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CRUISE REPORT

TOCS K96-06

July-August 1996

TOCS CRUISE REPORT NO. 7

JAMSTEC

CONTENTS

1. Cruise Summary

Ship	: R/V KAIYO	
Institute	: Japan Marine Science and Technology Center(JAMSTEC)	
Chief Scientist	: Kunio Yoneyama / JAMSTEC	
Cruise Code	: K9606	
Project Title	: Tropical Ocean Climate Study (TOCS)	
Period	: Jul. 7, 1996 - Aug. 5, 1996	
Ports of call	: Koror, Republic of Palau	(Jul. 2- 7, 1996)
	Kavieng, Papua New Guinea	(Jul. 23-25, 1996)
	Guam, United States of America	(Aug. 5- 8, 1996)

Purpose :

The purpose of this cruise was to observe physical oceanographic conditions in the tropical western Pacific for better understanding of atmosphere-ocean interaction and its affect on the ENSO(El Nino/Southern Oscillation) phenomena and global climate change. The cruise was carried out under the research program of the Tropical Ocean Climate Study(TOCS) at Japan Marine Science and Technology Center. The program is supported by the Science and Technology Agency of Japan. The cruise was conducted as a joint cruise between BPP Teknologi, Indonesia and JAMSTEC.

During this cruise recoveries/deployments of the meteorological and oceanographic buoys (ATLAS) as part of the TAO-array were also conducted by Pacific Marine Environmental Laboratory(PMEL) of the National Oceanic and Atmospheric Administration(NOAA), USA.

Observation Summary :

The following measurements were completed ; 48 CTD (Conductivity-Temperature-Depth profiler) casts, 78 upper air sounding by radiosonde, continuous ADCP (Acoustic Doppler Current Profiler) measurements, and 4 recoveries and 4 deployments of subsurface ADCP moorings. Six recoveries, 7 deployments and 4 repairs of ATLAS buoys were also carried out.

Preliminary results :

During this TOCS cruise, easterly surface wind and westward current dominated along the equator (between 3°S and 1°N), and the sea surface temperature was much higher than usual. These results indicate that so-called "La Nina"-like condition still remains in the tropical western Pacific ocean.

The sea surface temperature was above 29°C (almost close to 30°C) all over the observation area of this cruise. The isotherm depth of 28°C was laid between 100m and 120m, and that of 20°C was between 180m and 200m. These values are as same as or deeper than that of the last two TOCS cruises (K9505:Jul. 1995 and K9601:Jan.-Feb. 1996) that both also showed La Nina phase.

Intertropical Convergence Zone(ITCZ) well developed along the 10°N latitude line where easterly surface wind flow into. During this period, four tropical depressions had developed from the ITCZ and they seemed to relate to the existance of the easterly wave.

Along the equator (3°S-1°N), the South Equatorial Current flowed westward in the surface layer at about 1 kt (west of 145°E) and 0.5 kt (east of 145°E). The North Equatorial Countercurrent can be seen between 2°N and 6°N lines.

From the CTD observation (See Section 4), we observed the following features.

In this observed area, high salinity area (> 35.4 PSU) intruded from the southern hemisphere into the equator between 100db and 250db as previous cruises reported. Near the surface, much lower salinity area(< 34.0 PSU) existed in the northern hemisphere where much rain were observed.

On the equator homogeneous temperature layer existed from sea surface to about 80m between 138°E and 145°E as same as one year ago cruise(K9505). Below the 200 db, D.O. values in the northern hemisphere are lower than that in the southern hemisphere. Especially, very low D.O. value region (< 2.0 ml/l) intruded from north to the equator between 200db and 500db depth along the 137°E line. This tendency cannot be seen along the 156°E line(cf. weak along the 147°E).

From the atmospheric sounding and satellite images (See Section 5 and appendix 2), we can mention as follows.
The ITCZ was very active and the easterly wind was dominant whole this cruise near the surface. Some cloud clusters can be traced by satellite images. For example, cloud cluster which was observed near 165°E between the equator and 5°N on July 14 moved westward at phase speed of about 6m/s and merged into more large cloud mass.
In the west of 147°E (or before July 16), esterly was dominant at whole altitude in the troposhpere with the maximum speed at around 700hPa. On and east of 147°E (or after July 16), westerly was dominant in the surface layer and easterly was dominant above 800hPa. Some cases showed the dryness above the 0°C layer (or 500hPa level). During this whole period, however, they did not show strong dry air layer in the lower troposhere.

In this cruise, we recovered four subsurface ADCP(Acoustic Doppler Current Profiler) moorings (See Section 6).
Two mooring sites of (2.5°S, 142°E) and (2°S, 142°E) are designed and deployed to evaluate the influence of the New Guinea Coastal Under Current onto the warm water pool region. In the 200m layer, both sites showed constant westward flow of -40cm/sec for 2°S site and -50cm/sec for 2.5°S site, respectiely. On the other hand, in the 50m layer, they showed the seasonal changes of the zonal component of the current. The westward flow (about -40cm/sec) was dominant in the boreal summer, while the eastward flow (40～50cm/sec) was dominant in the boreal winter.
At the (0,156°E) site where is located in the warm water pool, it showed different features from the sites above mentioned. In the 50m layer, the westward flow (-20cm/sec) was dominant before November 1995 and after June 1996. The eastward flow of about 30cm/sec appeared from December 1995 through January 1996. In the 120m layer, zonal current component showed the seasonal changes ; eastward flow (20cm/sec) was dominant in the boreal summer and westward flow (-30～-60cm/sec) was dominant in the boreal winter. The Eqatorial Under Current (40～50cm/sec) can be seen through this deploying period in te 200m layer.

Acknowledgement.

Finally, we would like to express our special thanks to the Captain Ishida and crew members of R/V KAIYO. This cruise was never carried out successfully without their excellent support.

2. List of Shipboard Instruments

(1) CTD (Conductivity-Temperature-Depth profiler)
SBE9-11 plus system,Sea Bird Electronics,Inc.,USA for 6800m depth

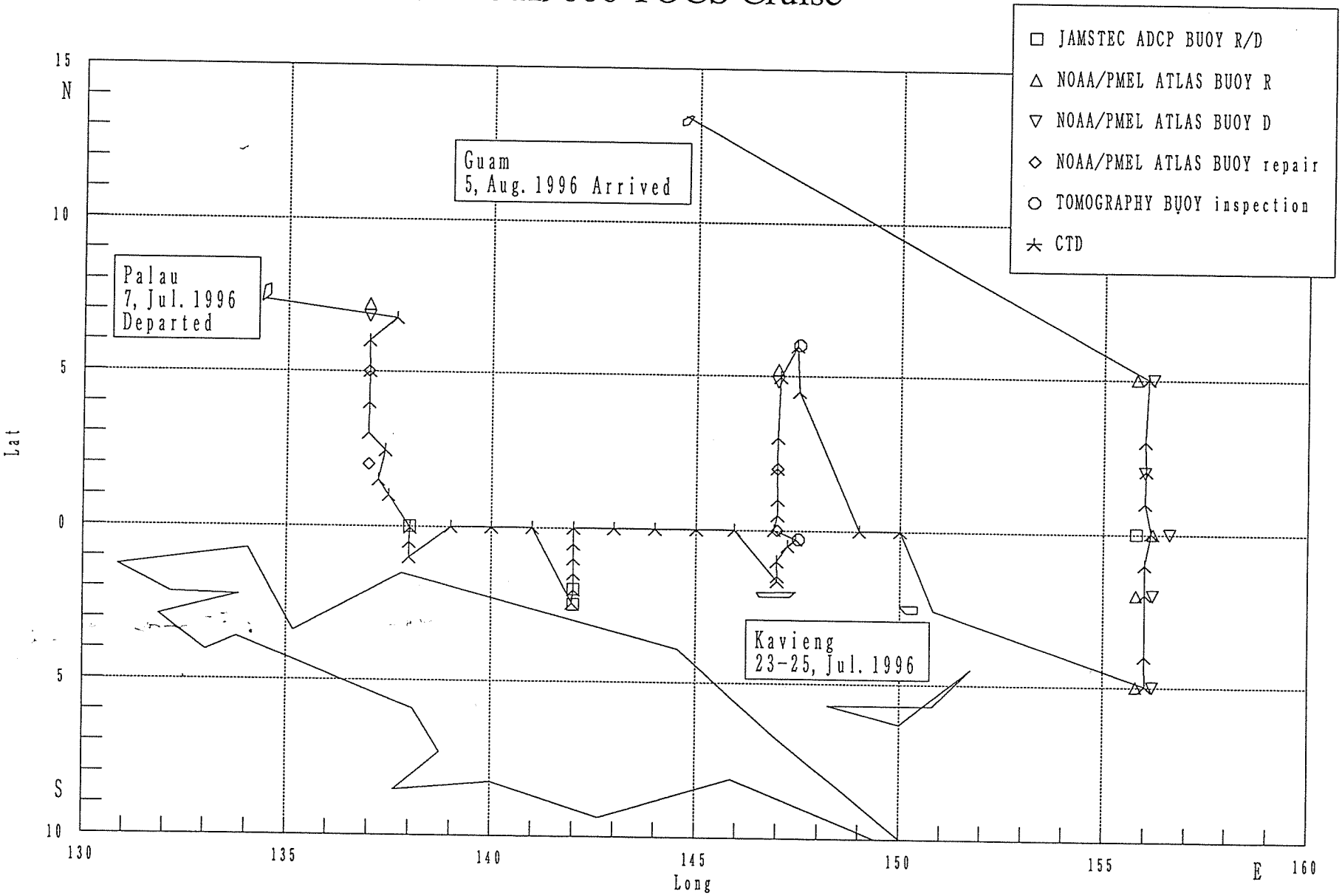
(2) Shipboard ADCP (Acoustic Doppler Current Profiler)
a. JLN610,JAPAN Radio Co.Ltd.
(125khz,6m bin width,3 depth layers of 20m,50m and 80m)
b. VM-75, RD Instruments, USA
(75khz, 16m bin length, Nominal range 560m starting 30m depth)

(3) Upper air sounding (Omega sonde)
Digi CORA MW11 Vaisala, Finland
Omega Sonde Rs-80N

(4) Dissolved Oxygen
TOA Portable Dissolved Oxygen Meter Model DO-25A
Metrohn Model 716 DMS Titrino / 10ml of titration vessel
Pt.Electrode / 6.0401.100
SBE13,Sea Bird Electronics,Inc.,USA

(5) Bottom Salinitty
Guildline Autosal model 8400B

3. Observation Sites K9606 TOCS Cruise



4.CTD Cast

4.1 CTD Sites

Figure in this page shows CTD Sites.
Pressure,salinity,temperature and dissolved oxygen were measured in each sites from sea surface to 1000m depth except stations C01,C29,C33,C36 and C37 (to 3000m).

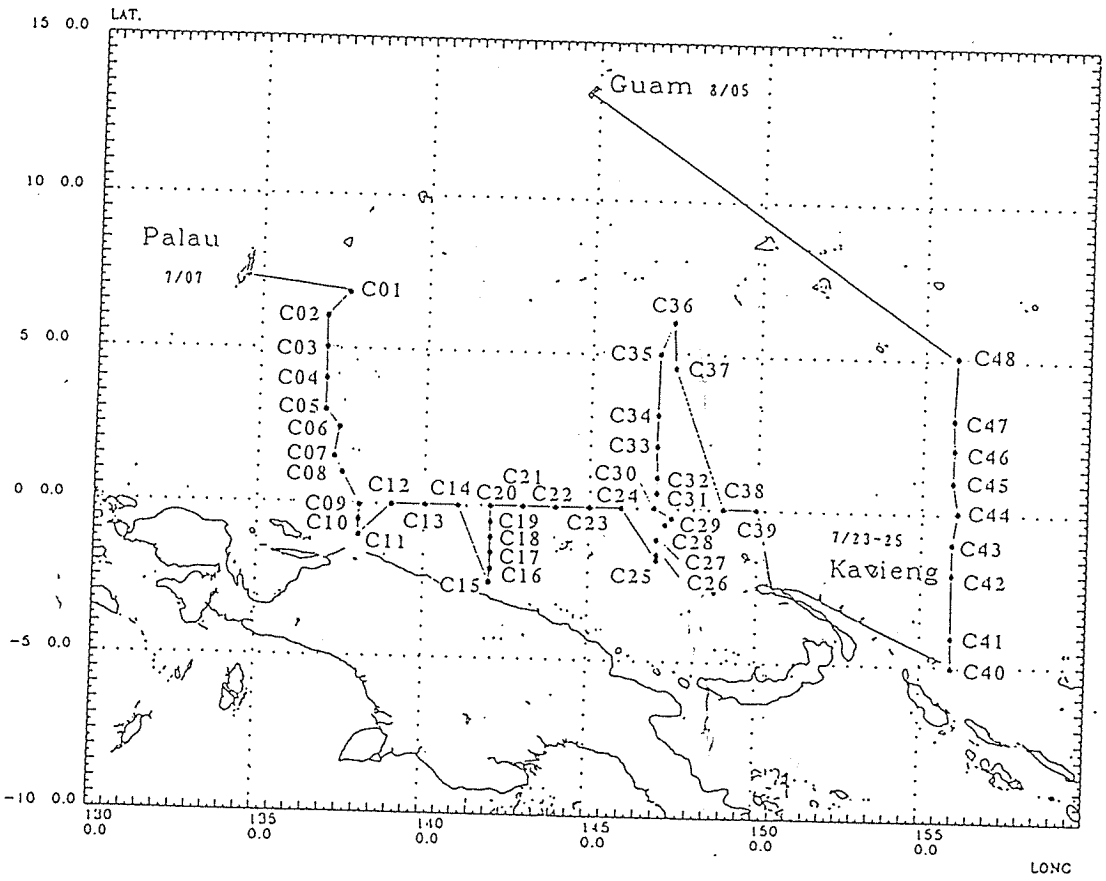
<Insturuments and software>

CTD Instruments : Sea-Bird Electronics,Inc.,model

SBE9plus CTD underwater unit	S/N 09p8010-0319
SBE11plus CTD deck unit	S/N 11p8010-0307
Pressure sensor	S/N 41223
Temperature sensor	S/N 031465
Conductivity sensor	S/N 041174
Dissolved Oxygen sensor	S/N 130311

Software : Sea-Bird Electronics,Inc.,model
SEASOFT Ver.4.207

The seawater samples for an electrode method , Winkler method and Autosal were collected by 5 liter Niskin water samplers in 50,100,150,200,250,300,400,500,600,800,1000m depth.



CTD Sites

4.2 CTD Cast Table

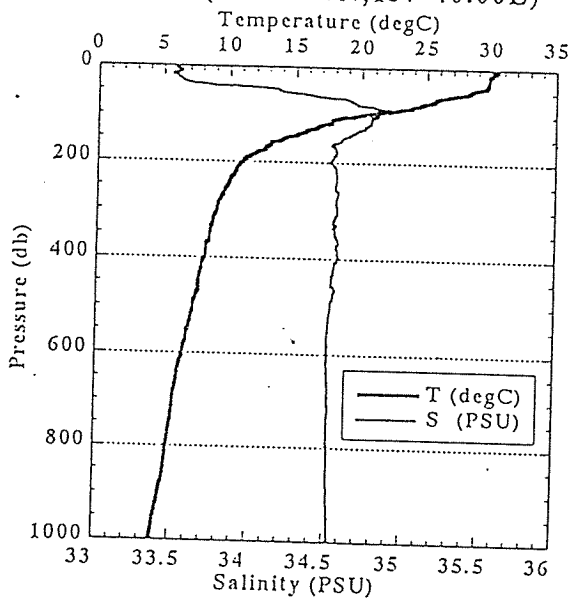
St.	Time (GMT)	Latitude	Longitude
C01	08-Jun-96 07:50	06°45.800'N	137°40.000'E
C02	08-Jun-96 16:00	06°00.000'N	137°00.000'E
C03	09-Jun-96 00:03	05°00.287'N	137°00.544'E
C04	09-Jun-96 07:30	04°00.000'N	137°00.000'E
C05	09-Jun-96 14:40	02°59.710'N	136°59.200'E
C06	09-Jun-96 21:10	02°27.031'N	137°24.236'E
C07	10-Jun-96 06:08	01°30.177'N	137°14.773'E
C08	10-Jun-96 10:10	00°59.917'N	137°29.777'E
C09	11-Jun-96 03:50	00°02.400'S	138°01.000'E
C10	11-Jun-96 07:15	00°30.064'S	137°59.437'E
C11	11-Jun-96 11:20	00°59.871'S	137°59.653'E
C12	11-Jun-96 20:00	00°00.036'S	138°59.708'E
C13	12-Jun-96 02:22	00°00.036'S	139°59.536'E
C14	12-Jun-96 08:39	00°00.003'N	140°59.661'E
C15	13-Jun-96 12:03	02°27.146'S	141°57.539'E
C16	13-Jun-96 23:09	02°01.115'S	142°00.018'E
C17	14-Jun-96 03:30	01°29.867'S	141°59.993'E
C18	14-Jun-96 07:41	01°00.306'S	141°59.720'E
C19	14-Jun-96 11:32	00°30.262'S	141°59.750'E
C20	14-Jun-96 15:28	00°00.026'N	141°59.671'E
C21	14-Jun-96 22:26	00°00.135'S	142°59.713'E
C22	15-Jun-96 05:04	00°00.121'S	143°59.758'E
C23	15-Jun-96 11:45	00°00.121'S	144°59.788'E
C24	15-Jun-96 18:33	00°00.087'S	145°56.592'E
C25	16-Jun-96 06:43	01°39.920'S	146°59.695'E
C26	16-Jun-96 08:34	01°29.879'S	146°59.815'E
C27	16-Jun-96 12:31	01°00.128'S	146°59.447'E
C28	16-Jun-96 17:06	00°30.045'S	147°15.062'E
C29	16-Jun-96 21:02	00°17.511'S	147°26.452'E
C30	17-Jun-96 03:22	00°00.925'N	146°55.231'E
C31	17-Jun-96 09:28	00°30.146'N	146°59.704'E
C32	17-Jun-96 13:06	01°00.052'N	146°59.826'E
C33	17-Jun-96 22:31	02°00.326'N	146°59.531'E
C34	18-Jun-96 05:48	03°00.045'N	146°59.857'E
C35	19-Jun-96 04:08	04°57.428'N	147°03.020'E
C36	19-Jun-96 23:44	05°58.514'N	147°27.423'E
C37	20-Jun-96 08:43	04°29.961'N	147°30.414'E
C38	21-Jun-96 20:02	00°00.118'S	148°59.754'E
C39	22-Jun 96 03:05	00°00.004'S	149°59.987'E
C40	26-Jun-96 07:50	04°58.433'S	156°00.573'E
C41	27-Jun-96 07:52	04°00.021'S	156°00.069'E
C42	28-Jun-96 02:50	01°58.644'S	155°59.852'E
C43	28-Jun-96 09:19	00°59.930'S	155°59.817'E
C44	29-Jun-96 01:19	00°02.068'N	156°09.588'E
C45	30-Jun-96 07:56	00°59.841'N	155°59.980'E
C46	30-Jun-96 22:27	02°03.088'N	156°01.558'E
C47	31-Jun-96 05:29	02°59.978'N	156°00.214'E
C48	01-Aug-96 01:03	05°00.816'N	156°04.692'E

July のまちがい。 C15のtimeは一日すすむ

ADCP K9606は生は時差補正しないが K9601はしてある。

4.3 Profiles (Temperature,Salinity,D.O.,sigma-theta)

St.C01 (06-45.80N,137-40.00E)



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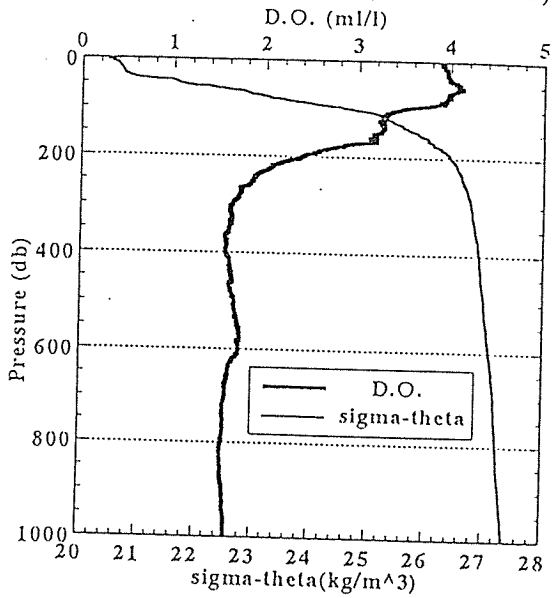

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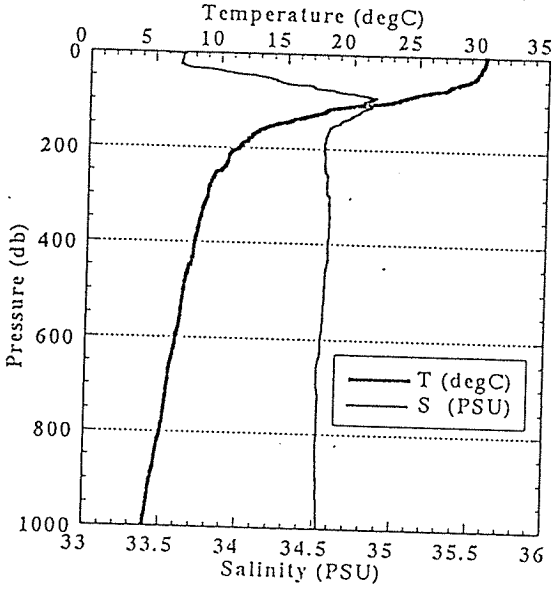

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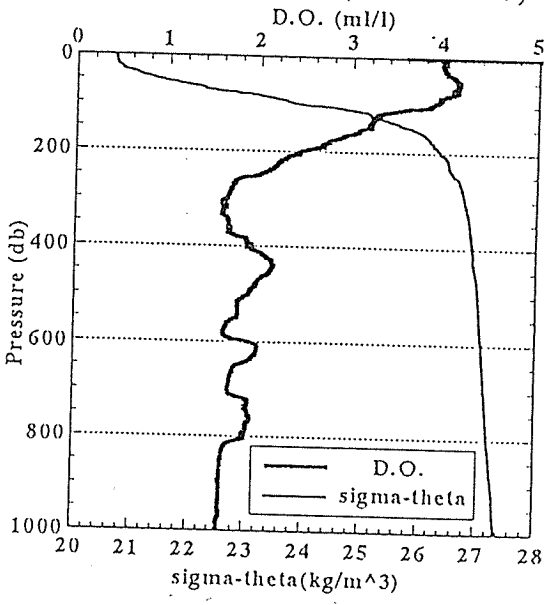
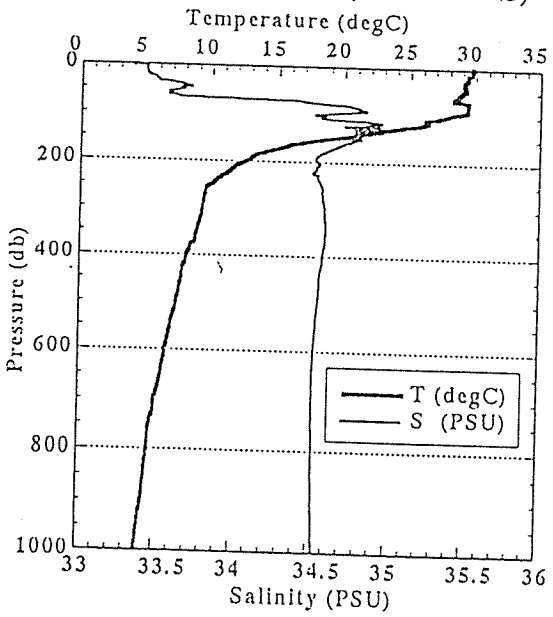


St.C03 (05-00.29N,137-00.54E)



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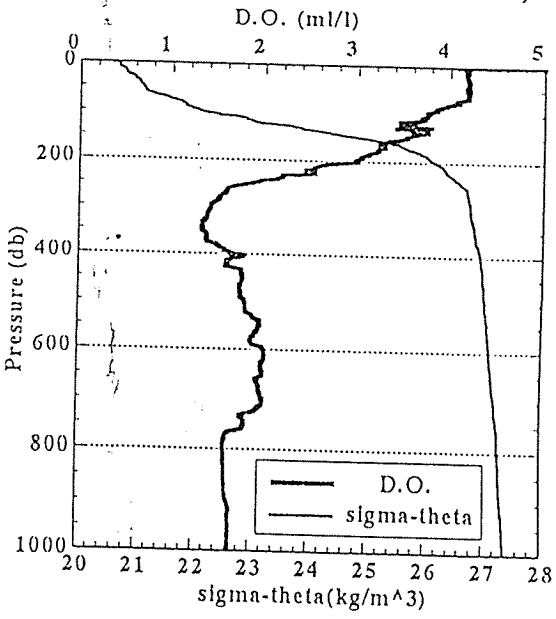
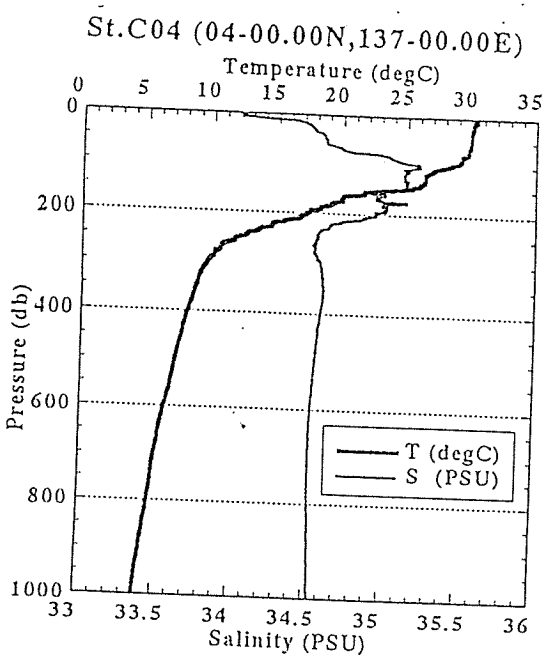
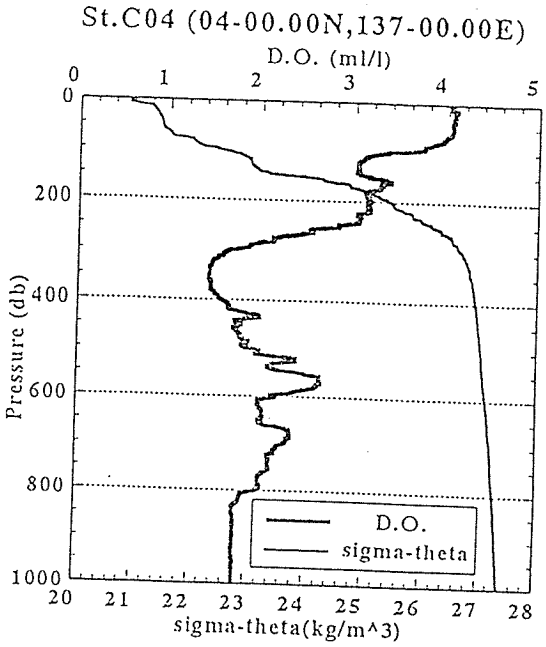
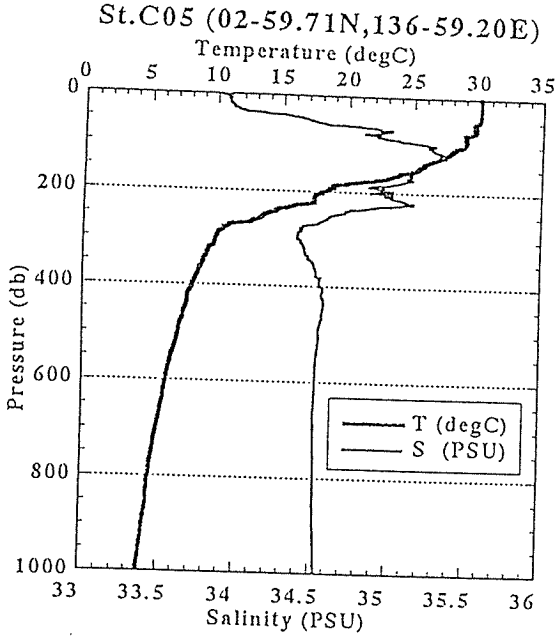
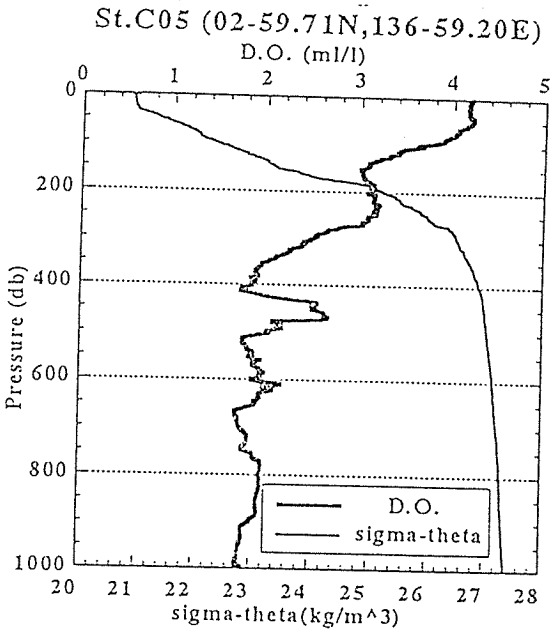



St.C04 (04-00.00N,137-00.00E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C04 (04-00.00N,137-00.00E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta


St.C05 (02-59.71N,136-59.20E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)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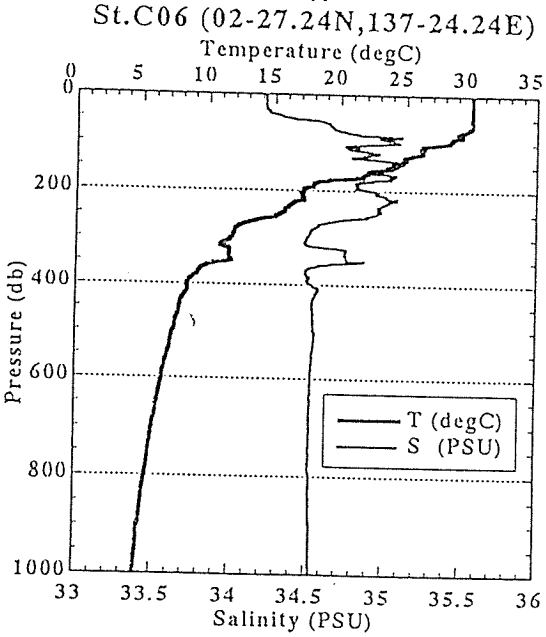
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta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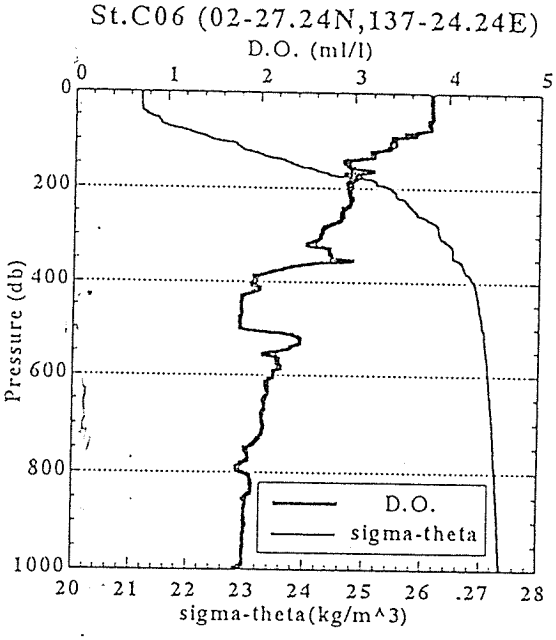
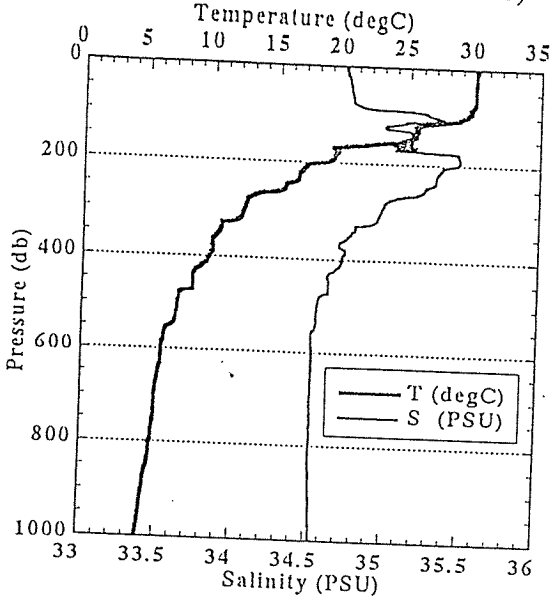
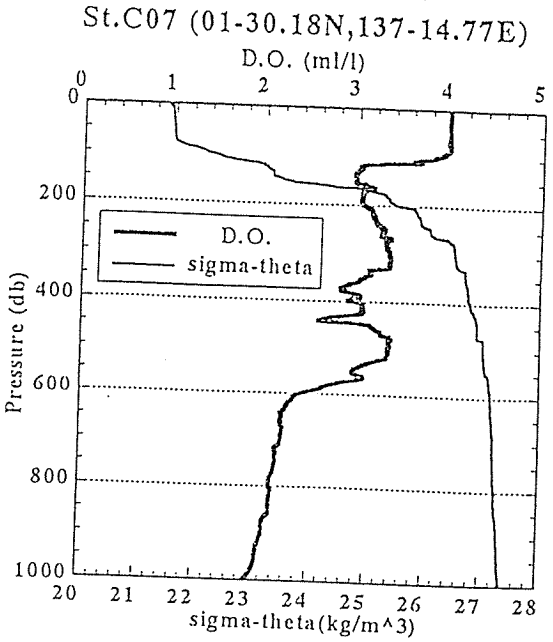
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C06 (02-27.24N,137-24.24E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

St.C07 (01-30.18N,137-14.77E)



St.C07 (01-30.18N,137-14.77E)



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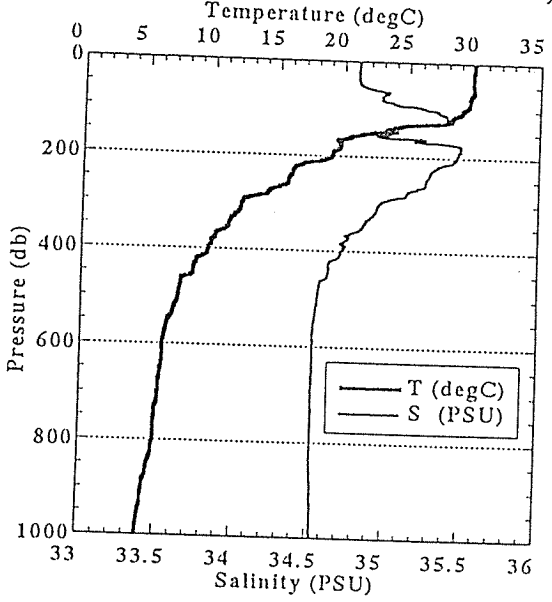

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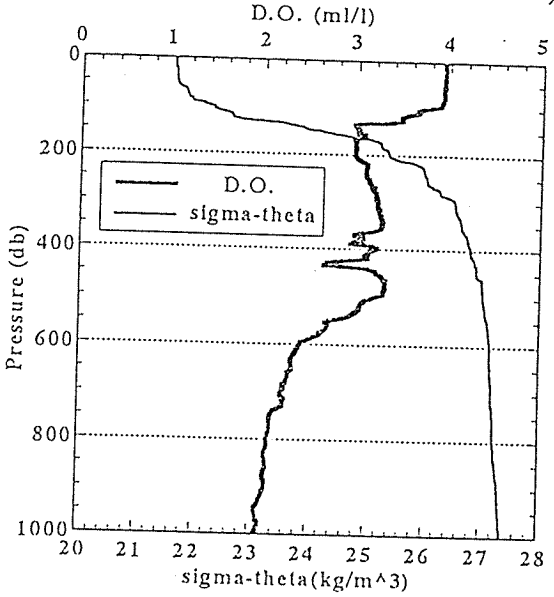

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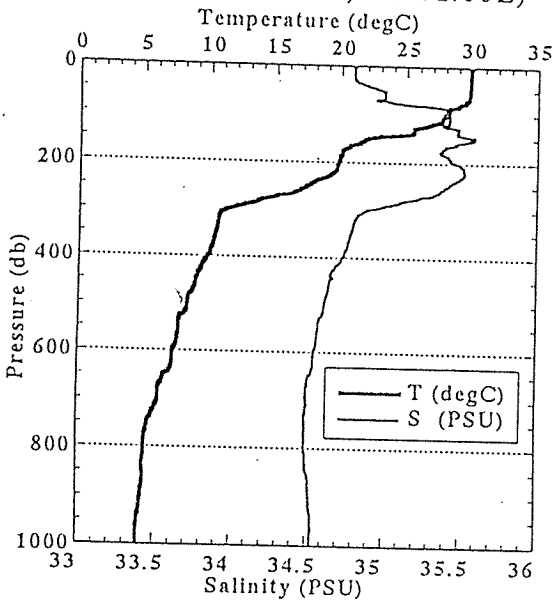

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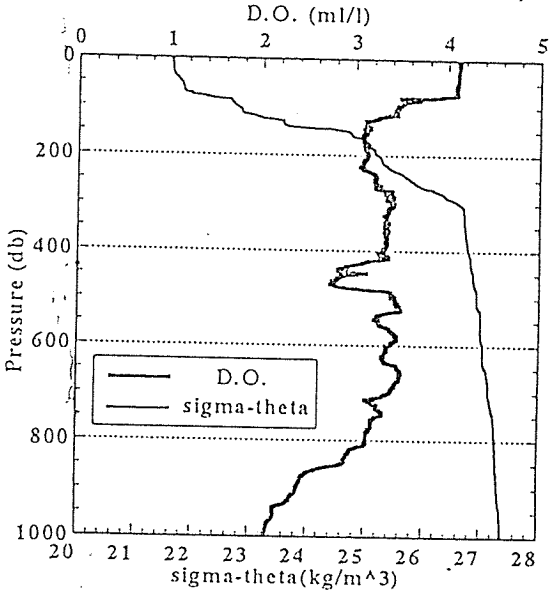
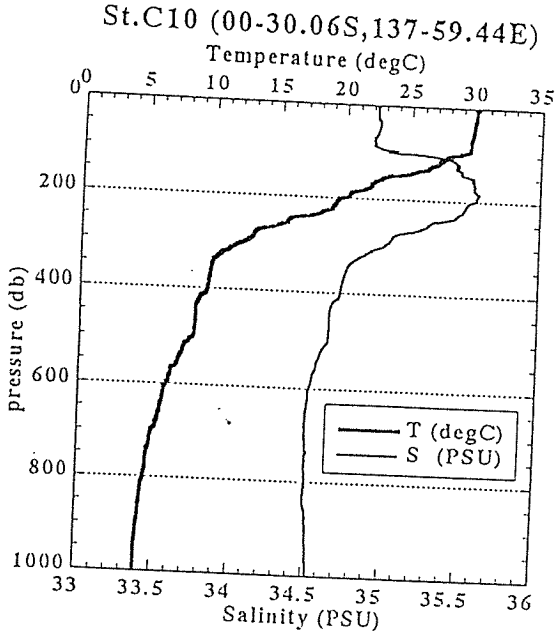
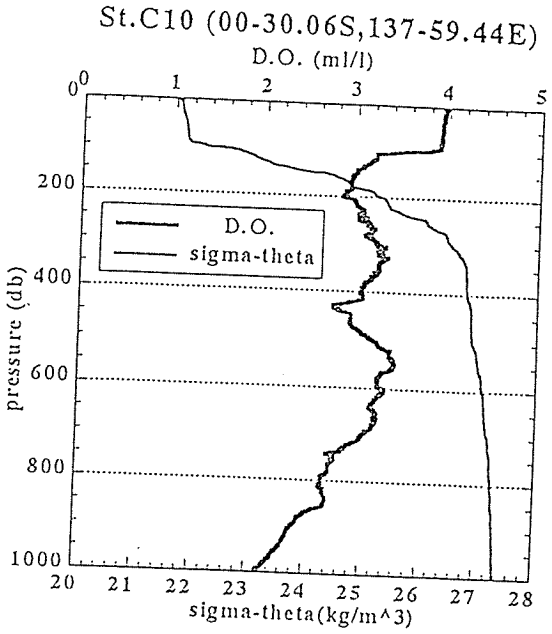
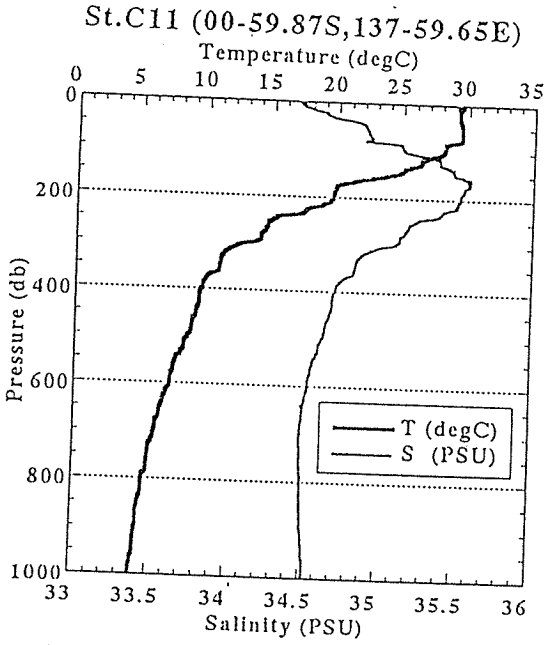



St.C10 (00-30.06S,137-59.44E)
Temperature (degC)
pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C10 (00-30.06S,137-59.44E)
D.O. (ml/l)
pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta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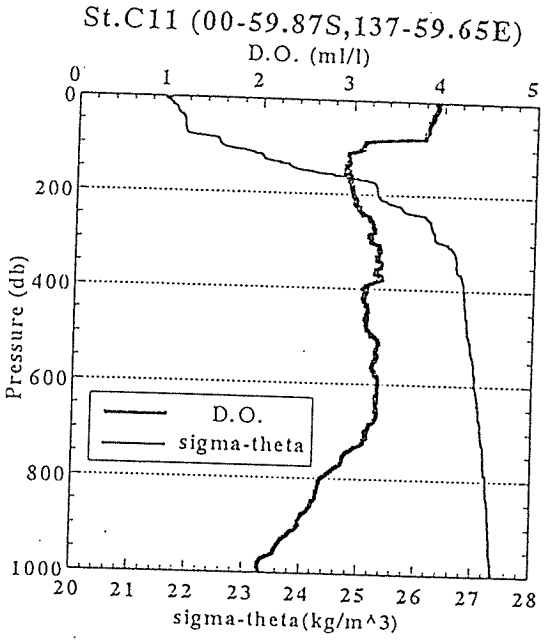
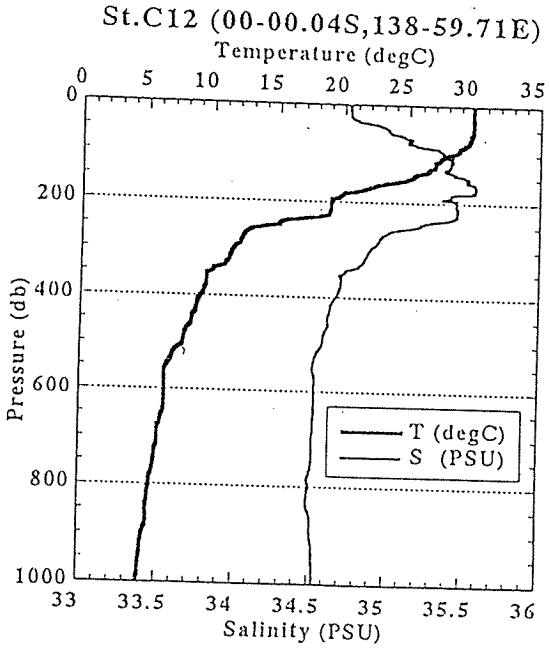
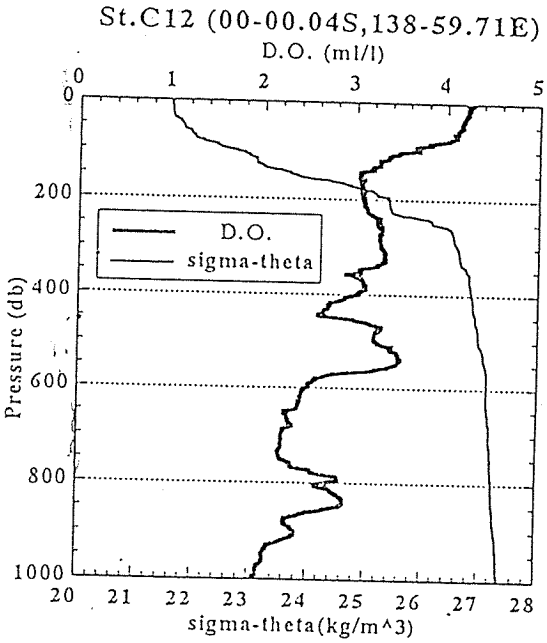
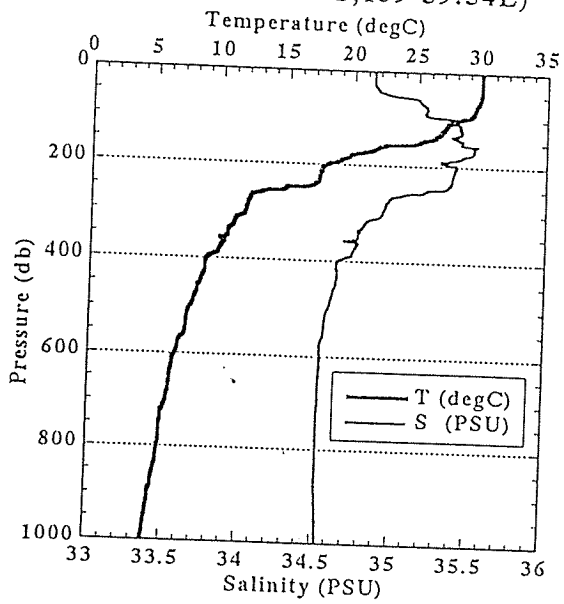
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C11 (00-59.87S,137-59.65E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

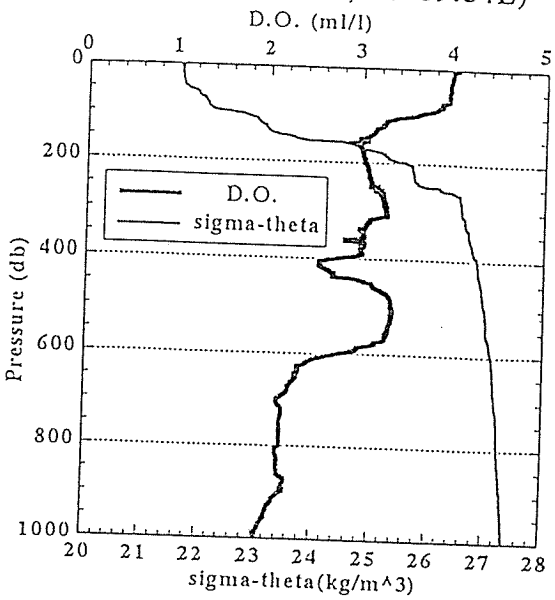

St.C12 (00-00.04S,138-59.71E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C12 (00-00.04S,138-59.71E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

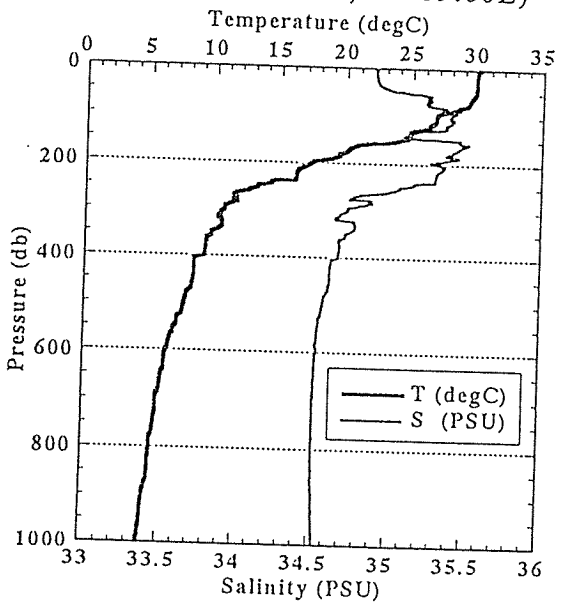
St.C13 (00-00.03S,139-59.54E)



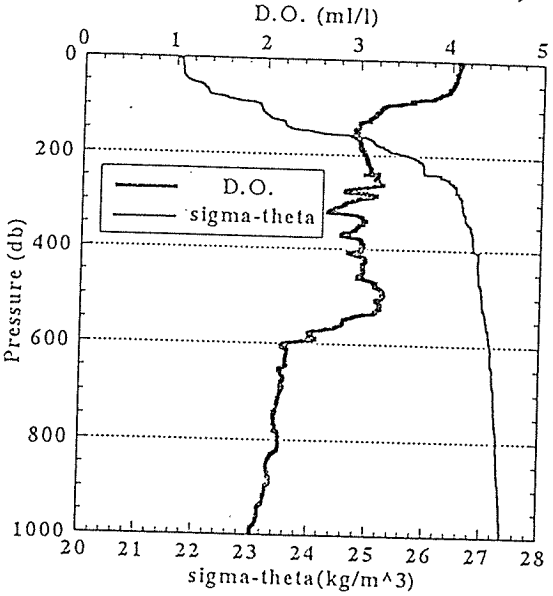
St.C13 (00-00.03S,139-59.54E)



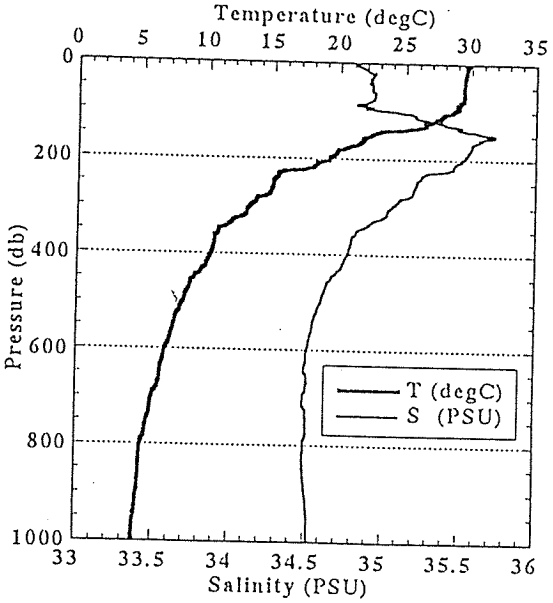
St.C14 (00-00.00N,140-59.66E)



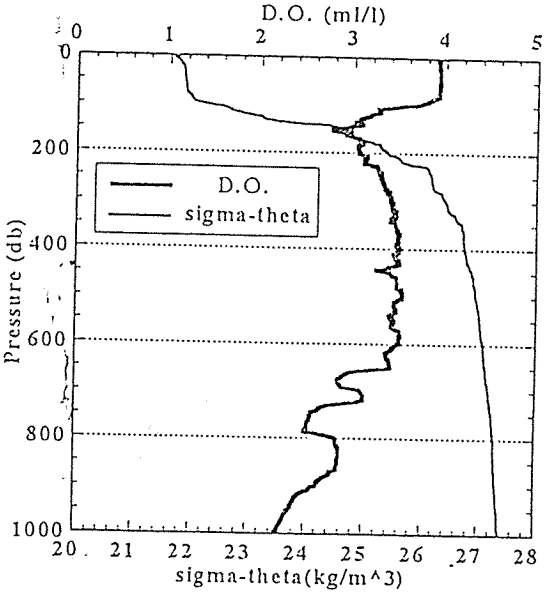
St.C14 (00-00.00N,140-59.66E)



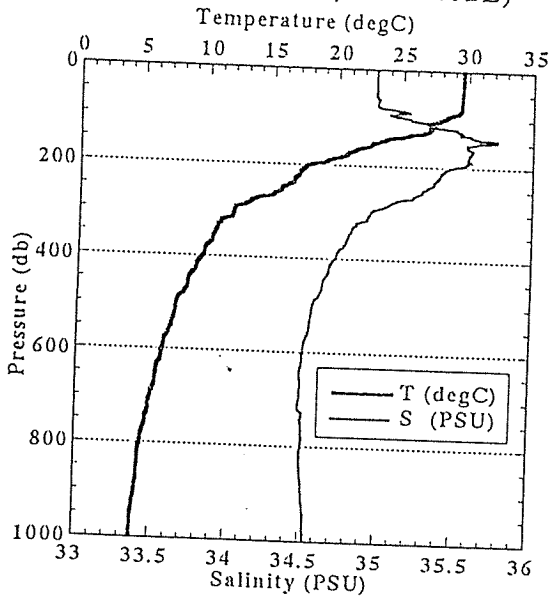
St.C15 (02-27.15S,141-57.54E)



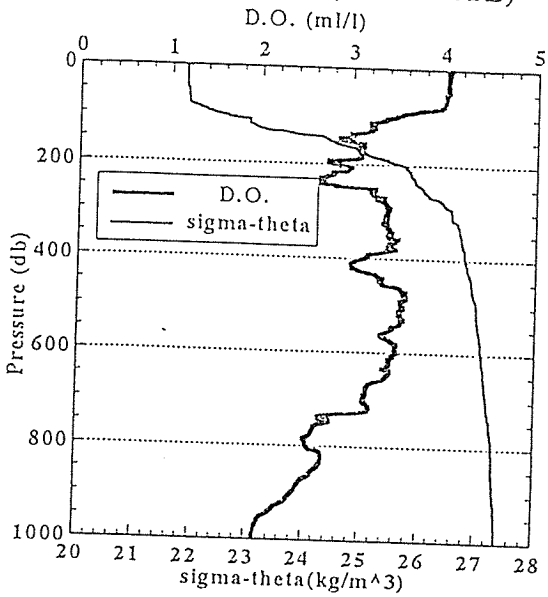
St.C15 (02-27.15S,141-57.54E)



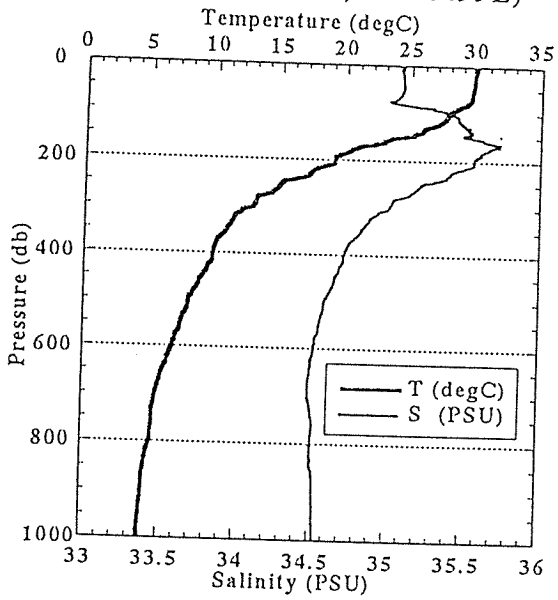
St.C16 (02-01.12S,142-00.02E)



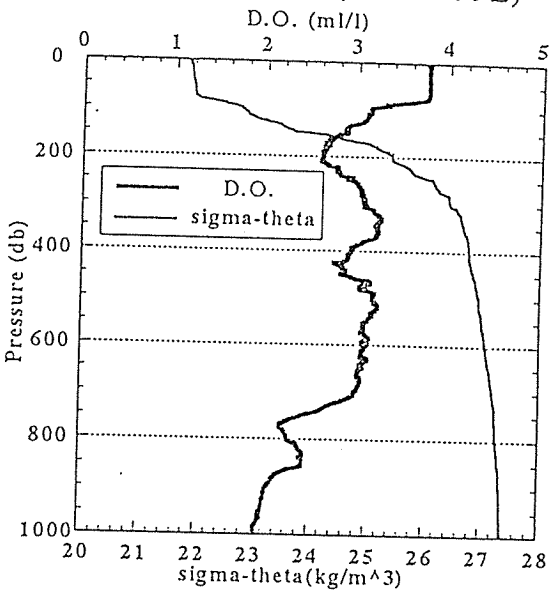
St.C16 (02-01.12S,142-00.02E)



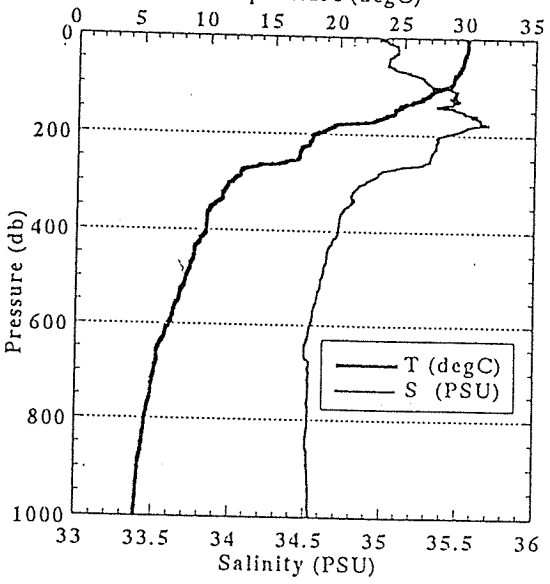
St.C17 (01-29.87S,141-59.99E)



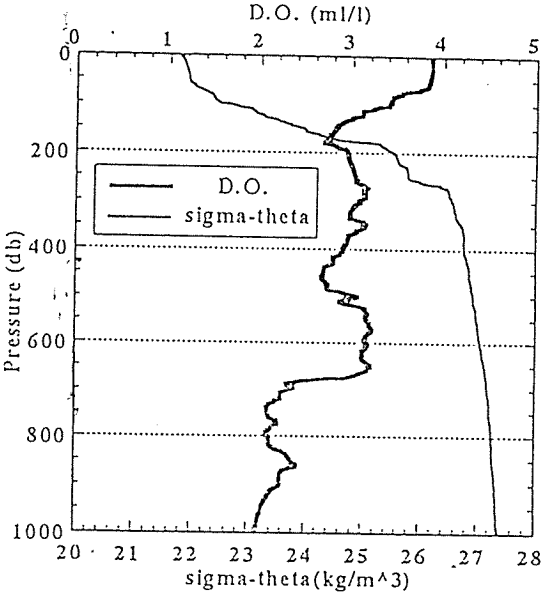
St.C17 (01-29.87S,141-59.99E)



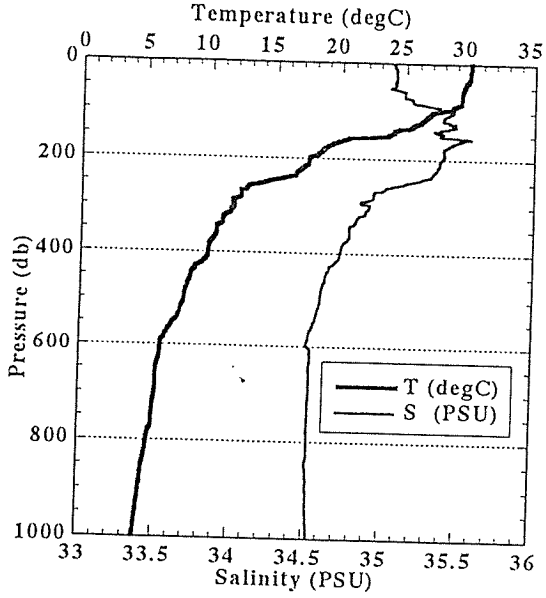
St.C18 (01-00.31S,141-59.72E)



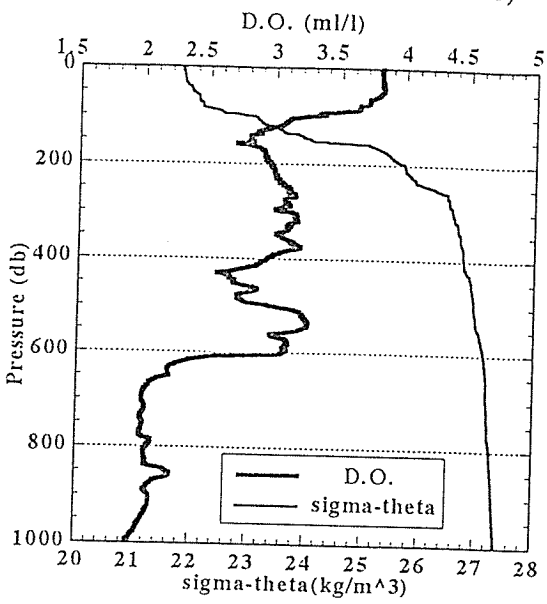
St.C18 (01-00.31S,141-59.72E)



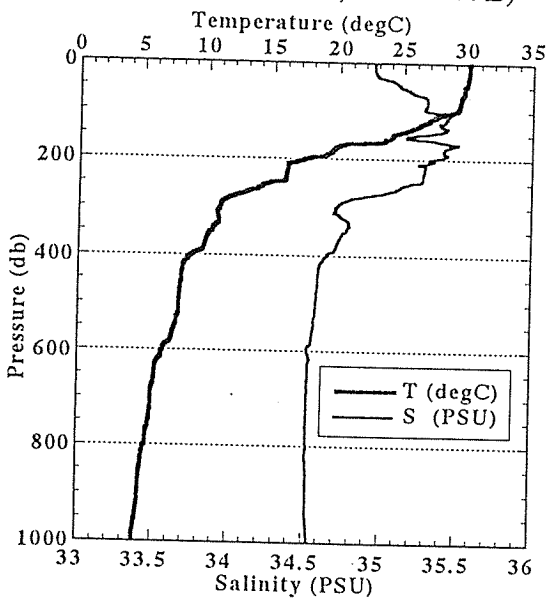
St.C19 (00-30.26S,141-59.75E)



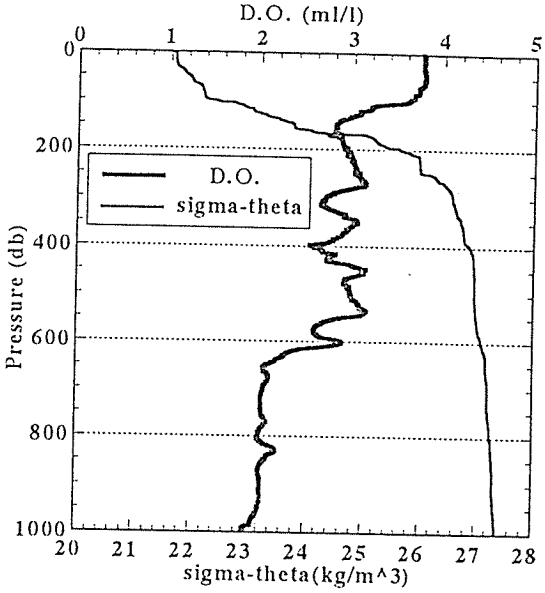
St.C19 (00-30.26S,141-59.75E)



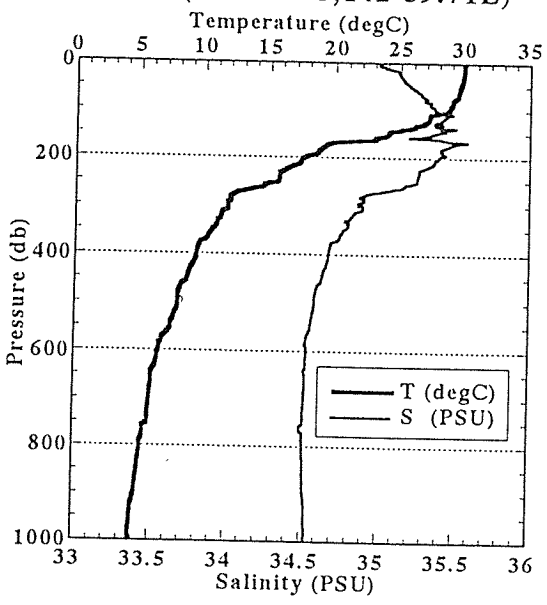
St.C20 (00-00.03N,141-59.67E)



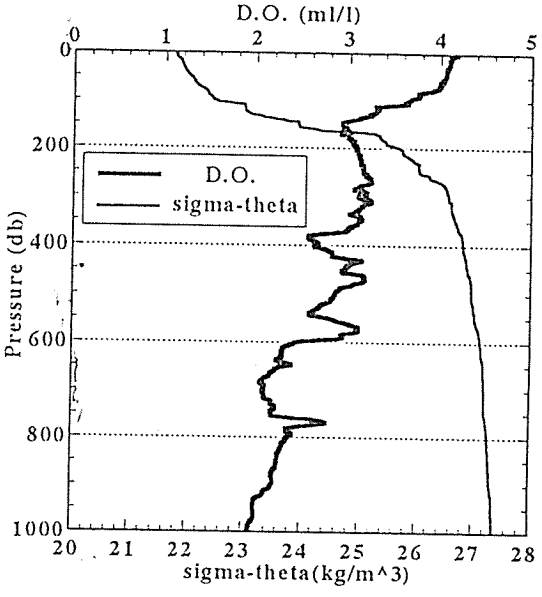
St.C20 (00-00.03N,141-59.67E)

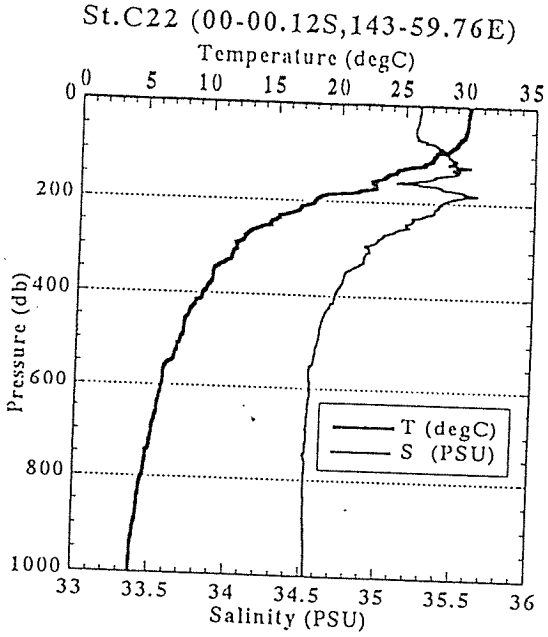


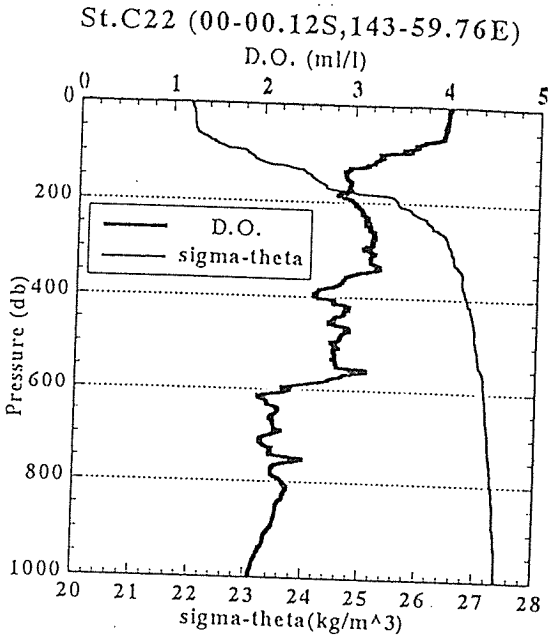
St.C21 (00-00.14S,142-59.71E)

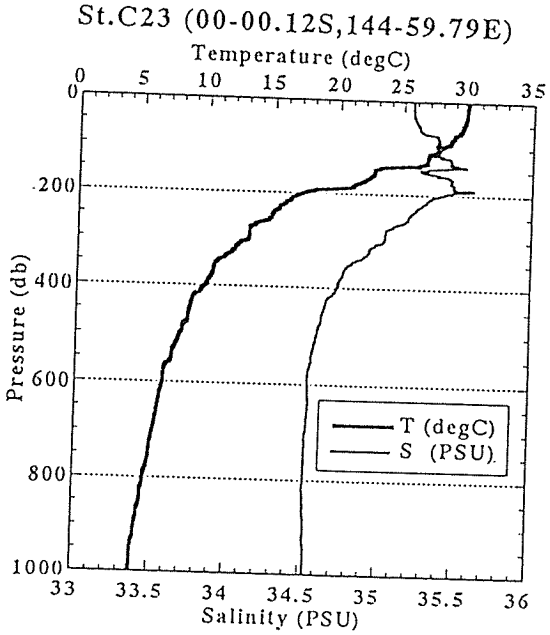


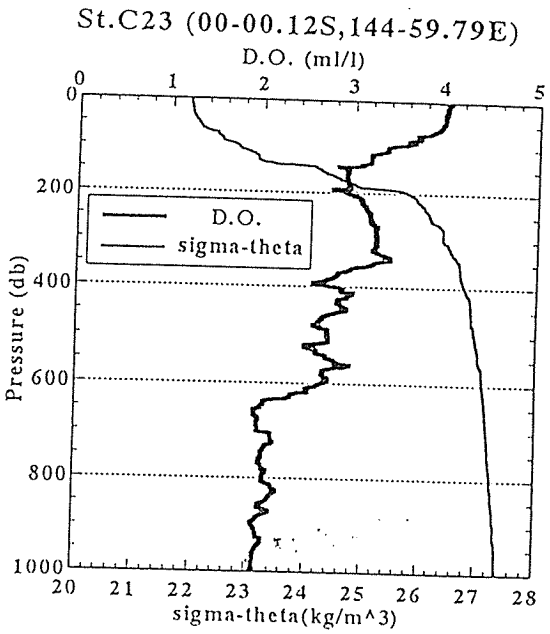
St.C21 (00-00.14S,142-59.71E)

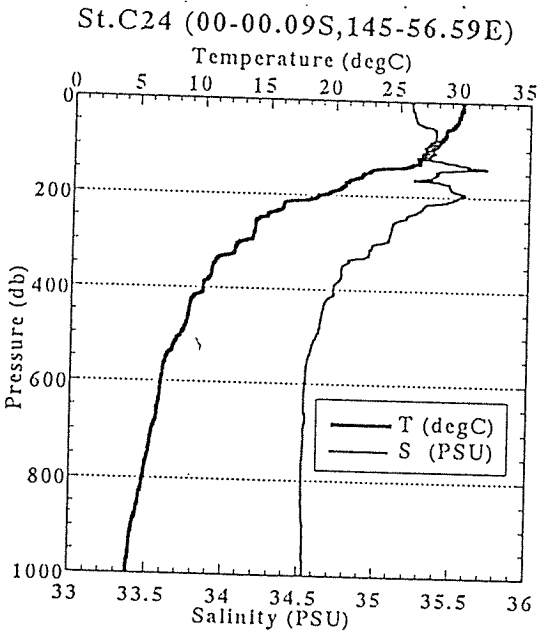


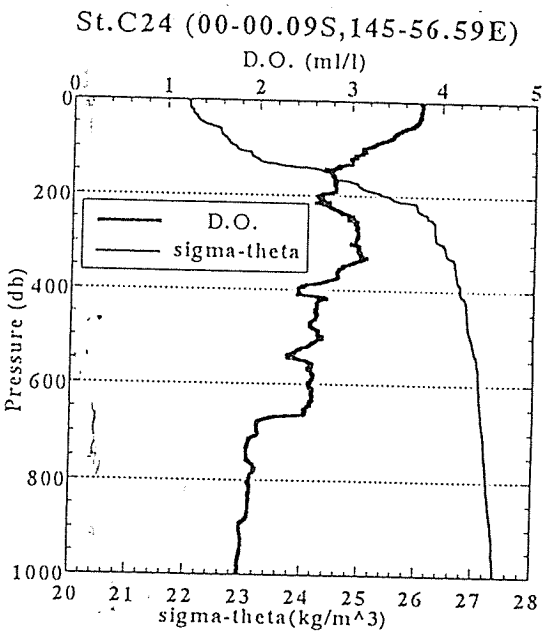

St.C22 (00-00.12S,143-59.76E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

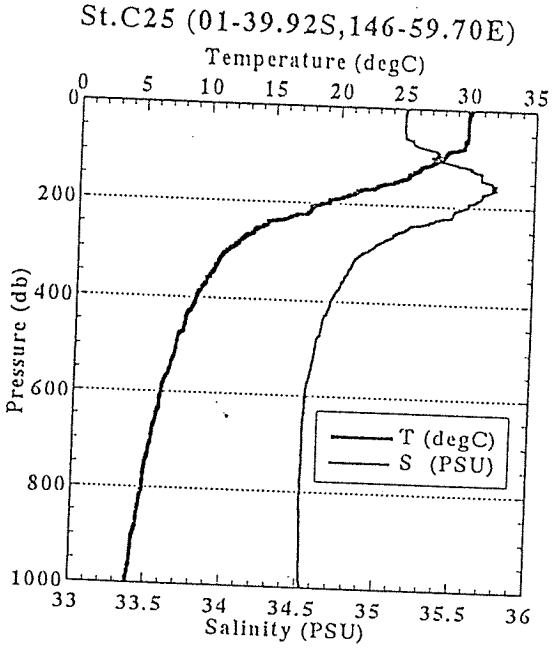

St.C22 (00-00.12S,143-59.76E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

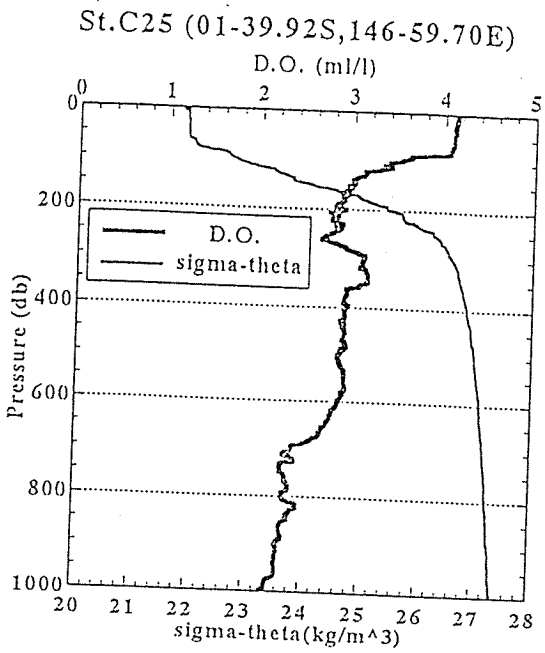

St.C23 (00-00.12S,144-59.79E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

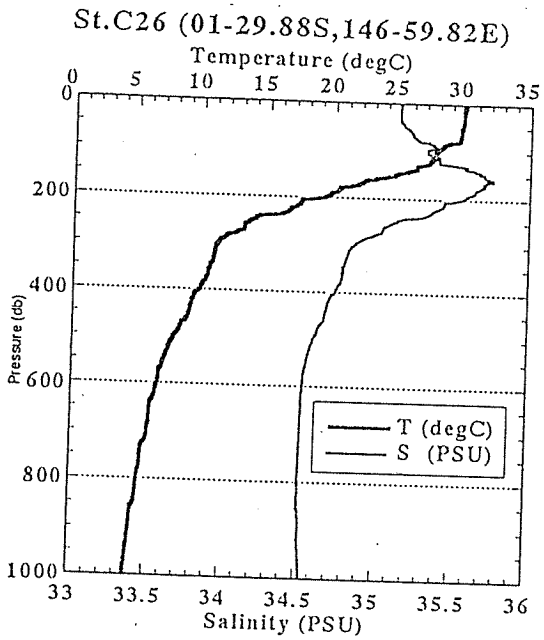

St.C23 (00-00.12S,144-59.79E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

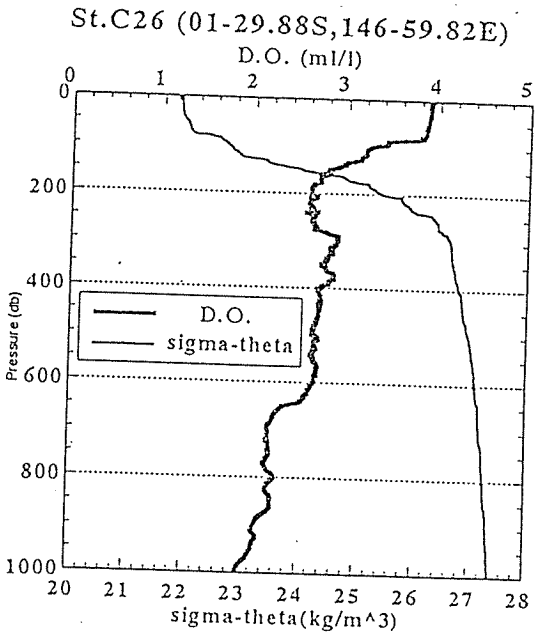

St.C24 (00-00.09S,145-56.59E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

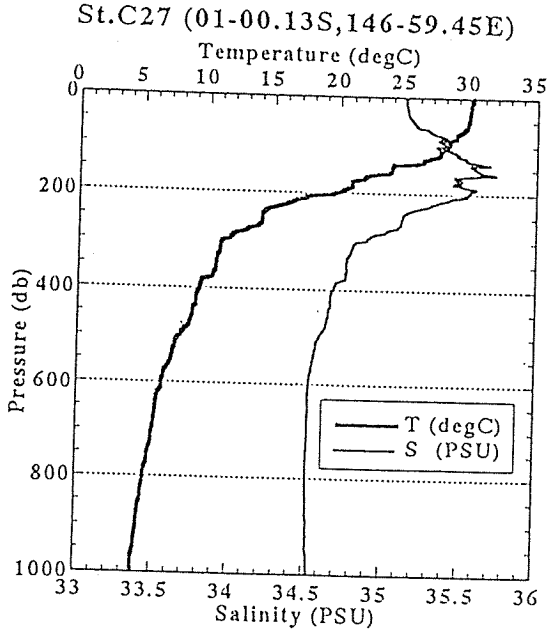

St.C24 (00-00.09S,145-56.59E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

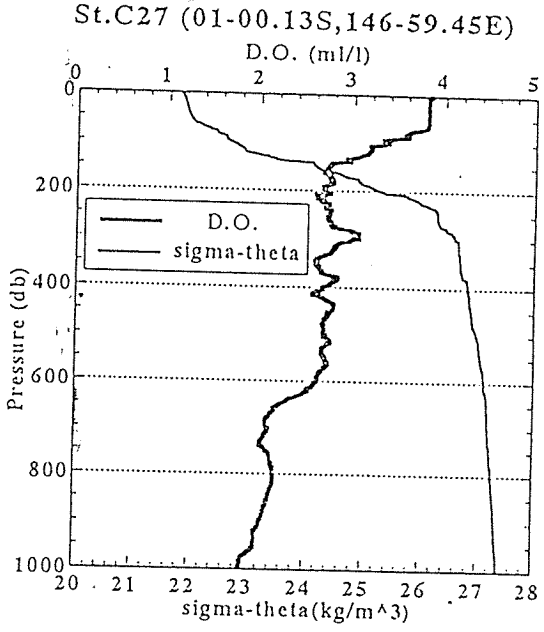

St.C25 (01-39.92S,146-59.70E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

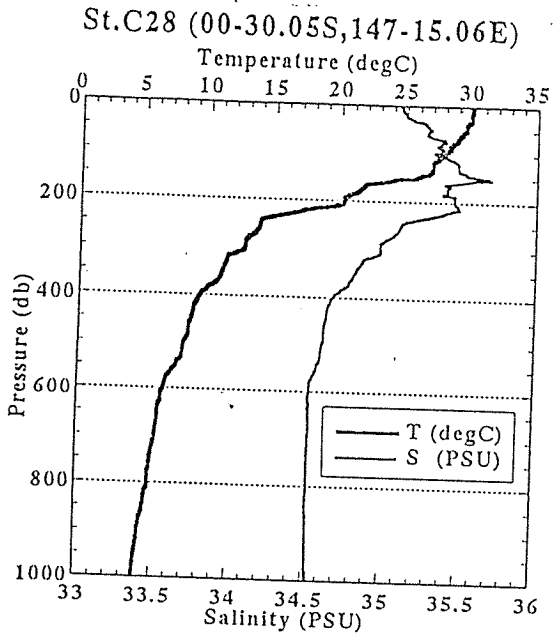

St.C25 (01-39.92S,146-59.70E)
D.O. (ml/l)
Pressure (db)
D.O.
sigma-theta
sigma-theta(kg/m^3)

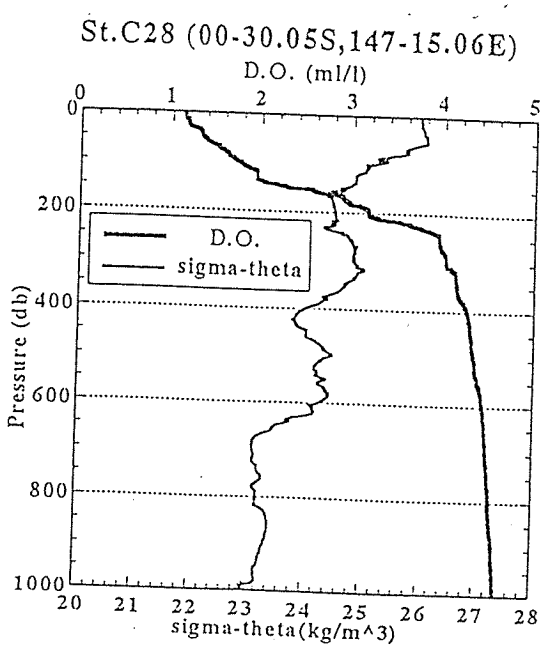

St.C26 (01-29.88S,146-59.82E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

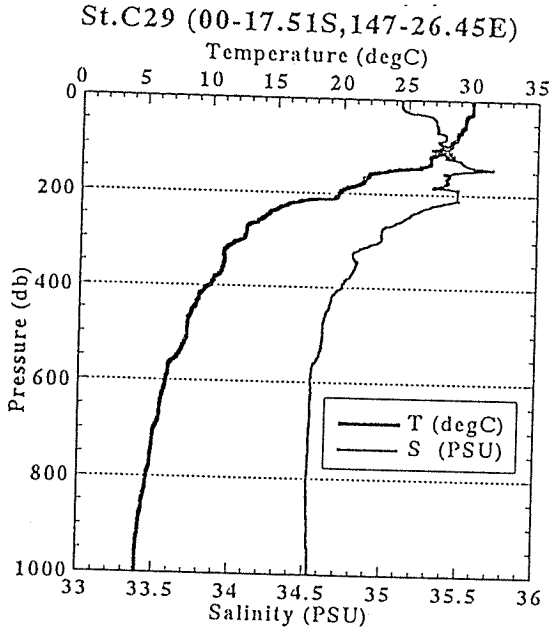

St.C26 (01-29.88S,146-59.82E)
D.O. (ml/l)
Pressure (db)
D.O.
sigma-theta
sigma-theta(kg/m^3)

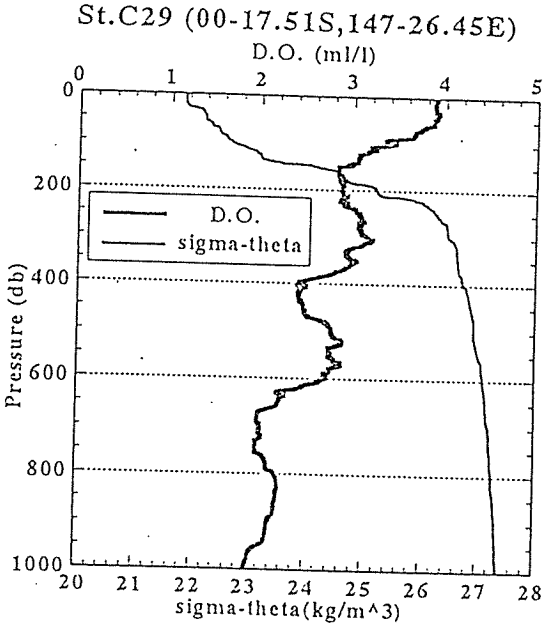

St.C27 (01-00.13S,146-59.45E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

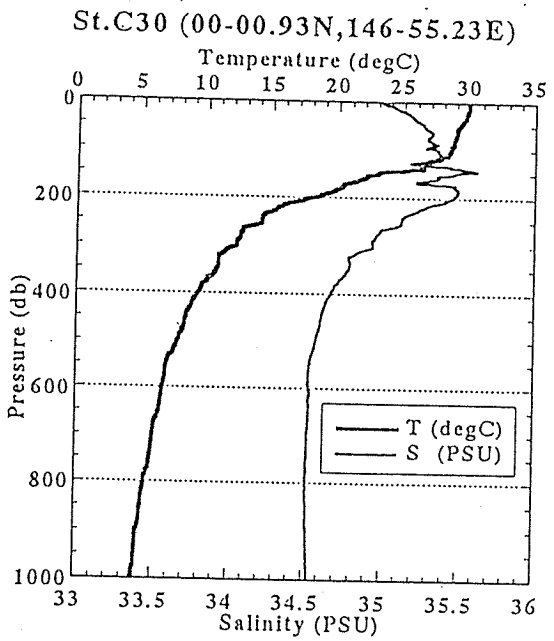

St.C27 (01-00.13S,146-59.45E)
D.O. (ml/l)
Pressure (db)
D.O.
sigma-theta
sigma-theta(kg/m^3)

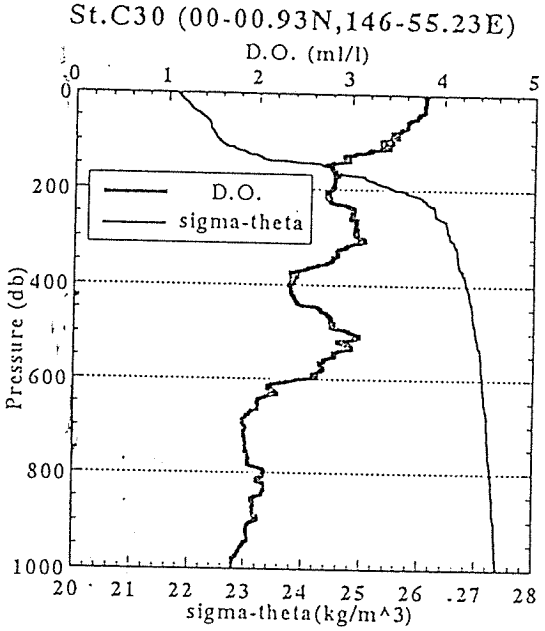

St.C28 (00-30.05S,147-15.06E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C28 (00-30.05S,147-15.06E)
D.O. (ml/l)
Pressure (db)
D.O.
sigma-theta
sigma-theta(kg/m^3)

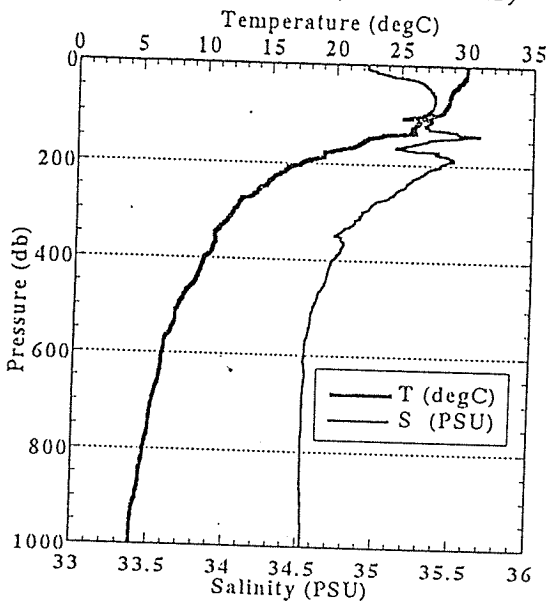

St.C29 (00-17.51S,147-26.45E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C29 (00-17.51S,147-26.45E)
D.O. (ml/l)
Pressure (db)
D.O.
sigma-theta
sigma-theta(kg/m^3)

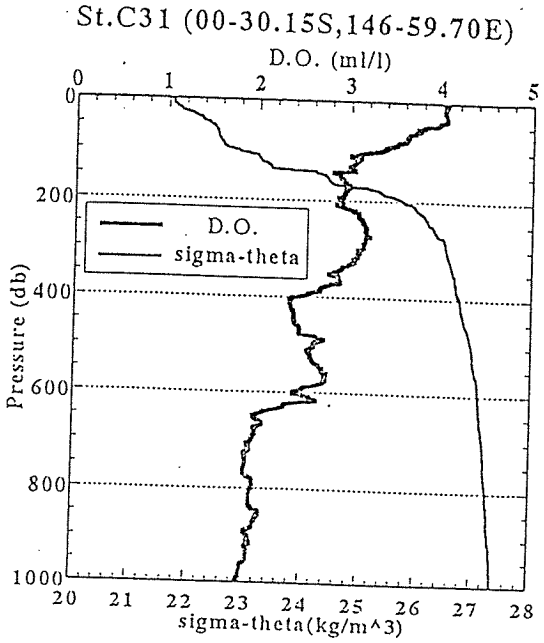

St.C30 (00-00.93N,146-55.23E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C30 (00-00.93N,146-55.23E)
D.O. (ml/l)
Pressure (db)
D.O.
sigma-theta
sigma-theta(kg/m^3)

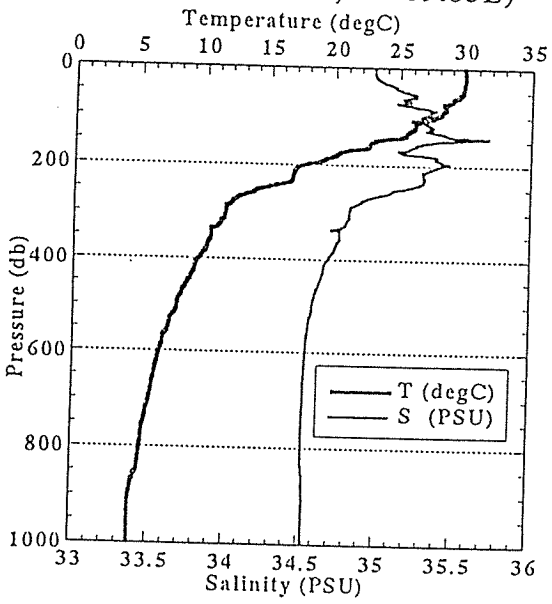
St.C31 (00-30.15N,146-59.70E)



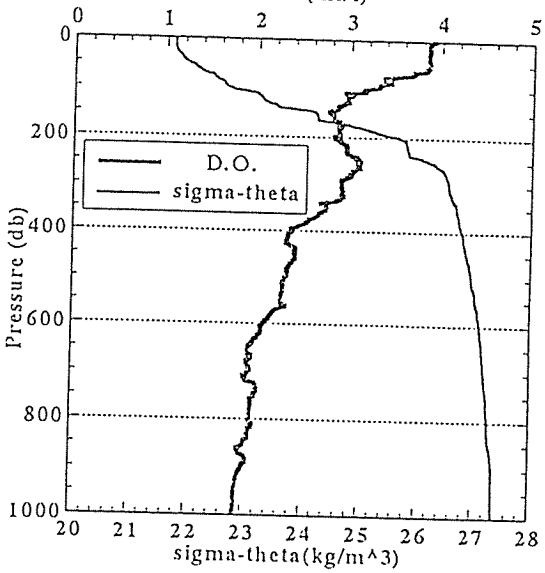
St.C31 (00-30.15S,146-59.70E)



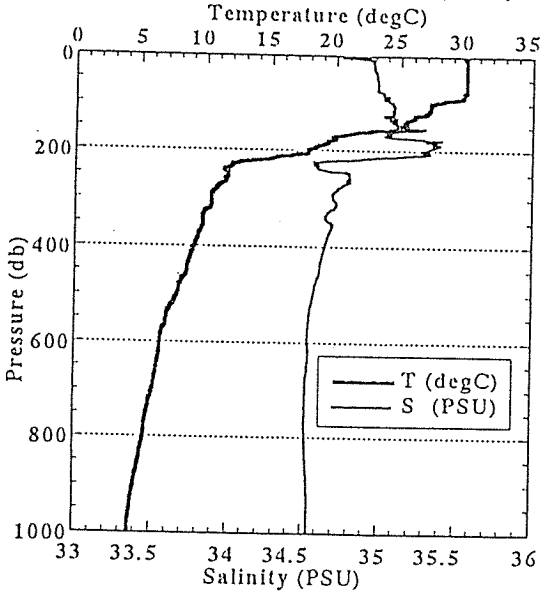
St.C32 (01-00.05N,146-59.83E)



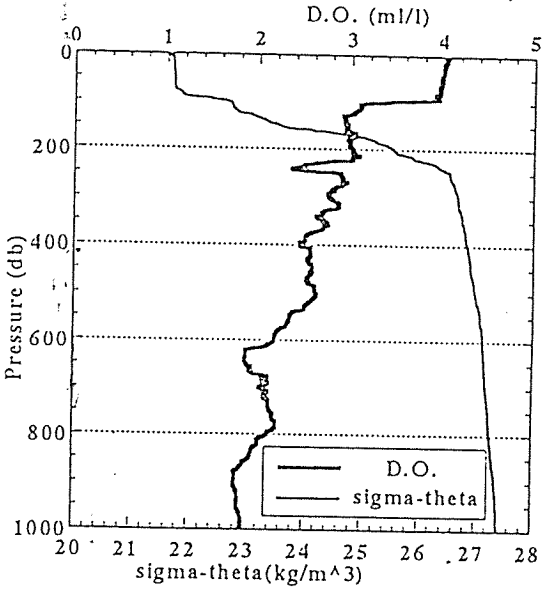
St.C32 (01-00.05N,146-59.83E)

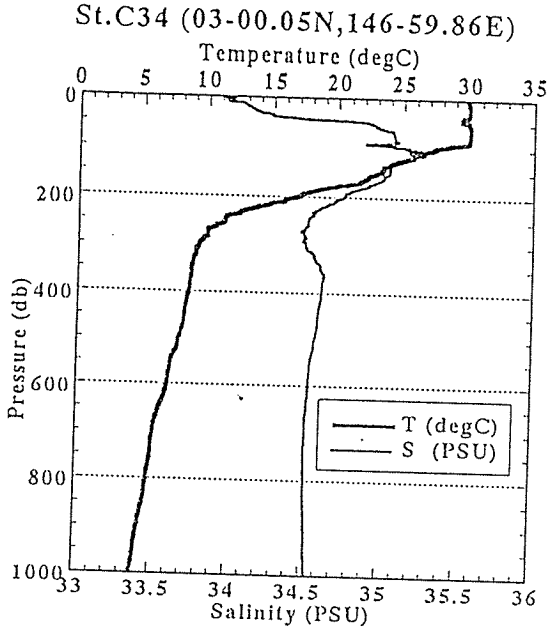


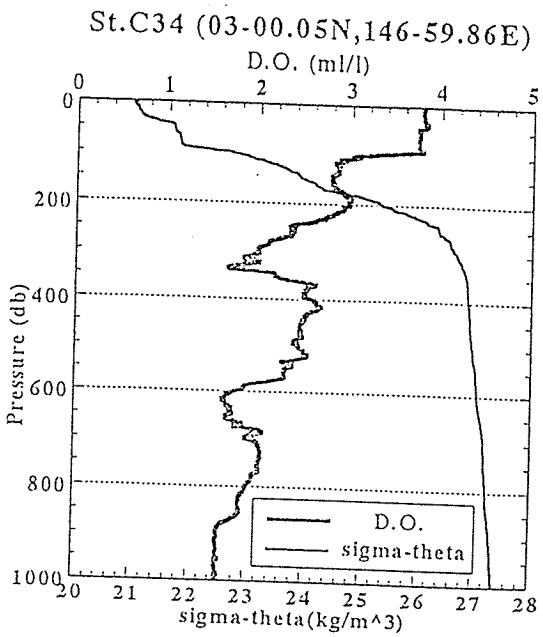
St.C33 (02-00.33N,146-59.53E)

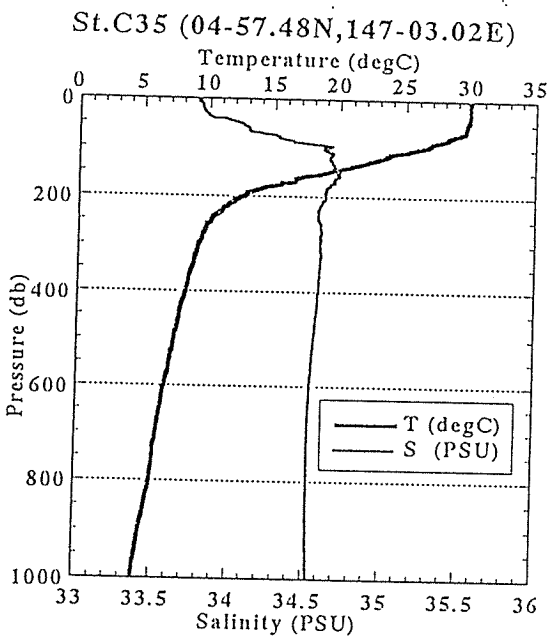


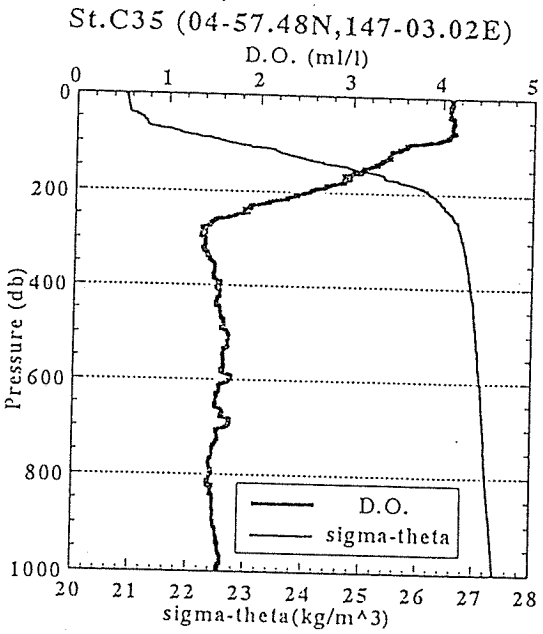
St.C33 (02-00.33N,146-59.53E)

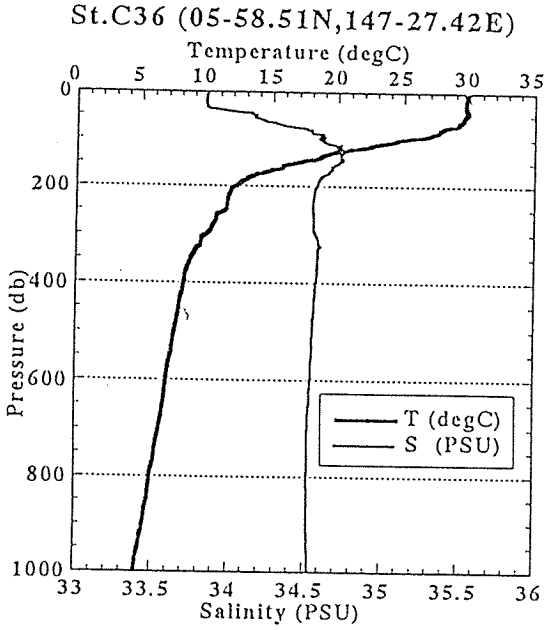


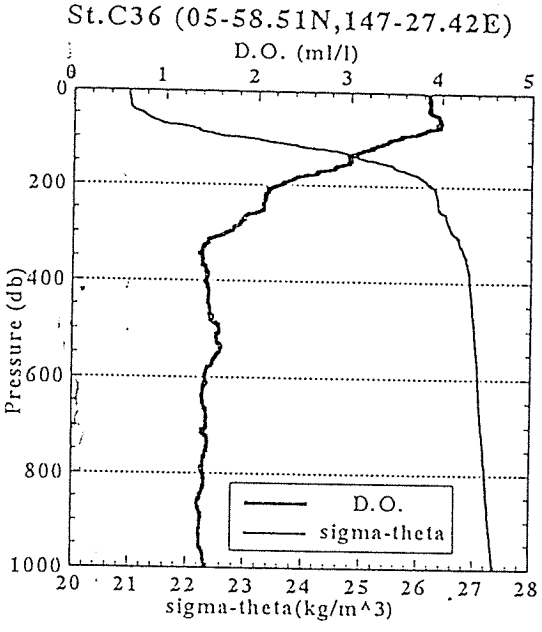

St.C34 (03-00.05N,146-59.86E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

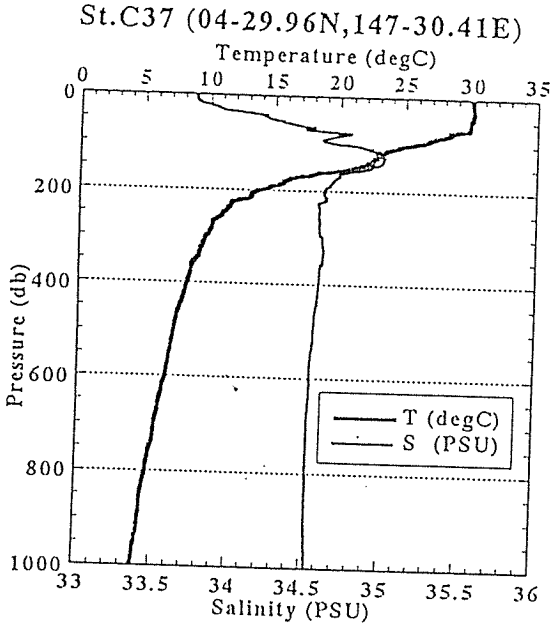

St.C34 (03-00.05N,146-59.86E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

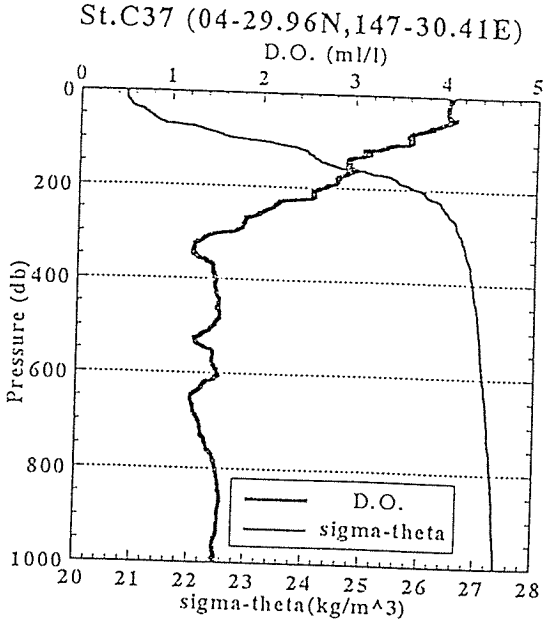

St.C35 (04-57.48N,147-03.02E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

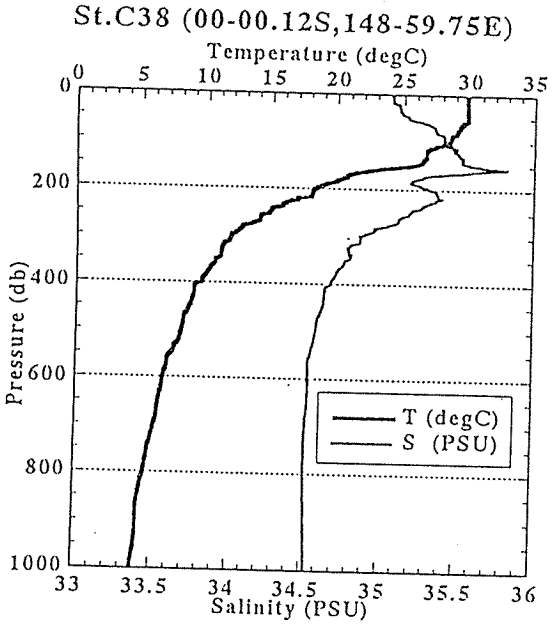

St.C35 (04-57.48N,147-03.02E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

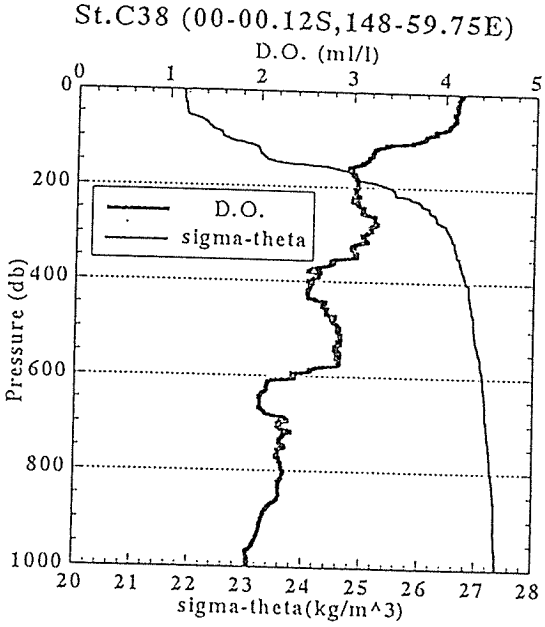

St.C36 (05-58.51N,147-27.42E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)

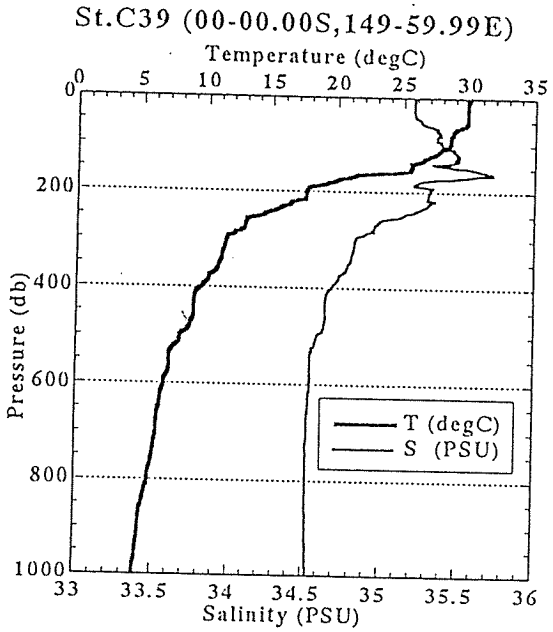

St.C36 (05-58.51N,147-27.42E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

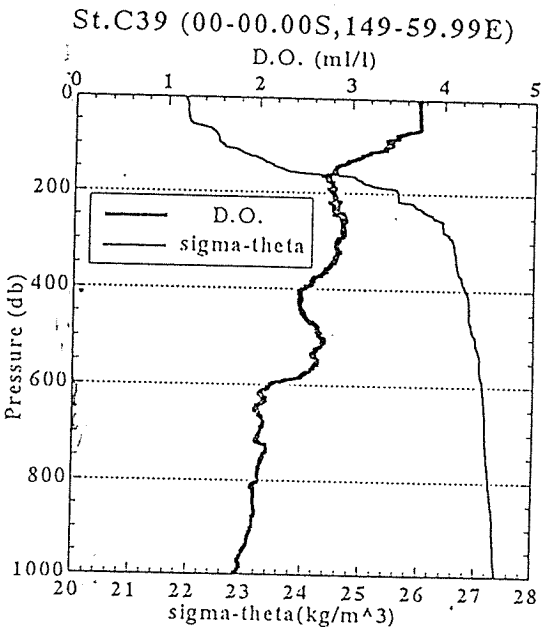

St.C37 (04-29.96N,147-30.41E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C37 (04-29.96N,147-30.41E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

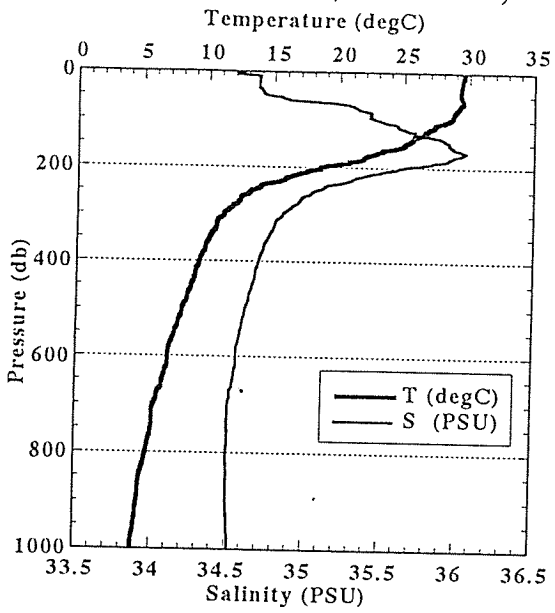

St.C38 (00-00.12S,148-59.75E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C38 (00-00.12S,148-59.75E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

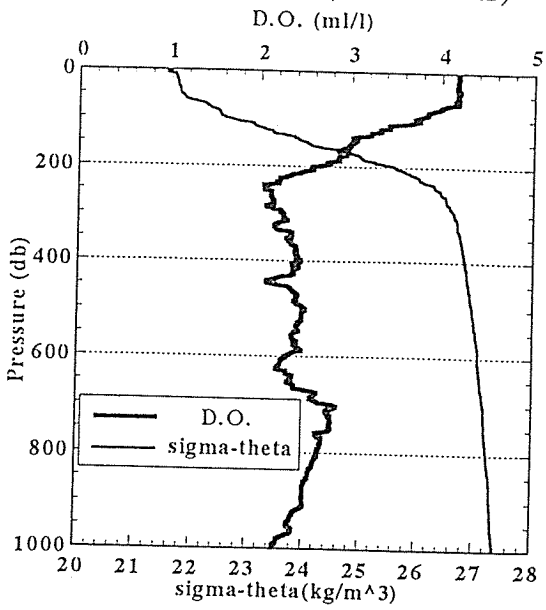

St.C39 (00-00.00S,149-59.99E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C39 (00-00.00S,149-59.99E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

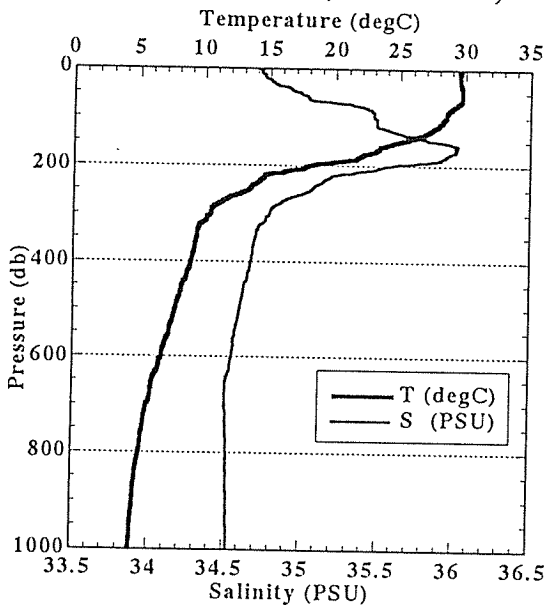
St.C40 (04-58.43S,156-00.57E)



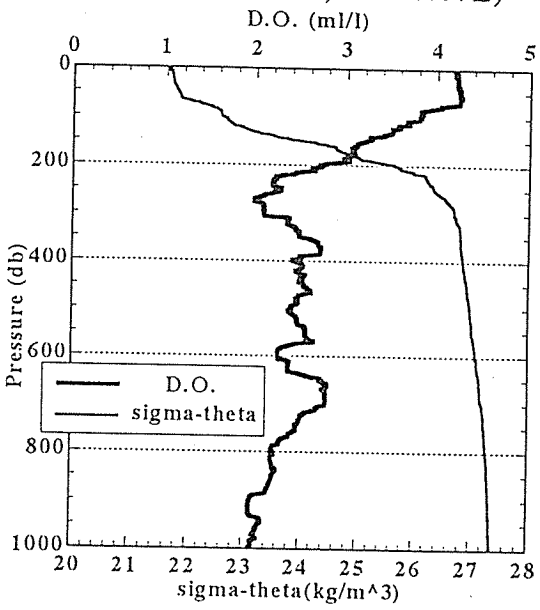
St.C40 (04-58.43S,156-00.57E)



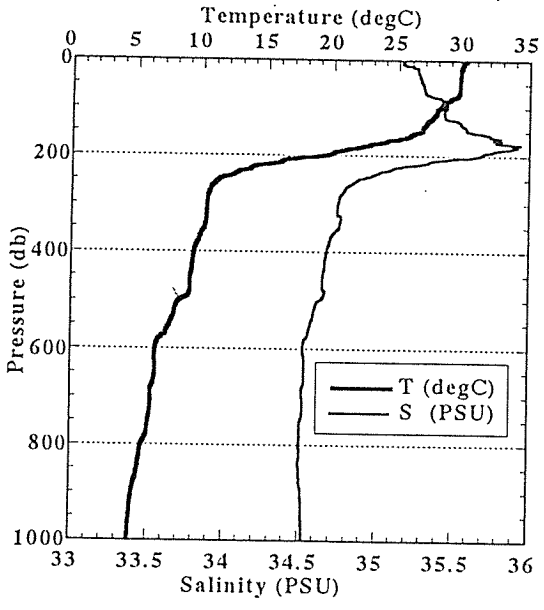
St.C41 (04-00.02S,156-00.07E)



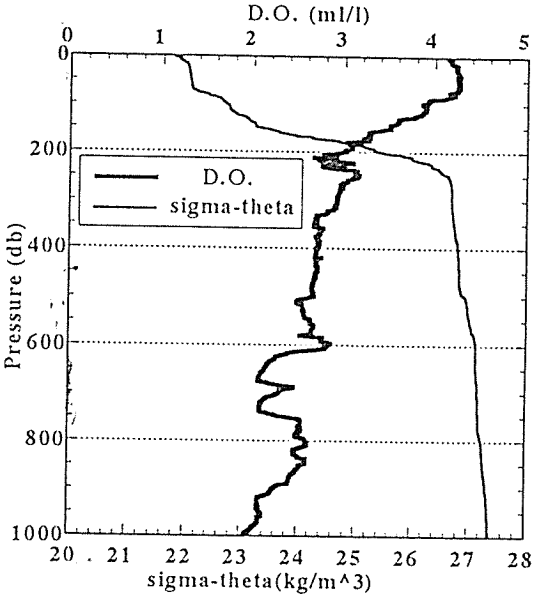
St.C41 (04-00.02S,156-00.07E)

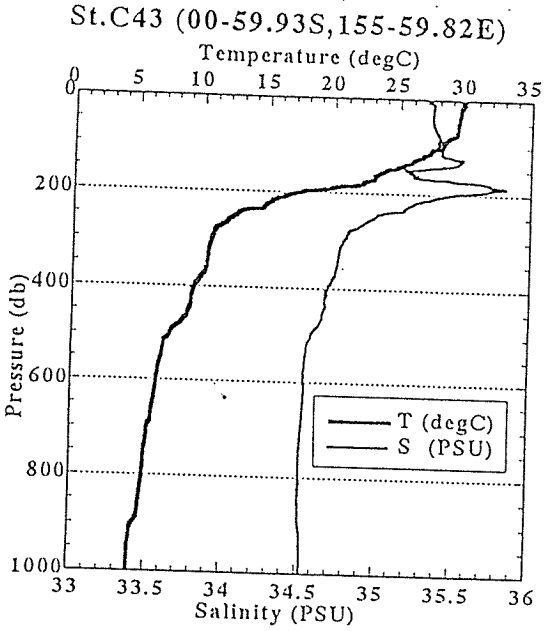


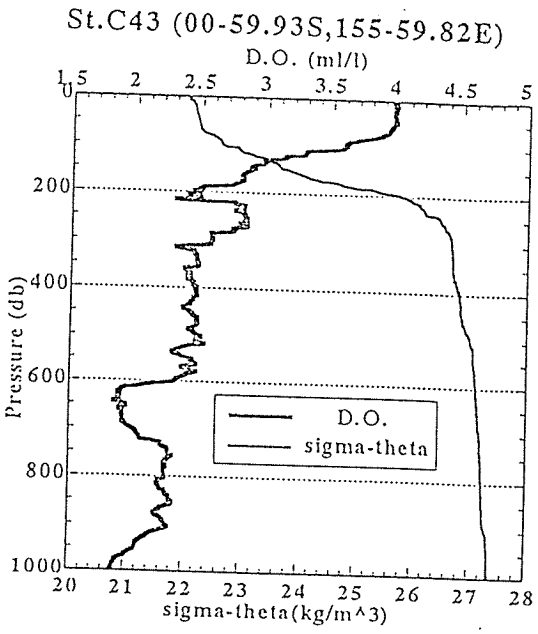
St.C42 (01-58.64S,155-59.85E)

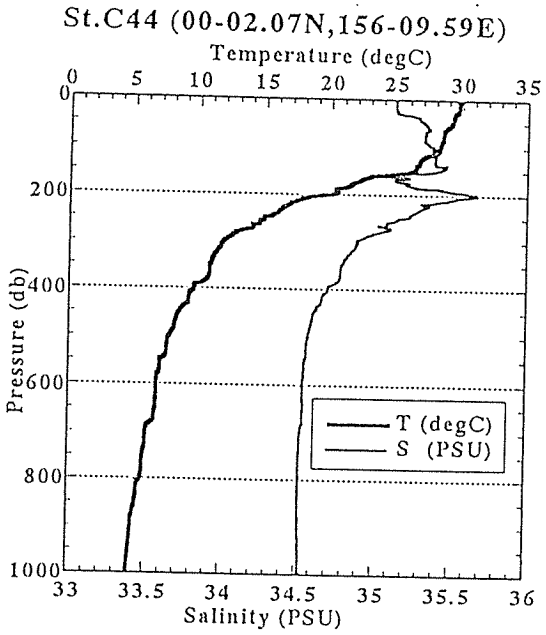


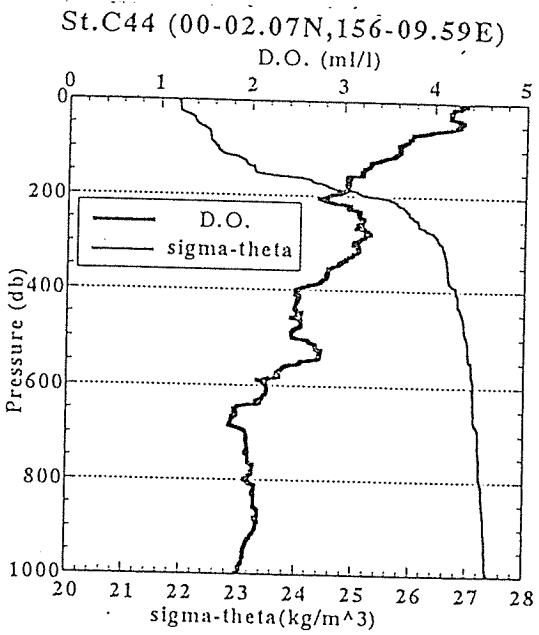
St.C42 (01-58.64S,155-59.85E)

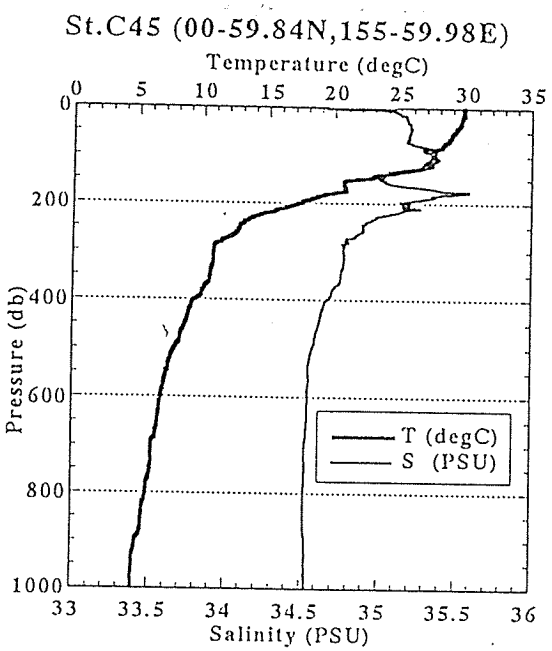


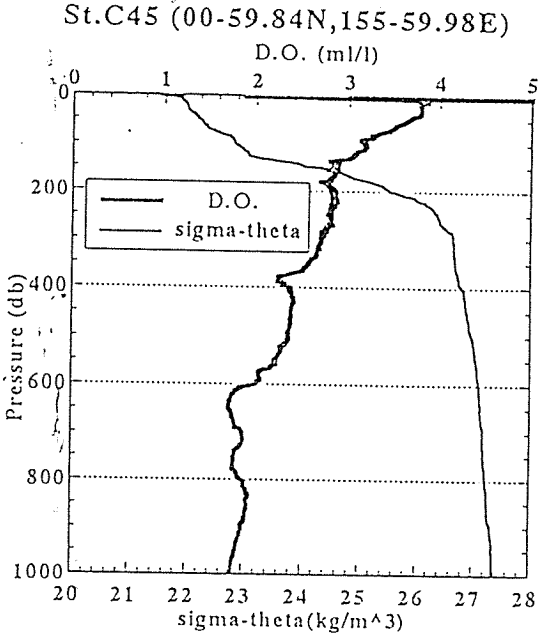

St.C43 (00-59.93S,155-59.82E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C43 (00-59.93S,155-59.82E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

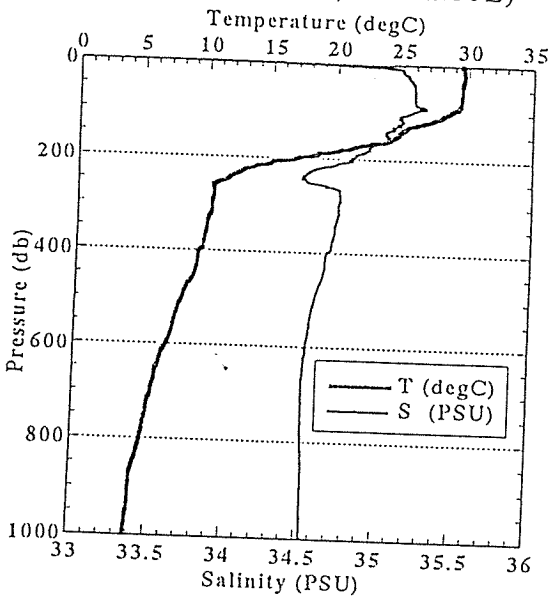

St.C44 (00-02.07N,156-09.59E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C44 (00-02.07N,156-09.59E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

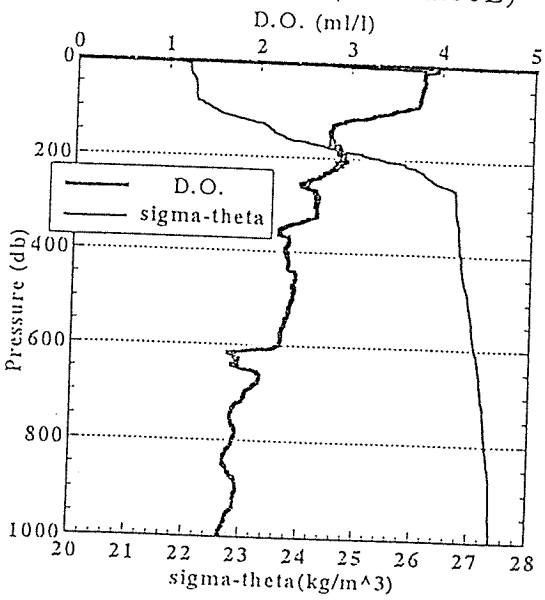

St.C45 (00-59.84N,155-59.98E)
Temperature (degC)
Pressure (db)
Salinity (PSU)
T (degC)
S (PSU)


St.C45 (00-59.84N,155-59.98E)
D.O. (ml/l)
Pressure (db)
sigma-theta(kg/m^3)
D.O.
sigma-theta

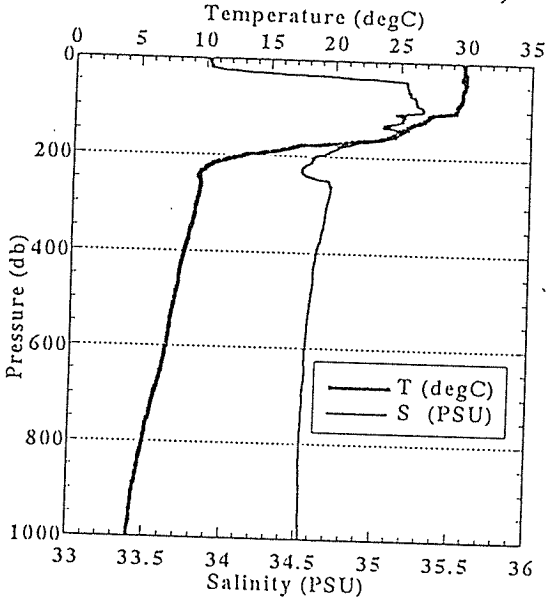
St.C46 (02-03.09N,156-01.56E)



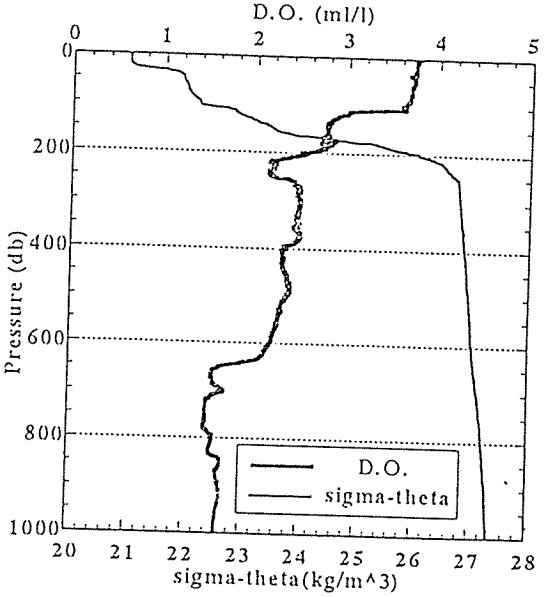
St.C46 (02-03.09N,156-01.56E)



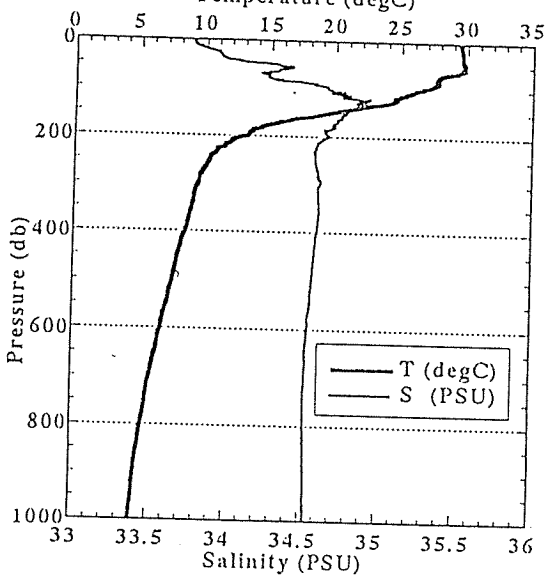
St.C47 (02-59.98N,156-00.21E)



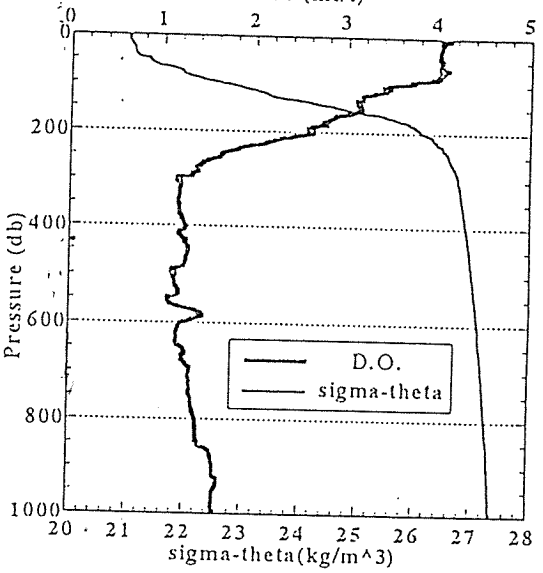
St.C47 (02-59.98N,156-00.21E)



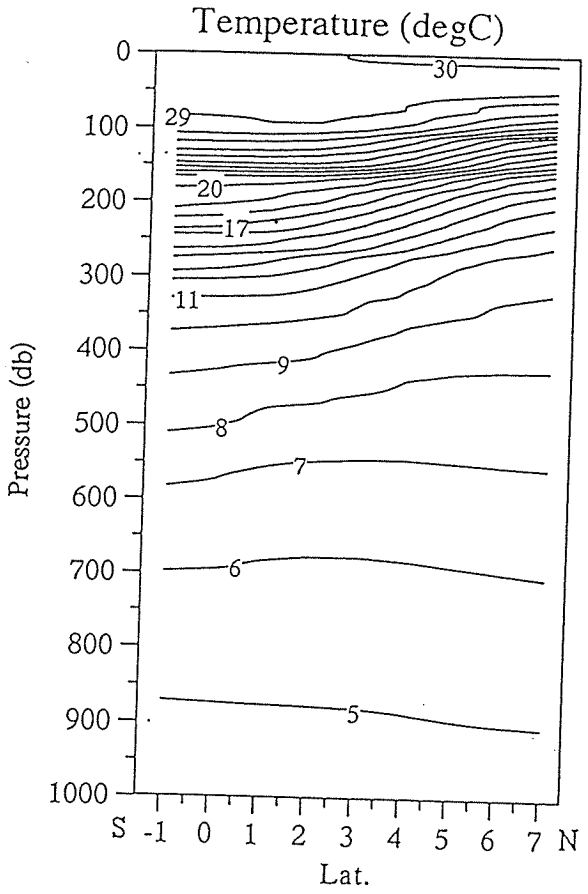
St.C48 (05-00.82N,156-04.69E)

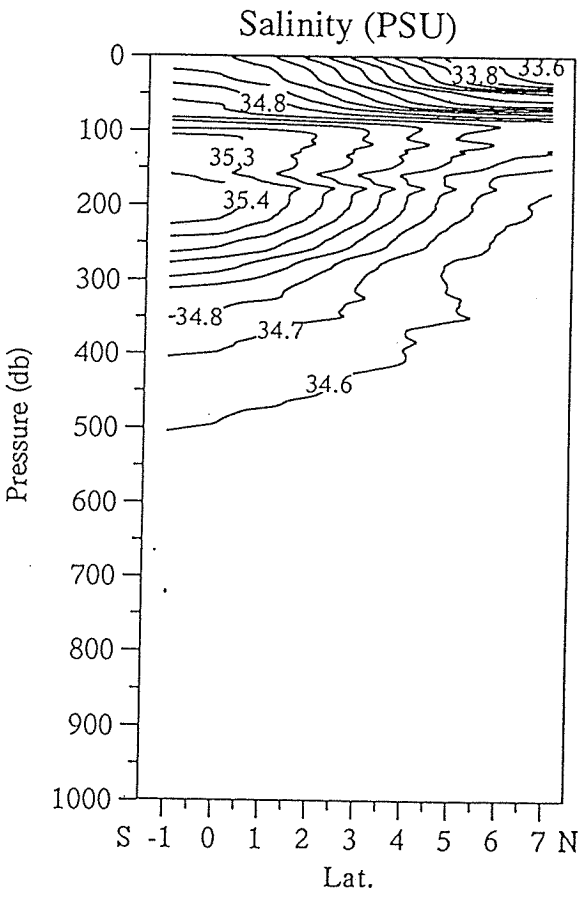


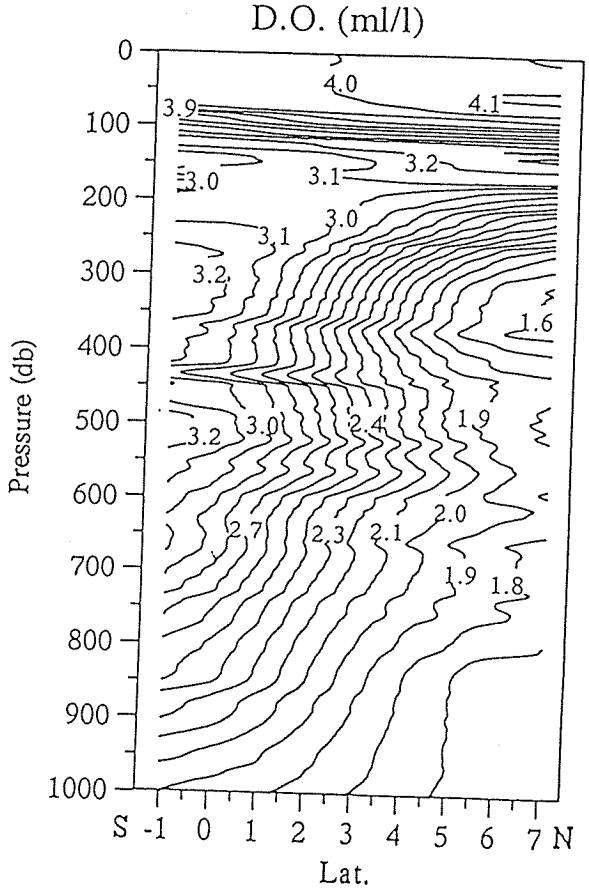
St.C48 (05-00.82N,156-04.69E)

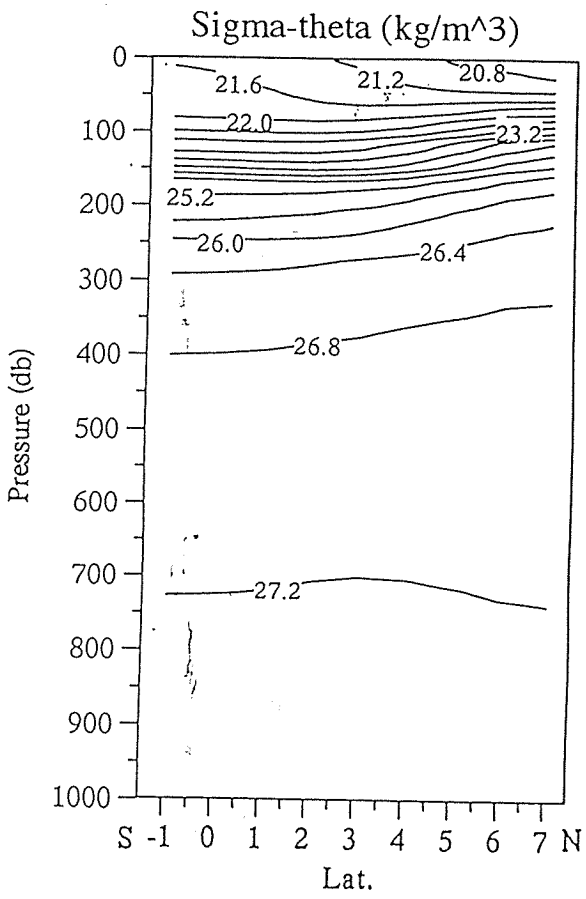


4.4 Cross Sections
(along 138E,142E,147E,156E and Equator)
along 138E

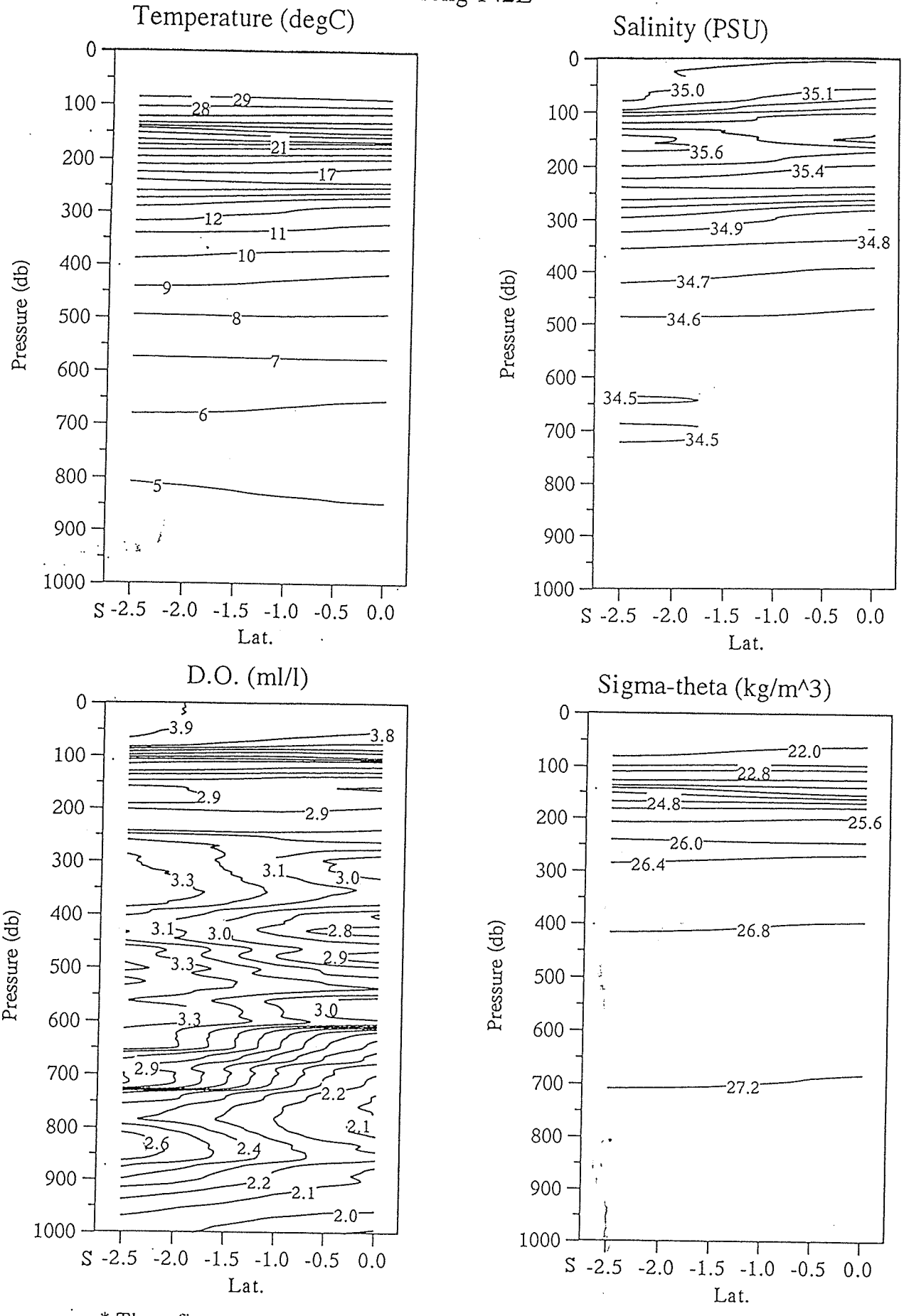








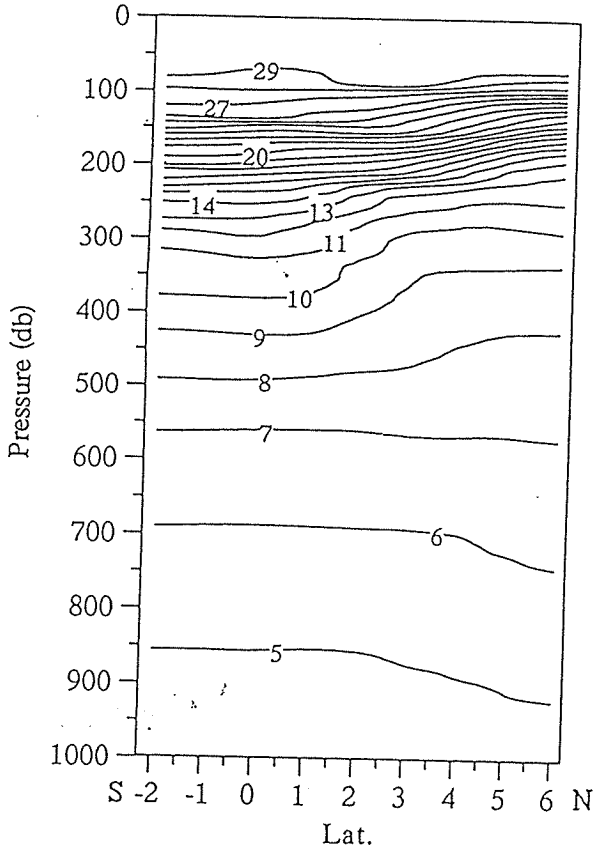
along 142E



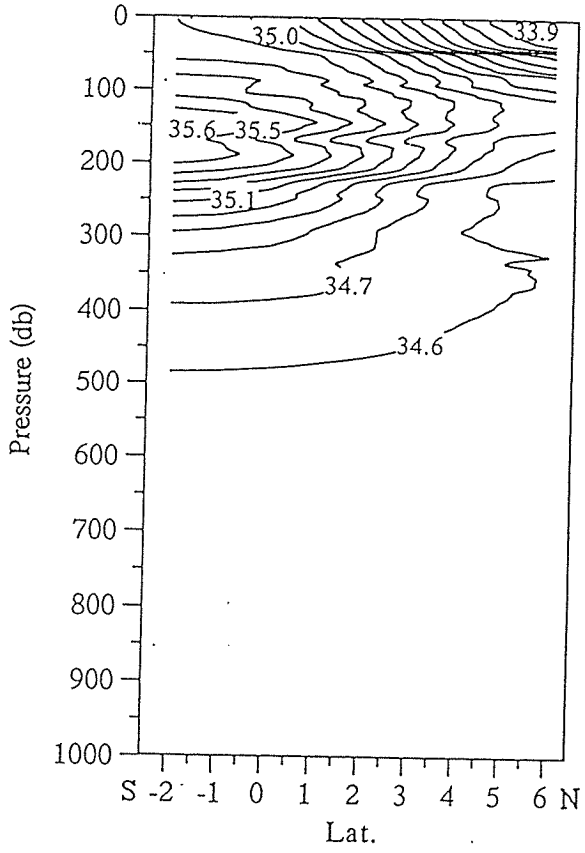
* These figures' scale are different from other figures.

along 147E

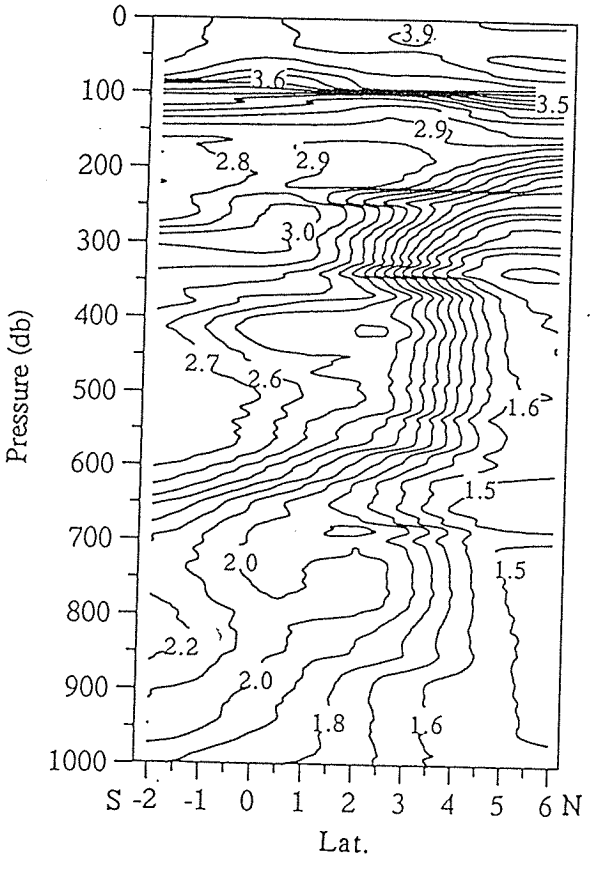
Temperature (degC)



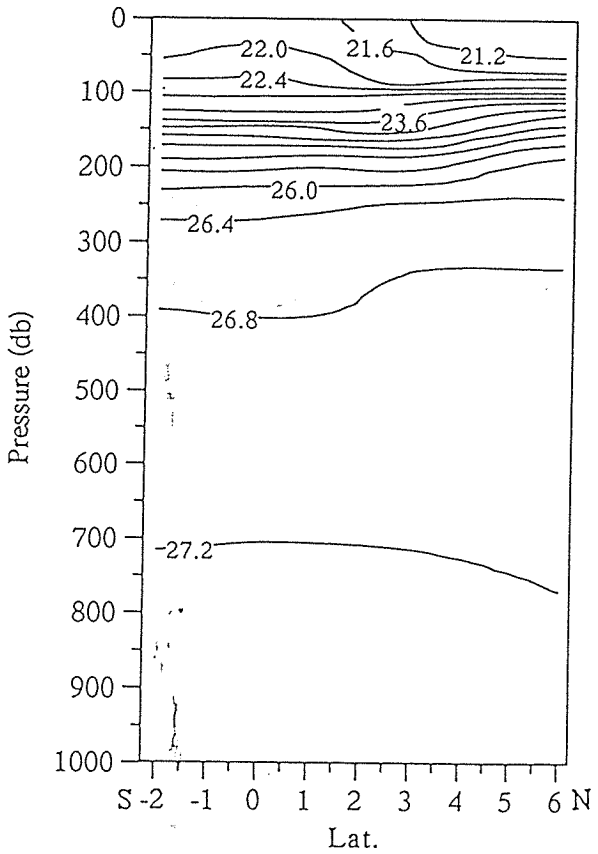
Salinity (PSU)



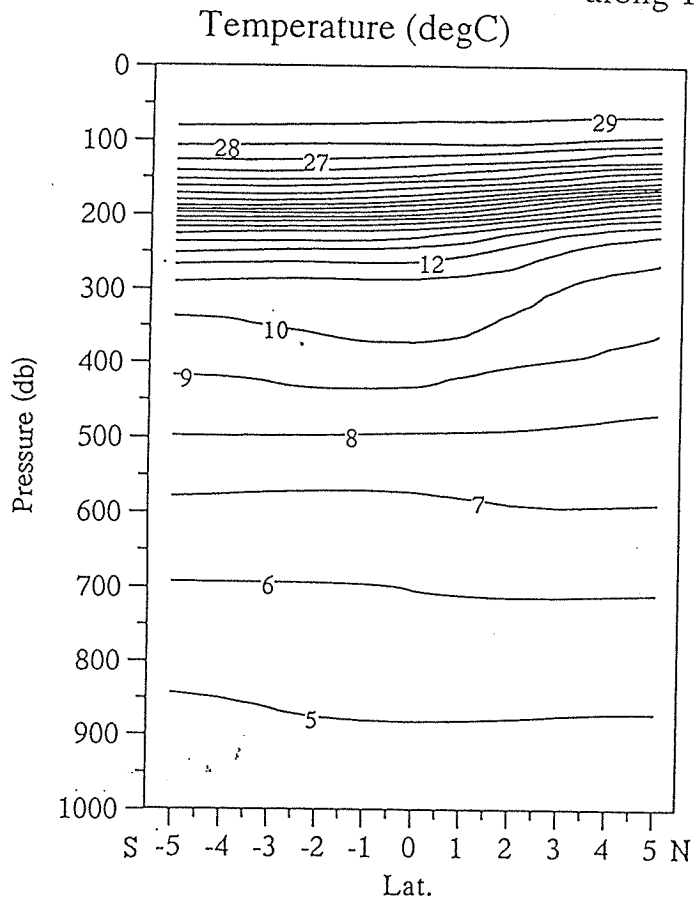
D.O. (ml/l)

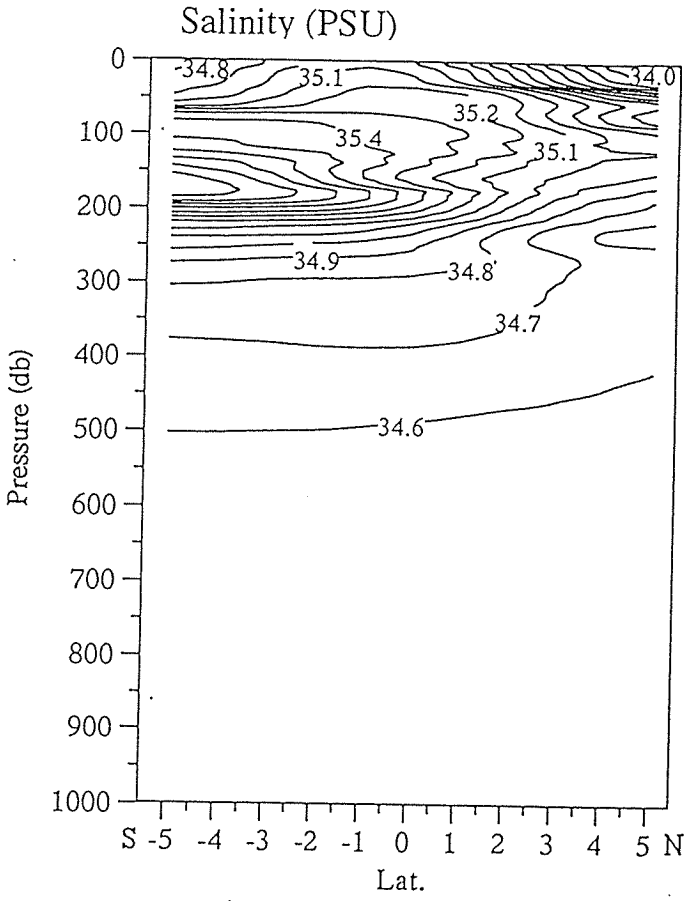


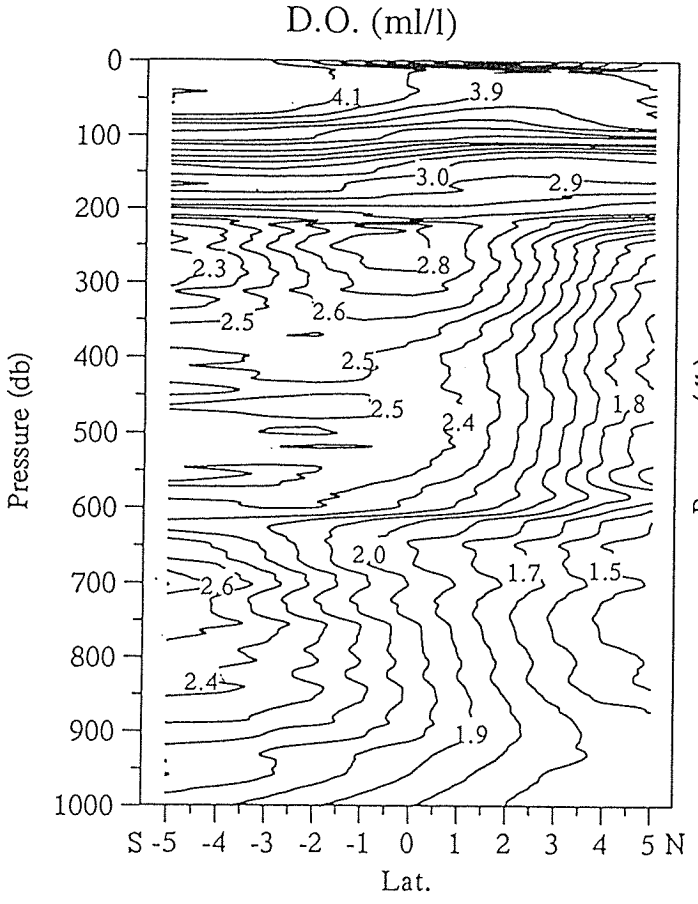
Sigma-theta (kg/m^3)

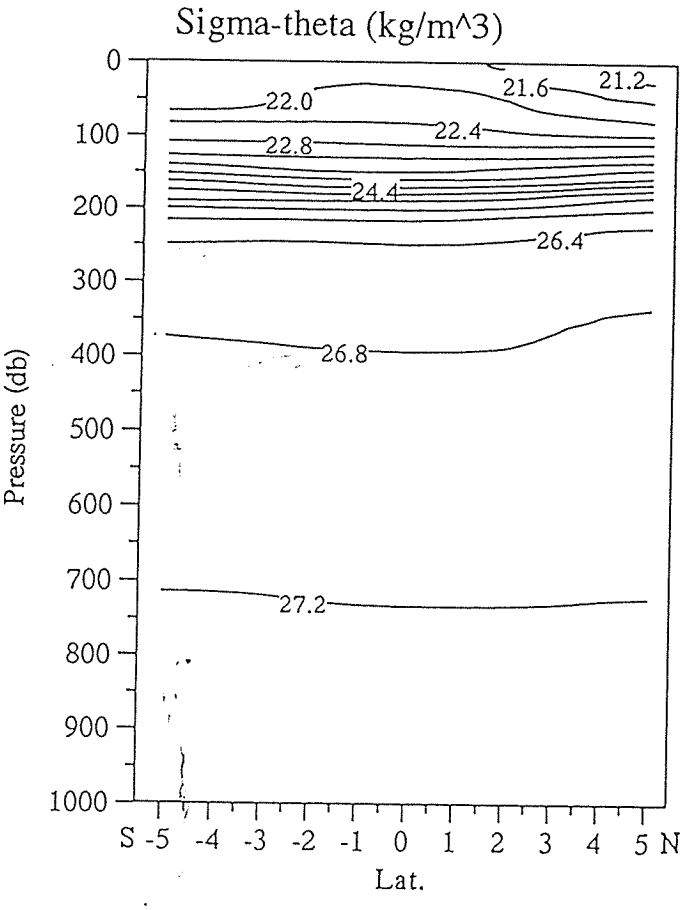


along 156E


Temperature (degC)
Pressure (db)
0
100
200
300
400
500
600
700
800
900
1000
29
28
27
12
10
9
8
7
6
5
S -5 -4 -3 -2 -1 0 1 2 3 4 5 N
Lat.

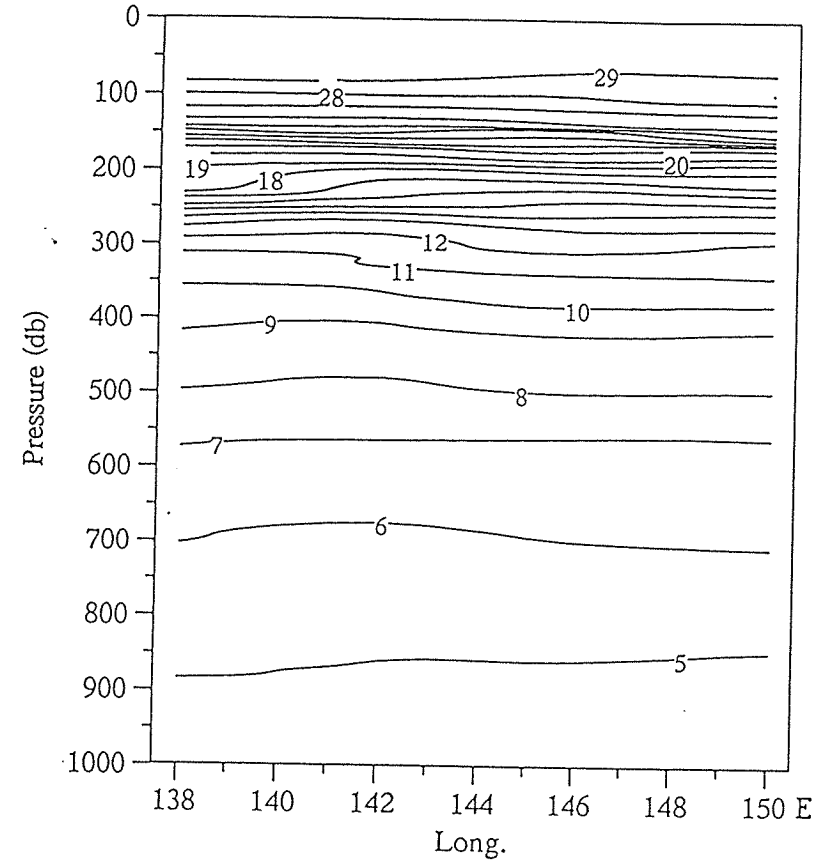

Salinity (PSU)
Pressure (db)
0
100
200
300
400
500
600
700
800
900
1000
34.8
35.1
34.0
35.2
35.4
35.1
34.9
34.8
34.7
34.6
S -5 -4 -3 -2 -1 0 1 2 3 4 5 N
Lat.


D.O. (ml/l)
Pressure (db)
0
100
200
300
400
500
600
700
800
900
1000
4.1
3.9
3.0
2.9
2.3
2.8
2.5
2.6
2.5
2.5
2.4
1.8
2.0
1.7
1.5
2.6
2.4
1.9
S -5 -4 -3 -2 -1 0 1 2 3 4 5 N
Lat.

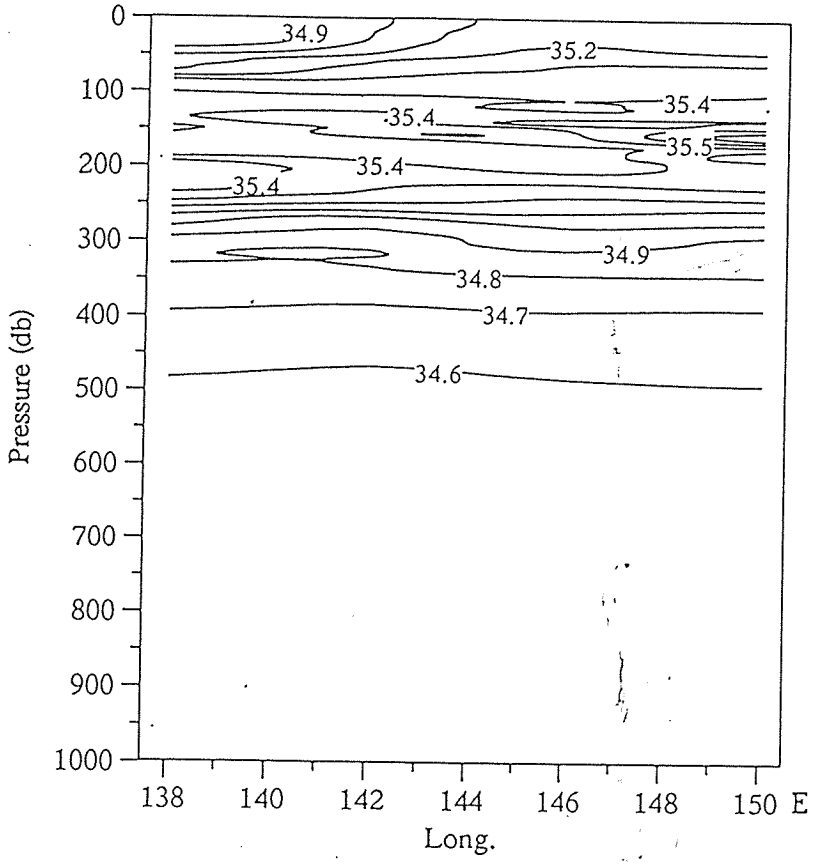

Sigma-theta (kg/m^3)
Pressure (db)
0
100
200
300
400
500
600
700
800
900
1000
22.0
21.6
21.2
22.8
22.4
24.4
26.4
26.8
27.2
S -5 -4 -3 -2 -1 0 1 2 3 4 5 N
Lat.

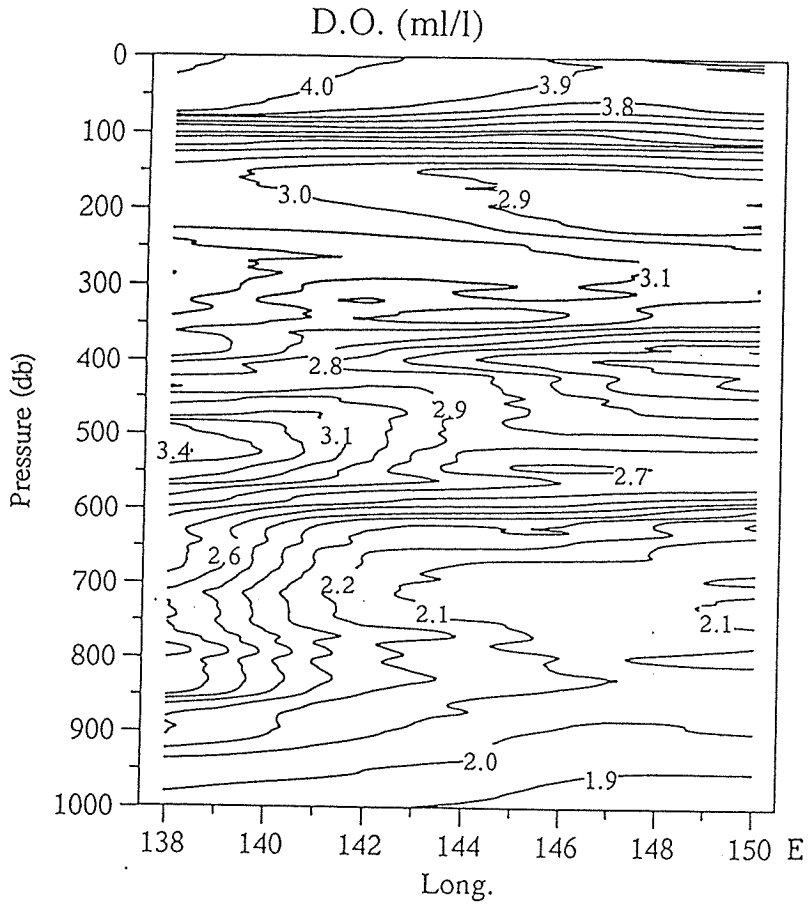
along Equator

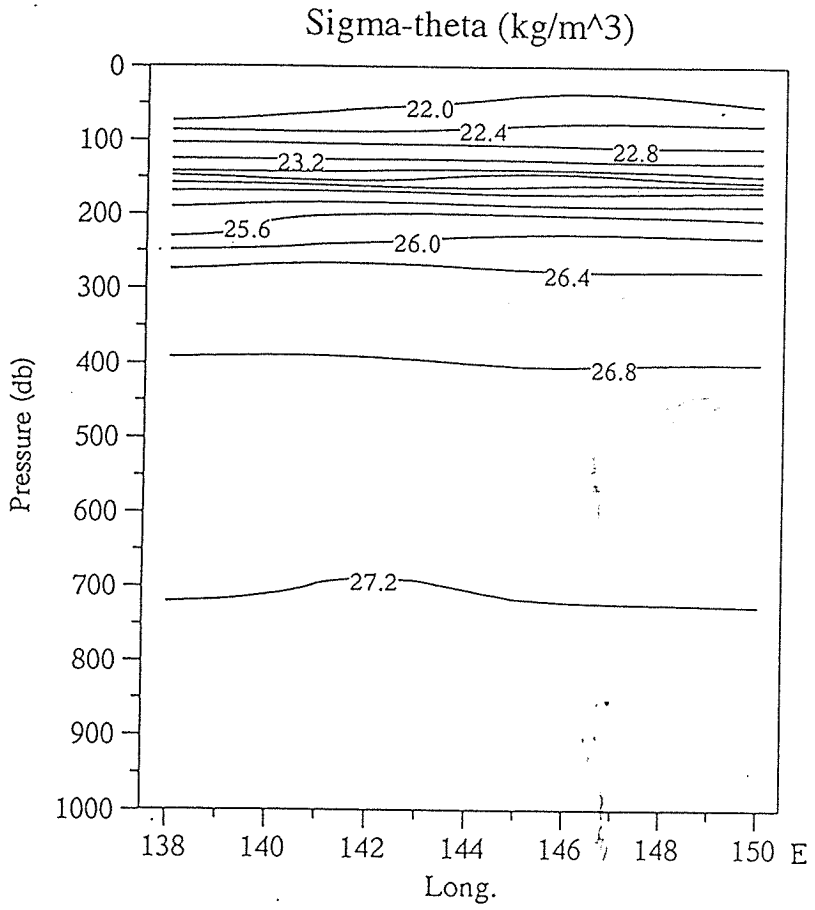
Temperature (degC)



Salinity (PSU)




D.O. (ml/l)
Pressure (db)
0
100
200
300
400
500
600
700
800
900
1000
4.0
3.9
3.8
3.0
2.9
3.1
2.8
2.9
3.4
3.1
2.7
2.6
2.2
2.1
2.1
2.0
1.9
138
140
142
144
146
148
150 E
Long.


Sigma-theta (kg/m^3)
Pressure (db)
0
100
200
300
400
500
600
700
800
900
1000
22.0
22.4
22.8
23.2
25.6
26.0
26.4
26.8
27.2
138
140
142
144
146
148
150 E
Long.

4.5 Bottle Salinity

Station 4

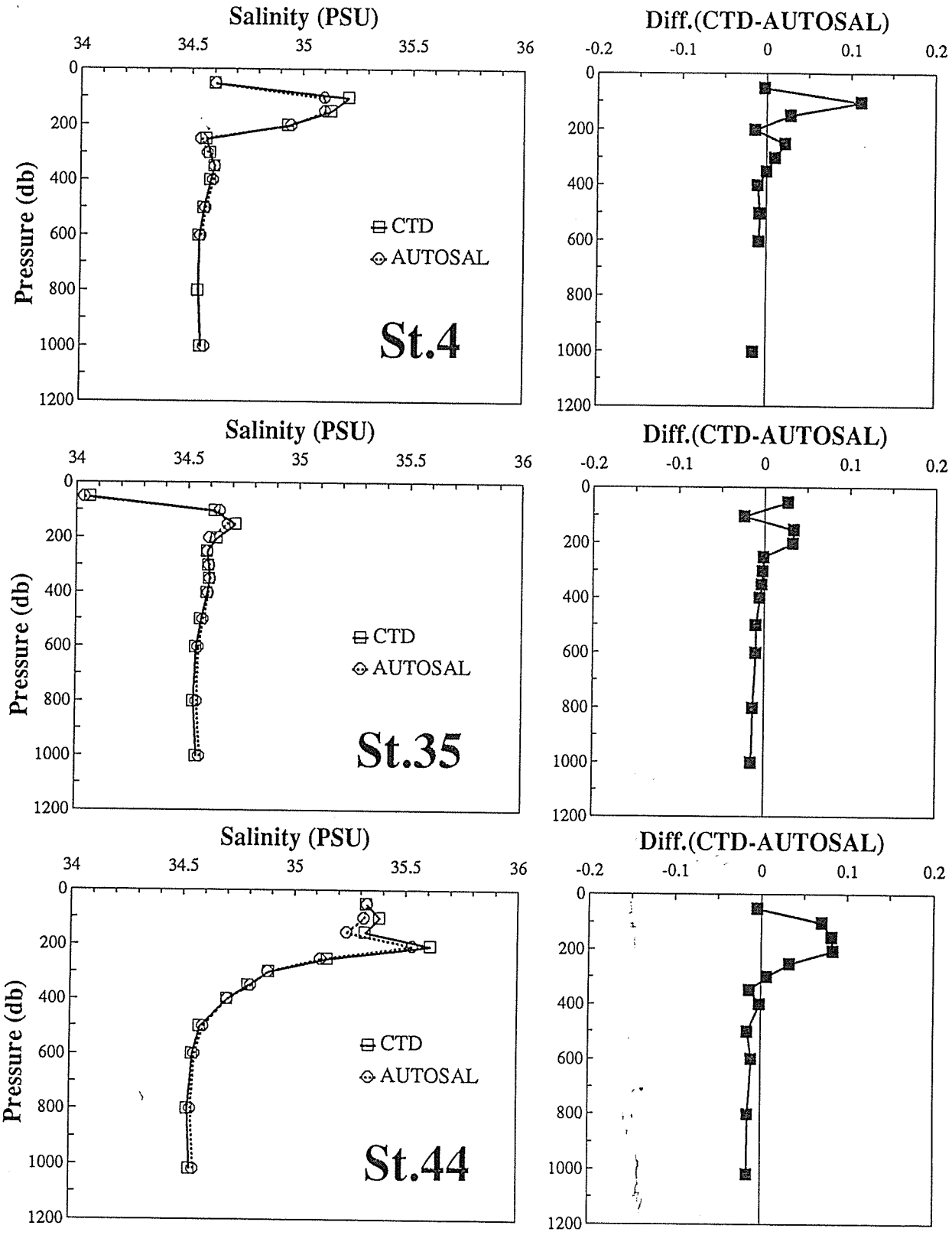
Niskin	Pressure (db)	Salinity (PSU) CTD	Salinity (PSU) AUTOSAL	Difference (CTD-AUTOSAL)	
1	1001	34.5416	34.5568	-0.0152	
2	800	34.5275	———	———	leak
3	600	34.5302	34.5395	-0.0093	
4	499	34.5512	34.5600	-0.0088	
5	399	34.5814	34.5925	-0.0111	
6	349	34.5995	34.6004	-0.0009	
7	300	34.5774	34.5680	0.0094	
8	250	34.5607	34.5395	0.0212	
9	199	34.9318	34.9462	-0.0144	
10	150	35.1287	35.1009	0.0278	
11	101	35.2098	35.0984	0.1114	
12	51	34.6019	34.6051	-0.0032	

Station 35

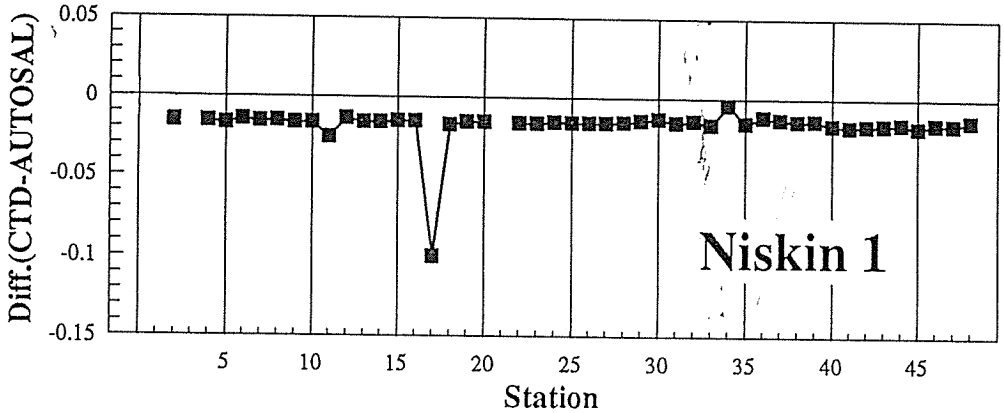
Niskin	Pressure (db)	Salinity (PSU) CTD	Salinity (PSU) AUTOSAL	Difference (CTD-AUTOSAL)
1	1001	34.5384	34.5537	-0.0153
2	800	34.5259	34.5392	-0.0133
3	601	34.5360	34.5462	-0.0102
4	501	34.5565	34.5665	-0.0100
5	402	34.5830	34.5891	-0.0061
6	350	34.5934	34.5972	-0.0038
7	301	34.5899	34.5926	-0.0027
8	250	34.5827	34.5842	-0.0015
9	201	34.6256	34.5934	0.0322
10	150	34.7096	34.6763	0.0333
11	101	34.6151	34.6390	-0.0239
12	50	34.0595	34.0329	0.0266

Station 44

Niskin	Pressure (db)	Salinity (PSU) CTD	Salinity (PSU) AUTOSAL	Difference (CTD-AUTOSAL)
1	1016	34.5337	34.5495	-0.0158
2	800	34.5229	34.5381	-0.0152
3	598	34.5438	34.5548	-0.0110
4	499	34.5756	34.5912	-0.0156
5	399	34.6982	34.7001	-0.0019
6	347	34.7926	34.8061	-0.0135
7	297	34.8868	34.8805	0.0063
8	251	35.1501	35.1177	0.0324
9	203	35.6114	35.5284	0.0830
10	152	35.3175	35.2362	0.0813
11	100	35.3823	35.3126	0.0697
12	50	35.322	35.3272	-0.0052


Salinity (PSU)
34
34.5
35
35.5
36
Pressure (db)
0
200
400
600
800
1000
1200
CTD
AUTOSAL
St.4
Diff.(CTD-AUTOSAL)
-0.2
-0.1
0
0.1
0.2
Salinity (PSU)
Pressure (db)
CTD
AUTOSAL
St.35
Diff.(CTD-AUTOSAL)
Salinity (PSU)
Pressure (db)
CTD
AUTOSAL
St.44
Diff.(CTD-AUTOSAL)

Station #	Pressure (db)	Salinity (PSU) CTD	Salinity (PSU) AUTOSAL	Difference (CTD-AUTOSAL)
1	miss fire			
2	1001	34.5303	34.5457	-0.0154
3	leak			
4	1001	34.5416	34.5568	-0.0152
5	1015	34.5439	34.5602	-0.0163
6	1005	34.5384	34.5525	-0.0141
7	1001	34.5418	34.5570	-0.0152
8	999	34.5371	34.5521	-0.0150
9	1019	34.5373	34.5532	-0.0159
10	1003	34.5345	34.5506	-0.0161
11	1000	34.5283	34.5534	-0.0251
12	1003	34.5367	34.5501	-0.0134
13	1029	34.5390	34.5546	-0.0156
14	1008	34.5405	34.5560	-0.0155
15	1000	34.5309	34.5457	-0.0148
16	1009	34.5414	34.5562	-0.0148
17	1008	34.5387	34.6383	-0.0996
18	1002	34.5347	34.5519	-0.0172
19	1022	34.5409	34.5561	-0.0152
20	1001	34.5373	34.5527	-0.0154
21	leak			
22	1000	34.5355	34.5514	-0.0159
23	1020	34.5380	34.5540	-0.0160
24	1003	34.5378	34.5529	-0.0151
25	1005	34.5347	34.5504	-0.0157
26	1004	34.5395	34.5553	-0.0158
27	1022	34.5377	34.5535	-0.0158
28	1001	34.5350	34.5501	-0.0151
29	1001	34.5374	34.5516	-0.0142
30	1003	34.5423	34.5551	-0.0128
31	1005	34.5363	34.5517	-0.0154
32	1018	34.5416	34.5558	-0.0142
33	1007	34.5460	34.5623	-0.0163
34	1001	34.5415	34.5455	-0.0040
35	1001	34.5384	34.5537	-0.0153
36	1002	34.5380	34.5495	-0.0115
37	1000	34.5392	34.5523	-0.0131
38	1007	34.5380	34.5523	-0.0143
39	1001	34.5372	34.5510	-0.0138
40	1000	34.5221	34.5385	-0.0164
41	1000	34.5313	34.5489	-0.0176
42	1000	34.5311	34.5478	-0.0167
43	1004	34.5325	34.5488	-0.0163
44	1016	34.5337	34.5495	-0.0158
45	1002	34.5335	34.5515	-0.0180
46	1007	34.5412	34.5570	-0.0158
47	1005	34.5354	34.5515	-0.0161
48	1001	34.5399	34.5537	-0.0138



4.6 Dissolved Oxygen Measurement

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Sanyou Techno Marine, Inc., Japan

Objectives:

Mesurement of dissolved oxygen using D.O.meter with correction of the Winkler titration.
Comparison of D.O.meter data corrected by the Winkler titration with CTD D.O. data.

Instruments:

D.O.meter ;TOA Portable Dissolved Oxygen Meter Model DO-25A
Titrator ;Metrohm Model 716 DMS Totrino/ 10ml of titration vessel
Ditector ;Pt Electrode/ 6.0401.100
Software ;Data acquisition/ Metrohm,METRODATA/ 6.6040.100

Methods :

The samples for D.O.meter were collected from 5-liter Niskin water samplers into 100ml D.O. glassbottles. In each cast several samples for the Winkler titration were collected into caribrated BOD flasks (ca, 180 ml)(see Green and Carritt 1966). During sampling, 3-bottles -volume of sample water was overflowed and sampling water temperature was measured.

After the sampling D.O.meter with salinity correction. Before measurement, the D.O.meter was ajusted to 0-100%(see TOA D.O.meter operation manual).

The samples for the titration method were analyzed within 2 hours. Before the measurement, the D.O.values were obtained by Metrohm piston buret of 10ml with Pt Erectrode using whole bottle titration in the laboratory controlled temperature (ca,22 ' c)

The vaules of the D.O.meter were corrected with calibration factors. The factors were linear regression line based on the Winkler titration value vs D.O.meter Value.

The standerdizations have been done every day before the sample titration.

We refered to the WHP Oparations and Methods(Culberson,1991).

Reproducibility:

(1) D.O.meter Value

143 pairs of samples were analyzed as replicates taken same Niskin bottle. Difference of replicates samples were an average of 0.009 ml/ l, and standard deviation (2 sigma) of 0.024 ml/ l (0.52% of D.O. maximum in this cruise).

(2) Winkler Titration Value

In the same way, 84 pairs of samples were analyzed. Difference was an average of 0.005 ml/ l, and standared deviation (2 sigma) of 0.009 ml/ l (0.19% of D.O. maximum in this cruise).

Results :

(1) D.O.meter Values Correction

Linear regression line was obtained by 343 pairs of D.O.meter-Winkler data.(Fig.4.6.1) All D.O.meter data were corrected by this formula, and corrected D.O. data were Shown in Table.4.6.1.

Formula : $Y = 0.086 + 0.990 \times X$ (n = 343)

$R = 0.999$

Y : Winkler Value (ml/ l) X : D.O. meter Value (ml/ l)

(2) CTD-D.O. Sensor Value correction

In the same way, linear regression line was obtained by 709 pairs of CTD-D.O.Sensor -corrected D.O. data. (Fig.4.6.2, Fig.4.6.3) In this cruise CTD-D.O. Sensor's tune was wrong, compare CTD upcast,down cast. Niskin water samplers usually collected sea water when CTD was upcast.

Fomula : $Y = 0.347 + 1.092 \times X$ (n = 709)

$R = 0.989$

Y : Corrected D.O. Value (ml/ l) X : CTD-D.O. Sensor Upcast Value (ml/ l)

Fomula : $Y = 0.072 + 1.065 \times X$ (n = 709)

$R = 0.965$

Y : Corrected D.O. Value (ml/ l) X : CTD-D.O. Sensor Downcast Value (ml/ l)

(3) Contour

Contour in Fig.4.6.3 were made from corrected dissolved oxygen data in Table.6.5.1

Equator Line : Stn 9,12,13,14,20,21,22,23,24,30,38,39

137E Line : Stn 11,10,9,8,7,6,5,4,3,2,1

142E Line : Stn 15,16,17,18,19,20

147E Line : Stn 25,26,27,28,30,31,32,33,34,37,35,36

156E Line : Stn 40,41,42,43,44,45,46,47,48

(4) Vertical plofiles

Vertical plofiles in Fig.4.6.4.were made from corrected D.O. data in Table.4.6.1

(5) Comparison of CTD D.O. Sensor and corrected D.O.data

In Fig.4.6.4, upcasting and downcasting with corrected D.O. data.

Root mean squares for each depth were also calucurated and shown Table.4.6.2.

(6) Comments

D.O. consentrations largely decreased from 4.4 ml/ l to 3.4 ml/ l near 100db depth along the equator.

Below the 200db depth, the D.O. values in the hemisphere are much lower than that in the southern hemisphere.

The intrusion of the low D.O. region (< 2.0 ml/ l) from north to south can be found between 200db and 500db along the 137 ' E line.

This tendercy becomes weak in the eastern observation lines. (147 ' E,156 ' E)

Reference :

Culberson,C.H.(1991) Dissolved Oxygen, in WHP Oparations and Methods, Woods Hole., pp1-15

Culberson,C.H.,G.Knapp,R.T.Williams and F.Zemlyak(1991) A comparison of methods for the ditermination of dissolved oxygen in sea water(WHPO 91-2),Woods Hole.

Green,E.J. and D.E.Carritt (1966) An Improved Iodine Determination Flask for Whole-bottle Titrations,Analyst,91,207-208.

Horibe,Y.,Y.Kodama and K.Shigehara(1972) Errors in sampling procedure for the determination of dissolved oxygen by Winkler method,J. Oceanogr.Soc, Jpn.,28,203-206.

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S.Kitagawa and K.Taira(1993) Measurement of dissolved oxygen by an electrode method, Umi no Kagaku (in Japanese),2,15-18.

TOA Electronics Ltd.(1991) DO-25A Portable Dissolved Oxygen meter Oparation Manual, Tokyo,29

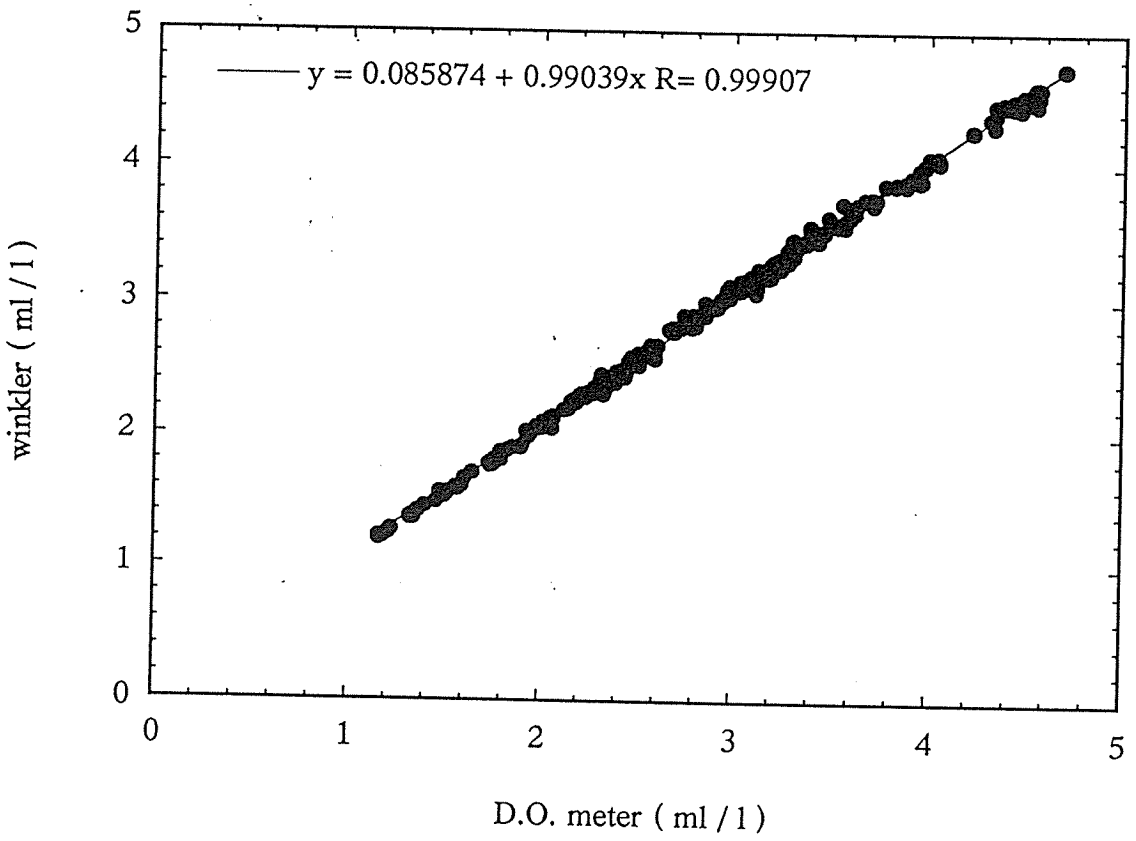


Fig.4.6.1 D.O. meter - Winkler

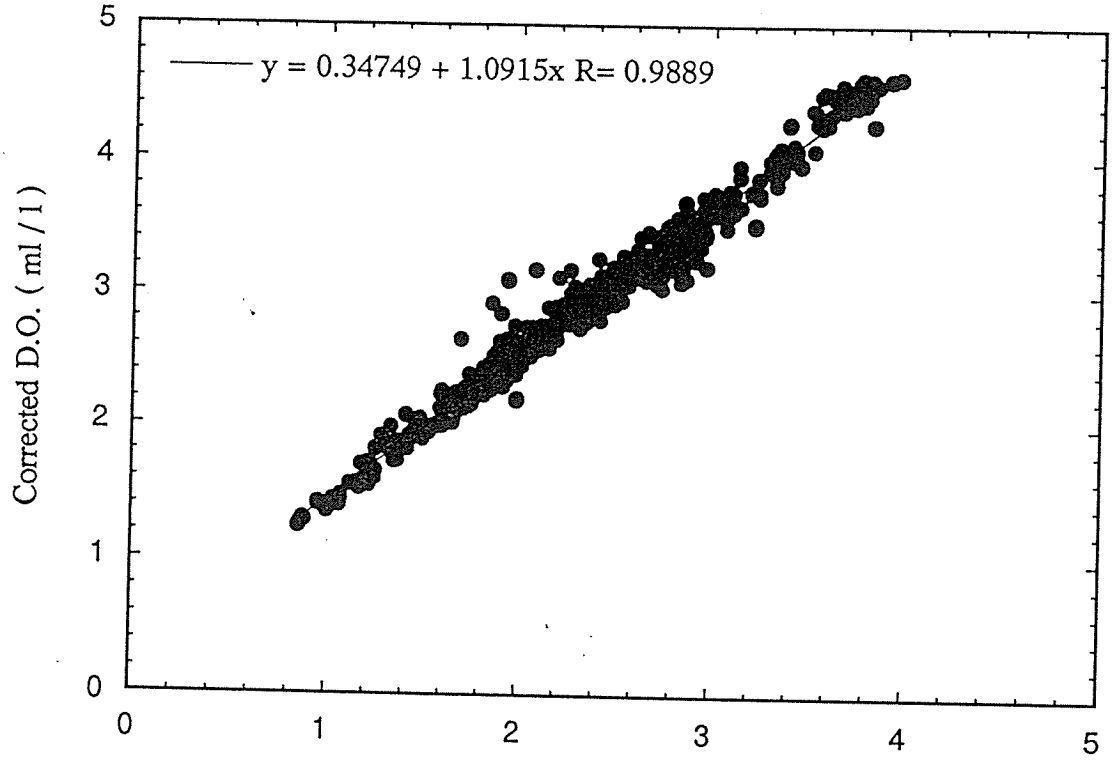


Fig.4.6.2 (1) CTD D.O.(Up) - Corrected D.O.

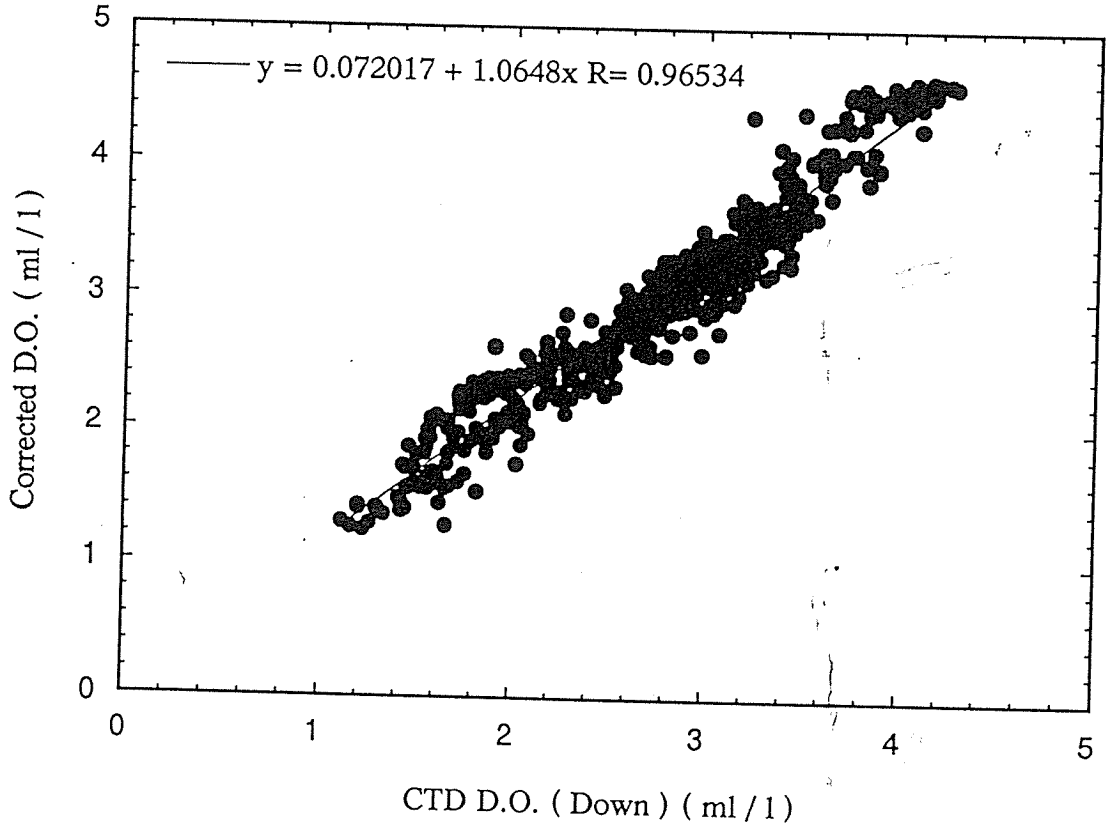


Fig.4.6.2 (2) CTD D.O.(Down) - Corrected D.O.

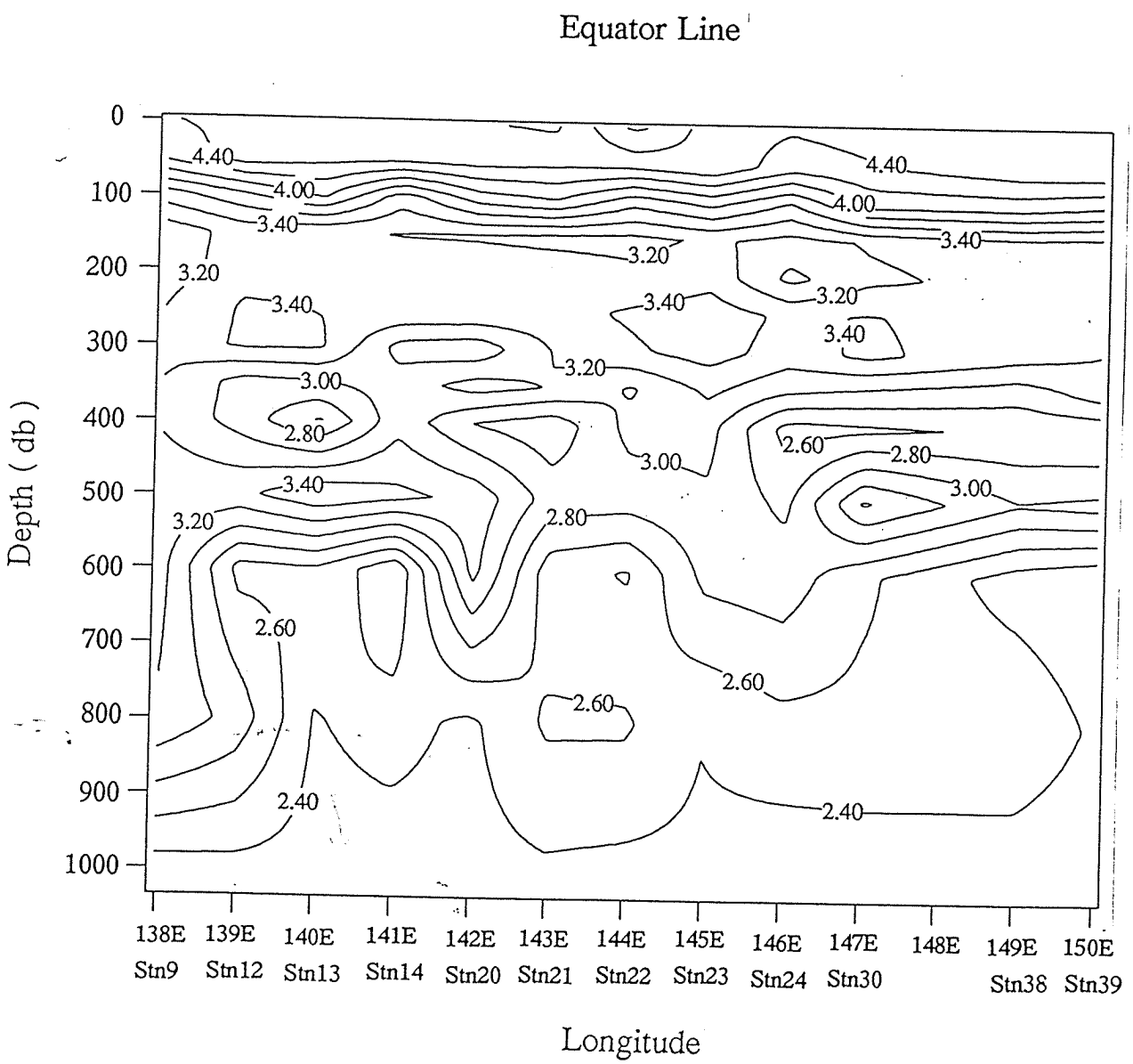


Fig.4.6.3 (1) Dissolved Oxygen Contour

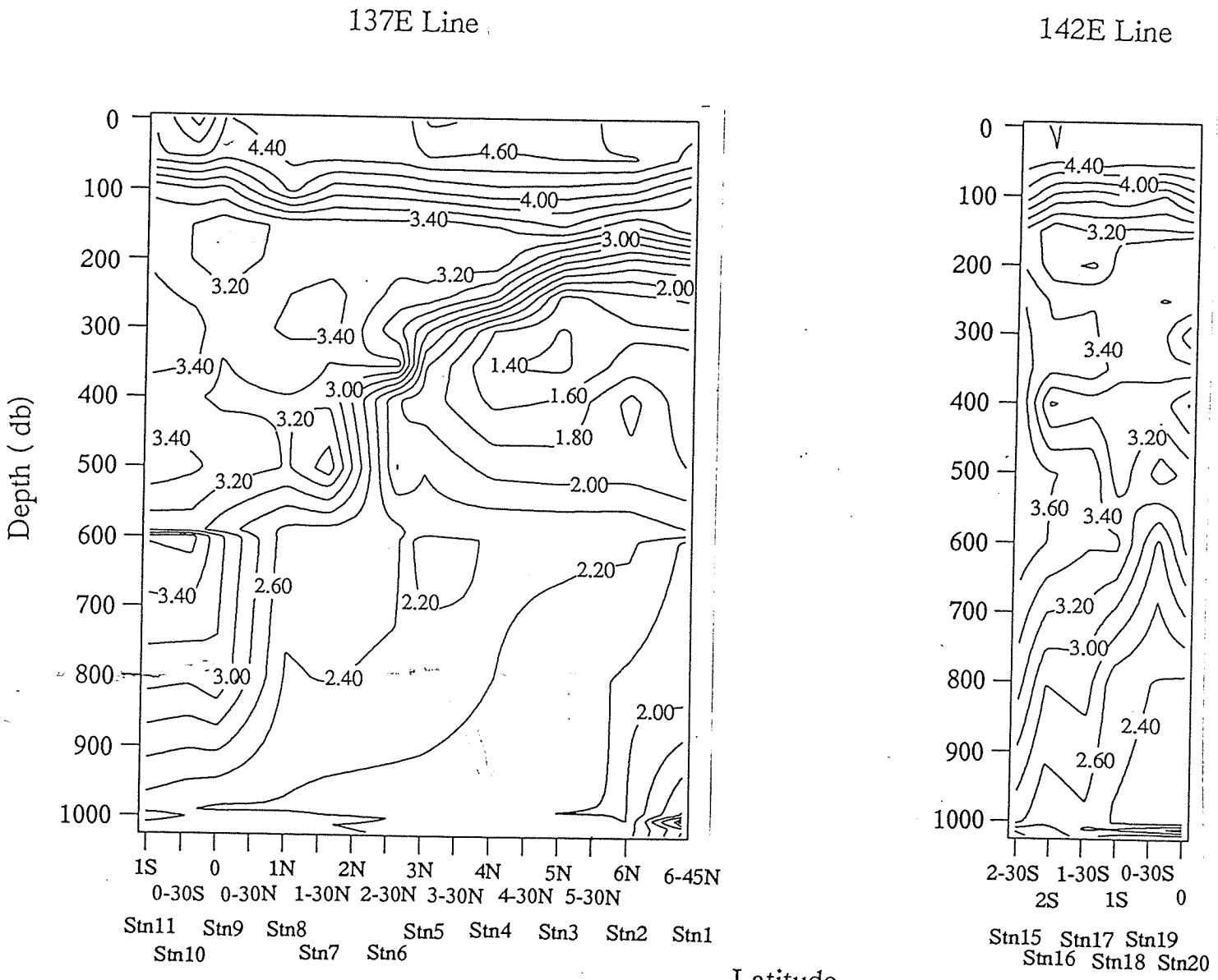


Fig.4.6.3 (2) Dissolved Oxygen Contour

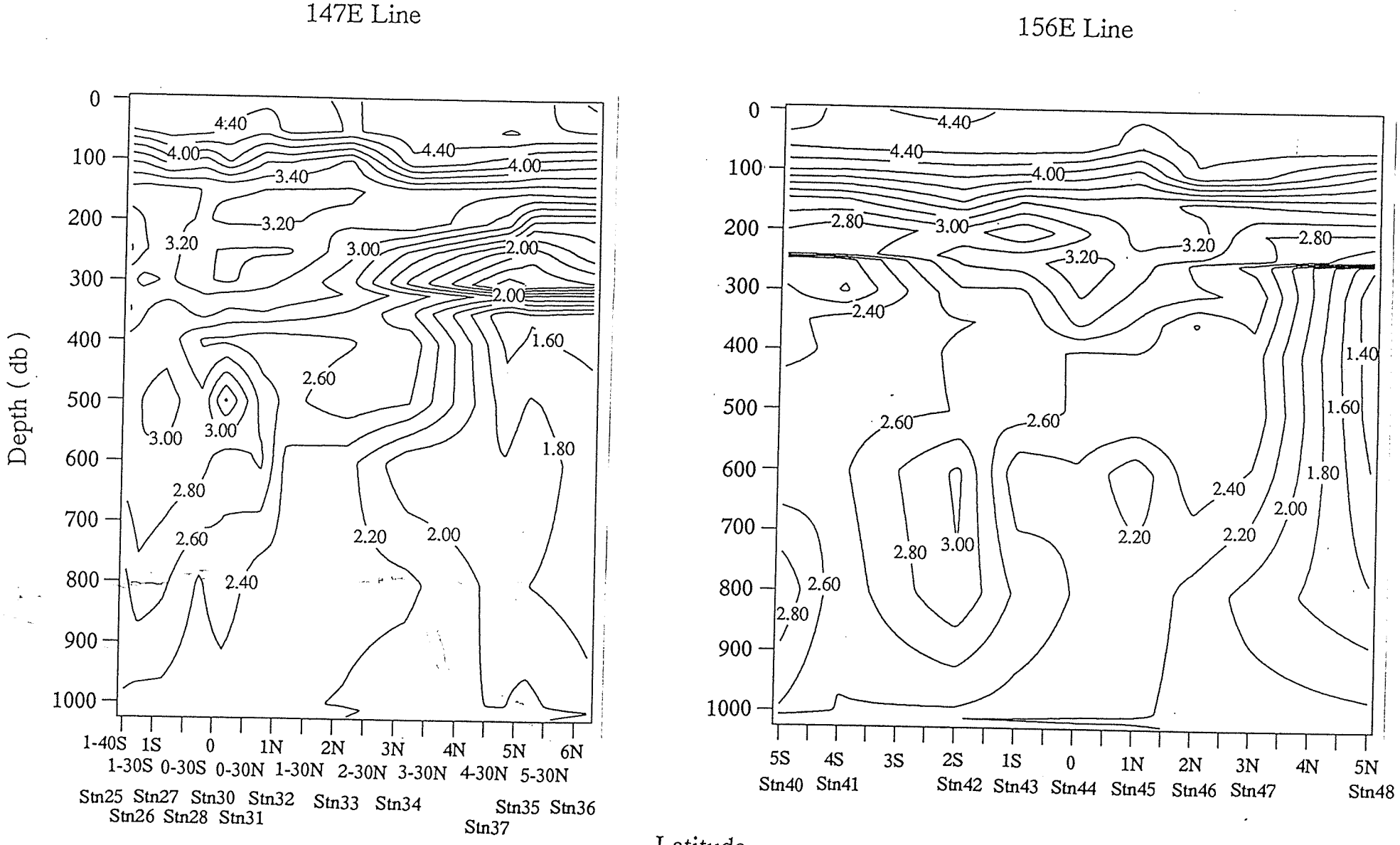


Fig.4.6.3 (3) Dissolved Oxygen Contour

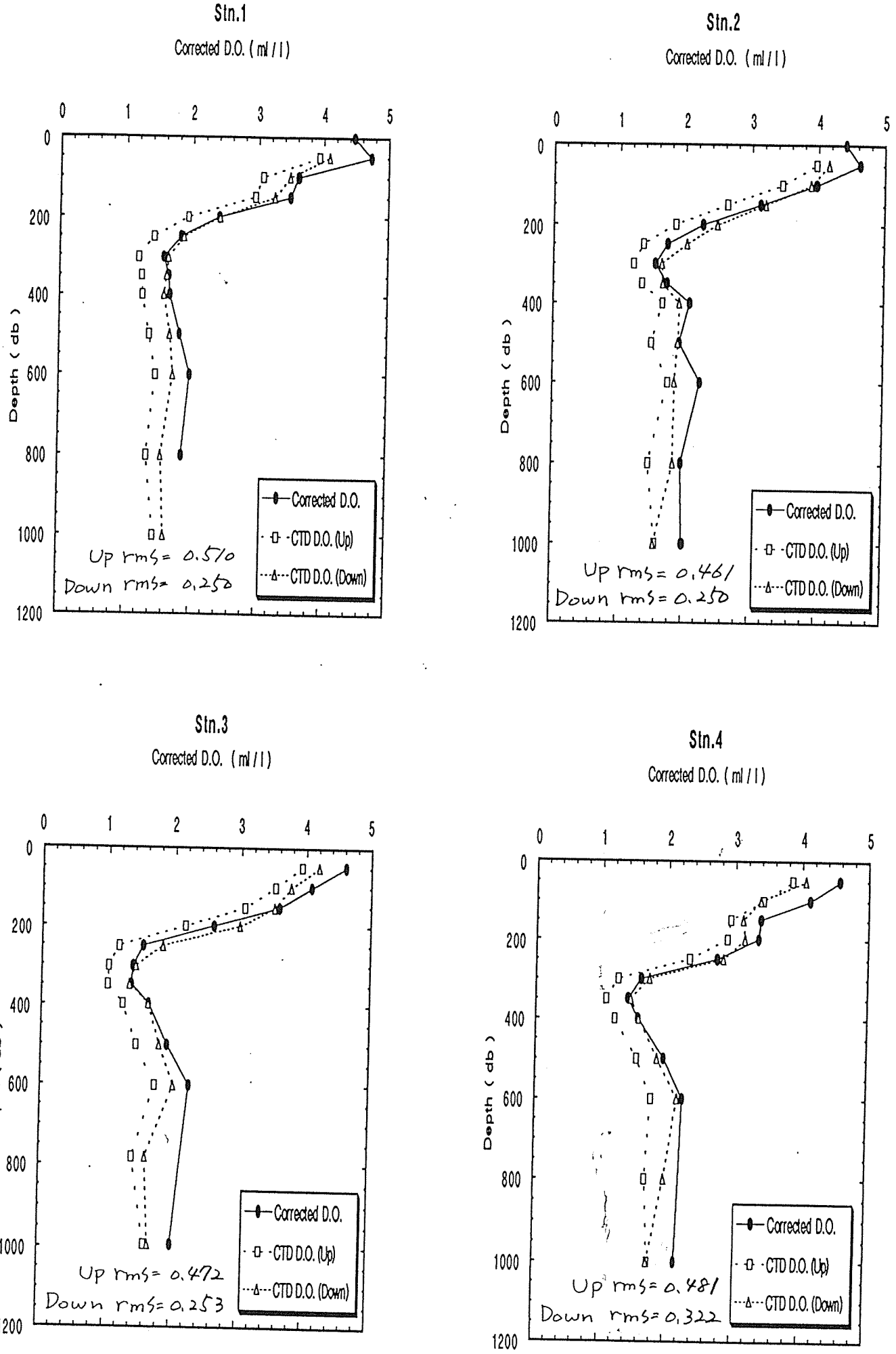
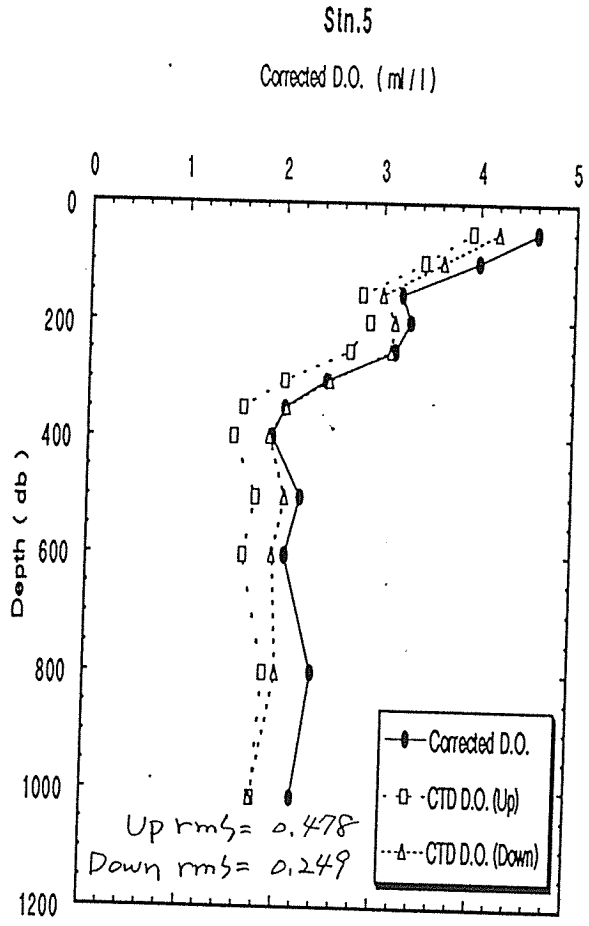
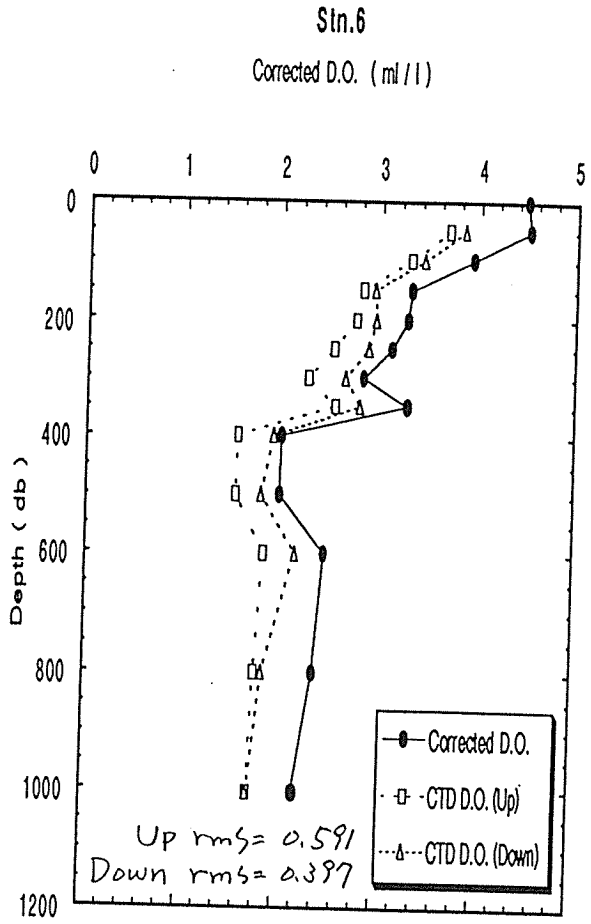
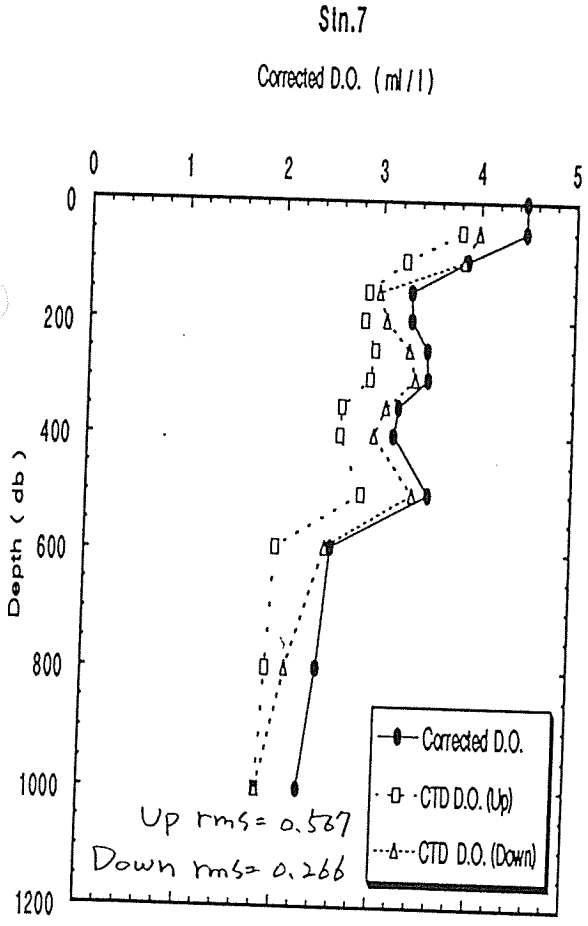


Fig.4.6.4 (1) Vertical plofiles







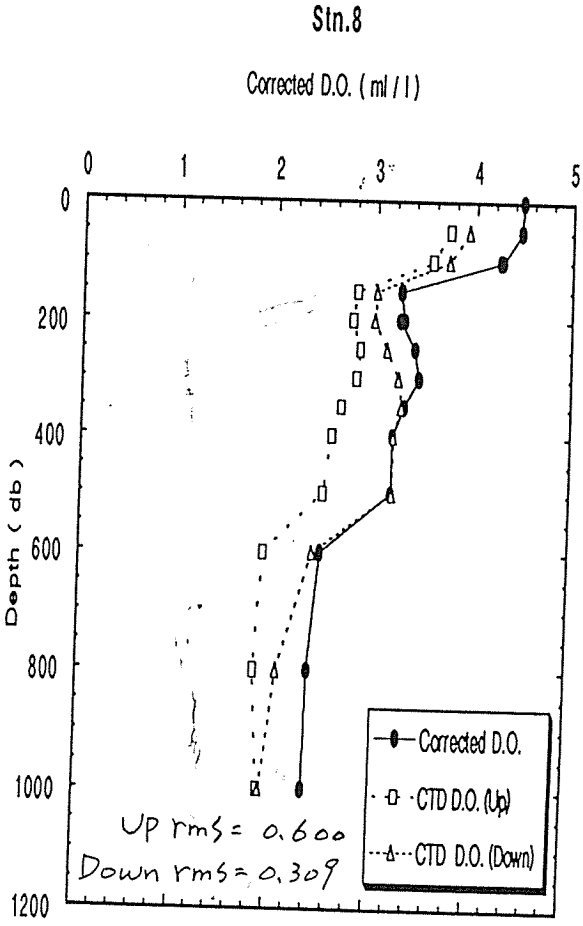
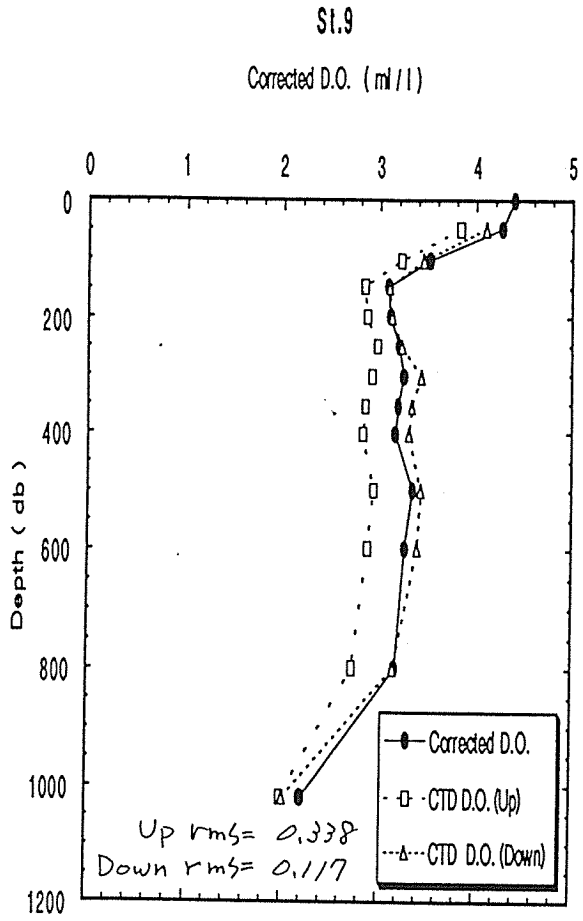
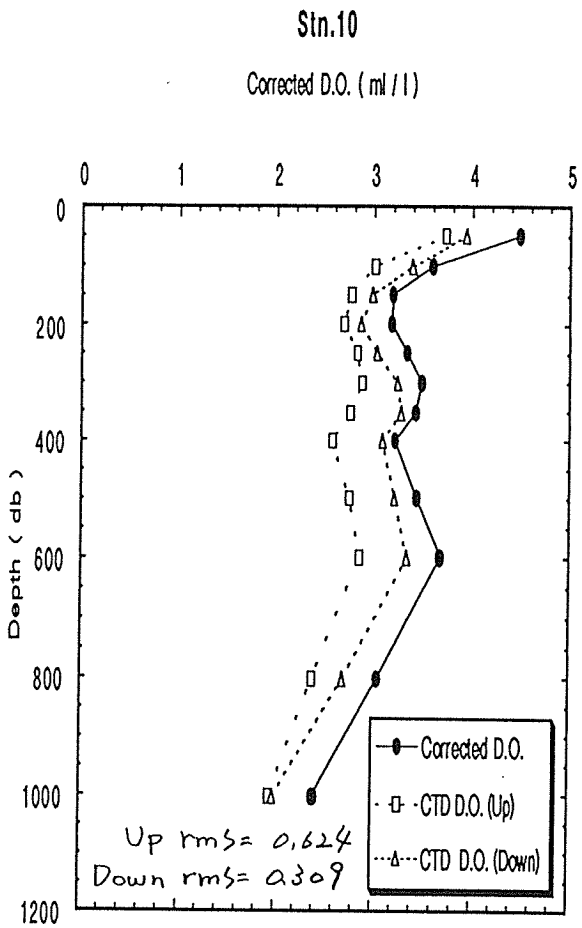
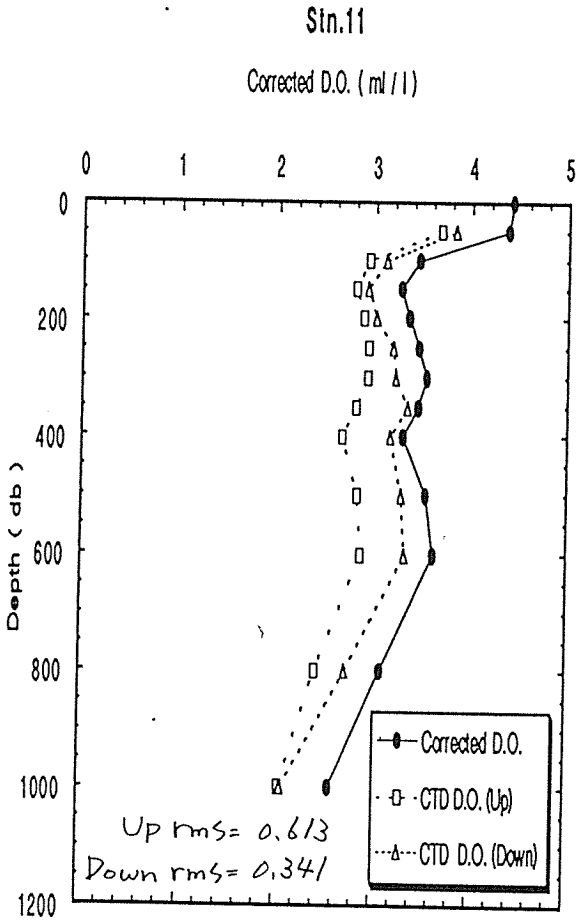


Fig.4.6.4 (2) Vertical plofiles







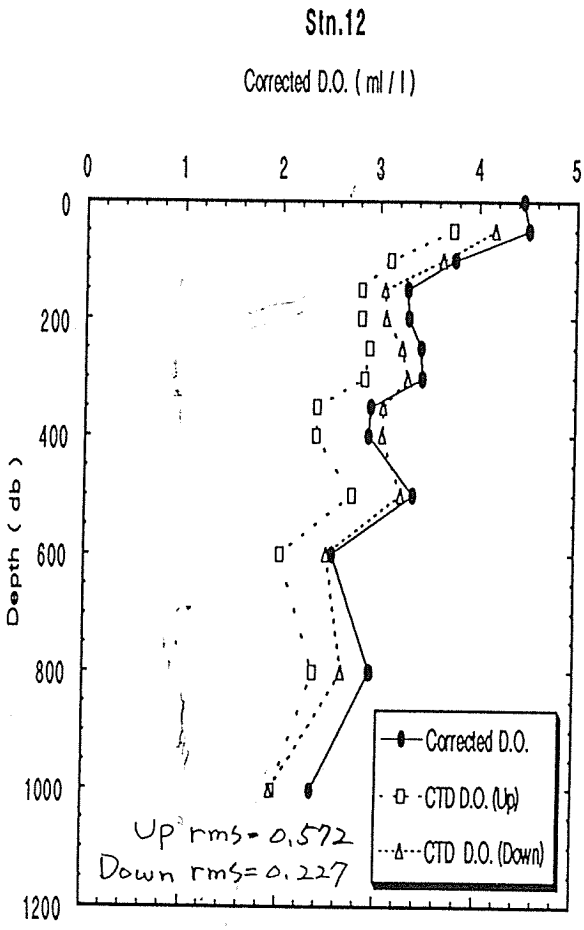
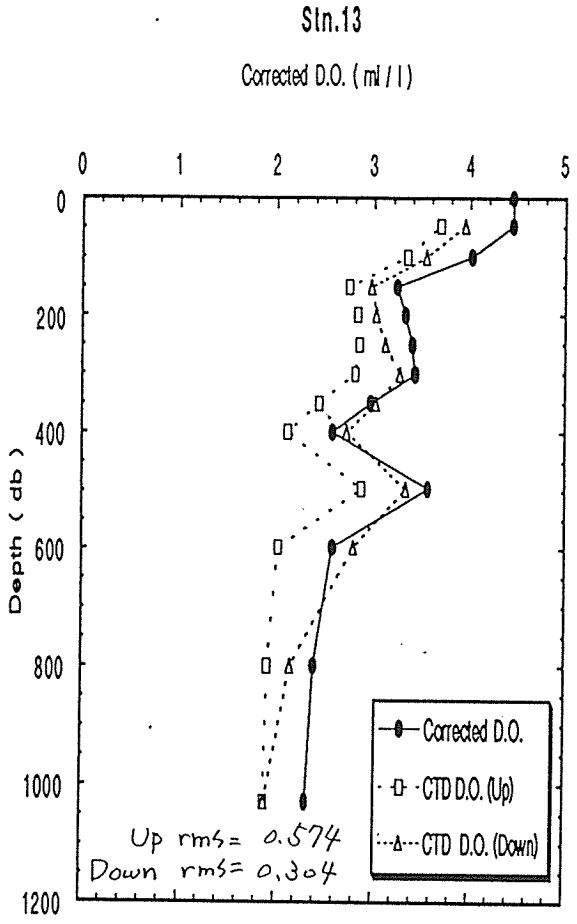
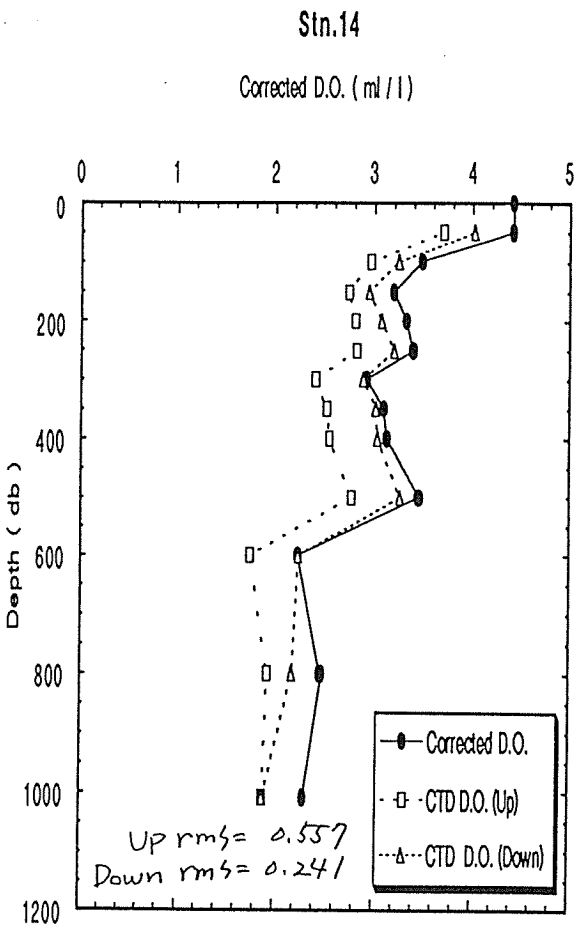
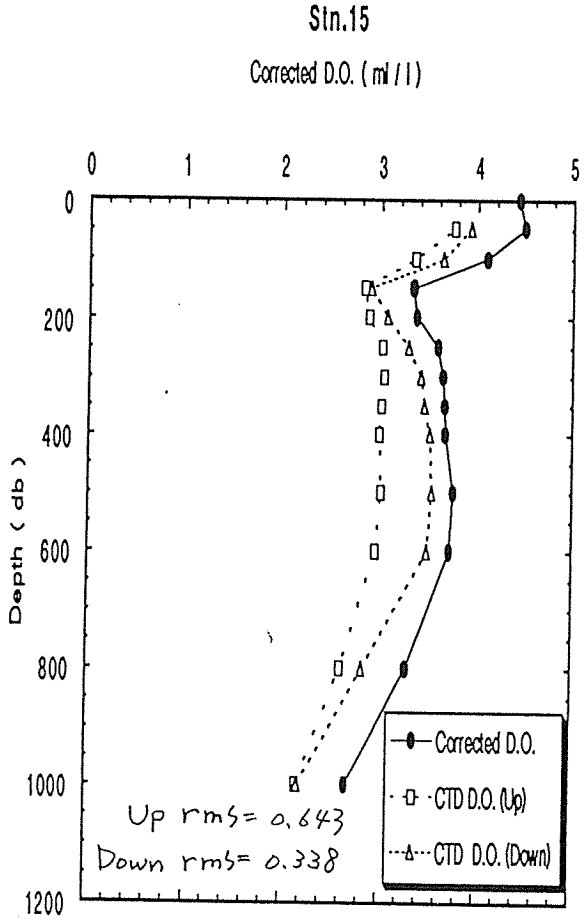


Fig.4.6.4 (3) Vertical plofiles







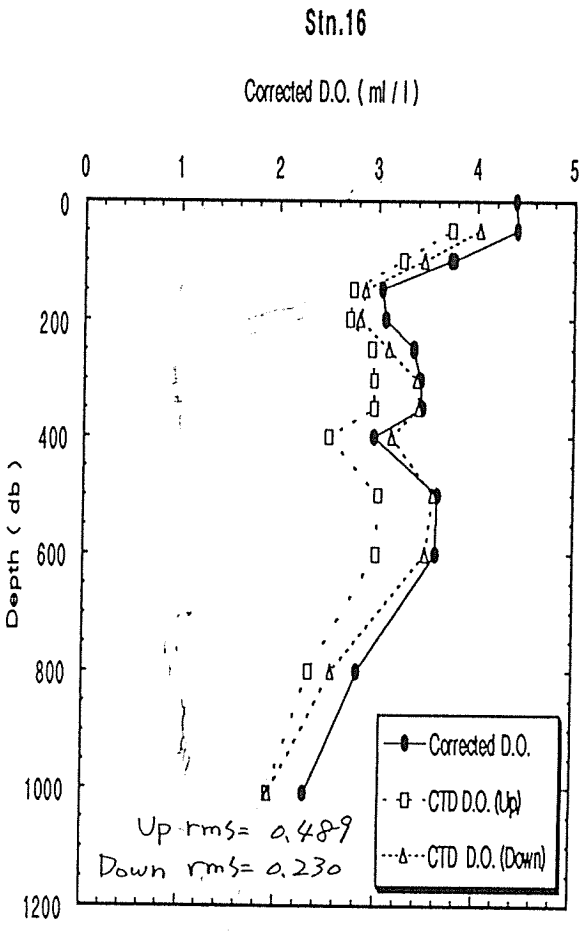


Fig.4.6.4 (4) Vertical plofiles

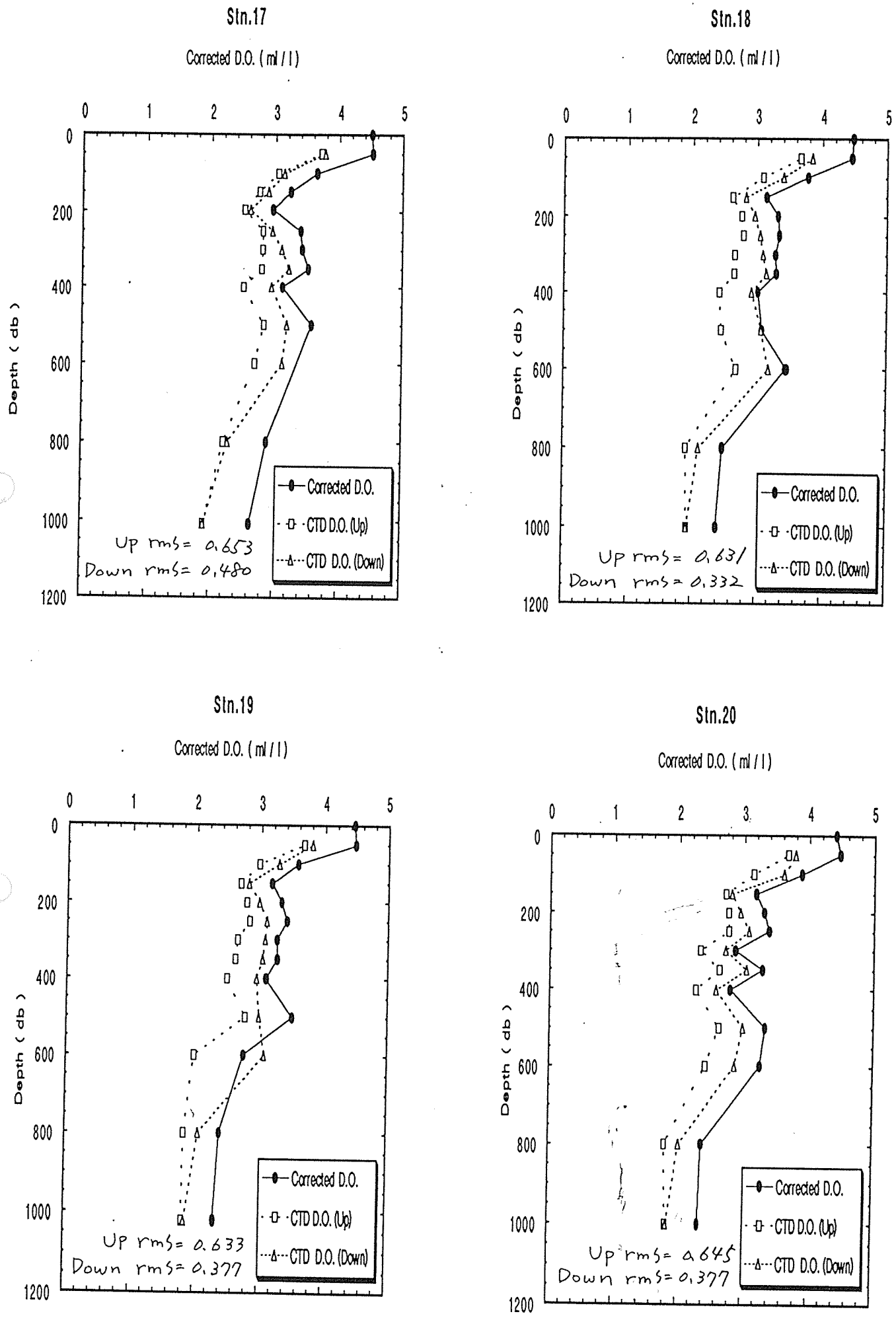
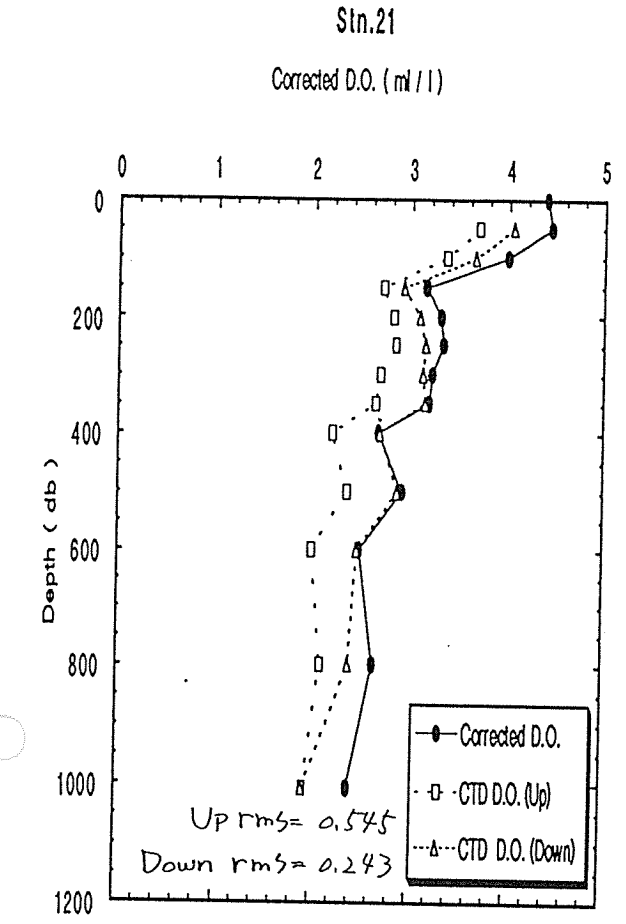
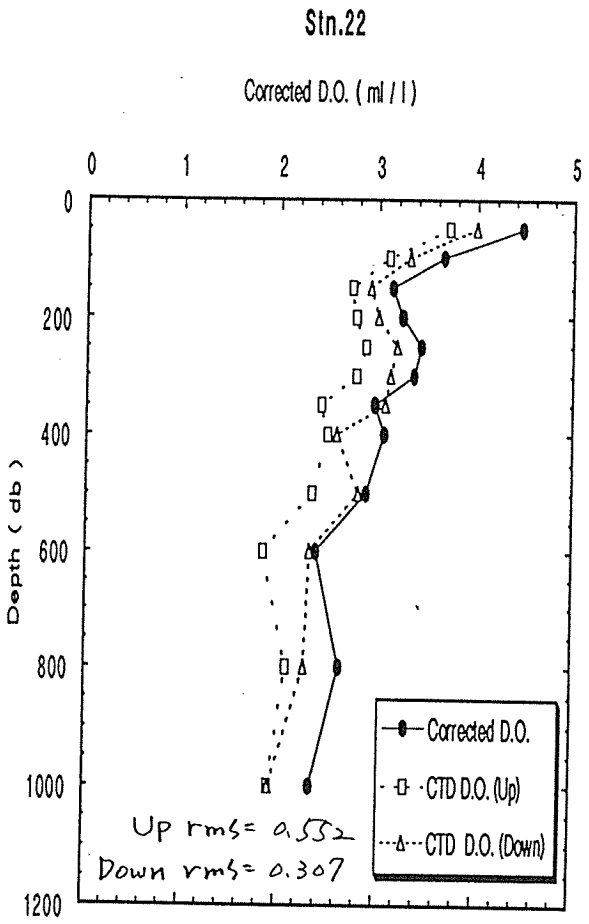
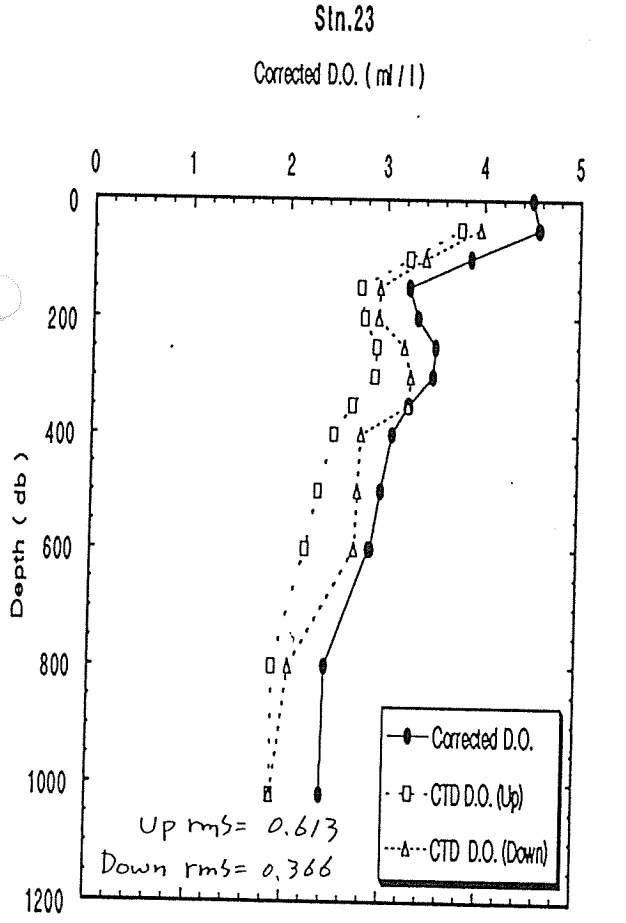


Fig.4.6.4 (5) Vertical plofiles







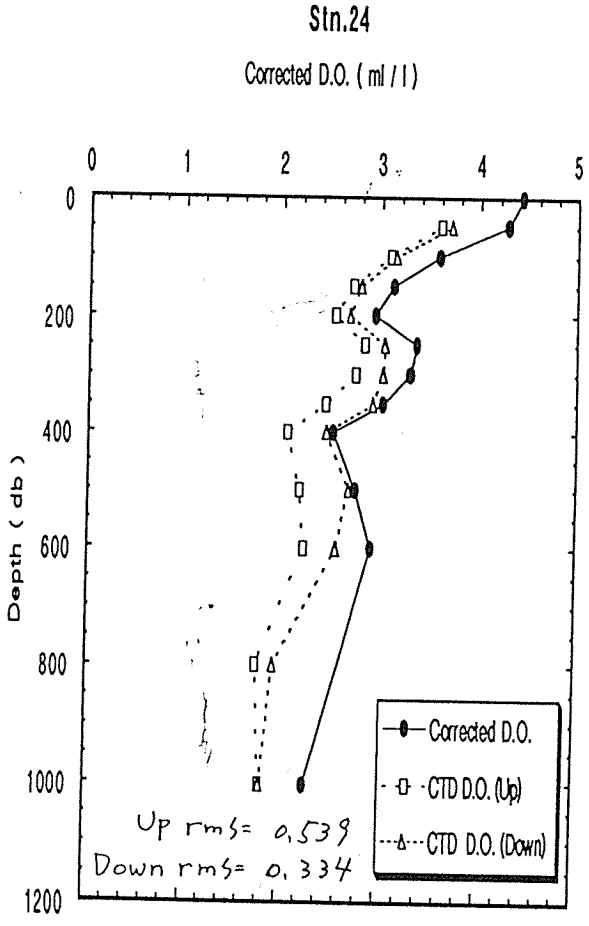


Fig.4.6.4 (6) Vertical plofiles

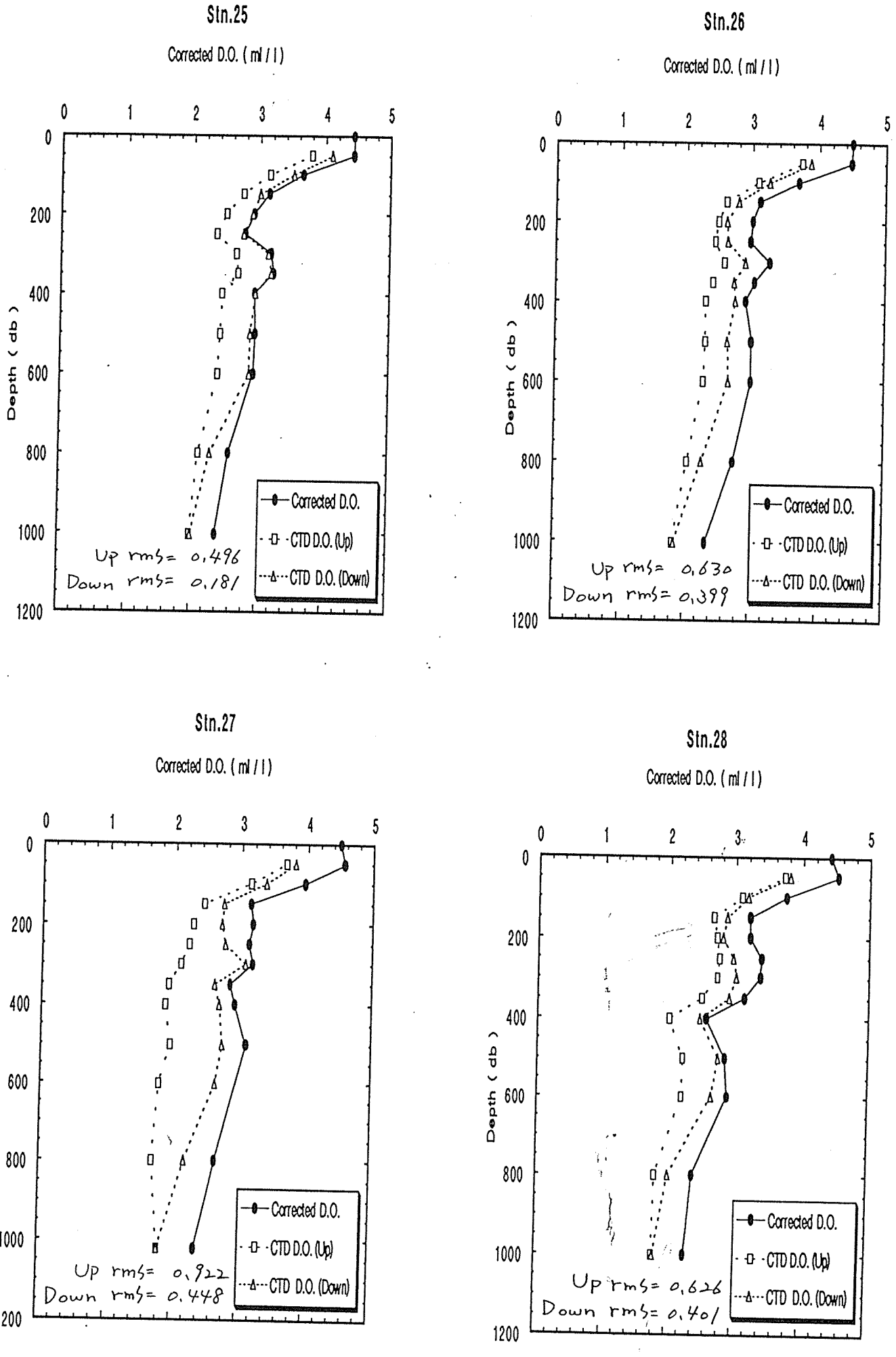
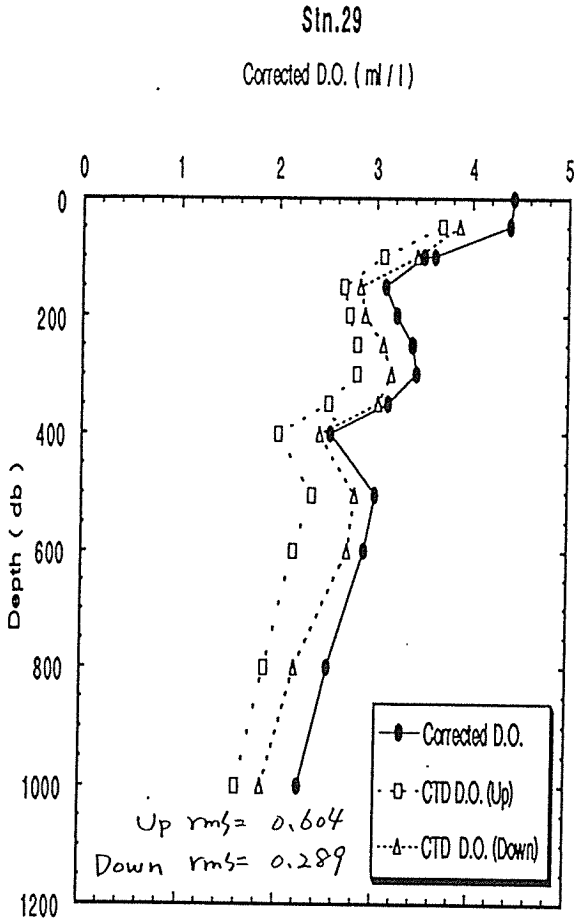
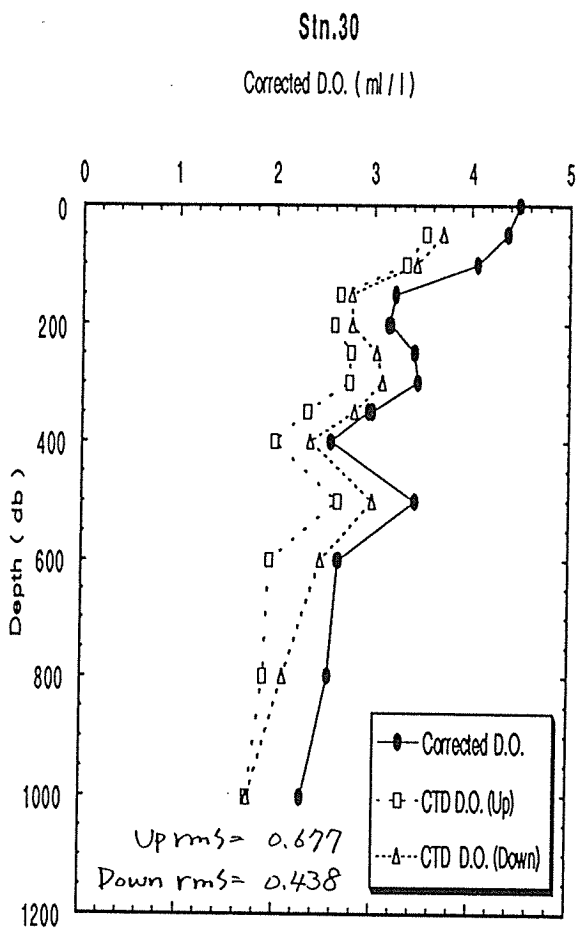
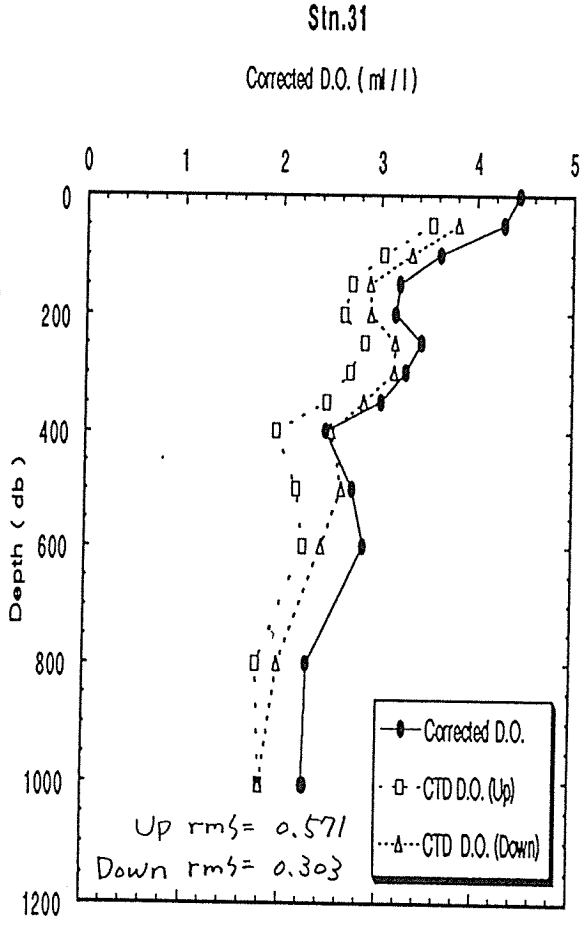


Fig.4.6.4 (7) Vertical plofiles







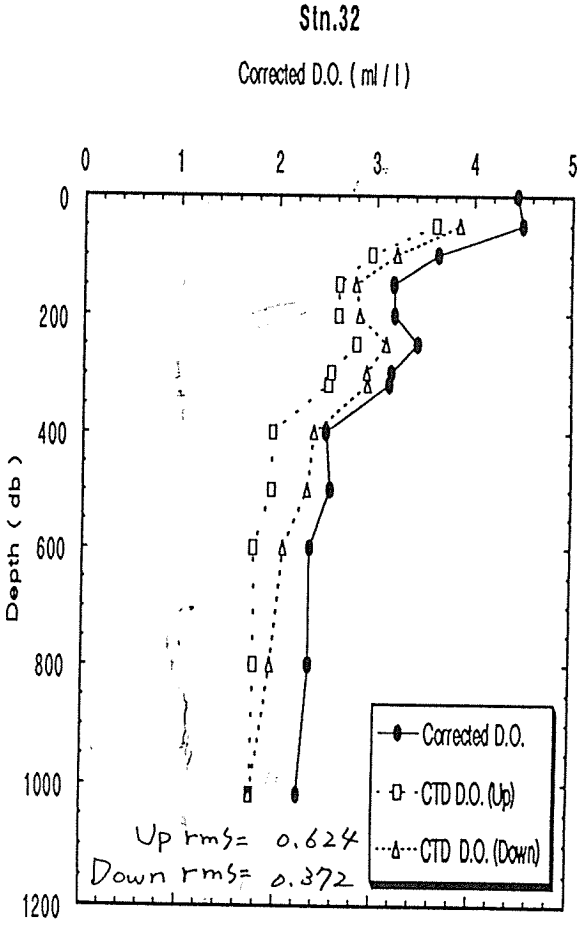


Fig.4.6.4 (8) Vertical plofiles

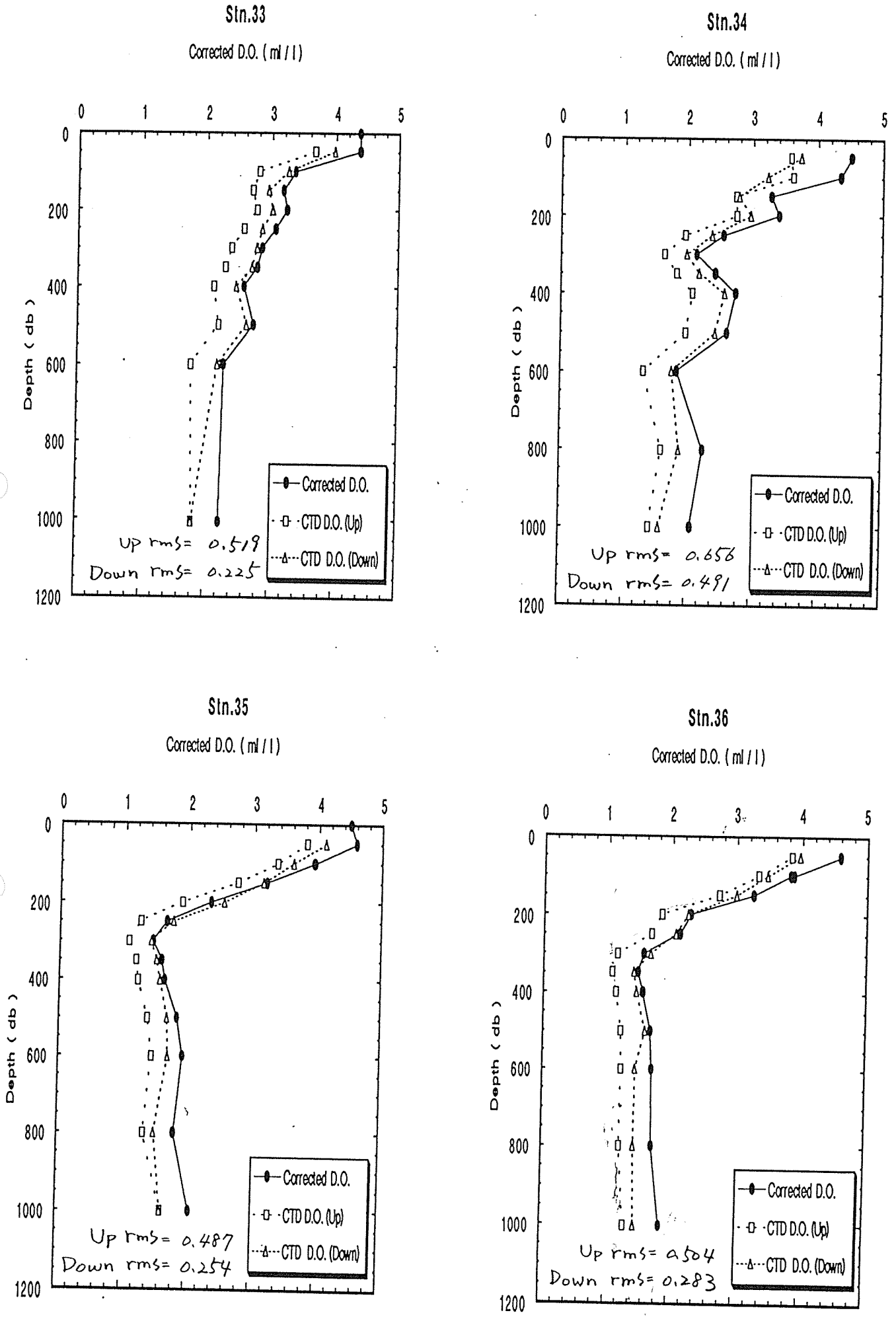
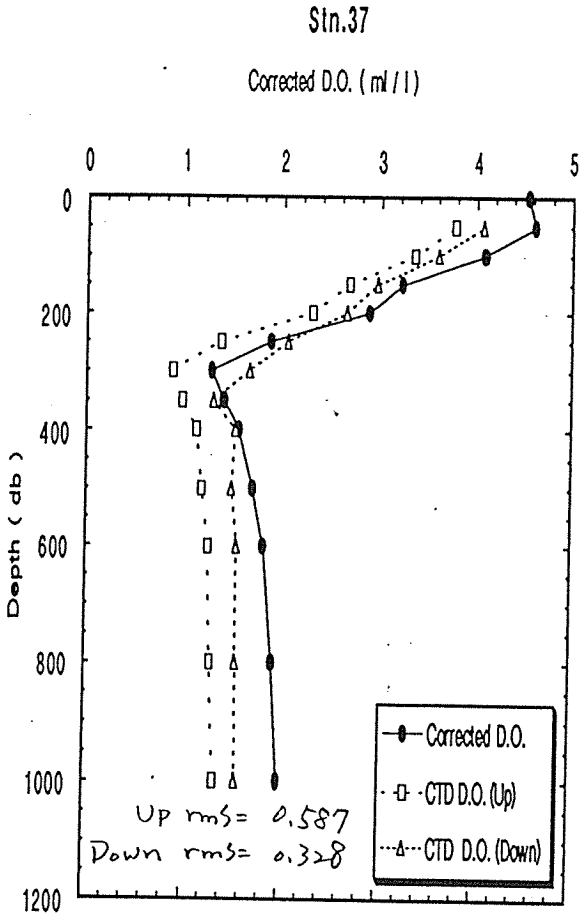
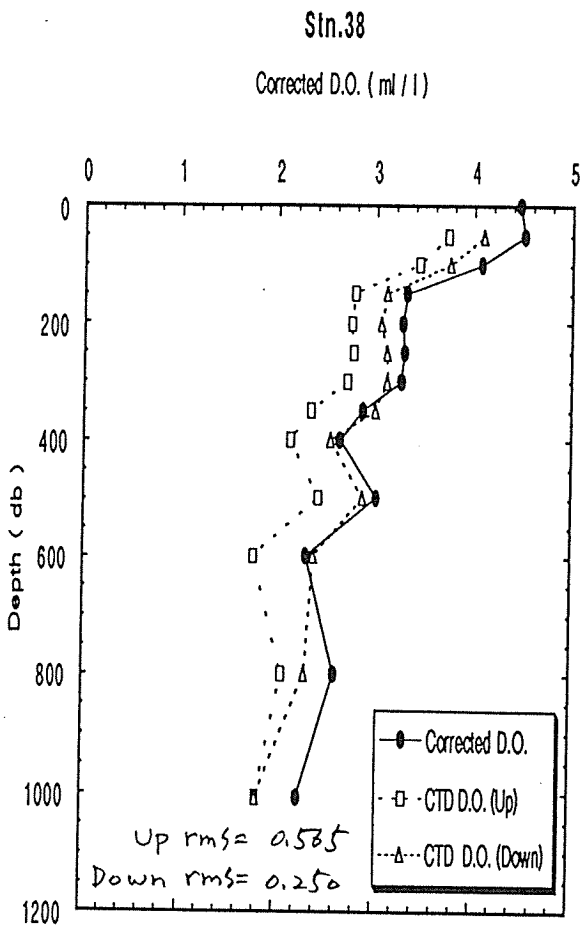
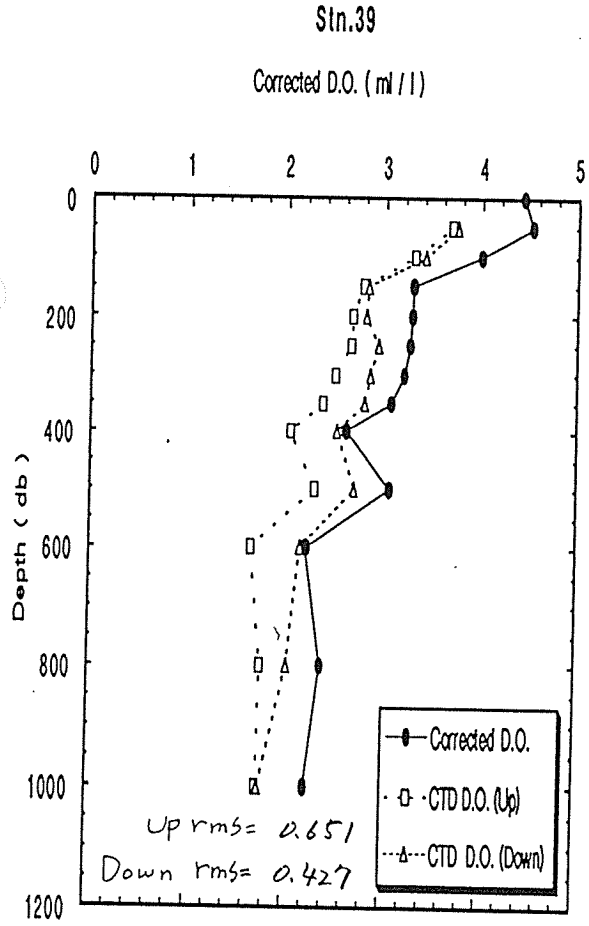


Fig.4.6.4 (9) Vertical plofiles







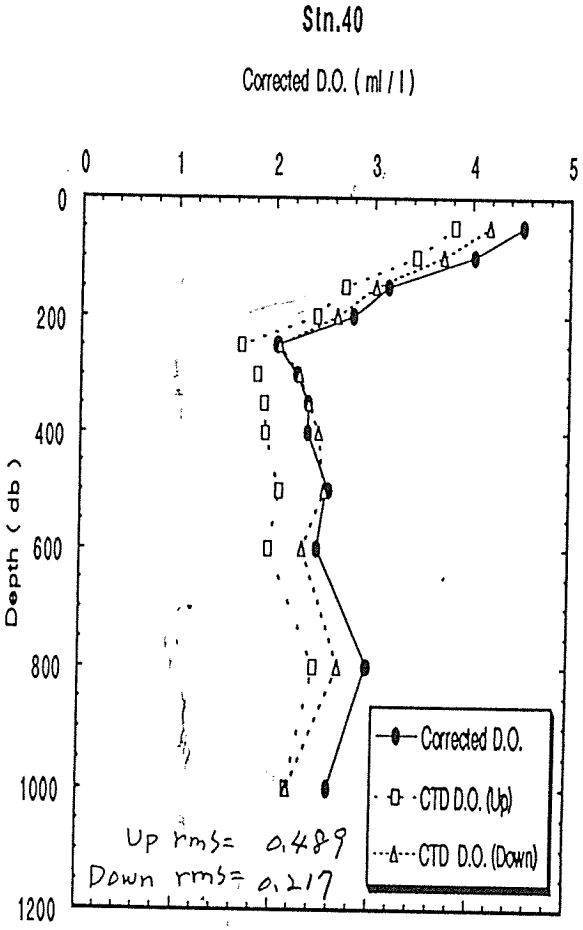


Fig.4.6.4 (10) Vertical plofiles

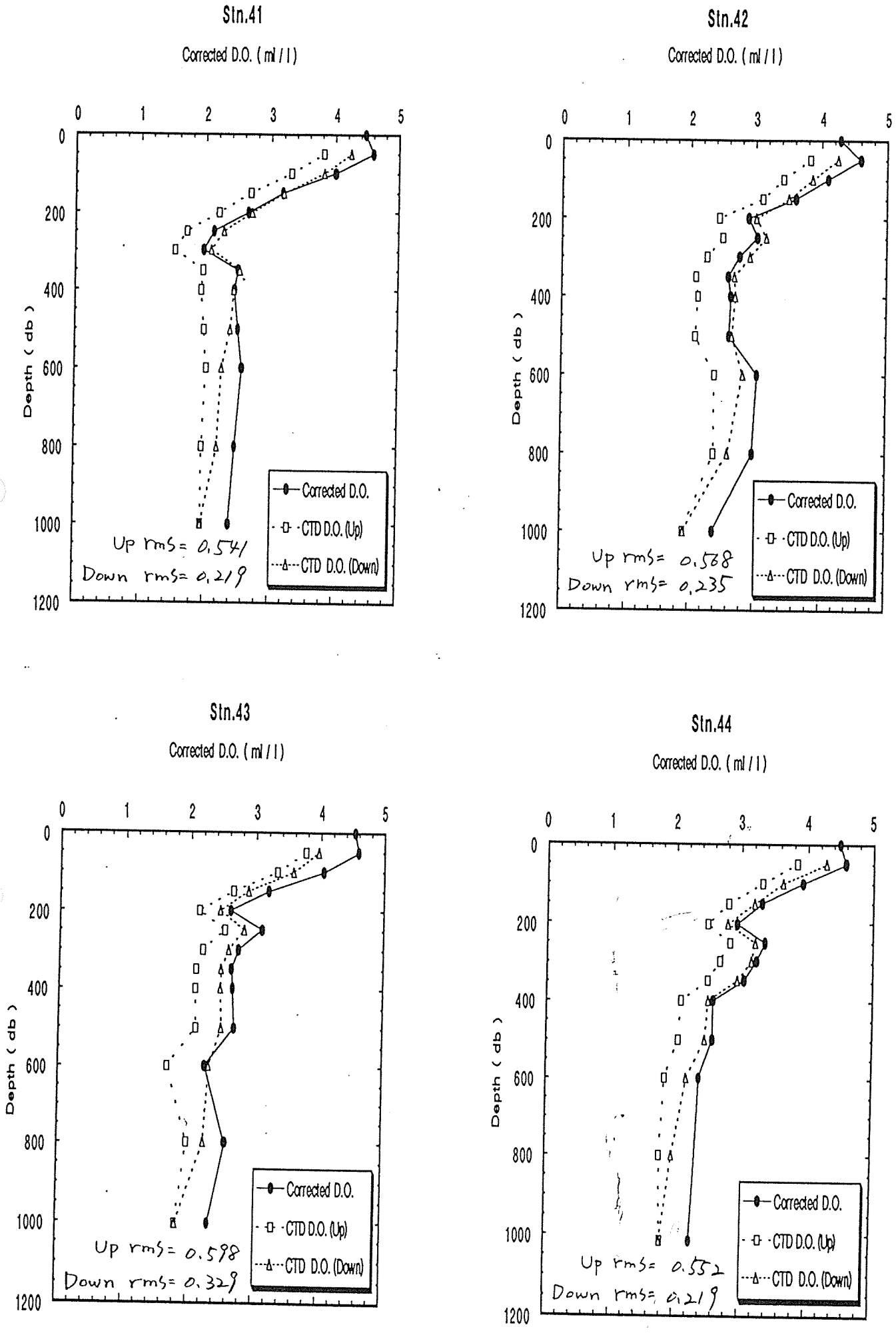
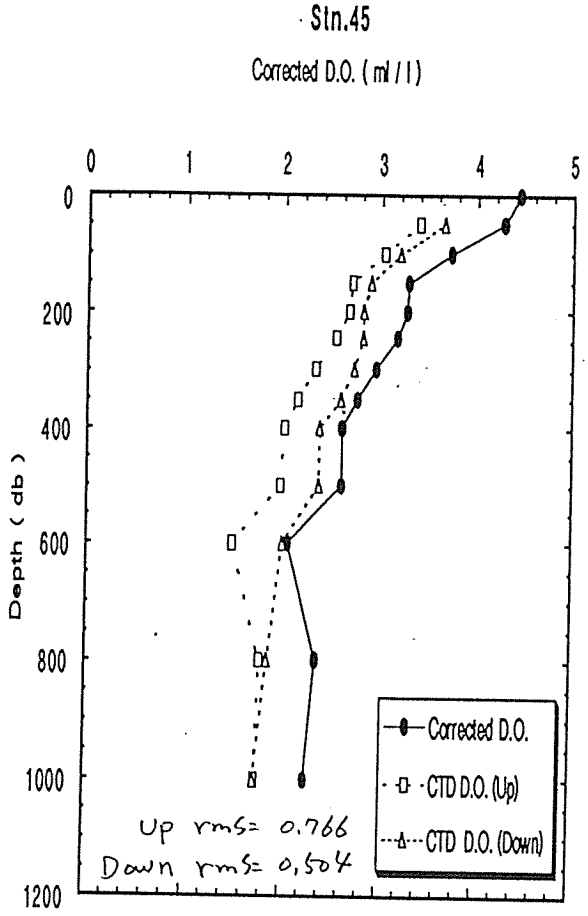
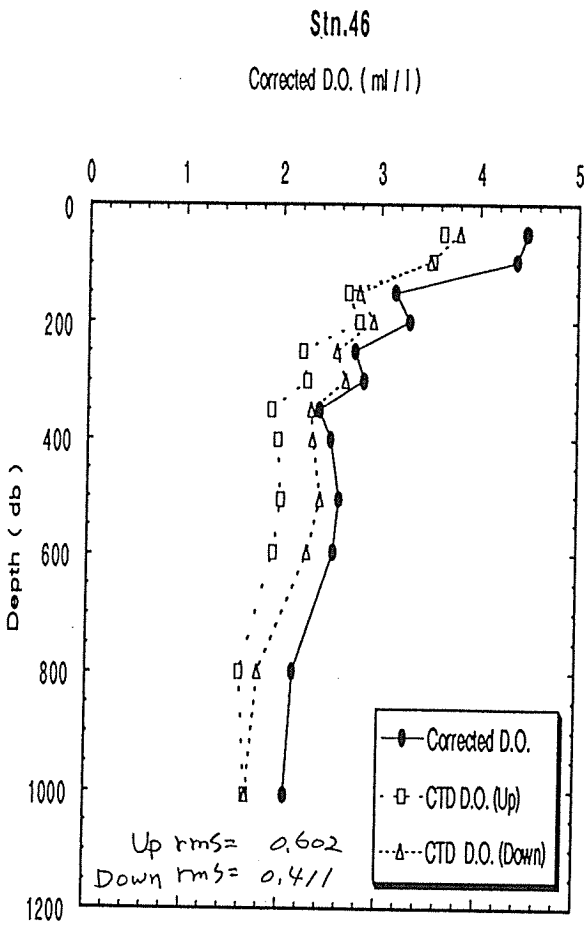
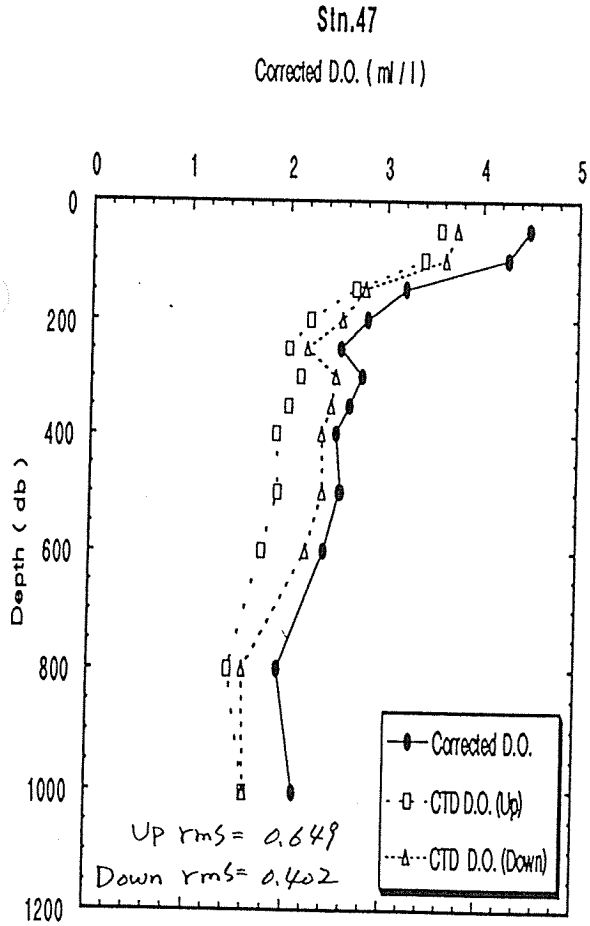


Fig.4.6.4 (11) Vertical plofiles







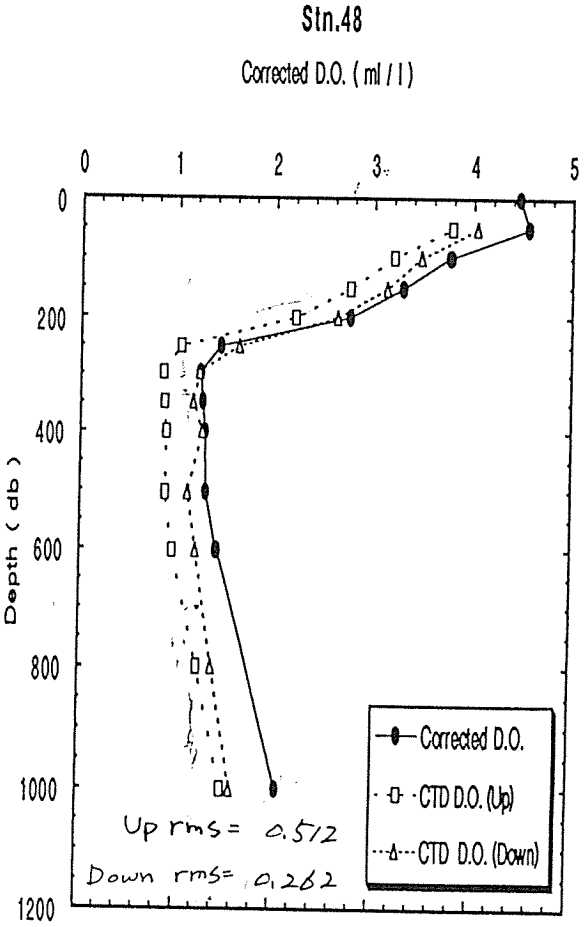


Fig.4.6.4 (12) Vertical plofiles

Table.4.6.1 (1) Corrected D.O. data

Stn. 6-45N	1 137-40E	Stn. 6N	2 137E	Stn. 5N	3 137E	Stn. 4N	4 137E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.47	0	4.41	0	n.d.	0	n.d.
50	4.73	51	4.62	49	4.61	51	4.56
100	3.61	101	3.97	101	4.08	101	4.11
150	3.49	150	3.13	153	3.58	150	3.38
201	2.40	200	2.27	200	2.59	199	3.35
251	1.82	250	1.74	253	1.53	250	2.73
304	1.57	300	1.55	303	1.38	300	1.60
350	1.64	350	1.73	349	1.35	349	1.40
399	1.66	400	2.08	398	1.62	399	1.55
499	1.81	500	1.92	500	1.90	499	1.94
602	1.97	600	2.24	601	2.24	600	2.24
802	1.86	800	1.96	781	3.89	800	2.54
1002	3.30	1001	2.00	993	2.00	1001	2.14

Stn. 3N	5 137E	Stn. 2-30N	6 137-30E	Stn. 1-30N	7 137-15E	Stn. 1N	8 137-30E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	n.d.	0	4.48	0	4.47	0	4.48
50	4.60	50	4.51	51	4.47	50	4.47
100	4.00	99	3.93	99	3.87	101	4.26
155	3.21	150	3.30	153	3.30	152	3.25
201	3.30	201	3.27	201	3.31	200	3.27
252	3.14	251	3.12	251	3.48	249	3.40
303	2.45	301	2.83	301	3.49	300	3.45
350	2.02	349	3.28	350	3.19	349	3.30
400	1.90	400	2.01	400	3.15	400	3.19
503	2.19	500	2.00	502	3.51	500	3.18
603	2.04	601	2.46	594	2.53	601	2.48
801	2.35	800	2.37	799	2.41	801	2.38
1015	2.17	1005	2.20	1001	2.25	999	2.36

Stn. 0	9 138E	Stn. 0-30E	10 138E	Stn. 1S	11 138E	Stn. 0	12 139E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.39	0	n.d.	0	4.42	0	4.45
49	4.27	50	4.48	50	4.38	50	4.51
103	3.52	102	3.59	101	3.46	101	3.76
148	3.09	149	3.19	149	3.27	151	3.29
199	3.11	199	3.18	199	3.35	200	3.30
250	3.20	249	3.34	250	3.46	250	3.43
302	3.25	301	3.49	301	3.54	302	3.44
354	3.19	352	3.43	352	3.45	350	2.92
402	3.16	401	3.22	402	3.30	400	2.90
499	3.34	499	3.44	502	3.54	500	3.36
598	3.27	600	3.68	602	3.62	600	2.53
798	3.17	802	3.05	800	3.08	801	2.93
1019	2.20	1003	2.40	1000	2.56	1003	2.34

Stn. 0	13 140E	Stn. 0	14 141E	Stn. 2-30S	15 142E	Stn. 2S	16 142E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.45	0	4.42	0	4.43	0	4.39
48	4.45	50	4.42	49	n.d.	50	4.40
101	4.02	99	3.48	100	4.09	101	3.75
152	3.23	151	3.19	149	3.33	149	3.04
200	3.32	200	3.32	198	3.37	200	3.07
251	3.39	251	3.39	249	3.59	250	3.36
301	3.42	300	2.92	300	3.64	302	3.43
351	2.97	349	3.09	350	3.66	351	3.45
400	2.57	400	3.13	400	3.67	401	2.97
496	3.57	500	3.46	500	3.75	500	3.61
598	2.58	600	2.24	600	3.72	601	3.59
799	2.39	800	2.47	800	3.28	801	2.81
1029	2.31	1008	2.30	1000	2.66	1009	2.29

n.d.=NO DATA

Table.4.6.1 (2) Corrected D.O. data

Stn.	17	Stn.	18	Stn.	19	Stn.	20
1-30S	142E	1S	142E	0-30S	142E	0	142E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.51	0	4.47	0	4.45	0	4.40
50	4.52	51	4.45	51	4.47	50	4.47
101	3.65	100	3.77	100	3.57	100	3.88
149	3.23	152	3.14	151	3.17	151	3.18
195	2.96	200	3.32	201	3.32	201	3.31
250	3.39	250	3.34	251	3.41	249	3.39
299	3.42	300	3.28	300	3.25	300	2.86
351	3.52	350	3.30	350	3.26	350	3.29
400	3.12	401	3.01	400	3.09	401	2.79
500	3.57	500	3.07	500	3.50	499	3.34
600	3.47	601	3.45	600	2.75	598	3.26
800	2.88	801	2.47	799	2.39	799	2.36
1008	2.63	1002	2.39	1022	2.31	1001	2.33

Stn.	21	Stn.	22	Stn.	23	Stn.	24
0	143E	0	144E	0	145E	0	146E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.39	0	n.d.	0	4.50	0	4.42
50	4.44	50	4.46	50	4.57	50	4.27
100	3.99	99	3.66	100	3.86	100	3.58
151	3.15	150	3.14	149	3.23	150	3.12
201	3.30	200	3.24	201	3.33	200	2.94
248	3.33	250	3.43	250	3.51	250	3.36
299	3.21	300	3.37	300	3.49	301	3.30
349	3.18	350	2.97	350	3.24	350	3.03
400	2.66	400	3.07	400	3.07	400	2.52
499	2.91	500	2.89	500	2.96	500	2.75
600	2.48	600	2.38	600	2.86	601	2.91
799	2.63	800	2.63	801	2.42	799	n.d.
1008	2.38	1000	2.34	1020	2.39	1003	2.27

Stn.	25	Stn.	26	Stn.	27	Stn.	28
1-40S	147E	1-30S	147E	1S	147E	0-30S	147-15E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.43	0	4.49	0	4.50	0	4.41
50	4.43	50	4.47	50	4.56	50	4.52
100	3.66	100	3.69	100	3.95	100	3.75
149	3.14	149	3.12	150	3.14	150	3.21
200	2.91	199	3.00	201	3.17	200	3.21
251	2.78	250	2.98	251	3.12	251	3.39
299	3.17	301	3.26	300	3.17	299	3.37
348	3.21	351	3.04	351	2.84	350	3.14
399	2.94	398	2.91	401	2.91	401	2.56
501	2.95	500	3.00	501	3.09	500	2.85
602	2.92	600	3.00	601	2.91	599	2.89
800	2.57	800	2.74	800	2.64	800	2.37
1005	2.38	1004	2.33	1022	2.35	1001	2.27

Stn.	29	Stn.	30	Stn.	31	Stn.	32
0-17S	147-30E	0	147E	0-30N	147E	1N	147E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.43	0	4.49	0	4.44	0	4.44
49	4.39	50	4.37	50	4.28	50	4.50
100	3,55	101	4.06	100	3.62	100	3.64
151	3.09	151	3.22	150	3.20	150	3.18
200	3.21	202	3.16	201	3.16	202	3.19
250	3.38	249	3.41	249	3.43	250	3.43
300	3.42	299	3.45	299	3.27	298	3.16
350	3.13	349	2.97	349	3.01	318	3.14
402	2.53	400	2.56	398	2.45	399	2.50
505	3.00	500	3.43	500	2.72	499	2.55
599	2.89	600	2.64	599	2.84	600	2.35
801	2.52	799	2.55	801	2.27	800	2.34
1001	2.24	1003	2.28	1005	2.25	1018	2.24

n.d.=NO DATA

Table.4.6.1 (3) Corrected D.O. data

Stn. 2N	33 147E	Stn. 3N	34 147E	Stn. 5N	35 147E	Stn. 6N	36 147-30E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.38	0	n.d.	0	4.50	0	n.d.
49	4.38	48	4.51	50	4.59	51	4.59
101	3.36	99	4.35	101	3.93	100	3.85
150	3.18	149	3.28	150	3.19	150	3.25
201	3.23	199	3.40	201	2.33	199	2.29
250	3.06	251	2.55	250	1.65	249	2.12
299	2.85	300	2.13	301	1.44	300	1.56
350	2.78	349	2.43	350	1.58	348	1.47
399	2.57	399	2.74	402	1.63	400	1.55
497	2.73	501	2.61	501	1.83	500	1.67
599	2.27	599	1.83	601	1.92	600	1.70
n.d.	n.d.	802	2.26	800	1.80	799	1.72
1007	2.23	1001	2.07	1001	2.06	1002	1.86

Stn. 4-30N	37 147-30E	Stn. 0	38 149E	Stn. 0	39 150E	Stn. 5S	40 156E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.54	0	4.46	0	4.43	0	n.d.
51	4.61	52	4.51	51	4.53	50	4.52
100	4.09	100	4.08	100	4.00	100	4.02
150	3.22	150	3.31	149	3.29	150	3.15
201	2.88	202	3.27	200	3.27	200	2.80
251	1.87	251	3.29	251	3.25	249	2.03
300	1.27	301	3.26	302	3.20	300	2.23
350	1.40	350	2.87	351	3.07	350	2.34
400	1.56	400	2.64	399	2.61	401	2.34
501	1.70	498	3.01	500	3.05	501	2.54
602	1.82	599	2.30	600	2.21	600	2.44
800	1.92	800	2.60	800	2.37	799	2.96
1000	1.99	1007	2.24	1001	2.22	1000	2.58

Stn. 4S	41 156E	Stn. 2S	42 156E	Stn. 1S	43 156E	Stn. 0	44 156E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.47	0	4.28	0	4.53	0	4.49
50	4.59	50	4.60	51	4.59	50	4.58
100	4.00	100	4.09	101	4.04	100	3.92
151	3.18	150	3.61	151	3.19	152	3.31
202	2.65	200	2.89	200	2.62	203	2.94
250	2.12	250	3.03	249	3.09	251	3.36
299	1.96	299	2.76	300	2.74	297	3.23
351	2.50	350	2.59	349	2.64	347	3.05
401	2.45	400	2.63	399	2.66	399	2.58
501	2.51	501	2.61	500	2.69	499	2.57
600	2.57	600	3.04	599	2.25	598	2.37
800	2.47	800	2.98	798	2.57	800	2.24
1000	2.39	1000	2.37	1004	2.32	1016	2.25

Stn. 1N	45 156E	Stn. 2N	46 156E	Stn. 3N	47 156E	Stn. 5N	48 156E
Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)	Depth(db)	D.O.(ml/l)
0	4.44	0	n.d.	0	n.d.	0	4.46
49	4.28	49	4.47	49	4.49	51	4.56
101	3.73	98	4.38	99	4.27	100	3.77
151	3.28	151	3.15	149	3.21	152	3.30
200	3.27	200	3.30	201	2.80	201	2.75
245	3.17	250	2.74	250	2.53	251	1.44
298	2.95	300	2.83	300	2.75	297	1.24
350	2.75	350	2.38	352	2.63	349	1.26
400	2.60	401	2.50	399	2.49	400	1.29
500	2.60	505	2.59	499	2.54	504	1.30
601	2.05	597	2.53	599	2.38	602	1.41
799	2.35	799	2.13	801	1.92	799	1.74
1002	2.25	1007	2.06	1005	2.10	1001	2.05

n.d.=NO DATA

Table.4.6.2 Comparison of CTD D.O.Sensor and D.O. data

Niskin No.	Depth (db)	rms	
		CTD (Up)	CTD (Down)
1	1000	0.496	0.466
2	800	0.581	0.355
3	600	0.609	0.227
4	500	0.615	0.211
5	400	0.557	0.172
6	350	0.587	0.183
7	300	0.574	0.214
8	250	0.538	0.260
9	200	0.509	0.290
10	150	0.508	0.313
11	100	0.664	0.469
12	50	0.767	0.552

5. Meteorological Measurements

Objectives : To promote our understanding about the air–sea interaction over the "warm water pool" area.

5.1 Atmospheric Sounding

Method

We observed vertical profiles of pressure, temperature, relative humidity, and wind speed/direction by using VAISALA DigiCORA MW 11 semi–Automatic Radiosonde System. The system consists of Main processor (MW11), Local VLF Antenna (CAS11B/CAA21), UHF Telemetry Antenna (RB21), Microdisk Recorder (MF12), Ground Check Set (GC22), printer (EPSON LX–1050), Balloon Launcher (ASAP), and Radiosonde (RS80–15N).

The surface data were measured by using handy humidity and temperature meter (YOKOGAWA 2451–01), shipboard Aneroid barometer (YANAGI type 8A) and wind speed/direction meter (OGASAWARA).

We launched the radiosonde with balloon every 6 hours at 00Z, 06Z, 12Z, and 18Z from 9th JUL '96 to 22nd JUL '96 and from 27th JUL '96 to 2nd AUG '96. So we obtained 78 sounding data. Table 5–1 shows Radiosonde Launch Log.

Preliminary Results

Fig.5–1 shows the EMAGRAM and wind profiles with sounding time (YYMMDDTT UTC) and position.

The easterly wind almost dominated on the west side area of 147E.

On the 147E line, we observed the westerly wind near the surface at the northern side of 2N.

On the 156E line, there was westerly wind from surface to 350 hPa at the southern side of 2S, and the atmosphere was dry. On the other hand, at the northern side of 2S on the 156E line, the easterly wind existed at the lower layer.

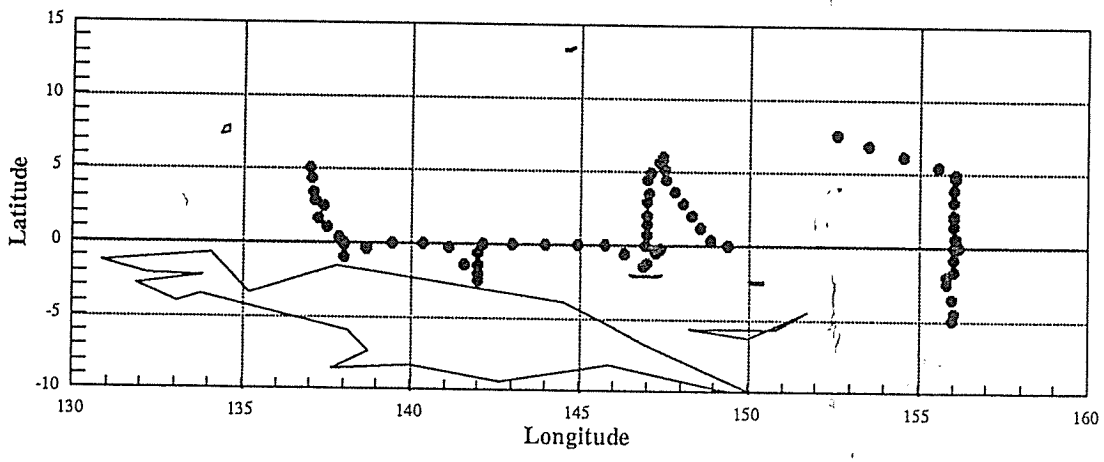


Table 5-1 Radio Sonde Launch Log Sites

No.	Time(UTC) YYMMDDTT	Position lat.			Long.			Surface Press. (hP)	Temp. (DEG-C)	RH (%)	W.D. (deg)	W.S. (m/s)	Max Altitude (hPa)	(m)	Cloud Amount	Type
01	96 07 09 00	05	00	N	137	00	E	1009.2	28.2	81	110	5.0	42.4	21,635	2	Cu,Sc
02	96 07 09 06	04	19	N	137	01	E	1005.8	29.0	76	083	5.6	41.9	21,688	9	Cu,Sc,Ns
03	96 07 09 12	03	27	N	137	06	E	1007.5	28.5	75	075	6.2	54.0	20,137	3	Cu,Sc
04	96 07 09 18	02	47	N	137	07	E	1007.0	27.0	84	098	6.7	58.8	19,638	9	Cu,Ns
05	96 07 10 00	02	26	N	137	24	E	1008.6	29.7	71	095	7.2	35.1	22,733	3	Cu,Cs
06	96 07 10 06	01	37	N	137	16	E	1005.0	29.3	74	111	4.1	34.9	22,798	7	Cu,Ac
07	96 07 10 12	00	59	N	137	29	E	1008.3	28.3	77	105	6.1	80.2	17,813	0	
08	96 07 10 18	00	19	N	137	51	E	1005.3	27.1	77	013	1.4	48.4	20,786	1	Sc
09	96 07 11 00	00	02	S	137	59	E	1008.5	29.0	79	042	5.2	33.5	24,609	9-	Cu,Sc,Cb
10	96 07 11 06	00	10	S	138	00	E	1005.9	26.9	87	144	6.7	49.1	20,702	9	Cu,Sc,Cb
11	96 07 11 12	01	00	S	138	00	E	1008.3	26.9	89	340	5.0	40.5	21,914	0	
12	96 07 11 18	00	21	S	138	40	E	1006.5	27.7	85	026	6.3	45.0	21,250	2	Cu,Cb
13	96 07 12 00	00	01	S	139	26	E	1008.8	24.5	93	100	9.6	593.0	4,511	10	Sc
14	96 07 12 06	00	00	S	140	21	E	1006.6	28.3	73	101	4.7	31.7	23,340	2	Ci,Ac
15	96 07 12 12	00	18	S	141	07	E	1009.5	27.7	80	120	4.4	44.9	22,143	1	Cs
16	96 07 12 18	01	29	S	141	35	E	1007.7	28.5	77	088	5.8	44.7	21,286	1	Cb
17	96 07 13 00	02	29	S	141	58	E	1011.2	29.0	76	060	3.0	34.9	24,421	3	Cb,Ac,Cs
18	96 07 13 06	02	05	S	141	59	E	1006.7	28.7	76	104	4.6	40.5	21,877	7	Cb,Cu,Si
19	96 07 13 12	02	01	S	141	59	E	1009.8	28.3	83	080	5.0	76.5	18,123	2	Cb,Cu
20	96 07 13 18	02	00	S	141	58	E	1007.6	28.3	80	092	5.4	40.2	21,918	1-	Cu
21	96 07 14 00	02	01	S	142	00	E	1009.6	29.4	75	070	5.0	38.3	24,808	2	Cu,Ac
22	96 07 14 06	01	23	S	141	59	E	1006.3	28.5	79	041	11.0	43.4	21,451	8	Ns,Cb,Cu,Ci
23	96 07 14 12	00	34	S	142	00	E	1008.8	27.2	83	054	6.0	Unknown	Unknown	1	Ac,Sc
24	96 07 14 18	00	00	S	142	08	E	1006.6	28.1	81	080	5.9	40.7	21,845	3	Cu,Cb
25	96 07 15 00	00	00	S	143	00	E	1009.1	30.2	68	090	6.5	29.5	26,976	2	Cb,Cu,Ac
26	96 07 15 06	00	01	S	144	00	E	1006.3	27.5	86	105	6.0	36.8	22,469	4	Cb,Cu,Ac
27	96 07 15 12	00	00	S	144	57	E	1008.5	28.6	73	097	8.0	45.2	21,220	0+	St
28	96 07 15 18	00	00	S	145	47	E	1007.4	28.2	75	078	4.9	44.8	21,250	1	Cu
29	96 07 16 00	00	34	S	146	20	E	1009.1	29.1	71	105	5.5	29.3	23,890	1-	Cu,Ci
30	96 07 16 06	01	26	S	146	54	E	1005.8	28.7	73	102	5.7	31.2	23,505	2	Cu,Cb,Ac
31	96 07 16 12	01	13	S	147	00	E	1009.3	27.0	85	Calm	0.0	41.1	21,820	2	As
32	96 07 16 18	00	30	S	147	15	E	1007.3	27.5	91	75	5.0	42.9	21,535	Unknown	Unknown
33	96 07 17 00	00	18	S	147	25	E	1008.9	29.0	75	109	5.2	48.2	23,119	7	Sc,Cb,Ci
34	96 07 17 06	00	02	N	146	55	E	1006.1	29.0	72	136	9.1	33.4	23,099	9	Cu,Sc
35	96 07 17 12	00	40	N	147	00	E	1008.3	27.0	83	132	2.5	43.9	21,418	0	
36	96 07 17 18	01	26	N	147	00	E	1006.7	28.4	78	239	5.0	72.5	18,410	9	Unknown
37	96 07 18 00	02	00	N	147	00	E	1010.1	27.4	82	205	3.0	32.6	26,269	10	Cu,Sc
38	96 07 18 06	02	54	N	147	00	E	1007.2	25.4	88	250	7.6	44.3	21,341	10-	Ns,Sc,Cu
39	96 07 18 12	03	32	N	147	02	E	1009.6	26.4	84	261	6.5	33.2	23,136	4	As,Sc
40	96 07 18 18	04	28	N	147	01	E	1007.4	27.2	80	283	4.1	33.7	23,015	4	Cu,Sc
41	96 07 19 00	04	58	N	147	04	E	1009.2	29.0	74	236	2.0	23.6	25,255	7	Cu,Ci,Ac
42	96 07 19 06	04	57	N	147	04	E	1007.4	31.3	59	244	3.8	Unknown	Unknown	8	Sc,Cu,Ac
43	96 07 19 12	05	37	N	147	20	E	1009.1	28.5	76	281	3.2	81.1	18,000	0	
44	96 07 19 18	05	54	N	147	27	E	1007.4	27.4	80	265	4.5	49.9	20,620	4	Cu
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46	96 07 20 06	05	12	N	147	30	E	1007.1	27.6	80	244	7.5	28.6	24,050	10	Cu,Sc
47	96 07 20 12	04	29	N	147	33	E	1010.7	27.6	85	280	5.0	45.0	21,226	2	Cs
48	96 07 20 18	03	38	N	147	48	E	1008.6	27.1	83	154	9.1	31.4	23,442	1	Ac
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54	96 07 27 00	05	00	S	155	59	E	1011.2	28.3	71	035	2.0	30.5	26,296	7	Ac,Cu
55	96 07 27 06	04	28	S	156	01	E	1008.0	28.0	71	328	2.0	44.5	21,336	1	Cu
56	96 07 27 12	03	34	S	155	57	E	1010.2	27.7	75	Calm	0.0	41.6	21,737	1	Ac,Cs,Cu
57	96 07 27 18	02	27	S	155	49	E	1008.6	27.4	76	247	1.9	49.7	20,614	1	Ac
58	96 07 28 00	02	01	S	155	48	E	1010.0	28.9	69	140	2.7	40.1	21,953	2	Cu
59	96 07 28 06	01	43	S	156	01	E	1006.5	29.6	69	230	2.9	35.4	22,738	7	Cu
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62	96 07 29 00	00	00	S	156	06	E	1010.2	29.9	70	210	3.0	29.0	24,010	10-	Sc,Ac,Cu
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65	96 07 29 18	00	01	S	156	02	E	1006.9	28.2	74	180	4.0	40.3	21,923	3	Cu
66	96 07 30 00	00	01	N	156	12	E	1009.2	28.4	74	235	4.0	41.5	24,106	3	Cu
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69	96 07 30 18	02	01	N	156	00	E	1008.9	25.3	90	310	4.0	32.7	23,217	10	Ns,St,Sc
70	96 07 31 00	02	03	N	156	02	E	1011.1	26.7	80	180	5.0	31.2	26,319	9	Sc,Cu
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76	96 08 01 12	06	07	N	154	32	E	1012.8	27.1	85	205	7.5	51.8	20,451	3	Ac,Sc,Cu
77	96 08 01 18	06	51	N	153	31	E	1010.0	26.5	86	215	9.8	38.8	22,189	8	Ac,Cb,Cu
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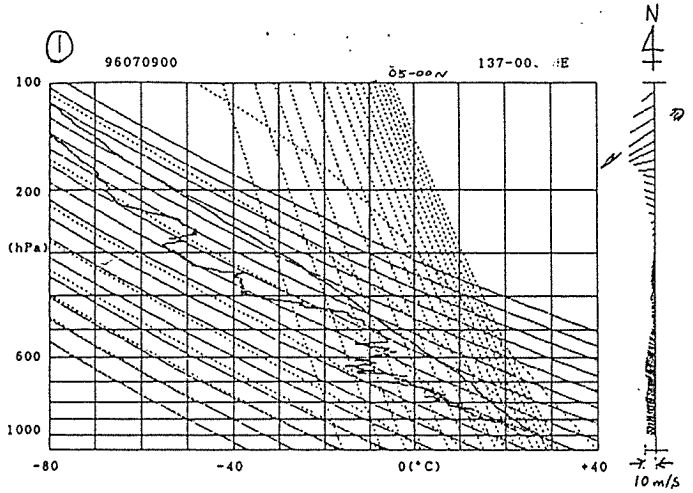
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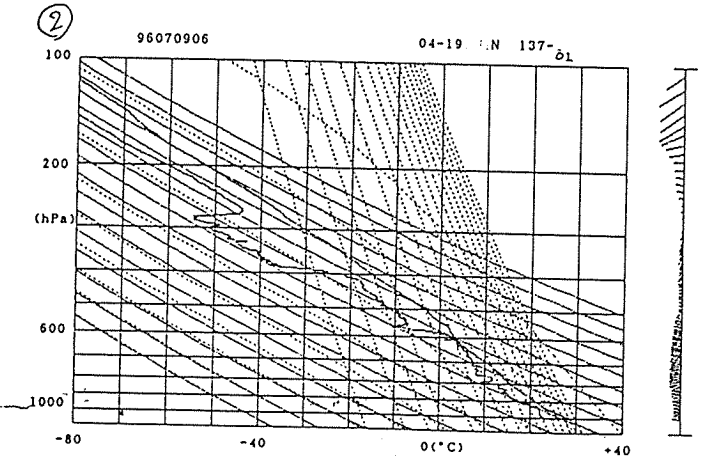
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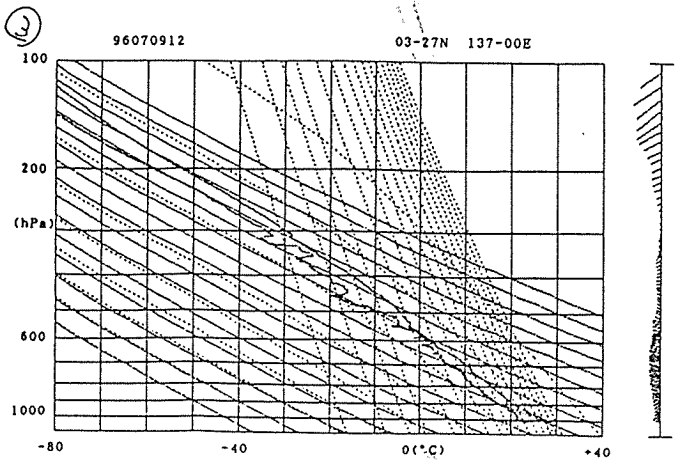
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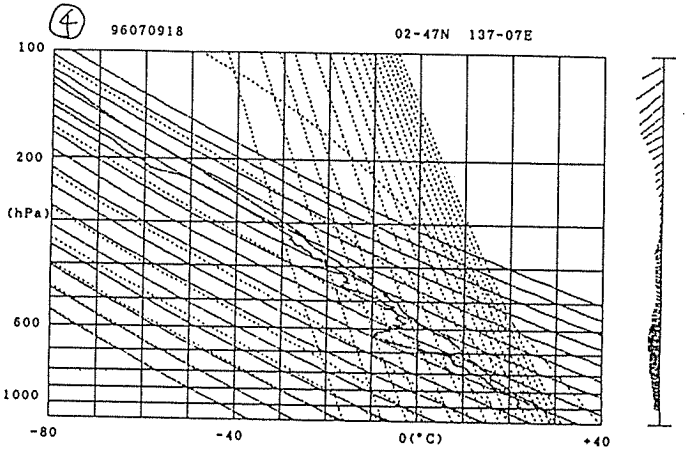
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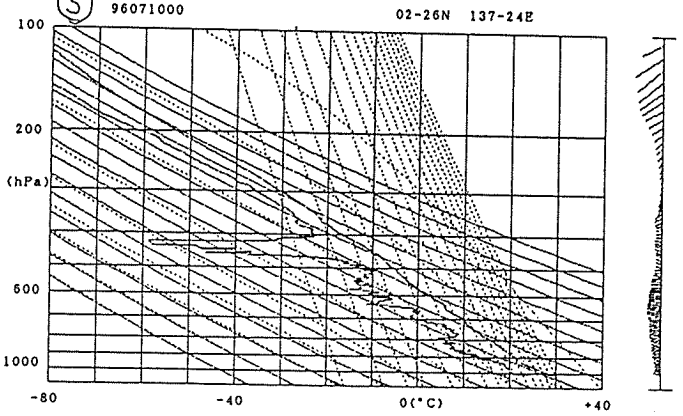
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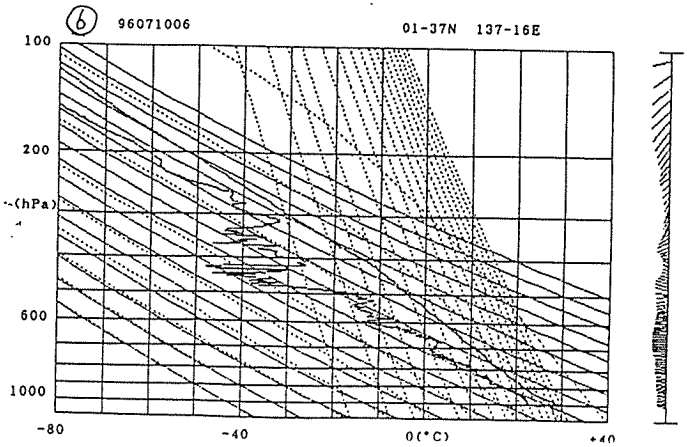
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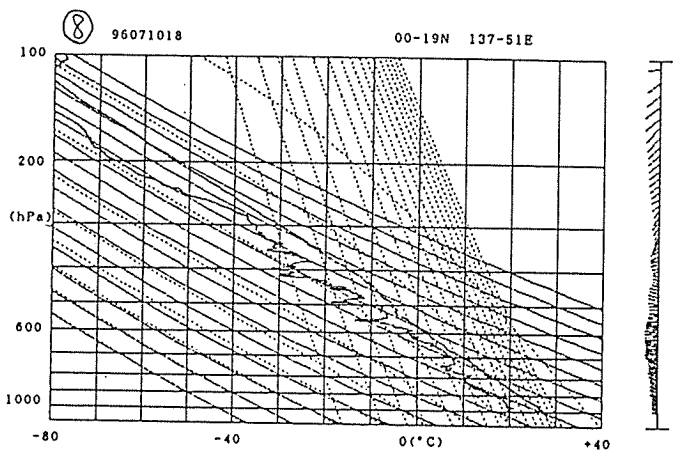
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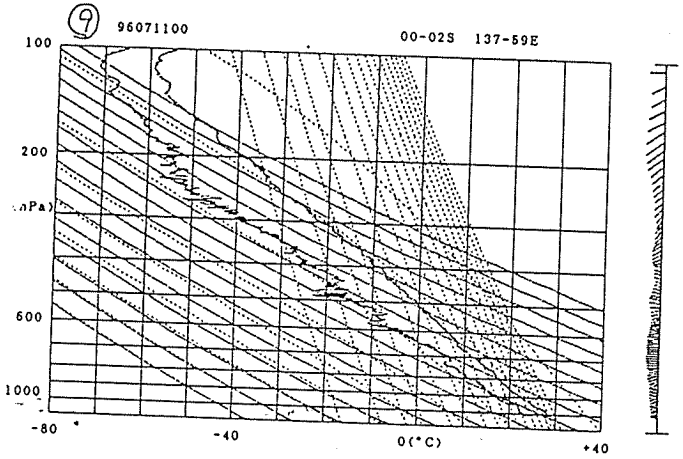
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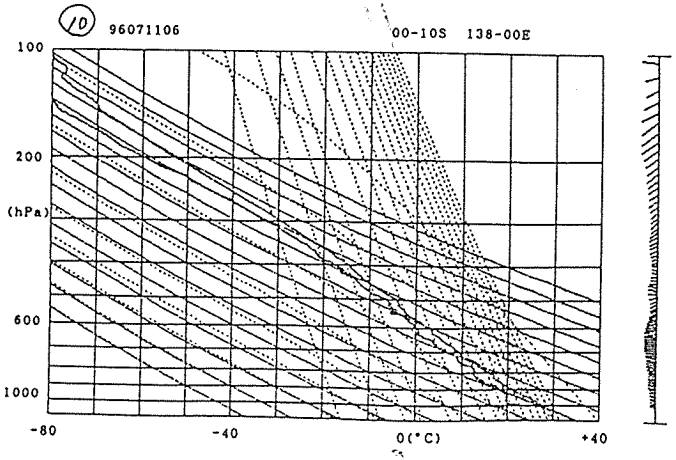
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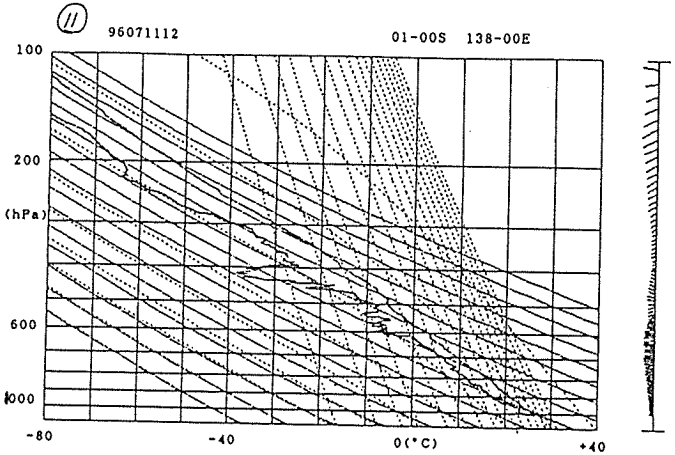
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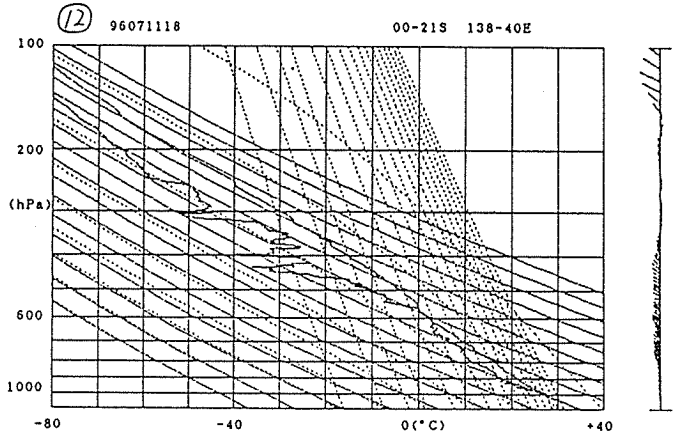
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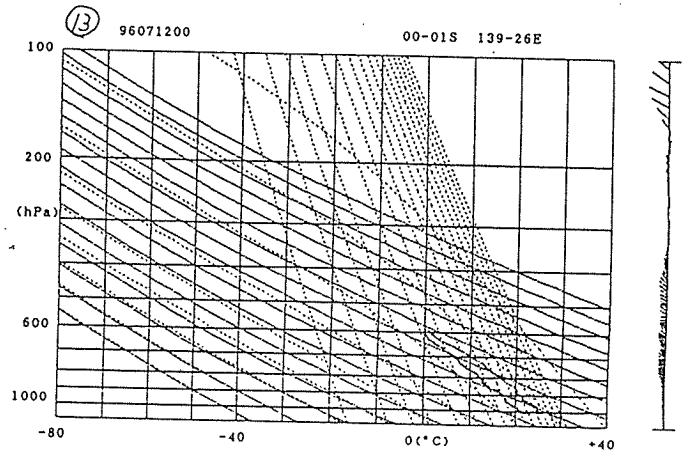
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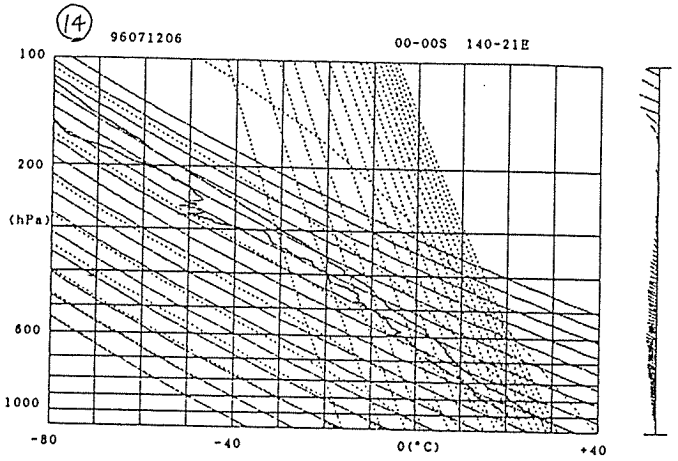
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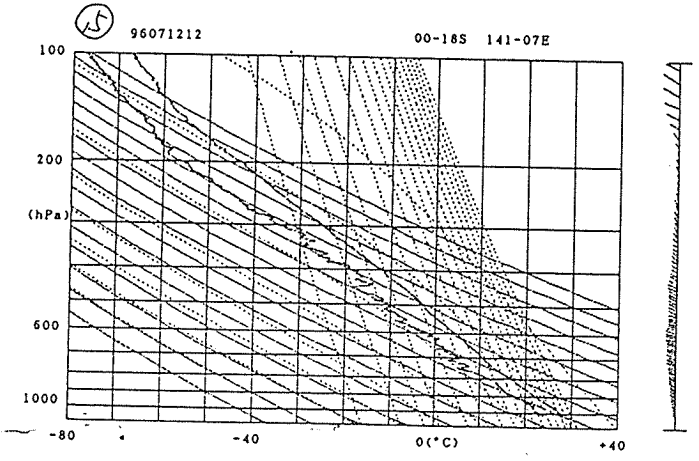
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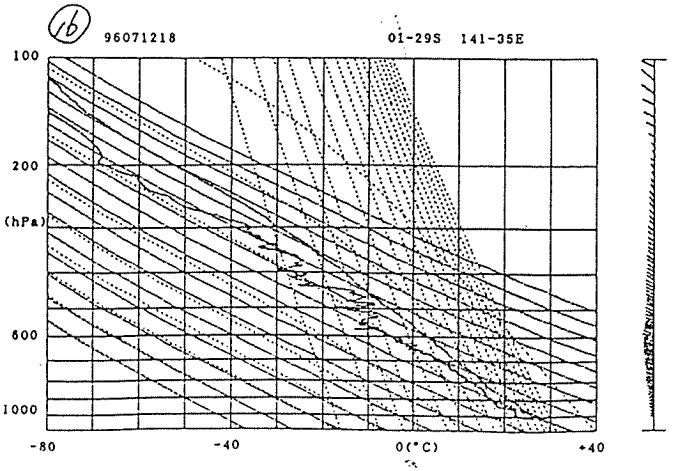
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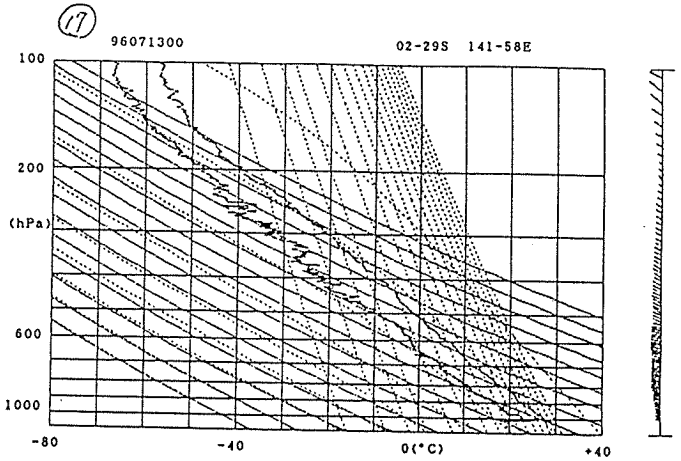
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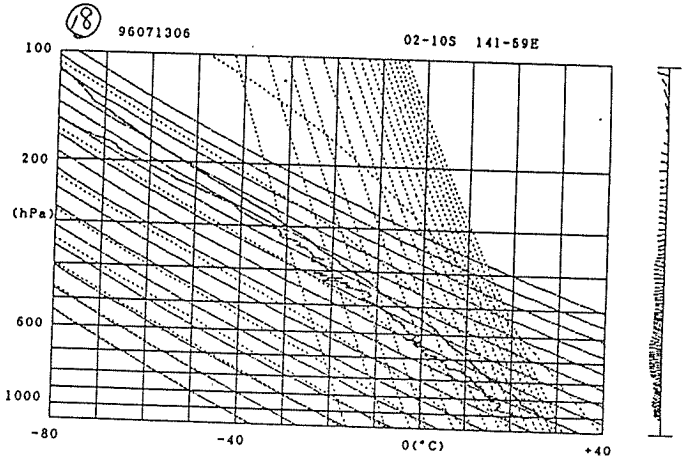
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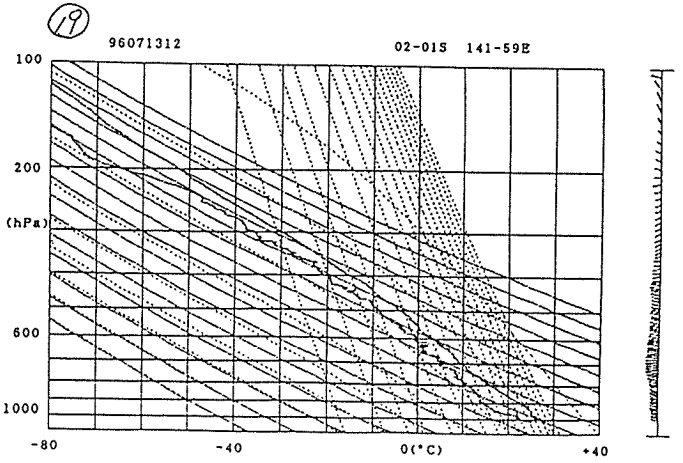
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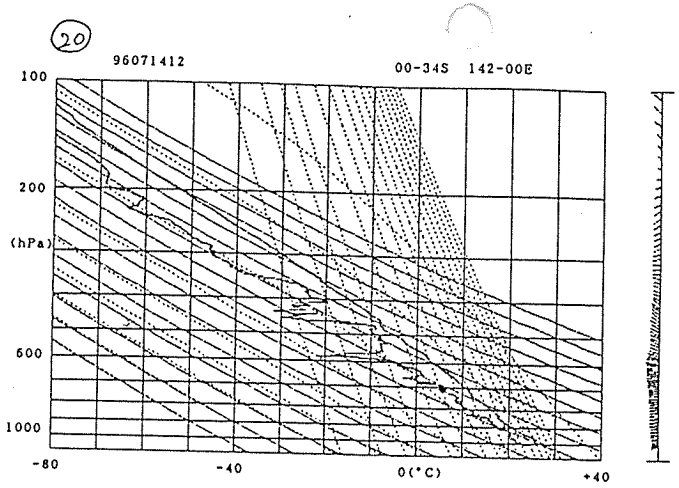
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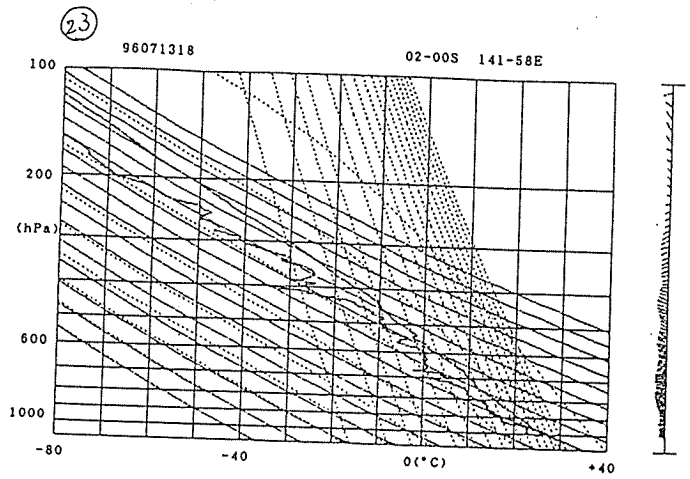
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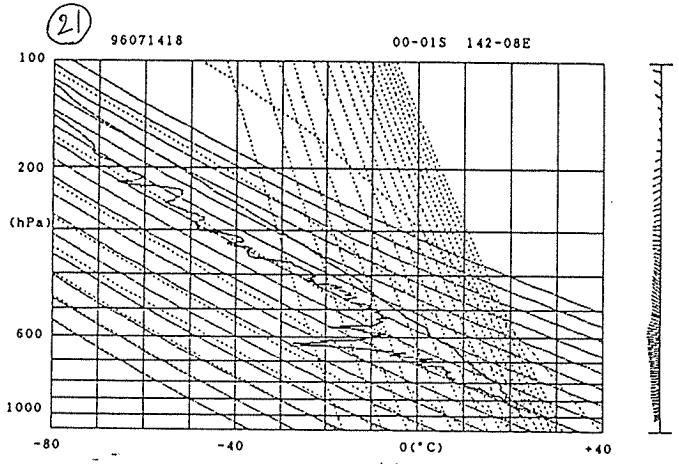
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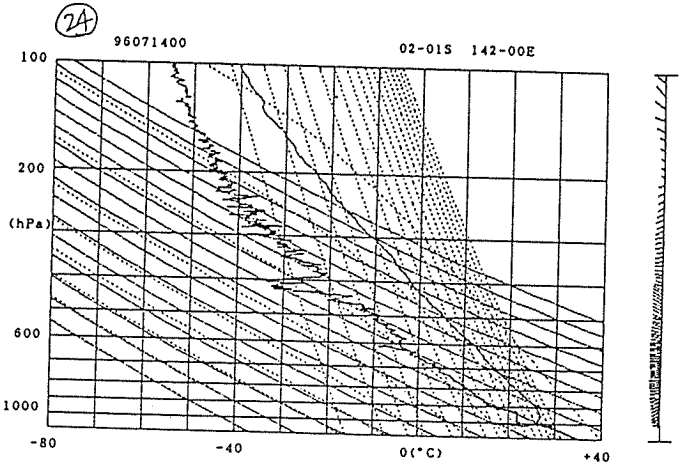
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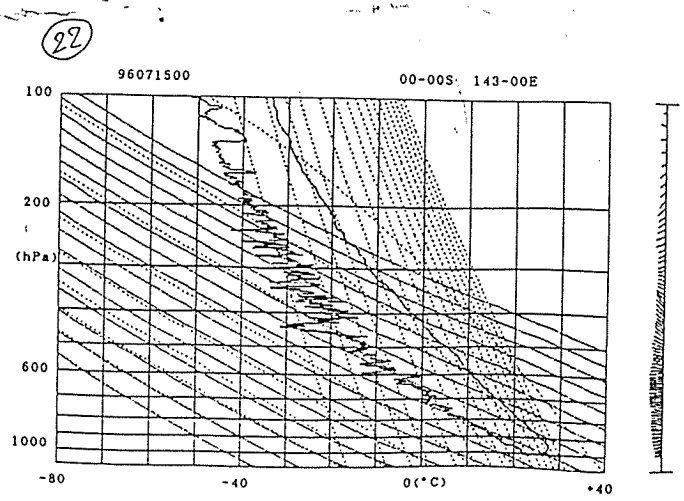
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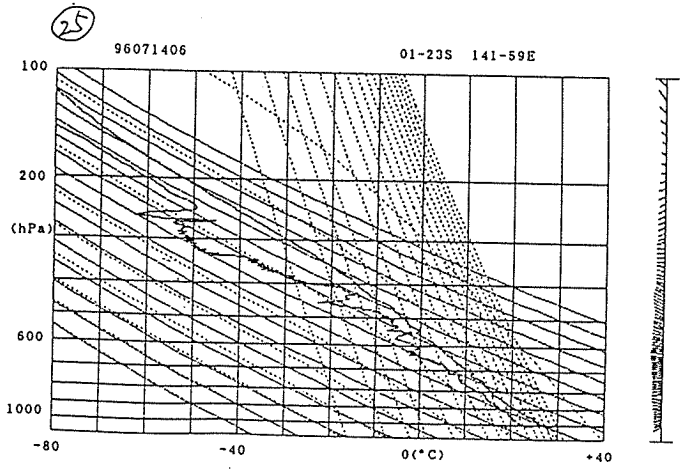
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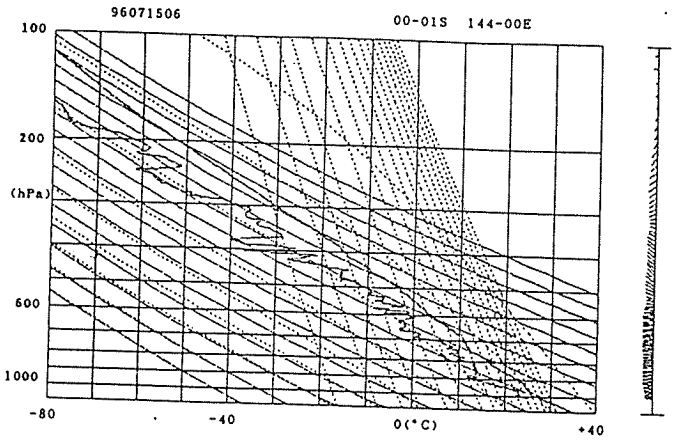

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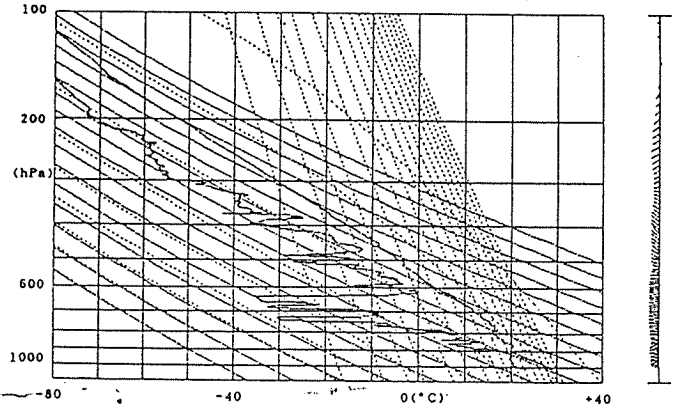

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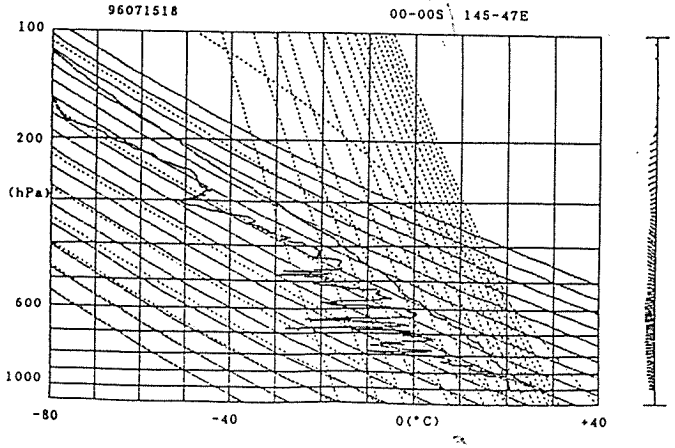

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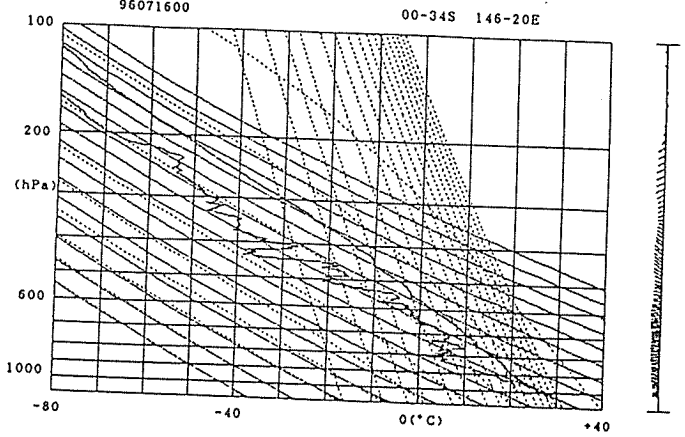

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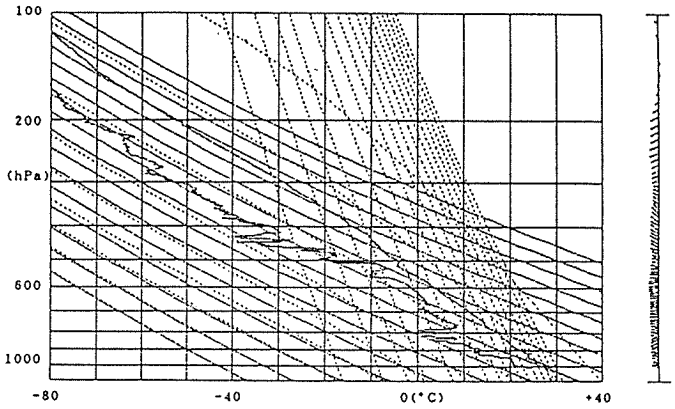

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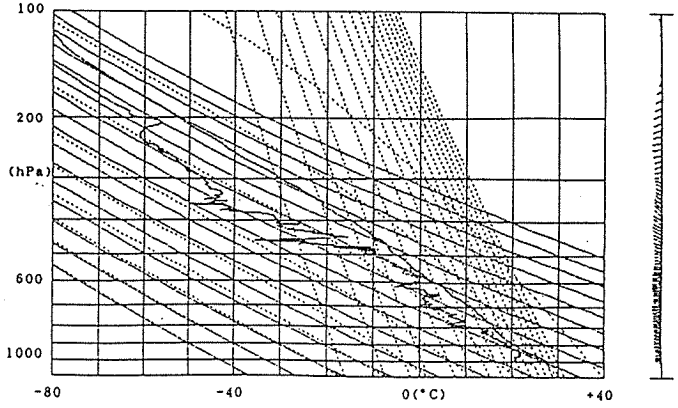

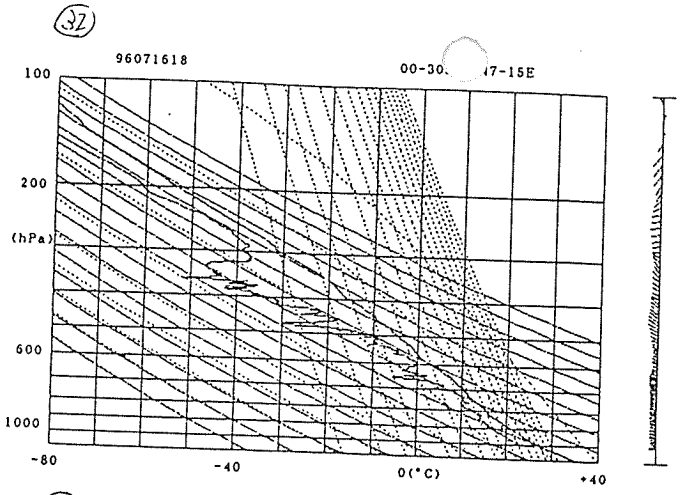
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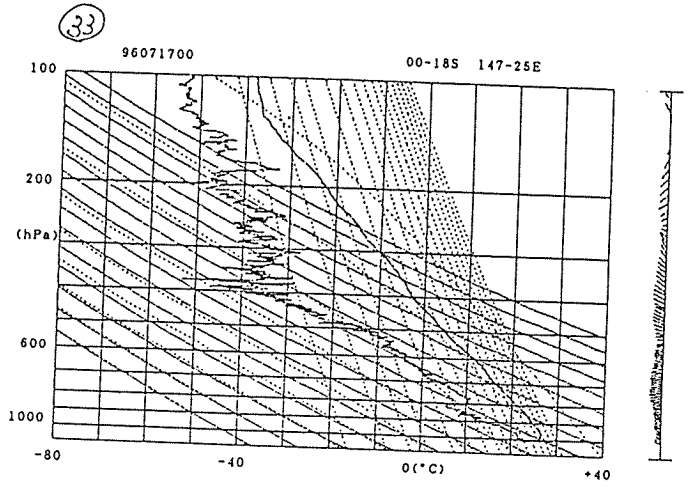
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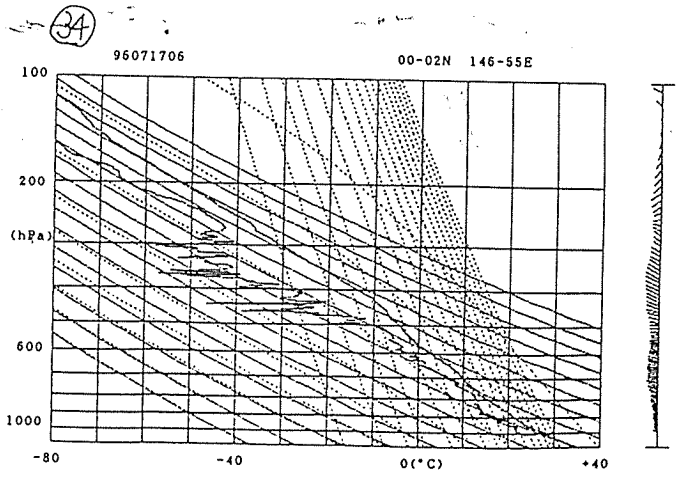
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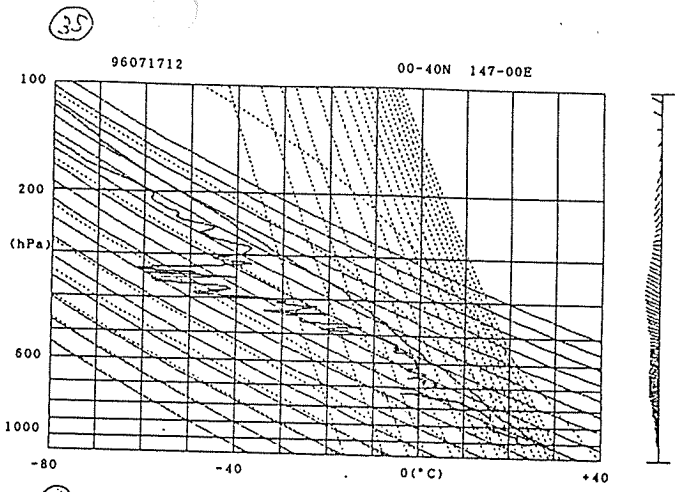
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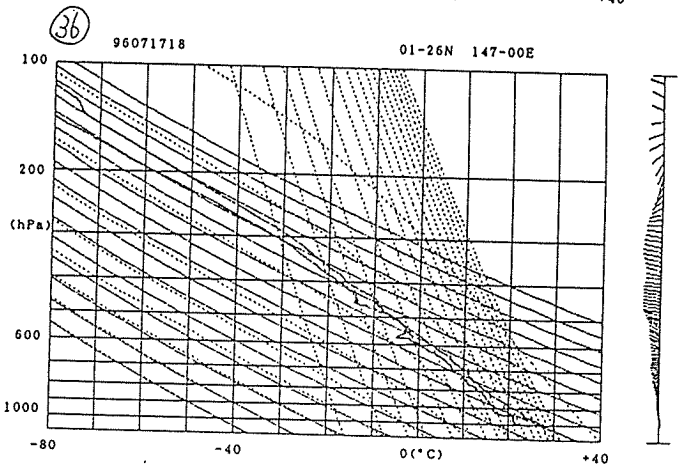
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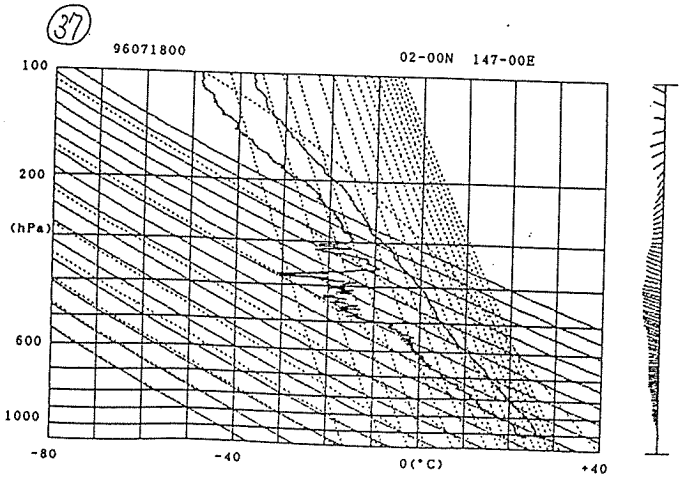
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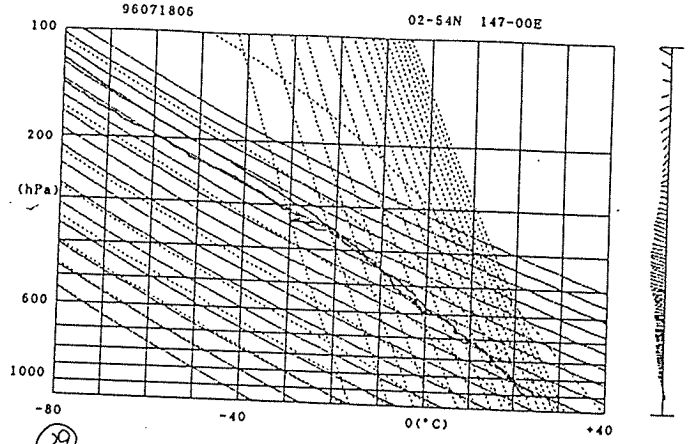

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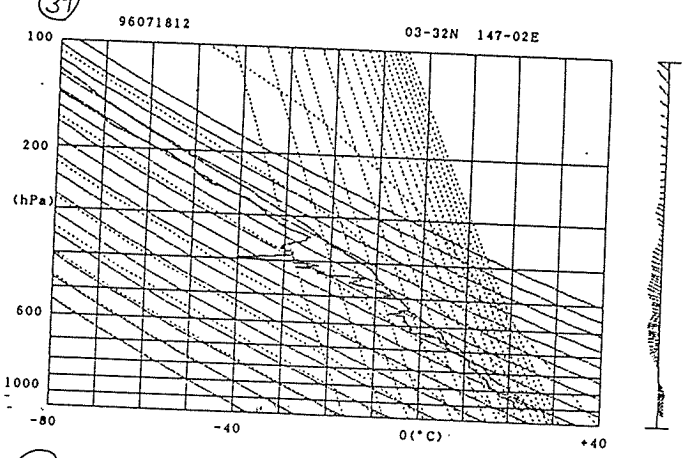

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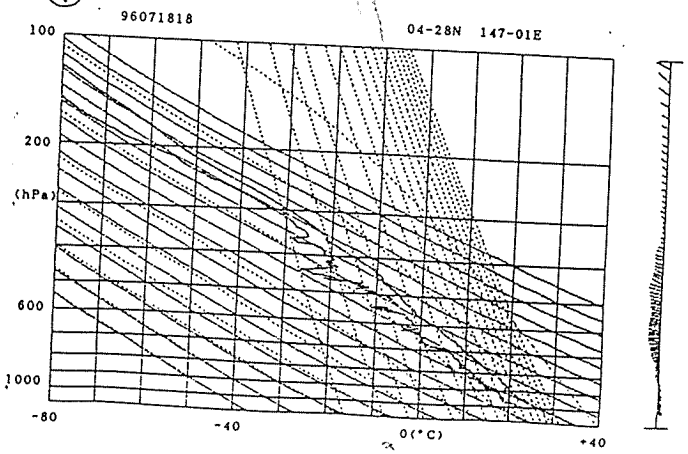

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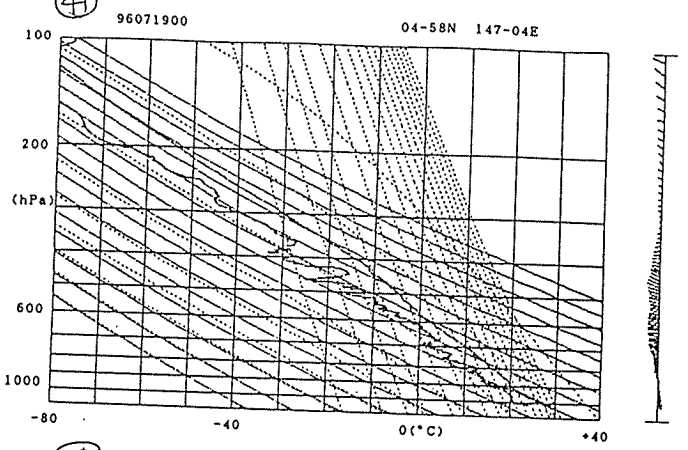

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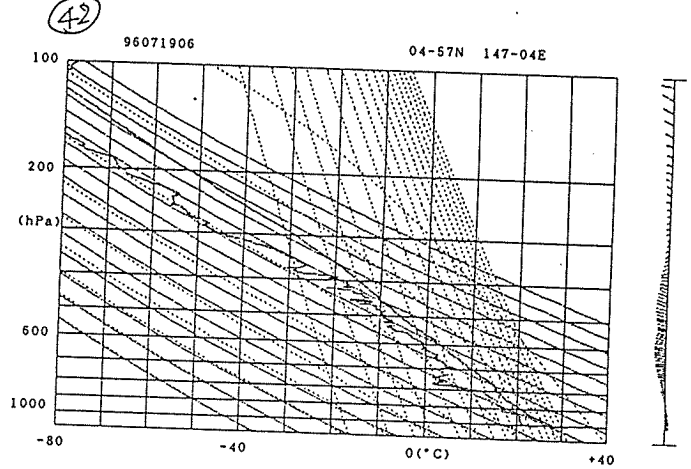

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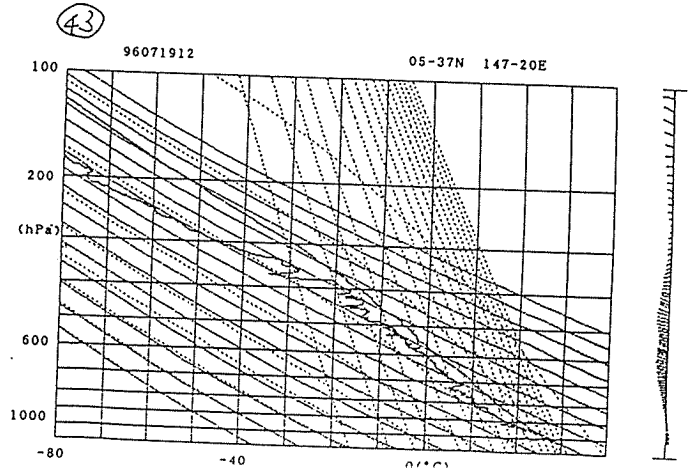

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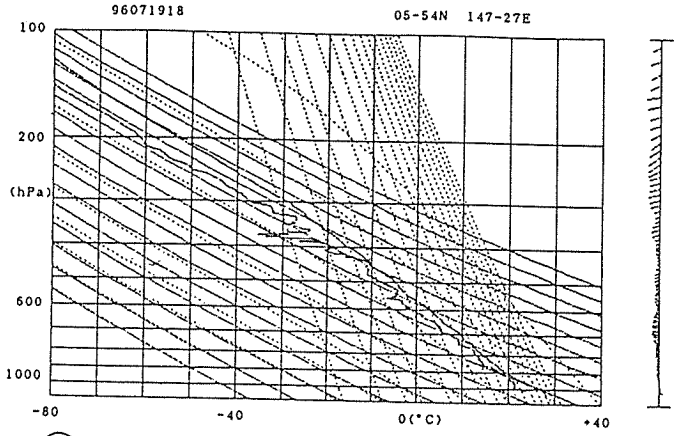

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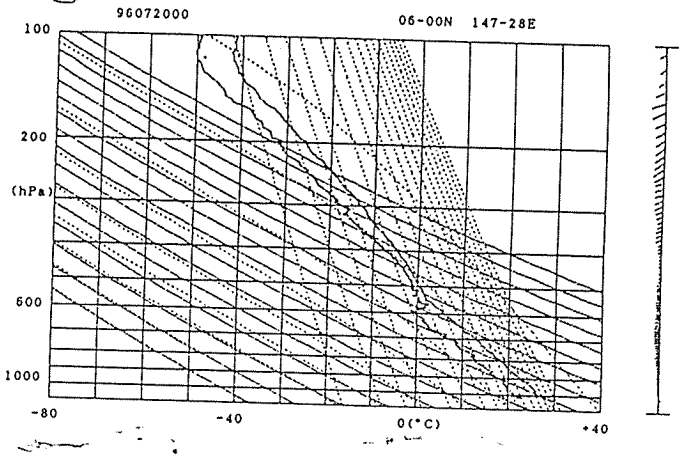

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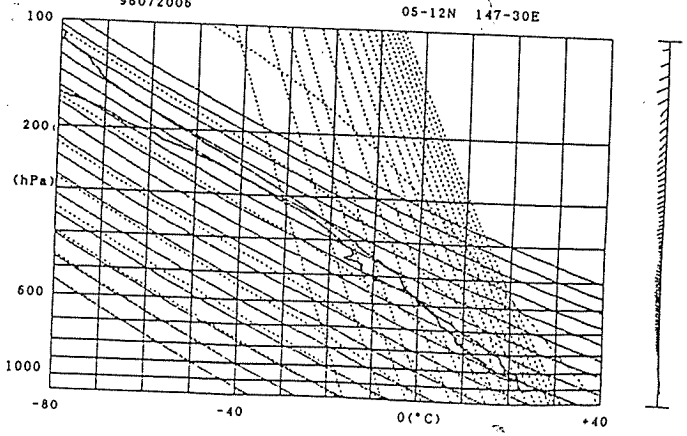

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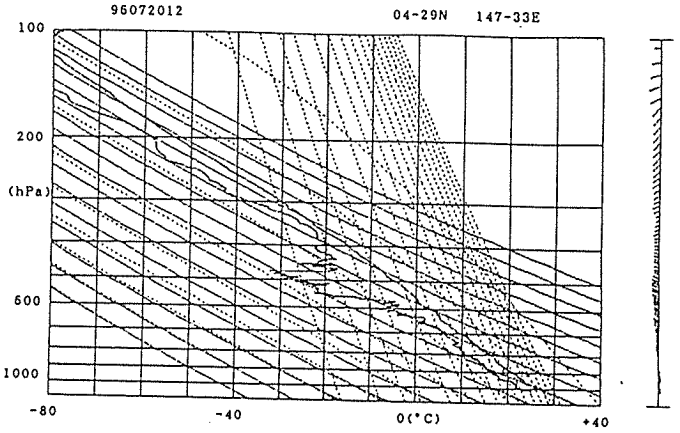

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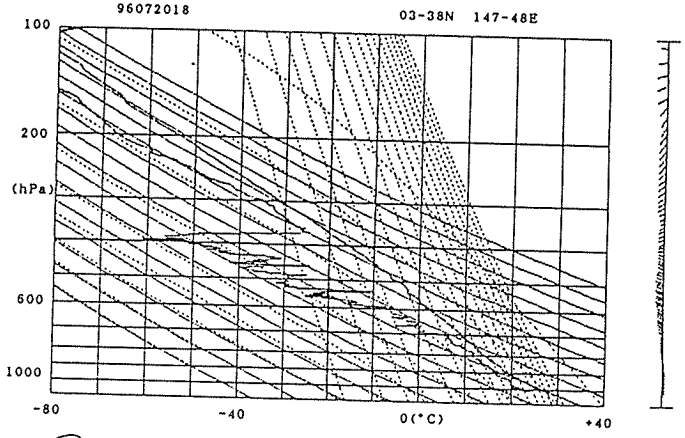

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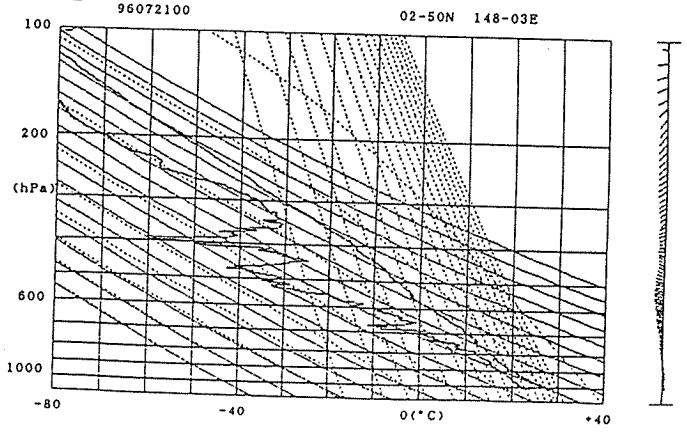

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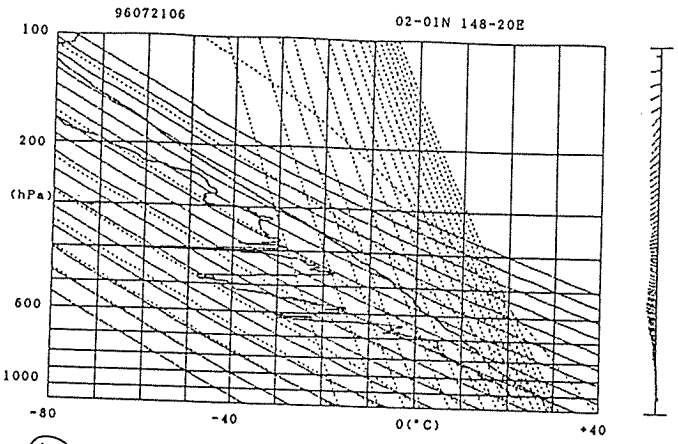

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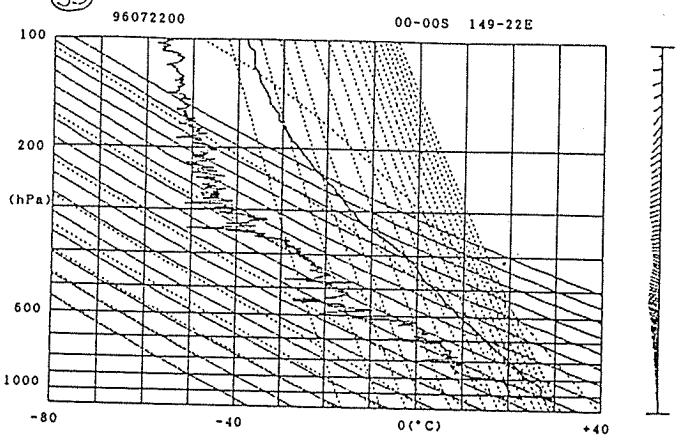

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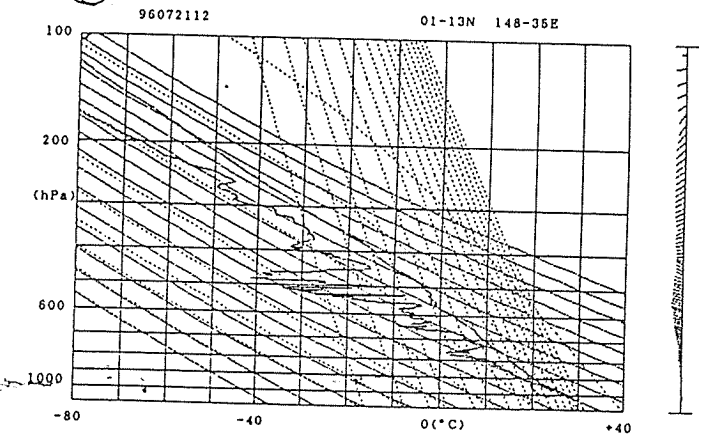

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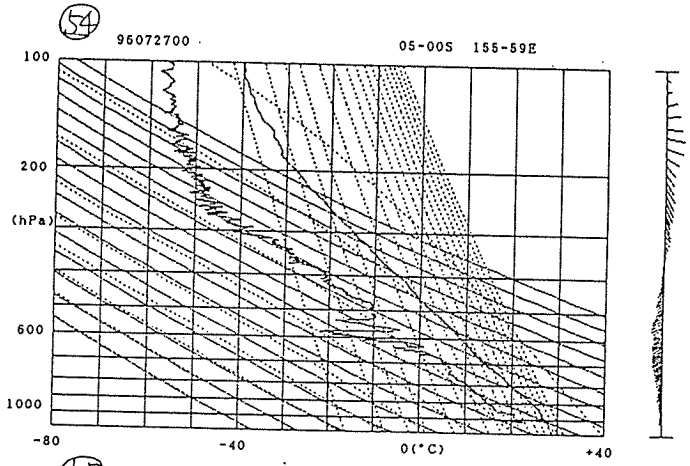

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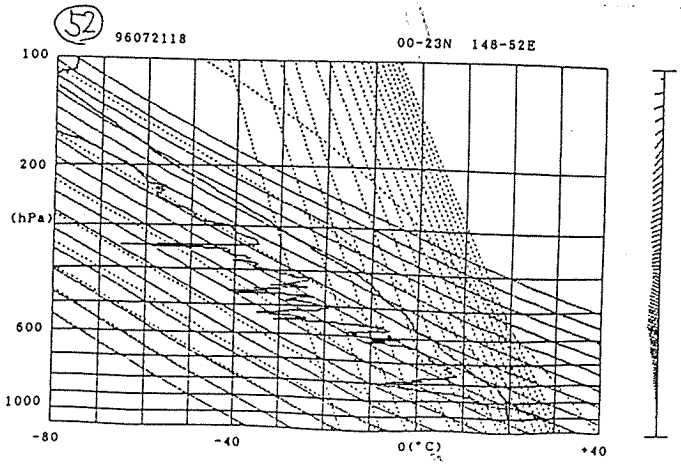

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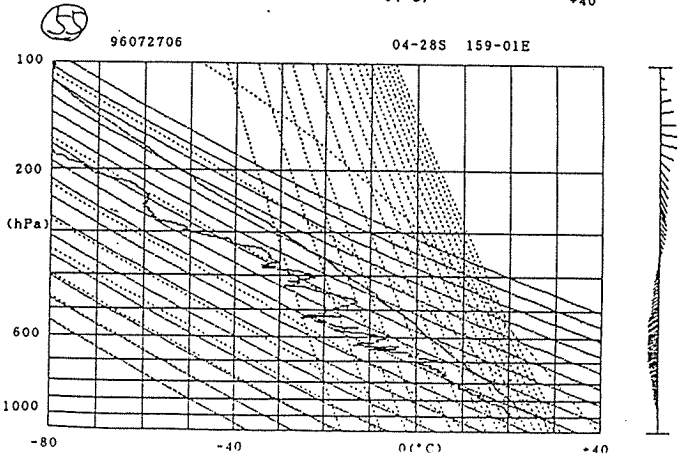

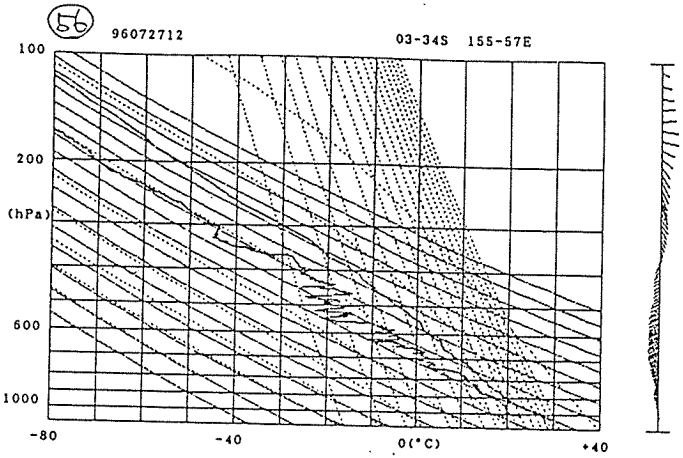
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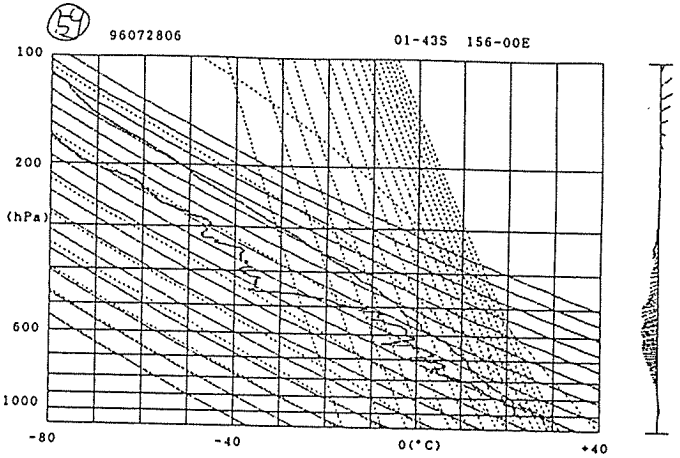
(hPa)
600
1000
-80
-40
0(°C)
+40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(hPa)
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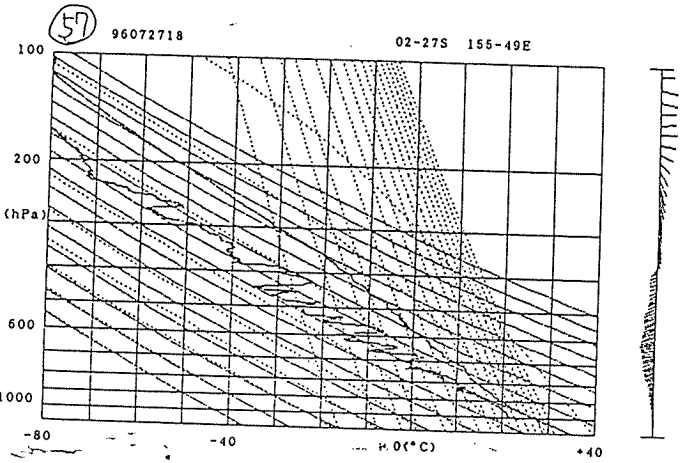
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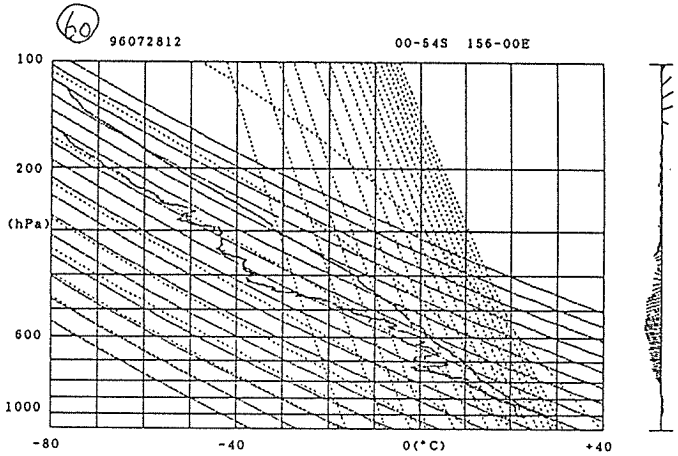
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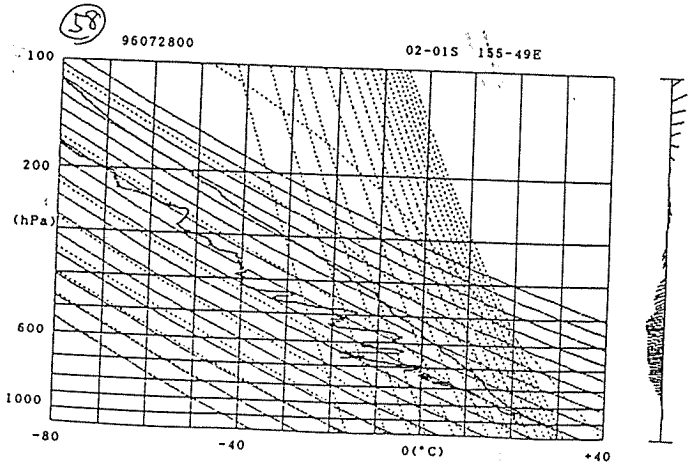
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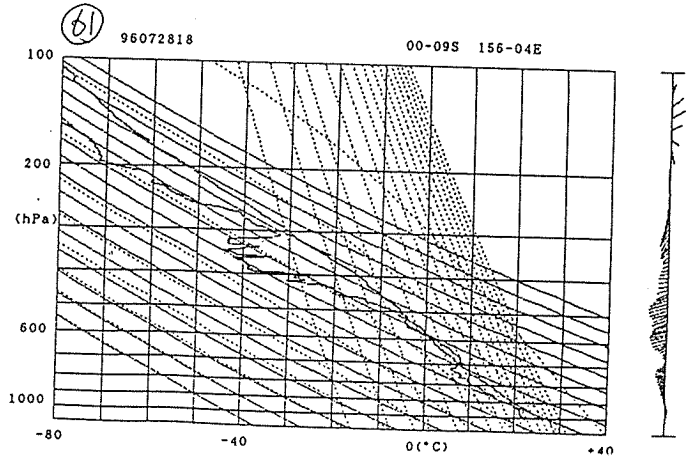
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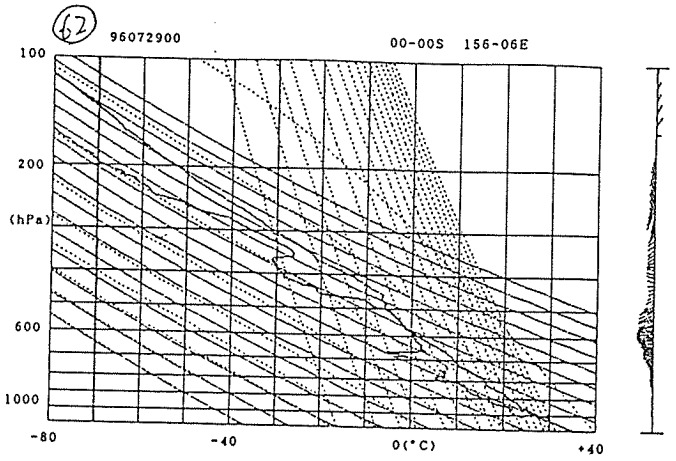
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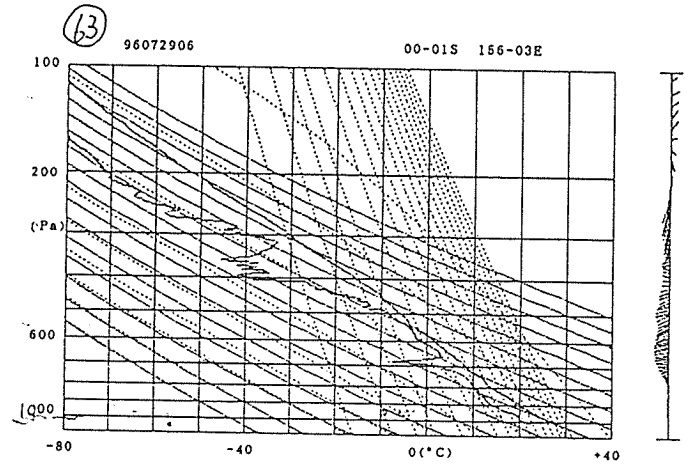
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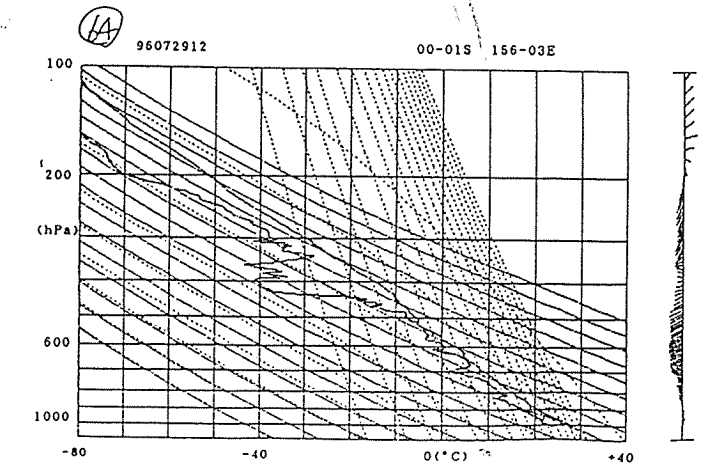
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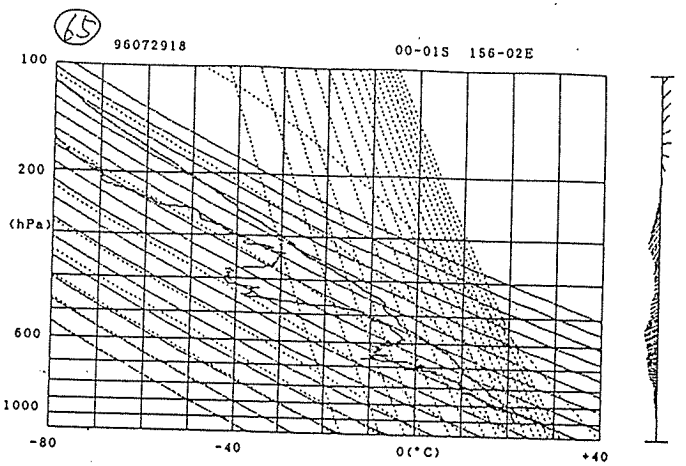
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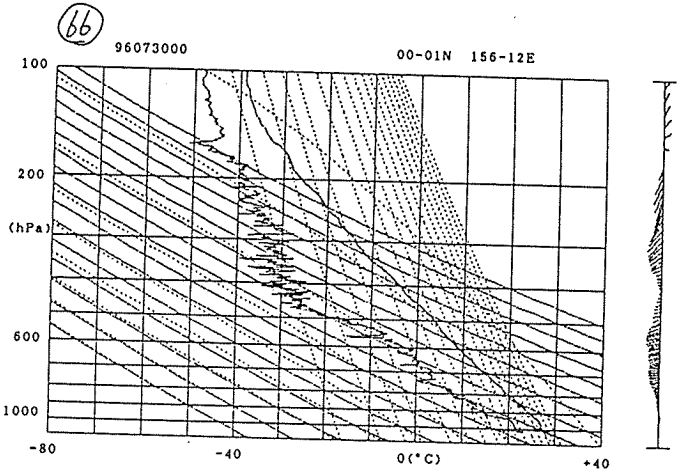
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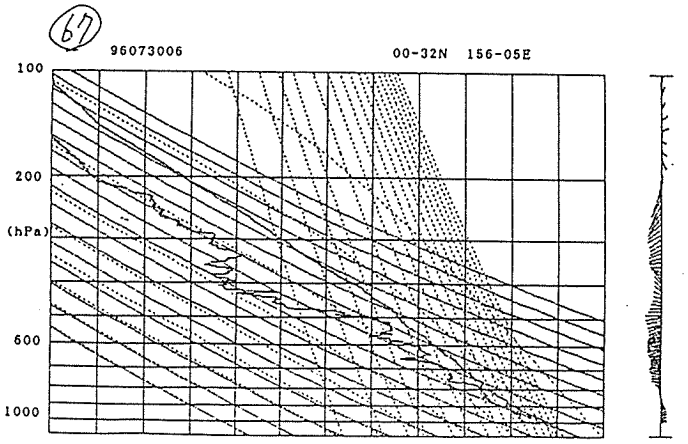
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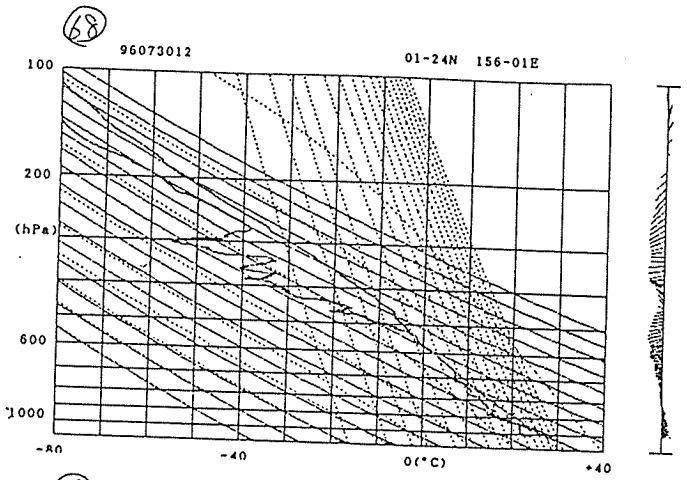
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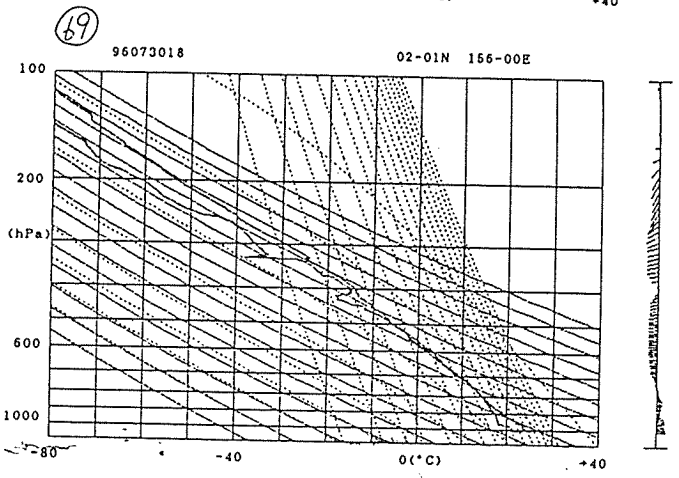
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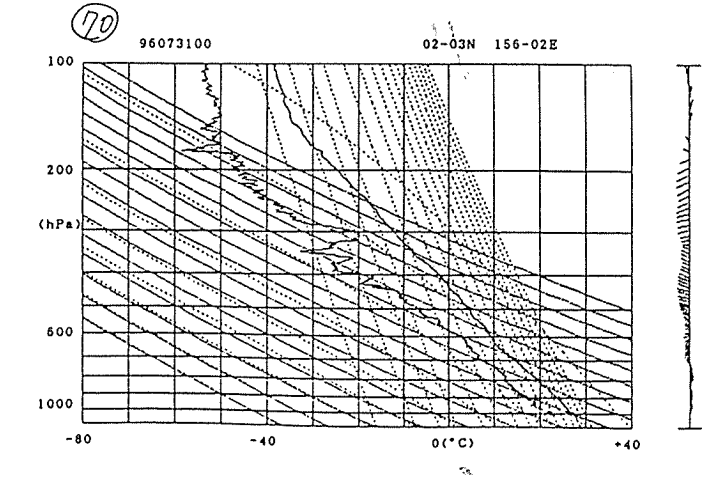
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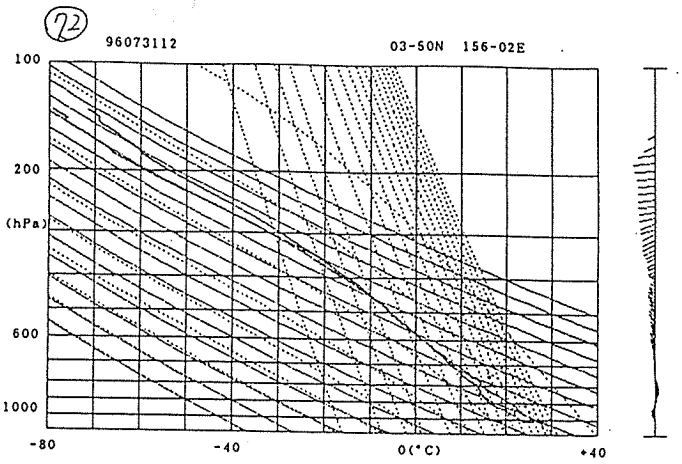
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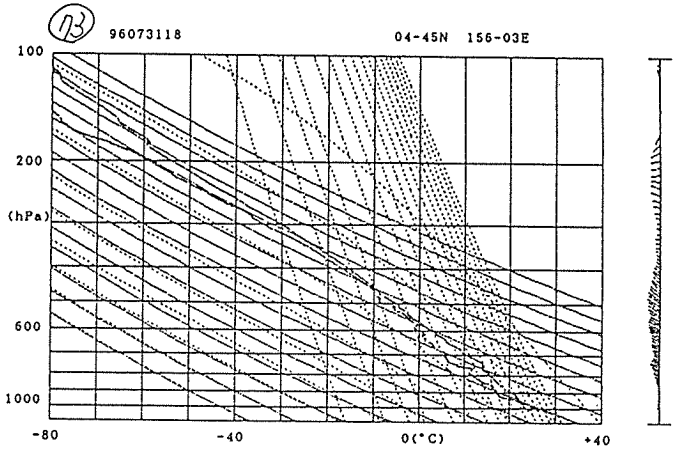
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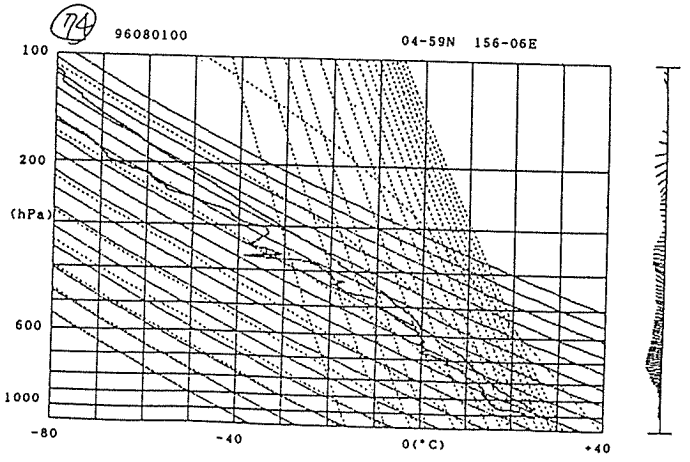
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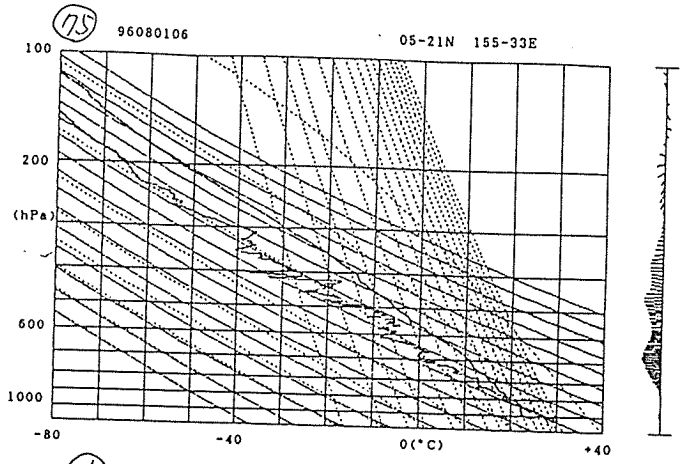
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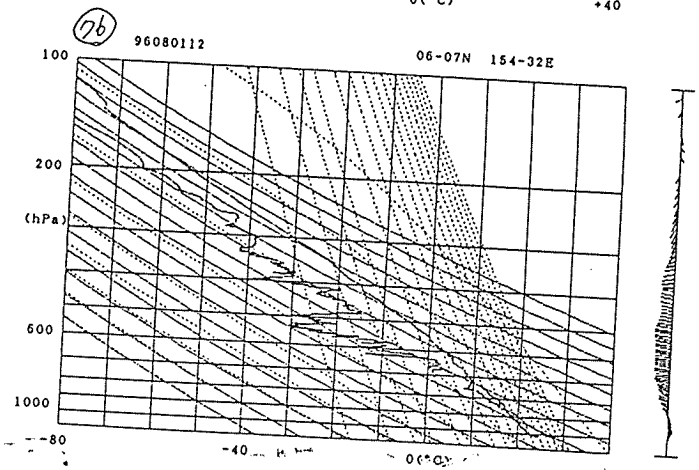
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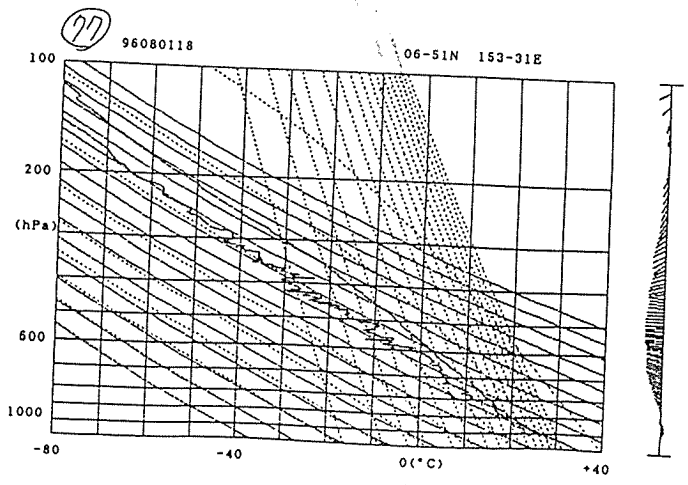
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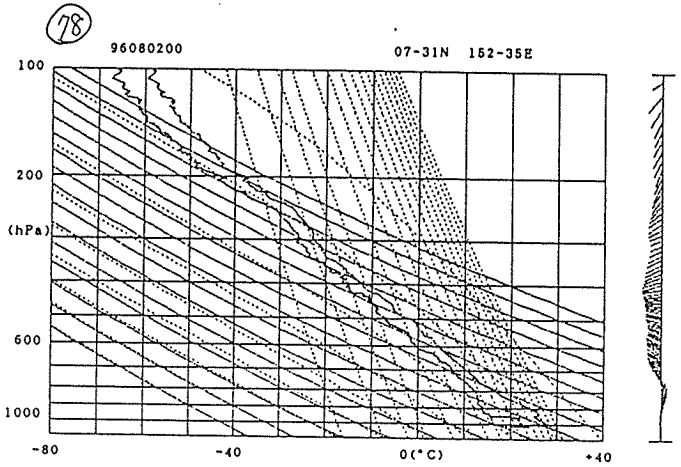
78
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(hPa)
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5.2 Surface Meteorological Measurements

We observed some surface meteorological parameters (pressure, dry bulb temperature, wet bulb temperature, dewpoint temperature, sea surface temperature, relative humidity, wind speed/direction, cloud amount and weather) every 3 hours from Palau to Guam via Kavieng. The parameters were recorded by officer and crew of R/V KAIYO according to the Ship's Weather Observation Reports.

Fig.5-2 and Table 5-2 show results of the observation.

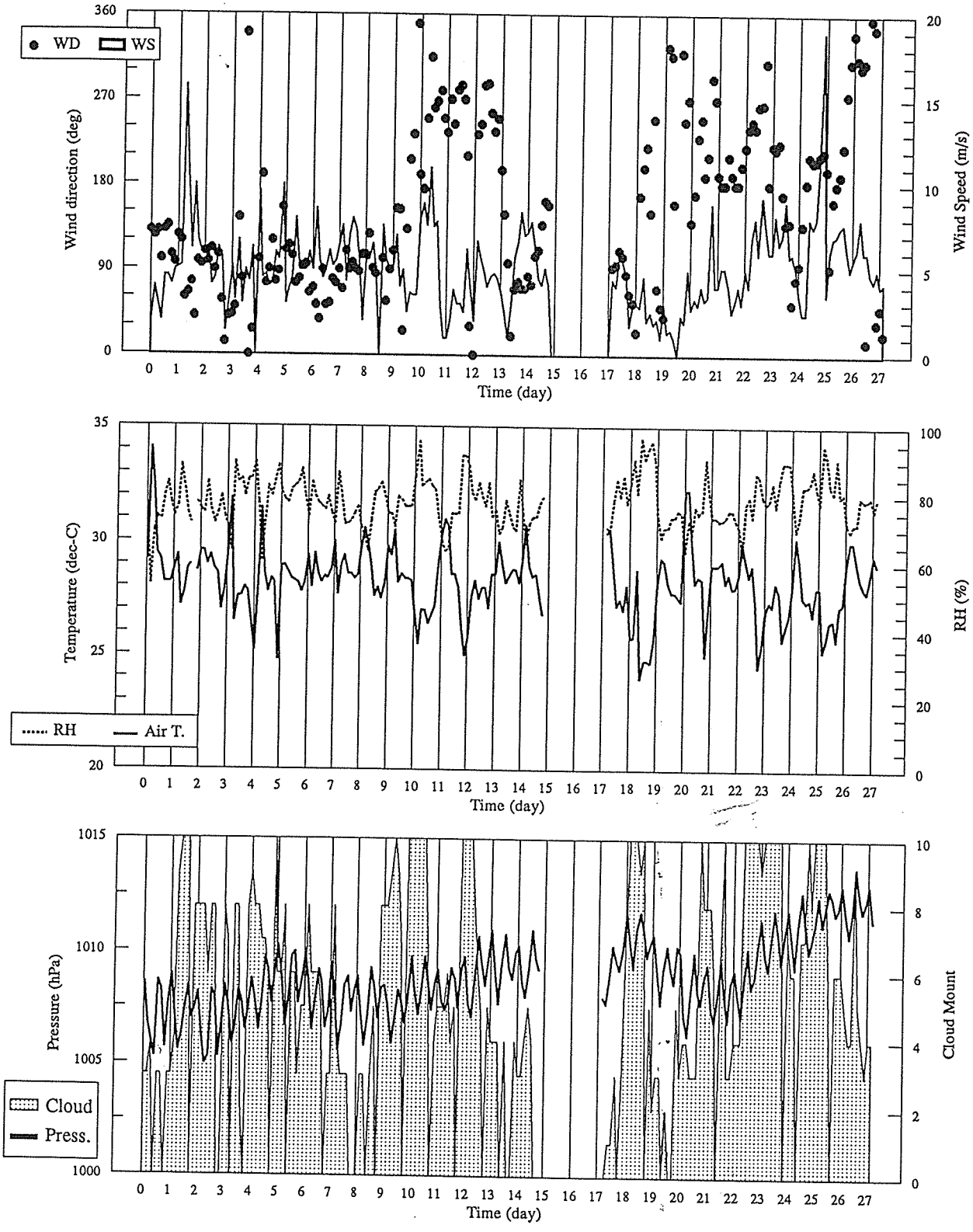


Fig 5-2 Surface Meteorological Mesurements

Table 5-2 Surface Meteorological Mesurements

Time UTC	Ship's T.	Position lat.	Long.	W.D. (deg-C)	W.S. (m/s)	Weather	Press. (hP)	Air Temp. (deg-C)	Wet Temp. (deg-C)	SST (deg-C)	Dew P.T. (deg-C)	RH (%)	Cloud Amount
		PALAU											
95 JUL 8 0	JUL 8 9	6 45 N	137 41 E	130	2.0	bc	1008.6	29.2	25.2	29	23.5	73	3
3	12	6 45 N	137 39 E	125	4.0	bc	1006.8	34.1	26.3	29	23.5	54	3
6	15	6 46 N	137 42 E	130	3.0	bc	1006.0	32.4	27.6	29	25.9	70	4
9	18	6 47 N	137 39 E	100	2.0	bc	1005.3	29.5	25.7	30	24.4	74	unknown
12	21	6 37 N	137 29 E	131	4.6	bc	1008.7	29.2	25.3	29	23.8	73	3
15	9 0	6 8 N	137 8 E	135	4.6	bc	1008.3	28.2	25.5	29	24.5	80	3
18	3	5 51 N	137 0 E	104	4.1	bc	1005.7	28.2	26.0	29	25.2	84	unknown
21	6	5 15 N	137 0 E	97	5.0	bc	1007.8	28.2	25.2	29	24.0	78	3
9 0	9	5 0 N	137 1 E	125	5.1	bc	1009.0	28.8	25.2	28	24.0	74	3
3	12	4 42 N	137 2 E	120	5.2	bc	1007.2	29.4	26.0	29	24.8	77	4
6	15	4 13 N	137 0 E	60	15.8	q	1005.6	27.2	25.8	29	25.5	89	9
9	18	3 54 N	137 0 E	65	10.0	o	1006.3	27.8	25.4	29	24.5	82	10
12	21	3 24 N	137 0 E	76	6.2	o	1007.5	28.8	25.3	29	24.0	75	10
15	10 0	3 0 N	137 0 E	40	10.0	q	1008.5	29.0	25.0	29	23.5	72	10
18	3	2 42 N	137 12 E	98	6.7	o	1007.0	unknown	unknown	29	unknown	unknow	unknown
21	6	2 27 N	137 24 E	95	6.0	c	1007.5	28.7	25.6	29	24.6	78	8
10 0	9	2 26 N	137 24 E	108	6.0	c	1008.2	29.6	26.2	29	25.0	76	8
3	12	2 2 N	137 20 E	98	6.2	c	1006.4	29.6	26.0	29	24.8	75	8
6	15	1 30 N	137 15 E	111	4.1	c	1005.0	29.0	26.8	29	26.4	84	8
9	18	1 11 N	137 24 E	90	4.5	bc	1005.3	29.4	25.8	29	24.7	76	6
12	21	0 58 N	137 29 E	105	6.3	c	1008.3	28.8	24.8	29	23.3	72	8
15	11 0	0 37 N	137 41 E	57	5.7	c	1008.0	28.6	25.0	29	23.7	75	8
18	3	0 13 N	137 54 E	13	1.4	c	1005.3	27.0	24.4	29	23.6	80	unknown
21	6	0 1 S	138 1 E	40	3.0	c	1006.8	27.9	24.3	29	23.0	74	unknown
11 0	9	0 1 S	138 0 E	42	5.2	c	1008.5	29.4	25.1	29	25.1	71	8
3	12	0 0 S	138 1 E	50	3.2	bc	1007.6	31.9	26.2	29	24.2	64	7
6	15	0 17 S	138 0 E	144	6.7	o	1005.9	26.5	25.4	29	25.2	90	unknown
9	18	0 40 S	137 59 E	80	3.0	c	1006.5	27.6	25.5	29	24.8	84	8
12	21	1 0 S	137 59 E	340	5.0	c	1008.3	27.6	25.6	28	24.9	85	8
15	12 0	0 39 S	138 21 E	0	4.3	b	1007.8	28.0	25.4	28	24.5	80	2
18	3	0 15 S	138 45 E	26	6.3	c	1006.5	27.8	25.8	29	25.3	85	unknown
21	6	0 0 S	138 54 E	calm	0.0	c	1007.5	26.5	24.5	29	23.8	85	8
12 0	9	0 1 S	139 33 E	100	9.6	r	1008.8	25.2	24.0	29	23.5	90	9
3	12	0 0 S	139 59 E	190	4.5	c	1007.9	28.2	25.0	29	23.8	78	8
6	15	0 0 S	140 31 E	75	4.7	c	1006.5	31.5	25.4	29	23.3	61	8
9	18	0 0 S	141 0 E	90	4.0	bc	1007.9	28.6	25.4	29	24.3	72	7
12	21	0 28 S	141 11 E	120	4.2	bc	1009.8	27.8	25.5	29	24.7	83	7
15	13 0	1 3 S	141 25 E	77	6.0	bc	1009.2	28.4	25.5	28	24.4	80	6
18	3	1 38 S	141 38 E	88	5.6	bc	1007.7	28.2	26.0	28	25.3	84	unknown
21	6	2 13 S	141 52 E	155	10.0	r	1009.3	24.8	23.4	28	22.3	89	10
13 0	9	2 28 S	141 56 E	110	3.0	bc	1010.3	28.9	26.2	28	25.0	81	6
3	12	2 27 S	141 58 E	115	3.9	bc	1008.8	29.0	26.0	28	25.0	79	6
6	15	1 59 S	141 59 E	104	4.6	bc	1006.7	28.7	25.6	29	24.4	78	8
9	18	2 0 S	142 0 E	75	8.0	c	1007.8	28.4	25.8	28	24.9	82	unknown
12	21	2 1 S	141 58 E	80	5.0	bc	1009.8	28.3	26.0	28	25.2	83	6
15	14 0	2 0 S	141 59 E	93	5.0	bc	1010.0	28.2	26.0	28	25.2	84	6
18	3	2 0 S	142 2 E	95	5.0	bc	1007.7	27.8	26.2	28	25.7	88	3
21	6	2 0 S	141 58 E	65	6.0	bc	1008.8	28.2	25.4	28	24.3	80	5
14 0	9	2 1 S	141 59 E	70	5.0	bc	1009.9	29.4	25.6	28	24.3	74	5
3	12	1 34 S	142 0 E	52	8.6	c	1008.7	28.0	25.8	28	25.0	84	8
6	15	1 15 S	142 0 E	37	5.5	bc	1006.5	29.5	26.6	29	25.5	80	6
9	18	0 57 S	141 59 E	90	4.5	bc	1007.8	28.6	25.6	29	24.6	78	6
12	21	0 30 S	142 0 E	52	5.0	bc	1009.2	28.2	25.0	29	23.8	77	6
15	15 0	0 4 S	142 0 E	54	6.1	bc	1008.7	28.5	25.2	29	24.0	76	5
18	3	0 0	142 16 E	79	5.2	bc	1006.6	28.4	25.8	29	25.0	80	unknown
21	6	0 0	142 47 E	75	5.5	bc	1007.3	28.8	25.2	28	23.8	75	3
15 0	9	0 0	143 7 E	90	6.5	bc	1009.5	30.0	25.8	29	24.3	72	3
3	12	0 0	143 38 E	69	7.6	c	1008.2	27.7	26.0	29	25.4	87	8
6	15	0 0 S	144 1 E	109	4.3	bc	1005.6	29.0	26.2	29	25.2	80	4
9	18	0 0	144 32 E	90	7.0	bc	1006.7	29.4	25.2	29	23.7	72	3
12	21	0 0 S	145 0 E	97	8.0	bc	1008.5	28.6	24.4	29	22.9	72	3
15	16 0	0 0 S	145 25 E	90	7.3	bc	1008.9	28.6	24.7	29	23.2	73	3
18	3	0 0 S	145 56 E	87	5.5	bc	1007.3	28.4	24.8	29	23.7	75	unknown
21	6	0 14 S	146 8 E	105	2.0	bc	1008.3	28.5	25.3	29	24.1	77	unknown
16 0	9	0 42 S	146 25 E	105	5.6	bc	1008.9	29.6	25.4	28	24.0	71	unknown
3	12	1 9 S	146 41 E	127	5.6	bc	1007.2	30.6	25.8	29	24.0	68	3
6	15	1 35 S	146 54 E	91	6.5	bc	1005.8	30.0	24.6	29	26.0	64	3
9	18	1 30 S	147 0 E	85	5.0	bc	1007.2	29.0	25.0	29	23.9	73	unknown
12	21	1 5 S	147 0 E	calm	0.0	bc	1009.3	27.6	25.0	29	24.0	81	3
15	17 0	0 46 S	147 7 E	101	7.6	bc	1008.4	28.0	25.5	29	24.6	82	5
18	3	0 30 S	147 15 E	56	5.6	c	1007.0	27.5	25.4	29	24.8	84	unknown
21	6	0 18 S	147 26 E	90	5.0	c	1008.4	28.2	25.4	29	24.3	80	8
17 0	9	0 17 S	147 28 E	109	5.2	c	1008.5	29.8	26.2	29	25.0	75	8
3	12	0 0 S	146 59 E	154	7.0	c	1007.6	29.4	25.8	29	24.6	75	8
6	15	0 3 N	146 55 E	153	4.0	c	1005.9	30.5	26.0	29	24.4	71	9
9	18	0 27 N	146 59 E	25	5.0	o	1007.0	28.2	25.4	29	24.5	80	10
12	21	0 49 N	147 0 E	132	2.5	c	1008.3	28.6	25.6	29	24.5	79	9
15	18 0	1 10 N	147 0 E	206	3.6	bc	1007.8	28.4	25.2	29	23.9	77	7
18	3	1 33 N	147 0 E	233	3.5	o	1006.8	28.4	25.2	29	23.7	77	unknown
21	6	2 0 N	147 0 E	350	3.5	o	1008.0	28.3	25.2	29	23.6	77	10
18 0	9	2 0 N	147 0 E	190	8.0	q	1009.8	26.9	25.0	29	24.3	86	10
3	12	2 25 N	147 0 E	175	8.9	r	1008.3	25.5	25.0	29	24.8	96	10

	6		15	3	0 N	147	0 E	250	7.6	o	1007.2	27.0	24.8	29	24.3	83	10
	9		18	3	11 N	147	2 E	315	11.0	o	1008.3	27.0	25.0	28	24.3	84	10
	12		21	3	40 N	147	1 E	261	7.5	o	1009.8	26.4	24.4	29	23.7	85	10
	15	19	0	4	9 N	147	1 E	268	7.8	bc	1008.7	26.8	24.6	29	23.8	83	7
	18		3	4	36 N	147	1 E	279	2.8	bc	1007.4	27.2	24.8	29	24.0	82	unknown
	21		6	4	58 N	147	2 E	250	1.0	bc	1008.7	29.0	25.4	29	24.2	74	4
19	0		9	4	57 N	147	2 E	235	1.0	bc	1009.2	30.3	25.4	29	23.6	67	5
	3		12	4	57 N	147	3 E	270	2.0	bc	1007.8	31.0	25.4	29	23.4	64	5
	6		15	5	0 N	147	2 E	244	3.8	bc	1007.4	30.7	25.4	29	23.6	65	5
	9		18	5	21 N	147	12 E	280	3.0	bc	1007.8	28.6	25.2	29	23.8	75	6
	12		21	5	43 N	147	22 E	285	3.0	bc	1009.3	28.6	25.0	29	23.7	75	4
	15	20	0	5	54 N	147	27 E	270	2.5	bc	1008.8	28.0	24.5	29	23.2	75	5
	18		3	5	55 N	147	27 E	210	6.2	o	1007.5	26.2	25.2	29	24.8	92	unknown
	21		6	5	55 N	147	26 E	30	4.0	r	1009.3	25.0	24.0	29	22.6	92	10
20	0		9	5	58 N	147	27 E	0	2.0	r	1009.8	25.8	24.4	29	23.9	89	10
	3		12	5	41 N	147	28 E	233	6.7	o	1007.7	27.6	25.0	29	24.1	81	10
	6		15	5	4 N	147	30 E	244	5.7	o	1007.1	28.3	25.4	29	24.3	79	10
	9		18	4	30 N	147	31 E	285	5.0	c	1008.9	27.5	25.4	29	24.7	84	8
	12		21	4	25 N	147	34 E	287	4.0	bc	1010.7	28.0	25.2	29	24.2	80	6
Time Corr.	15	21	0	3	59 N	147	42 E	256	4.6	bc	1009.6	28.0	24.8	29	23.6	77	5
	18		4	3	34 N	147	49 E	236	4.8	bc	1008.5	27.1	25.0	29	24.8	84	unknown
	21		7	3	9 N	147	57 E	250	4.5	bc	1009.7	28.6	25.0	28	23.9	74	5
21	0		10	2	43 N	147	6 E	195	3.6	bc	1011.0	28.6	25.2	29	24.6	76	4
	3		13	2	18 N	148	14 E	148	2.6	bc	1009.2	30.0	25.4	29	23.8	69	4
	6		16	1	54 N	148	22 E	97	1.0	bc	1007.7	29.1	24.9	29	23.4	71	4
	9		19	1	31 N	148	30 E	20	3.0	c	1009.5	28.2	25.2	29	24.0	79	unknown
	12		22	1	6 N	148	37 E	69	5.7	bc	1010.8	28.5	24.9	29	24.4	75	4
	15	22	1	0	41 N	148	45 E	77	6.7	bc	1009.3	28.8	24.6	29	23.0	71	unknown
	18		4	0	16 N	148	54 E	70	8.4	bc	1008.8	28.8	24.4	29	22.7	70	unknown
	21		7	0	0 S	149	0 E	70	7.0	bc	1010.0	28.2	26.2	28	25.5	85	4
22	0		10	0	0	149	30 E	83	7.2	bc	1010.3	29.2	25.6	29	24.4	75	3
	3		13	0	0	150	0 E	74	7.8	bc	1008.7	30.8	25.6	29	23.7	66	3
	6		16	0	21 S	150	5 E	104	6.2	bc	1008.0	29.0	25.0	29	23.5	72	4
	9		19	0	50 S	150	12 E	110	4.5	bc	1009.3	28.5	24.8	29	23.7	74	5
	12		22	1	20 S	150	19 E	137	4.1	bc	1011.0	28.6	24.8	28	23.4	74	4
	15	23	1	1	50 S	150	27 E	162	5.1	b	1009.8	27.6	24.6	29	23.5	78	0
	18		4	2	17 S	150	34 E	158	4.1	bc	1009.2	26.8	24.0	29	22.9	80	unknown
					KAVIENG												
25	3		13	2	40 S	151	9 E	92	4.4	bc	1008.0	30.4	26.0	29	24.4	71	unknown
	6		16	2	55 S	151	40 E	95	4.0	bc	1007.7	30.6	26.0	29	24.4	70	unknown
	9		19	3	11 S	152	12 E	110	6.0	b	1008.9	28.8	25.7	29	24.6	79	1
	12		22	3	40 S	153	0 E	104	5.5	b	1010.3	27.2	25.2	29	24.4	85	1
	15	26	1	3	45 S	153	10 E	85	4.7	bc	1009.6	27.5	24.6	29	23.4	80	3
	18		4	3	50 S	153	44 E	64	1.7	bc	1009.2	27.0	25.2	29	24.4	86	unknown
	21		7	3	54 S	154	20 E	55	3.0	bc	1010.2	28.1	25.0	29	23.9	78	3
26	0		10	3	58 S	154	53 E	24	3.0	bc	1011.8	25.8	23.6	28	22.8	84	7
	3		13	4	23 S	155	21 E	168	2.8	o	1010.5	25.8	24.7	28	24.3	91	10
	6		16	4	48 S	155	47 E	198	4.6	o	1009.3	28.8	26.2	29	25.3	81	10
	9		19	4	58 S	156	0 E	220	2.0	o	1011.0	24.0	23.8	28	23.7	97	10
	12		22	4	57 S	155	59 E	150	2.5	c	1011.8	24.8	23.6	28	23.2	91	9
	15	27	1	4	56 S	155	57 E	250	1.8	r	1011.0	24.8	24.0	28	24.1	94	10
	18		4	4	57 S	155	56 E	70	2.1	c	1009.8	24.7	24.2	29	24.0	96	unknown
	21		7	5	0 S	156	0 E	50	1.0	bc	1010.4	25.8	24.6	28	24.0	91	5
27	0		10	5	0 S	155	59 E	40	3.0	b	1010.8	28.2	24.6	28	23.3	74	2
	3		13	4	48 S	156	0 E	326	1.3	bc	1009.3	29.3	24.6	28	22.9	68	3
	6		16	4	18 N	156	0 E	317	1.5	bc	1007.7	29.2	25.0	28	23.5	71	3
	9		19	3	57 S	156	0 E	160	1.0	bc	1009.2	28.2	24.0	29	22.4	71	unknown
	12		22	3	23 S	155	56 E	calm	0.0	b	1010.3	27.8	24.2	29	22.8	74	2
	15	28	1	2	50 S	155	51 E	320	2.3	bc	1009.3	27.8	24.2	29	22.9	74	unknown
	18		4	2	18 N	155	48 E	247	1.9	bc	1008.6	27.6	24.2	29	22.9	76	unknown
	21		7	2	0 S	155	46 E	270	5.0	bc	1010.3	27.4	23.9	29	22.6	75	5
28	0		10	2	0 S	155	58 E	140	2.7	bc	1010.0	32.3	26.6	29	24.6	64	3
	3		13	1	59 N	156	0 E	170	3.3	bc	1007.2	32.3	28.1	29	26.9	73	4
	6		16	1	35 N	156	0 E	230	2.9	bc	1006.3	30.0	25.4	29	23.8	69	4
	9		19	1	0 N	156	0 E	250	4.0	bc	1008.3	28.2	25.0	29	23.9	77	3
	12		22	0	46 N	156	1 E	189	3.2	bc	1010.0	28.5	25.0	29	23.7	75	3
	15	29	1	0	24 N	156	3 E	210	3.4	bc	1008.3	28.4	25.0	29	23.7	76	3
	18		4	0	3 N	156	4 E	293	8.9	q	1007.7	25.0	23.8	29	23.3	91	10
	21		7	0	1 N	156	5 E	270	4.0	c	1008.9	27.2	24.6	29	23.7	81	8
29	0		10	0	1 N	156	5 E	190	4.0	c	1009.5	29.0	25.4	29	23.8	74	8
	3		13	0	0	156	4 E	180	5.1	c	1007.5	29.0	25.4	29	23.8	74	8
	6		16	0	1 N	156	4 E	180	5.1	bc	1006.9	29.0	25.2	29	23.7	73	6
	9		19	0	0 S	156	3 E	210	4.0	c	1008.1	29.2	25.2	29	23.5	73	unknown
	12		22	0	1 S	156	2 E	190	2.5	bc	1009.7	28.2	24.6	29	23.3	74	6
	15	30	1	0	1 S	156	2 E	180	3.1	c	1008.2	28.6	25.4	29	24.3	76	10
	18		4	0	1 S	156	1 E	180	4.0	bc	1006.9	28.0	24.6	29	23.2	76	3
	21		7	0	1 N	156	4 E	200	3.0	bc	1008.7	28.0	24.2	28	22.7	73	3
30	0		10	0	1 N	156	10 E	220	5.0	bc	1009.2	28.6	24.4	28	22.9	71	4
	3		13	0	11 N	156	8 E	240	4.0	bc	1008.2	30.0	25.4	28	23.9	63	4
	6		16	0	41 N	156	3 E	247	6.9	bc	1007.1	29.2	26.0	29	24.9	78	4
	9		19	1	4 N	156	0 E	240	8.0	o	1008.8	28.5	25.5	29	24.4	80	10
	12		22	1	34 N	156	0 E	264	5.9	o	1010.2	29.0	25.3	29	23.8	74	10
	15	31	1	2	2 N	156	2 E	265	9.3	o	1008.4	27.2	25.7	29	25.2	87	10
	18		4	2	1 N	155	0 E	310	7.5	r	1008.9	24.5	23.8	29	23.5	86	10
	21		7	2	1 N	156	2 E	180	6.0	o	1010.3	25.5	23.8	29	23.1	80	10
31	0		10	2	11 N	156	2 E	221	6.0	c	1011.5	27.0	24.0	29	22.9	78	9
	3		13	2	39 N	156	1 E	218	8.2	o	1009.9	27.4	24.5	29	23.4	79	10

	6		16	3	0 N	156	1 E	224	6.5	o	1009.2	27.2	25.0	29	24.3	84	10
	9		19	3	28 N	156	2 E	170	7.0	o	1010.6	28.2	25.0	29	23.8	77	10
	12		22	3	59 N	156	2 E	138	9.0	r	1011.9	27.8	25.8	29	25.2	85	10
	15	AUG 1	1	4	28 N	156	3 E	140	5.8	o	1010.7	25.7	24.5	29	24.1	90	10
	18		4	4	52 N	156	3 E	54	5.9	o	1009.5	26.3	25.0	28	24.5	90	10
	21		7	5	0 N	156	3 E	80	5.0	c	1010.9	26.8	25.4	28	24.9	90	unknown
AUG 1	0		10	5	0 N	156	4 E	95	3.5	bc	1011.9	28.0	25.3	28	24.3	81	7
	3		13	5	7 N	155	57 E	137	2.4	bc	1010.6	30.2	25.8	29	24.2	70	6
	6		16	5	28 N	155	25 E	182	2.4	bc	1009.3	29.2	25.5	29	24.0	74	6
	9		19	5	52 N	154	52 E	210	8.0	c	1011.2	27.6	25.4	29	24.6	83	unknown
	12		22	6	27 N	154	3 E	205	7.5	bc	1012.7	27.4	25.2	28	24.4	83	7
	15	2	1	6	35 N	153	53 E	206	8.0	bc	1011.2	27.5	25.4	28	24.7	84	7
	18		4	6	56 N	153	23 E	211	11.2	o	1010.0	26.8	25.3	28	24.8	88	10
	21		7	7	16 N	152	55 E	215	19.0	c	1010.6	28.0	25.5	28	24.6	82	8
2	0		10	7	39 N	152	25 E	196	3.5	o	1011.3	28.0	25.0	28	23.9	78	10
	3		13	7	59 N	151	56 E	92	6.0	r	1012.5	25.2	24.5	28	24.0	95	10
	6		16	8	17 N	151	24 E	163	6.9	o	1011.2	25.7	24.5	28	24.1	91	10
	9		19	8	31 N	150	50 E	180	7.0	o	1011.9	26.5	24.2	28	23.2	83	10
	12		22	8	39 N	150	27 E	190	7.5	bc	1012.8	26.6	24.0	28	23.1	81	6
	15	3	1	8	39 N	150	27 E	220	7.7	bc	1012.4	25.7	24.5	28	24.1	91	unknown
	18		4	8	39 N	150	27 E	275	6.2	bc	1011.7	27.2	24.6	28	23.7	80	6
	21		7	8	48 N	150	25 E	310	5.0	bc	1012.0	27.3	24.6	28	23.5	81	6
3	0		10	9	16 N	150	0 E	340	5.6	bc	1013.0	29.0	25.0	28	23.5	72	6
	3		13	9	41 N	149	30 E	314	6.2	bc	1011.8	30.0	25.6	28	24.0	70	5
	6		16	10	2 N	148	59 E	305	8.0	bc	1010.7	30.0	25.8	28	24.3	72	4
	9		19	10	25 N	148	28 E	310	6.0	bc	1011.8	29.1	25.0	28	23.5	72	4
	12		22	10	49 N	147	56 E	14	6.0	c	1013.8	28.4	25.5	28	24.4	80	9
	15	4	1	11	12 N	147	23 E	356	4.7	bc	1012.6	28.0	25.2	28	24.1	79	5
	18		4	11	36 N	147	50 E	346	4.3	bc	1011.8	27.8	25.0	28	23.9	79	4
	21		7	12	0 N	146	17 E	34	5.0	bc	1012.3	28.5	25.6	28	24.4	80	3
4	0		10	12	23 N	145	44 E	49	4.0	bc	1013.0	29.4	25.8	28	24.6	76	4
	3		13	12	47 N	145	10 E	22	4.2	bc	1011.4	29.0	26.2	28	25.2	80	4

GUAM

*wether b : Fine (cloud 0 to 2)
bc : Fine but cloudy (cloud 3 to 7)
c : Cloudy (cloud 8 to 10)
o : Overcast (cloud 10)
r : Rain
q : Squalls

6. JAMSTEC ADCP MOORING

To get the knowledge of physical process in the western equatorial pacific. In this cruise (K96-06) , we recovered four ADCP mooring at (0 ° N,138° E), (2.5° S,142° E), (2° S,142° E) and (0° N,156° E), and deployed four ADCP mooring at the same place.

Instrument:

ADCP

Distance to first bin:17.5m
Pings per ensemble:16
Time per ping:2.00s
Bin length:8.00m
Sampling Interval:3600s

- Serial Number:1225 (Mooring No.950708-00N138E)
- Serial Number:1155 (Mooring No.950710-2.5S142E)
- Serial Number:1154 (Mooring No.950711-02S142E)
- Serial Number:1224 (Mooring No.950719-00N156E)
- Serial Number:1221 (Mooring No.960711-00N138E)
- Serial Number:1152 (Mooring No.960713-2.5S142E)
- Serial Number:1153 (Mooring No.960713-02S142E)
- Serial Number:1151 (Mooring No.960729-00N156E)

CTD

SBE-16
Sampling Interval:1800s

- Serial Number:1280 (Mooring No.950708-00N138E)
- Serial Number:1287 (Mooring No.950710-2.5S142E)
- Serial Number:1288 (Mooring No.950711-02S142E)
- Serial Number:1278 (Mooring No.950719-00N156E)
- Serial Number:1279 (Mooring No.960711-00N138E)
- Serial Number:1284 (Mooring No.960713-2.5S142E)
- Serial Number:1285 (Mooring No.960713-02S142E)
- Serial Number:1286 (Mooring No.960729-00N156E)

CTDis mounted ADCP buoy with the flame.

Deployment:

Four ADCP mooring were deployed at (0° N,138° E), (2.5° S,142° E), (2° S,142° E) and (0° N,156° E). The moorings were planed to make the ADCP buoy placed at about 270m. When we deployed, we adjusted length of the nylon rope at (2.5° S,142° E), and (2° S,142° E) . Because the bottom depth of points were shallower than that of our plan. After we released the anchor, we monitored depth of the acoustic releaser (Fig.6-1,2). The descent rate was about 2.4m/sec. After the mooring lated, we calibrated each position of the mooring.

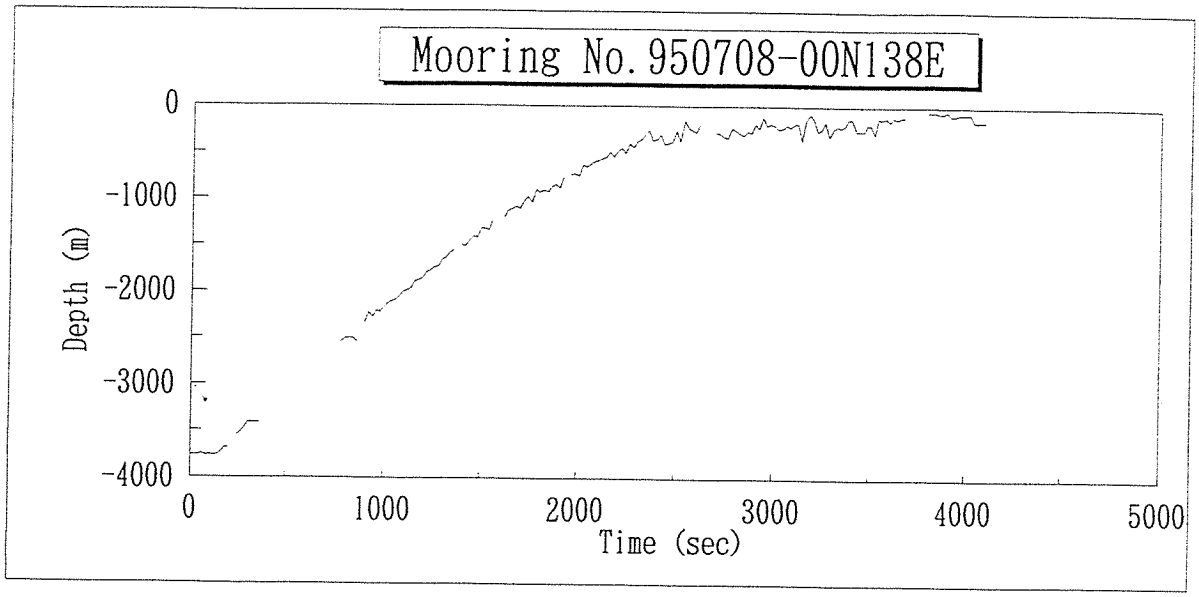
Results of calibration

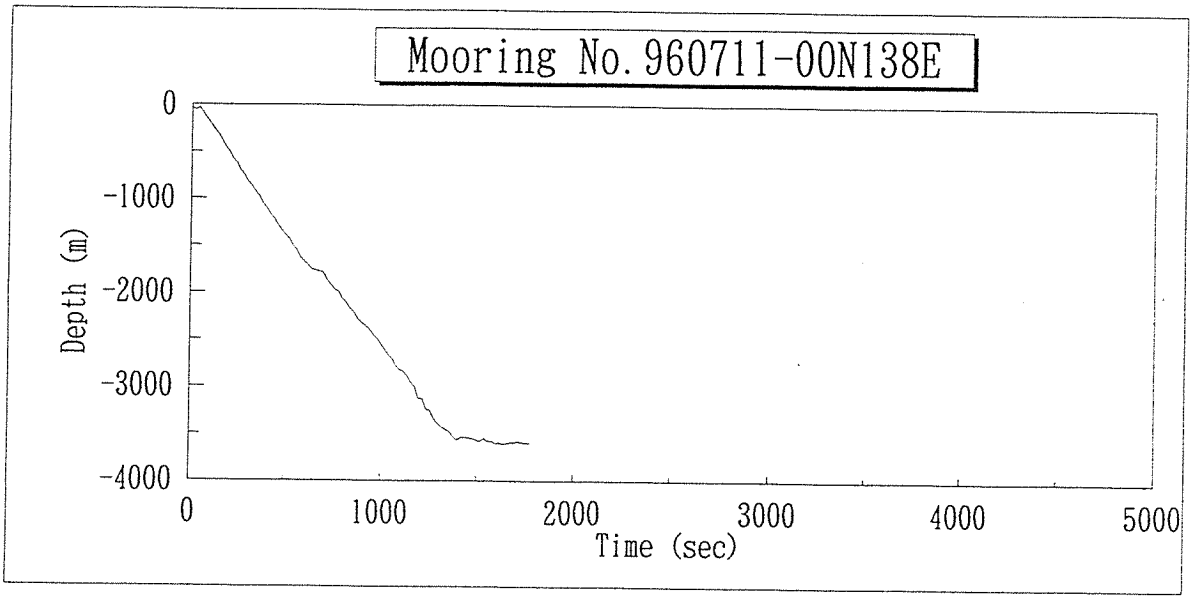
- Mooring No.960711-00N138E
  Lat: 0° 01.236N Long:138° 01.795E
- Mooring No.960713-2.5S142E
  Lat: 2.5° 28.114S Long:141° 57.242E
- Mooring No.960713-2S142E
  Lat: 1° 59.908S Long:141° 59.704E
- Mooring No.960729-00N156E
  Lat: 0° 00.027N Long:156° 05.414E

Recovery

We recovered four ADCP moorings which were deployed on Jul.1995 (K95-05).

After the recovery, we uploaded ADCP and CTD data into a computer, then raw data were converted into ASCII code. Results are shown in the figures on following pages. Fig.6-3~6 shows CTD depth data every half year. Fig.6-7~ 61 shows the velocity data (eastward and northward component) at 50, 120 and 200m depth every three months.





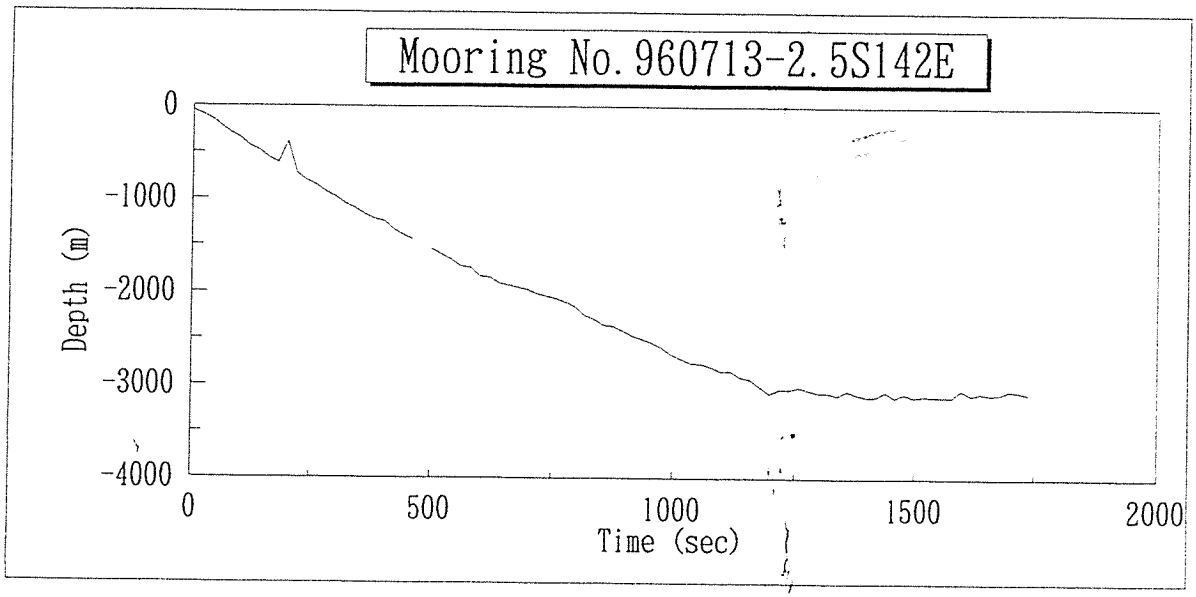
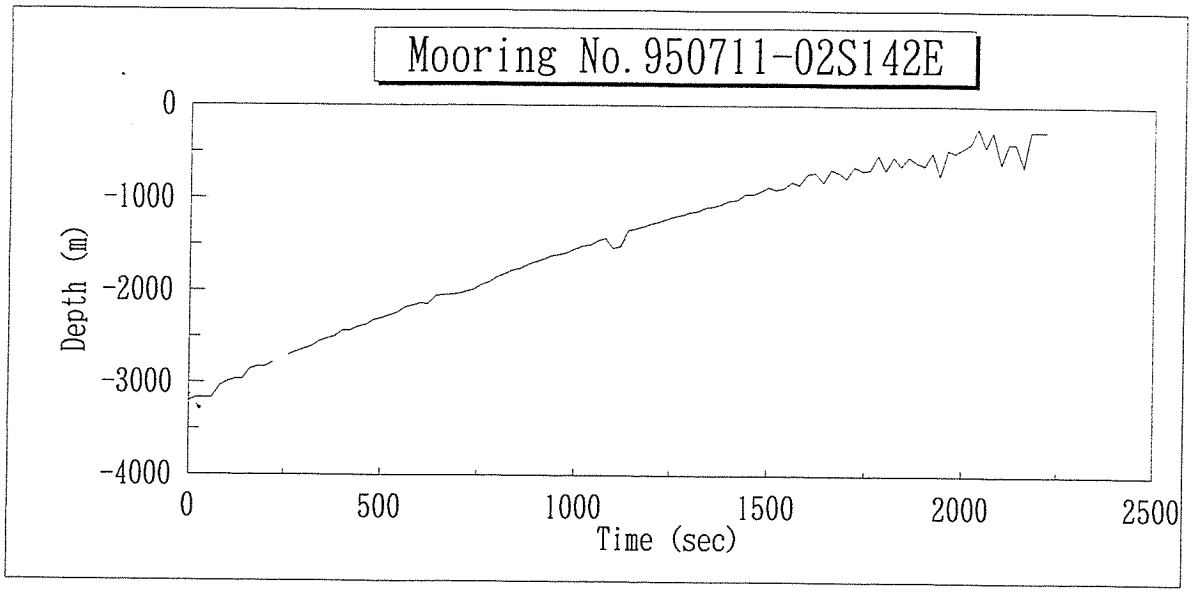
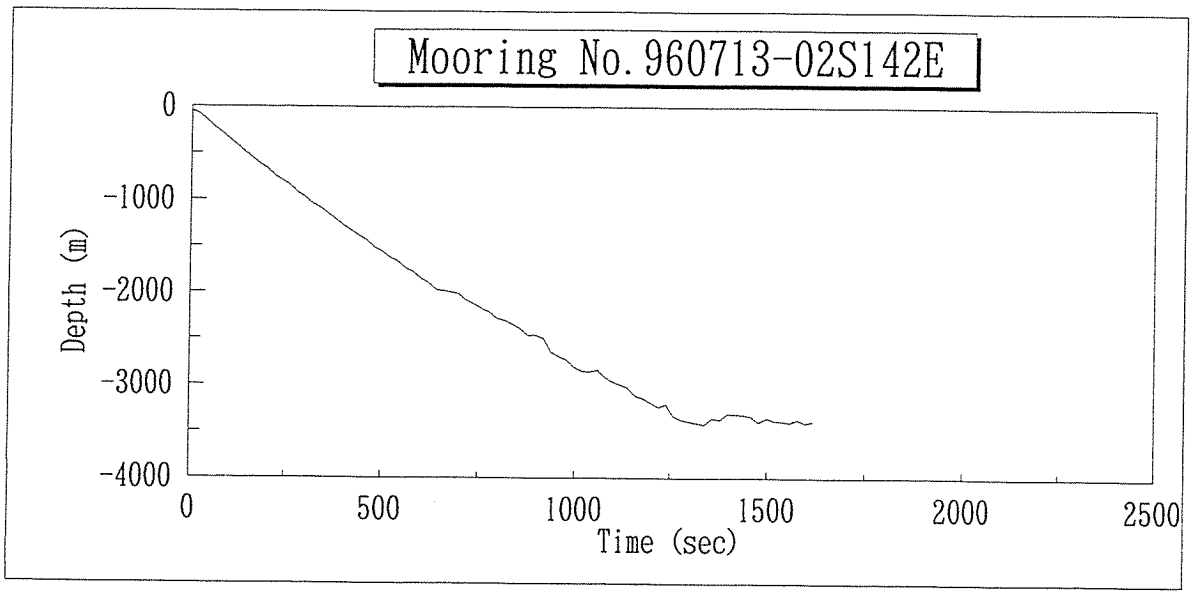


Fig. 6-1 Releaser Depth Monitor





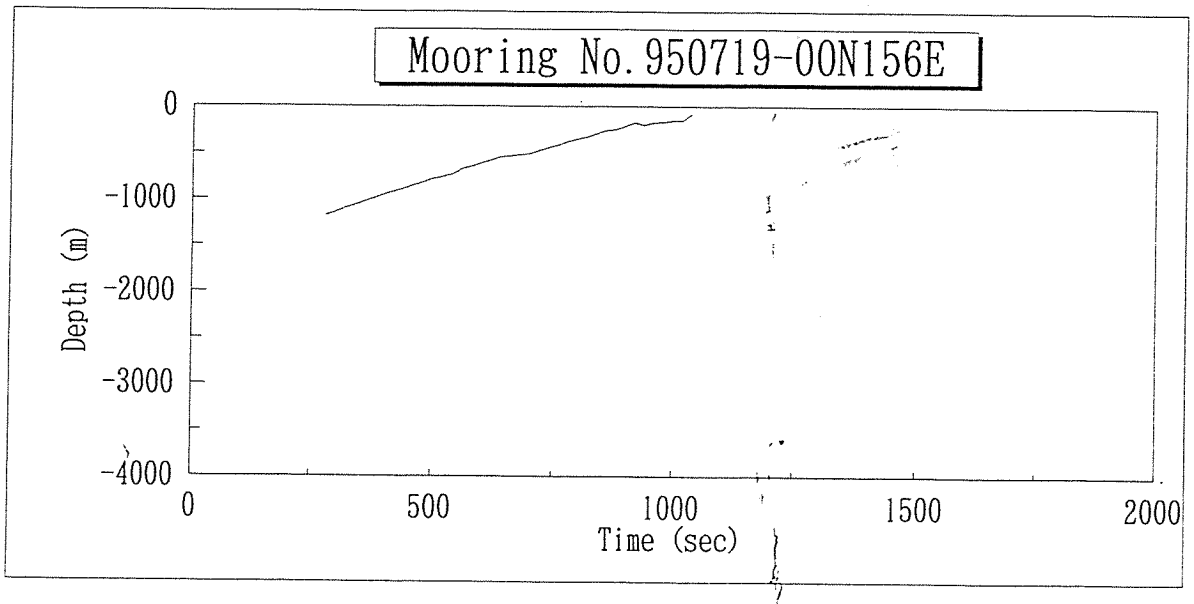
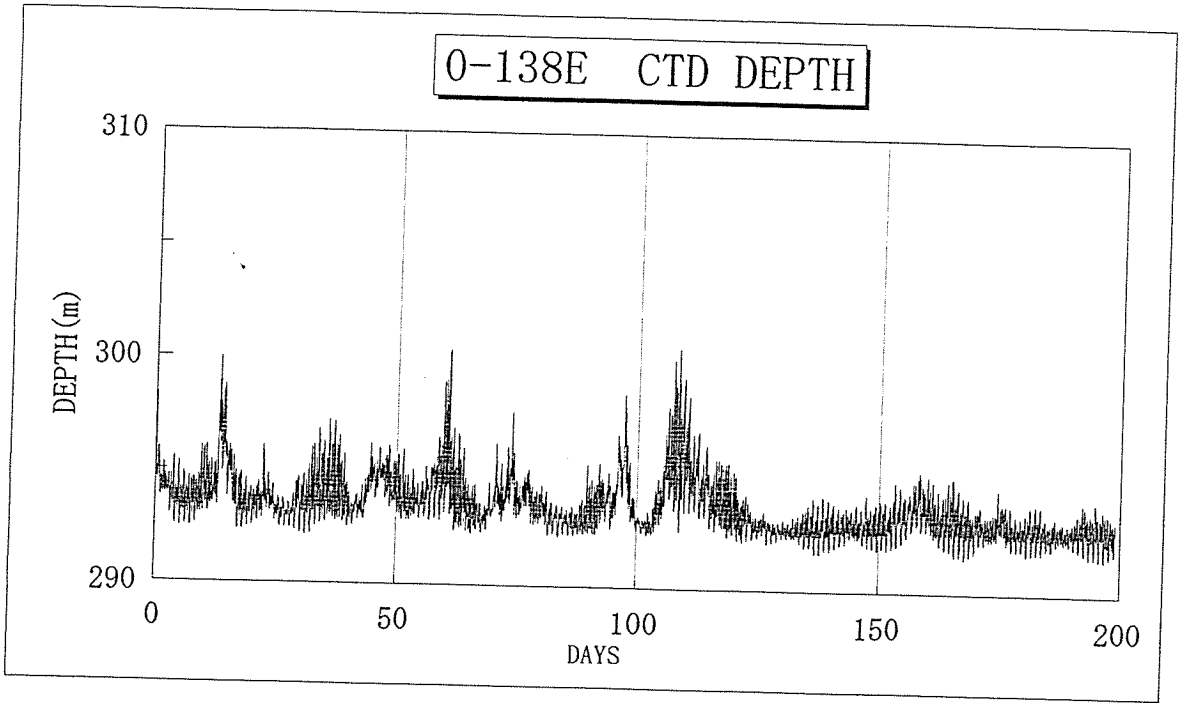


Fig. 6-2 Releaser Depth Monitor



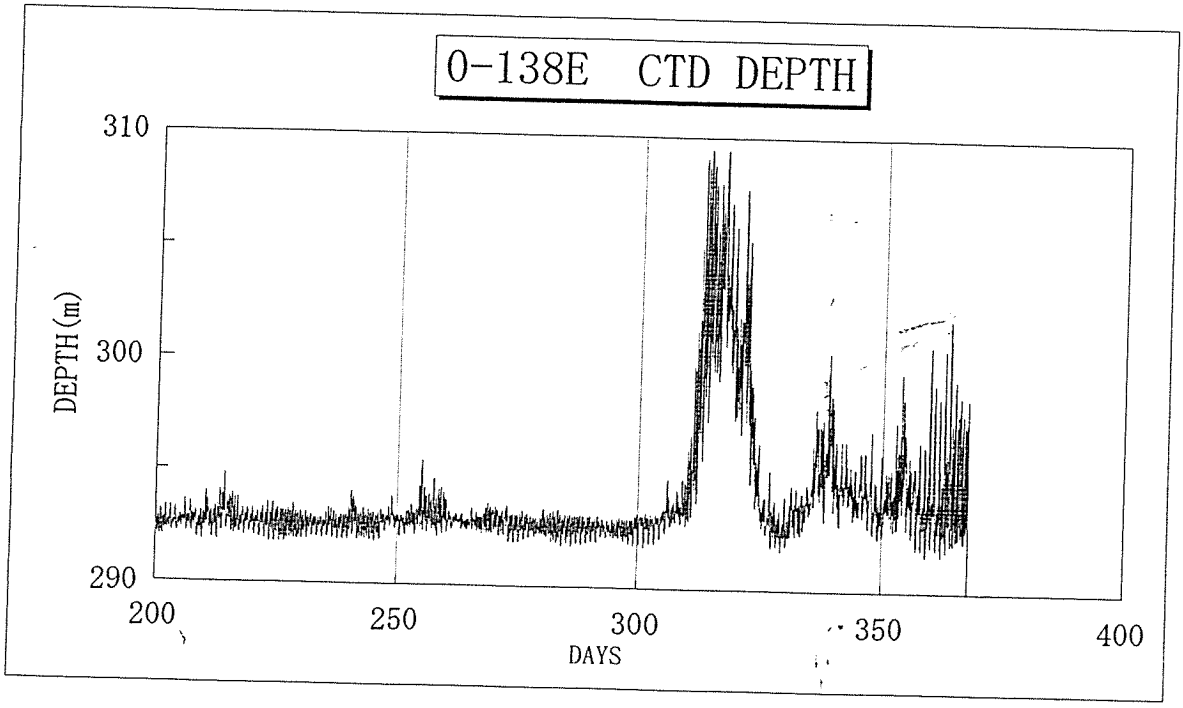
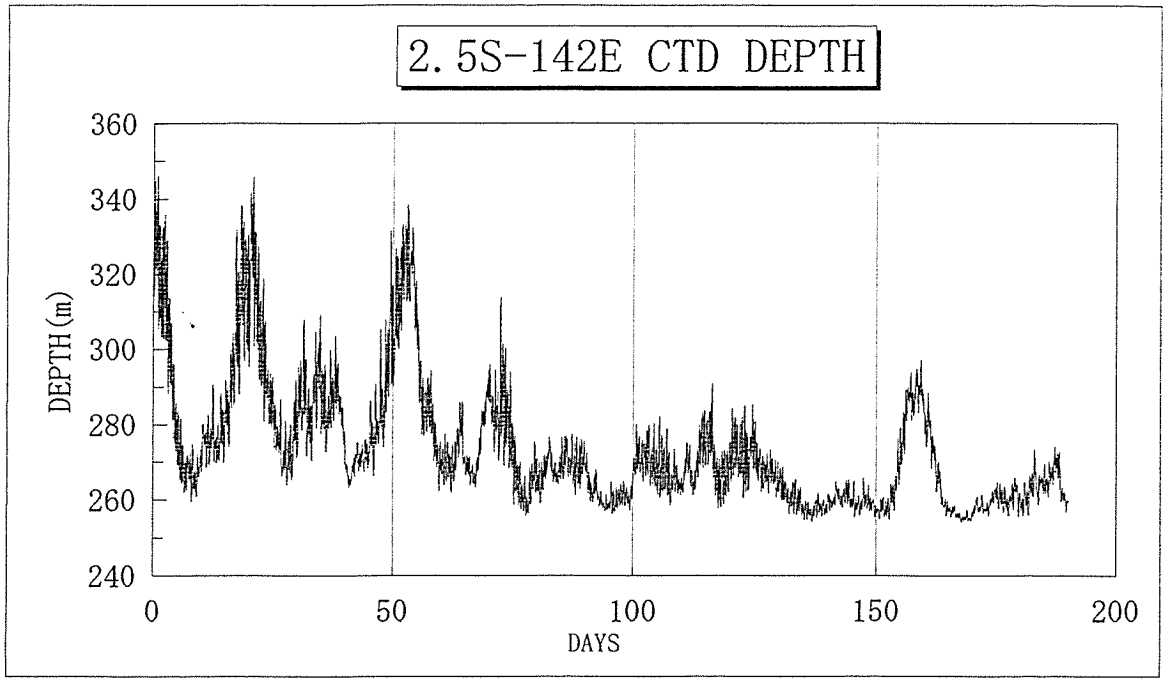


FIg 6-3 Time Series of CTD Depth



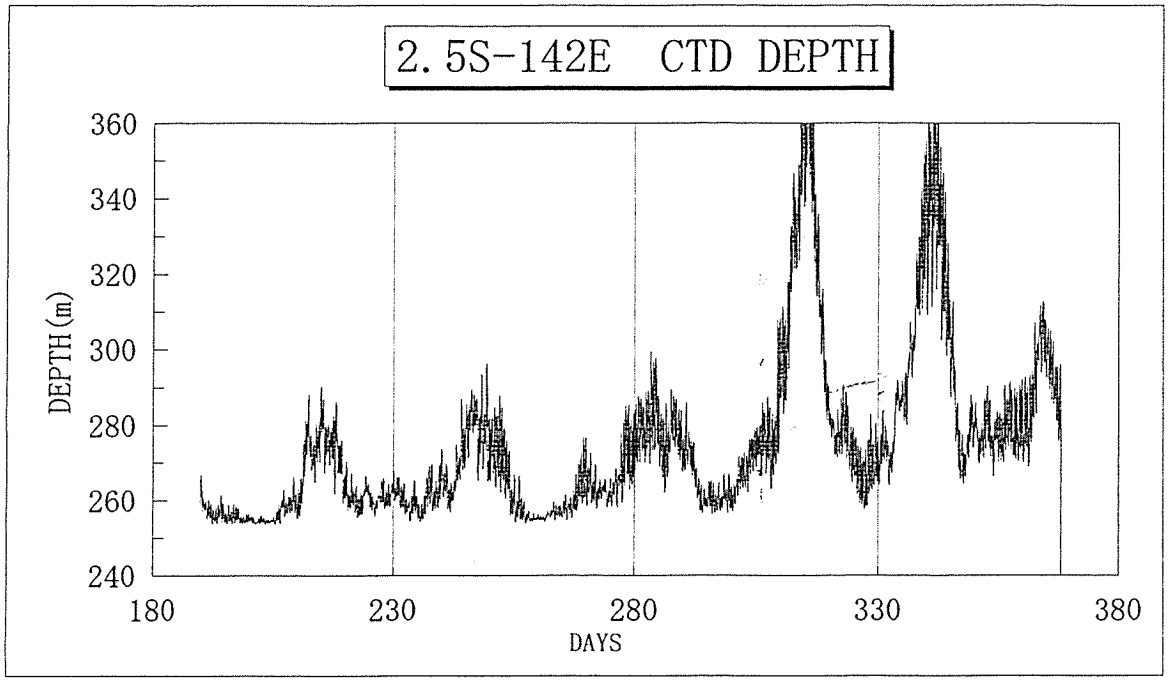
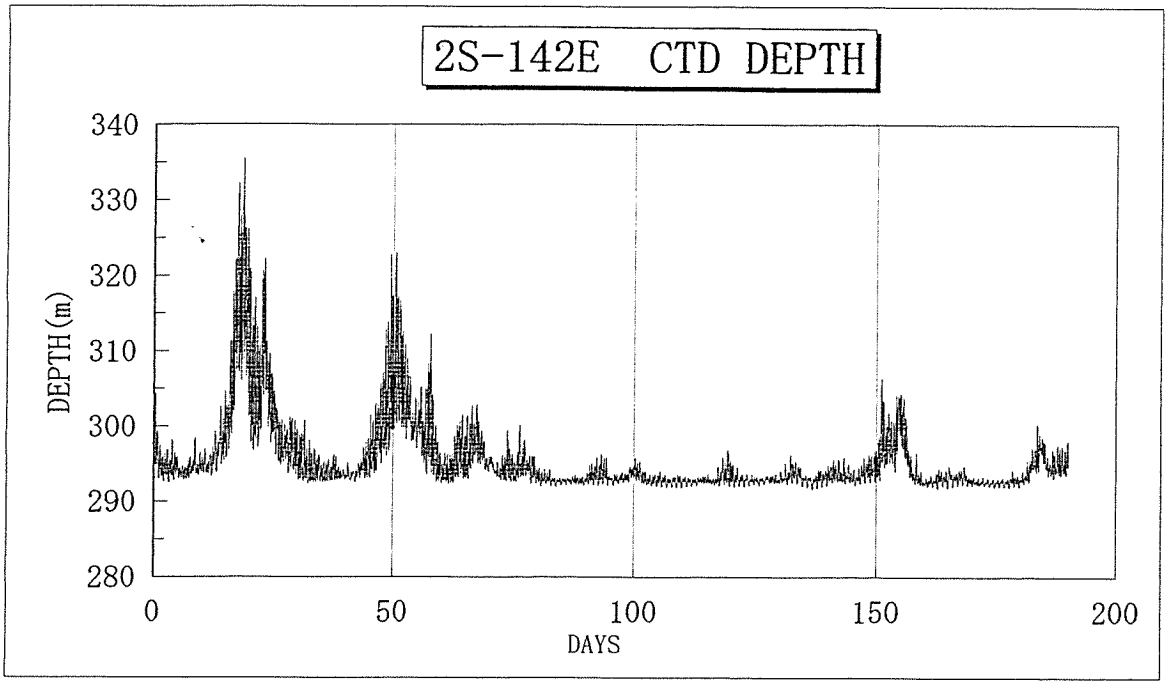


FIg 6-4 Time Series of CTD Depth



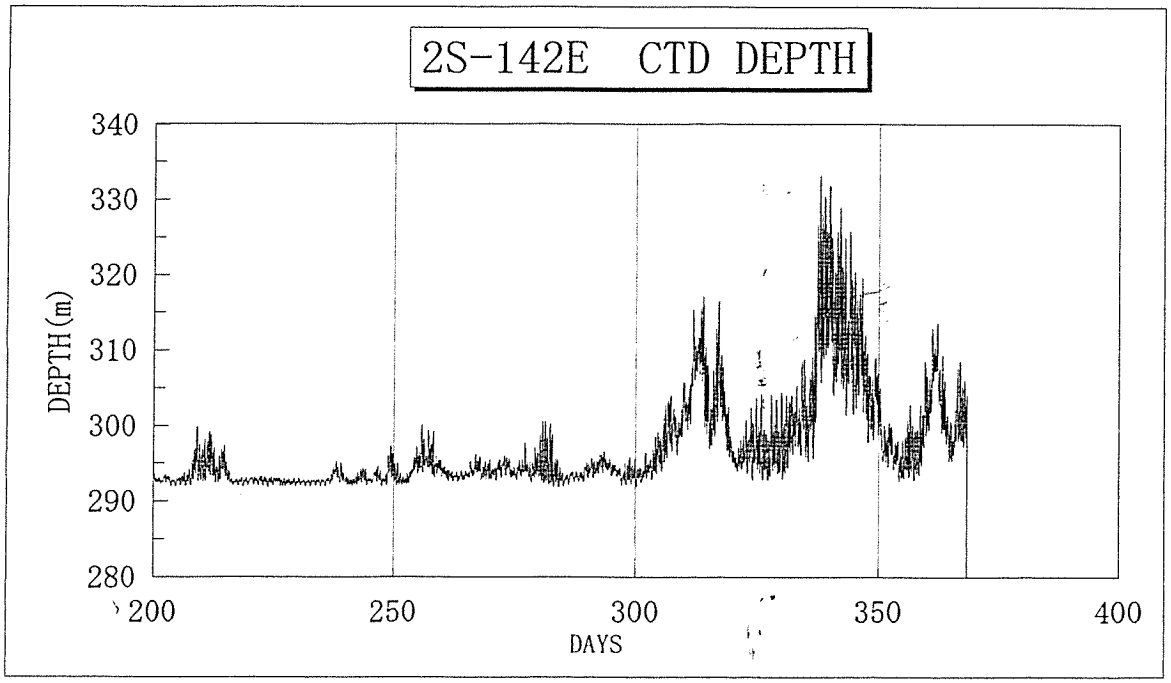
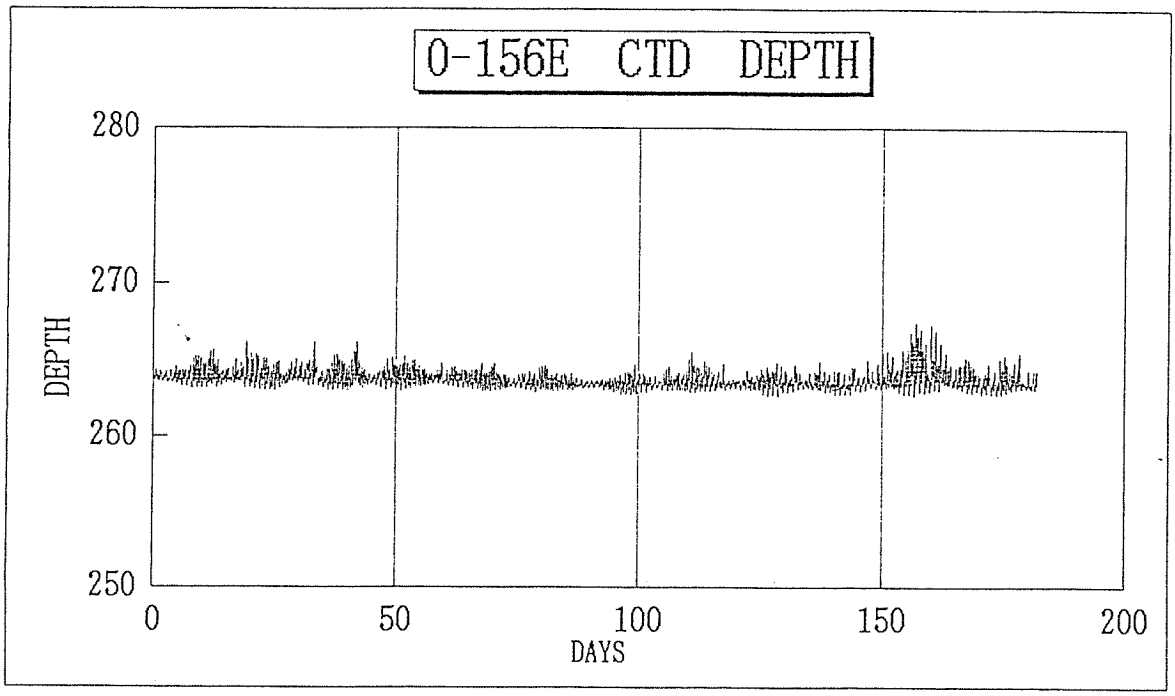


FIg 6-5 Time Series of CTD Depth



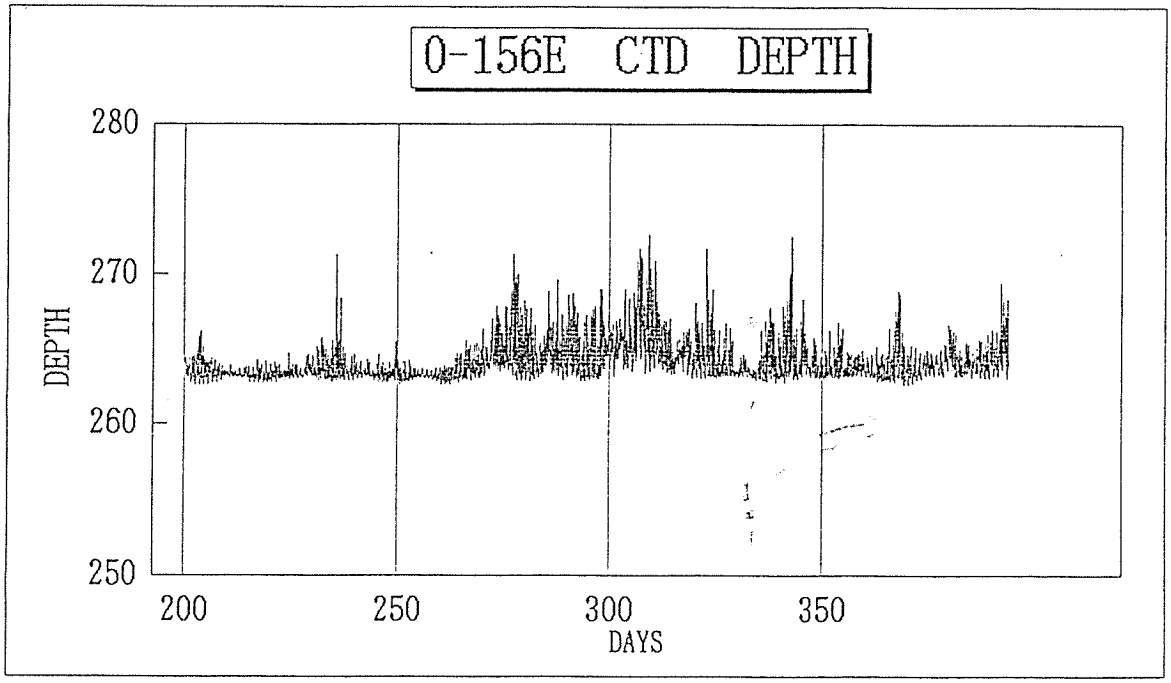
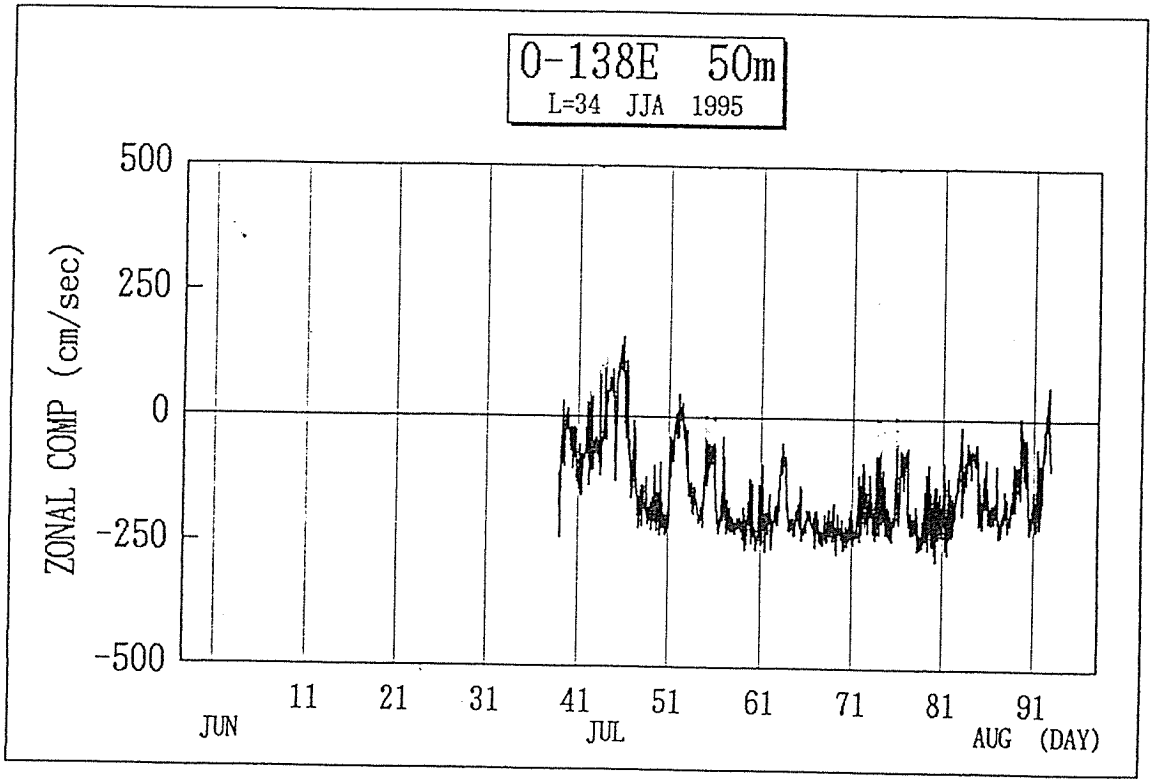


FIg 6-6 Time Series of CTD Depth



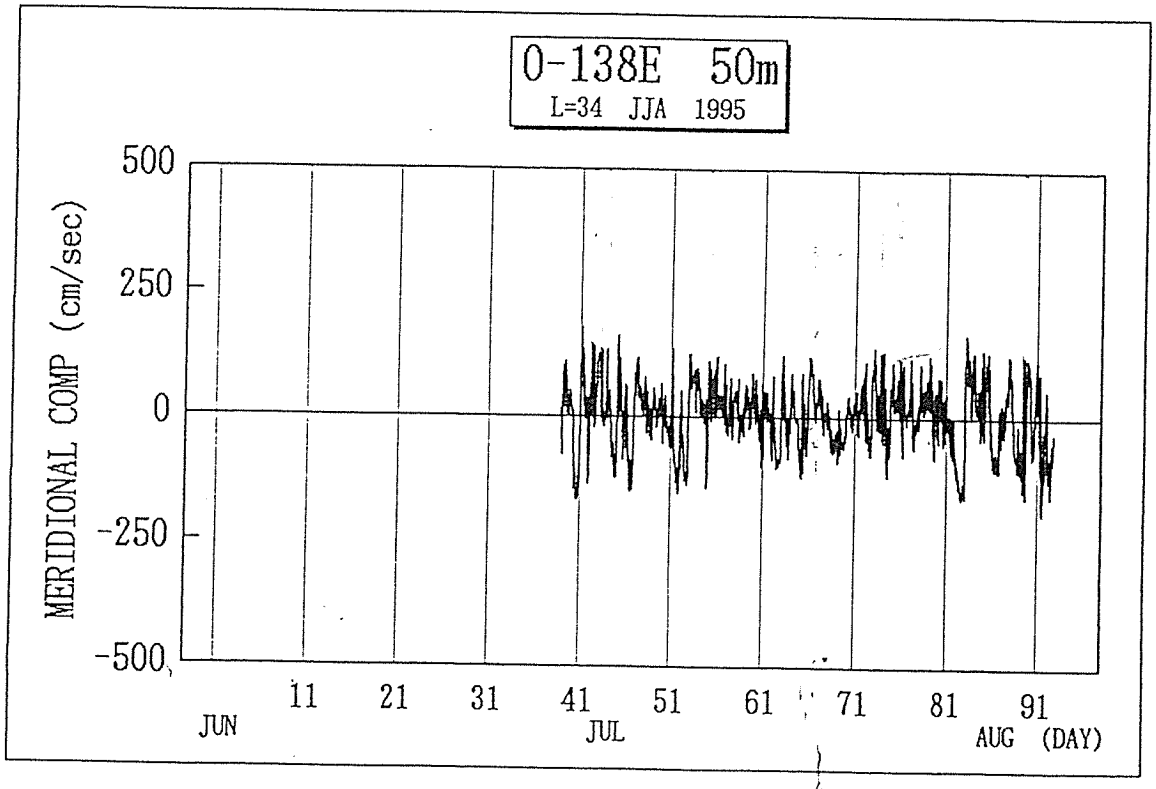
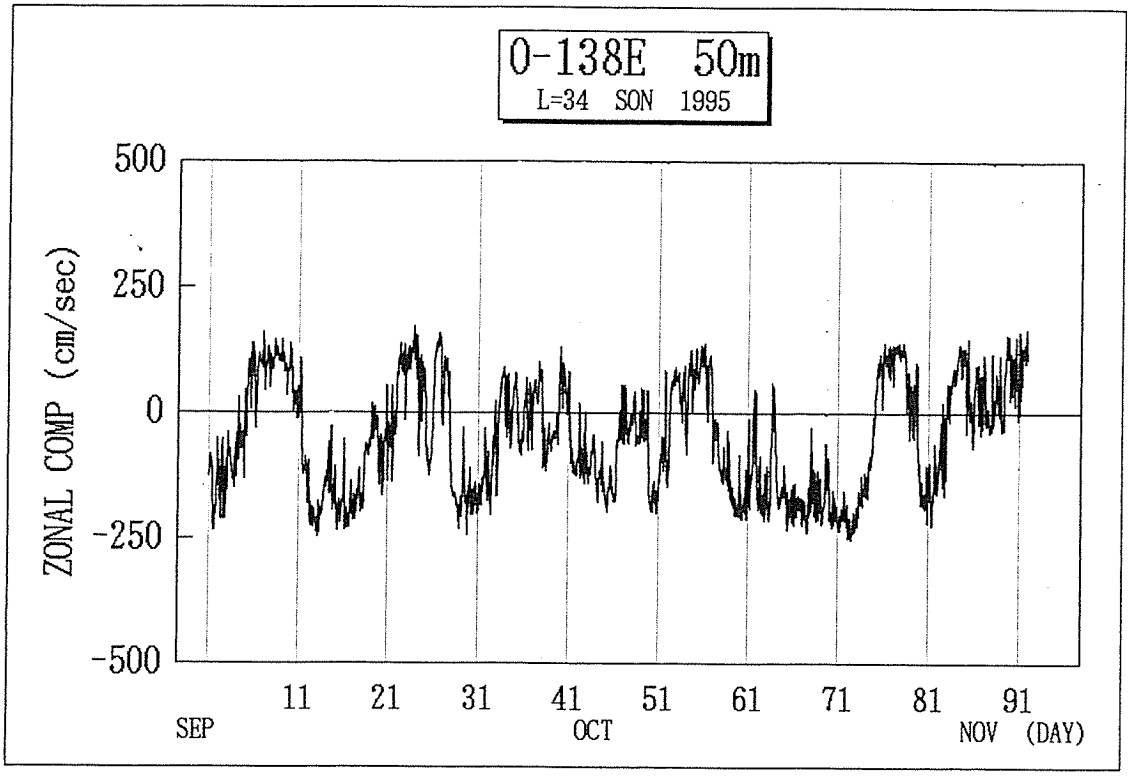


Fig.6-7 Time Series of Velocity



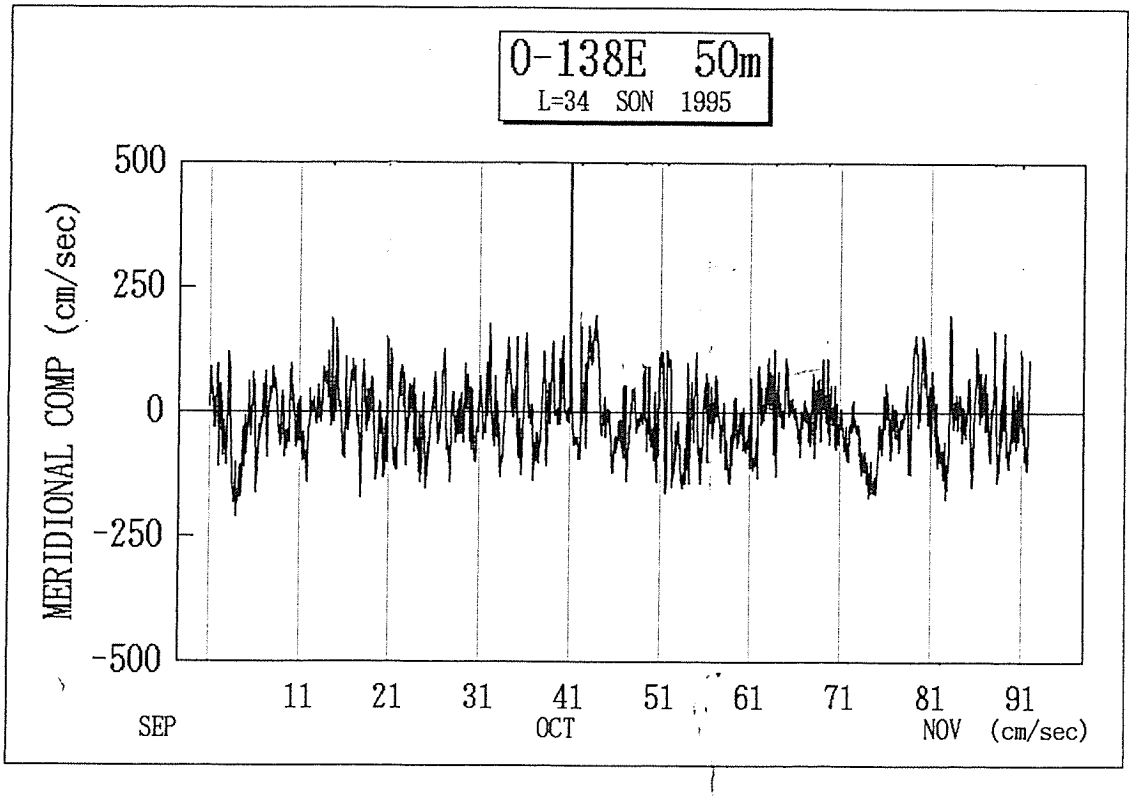
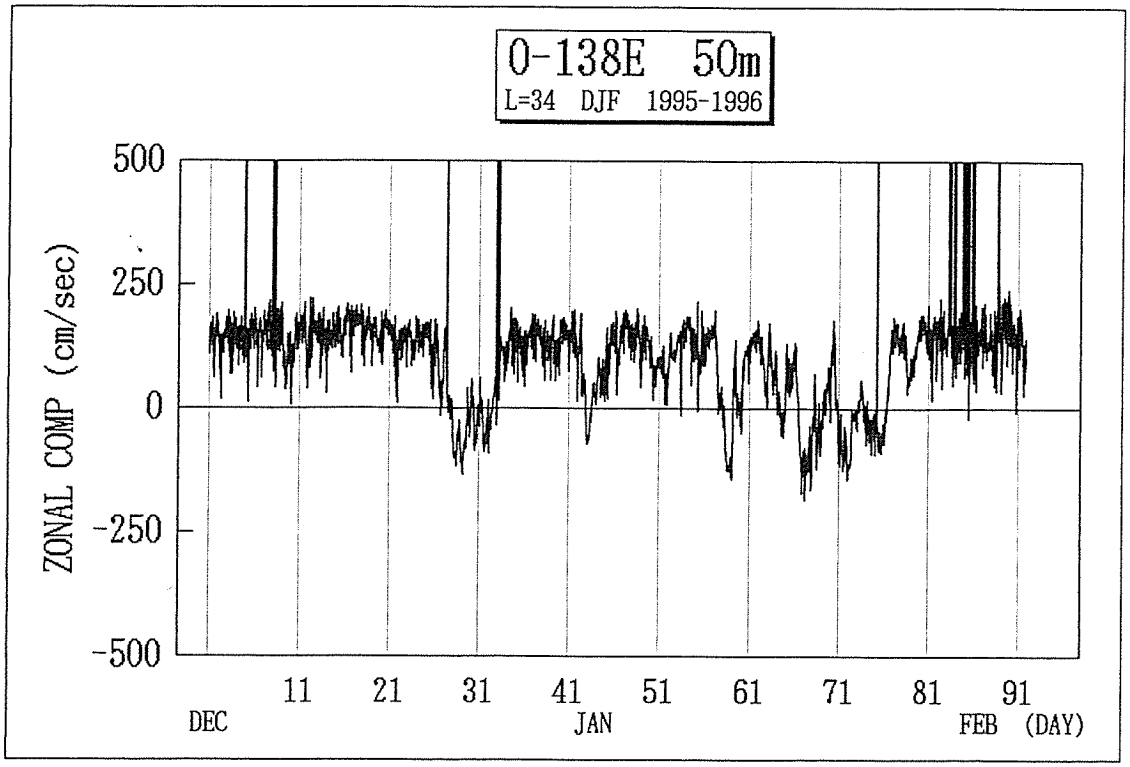


Fig.6-8 Time Series of Velocity



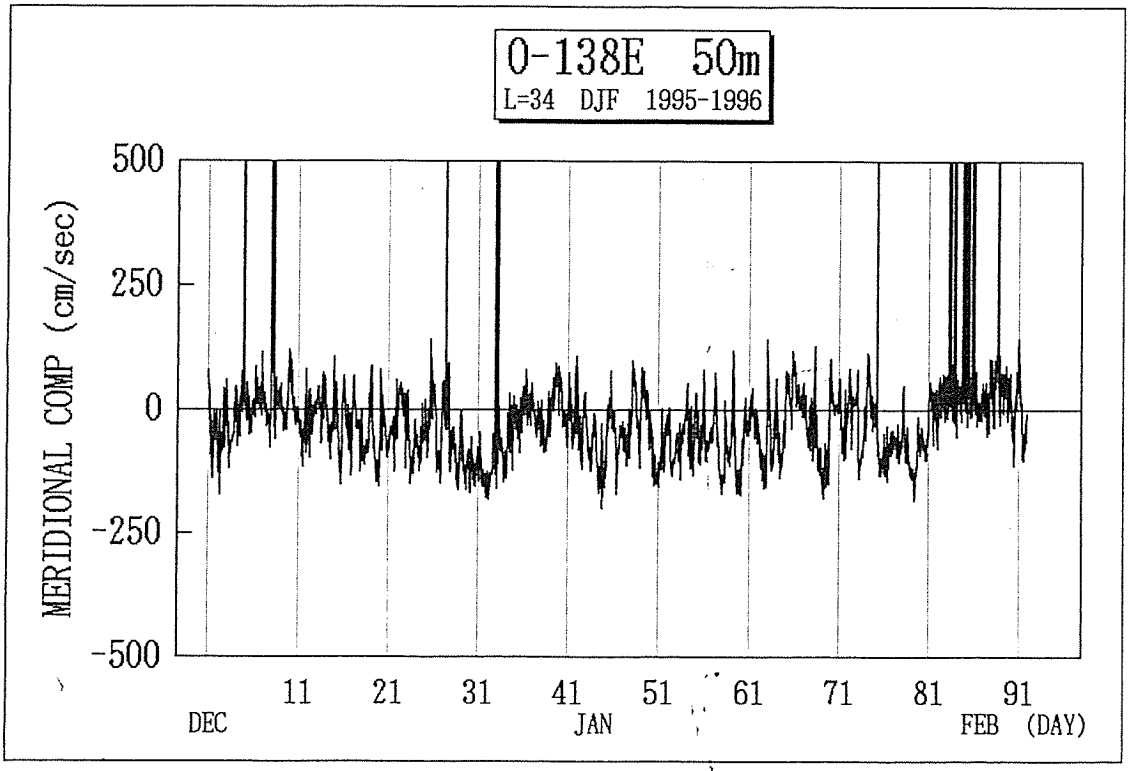
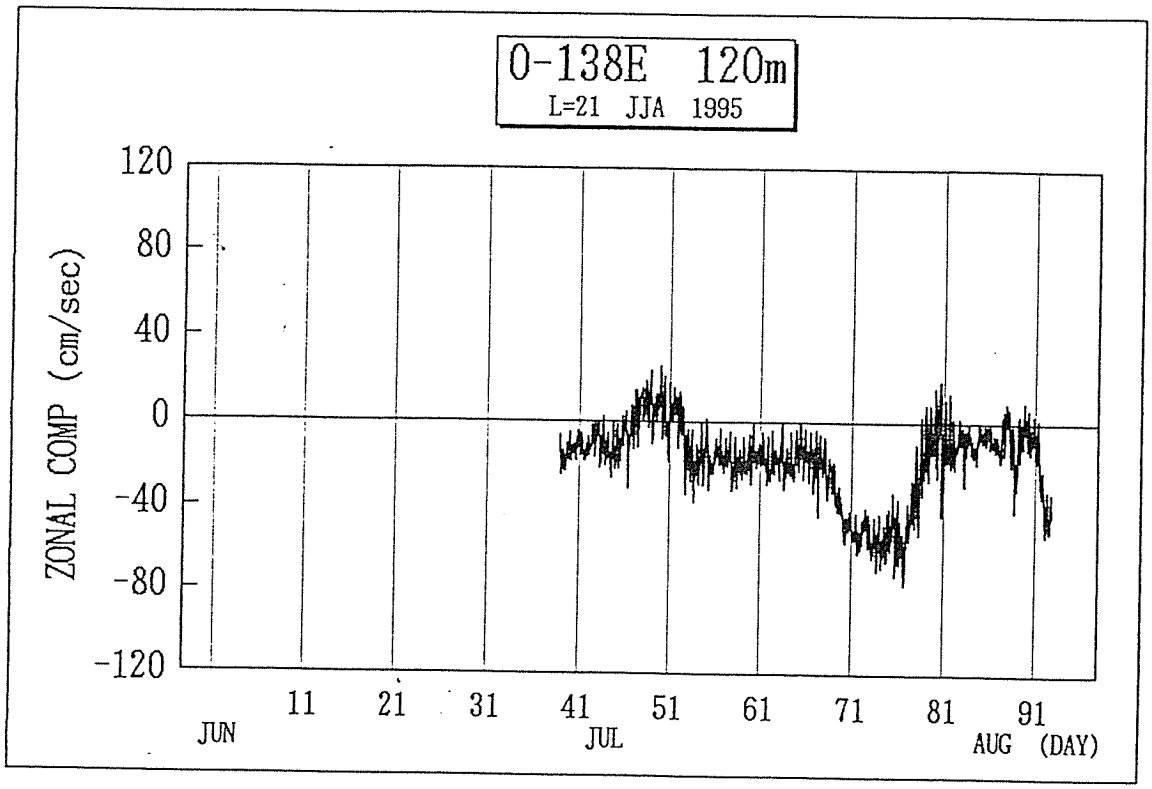


Fig.6-9 Time Series of Velocity



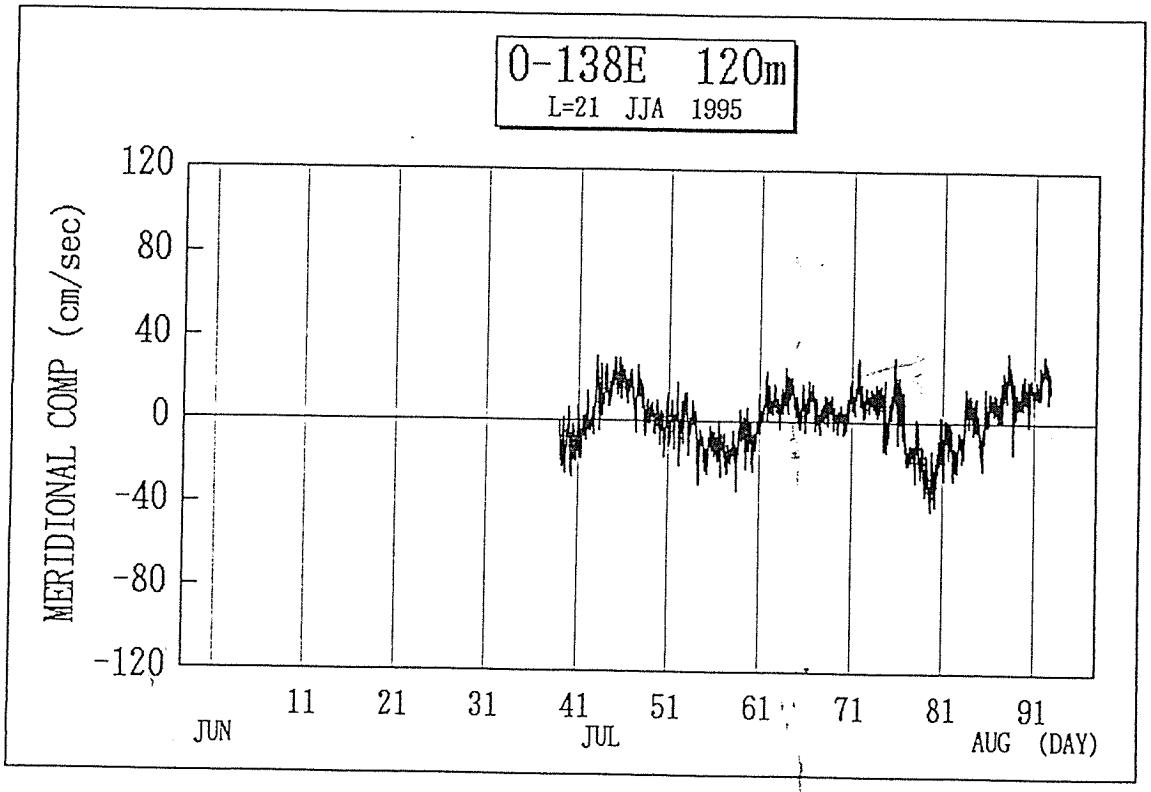
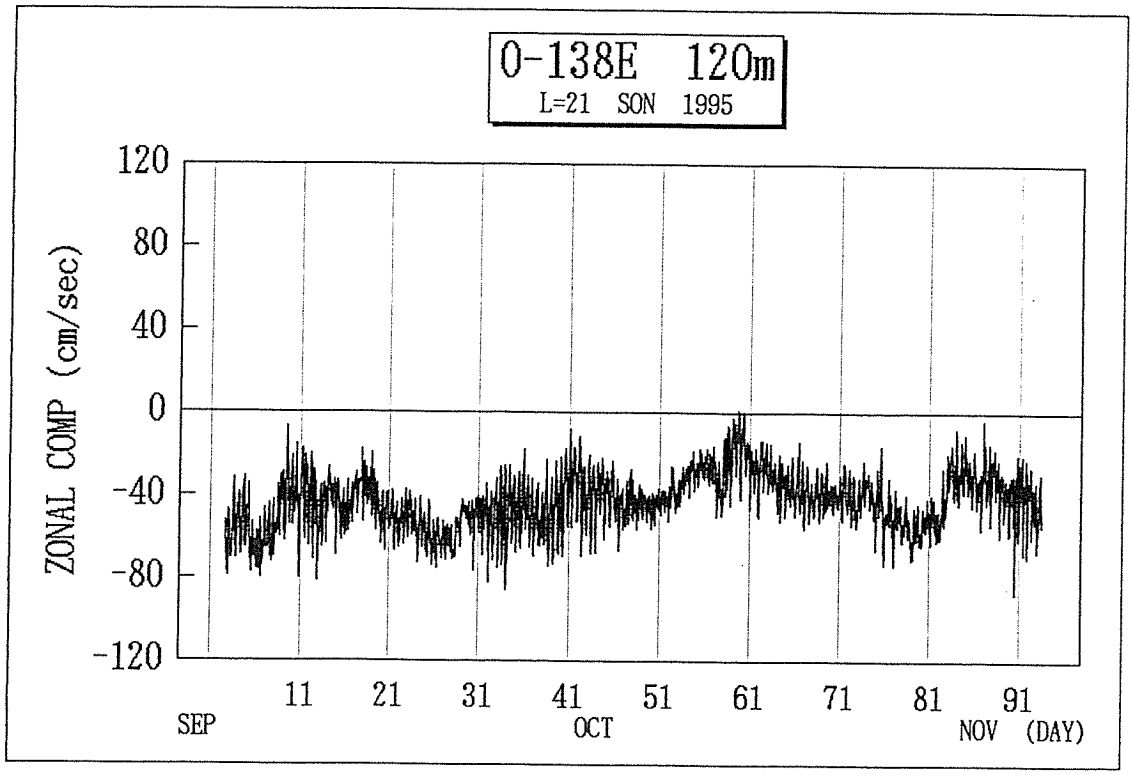


Fig.6-10 Time Series of Velocity



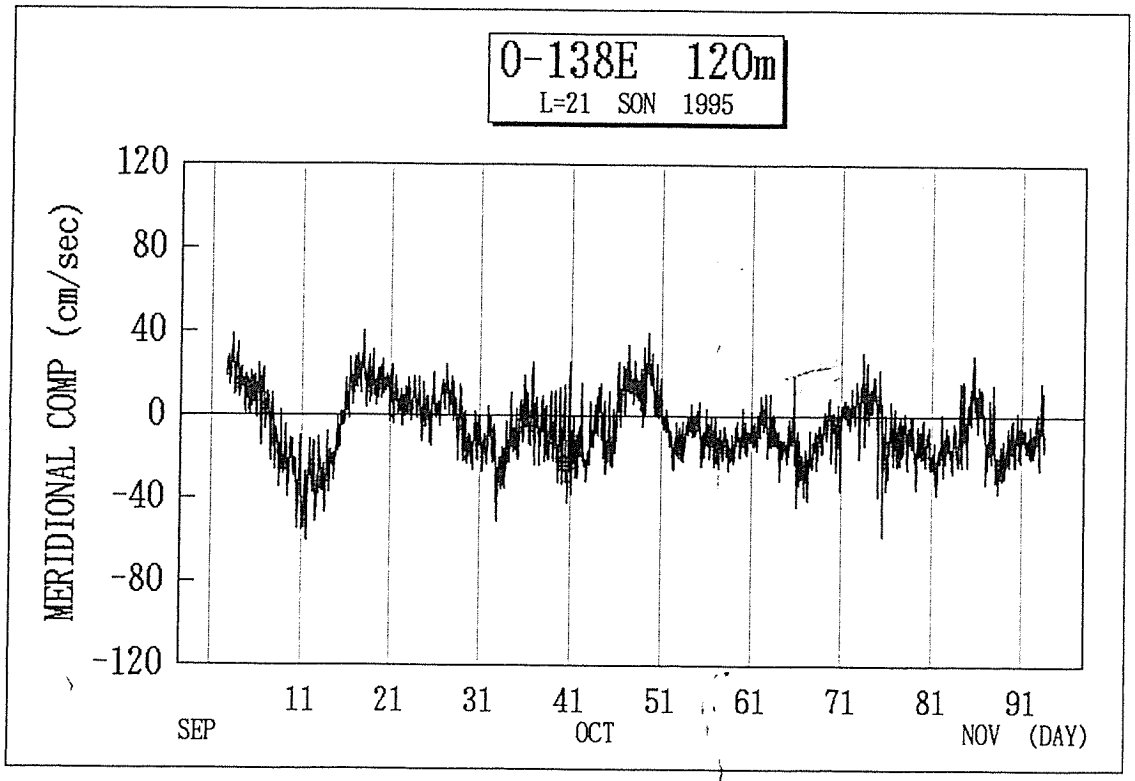
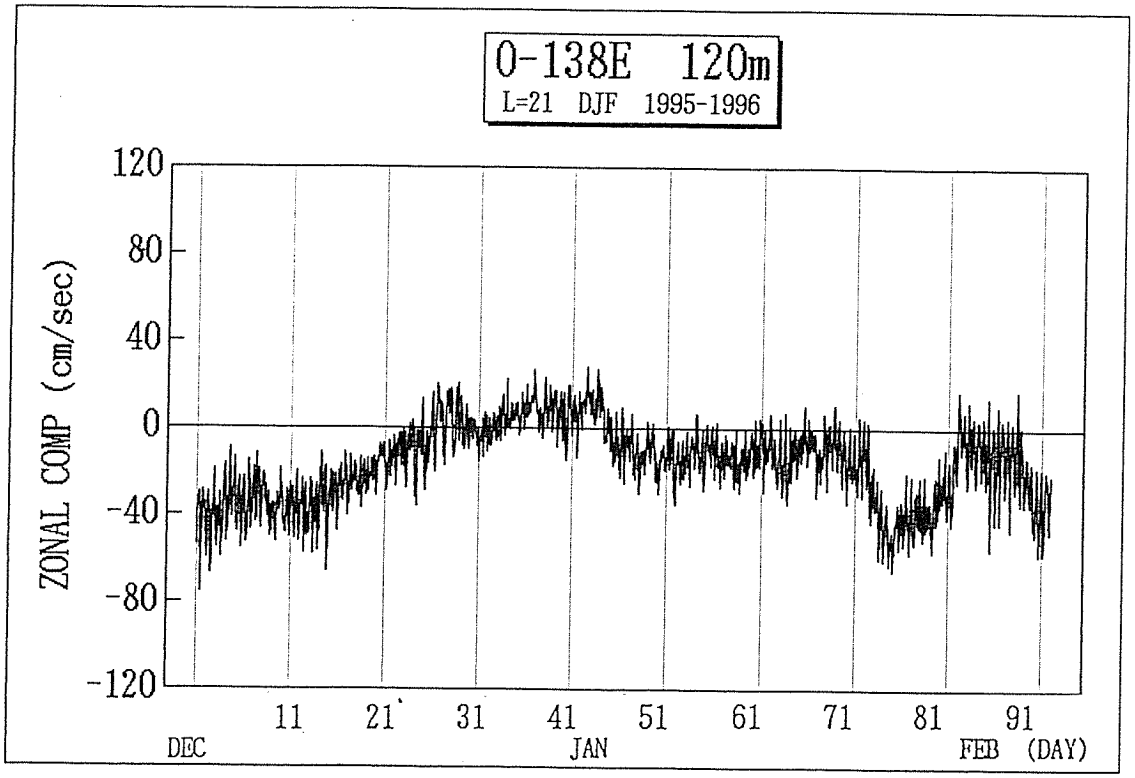


Fig.6-11 Time Series of Velocity



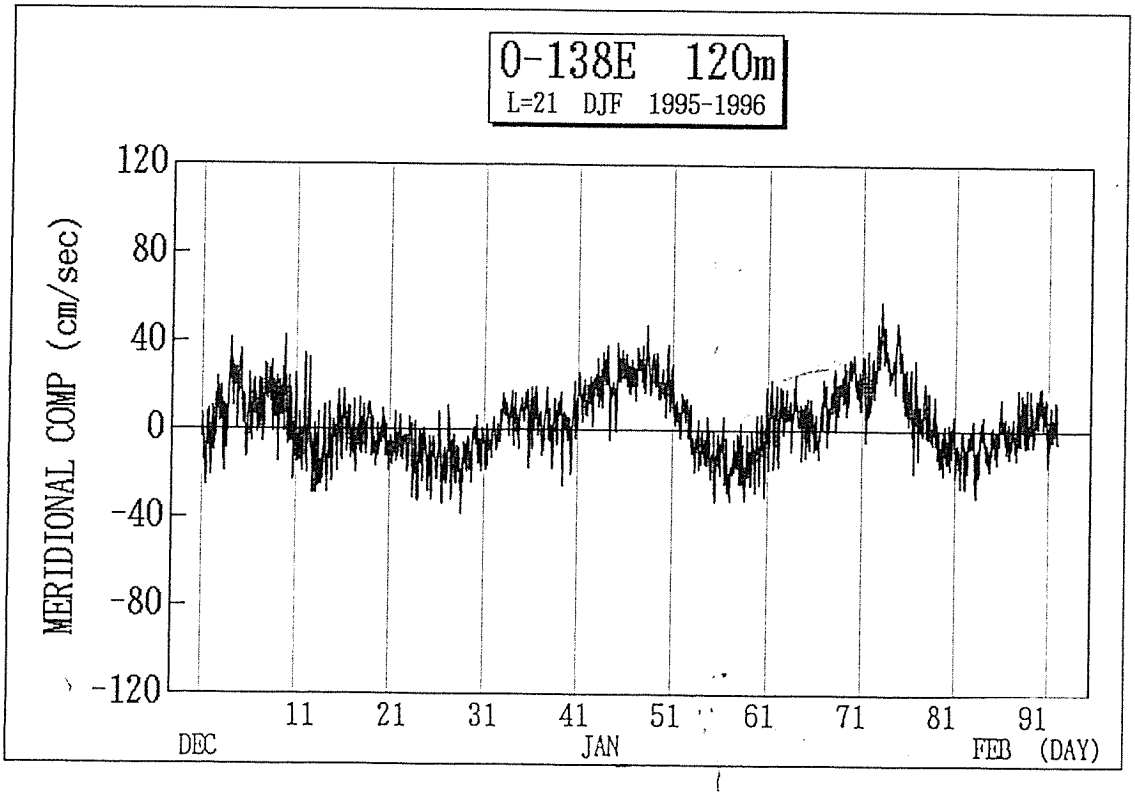
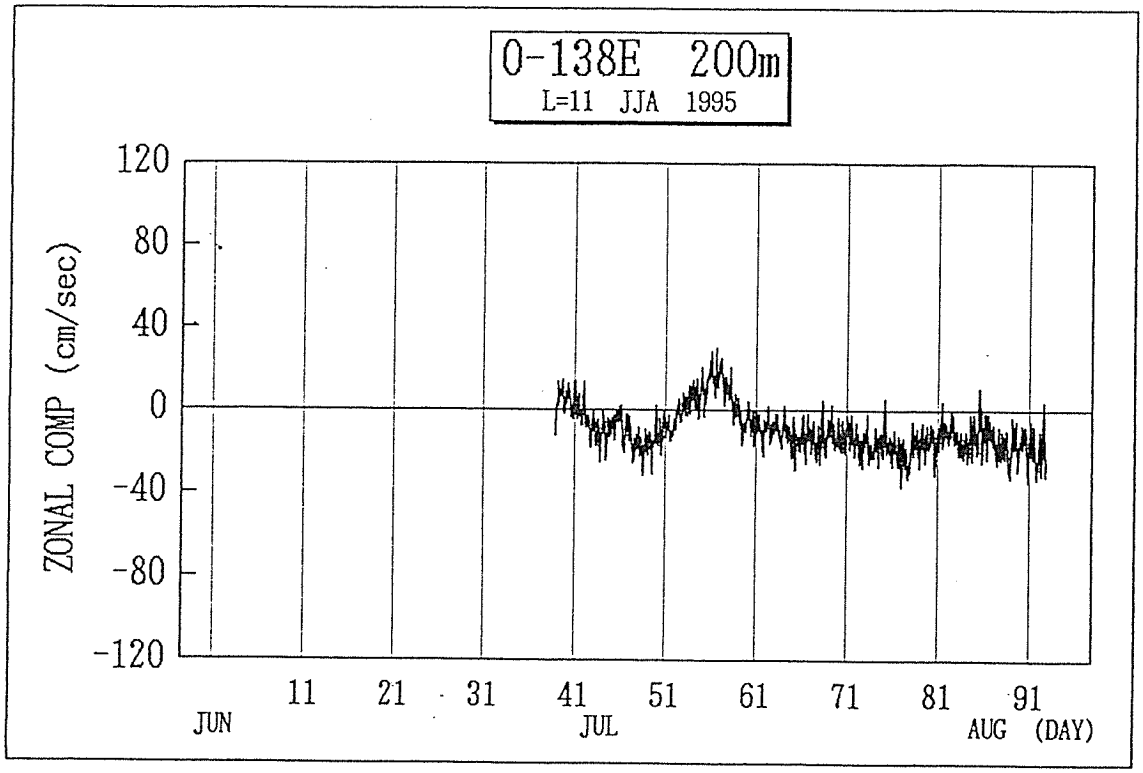


Fig.6-12 Time Series of Velocity



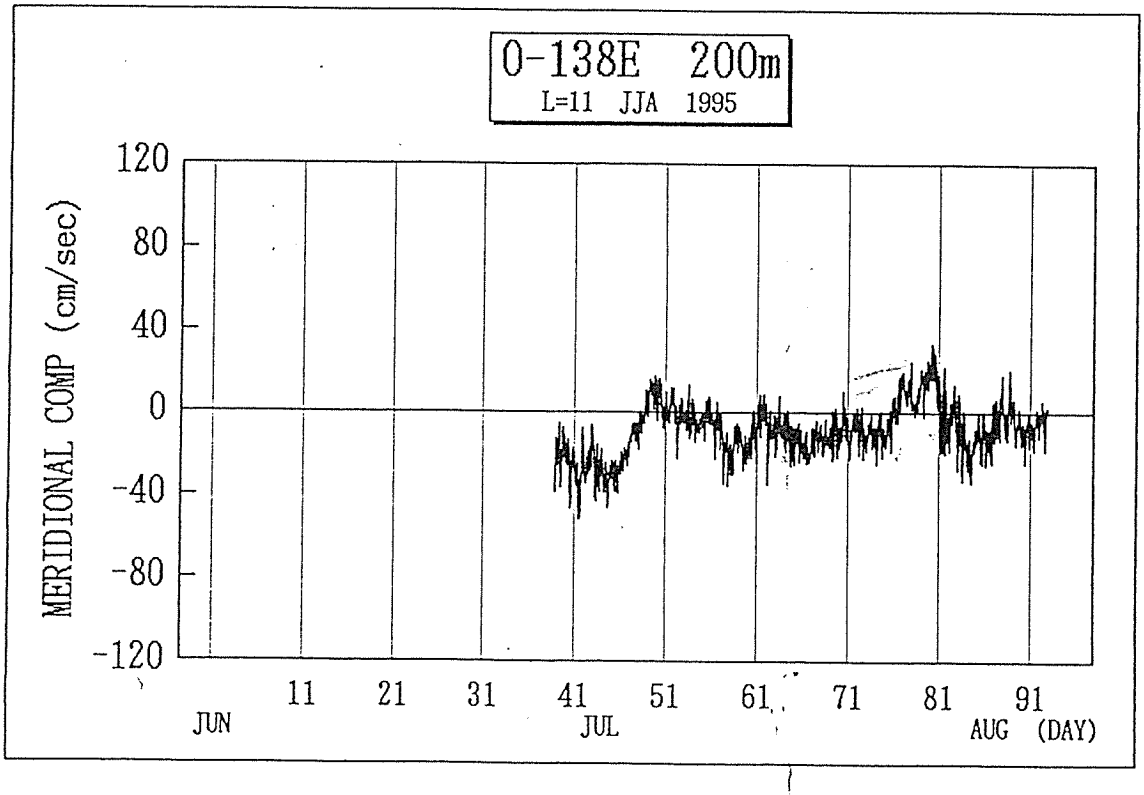
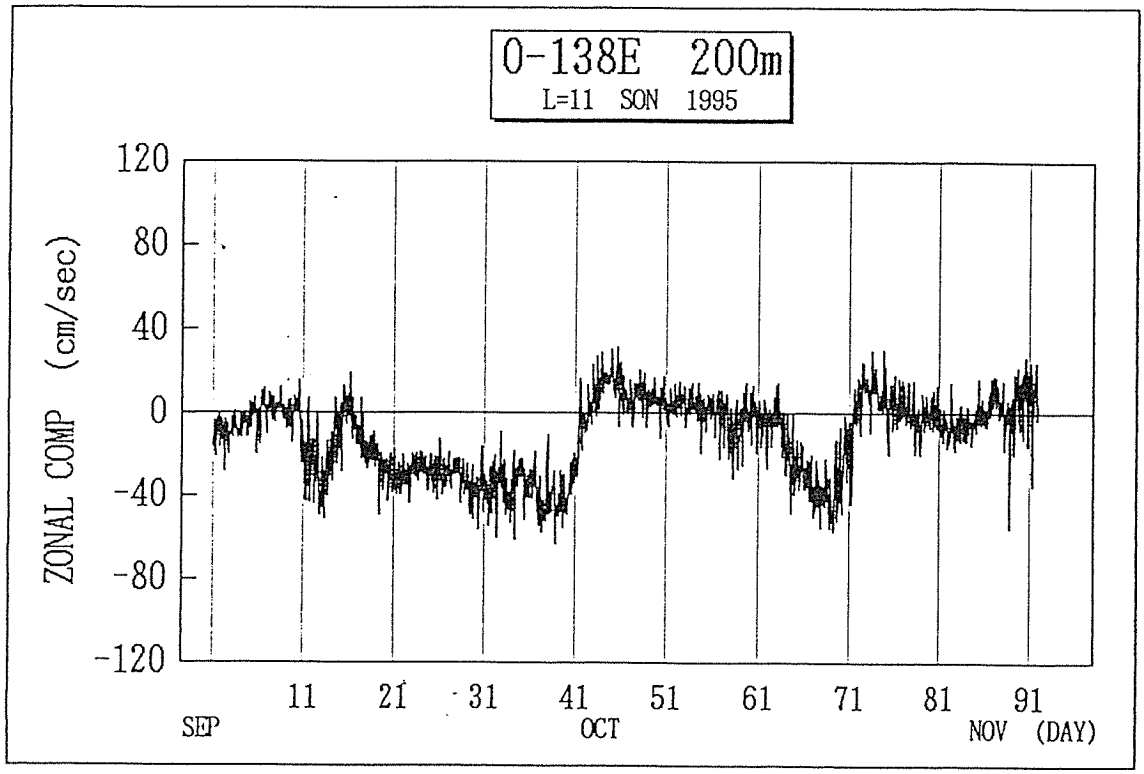


Fig.6-13 Time Series of Velocity



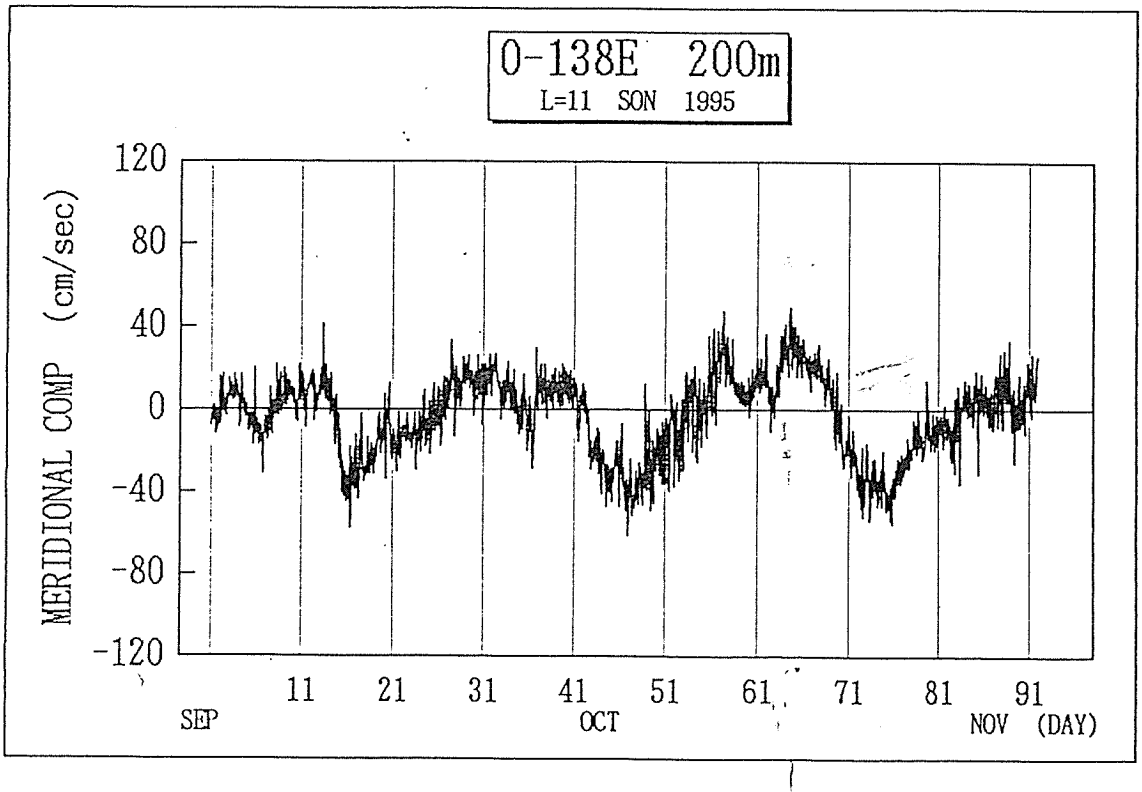
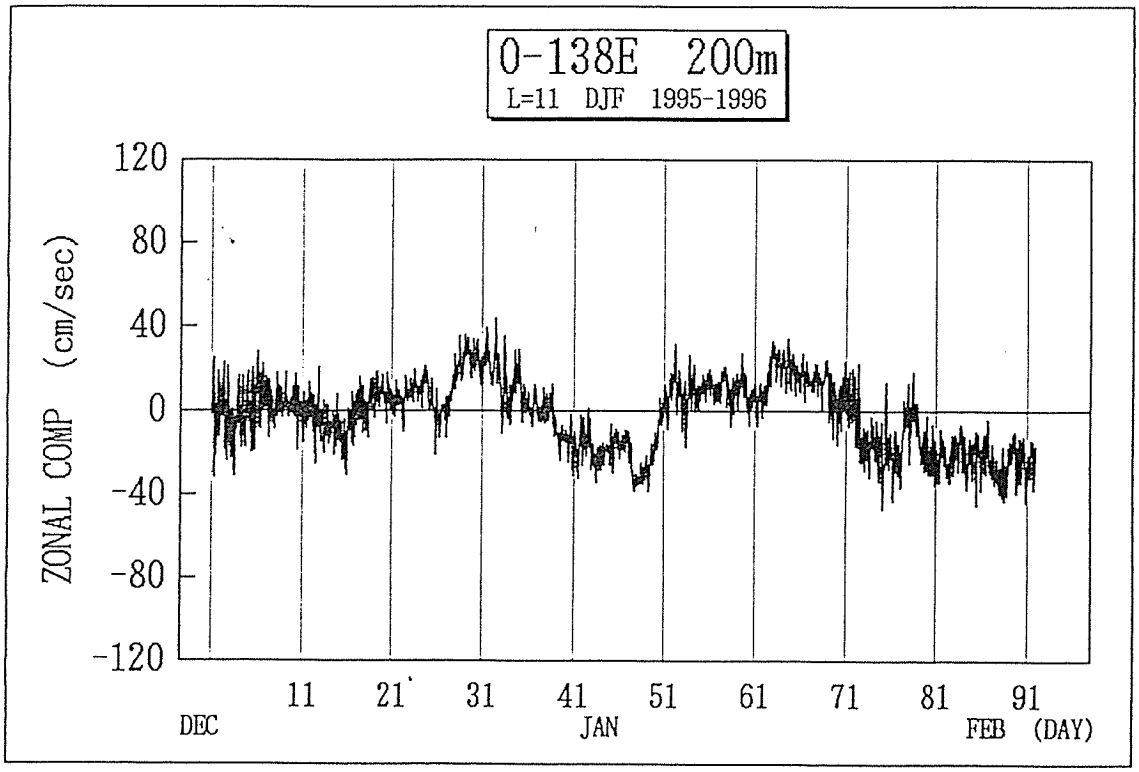


Fig.6-14 Time Series of Velocity



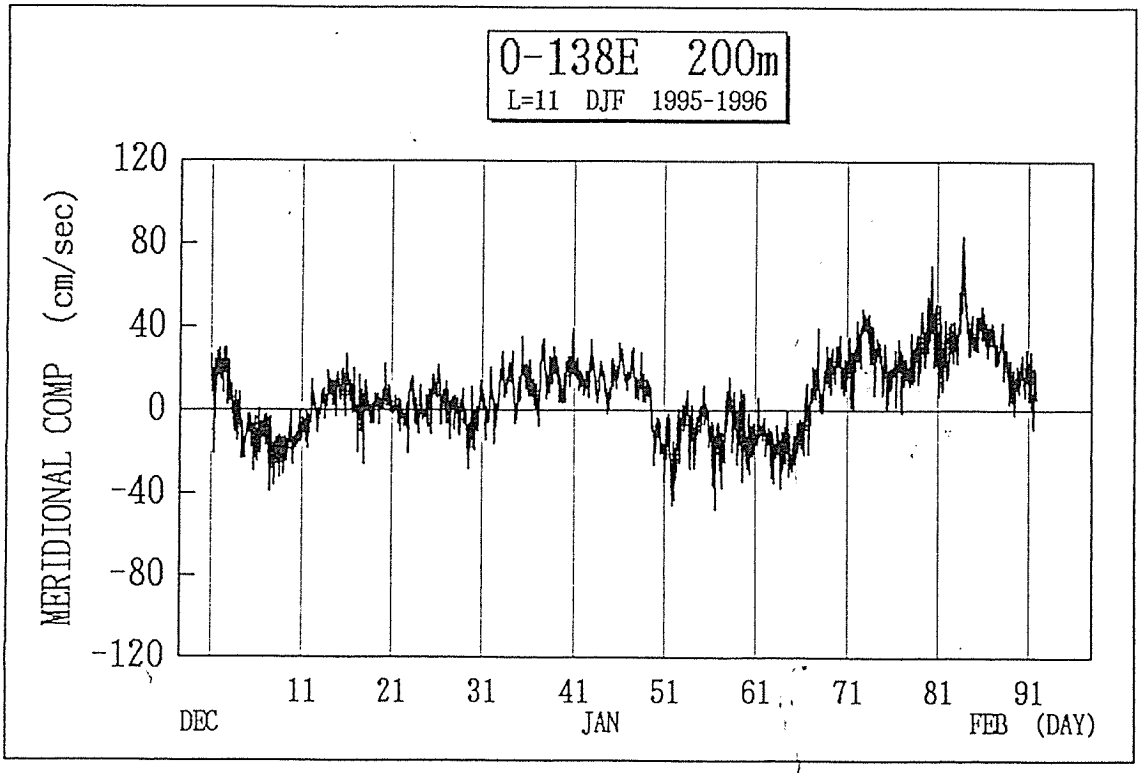
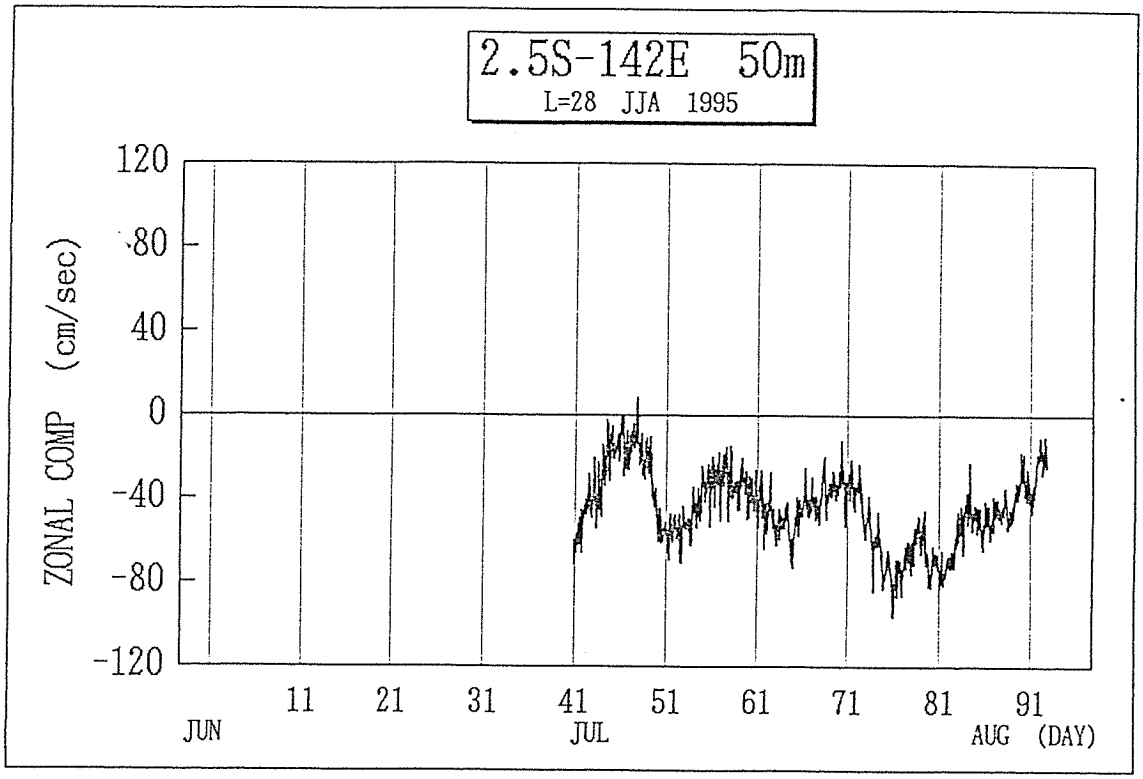


Fig.6-15 Time Series of Velocity



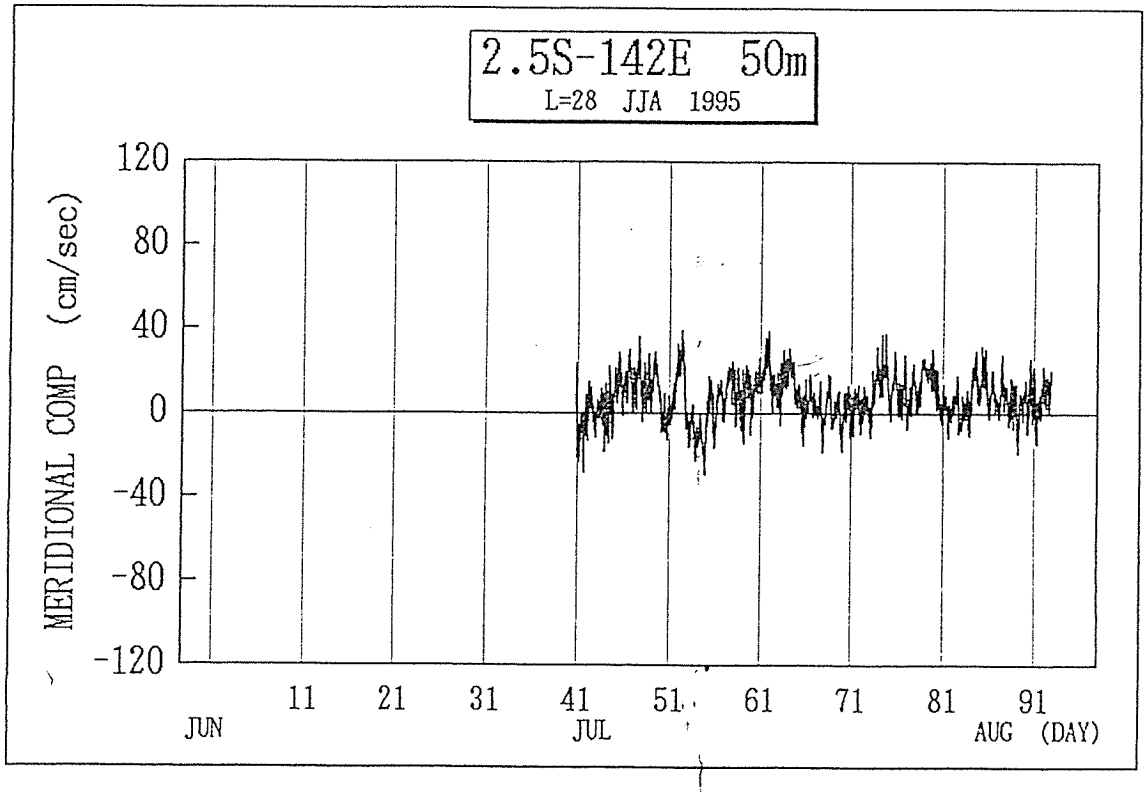
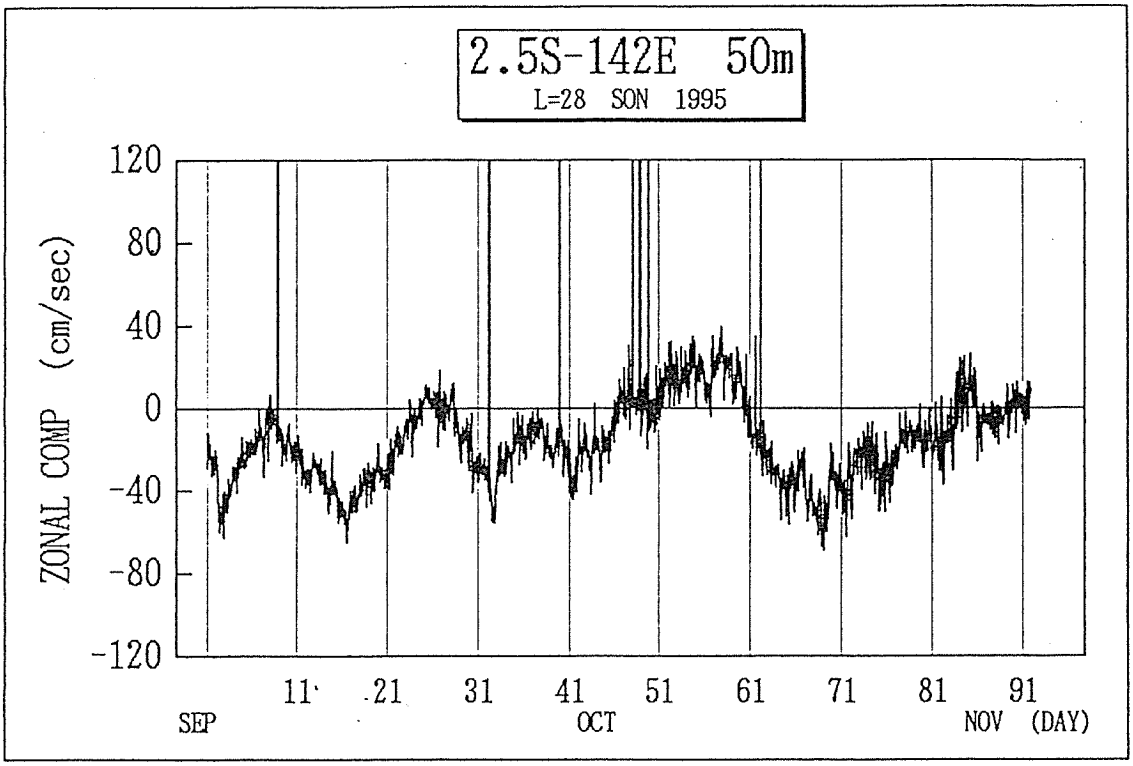


Fig.6-16 Time Series of Velocity



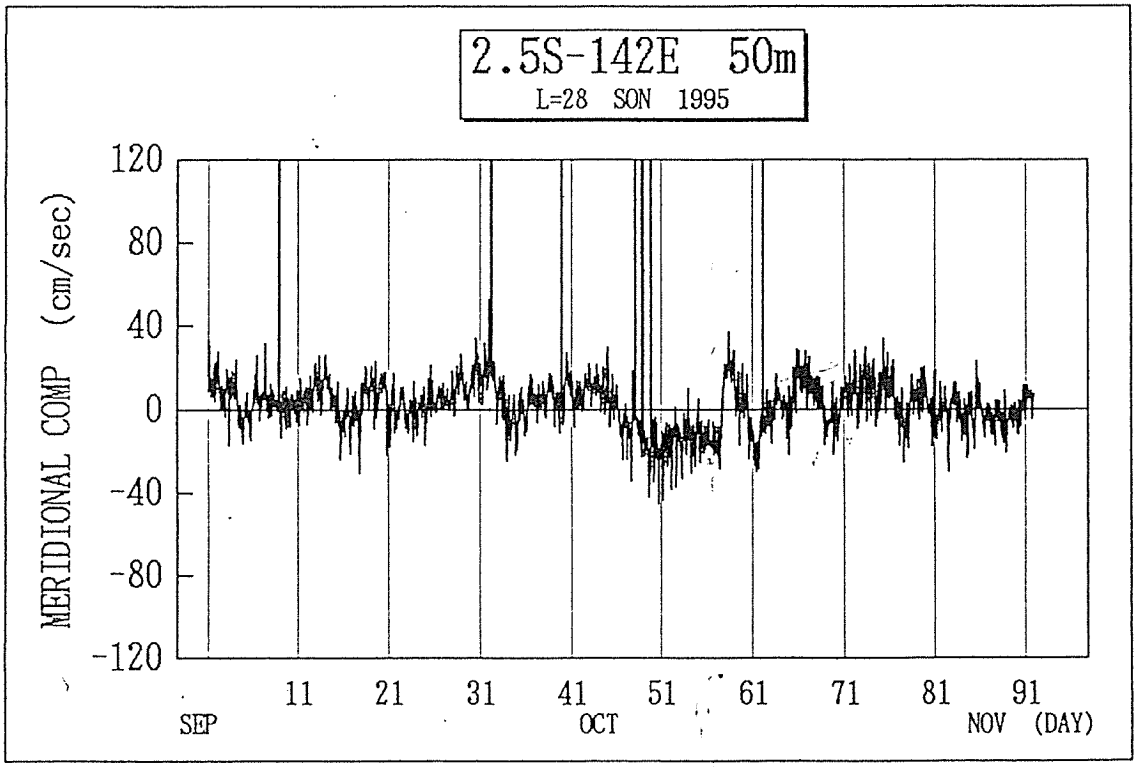
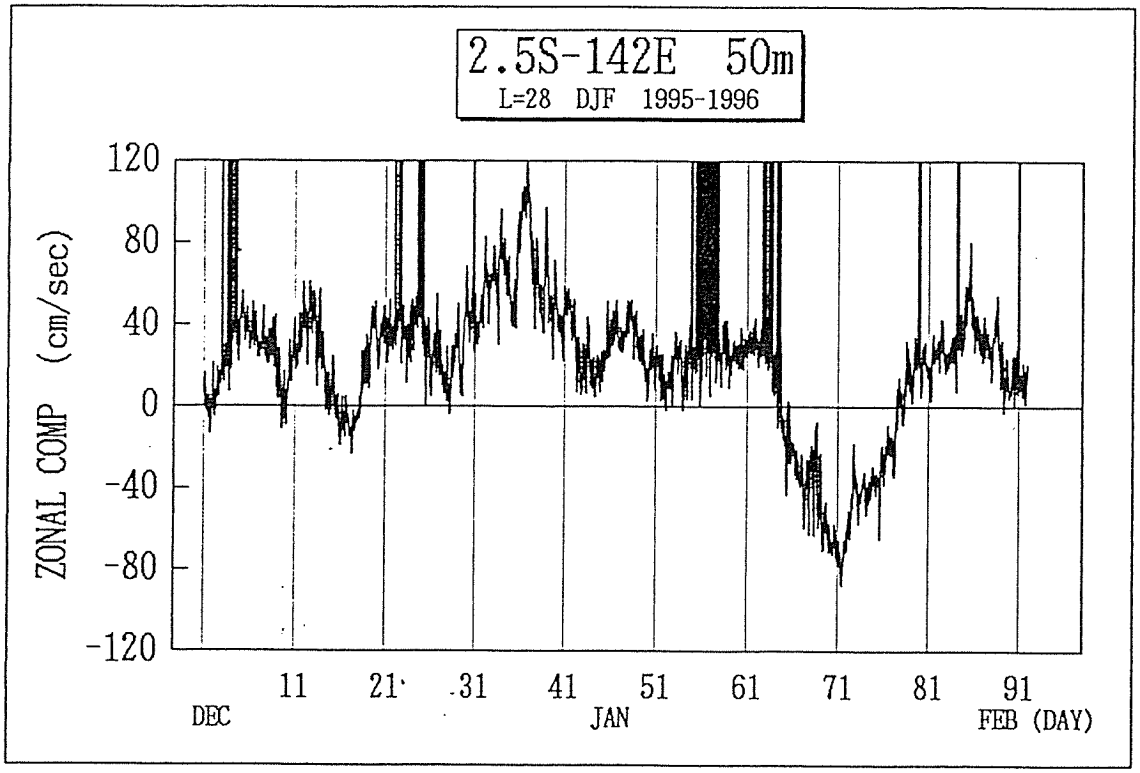


Fig.6-17 Time Series of Velocity



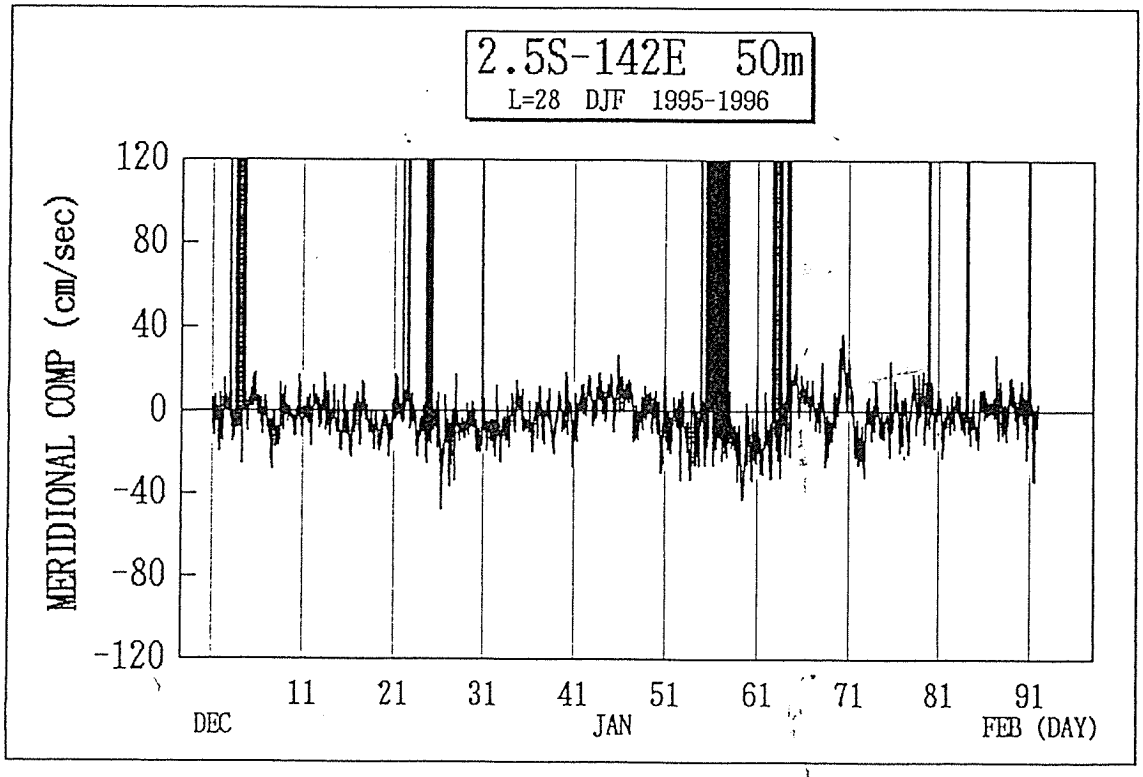
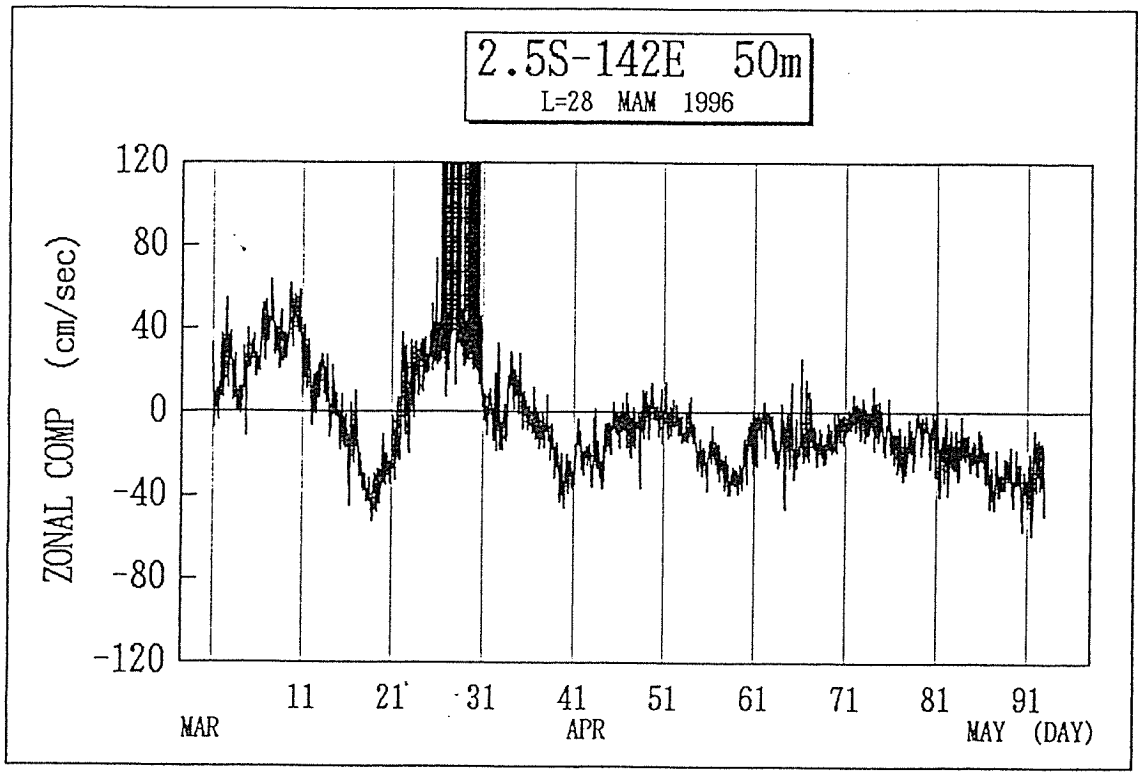


Fig.6-18 Time Series of Velocity



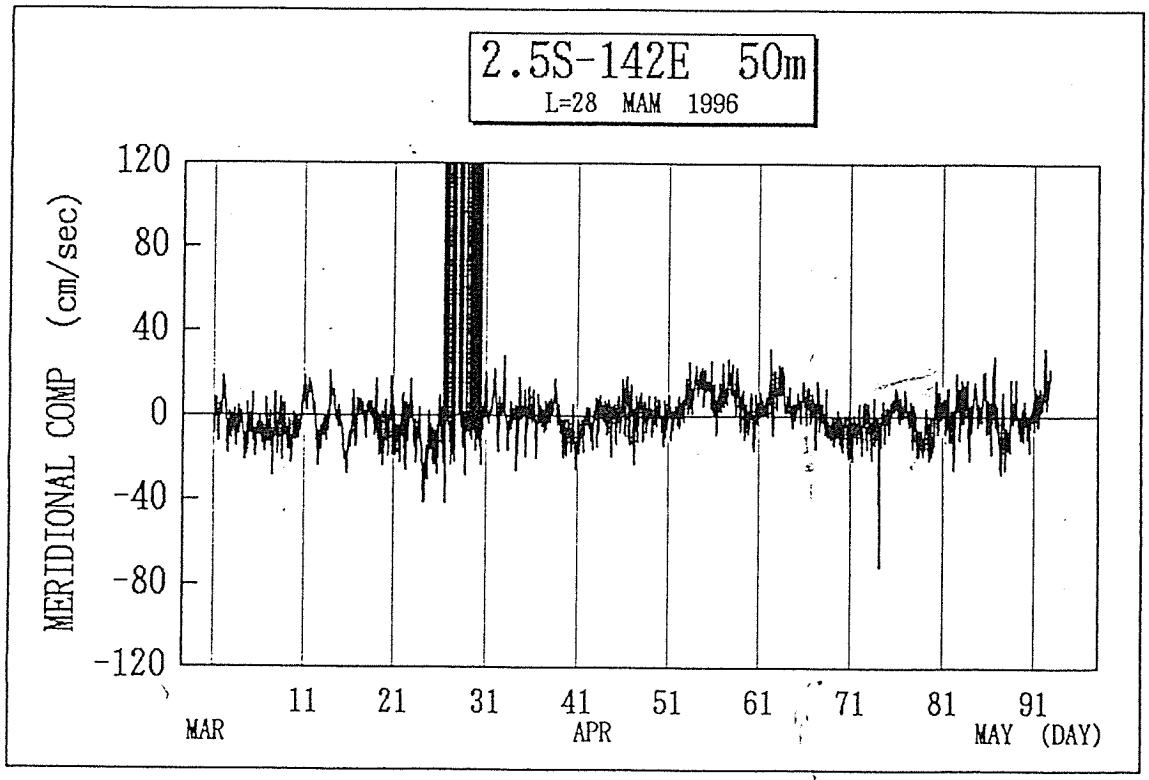
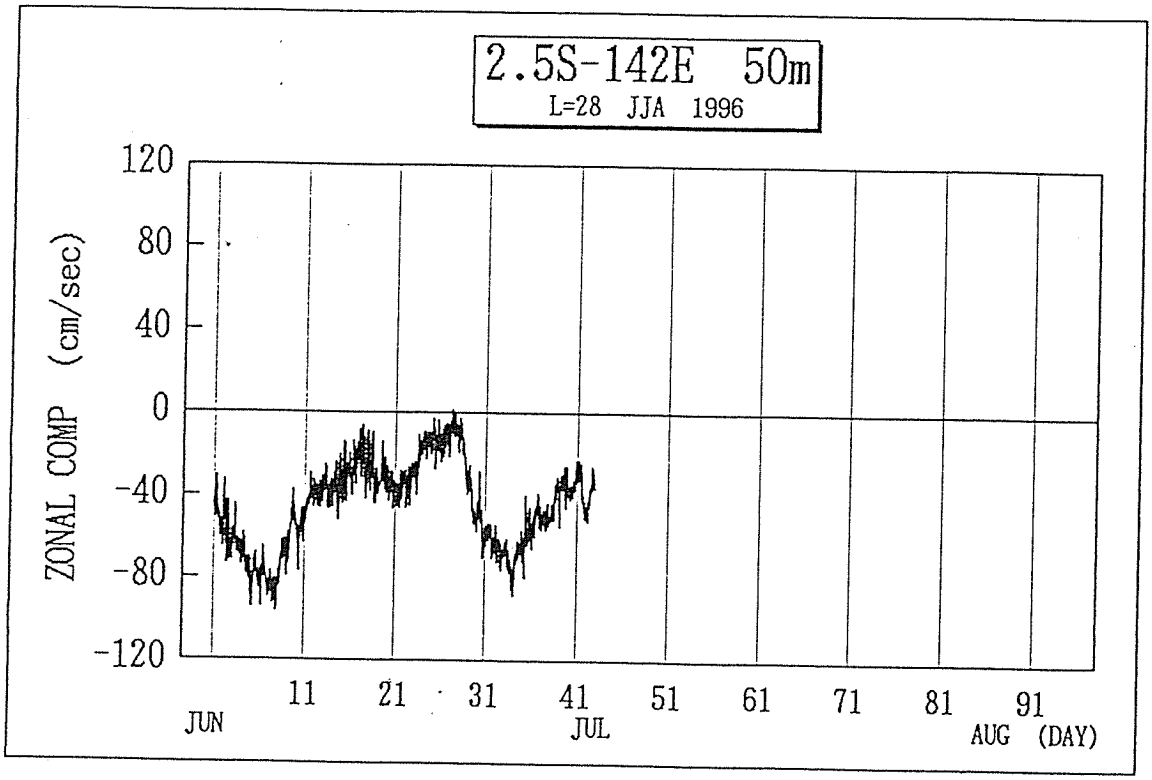


Fig.6-19 Time Series of Velocity



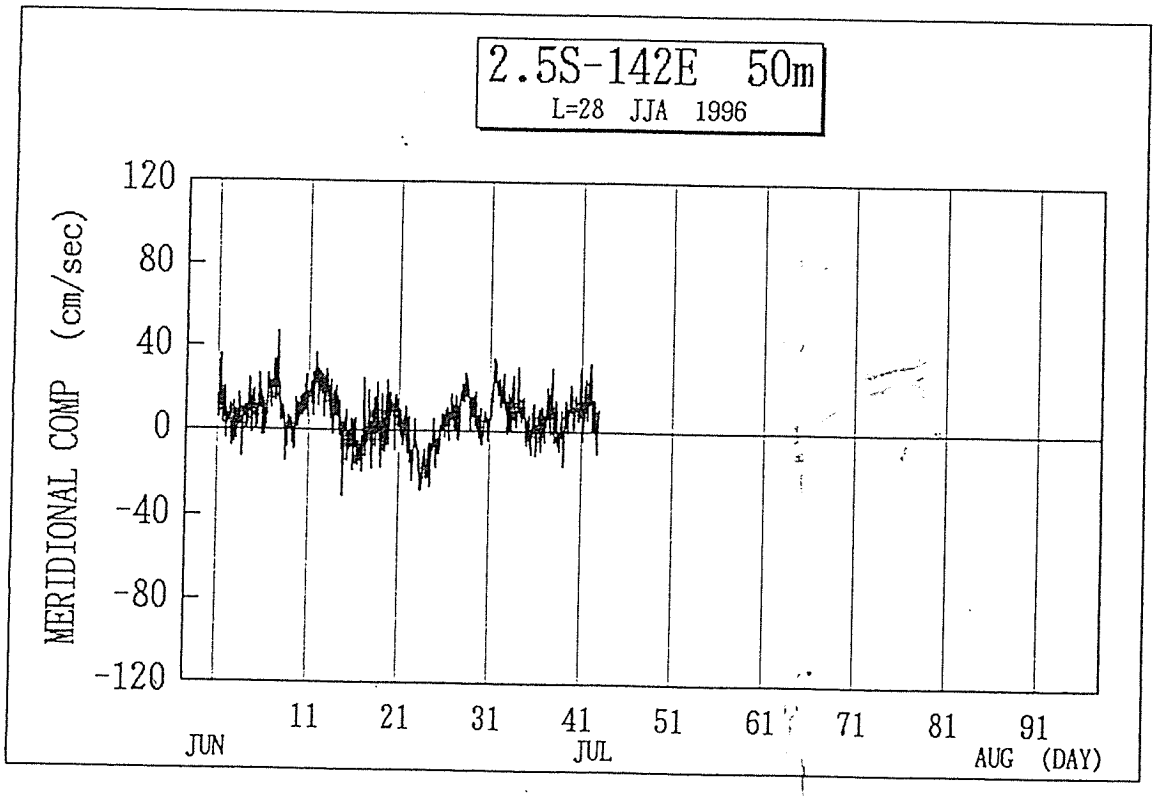
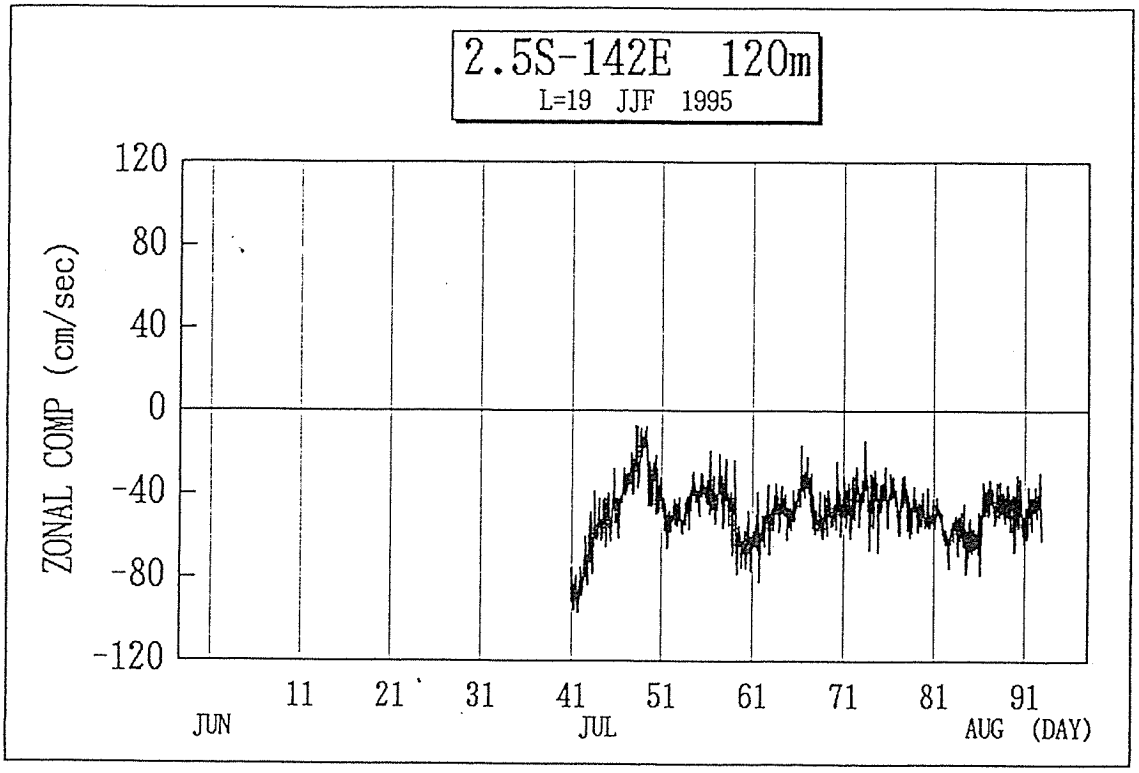


Fig.6-20 Time Series of Velocity



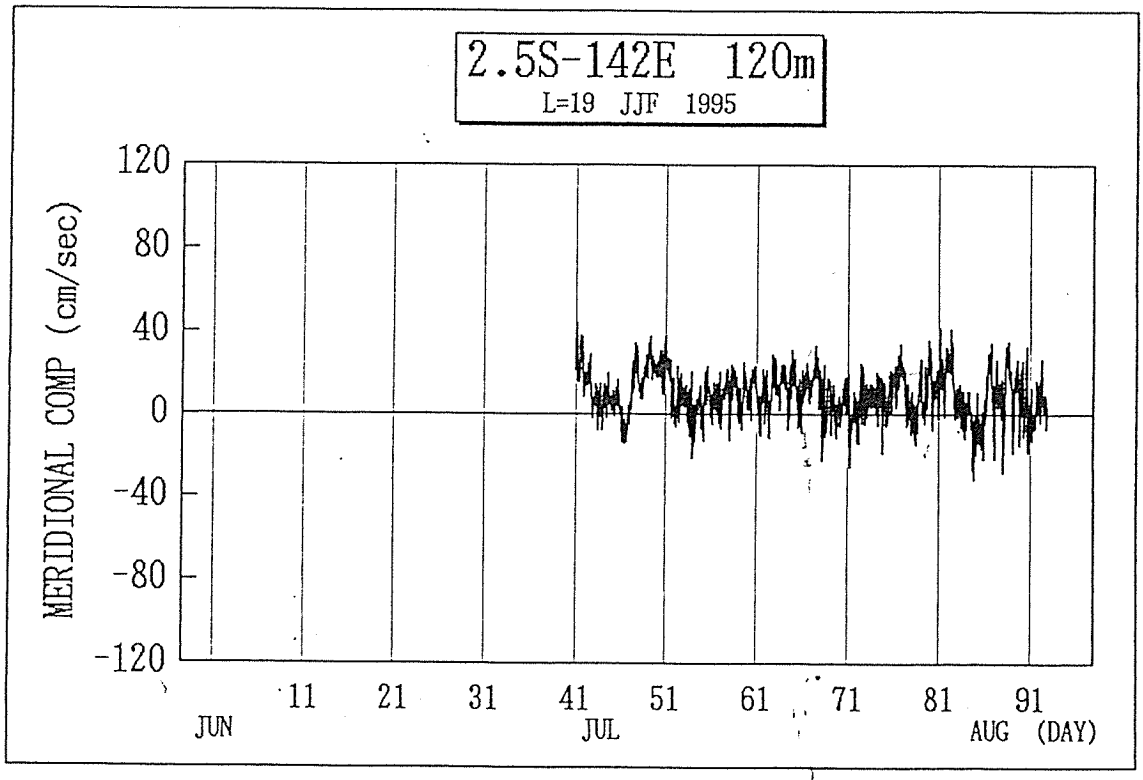
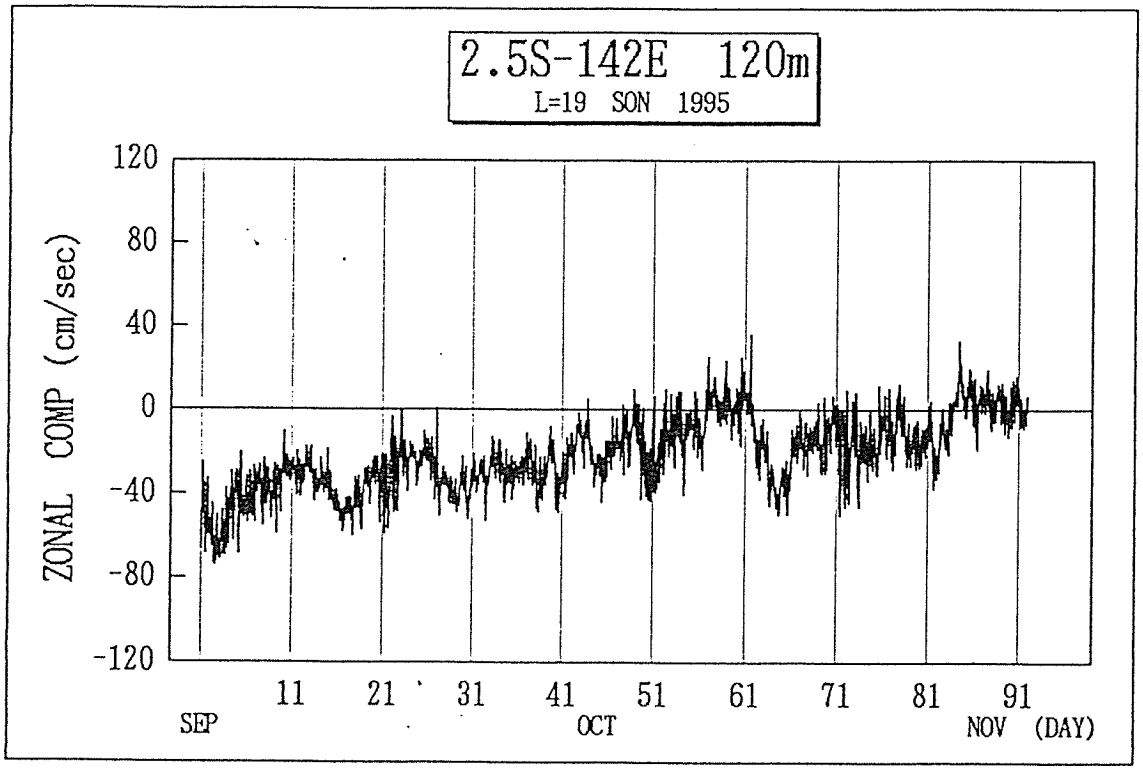


Fig.6-21 Time Series of Velocity



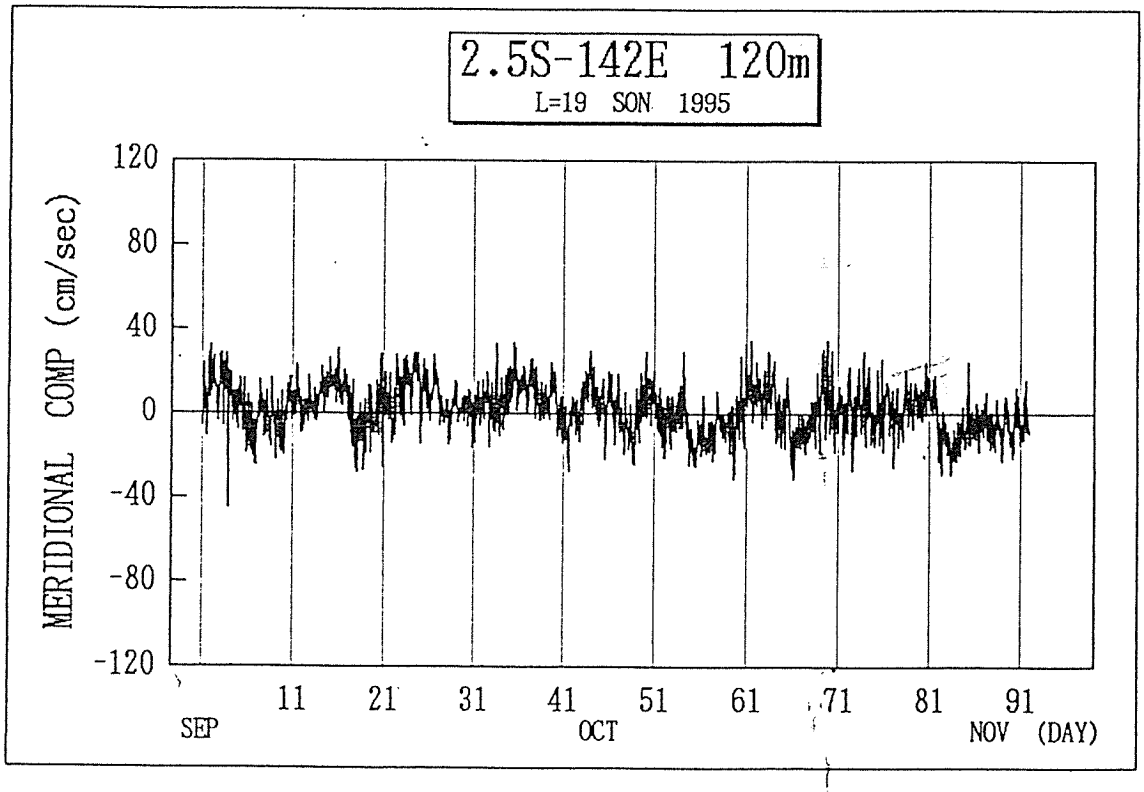
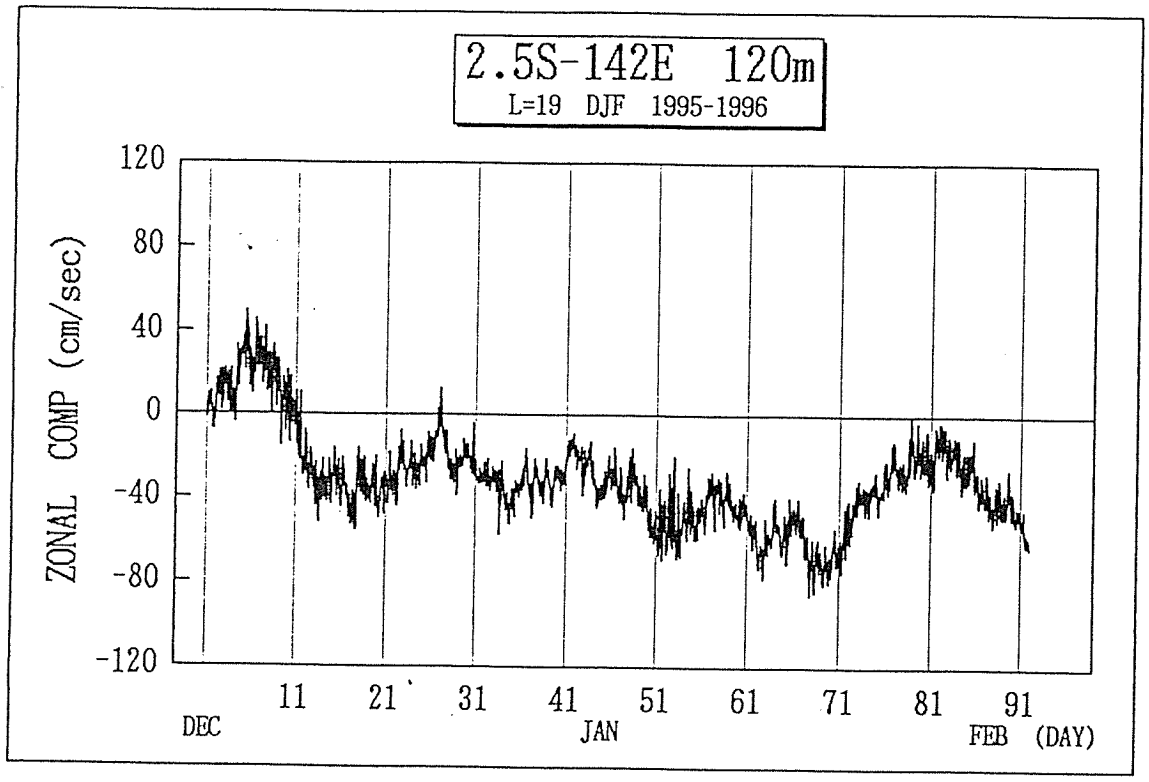


Fig.6-22 Time Series of Velocity



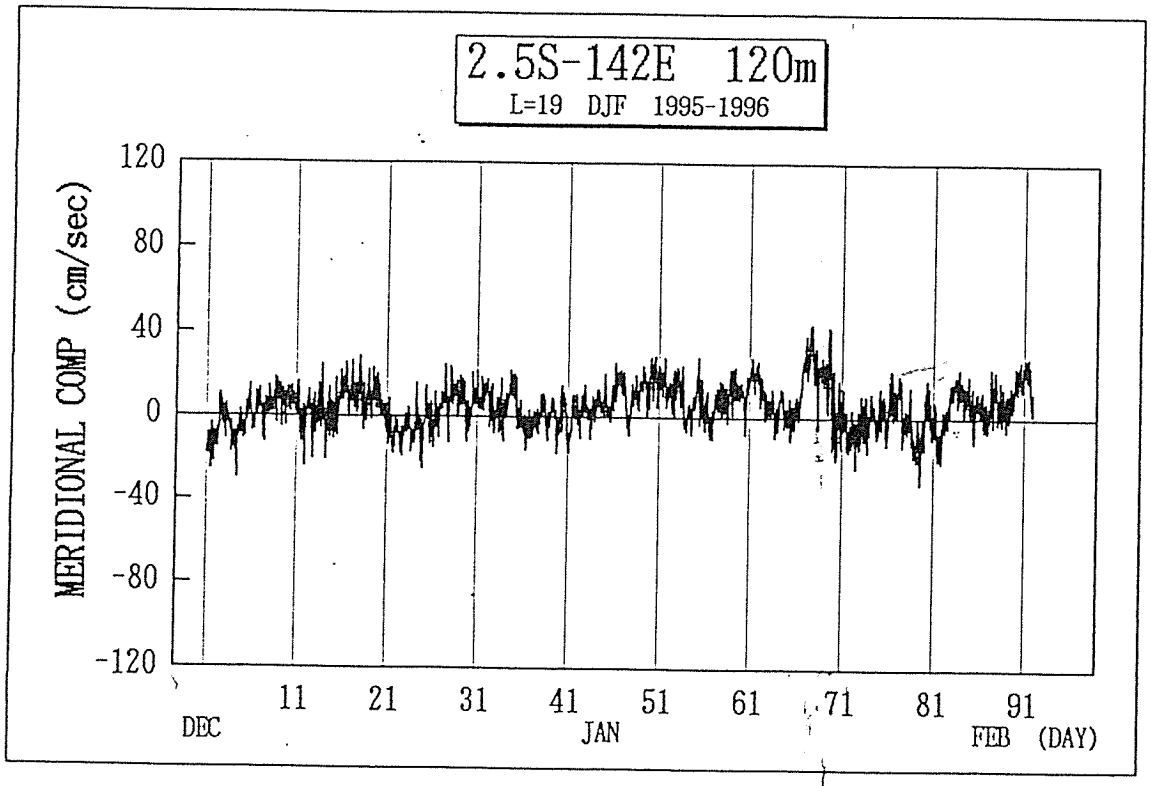
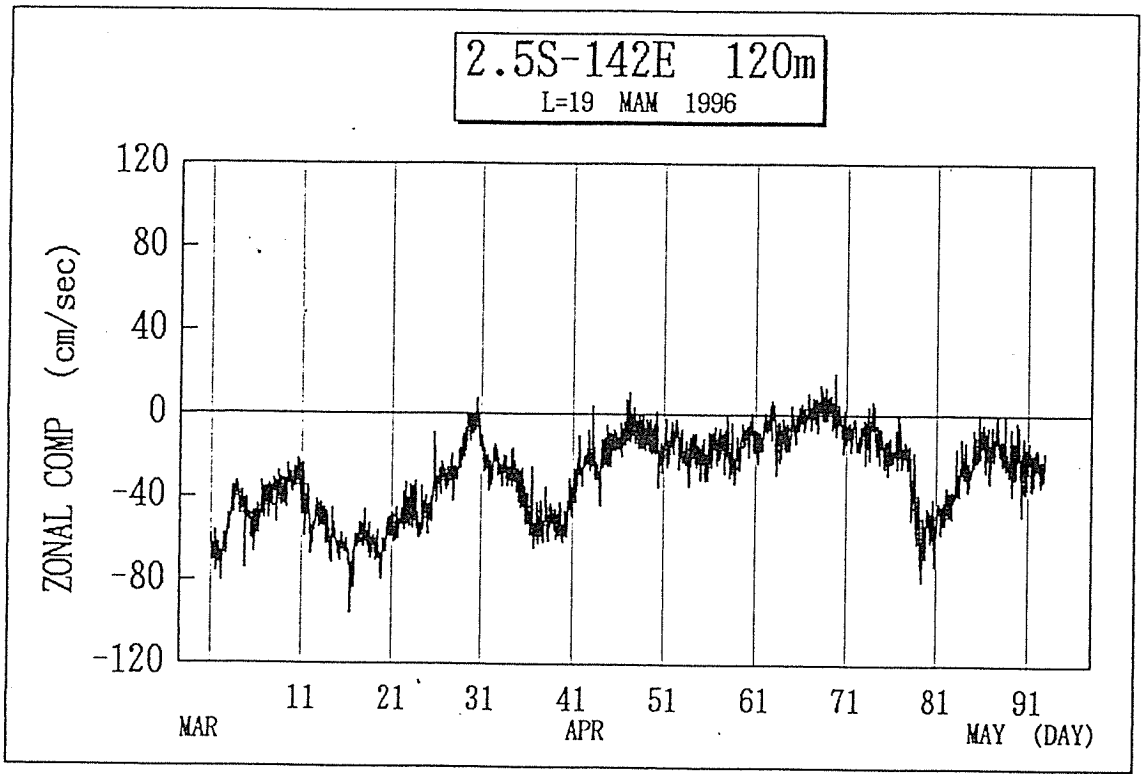


Fig.6-23 Time Series of Velocity



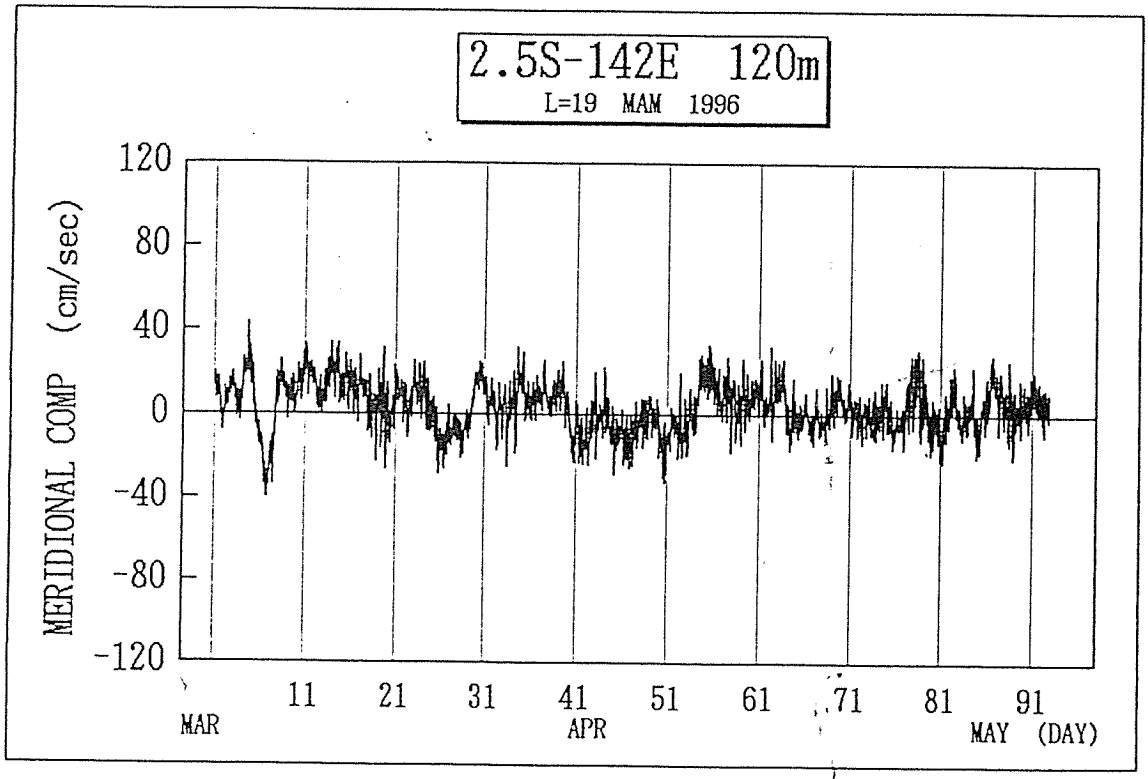
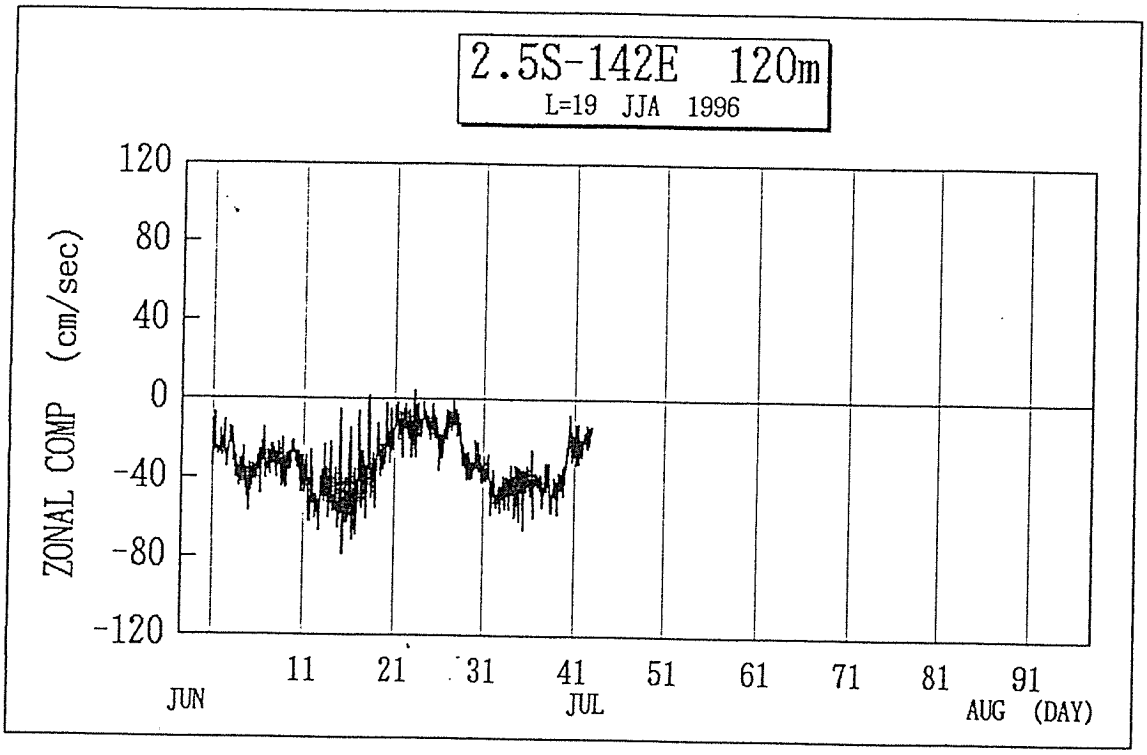


Fig.6-24 Time Series of Velocity



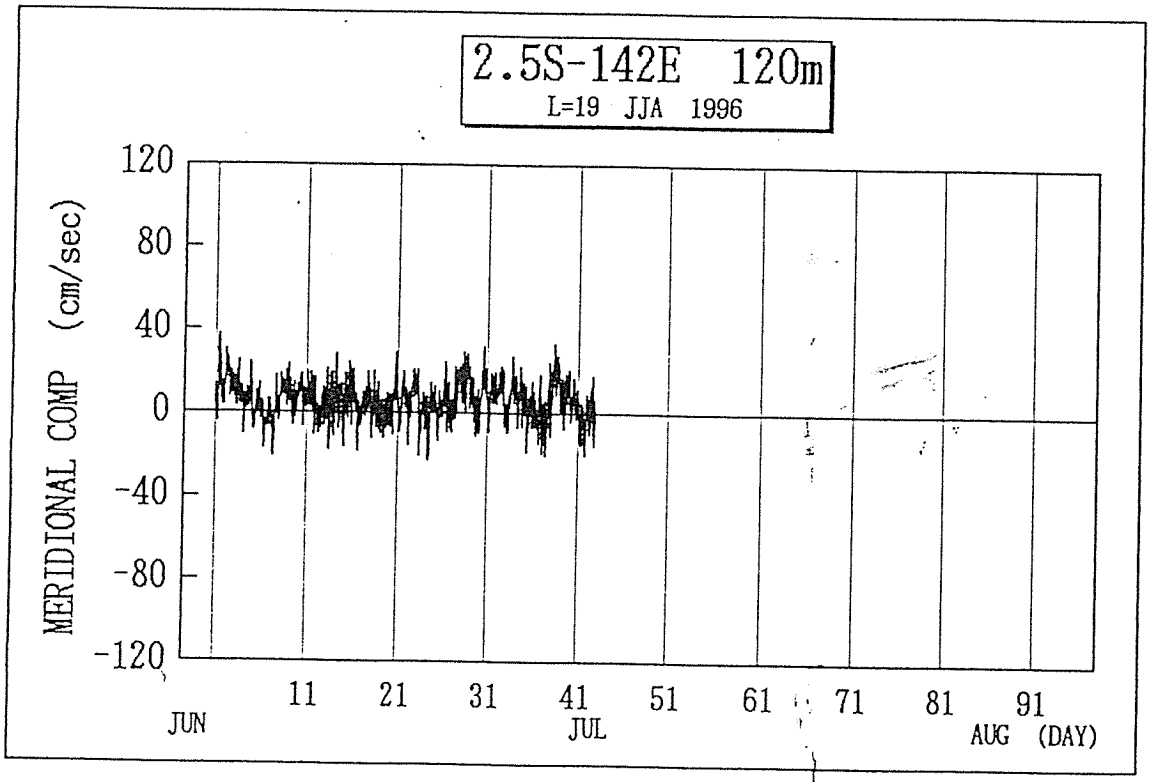
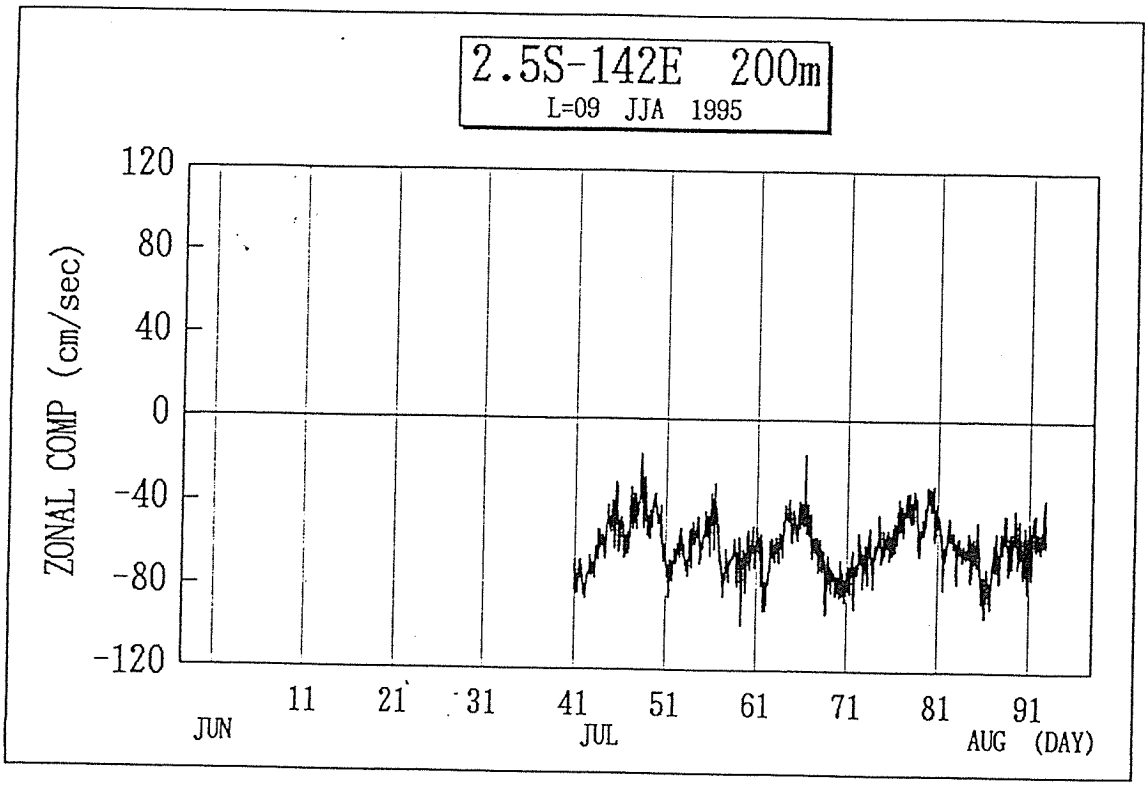


Fig.6-25 Time Series of Velocity



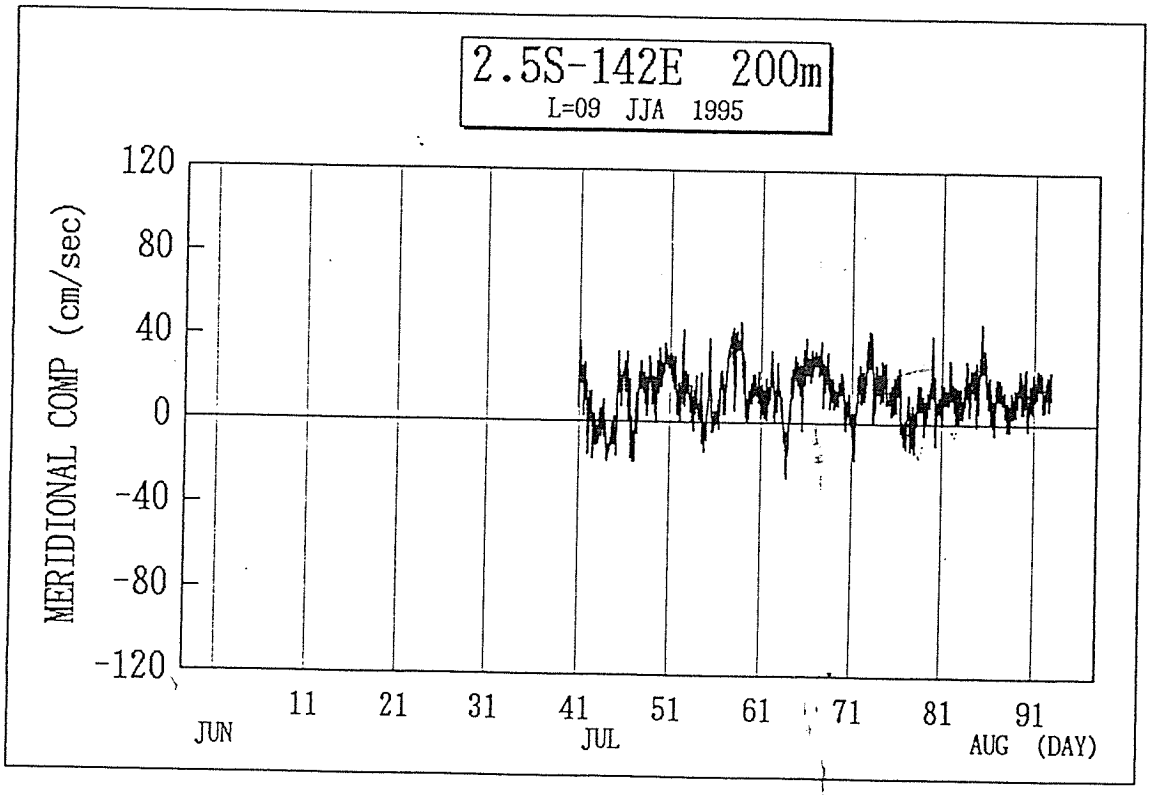
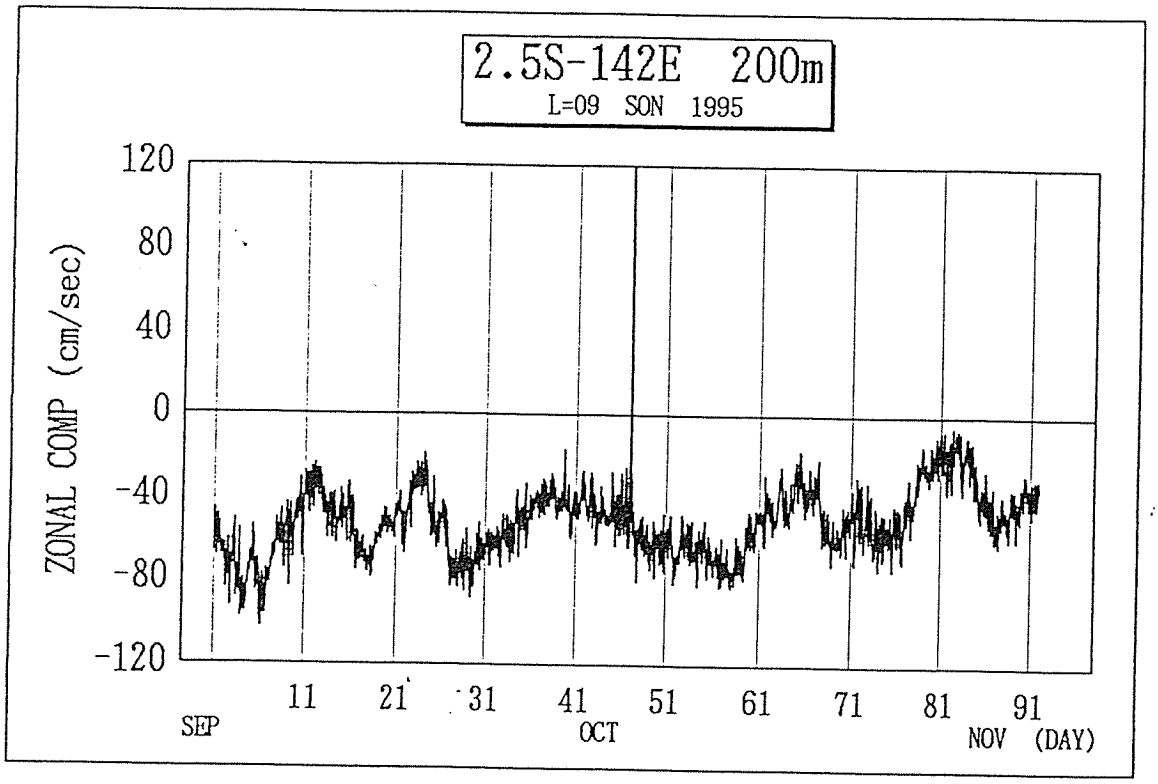


Fig.6-26 Time Series of Velocity



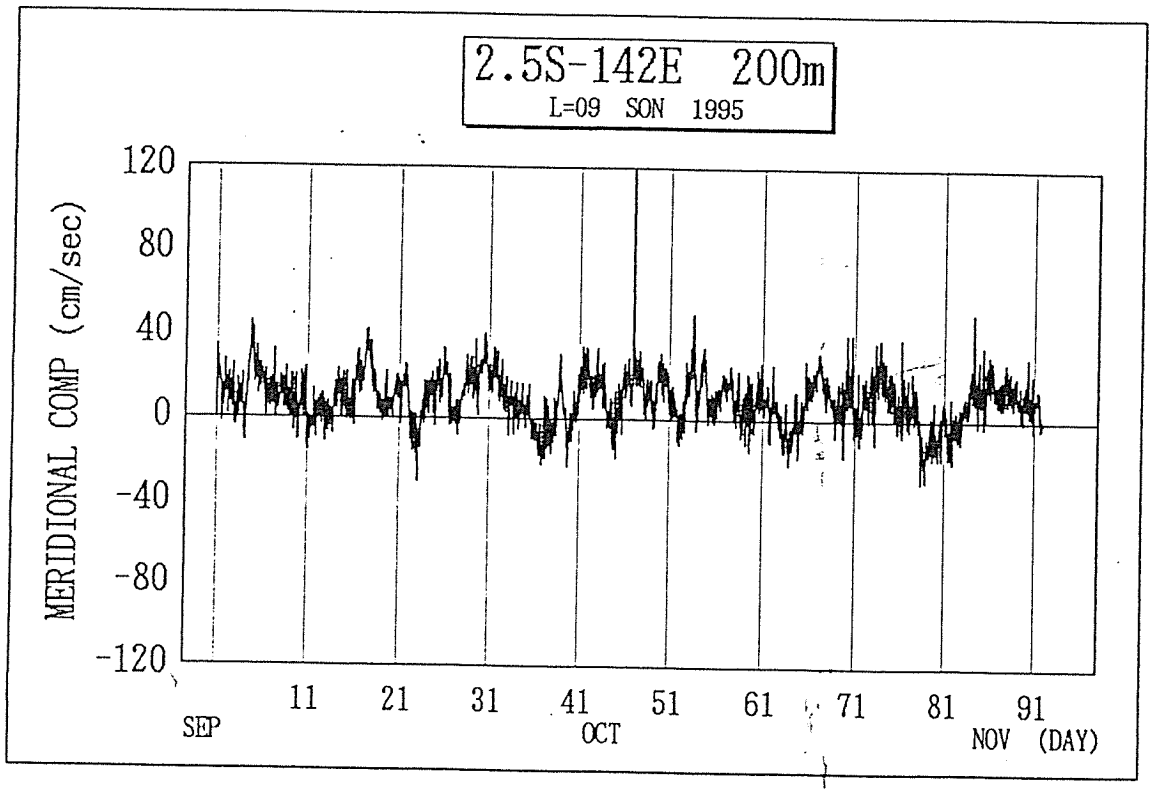
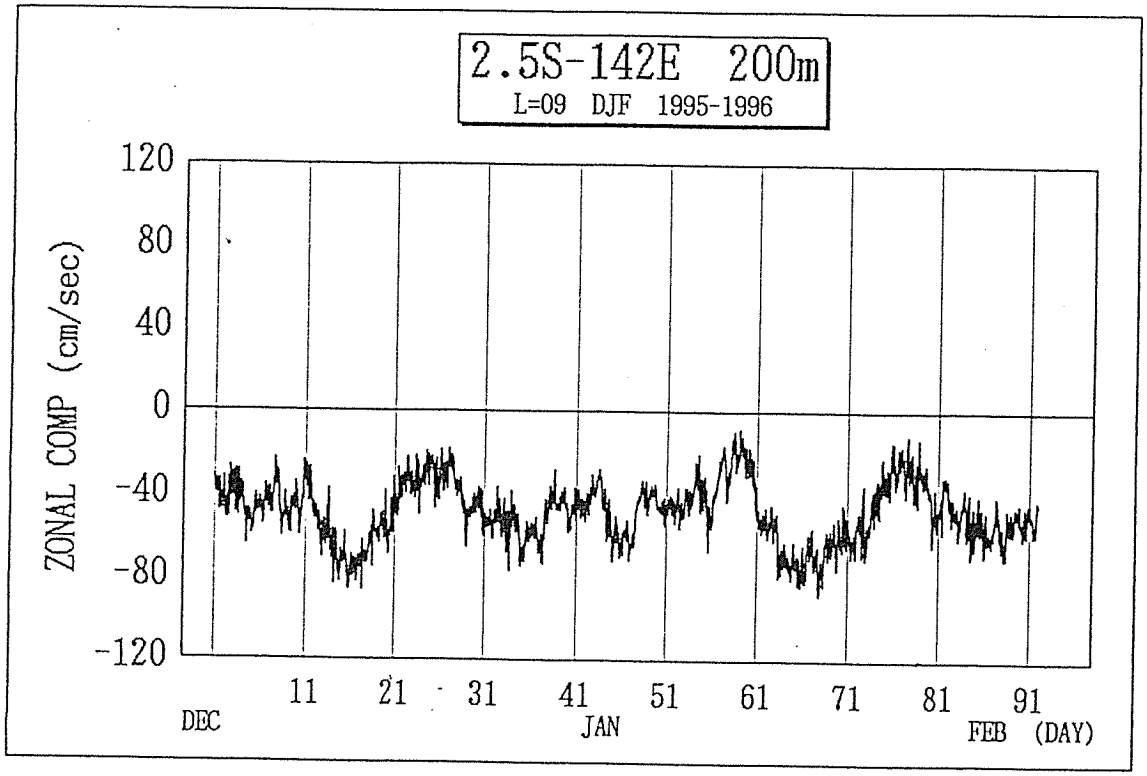


Fig.6-27 Time Series of Velocity



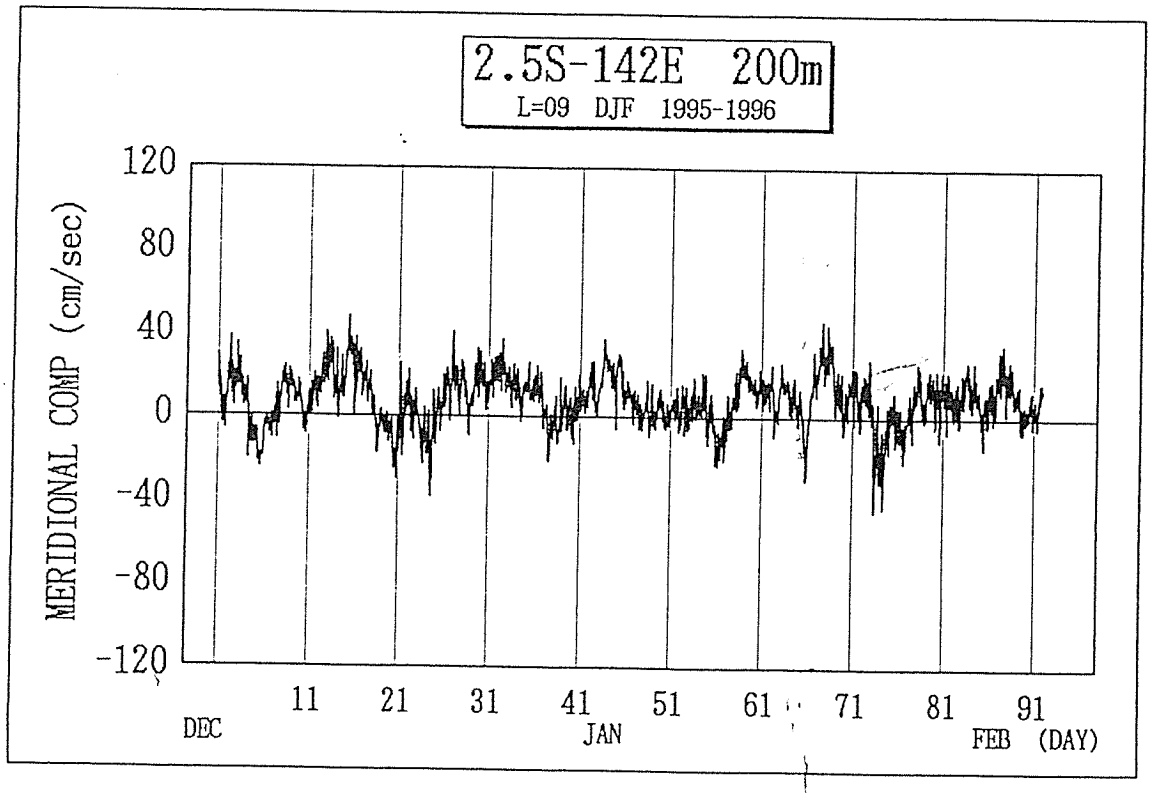
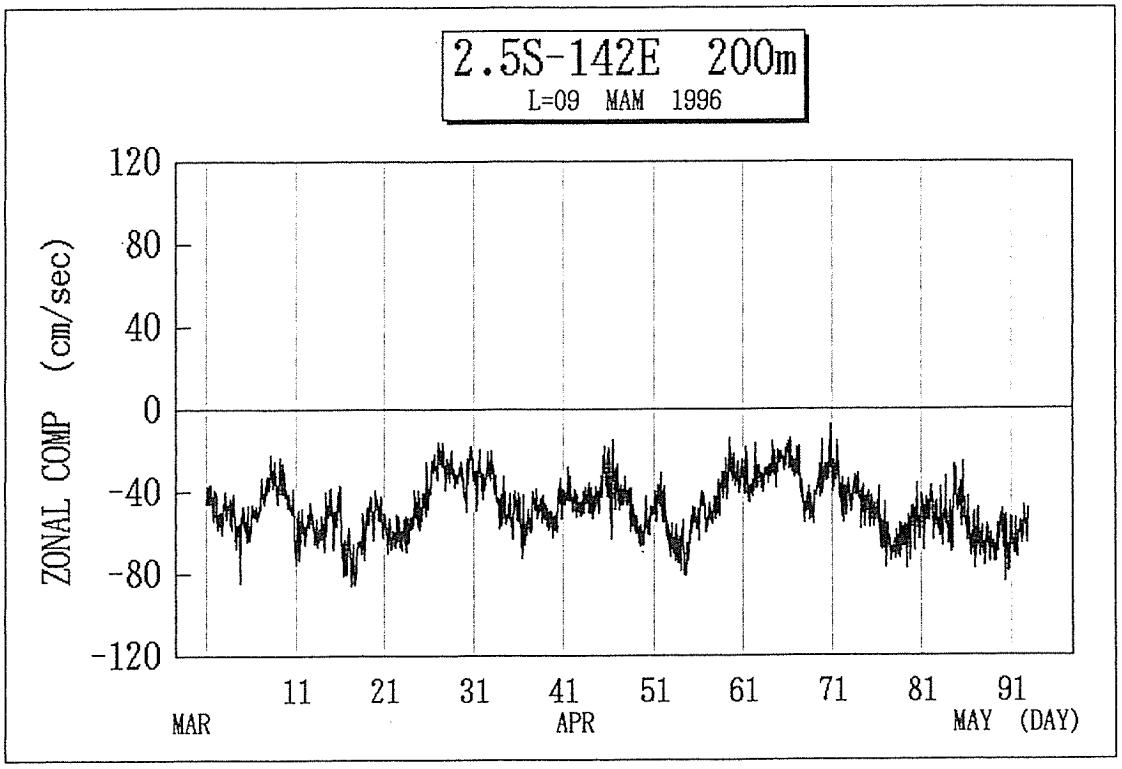


Fig.6-28 Time Series of Velocity



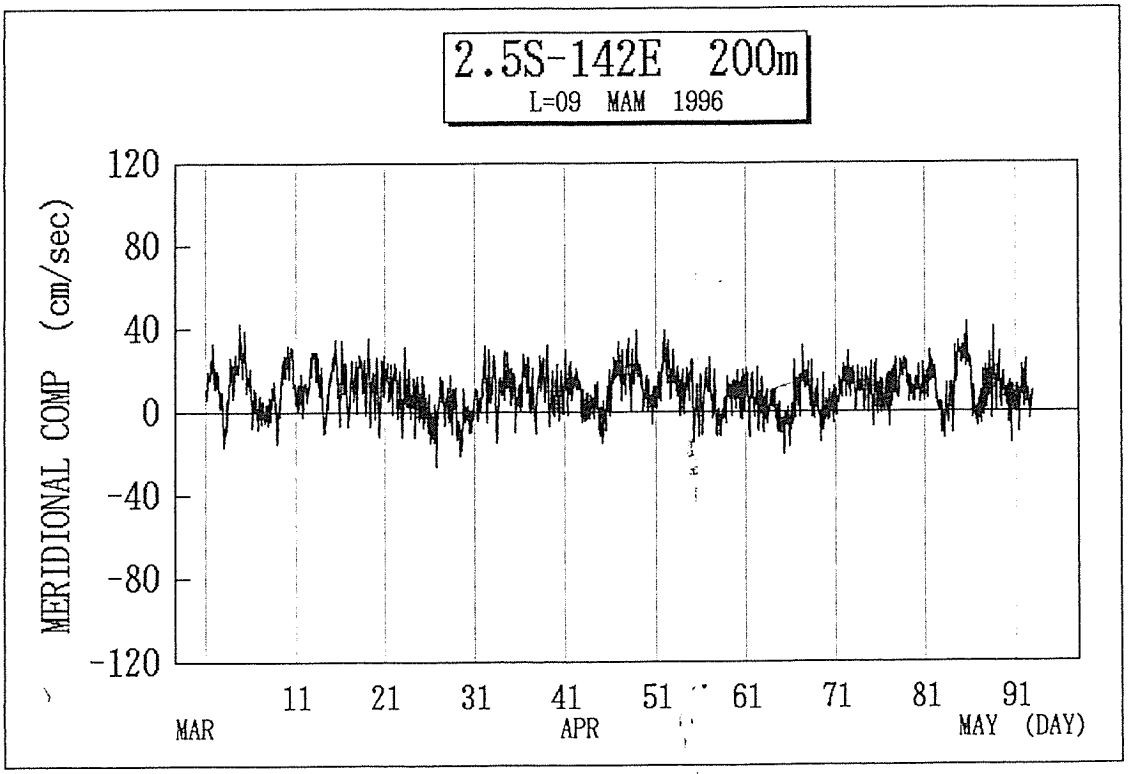
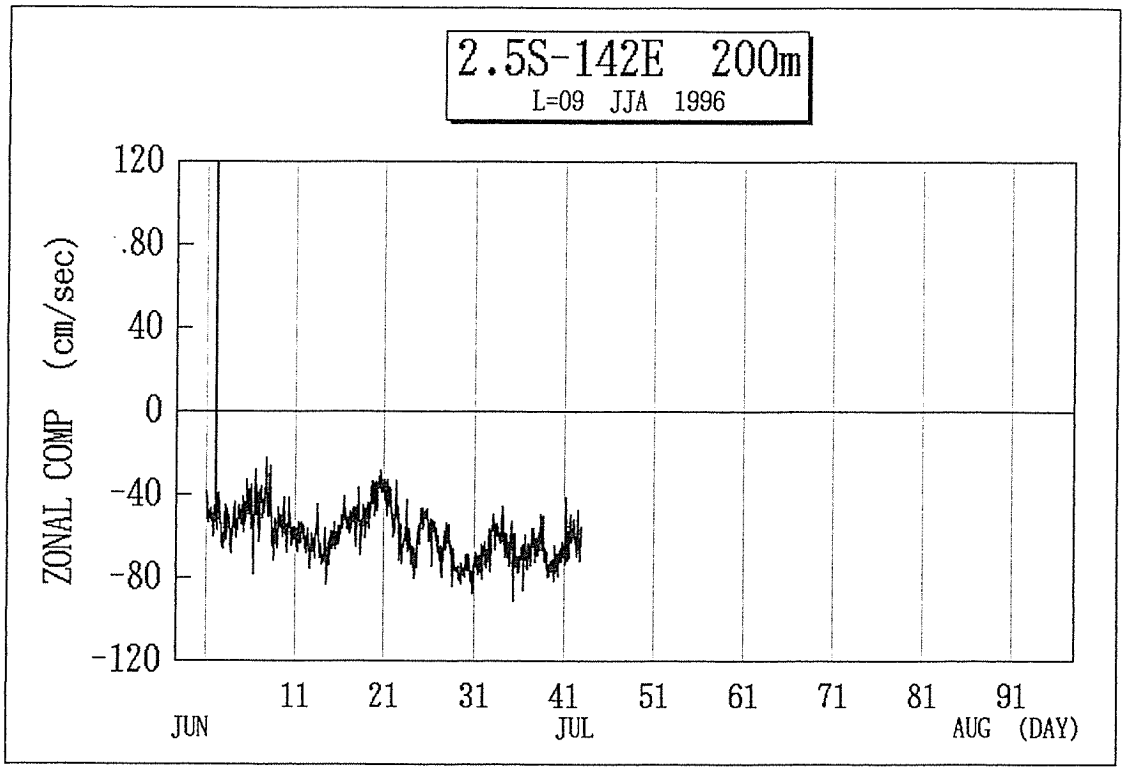


Fig.6-29 Time Series of Velocity



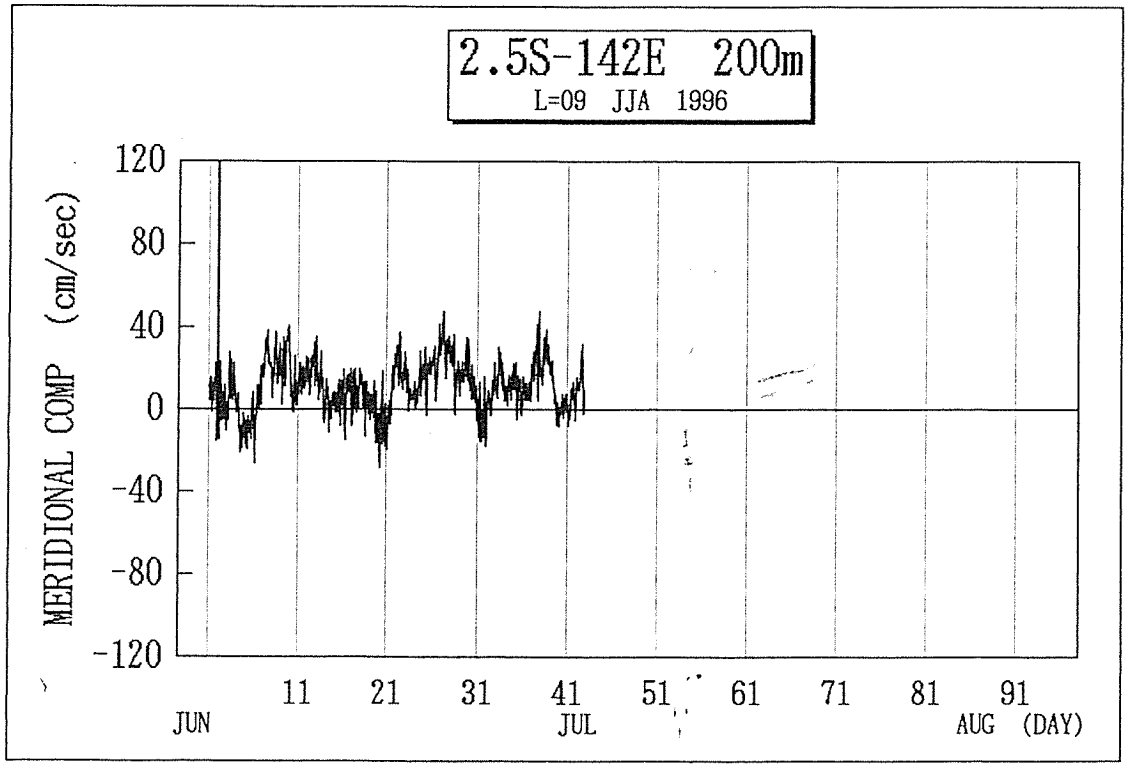
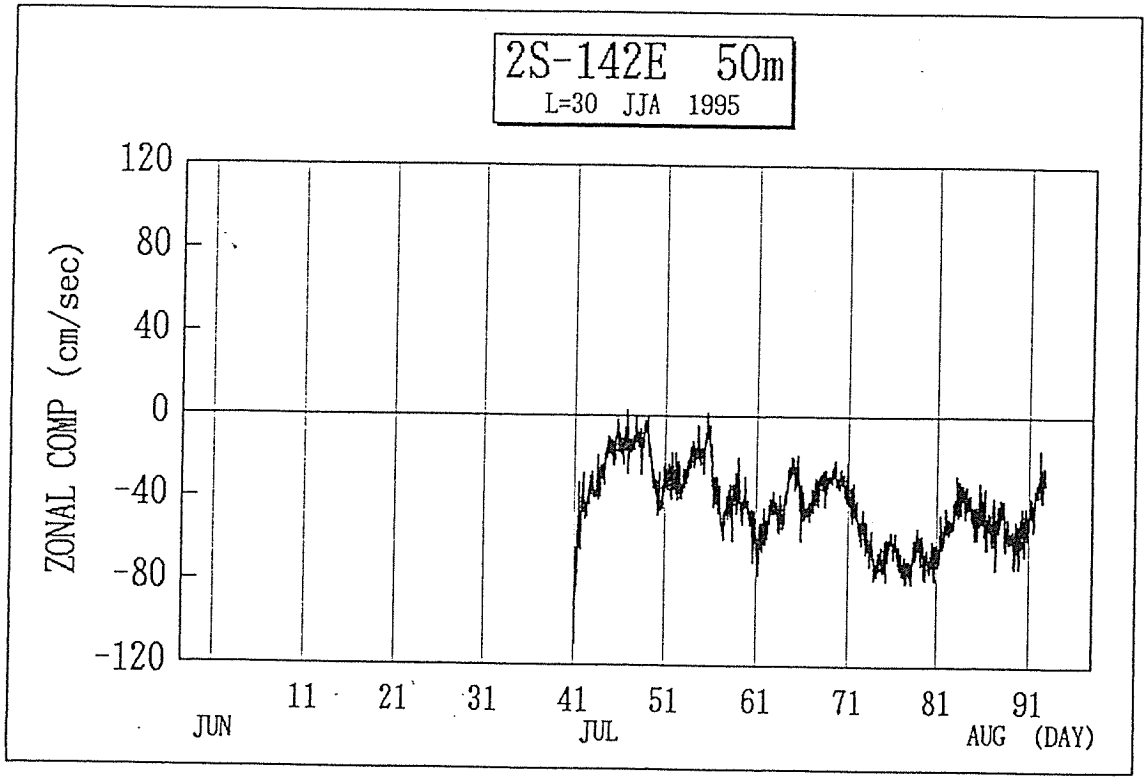


Fig.6-30 Time Series of Velocity



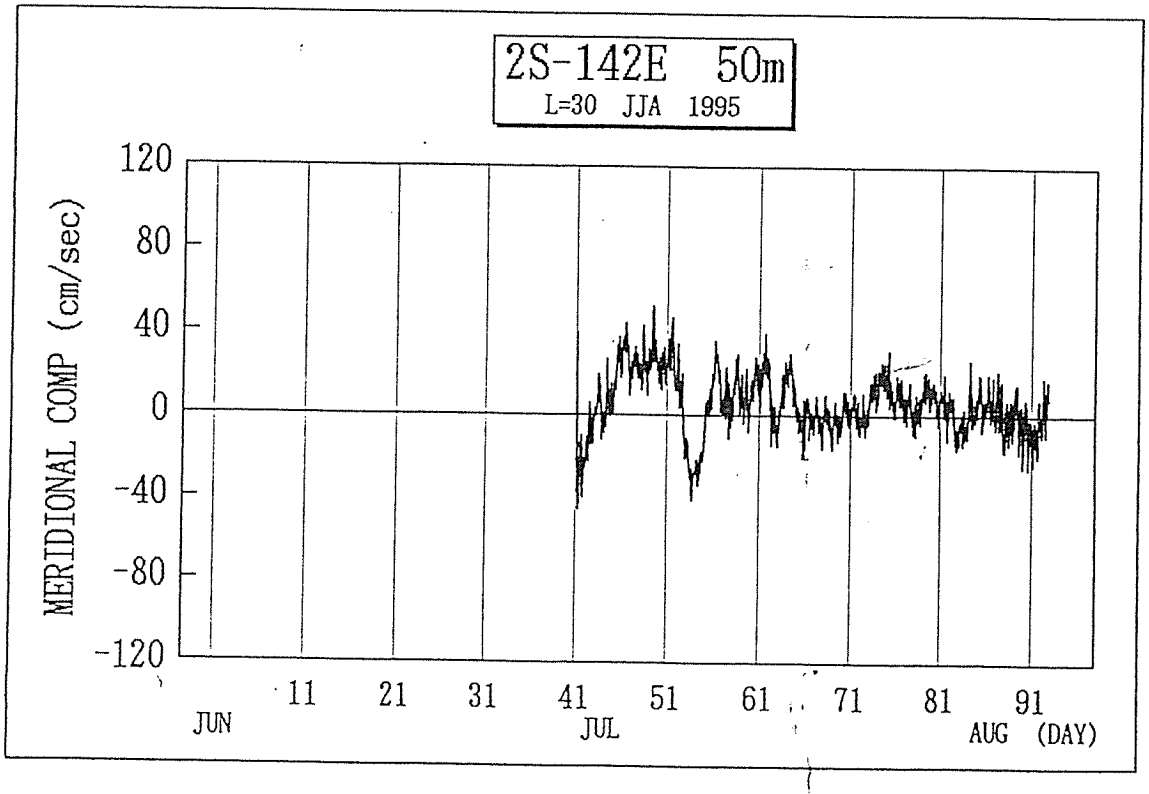
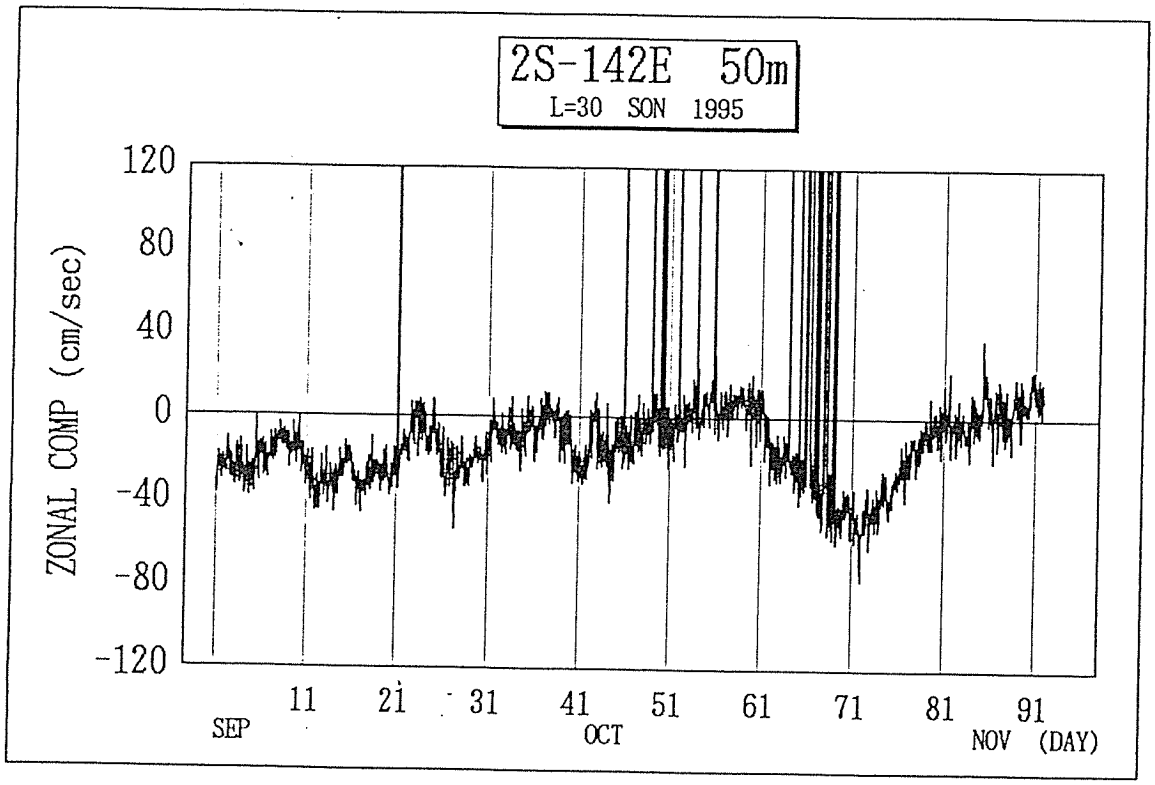


Fig.6-31 Time Series of Velocity



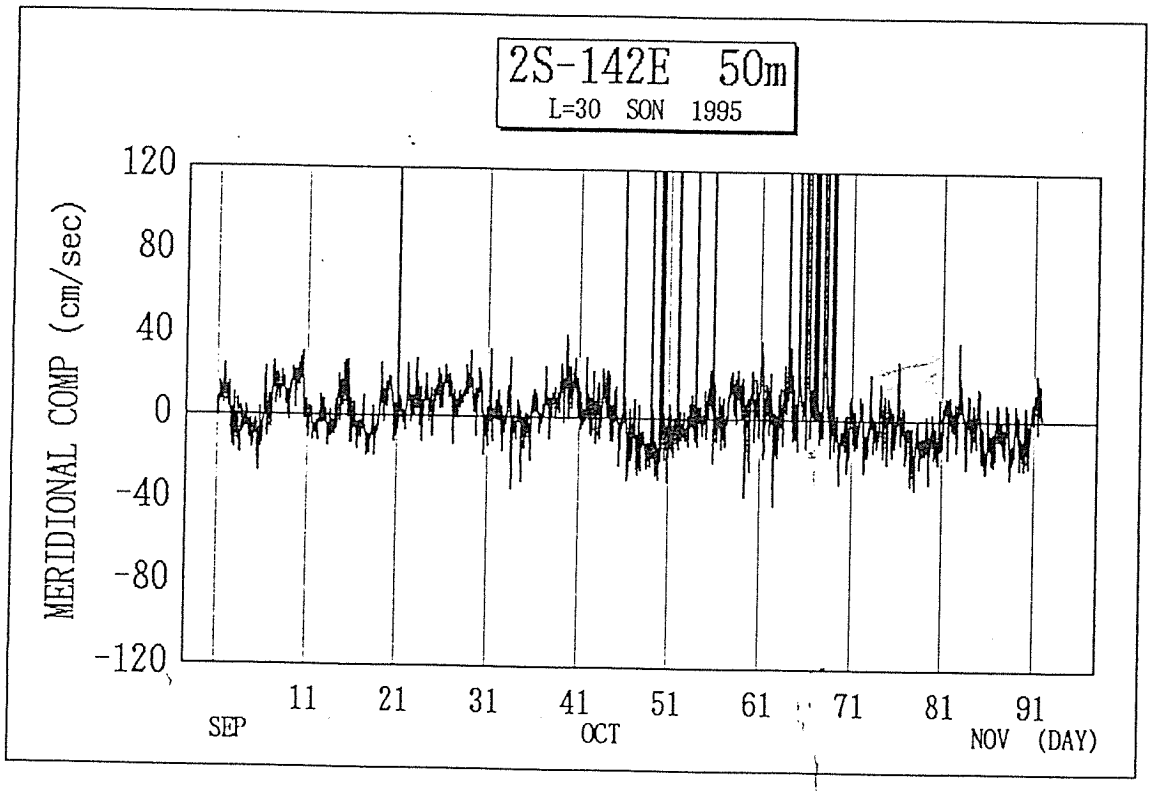
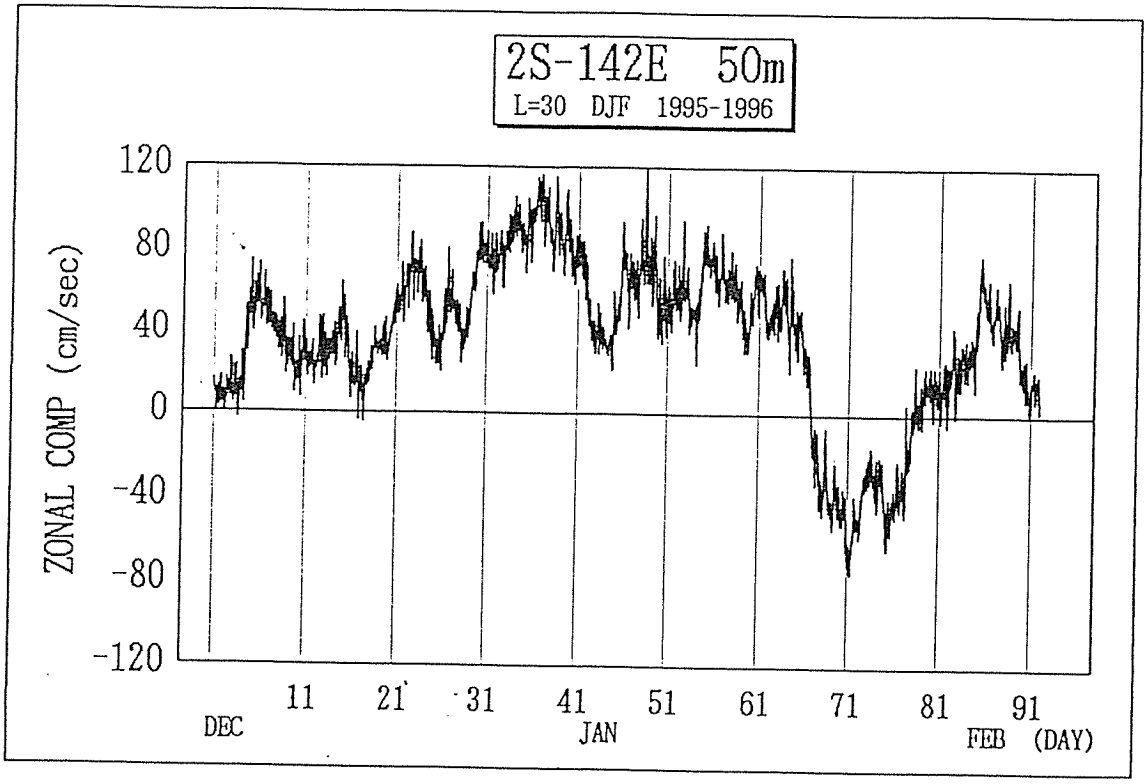


Fig.6-32 Time Series of Velocity



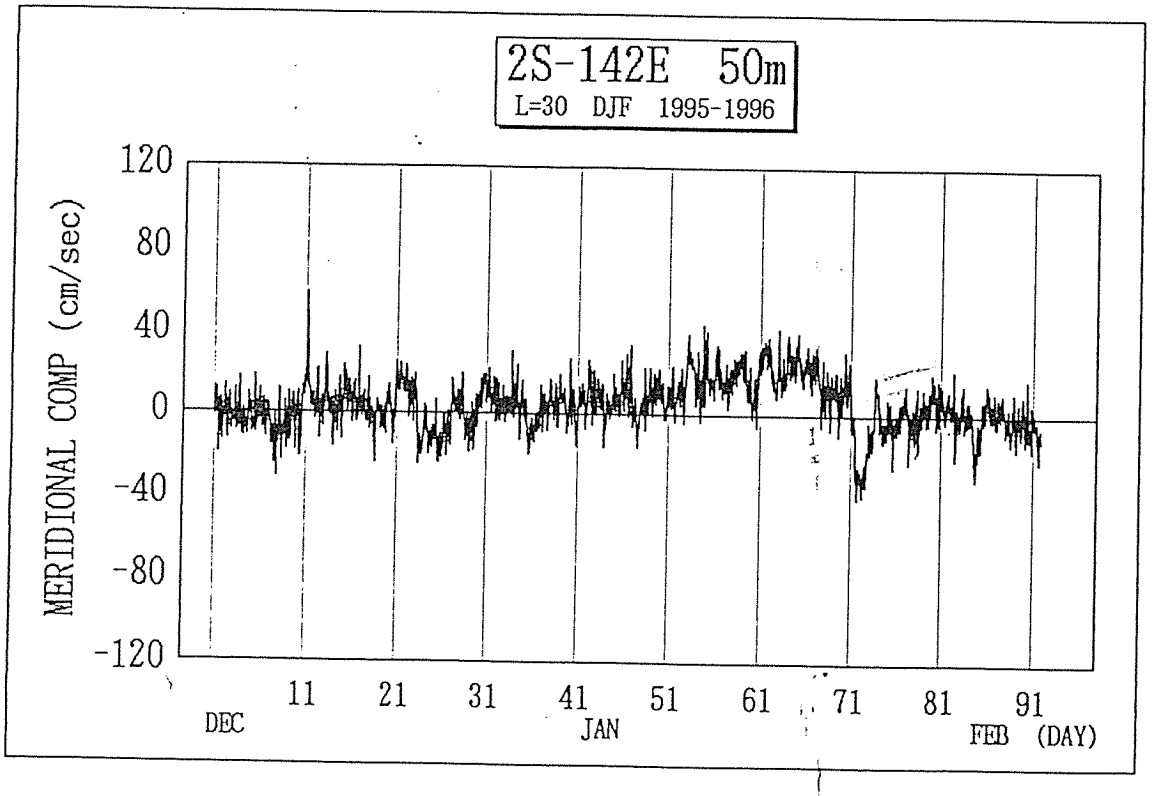
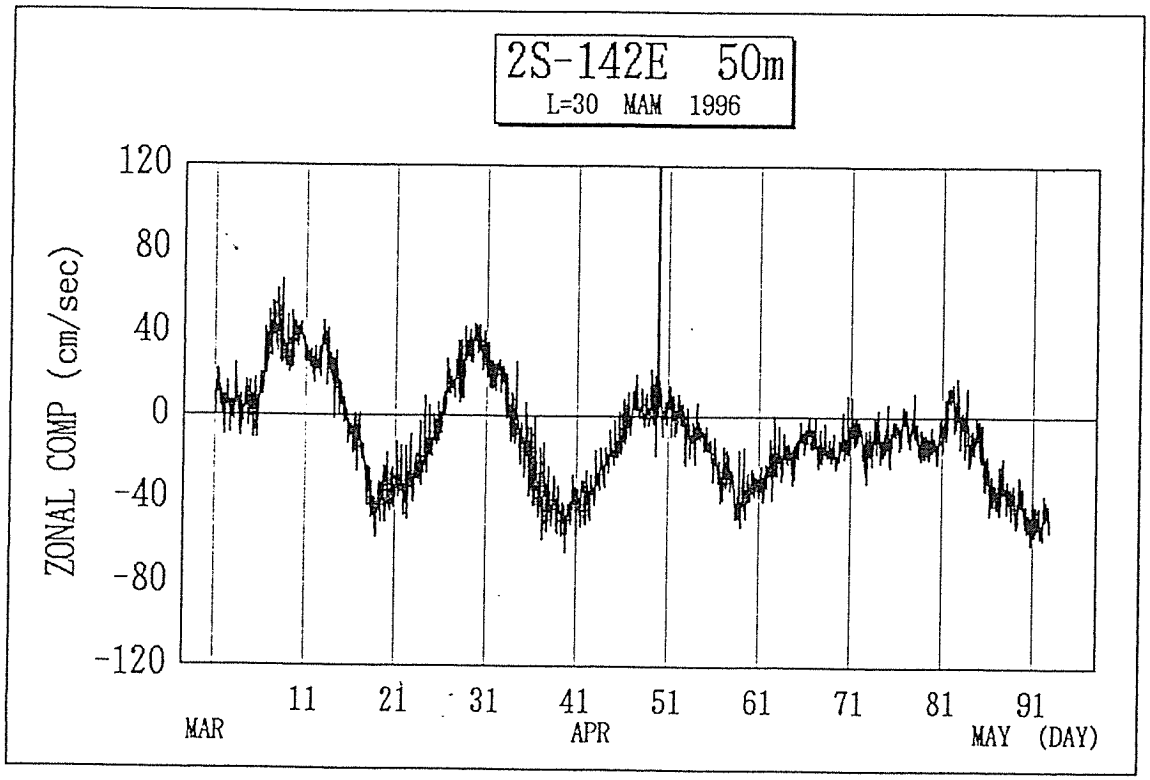


Fig.6-33 Time Series of Velocity



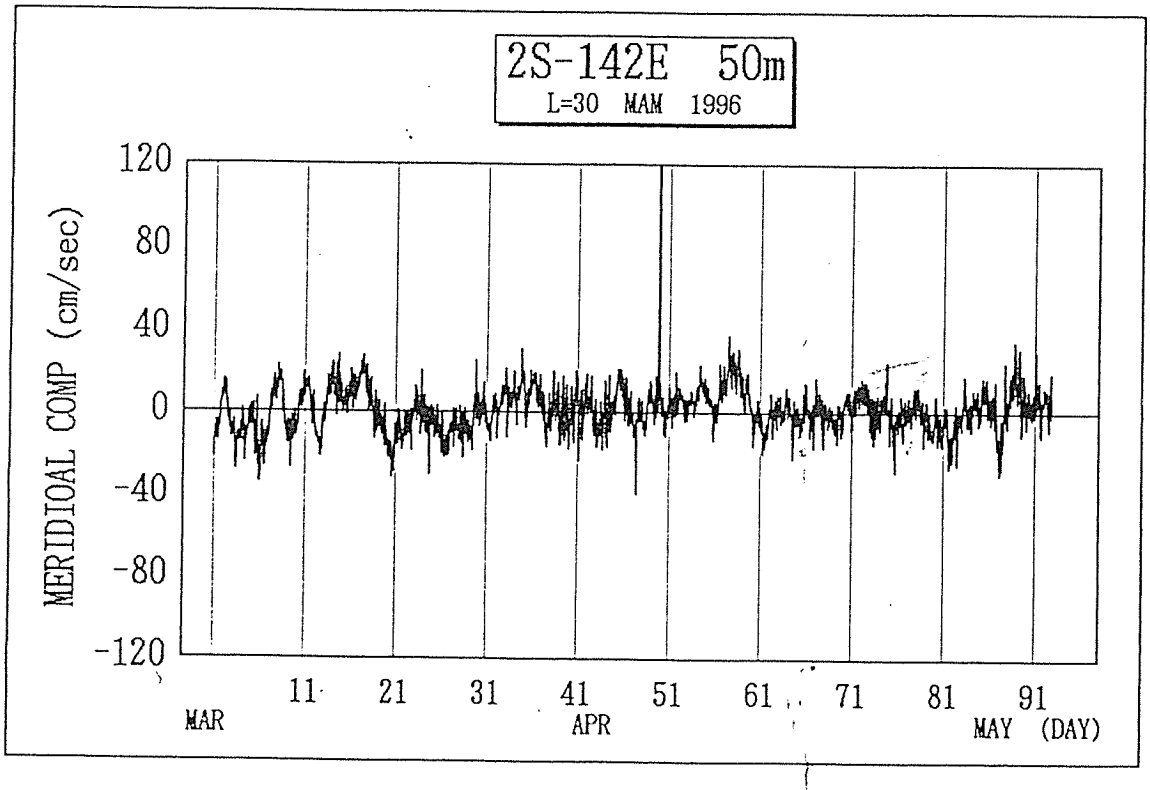
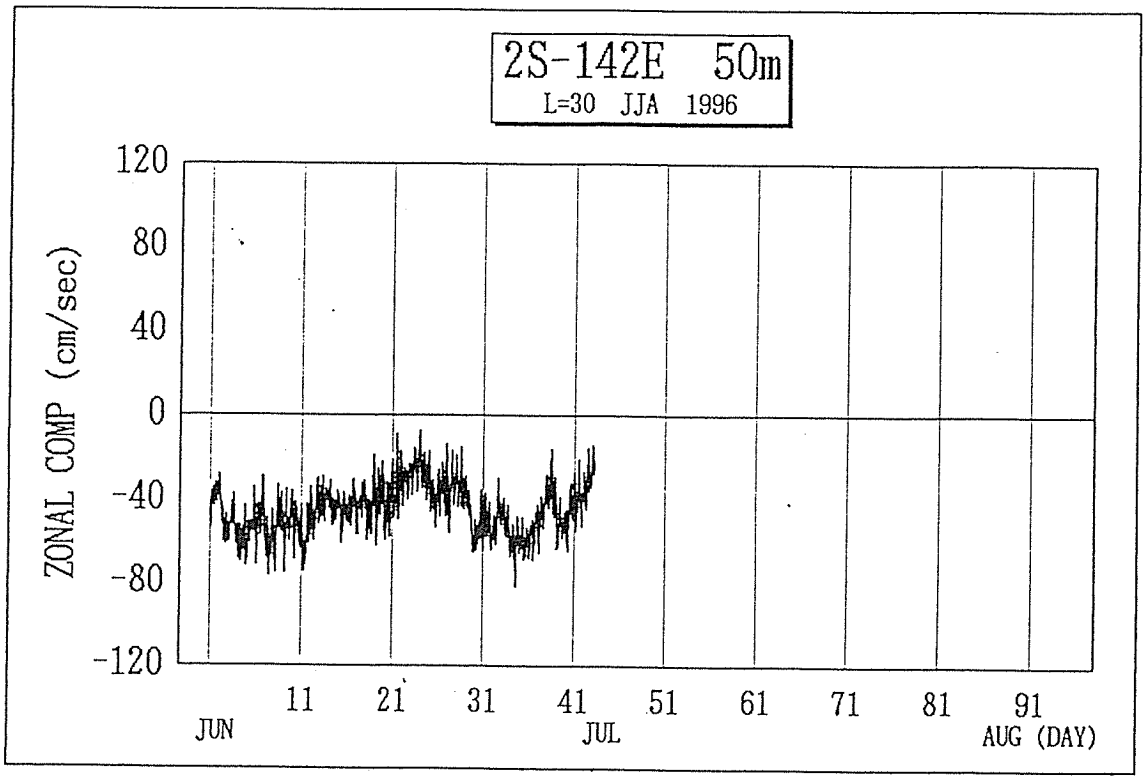


Fig.6-34 Time Series of Velocity



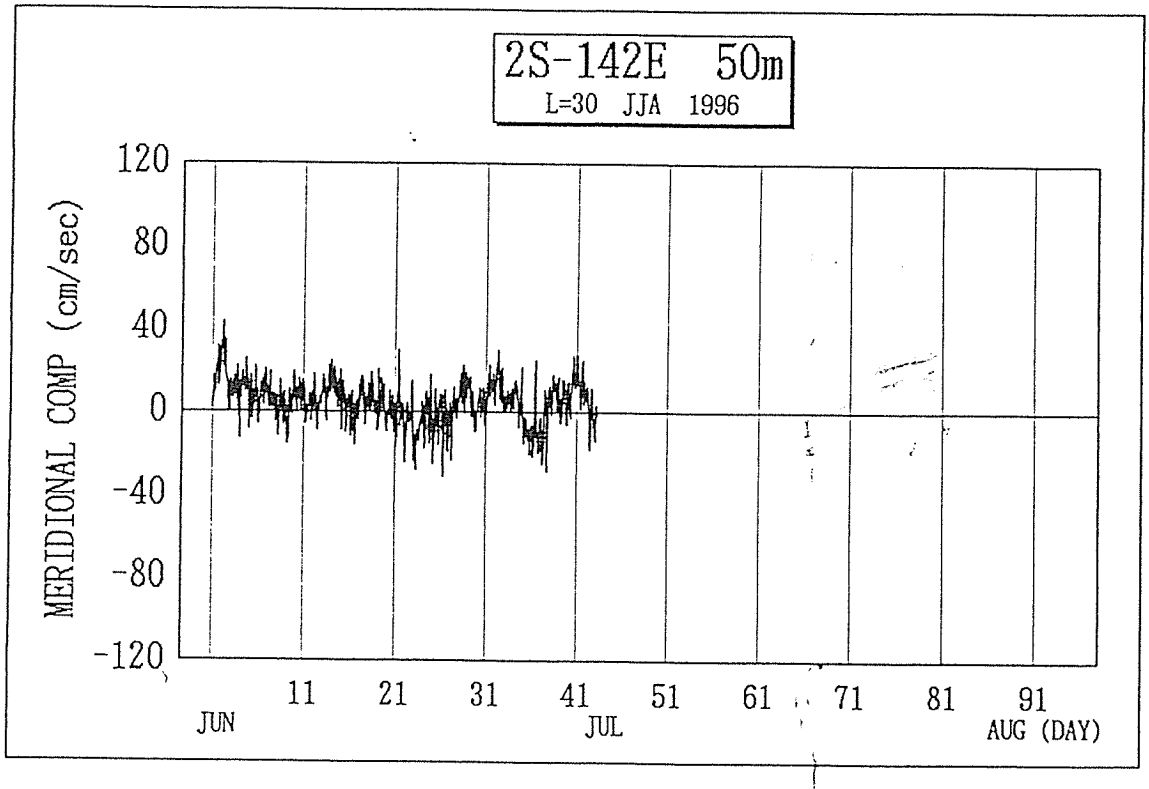


Fig.6-35 Time Series of Velocity

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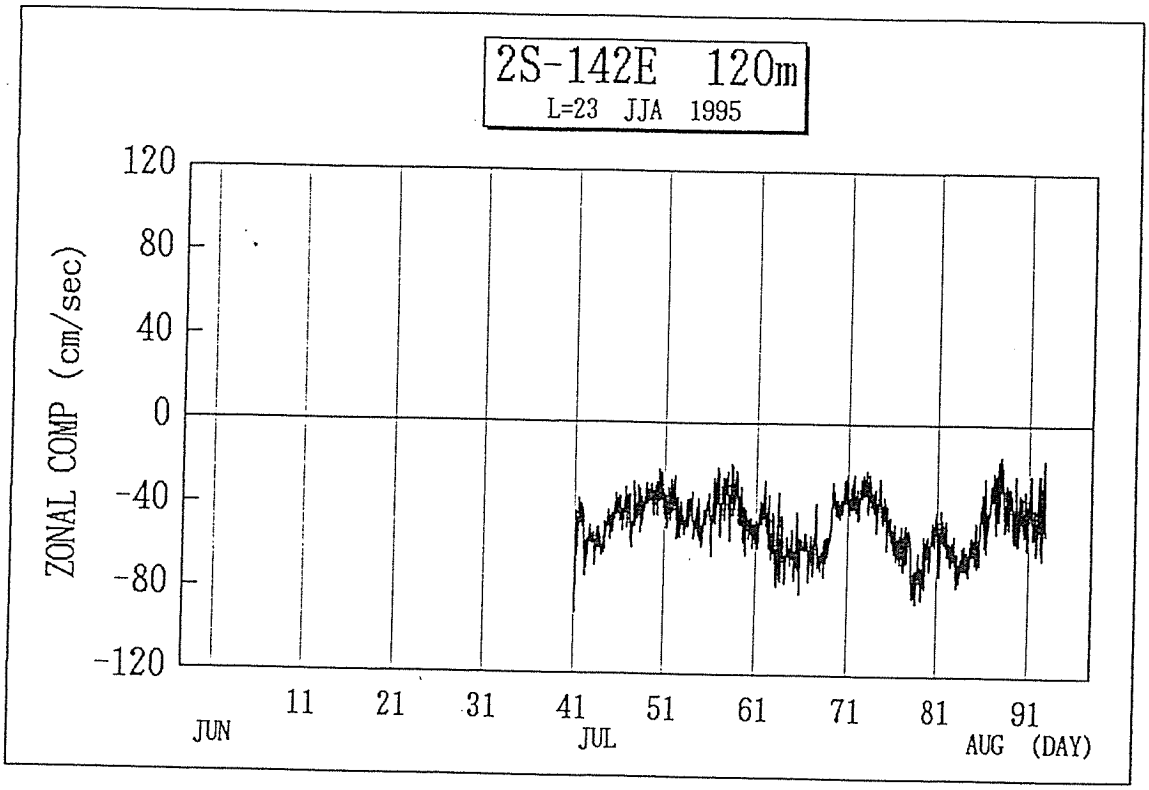


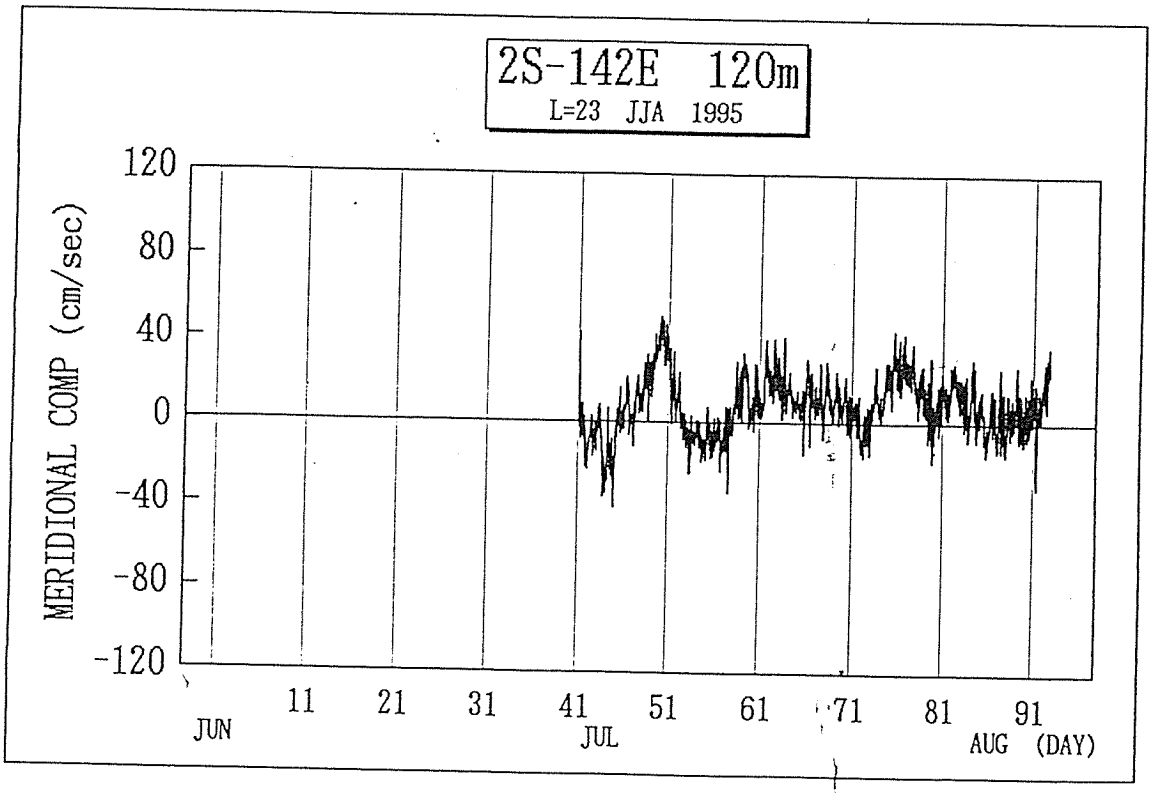
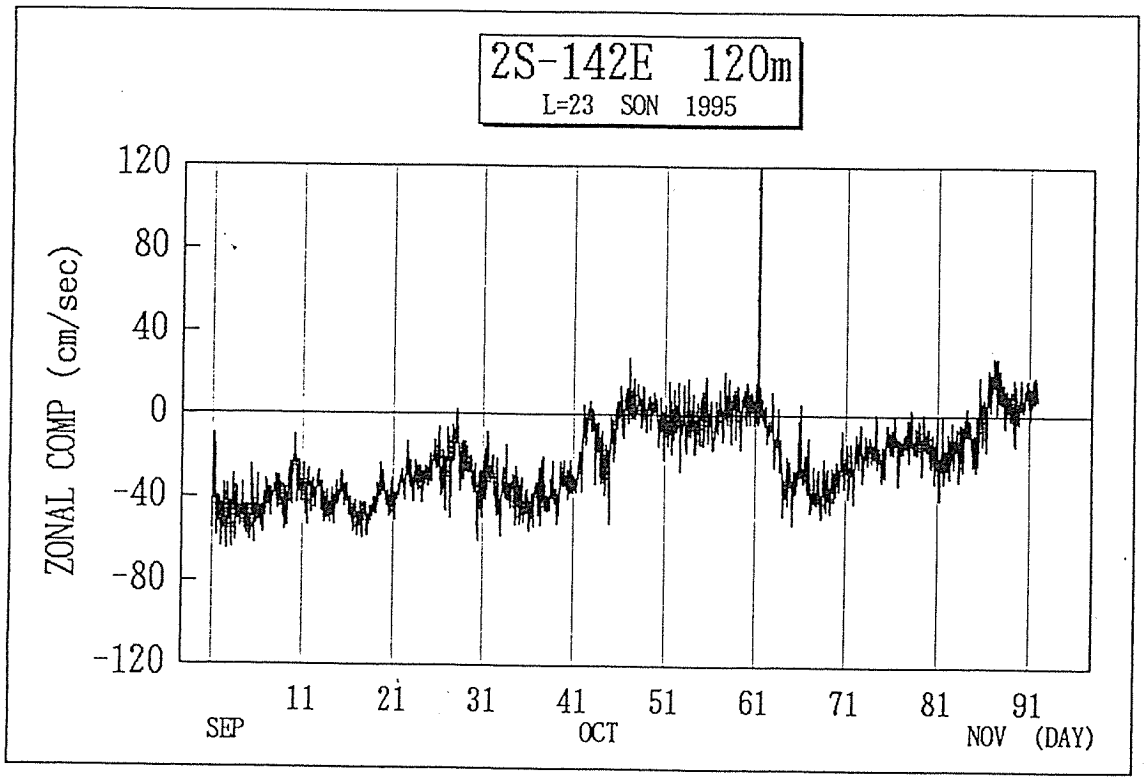


Fig.6-36 Time Series of Velocity



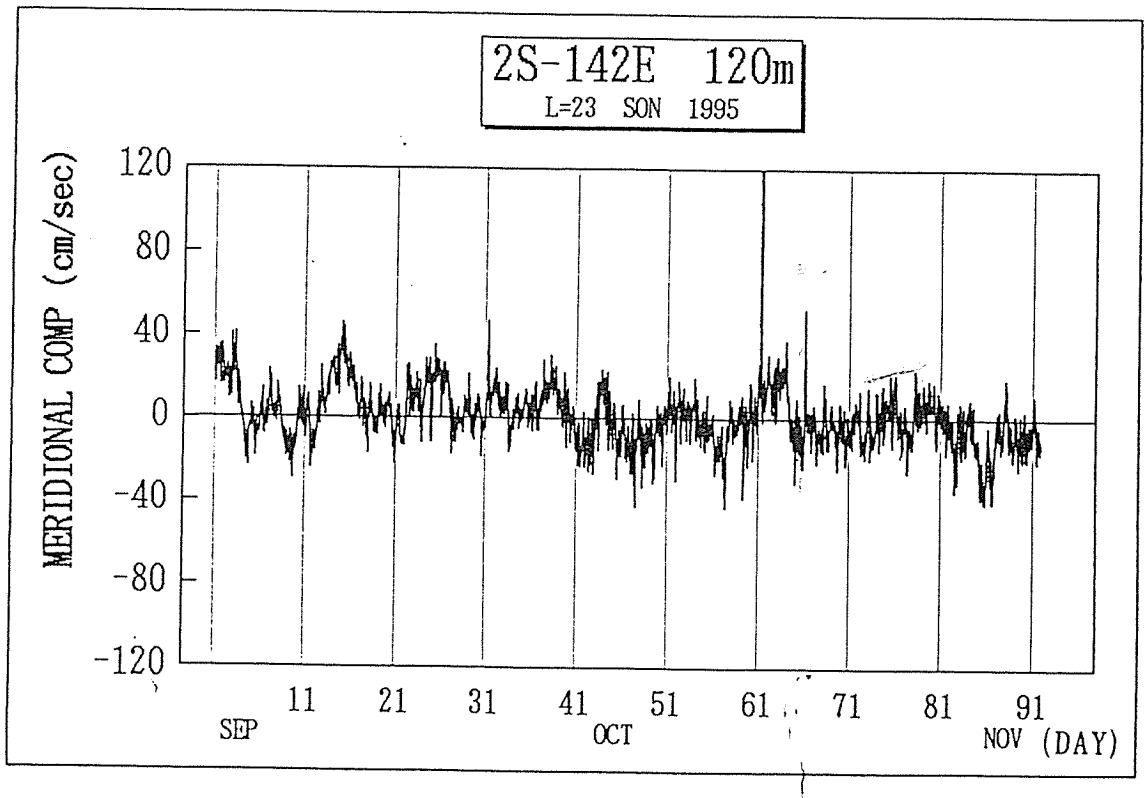
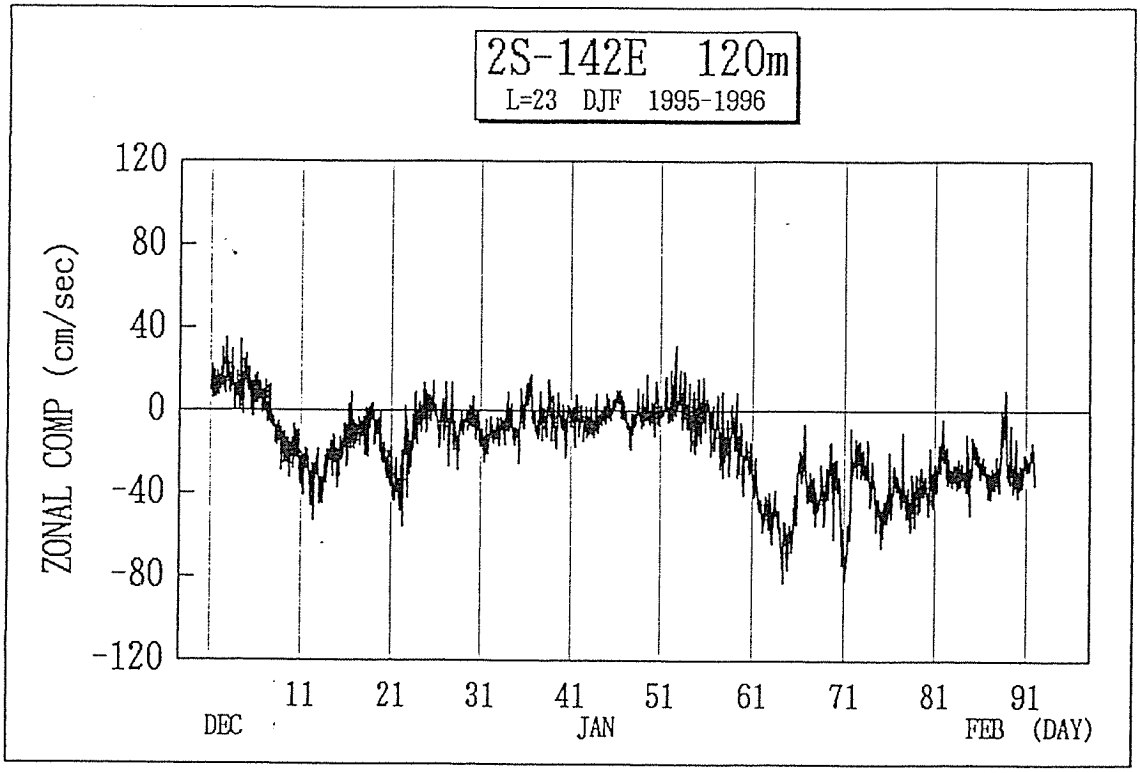


Fig.6-37 Time Series of Velocity



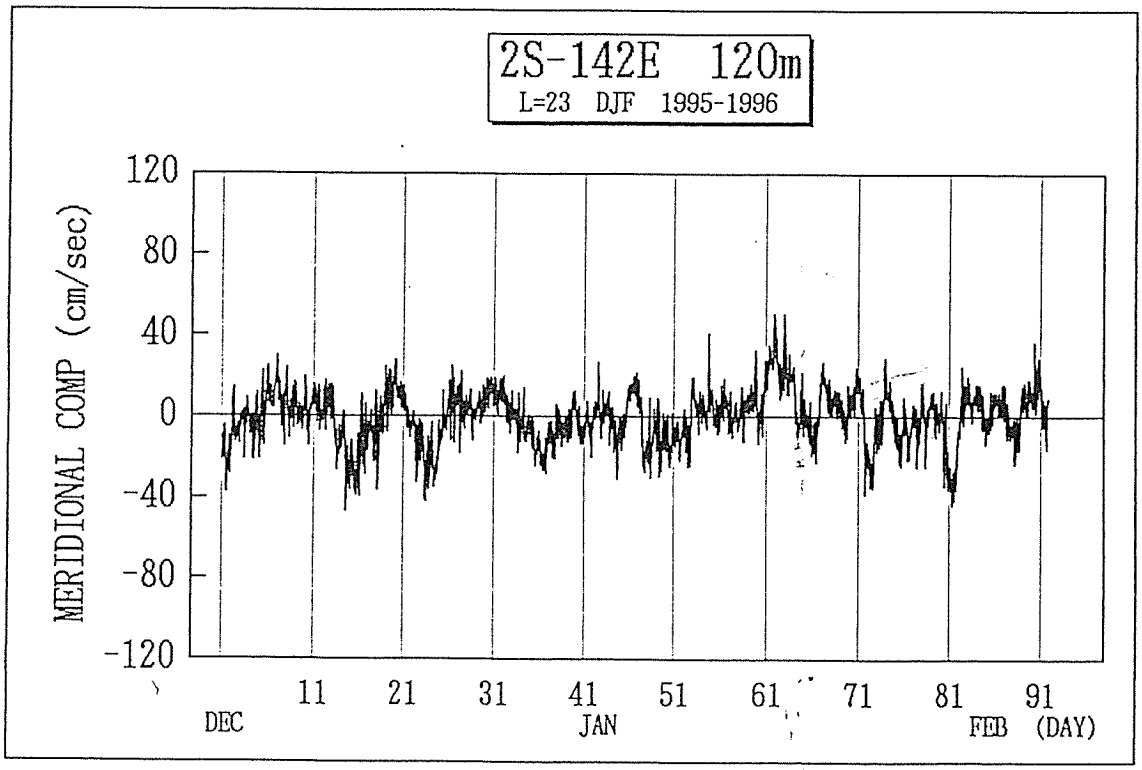
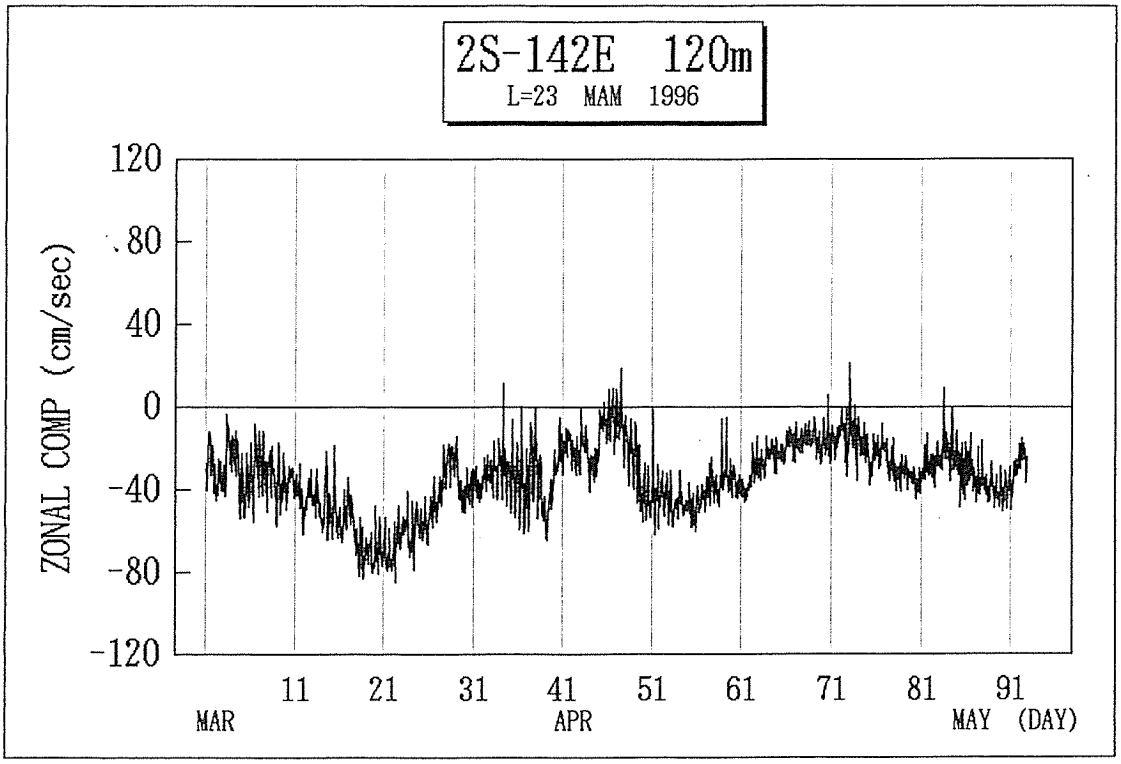


Fig.6-38 Time Series of Velocity



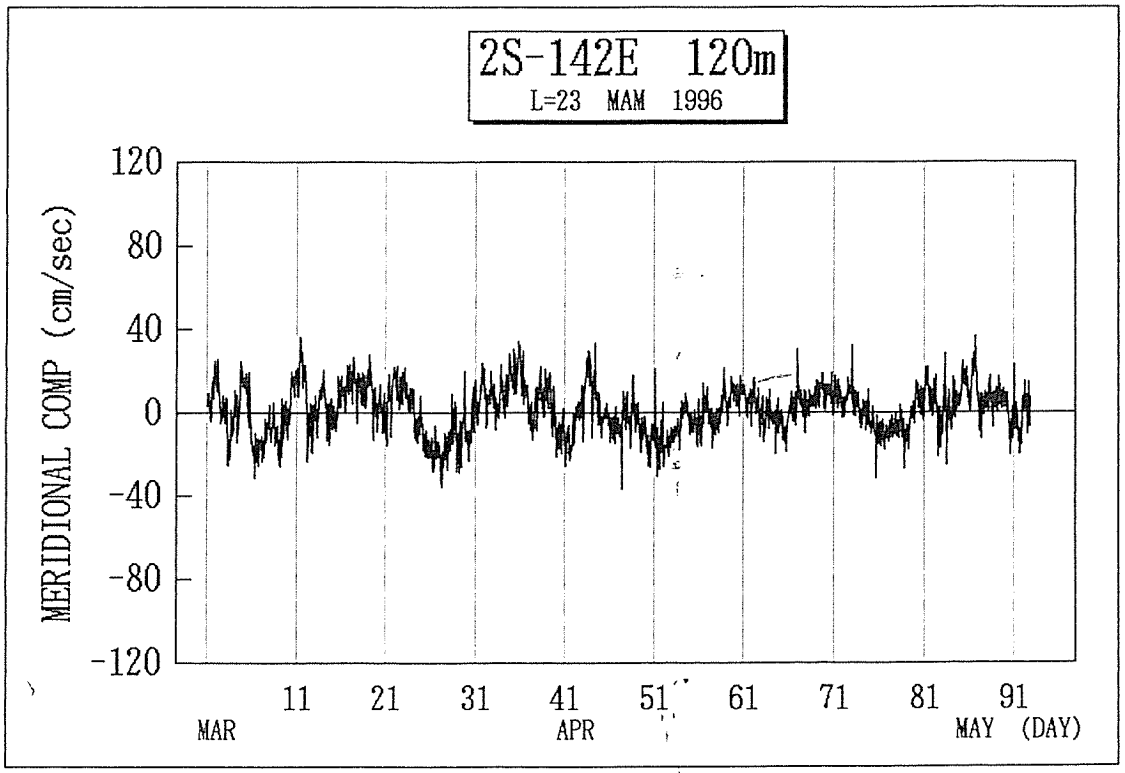
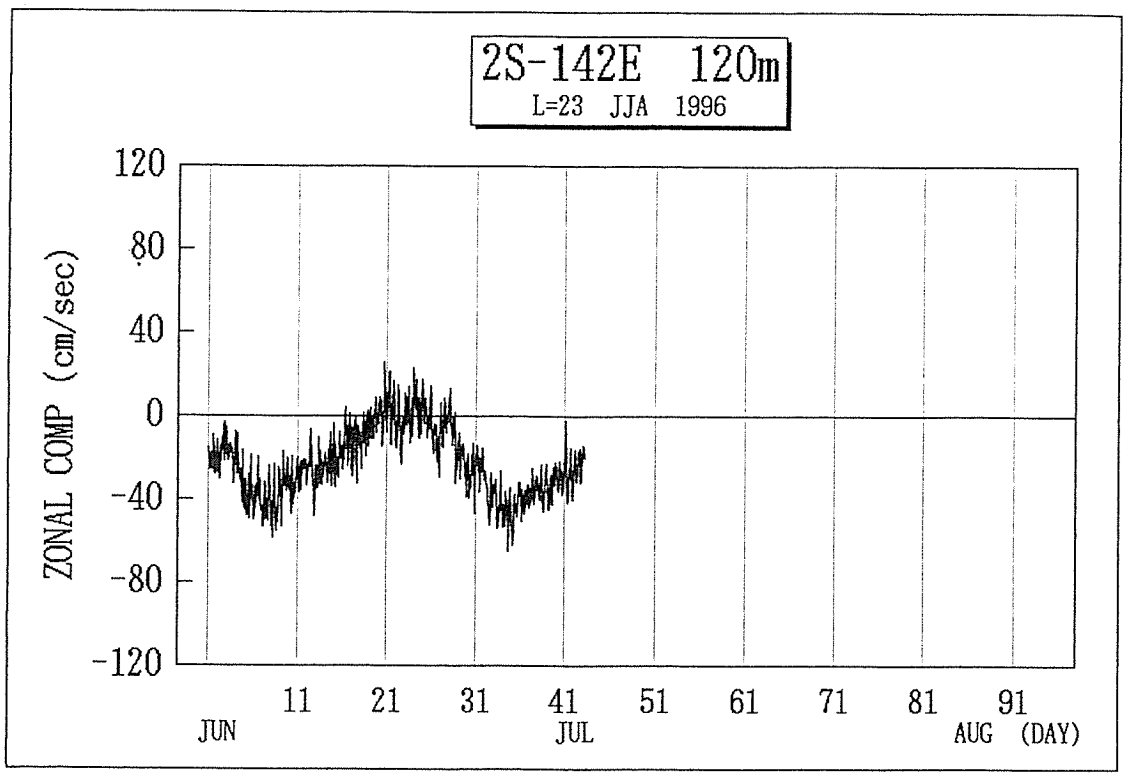


Fig.6-39 Time Series of Velocity



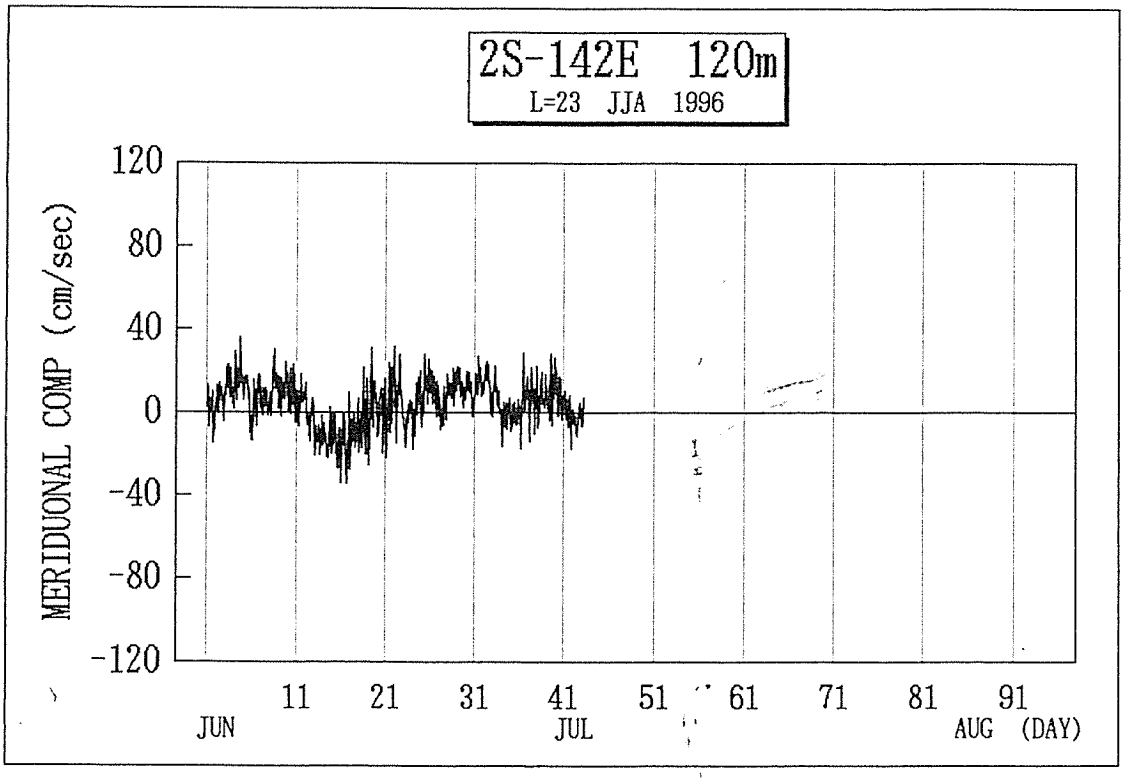
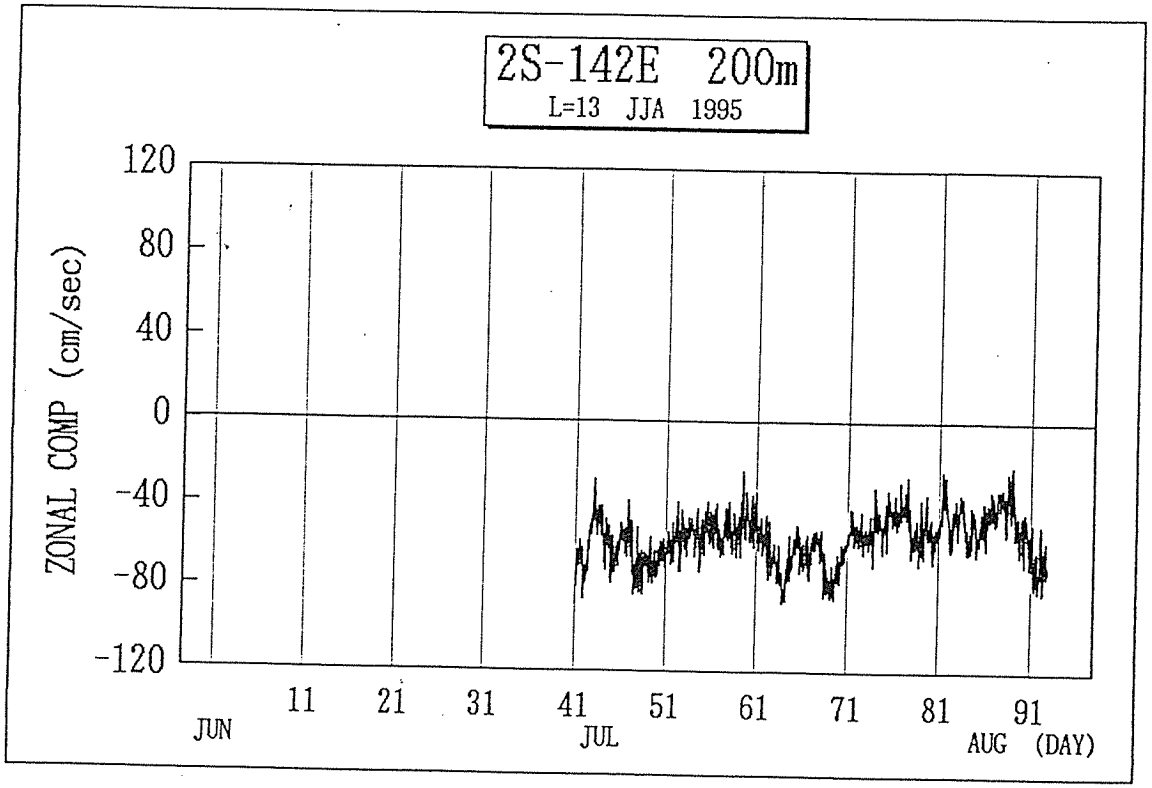


Fig.6-40 Time Series of Velocity



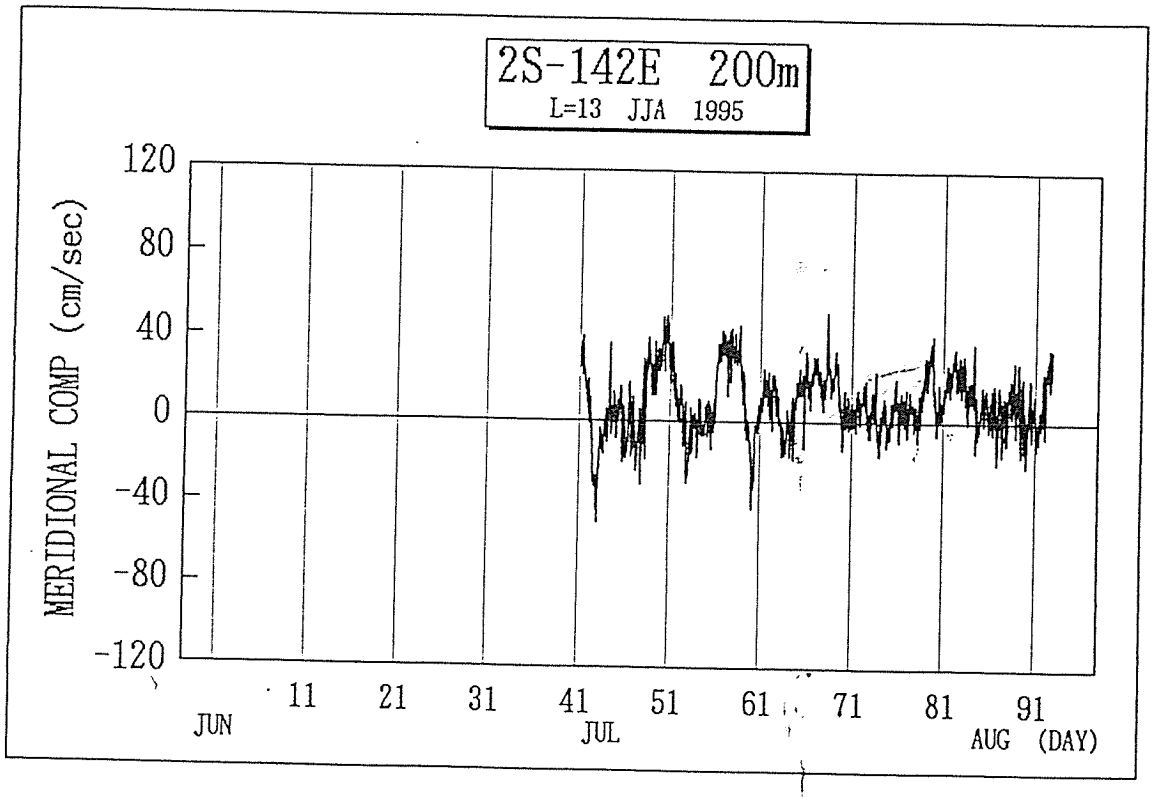
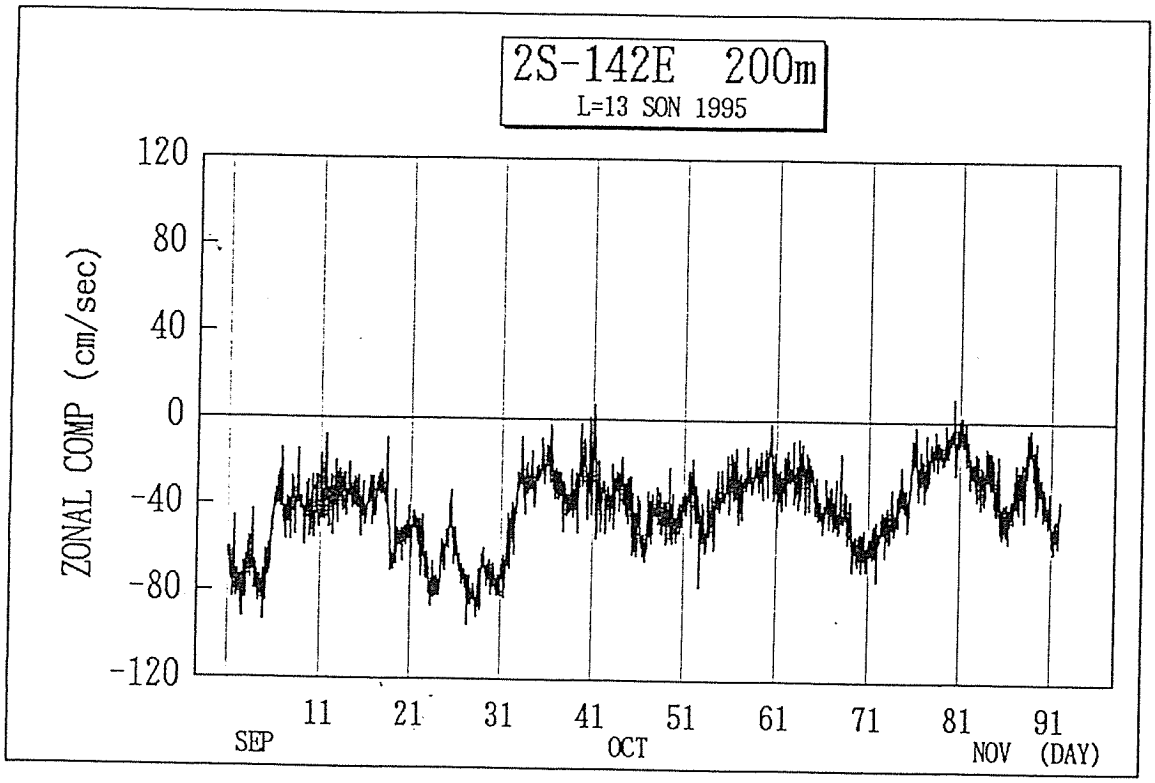


Fig.6-41 Time Series of Velocity



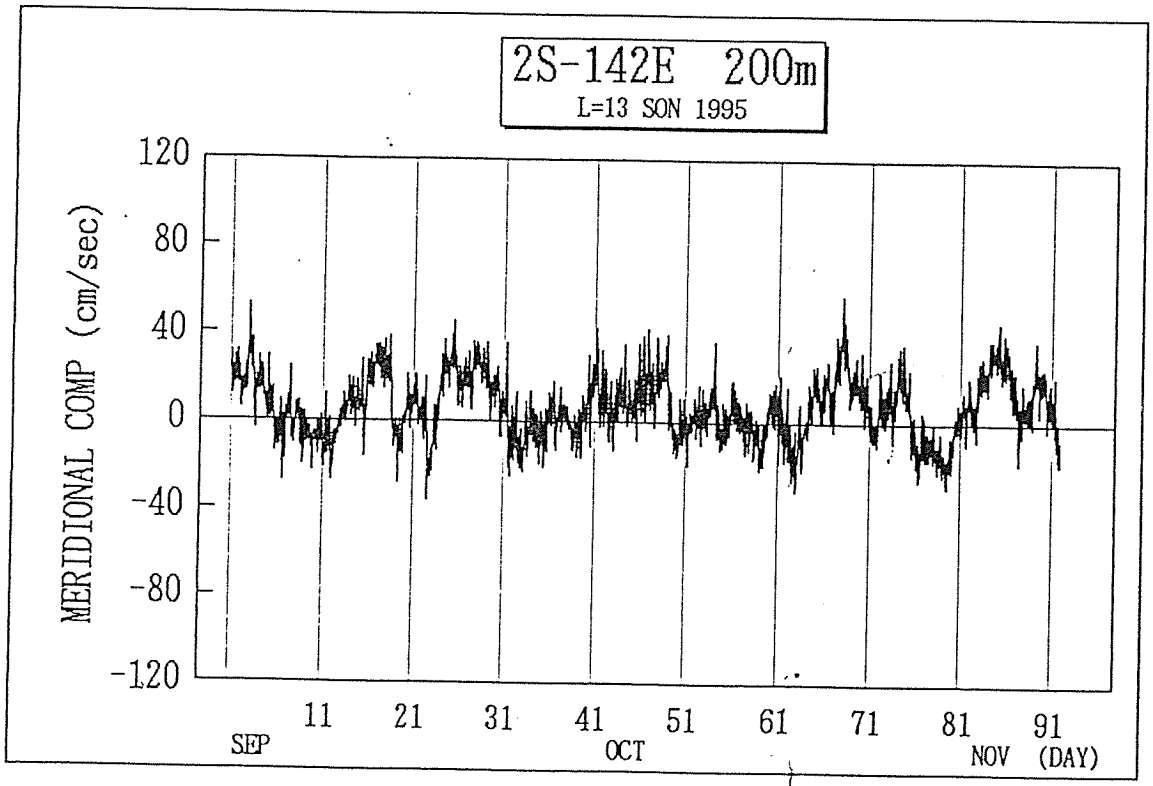
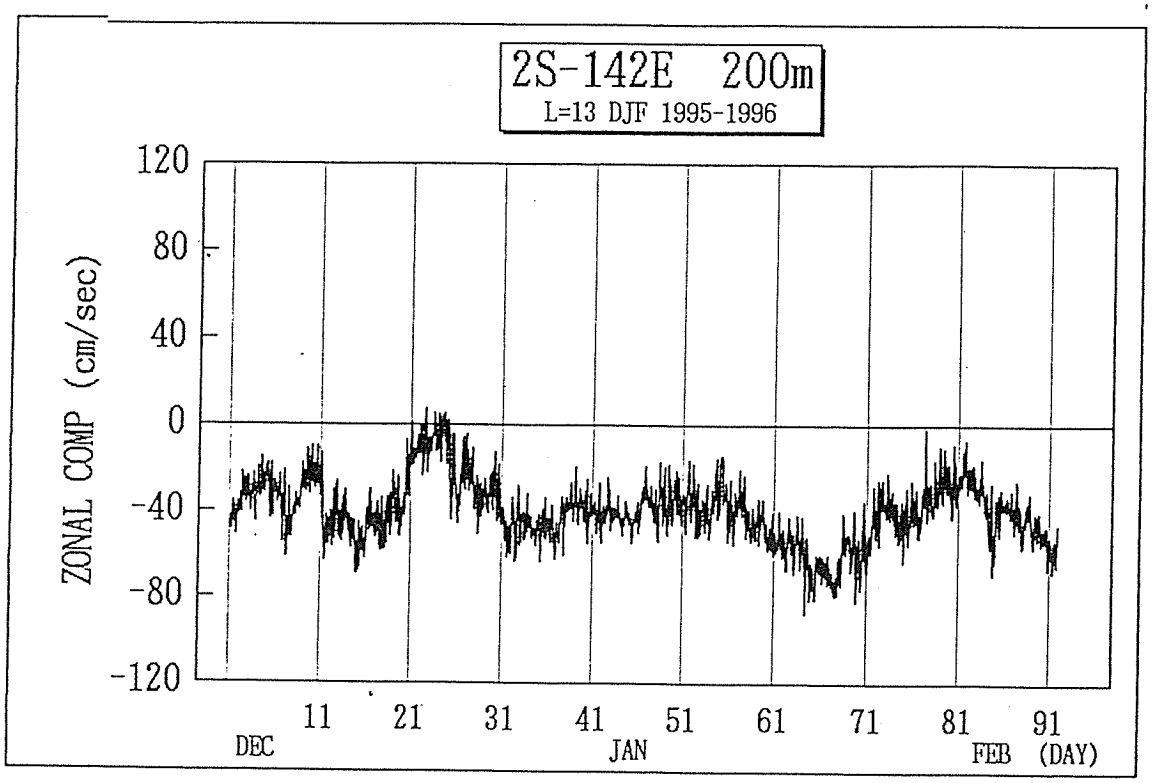


Fig.6-42 Time Series of Velocity



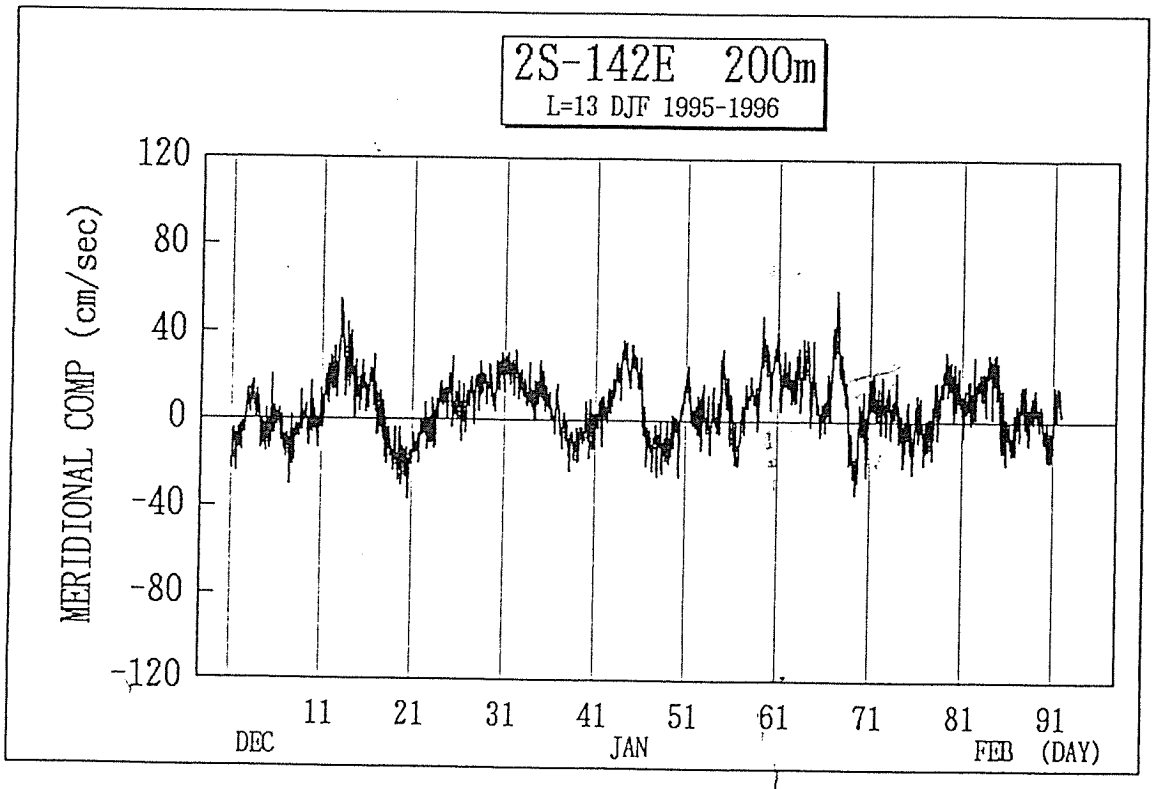
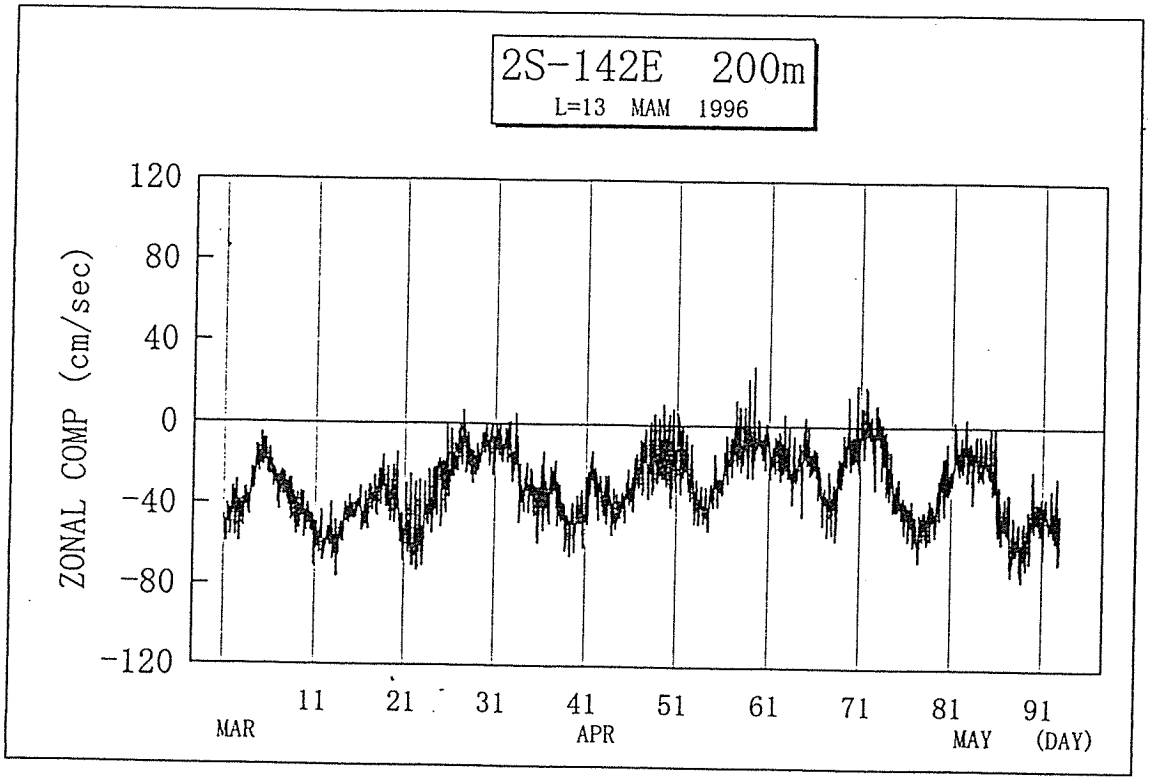


Fig.6-43 Time Series of Velocity



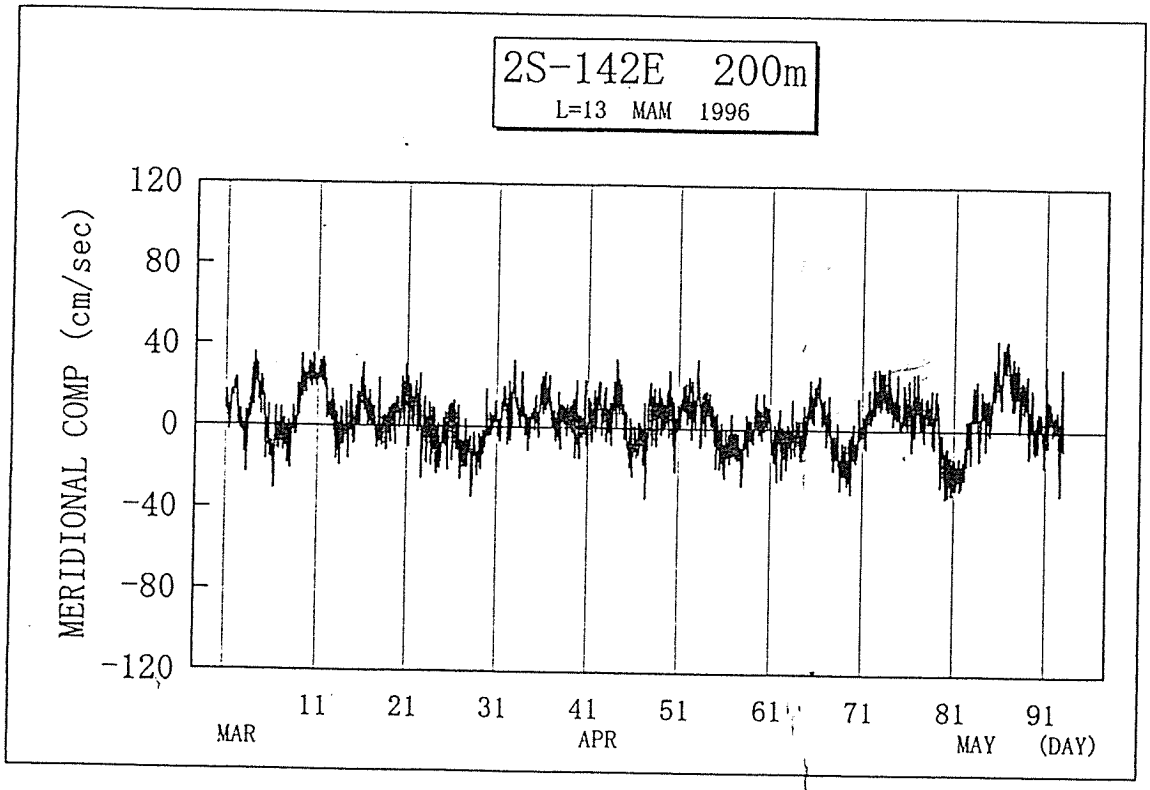
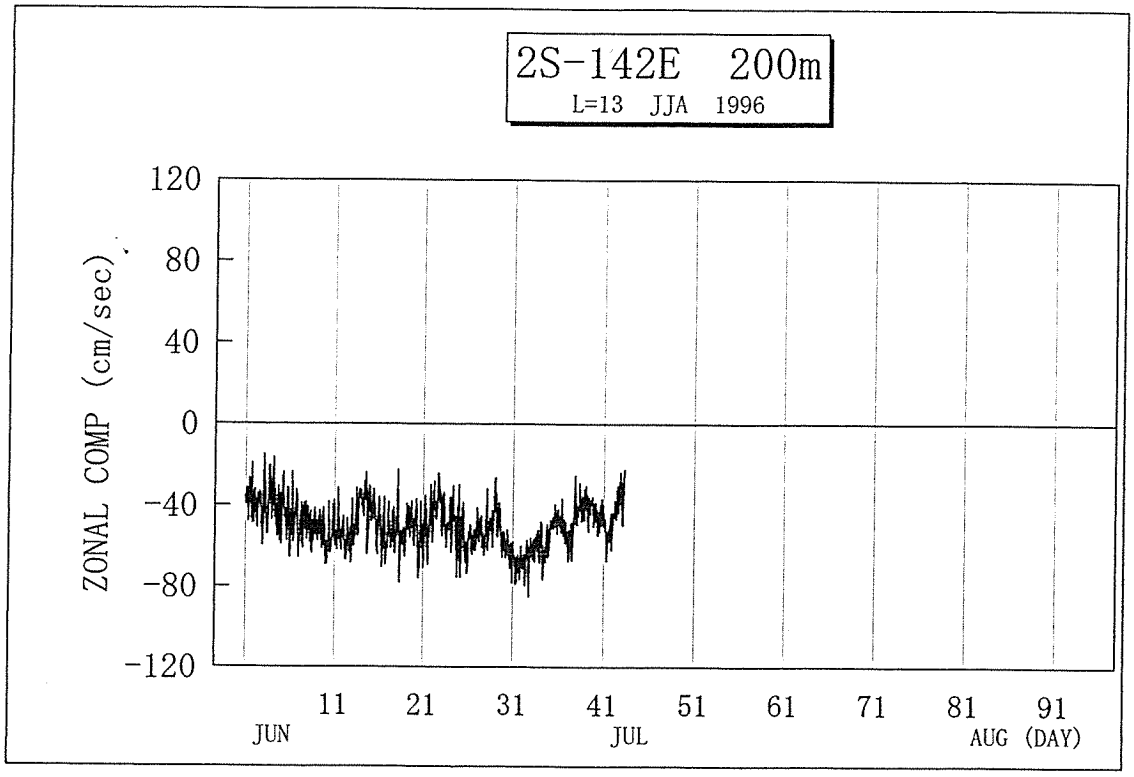


Fig.6-44 Time Series of Velocity



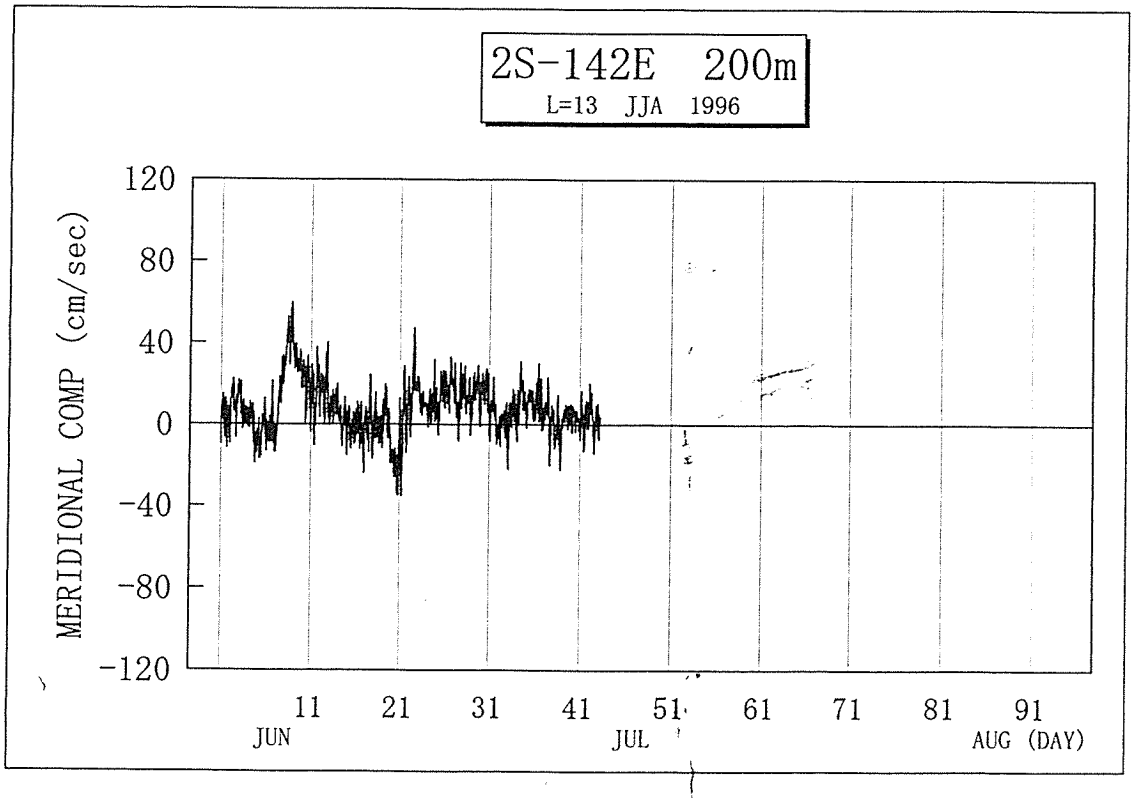
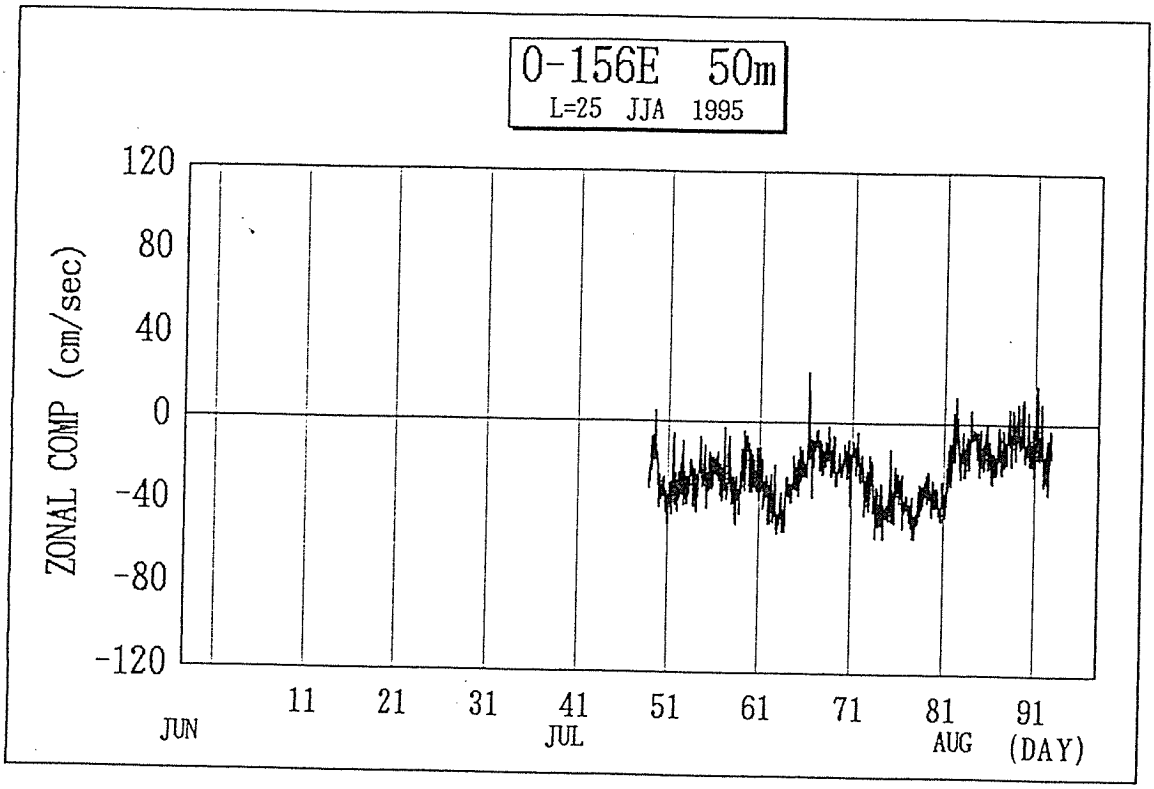


Fig.6-45 Time Series of Velocity



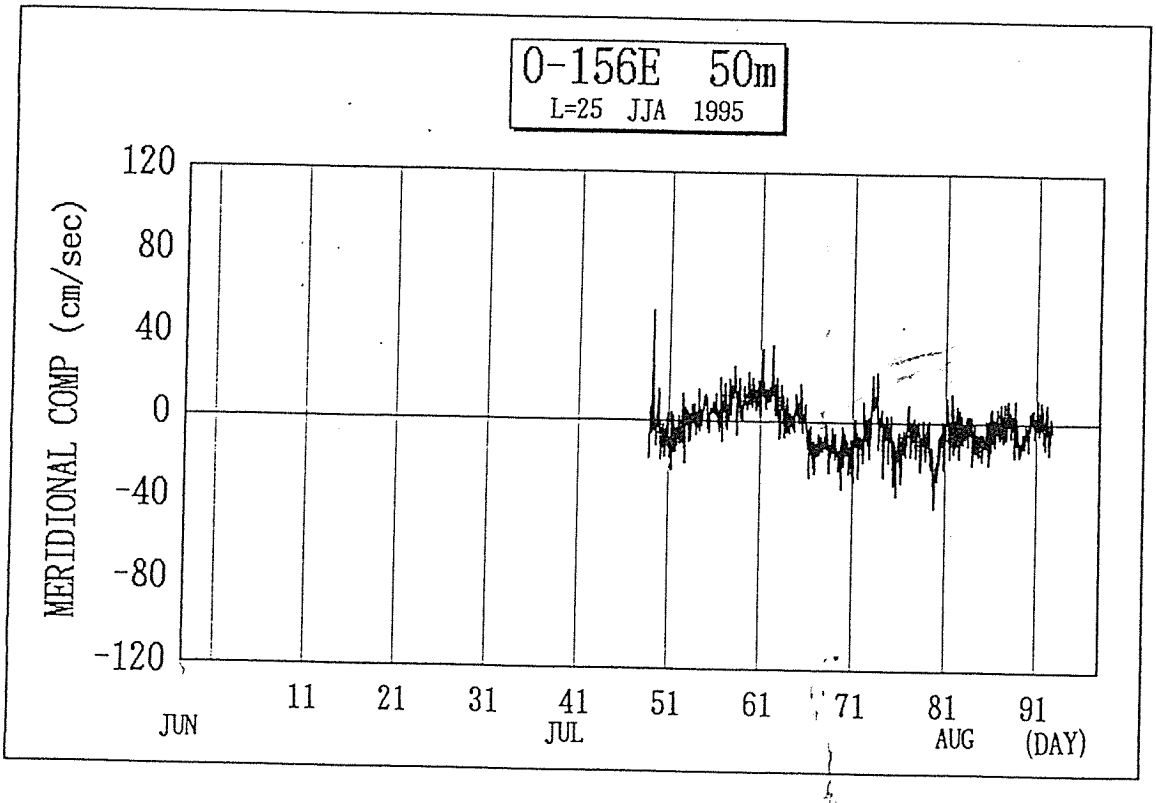
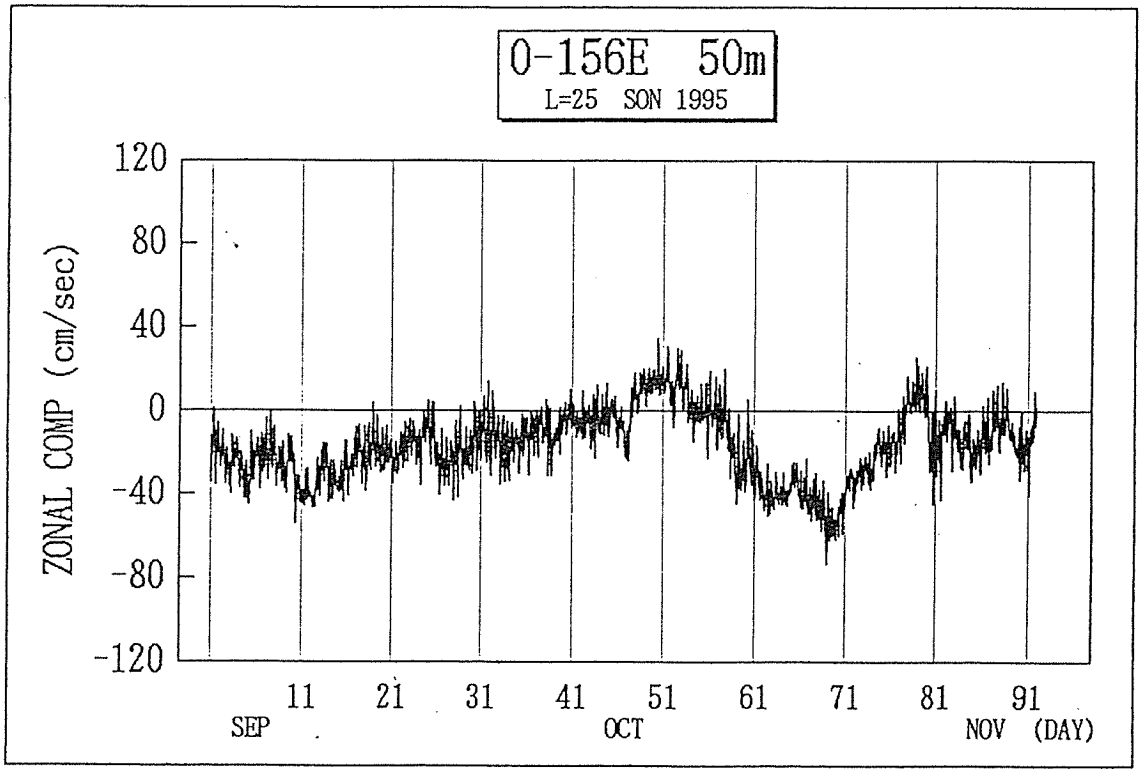


Fig.6-46 Time Series of Velocity



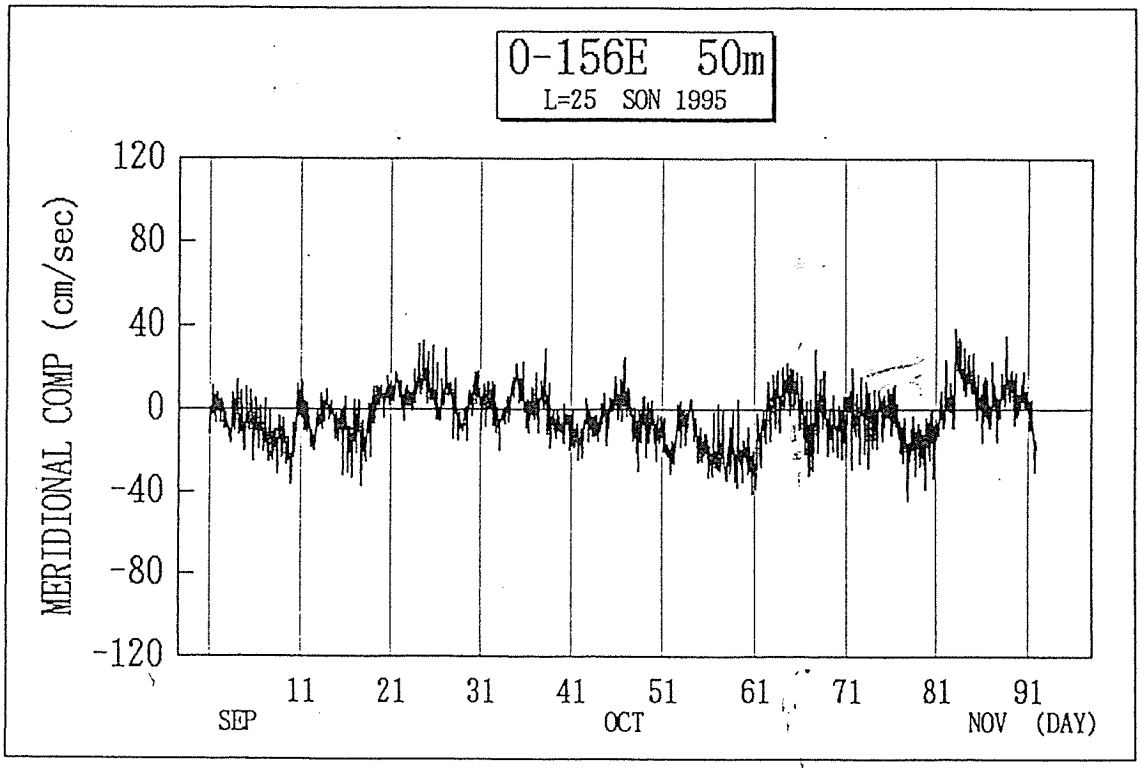
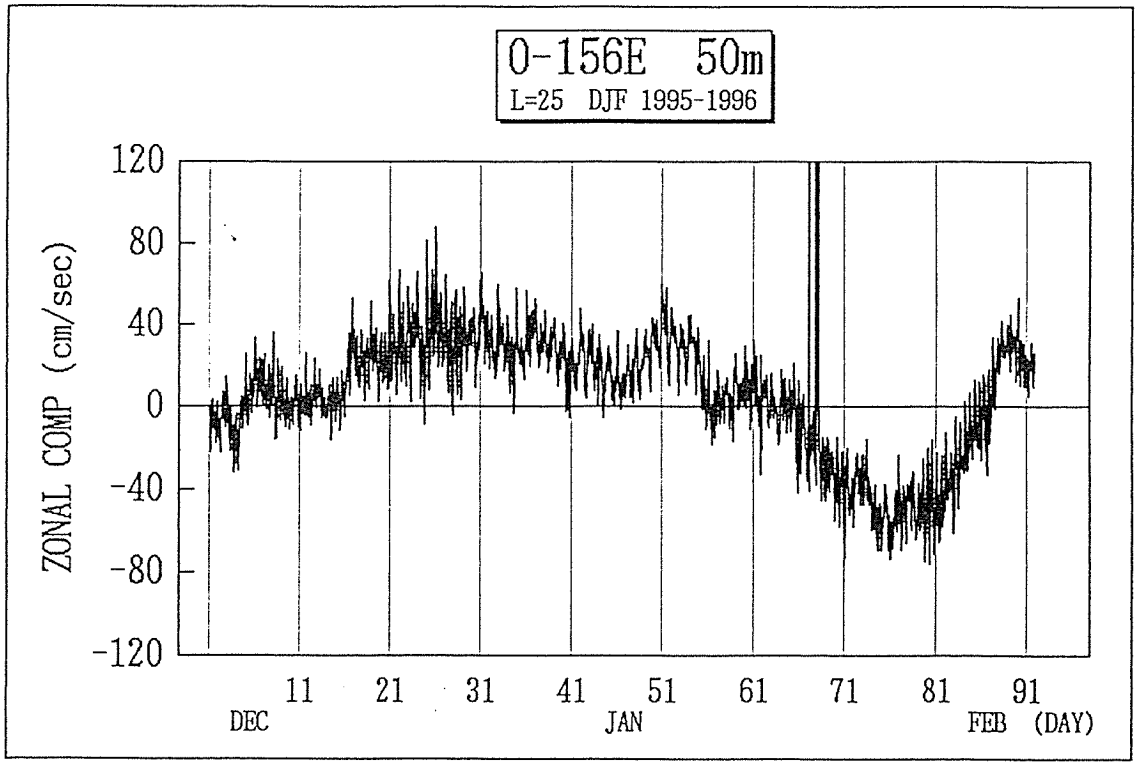


Fig.6-47 Time Series of Velocity



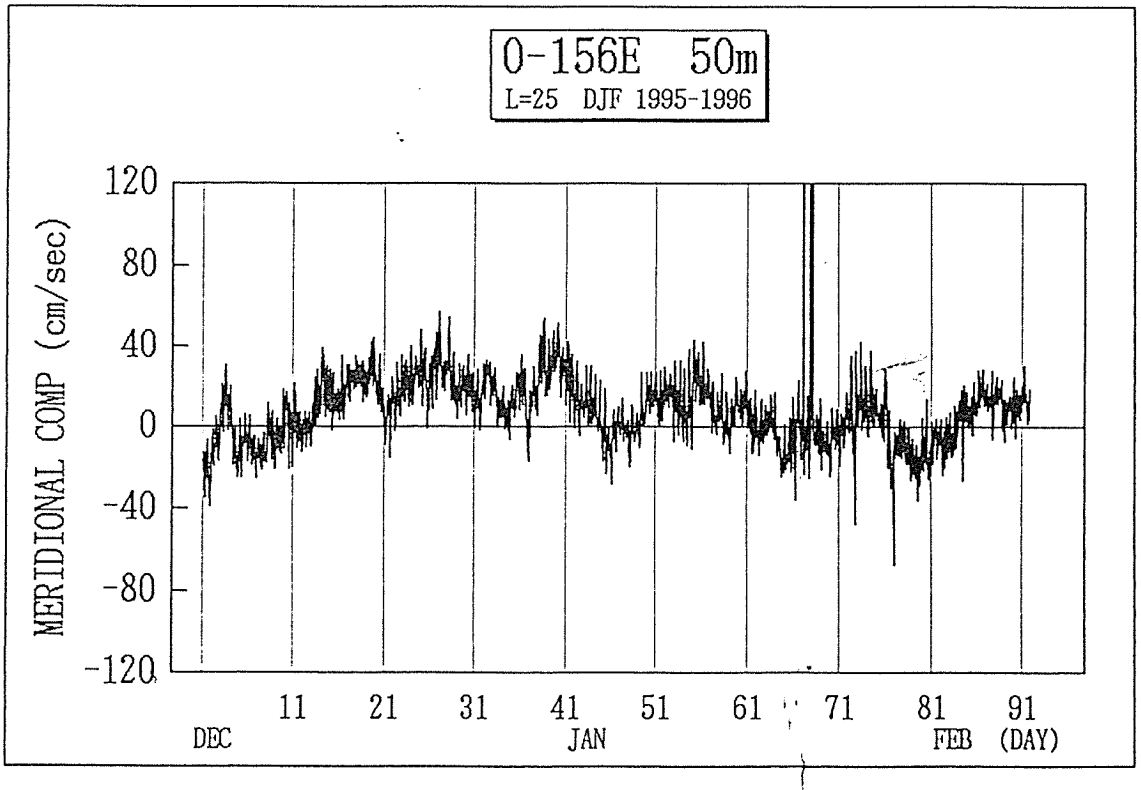
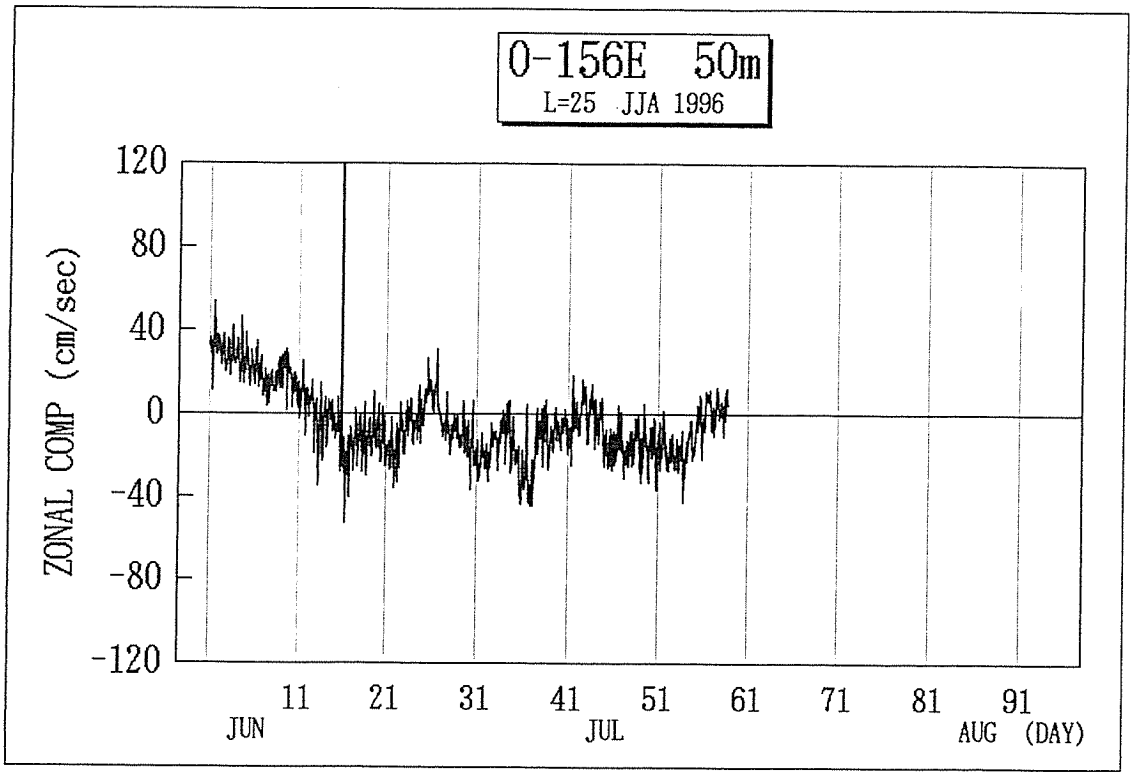


Fig.6-48 Time Series of Velocity



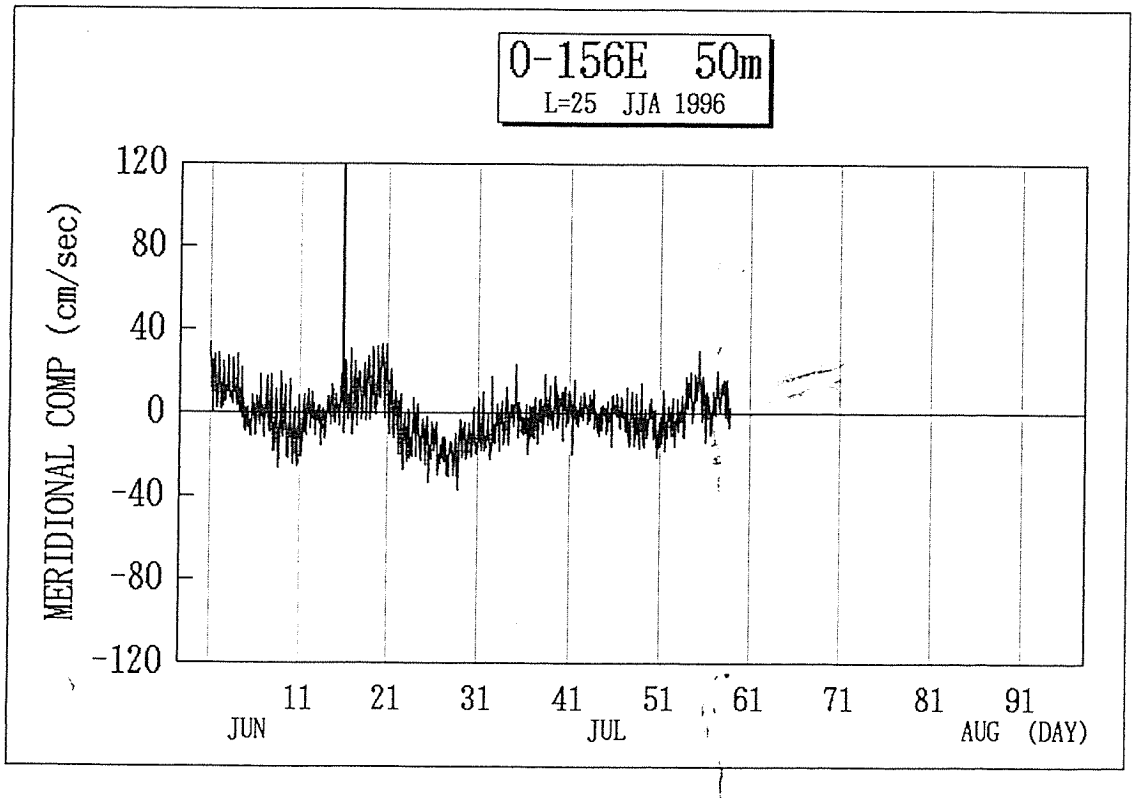
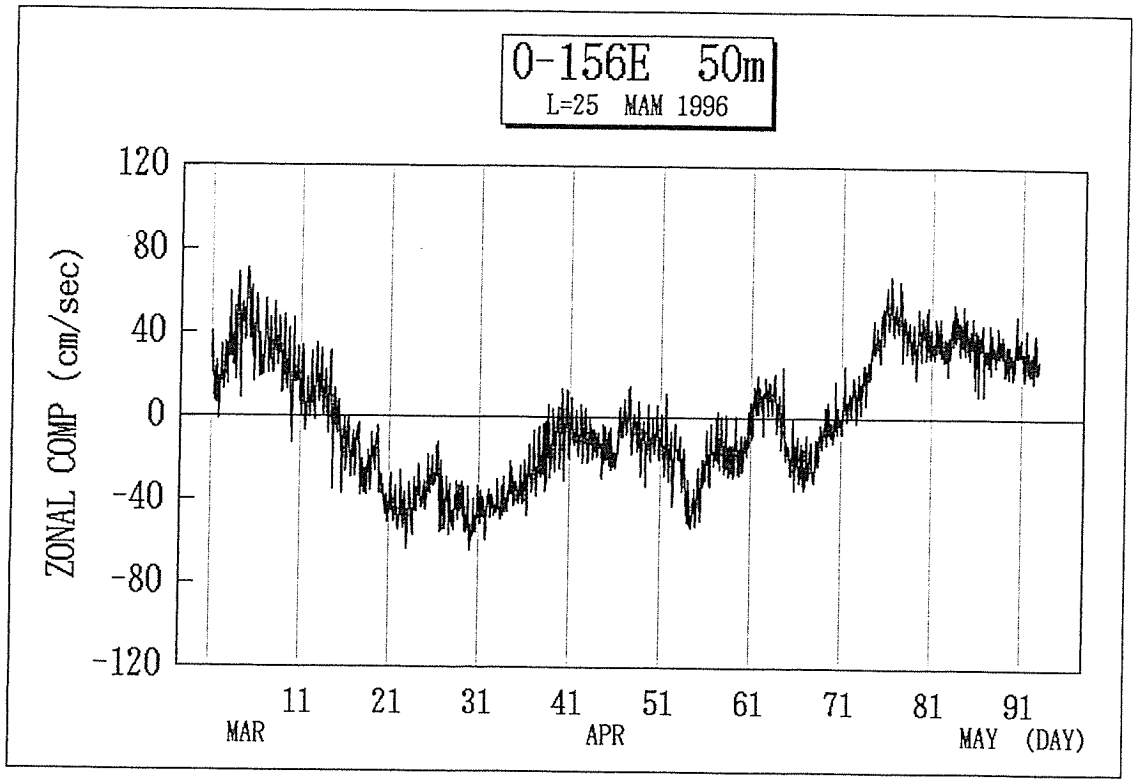


Fig.6-49 Time Series of Velocity



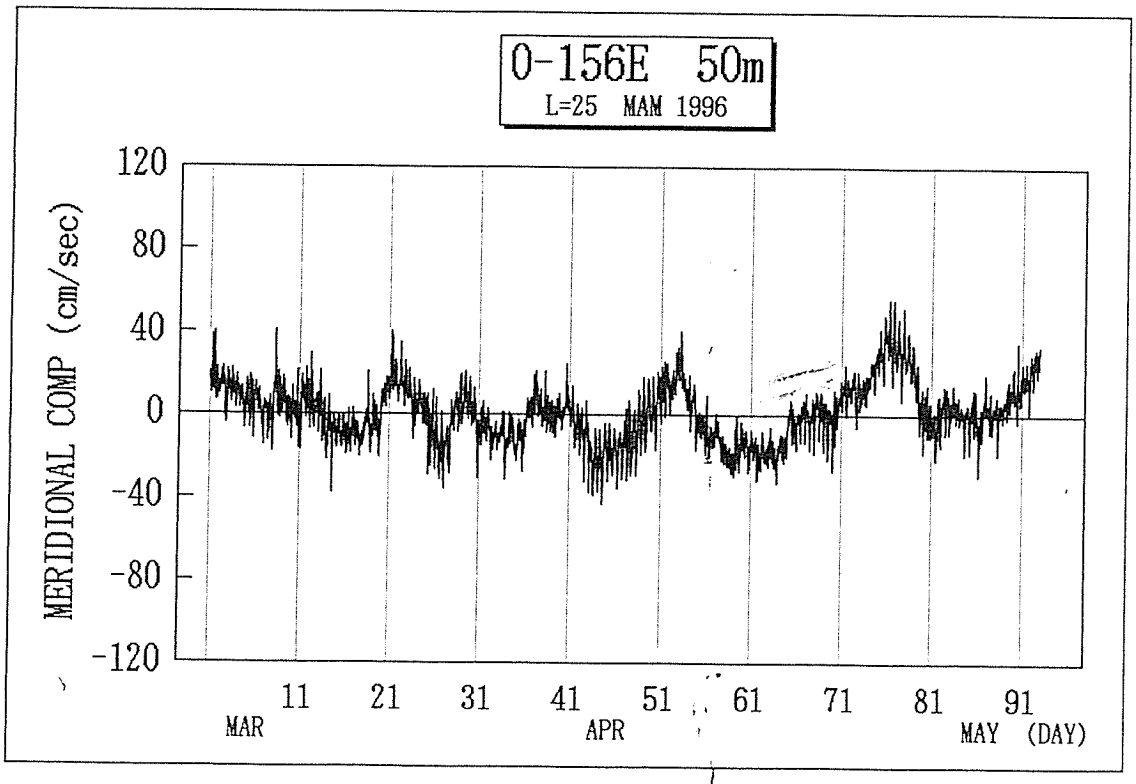
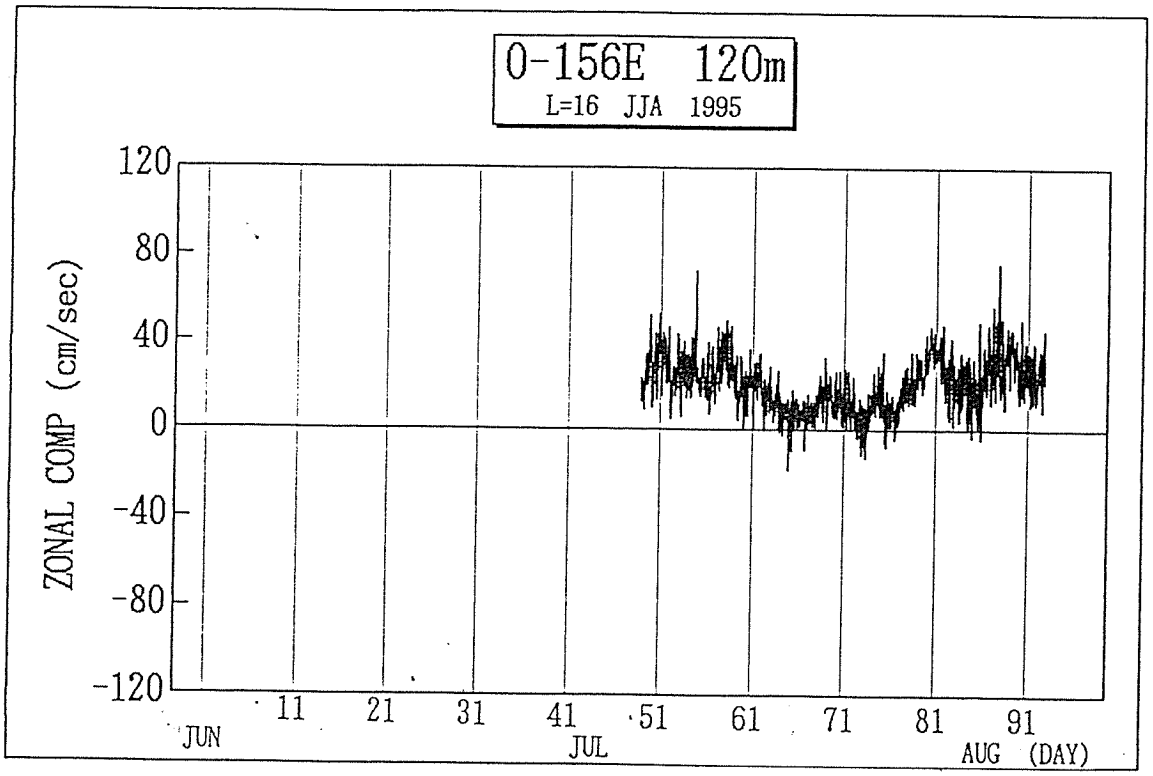


Fig.6-50 Time Series of Velocity



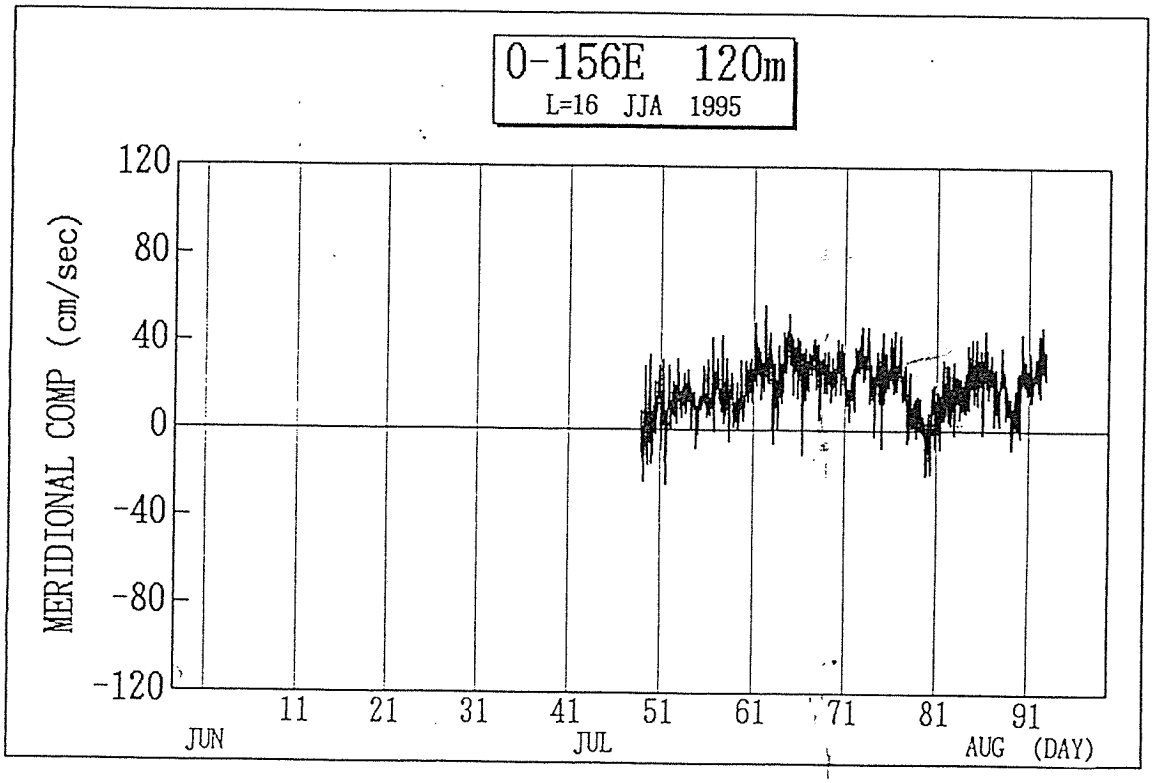
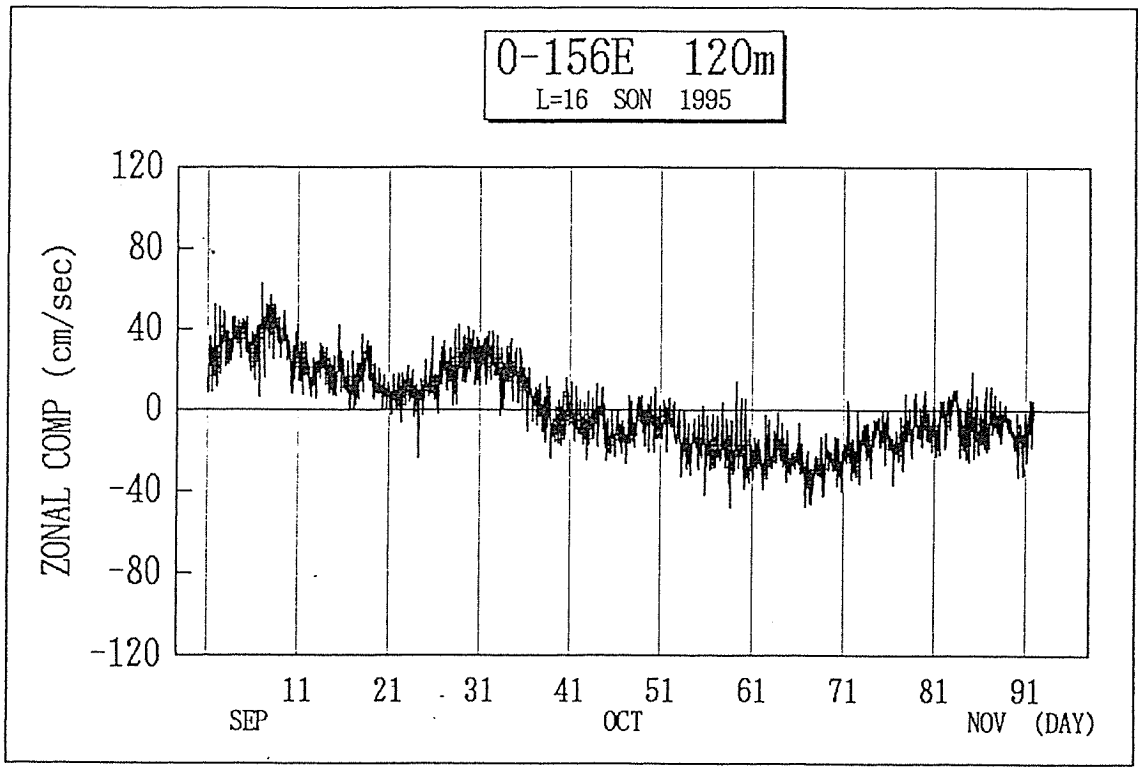


Fig.6-51 Time Series of Velocity



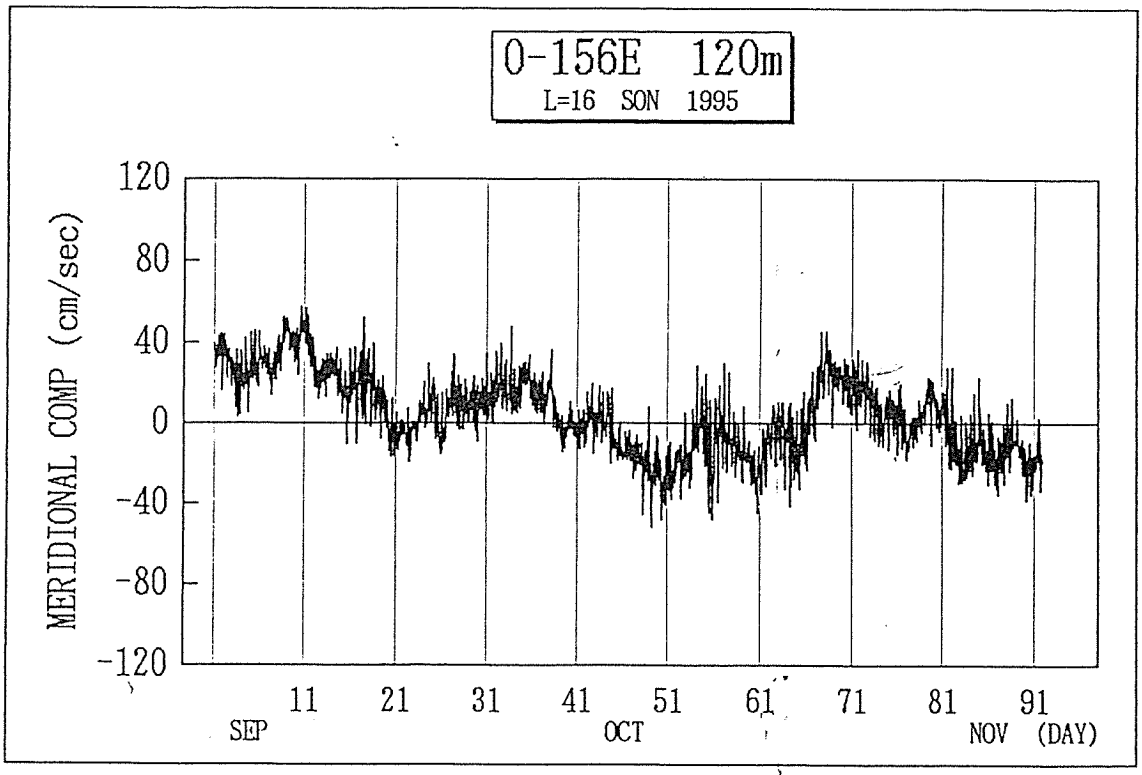
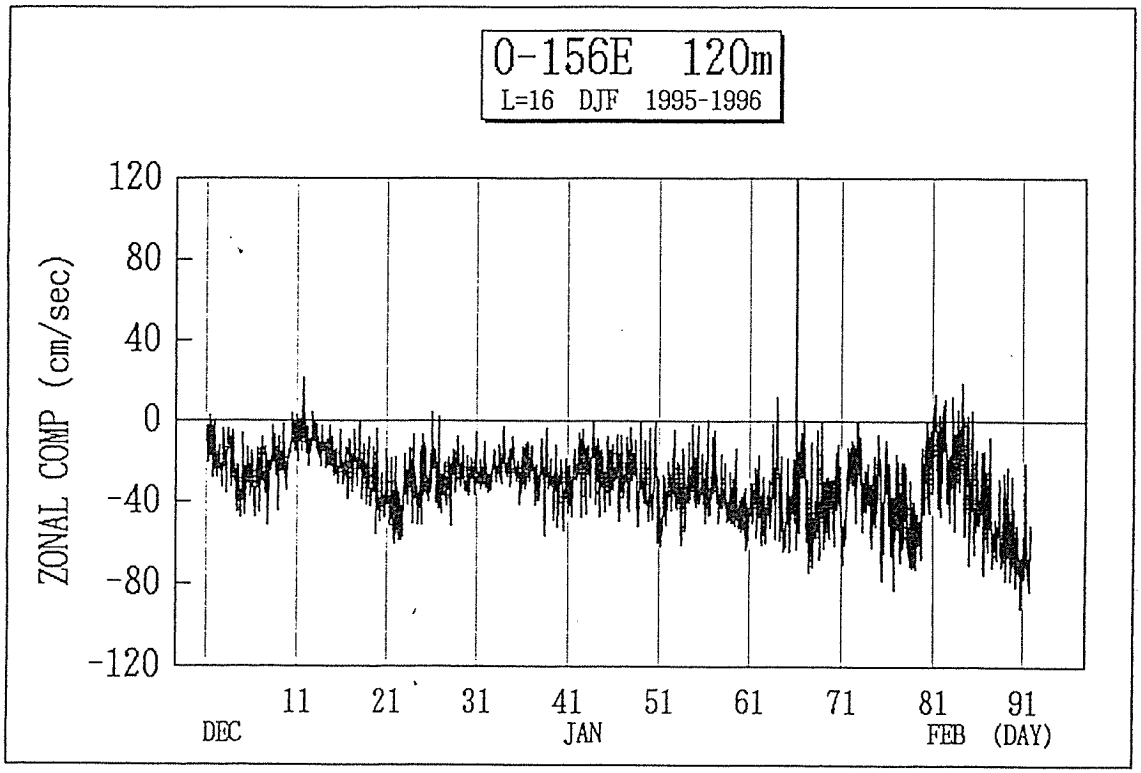


Fig.6-52 Time Series of Velocity



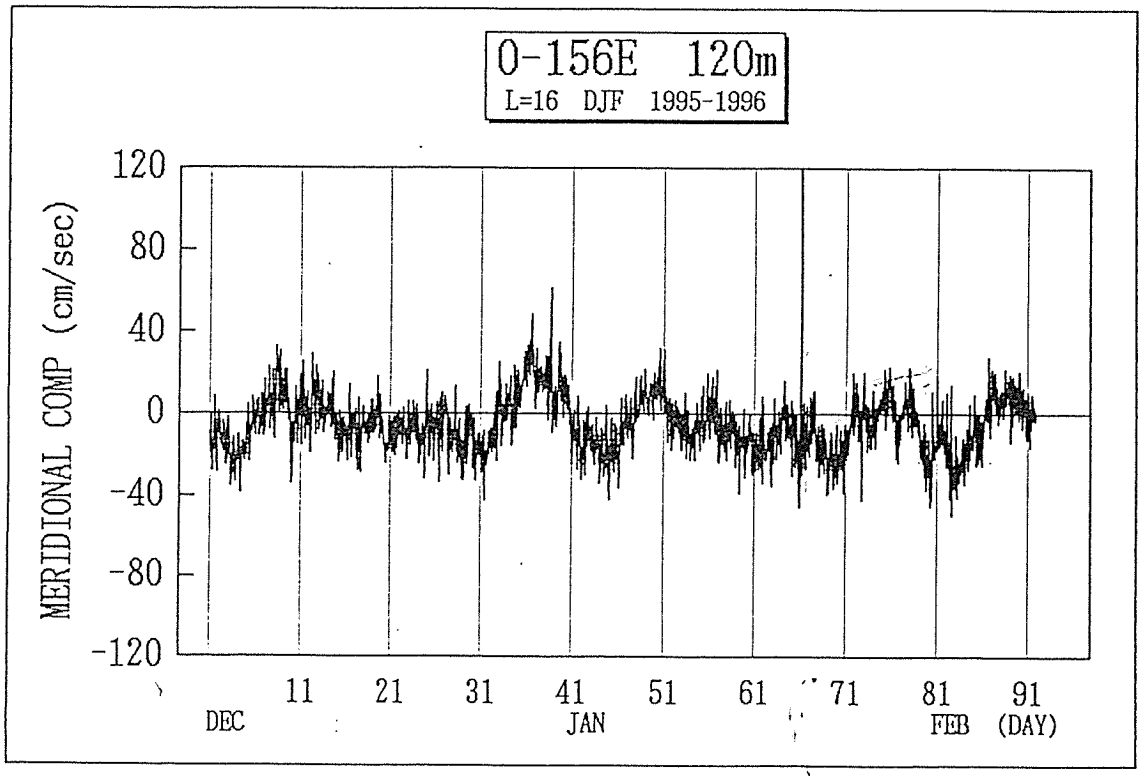
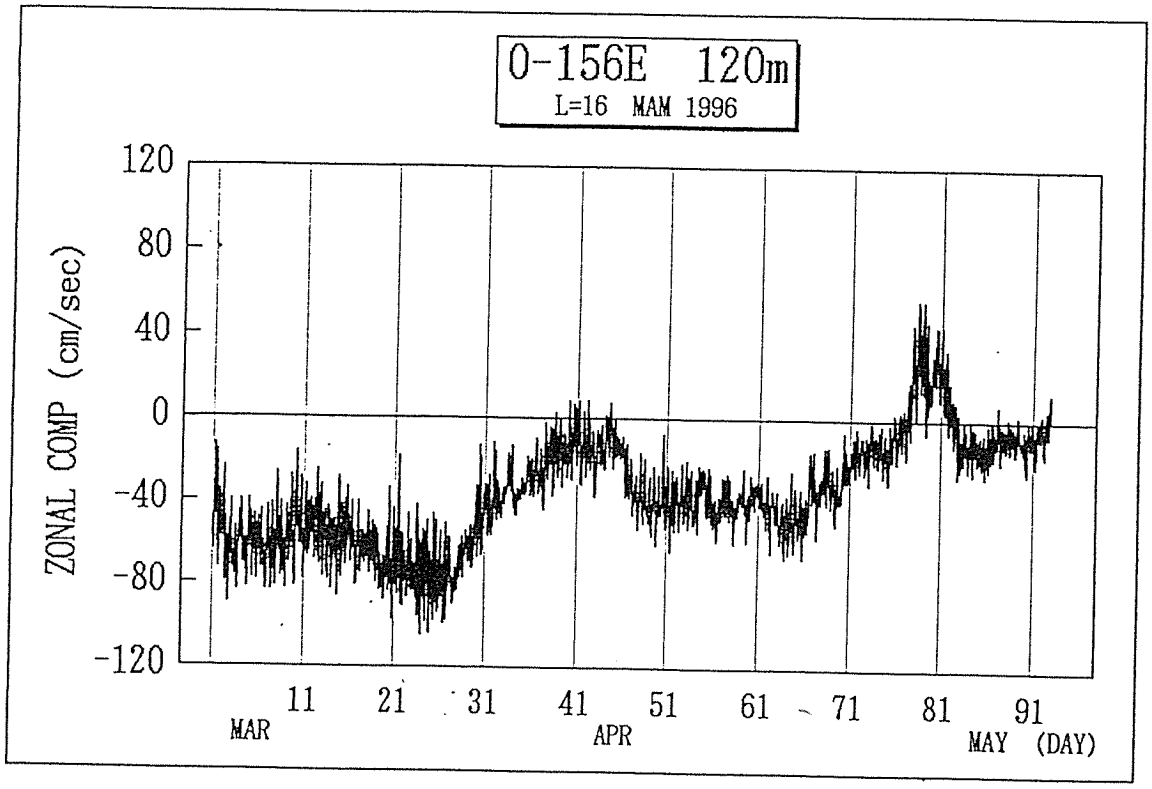


Fig.6-53 Time Series of Velocity



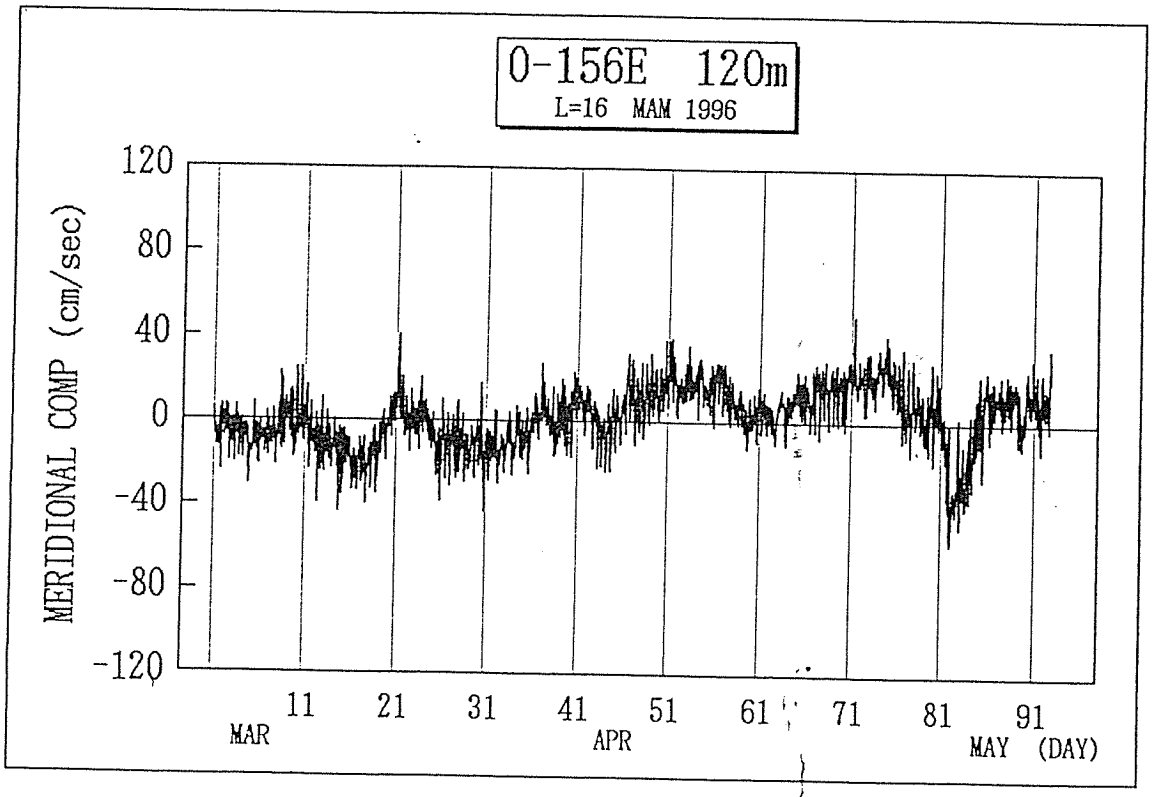
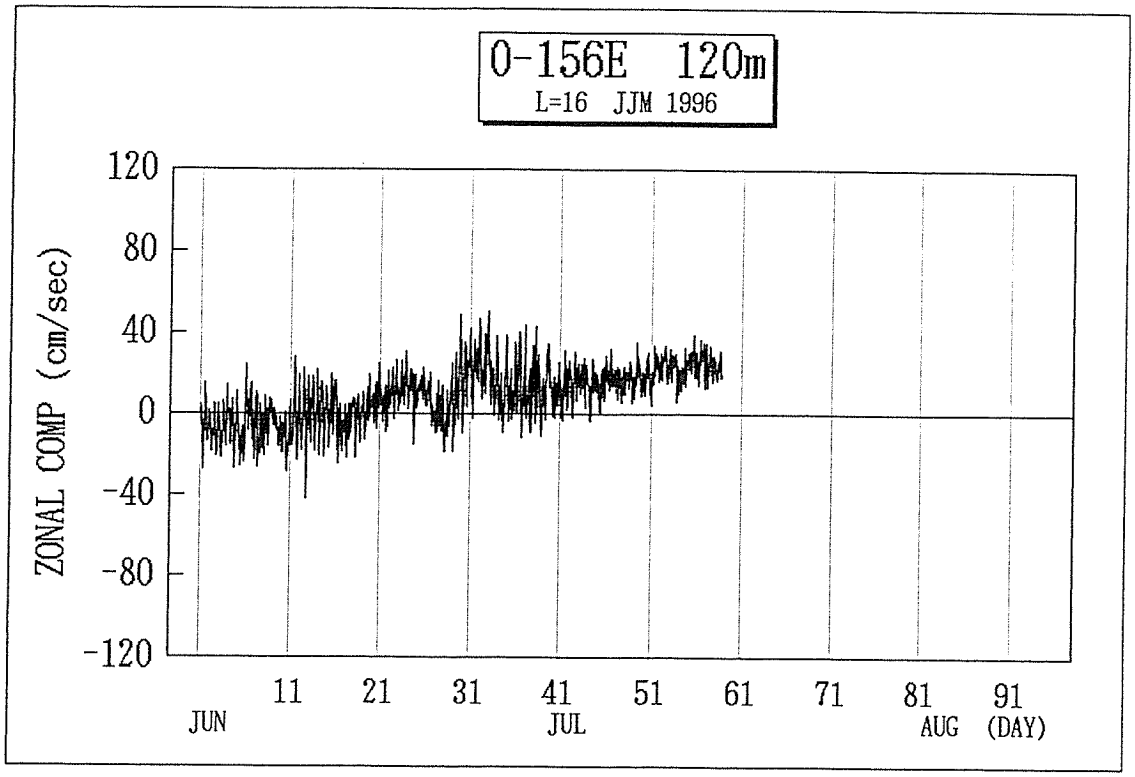


Fig.6-54 Time Series of Velocity



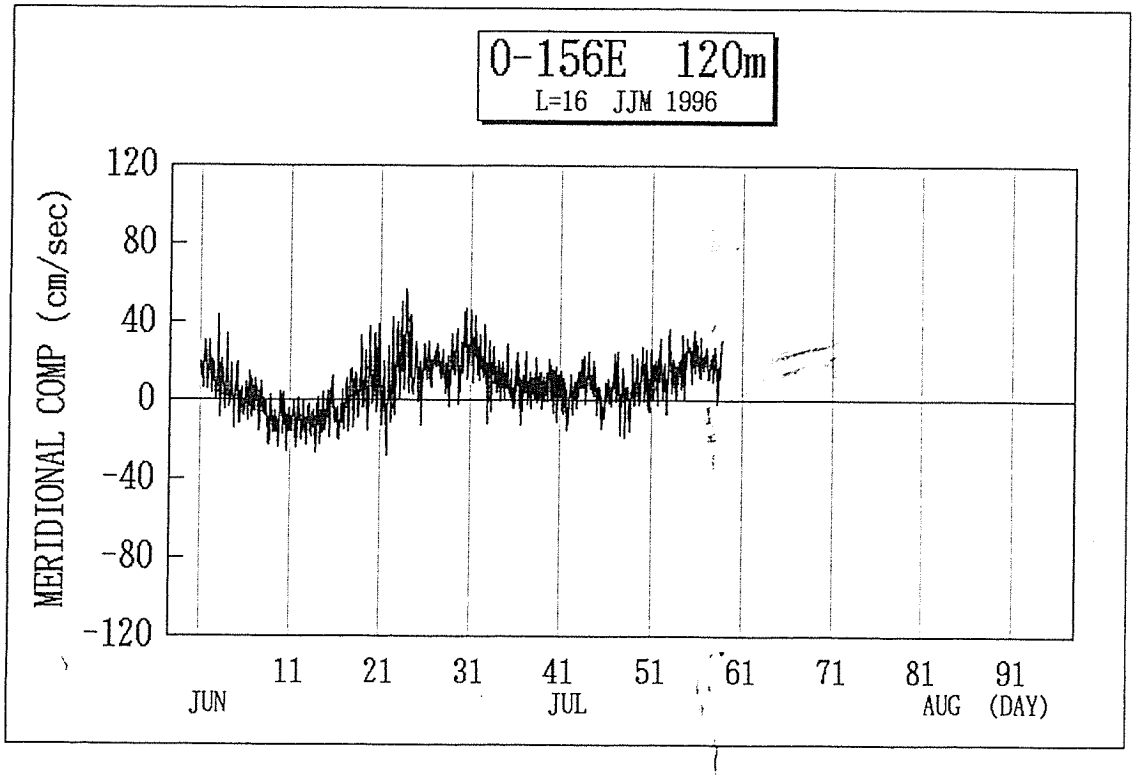
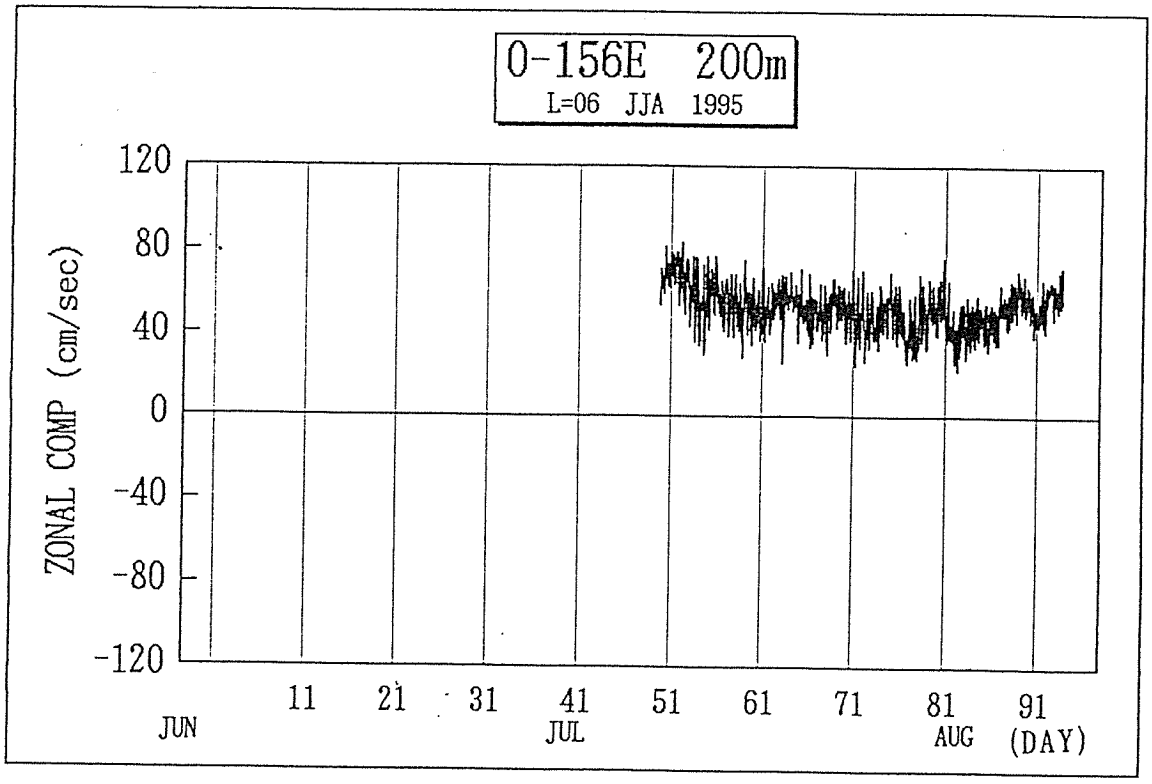


Fig.6-55 Time Series of Velocity



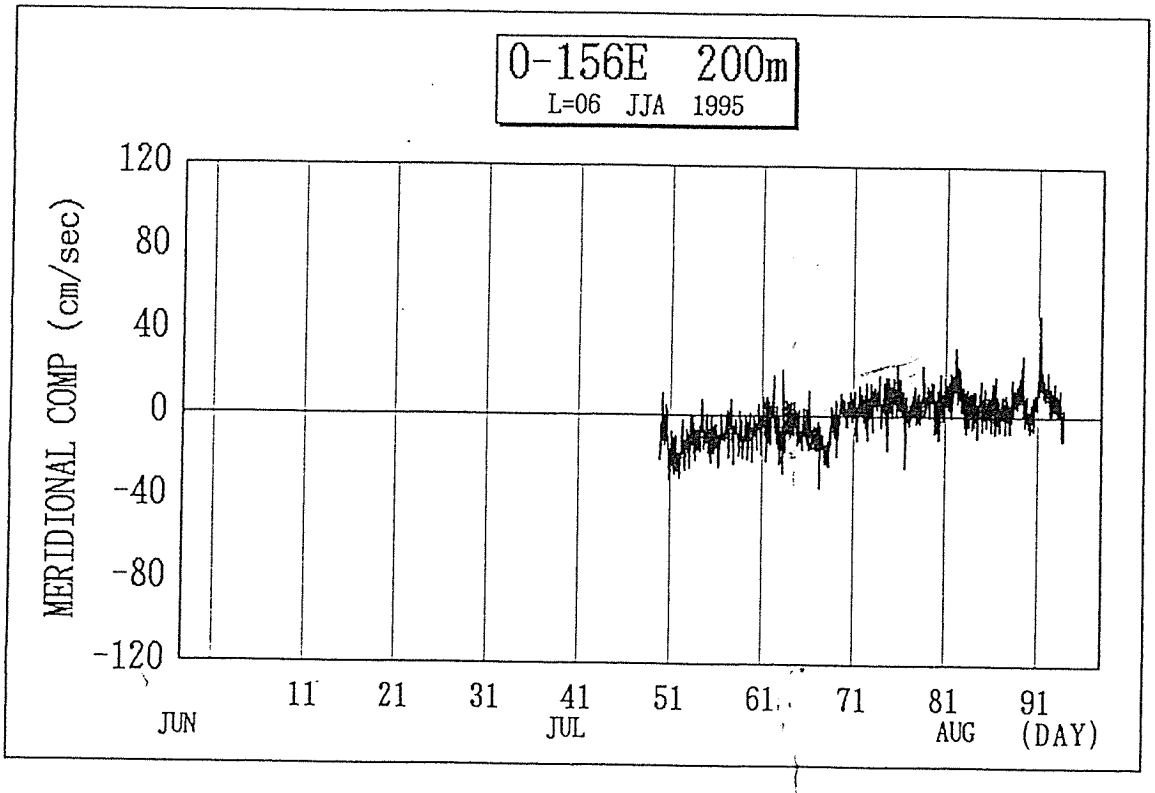
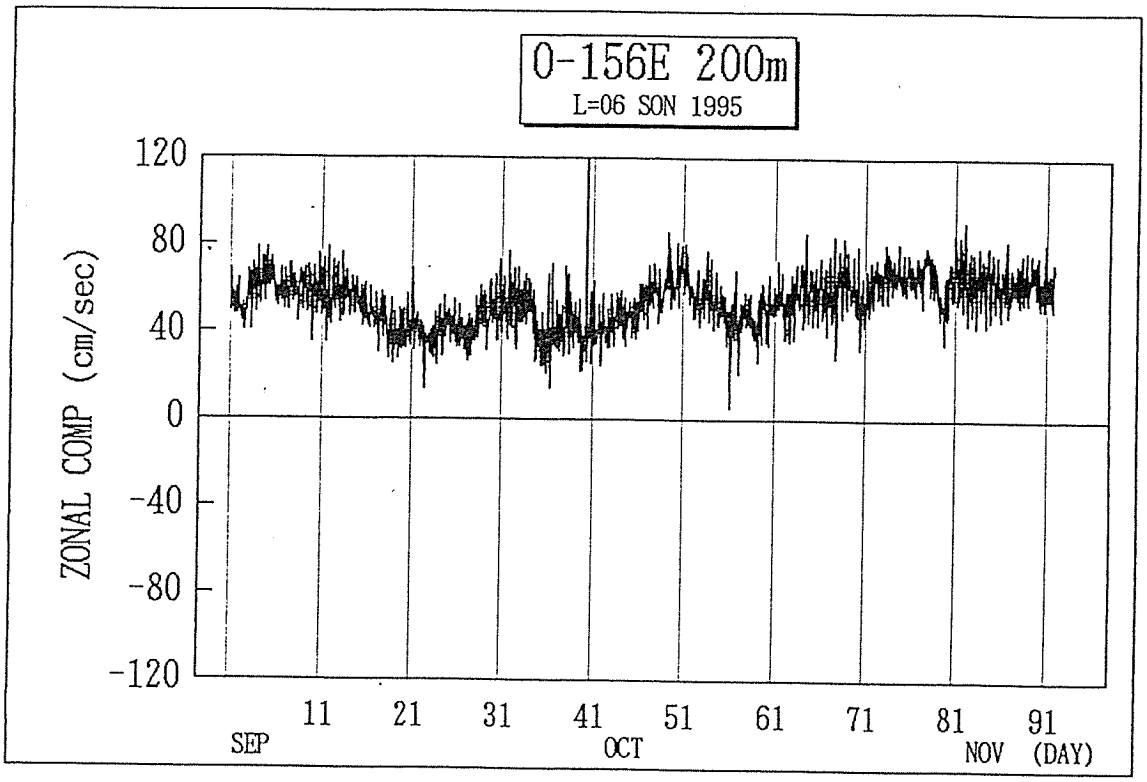


Fig.6-56 Time Series of Velocity



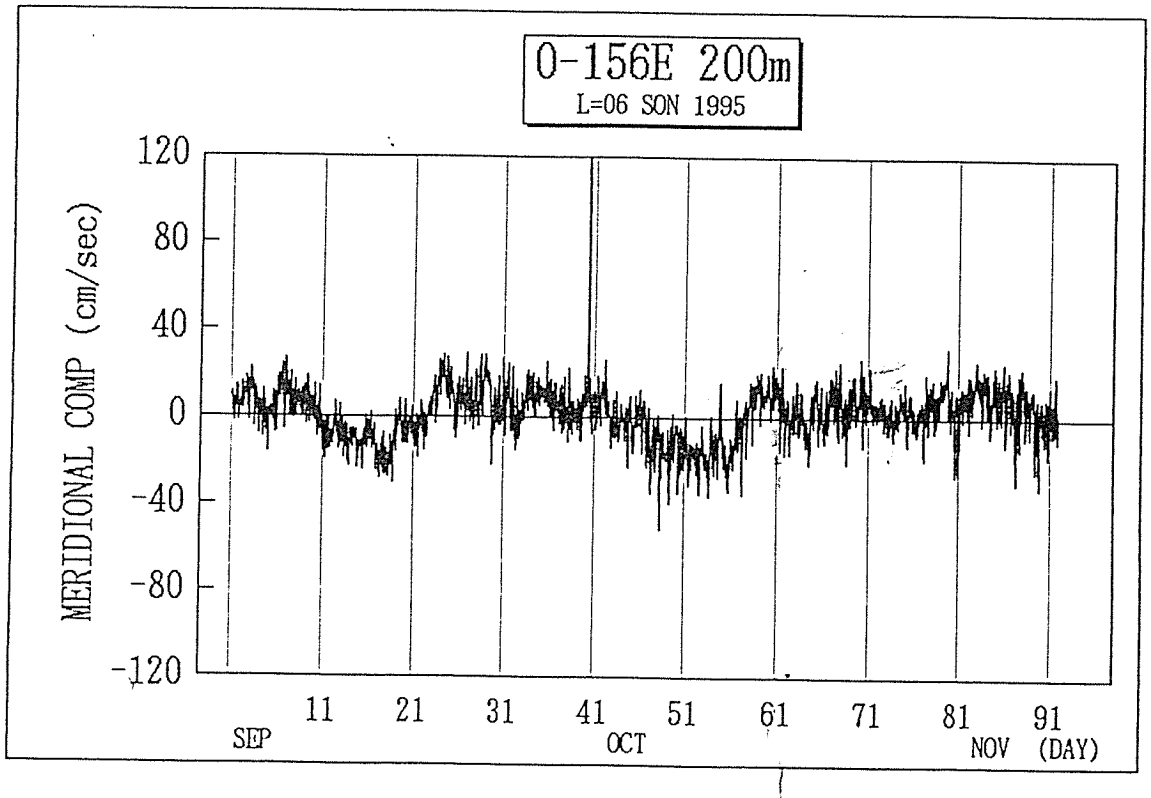
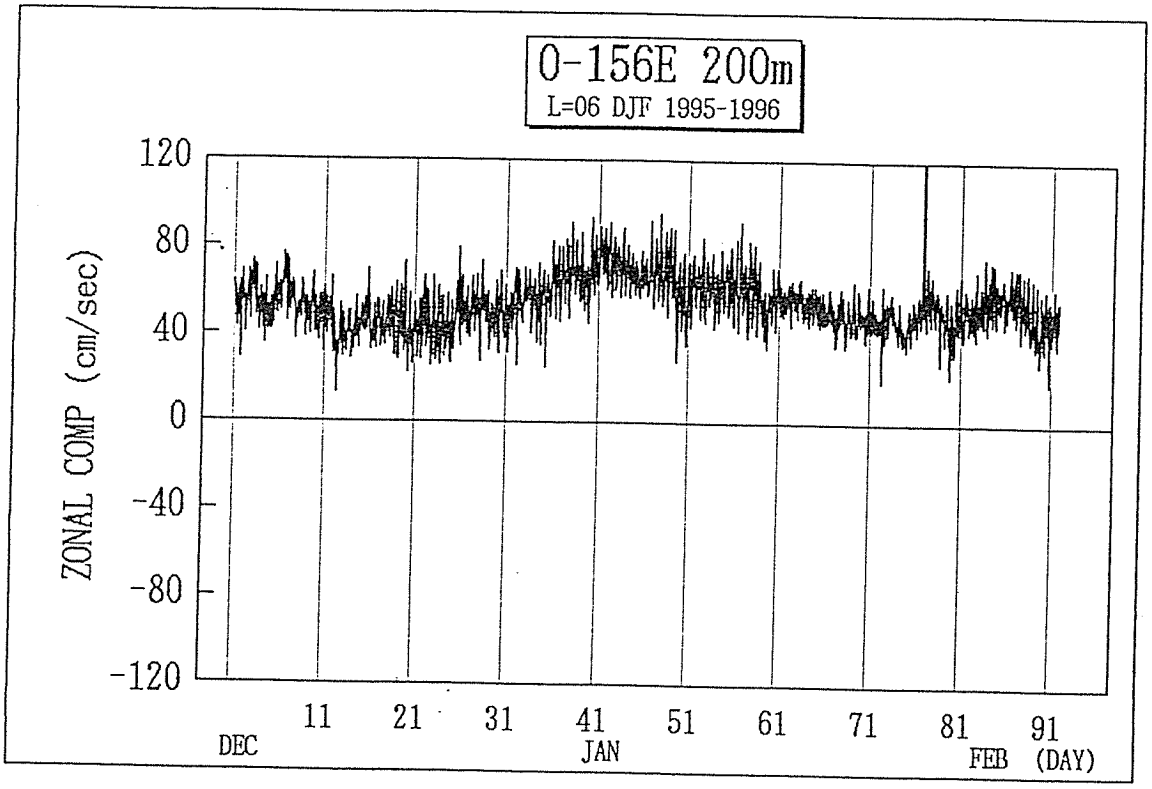


Fig.6-57 Time Series of Velocity



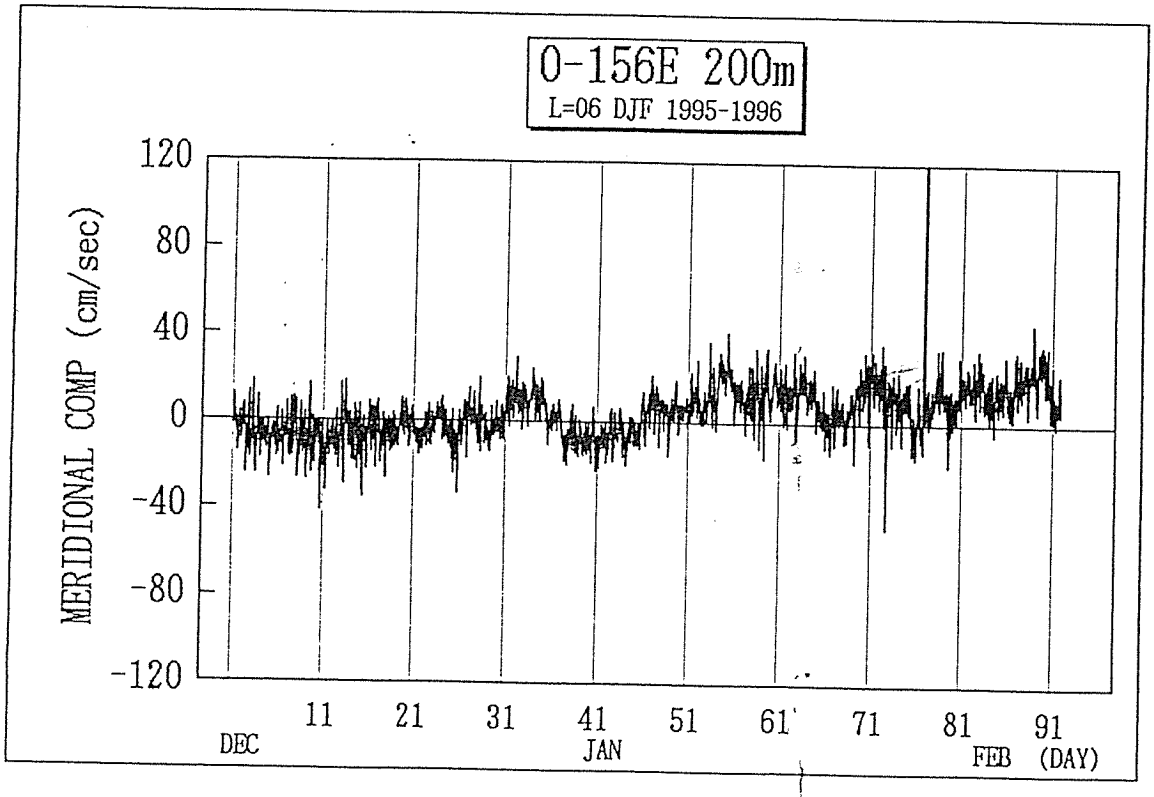
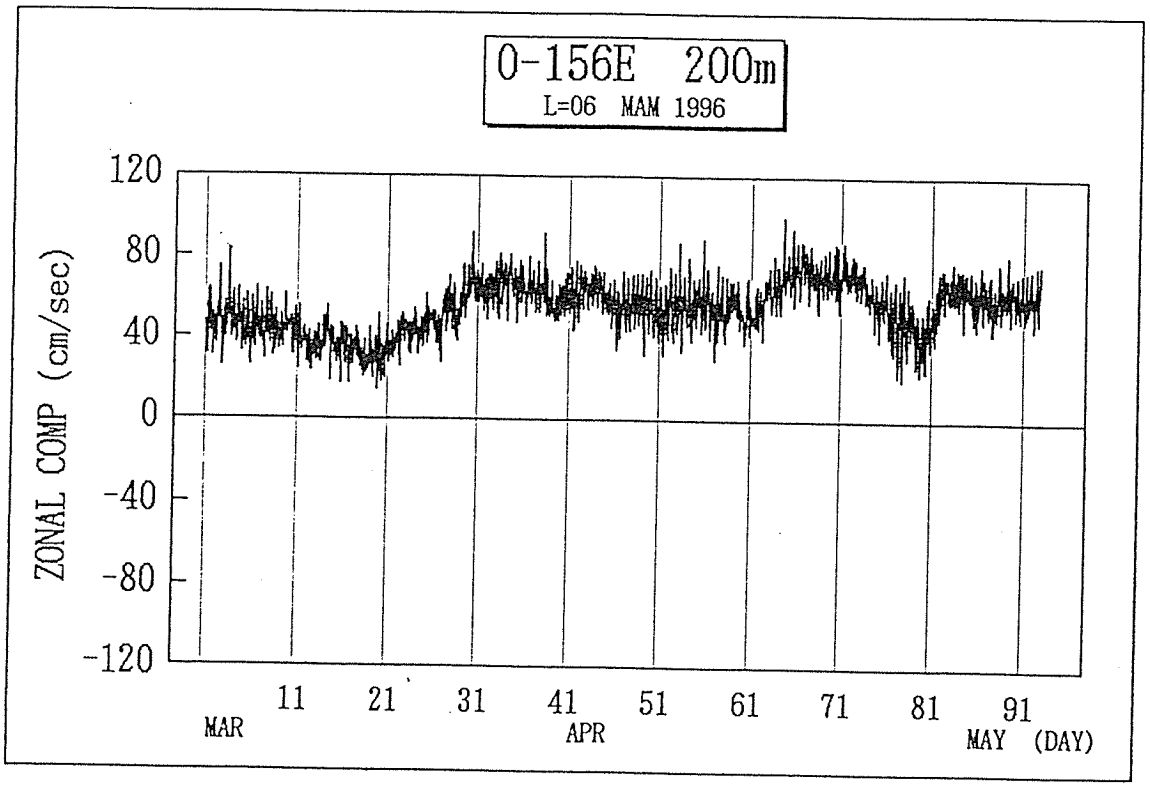


Fig.6-58 Time Series of Velocity



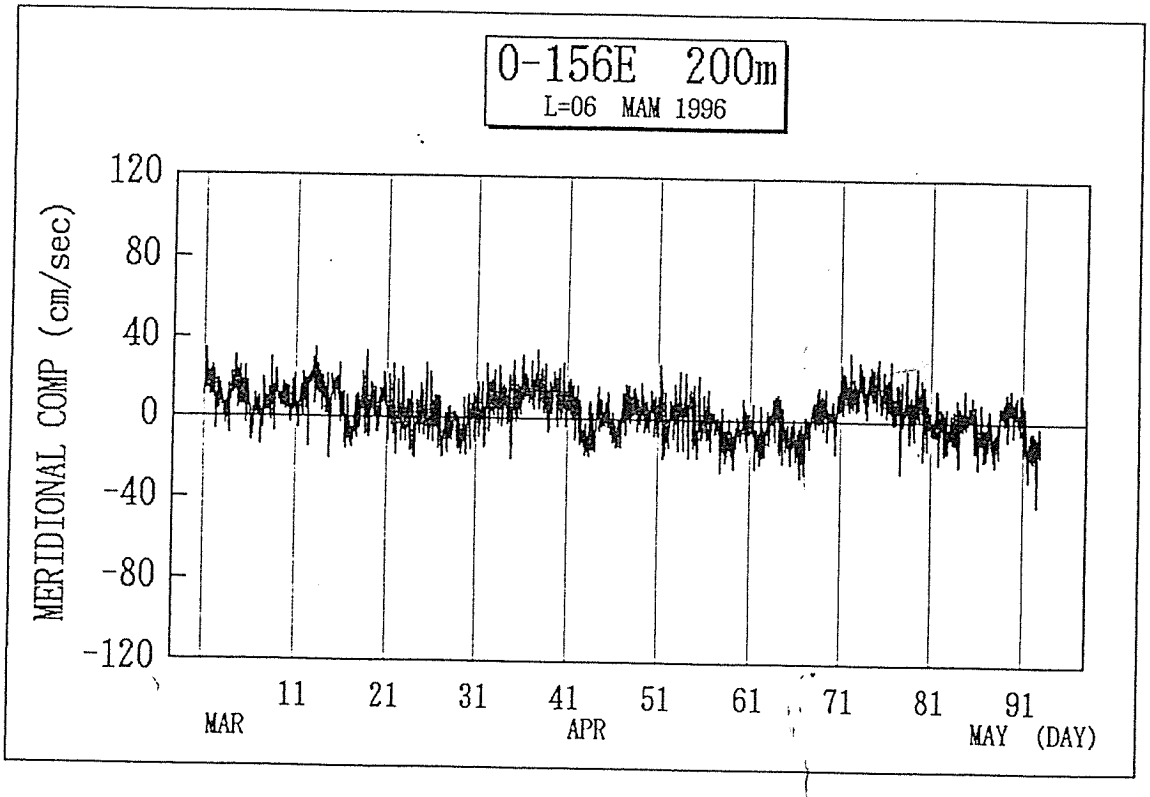
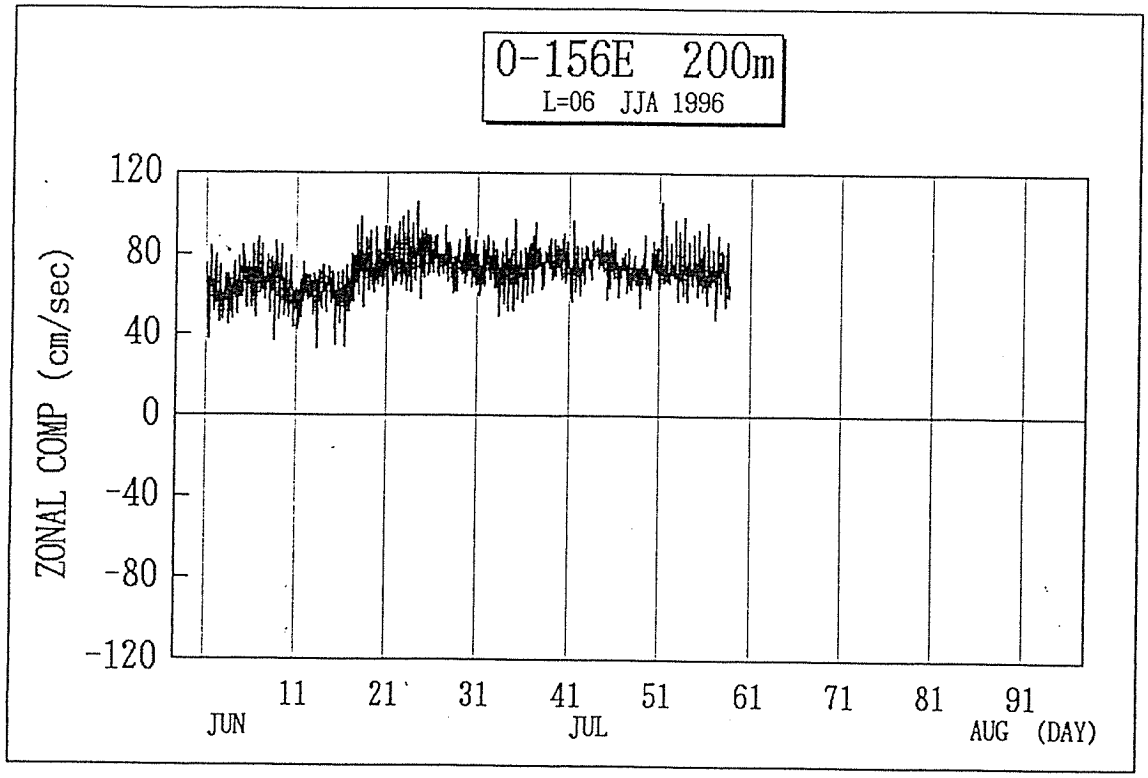


Fig.6-59 Time Series of Velocity



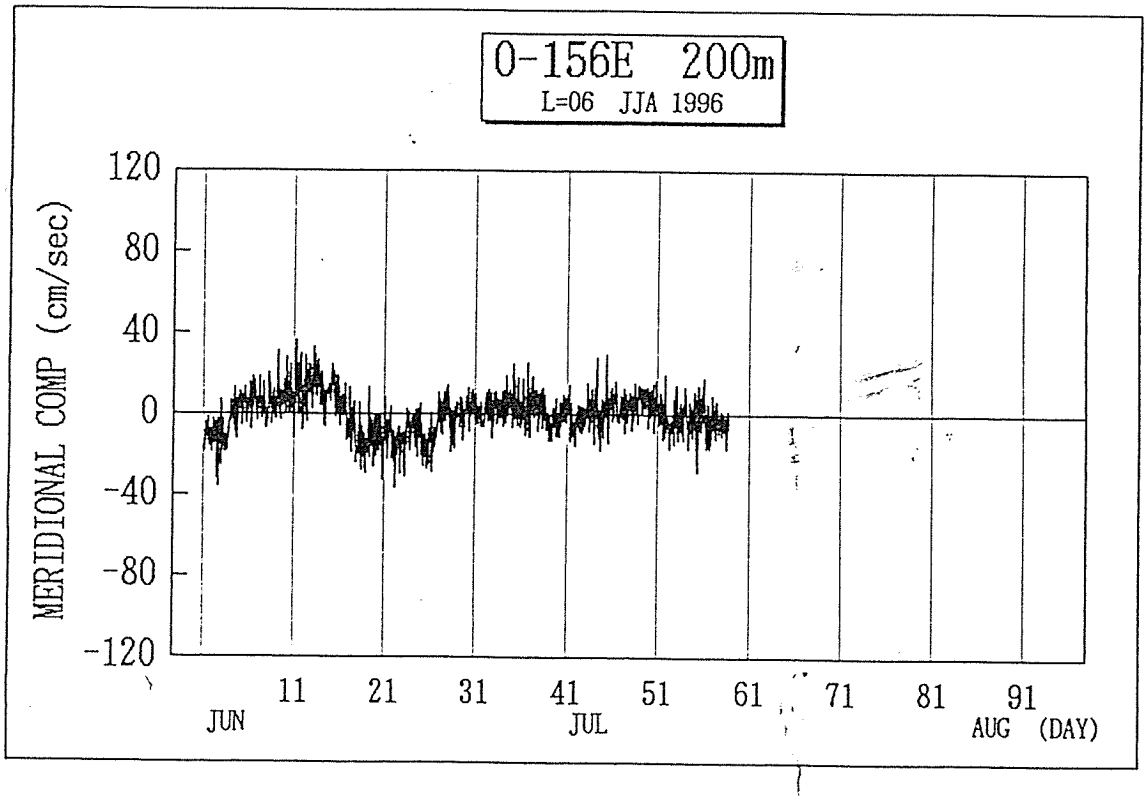


Fig.6-60 Time Series of Velocity

DEPLOYMENT & RECOVERY

MOORING No. 950708-00138E

PROJECT	TOCS	TIME	
AREA		RECORDER (D)	Y. KURODA
POSITION	0°, 138°E	(R)	M. FUJISAKI
DEPTH	3910m		
PERIOD	9. July. 1995 ~ 10. July 1996	NAVIGATION SYSTEM :	WGS84
No.of DAYS	370		
LENGTH :	3625 m	DEPTH of BUOY :	285 m BUOYANCY : kg

ACOUSTIC RELEASER

TYPE	BENTHOS upper	TYPE	BENTHOS bottom
S/N	692	S/N	663
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0 kHz
TRANSMIT F.	14.0 kHz	TRANSMIT F.	13.5 kHz
ENABLE C.	E	ENABLE C.	C
RELEASE C.	D	RELEASE C.	B
BATTERY	2 years	BATTERY	2 years
TEST on DECK	OK	TEST on DECK	OK

DEPLOYMENT

DATE 8 July 1995 UTC SHIP Kaiyo CRUSE No. K9505

WEATHER Cloud CONDITIONS wave 0.6m 6.8s DIR. of WIND 100° VEL. of WIND 05m/s

DEPTH 3910 m DEPTH of A.R. 3756 m DESCEND. RATE 2.7 m/s BUOY :

POS. of STRT 0° 01.278S 138° 01.394E 21:35 HOR.RANGE m

POS. of DEP. 0° 01.240S 138° 01.924E 22:59 SINKER 23:59 DISAPPEAR. :

POS. of MOORING 0° 01.252S 138° 01.907E LANDING 23:23

NOTE

Local. Time : 9 July 95 06:35 start

Current 1.5~2KT 280°

Rain 22:40

~~H 536 324°~~

	TIME	S/R	DEPTH
SSBL	23:04:20		931
	05:21		1114
	06:57		1415
	11:27		2380
	23:00		3762
	125:07		3756

RECOVERY

DATE 10 July 1996 (UTC) SHIP KAIYO CRUSE No. K96-06

WEATHER C CONDITIONS 0.5m 7°S DIR. of WIND 020° VEL. of WIND 3.0 m/s

START of RELEASE 20 : 34 (UTC) FINISH of RELEASE 20 : 35

POS. of DISCOVERY 00° 01.654S 138° - 01.451 E ASCENDING RATE 1.3 m/s

DIRECTION 043° DISTANCE 1093 m

NOTE

ガラスま 海面まで浮上せず。

↓

3本目のケブラー巻き取り中に浮上カクニン

20:43

ADCP. ABSブイ 海面浮上カクニン

	TIME	S/R	DEPTH
SSBL	20:35		3731.7
	20:45		2552.2
	20:55		1535.3
	21:05		733.2
	21:10		506.5
	21:20		267.2

TIME RECORD

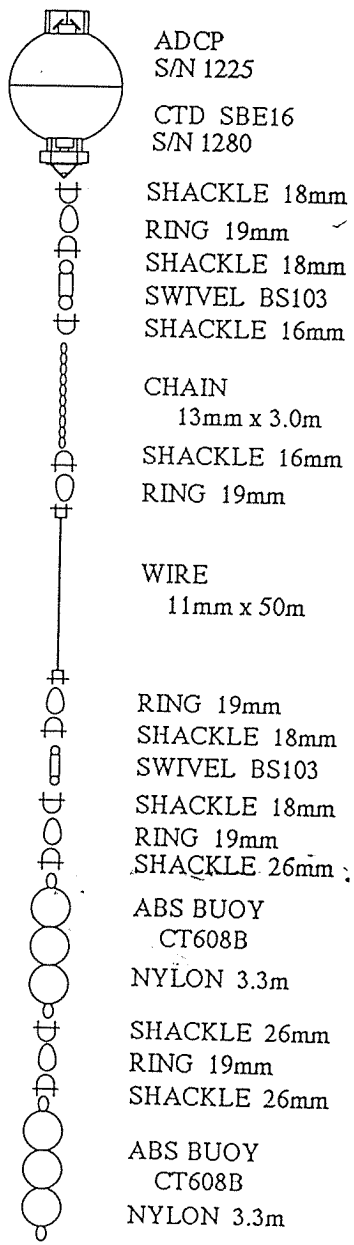
MOORING NO. : 950708-00138E

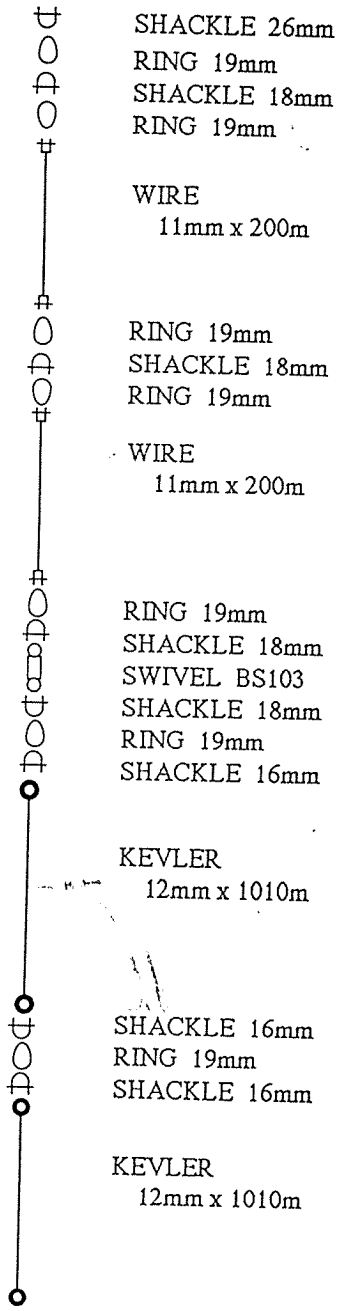
		DEPLOYMENT		RECOVERY (Date : 960710	
		START : 21 : ~~00~~ 32		START : 21 : 45 ロープつなぎとり	
		FINISH : 22 : 59		FINISH : 23 : 25	
ITEMS	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP	1225	21 : 35	with CTD 1280	21 : 55	
WIRE	50m	21 : 35 ~ 21 : 41	Aフレーム トラブル	21 : 59 ~ 22 : 02	
ABS BUOY	3	21 : 42		22 : 03	
〃	3	21 : 42		22 : 03	
WIRE	200m	21 : 43 ~ 21 : 45		22 : 07 ~ 22 : 12	
〃	200m	21 : 48 ~ 21 : 50		22 : 13 ~ 22 : 17	
KEVLER	1010m	21 : 52 ~ 22 : 07		22 : 19 ~ 22 : 39	
〃	1010m	22 : 09 ~ 22 : 28		22 : 43 ~ 23 : 03	
〃	1010m	22 : 29 ~ 22 : 47		23 : 05 ~ 23 : 22	23 : 09 ガラス玉浮上 カクニン
GLASS BALL	10	22 : 52		23 : 23	
A. R.	1	22 : 52	692	23 : 23	
〃	1	22 : 53	663	23 : 25	22 : 23 上甲板に回収後 作業甲板へ移す
NYLON	94m	22 : 53 ~ 22 : 54			
SINKER		22 : 59			

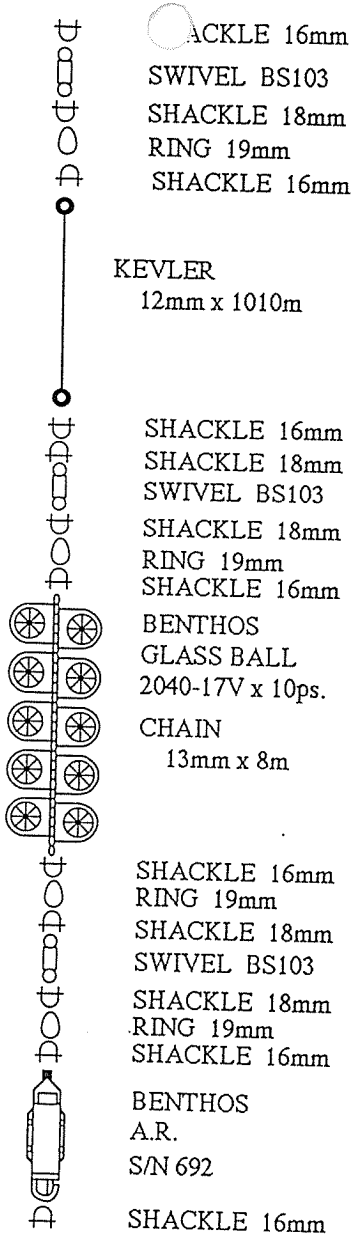
L. T. 6:00 AM Depth of Water 3910 m
開始してすぐ Aフレームの不調

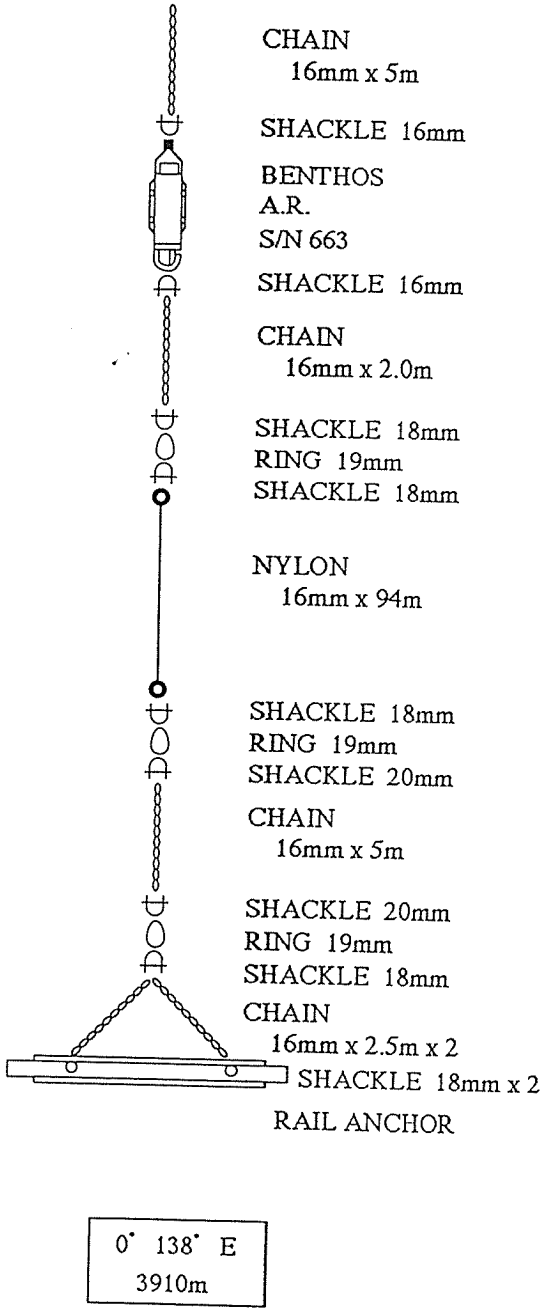
BENTHOS GLASS BALL 海面まで浮上せず。
ケブラーロープ3本目巻き上げ中(23:09)
海面浮上確認。

Fujisaki


ADCP
S/N 1225
CTD SBE16
S/N 1280
SHACKLE 18mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm
CHAIN
13mm x 3.0m
SHACKLE 16mm
RING 19mm
WIRE
11mm x 50m
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 26mm
ABS BUOY
CT608B
NYLON 3.3m
SHACKLE 26mm
RING 19mm
SHACKLE 26mm
ABS BUOY
CT608B
NYLON 3.3m


SHACKLE 26mm
RING 19mm
SHACKLE 18mm
RING 19mm
WIRE
11mm x 200m
RING 19mm
SHACKLE 18mm
RING 19mm
WIRE
11mm x 200m
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
KEVLER
12mm x 1010m
SHACKLE 16mm
RING 19mm
SHACKLE 16mm
KEVLER
12mm x 1010m


ACKLE 16mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
KEVLER
12mm x 1010m
SHACKLE 16mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
BENTHOS
GLASS BALL
2040-17V x 10ps.
CHAIN
13mm x 8m
SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
BENTHOS
A.R.
S/N 692
SHACKLE 16mm


CHAIN
16mm x 5m
SHACKLE 16mm
BENTHOS
A.R.
S/N 663
SHACKLE 16mm
CHAIN
16mm x 2.0m
SHACKLE 18mm
RING 19mm
SHACKLE 18mm
NYLON
16mm x 94m
SHACKLE 18mm
RING 19mm
SHACKLE 20mm
CHAIN
16mm x 5m
SHACKLE 20mm
RING 19mm
SHACKLE 18mm
CHAIN
16mm x 2.5m x 2
SHACKLE 18mm x 2
RAIL ANCHOR

0° 138° E
3910m

DEPLOYMENT & RECOVERY

MOORING No. 960711-00138E

PROJECT	TOCS	TIME	
AREA		RECORDER (D)	M. FUJISAKI
POSITION	0° 138°E	(R)	
DEPTH	≒ 910		
PERIOD	11 July 1996 ~	NAVIGATION SYSTEM :	
No.of DAYS			
LENGTH :	m	DEPTH of BUOY : m	BUOYANCY : kg

ACOUSTIC RELEASER

TYPE	BENTHOS (upper)	TYPE	BENTHOS (bottom)
S/N	719	S/N	631
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0 kHz
TRANSMIT F.	14.0 kHz	TRANSMIT F.	13.5 kHz
ENABLE C.	E	ENABLE C.	C
RELEASE C.	D	RELEASE C.	B
BATTERY	2 Years	BATTERY	2 Years
TEST on DECK	OK	TEST on DECK	OK

DEPLOYMENT

DATE 11 July 1996 SHIP KAIYO CRUSE No. K9606

WEATHER Cloud CONDITIONS wave 0.2m 7.4m/s DIR. of WIND 042 VEL. of WIND 5.2 m/s

DEPTH 3904m DEPTH of A.R. 3729 m DESCEND. RATE 2.2 m/s BUOY 00:16

POS. of STRT 0° 01.422S 137° 59.769E HOR.RANGE m

POS. of DEP. 0° 01.320S 138° 01.837E SINKER 01:41 DISAPPEAR. 01:52

POS. of MOORING 00° 01.236S 138° 01.795E LANDING 02:09

NOTE

- ガラスま.
  設置前に回収したものを再使用の予定であったが、回収時、海面まで浮上しなかったため新しいガラスまを使用。
- ワイヤー
  端末加工に不安があった（ボルト、ナット、割りピンで固定するのではなく割りピンのみで固定する仕様）ため、回収したワイヤの端末を流用した。

SSBL	TIME	S/R	DEPTH
S	01:41		56.7
S	01:45		624.3
B	01:49		1337.4
L	01:54		2105.8
	02:00		2997.9
	02:07		3579.1

RECOVERY

DATE SHIP CRUSE No.

WEATHER CONDITIONS DIR. of WIND VEL. of WIND

START of RELEASE : FINISH of RELEASE :

POS. of DISCOVERY ° ° ASCENDING RATE m/s

DIRECTION ° DISTANCE m

NOTE

SSBL	TIME	S/R	DEPTH
S			
S			
B			
L			

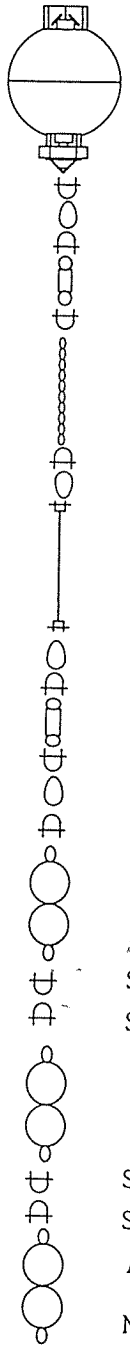
TIME RECORD

MOORING NO. 960711 - 00138E

		DEPLOYMENT		RECOVERY (Date:)	
		START : 00:13 FINISH : 01:41		START : FINISH :	
ITEM	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP & CTD	ADCP: 1221 CTD: 1279	00:16	ADCPわくに CTD取り付け		
WIRE	11mm x 50m	00:16 ~ 00:18			
ABS BUOY	CT608B 2連	00:20			
〃	〃	00:20			
〃	〃	00:20			
WIRE	11mm x 200m	00:20 ~ 00:28			
〃	〃	00:28 ~ 00:32			
KEVLER	12mm x 984m (USED)	00:32 ~ 00:51	水色 941013 147-B		
〃	〃	00:51 ~ 01:03	みどり 941012 142-A		
KEVLER	12mm x 505m (NEW)	01:05 ~ 01:10	青 9506		
KEVLER	12mm x 484m (USED)	01:12 ~ 01:17	黄 941012 147-D		
GLASS BALL	10ps.	01:27	NEW		
A. R.	719	01:27			
〃	631	01:28			
NYLON	16mm x 175	01:28 ~ 01:32			
RAIL ANCHOR	1.8ton	01:41			

- ワイヤーの端末は、回収したものを流用.
- ガラス玉は、新しいものを使用.
- ナイロン 173 → 175m

記録：Fujisaki



ADCP
S/N 1221

CTD SBE16
S/N 1279

SHACKLE 26mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm

CHAIN
13mm x 3.0m
SHACKLE 16mm
RING 19mm

WIRE
11mm x 50m

RING 19mm
SHACKLE 18mm
SWIVEL BS103

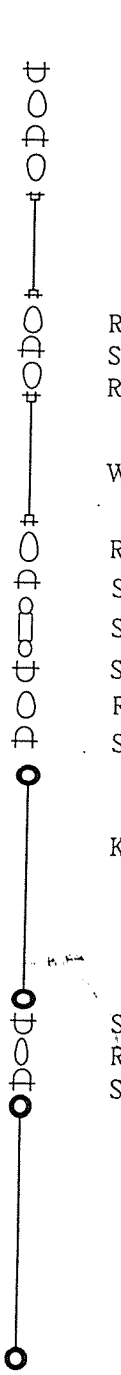
SHACKLE 18mm
RING 19mm
SHACKLE 26mm
ABS BUOY
CT608B
NYLON 2.2m

SHACKLE 26mm
SHACKLE 26mm

ABS BUOY
CT608B
NYLON 2.2m

SHACKLE 26mm
SHACKLE 26mm

ABS BUOY
CT608B
NYLON 2.2m



SHACKLE 26mm
RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
RING 19mm

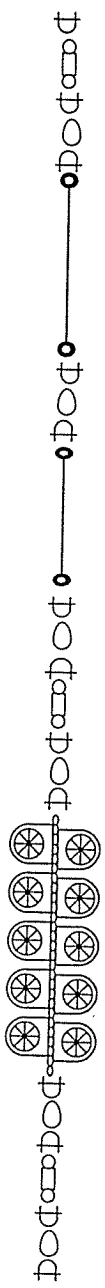
WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

KEVLER (USED)
12mm x 984m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER (USED)
12mm x 984m



SHACKLE 16mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

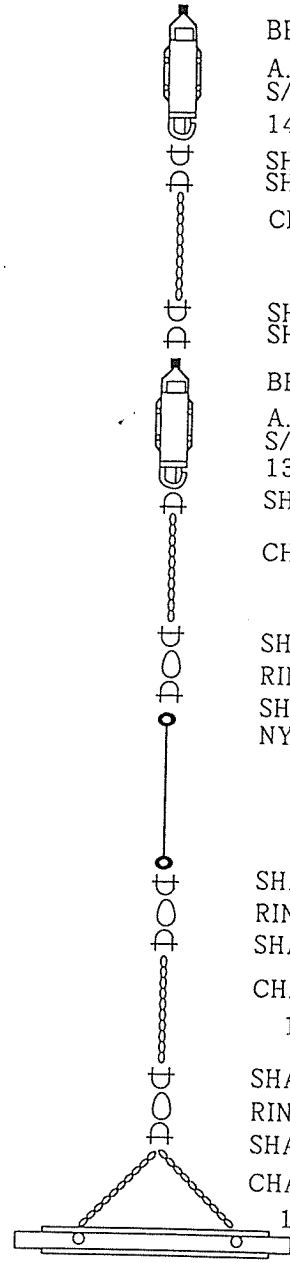
KEVLER (NEW)
12mm x 505m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER (USED)
12mm x 484m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
BENTHOS
GLASS BALL
2040-17V x 10ps.
CHAIN
13mm x 8m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm



BENTHOS
A.R.
S/N 719 E.C.=E
14.0kH R.C.=D
SHACKLE 16mm
SHACKLE 16mm
CHAIN
16mm x 5m

SHACKLE 16mm
SHACKLE 16mm

BENTHOS
A.R.
S/N 631 E.C.=C
13.5kH R.C.=B
SHACKLE 16mm

CHAIN
16mm x 2.0m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm
NYLON
16mm x 175m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm

CHAIN
16mm x 5m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm
CHAIN
16mm x 2.5m x 2

SHACKLE 18mm x 2
RAIL ANCHOR

0° 138° E
3910m

DEPLOYMENT & RECOVERY

MOORING No. 950710-2.5SK2E

PROJECT	TOCS	TIME	
AREA		RECORDER (D)	KURODA
POSITION	2°-30S 142°E	(R)	Fujisaki
DEPTH	3440m		
PERIOD	10 July 1995 ~ 12 July '96	NAVIGATION SYSTEM :	WGS'84
No.of DAYS			
LENGTH :	m	DEPTH of BUOY : m	BUOYANCY : kg

ACOUSTIC RELEASER

TYPE	BENTHOS	TYPE	BENTHOS
S/N	664	S/N	664
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0 kHz
TRANSMIT F.	14.5 kHz	TRANSMIT F.	14.0 kHz
ENABLE C.	G, A	ENABLE C.	D
RELEASE C.	F	RELEASE C.	C
BATTERY	2 years	BATTERY	2 years
TEST on DECK	OK	TEST on DECK	OK

DEPLOYMENT

DATE 10 July 1995 UTC SHIP KAIYO CRUSE No. K9505

WEATHER Cloud CONDITIONS Wave H. 2.5m T 7.5 DIR. of WIND 150 VEL. of WIND 1m

DEPTH 3436 m DEPTH of A.R. 3265 m DESCEND. RATE 2.7 m/s BUOY :

POS. of STRT 02° 28.421 S 141° 57.722 E 21:10 HOR.RANGE m

POS. of DEP. 02° 28.667 S 141° 58.350 E 22:10 SINKER 22:09 DISAPPEAR. 22:21

POS. of MOORING 02° 28.623 S 141° 58.282 E LANDING 22:30

NOTE Start Local 06:10 11 July 95

134m Nylon Rope

SSBL	TIME	S/R	DEPTH
S	22:16:19	664	1117
S	16:48		1212
B	17:36		1356
L	22:24:32		2472
	24:56		2538
	30:30		3240
	30:31		3230

着底 by SSBL

RECOVERY

DATE 12 July 1996 SHIP KAIYO CRUSE No. K9606

WEATHER 0 CONDITIONS 03m 8.0S DIR. of WIND 090° VEL. of WIND 5 m/s

START of RELEASE 22:31 FINISH of RELEASE 22:31

POS. of DISCOVERY 02° 28.866S 141° 58.151E ASCENDING RATE m/s

DIRECTION 336° DISTANCE 650 m (Radar)

NOTE

134m Nylon Rope

ガラス、

海面まで浮上せず"

A.R. 追跡できず。

SSBL	TIME	S/R	DEPTH
S	1		
S	4		
B			
L			

TIME RECORD

MOORING NO. : 950710-25S142E

		DEPLOYMENT		RECOVERY (Date : 960712)	
		START : 21:09		START : 23:07	
		FINISH : 22:09		FINISH : 00:28 (960713) UTC	
ITEMS	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP	1155	21:11	CTD 1287	23:13	
WIRE	50m	~ 21:13		23:17 ~ 23:19	
ABS BUOY	3	21:13		23:20	
〃	3	21:14		23:20	
WIRE	200m	21:14 ~ 21:18		23:26 ~ 23:29	巻き上げ中 漁船近づく
〃	200m	21:20 ~ 21:22		23:30 ~ 23:34	
KEVLER	1000m	21:24 ~ 21:33		23:36 ~ 23:54	
〃	1000m	21:35 ~ 21:46		23:56 ~ 00:14	
〃	500m	21:48 ~ 21:54		00:17 ~ 00:25	
GLASS BALL	10	21:59		00:26	
A. R.	694	~~21~~ 22:00	14.5 G. F	00:26	
〃	664	~~21~~ 22:00	14.0 P. C	00:26	
NYLON	134m	22:00 ~ 22:02			
ANCHOR		22:09			

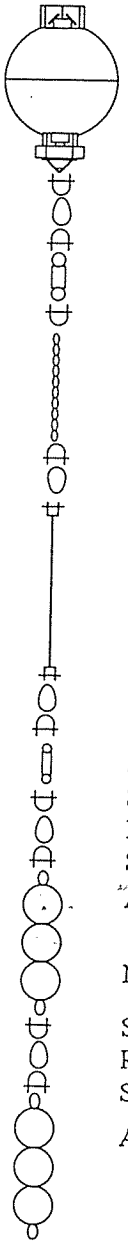
Depth of Water : ~~3460~~ 3440 m

22:28 リリーサ 起こす

23:39 ADCPブイ 浮上確認

22:31 ロープ 離し

ガラス玉、海面まで浮上せず



ADCP
S/N 1155

CTD SBE16
S/N 1287

SHACKLE 18mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm

CHAIN
13mm x 3.0m

SHACKLE 16mm
RING 19mm

WIRE
11mm x 50m

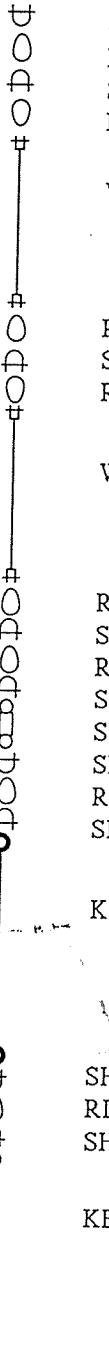
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B

NYLON 3.3m

SHACKLE 26mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B



SHACKLE 26mm
RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
RING 19mm

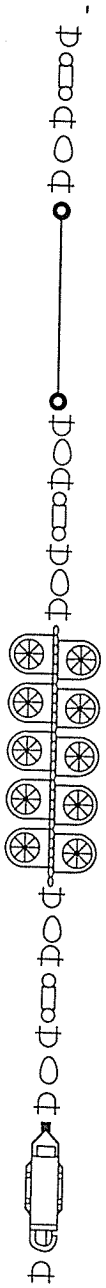
WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

KEVLER
12mm x 1010m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER
12mm x 1010m



SHACKLE 16mm

SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

KEVLER
12mm x 505m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

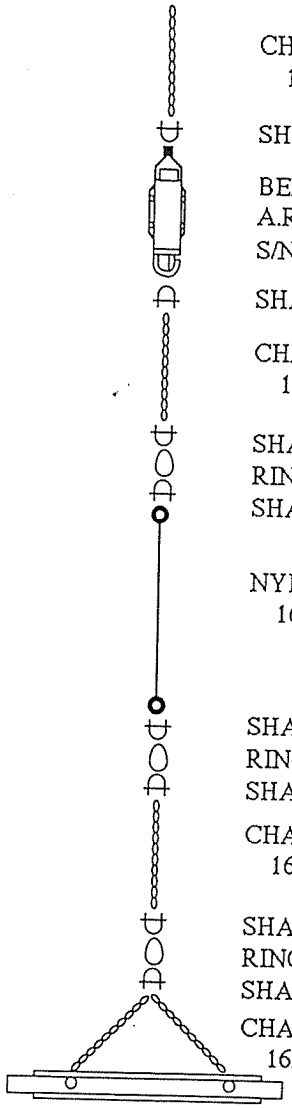
BENTHOS
GLASS BALL
2040-17V x 10ps.

CHAIN
13mm x 8m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

BENTHOS
A.R.
S/N 694

SHACKLE 16mm



CHAIN
16mm x 5m

SHACKLE 16mm

BENTHOS
A.R.
S/N 664

SHACKLE 16mm

CHAIN
16mm x 2.0m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm

NYLON
16mm x 134m

SHACKLE 18mm
RING 19mm
SHACKLE 20mm

CHAIN
16mm x 5m

SHACKLE 20mm
RING 19mm
SHACKLE 18mm

CHAIN
16mm x 2.5m x 2

SHACKLE 20mm x 2

RAIL ANCHOR

2.5° S , 142° E
3436m

DEPLOYMENT & RECOVERY

MOORING No. 960713 - 2.5S 142E

PROJECT	TOCS	TIME	
AREA		RECORDER (D)	M. FUJISAKI
POSITION	02°. 30 S 142° E	(R)	
DEPTH	3436		
PERIOD	13 July 1996～	NAVIGATION SYSTEM :	
No.of DAYS			

LENGTH : m DEPTH of BUOY : m BUOYANCY : kg

ACOUSTIC RELEASER

TYPE	BENTHOS A.R UPPER	TYPE	BENTHOS A.R Bottom
S/N	712	S/N	633
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0 kHz
TRANSMIT F.	13.5 kHz	TRANSMIT F.	14.0 kHz
ENABLE C.	B	ENABLE C.	E
RELEASE C.	A	RELEASE C.	D
BATTERY	2 YEARS	BATTERY	2 YEARS
TEST on DECK	OK	TEST on DECK	OK

DEPLOYMENT

DATE 13 July 1996 SHIP KAIYO CRUSE No. K96-06

WEATHER bc CONDITIONS WAVE 0.4m 8.0% DIR. of WIND 095 VEL. of WIND 5.0m

DEPTH 3336 m DEPTH of A.R. 3021 m DESCEND. RATE 2.4 m/s BUOY :

POS. of STRT 02° 27.644S 141° 55.762E HOR.RANGE m

POS. of DEP. 02° 28.235S 141° 57.303E SINKER 01 : 42 DISAPPEAR. 01 : 55

POS. of MOORING 02° 28.114S 141° 57.242E LANDING 02 : 05

NOTE

ABSブイ
6個→7個

GLASS BALL
10個→12個 (138Eで回収分 + New 2個)

ナイロン
180m→100m

SSBL	TIME	S/R	DEPTH
	01:43		52.3
	01:50		1831.8
	01:55		2063.3
	02:00		2800.3
	02:05		3103.2

RECOVERY

DATE SHIP CRUSE No.

WEATHER CONDITIONS DIR. of WIND VEL. of WIND

START of RELEASE : FINISH of RELEASE :

POS. of DISCOVERY ° ° ASCENDING RATE m/s

DIRECTION ° DISTANCE m

NOTE

SSBL	TIME	S/R	DEPTH

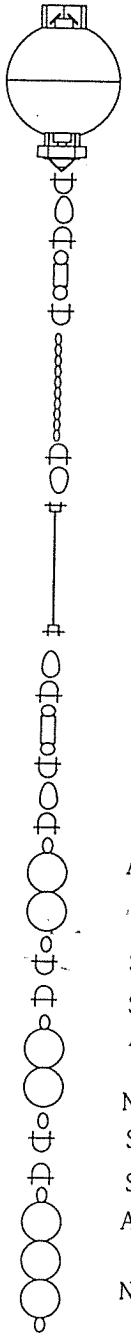
TIME RECORD

MOORING NO. 960713 - 2.5S142E

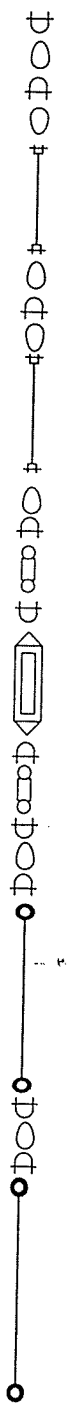
	DEPLOYMENT	RECOVERY (Date:)
	START : 00:40 FINISH : 01:43	START : FINISH :

ITEM	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP & CTD	ADCP 1152 CTD 1284	00:43			
WIRE	50m	00:40~00:41	ワイヤーから入れはじめた.		
ABS BUOY	2	00:47			
〃	12	00:47			
〃	3	00:48	2連から3連に変更		
WIRE	200m	00:48~00:52			
〃	200m	00:54~00:58			
SACM		01:03			
KEVLER	984m	01:04~01:10	USED 9410 147-C		
〃	984m	01:12~01:20	USED 9410 142-B		
	500m	01:22~01:26	NEW 9506		
GLASS BALL	12	01:33	0° 138°E 回収分プラス 2個(NEW)		
A.R.	712	01:33			
A.R.	633	01:34			
NYLON	100m	01:34~01:36			
ANCHOR		01:43			

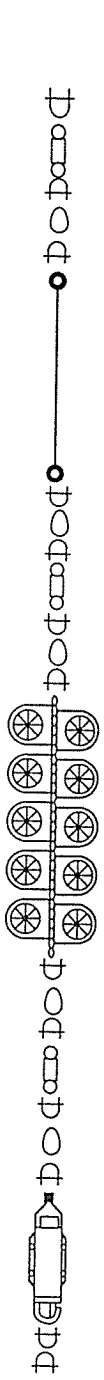
ナイロン
180m(予定) → 100m
ABS ブイ
6個(予定) → 7個
ガラス玉、
10個(予定) → 12個



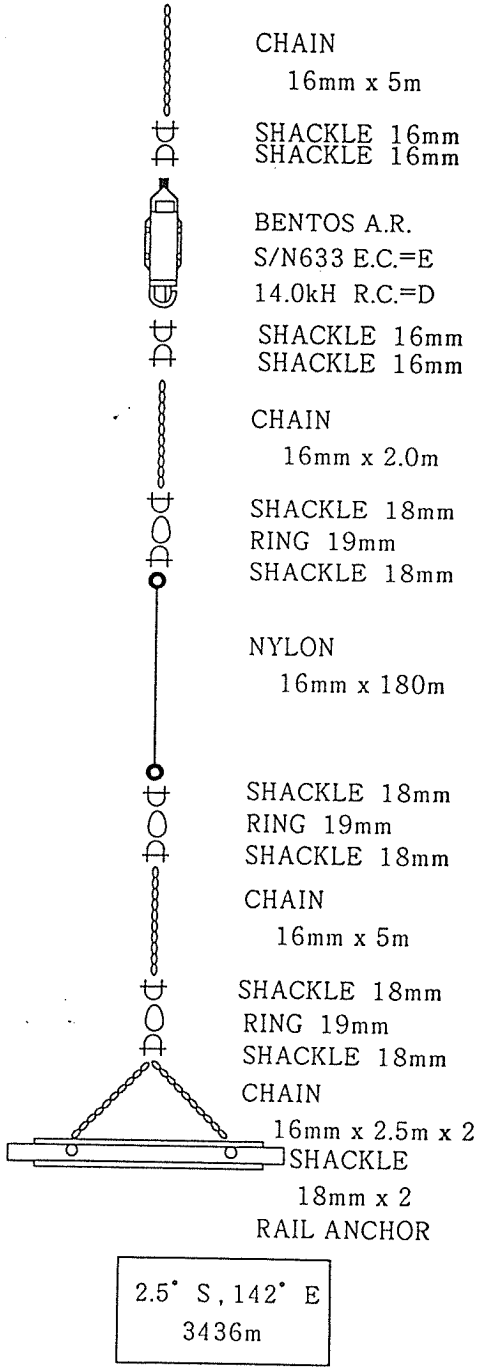
ADCP
S/N1152
CTD SBE16
S/N 1284
SHACKLE 18mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm
CHAIN
13mm x 3.0m
SHACKLE 16mm
RING 19mm
WIRE
11mm x 50m
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 26mm
ABS BUOY
CT608B
NYLON 2.2m
SHACKLE 26mm
SHACKLE 26mm
ABS BUOY
CT608B
NYLON 2.2m
SHACKLE 26mm
SHACKLE 26mm
ABS BUOY
CT608B
NYLON 3.3m



SHACKLE 26mm
RING 19mm
SHACKLE 18mm
RING 19mm
WIRE
11mm x 200m
RING 19mm
SHACKLE 18mm
RING 19mm
WIRE
11mm x 200m
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
SACM
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
KEVLER(USED)
12mm x 984m
SHACKLE 16mm
RING 19mm
SHACKLE 16mm
KEVLER(USED)
12mm x 984m



SHACKLE 16mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
KEVLER(NEW)
12mm x 505m
SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
BENTHOS
GLASS BALL
2040-17V x 12ps.
CHAIN
13mm x 8m
SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm
BENTOS A.R.
S/N712E.C.=B
13.5kHz R.C.=A
SHACKLE 16mm



CHAIN
16mm x 5m
SHACKLE 16mm
SHACKLE 16mm
BENTOS A.R.
S/N633 E.C.=E
14.0kH R.C.=D
SHACKLE 16mm
SHACKLE 16mm
CHAIN
16mm x 2.0m
SHACKLE 18mm
RING 19mm
SHACKLE 18mm
NYLON
16mm x 180m
SHACKLE 18mm
RING 19mm
SHACKLE 18mm
CHAIN
16mm x 5m
SHACKLE 18mm
RING 19mm
SHACKLE 18mm
CHAIN
16mm x 2.5m x 2
SHACKLE
18mm x 2
RAIL ANCHOR

2.5° S, 142° E
3436m

DEPLOYMENT & RECOVERY

MOORING No. 950711-2S142E

PROJECT	TOCS	TIME	
AREA		RECORDER (D)	KURODA
POSITION	2°S 142°E	(R)	
DEPTH	3609 m		
PERIOD	11 July 1995 ~	NAVIGATION SYSTEM :	WGS 84
No.of DAYS			
LENGTH :	3327 m	DEPTH of BUOY : 278 m	BUOYANCY : kg

ACOUSTIC RELEASER

	UPPER		BOTTOM	
TYPE	Benthos	TYPE	Benthos	
S/N	689	S/N	665	
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0	kHz
TRANSMIT F.	13.5 kHz	TRANSMIT F.	14.0	kHz
ENABLE C.	B	ENABLE C.	F	
RELEASE C.	A	RELEASE C.	D	
BATTERY	2years	BATTERY	2years	
TEST on DECK	✓	TEST on DECK	✓	

DEPLOYMENT

DATE	11 July 95 01:33 UTC	SHIP Kaiyo	CRUSE No. K9505
WEATHER bc	CONDITIONS	DIR. of WIND WSW	VEL. of WIND 1.7 m/s
DEPTH 3609 m	DEPTH of A.R. 34 m	DESCEND. RATE m/s	BUOY :
POS. of STRT	02° 00.194S 141° 55.084E 01:33	HOR.RANGE m	
POS. of DEP.	01° 59.993S 142° 00.060E 02:38	SINKER :	DISAPPEAR. :
POS. of MOORING	2°00.079S 141° 59.907E		LANDING :

NOTE 11 July 95 10:31 start
M 1156
B 2742
A 3443
02-00.105S
142-00.537E) ship
3:02

	TIME	H S/R	DEPTH
S	02:35:30	503	716
S	02:39:45	976	1471
B	02:46:29		2155
L	02:47:03		2554
	02:55:00		3434

RECOVERY

DATE 13 July 1996		SHIP KAIYO	CRUSE No. K96-06
WEATHER bc	CONDITIONS 5sec 0.5m	DIR. of WIND 110	VEL. of WIND 6.5 m/s
START of RELEASE	06 : 25	FINISH of RELEASE	06 : 28
POS. of DISCOVERY	02° 00.494S 141° 59.663E		ASCENDING RATE 1.3 m/s
DIRECTION	000°	DISTANCE	1.000 m

NOTE
下側のリリーサー(S/N665)反応悪し。上側(S/N689)も起こす。
浮上追跡：220 mまでは確認。その後はロスト。
2本目ケブラー巻き上げ中。ガラス玉、海面確認。

	TIME	S/R	DEPTH
S	06:30		2964.8
S	06:35		2436.4
B	06:45		1505.9
L	06:55		818.6
	07:00		746.2
	07:05		266.6

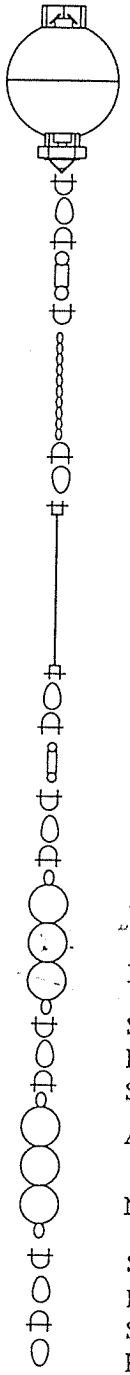
TIME RECORD

MOORING NO: 950711-2S142E

		DEPLOYMENT		RECOVERY (Date: 960713)	
		START: 01:31		START: 06:48	
		FINISH: 02:31		FINISH: 08:10	
ITEMS	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP	1154	01:33	CTD 1288	06:55	
WIRE	50m	~01:35		06:57~06:59	
ABS BUOY	3	01:36		07:01	
〃	3	01:36		07:01	
WIRE	200m	01:37~01:40		07:04~07:08	
〃	200m	01:42~01:44		07:09~07:13	
KEVLER	1000m	01:46~01:58		07:16~07:33	
〃	1000m	02:00~02:09		07:36~07:54	07:48 ガラス玉浮上確認
〃	500m	02:10~02:16	中古?	07:55~08:05	
〃	200m	02:17~02:20		08:06~08:09	
GLASS BALL	10	02:24		08:10	
A.R.	689	02:25	13.5 B,A	08:10	
〃	665	02:25	14.0 F,D	08:10	
NYLON	90m	02:25~02:26			
ANCHOR		02:31			

Depth of Water: 3610 m
Nylon Cut: 10m (100m ø5)

下側がリリーサー(665)反応悪し
15:04~15:15
リリーサー起こす。
下側が反応悪し。
上側も起こす。
15:25
下側切り離しコマンド
15:26
浮上確認
15:28 ブイ海面確認



ADCP
S/N 1154

CTD SBE16
S/N 1288

SHACKLE 18mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm

CHAIN
13mm x 3.0m

SHACKLE 16mm
RING 19mm

WIRE
11mm x 50m

RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B

NYLON 3.3m

SHACKLE 26mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B

NYLON 3.3m

SHACKLE 26mm
RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

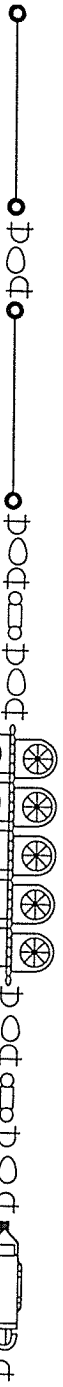
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

KEVLER
12mm x 1010m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER
12mm x 1010m

SHACKLE 16mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm



KEVLER
12mm x 505m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER
12mm x 202m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

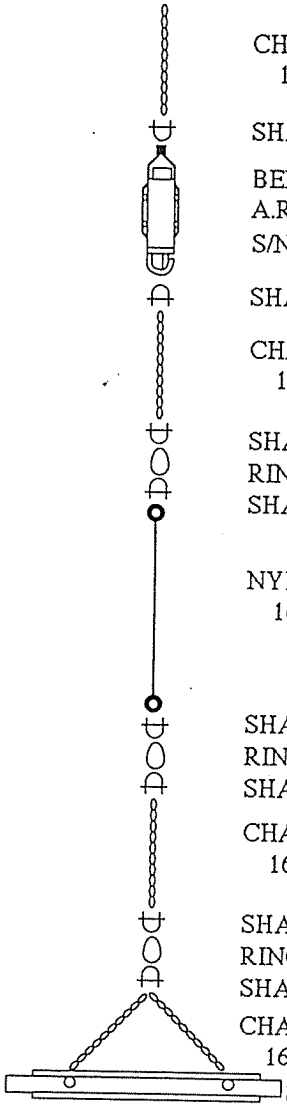
BENTHOS
GLASS BALL
2040-17V x 10ps.

CHAIN
13mm x 8m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

BENTHOS
A.R.
S/N 689

SHACKLE 16mm



CHAIN
16mm x 5m

SHACKLE 16mm

BENTHOS
A.R.
S/N 665

SHACKLE 16mm

CHAIN
16mm x 2.0m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm

NYLON
16mm x 90m

SHACKLE 18mm
RING 19mm
SHACKLE 20mm

CHAIN
16mm x 5m

SHACKLE 20mm
RING 19mm
SHACKLE 18mm

CHAIN
16mm x 2.5m x 2

SHACKLE 20mm x 2

RAIL ANCHOR

2° S 142° E
3609m

DEPLOYMENT & RECOVERY

MOORING No. 960713-2S142E

PROJECT	TOCS	TIME	
AREA		RECORDER (D)	Fujisaki
POSITION	2S 142E	(R)	
DEPTH	3609		
PERIOD	13 July '96 ～	NAVIGATION SYSTEM :	
No.of DAYS			
LENGTH :	m	DEPTH of BUOY : m	BUOYANCY : kg

ACOUSTIC RELEASER

TYPE	BENTHOS A.R (UPPER)	TYPE	BENTHOS A.R (BOTTOM)
S/N	717	S/N	635
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0 kHz
TRANSMIT F.	14.0 kHz	TRANSMIT F.	14.5 kHz
ENABLE C.	D	ENABLE C.	G
RELEASE C.	C	RELEASE C.	F
BATTERY	2 Years.	BATTERY	2 Years
TEST on DECK	OK	TEST on DECK	OK

DEPLOYMENT

DATE 13 July 1996 SHIP KAIYO CRUSE No. K9606

WEATHER bc CONDITIONS 0.4m 8s DIR. of WIND 080° VEL. of WIND 5 m/s

DEPTH 3606 m DEPTH of A.R. m DESCEND. RATE 2.5 m/s BUOY :

POS. of STRT 01° 59.845S 141° 57.975E HOR.RANGE m

POS. of DEP. 02° 00.045S 141° 59.780E SINKER 22:05 DISAPPEAR. 22:19

POS. of MOORING 01° 59.908S 141° 59.704E LANDING 22:30

NOTE

21:00
ADCP作動確認後、作業開始。

ABS ブイ
61個 → 71個

GLASS BALL
10個 → 12個

アロンロープ
105m → 100m

SSBL

	TIME	S/R	DEPTH
S	22:05		50.4
S	22:12		1156.9
B	22:18		2169.3
L	22:22		2802.3
	22:27		3388.3
	22:30		3398.1

RECOVERY

DATE		SHIP	CRUSE No.
WEATHER	CONDITIONS	DIR. of WIND	VEL. of WIND
START of RELEASE	:	FINISH of RELEASE	:
POS. of DISCOVERY	°	°	ASCENDING RATE m/s
DIRECTION	°	DISTANCE	m

NOTE

SSBL

	TIME	S/R	DEPTH
S			
S			
B			
L			

TIME RECORD

MOORING No. 960713 - 2S142E

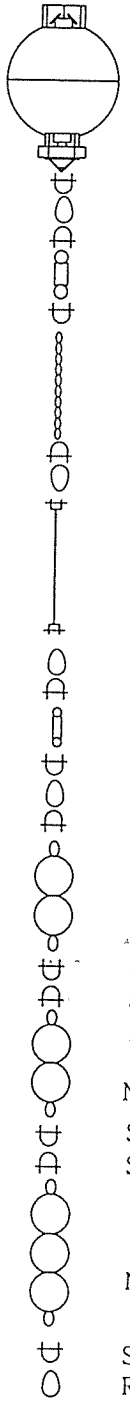
		DEPLOYMENT		RECOVERY (DATE:)	
		START: 21:01 FINISH: 22:05		START: FINISH:	
ITEM	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP & CTD	ADCP 1153 CTD 1285	21:05			
WIRE	50m	21:01 ~ 21:02			
ABS BUOY	2	21:06			
〃	2	21:07			
〃	3	21:07			
WIRE	200m	21:08 ~ 21:12			
〃	〃	21:14 ~ 21:18			
KEVLER	1010m	21:20 ~ 21:27	NEW 9410		
〃	〃	21:29 ~ 21:37	NEW		
〃	505m	21:38 ~ 21:42	NEW 9506		
〃	202m	21:45 ~ 21:47	NEW		
GLASS BALL	12	21:54	2S5 142E 回収分 プラス NEW 2コ		
A.R.	717	21:54			
〃	635	21:55			
NYLON	100m	21:55 ~ 21:56			
ANCHOR		22:05			

21:00 ADCP作動確認後、設置作業開始

ABSブイ 6個 を 7個に。

GLASS BALL 10個 を 12個に。

Fujisaki



ADCP
S/N 1153

CTD SBE16
S/N 1285

SHACKLE 26mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm

CHAIN
13mm x 3.0m
SHACKLE 16mm
RING 19mm

WIRE
11mm x 50m

RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B
NYLON 2.2m

SHACKLE 26mm
SHACKLE 26mm

ABS BUOY
CT608B
NYLON 2.2m

SHACKLE 26mm
SHACKLE 26mm

ABS BUOY
CT608B
NYLON 3.3m

SHACKLE 26mm
RING 19mm

SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

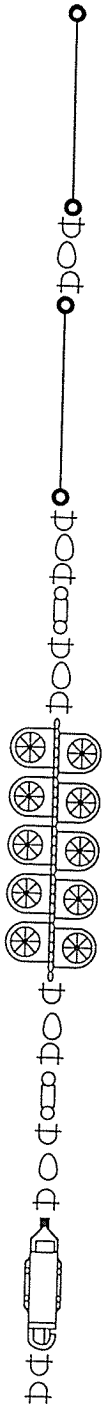
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

KEVLER(NEW)
12mm x 1010m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER(NEW)
12mm x 1010m

SHACKLE 16mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm



KEVLER(NEW)
12mm x 505m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER(NEW)
12mm x 202m

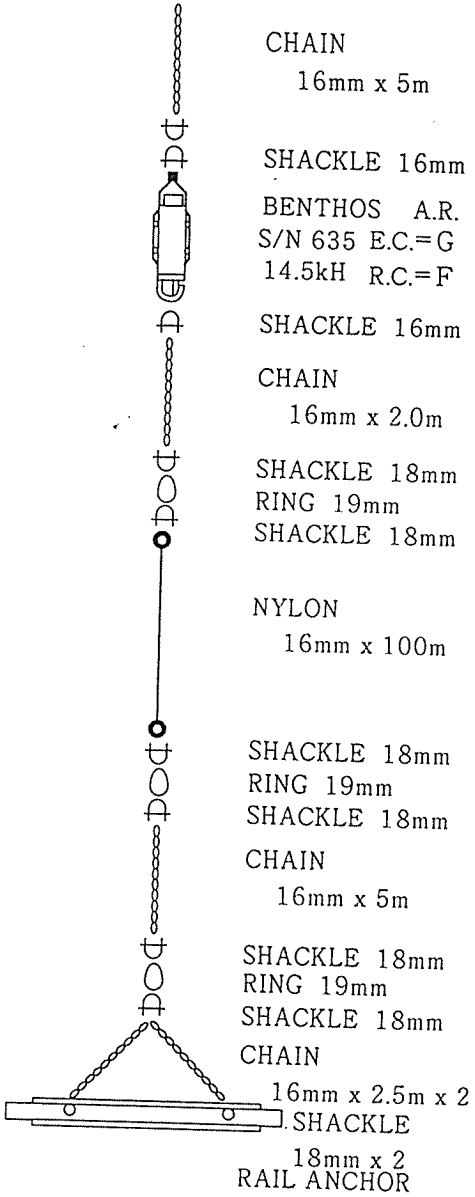
SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

BENTHOS
GLASS BALL
2040-17V x 12ps.
CHAIN
13mm x 8m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

BENTHOS A.R.
S/N 717 E.C.=D
14.0kH R.C.=C

SHACKLE 16mm
SHACKLE 16mm



CHAIN
16mm x 5m

SHACKLE 16mm

BENTHOS A.R.
S/N 635 E.C.=G
14.5kH R.C.=F

SHACKLE 16mm

CHAIN
16mm x 2.0m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm

NYLON
16mm x 100m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm

CHAIN
16mm x 5m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm

CHAIN
16mm x 2.5m x 2

SHACKLE
18mm x 2

RAIL ANCHOR

2° S 142° E
3609m

DEPLOYMENT & RECOVERY

MOORING No. 950719-00156E

PROJECT	TOCS	TIME	
AREA	Western Pacific	RECORDER (D)	Ando 95/7/11.
POSITION	0°N, 156°E	(R)	
DEPTH	1957m		
PERIOD	18 July 1995 ~	NAVIGATION SYSTEM :	WGS84
No.of DAYS			
LENGTH :	1675 m	DEPTH of BUOY :	270 m BUOYANCY : kg

ACOUSTIC RELEASER

TYPE	Benthos (Upper)	TYPE	Benthos (Lower)
S/N	690	S/N	667
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0 kHz
TRANSMIT F.	13.5 kHz	TRANSMIT F.	13.5 kHz
ENABLE C.	C	ENABLE C.	G
RELEASE C.	B	RELEASE C.	H
BATTERY	2years	BATTERY	2years
TEST on DECK	yes	TEST on DECK	yes

DEPLOYMENT

DATE 95/07/18 SHIP Kaiyo CRUSE No. K9505

WEATHER bc CONDITIONS calm. DIR. of WIND SSE VEL. of WIND /.

DEPTH 1959 m DEPTH of A.R. 1764 m DESCEND. RATE m/s BUOY :

POS. of STRT 0°00.320S, 156°04.177E HOR.RANGE m

POS. of DEP. 0°00.045S, 156°05.051E SINKER ~~30~~ 35 DISAPPEAR. :

POS. of MOORING 00°00.010S. 156°05.133E. LANDING 21:46

NOTE
捨てない方は690と同じ13.5kHzの信号が出た。

	TIME	-S-/R-ﾚﾝｼﾞ	DEPTH
SSBL	21:36		130
	21:38		512
	21:~~44~~ 41:58		~~2644~~ 1101
	21:49:16		1480
	21:46:10		1725
	21:47:55	704	1727

RECOVERY

DATE 29. July 1996 (J.S.T) SHIP KAIYO CRUSE No. K9606.

WEATHER C CONDITIONS 8.5s 0.6m DIR. of WIND 240° VEL. of WIND 4.0m

START of RELEASE 04:54 FINISH of RELEASE 04:54

POS. of DISCOVERY 00-00.063N 156-04.852E ASCENDING RATE 1.45 m/s

DIRECTION 094° DISTANCE 479. m

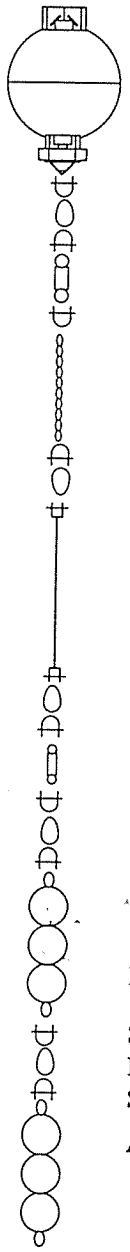
NOTE
切り離し直後から約5分A.R.追跡できず.

	TIME	S/R	DEPTH
SSBL	19:57		1182.2
	20:00		889.6
	20:03		542.3
	20:06		292.6
	20:09		138.1

TIME RECORD

MOORING NO: 950719-00156E

		DEPLOYMENT		RECOVERY (Date: 1996-07-29)	
		START: 20:53 FINISH: 21:35		START: 20:36 FINISH: 21:17	
ITEMS	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP	1224	20:56	CTD 1278	20:40	
WIRE	50m	20:57~20:58		20:42~20:50	
ABS BUOY	~~3~~ 2	20:58		20:46	
〃	~~3~~ 2	〃		〃	
〃	2	〃		〃	
WIRE	200m	20:58~21:01		20:50~20:54	
〃	200m	21:03~21:05		20:54~20:58	
KEVLER	1010m	21:07~21:~~1~~20		20:58~21:17	
GLASS BALL	10	21:26		21:16	
A.R.	690	21:27	13.5 C, B	21:16	
〃	667	21:28	14.5 G.F	21:15	
NYLON ROPE	160m	21:28~21:30			
ANCHOR		21:35			



ADCP
S/N 1224

CTD SBE16
S/N 1278

SHACKLE 18mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm

CHAIN
13mm x 3.0m

SHACKLE 16mm
RING 19mm

WIRE
10mm x 50m

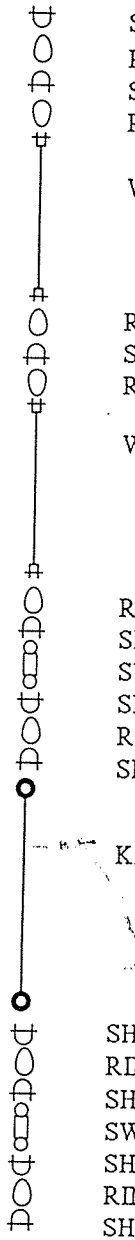
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B

NYLON 3.3m

SHACKLE 26mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B



SHACKLE 26mm
RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

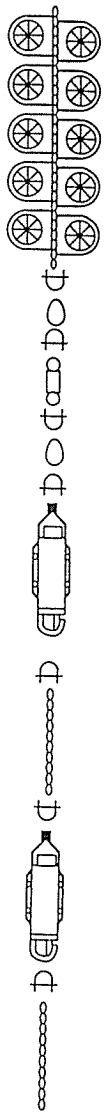
RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

KEVLER
12mm x 1010m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm



BENTHOS
GLASS BALL
2040-17V x 10ps.

CHAIN
13mm x 8m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

BENTHOS
A.R.
S/N 690

SHACKLE 16mm

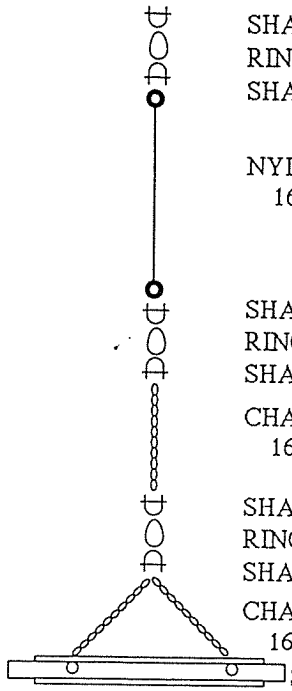
CHAIN
16mm x 5m

SHACKLE 16mm

BENTHOS
A.R.
S/N 667

SHACKLE 16mm

CHAIN
16mm x 2.0m



SHACKLE 18mm
RING 19mm
SHACKLE 18mm

NYLON
16mm x 160m

SHACKLE 18mm
RING 19mm
SHACKLE 20mm

CHAIN
16mm x 5m

SHACKLE 20mm
RING 19mm
SHACKLE 18mm

CHAIN
16mm x 2.5m x 2

SHACKLE
20mm x 2

RAIL ANCHOR

0° 156° E
1957m

DEPLOYMENT & RECOVERY

MOORING No. 960729-00156E

PROJECT	TOCS	TIME	
AREA	Western Pacific	RECORDER (D)	T. Katayama
POSITION	0°N, 156°E	(R)	
DEPTH	1957 m		
PERIOD	29 July 1996 ~	NAVIGATION SYSTEM :	WGS 84
No.of DAYS			
LENGTH :	1667 m	DEPTH of BUOY : 269 m	BUOYANCY : kg

ACOUSTIC RELEASER

TYPE	Benthos (Upper)	TYPE	Benthos (Lower)
S/N	716	S/N	666
RECEIVE F.	13.0 kHz	RECEIVE F.	13.0 kHz
TRANSMIT F.	13.5 kHz	TRANSMIT F.	14.5 kHz
ENABLE C.	C	ENABLE C.	F
RELEASE C.	B	RELEASE C.	E
BATTERY	2 years	BATTERY	2 years
TEST on DECK	OK	TEST on DECK	OK

DEPLOYMENT

DATE '96 Jul 28 (U.T) SHIP KAIYO CRUSE No. K96-06

WEATHER C CONDITIONS 8.0s 0.6m DIR. of WIND 220° VEL. of WIND 3.5 m

DEPTH 1,700 m DEPTH of A.R. 1,582 m DESCEND. RATE m/s BUOY :

POS. of STRT 00°00.061S 156°03.649E 2216 HOR.RANGE m

POS. of DEP. 00°00.095S 156°05.348E 2302 SINKER 23 :02 DISAPPEAR. 23 :09

POS. of MOORING 00°00.027S 156°05.414E LANDING 23 : 30

NOTE

ワイヤー：端末のシャックル部分が割ピンのみの固定であったため、回収した。ワイヤーからボルト・ナットを持ち上し、流用。

リリーサー：Upper, Lower 共に眠りたまま投入。直後、船上局から信号を送り起こす（両方）

シンカー投入後の直上水深は 1958 m

SSBL	TIME	S/R	DEPTH

RECOVERY

DATE SHIP CRUSE No.

WEATHER CONDITIONS DIR. of WIND VEL. of WIND

START of RELEASE : FINISH of RELEASE :

POS. of DISCOVERY ° ° ASCENDING RATE m/s

DIRECTION ° DISTANCE m

NOTE

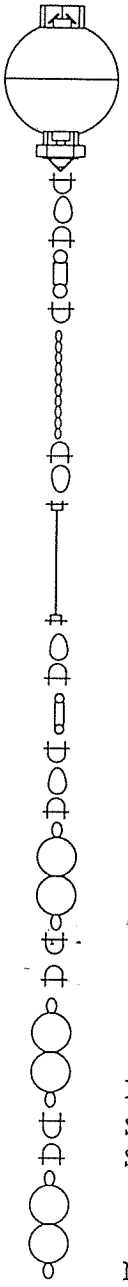
SSBL	TIME	S/R	DEPTH

TIME RECORD

MOORING No. 960729-00156E

		DEPLOYMENT		RECOVERY (Date:)	
		Start: 22:12 Finish: 23:01		Start: Finish:	
ITEM	S/N etc.	TIME	MEMO	TIME	MEMO
ADCP	11.51	22:16	CTD 6 128M		
WIRE	50m	22:12 ~ 22:18			
ABS BUOY	2	22:18			
〃	2	22:18			
〃	2	22:19			
WIRE	200m	22:19 ~ 22:24			
〃	200m	22:24 ~ 22:29			
KEVLER	716m	22:29 ~ 22:41	1994-10.12-716M No. 147-A2 (末)		
〃	262m	22:41 ~ 22:46	1994-10.12-262M No. 147-A1 (元)		
〃	101m	22:46 ~ 22:52	New (供用)		
GLASS BALL	10	22:52			
A.R.	716	22:52	13.5 C.B		
〃	666	22:53	14.5 F.E		
NYLON ROPE	106m	22:53 ~ 23:01			
ANCHOR		23:01			

リリーサー Upper. Lower 共に眠らせたまま、投入してしまったので
投入直後. Upper. Lower 共におこす



ADCP
S/N 1220
CTD SBE16
S/N 1282

SHACKLE 26mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 16mm

CHAIN
13mm x 3.0m

SHACKLE 16mm
RING 19mm

WIRE
10mm x 50m

RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 26mm

ABS BUOY
CT608B

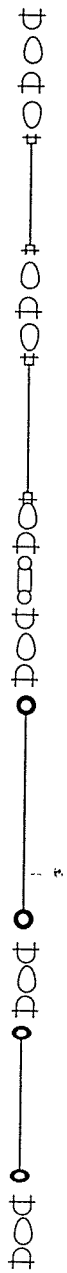
NYLON 2.2m
SHACKLE 26mm
SHACKLE 26mm

ABS BUOY
CT608B

NYLON 2.2m
SHACKLE 26mm
SHACKLE 26mm

ABS BUOY
CT608B

NYLON 2.2m



SHACKLE 26mm
RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

RING 19mm
SHACKLE 18mm
RING 19mm

WIRE
11mm x 200m

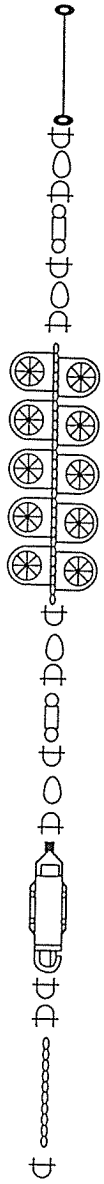
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

KEVLER(USED)
12mm x 716m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm

KEVLER(USED)
12mm x 262m

SHACKLE 16mm
RING 19mm
SHACKLE 16mm



KEVLER(NEW)
12mm x 101m

SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

BENTHOS
GLASS BALL
2040-17V x 10ps.

CHAIN
13mm x 8m

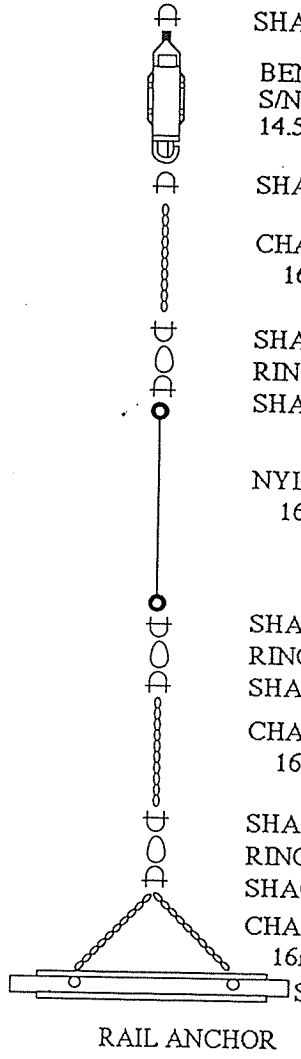
SHACKLE 16mm
RING 19mm
SHACKLE 18mm
SWIVEL BS103
SHACKLE 18mm
RING 19mm
SHACKLE 16mm

BENTHOS A.R.
S/N 716 E.C.=C
13.5kH R.C.=B

SHACKLE 16mm
SHACKLE 16mm

CHAIN
16mm x 5m

SHACKLE 16mm



SHACKLE 16mm

BENTHOS A.R.
S/N 666 E.C.=F
14.5kH R.C.=E

SHACKLE 16mm

CHAIN
16mm x 2.0m

SHACKLE 18mm
RING 19mm
SHACKLE 18mm

NYLON
16mm x 106m

SHACKLE 18mm
RING 19mm
SHACKLE 20mm

CHAIN
16mm x 5m

SHACKLE 20mm
RING 19mm
SHACKLE 18mm

CHAIN
16mm x 2.5m x 2

SHACKLE
20mm x 2

RAIL ANCHOR

0° 156° E
1957m

7. NOAA/Pacific Marine Environmental Laboratory
TOCS Cruise KAIYO-96-06

Participants: Timothy Wright
Steve Kunze
Anita Lopez

Dates: July 7 to August 5, 1996

Ports: Koror,Palau - Kavieng, Papua New Guinea - Guam

Overview:

PMEL participated in a joint cruise with JAMSTEC aboard the R/V KAIYO to service the ATLAS moorings in the western Pacific of the Tropical Atmosphere-Ocean (TAO) array. Seven surface moorings consisting of surface buoys with thermistor chains to 500 meters were deployed at 7N 137E, 5N 147E, 5S 156E, 2S 156E, 0 156E, 2N 156E and 5N 156E. Six buoys were recovered from these same sites except 2N 156E which had drifted away.

In addition, four sites were visited and repaired. Repairs consisted of a relative humidity sensor swap at 5N 137E; tube and wind sensor replacement at 2N 137E and 0 147E and a tube swap at 2N 147E. The sites at 2S, 2N and 0 156E also were fitted with rain guages and an Eppley radiation sensor.

A request was made by PMEL on August 1 to visit the 8N 156E site which had stopped transmissions. KAIYO was unable to visit the site due to a series of tropical depression at 10N and possible rerouting of the ship's track with consequent delay in the arrival at Guam.

Operations:

MOORING	TIME/DATE	LOCATION	OPERATION
ET-305	21:45 7/7/96	6 43.6N, 137 41.5E	Recovery
ET-394	04:25 7/8/96	6 45.6N, 137 40.5E	Deployment
ET-380	23:20 7/8/96	5 00.2N, 136 59.6E	Repair RH
ET-379	22:33 7/9/96	2 26.1N, 137 24.1E	Tube Swap
ET-377	05:39 7/17/96	0 02.5N, 146 54.8E	Repair Wind
ET-378	00:16 7/18/96	2 00.1N, 146 59.8E	Tube Swap
ET-351	20:50 7/18/96	4 58.0N, 147 01.9E	Recovery
ET-398	02:37 7/19/96	4 57.4N, 147 02.4E	Deployment
ET-310	09:46 7/26/96	4 59.6S, 156 00.7E	Recovery
ET-399	01:10 7/27/96	4 59.8S, 155 59.9E	Deployment
ET-341	21:28 7/27//96	1 59.9S, 155 46.4E	Recovery
ET-400	01:42 7/28/96	1 59.9S, 155 59.7E	Deployment
ET-342	19:55 7/29/96	0 00.8N, 156 04.1E	Recovery
ET-402	00:18 7/30/96	0 00.9N, 156 09.9E	Deployment
ET	21:20 7/30/96	2 01.5N, 156 01.4E	Deployment
ET-344	19:52 7/31/96	4 59.7N, 156 03.6E	Recovery
ET	00:03 8/1/96	4 59.8N, 156 04.5E	Deployment

8. Inspection of Surface Buoy for JAMSTEC/200Hz Tomography Systems
TOCS Cruise

Participants: Hidetoshi Fujimori
Tomoyuki Kanaizumi

Dates: July 07 to July 23, 1996

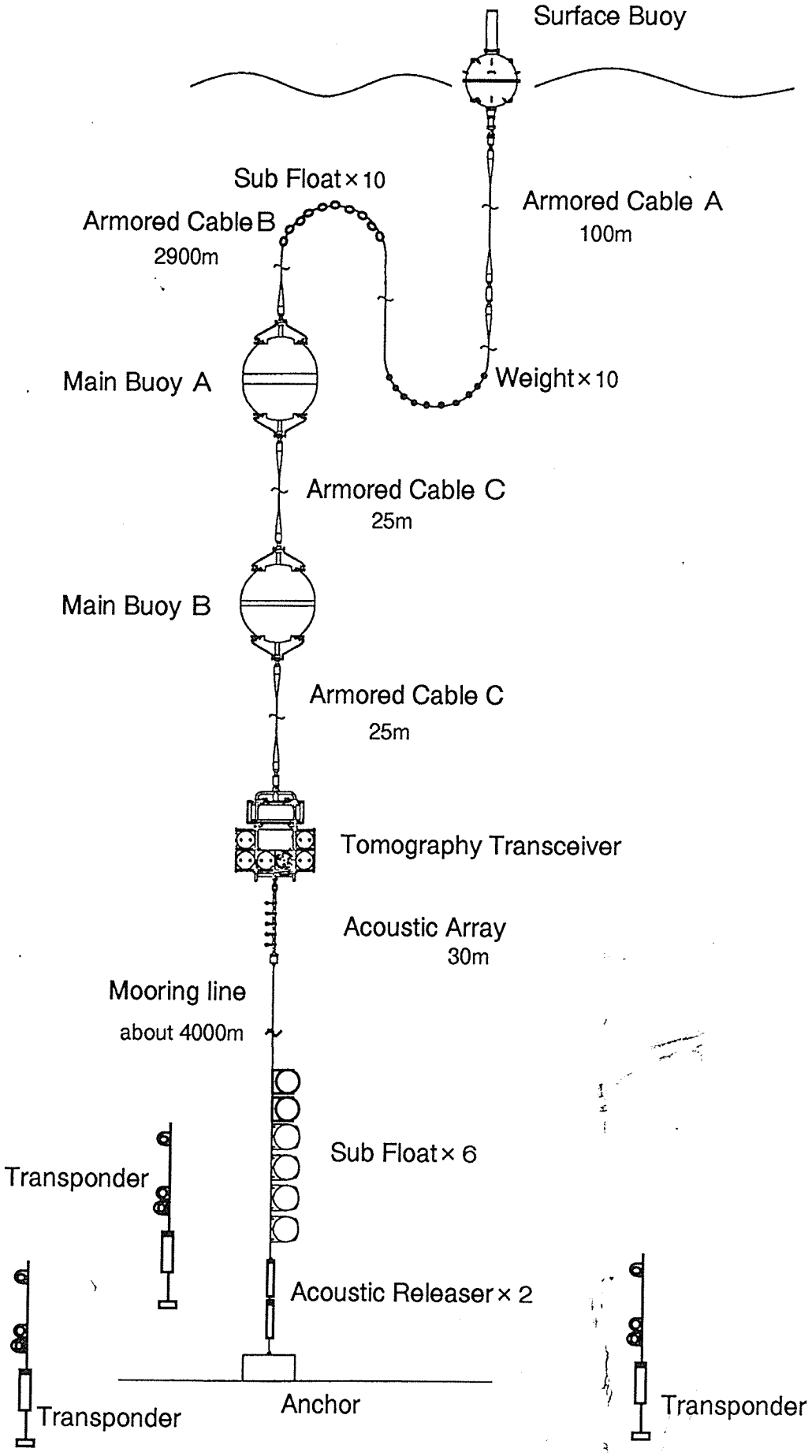
Ports: Koror(Palau) - Kavieng(Papua New Guinea)

Objectives:

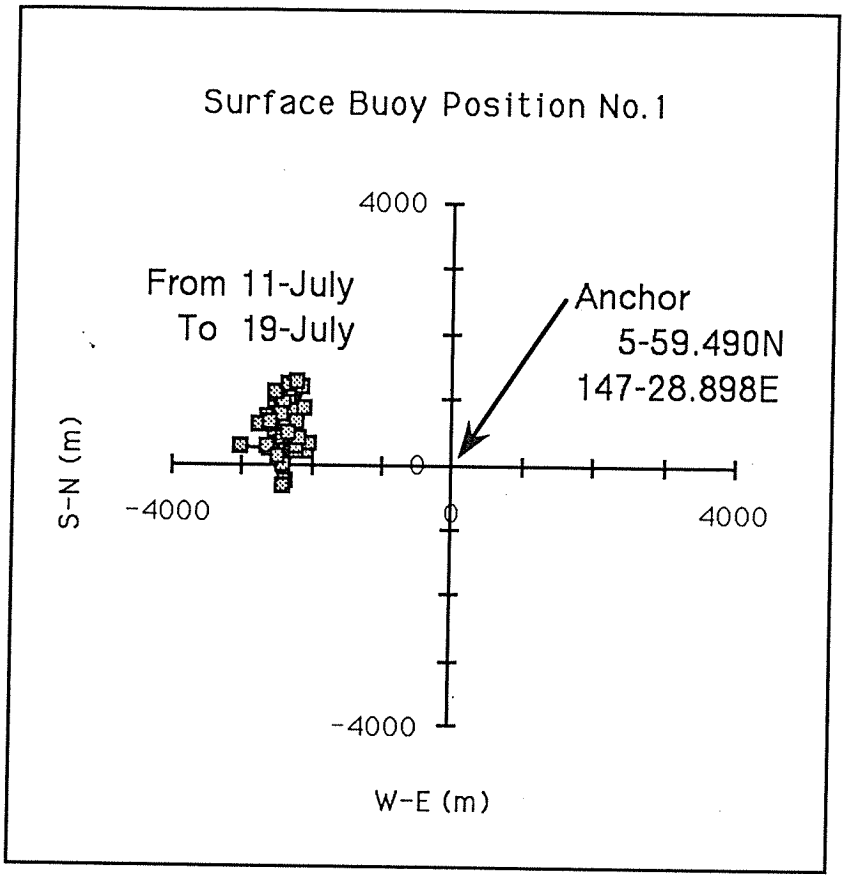
The purpose of this inspection was check the surface buoy condition for 200Hz Tomography Systems. Two systems were deployed at the points of 0.3S,147.5E and 6N,147.5E in April,1996 for tomography observation. Tomography sound source and hydrophone array were moored about 1,000meters depth and this system has surface buoy. Surface buoy and electronics of tomography transceiver are connected by armored cable. The surface buoy communicates to land station using INMARSAT-C system and sends data of tomography observation. In this time confirm the surface buoy, joint, connector and armored cable by eye to have some injured sign, fishing longline, net, etc or not.

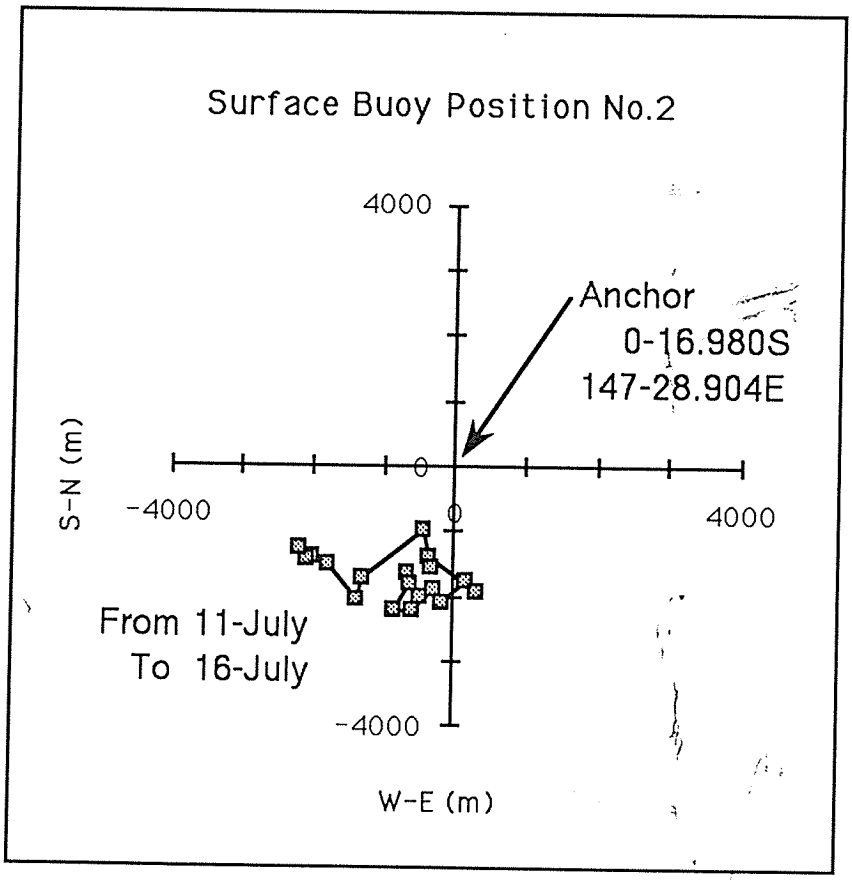
Results:

The inspection of the surface buoys were carried out at 17-July for No.2 and 20-July for No.1. There were no sign of injured, fishing longline, net and so on on both buoys. Some shells and seaweeds sticked to the housing, joint and connector of surface buoys. Amount of sticked matter on the buoy of No.1(North side) was much than No.2(South side). Surface buoy of No.2 was located to the south from the Anchor of this mooring and Surface buoy of No.1 was located to the west .For this inspection work boat was used to arrive the surface buoys. To confirm the condition of under sea part of buoys, glass boxes were used. This inspection recorded by cameras and video tape recorder.



200Hz Tomography System


Surface Buoy Position No.1
4000
From 11-July
To 19-July
Anchor
5-59.490N
147-28.898E
S-N (m)
-4000
0
0
4000
-4000
W-E (m)


Surface Buoy Position No.2
4000
Anchor
0-16.980S
147-28.904E
S-N (m)
0
-4000
0
4000
From 11-July
To 16-July
-4000
W-E (m)

9. SUMMARY REPORT
TROPICAL OCEAN CLIMATE STUDY K9606
R/V KAIYO July 7th - August 5th, 1996

Djoko HARTOYO, Ali ALKATIRI, Bugi Wiku WICAKSONO,
Mustofa and Raden TRIMANADI
BPPT-Indonesia

INTRODUCTION

1. Background

The Tropical Ocean Climate Study cruise have been carried out by Research Vessel KAIYO in Tropical Western Pacific within and outside Indonesia Economic Exclusive Zone on July to August 1996. This survey activity based on The Implementing arrangement between BPPT (Agency for the Assessment and Application of Technology) and JAMSTEC (Japan Marine Science and Technology Center) signed in June 6th, 1996 by Shin-ichi Ishii (executive Director JAMSTEC) and Prof. MT. Zen (Deputy Chairman for Natural Resources Development, BPP Teknologi).

2. Purpose

The main purpose of TOCS cruise is to observe Physical Oceanographic condition in the Western Pacific to archive a better understanding of Ocean-atmosphere interaction affecting on the ENSO (El Nino Southern Oscillation) phenomena and climate change This mechanism is very important to predict the anomaly of ENSO. The long purpose for this study that the data base could be process with numeric modeling to make clear the mechanism of ENSO phenomena.

3 Time duration and field

Tropical Ocean Climate Study K9606 cruise was done on July 7th, 1996 to August 5th, 1996, started from Palau and ended at Guam with port call in Kavieng. The area consists as Western Pacific Ocean, Indonesia EEZ Northern Irian Jaya/Papua New Guinea along 5 South to 7.00 degree North and 137.00 to 156.00 degree East.

SURVEY ACTIVITY

The Tropical Ocean Climate Study cruise activity consists as follow :

1. CTD (Conductivity, Temperature, Depth) observation

Forty eight stations CTD including the 5 liter rosette water sampler with SBE 9 plus CTD for 8000 meters were used in TOCS K9606 cruise. The sensors attached on the CTD wire with two temperature sensors, two conductivity sensors, pressure sensor, dissolve oxygen sensor, 8 of reversing thermometer (SIS RTM) and 4 of reversing pressure meters (SIS RPM). The CTD cast are 1000 meters depth in every stations, except at stations 01, 29, 34, 36 and 37 the cast are 3000 meters. The wire was a single conductor 10,6 mm Steel rope manufactured by Rochester cables and the winch was built by Tsurumi Seiki Japan.

2. Subsurface ADCP Moorings

Four-JAMSTEC subsurface ADCP moorings were recovered and deployed at (0, 138°E), (2.30°S, 142° E), (2°S, 142°E), and (0, 156°E). The mooring system is design to obtain the variability of the equatorial current. Each mooring was equipped with Acoustic Doppler Current Profiler at 300 meters with buoy, one CTD SBE 16 at just below the ADCP. Two *Benthos Acoustic releases* with glass balls used to release ADCP buoy from sinker on the recovery.

3. Atmospheric Sonde

Seventy eight of atmospheric sonde were done every 6 hour to measure for vertical pressure, temperature, wind speed/direction, and relative humidity. The sensor of radiosonde type VAISALA DigiCORA MW 11 Automatic Radiosonde Set. Omegasonde were launched to air with balloon that contain Helium gas, the data transmitted real time to receiver at the container on board until 20.000 meters high.

4. Dissolved Oxygen Measurement

The measurement of dissolved oxygen was done on 48 CTD stations with direct measured by sensor that be attach on CTD system and water sampler that collected from 5-Niskin water

samples into 100 ml Dissolved Oxygen glass bottles and samples for Winkler titration were collected into 180 ml calibrated BOD flasks. The sampling were collected at 1000, 800, 600, 500, 400, 350, 300, 250, 200, 150, 100, 50 meters depth in every stations. The samples for titration method were analyzed within 2 hours. The D.O value were obtained by Metrohm piston burette of 10 ml with Pt Electrode using whole bottle titration in the laboratory with temperature controlled.

5. Salinity Sampling

Sampling for salinity were done in every station, the salinity samples are collected just at deep layer 1000 m deep, except at station 35 samples were collected at 12 layers. Salinity samples are stored in 250 ml phoenix brown glass bottles with screw caps and measured using Guildline Autosal model 8400B with constant bath temperature.

6. ATLAS Surface Buoys

Seven-surface ATLAS buoys were deployed and recovered at (7° N,137° E), (5°N, 147°E), (5°N, 156°E), (5°S, 156°E), (2°S, 156°E), (0, 156°E), (2°N, 156°E). Three ATLAS repaired at (5°N, 137° E), (5°N, 147°E), (0, 156°E). Each ATLAS mooring consisting of surface buoy with thermistor chains down to 500 meters, Sea Surface Temperature sensor, Wind sensor, air temperature/humidity sensor, data logger/transmitter and ARGOS antenna. ATLAS moorings are designed to obtain surface meteorological data and subsurface water temperature.

CONCLUSION

The recovery and deployment of ADCP subsurface buoys and ATLAS surface buoys have finished succesfully, forty eight stations CTD sampling including Niskin water sampling for dissolved oxygen and Salinity were done along 137° to 156° East Longitude and 7° North to 5° South Latitude. The operations during this cruise went absolutely well and The ship's personnel performed in an professional manner.

ACKNOWLEDGMENT

Finally The Tropical Ocean Climate Study cruise have been done succesfully. We would like to thank JAMSTEC for funding our trip and all expenses, our director, Dr. Indroyono Soesilo and Project Manager R/V Baruna Jaya Dipl. Ing. Basri M. Ganie for appointing us to participate in TOCS K9606 Cruise. Chief Scientist Kunio Yoneyama and Technical Staffs, Captain Sadao Ishida and crew members of Research Vessel KAIYO.

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Third Officer	Takashi Yamamoto
Jr. Third Officer	Masakatsu Yamada
Chief Engineer	Hiroyoshi Kikkawa
Second Engineer	Mitsuhiro Ueki
Third Engineer	Kazuhito Yoshiura
Chief Radio Officer	Toshio Imai
Second Radio Officer	Hiroyasu Saitake
Boatswain	Takami Hayashi
Able Seaman	Tsutomu Sato
Able Seaman	Yoshio Ojiri
Able Seaman	Yoshiaki Shirai
Able Seaman	Kingo Nakamura
Able Seaman	Tadahiko Toguchi
Able Seaman	Hideo Isobe
No.1 Oiler	Kazumi Sakamoto
Oiler	Masayuki Masunaga
Oiler	Masaru Kitano
Oiler	Kiyoshi Yawata
Oiler	Junji Mori
Chief Steward	Kenji Kutani
Steward	Toshiharu Kishita
Steward	Jihei Nakatsuka
Steward	Kaoru Takashima
Steward	Takeshi Miyauchi

Appendix

A-1 Time Table
A-2 GMS Images

A-4 Minute of Meeting for Reviewing This Cruise

A1. Time Table of TOCS K9606 Cruise

July 06 (Sat) Local Time(-9h=UTC) Fine
08:45～16:00 Loading the gear of PMEL buoy

July 07 (Sun) Local Time(-9h=UTC) Fine
08:15 Depart Palau
10:30～10:50 Guidance for safety ship life
11:00～12:10 Meeting for ATLAS Buoy Recovery/Deployment
13:00～13:15 Fire Drill
13:20～15:30 ATLAS Buoy Assembly
15:45～16:15 Meeting for CTD/Radiosonde observations

July 08 (Mon) Local Time(-9h=UTC) Fine
06:40～09:25 ATLAS Buoy Recovery (06°43.896N, 137°41.620E)
09:00 Start surface meteorological measurement(every 3h)
11:14～13:26 ATLAS Buoy Deployment (06°45.149N, 137°40.847E) 4195m
16:30～19:37 CTD-01 (06°46N, 137°40E) down to 3000m

July 09 (Tue) Local Time(-9h=UTC) Fine/Rain/Thunderstorm
00:45～02:00 CTD-02 (06°00N, 137°00E)
08:00～08:40 ATLAS Buoy Repair (05°00.2N, 136°59.7E)
08:38～10:00 SONDE-01(05°00N, 137°00E)
09:04～09:54 CTD-03 (05°00N, 137°01E)
14:28～16:03 SONDE-02(04°19N, 137°01E)
16:30～17:18 CTD-04 (04°00N, 137°00E)
20:52～23:00 SONDE-03(03°27N, 137°00E)
23:40～00:40 CTD-05 (03°00N, 136°59E)

July 10 (Wed) Local Time(-9h=UTC) Fine
02:40～04:30 SONDE-04(02°47N, 137°07E)
06:12～07:03 CTD-06 (02°27N, 137°24E)
07:50～09:20 ATLAS Buoy Repair (02°26N, 137°24E)
08:34～10:10 SONDE-05(02°26N, 137°24E)
14:46～16:26 SONDE-06(01°37N, 137°16E)
15:08～16:00 CTD-07 (01°30N, 137°15E)
18:00～18:45 Meeting for ADCP Mooring
19:05～20:05 CTD-08 (01°00S, 137°30E)
20:35～21:55 SONDE-07(00°59N, 137°29E)

July 11 (Thu) Local Time(-9h=UTC) Cloudy/Rain/Fine
02:25～04:35 SONDE-08(00°19N, 137°51E)
05:35～08:25 ADCP Mooring Recovery (00°01.373S, 138°01.403E) 3894m
08:33～10:35 SONDE-09(00°02S, 137°59E)
09:10～10:41 ADCP Mooring Deployment(00°01.320S, 138°01.837E) 3916m
11:13～12:25 Calibration of the ADCP Mooring position
→ (00°01.236S, 138°01.795E)
12:50～13:40 CTD-09 (00°03S, 138°02E)
14:38～16:03 SONDE-10(00°10S, 138°00E)
20:10～21:05 CTD-11 (01°00S, 138°00E)
20:34～22:25 SONDE-11(01°00S, 138°00E)

July 12 (Fri) Local Time(-9h=UTC) Rain/Fine

02:38～04:04	SONDE-12(00°21S,138°40E)	
05:00～05:51	CTD-12 (00°01N,139°00E)	
08:45～09:25	SONDE-13(00°01S,139°26E)	
11:22～12:07	CTD-14 (00°00, 140°00E)	
14:16～16:05	SONDE-14(00°00S,140°21E)	
17:39～18:27	CTD-15 (00°00N,141°00E)	
20:25～22:03	SONDE-15(00°22S,141°09E)	

July 13 (Sat) Local Time(-9h=UTC) Cloudy/Fine

02:20～04:00	SONDE-16(01°29S,141°35E)	
07:27～09:27	ADCP Mooring Recovery (02°28.623S,141°58.408E)	
08:27～10:10	SONDE-17(02°29S,141°58E)	
09:40～11:12	ADCP Mooring Deployment(02°28.235S,141°57.303E)	3336m
11:15～11:56	Calibration of the ADCP Mooring position → (02°28.114S,141°57.242E)	
14:35～16:15	SONDE-18(02°10S,141°59E)	
15:00～17:10	ADCP Mooring Recovery (02°00.474S,141°59.663E)	
20:36～21:57	SONDE-19(02°01S,141°59E)	

July 14 (Sun) Local Time(-9h=UTC) Cloudy | Fine

02:23～04:05	SONDE-20(02°00S,141°58E)	
06:01～07:05	ADCP Mooring Deployment(02°00.045S,141°59.780E)	3606m
08:04～09:26	Calibration of the ADCP Mooring position → (01°59.908S,141°59.704E)	
08:09～08:52	CTD-16 (02°01S,142°00E)	
08:25～09:56	SONDE-21(02°01S,142°00E)	
12:30～13:21	CTD-17 (01°30S,142°00E)	
14:26～16:00	SONDE-22(01°30S,142°00E)	
16:41～17:26	CTD-18 (01°00S,142°00E)	
20:26～22:30	SONDE-23(00°34S,142°00E)	
20:32～21:22	CTD-19 (00°30S,142°00E)	

July 15 (Mon) Local Time(-9h=UTC) Cloudy | Shower/Fine

00:28～01:16	CTD-20 (00°00, 142°00E)	
02:29～04:14	SONDE-24(00°00, 142°08E)	
07:26～08:10	CTD-21 (00°00, 143°00E)	
08:25～10:10	SONDE-25(00°00, 143°00E)	
14:04～15:21	CTD-22 (00°00, 144°00E)	
14:40～16:20	SONDE-26(00°01S,144°00E)	
20:36～22:15	SONDE-27(00°00, 144°57E)	
20:45～21:35	CTD-23 (00°00, 145°00E)	

July 16 (Tue) Local Time(-9h=UTC) Fine/Rain

02:18～03:58	SONDE-28(00°00, 145°47E)	
03:33～04:23	CTD-24 (00°00, 145°57E)	
08:30～10:10	SONDE-29(00°34S,146°20E)	
08:50～10:30	ATLAS Buoy Assembly	
14:32～16:26	SONDE-30(01°28S,146°52E)	
15:43～16:33	CTD-25 (01°40S,147°00E)	
17:34～18:29	CTD-26 (01°30S,147°00E)	
20:31～22:26	SONDE-31(01°13S,147°00E)	
21:31～22:23	CTD-27 (01°00S,146°59E)	

July 17 (Wed) Local Time(-9h=UTC) Cloudy
02:06～02:58 CTD-28 (00°30S, 147°15E)
02:32～04:07 SONDE-32(00°30S, 147°15E)
05:29～05:49 Tomography Buoy Inspection (00°17.556S, 147°27.129E)
06:02～08:12 CTD-29 (00°18S, 147°26E) down to 3000m
08:23～10:03 SONDE-33(00°18S, 147°25E)
08:47～09:06 Tomography Buoy Re-inspection
12:22～13:11 CTD-30 (00°01N, 146°55E)
13:35～14:40 ATLAS Buoy Repair (00°02.110N, 146°54.990E)
14:13～15:57 SONDE-34(00°02N, 146°55E)
18:28～19:13 CTD-31 (00°30N, 147°00E)
20:30～22:10 SONDE-35(00°40N, 147°00E)
22:06～22:53 CTD-32 (01°00N, 147°00E)

July 18 (Thu) Local Time(-9h=UTC) Rain | Cloudy
02:24～03:45 SONDE-36(01°26N, 147°00E)
07:33～08:17 CTD-33 (02°00N, 146°59E)
08:22～10:04 SONDE-37(02°00N, 146°59E)
08:30～09:35 ATLAS Buoy Repair (02°00.369N, 146°59.318E)
14:30～16:23 SONDE-38(02°57N, 147°00E)
14:40～16:50 CTD-34 (03°00N, 147°00E) down to 3000m
20:24～22:05 SONDE-39(03°32N, 147°03E)

July 19 (Fri) Local Time(-9h=UTC) Fine
02:18～03:55 SONDE-40(04°28N, 147°01E)
05:45～08:28 ATLAS Buoy Recovery (04°58.737N, 147°01.535E) 4260m
08:30～10:30 SONDE-41(04°58N, 147°04E)
09:48～11:37 ATLAS Buoy Deployment (04°57.369N, 147°01.635E) 4290m
13:08～14:05 CTD-35 (04°57N, 147°02E)
14:26～16:00 SONDE-42(04°57N, 147°04E)
20:35～22:00 SONDE-43(05°37N, 147°20E)

July 20 (Sat) Local Time(-9h=UTC) Rain/Cloudy
02:26～04:20 SONDE-44(05°54N, 147°27E)
07:48～08:15 Tomography Buoy Inspection (06°00.060N, 147°27.790E)
08:20～10:00 SONDE-45(06°00N, 147°28E)
08:44～10:41 CTD-36 (05°59N, 147°27E)
12:55～13:45 ATLAS Buoy Assembly
14:37～16:17 SONDE-46(05°12N, 147°30E)
17:43～20:20 CTD-37 (04°30N, 147°30E)
20:25～22:02 SONDE-47(04°29N, 147°33E)

July 21 (Sun) Local Time(-10h=UTC) Fine
00:00→01:00 Time Adjustment
03:37～05:23 SONDE-48(03°38N, 147°48E)
09:32～11:20 SONDE-49(02°50N, 148°03E)
15:25～17:05 SONDE-50(02°01N, 148°20E)
21:28～23:15 SONDE-51(01°13N, 148°35E)

July 22 (Mon) Local Time(-10h=UTC) Fine
03:23～04:50 SONDE-52(00°23N, 148°52E)
06:02～06:47 CTD-38 (00°00, 149°00E)
09:20～11:01 SONDE-53(00°00, 149°22E)
13:02～13:55 CTD-39 (00°00, 150°00E)

July 23 (Tue) Local Time(-10h=UTC) Fine
07:30 Arrive at Kavieng
Bunkering

July 24 (Wed) Local Time(-10h=UTC) Fine | Squall
Day Off

July 25 (Thu) Local Time(-10h=UTC) Fine
08:30 Depart Kavieng
10:00～10:30 Guidance for safety ship life
11:00～11:20 Fire Drill
13:00～13:30 Meeting for Reverse Catenary ATLAS Recovery/Deployment

July 26 (Fri) Local Time(-10h=UTC) Fine | Squall / Rain
09:40～10:40 Preparation for ATLAS, CTD, and Radiosonde Observations
17:48～18:43 CTD-40 (04°58S, 156°01E)

July 27 (Sat) Local Time(-10h=UTC) Fine
05:43～08:14 ATLAS Buoy Recovery (05°00.078S, 156°00.220E)
09:17～11:07 SONDE-54(05°00S, 156°00E)
09:51～11:43 ATLAS Buoy Deployment (04°59.980S, 156°00.552E) 1523m
13:05～14:30 ATLAS Buoy Assembly
15:13～16:50 SONDE-55(04°28S, 156°01E)
17:53～18:32 CTD-41 (04°00S, 156°00E)
21:20～22:59 SONDE-56(03°34S, 155°57E)

July 28 (Sun) Local Time(-10h=UTC) Fine
03:15～04:50 SONDE-57(02°27S, 155°49E)
07:23～08:50 ATLAS Buoy Recovery (01°59.795S, 155°45.972E)
09:26～11:12 SONDE-58(02°01S, 155°48E)
10:35～12:28 ATLAS Buoy Deployment (02°00.005S, 156°00.100E)
12:52～13:38 CTD-42 (01°59S, 156°00E)
14:00～15:30 ADCP Mooring Assembly
15:25～17:02 SONDE-59(01°43S, 156°00E)
19:19～20:09 CTD-43 (01°00S, 156°00E)
21:13～23:06 SONDE-60(00°54S, 156°01E)

July 29 (Mon) Local Time(-10h=UTC) Cloudy/Fine
03:18～05:04 SONDE-61(00°09S, 156°04E)
05:49～07:16 ADCP Mooring Recovery (00°00.063N, 156°04.852E)
08:11～09:02 ADCP Mooring Deployment(00°00.095S, 156°05.348E) 1958m
09:25～11:07 SONDE-62(00°00, 156°06E)
09:40～10:14 Calibration of the ADCP Mooring position
→ (00°00.027S, 156°05.414E)
10:40～11:30 ATLAS Buoy Assembly
15:33～17:17 SONDE-63(00°01S, 156°03E)
21:21～23:16 SONDE-64(00°01S, 156°03E)

July 30 (Tue) Local Time(-10h=UTC) Fine
03:20～04:58 SONDE-65(00°01S,156°02E)
05:52～07:47 ATLAS Buoy Recovery (00°00.601N,156°03.650E)
09:06～10:50 ATLAS Buoy Deployment (00°00.964N,156°09.452E) 1972m
09:22～11:00 SONDE-66(00°01N,156°12E)
11:09～12:07 CTD-44 (00°02N,156°09E)
13:00～14:40 Preparation of ATLAS deployment
15:23～17:10 SONDE-67(00°32N,156°05E)
17:56～18:43 CTD-45 (01°00N,156°00E)
21:20～23:05 SONDE-68(01°27N,156°00E)

July 31 (Wed) Local Time(-10h=UTC) Rain/Cloudy
03:20～05:04 SONDE-69(02°01N,156°00E)
06:08～07:39 ATLAS Buoy Deployment (02°01.523N,156°00.757E) 2599m
08:27～09:18 CTD-46 (02°03N,156°02E)
09:20～10:56 SONDE-70(02°03N,156°02E)
09:30～10:15 ATLAS Buoy Assembly
16:00～17:00 SONDE-71(03°00N,156°00E)
15:29～16:14 CTD-47 (03°00N,156°00E)
21:17～23:14 SONDE-72(03°50N,156°02E)

Aug. 01 (Thu) Local Time(-10h=UTC) Fine
03:20～04:52 SONDE-73(04°45N,156°03E)
05:50～07:39 ATLAS Buoy Recovery (04°59.804N,156°03.352E)
08:43～10:03 ATLAS Buoy Deployment (04°59.789N,156°03.652E) 3607m
09:25～11:10 SONDE-74(04°59N,156°06E)
11:03～11:59 CTD-48 (05°01N,156°06E)
13:00～14:00 Replacement of the gear
15:21～17:10 SONDE-75(05°21N,155°33E)
21:19～23:00 SONDE-76(06°07N,154°32E)

Aug. 02 (Fri) Local Time(-10h=UTC) Rain
03:20～04:55 SONDE-77(06°51N,153°31E)
09:16～11:04 SONDE-78(07°33N,152°33E)
Drifting near NUMOITO Atoll
because of rough sea condition

Aug. 03 (Sat) Local Time(-10h=UTC) Fine
11:00～11:45 Meeting for reviewing
Cruise for Guam

Aug. 04 (Sun) Local Time(-10h=UTC) Fine
Cruise for Guam

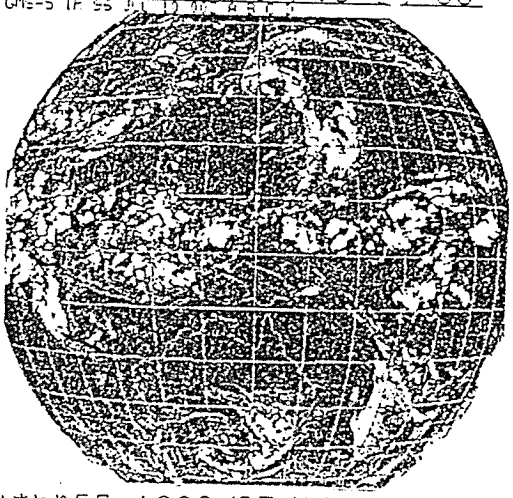
Aug. 05 (Mon) Local Time(-10h=UTC) Fine/Rain
08:00 Arrive at Guam
13:00～15:00 Unloading the gear of PMEL buoy

A2. GMS IR Images

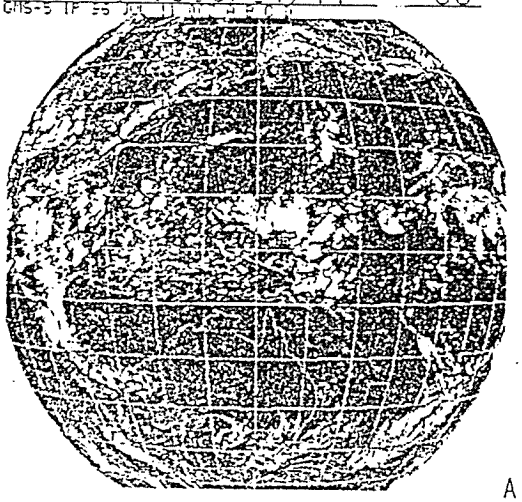
ひまわり5号 1996/07/08 00

ひまわり5号 1996/07/09 00

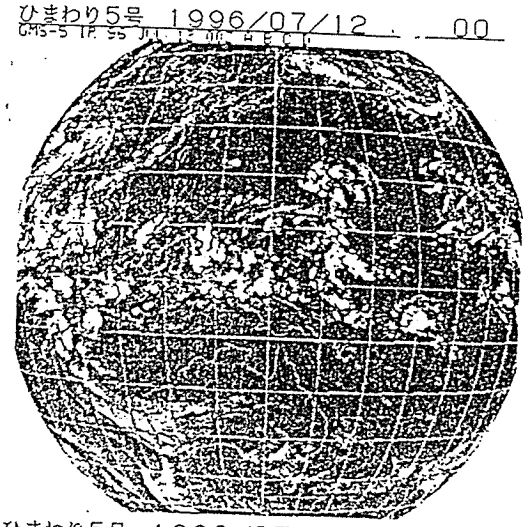
ひまわり5号 1996/07/10 00



ひまわり5号 1996/07/11 00



ひまわり5号 1996/07/12 00



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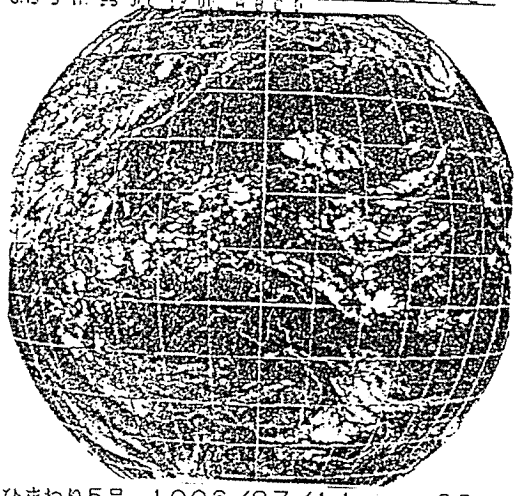
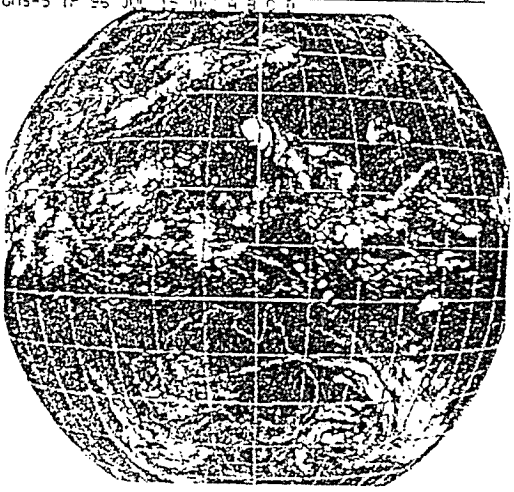


ひまわり5号 1996/07/14 00

ひまわり5号 1996/07/15 00



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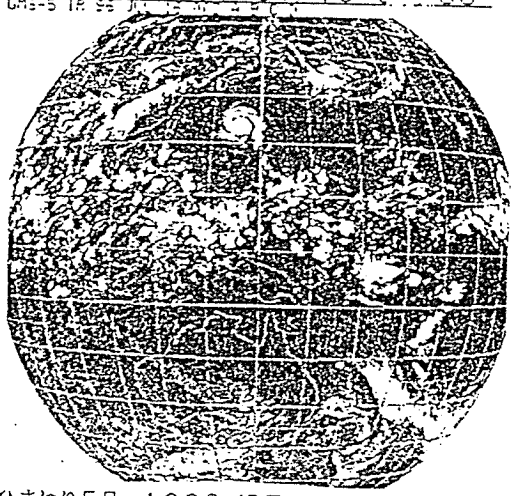

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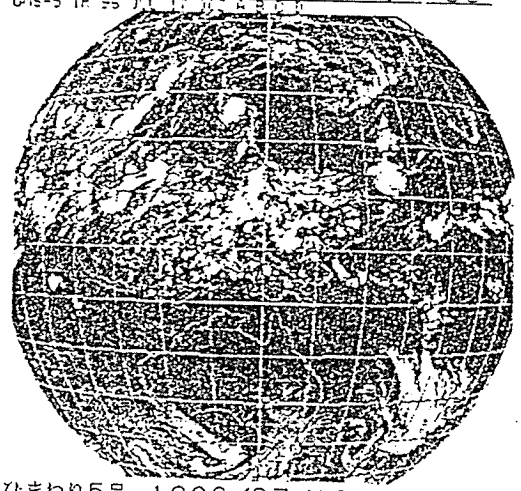

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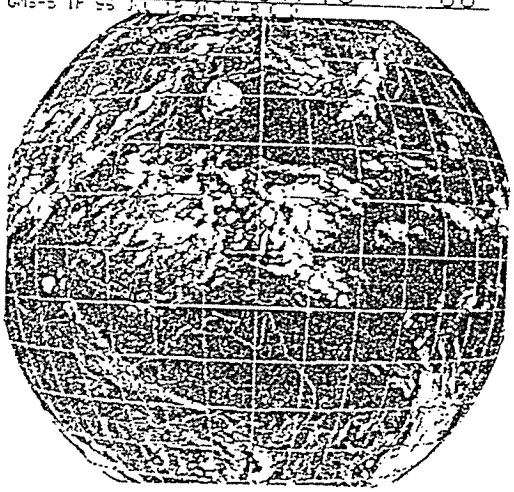

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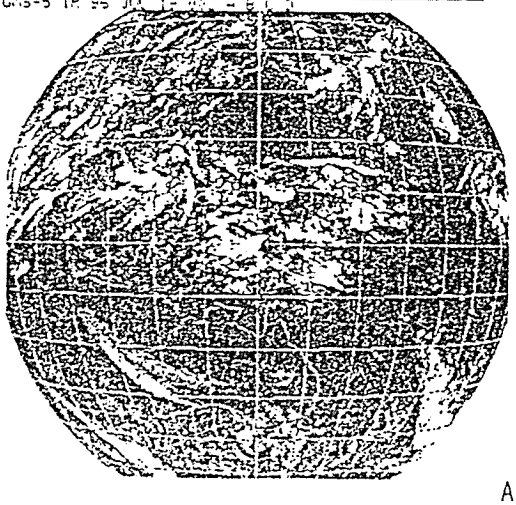

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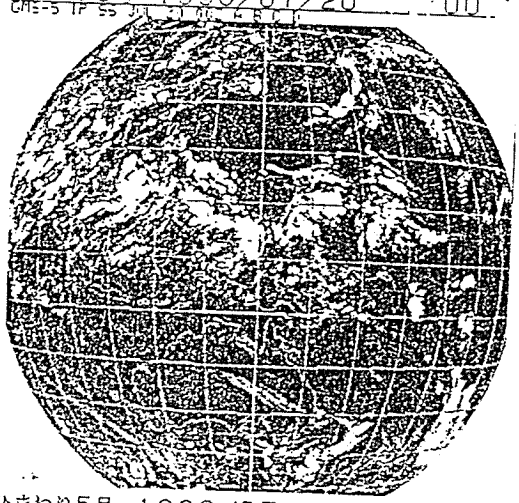

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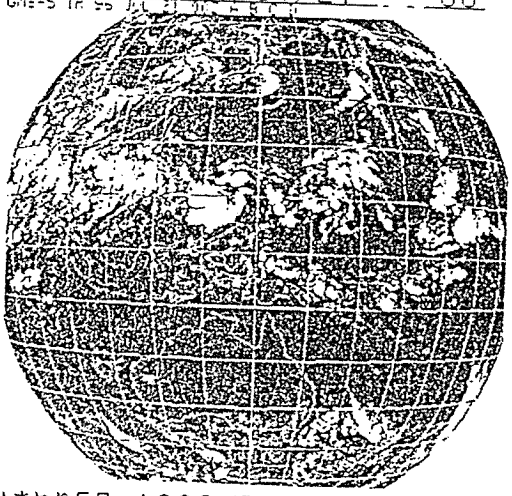

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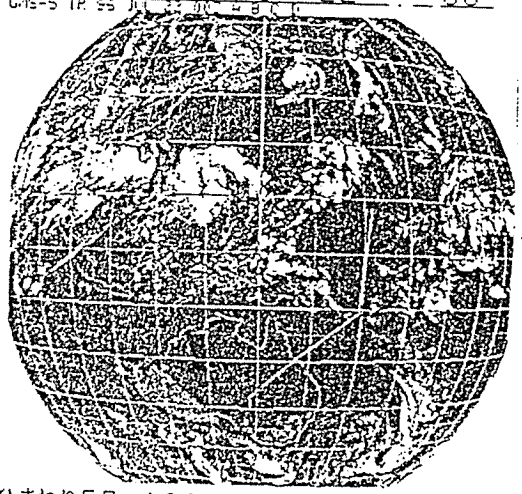

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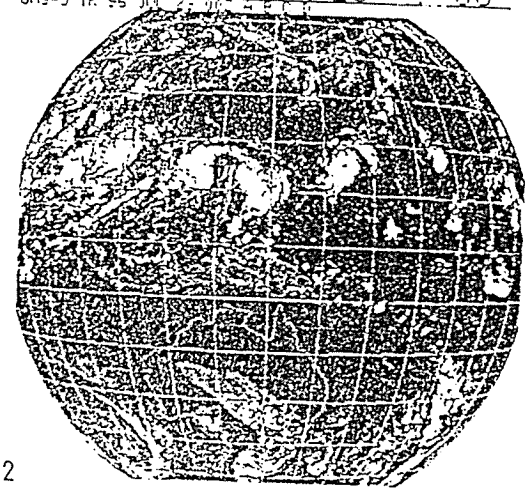

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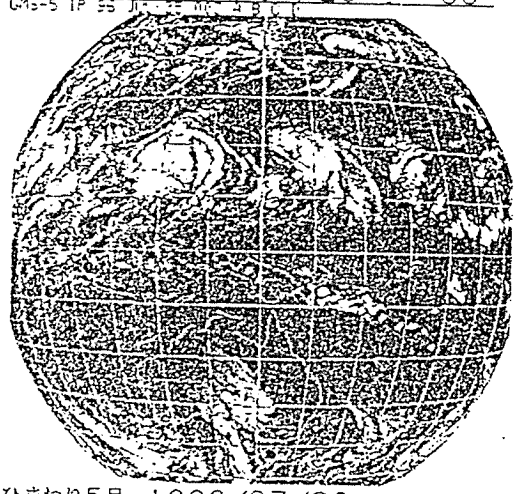

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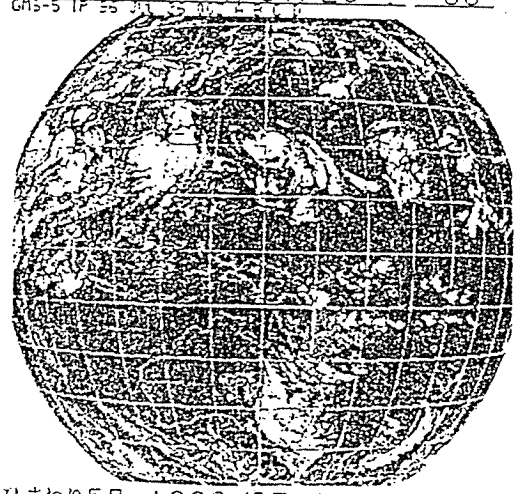

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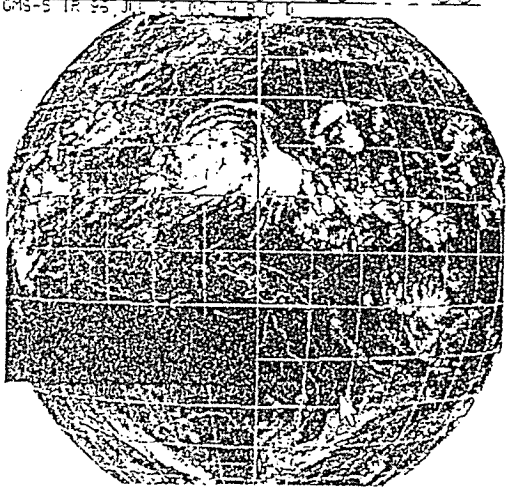

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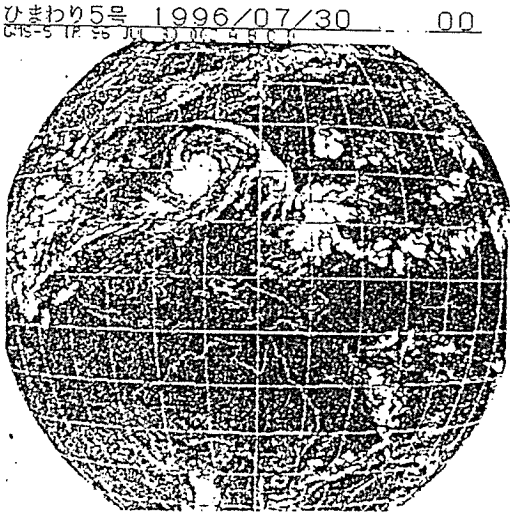

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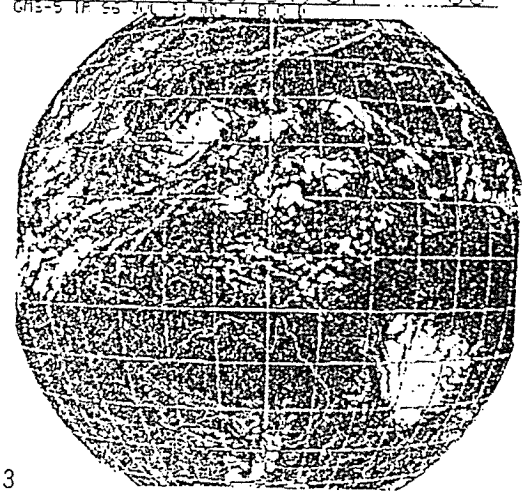

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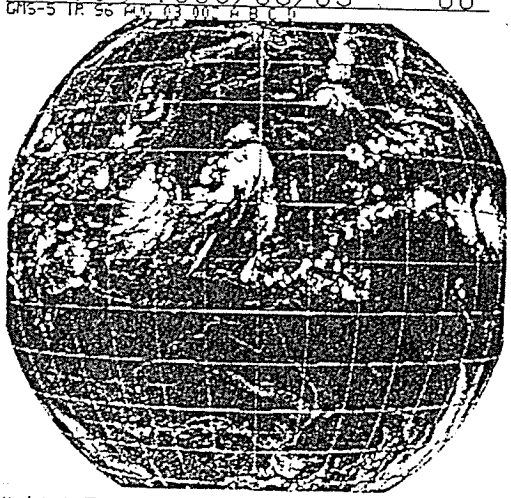

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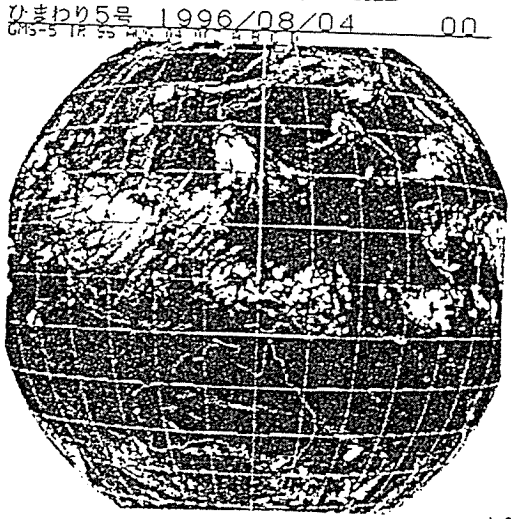

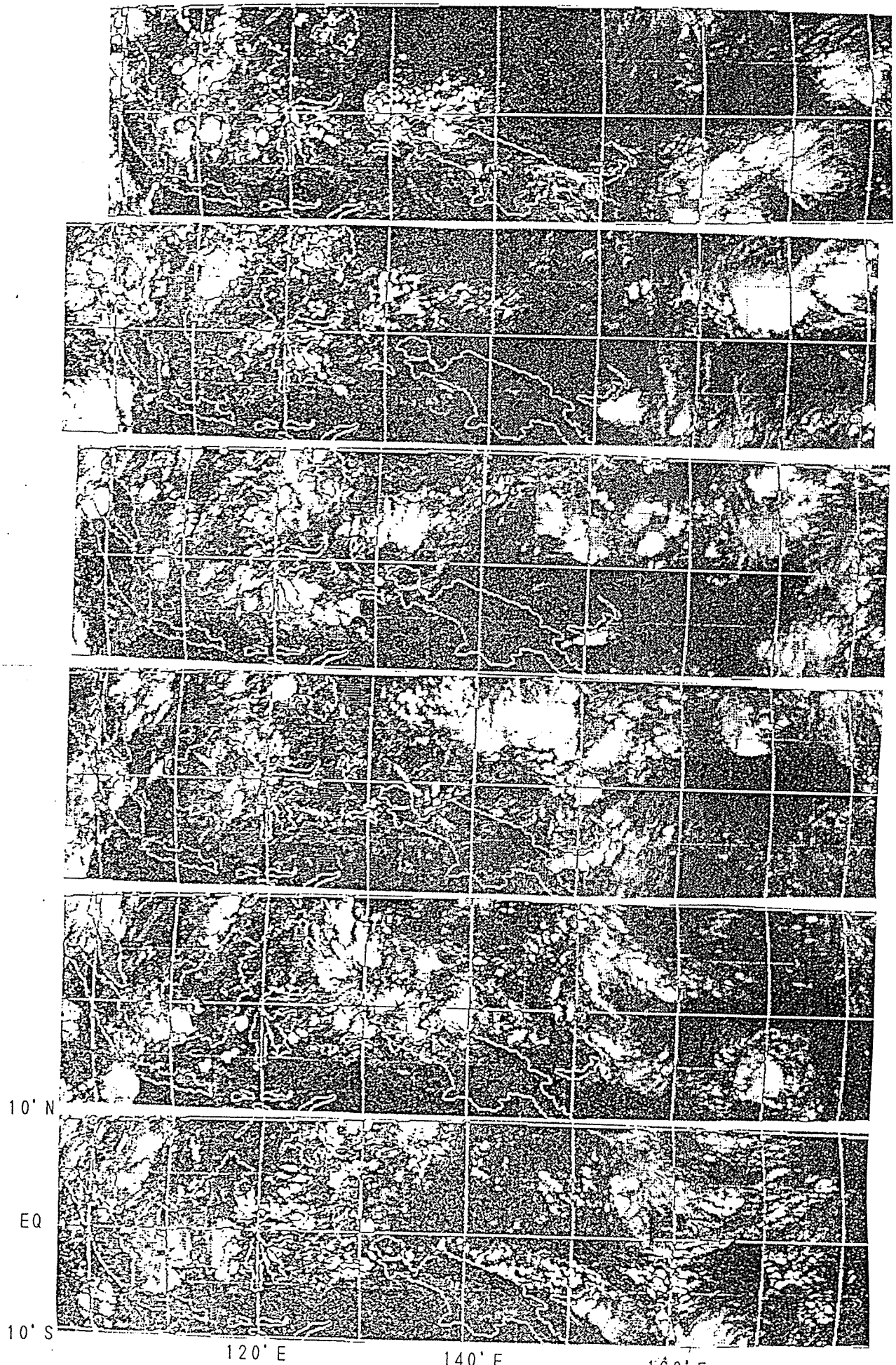
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July 10
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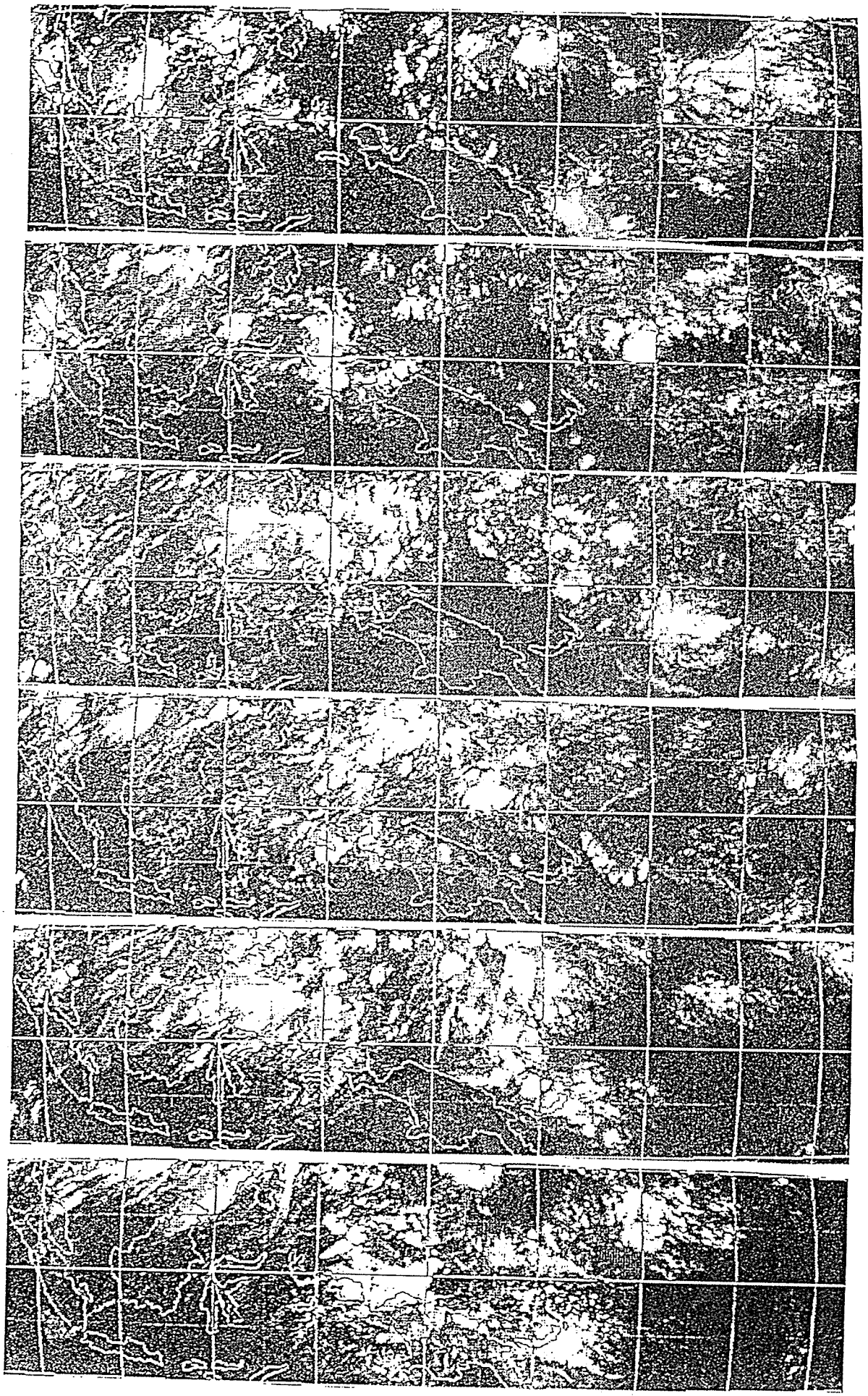

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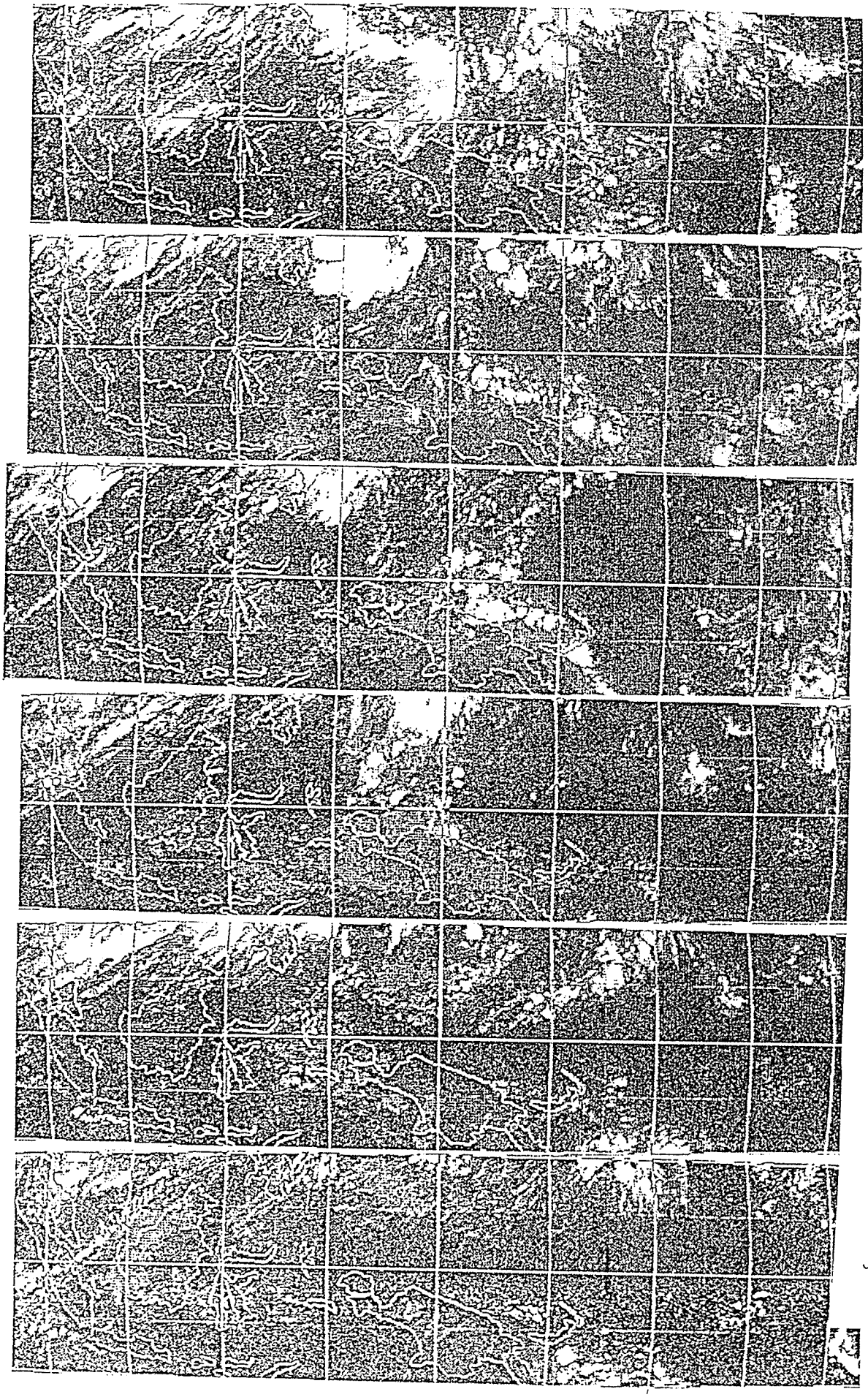

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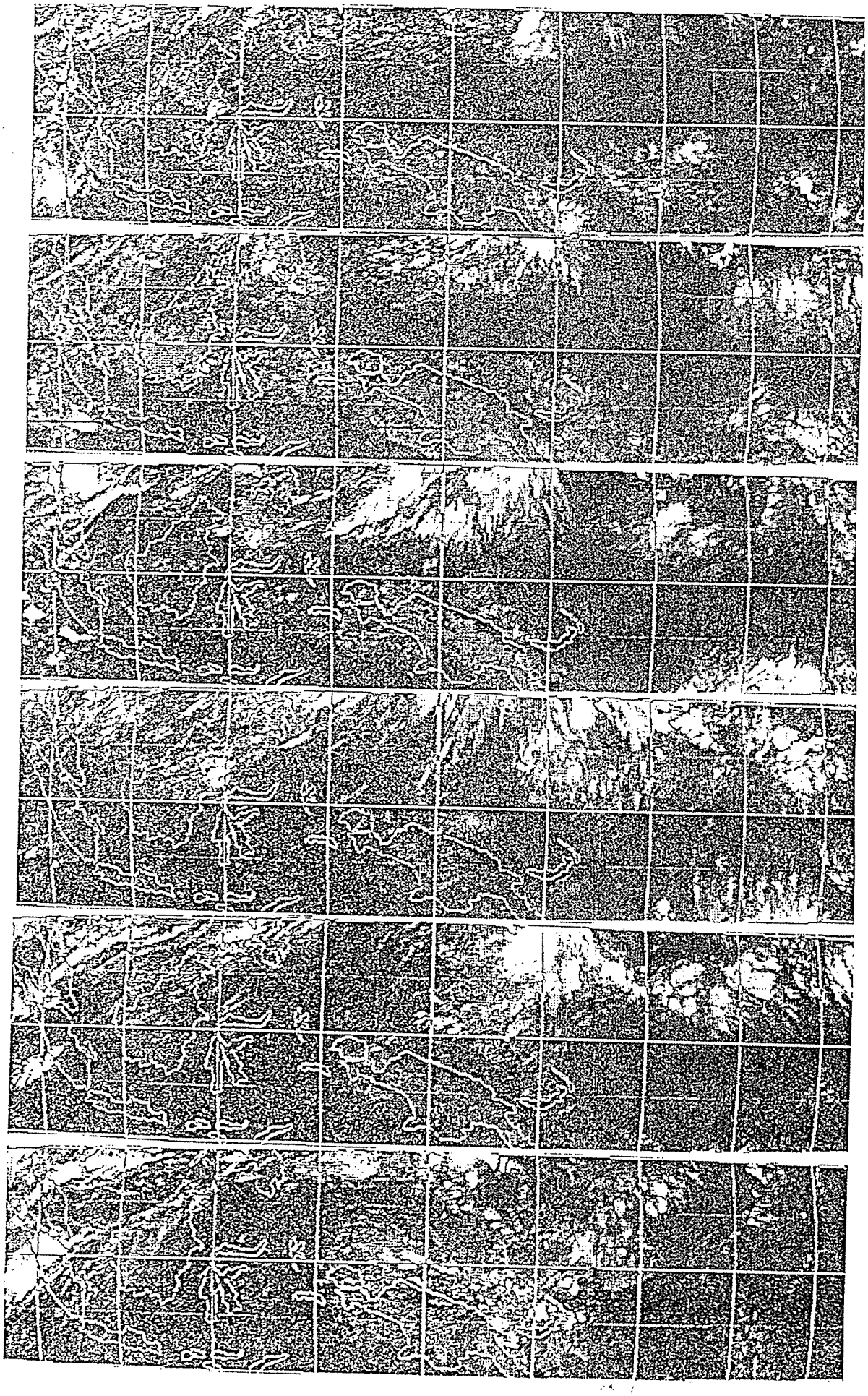

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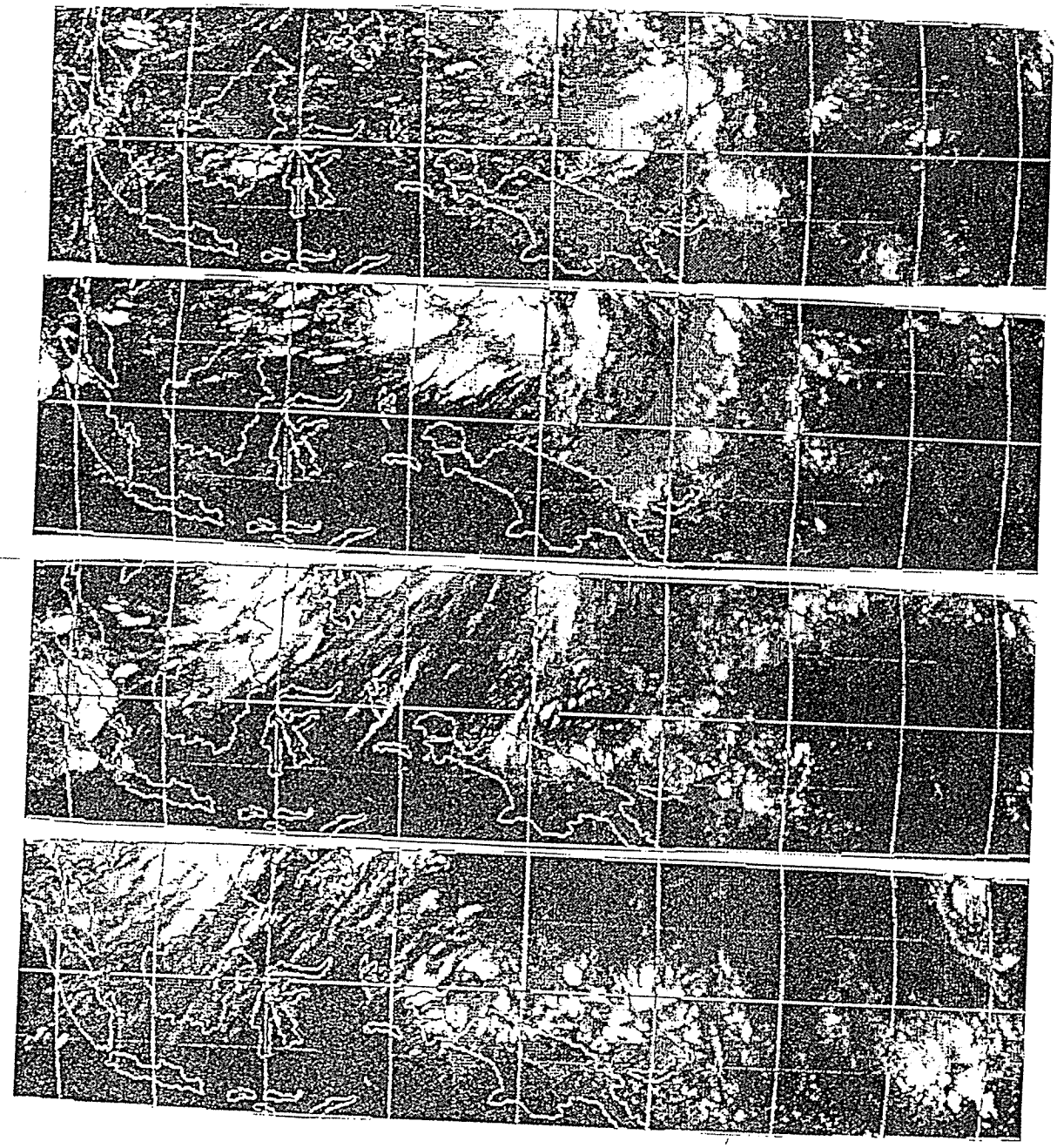

Aug. 01
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Aug. 04
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A4

3,Aug.1996

議事録

議　題：今航海の反省、次航海の課題

日　時：1996年8月3日(土)11:00 ～ 11:45

場　所：かいよう会議室

参加者：かいよう船長・機関長・通信長・一航士・一機士・甲板長・操機長
司厨長
研究者側米山主席研究員以下全員

会議開始にあたり米山主席研究員より、「TOCSクルーズにおける係留系設置・回収作業上の問題点の指摘、その他CTD、ゾンデ観測や船内生活上の問題点、要望等を出して欲しい」との趣旨説明があった。席上提起された問題点や要望の骨子を以下に記す。

1．積み込み機材について

1)PMELのanchorに予め振れ止め用のwire又はeye-boltの溶接を行ってきて欲しい

2)anchorの下に敷く為に、通常のpalletより頑丈なpalletを持ってきて欲しい

2．作業の安全について

1)設置回収作業に携わる人の役割を明確にし、ある作業を同時に行う人数を減らした方がより安全である

2)準備作業も一ヶ所に大勢集まり過ぎているので減らした方が良い

3)作業監督とは別に安全管理を行う人がいると良い

4)PMEL staffの行動についても、危険がないか見ていて欲しい(PMEL staff要望)

5)外国人乗船者に対し、「危ない」、「離れろ」等の作業安全上必要な基本的日本語の教育を行うと良い

6)helmetの顎紐着用を徹底するように

3．6日連続の設置回収作業について

1)今回の程度であればこなせるが、これ以上の負荷は事故発生が危惧される

4．CTDのシーブについて

1)wireの素線が切れないように幅広のシーブ等検討した方がよい
－幅広のシーブの場合溝ができて摩擦が増加する等別の問題が発生する。本件については帰ってから検討する

以上