NOAA Technical Report ERL 379-AOML 24

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STD Observations From the R/V COLUMBUS ISELIN During Phase III of GATE

William McLeish
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Atlantic Oceanographic and Meteorological Laboratories
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Elliot Richardson, Secretary

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Robert M. White, Administrator

Environmental Research Laboratories
Wilmot Hess, Director

Boulder, Colorado

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CONTENTS

STD OBSERVATIONS FROM THE R/V COLUMBUS ISELIN DURING PHASE III OF GATE

William McLeish[1]
S. Michael Minton[2]

The R/V COLUMBUS ISELIN obtained 92 acceptable STD casts during Phase III of GATE. A computer processing scheme was modified for these particular data. Plots of temperature, salinity, and sigma-T versus pressure and temperature-salinity diagrams were prepared. The processed values at 1-decibar intervals were written on magnetic tape and placed in the archives of the National Oceanographic Data Center.

1. INTRODUCTION

In conjunction with the GATE operations during the period 9-19 September 1974 within the region Lat. 8°29' to 9°44'N, Long. 19°50' to 23°13'W, the R/V COLUMBUS ISELIN obtained 92 acceptable casts, measuring temperature and salinity vs. pressure in the upper ocean. Of these casts, 24 were obtained on 19 September in a rapid series of shallow lowerings. The data obtained during all down casts have been processed and are presented in this report.

2. THE INSTRUMENT

A Plessey Model 9040 S/T/D Environmental Profiling System generated a graph of temperature and salinity vs. depth during each cast. It also supplied these signals to a Plessey Model 8114A Digital Data Logger, which wrote the digital data onto magnetic tape. The digital data tapes were used in subsequent data processing.

The instrument recorded readings of temperature, salinity, and pressure at 4 scans/second, and the lowering rate was 20 m/min in some casts and 10 m/min in others. The range of

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the pressure sensor was 3000 decibars with a stated accuracy of 0.25% and a repeatability of 0.1% (Plessey, 1973). The stated accuracy of the temperature channel was 0.02°C with a repeatability of 0.01°C. The instruction manual stated that the accuracy of the salinity channel was 0.02 °/₀₀ but that corrections could give an accuracy of 0.01 °/₀₀ and that the repeatability was 0.01 °/₀₀ (Plessey, 1973).

3. PROCESSING METHODS

While the methods used in processing STD data are generally similar to the system described by Scarlet (1975) and to the procedures used by others in CEDDA and in these laboratories, a number of modifications have been developed for processing the present data. This program uses correction equations recommended by the instrument manufacturer.

First, each measurement is converted to units of decibars (pressure), °C (temperature), or °/₀₀ (salinity). Then the value of each data point and the difference between the data point and the previous one in the same channel are compared with an appropriate set of fairly wide limits. Any scan containing a data point outside the limits is deleted. Primarily this step removes digitizing and tape writing errors. Next, data in the pressure and temperature channels are filtered. A 0.33 Hz low-pass filter on pressure is used to reduce noise in the sink rate calculation described below. A 1 Hz low-pass filter on temperature removes digitization noise from that channel as well as the effect of the noise on the corrections to the salinity data.

The response of the temperature sensor is sufficiently slow that significant errors were produced by the conditions under which the casts were made. The temperature errors in turn introduced significant errors into the salinity channel, for which the calculated product depends on the temperature reading. The rate change of temperature is calculated by

$$\frac{\Delta T(1)}{\Delta t} = \frac{T(3)-T(1)}{2I},$$

where I = the sample interval, 0.25 sec. A forward difference calculation was selected in order to compensate in part for the time lag in the readings. The corrected temperature for each scan is given by

$$T(1)' = T(1) + \tau \frac{\Delta T(1)}{\Delta t}.$$

The quantity τ is the time constant of the temperature channel quoted by the manufacturer as 0.35 sec. A protective shield about the temperature sensor was removed on 11 September, and a time constant of 0.15 sec was assumed for later casts. Salinity readings are corrected according to

$$S_c = S_o \left[1 - T_c \alpha \beta\right]$$

where T_c is the temperature correction, and α and β are coefficients calculated for each scan according to equations and laboratory data in the instruction manual (Plessey, 1973).

As the sensor assembly is lowered through a temperature gradient, a quantity of heat is conducted from the instrument case to the surrounding water. The present observations indicate that, when the descent rate is sufficiently decreased by the roll of the ship, heating of water around the salinity sensor can produce significant errors in that channel. The errors have a sign opposite to those induced by the slow response of the temperature sensor. Previous calculation procedures attempted to avoid errors resulting from decreased descent rate by deleting all except the first scan at each depth. Typically about 20 percent of the data are retained in that process. The present calculation determines the sink rate from the filtered depth values at each scan and deletes those scans with sink rates less than 24 or 12 m/sec or at pressures less than those of previously accepted scans. Typically this procedure retains approximately 40 percent of the scans.

Next, calibration offset values derived from external observations are added to the pressure and salinity values. The pressure offset is obtained by comparison of instrument readings near the surface with direct observation of depth, and the salinity offset is obtained by comparison of the salinities of water samples with the instrument readings at the same depth. Erratic salinity readings are detected by comparison with neighboring values. A least-squares linear fit to the six salinity values about each reading (3 before and 3 after) is determined, and the standard deviation of the six differences from the fit line is calculated. A weighted mean of the surrounding values is obtained and compared with the observed value. When the difference is greater than 2.5 times the standard deviation, the salinity value is replaced by the weighted mean. This procedure usually changes one to 7 percent of the salinity values. In a check for gravitational stability, any scans are deleted for which the sigma-T value is more than 0.05 units smaller than any such preceding value. Seldom are more than four scans in a cast rejected by this process.

In order to remove some remaining salinity errors, overlapping groups of 24 scans are selected, and a straight line-root mean square best fit to the salinity values is calculated for each segment. Scans are deleted for which the salinity value differs by more than 0.05% from the best fit line. The temperature values within each 1 decibar pressure interval are averaged, and the salinity values are treated similarly. Finally, a low-pass filter with a cutoff of 0.2 cycles/meter is applied to the averaged salinity readings.

4. PRESENTATION OF DATA

Table 1 lists the casts that have been processed, and includes the number assigned to each cast before processing, then the location, date, start time, depth range, lowering rate, and time constant used. Up-casts and special maneuvers have not been processed. Graphs for each cast include depth-temperature, depth-salinity, and depth-sigma-T plots and a temperature-salinity diagram.

The entire set of processed data at one-decibar pressure intervals is written on a magnetic tape labeled SGATØ2 that was submitted to archives of the National Oceanographic Data Center, Washington, D. C.

5. ACKNOWLEDGEMENTS

Mr. F. Ostapoff, Director, Sea-Air Interaction Laboratory, was the Chief Scientist aboard the R/V COLUMBUS ISELIN during the above period, and Dr. Ants Leetmaa, Physical Oceanography Laboratory, collected the data. Both furnished valuable advice in the processing of the data.

6. REFERENCES

Plessey Environmental Systems, "Model 9040 S/T/D Environmental Profiling System Instruction Manual," Plessey, San Diego, 1973.

Scarlet, R. I., A data processing method for salinity, temperatur[e] and depth profiles, Deep-Sea Research 22, 509-515, 1975.

Table 1

Catalog of STD Casts

Cast #	Location Lat. Long.	Date 1974	Start Time	Depth Range m	Lowering Rate m/min	Time Constant sec
2	8°29.49'N 23°02.26'W	Sept. 9	0130	2-275	20	0.35
3	"		0230	1-276		
4	"		0330	1-514		
5	8°54.13'N 23°02.26'W		0430	2-530		
6	"		0620	2-508		
7	"		0720	2-548		
8	"		0815	3-056		
9	"		0910	141-532		
11	"		1105	2-538		
12	"		1200	2-494		
13	8°54.13'N 23°13.12'W	Sept. 10	0100	2-512		
14	"		0200	1-524		
15	"		0300	1-488		
16	"		0650	4-516		
17	"		0750	1-548		
18	"		0845	2-515		
19	"		0938	2-542		
20	"		1305	4-513		
21	"		1440	1-511		
22	8°54.13'N 23°13.13'W		1553	2-611		
23	"		1709	3-950		
24	"		1836	2-512		
25	"		1930	2-514		
26	8°54.42'N 22°50.30'W	Sept. 11	1043	3-516		
27	"		1139	2-532		

Table 1 (Continued)

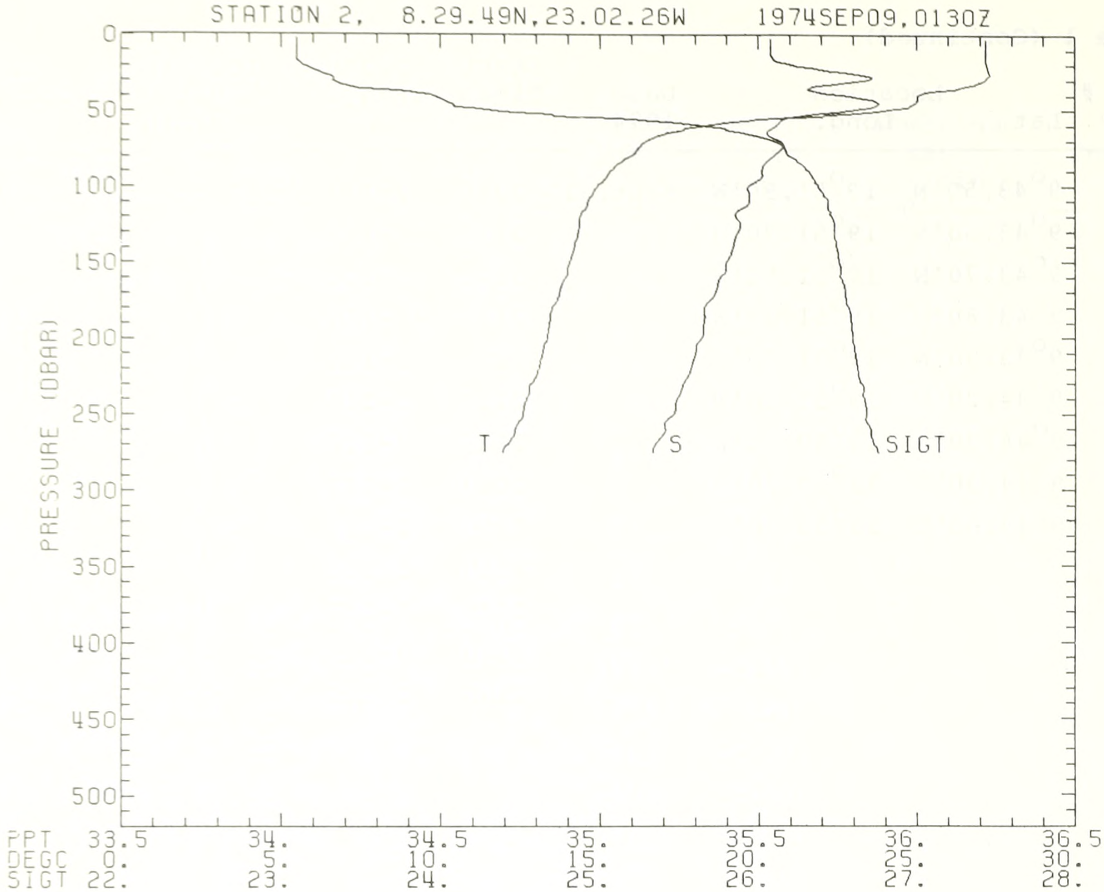
Cast #	Location Lat.	Long.	Date 1974	Start Time	Depth Range m	Lowering Rate m/min	Time Constant sec
28	8°54.42'N	22°50.30'W	Sept. 11	1238	1-514	20	0.35
29	"			1348	1-511		
30	"			1550	4-514		0.15
31	"			1650	2-533		
32	"			1957	65-516		
33	"			2131	3-109		
34	"			2200	3-212		
35	"			2230	3-114		
36	"		Sept. 12	0110	16-216	10	
37	"			0210	2-199		
38	"			0310	5-223		
39	"			0430	3-209		
40	"			0520	2-207		
41	"			0608	2-207		
42	"			0650	2-216		
43	"			0800	4-214		
44	"			0900	3-212		
45	"			1000	3-212		
46	"			1100	3-210		
47	"			1200	2-213		
48	"			1245	5-53		
49	"			1407	9-56		
51	9°11.40'N	23°12.00'W		1914	2-508	20	
53	8°47.00'N	23°12.20'W	Sept. 13	0000	2-513		
54	8°36.50'N	23°12.70'W		0210	4-510		
55	8°25.90'N	23°13.40'W		0440	4-520		
56	8°29.49'N	23°02.26'W		0700	4-559		

Table 1 (Continued)

Cast #	Location Lat.	Location Long.	Date 1974	Start Time	Depth Range m	Lowering Rate m/min	Time Constant sec
57	8°29.49'N	23°02.26'W	Sept. 13	0832	4-108	10	0.15
58	8°54.42'N	22°50.30'W	Sept. 14	0737	4-114		
59	"			0858	2-107		
60	"			0952	3-113	↓	
61	"			1058	3-116	20	
62	"			1158	4-117		
63	"			1414	4-111		
64	"			1459	4-115		
65	"			1555	3-140		
66	8°56.09'N	22°47.03'W	Sept. 15	1745	4-231		
67	8°47.03'N	22°45.03'W		1958	2-217		
68	8°57.02'N	22°46.04'W		2225	3-221		
69	8°48.06'N	22°45.05'W	Sept. 16	0105	3-210		
70	8°56.07'N	22°46.03'W		0351	2-214		
71	8°29.49'N	23°02.26'W	Sept. 17	2220	2-516		
72	"		Sept. 18	0008	4-538		
74	9°41.10'N	19°55.40'W	Sept. 19	1455	2-113		
75	"			1526	3-113		
76	"			1537	1-57		
77	9°41.40'N	19°54.90'W		1556	1-109		
78	9°41.60'N	19°54.70'W		1626	2-111		
79	9°41.90'N	19°54.30'W		1655	2-111		
80	9°42.20'N	19°53.90'W		1758	2-50		
81	9°42.90'N	19°52.70'W		1955	4-111		
82	9°43.10'N	19°52.60'W		2010	2-115		
83	9°43.20'N	19°52.40'W		2025	2-112		
84	9°43.30'N	19°52.52'W		2040	2-112	↓	↓

Table 1 (Continued)

Cast #	Location Lat.	Location Long.	Date 1974	Start Time	Depth Range m	Lowering Rate m/min	Time Constant sec
85	9°43.50'N	19°51.90'W	Sept. 19	2055	2-113	20	0.15
86	9°43.60'N	19°51.70'W		2110	1-110	↓	↓
87	9°43.70'N	19°51.50'W		2125	1-128		
88	9°43.80'N	19°51.30'W		2140	41-115		
89	9°43.90'N	19°51.20'W		2155	2-115		
90	9°44.20'N	19°51.10'W		2210	1-117		
91	9°44.30'N	19°50.80'W		2225	4-117		
92	9°44.30'N	19°50.70'W		2240	1-117		
93	9°44.60'N	19°50.40'W		2255	2-111		
94	"			2310	3-115		
95	"			2325	2-117		
96	"			2340	2-115		
97	"			2355	2-115	↓	↓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PRESSURE (DBAR)
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100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
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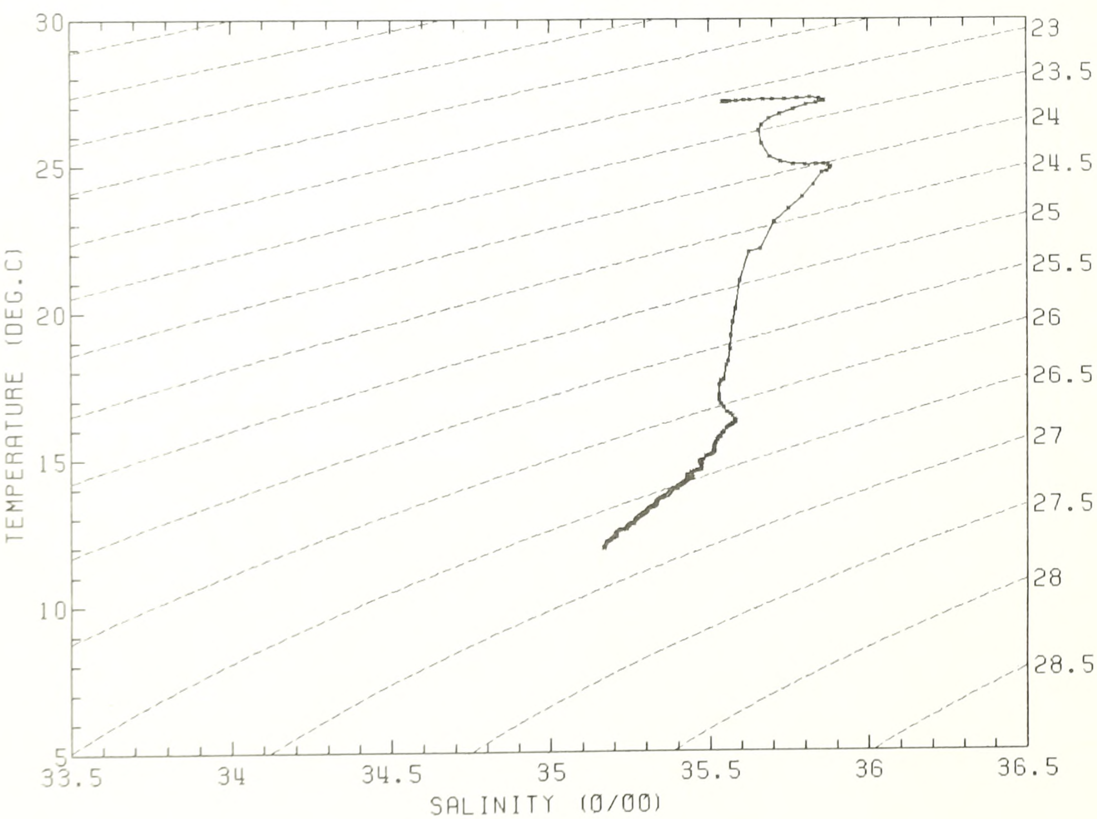
SIGT 22. 23. 24. 25. 26. 27. 28.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25
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15
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23.5
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24.5
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26
26.5
27
27.5
28
28.5
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SALINITY (0/00)

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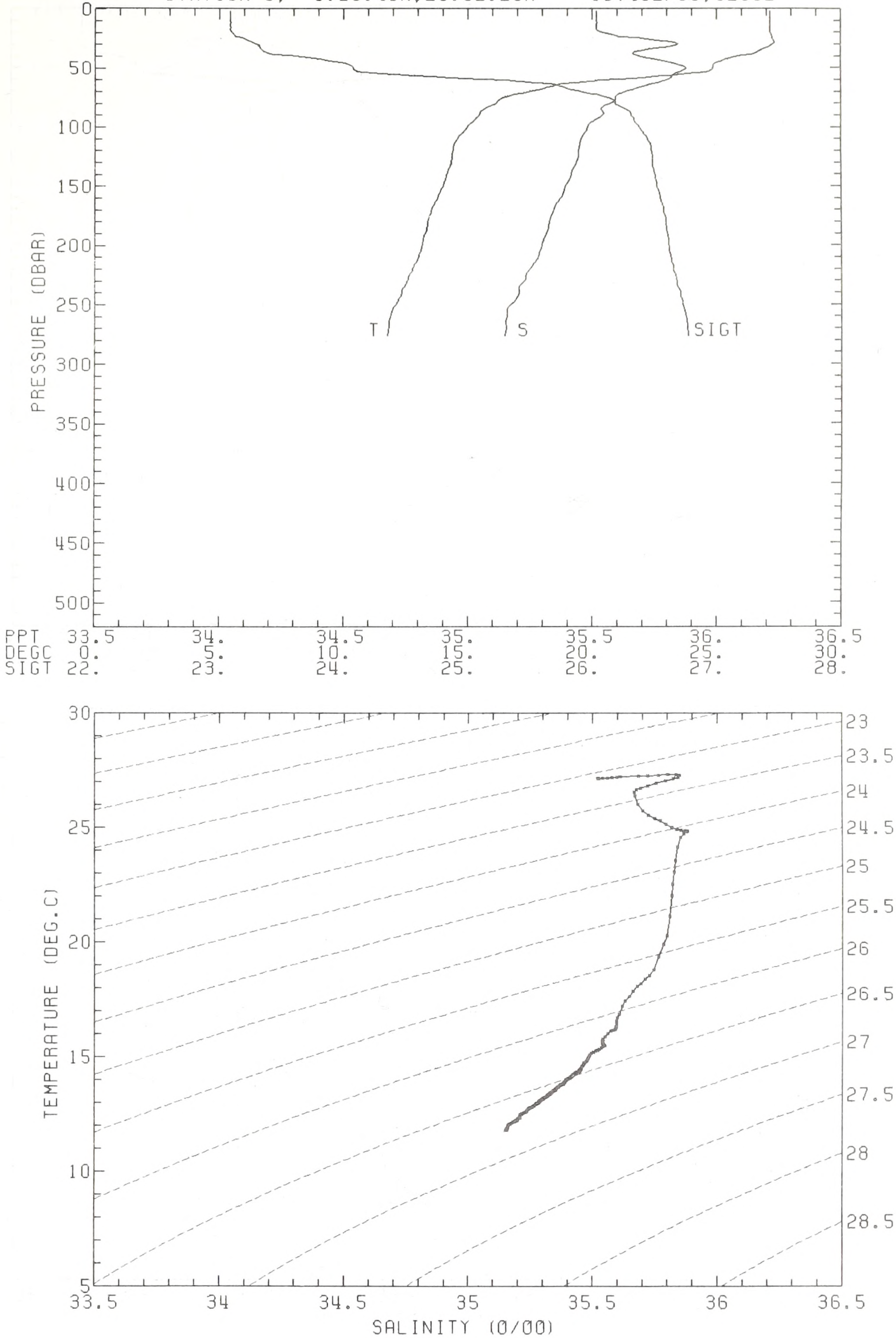

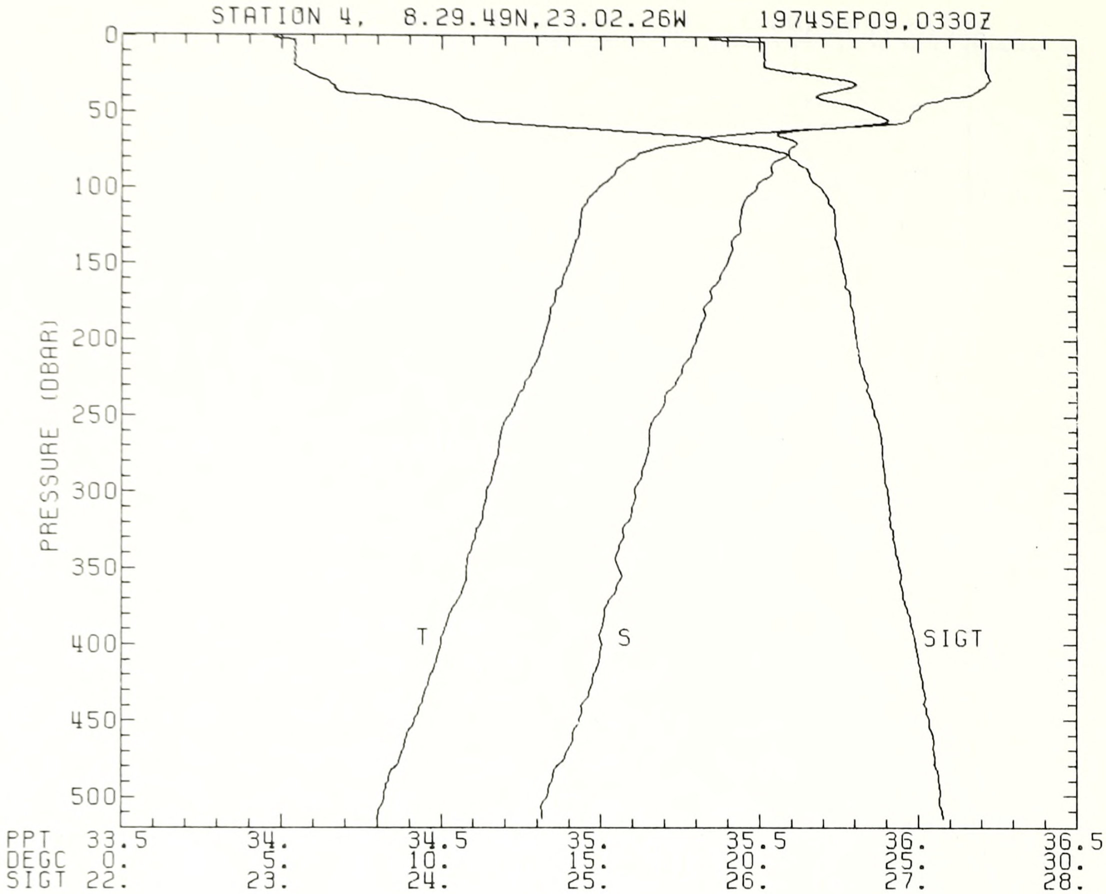
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PRESSURE (DBAR)
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SIGT
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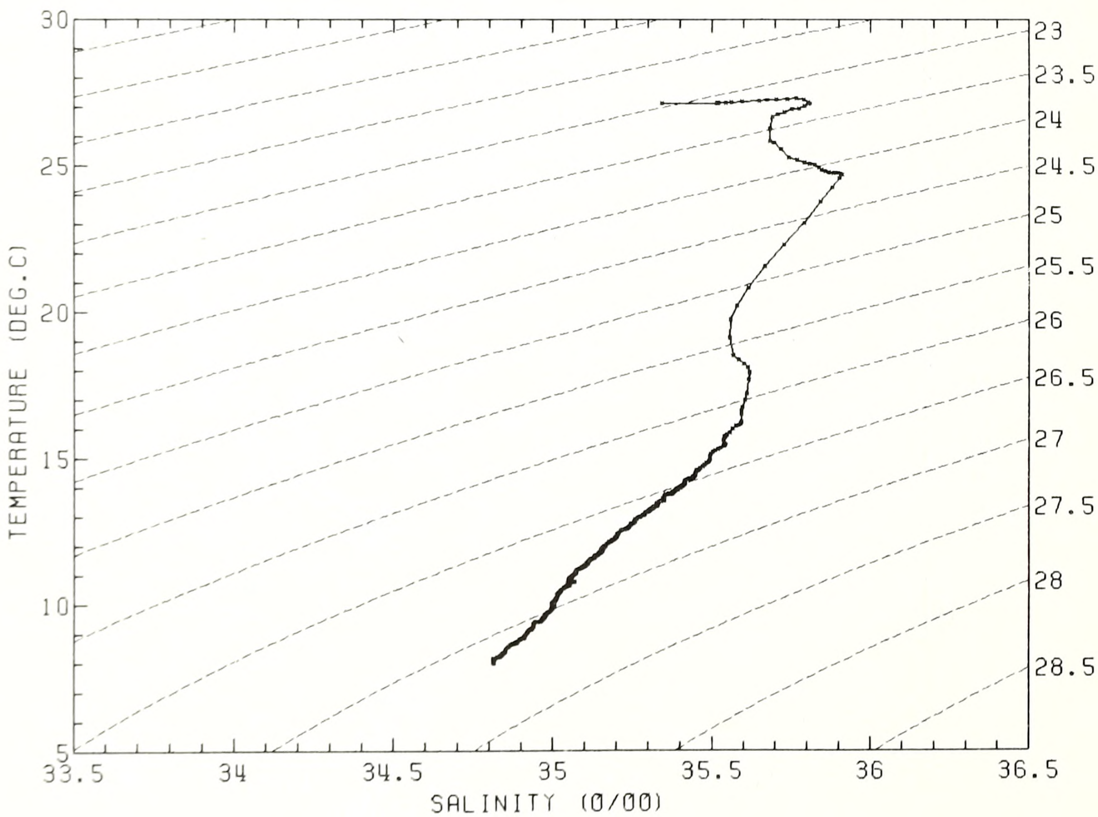
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.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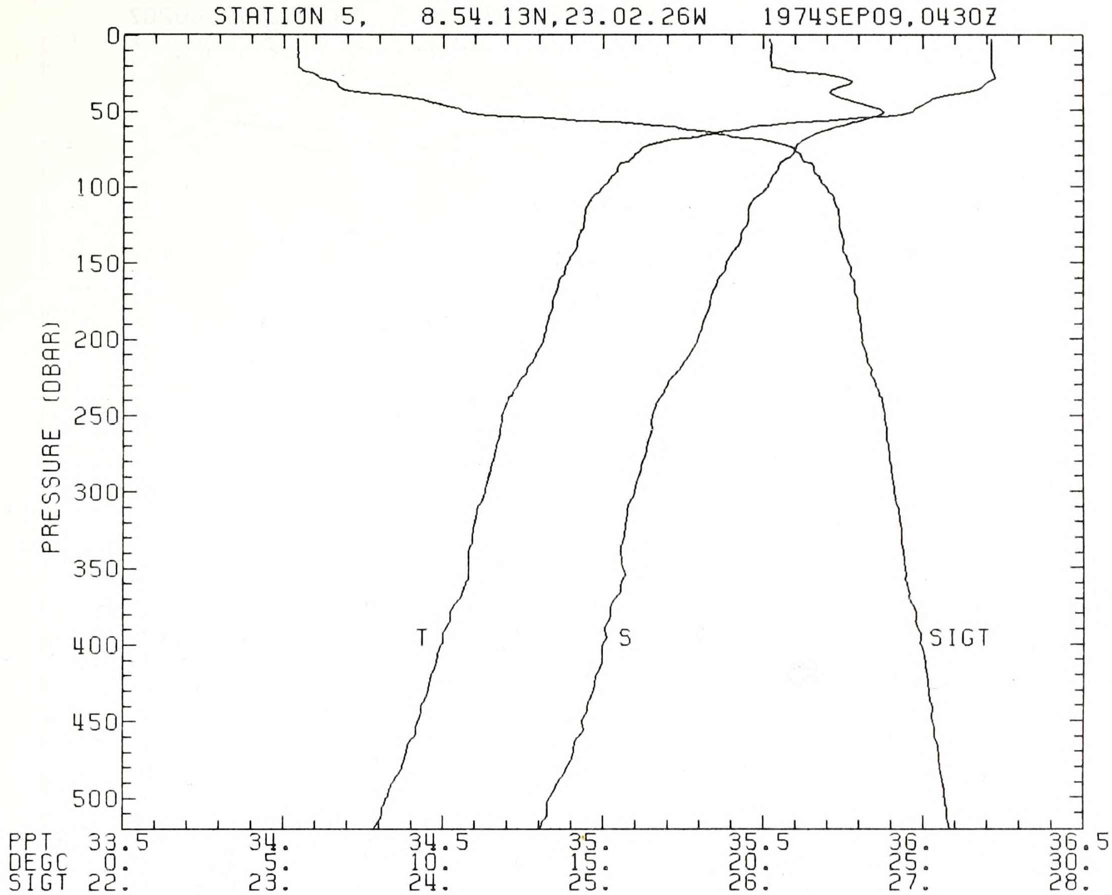
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)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SIGT
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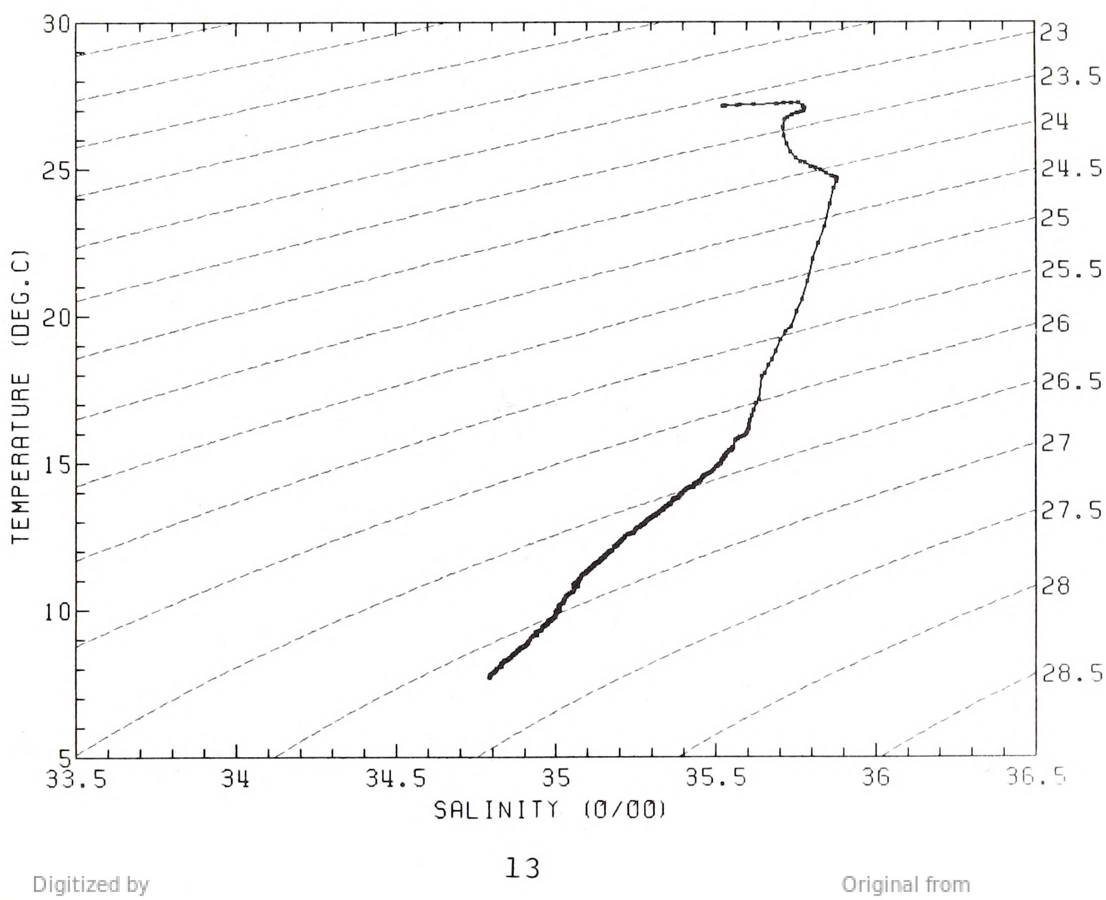
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27.5
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33.5
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34.5
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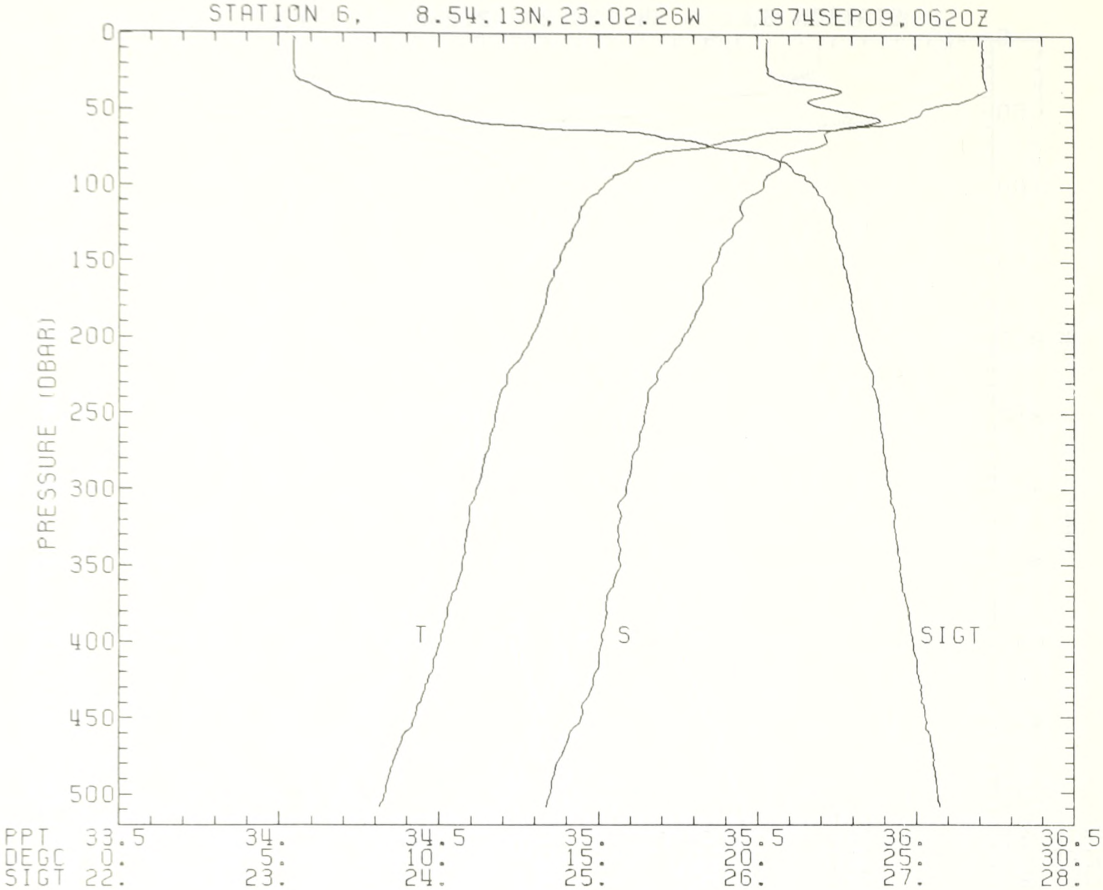

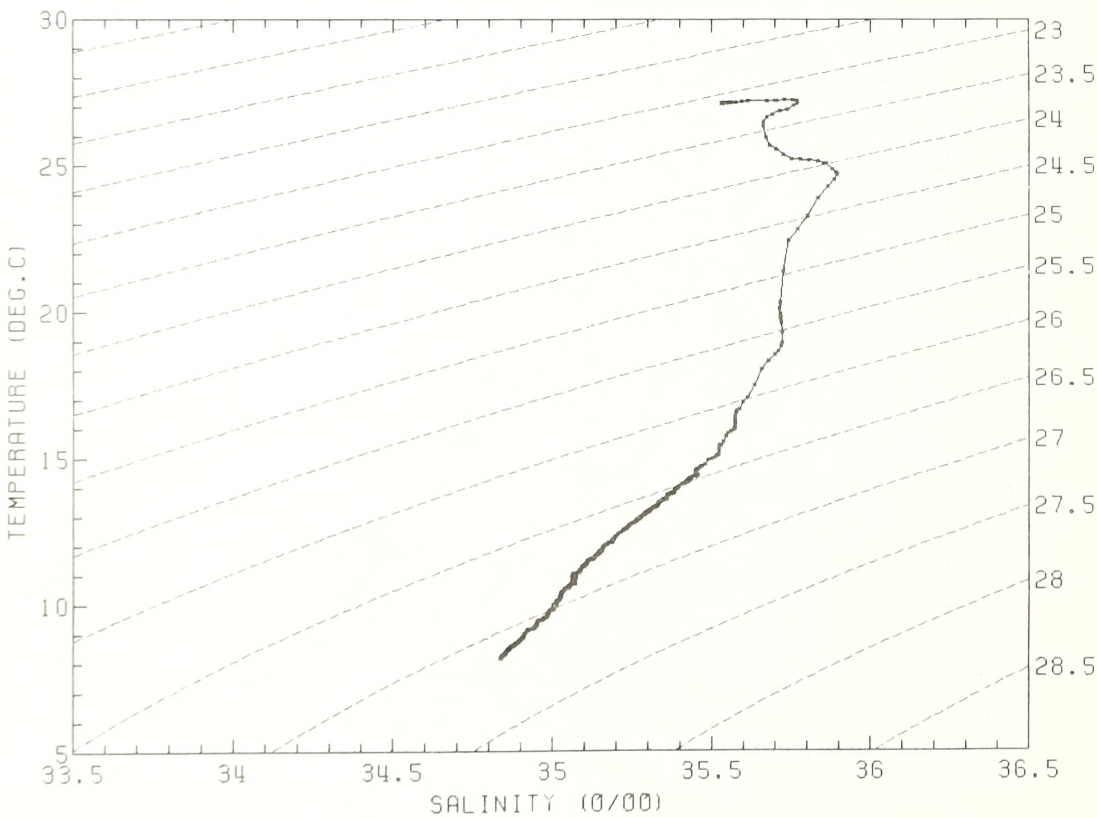

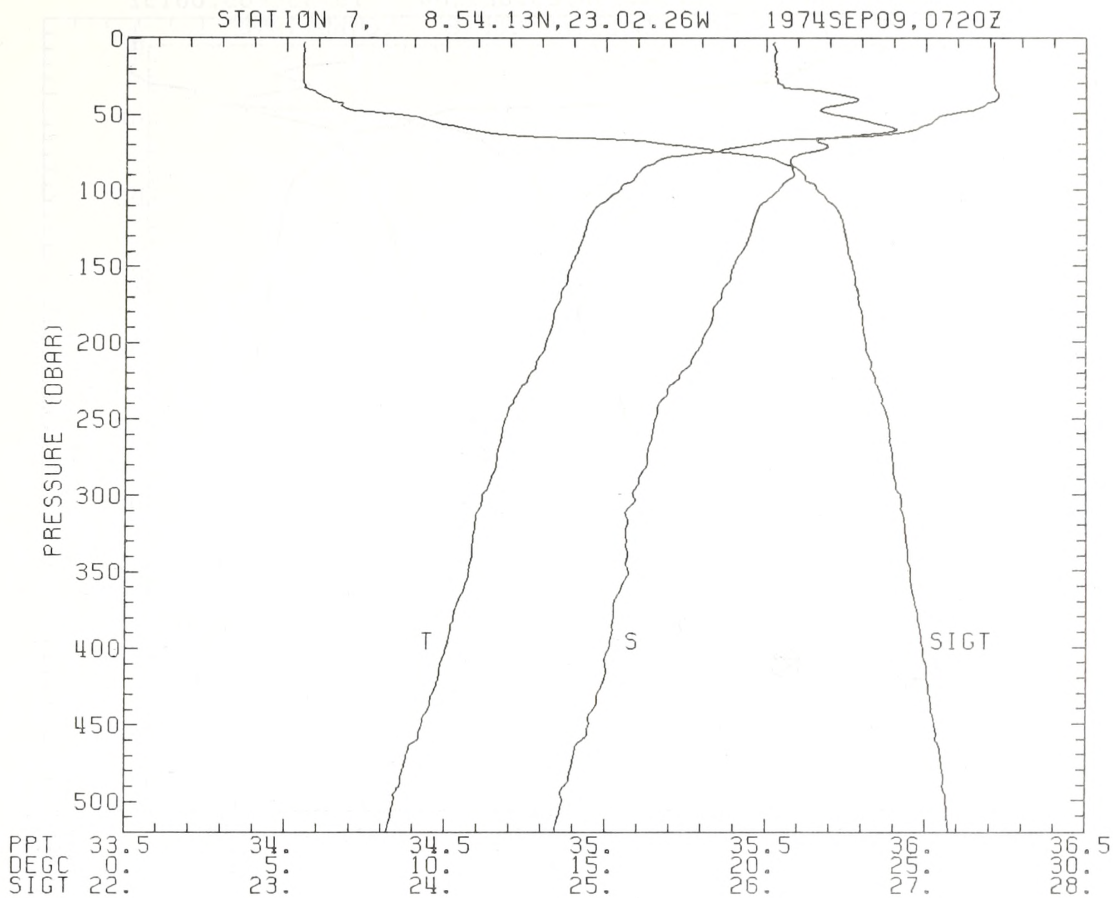
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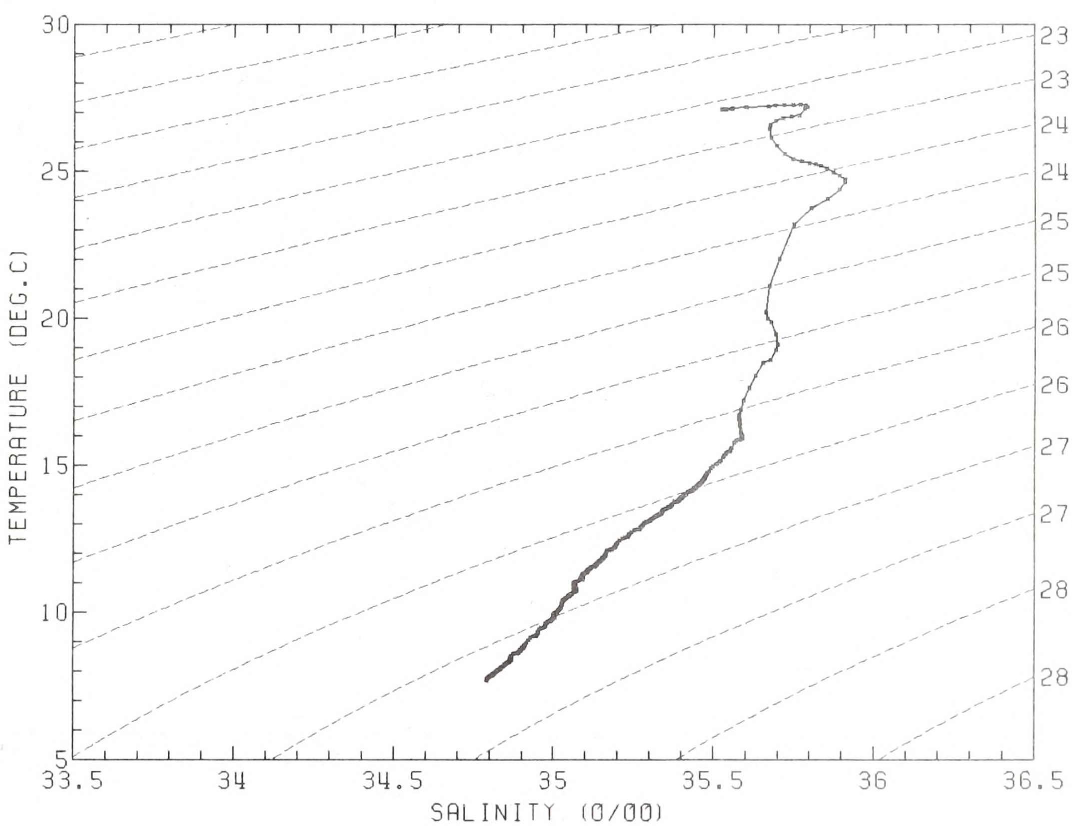
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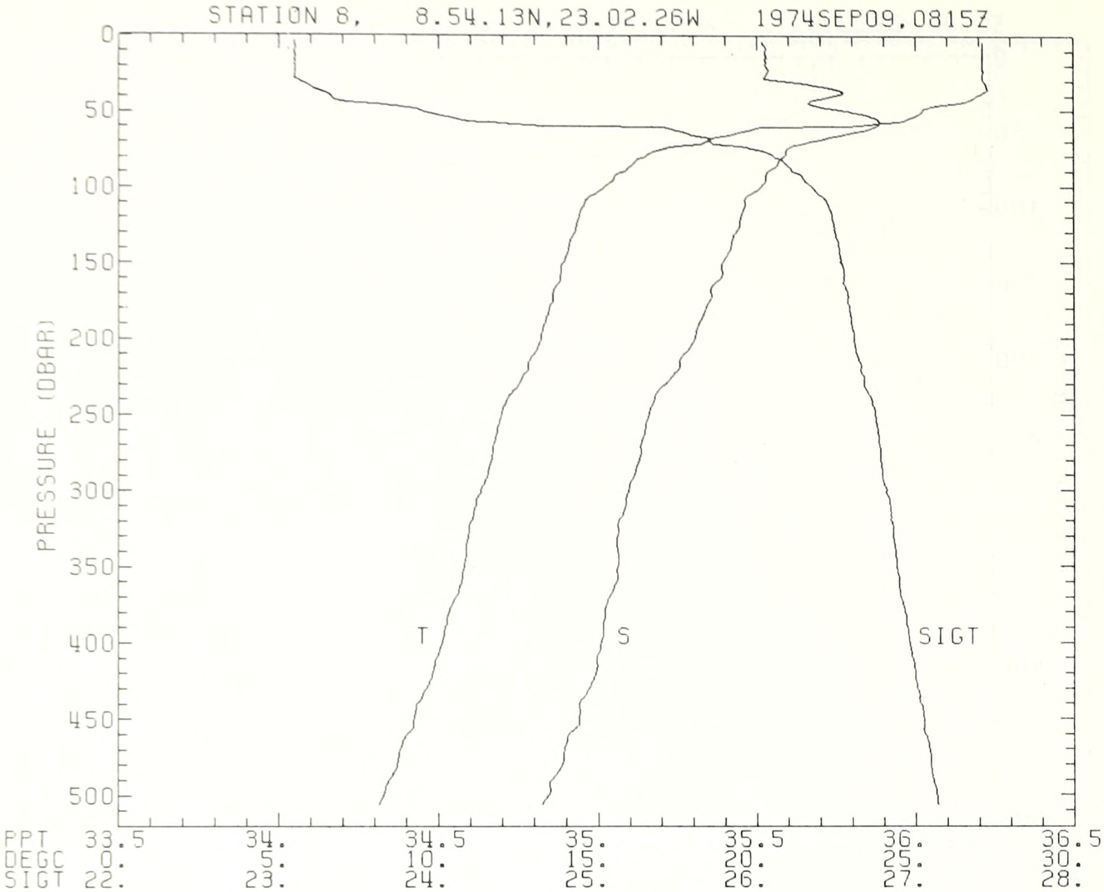
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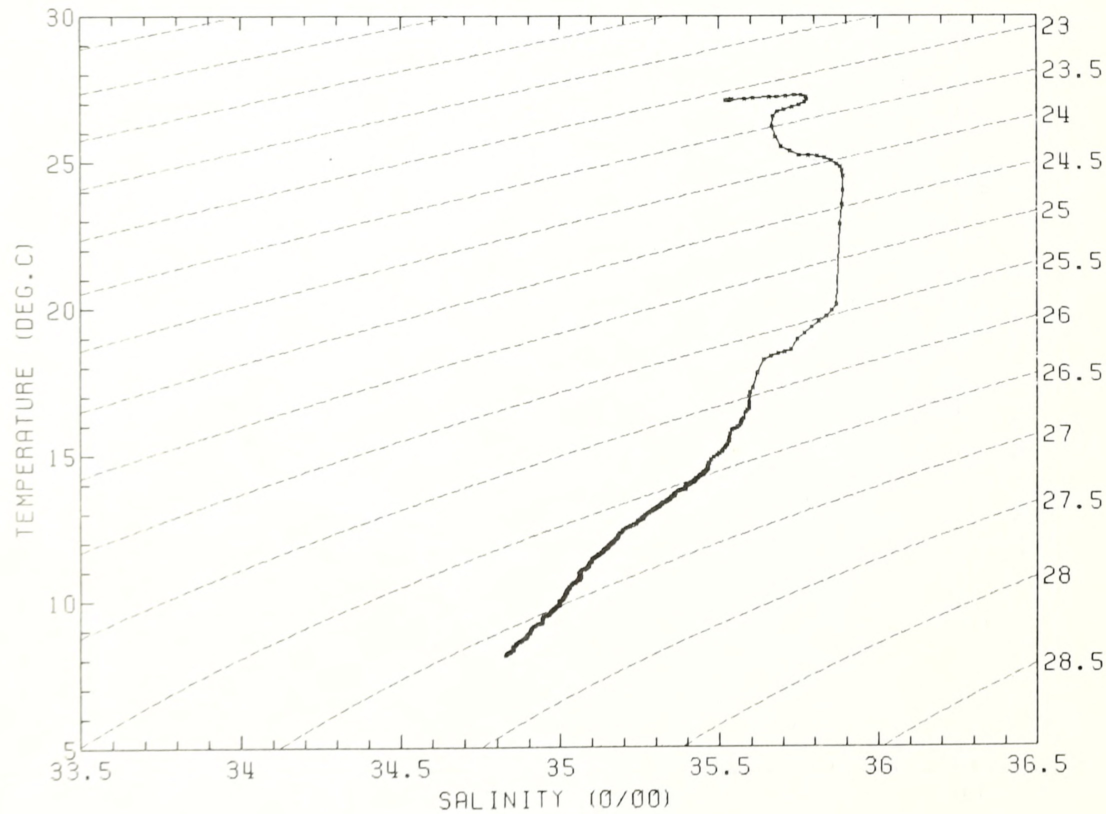
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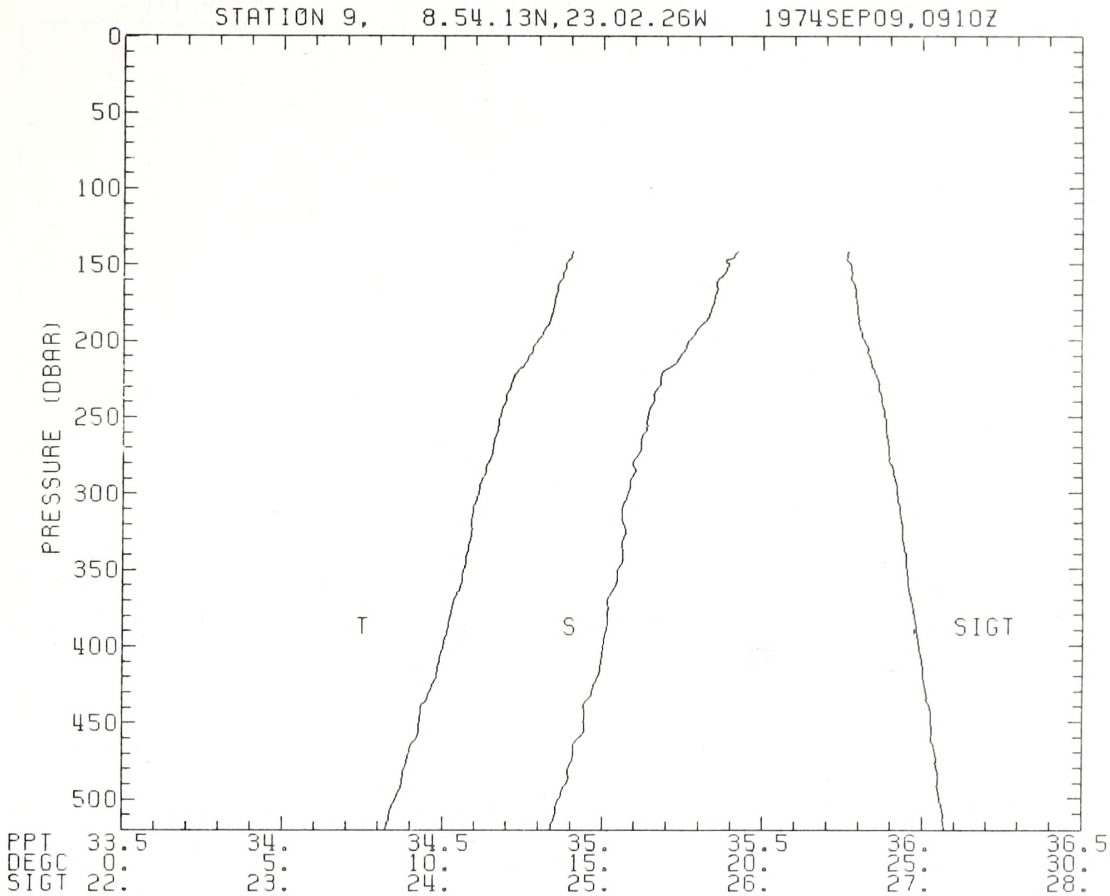
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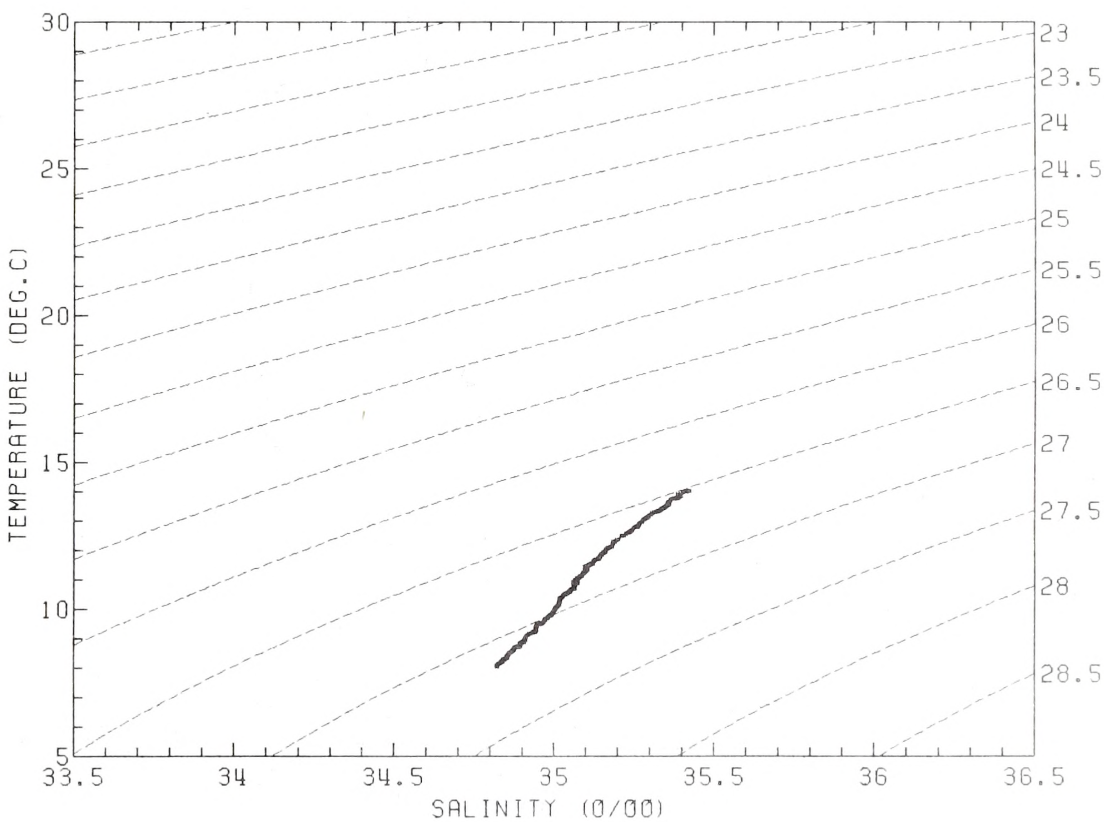
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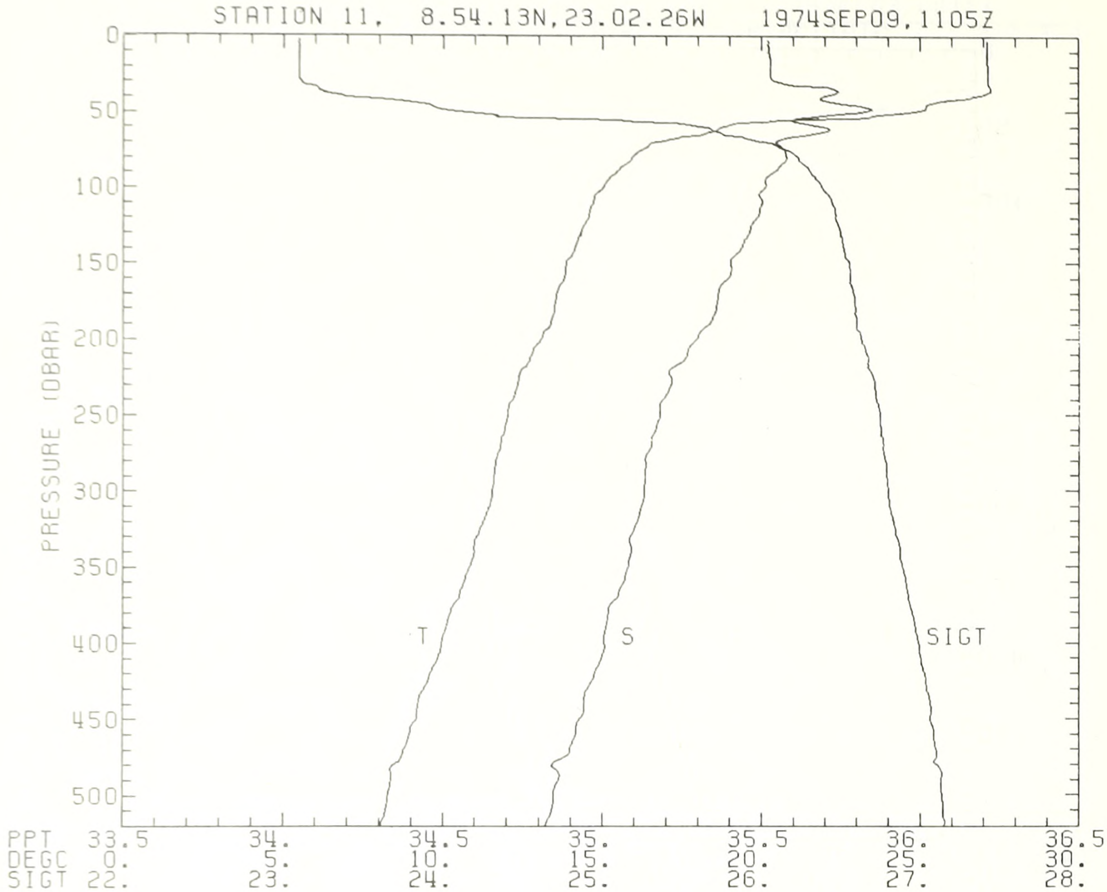
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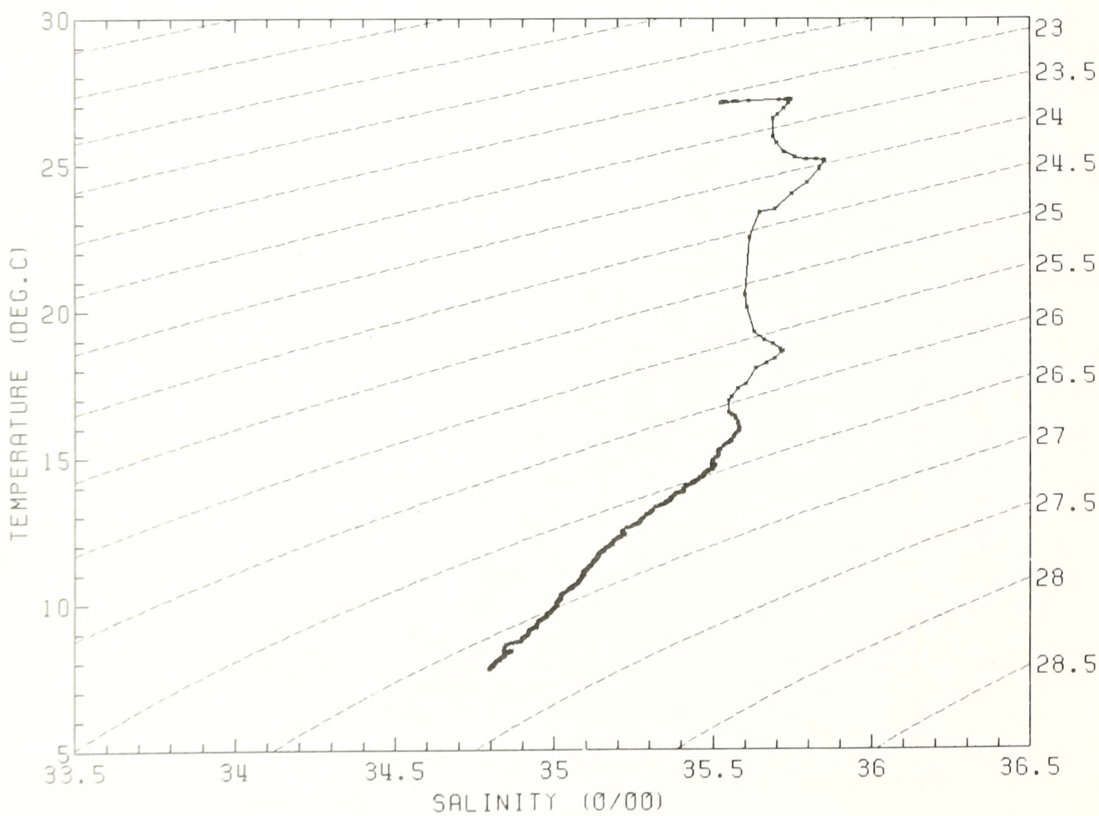
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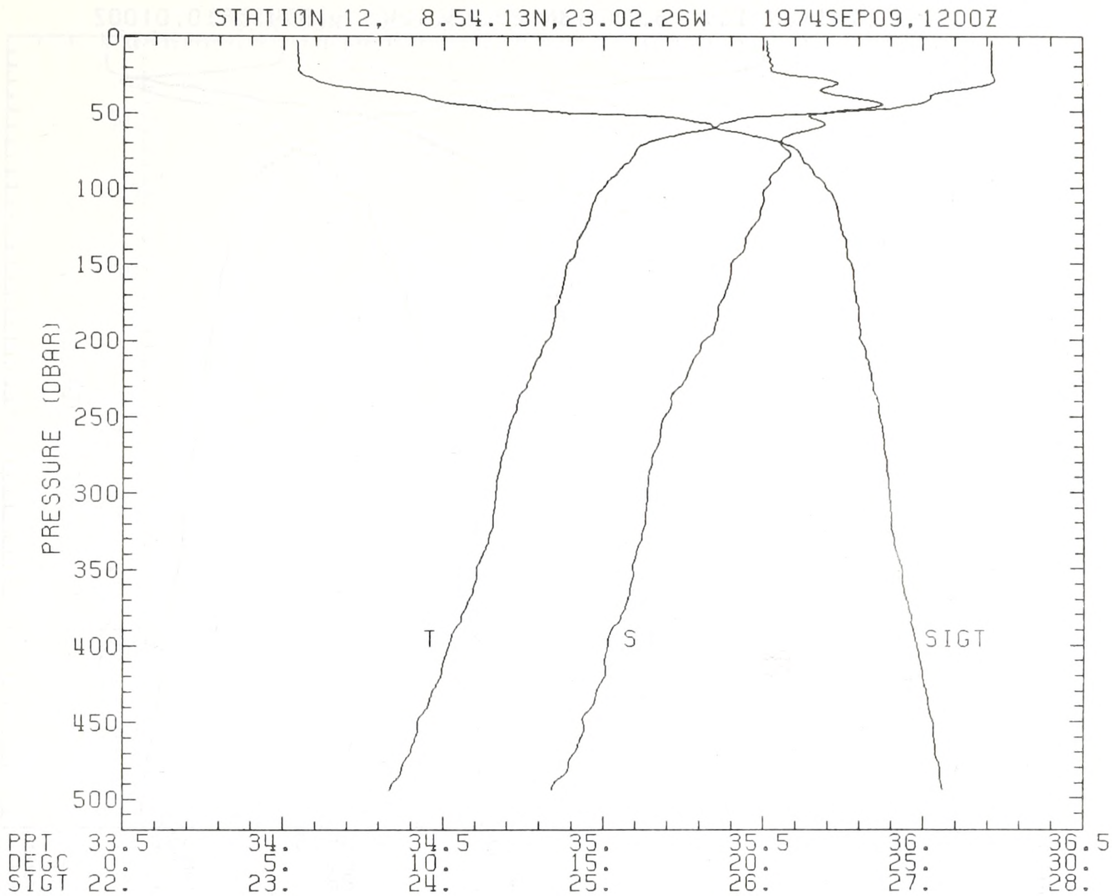
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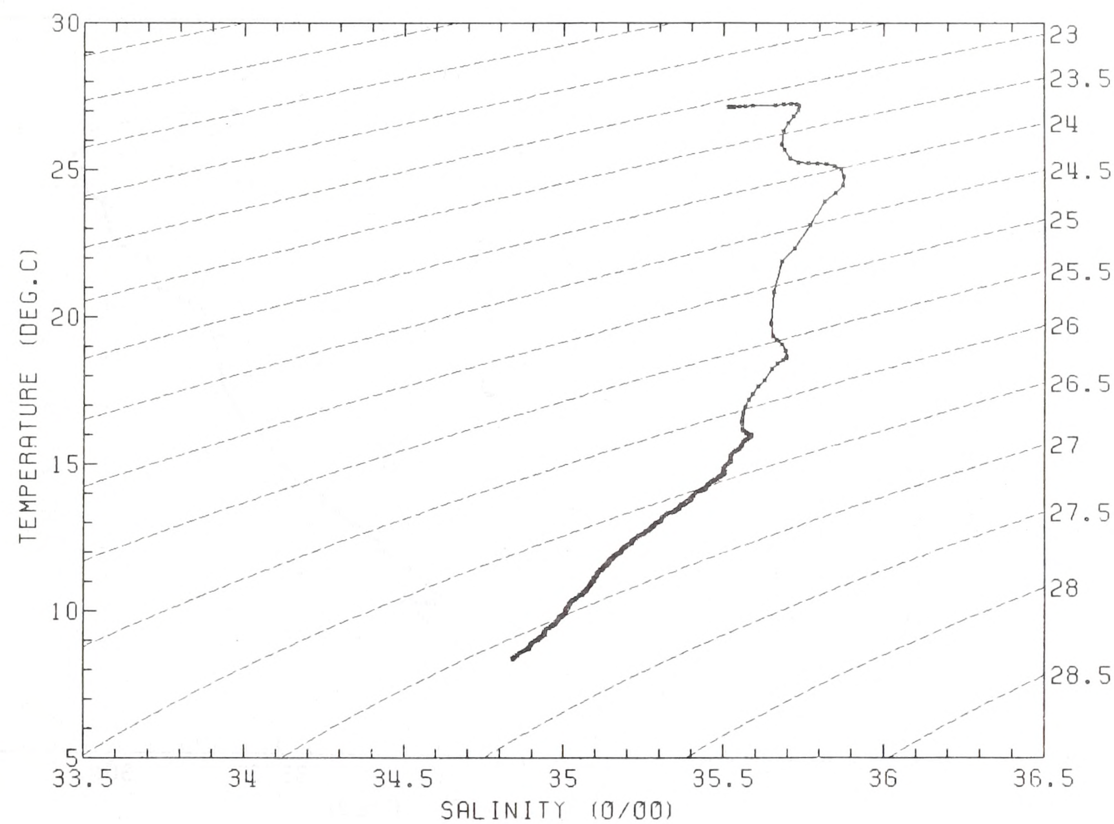
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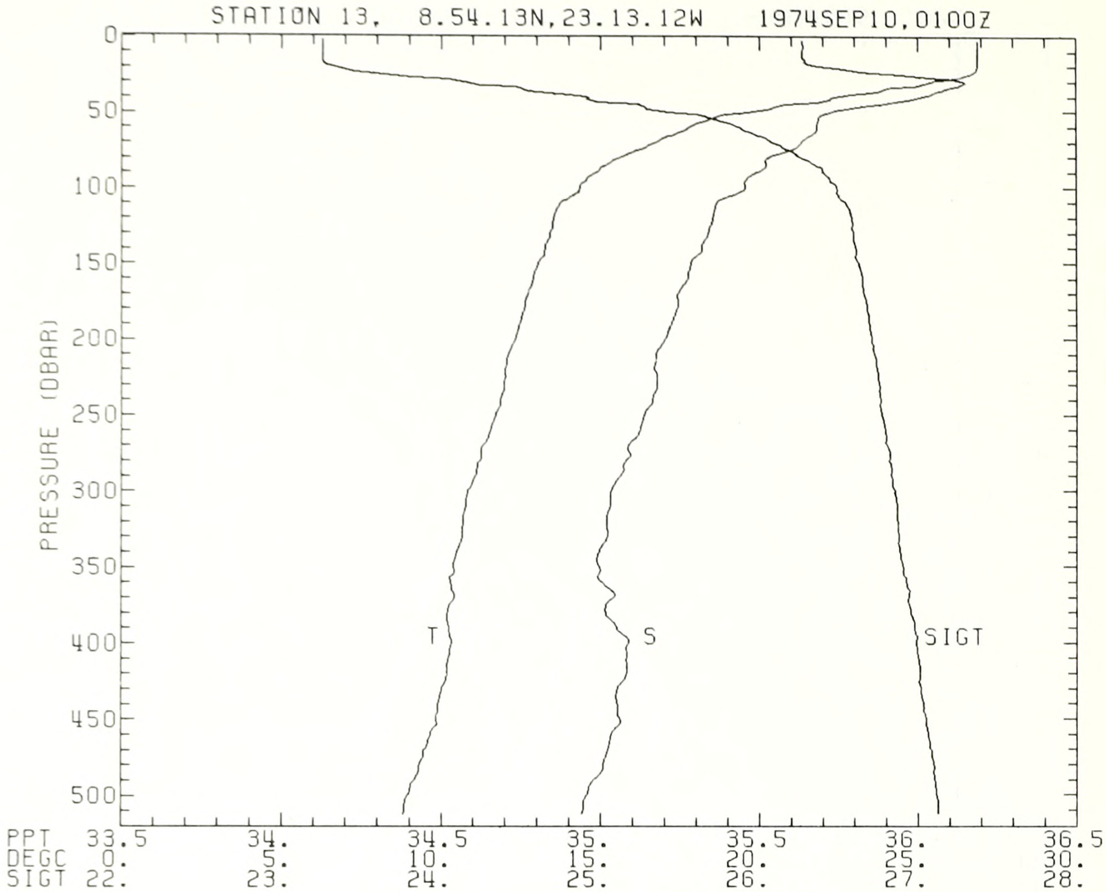
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 13, 8.54.13N,23.13.12W 1974SEP10,0100Z
PRESSURE (DBAR)
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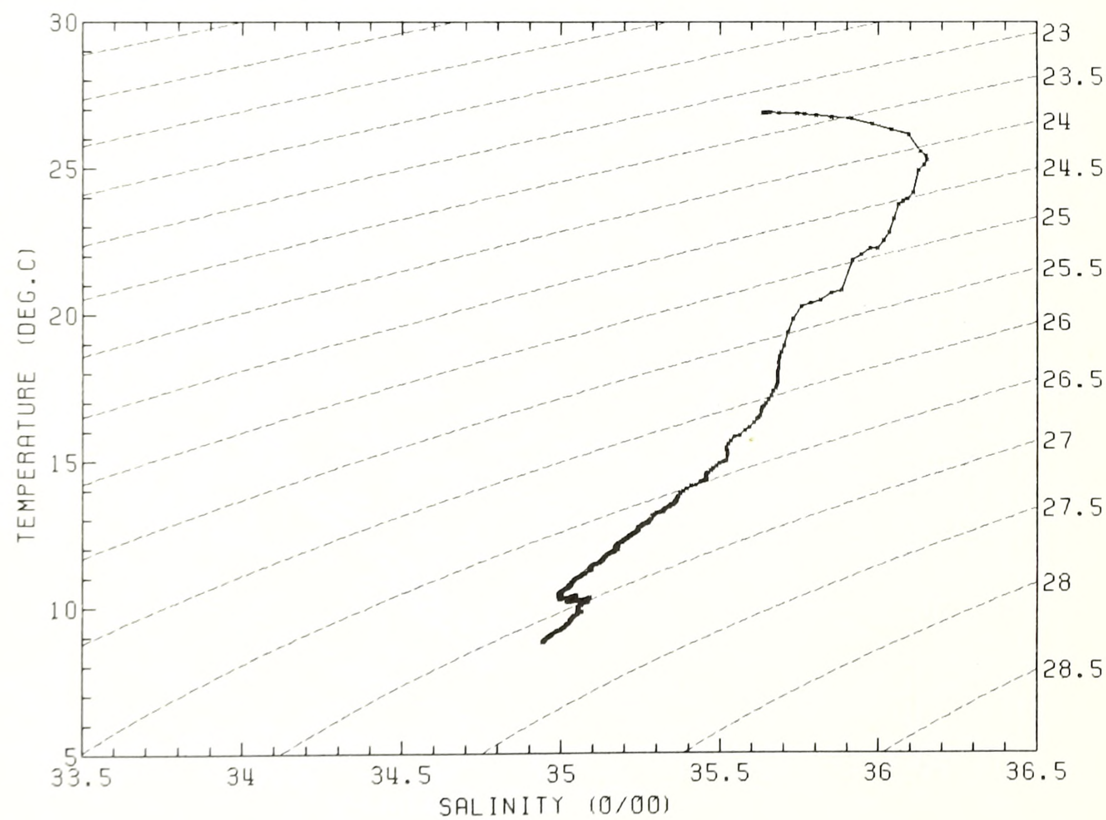
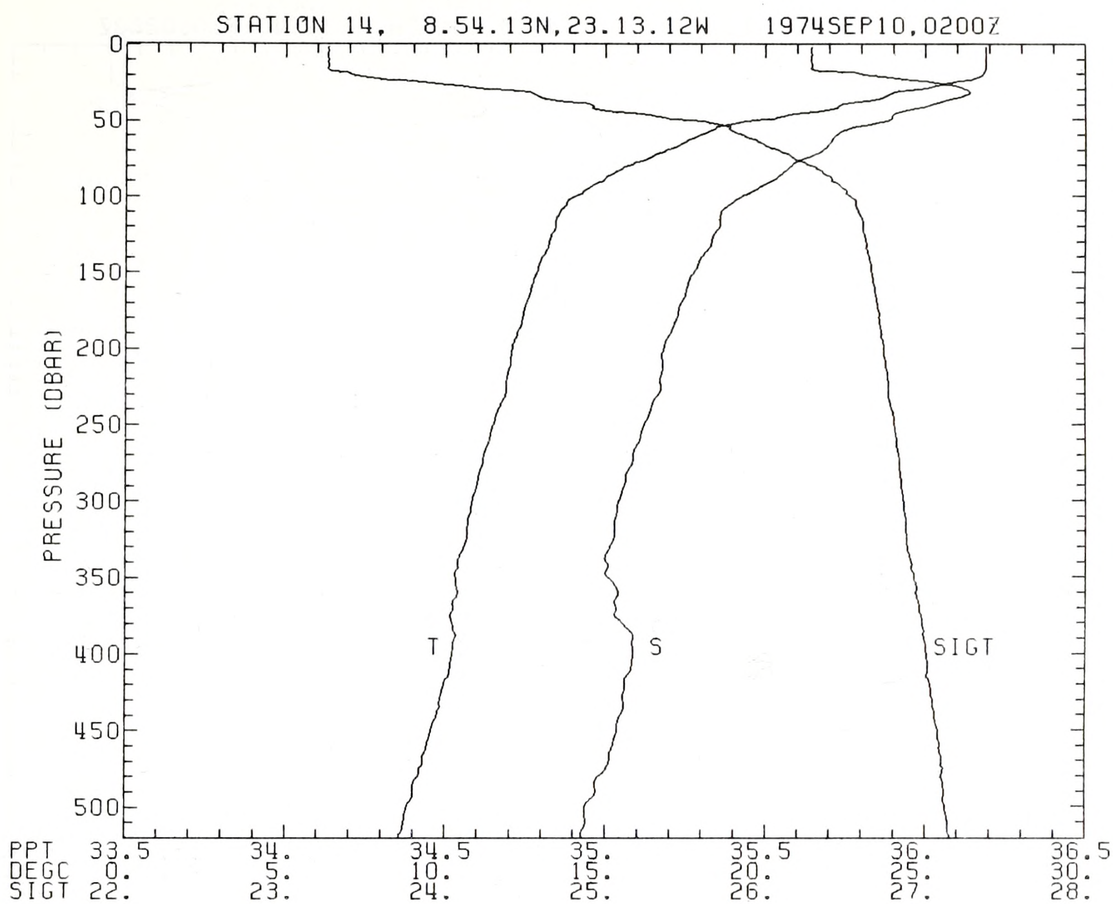
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
SALINITY (0/00)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PRESSURE (DBAR)
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T
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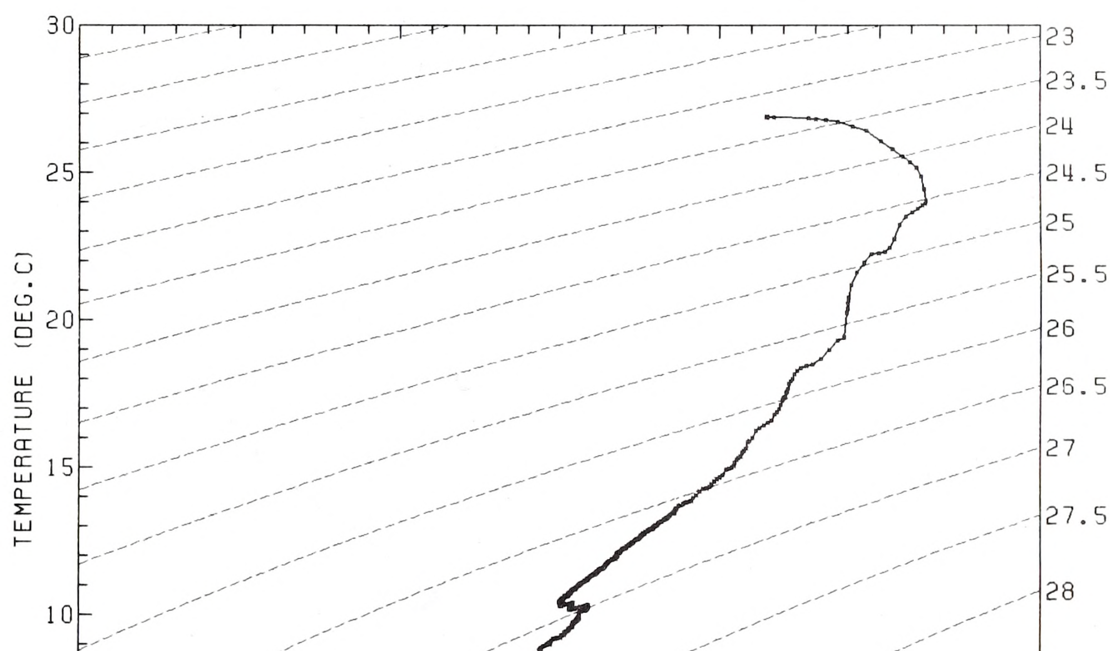
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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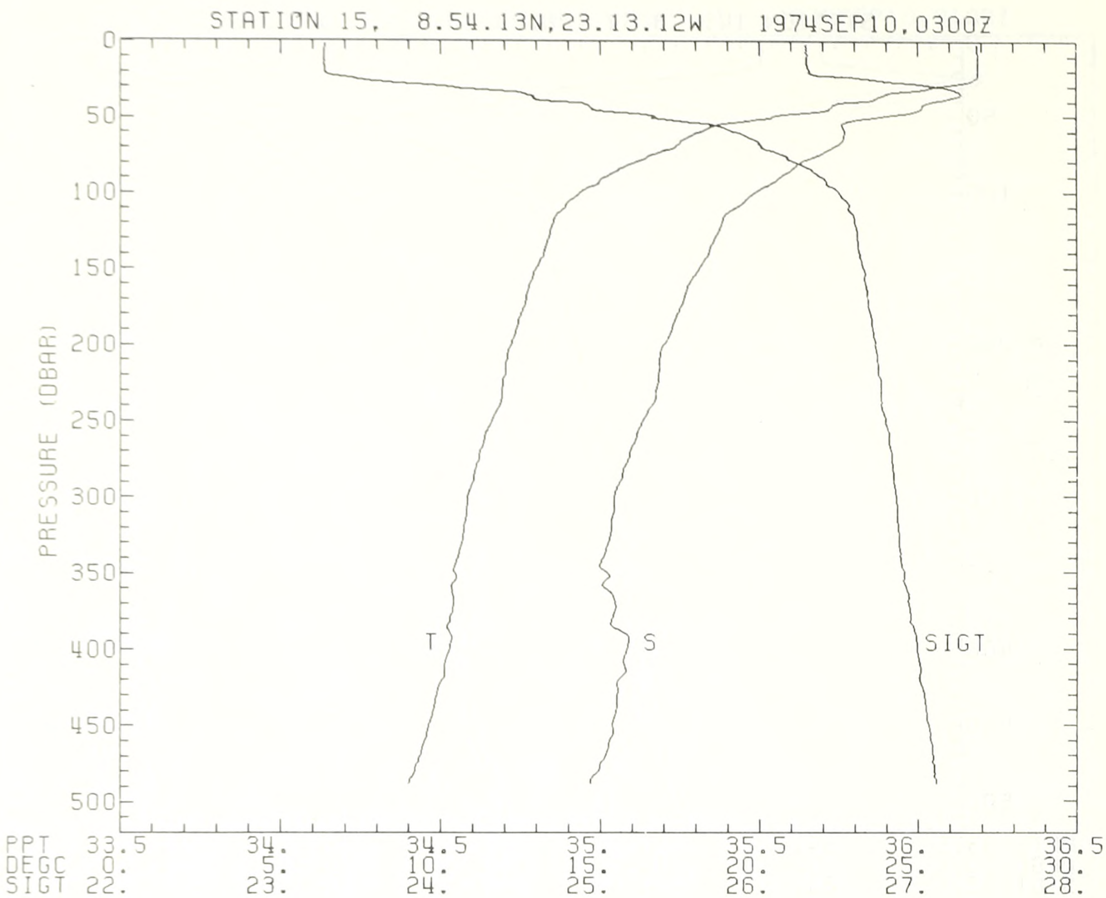
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PRESSURE (DBAR)
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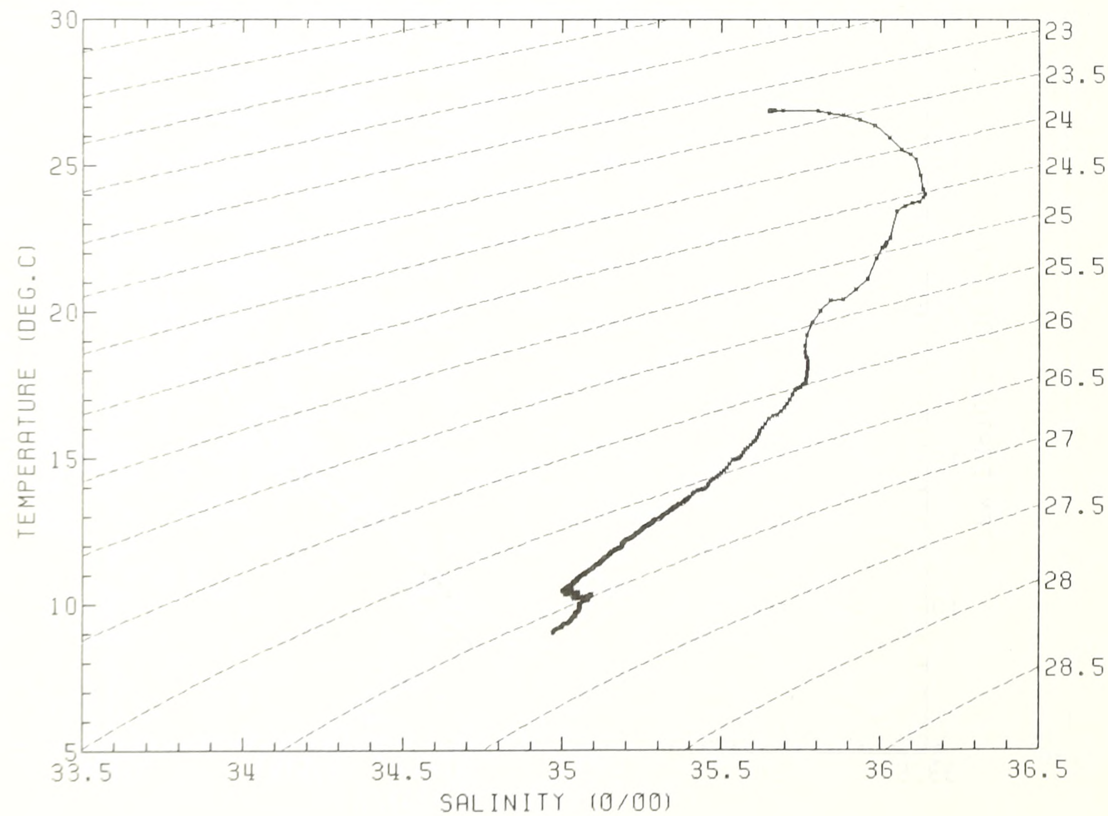
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.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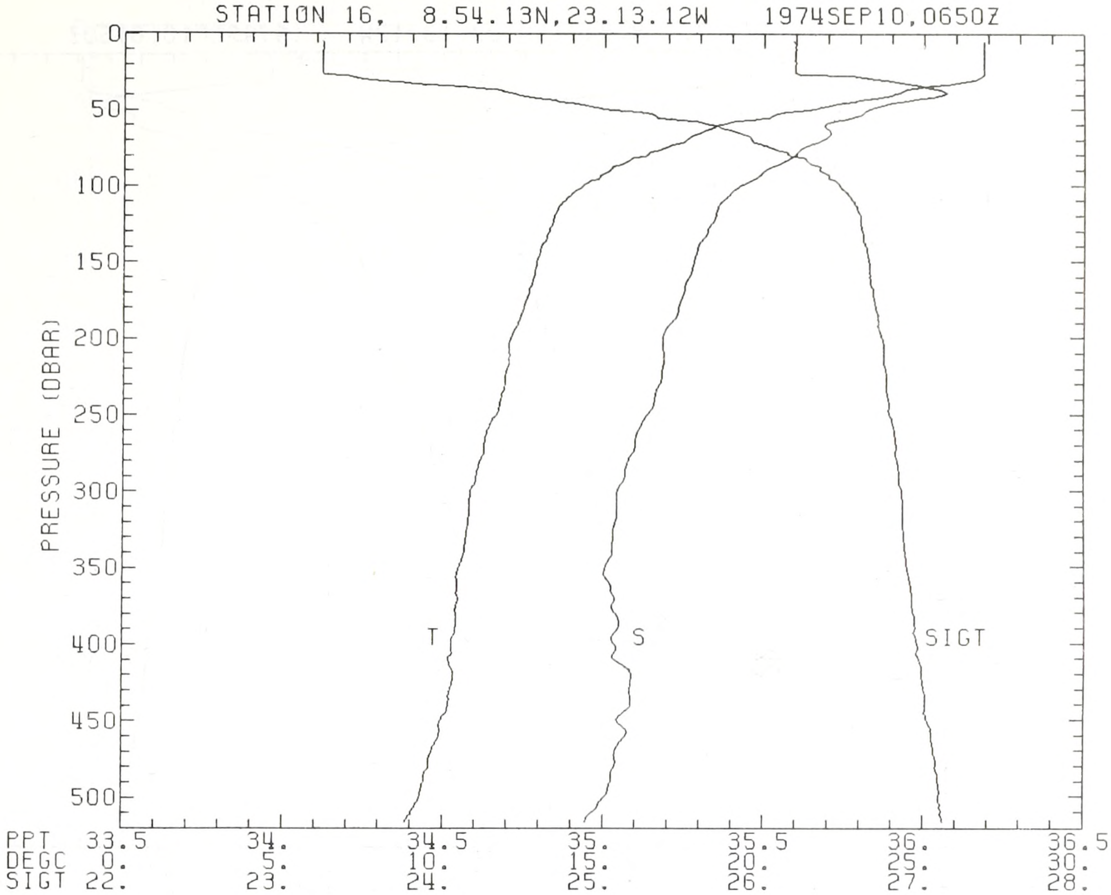
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PRESSURE (DBAR)
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SIGT
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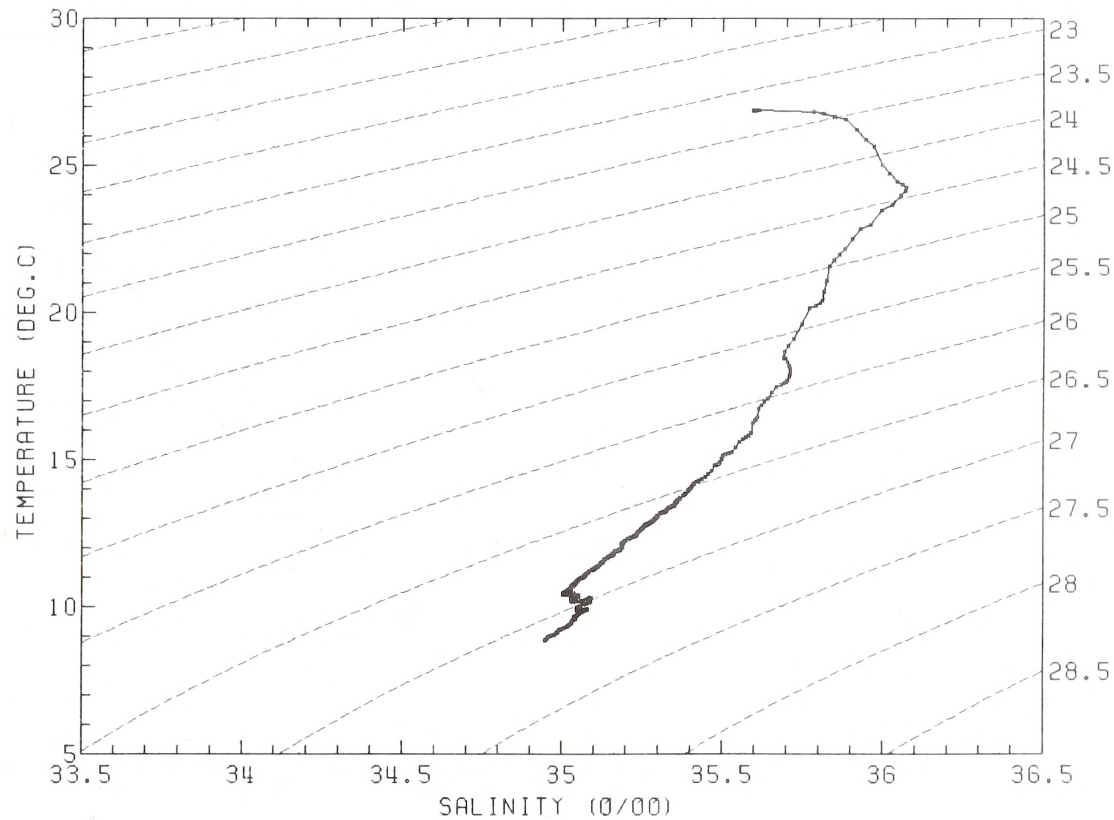
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.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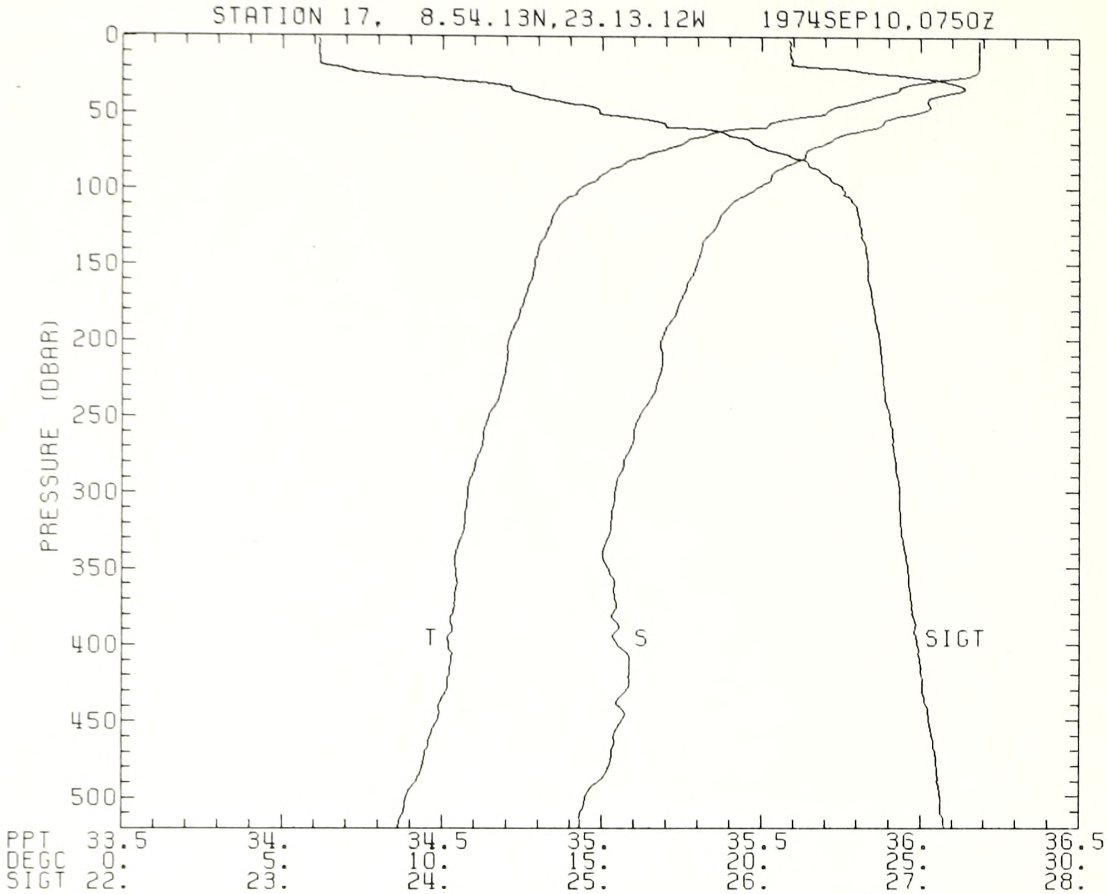
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SIGT
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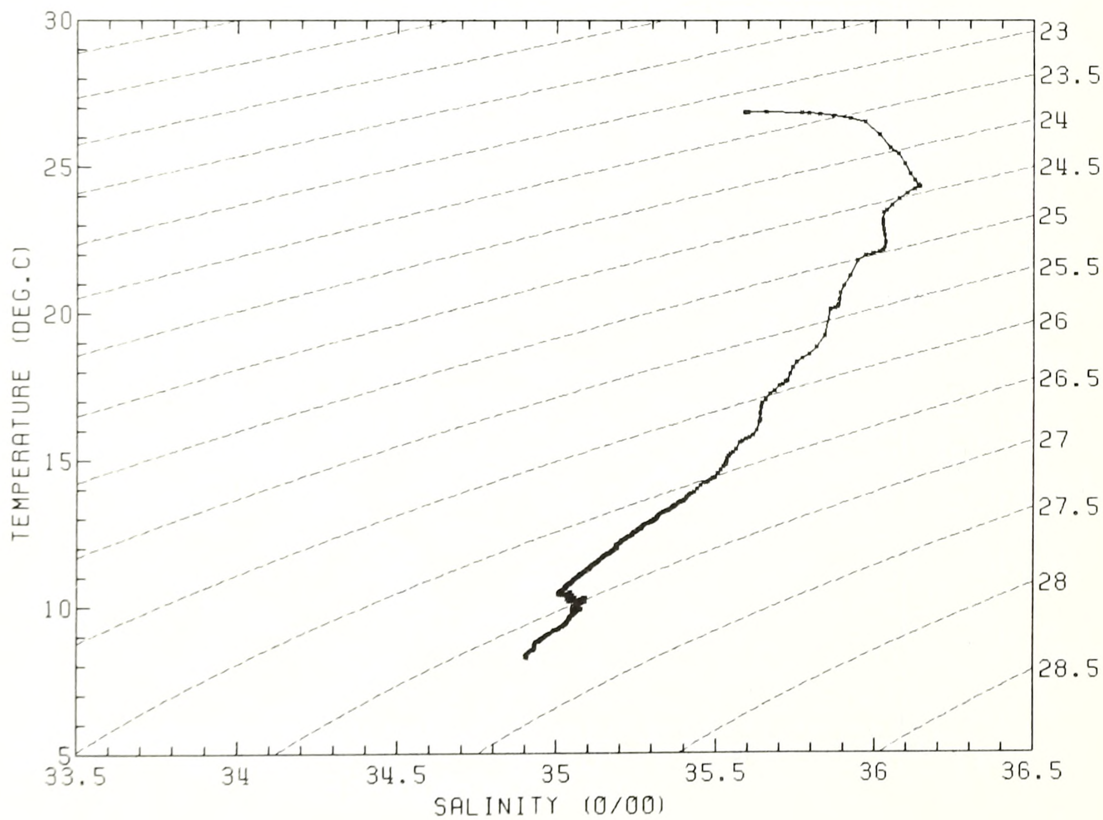
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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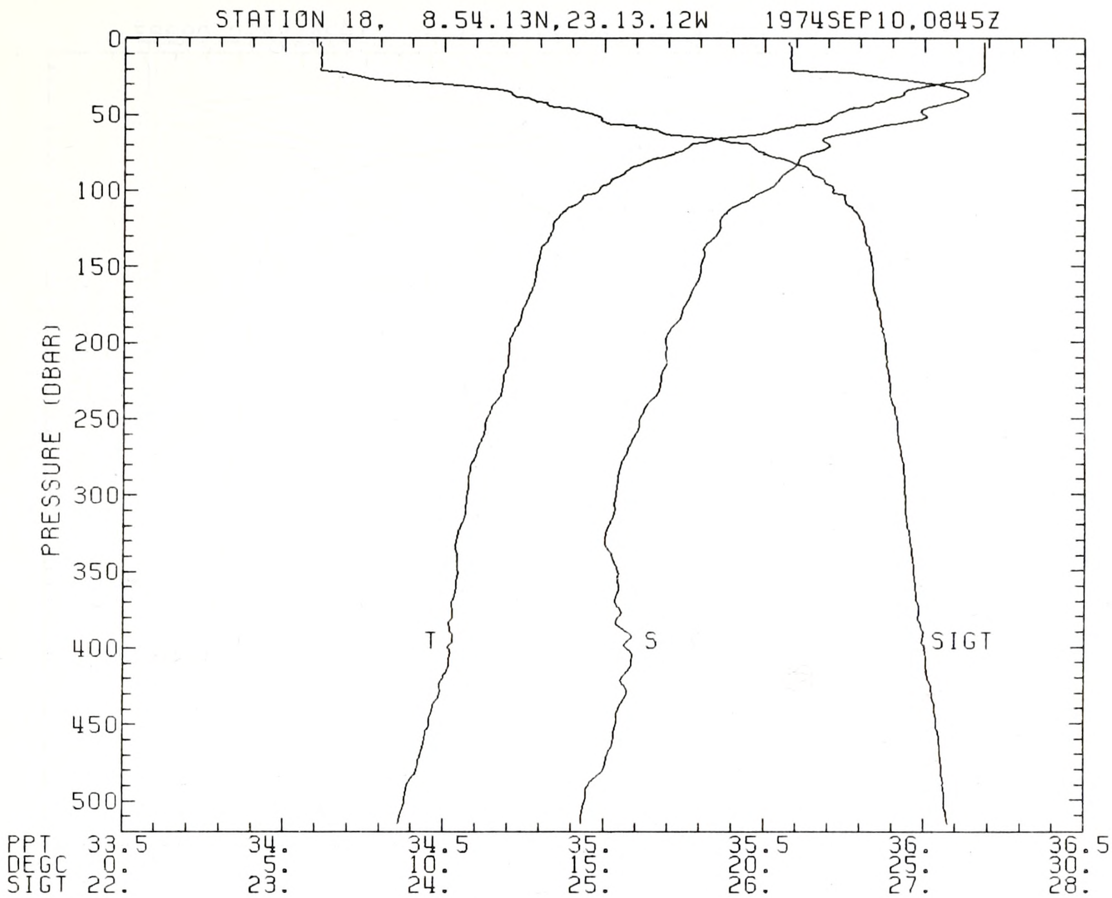
STATION 18, 8.54.13N,23.13.12W 1974SEP10,0845Z
PRESSURE (DBAR)
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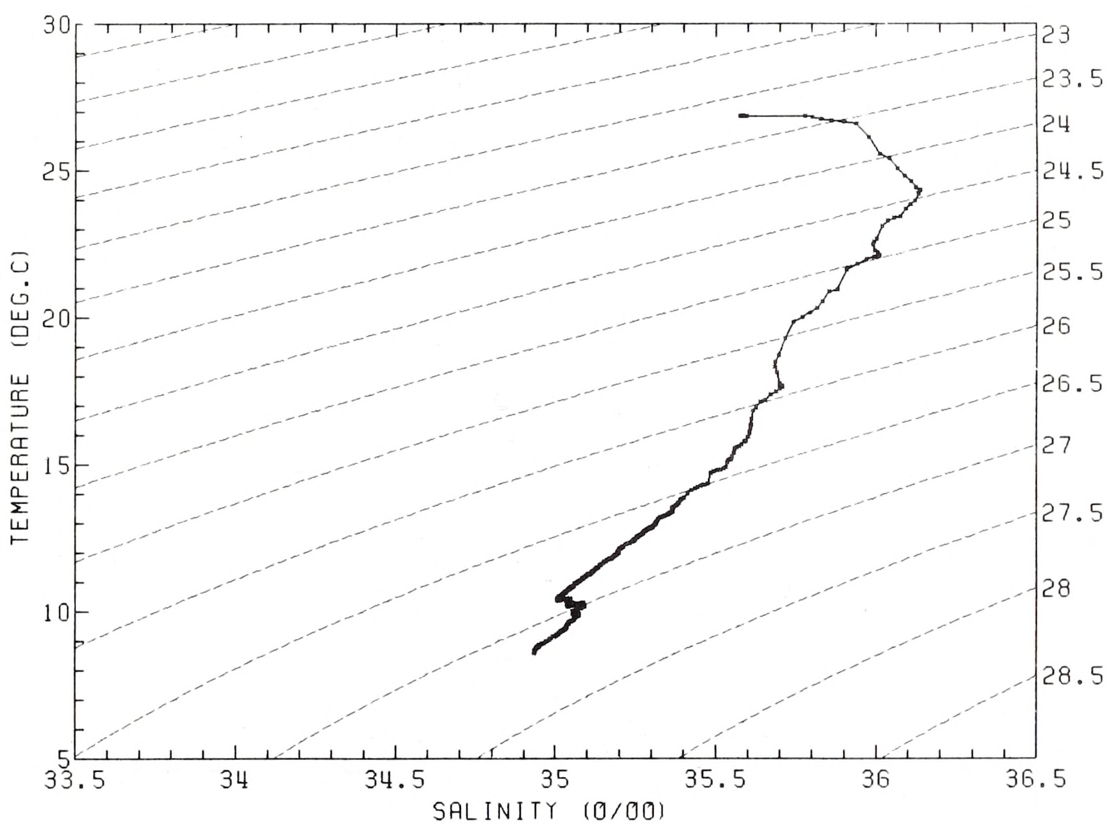
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)
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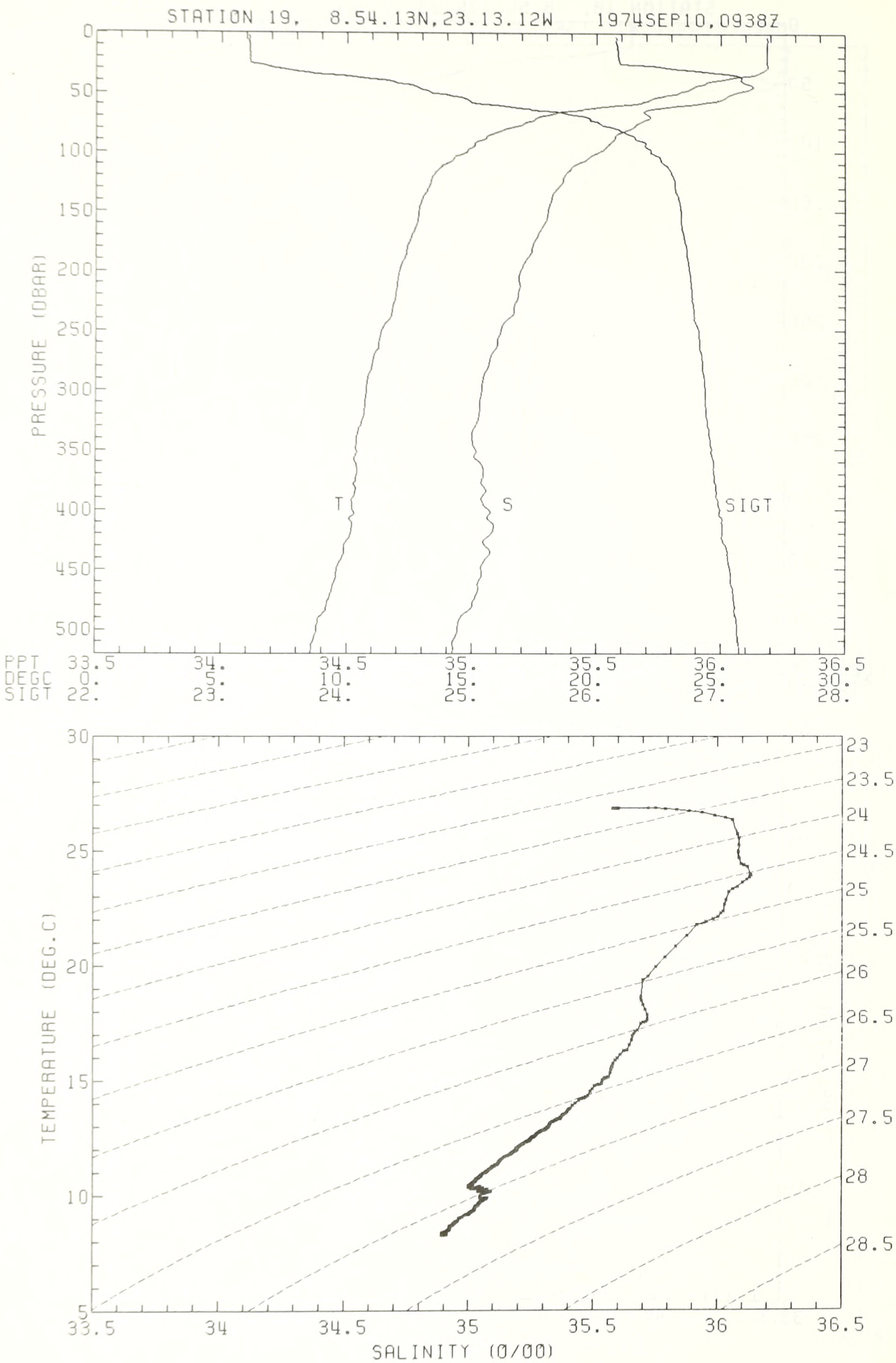
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PRESSURE (DBAR)
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SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
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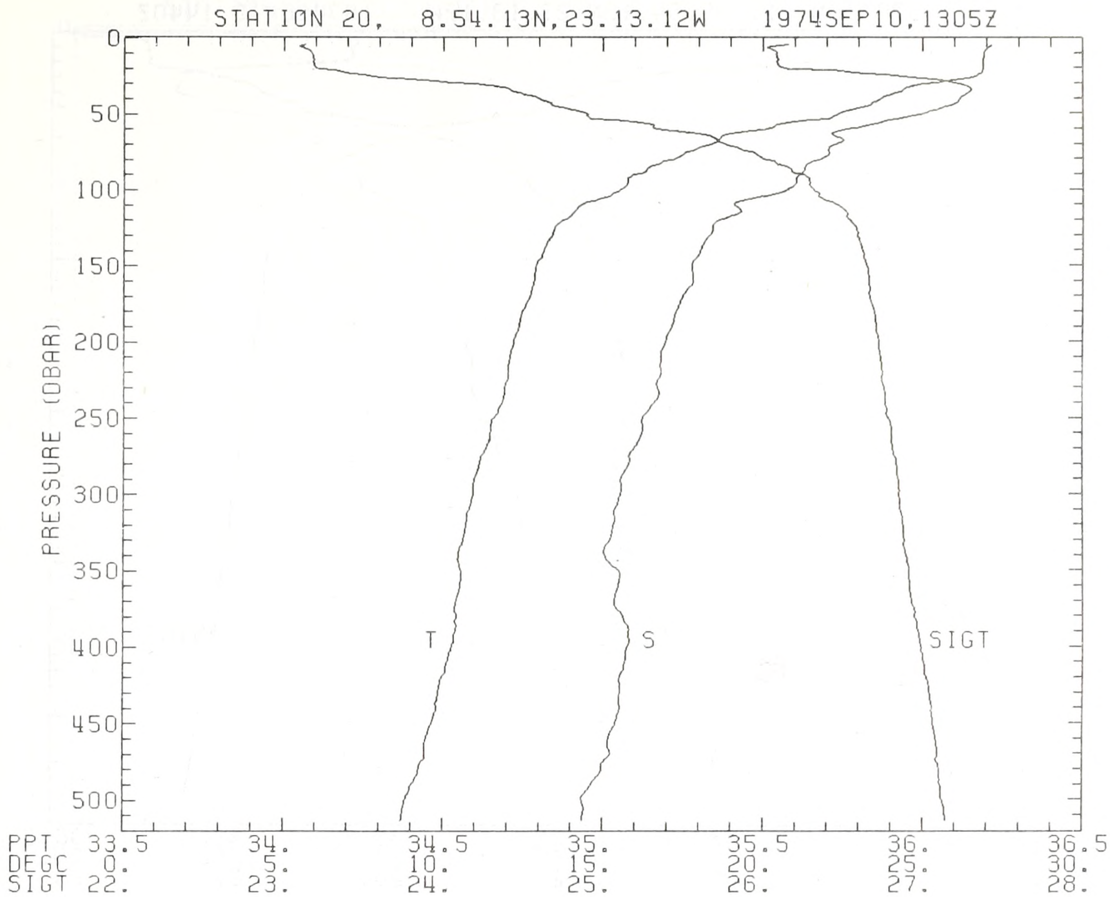
SALINITY (0/00)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PRESSURE (DBAR)
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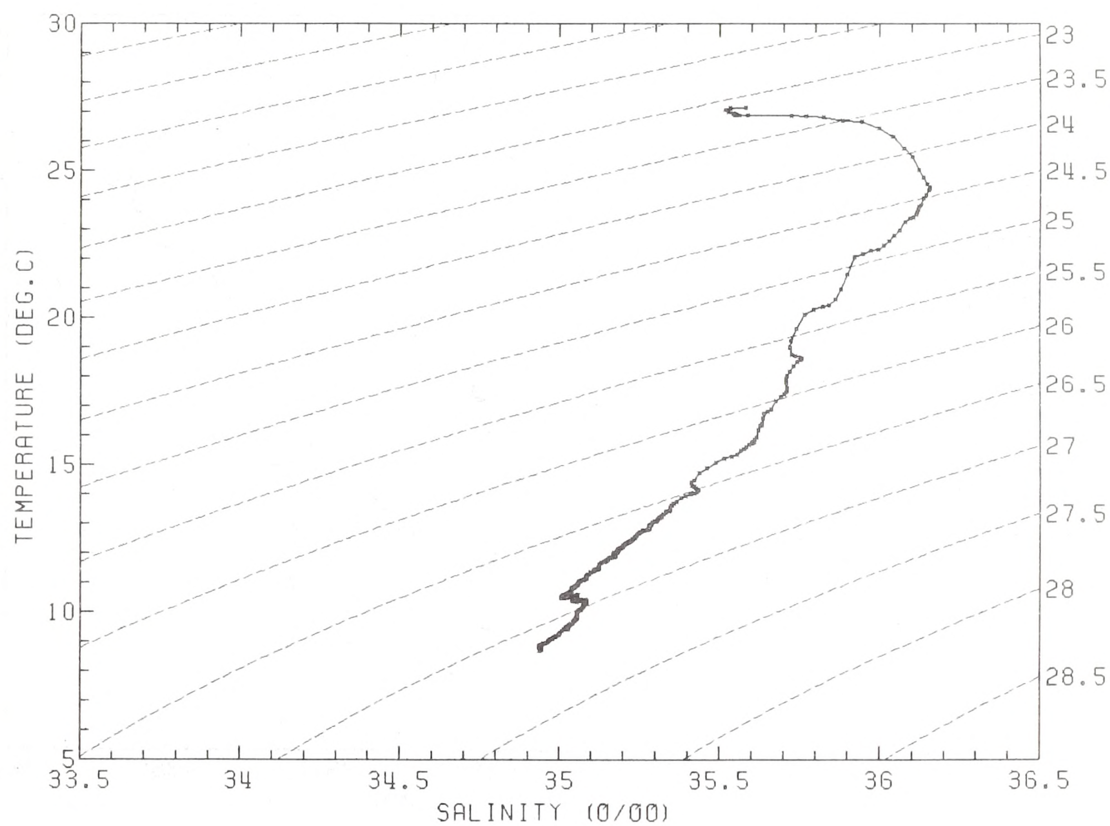
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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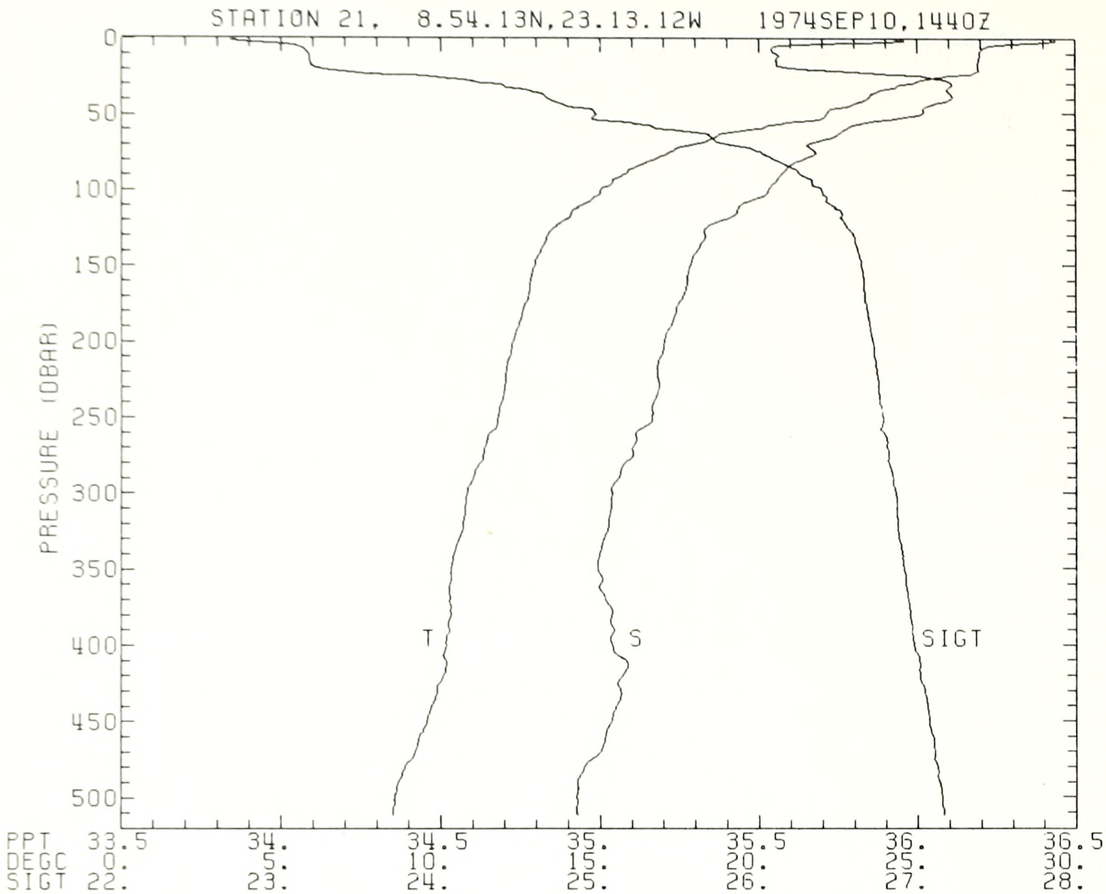
STATION 21, 8.54.13N,23.13.12W 1974SEP10,1440Z
PRESSURE (DBAR)
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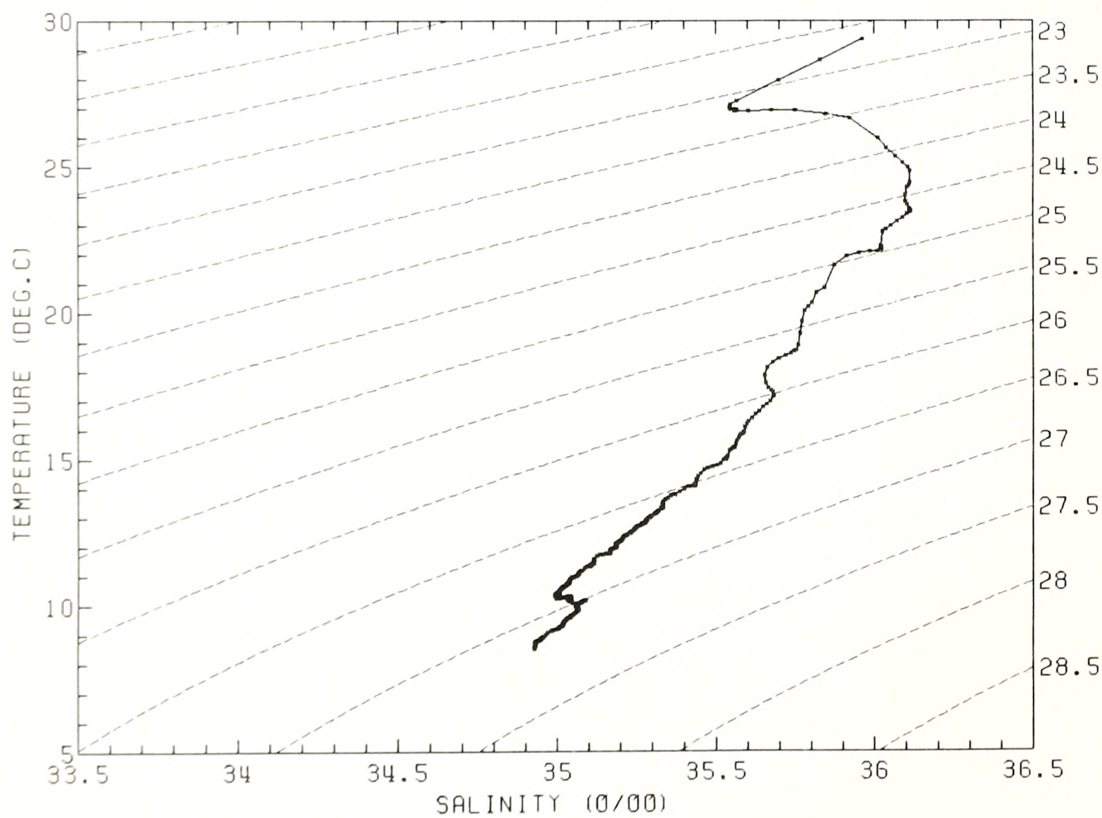
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.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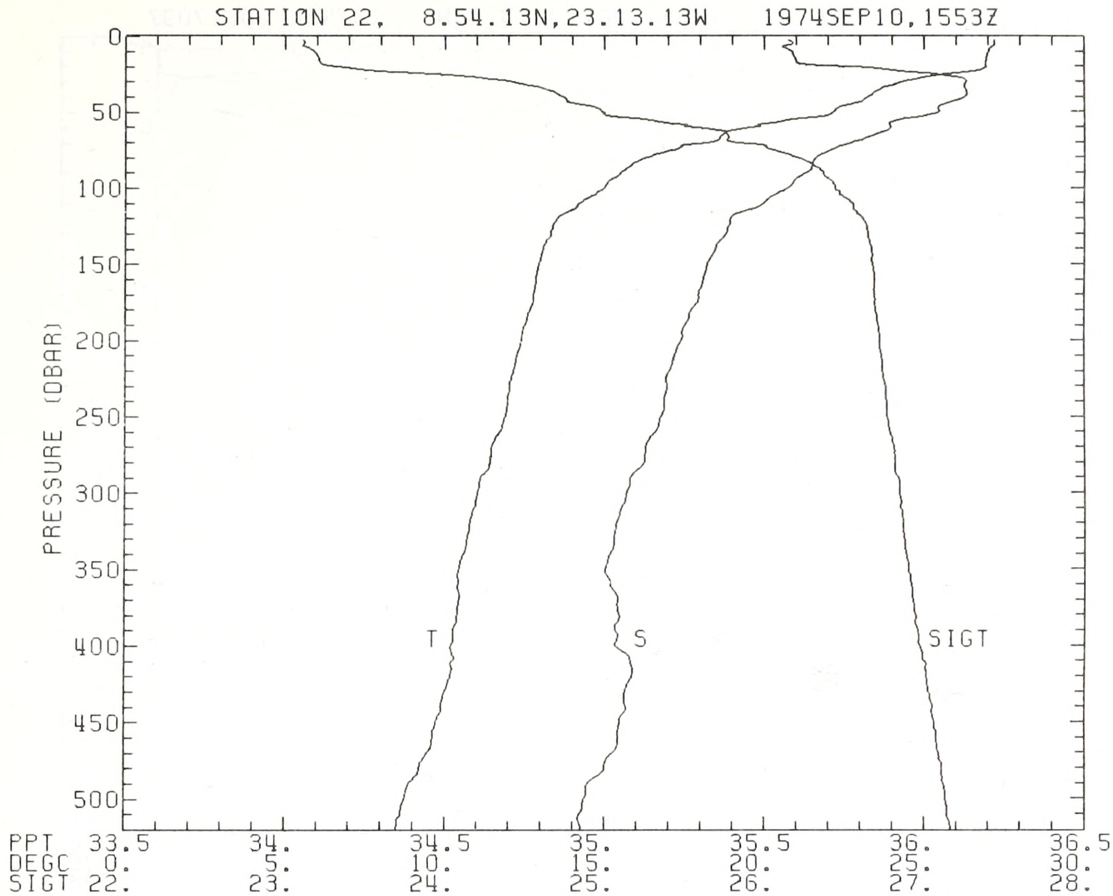
SALINITY (0/00)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PRESSURE (DBAR)
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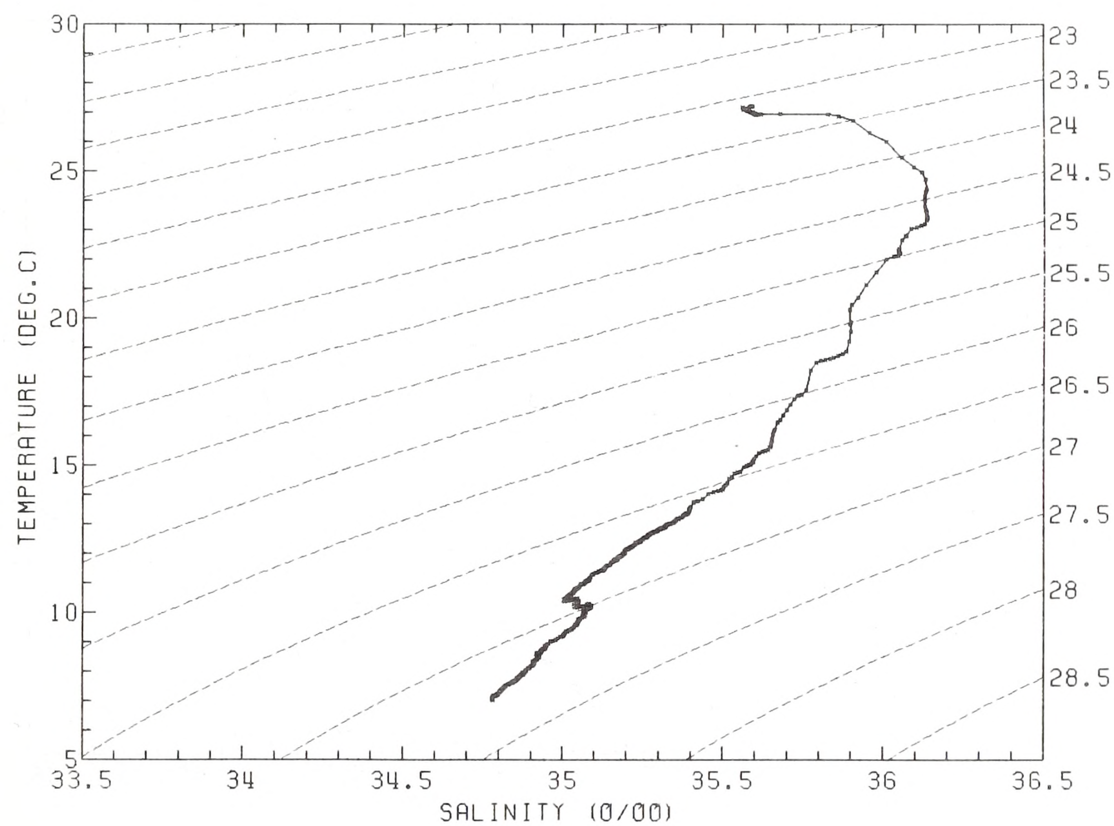
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.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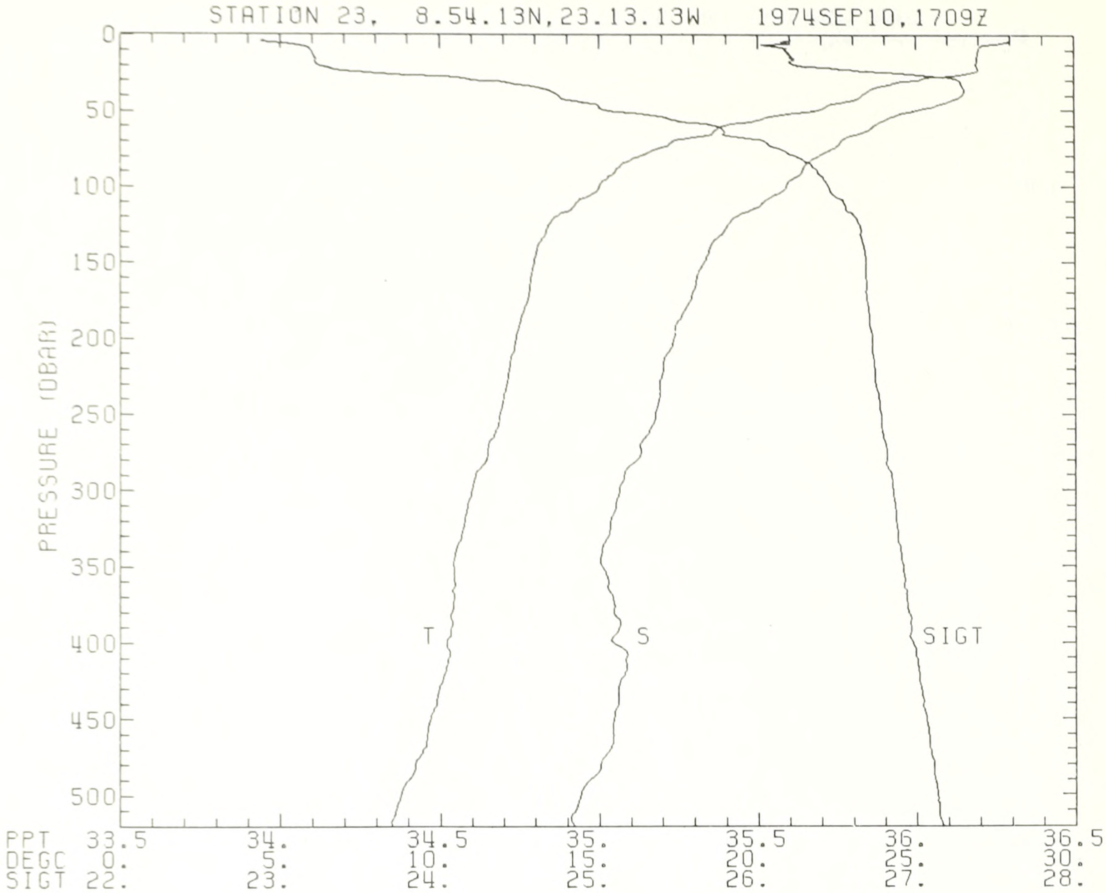
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SIGT
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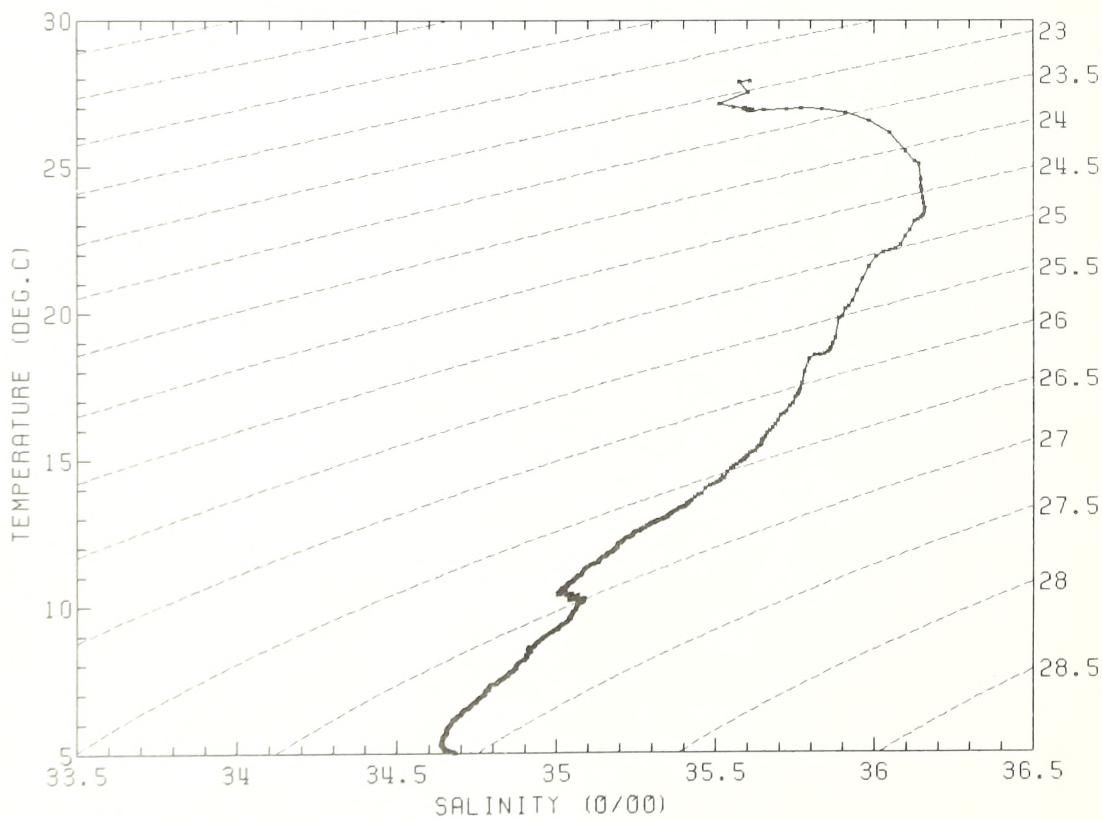
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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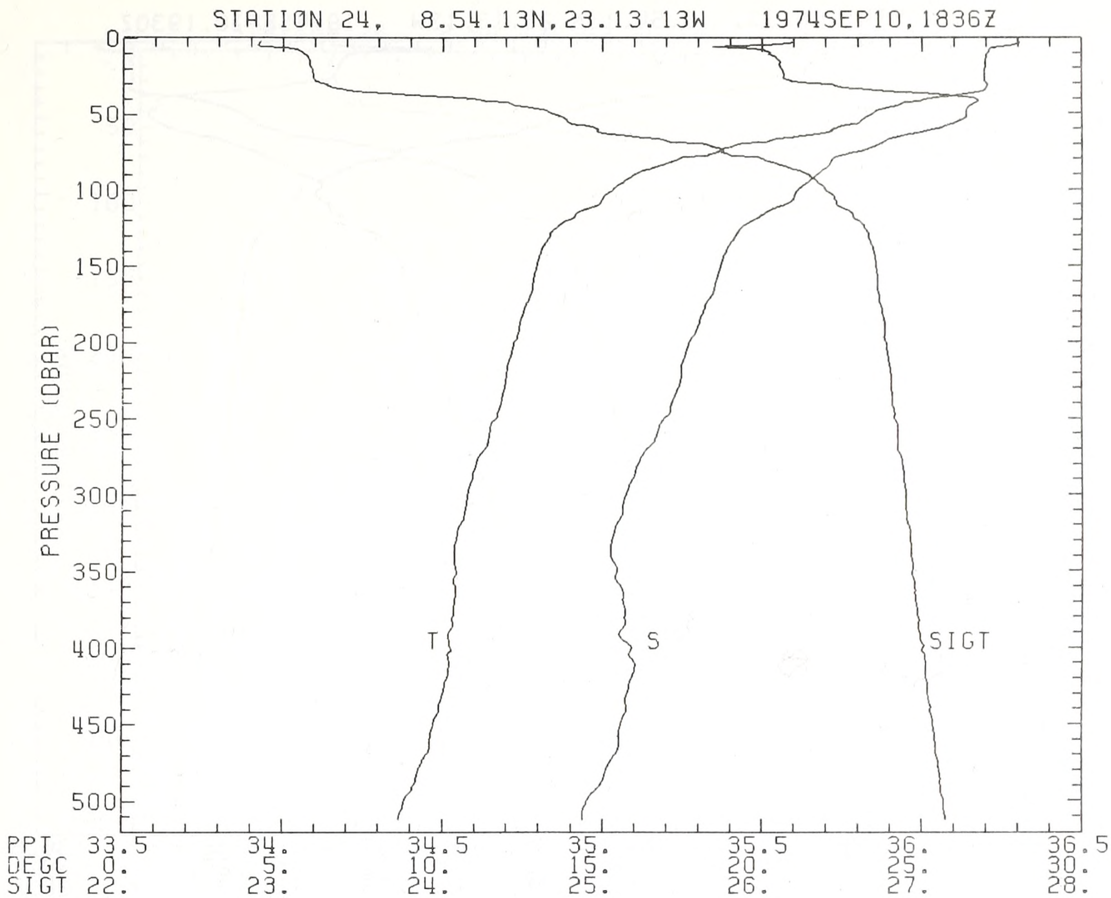
SALINITY (0/00)



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PRESSURE (DBAR)
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SIGT
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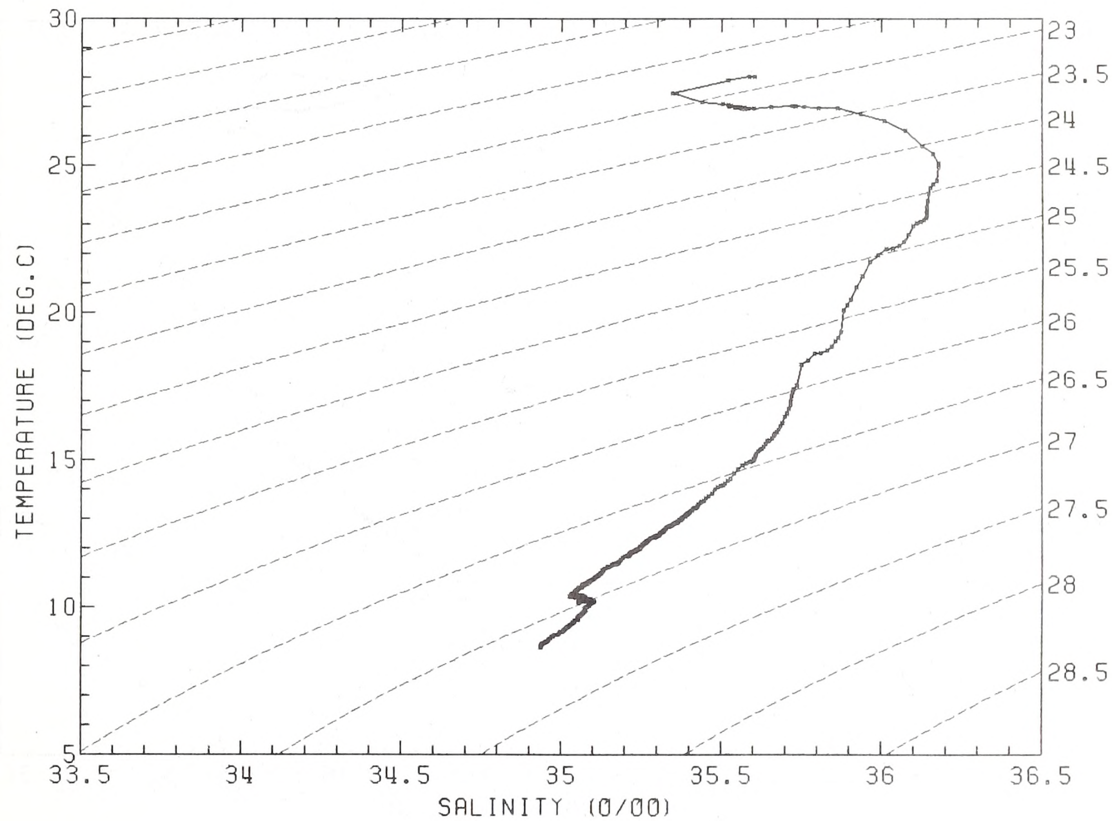
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.



TEMPERATURE (DEG.C)
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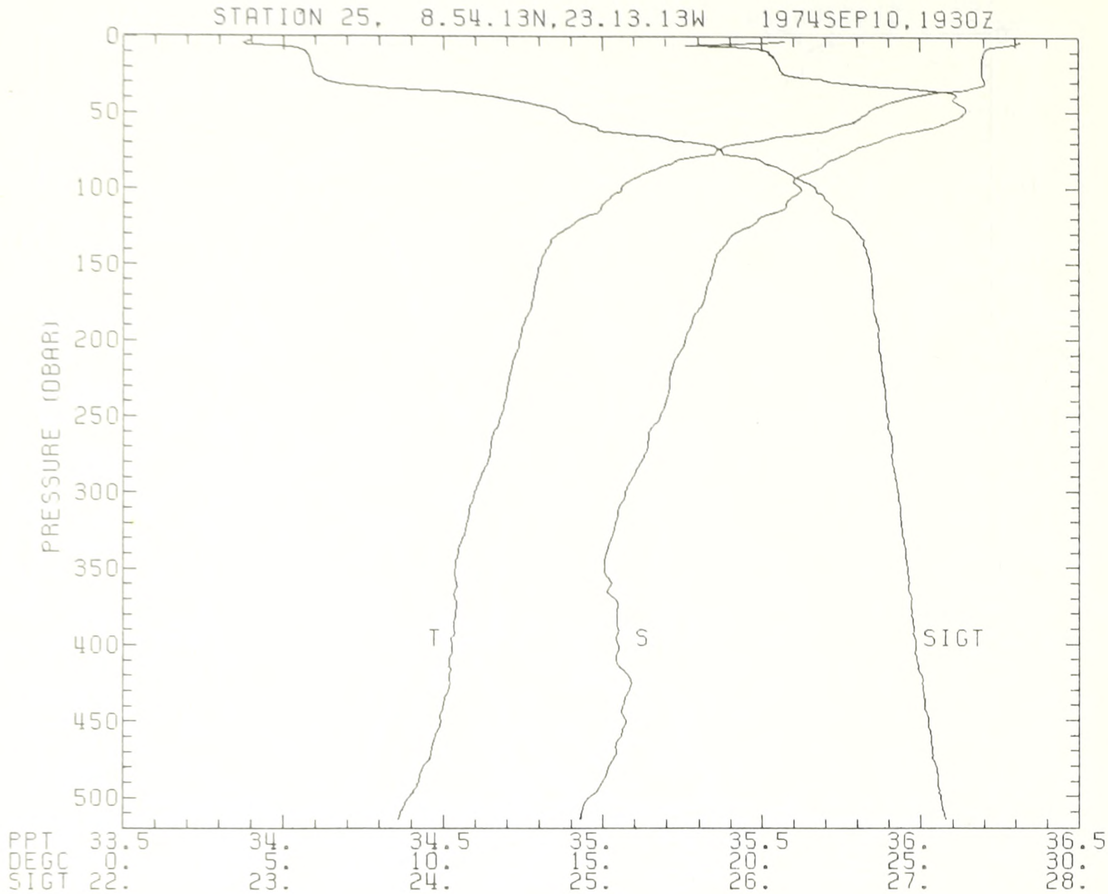
SALINITY (0/00)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PRESSURE (DBAR)
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SIGT
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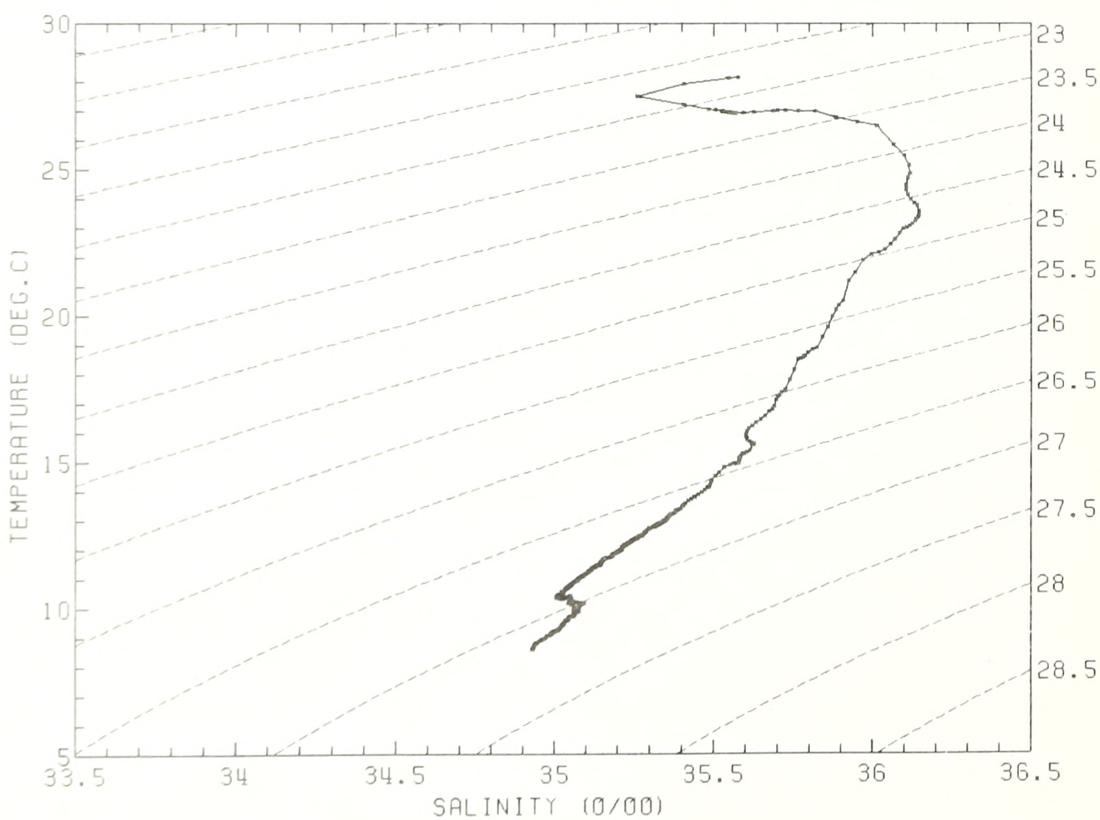
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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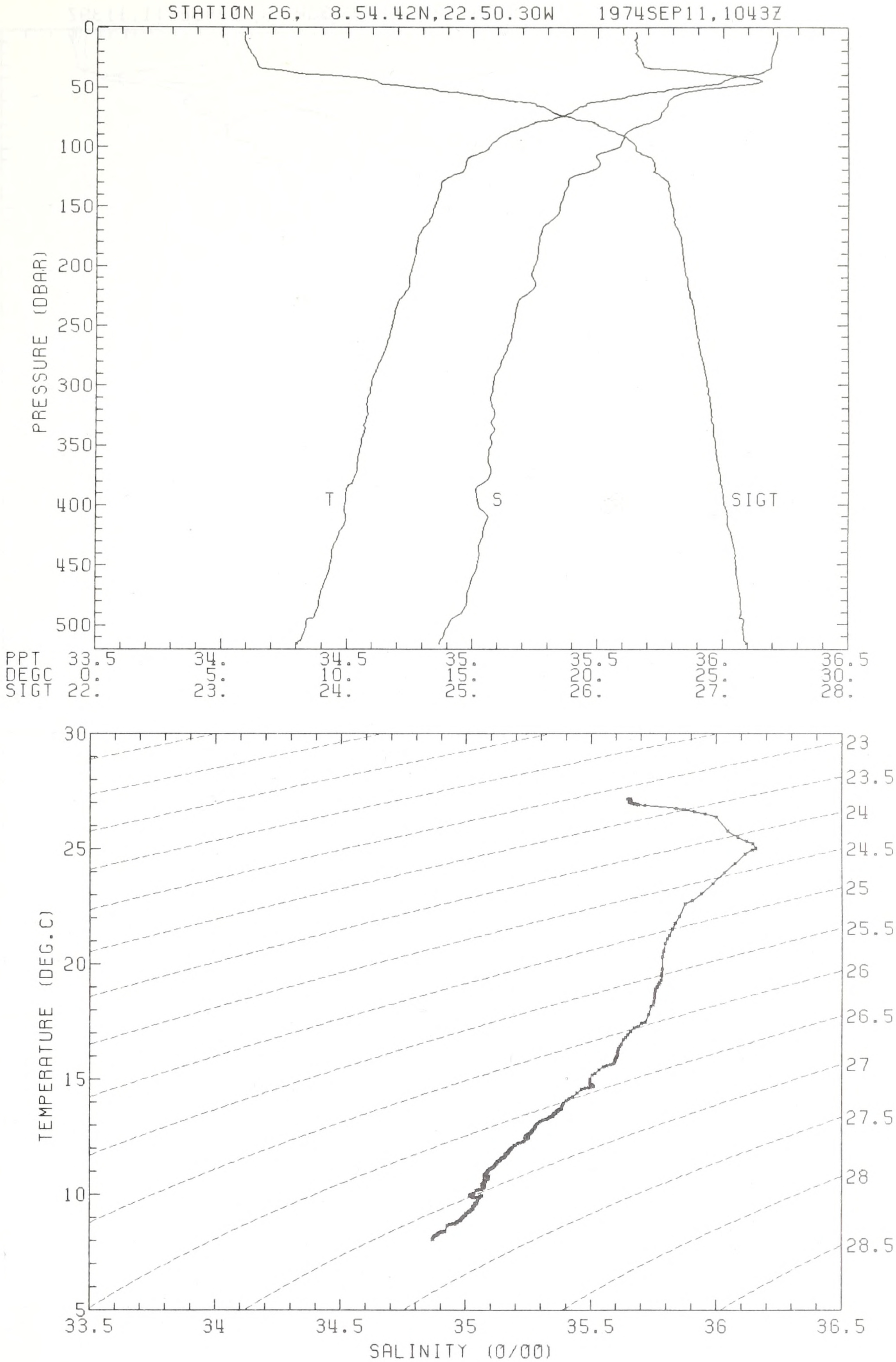
SALINITY (0/00)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PRESSURE (DBAR)
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SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
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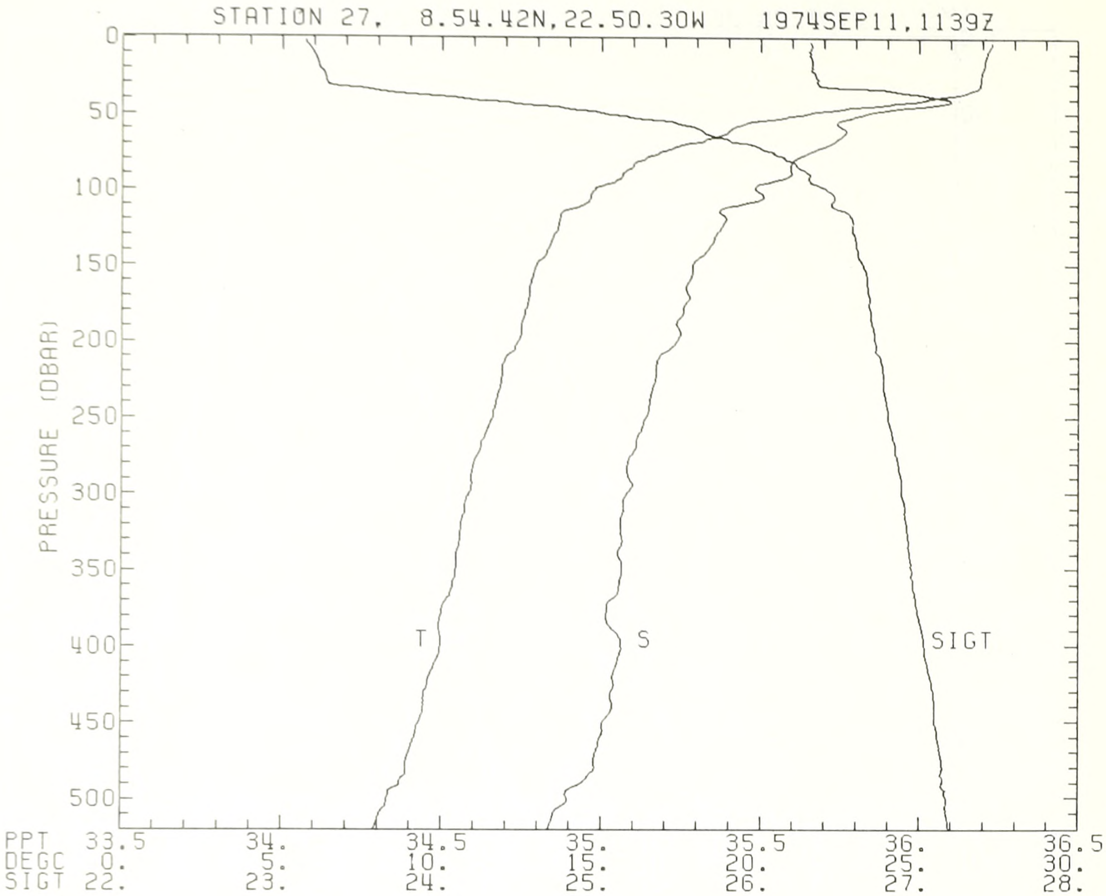
SALINITY (0/00)



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PRESSURE (DBAR)
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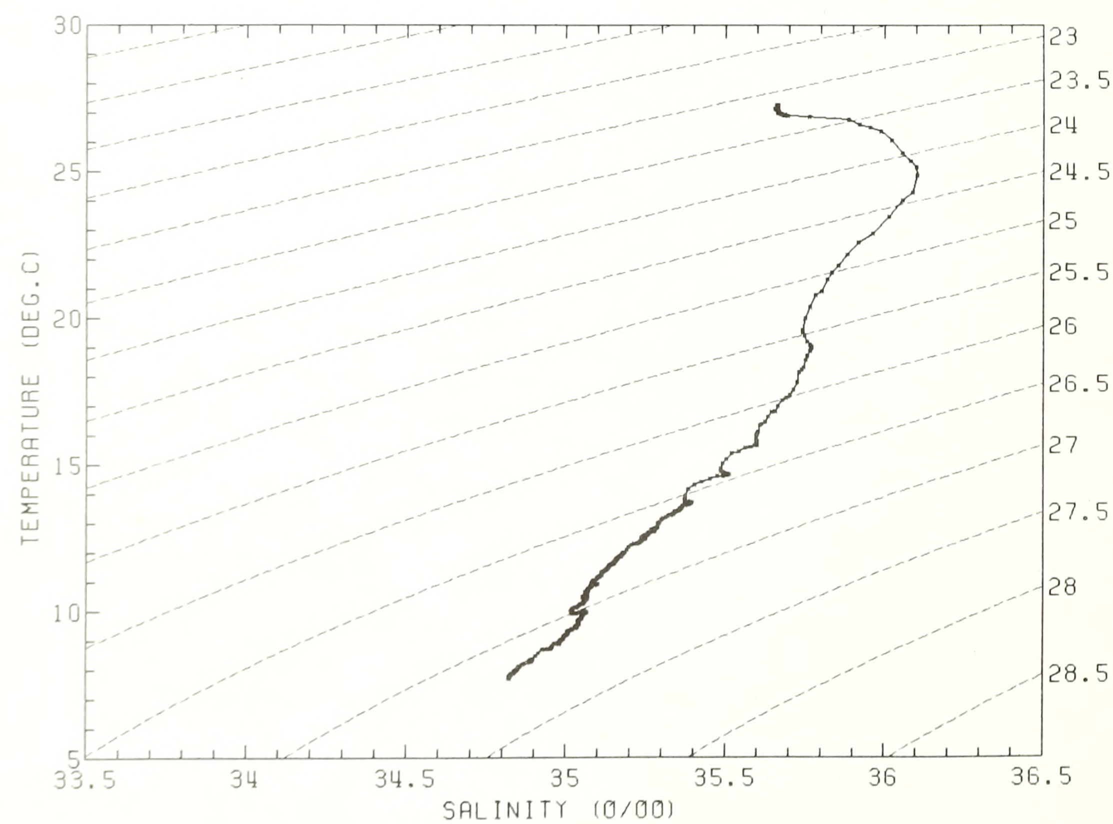
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.



TEMPERATURE (DEG.C)
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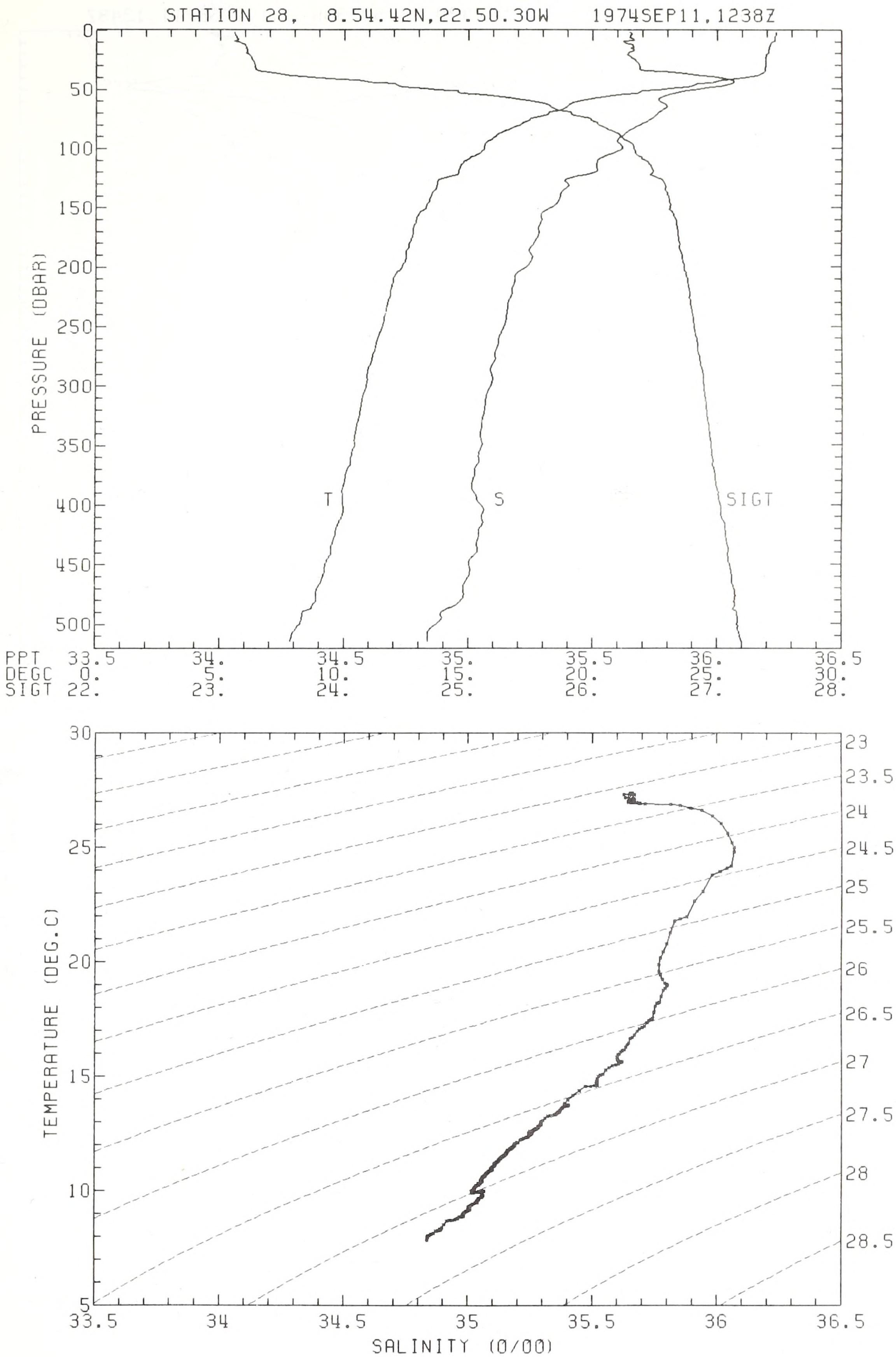
SALINITY (0/00)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PRESSURE (DBAR)
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SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
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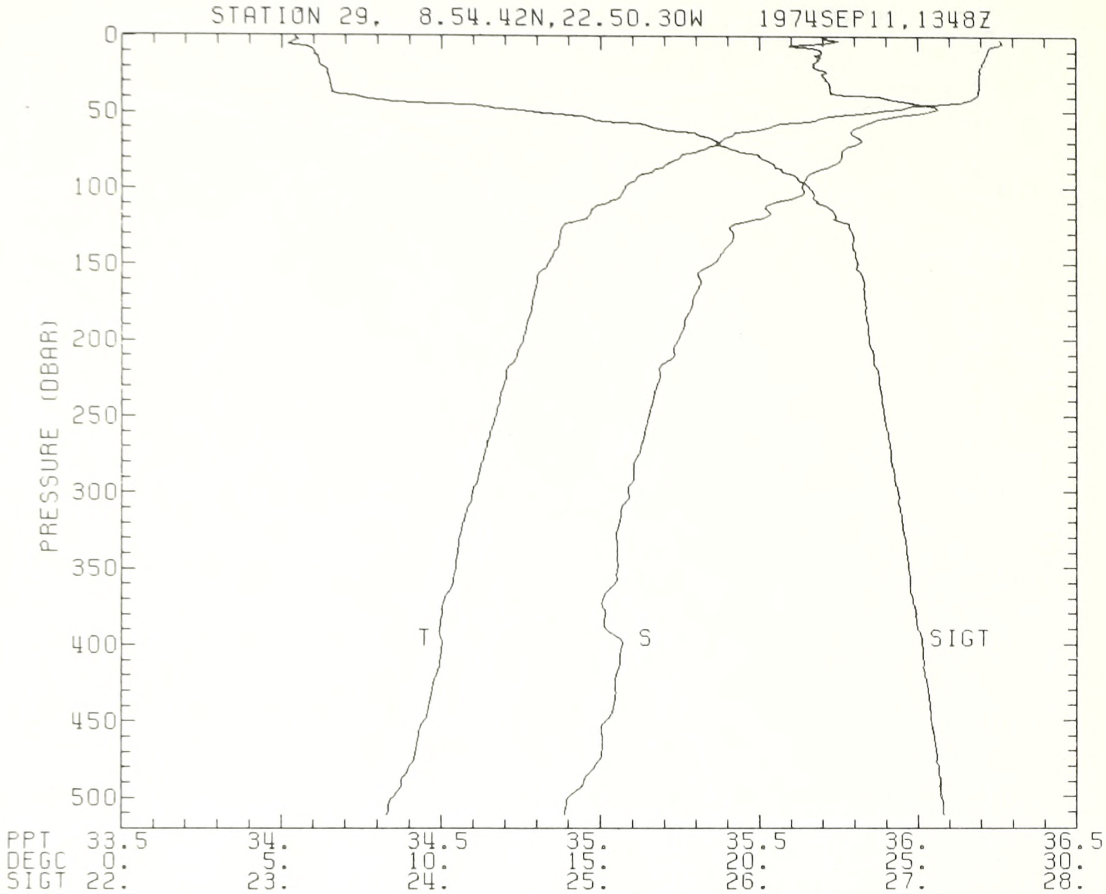
SALINITY (O/OO)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PRESSURE (DBAR)
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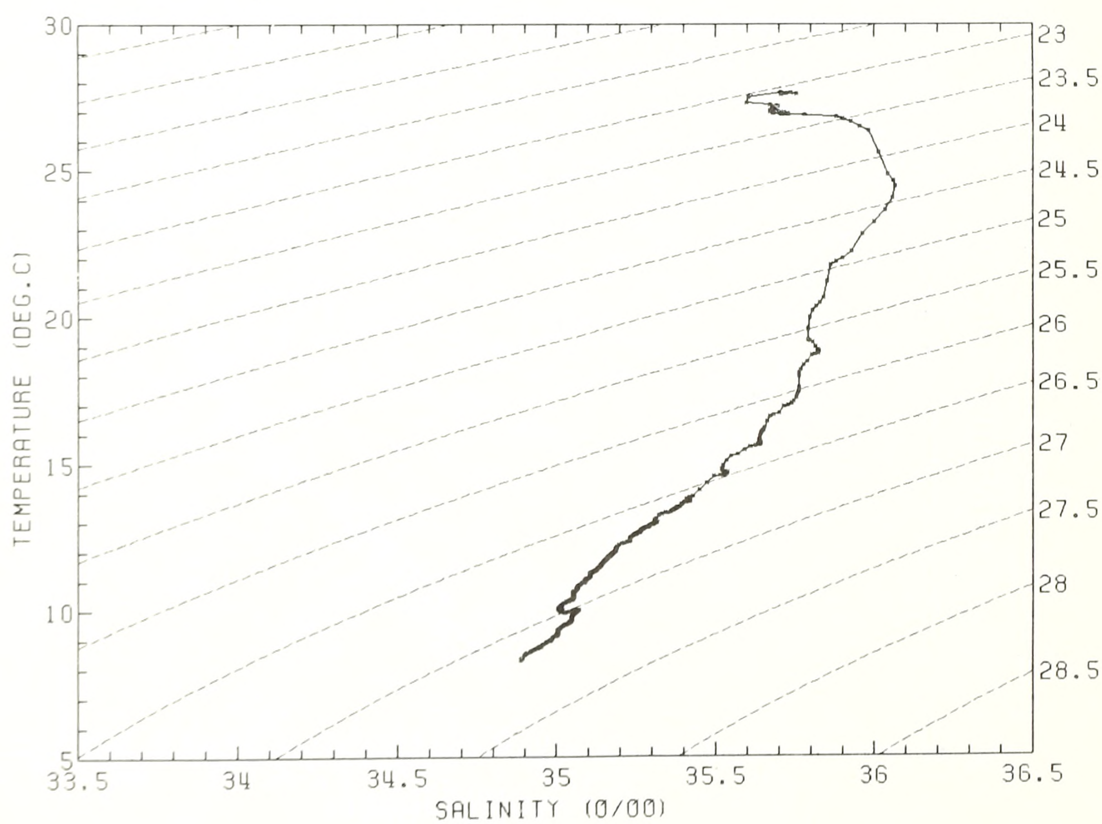
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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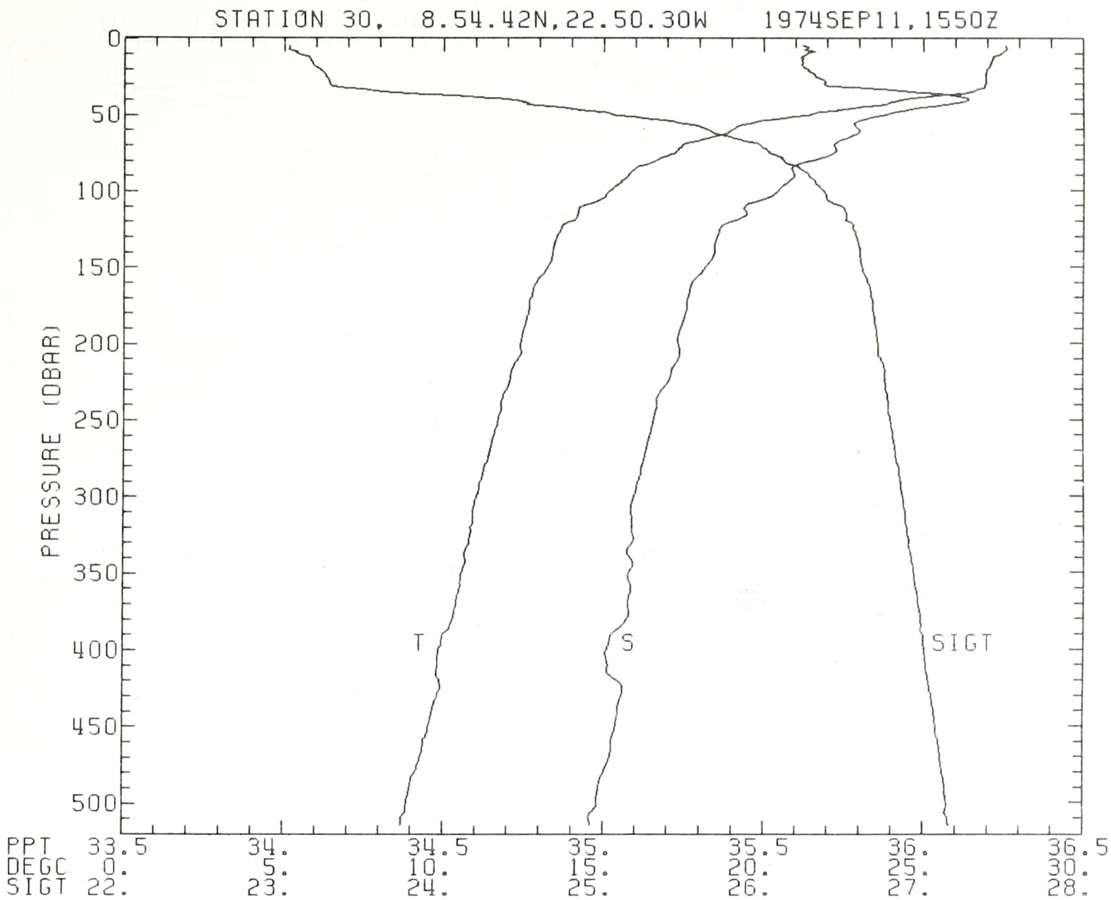
SALINITY (0/00)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PRESSURE (DBAR)
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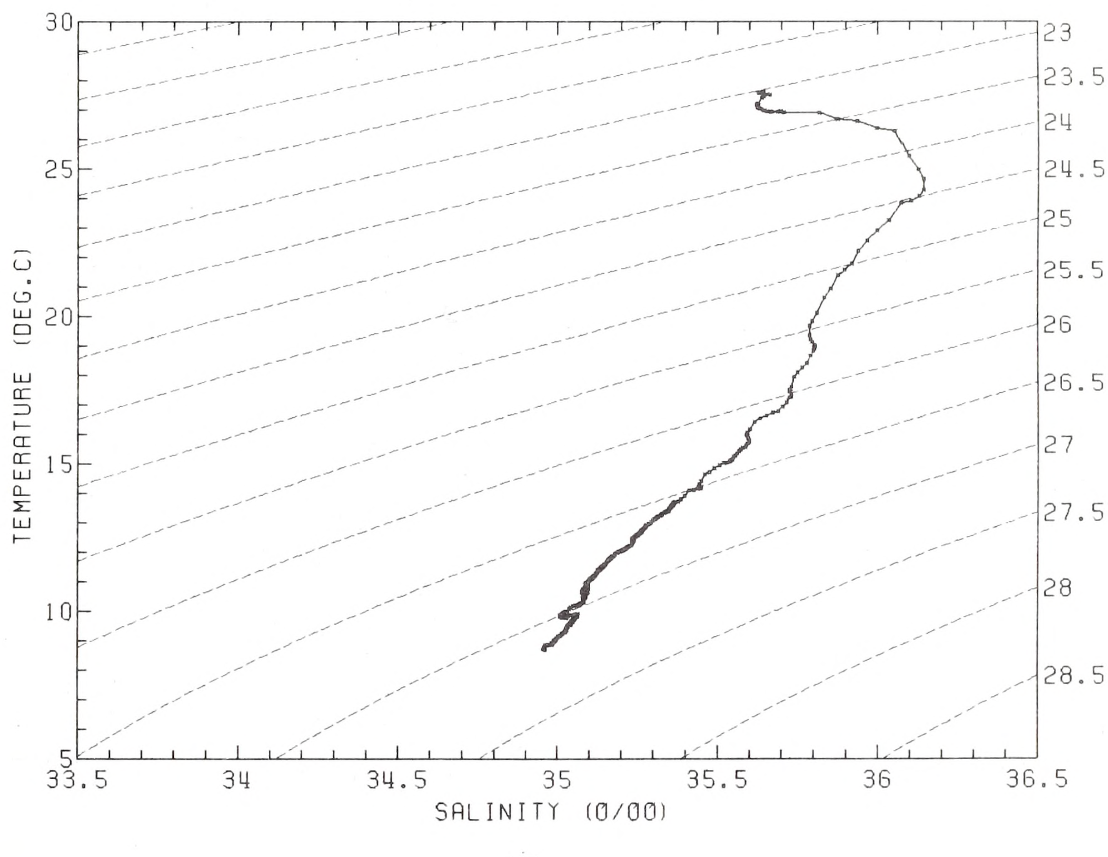
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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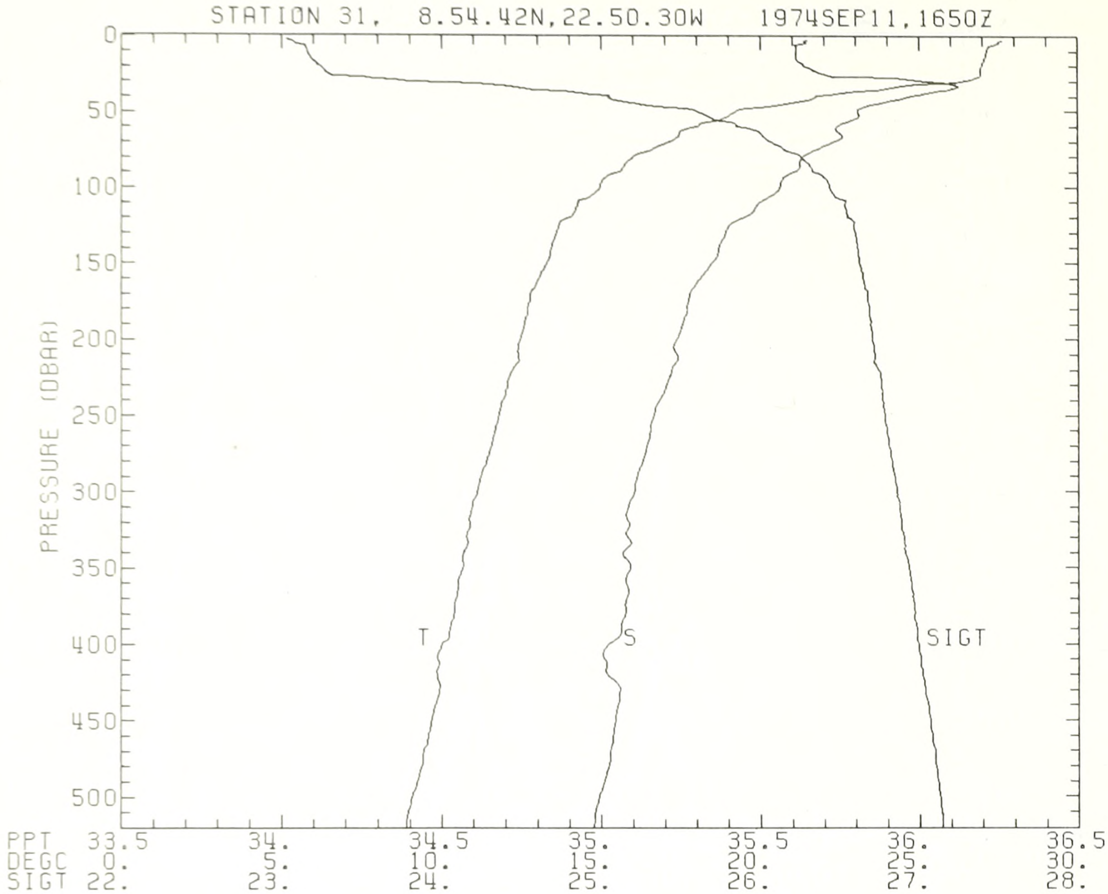
SALINITY (0/00)


STATION 31, 8.54.42N,22.50.30W 1974SEP11,1650Z
PRESSURE (DBAR)
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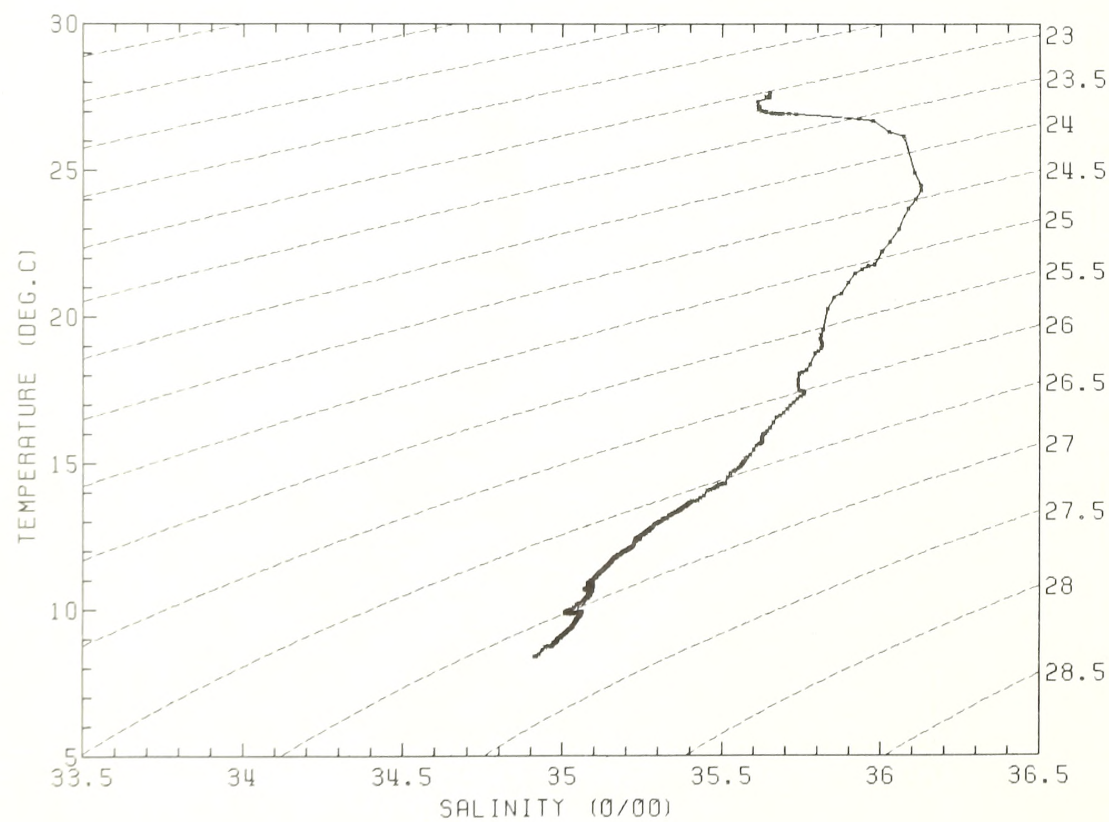
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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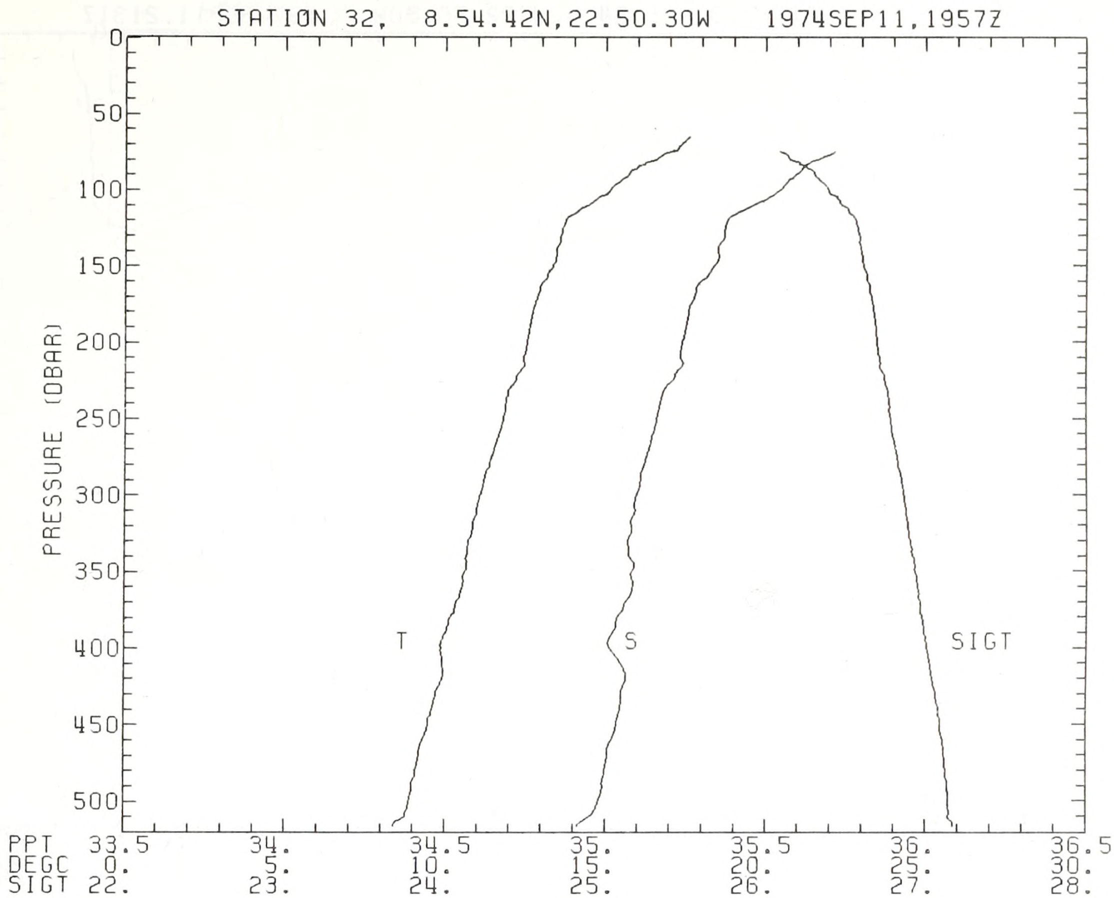
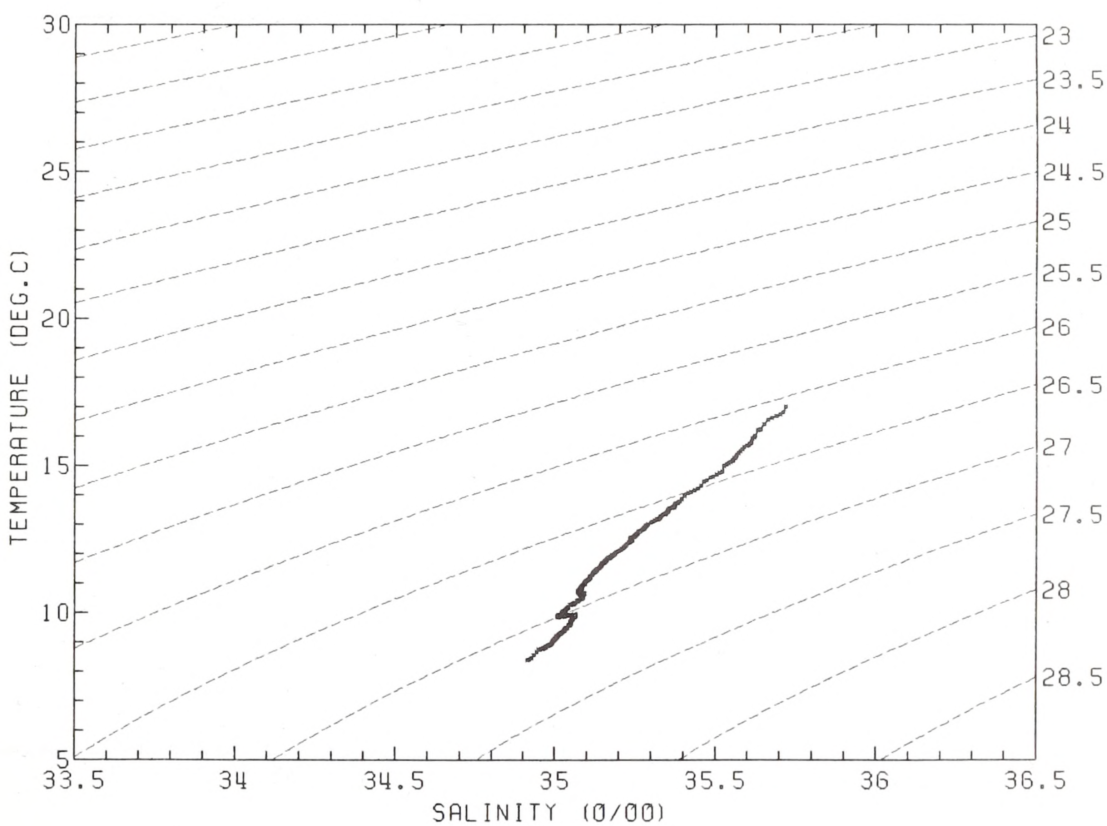
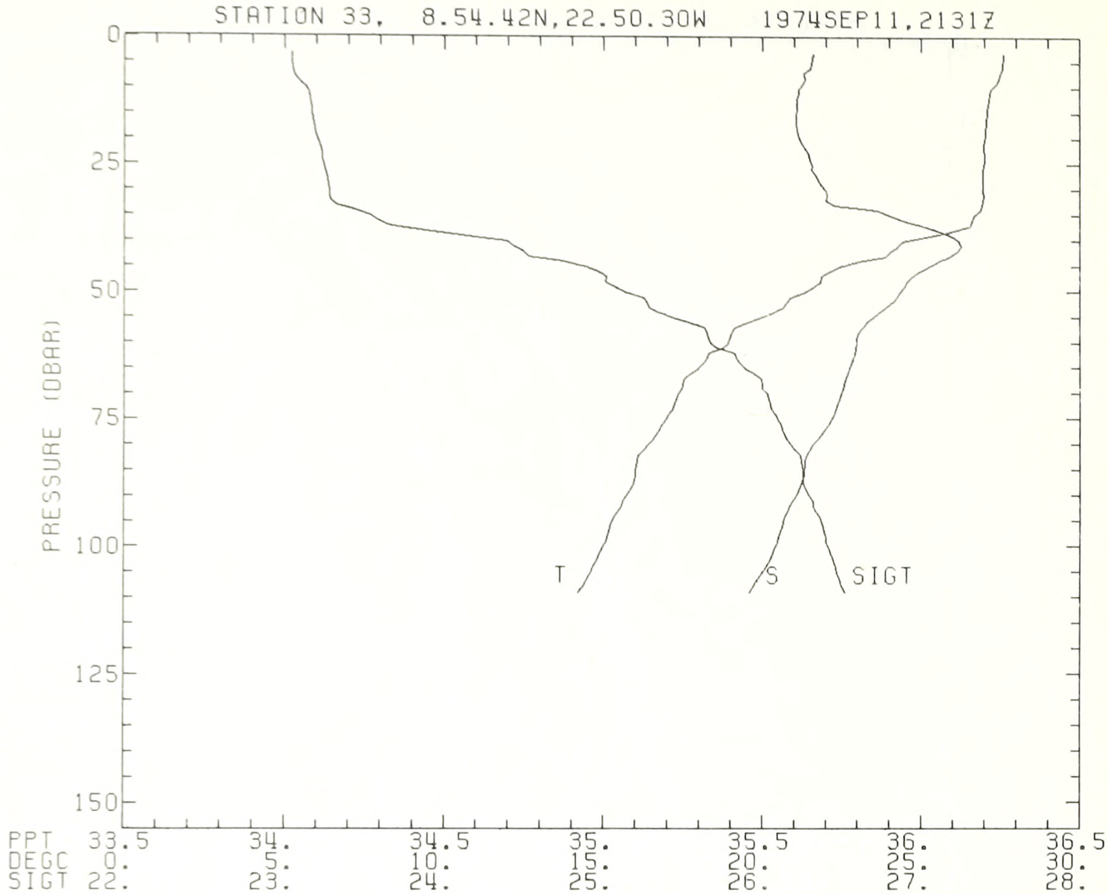
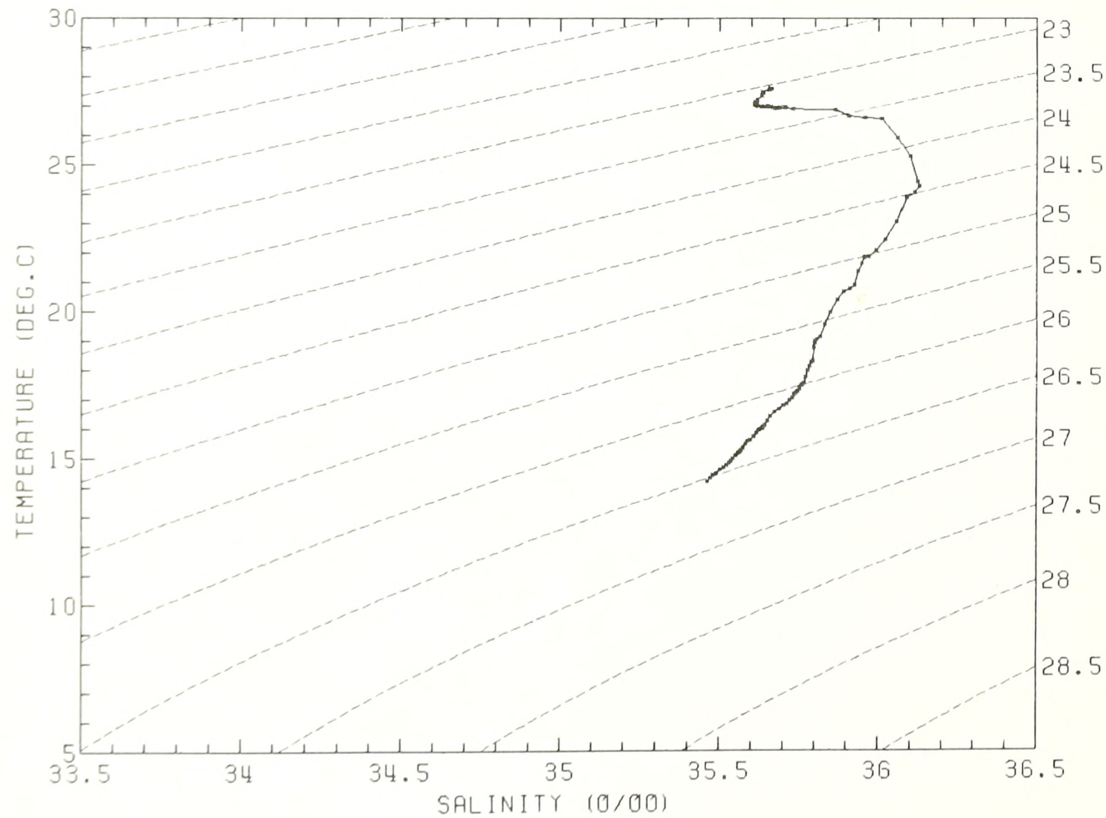
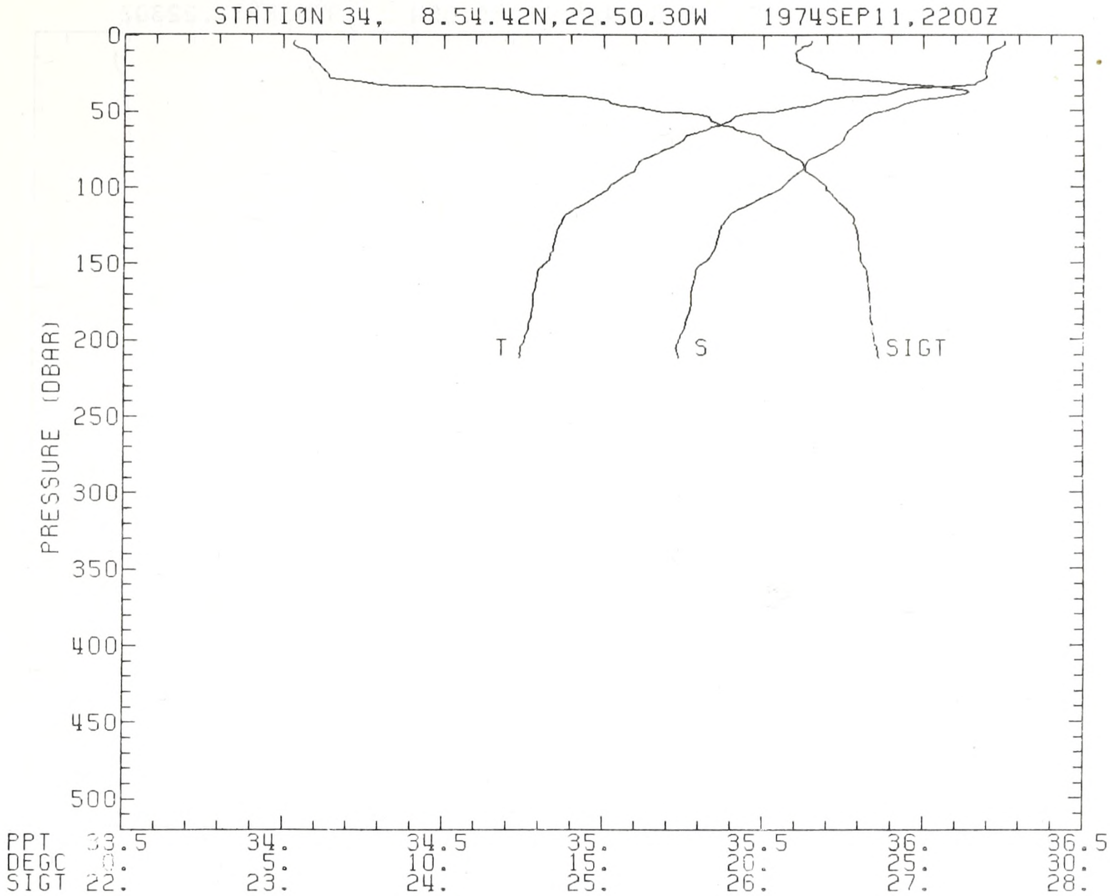
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

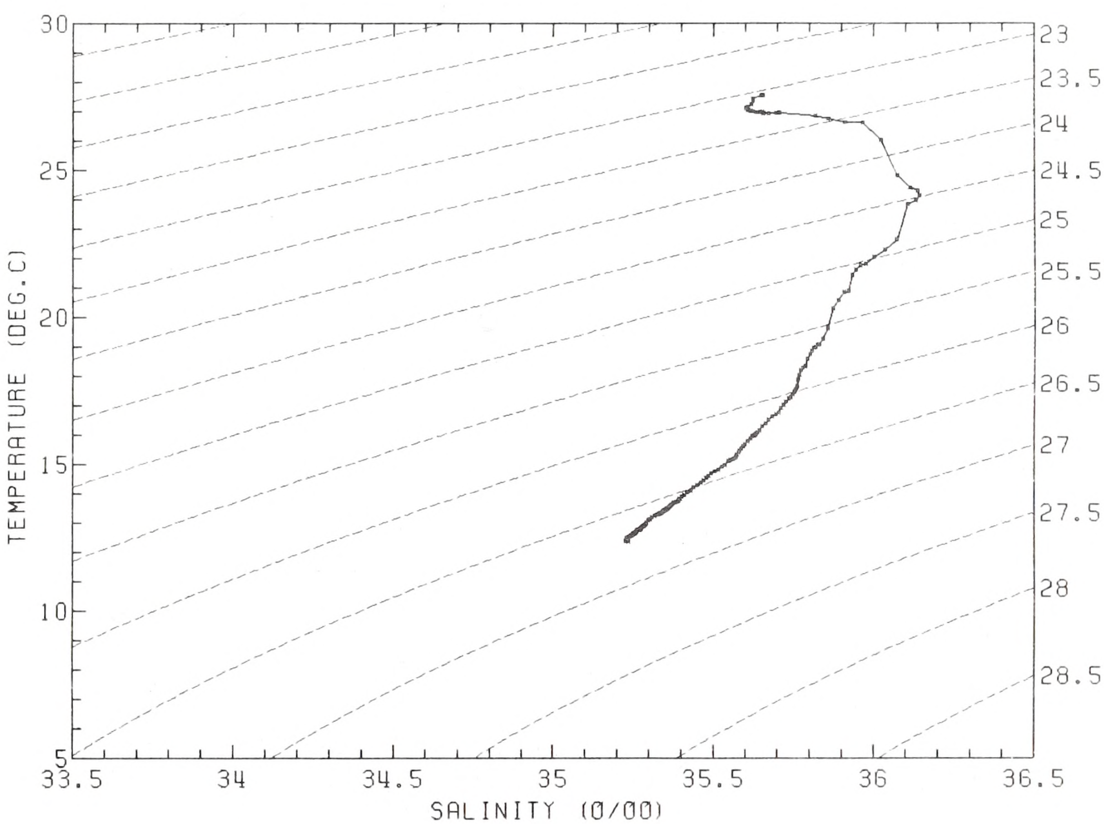

STATION 32, 8.54.42N,22.50.30W 1974SEP11,1957Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.

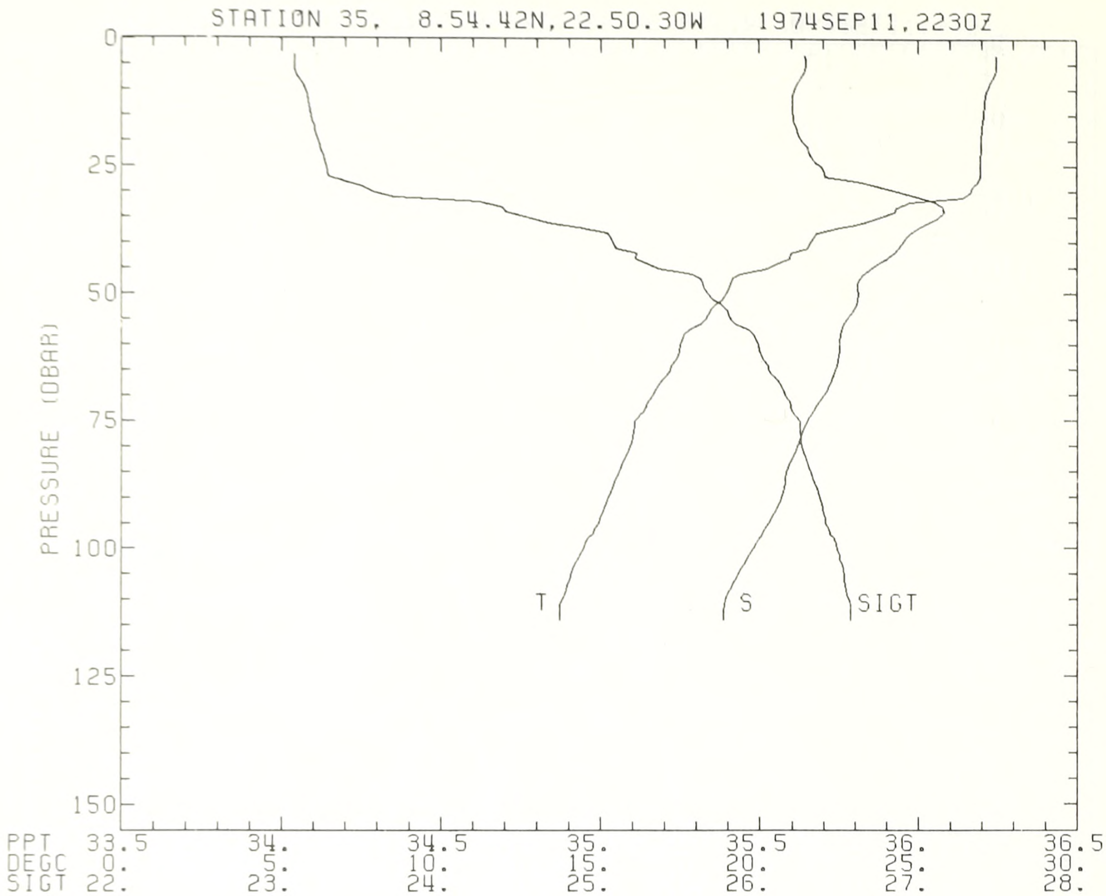

TEMPERATURE (DEG.C)
30
25
20
15
10
5
23
23.5
24
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

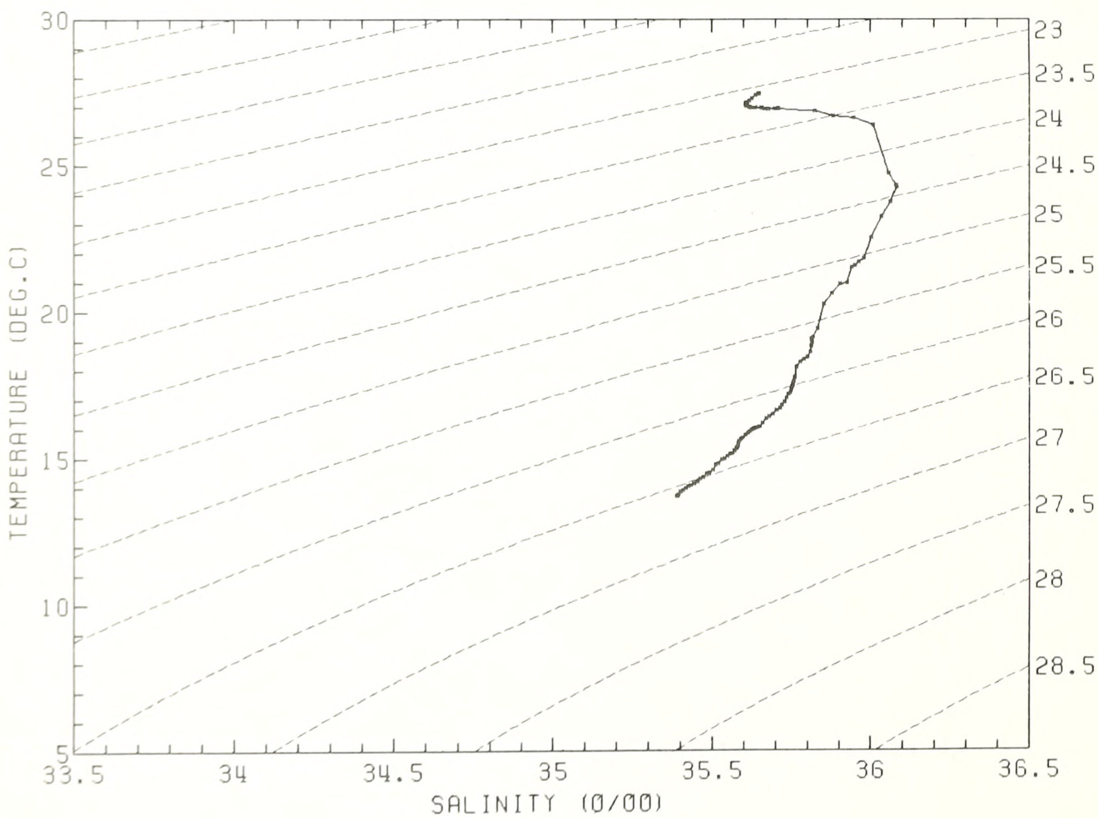

STATION 33, 8.54.42N,22.50.30W 1974SEP11,2131Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
30
25
20
15
10
5
23
23.5
24
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

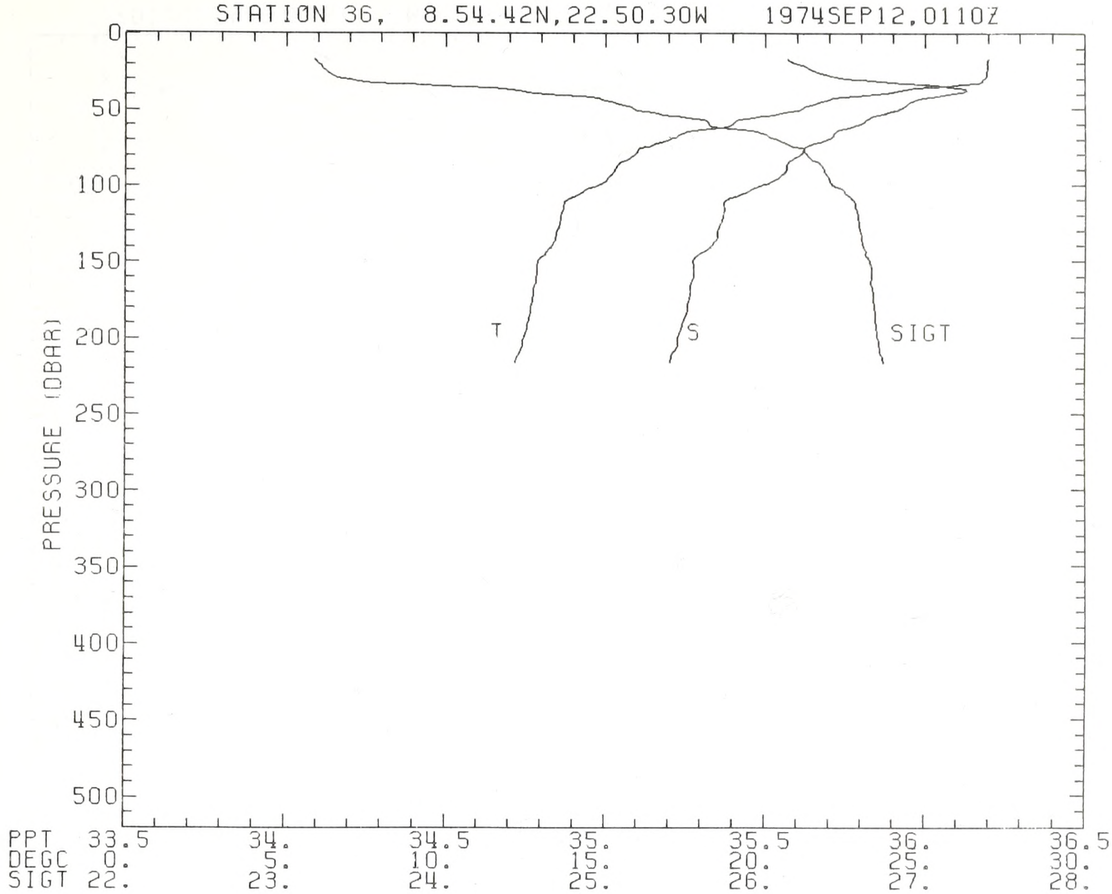

STATION 34, 8.54.42N,22.50.30W 1974SEP11,2200Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.

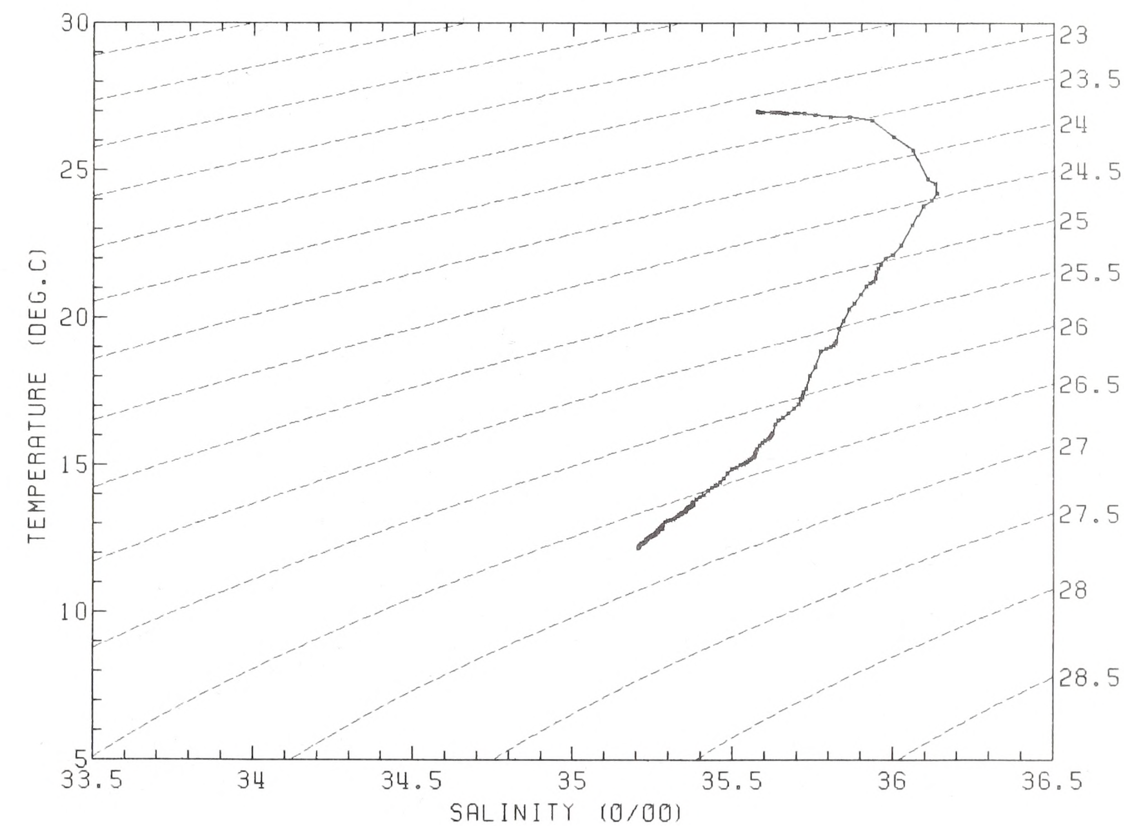

TEMPERATURE (DEG.C)
30
25
20
15
10
5
23
23.5
24
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

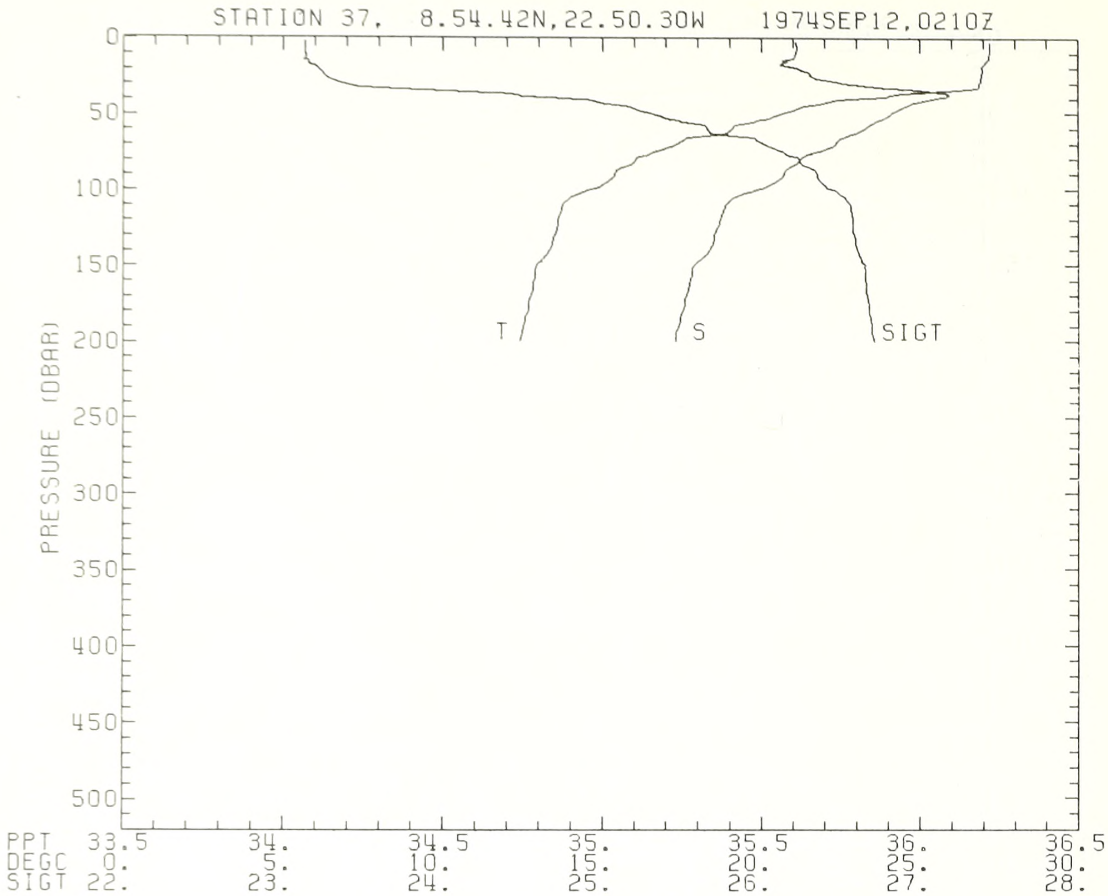

STATION 35, 8.54.42N,22.50.30W 1974SEP11,2230Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.

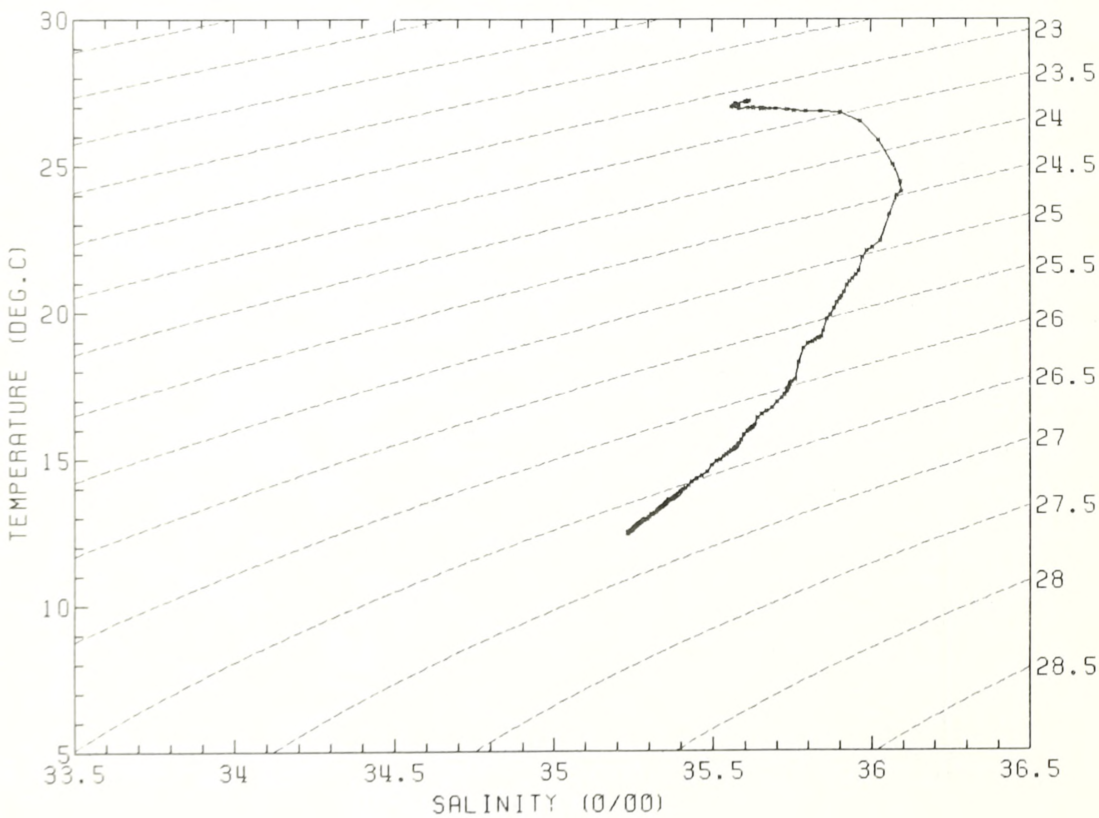

TEMPERATURE (DEG.C)
30
25
20
15
10
5
23
23.5
24
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

STATION 36, 8.54.42N,22.50.30W 1974SEP12,0110Z

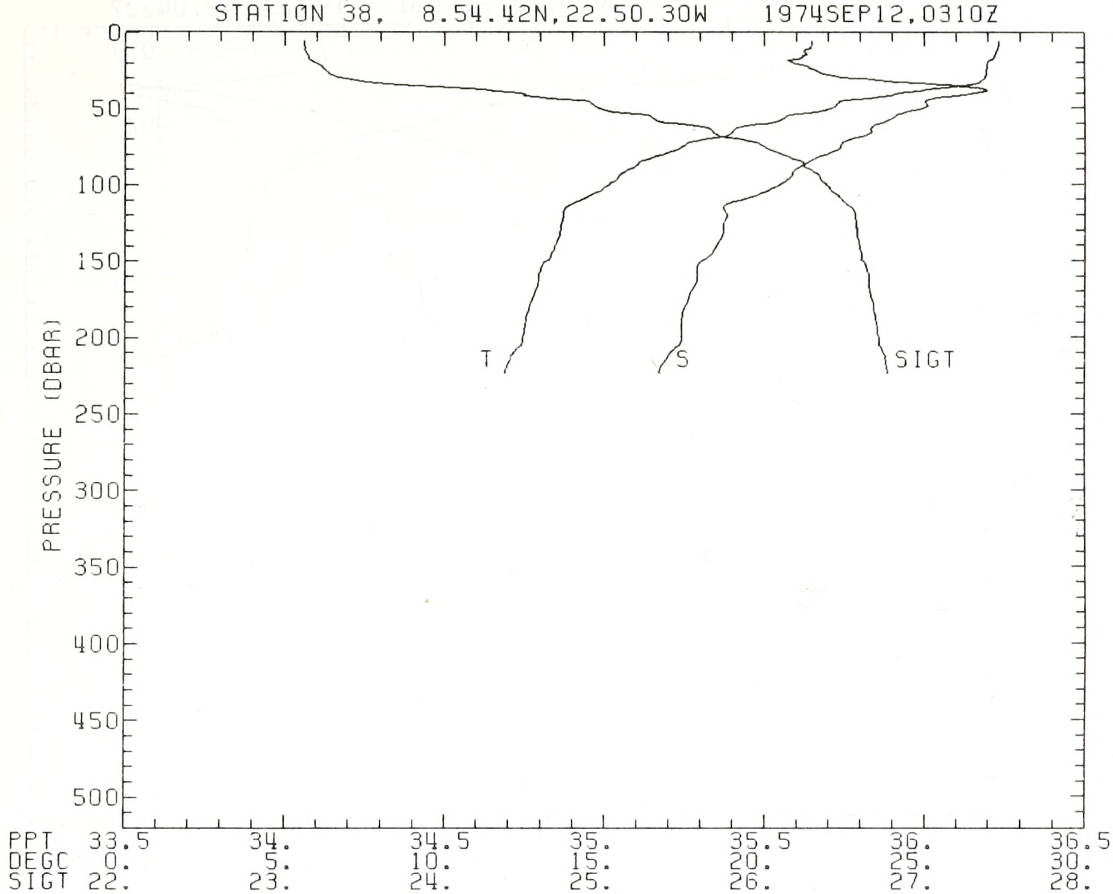


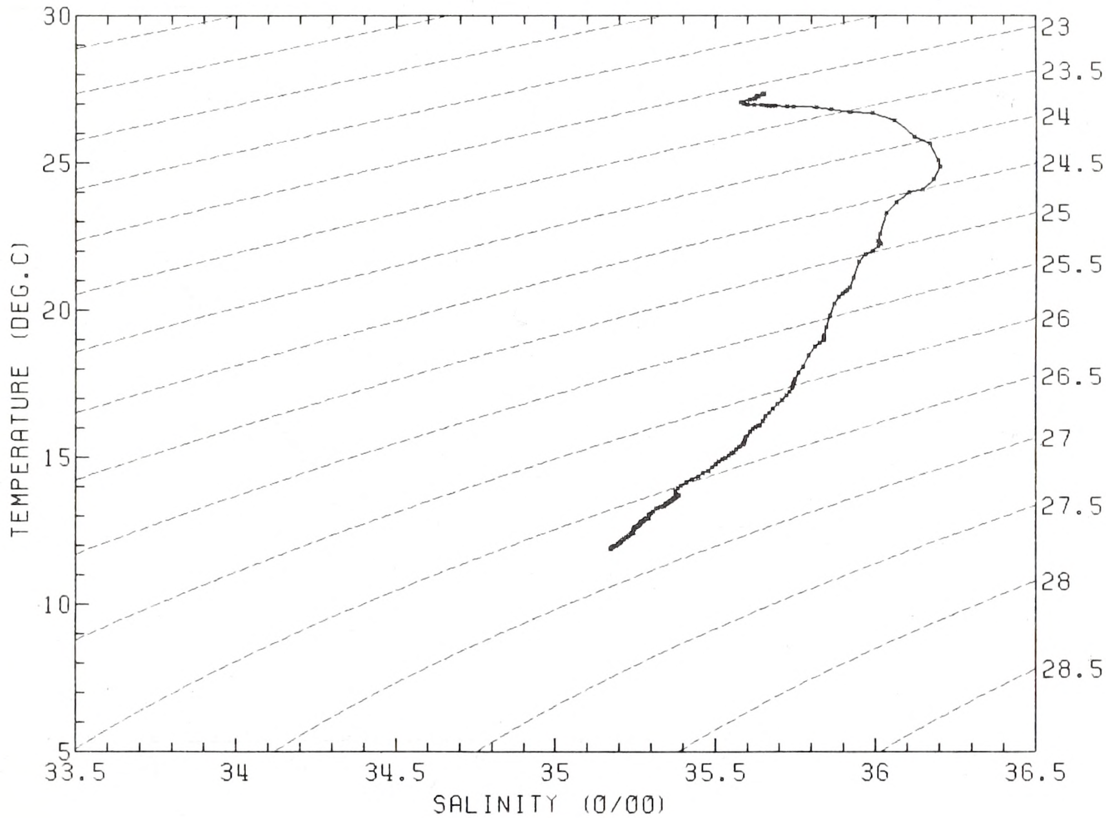


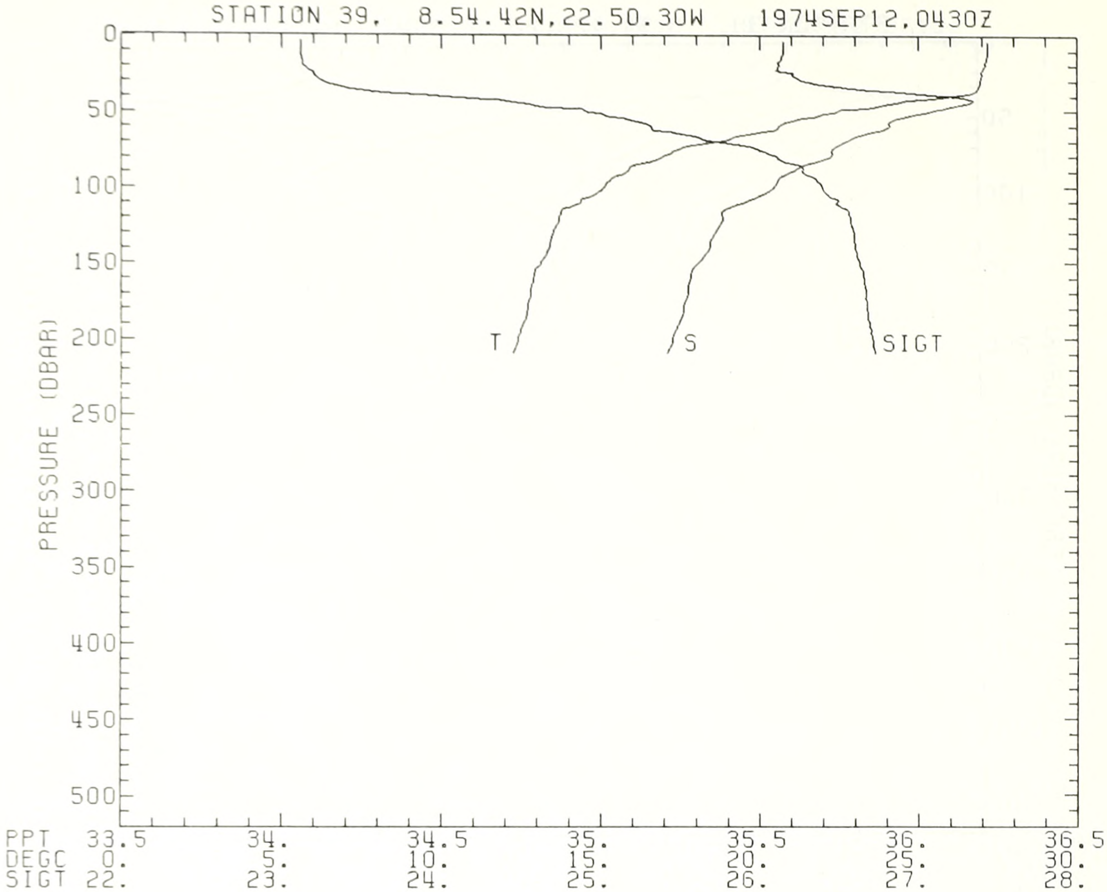

STATION 37, 8.54.42N,22.50.30W 1974SEP12,0210Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
30
25
20
15
10
5
23
23.5
24
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

STATION 38, 8.54.42N,22.50.30W 1974SEP12,0310Z






STATION 39, 8.54.42N,22.50.30W 1974SEP12,0430Z
0
50
100
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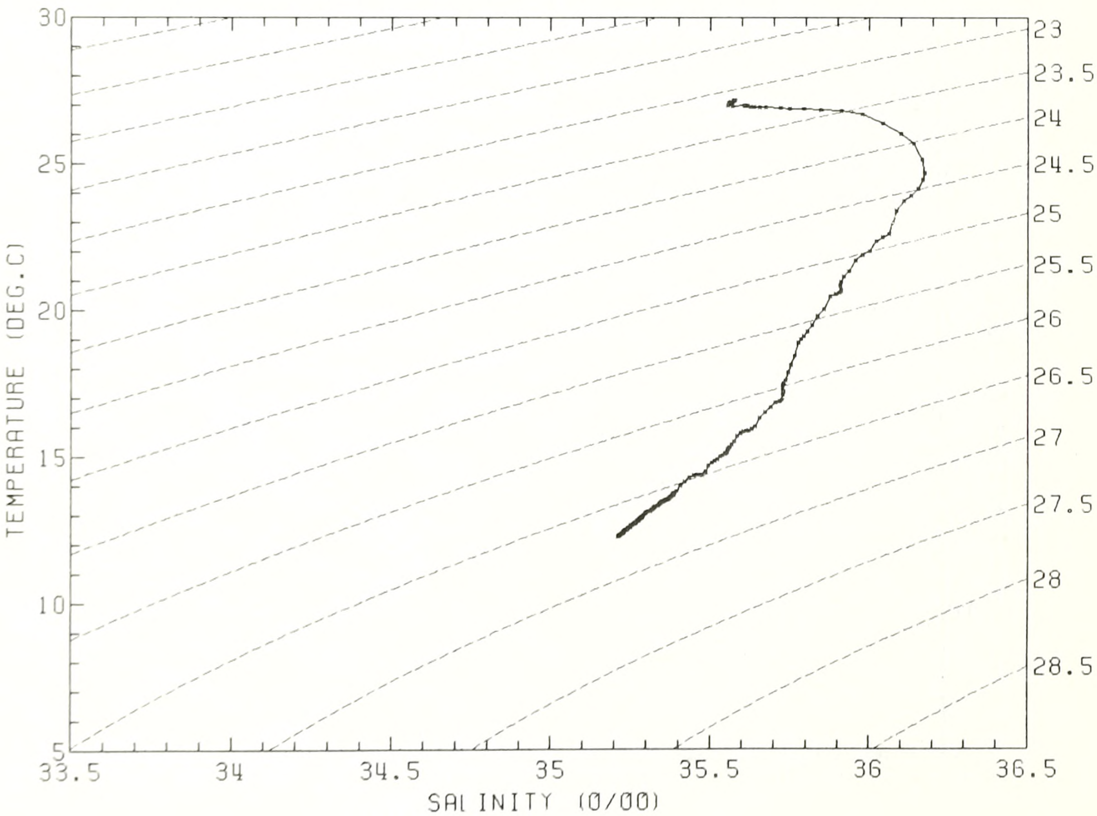
250
300
350
400
450
500
PRESSURE (DBAR)
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


30
25
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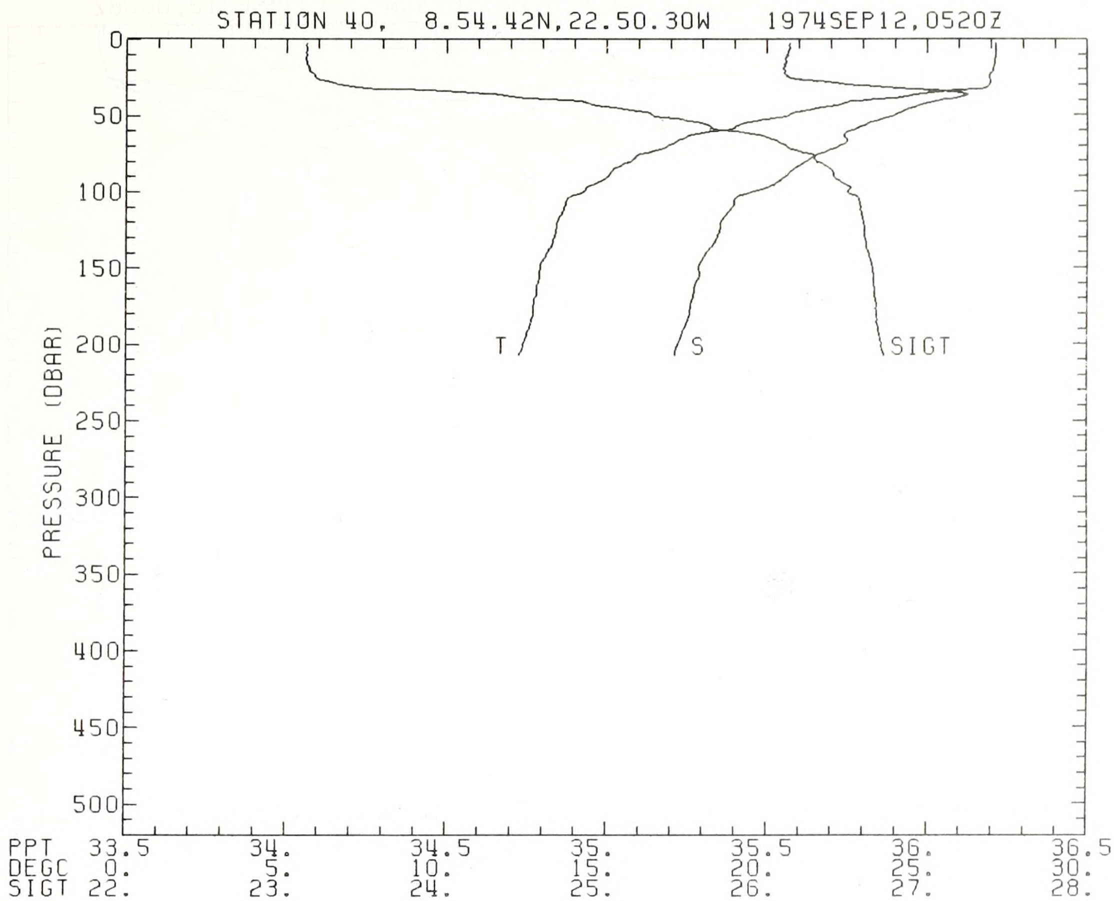
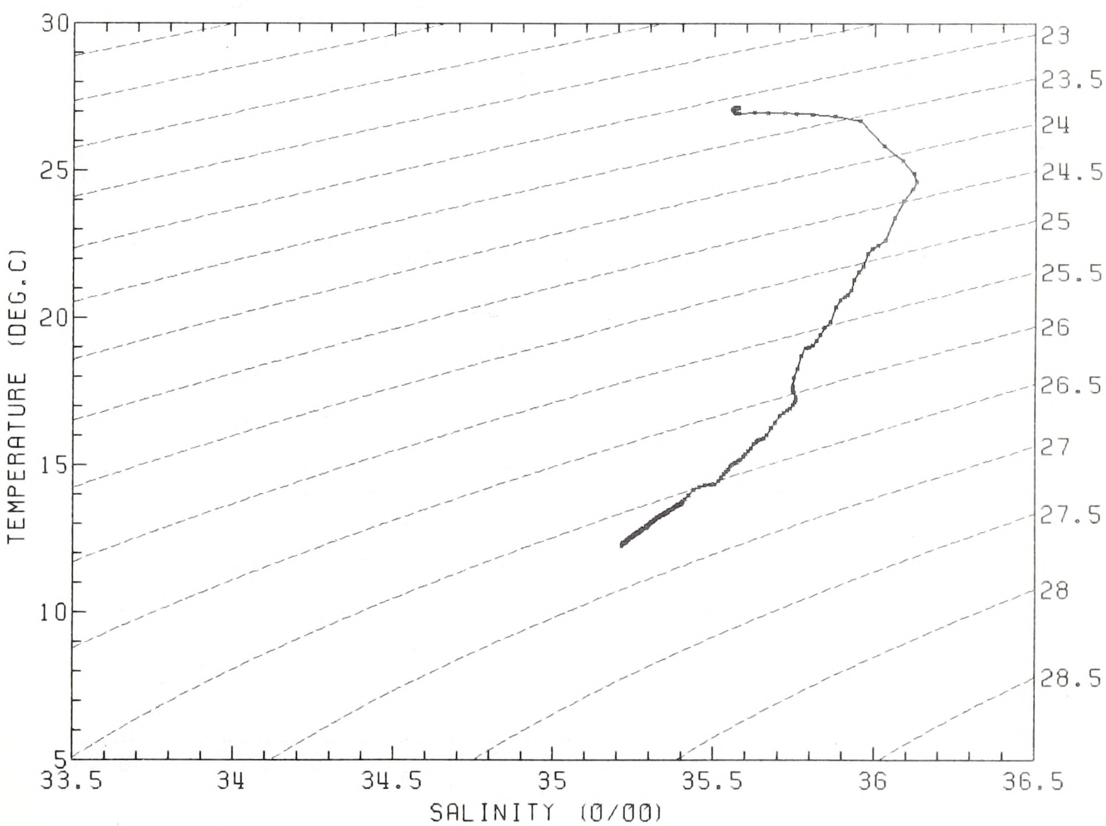
15
10
5
TEMPERATURE (DEG.C)
23
23.5
24
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 40, 8.54.42N,22.50.30W 1974SEP12,0520Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
30
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24.5
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26.5
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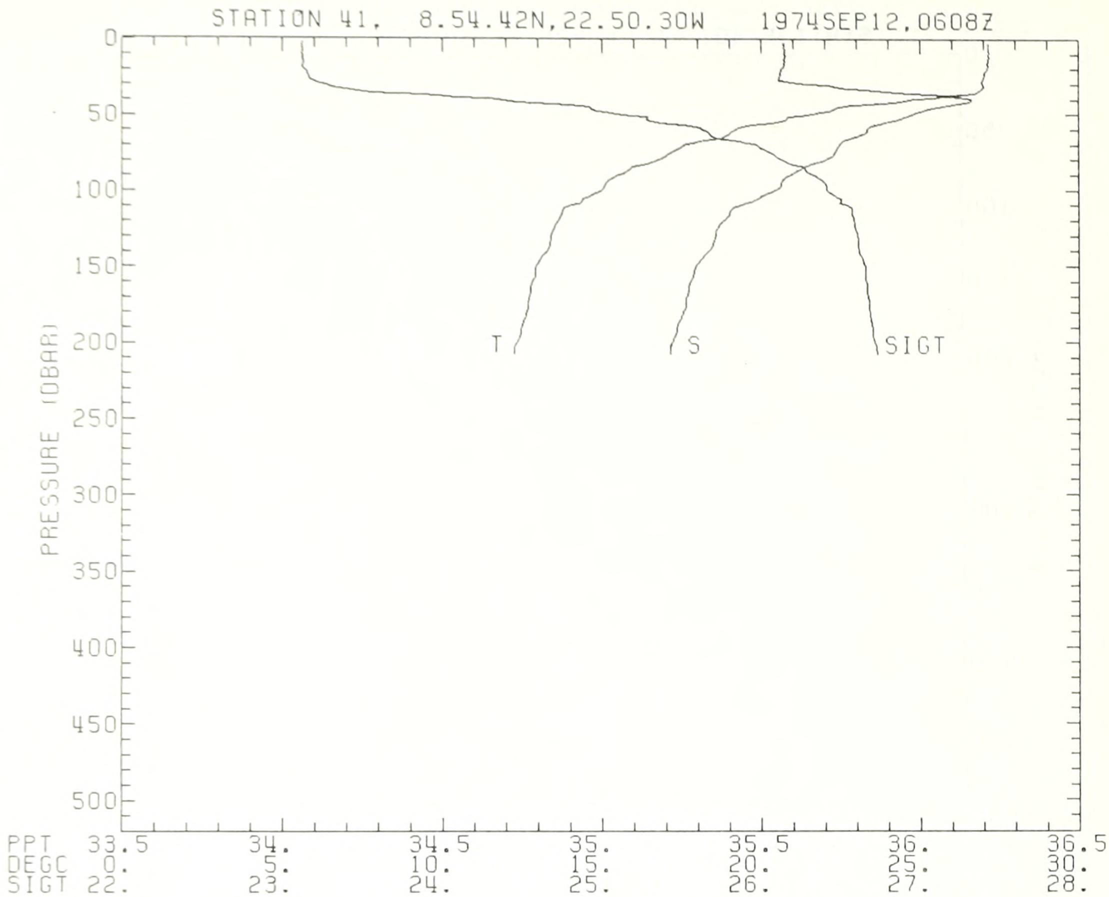
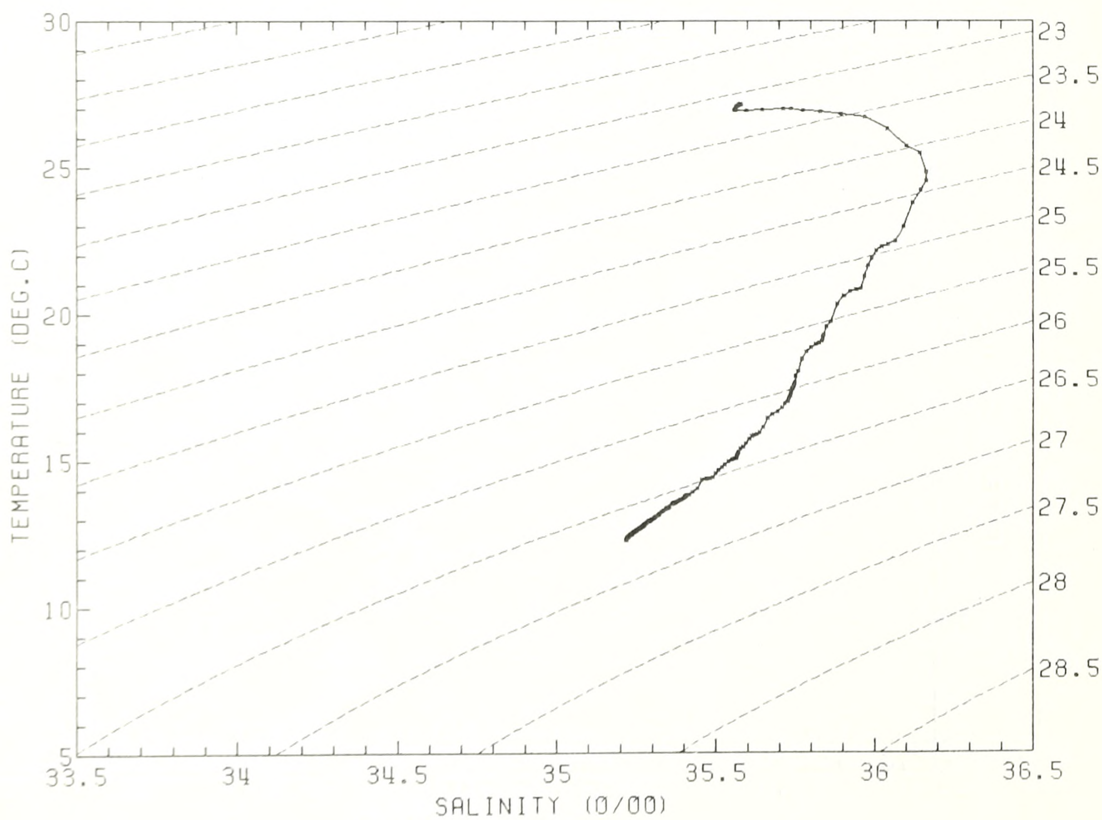
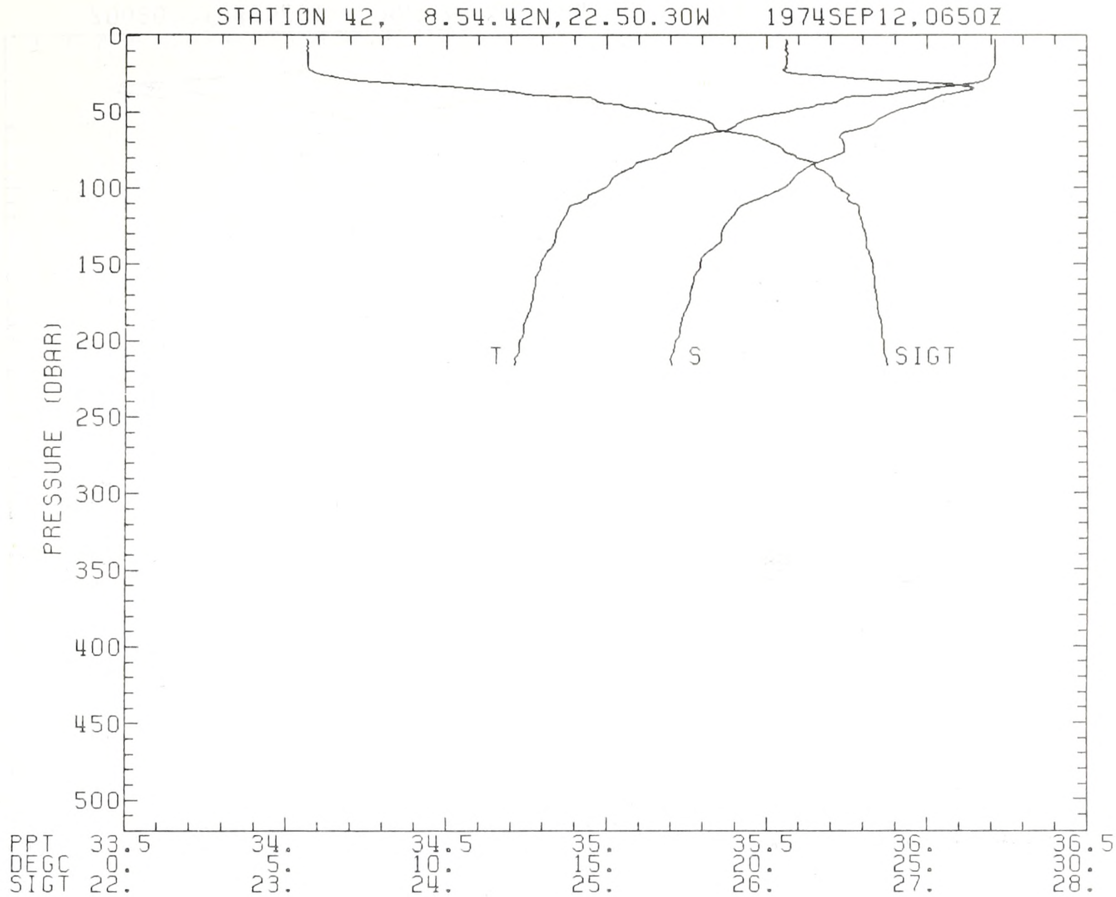
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

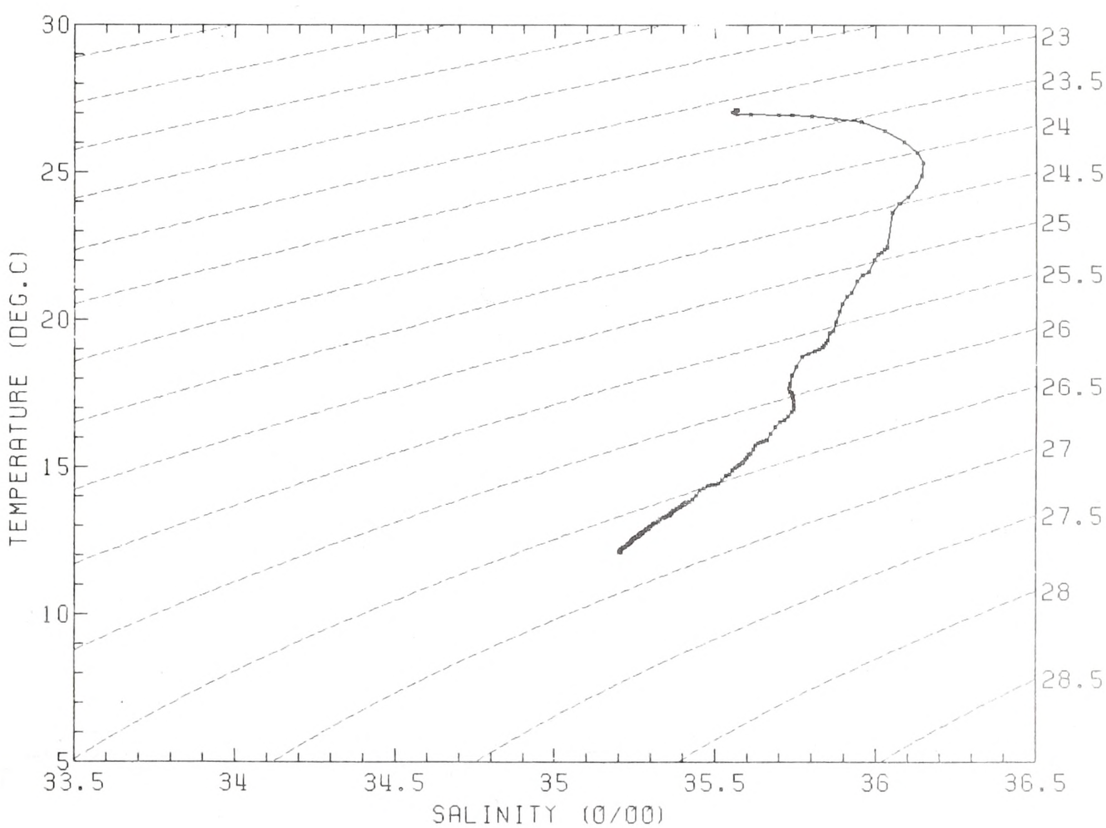


STATION 41, 8.54.42N,22.50.30W 1974SEP12,0608Z
PRESSURE (DBAR)
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.



TEMPERATURE (DEG.C)
SALINITY (0/00)


STATION 42, 8.54.42N,22.50.30W 1974SEP12,0650Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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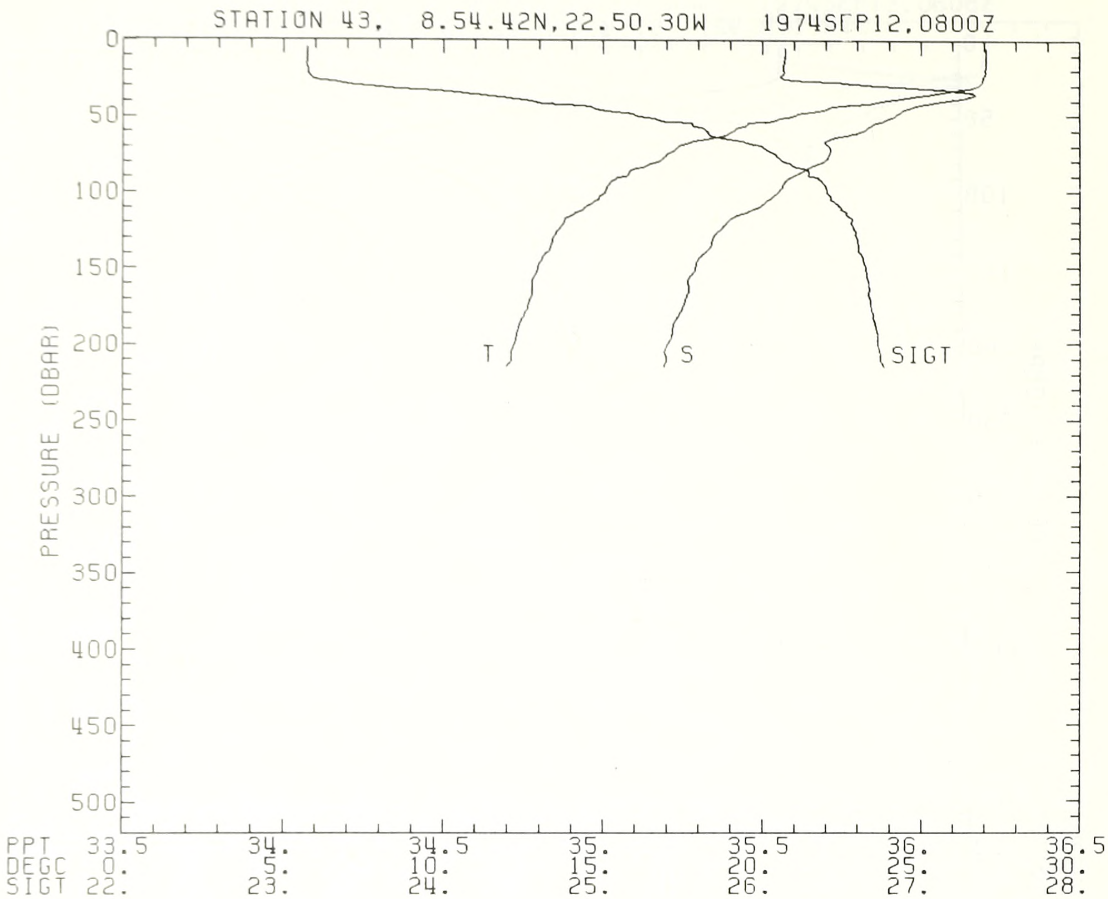
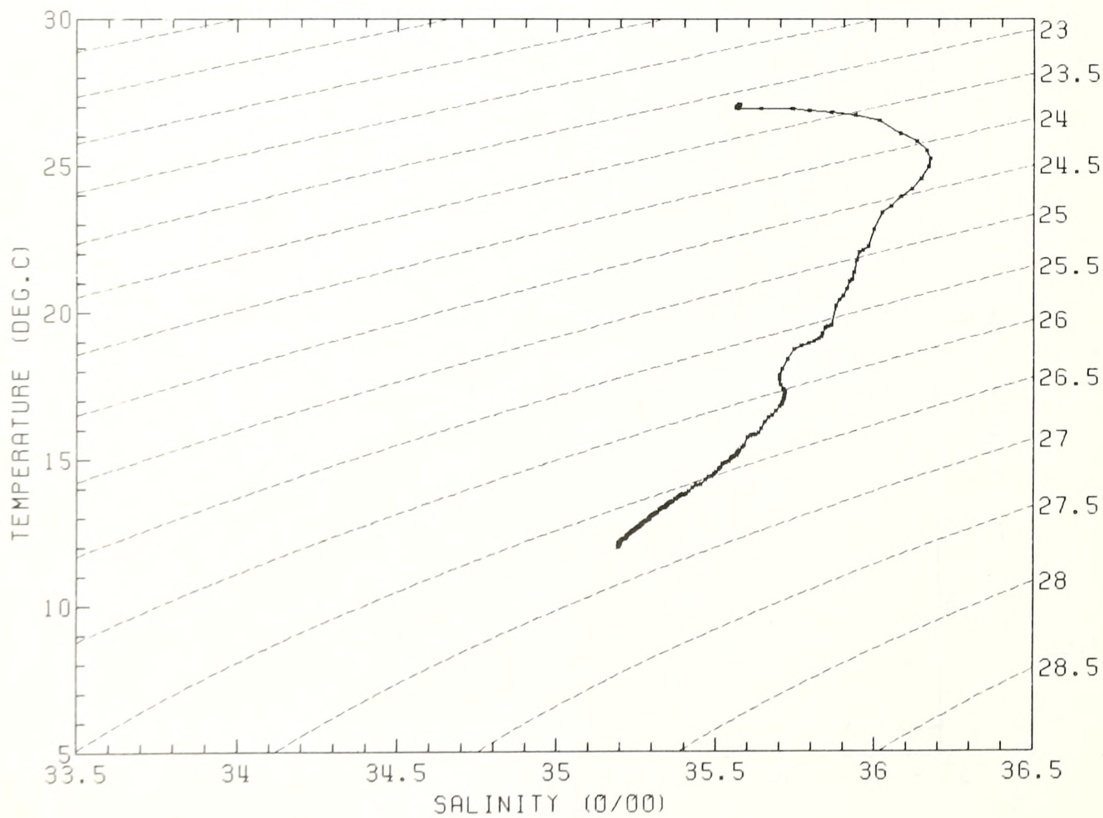
25
20
15
10
5
23
23.5
24
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 43, 8.54.42N,22.50.30W 1974SEP12,0800Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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25
20
15
10
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23.5
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24.5
25
25.5
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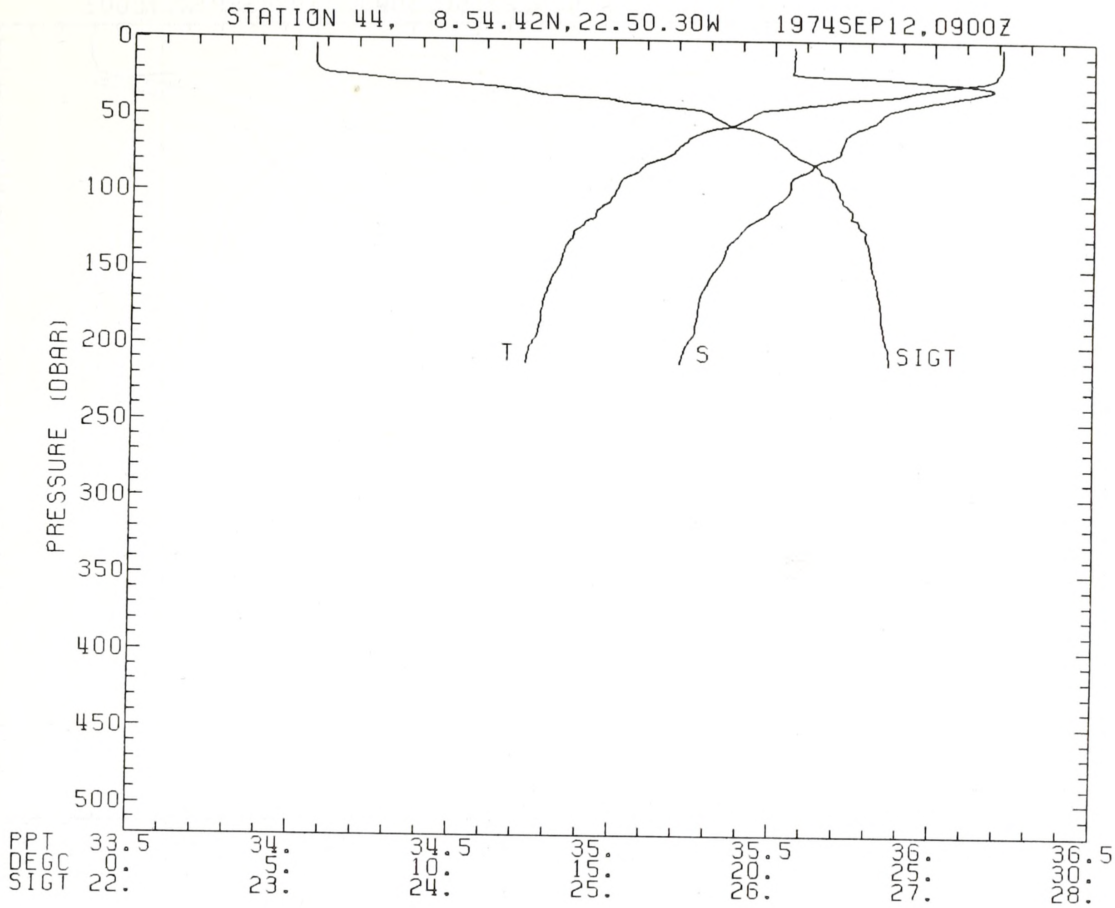
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 44, 8.54.42N,22.50.30W 1974SEP12,0900Z
PRESSURE (DBAR)
0
50
100
150
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250
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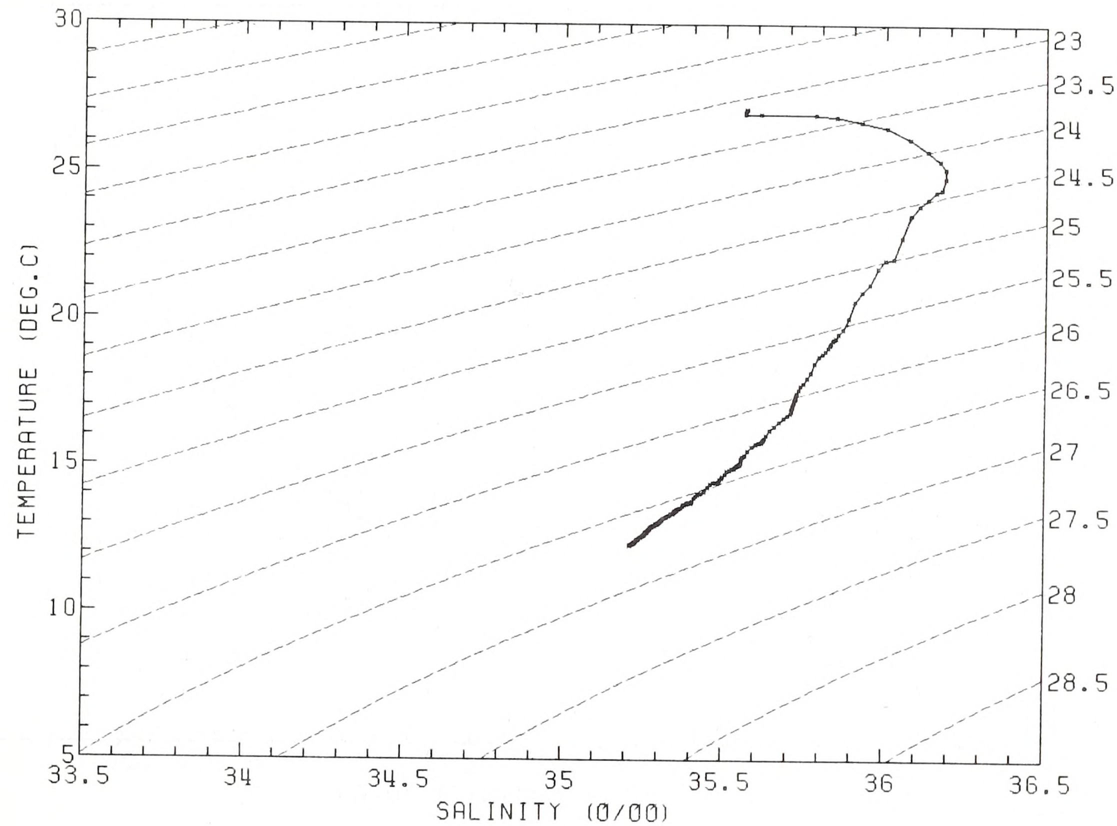
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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25
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26.5
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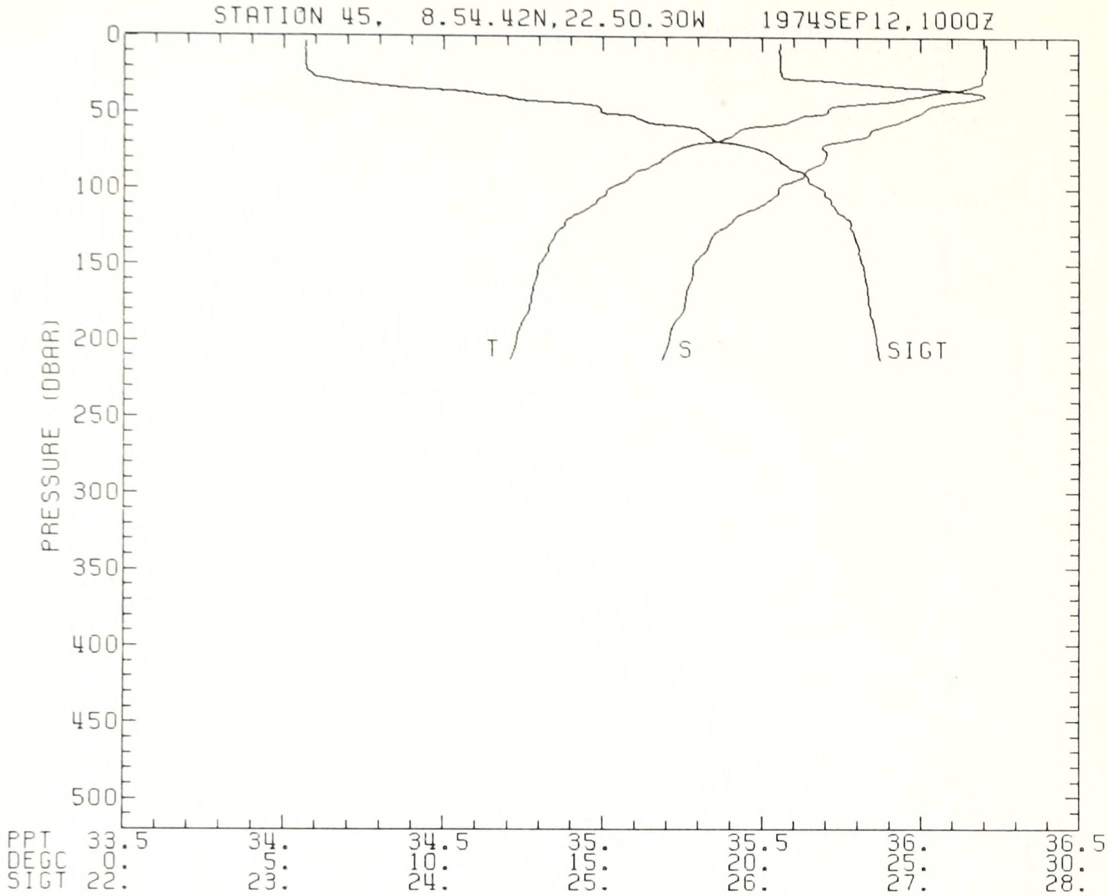
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 45, 8.54.42N,22.50.30W 1974SEP12,1000Z
PRESSURE (DBAR)
0
50
100
150
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250
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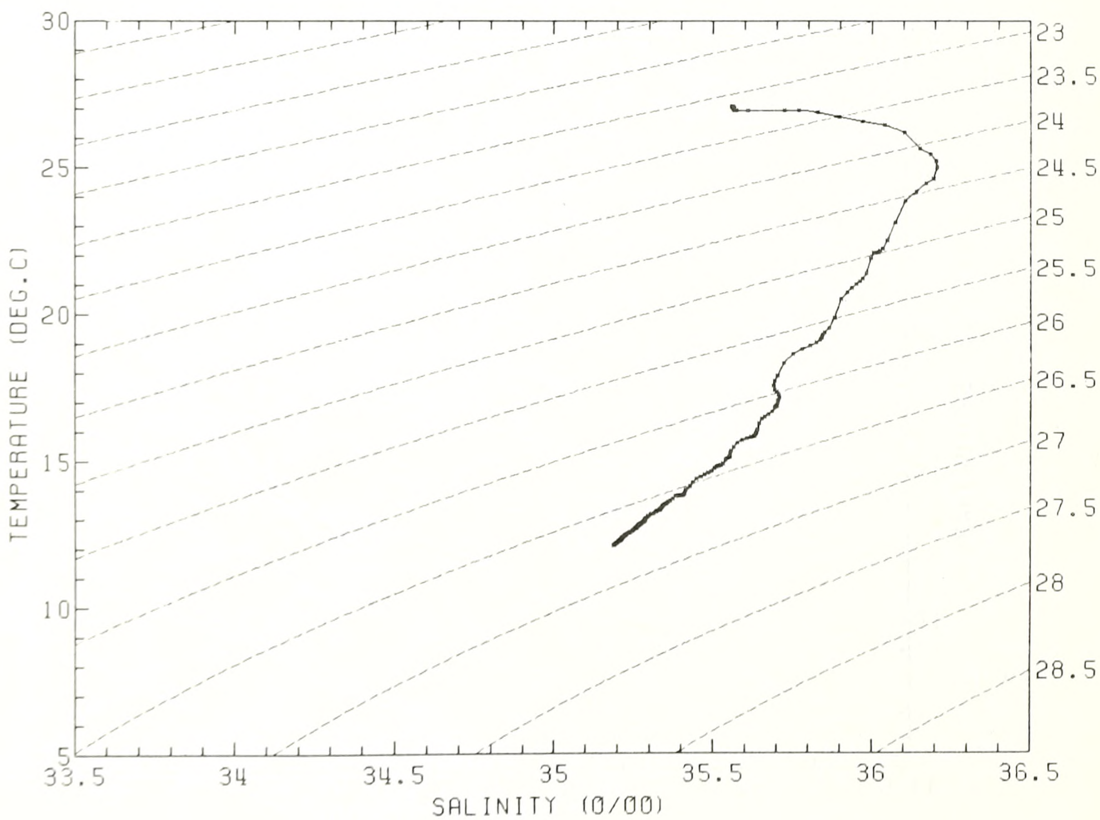
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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24.5
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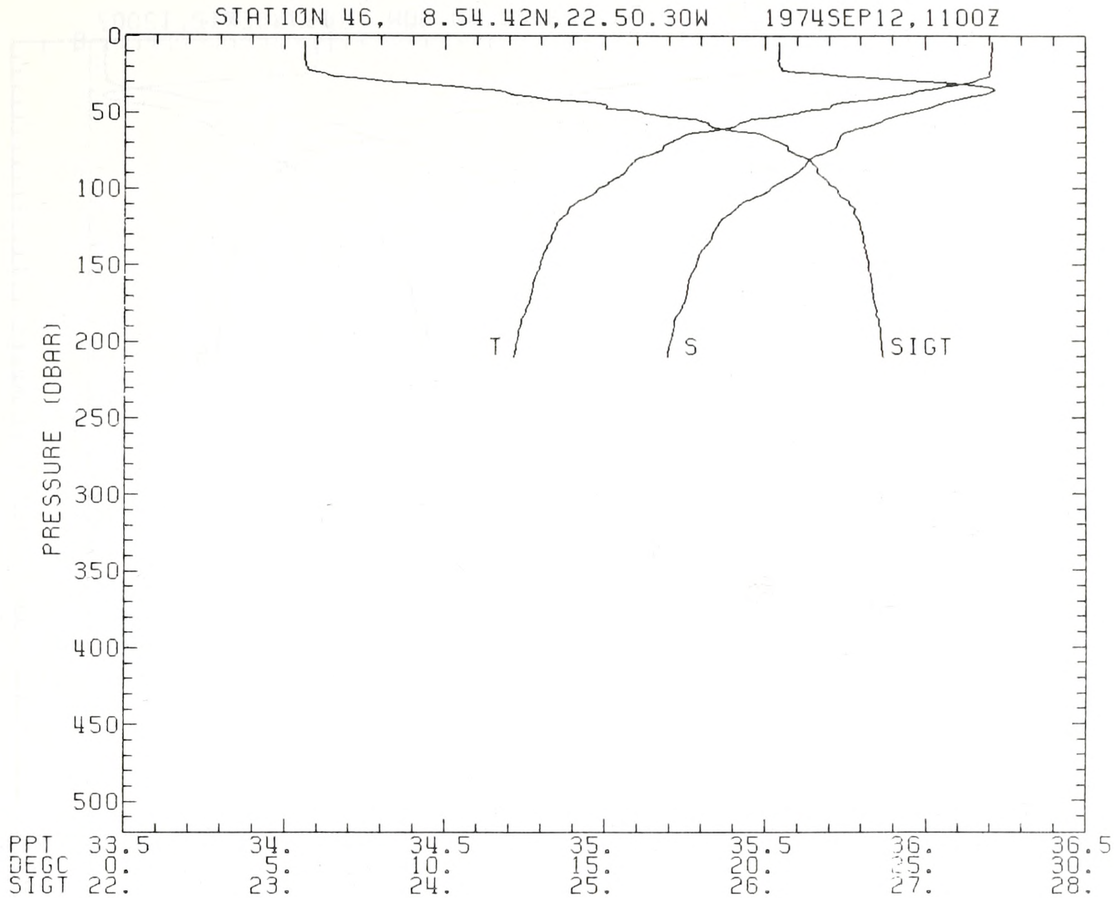
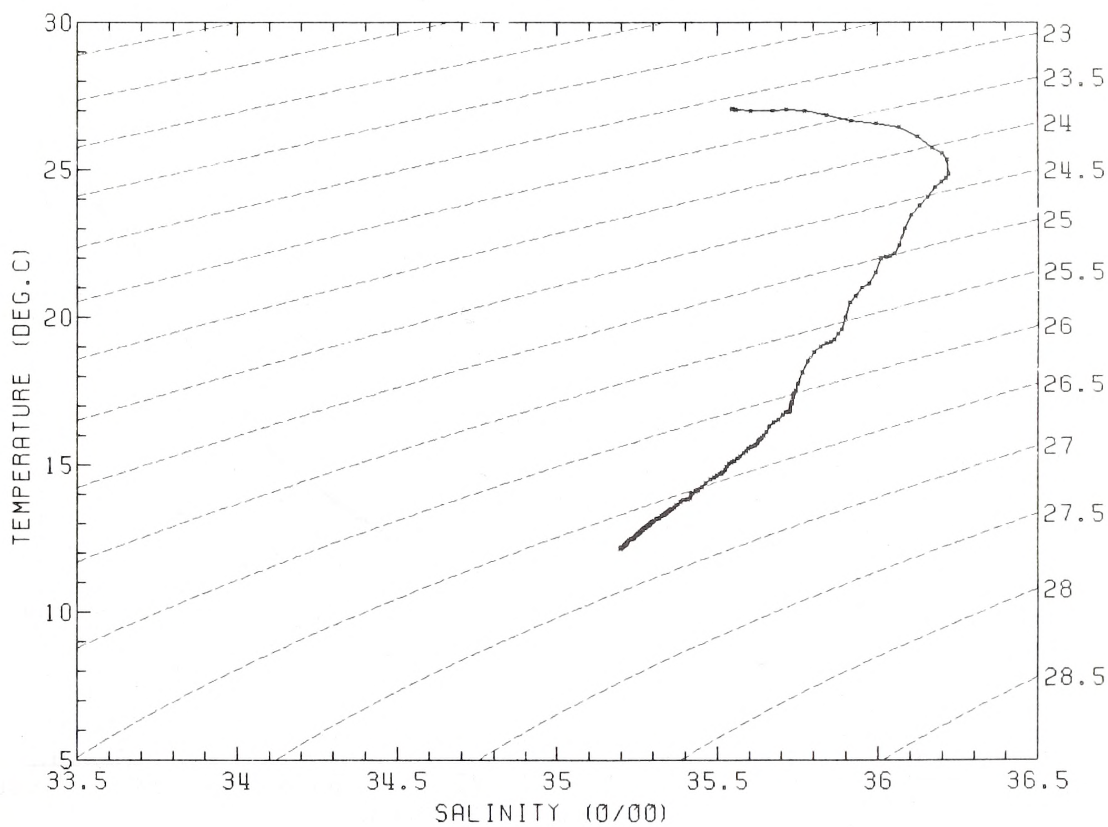
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 46, 8.54.42N,22.50.30W 1974SEP12,1100Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
30
25
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23.5
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24.5
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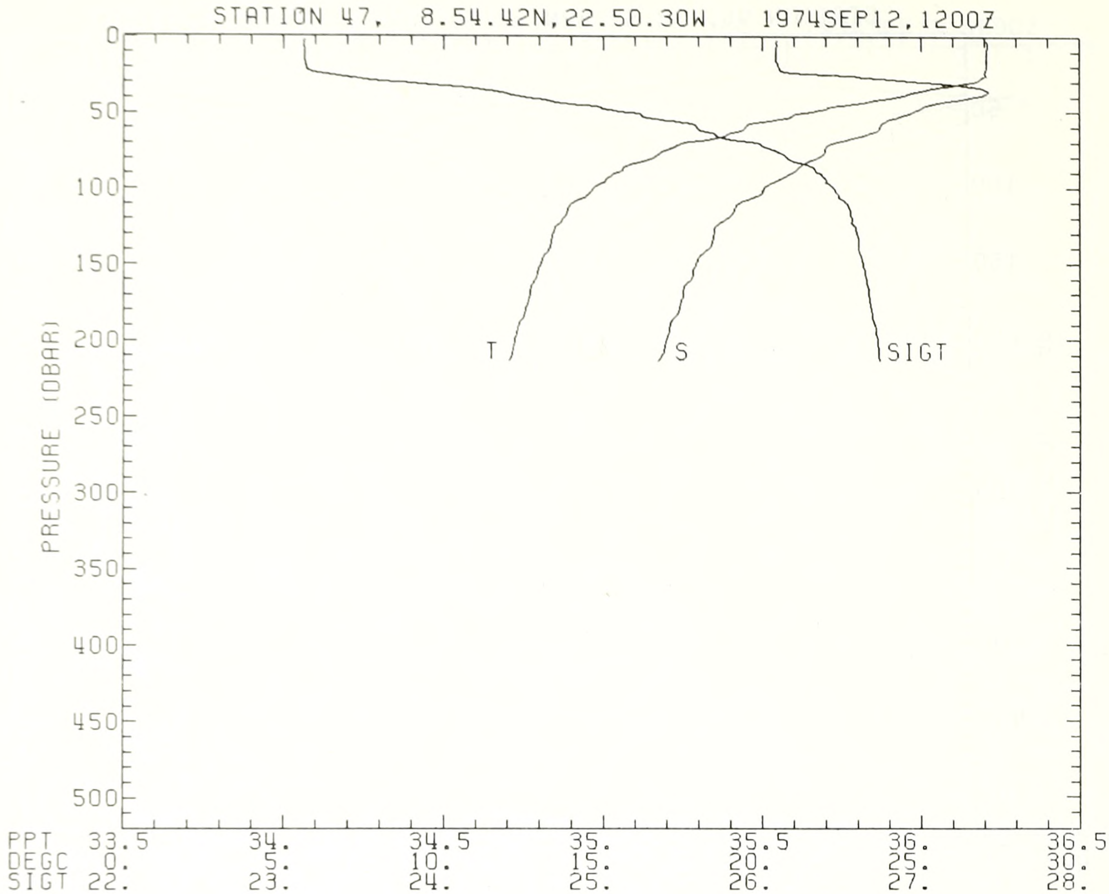
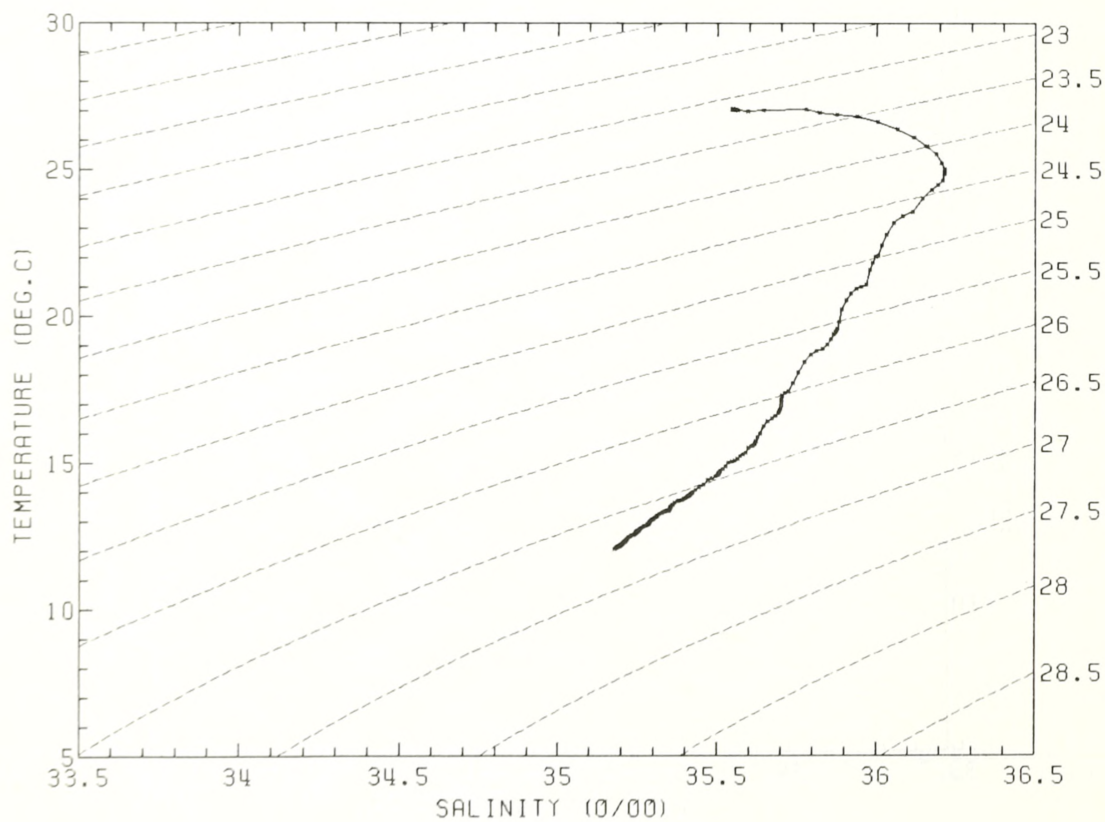
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 47, 8.54.42N,22.50.30W 1974SEP12,1200Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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24.5
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25.5
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26.5
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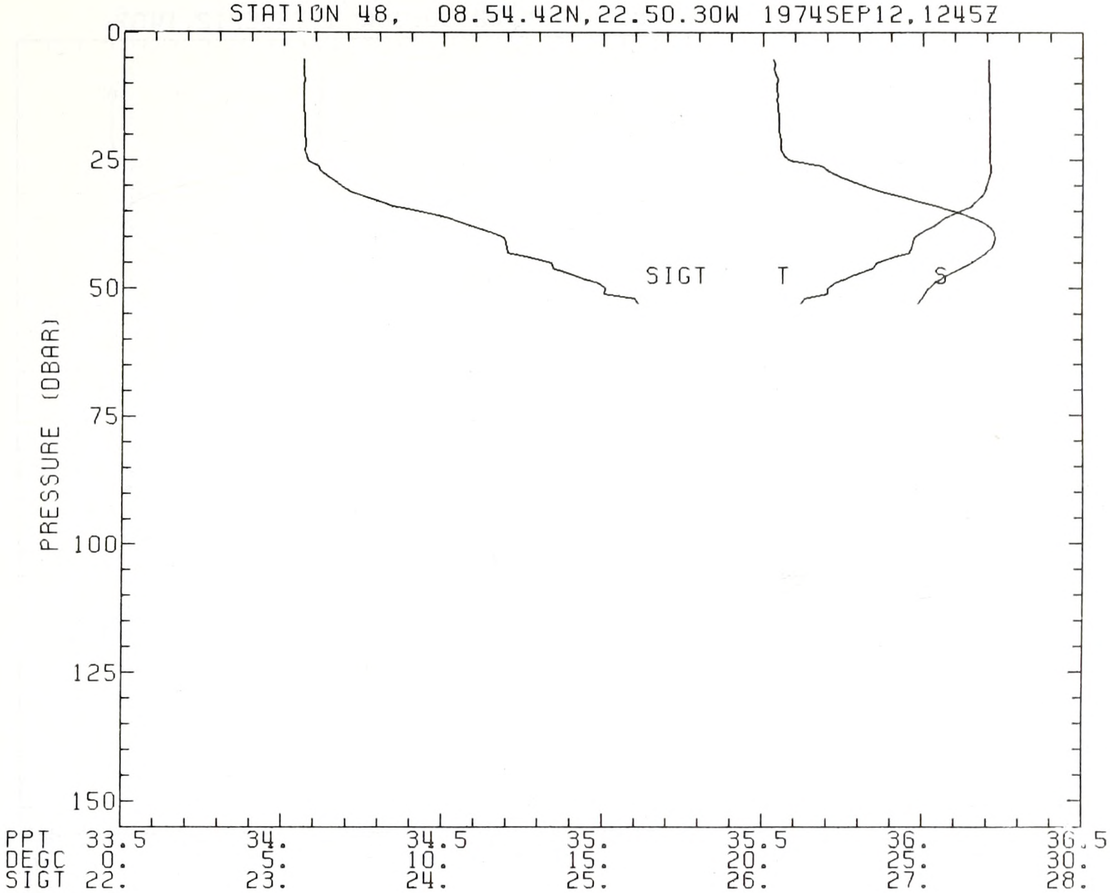
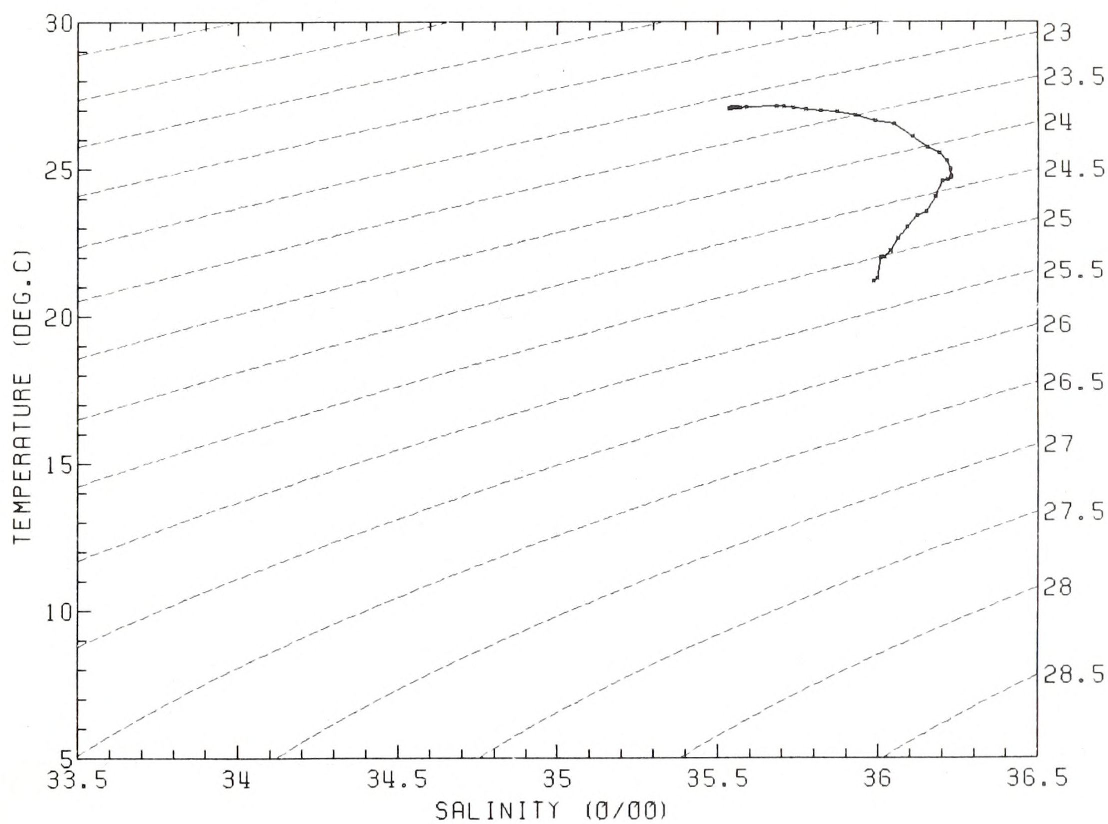
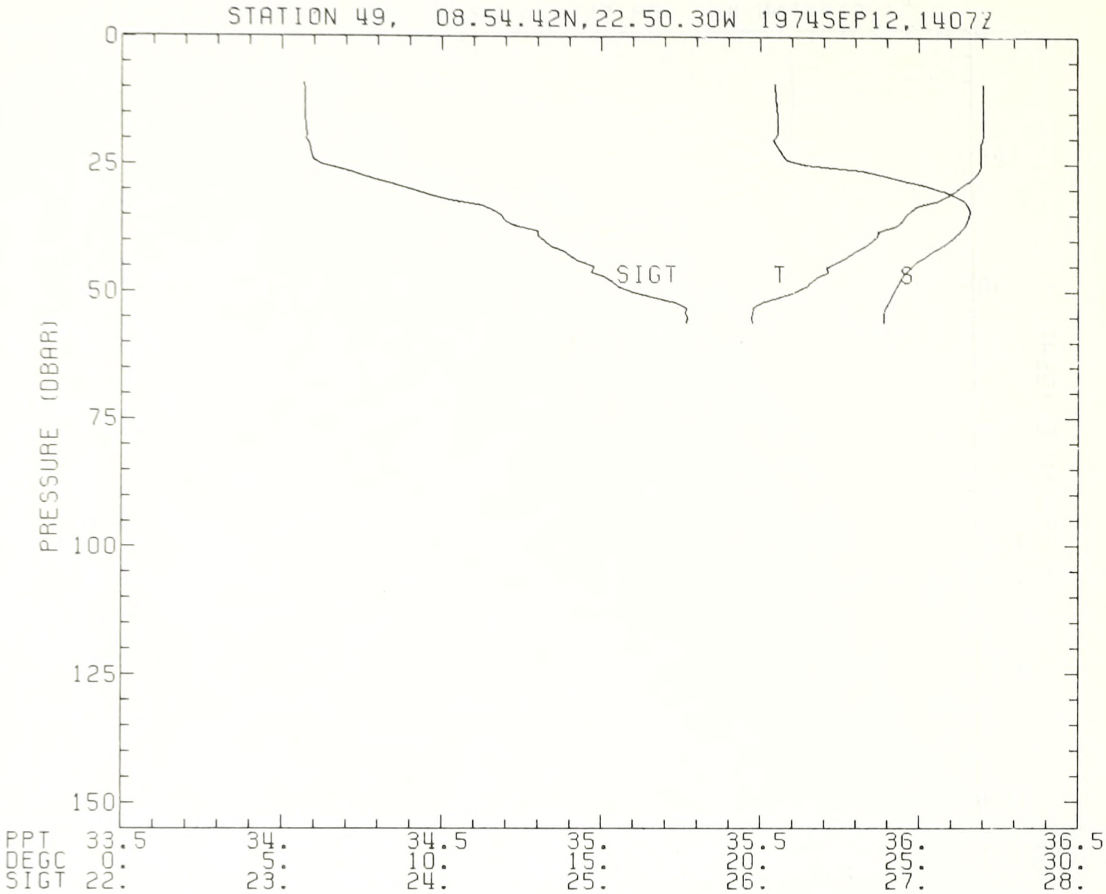
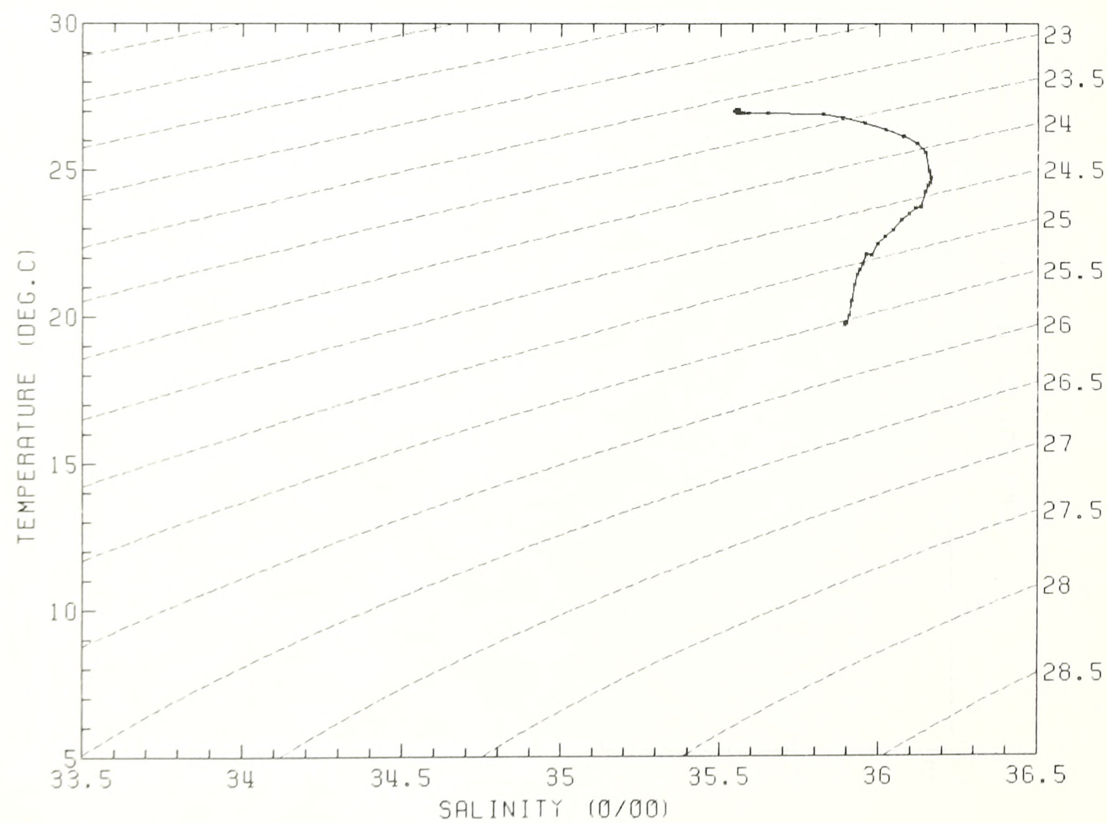
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

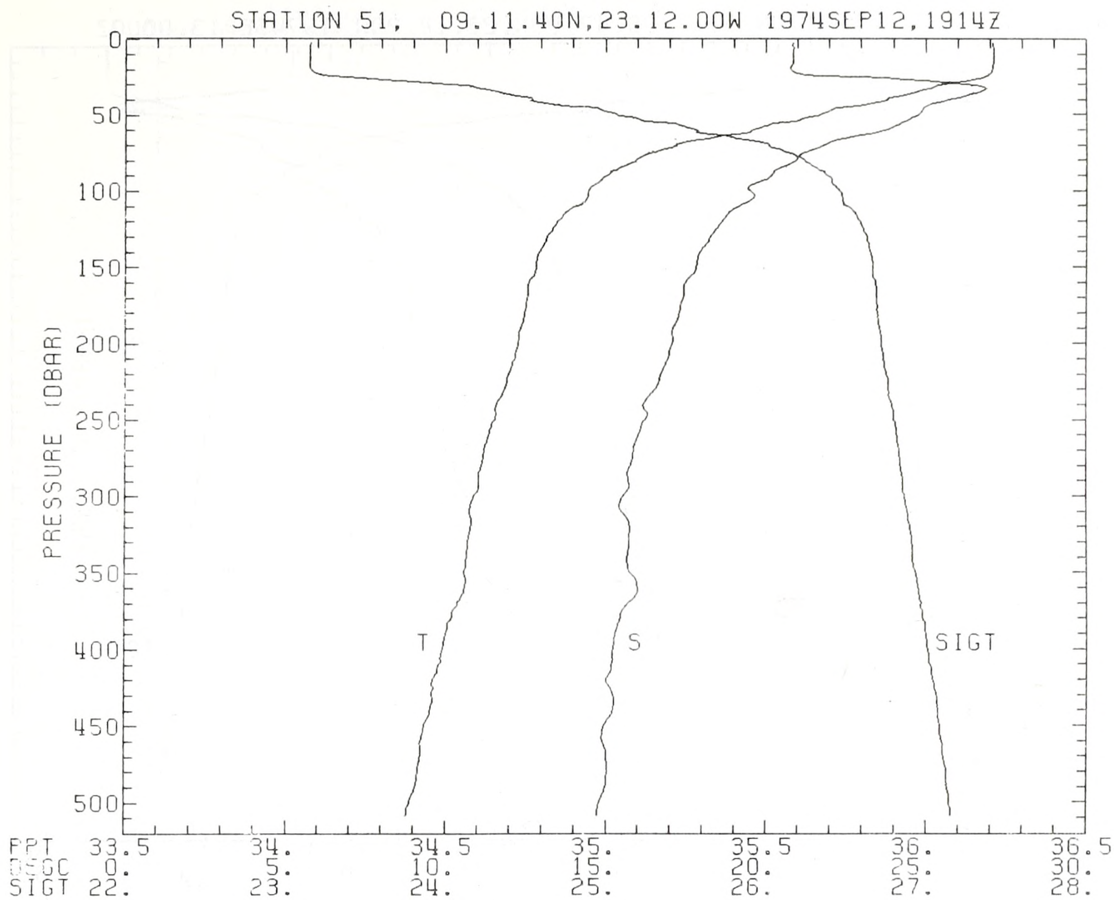
STATION 48, 08.54.42N,22.50.30W 1974SEP12,1245Z

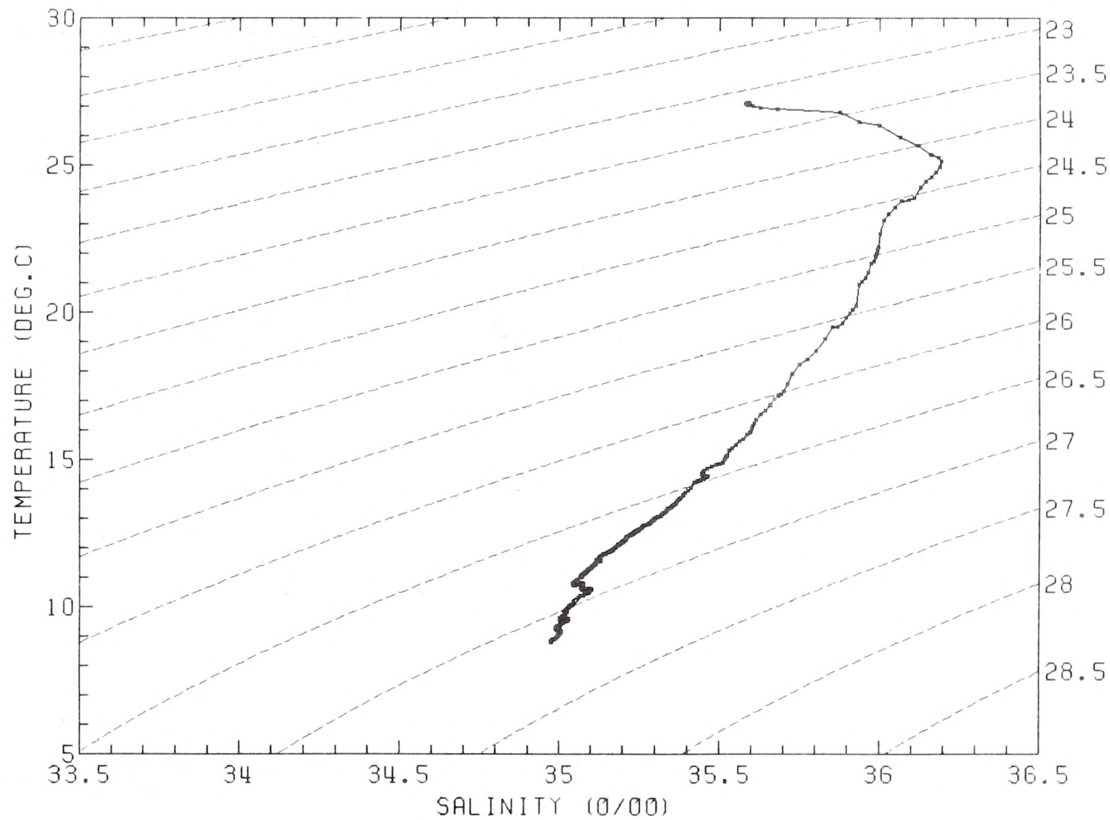





STATION 49, 08.54.42N,22.50.30W 1974SEP12,1407Z
PRESSURE (DBAR)
SIGT
T
S
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
SALINITY (0/00)


STATION 51, 09.11.40N,23.12.00W 1974SEP12,1914Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
30
25
20
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25.5
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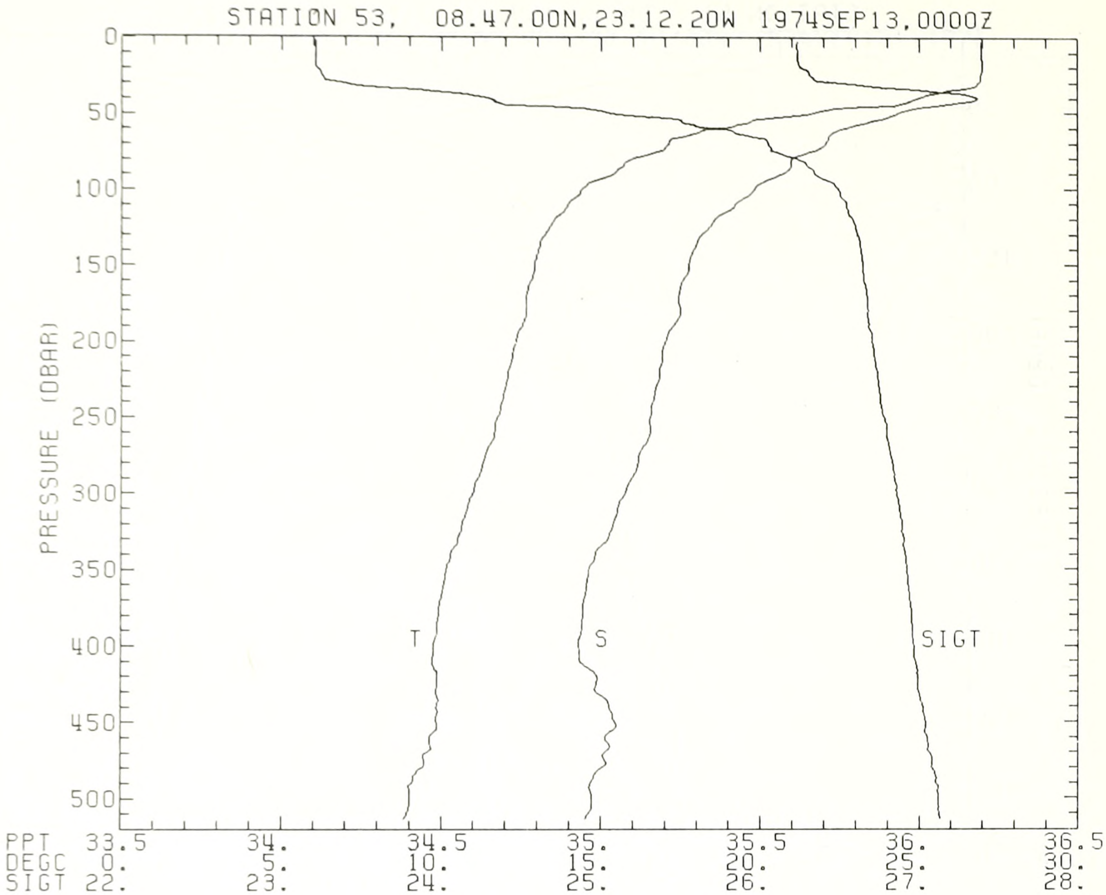
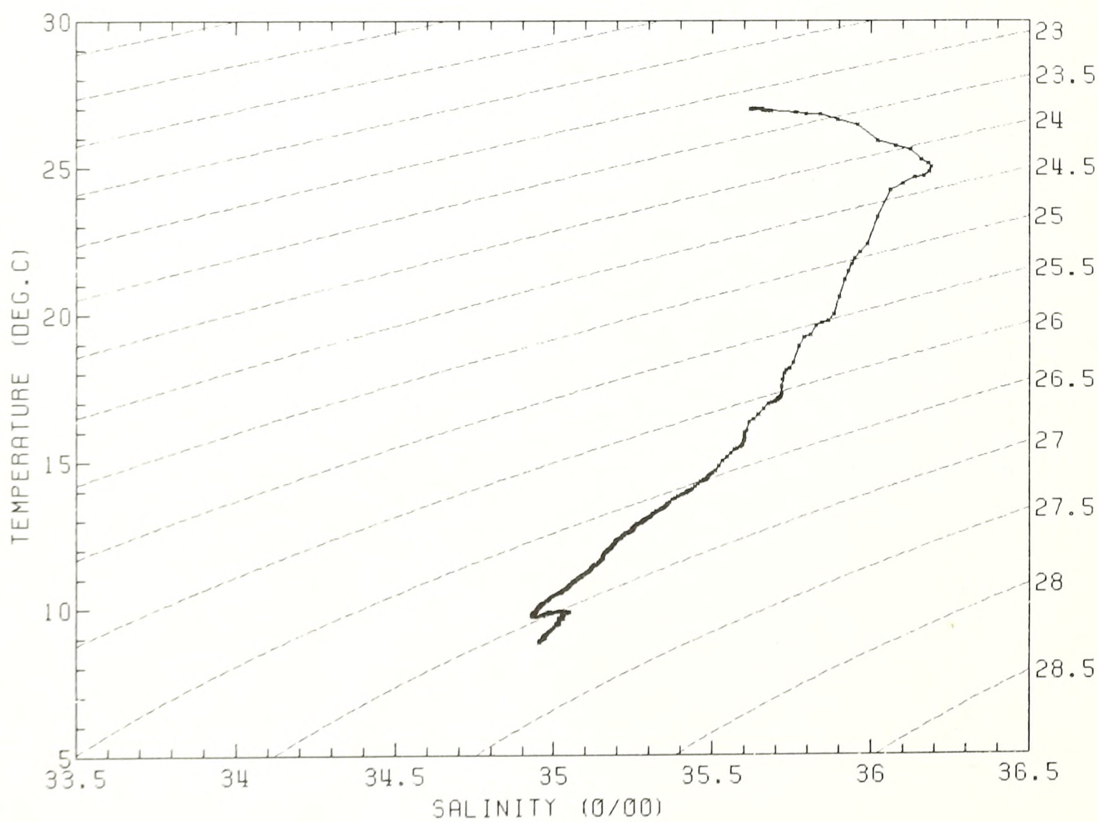
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (O/OO)



STATION 53, 08.47.00N,23.12.20W 1974SEP13,0000Z
PRESSURE (DBAR)
0
50
100
150
200
250
300
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.



TEMPERATURE (DEG.C)
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23.5
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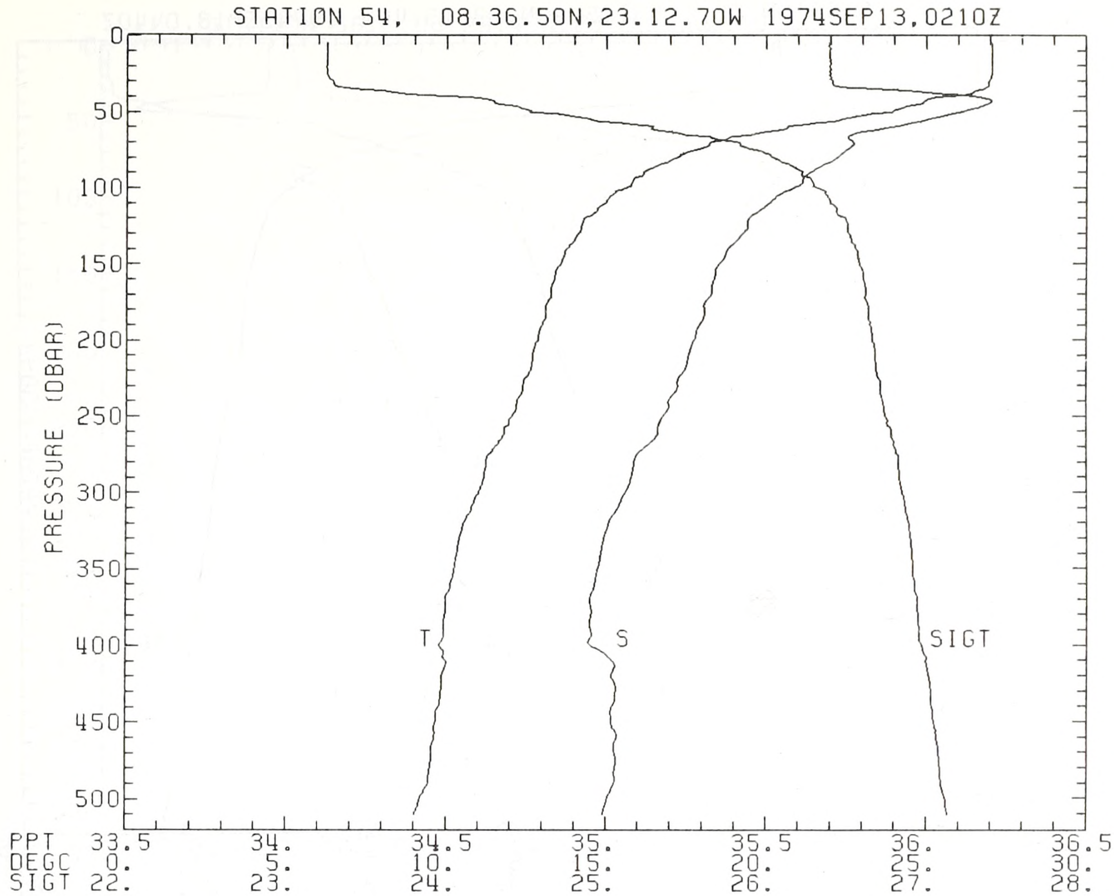
24.5
25
25.5
26
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 54, 08.36.50N,23.12.70W 1974SEP13,0210Z
PRESSURE (DBAR)
0
50
100
150
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250
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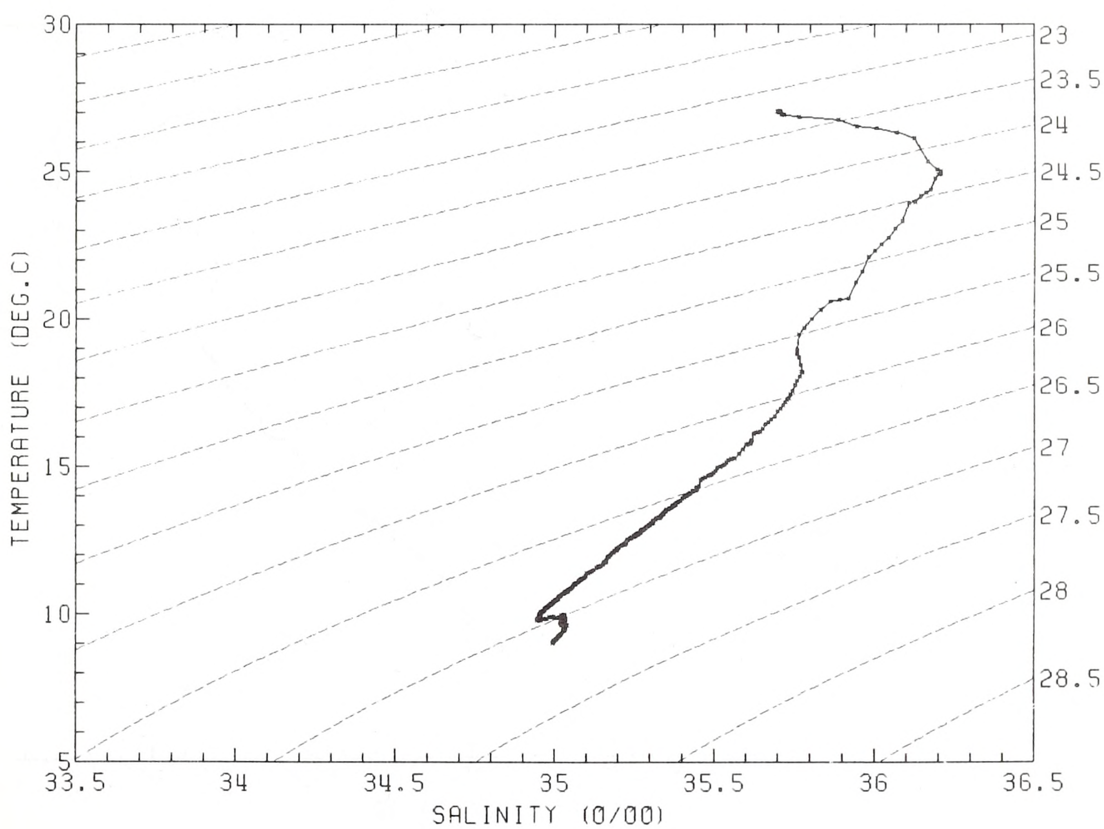
350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
30
25
20
15
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23.5
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24.5
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25.5
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26.5
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27.5
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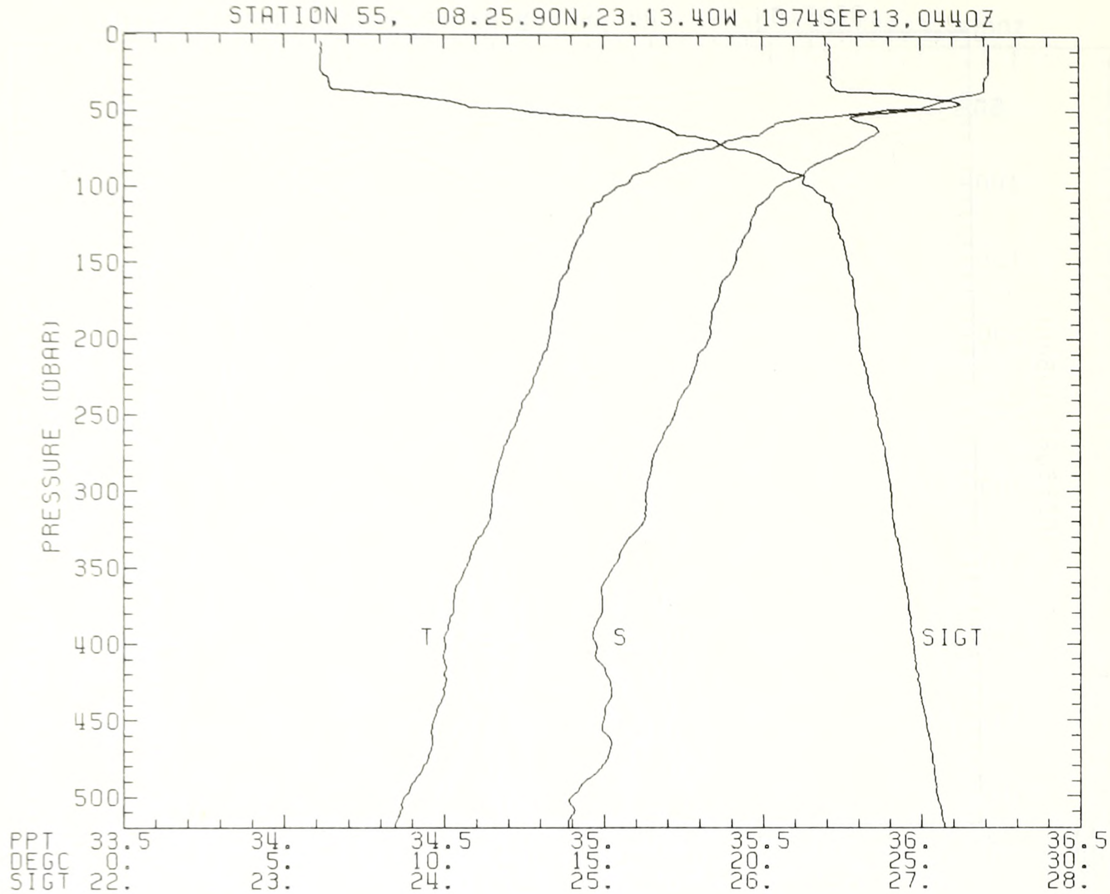
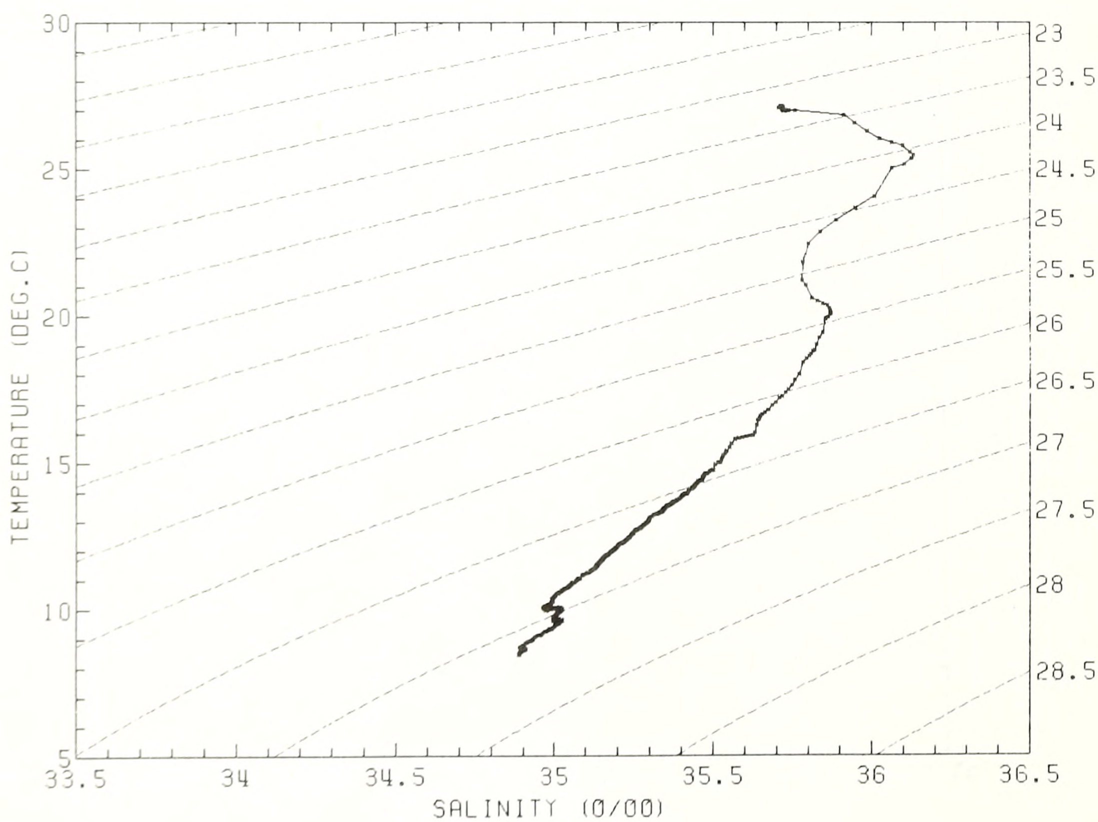
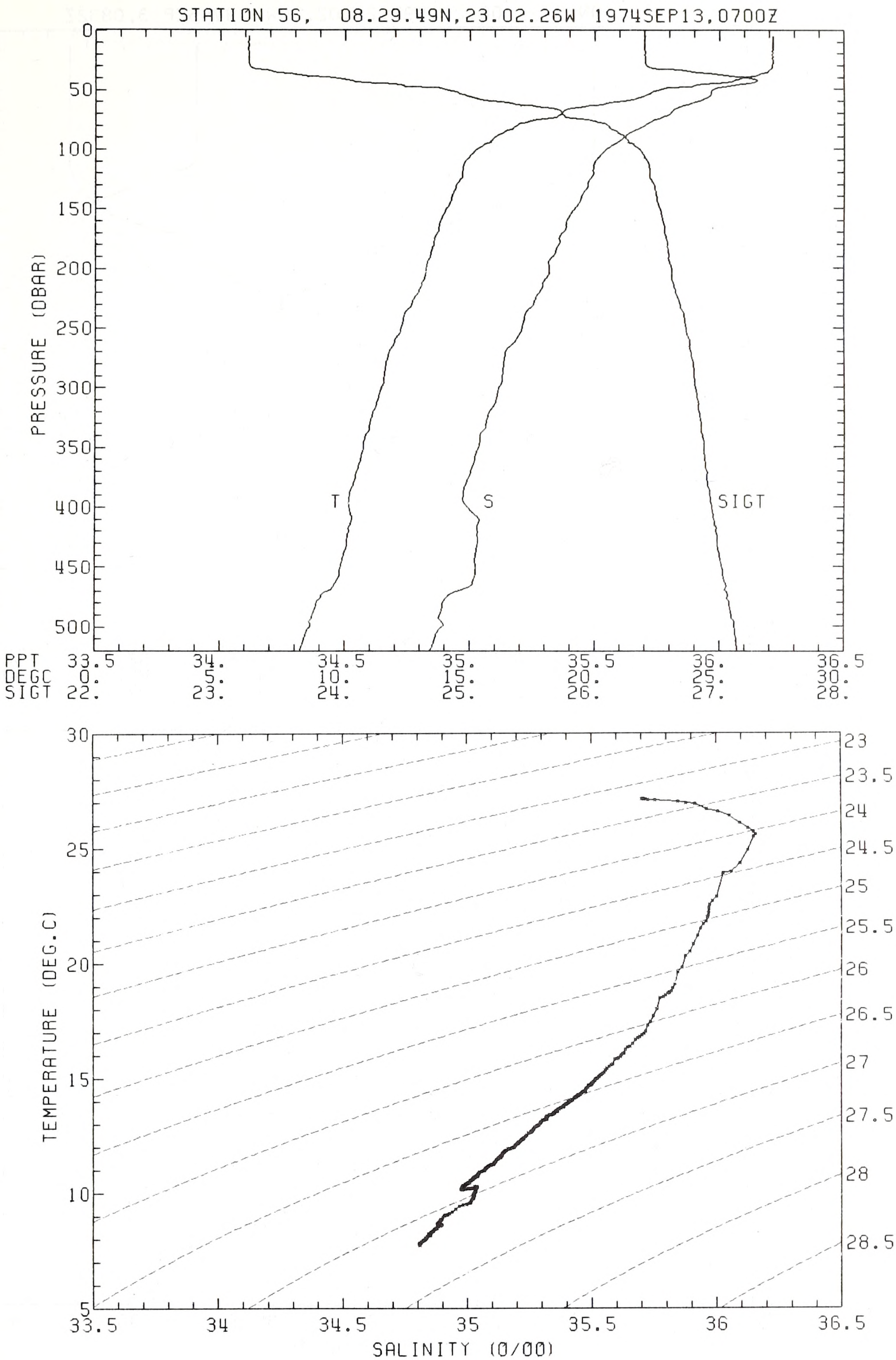
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 55, 08.25.90N,23.13.40W 1974SEP13,0440Z
PRESSURE (DBAR)
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
SALINITY (0/00)


STATION 56, 08.29.49N,23.02.26W 1974SEP13,0700Z
PRESSURE (DBAR)
0
50
100
150
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250
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350
400
450
500
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
30
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23.5
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24.5
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26.5
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27.5
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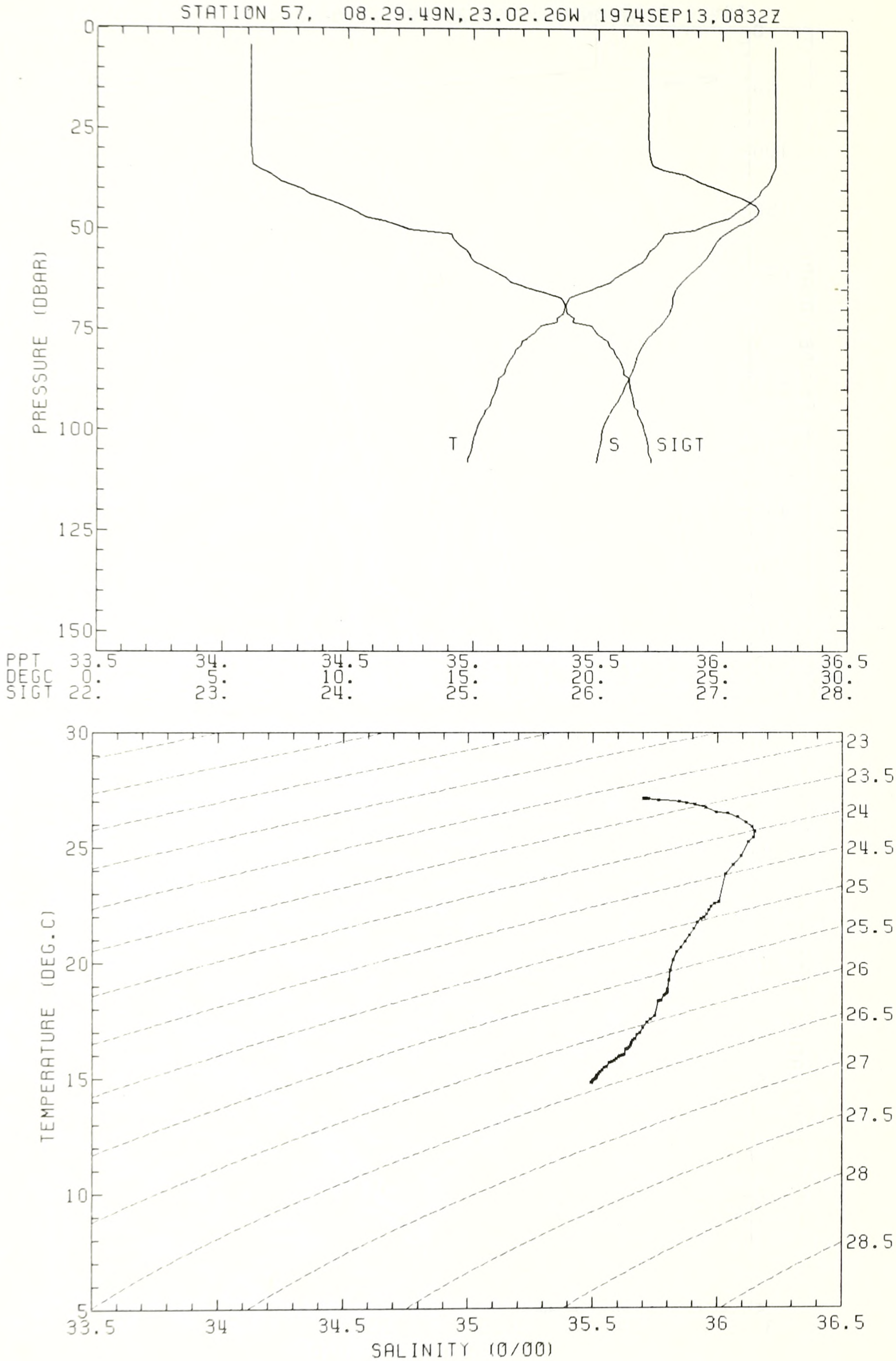
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 57, 08.29.49N,23.02.26W 1974SEP13,0832Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
30
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20
15
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23.5
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24.5
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25.5
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26.5
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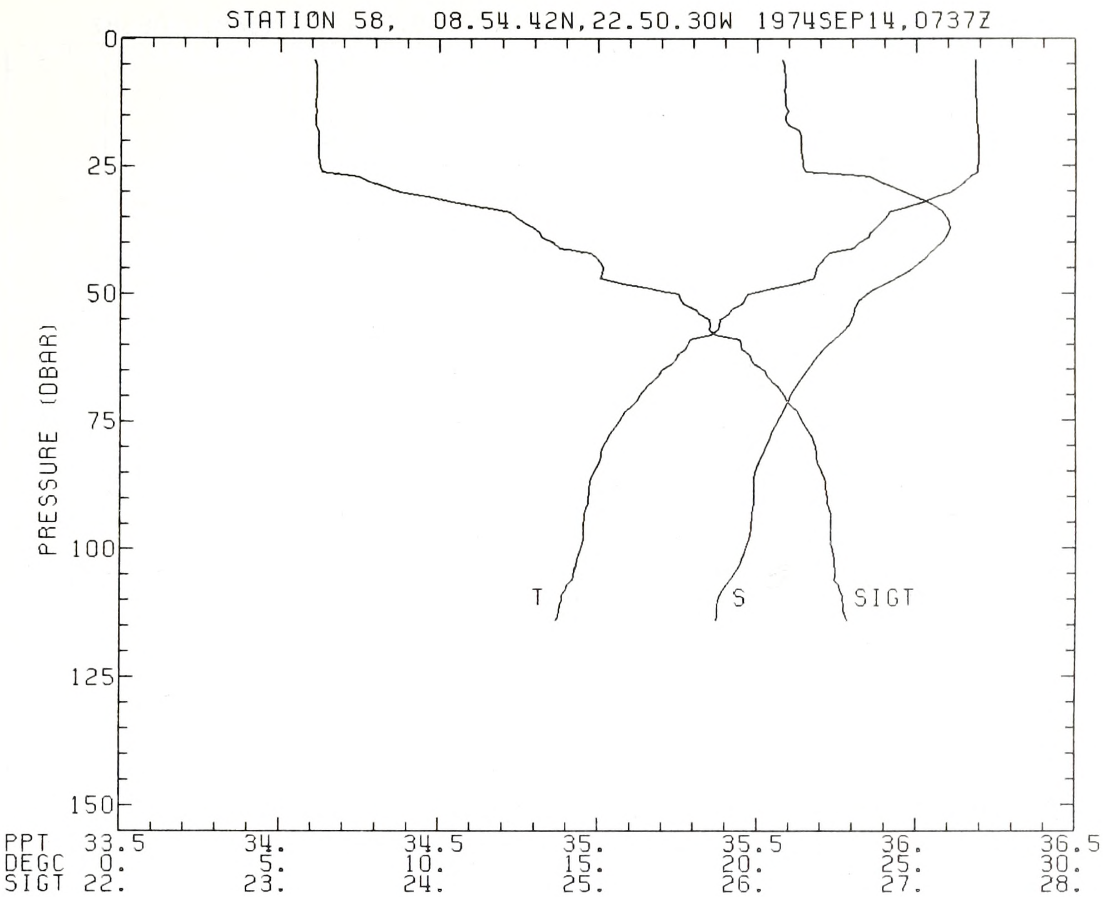
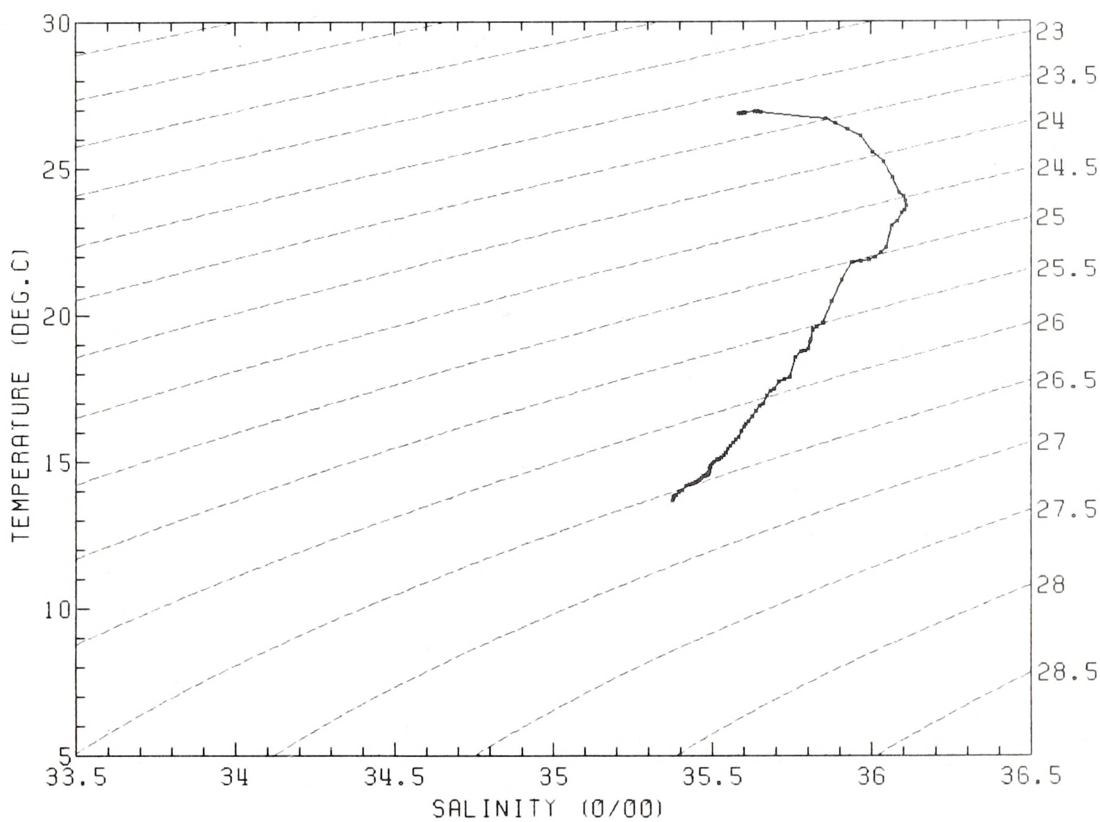
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 58, 08.54.42N,22.50.30W 1974SEP14,0737Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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27.5
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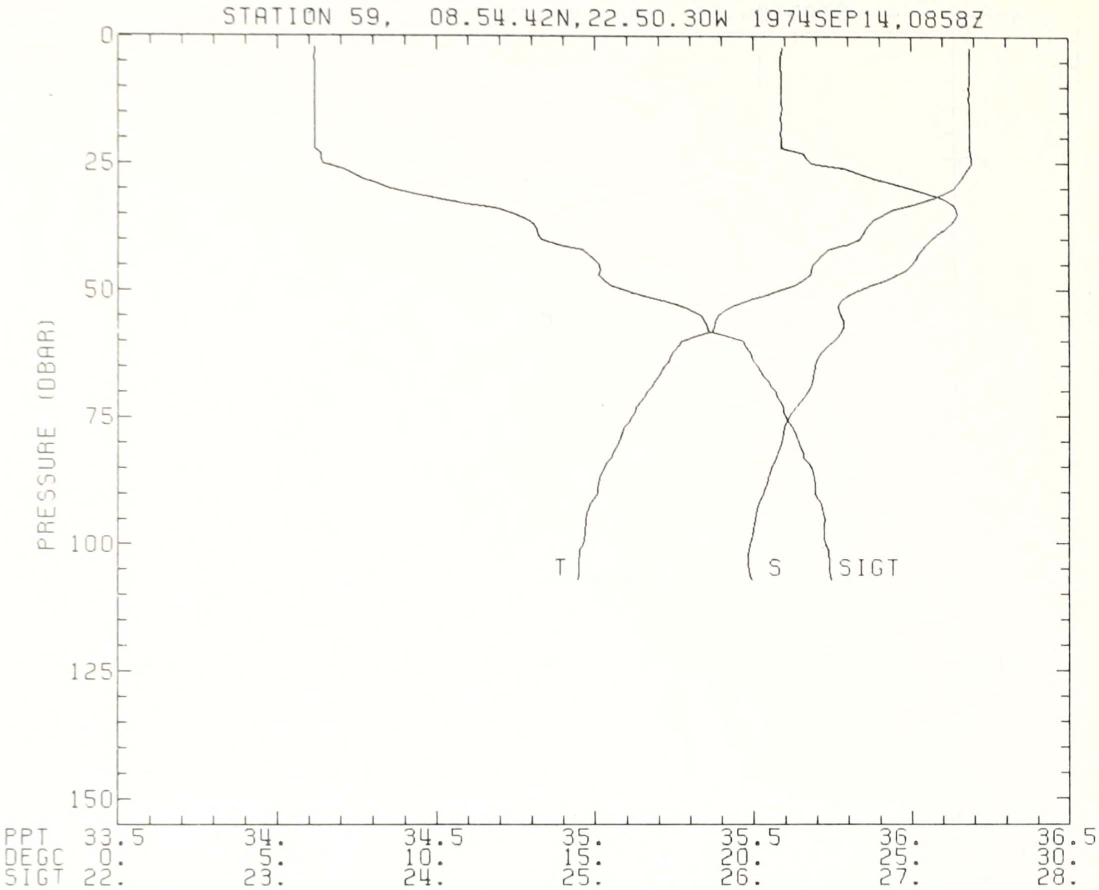
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 59, 08.54.42N,22.50.30W 1974SEP14,0858Z
PRESSURE (DBAR)
0
25
50
75
100
125
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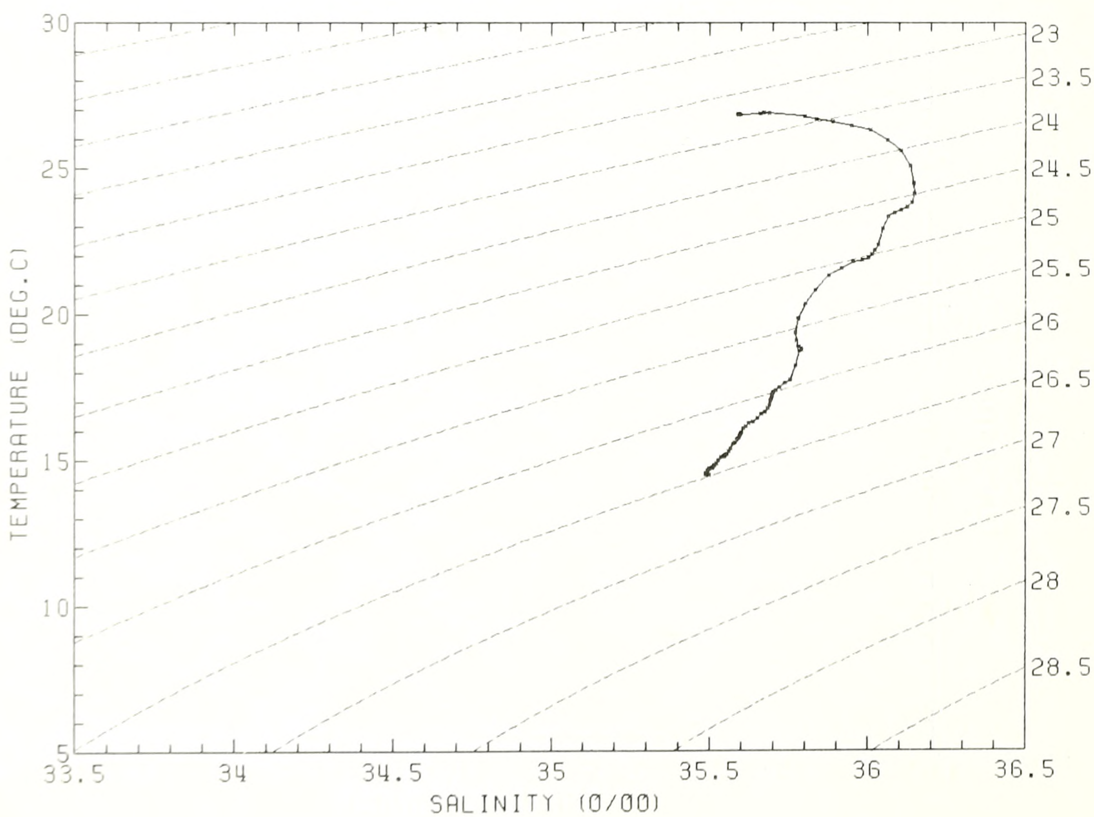
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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27.5
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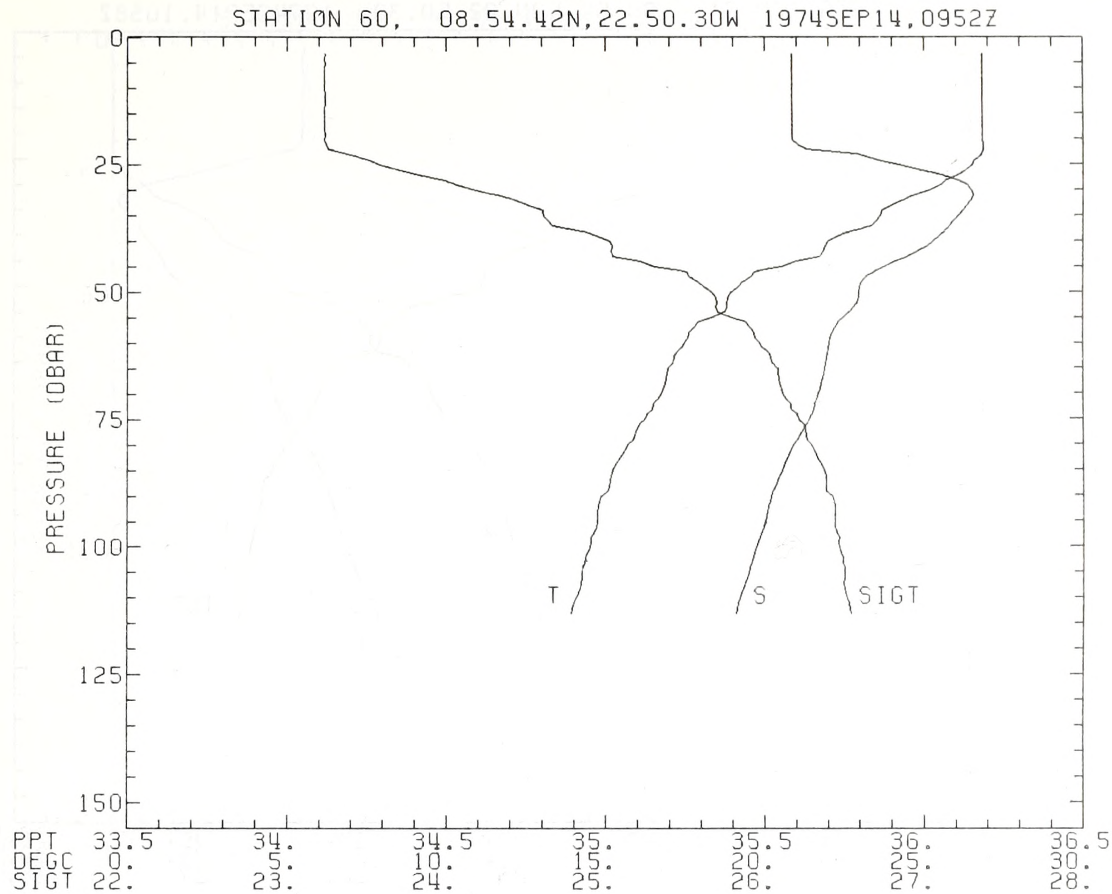
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)



STATION 60, 08.54.42N,22.50.30W 1974SEP14,0952Z
PRESSURE (DBAR)
0
25
50
75
100
125
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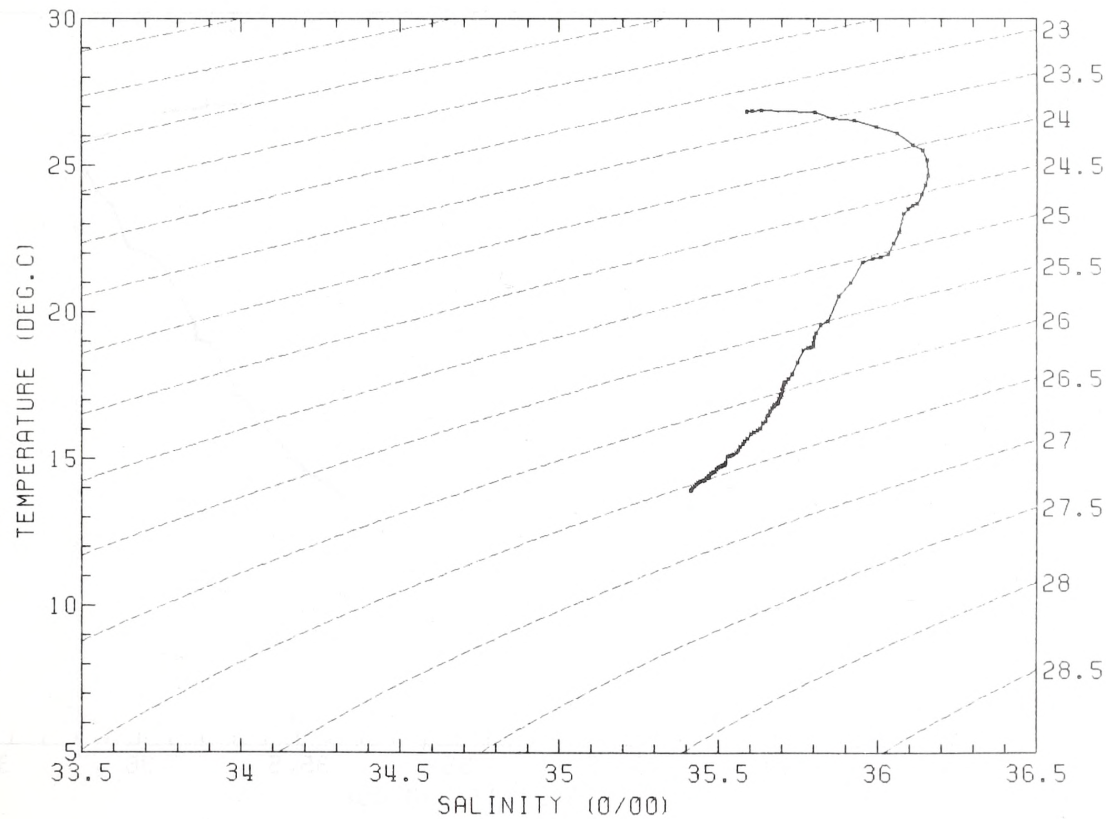
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.



TEMPERATURE (DEG.C)
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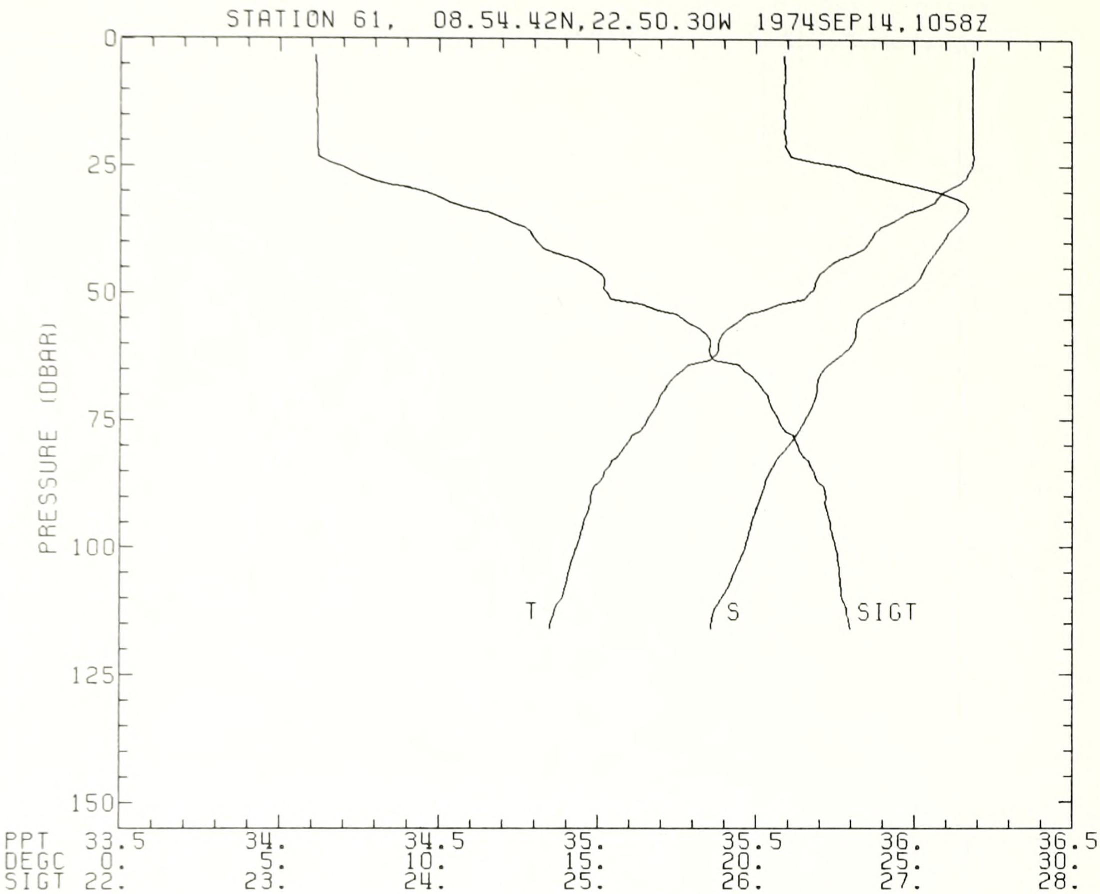
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 61, 08.54.42N,22.50.30W 1974SEP14,1058Z
PRESSURE (DBAR)
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75
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125
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T
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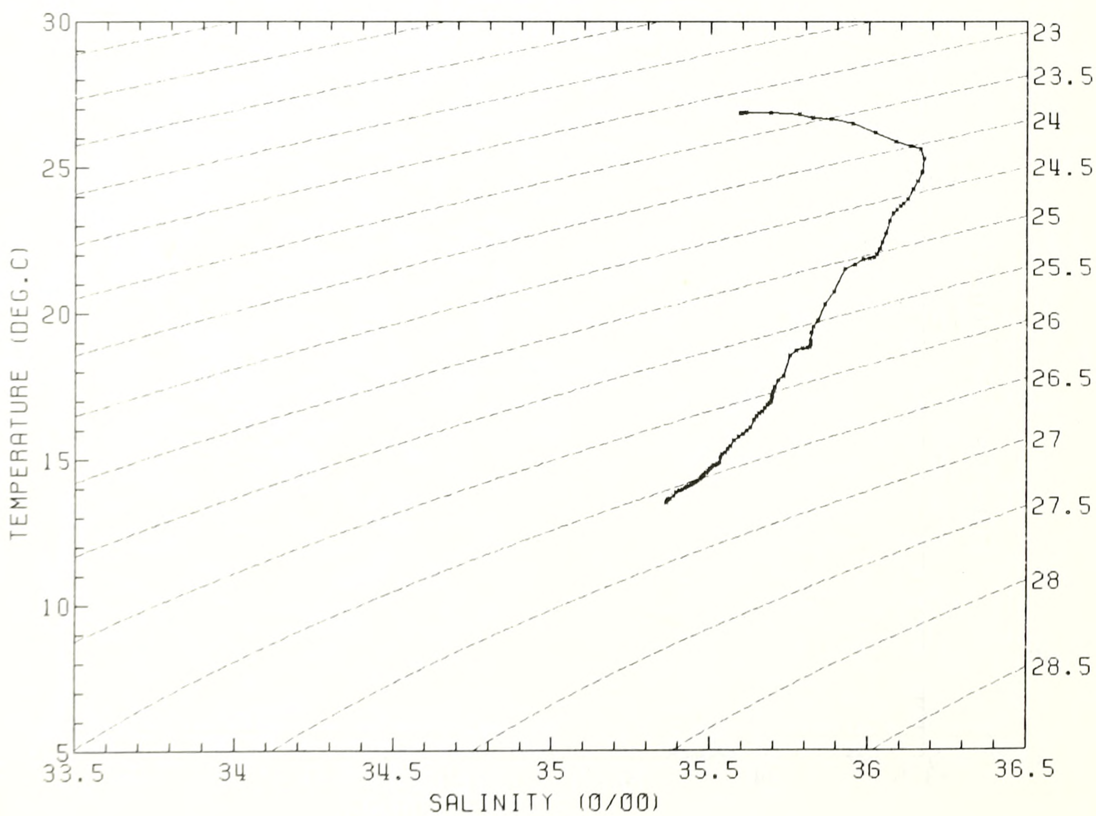
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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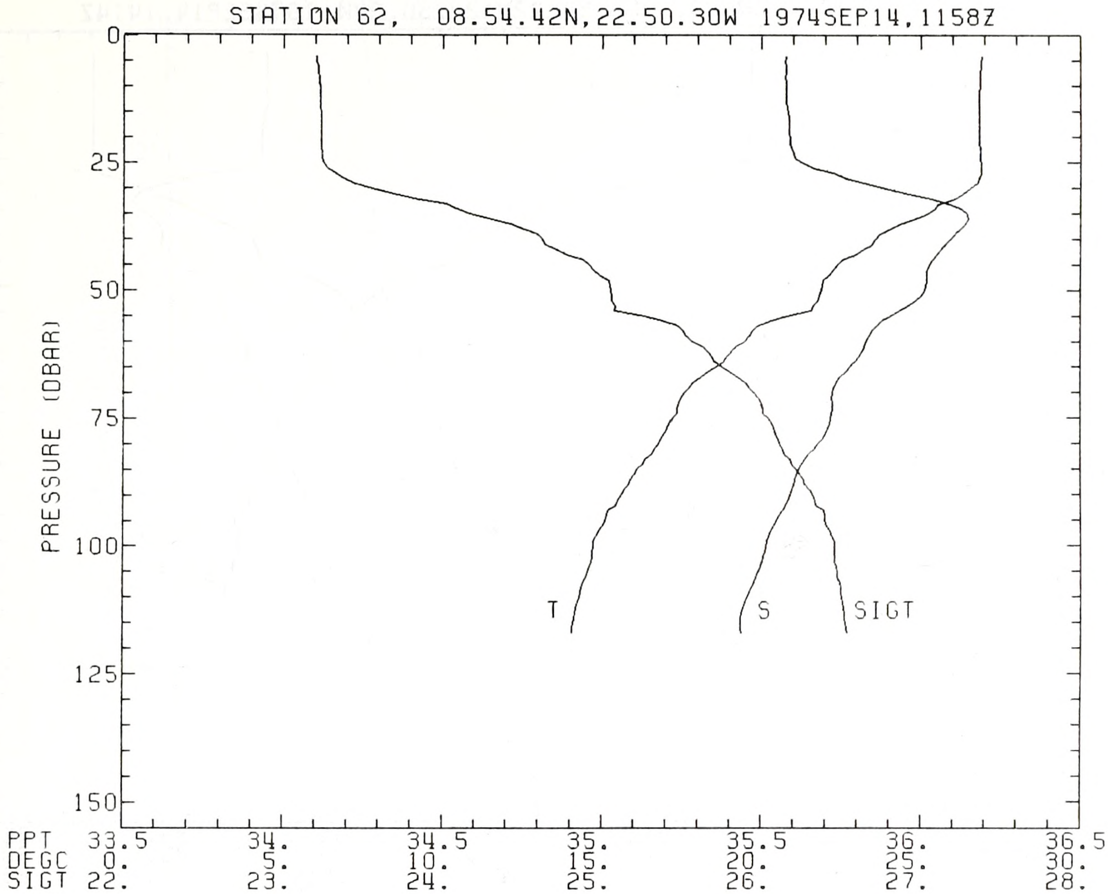
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 62, 08.54.42N,22.50.30W 1974SEP14,1158Z
PRESSURE (DBAR)
0
25
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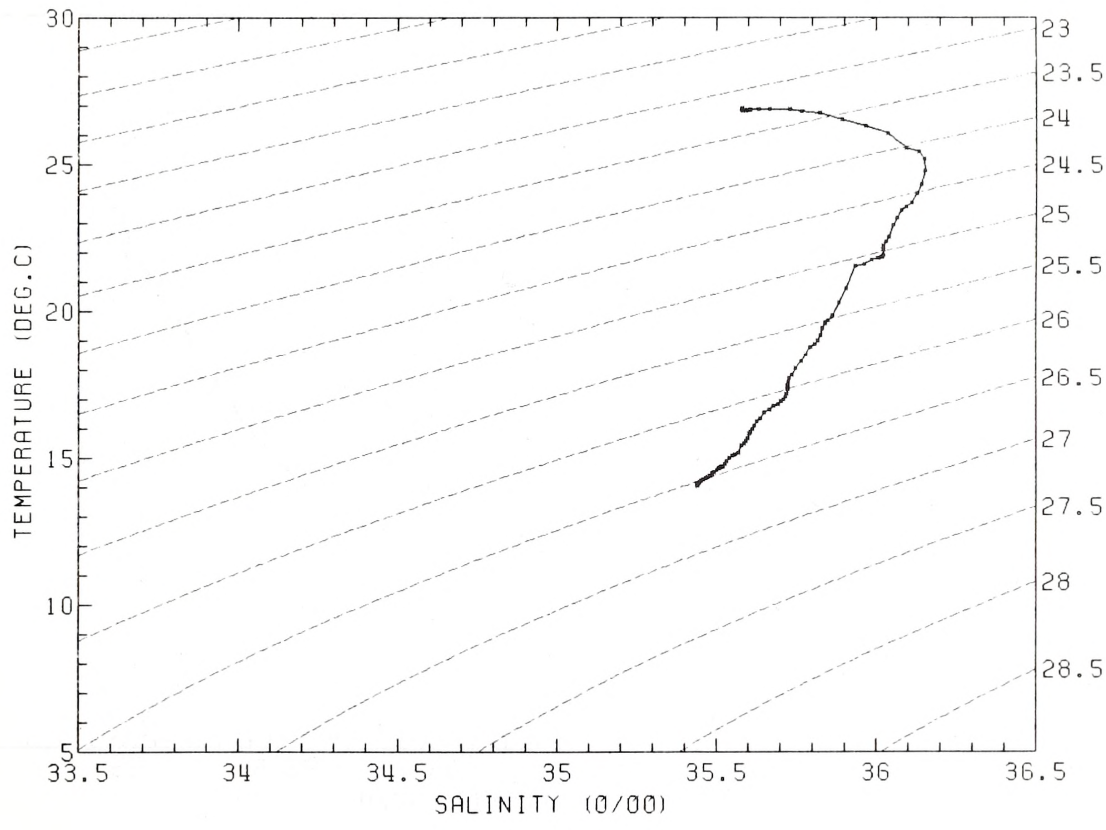
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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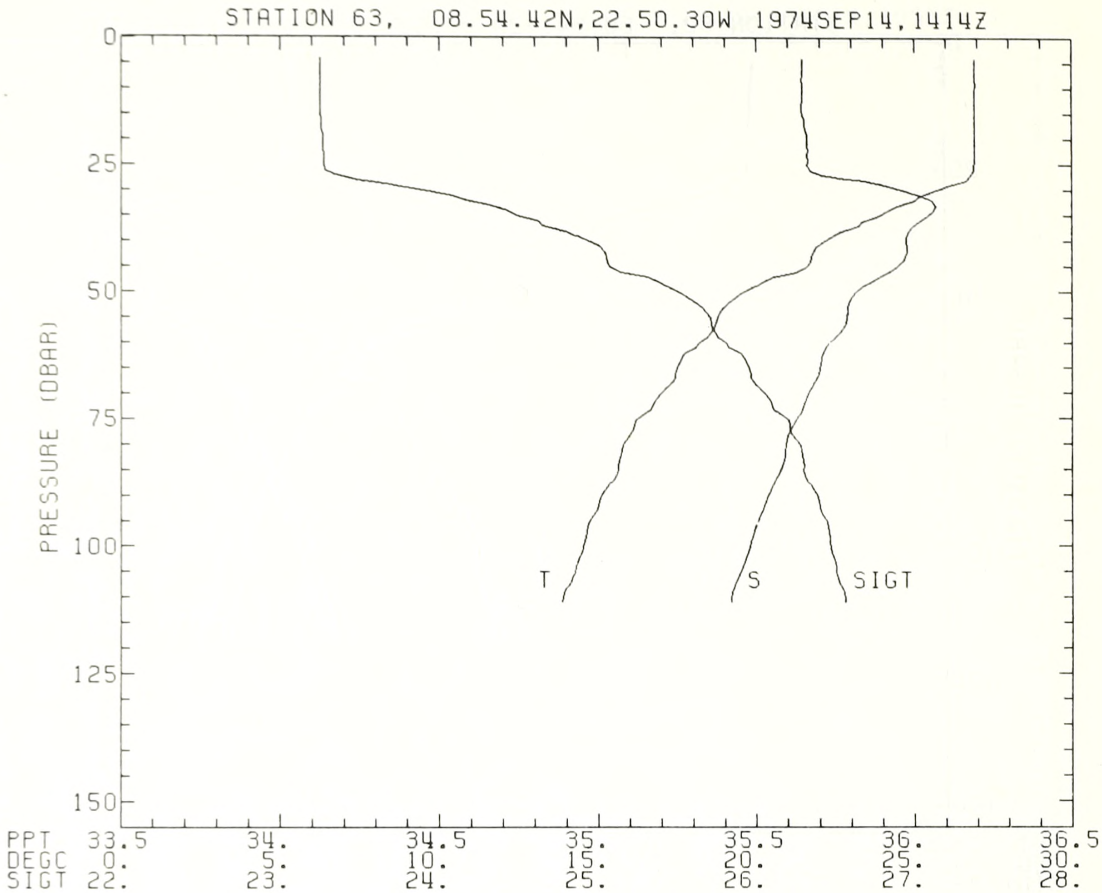
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 63, 08.54.42N,22.50.30W 1974SEP14,1414Z
PRESSURE (DBAR)
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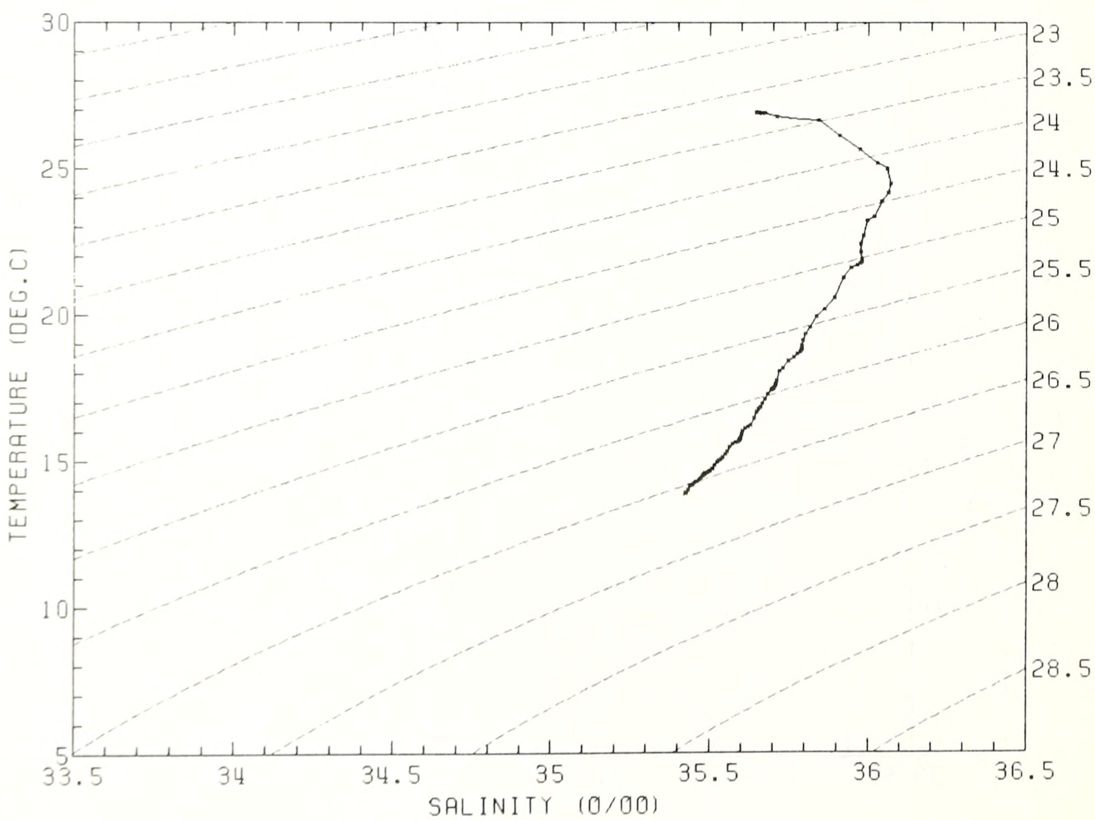
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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27.5
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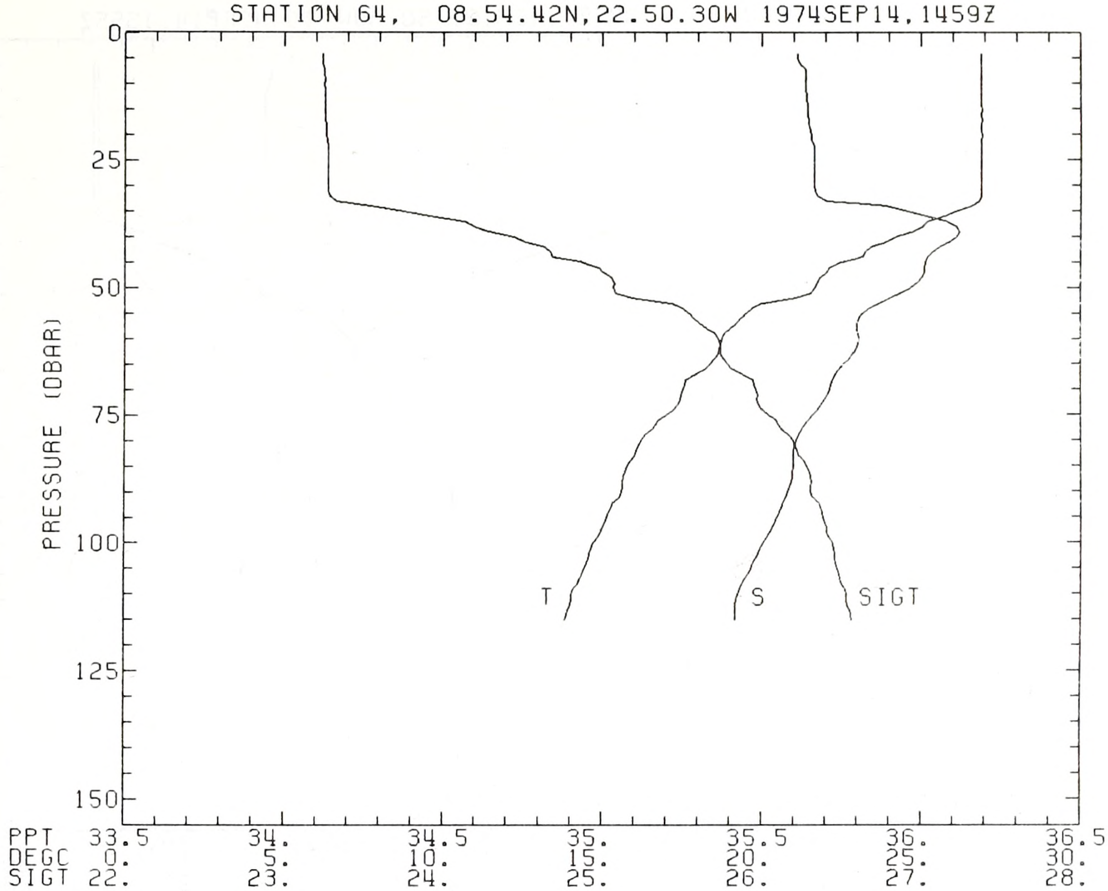
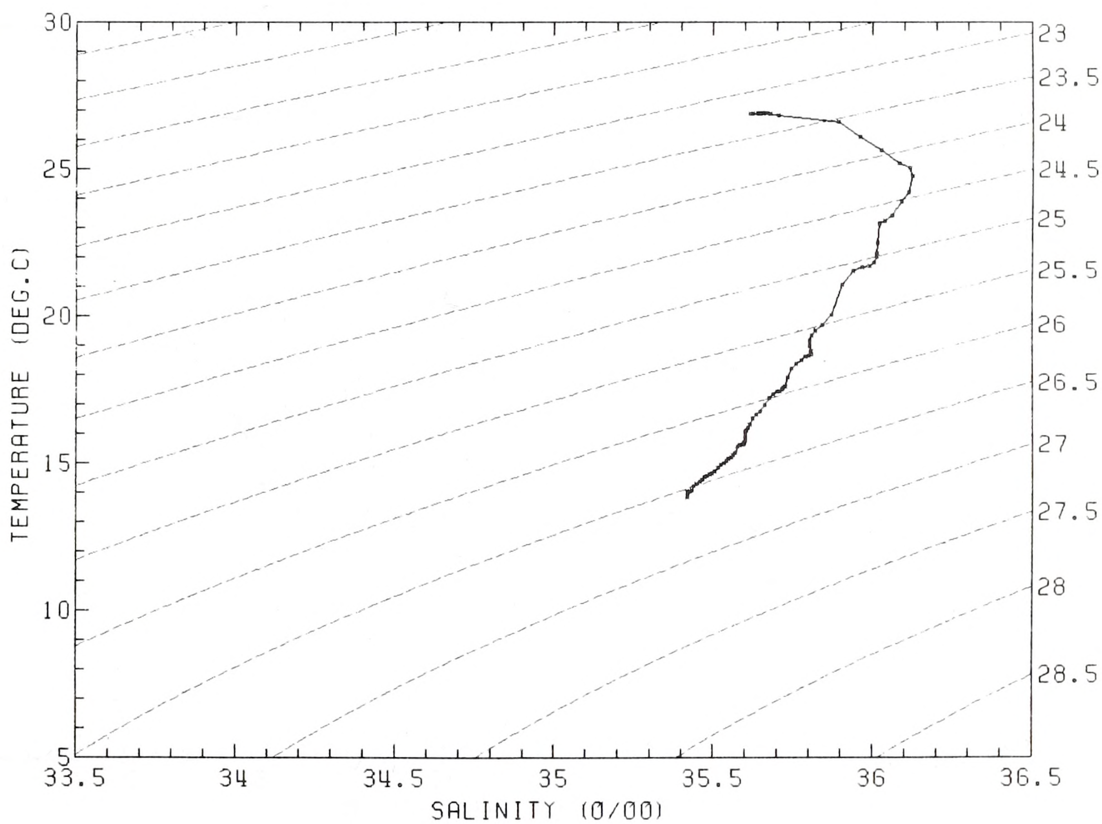
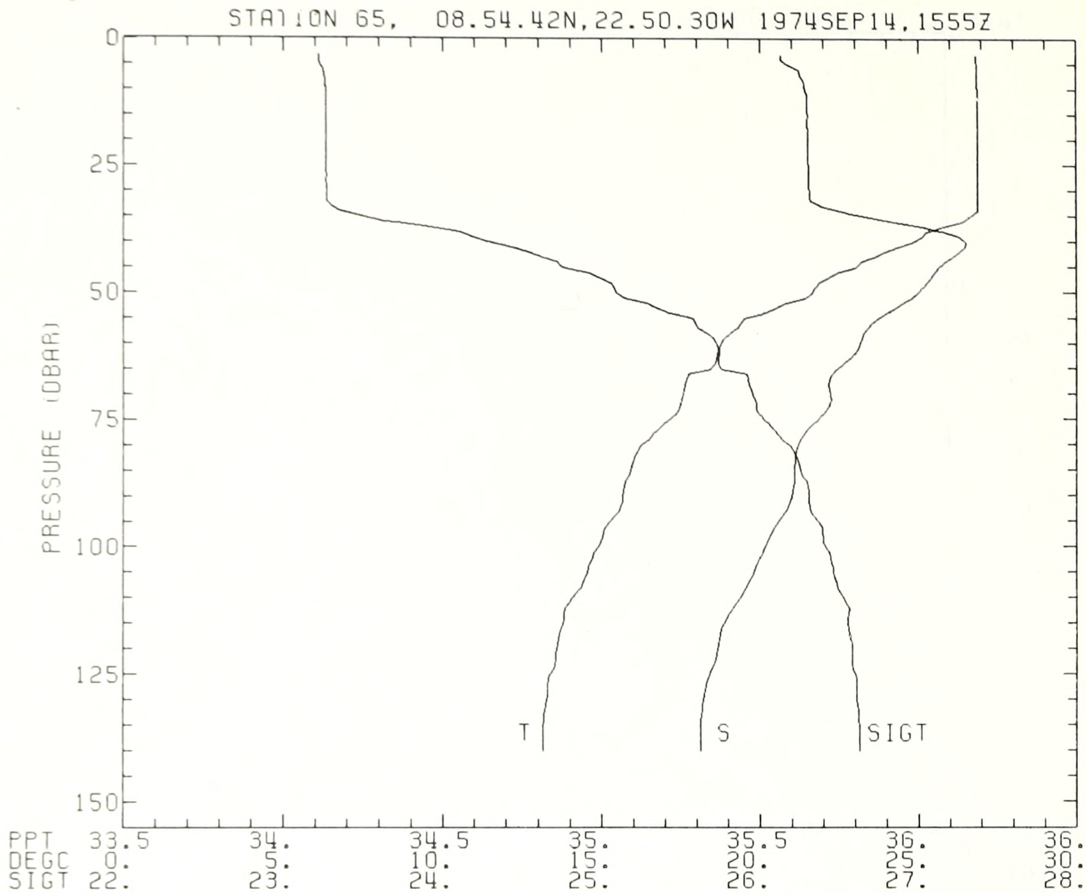
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

STATION 64, 08.54.42N,22.50.30W 1974SEP14,1459Z






STATION 65, 08.54.42N,22.50.30W 1974SEP14,1555Z
PRESSURE (DBAR)
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25
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75
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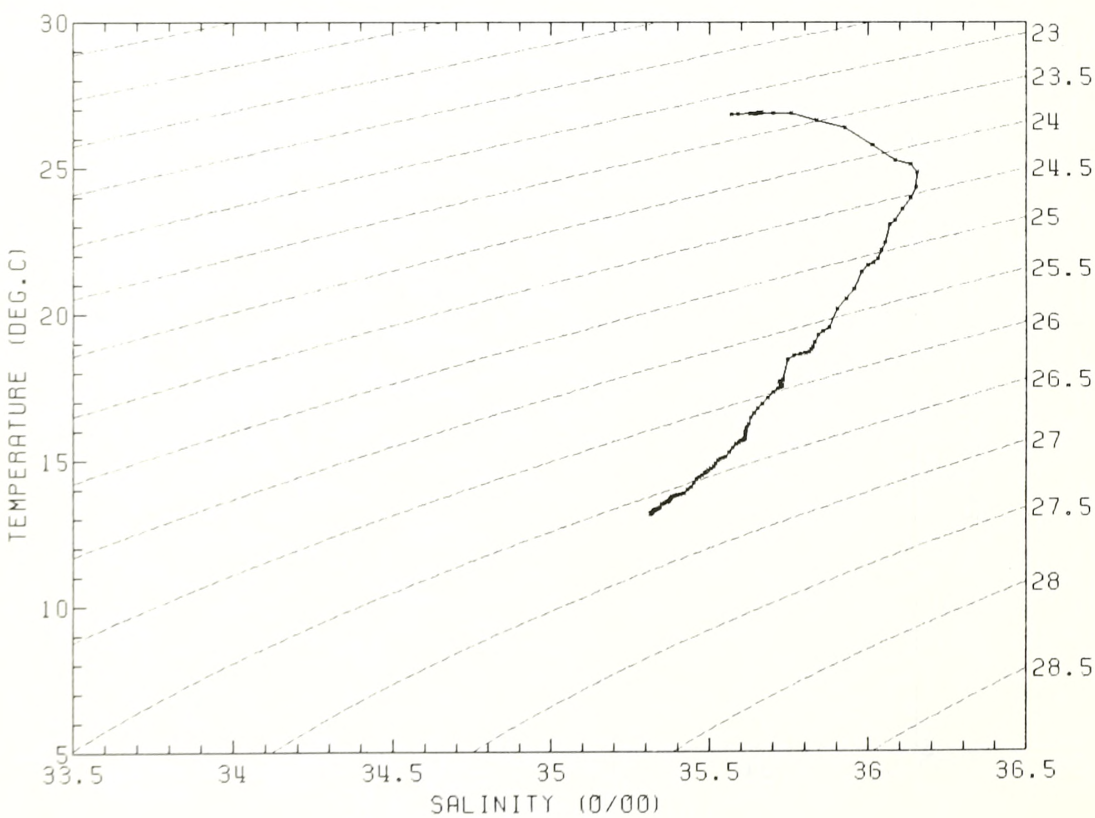
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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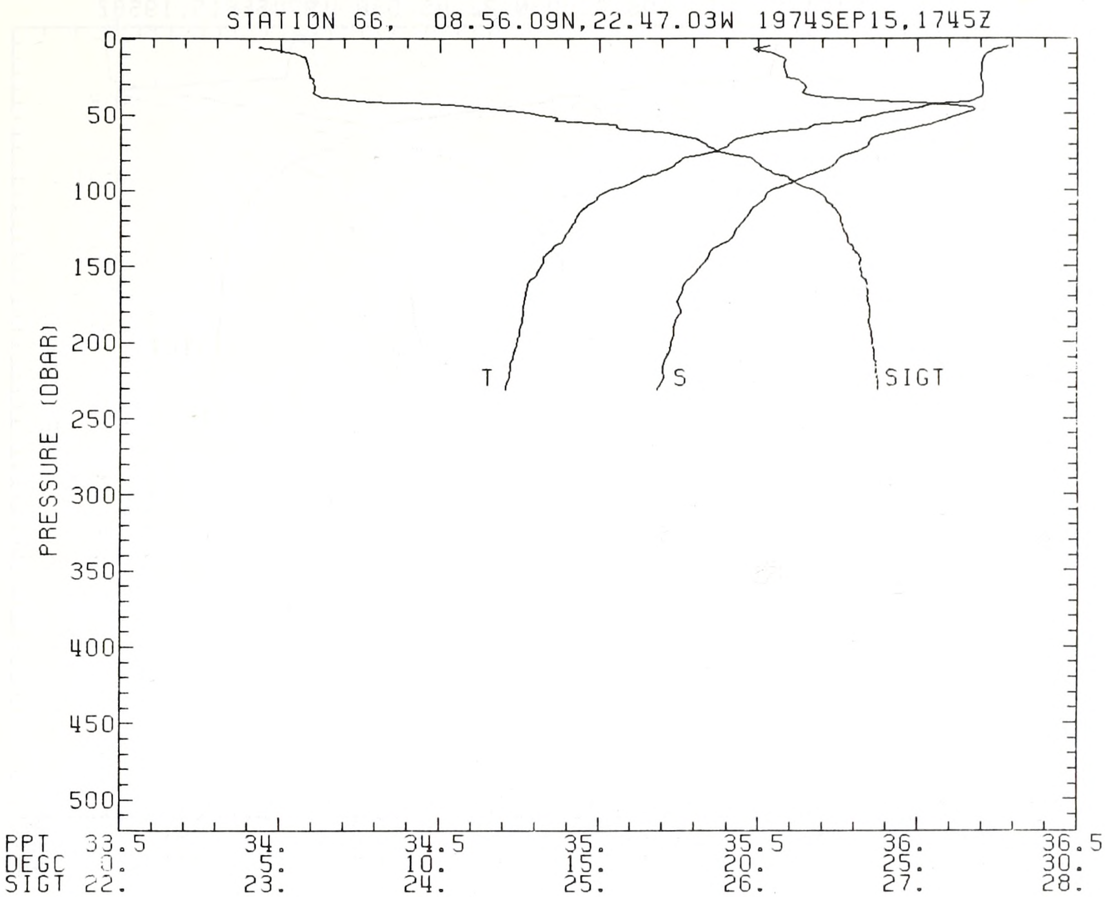
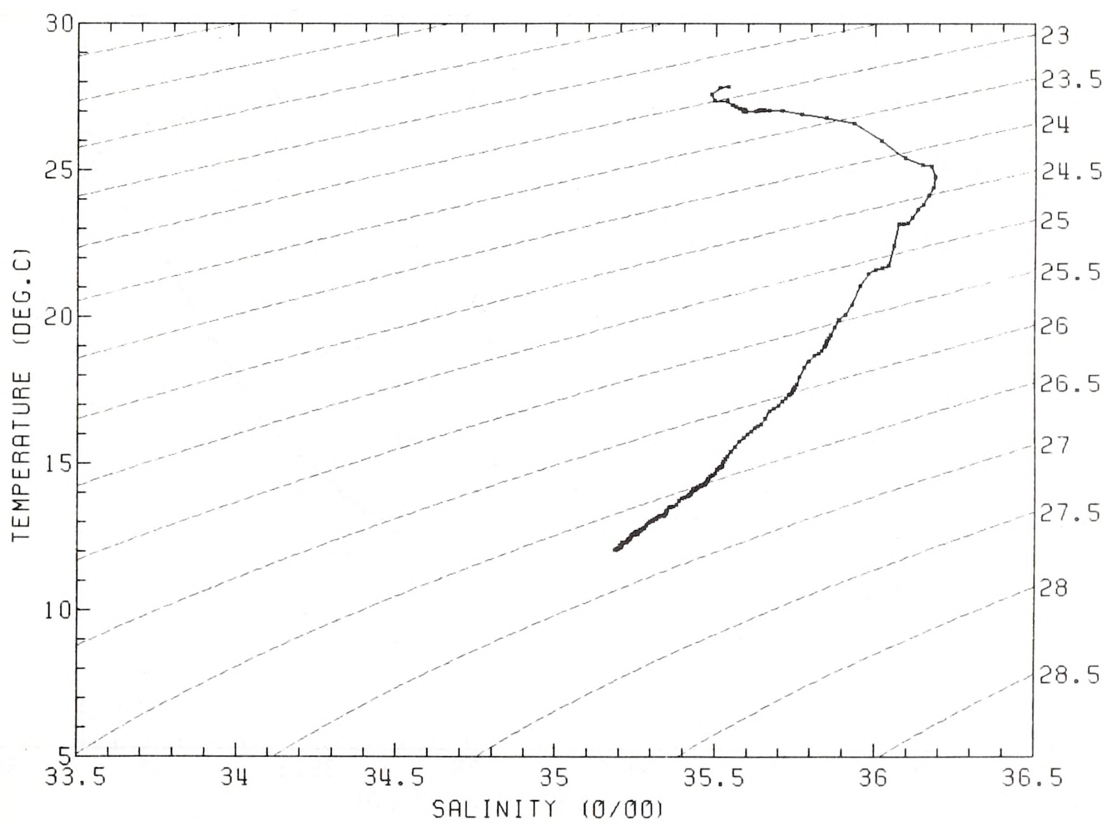
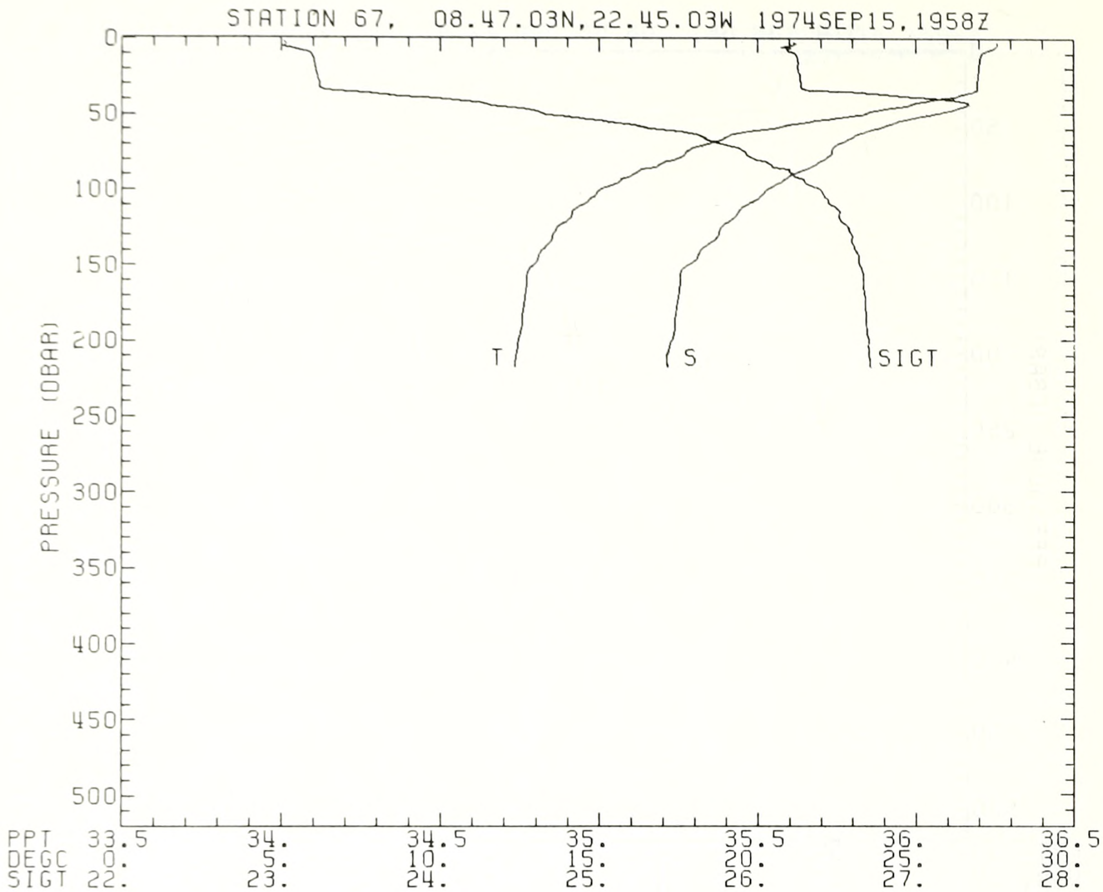
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 66, 08.56.09N,22.47.03W 1974SEP15,1745Z
PRESSURE (DBAR)
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
SALINITY (0/00)


STATION 67, 08.47.03N,22.45.03W 1974SEP15,1958Z
PRESSURE (DBAR)
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50
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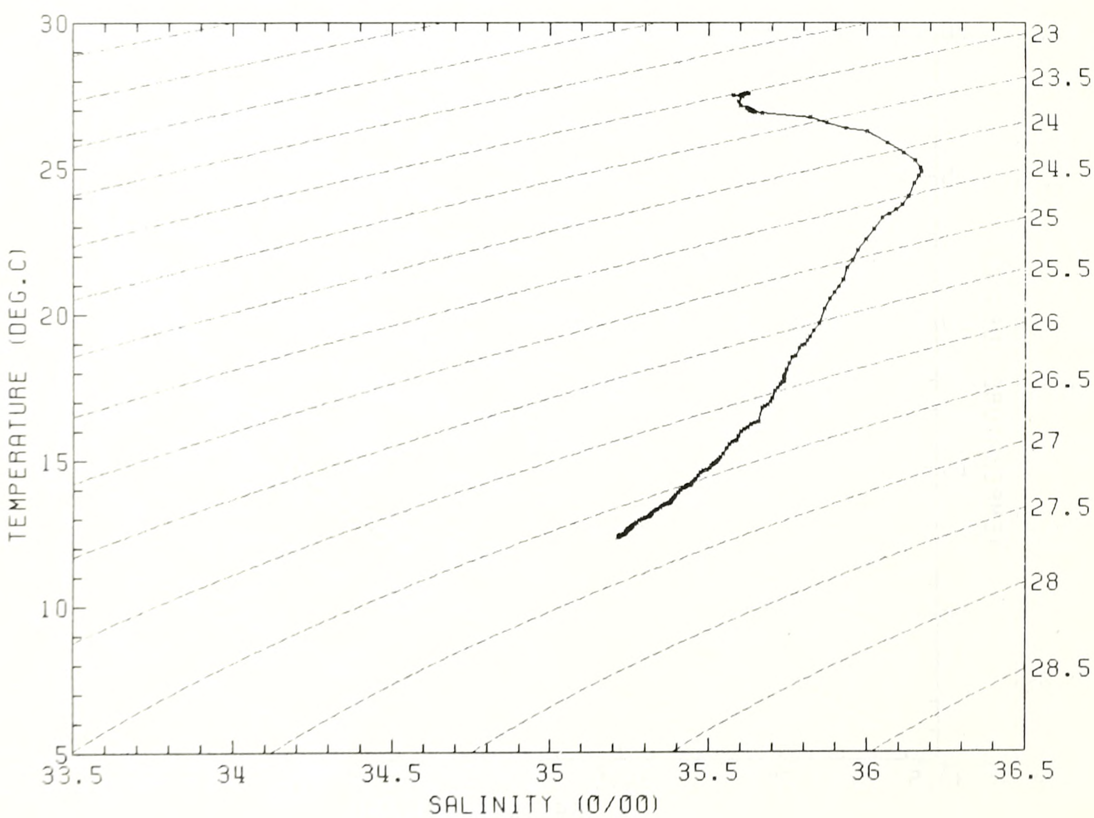
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)
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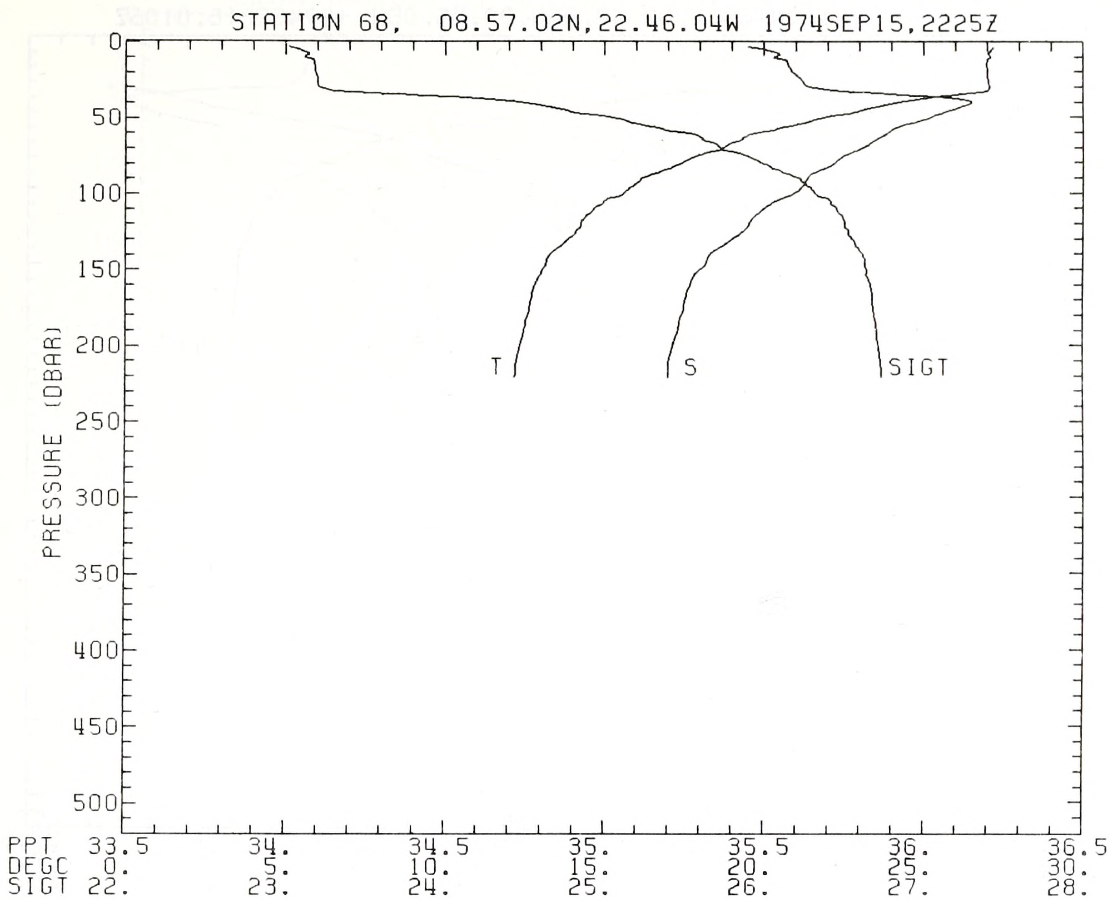
STATION 68, 08.57.02N,22.46.04W 1974SEP15,2225Z
PRESSURE (DBAR)
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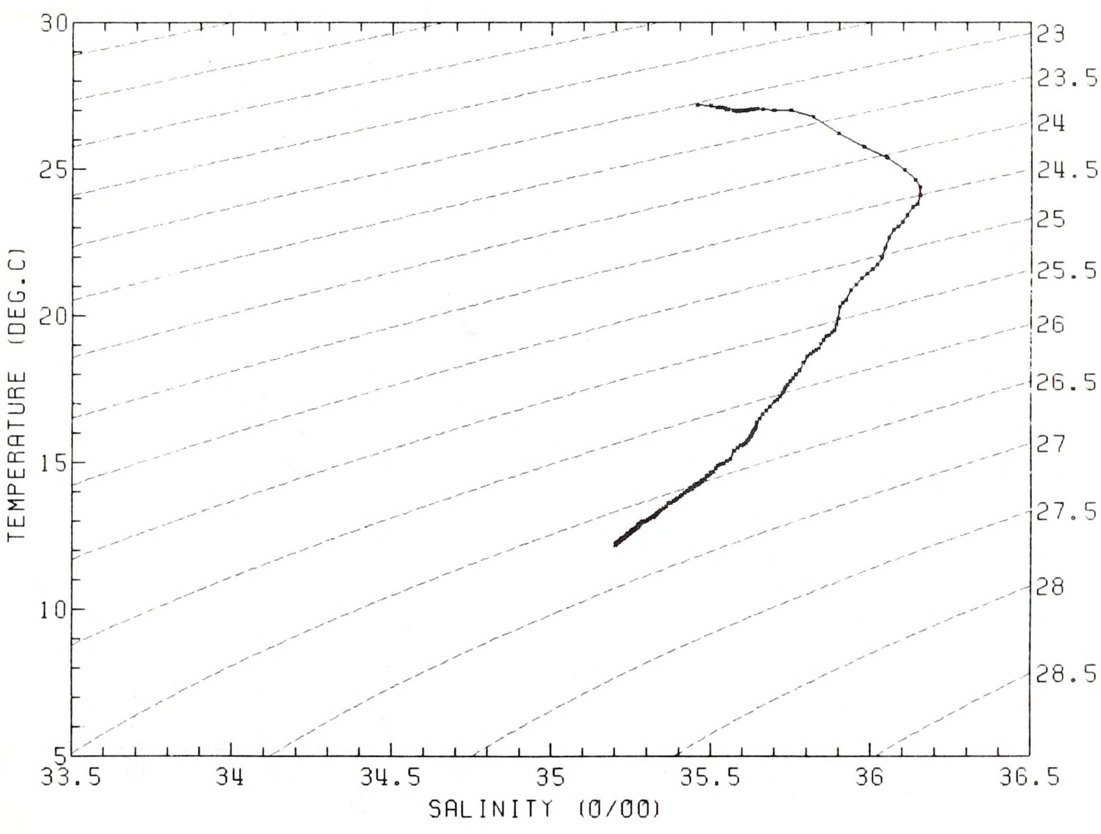
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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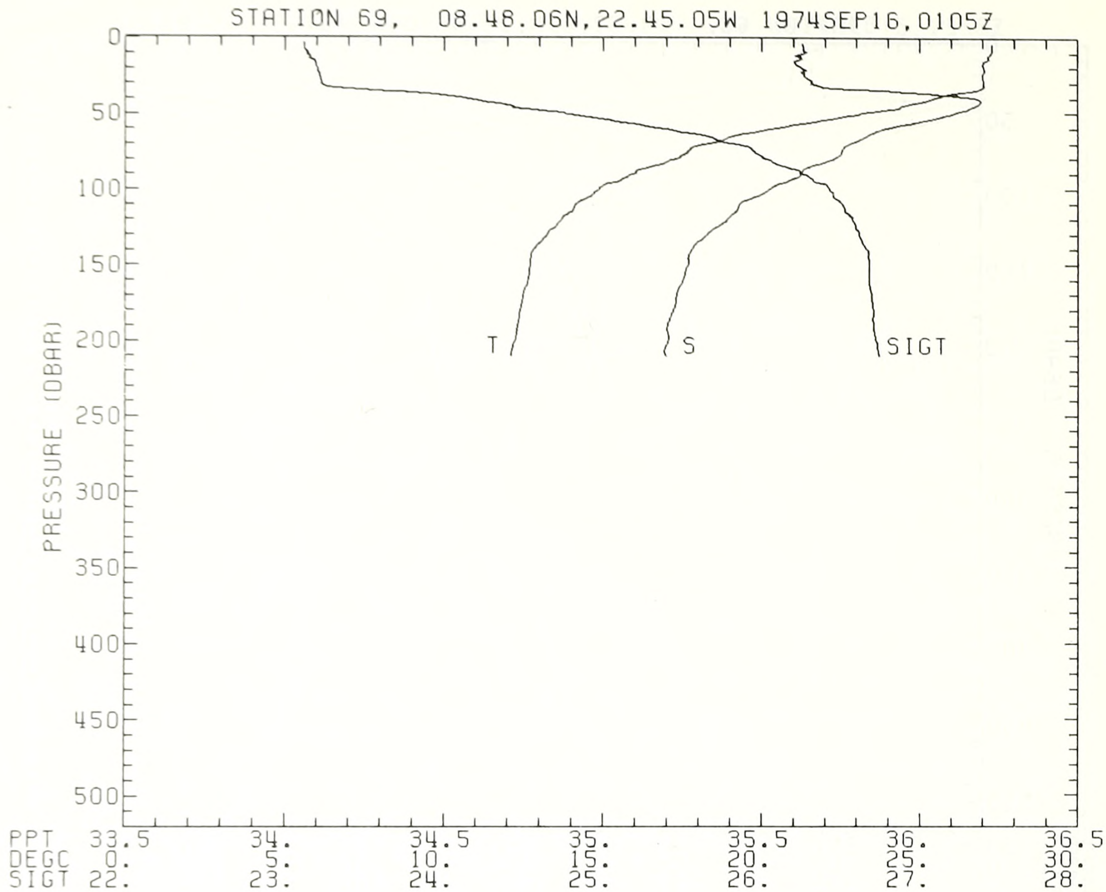
SALINITY (0/00)


STATION 69, 08.48.06N,22.45.05W 1974SEP16,0105Z
PRESSURE (DBAR)
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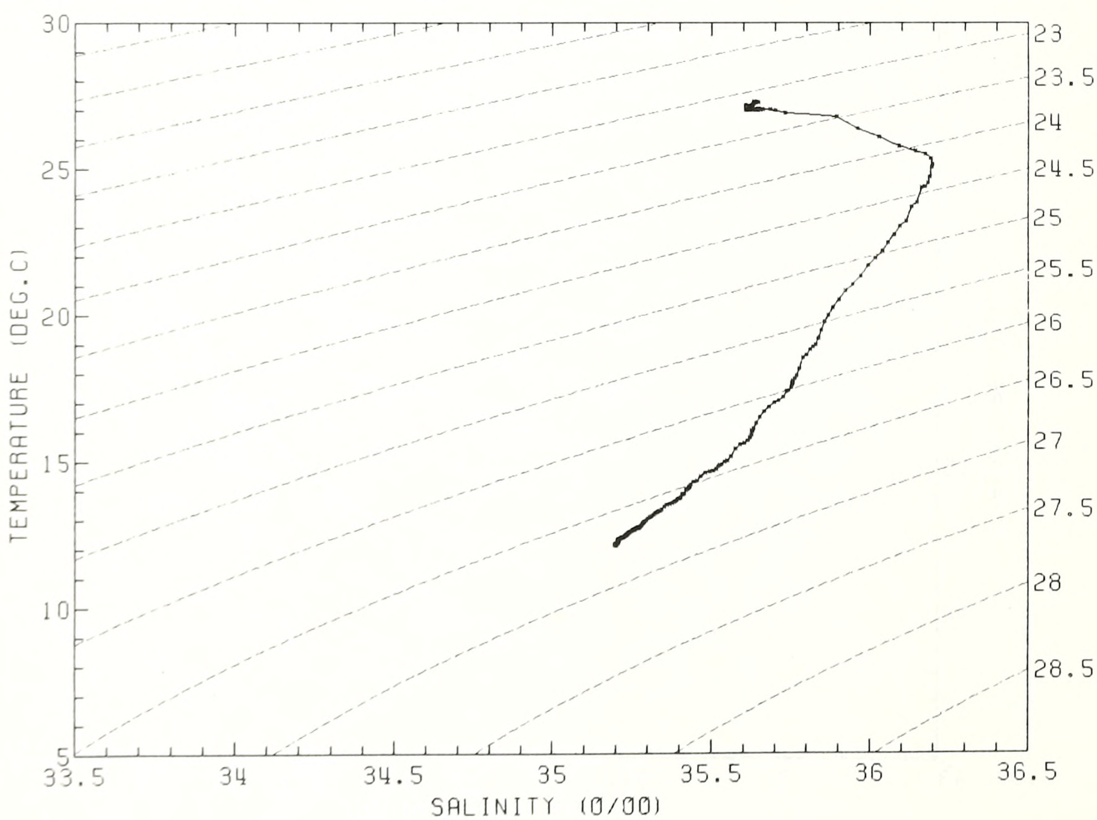
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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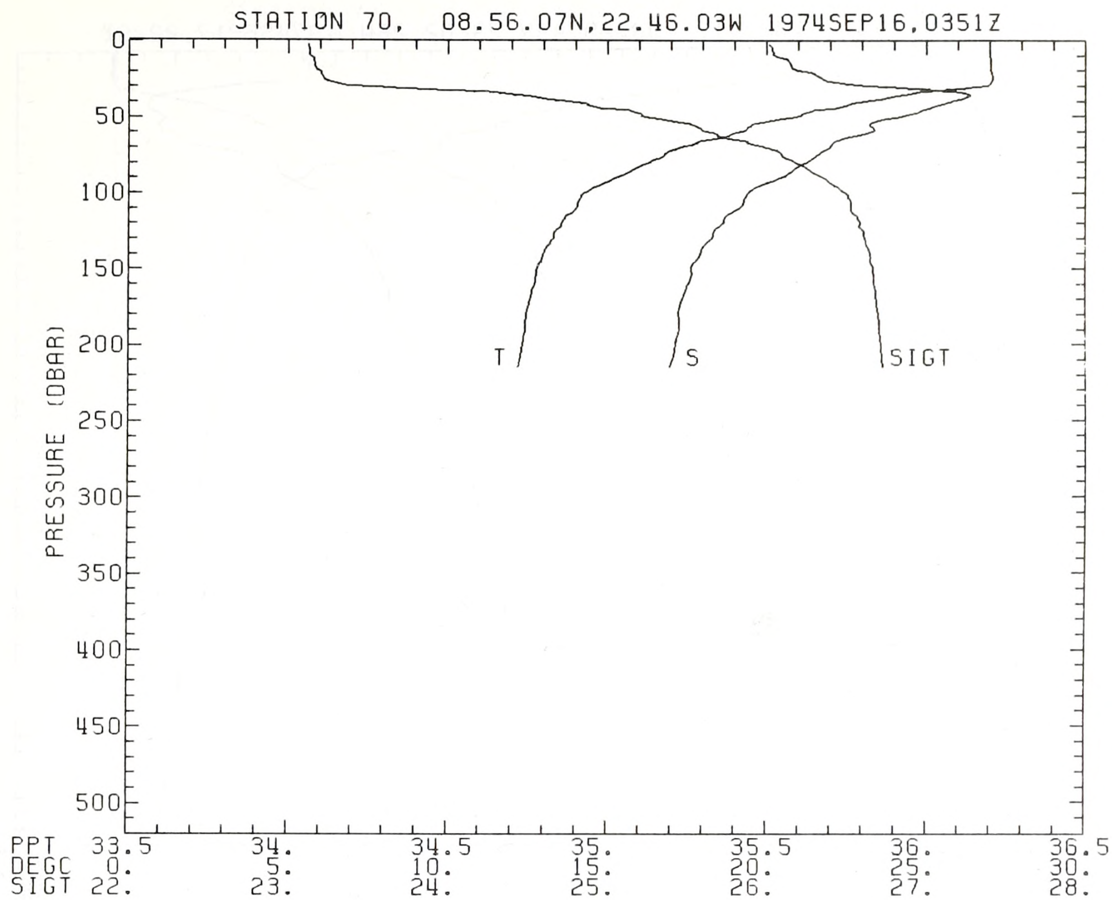
SALINITY (0/00)


STATION 70, 08.56.07N,22.46.03W 1974SEP16,0351Z
PRESSURE (DBAR)
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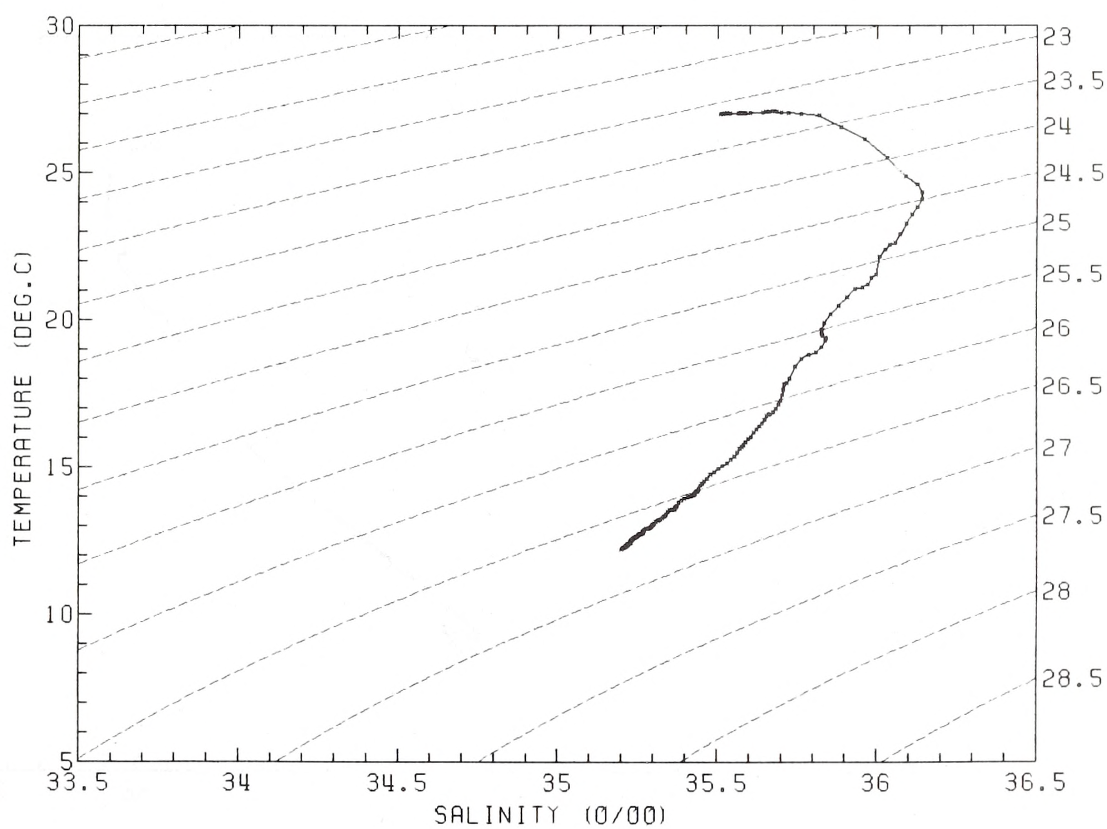
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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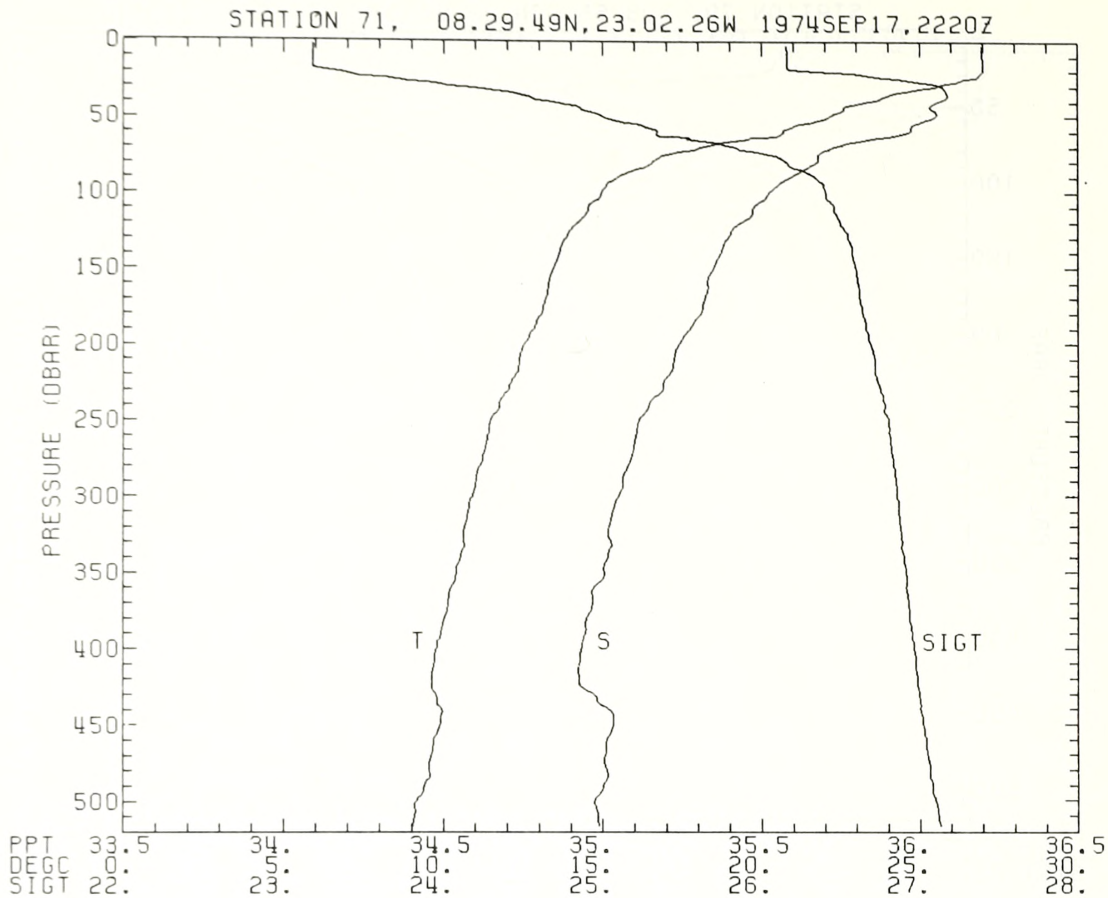
SALINITY (0/00)


STATION 71, 08.29.49N,23.02.26W 1974SEP17,2220Z
PRESSURE (DBAR)
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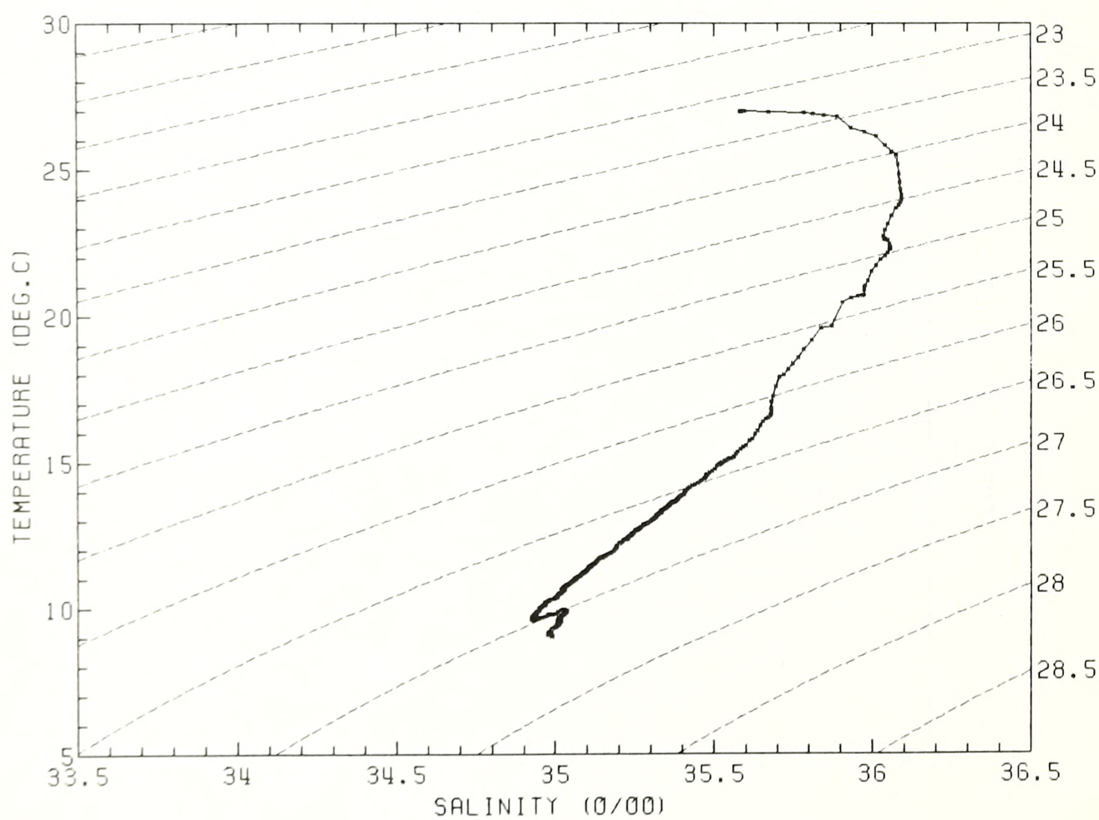
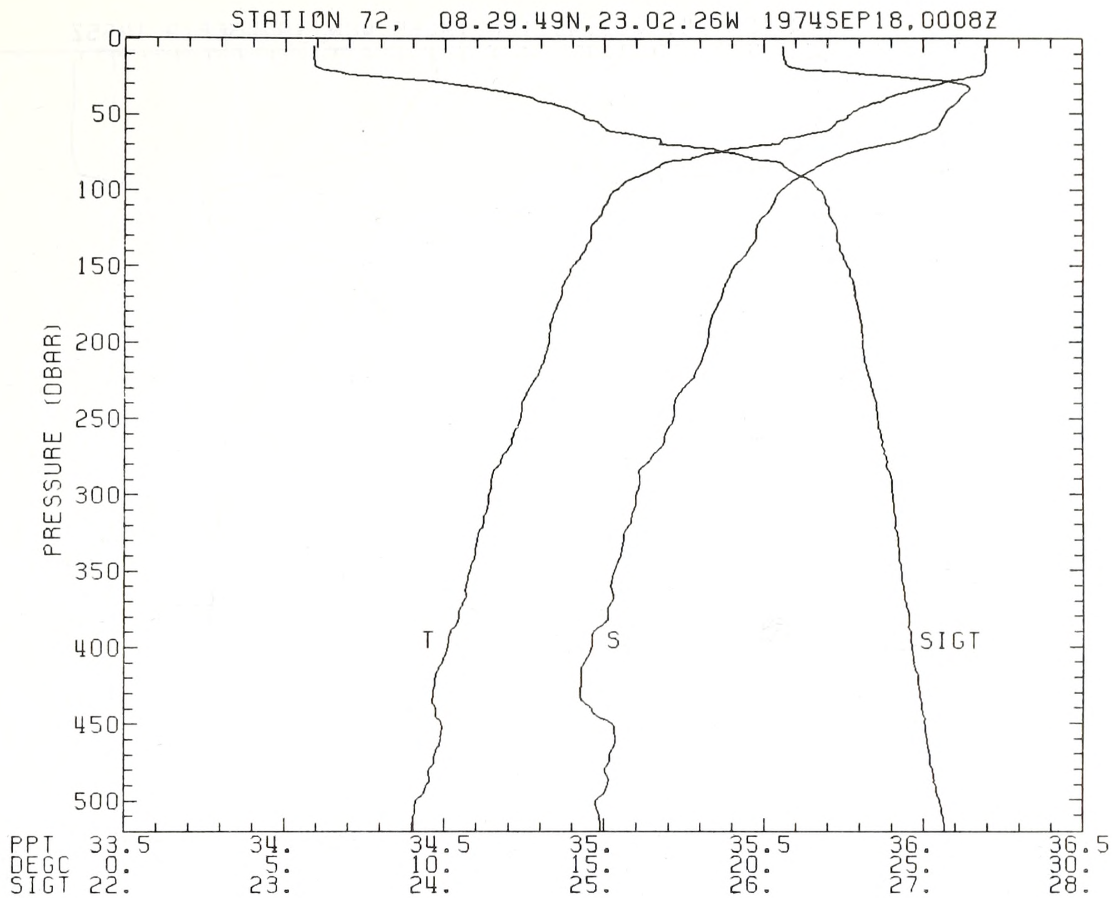
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
SALINITY (0/00)


STATION 72, 08.29.49N,23.02.26W 1974SEP18,0008Z
PRESSURE (DBAR)
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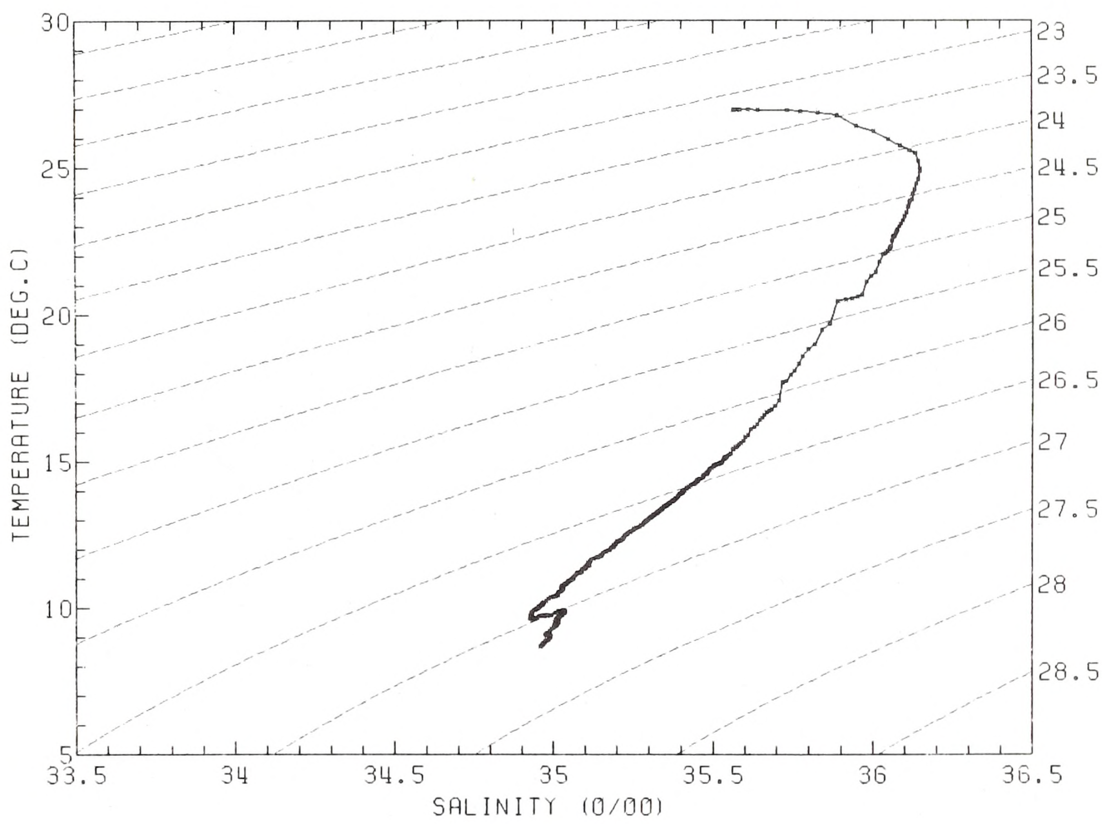
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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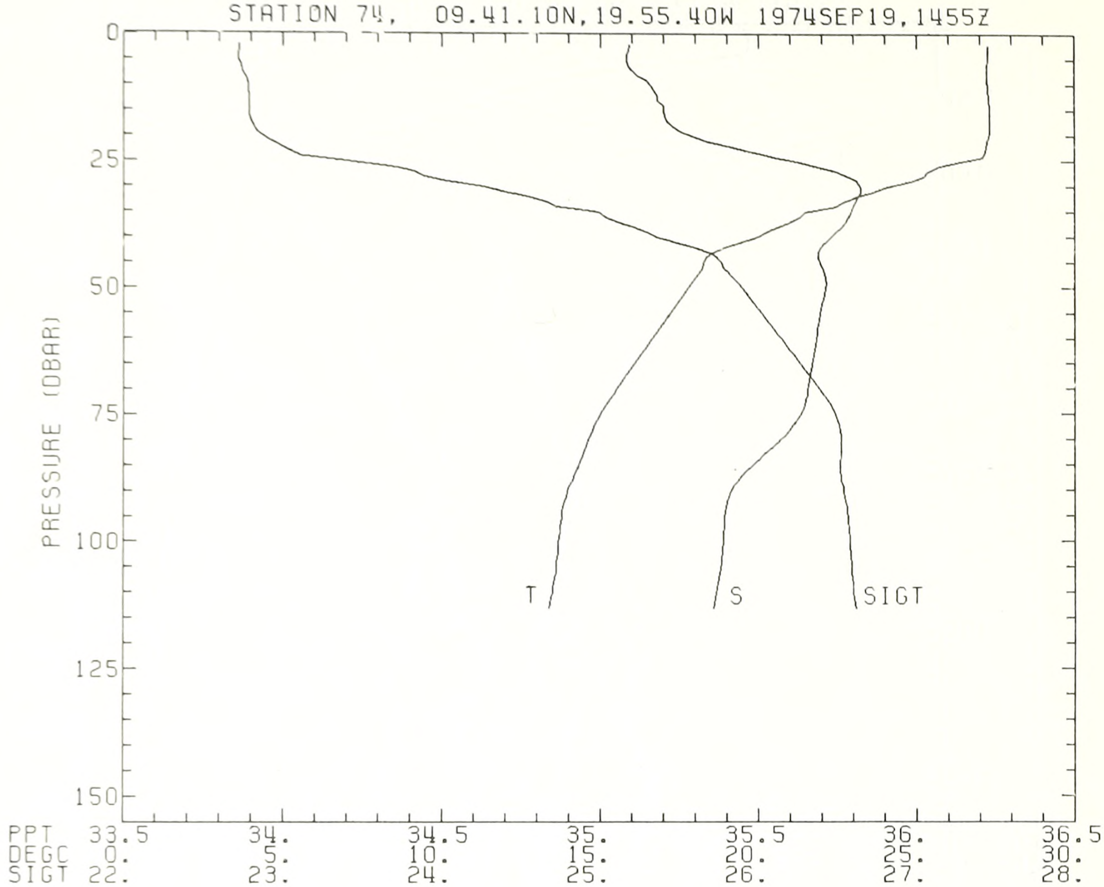
36.5
SALINITY (0/00)


STATION 74, 09.41.10N,19.55.40W 1974SEP19,1455Z
PRESSURE (DBAR)
0
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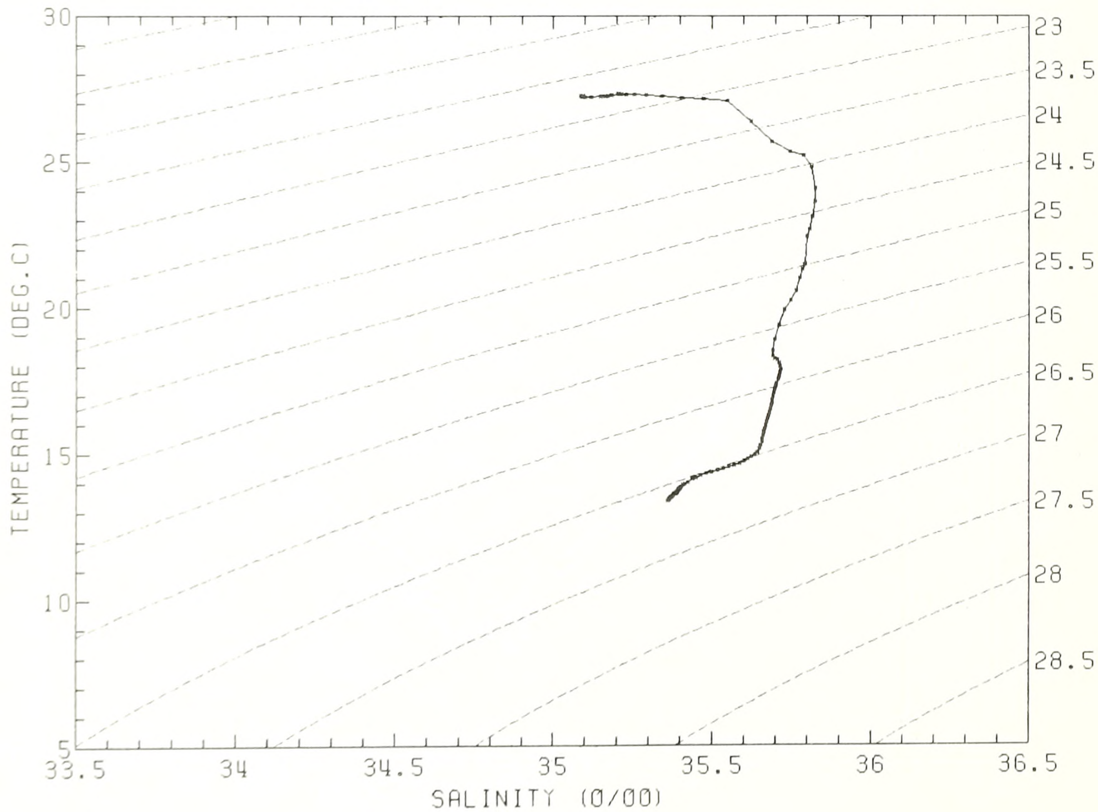
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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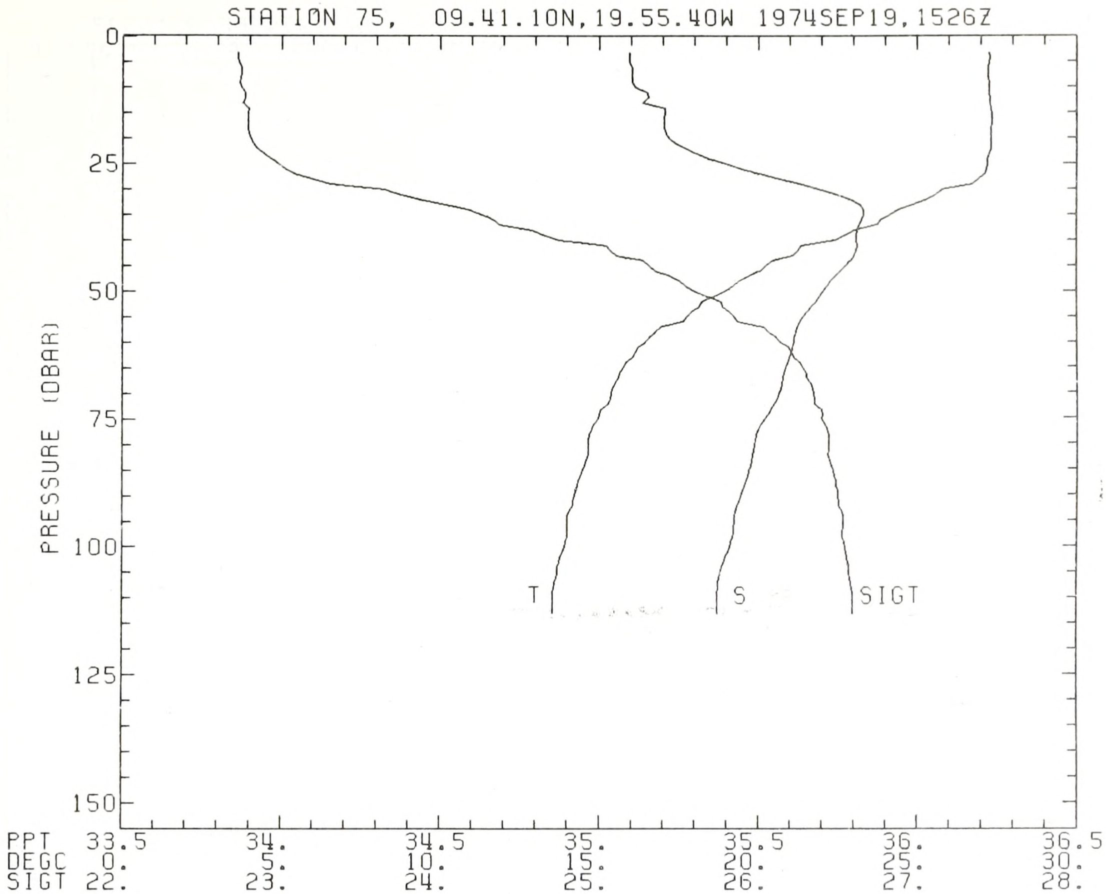
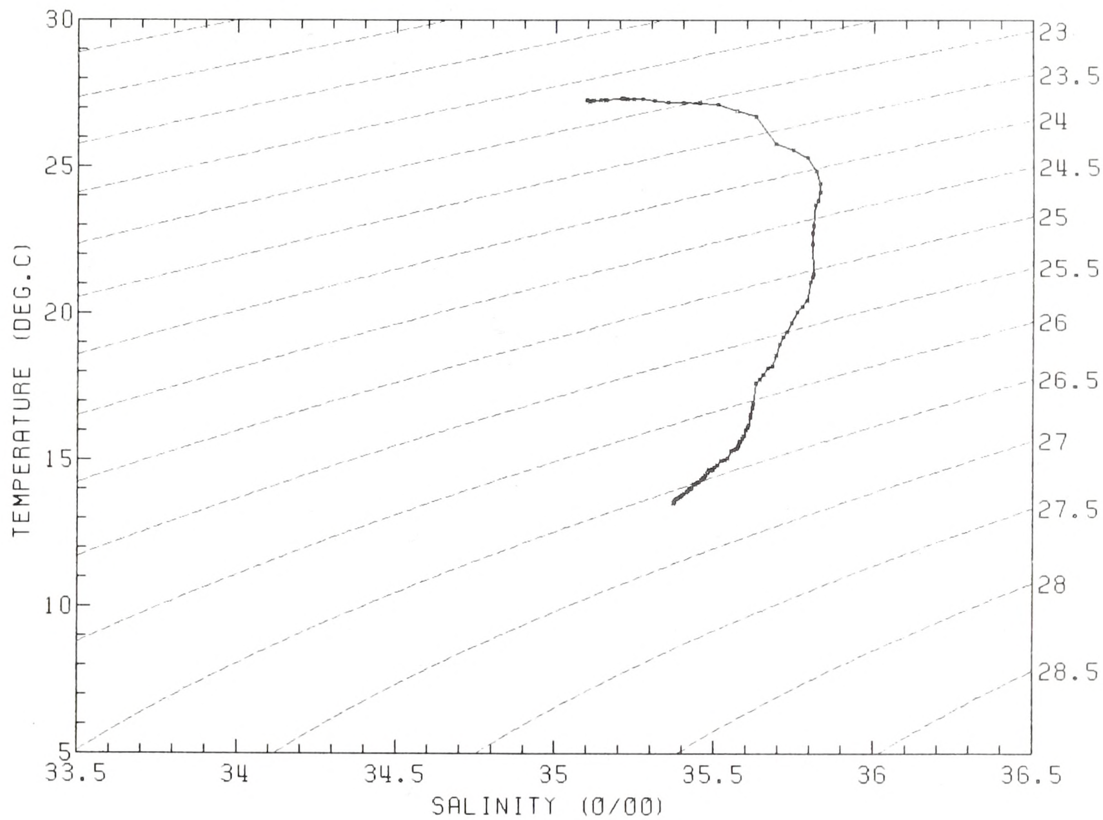
26.5
27
27.5
28
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 75, 09.41.10N,19.55.40W 1974SEP19,1526Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
30
25
20
15
10
5
SALINITY (0/00)
33.5 34 34.5 35 35.5 36 36.5
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27.5
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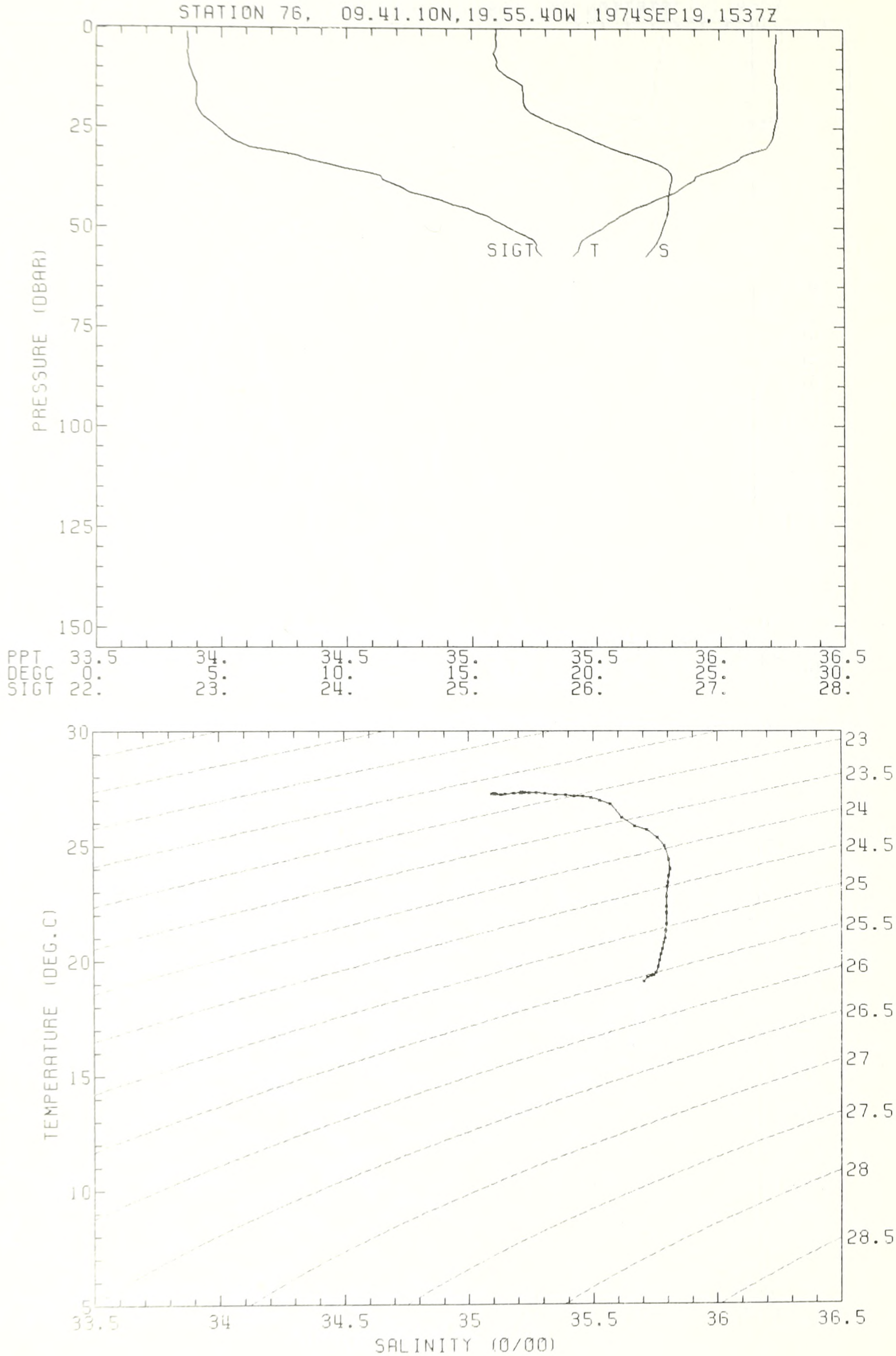
28.5


STATION 76, 09.41.10N,19.55.40W 1974SEP19,1537Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
SIGT
T
S
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
30
25
20
15
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23.5
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24.5
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26.5
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27.5
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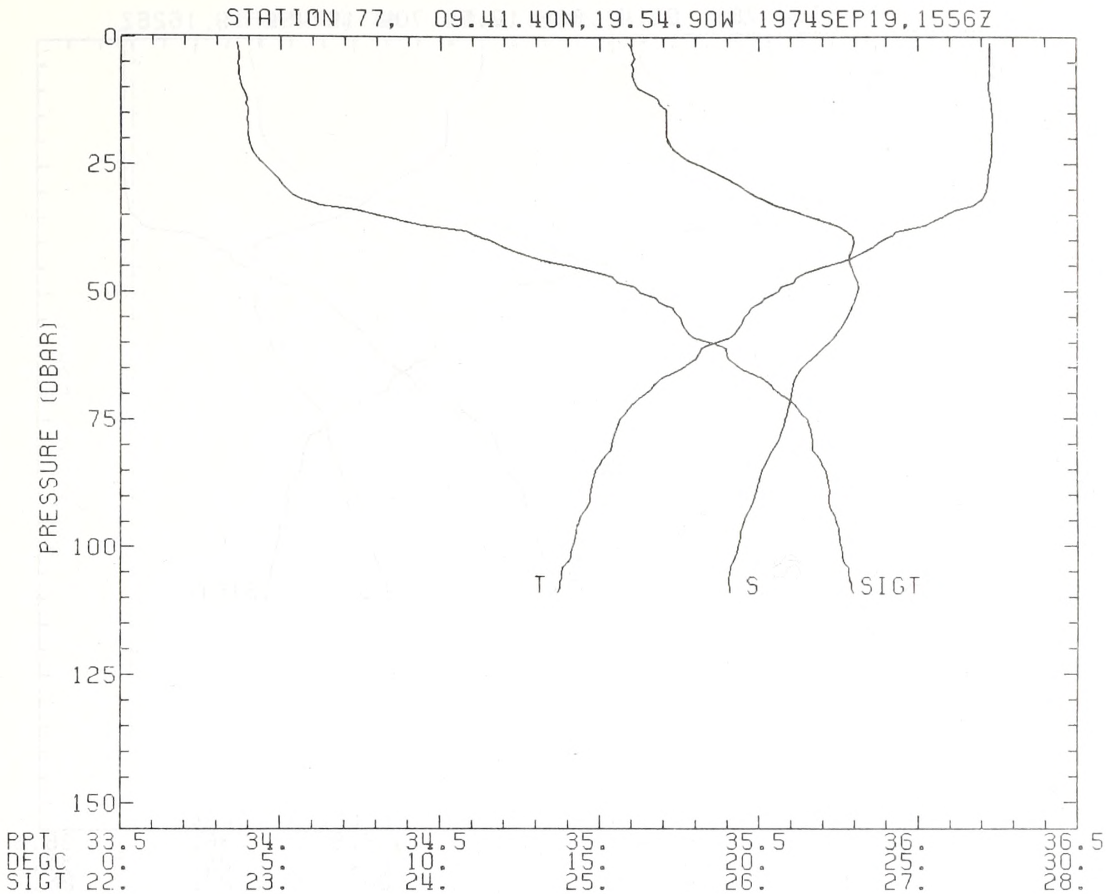
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 77, 09.41.40N, 19.54.90W 1974SEP19, 1556Z
PRESSURE (DBAR)
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75
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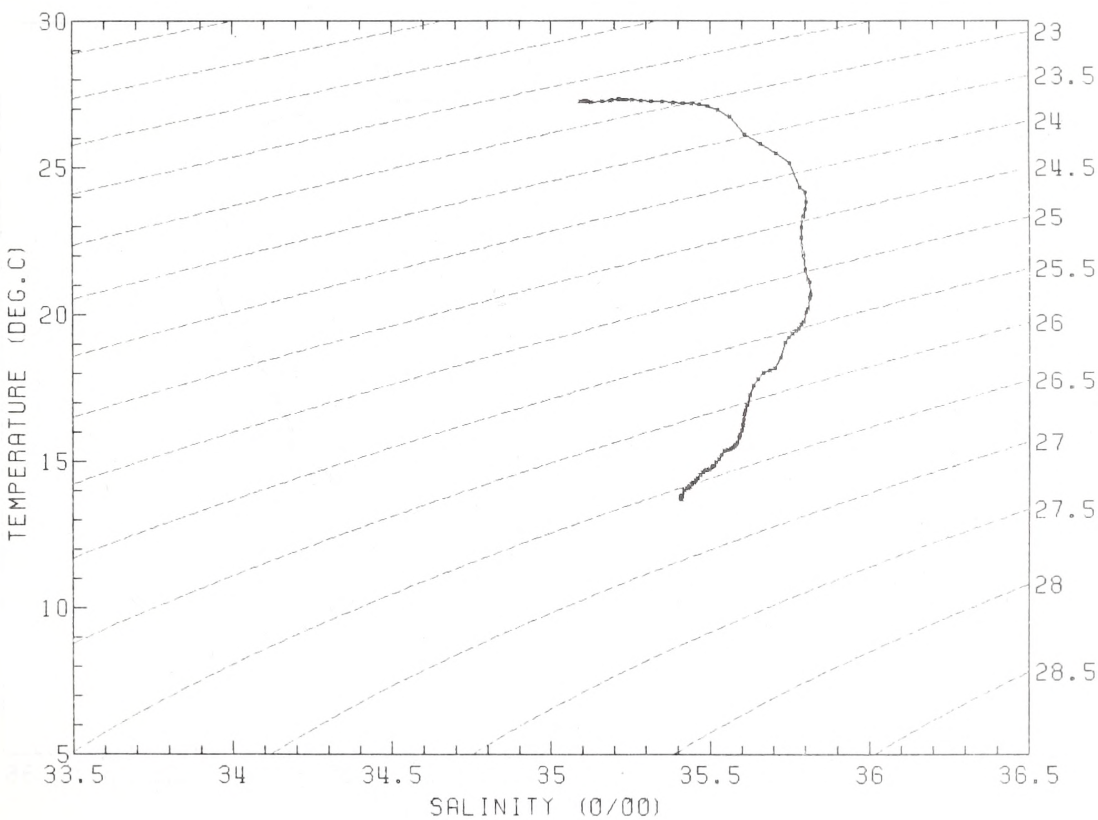
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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25
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15
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23.5
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26.5
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27.5
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28.5
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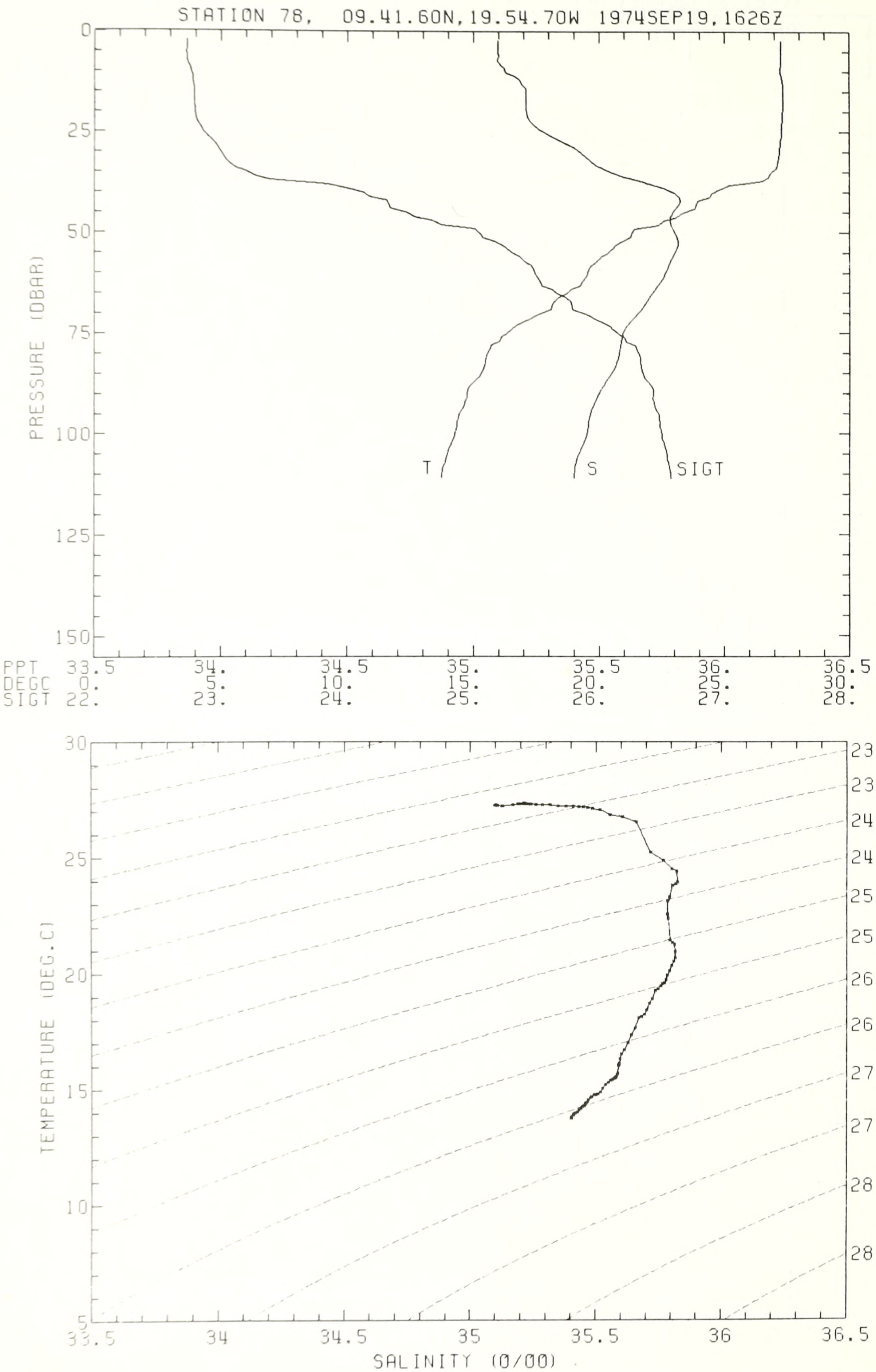
SALINITY (0/00)


STATION 78, 09.41.60N,19.54.70W 1974SEP19,1626Z
PRESSURE (DBAR)
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125
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T
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SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
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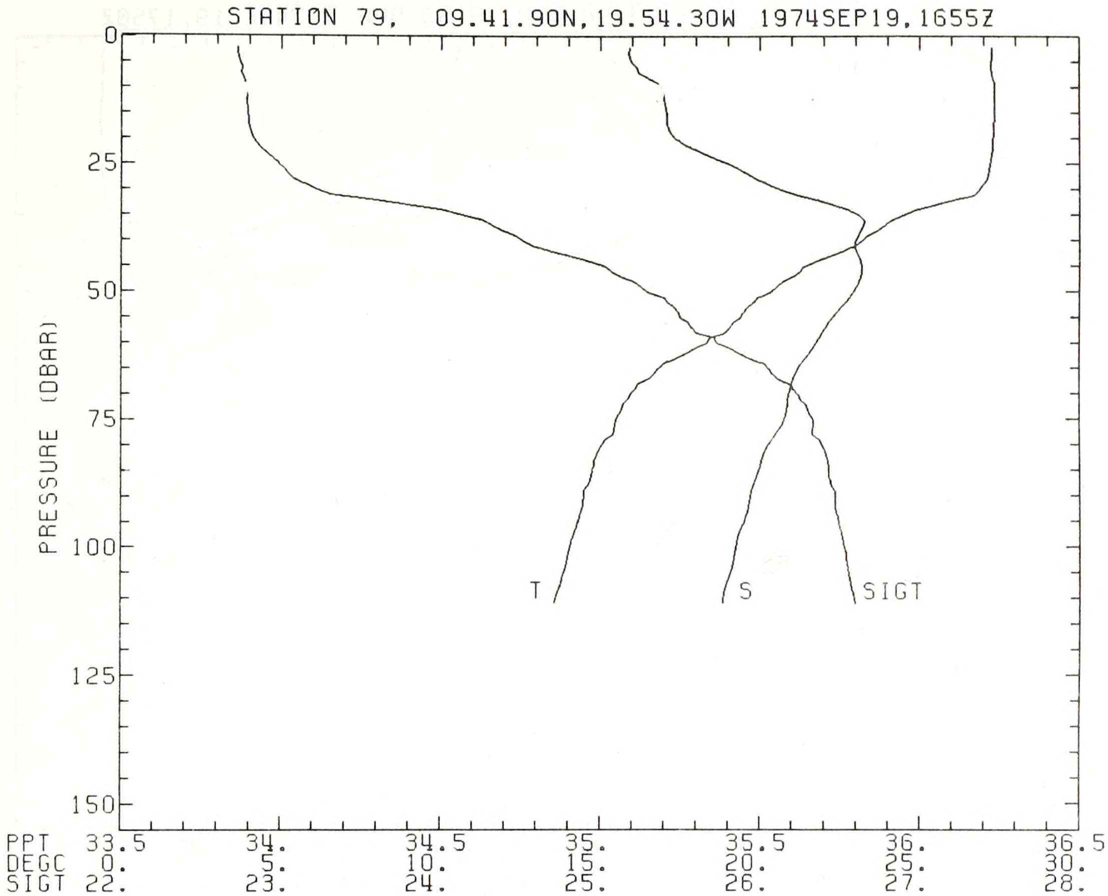
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 79, 09.41.90N, 19.54.30W 1974SEP19, 1655Z
PRESSURE (DBAR)
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25
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75
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125
150
T
S
SIGT
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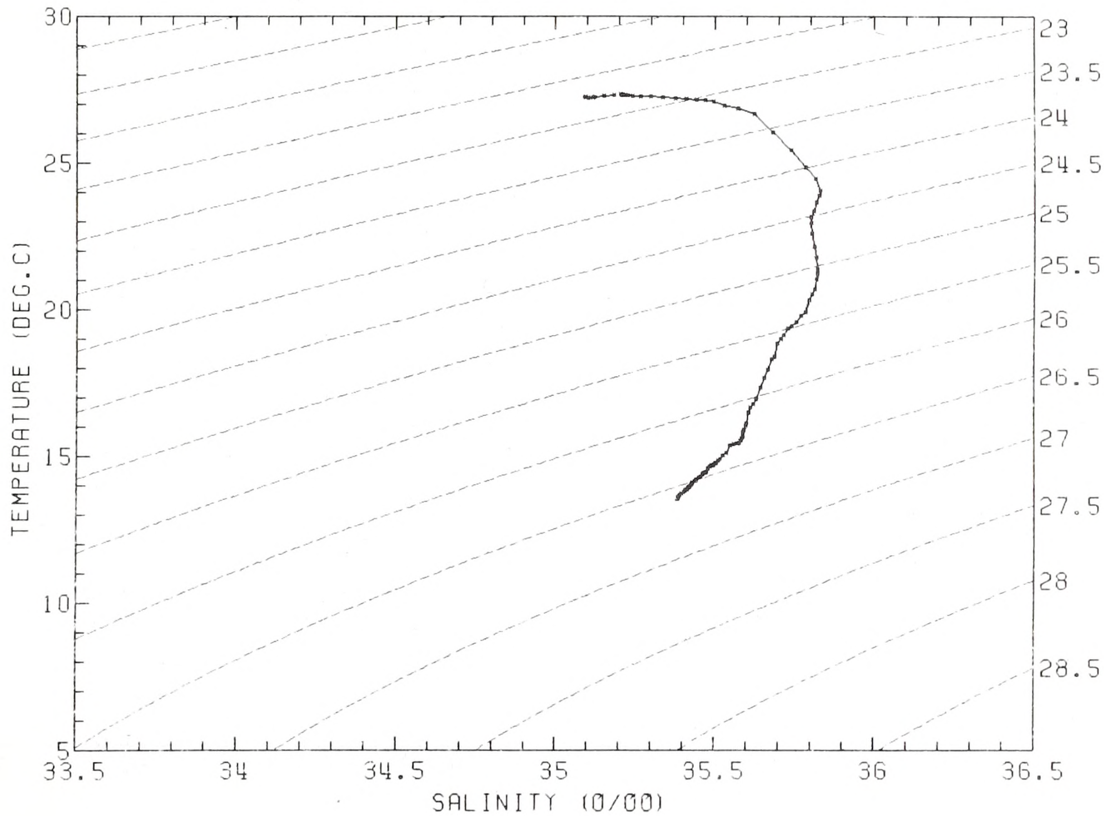
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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27.5
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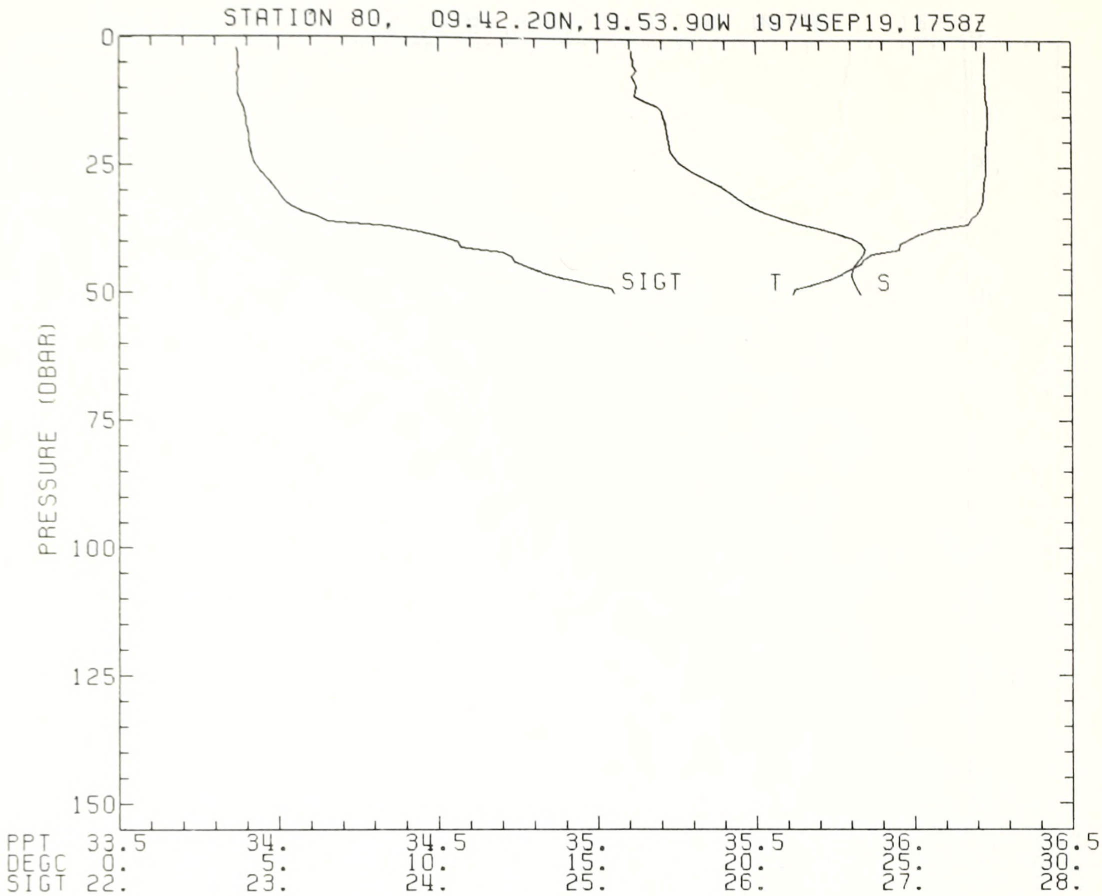
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)



STATION 80, 09.42.20N,19.53.90W 1974SEP19,1758Z
PRESSURE (DBAR)
0
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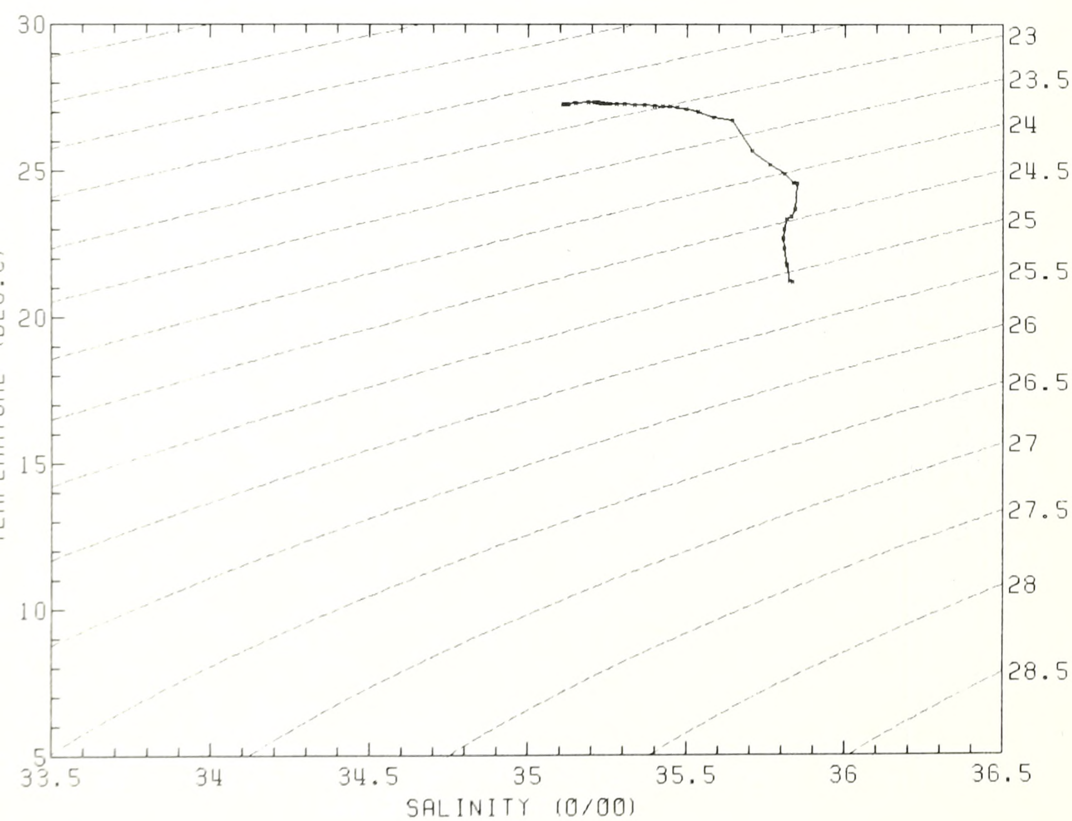
50
75
100
125
150
SIGT
T
S
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.



TEMPERATURE (DEG.C)
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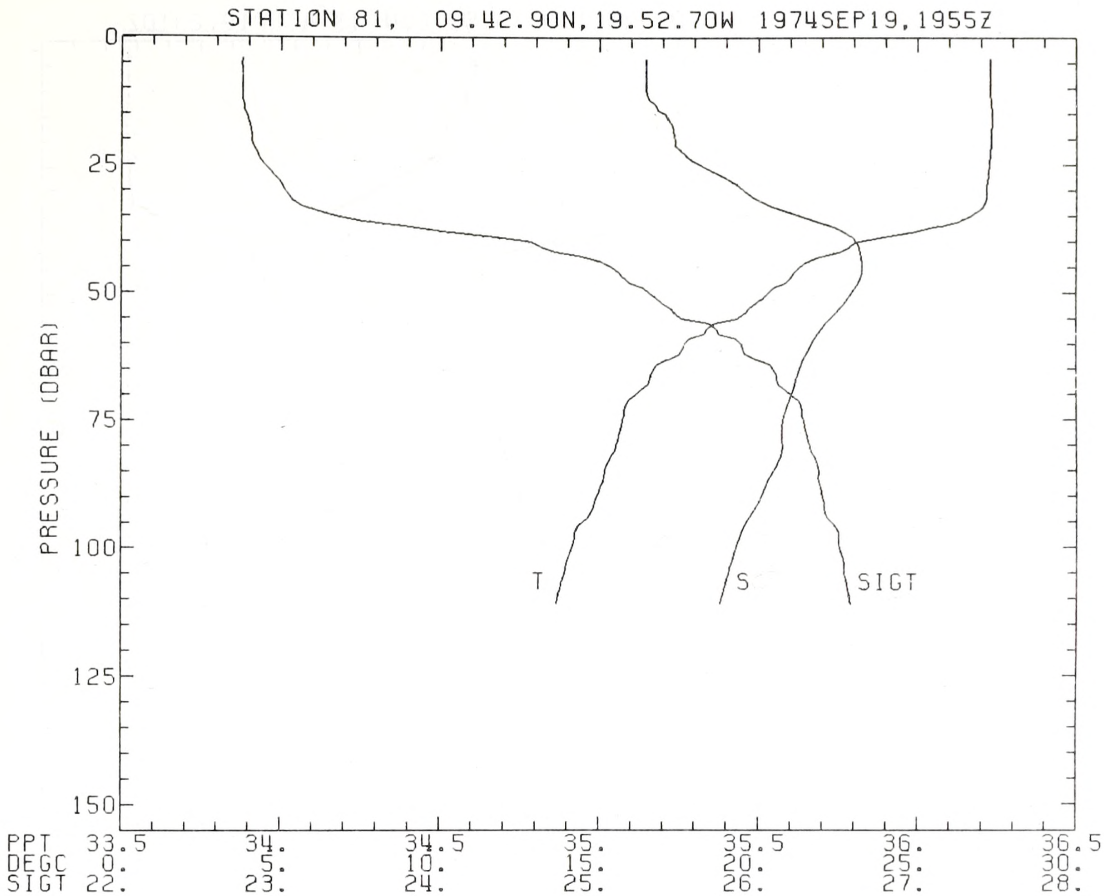
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (O/OO)


STATION 81, 09.42.90N,19.52.70W 1974SEP19,1955Z
PRESSURE (DBAR)
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75
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125
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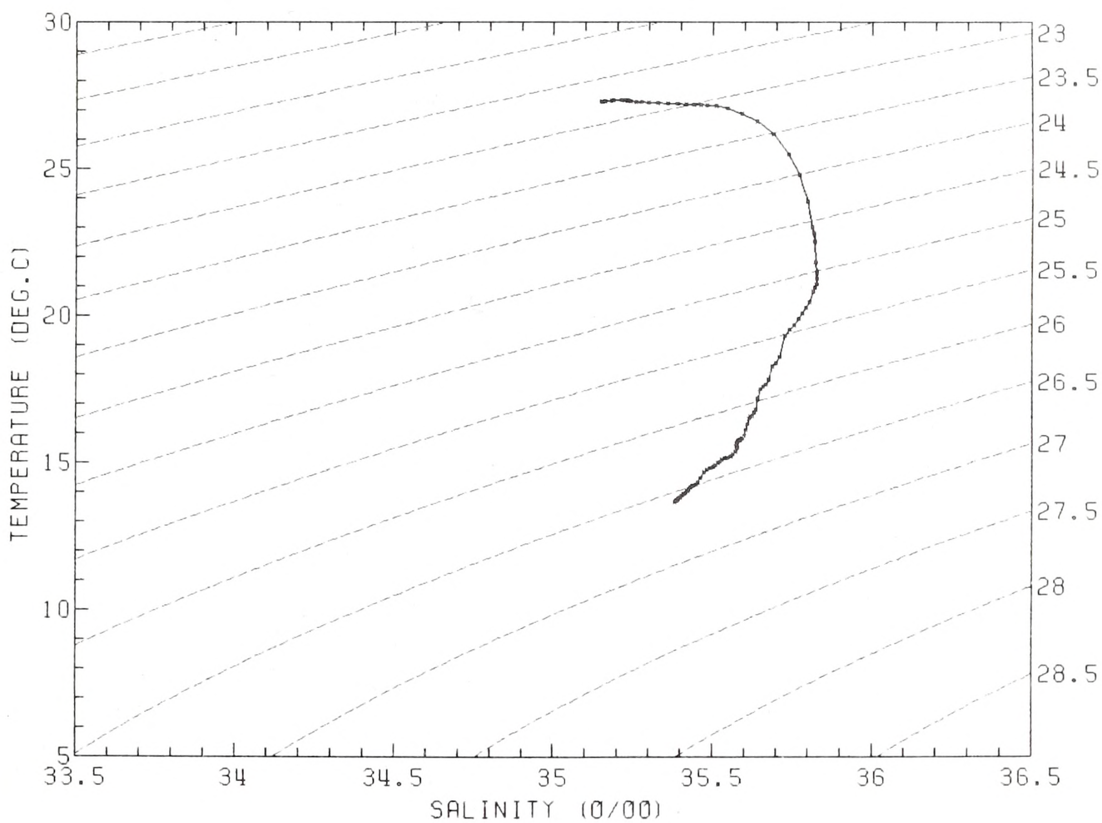
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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27.5
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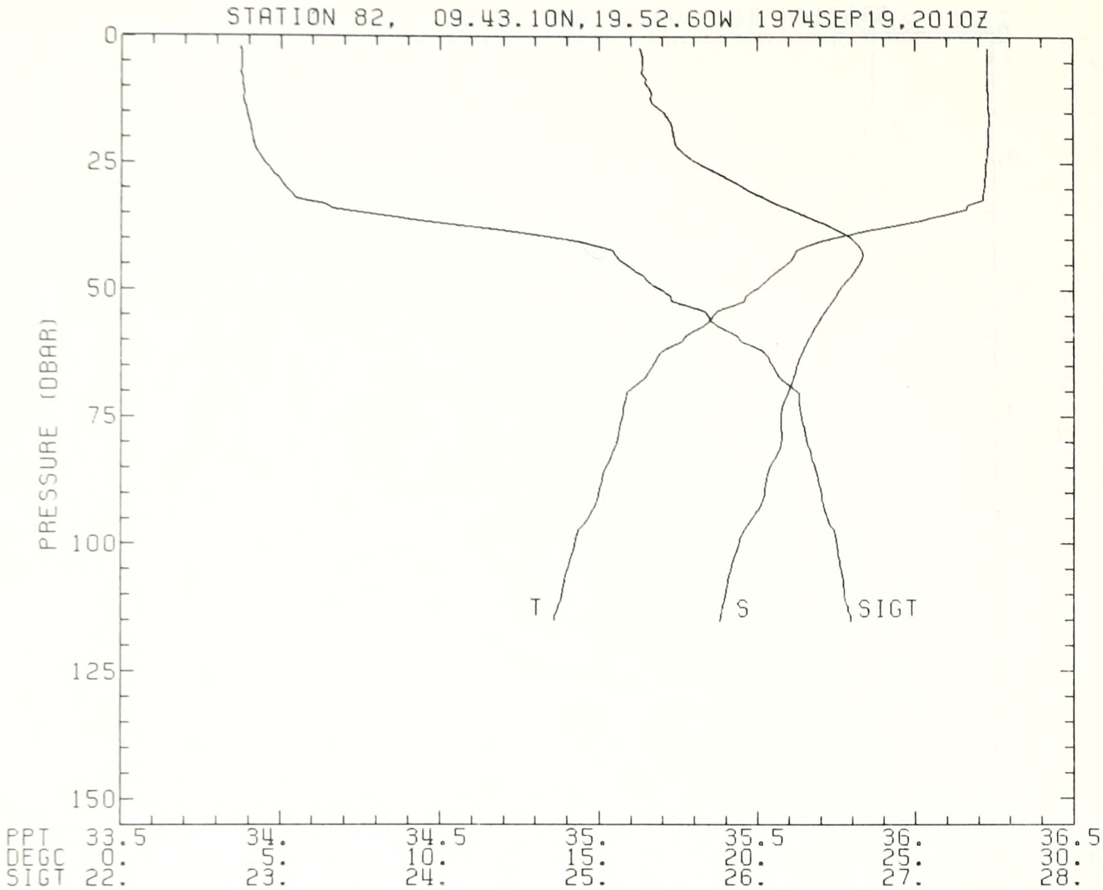
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 82, 09.43.10N,19.52.60W 1974SEP19,2010Z
PRESSURE (DBAR)
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75
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T
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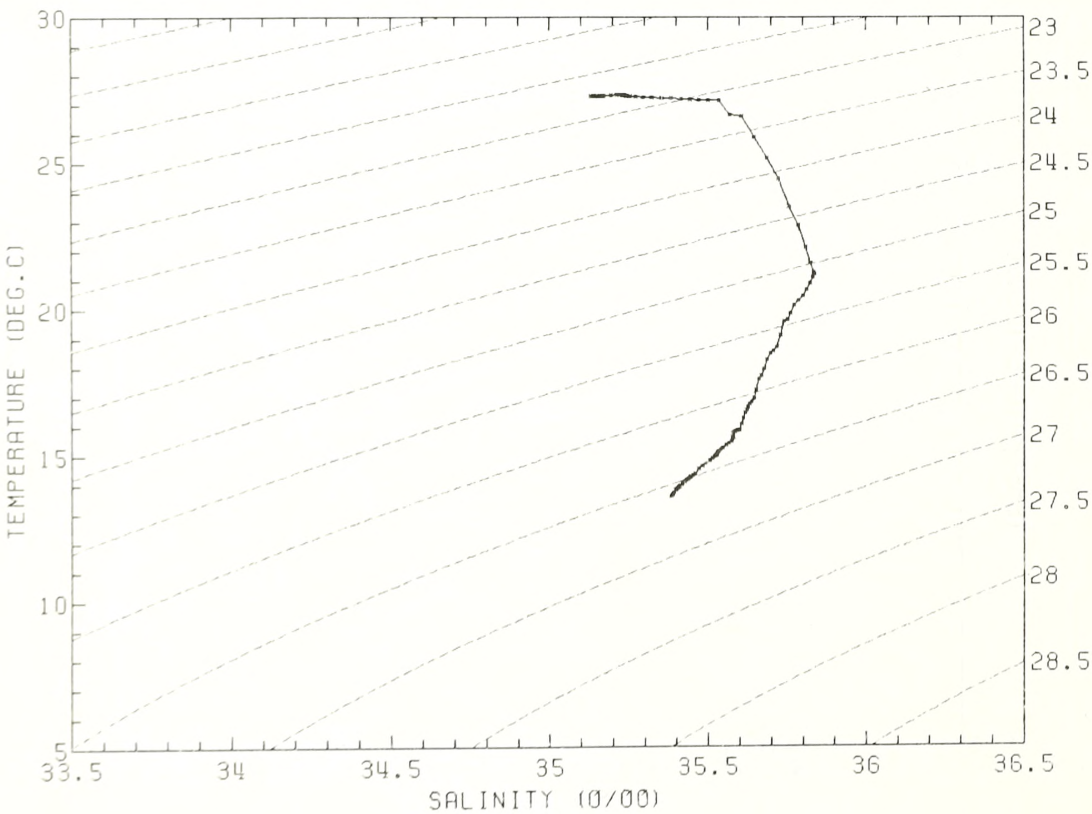
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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27.5
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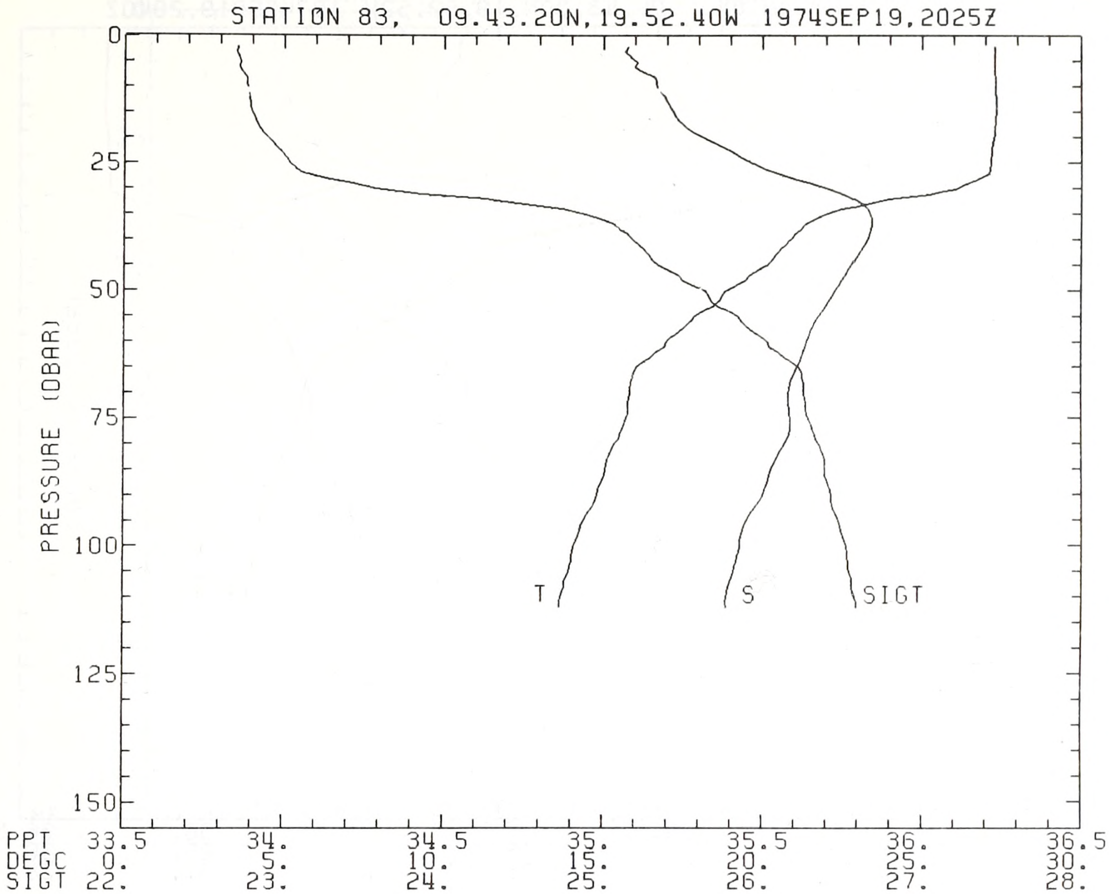
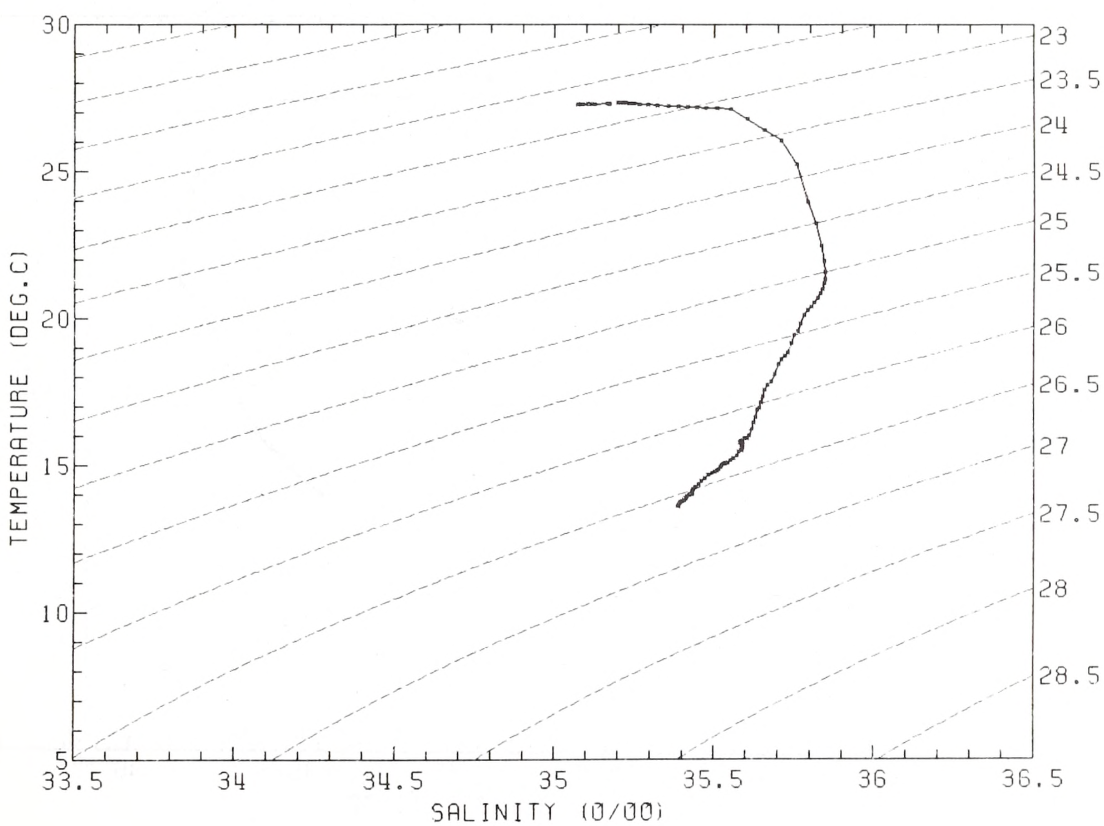
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 83, 09.43.20N,19.52.40W 1974SEP19,2025Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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27.5
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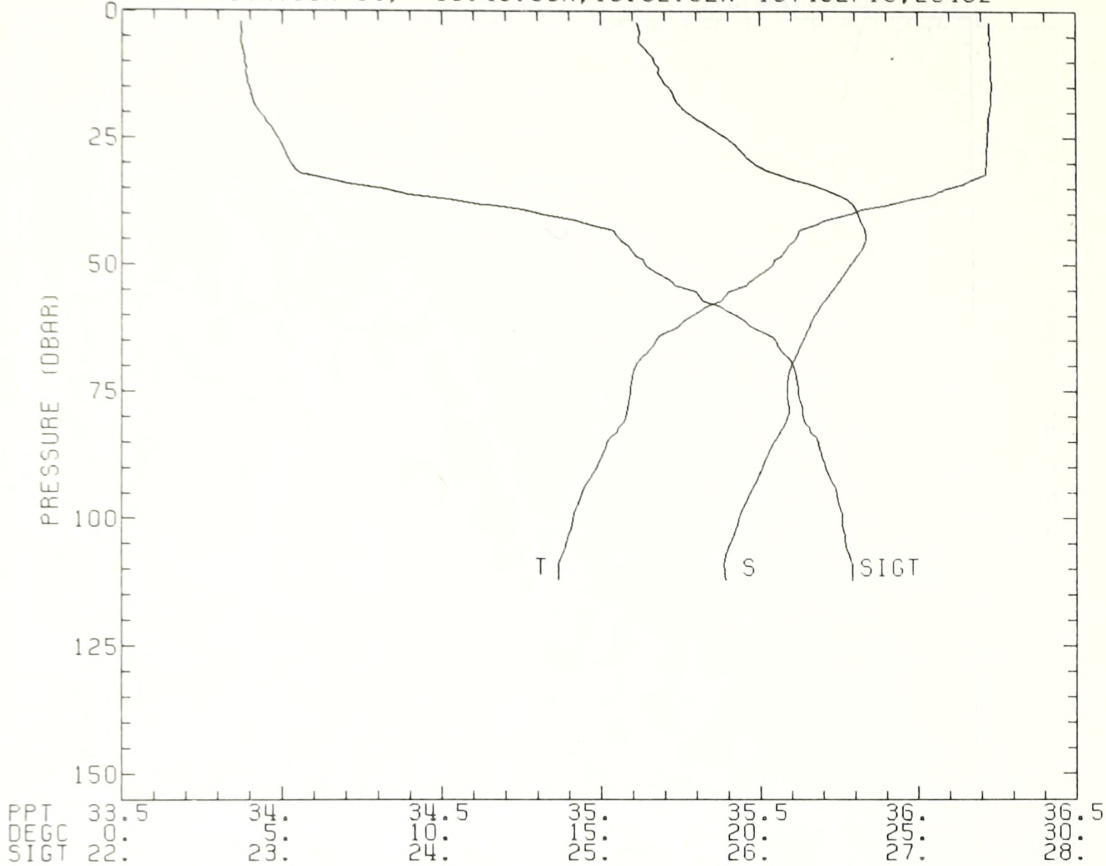
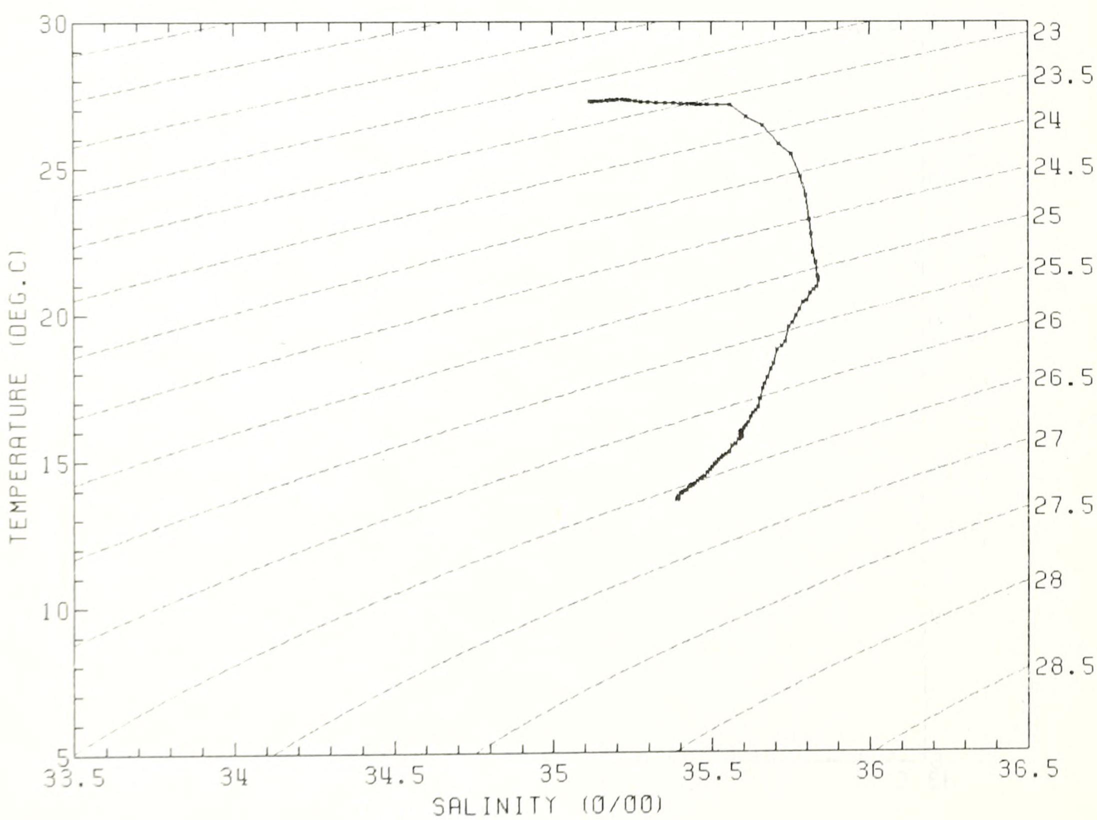
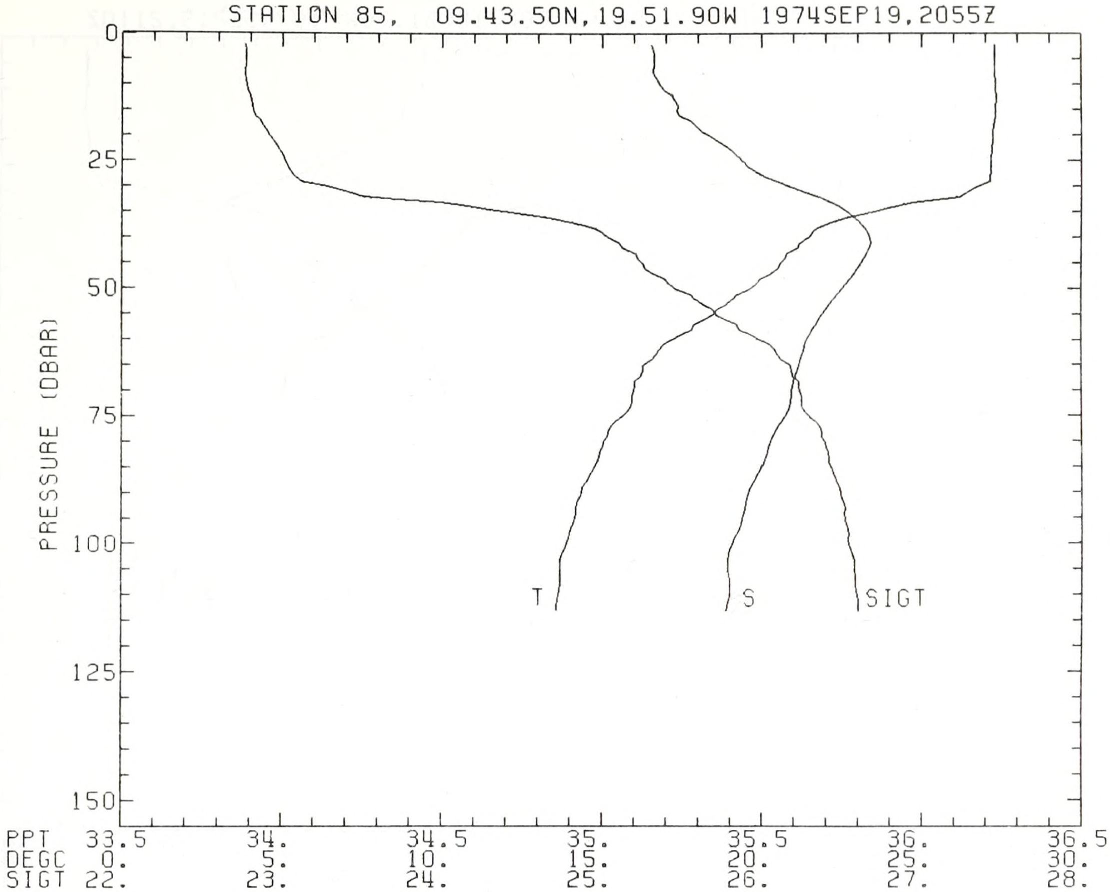
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

STATION 84, 09.43.30N,19.52.52W 1974SEP19,2040Z






STATION 85, 09.43.50N,19.51.90W 1974SEP19,2055Z
PRESSURE (DBAR)
0
25
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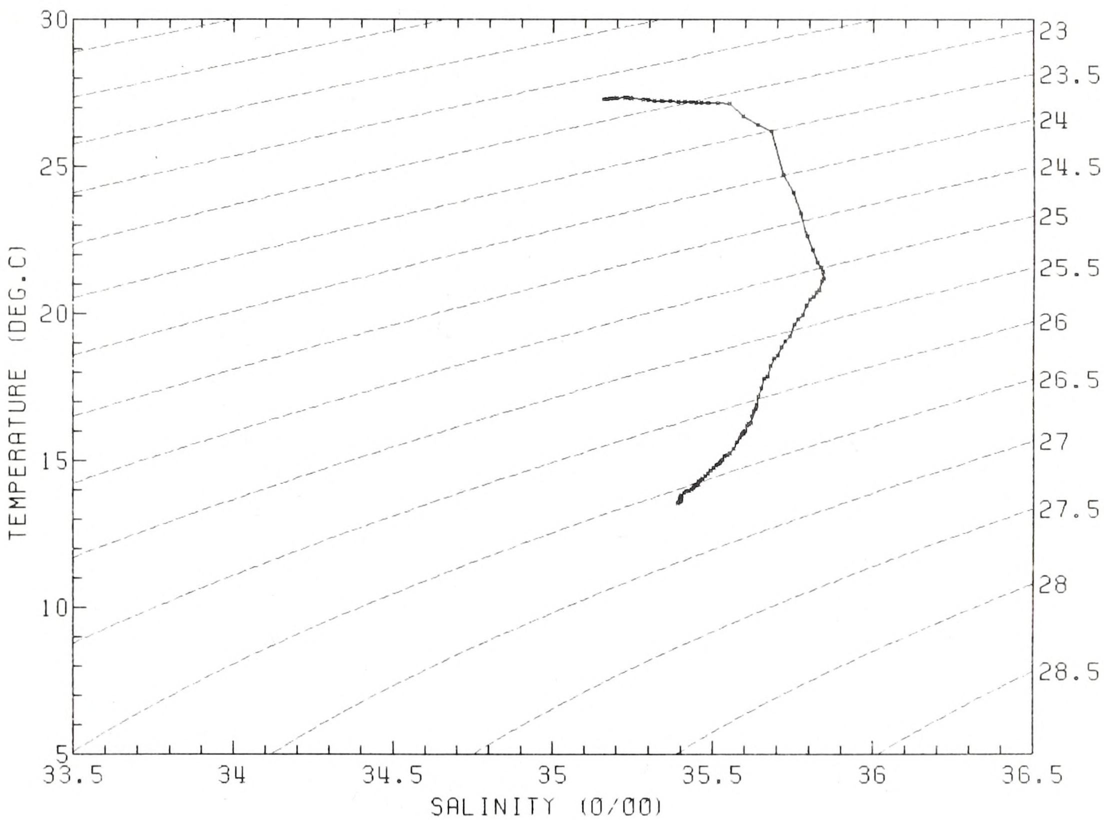
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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24.5
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26.5
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27.5
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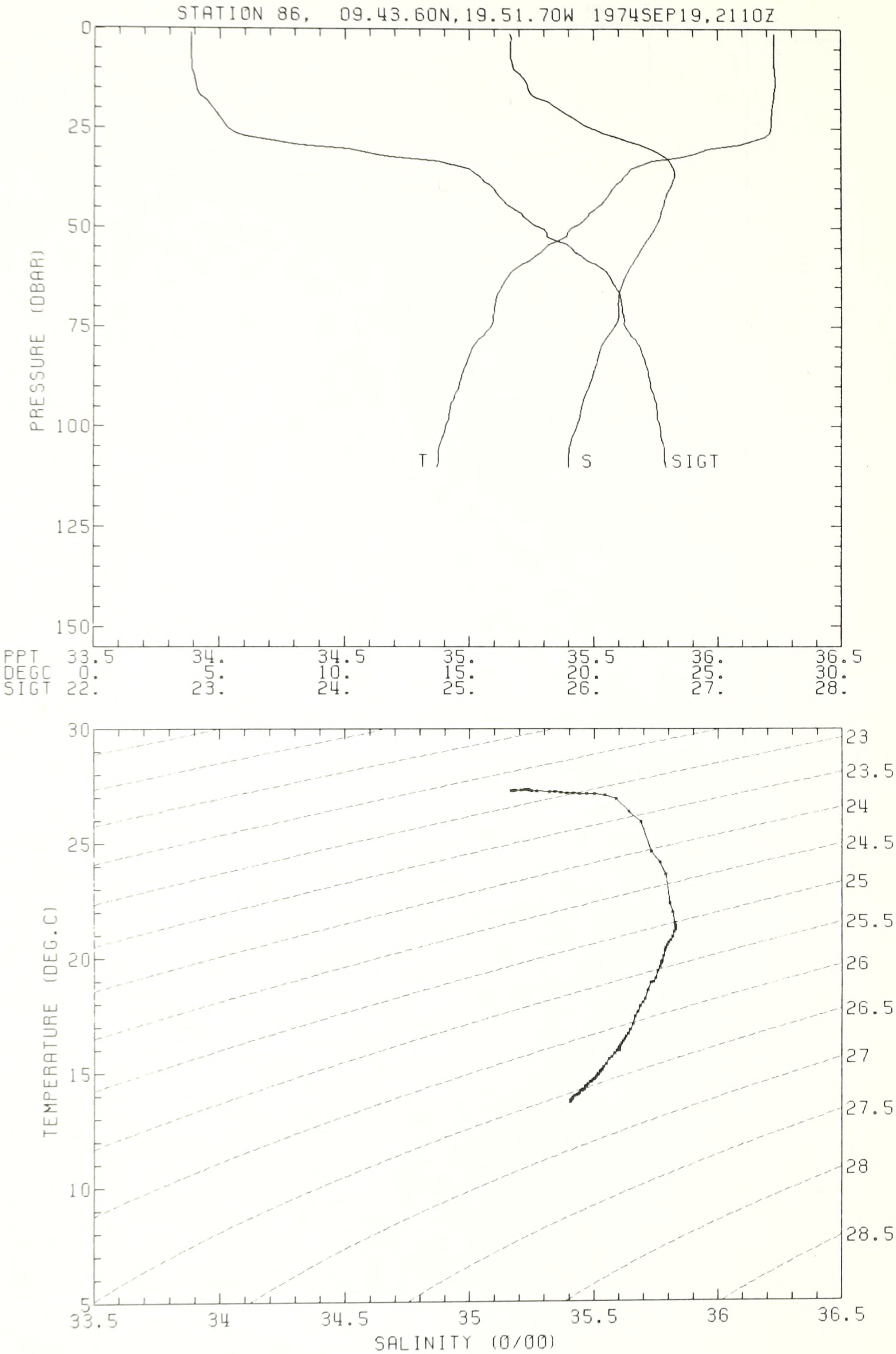
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 86, 09.43.60N, 19.51.70W 1974SEP19,2110Z
PRESSURE (DBAR)
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.
TEMPERATURE (DEG.C)
SALINITY (0/00)
23
23.5
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26.5
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27.5
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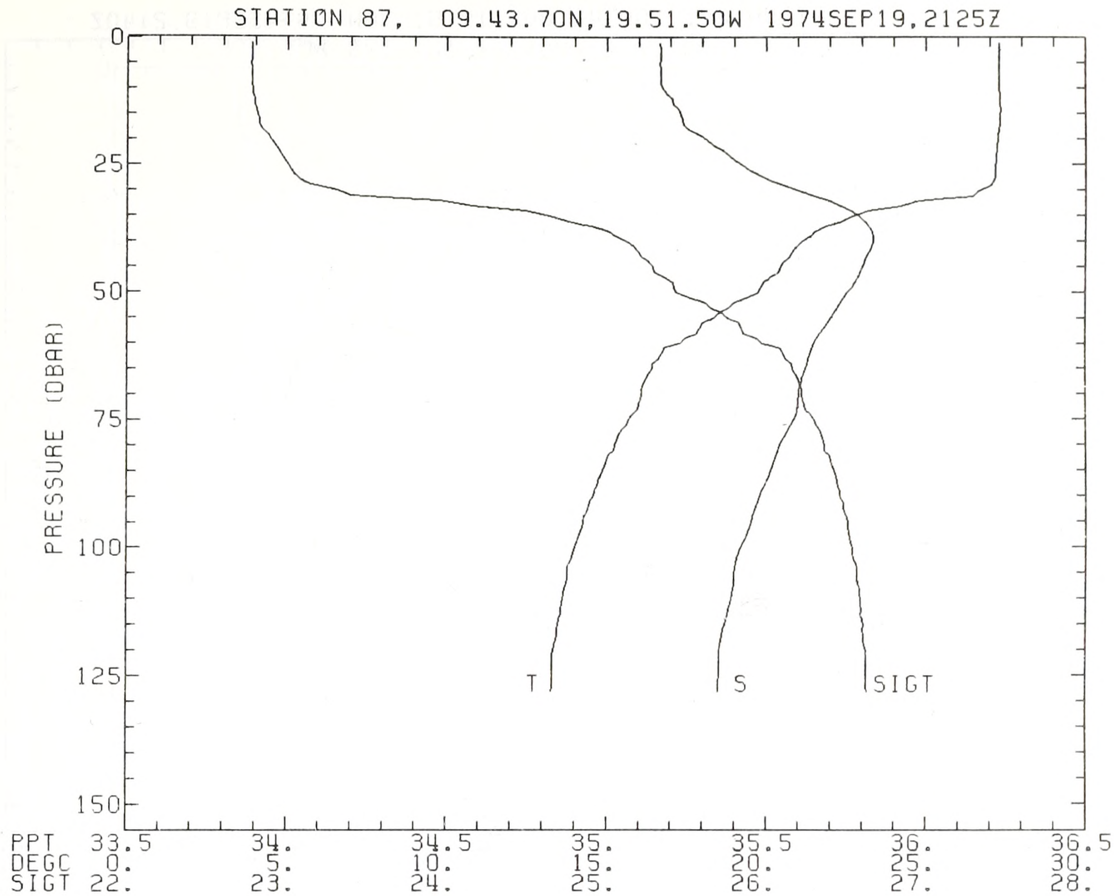
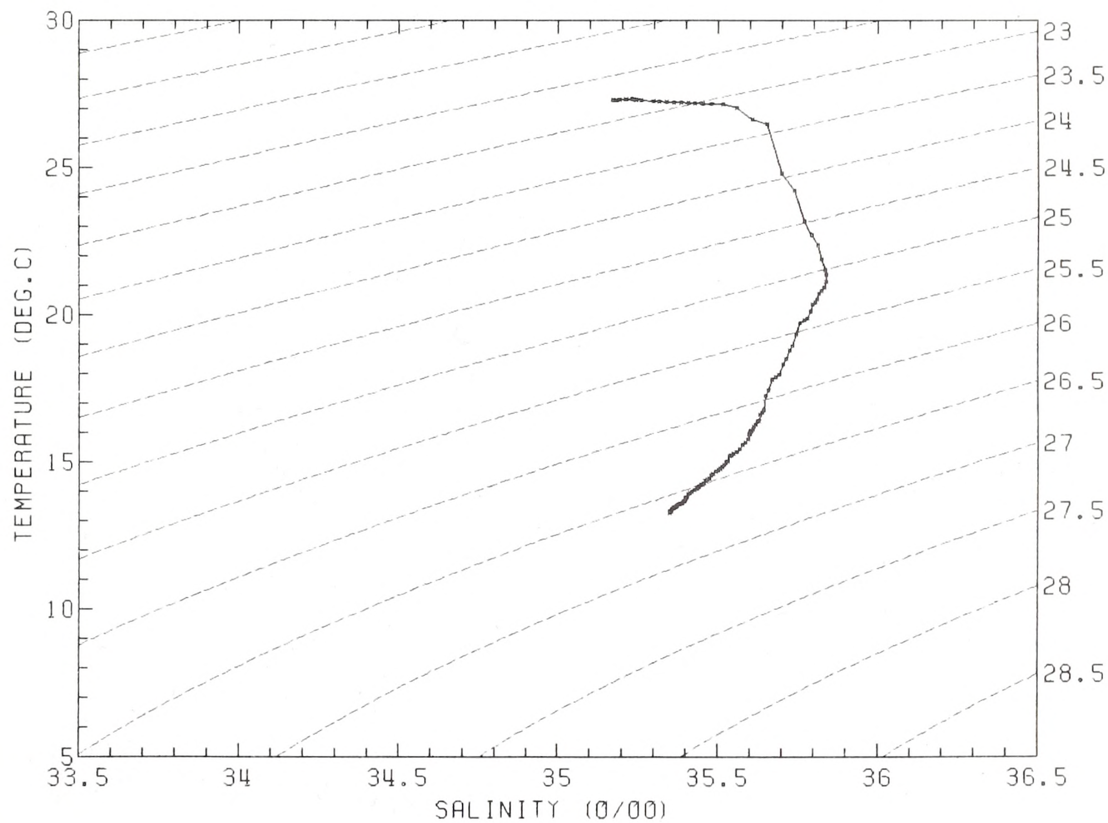
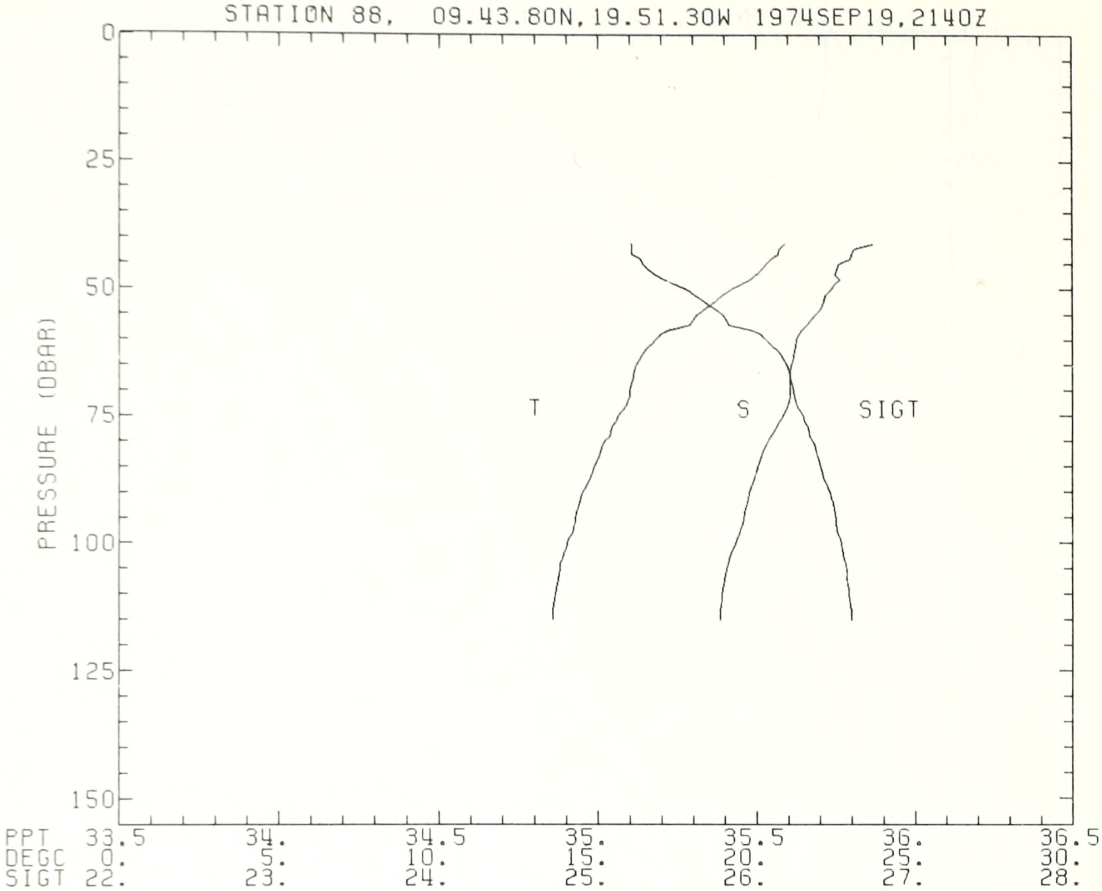
28.5


STATION 87, 09.43.70N, 19.51.50W 1974SEP19, 2125Z
PRESSURE (DBAR)
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
SALINITY (0/00)


STATION 88, 09.43.80N,19.51.30W 1974SEP19,2140Z
PRESSURE (DBAR)
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25
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75
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125
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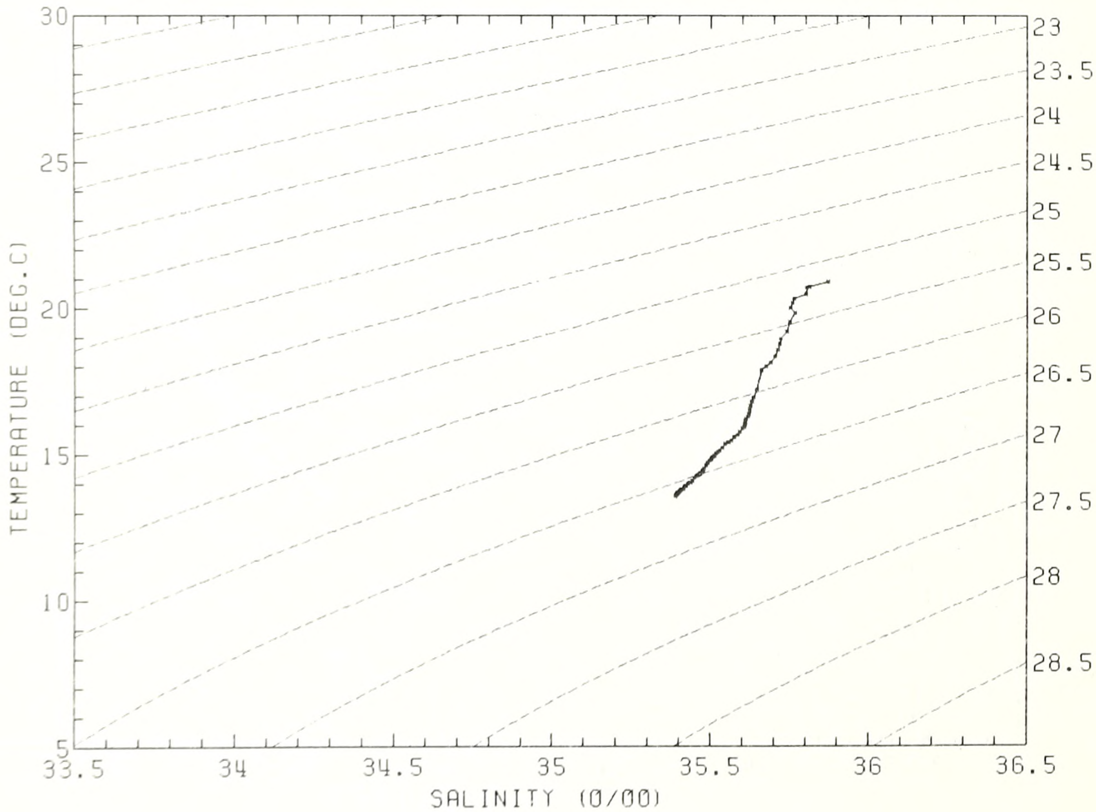
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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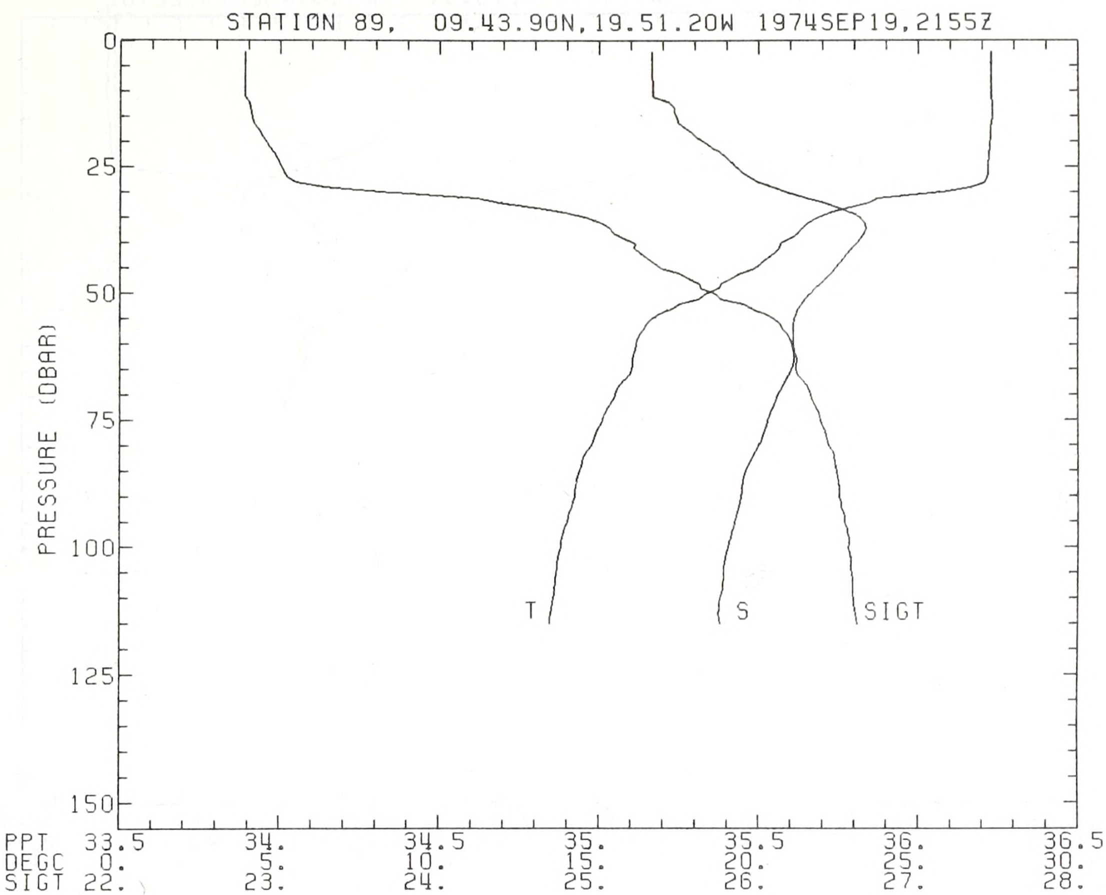
28.5
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)


STATION 89, 09.43.90N,19.51.20W 1974SEP19,2155Z
PRESSURE (DBAR)
0
25
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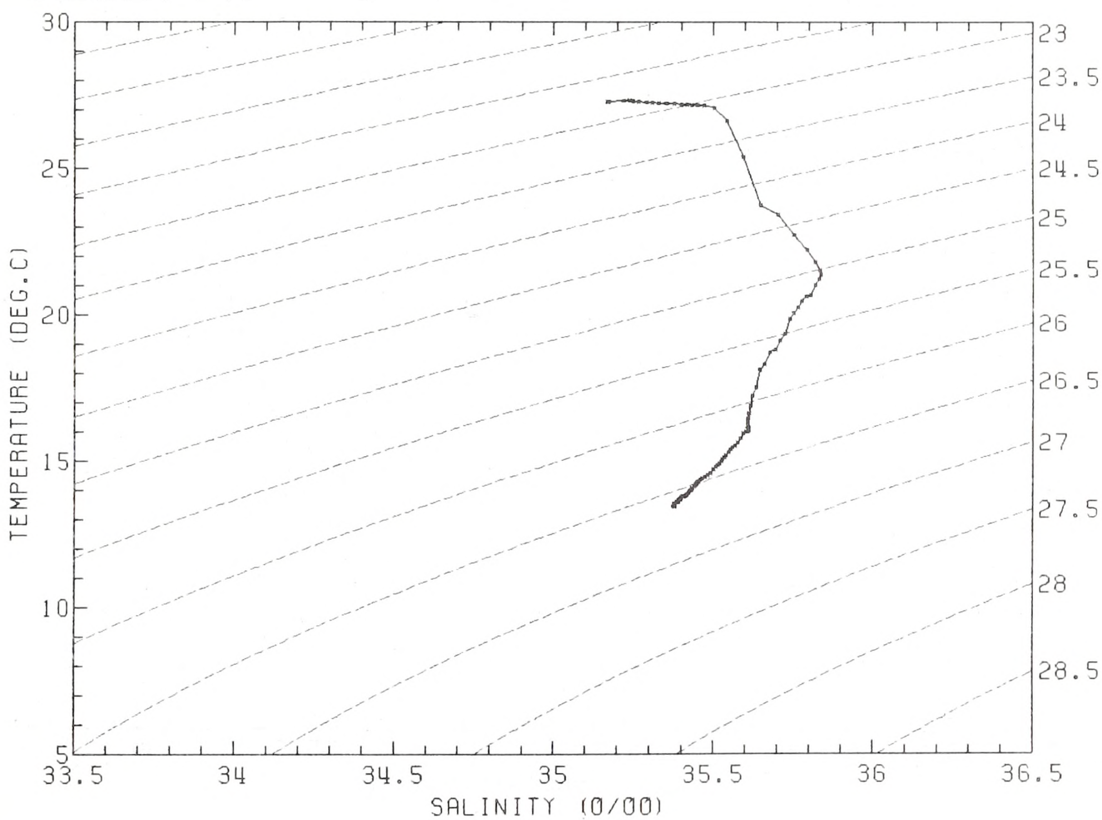
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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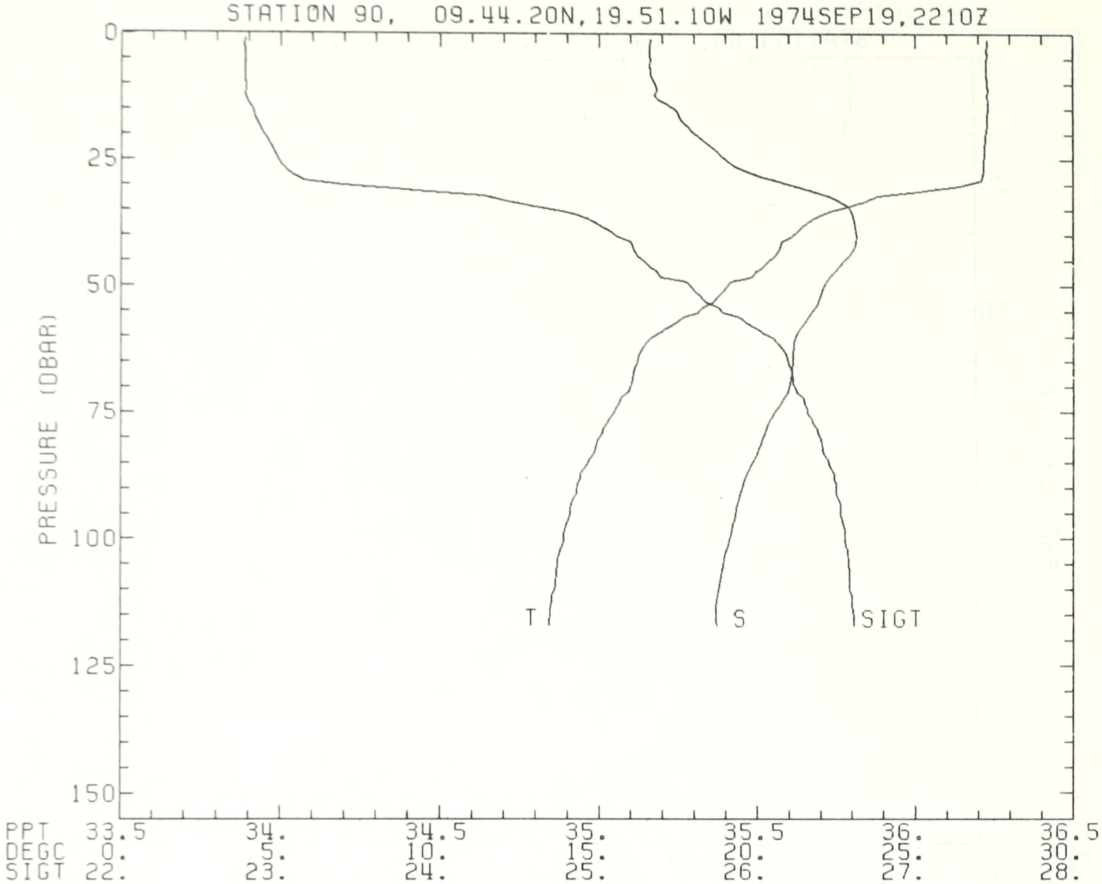
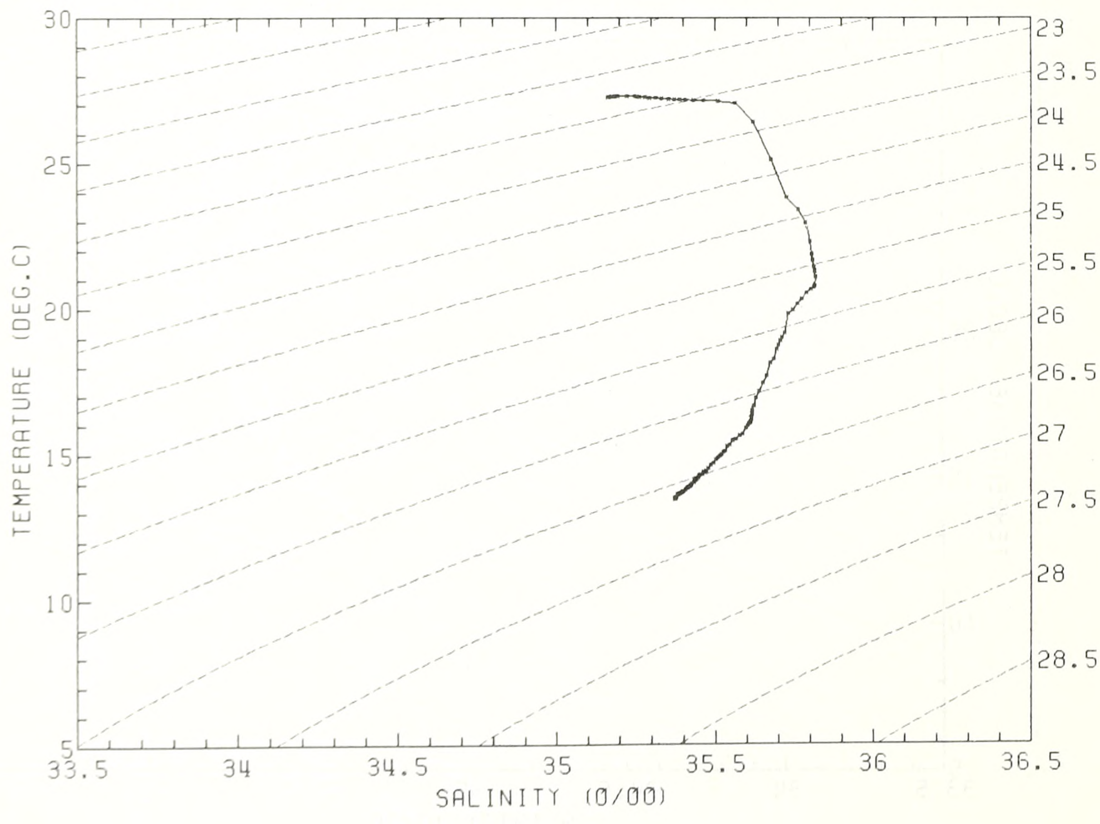
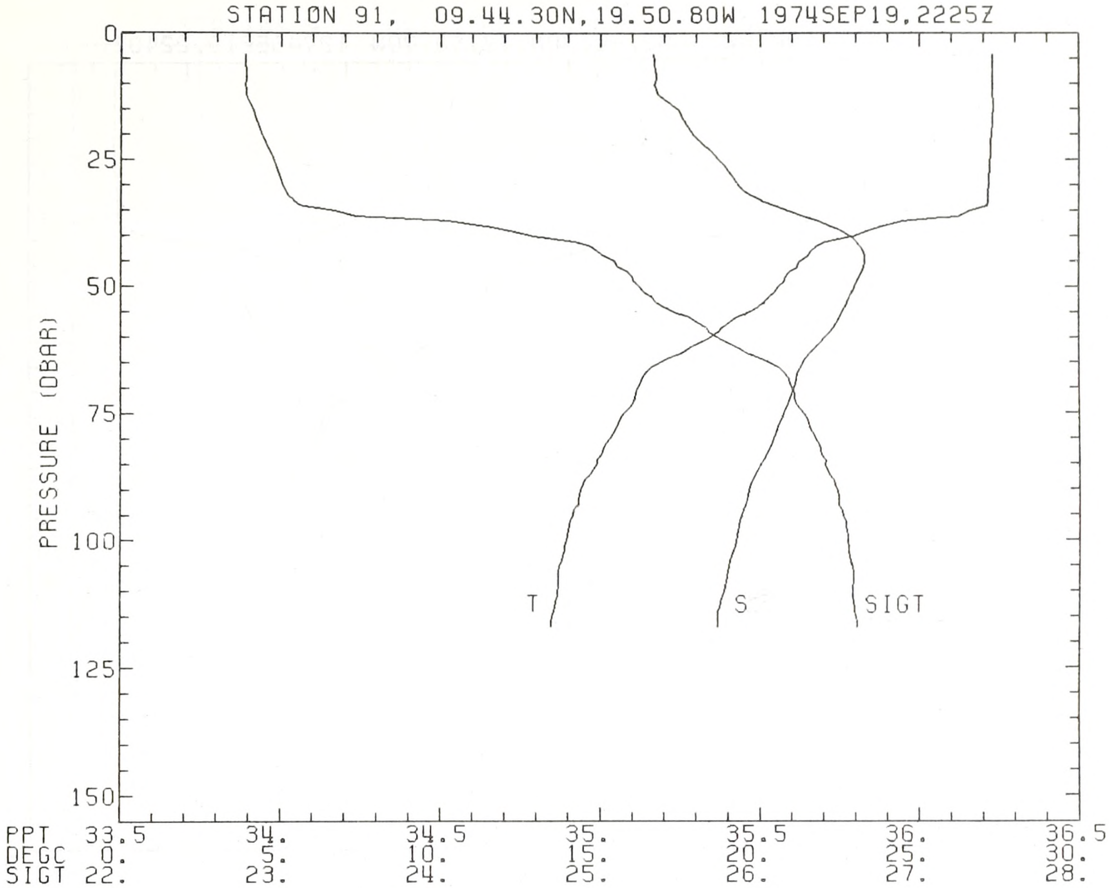
33.5 34 34.5 35 35.5 36 36.5
SALINITY (0/00)

STATION 90, 09.44.20N,19.51.10W 1974SEP19,2210Z






STATION 91, 09.44.30N,19.50.80W 1974SEP19,2225Z
PRESSURE (DBAR)
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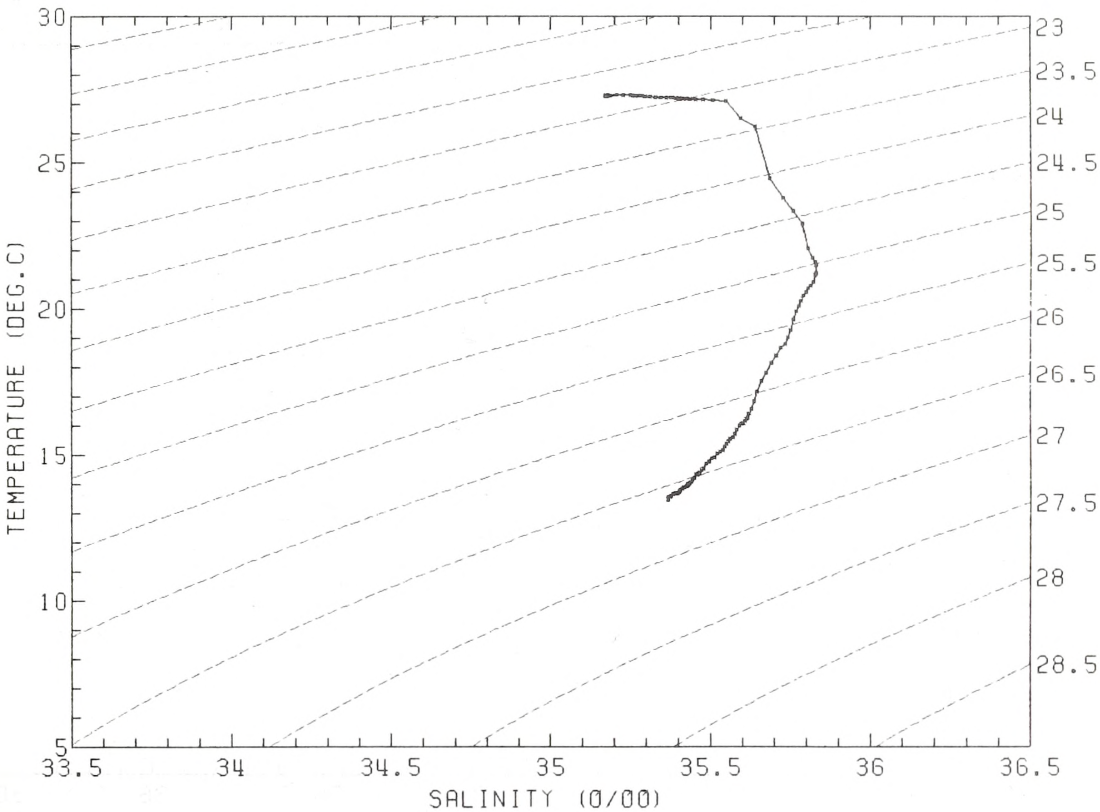
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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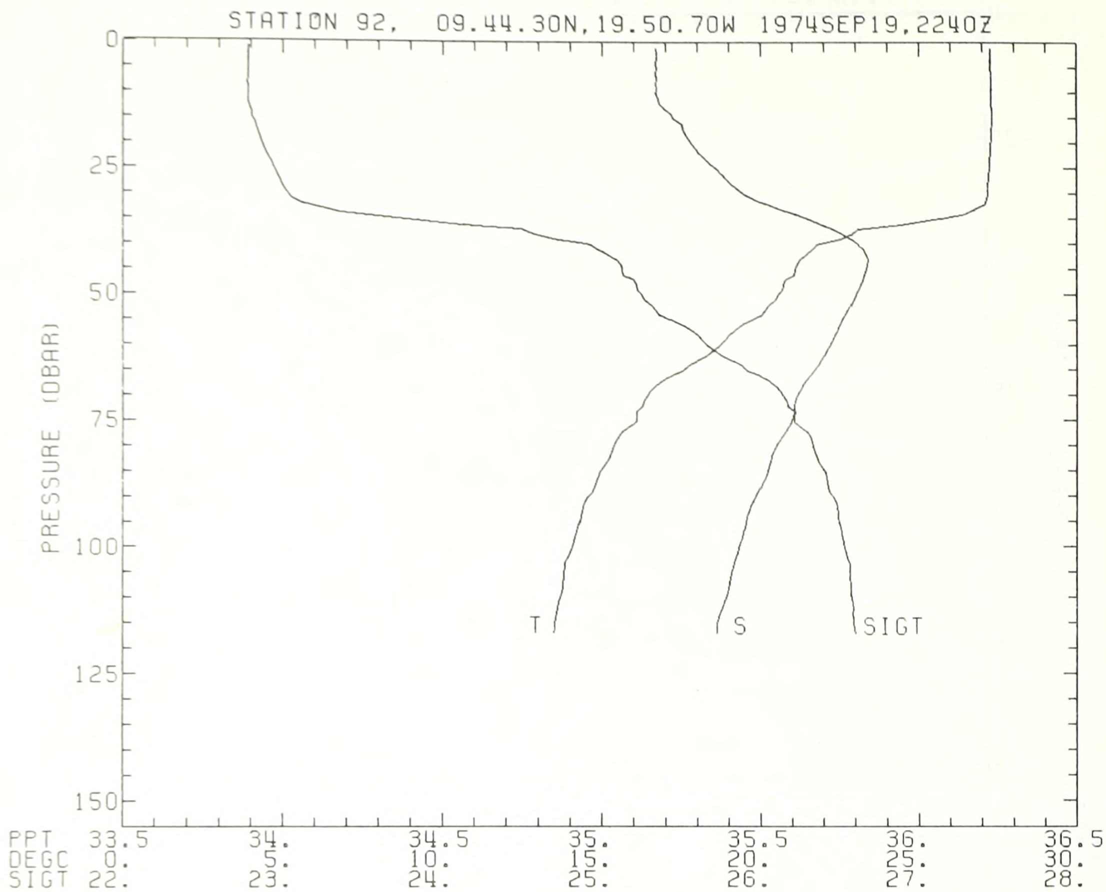
SALINITY (0/00)


STATION 92, 09.44.30N,19.50.70W 1974SEP19,2240Z
PRESSURE (DBAR)
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S
SIGT
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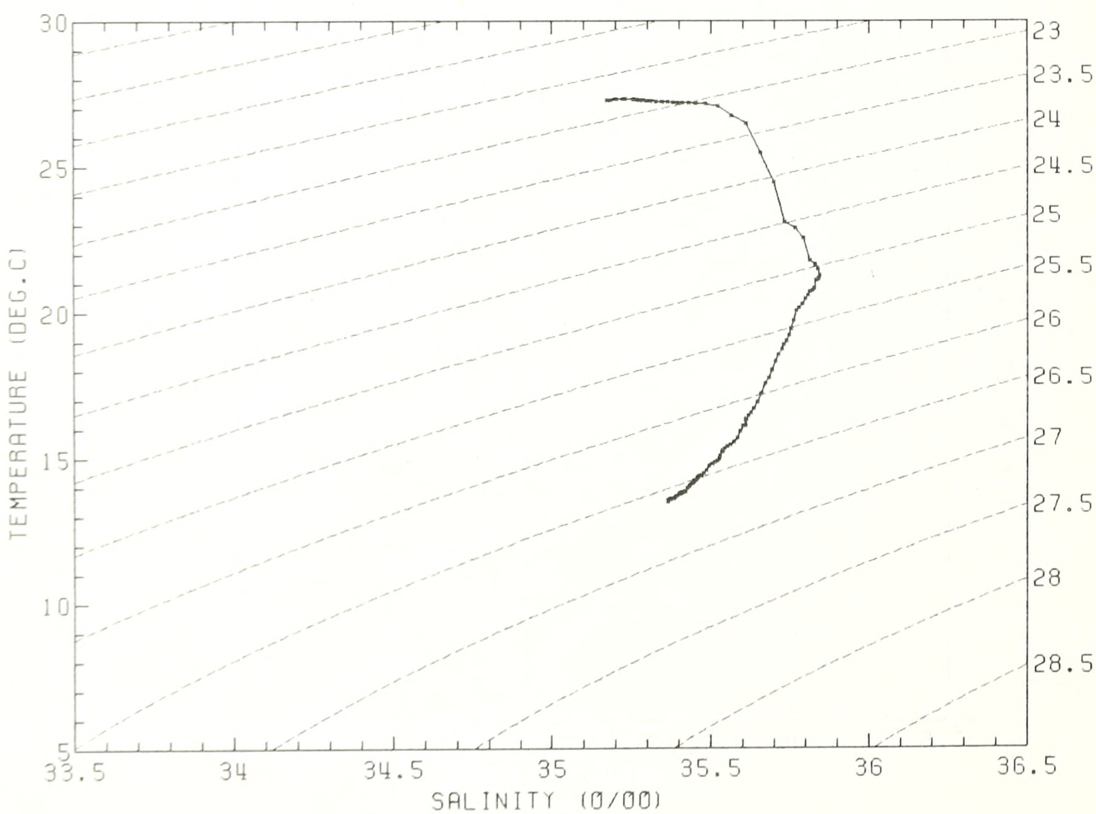
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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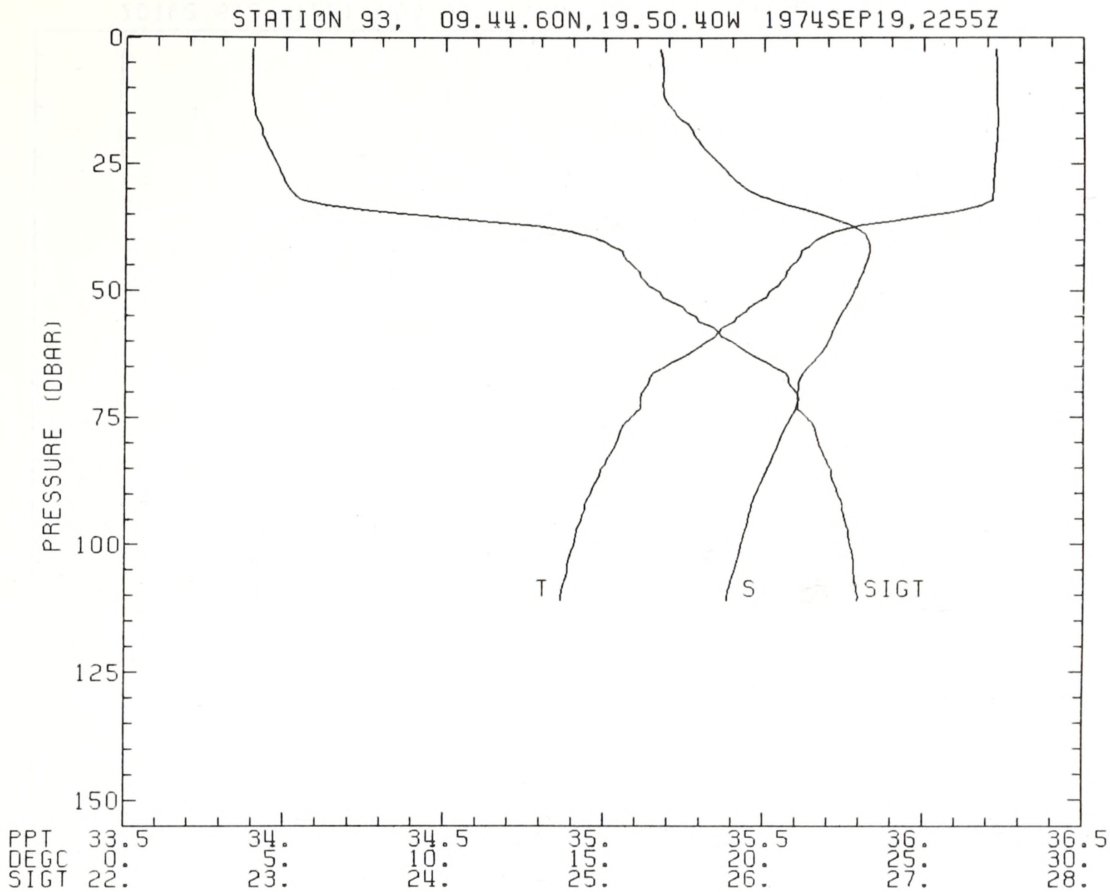
SALINITY (0/00)


STATION 93, 09.44.60N,19.50.40W 1974SEP19,2255Z
PRESSURE (DBAR)
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125
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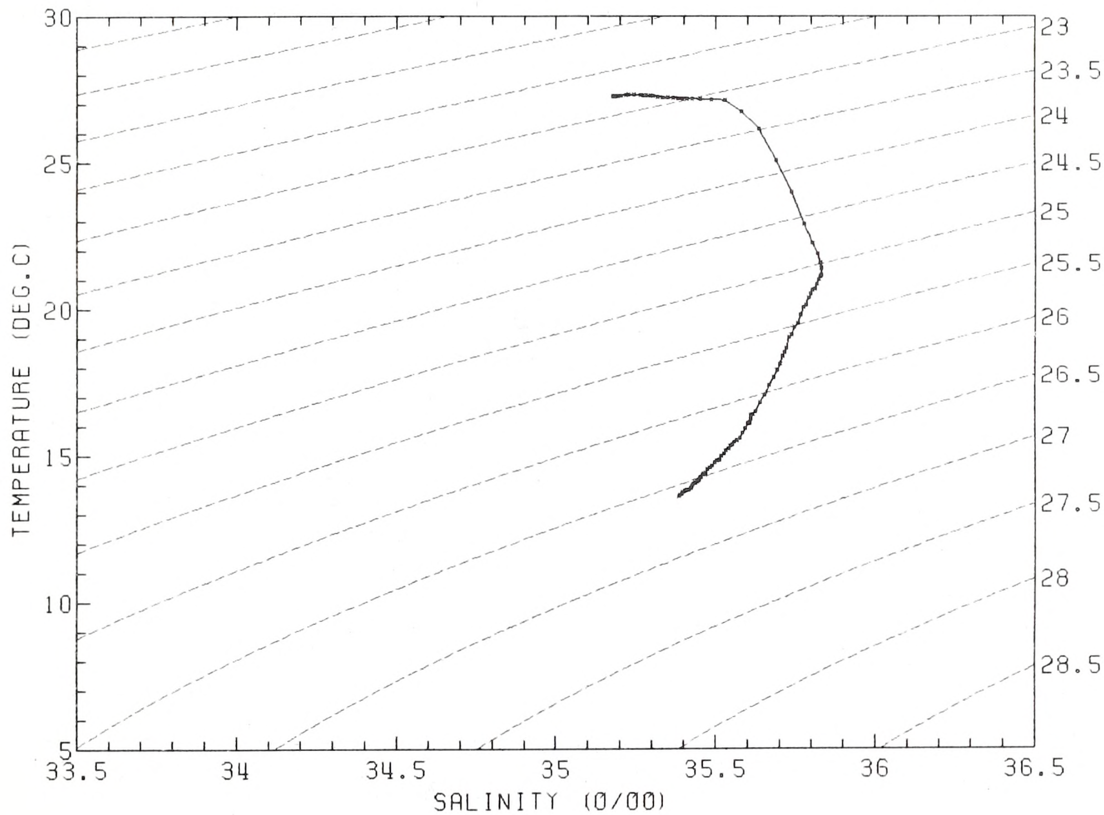
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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35.5
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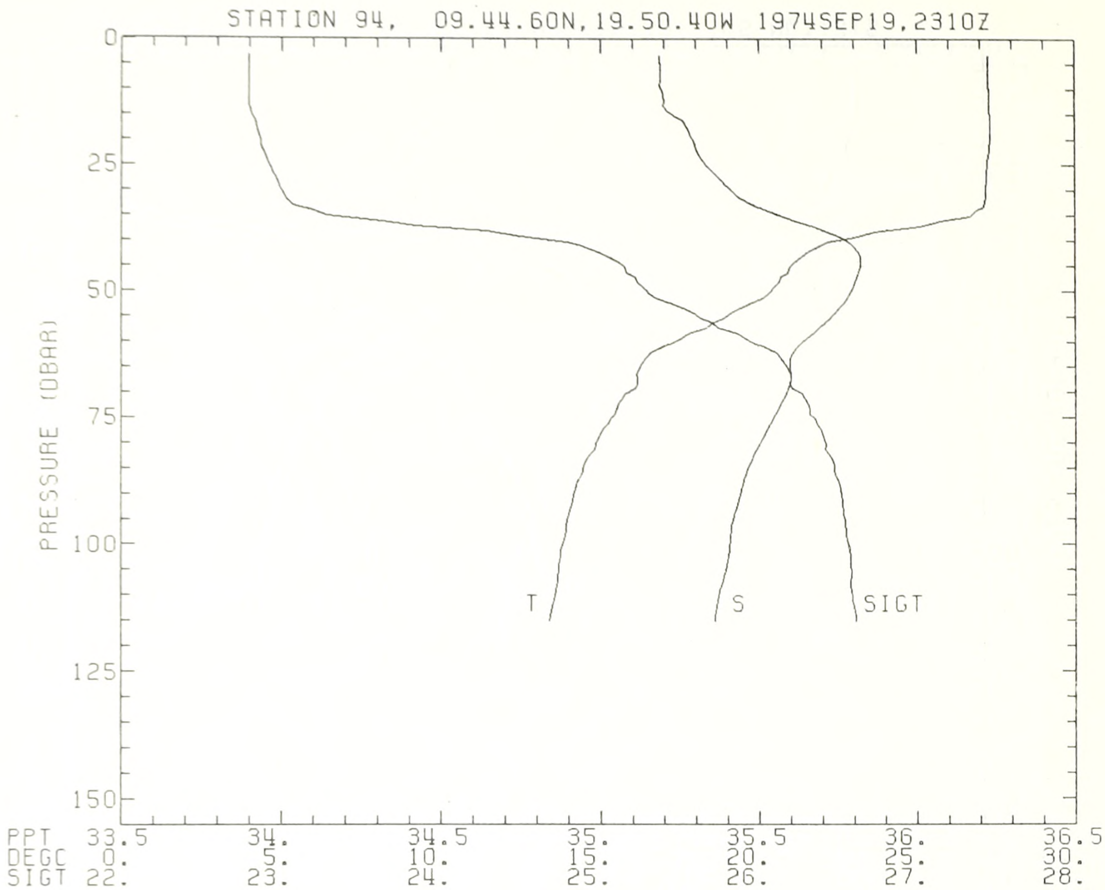
36.5
SALINITY (0/00)


STATION 94, 09.44.60N, 19.50.40W 1974SEP19, 2310Z
PRESSURE (DBAR)
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75
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125
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T
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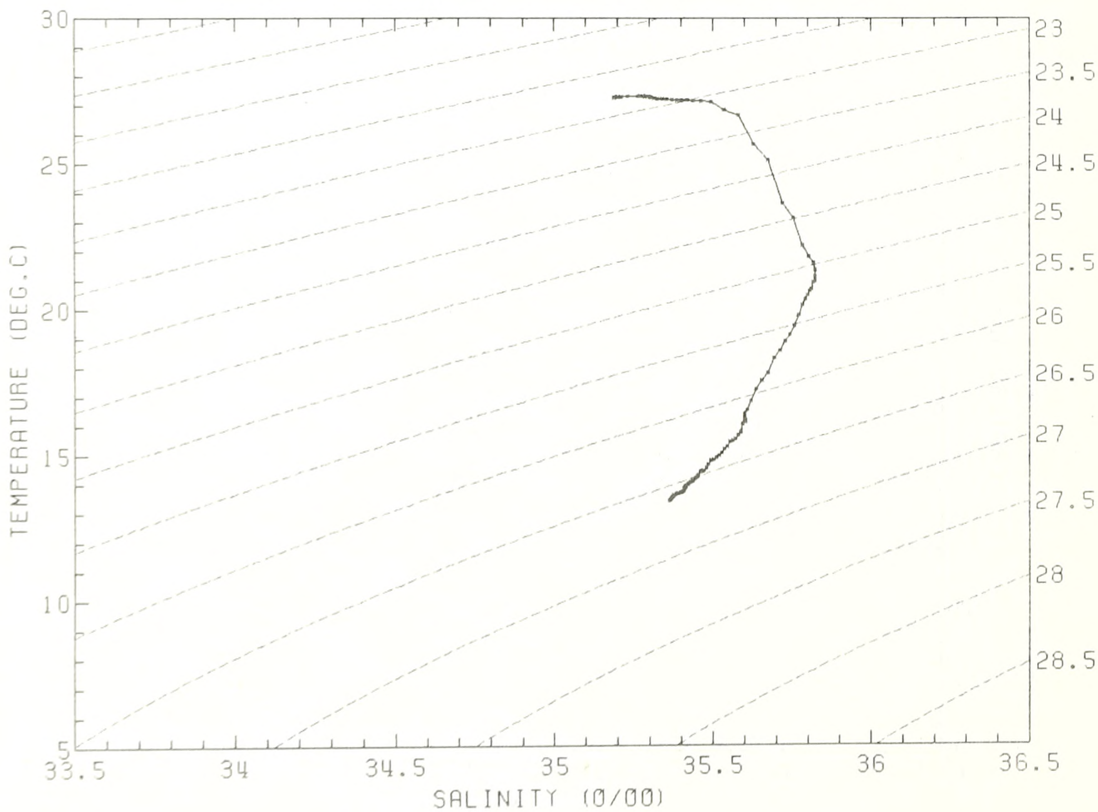
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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23.5
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33.5
34
34.5
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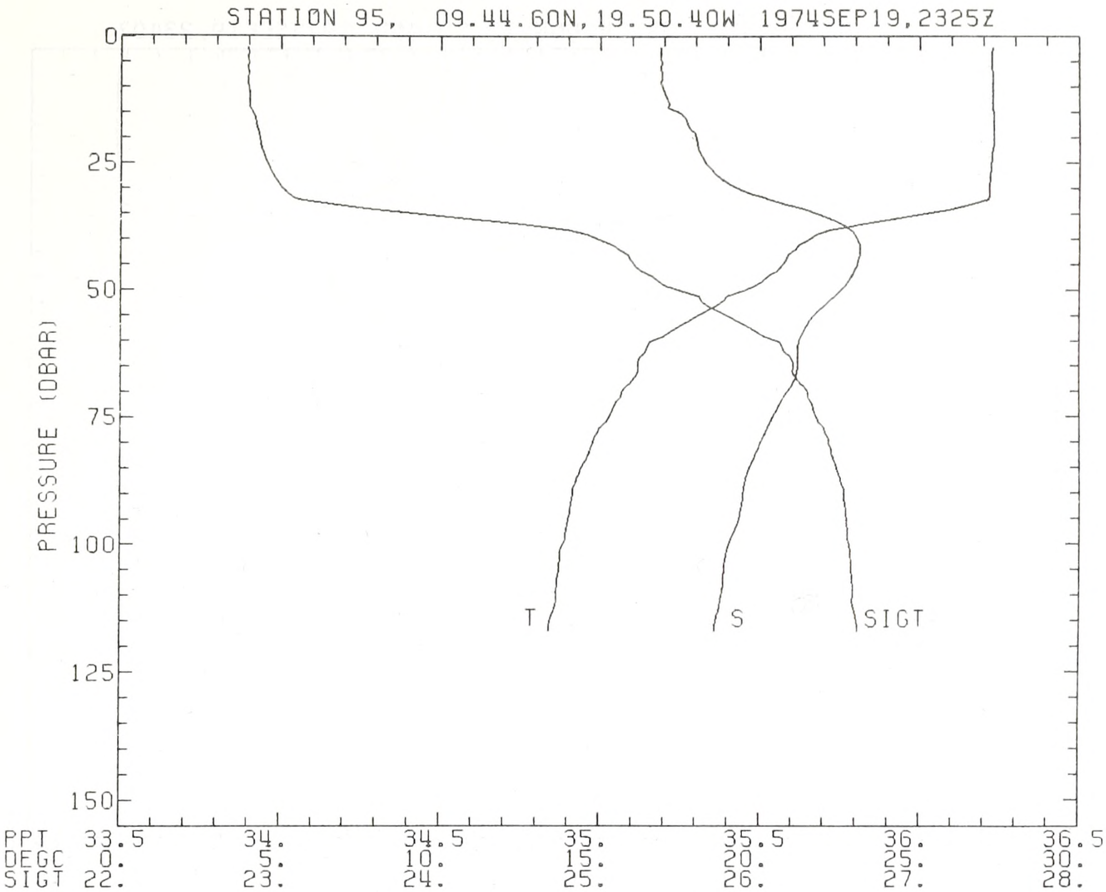
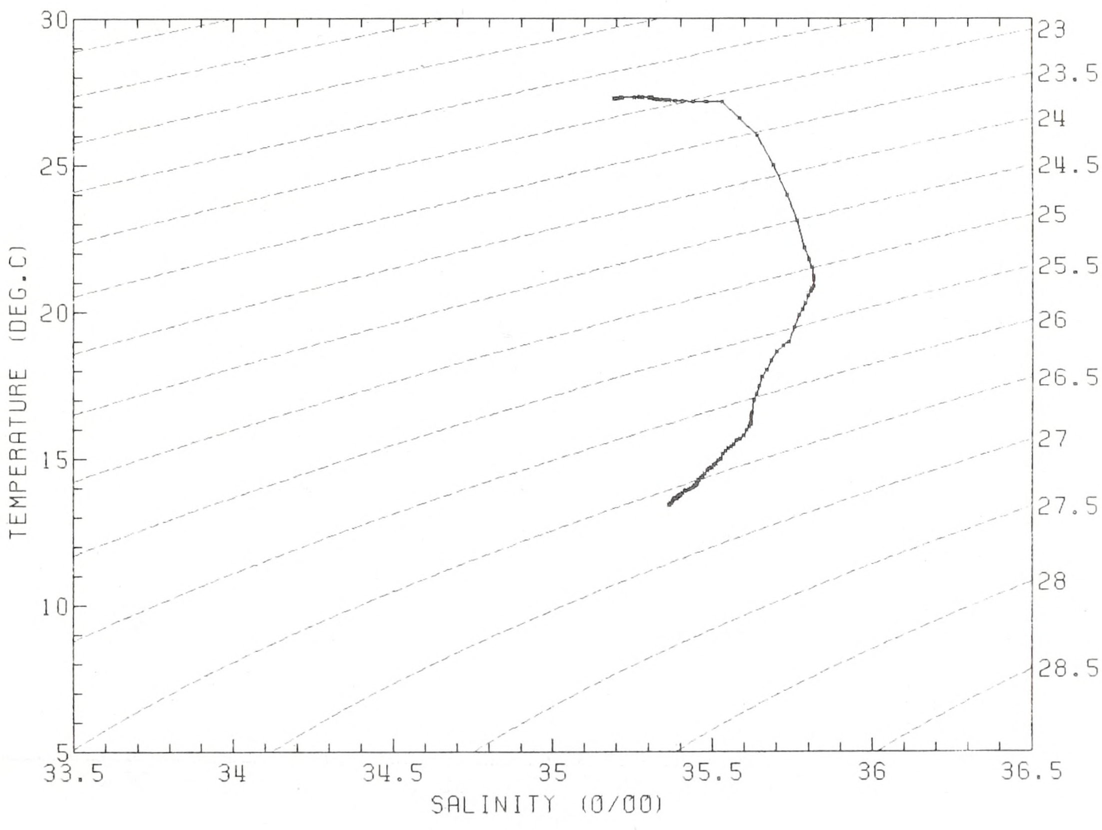
35.5
36
36.5
SALINITY (0/00)


STATION 95, 09.44.60N,19.50.40W 1974SEP19,2325Z
PRESSURE (DBAR)
0
25
50
75
100
125
150
T
S
SIGT
PPT 33.5 34. 34.5 35. 35.5 36. 36.5
DEGC 0. 5. 10. 15. 20. 25. 30.
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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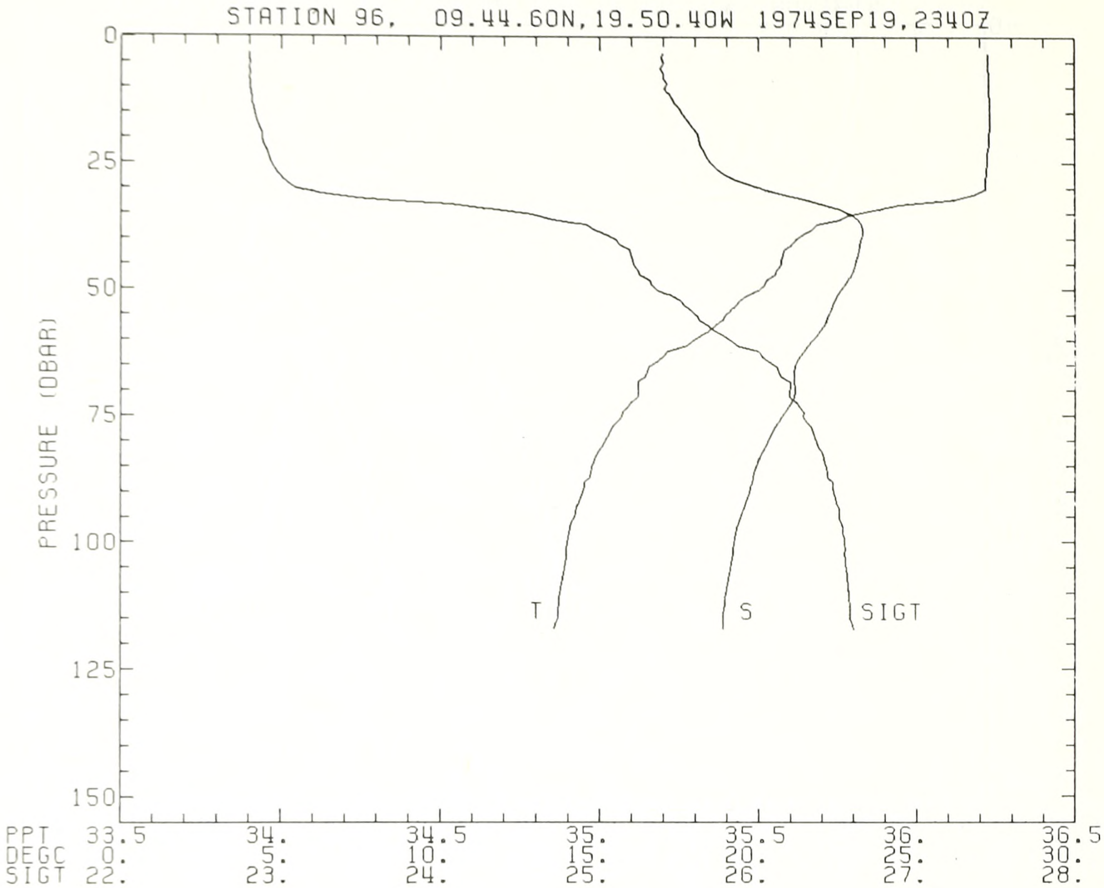
SALINITY (0/00)


STATION 96, 09.44.60N,19.50.40W 1974SEP19,2340Z
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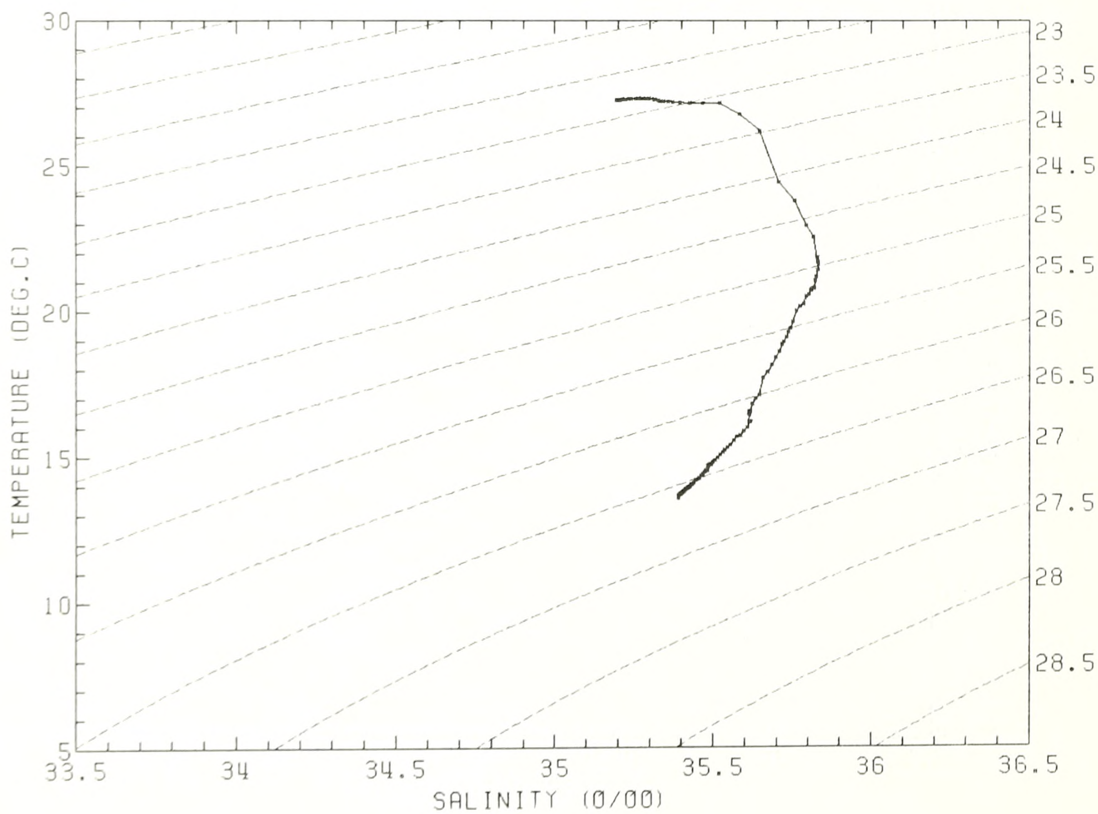
SIGT 22. 23. 24. 25. 26. 27. 28.


TEMPERATURE (DEG.C)
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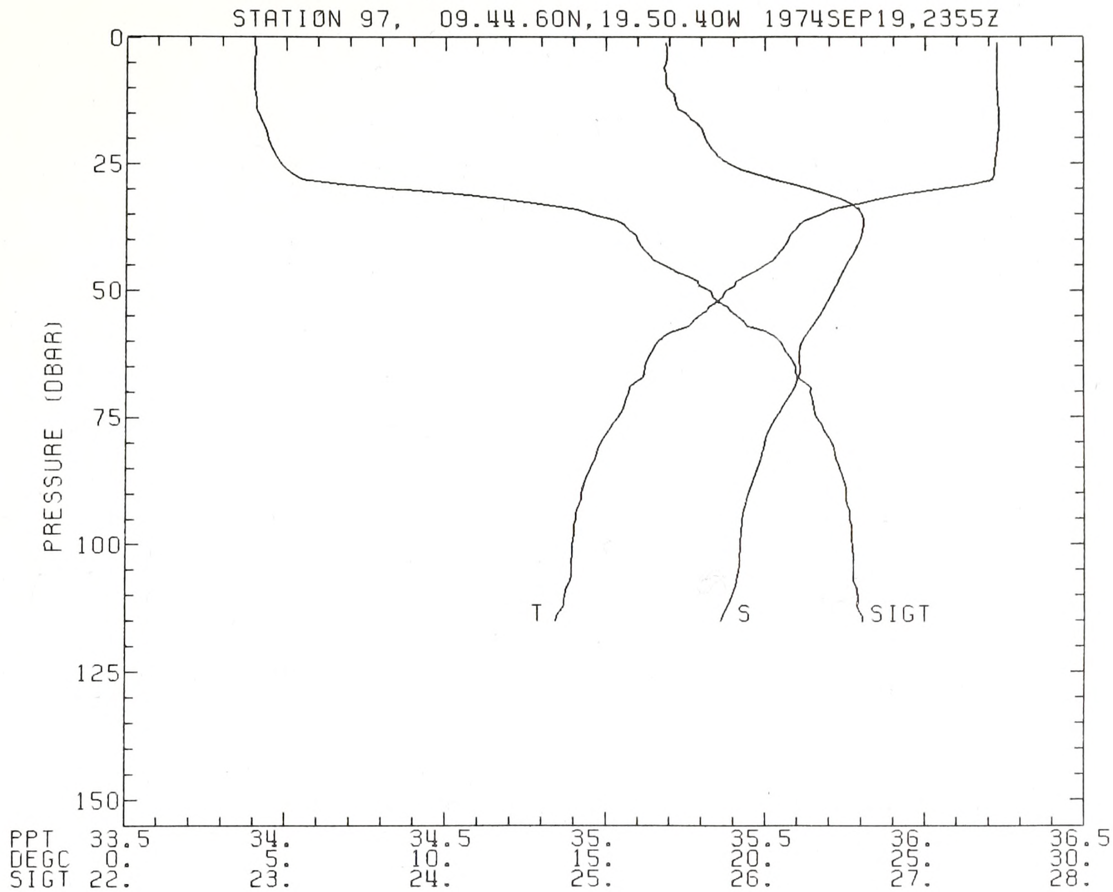
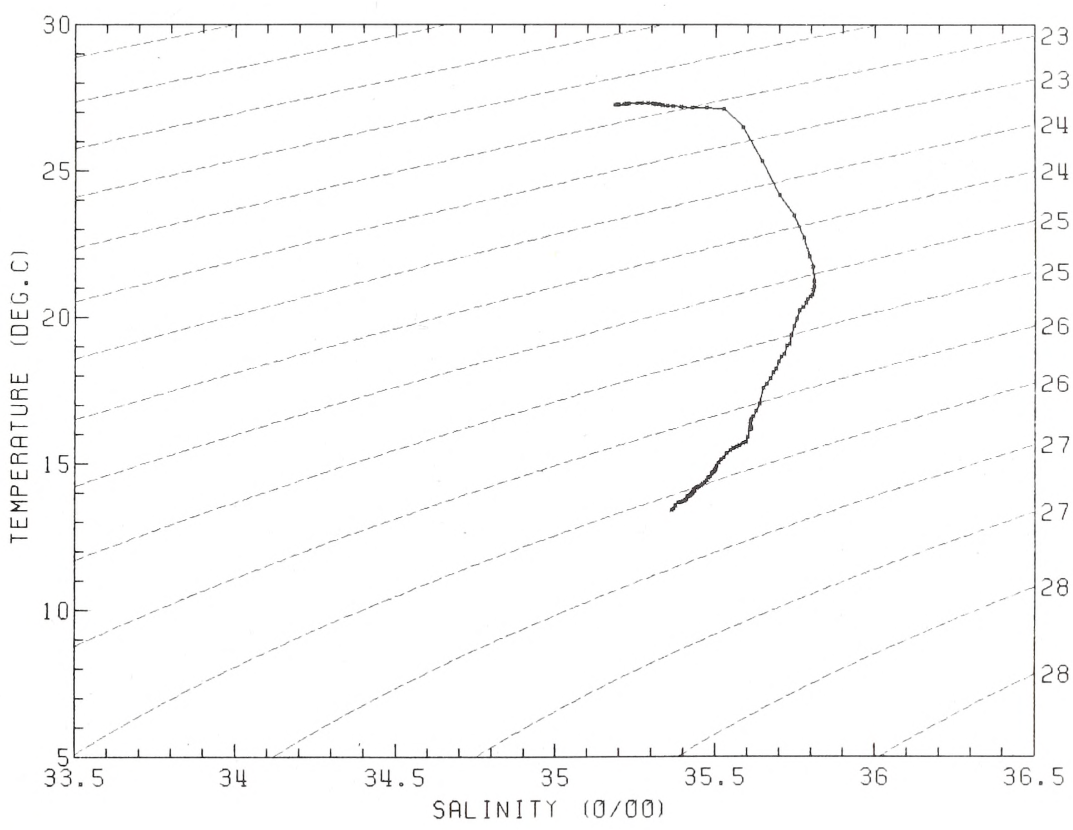
SALINITY (0/00)





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Environmental Research LABORATORIES

The mission of the Environmental Research Laboratories (ERL) is to conduct an integrated program of fundamental research, related technology development, and services to improve understanding and prediction of the geophysical environment comprising the oceans and inland waters, the lower and upper atmosphere, the space environment, and the Earth. The following participate in the ERL missions:

MESA *Marine EcoSystems Analysis Program.* Plans, directs, and coordinates the regional projects of NOAA and other federal agencies to assess the effect of ocean dumping, municipal and industrial waste discharge, deep ocean mining, and similar activities on marine ecosystems.

OCSEA *Outer Continental Shelf Environmental Assessment Program.* Plans, directs, and coordinates research of federal, state, and private institutions to assess the primary environmental impact of developing petroleum and other energy resources along the outer continental shelf of the United States.

WM *Weather Modification Program Office.* Plans, directs, and coordinates research within ERL relating to precipitation enhancement and mitigation of severe storms. Its National Hurricane and Experimental Meteorology Laboratory (NHEML) studies hurricane and tropical cumulus systems to experiment with methods for their beneficial modification and to develop techniques for better forecasting of tropical weather. The Research Facilities Center (RFC) maintains and operates aircraft and aircraft instrumentation for research programs of ERL and other government agencies.

AOML *Atlantic Oceanographic and Meteorological Laboratories.* Studies the physical, chemical, and geological characteristics and processes of the ocean waters, the sea floor, and the atmosphere above the ocean.

PMEL *Pacific Marine Environmental Laboratory.* Monitors and predicts the physical and biological effects of man's activities on Pacific Coast estuarine, coastal, deep-ocean, and near-shore marine environments.

GLERL *Great Lakes Environmental Research Laboratory.* Studies hydrology, waves, currents, lake levels, biological and chemical processes, and lake-air interaction in the Great Lakes and their watersheds; forecasts lake ice conditions.

GFDL *Geophysical Fluid Dynamics Laboratory.* Studies the dynamics of geophysical fluid systems (the atmosphere, the hydrosphere, and the cryosphere) through theoretical analysis and numerical simulation using powerful, high-speed digital computers.

APCL *Atmospheric Physics and Chemistry Laboratory.* Studies cloud and precipitation physics, chemical and particulate composition of the atmosphere, atmospheric electricity, and atmospheric heat transfer, with focus on developing methods of beneficial weather modification.

NSSL *National Severe Storms Laboratory.* Studies severe-storm circulation and dynamics, and develops techniques to detect and predict tornadoes, thunderstorms, and squall lines.

WPL *Wave Propagation Laboratory.* Studies the propagation of sound waves and electromagnetic waves at millimeter, infrared, and optical frequencies to develop new methods for remote measuring of the geophysical environment.

ARL *Air Resources Laboratories.* Studies the diffusion, transport, and dissipation of atmospheric pollutants; develops methods of predicting and controlling atmospheric pollution; monitors the global physical environment to detect climatic change.

AL *Aeronomy Laboratory.* Studies the physical and chemical processes of the stratosphere, ionosphere, and exosphere of the Earth and other planets, and their effect on high-altitude meteorological phenomena.

SEL *Space Environment Laboratory.* Studies solar-terrestrial physics (interplanetary, magnetospheric, and ionospheric); develops techniques for forecasting solar disturbances; provides real-time monitoring and forecasting of the space environment.

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National Oceanic and Atmospheric Administration
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