.00
8.00
13.00
18.00
6.00
1.00
-4.00
-9.00
-14.00
-19.00
REL. POS. N (KM)

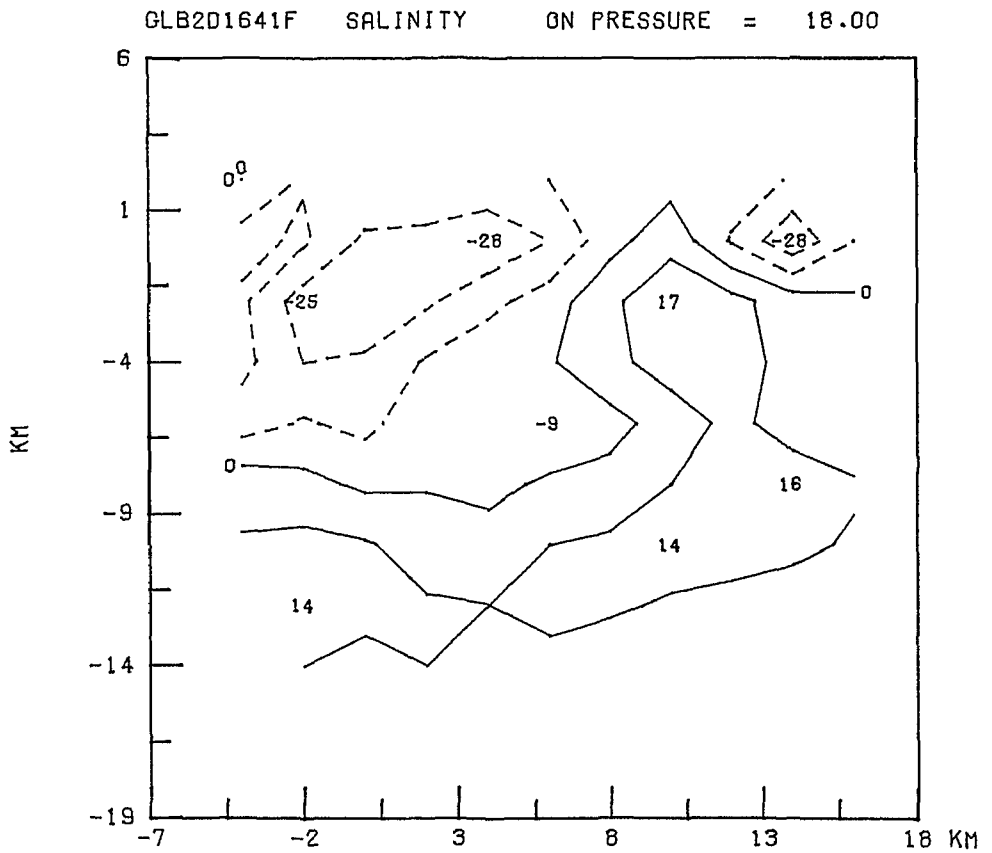

GLB2D1651F POT.TEMP. ON PRESSURE = 17.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
28
33
18
0
20
11
16
-20
58
0
13
-20
-20
-20

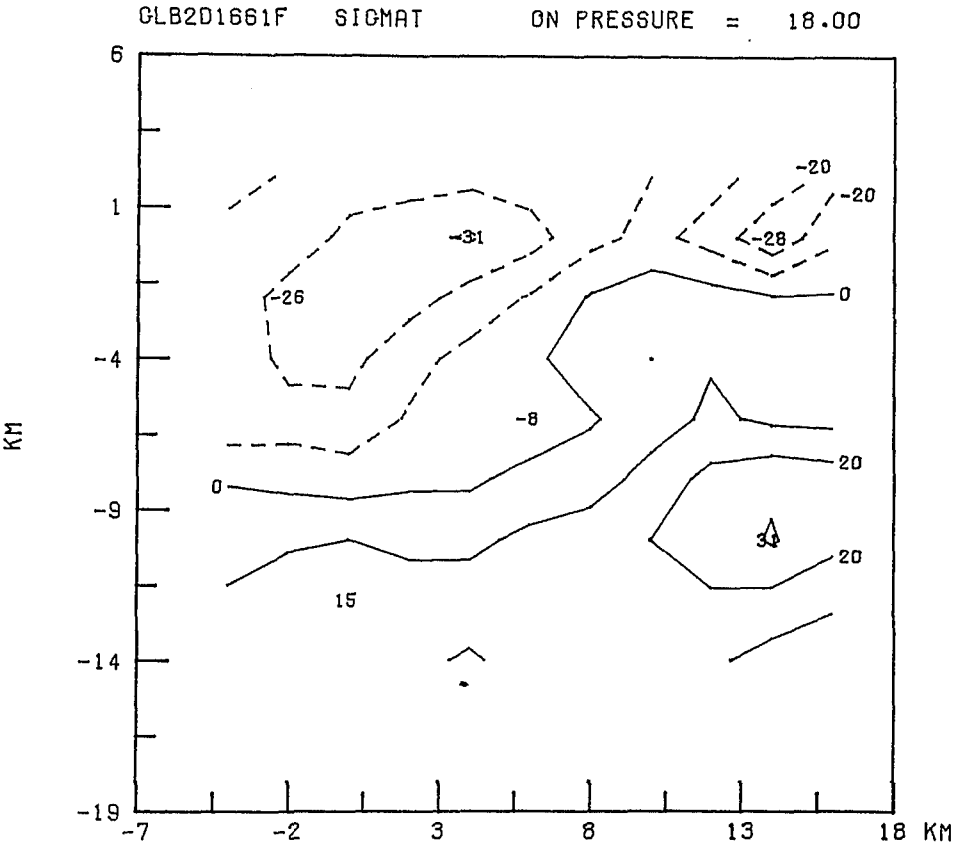

GLB2D1641F SALINITY ON PRESSURE = 17.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
0
0
-20
-20
-29
-28
-27
0
-6
0
17
16

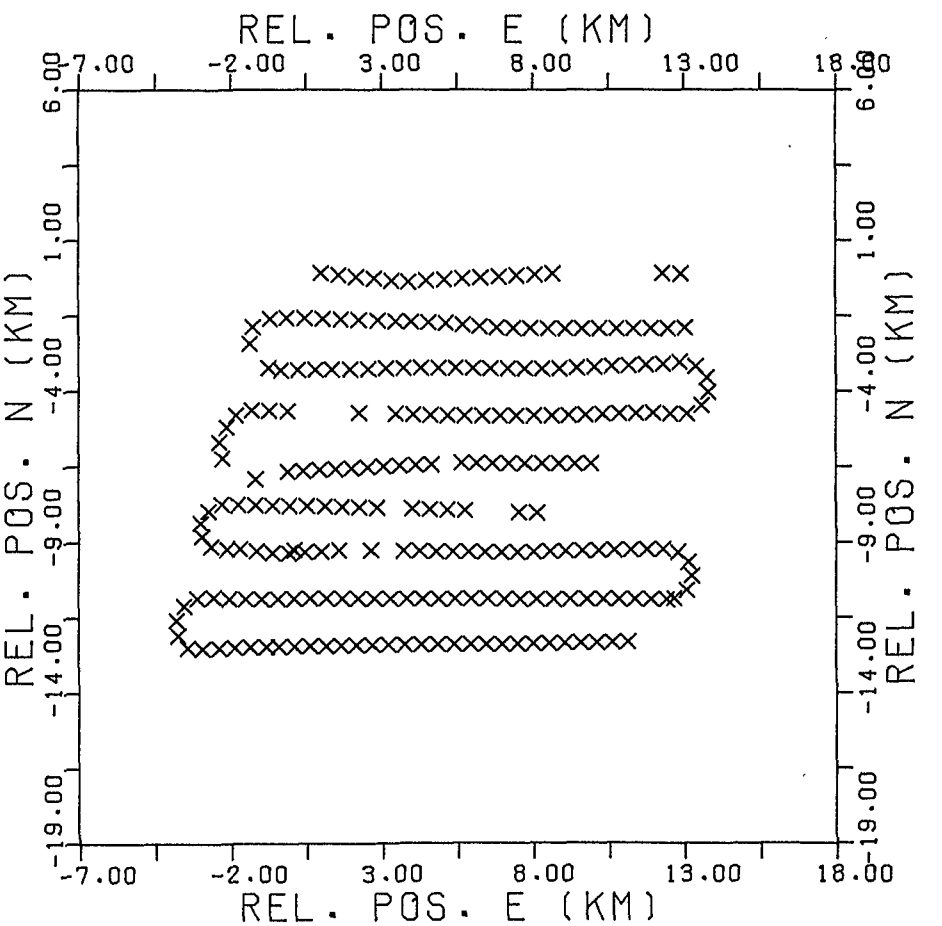

GL82D1661F SIGMAT ON PRESSURE = 17.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-20
-32
-29
0
-27
20
0
32
20
16


REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
6.00
1.00
-4.00
-9.00
-14.00
-19.00
REL. POS. N (KM)


GLB2D1651F POT.TEMP. ON PRESSURE = 18.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
26
38
10
0
20
21
-20
-62
-40
-15
-20
-20
-20
0


GLB2D1641F SALINITY ON PRESSURE = 18.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
0
-26
-28
25
17
0
-9
0
16
14
14


GLB2D1661F SIGMAT ON PRESSURE = 18.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-20
-31
-28
-26
0
-8
0
20
20
15


REL. POS. E (KM)
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3.00
8.00
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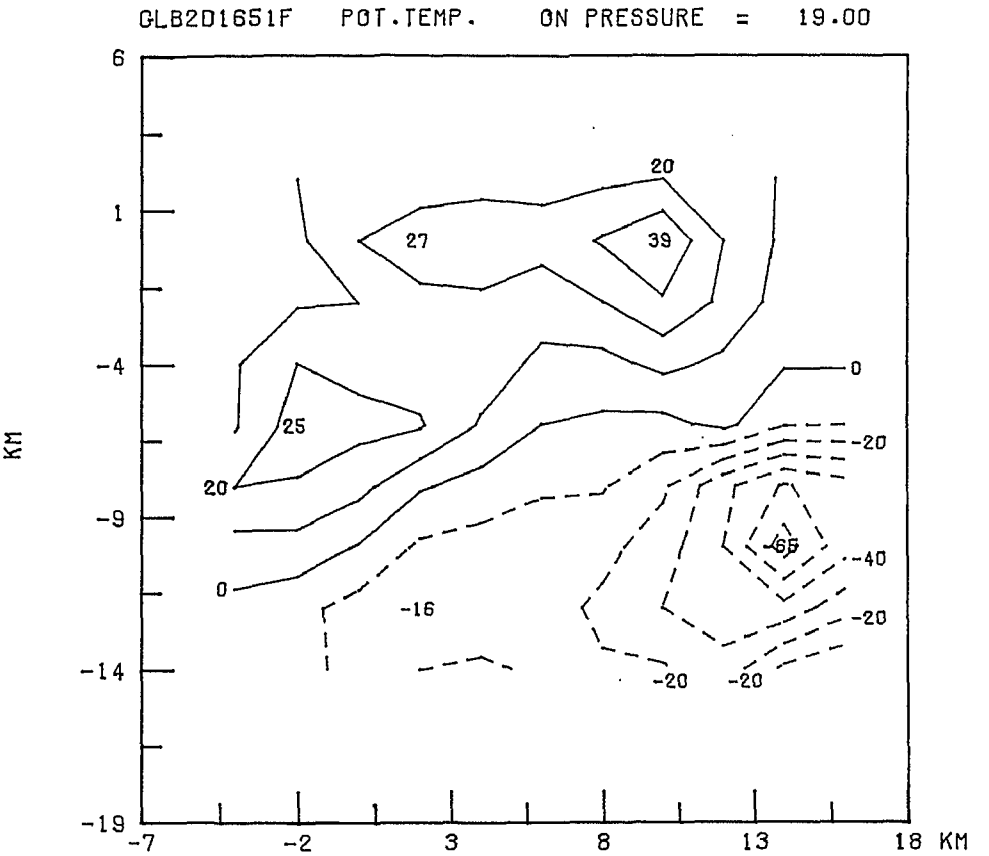
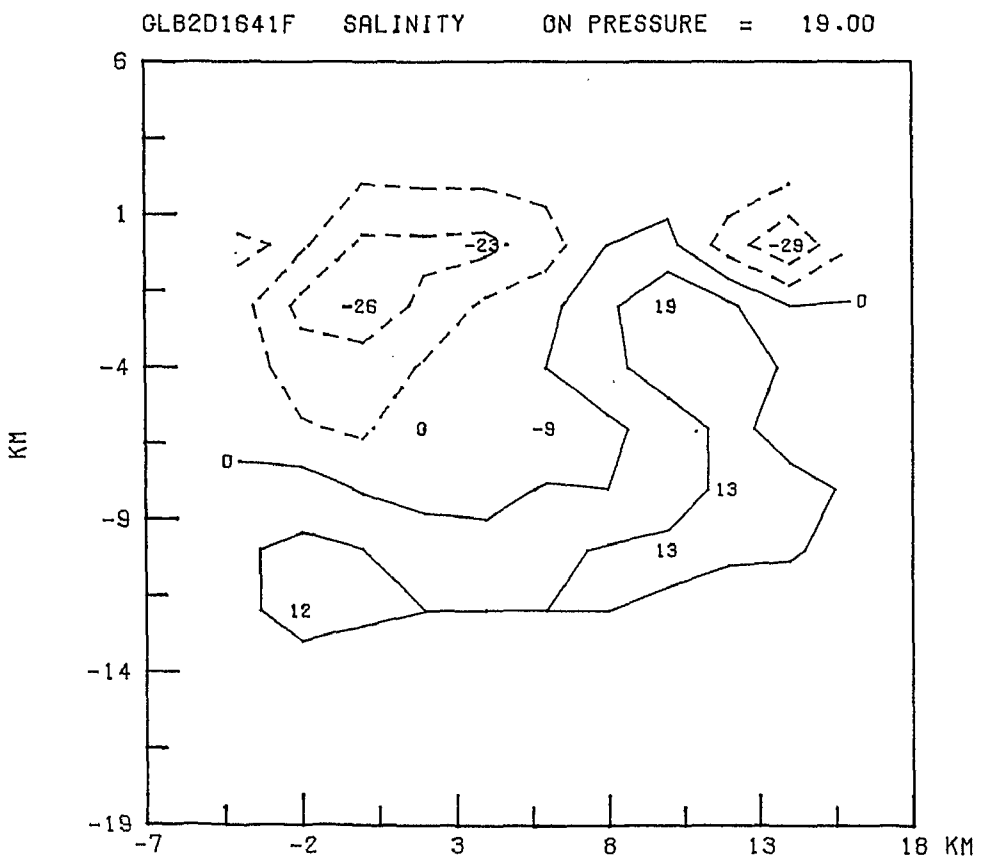
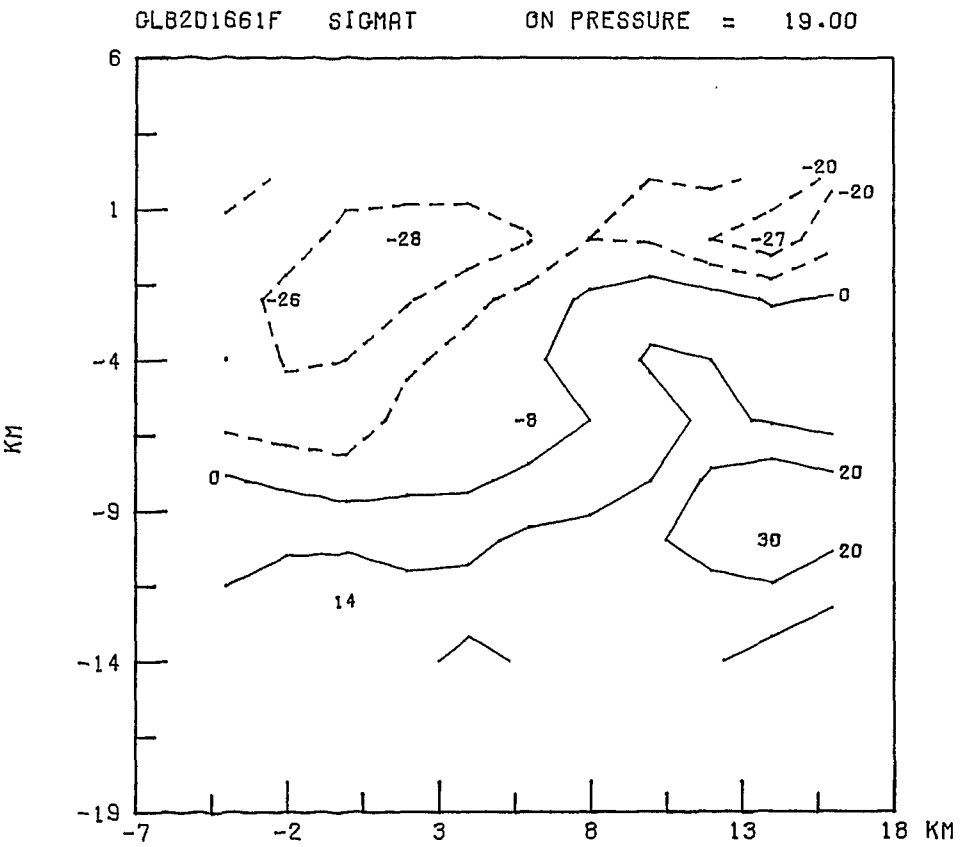
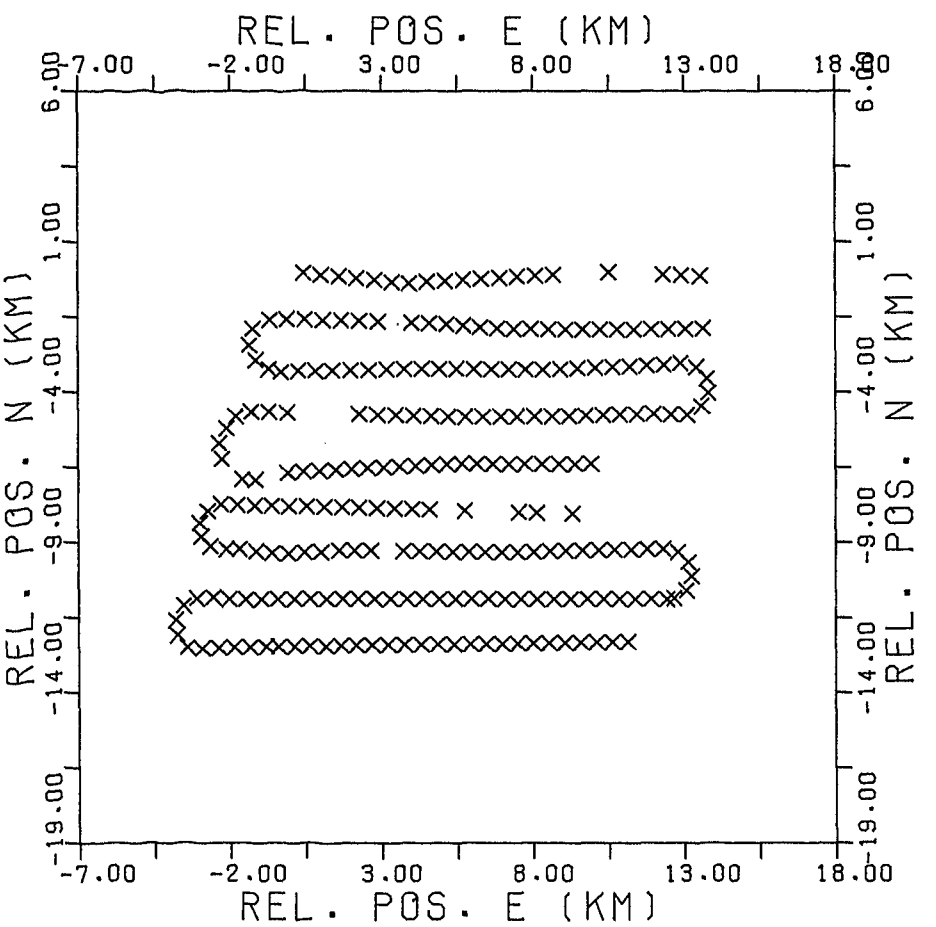
18.00
REL. POS. N (KM)
6.00
1.00
-4.00
-9.00
-14.00
-19.00

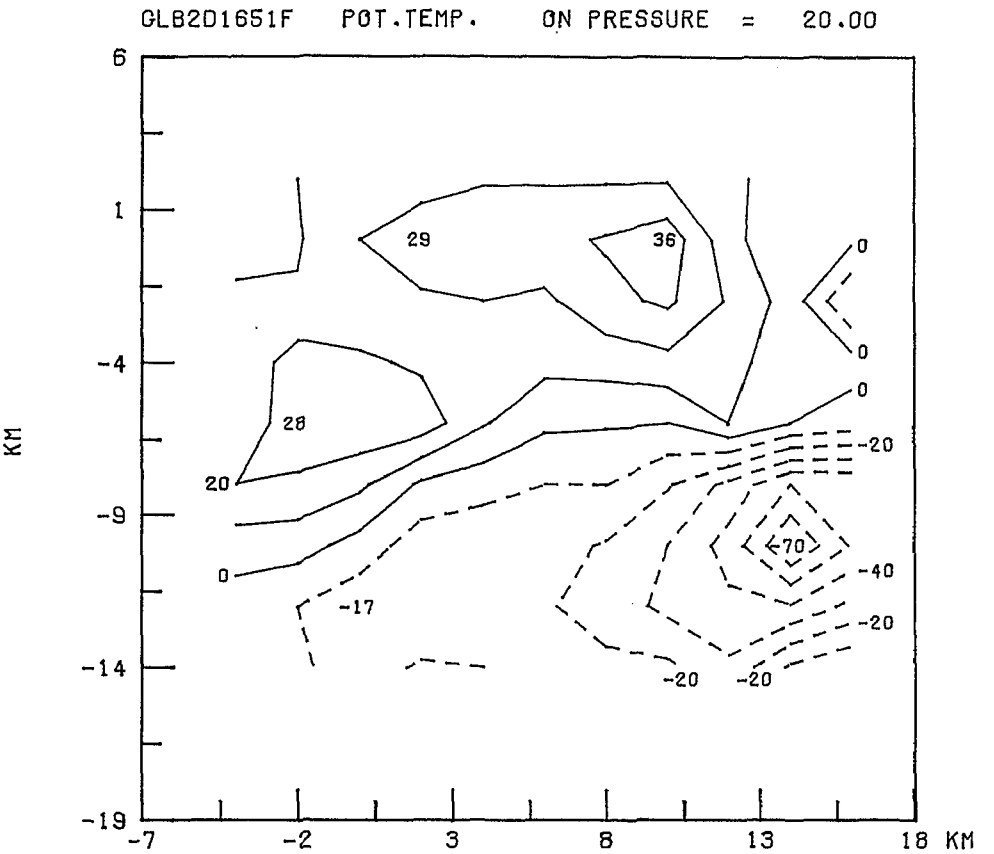


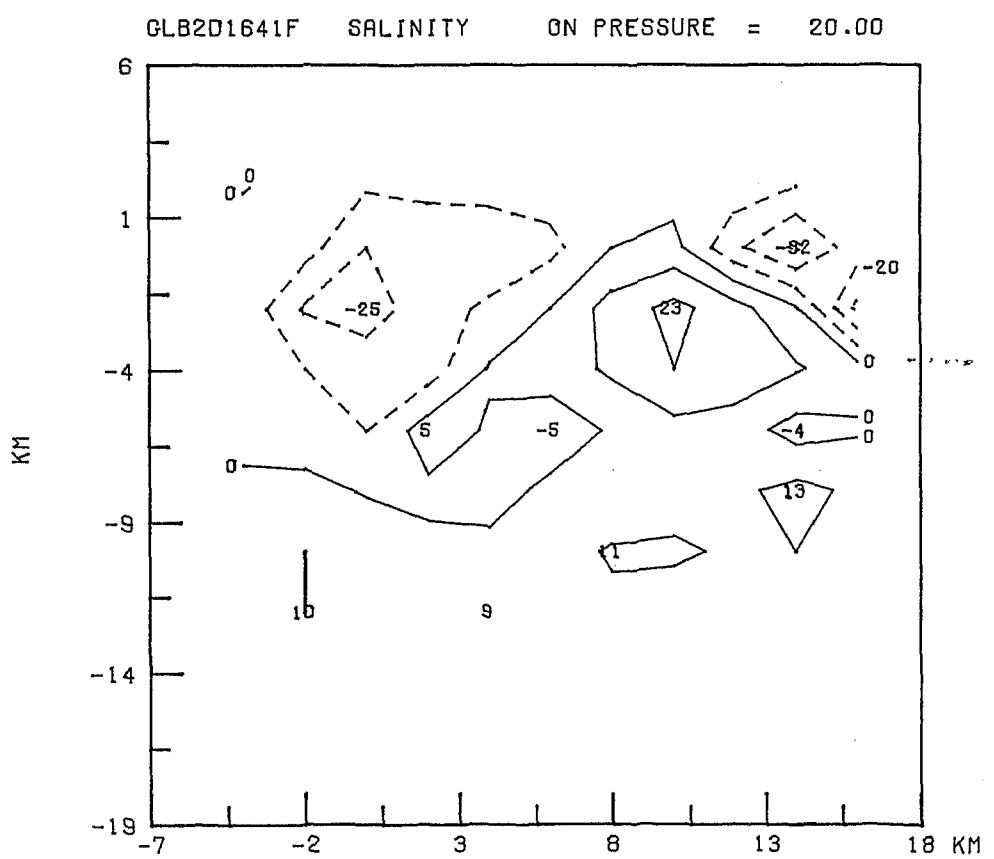


-Isobaric Maps (Pot. Temp. and Salinity) -


GL82D1661F SIGMAT ON PRESSURE = 19.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-20
-27
-28
-26
0
-8
0
20
30
20
14


REL. POS. E (KM)
-7.00
-2.00
3.00
8.00
13.00
18.00
6.00
1.00
-4.00
-9.00
-14.00
-19.00
REL. POS. N (KM)


GLB2D1651F POT.TEMP. ON PRESSURE = 20.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
29
36
0
0
28
0
20
0
-20
-70
-40
-17
-20
-20
-20


GLB2D1641F SALINITY ON PRESSURE = 20.00
KM
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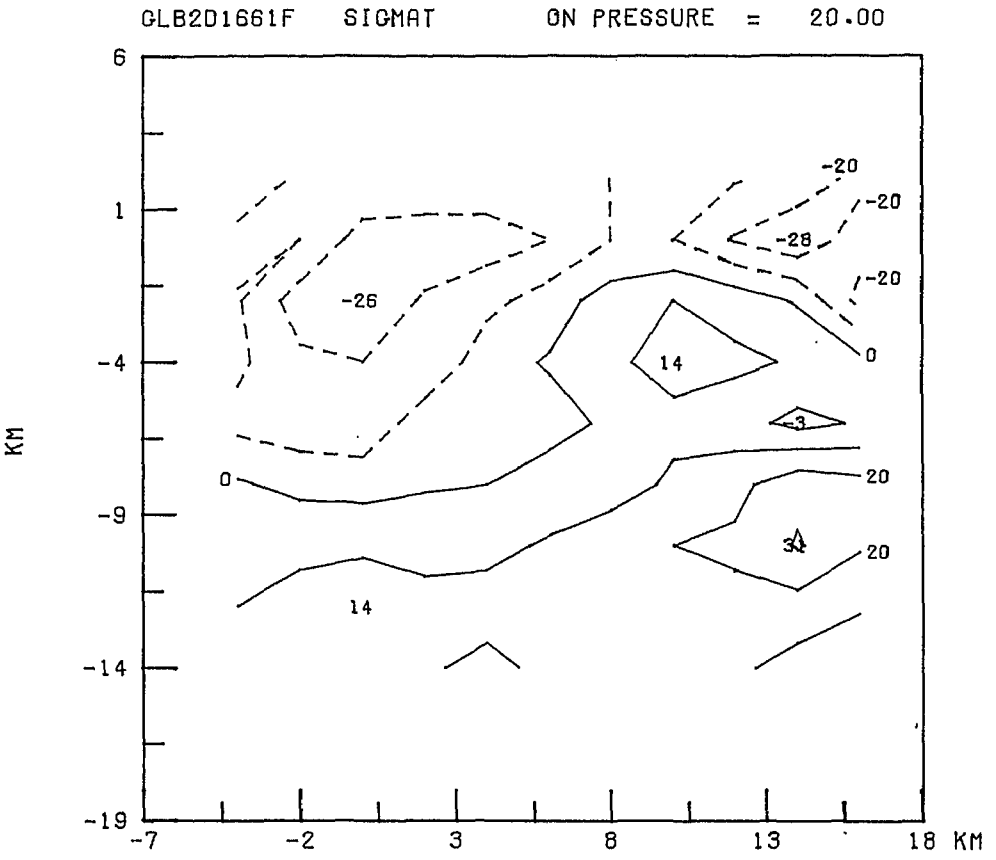
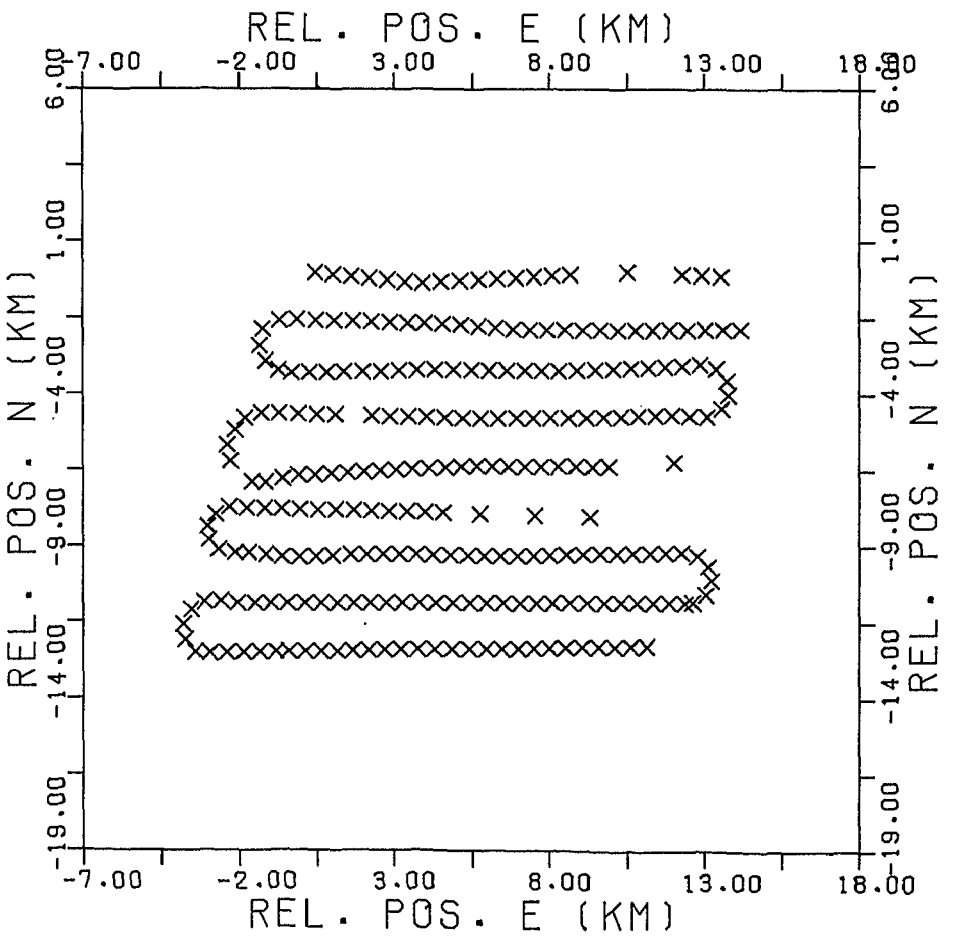
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
0
0
-32
-20
-25
23
0
5
-5
0
-4
0
13
1
10
9


GLB2D1661F SIGMAT ON PRESSURE = 20.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
-20
-20
-28
-20
-26
0
14
-3
0
20
34
20
14


REL. POS. E (KM)
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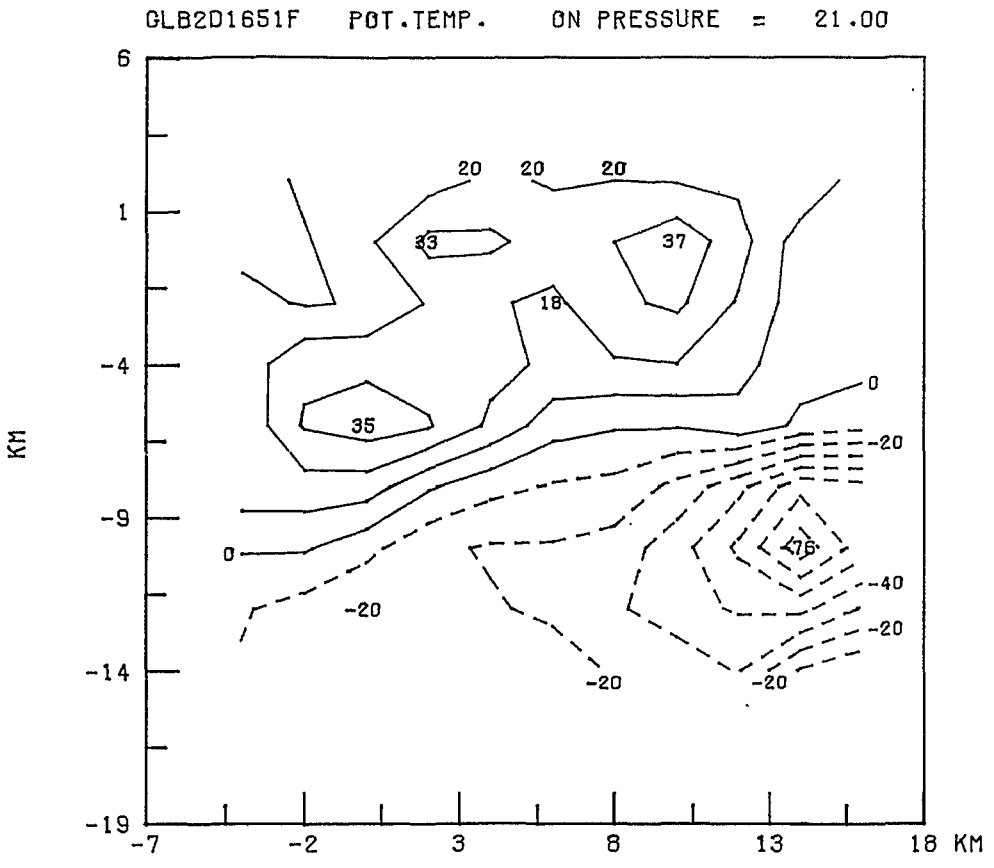
-2.00
3.00
8.00
13.00
18.00
6.00
1.00
-4.00
-9.00
-14.00
-19.00
REL. POS. N (KM)


GLB2D1651F POT.TEMP. ON PRESSURE = 21.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
20
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20
33
37
18
35
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-20
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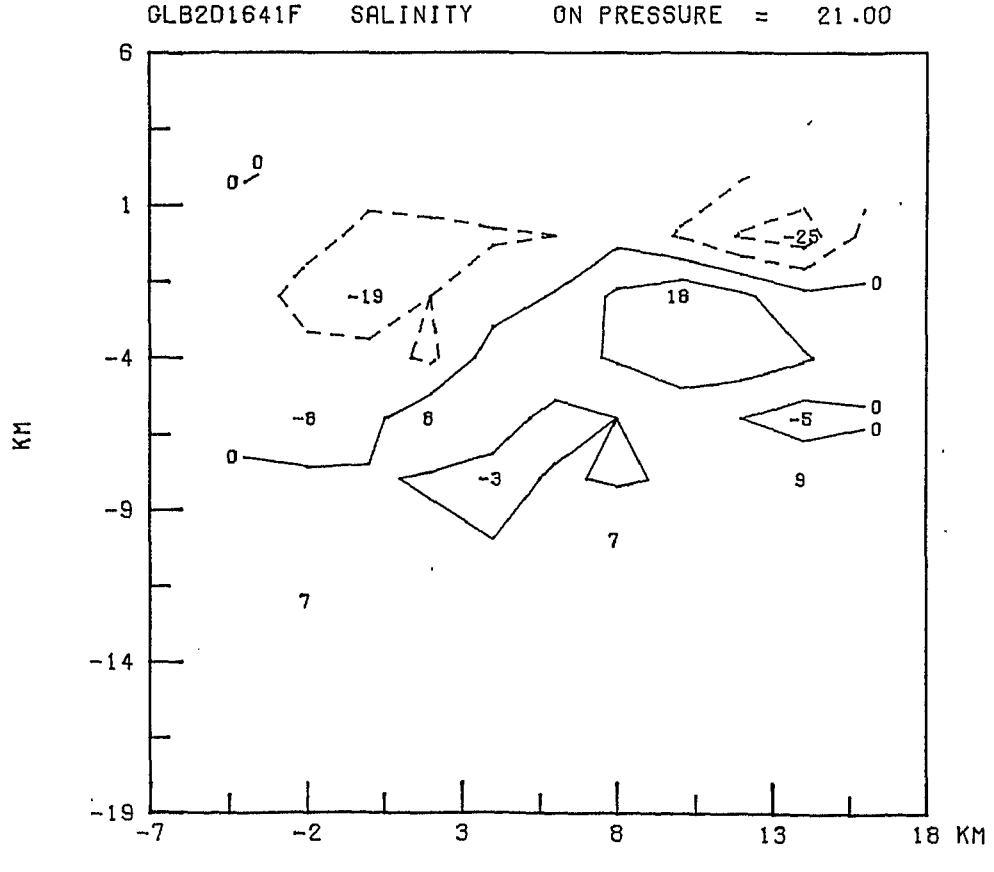
-40
-20
-20
-20


GLB2D1641F SALINITY ON PRESSURE = 21.00
KM
6
1
-4
-9
-14
-19
-7
-2
3
8
13
18 KM
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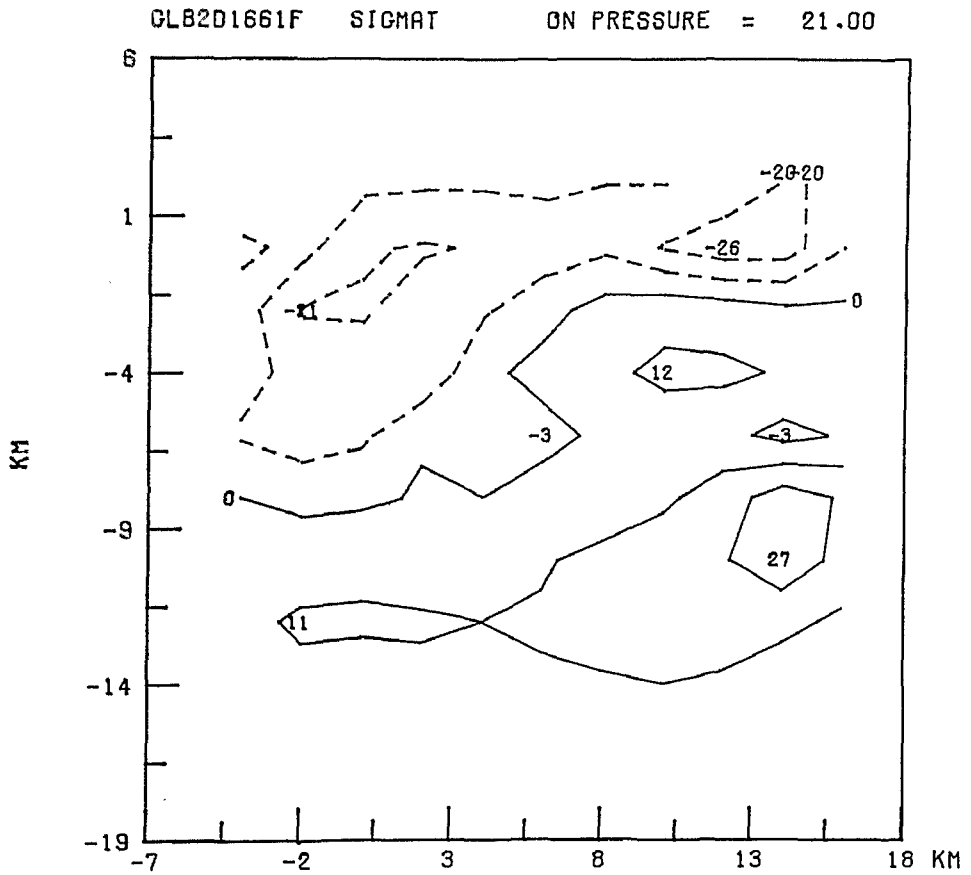
0
-25
-19
18
0
-8
8
-5
0
0
0
-3
9
7
7


GLB2D1661F SIGMAT ON PRESSURE = 21.00
KM
6
1
-4
-9
-14
-19
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-2
3
8
13
18 KM
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-20
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0
12
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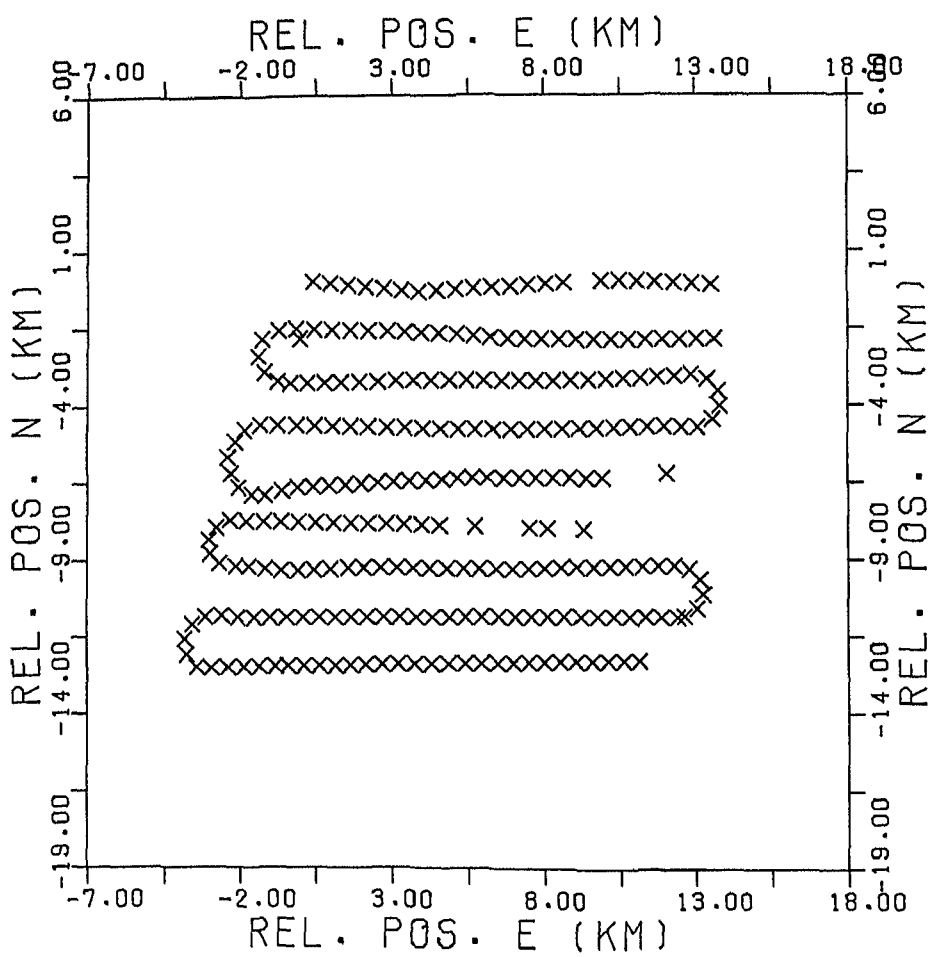
-3
0
27
11


REL. POS. E (KM)
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-2.00
3.00
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6.00
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-4.00
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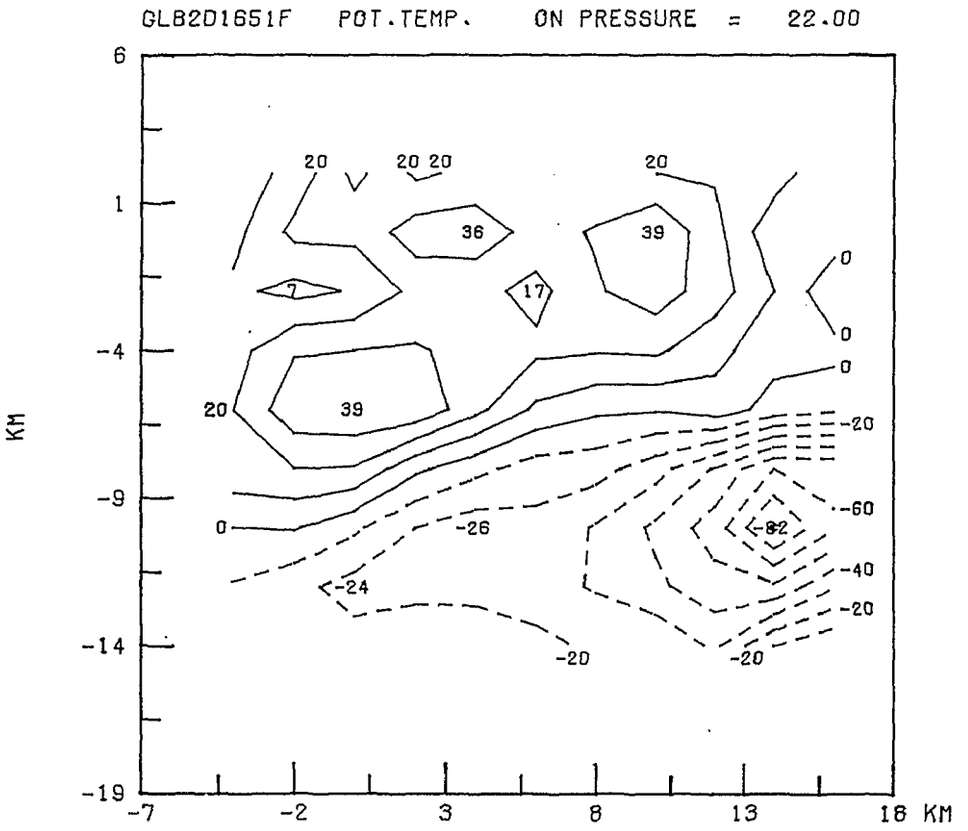
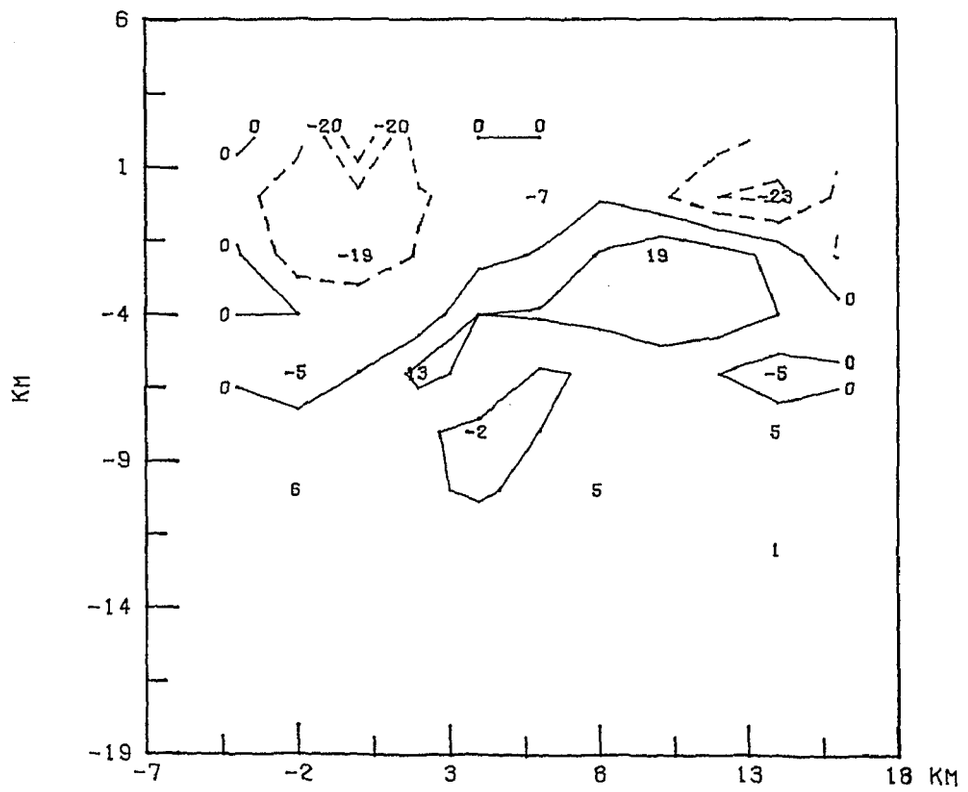
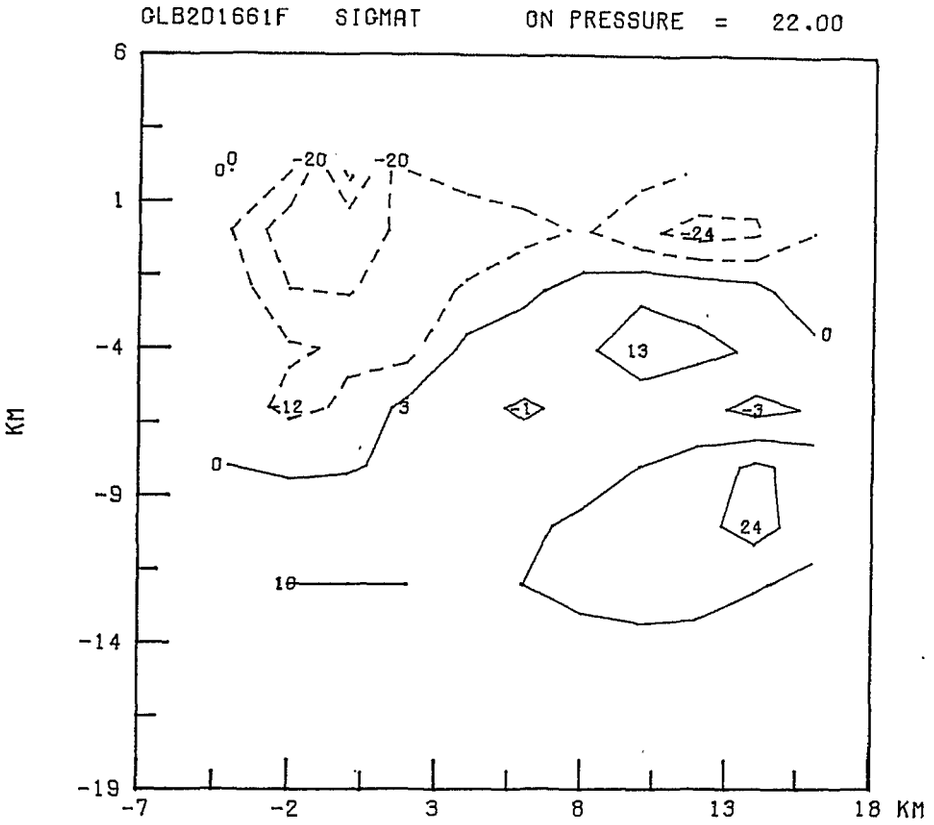
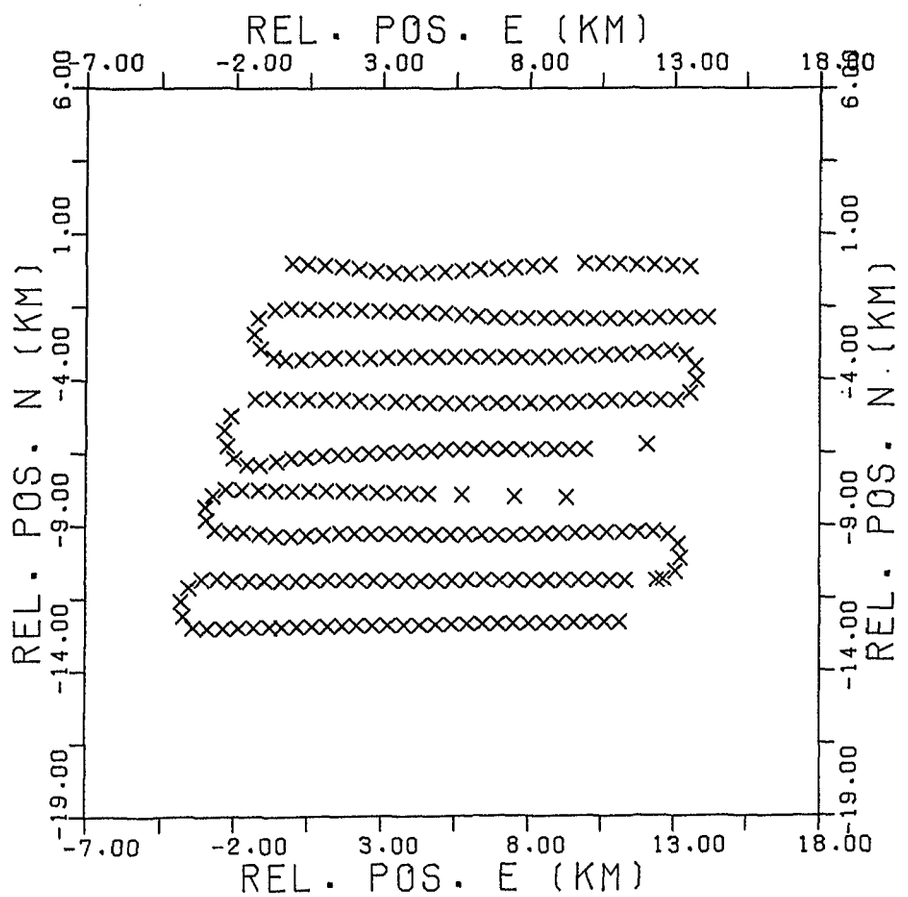
-14.00
-19.00
REL. POS. N (KM)



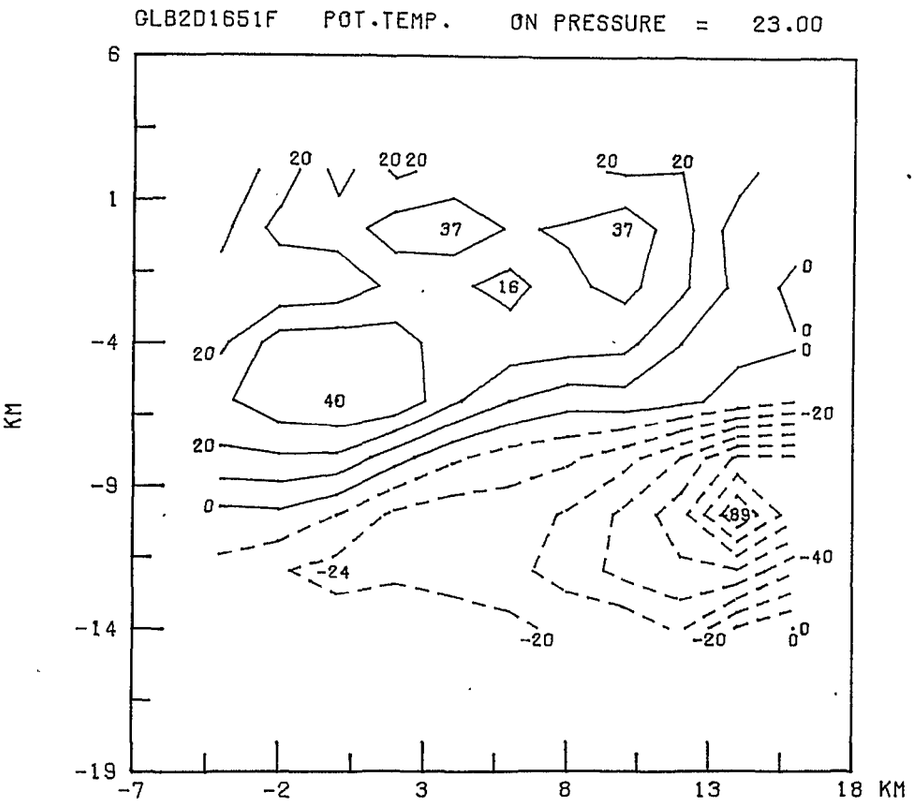


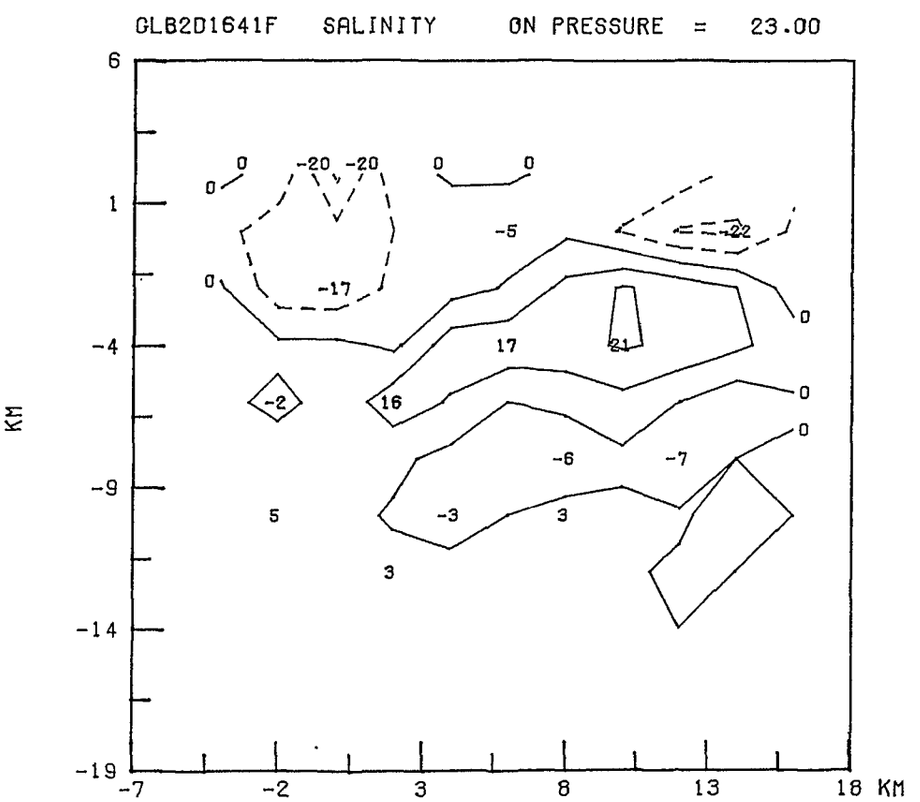
-Isobaric Maps (Pot. Temp. and Salinity) -



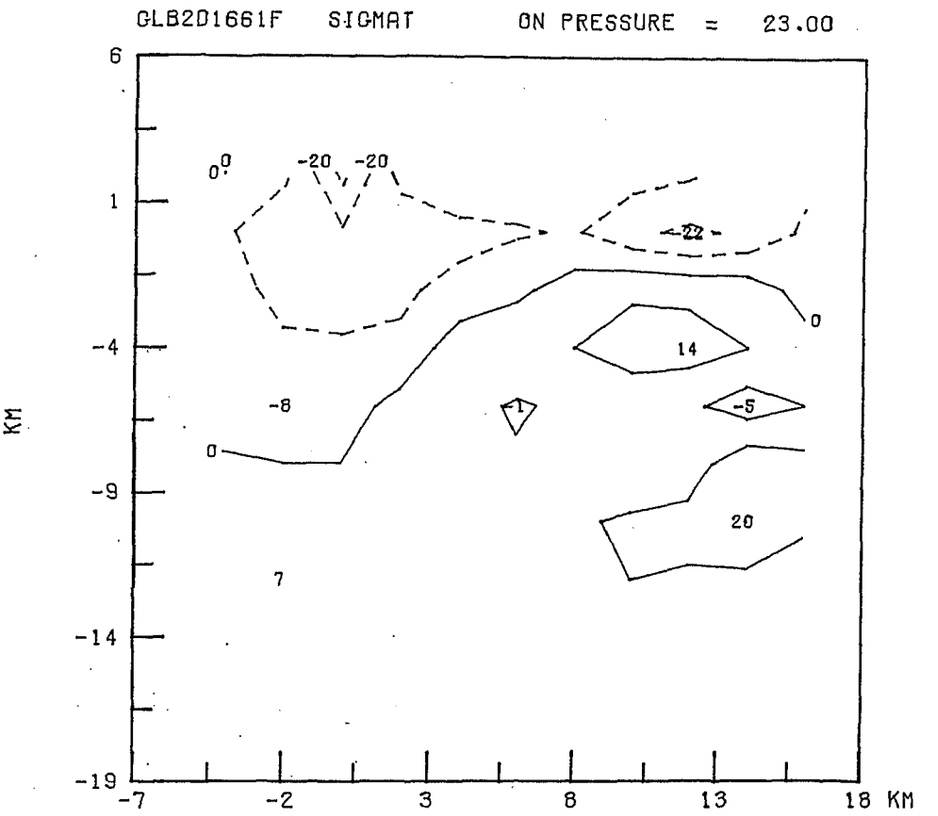


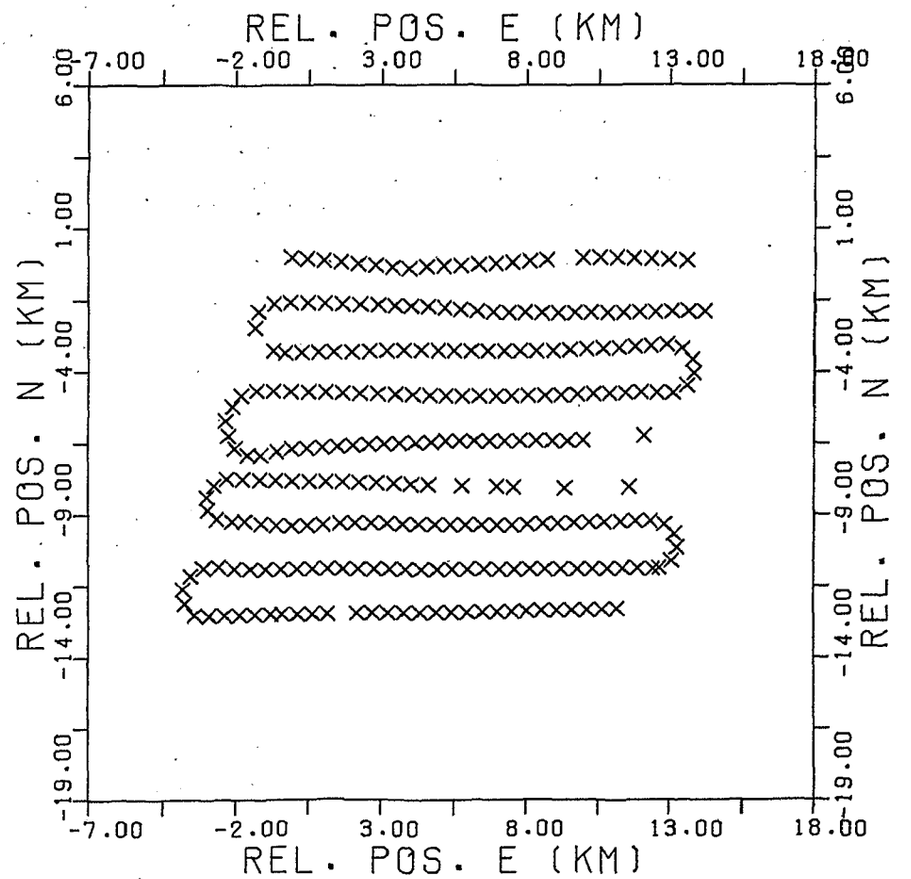
-Isobaric Maps (Density and Positions)-



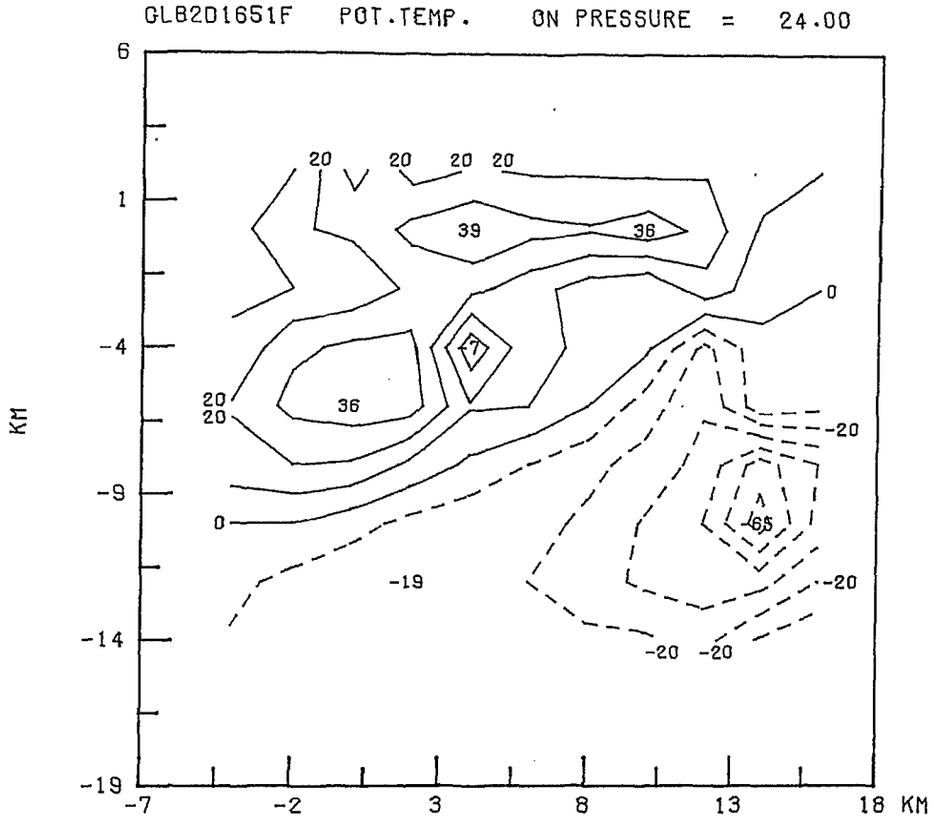


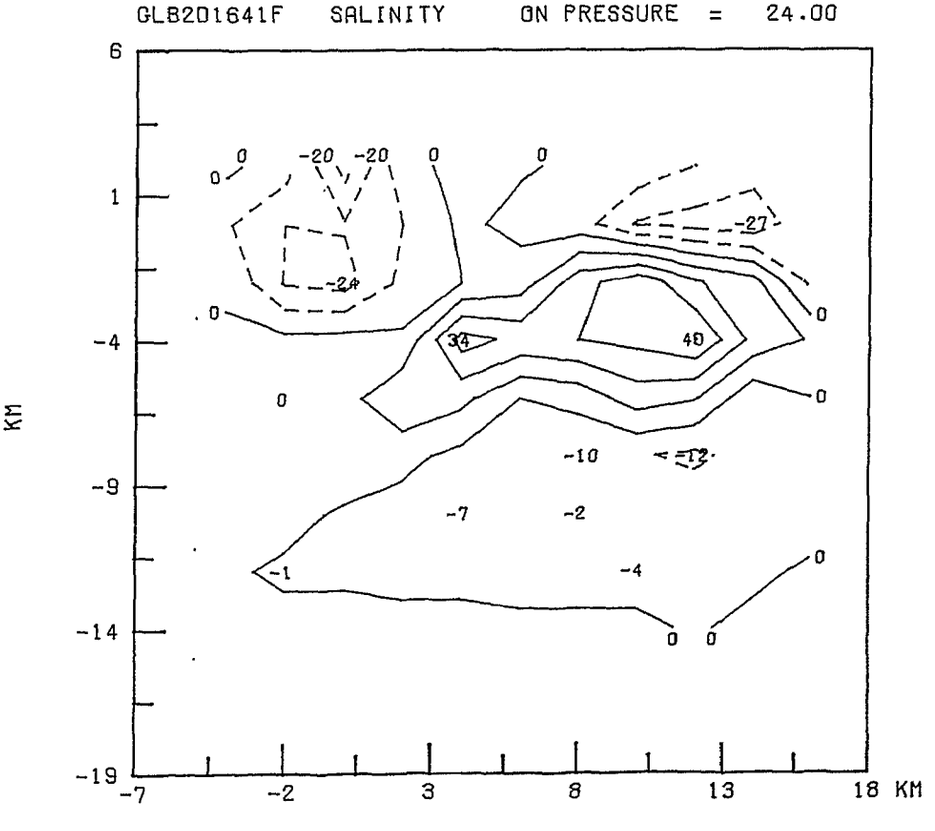
-Isobaric Maps (Pot. Temp. and Salinity) -



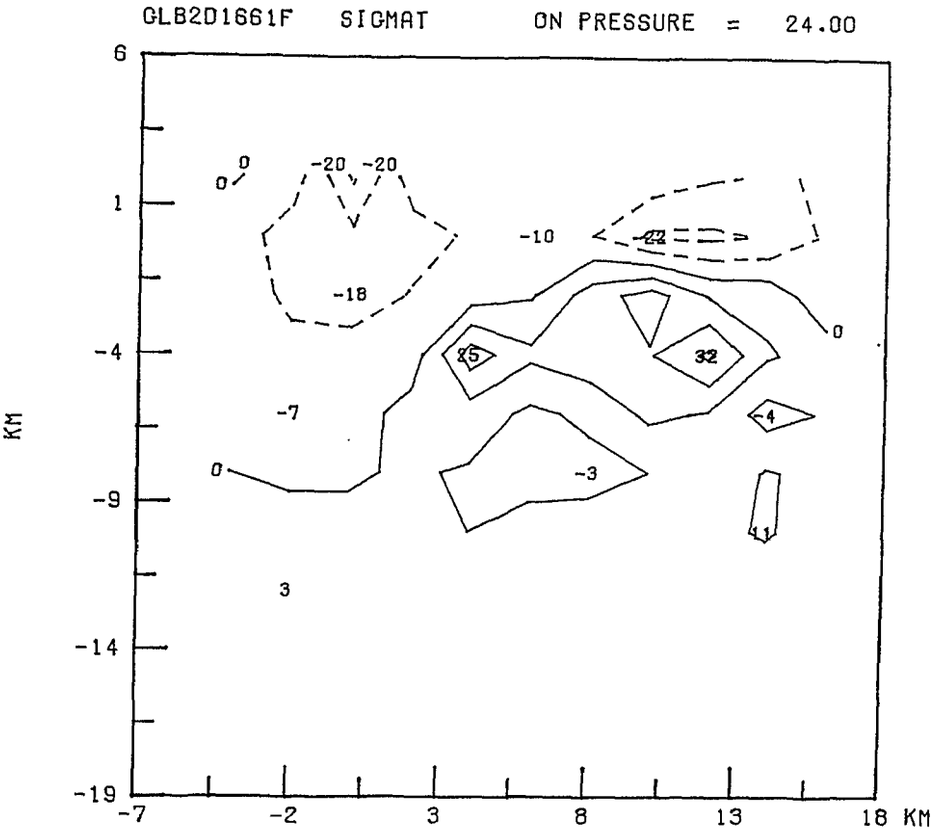


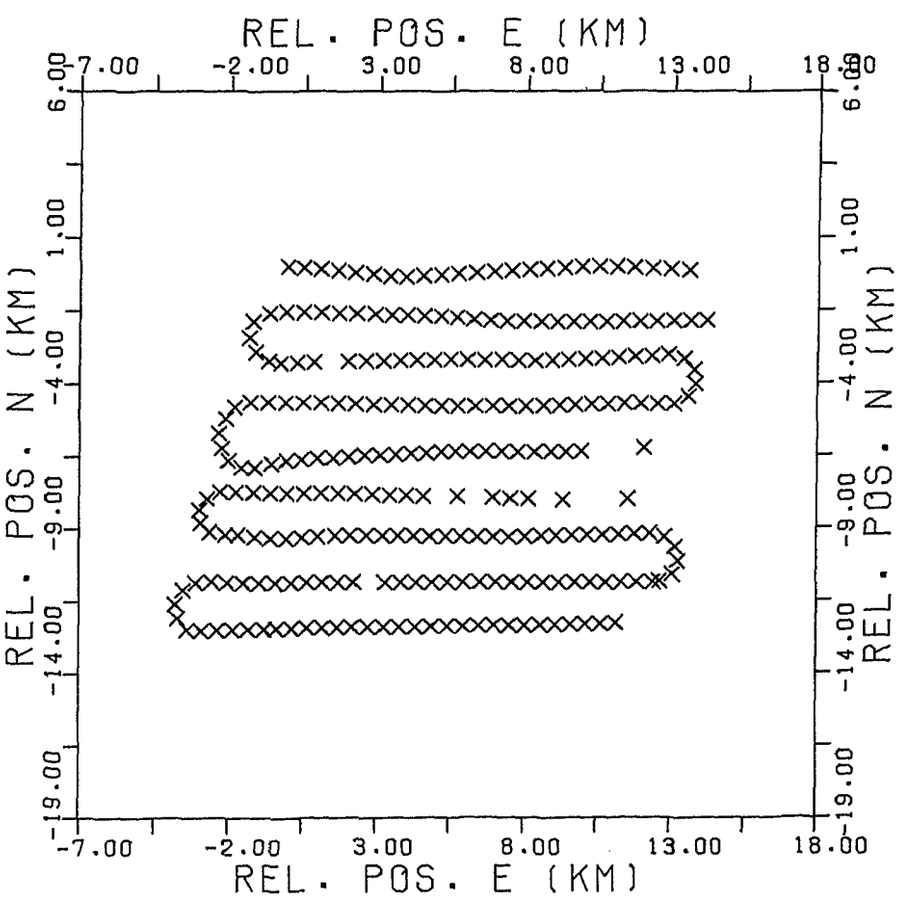
-Isobaric Maps (Density and Positions) -





-Isobaric Maps (Pot. Temp. and Salinity) -





-Isobaric Maps (Density and Positions)-