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## A compilation of current, temperature and conductivity data from moorings F1 and F2 in the GATE C-area

by

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With 35 figures and 3 tables

Eine Zusammenstellung der Strömungs-, Temperatur- und Leitfähigkeitsdaten von den verankerten Meßsystemen F1 und F2 im GATE C-Gebiet

### Zusammenfassung

Die ozeanographischen Arbeiten der Gruppen aus der Bundesrepublik Deutschland bei GATE konzentrierten sich auf die Untersuchungen im C-Gebiet um 9° N, 23° W und am Äquator. Hier werden in konzentrierter Form die Daten dargestellt, die im C-Gebiet mit den verankerten Meßsystemen F 1 und F 2 gewonnen wurden. Der Aufsatz enthält eine kurze Diskussion der Geräteprobleme und Angaben zur Datenaufbereitung und zur statistischen Analyse. Die Daten werden graphisch in der Form von Zeitreihen, progressiven Vektordiagrammen, Häufigkeitsverteilungen und Spektren der horizontalen kinetischen Energie und der Temperaturvarianz dargestellt.

### Summary

Oceanographic measurements by groups from the Federal Republic of Germany contributed mainly to the C-Scale Experiment (centered at 9° N, 23° W) and the Equatorial Experiment. In this paper the data are presented that were obtained from the moorings F 1 and F 2 in the C-area. After a short discussion of instrument problems, data processing and statistical analysis, the data are presented graphically as time series, progressive vector diagrams, frequency distributions and spectra of horizontal kinetic energy and of temperature variance.

### 1 Introduction

The first major experiment of GARP, the Global Atmospheric Research Programme, was the GARP Atlantic Tropical Experiment (GATE). The objectives and the design of the oceanographic investigations in this experiment have been summarized by SCOR WG 43 (1973) and PHILANDER et al. (1974). Measurements by groups from the Federal Republic of Germany contributed mainly to the C-Scale Experiment (length scale  $\leq 100$  km, centered at 9° N, 23° W) and the Equatorial Experiment (BROCKMANN et al. 1974; SIEDLER et al. 1975; MEINCKE 1978).

This paper is concerned with data from moorings F 1 and F 2 in the C-Scale array (fig. 1) taken with the aim of studying the coupling of internal waves to the mixed layer. Since these data were also needed for other studies in the C- and larger B-Scale, it seemed appropriate to present them in a condensed form as a basis for further scientific analysis. No attempt will be made here to go beyond a description of the data. A compilation of related data obtained by vertically profiling instruments from F. R. G. vessels in the C-Scale was presented by PETERS (1978).

The major part of this paper presents data from the two-legged mooring F 1 (location 8° 49.9' N, 22° 52.6' W). The development of this mooring was an effort to provide reliable current velocity data from the mixed layer and the thermocline in the open tropical ocean with a close horizontal and vertical spacing of instruments. SIEDLER et al. (1976 a, b) have shown that the good performance of this mooring allowed high-quality current data to be

obtained. The pattern of instrument positions is shown in fig. 2 a, and a true to scale diagram of the mooring cables is given in fig. 2 b. Time changes of the pressure (depth) of instrument 10 607 are presented in fig. 2 c, and fig. 2 d gives the frequency distribution of pressure readings for instruments carrying pressure sensors.

F 2 was a conventional surface mooring (fig. 3, location  $8^{\circ} 44.76' \text{N}$ ,  $23^{\circ} 04.24' \text{W}$ ) where current data quality is bound to be degraded by mooring motion due to surface waves (see SAUNDERS 1976).

As a supplement to the statistical and spectral data presented in this paper, some results on the mean hydrographic conditions are given in figs. 4 to 7. The upper parts of the profiles of temperature, salinity and  $\sigma_t$  versus pressure in fig. 4 and the resulting profile of the Brunt-Väisälä frequency in fig. 5 down to 500 dbar represent the average of 110 CTD casts, taken at 3-hourly intervals from the vessel "Planet" from 3rd September to 17th September 1974, i. e. during most of the time when moorings F 1 and F 2 were deployed. "Planet" was stationed approx. 40 km NNW of mooring F 1 (see fig. 1). The individual CTD profiles were treated by a comprehensive editing routine including smoothing (PETERS 1976). Derived quantities were computed by formulas proposed by FOFONOFF et al. (1974). The means of pressure, temperature and salinity were calculated on  $\sigma_t$ -levels. Results from the uppermost 20 m of the water column are not shown because of the great variability in this range due to atmospheric forcing. Only a restricted number of deep casts are available from "Meteor". Hence, smoothed profiles from the single CTD cast No. 72 690 taken from the vessels "Meteor" approx. 60 km SW of mooring F 1 on 17th September 1974, 19.00 GMT, are presented in the lower parts of figs. 4 and 5.

Mean profiles of current components and temperature and of their variances obtained by averaging the data from mooring F 1 over the whole period of measurements (see fig. 8) are given for a comparison in figs. 6 and 7.

## 2 Instruments

The moorings were equipped with selfrecording instruments, measuring current, temperature, pressure and electrical conductivity in the water and meteorological data above the surface. A few comments on the criteria for selecting the instruments and on the calibration procedures will be given in the following.

The standard Aanderaa current meter which is widely used in oceanography (AANDERAA 1964) is seriously affected by surface wave induced motions when being used in a surface mooring. SAUNDERS (1975) has demonstrated that the observed speed values can exceed the true speed by a factor of 3,

and that direction values are heavily biased because of vane inertia. In general, spectral levels of kinetic energy determined by measurements on surface moorings are above the levels resulting from sub-surface mooring observations (GOULD & SAMBUCO 1974). The use of Vector Averaging Current Meters (VACM), however, leads to a reduction of this effect of mooring motions (McCULLOUGH 1975). Therefore, VACMs were used in the upper portion and partly in the horizontal line of mooring F 1. Lack of a sufficiently large number of these instruments lead to the use of Aanderaa current meters in mooring F 2 and in part of F 1.

It was important to obtain in these measurements reliable differences in direction of meters at different levels. In June 1975 direction tests of several VACMs, especially those occupying positions 10 609 and 10 610, were performed by means of a precision magnetometer and optical devices. No deviations exceeding the  $\pm 2.8$  degrees limits stated by the manufacturer were observed. There was no chance to check the calibration curves for speed given by the manufacturer before GATE (empirical rotor constant 34.6 cm/rev.), but this calibration is less critical than the direction calibrations for the scientific analysis.

No temperature calibration for the whole system had been done by the manufacturer, who quoted an accuracy of  $\pm 100 \cdot 10^{-3} \text{ }^{\circ}\text{C}$ . Unfortunately it was not possible to calibrate before GATE. Repeated calibration tests undertaken with another set of 34 instruments in Woods Hole (PAYNE et al. 1976), however, had led to the conclusion that the accuracy is typically better than  $\pm 10 \cdot 10^{-3} \text{ }^{\circ}\text{C}$ . In cooperation with the Woods Hole Oceanographic Institution, the thermistors of our VACMs used in GATE were calibrated after the experiment in February 1975. Assuming that these calibrations — five months after the field phase — can be used here, one obtains an accuracy of  $\pm 15 \cdot 10^{-3} \text{ }^{\circ}\text{C}$ .

The Aanderaa current meters used in GATE were standard instruments, with one modification: To allow for the large slant angle of the down-stream leg of mooring F 1 the gimbals of the instruments occupying positions 10 618, 10 619 and 10 620 had to be modified.

The temperature sensors of instruments delivered prior to 1970 were calibrated individually (positions 10 501—10 505). The tests proved that the instruments used in F 1 well met the manufacturer's specification of  $\pm 100 \cdot 10^{-3} \text{ }^{\circ}\text{C}$ . The manufacturer's temperature specifications were assumed to be correct for the other instruments.

Checks by compass readings showed in several cases that the direction accuracy is worse than the  $\pm 5$  degrees stated in the manufacturer's manual. No attempt, however, was made to systematically check the direction calibration of all Aanderaa meters.

A few Aanderaa meters used here were equipped with conductivity cells. Due to problems related to the time constants of conductivity and temperature sensors of the Aanderaa instruments, the time series of temperature and conductivity could only be analysed jointly at levels with smooth stratification and low variability. C/T data were treated by a method similar to normal CTD analysis. An example from F 2 for the resulting  $\sigma_t$ -frequency distribution is shown in fig. 35.

Mooring F 1 also carried an Aanderaa meteorological package. The cup anemometer, vane and compass were mounted 2 m above the sea surface on a toroid buoy. The data sampled at 12 cph were vector averaged over 1 hour in order to reduce noise induced by buoy motion. However, due to random direction readings in the 5 min samples the vector averaged mean speed is somewhat too small.

The Aanderaa thermistor chains carried 10 thermistors and 1 pressure sensor each. Unfortunately, the upper instrument failed, due to battery problems.

### 3 Data processing

The VACM tapes were decoded and calibrated at the Woods Hole Oceanographic Institution using their standard routines. According to PAYNE et al. (1976) and McCULLOUGH (1975) the following relationships between temperature, east and north components and recorded numbers were used:

$$\begin{aligned} T &= (A + B \ln R_T + C (\ln R_T)^2)^{-1} [\text{K}] \\ R_T &= R_1 + \frac{R_1 - R_2}{P_1 - P_2} (P - P_1) \\ P &= \frac{\Delta T}{N_T} \\ \text{EAST} &= \frac{2 E - R}{R} (a \bar{\omega} + b) [\text{cm/sec}] \\ \text{NORTH} &= \frac{2 N - R}{R} (a \bar{\omega} + b) [\text{cm/sec}] \end{aligned} \quad \left. \right\} \text{with } \bar{\omega} = \frac{R}{8 \Delta t} [\text{rev/sec}]$$

where:

$T$	temperature
$A, B, C$	thermistor constants
$R_T$	averaged value of thermistor resistance between two samples
$R_1, R_2$	external calibration resistances
$P$	averaged period of temperature oscillator between two samples
$P_1, P_2$	internal periods for reference resistances $R_1, R_2$
$\Delta t$	sampling interval (3.75 min in F1)
$N_T$	number of counts recorded in the temperature field on a VACM tape

$E, N, R$	number of counts recorded in the east and north field or in the rotor field on a VACM tape
EAST NORTH	} east and north components of the vector averaged current
$a, b$	empirical constants
$a = 36.1 \text{ cm/rev}$	} for $\bar{\omega} < 0.915 \text{ rev/sec}$
$b = 2.0 \text{ cm/sec}$	and
$a = 32.6 \text{ cm/rev}$	
$b = 5.2 \text{ cm/sec}$	for $\bar{\omega} \geq 0.915 \text{ rev/sec}$
$\bar{\omega}$	mean rotor rotation rate

All data from Aanderaa current meters, the thermistor chain and the wind recorder were processed at the Institut für Meereskunde in Kiel using standard programmes for transfer, decoding, calibration and editing. The following relationship between rotor revolutions per minute ( $R$ ) and speed ( $v$ ) was used in two different intervals:

$$\begin{aligned} v &= 0.9308 \cdot R && \text{for } 0 < R \leq 4.688 \text{ [cm/s]} \\ v &= 0.7175 \cdot R + 1 && \text{for } R > 4.688 \text{ [cm/s]} \end{aligned}$$

Spikes in the data series have been eliminated by linear interpolation. Aanderaa temperature, conductivity, and pressure data were calibrated by using third order polynomial calibration curves. After calibration and check of the time base the series have been truncated and stored on magnetic tapes in standard formats.

### 4 Statistical treatment

Standard statistical parameters, i. e. mean, variance, standard deviation, error of mean, skewness and kurtosis were calculated according to the following formulas:

$$\text{mean } \bar{A} = \frac{1}{n} \sum_{i=1}^n A_i$$

$$\text{variance } \sigma_A^2 = \frac{1}{n} \sum_{i=1}^n A_i^2 - \bar{A}^2$$

$$\text{standard error of the mean} = \frac{\sigma_A}{\sqrt{n}}$$

standard deviation =  $\sigma_A$

$$\text{skewness} = \frac{1}{\sigma_A^3} \frac{1}{n} \sum_{i=1}^n A_i^3 - \frac{3\bar{A}}{n} \sum_{i=1}^n A_i^2 + 2\bar{A}^3$$

$$\text{kurtosis} = \frac{1}{\sigma_A^4} \frac{1}{n} \sum_{i=1}^n A_i^4 - \frac{4\bar{A}}{n} \sum_{i=1}^n A_i^3 + \frac{6\bar{A}^2}{n} \sum_{i=1}^n A_i^2 - 3\bar{A}^4$$

with  $A_i$  denoting the i-th value of a series of n data points.

## 5 Data presentation

A summary of all available data from moorings F 1 and F 2 is given in tables 1 and 2, and specific problems with individual series are indicated on the right-hand side. Fig. 8 a, b presents progressive vector diagrams of wind and currents at mooring F 1 and fig. 9 for the currents at mooring F 2.

Statistical data and time series plots of hourly-averaged current components and temperatures are presented in figs. 10 to 29 for mooring F 1 and in figs. 30 to 35 for mooring F 2. Spectra of horizontal kinetic energy for selected levels are included in these figures (see table 3). All the necessary information is given in the figures' tables.

## Acknowledgements

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## References

- AANDERAA, J. R. (1964): A recording and telemetering instrument. — Techn. Rept. NATO Sub. Comm. Oc. Res. 16: 53 pp.
- BROCKMANN, C., J. MEINCKE, H. PETERS, G. SIEDLER & W. ZENK (1975): GATE, Oceanographic activities on F. R. G. research vessels. — Ber. Inst. Meeresk. Kiel 19: 25 pp.
- FORONOFF, N. P., S. P. HAYES & R. C. MILLARD jr. (1974): W. H. O. I. / Brown Micropofiler: Methods of calibration and data handling. — WHOI Techn. Rept. — 74-89: 64 pp. (unpubl. manuscript).
- GOULD, W. J., & E. SAMBUCO (1975): The effect of mooring type on measured values of ocean currents. — Deep-Sea Res. 22: 55—62.
- MCCULLOUGH, I. R. (1975): Vector averaging current meter speed calibration and recording technique. — WHOI Techn. Rept. — 75 — 44: 35 pp. (unpubl. manuscript).
- MEINCKE, J. (1978): Measurements of currents and stratification during the GATE Equatorial Experiment. — Data Report. — „Meteor“ Forsch.-Ergebn. A 20: 81—100.
- PAYNE, R. E., A. L. BRADSHAW, J. P. DEAN & K. E. SCHLEICHER (1976): Accuracy of temperature measurements with the VACM. — WHOI Techn. Rept. — 76—94: 78 pp. (unpubl. manuscript).
- PETERS, H. (1976): GATE — CTD data measured on the F. R. G. ships — ship board operations — calibration — editing. — Ber. Inst. f. Meereskunde Kiel 22: 27 pp.
- (1978): A compilation of CTD- and profiling current meter data from GATE 1974, F.S. "Meteor" and W.F.S. "Planet". — "Meteor" Forsch.-Ergebn. A 20: 49—80.
- PHILANDER, G., M. MIYAKE, Y. TARBEV & T. DE LA MORINIÈRE (1974): The oceanographic sub-programme for the GARP Atlantic Tropical Experiment. — GATE Rept. 8: 135 pp., ICSU/WMO, Geneva.
- SAUNDERS, P. M. (1976): Near surface current measurements. — Deep-Sea Res. 23 (3): 55—62.
- SCOR working group 43 (1973): SCOR Proposal for a GATE oceanographic programme. ICSU/WMO, 49 pp.
- SIEDLER, G., & W. ZENK (1975): Variations of temperature, salinity, and currents in the mixed layer and the thermocline (preliminary results). — GATE Rept. 14, vol. II: 372—378, ICSU/WMO, Geneva.
- SIEDLER, G., & E. GERLACH (1976 a): Verankerte Meßsysteme für die Tiefsee. — Intercean '76, Kongressbericht 2: 925—940, Düsseldorf.
- SIEDLER, G., E. R. GERLACH, R. KÄSE & W. ZENK (1976 b): Performance of the GATE two-legged mooring. — Polymode News 6 (unpubl. manuscript).
- World Data Center-A (1975 ff.): GARP Atlantic Tropical Experiment (GATE). — Data Catalogue. Asheville, North Carolina.

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Table 1 Summary of all available data from mooring F 1. The Julian date is given according the GATE Data Catalogue (World Data Center A, 1975).

IFM Ref. No.	Mean depth [m]	Nominal depth [m]	Sensor type	Aanderaa CM $\Delta t$ [min]	AMF VACM $\Delta t$ [min]
106 00		- 2	v	5.0	
106 01		0- 50		111	10.0
106 02	58 - 103	60- 105	P 101		10.0
106 03	55	56	v T P	50	
106 04	56	56	T	50	
106 05	57	56	v T P	5.0	
106 06	60	56	v T		375
106 07	61	56	v T P C	5.0	
106 08	62	56	v T		375
106 09	60	56	v T		375
106 10	59	56	v T		375
106 11	57	56	v T P C	5.0	
106 12	7	7	v T		375
106 13	18	18	v T		375
106 14					
106 15	40	40	v T		375
106 16	46	455	v T		375
106 17	51	51	v T		375
106 18	65	64	v T P C	5.0	
106 19	74	74	v T	5.0	
106 20	104	104	v T	5.0	
106 21					
106 22.	217	216	v T P C	5.0	

Tabelle 1 Zusammenfassung aller verfügbaren Daten der F 1-Verankerung. (Das Julianische Datum entspricht der Tabelle im „GATE Data Catalogue“ (World Data Center A, 1975).)

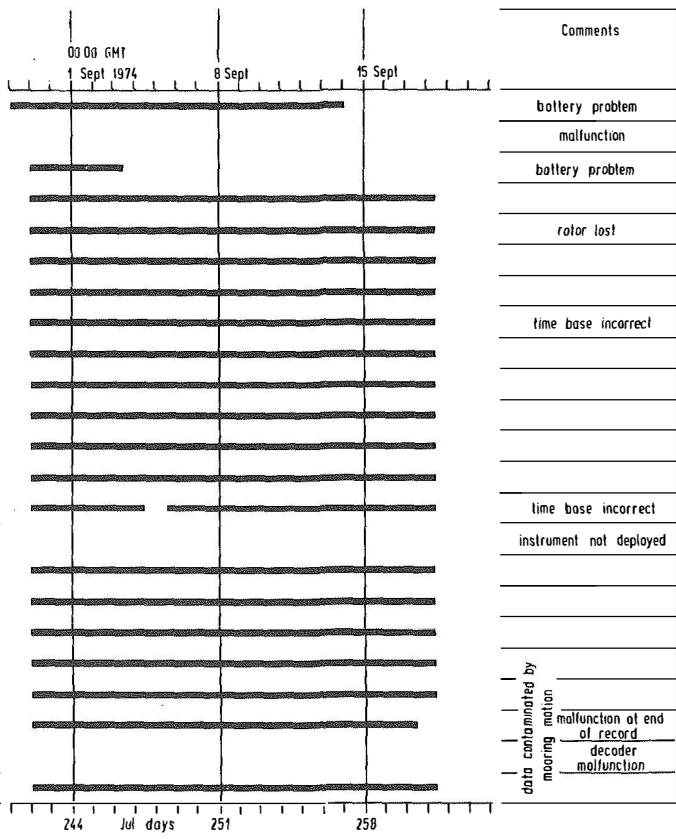


Table 2 Summary of all available data from mooring F 2.

Tabelle 2 Zusammenfassung aller verfügbaren Daten der F 2-Verankerung.

IFM Ref No	Mean depth [m]	Nominal depth [m]	Sensor type	Aanderaa CM $\Delta t$ [min]
105 01	10	5	v T	5.0
105 02	31	30	v T	5.0
105 03	43	40	v T	5.0
105 04	64	60	v T	5.0
105 05	105	100	v T	5.0
105 06	157	150	T C	5.0

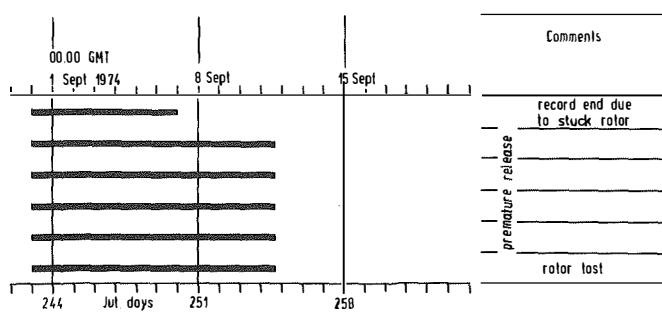


Table 3 Captions for figures 10—35.

Where graphs are presented here, the types of data are indicated by the following letters: U, V = east, north current/wind components, T = temperature, C = conductivity, p = pressure, E<sub>k</sub>, E<sub>T</sub> = autospectra of horizontal kinetic energy/temperature fluctuations. Mean values in the frequency distribution are marked by vertical arrows. All confidence limits shown are given for 95 %. Due to increasing band averaging with increasing frequencies, often two confidence limits are depicted, the right being valid for frequencies that are beyond the position of the confidence limit sign.

Tabelle 3 Zusammengefaßte Bildunterschriften zu den Abbildungen 10—35.

Daten in den hier gezeigten Zeichnungen sind durch folgende Buchstaben gekennzeichnet: U, V = Ost-, Nord-Strömungs-/Wind-Komponenten, T = Temperatur; p = Druck; E<sub>k</sub>, E<sub>T</sub> = Autospektren der kinetischen Energie/Temperaturfluktuationen. Mittelwerte in den Häufigkeitsverteilungen sind durch senkrechte Striche gekennzeichnet. Alle dargestellten Vertrauensgrenzen sind für 95 % angegeben. Aufgrund von zunehmender Bandmittelung mit zunehmender Frequenz sind oft zwei Vertrauensgrenzen angegeben. Die rechte von beiden ist von derjenigen Frequenz an maßgeblich, bei der die Schranken eingezeichnet sind.

fig.	ref. no.	mean depth (m)	freq. distr.	time series	auto spectra
10	10 600	—2	UV	UV	E <sub>k</sub>
11	10 602	58—103	—	10 × T, p	2 × E <sub>T</sub>
12	10 603	55	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
13	10 604	56	T	—	—
14	10 605	57	UVT	UVT	—
15	10 606	60	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
16	10 607	61	UVT	—	—
17	10 608	62	UVT	UVT	—
18	10 609	60	UVT	UVT	—
19	10 610	59	UVT	UVT	—
20	10 611	57	UVT	UVT	—
21	10 612	7	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
22	10 613	18	UVT	—	E <sub>k</sub> , E <sub>T</sub>
23	10 615	40	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
24	10 616	46	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
25	10 617	51	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
26	10 618	65	UVT	UVT	—
27	10 619	74	UVT	UVT	—
28	10 620	104	UVT	UVT	—
29	10 622	217	UVT	UVT	—
30	10 501	10	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
31	10 502	31	UVT	UVT	—
32	10 503	43	UVT	UVT	—
33	10 504	64	UVT	UVT	E <sub>k</sub> , E <sub>T</sub>
34	10 505	105	UVT	UVT	—
35	10 506	157	C, σ <sub>t</sub> , p T, p	—	—

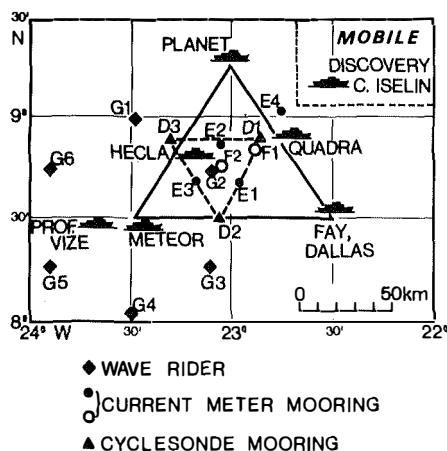


Fig. 1. Location of moorings and ships within the GATE-C-Scale area during phase III (30. Aug. 1974—18. Sept. 1974).

Abb. 1. Verteilung der Verankerungen und Schiffe im GATE-C-Scale-Gebiet während Phase III (30. August—18. September 1974).

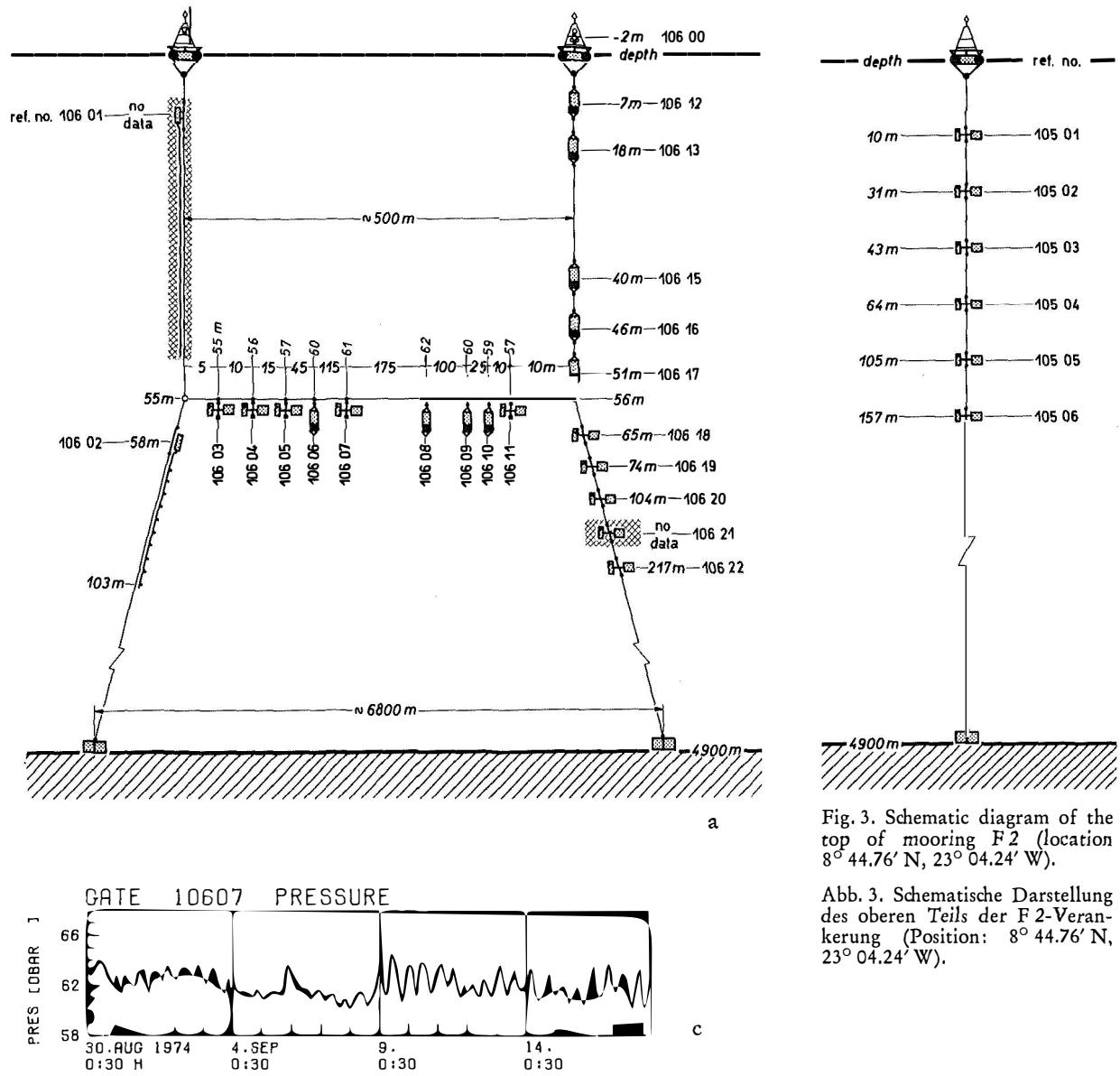


Fig. 2. Two-legged mooring F 1 (location  $8^{\circ} 49.9' N$ ,  $22^{\circ} 52.6' W$ ): a) Pattern of instrument position. b) True to scale diagram according to numerical model calculation. c) Pressure variations in the centre of the horizontal mooring string. d) Frequency distributions of pressure readings from horizontally moored instruments. Due to different instrumental resolution only mean pressures are comparable. They are marked by vertical arrows.

Abb. 2. Zwei-bein-Verankerung F 1 (Position:  $8^{\circ} 49.9' N$ ,  $22^{\circ} 52.6' W$ ): a) Schematische Anordnung der Instrumente. b) Maßstabsgerechte Darstellung aufgrund numerischer Modellrechnungen. c) Druckschwankungen in der Mitte der horizontalen Verankerungskette. d) Häufigkeitsverteilungen der Druckregistrierungen in horizontal verankerten Geräten. Wegen unterschiedlicher instrumenteller Auflösung können nur die gemittelten Druckwerte verglichen werden. Sie sind durch senkrechte Pfeile markiert.

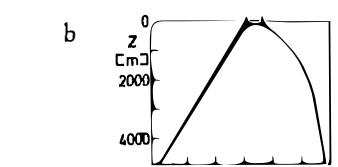


Fig. 3. Schematic diagram of the top of mooring F 2 (location  $8^{\circ} 44.76' N$ ,  $23^{\circ} 04.24' W$ ).

Abb. 3. Schematische Darstellung des oberen Teils der F 2-Verankerung (Position:  $8^{\circ} 44.76' N$ ,  $23^{\circ} 04.24' W$ ).

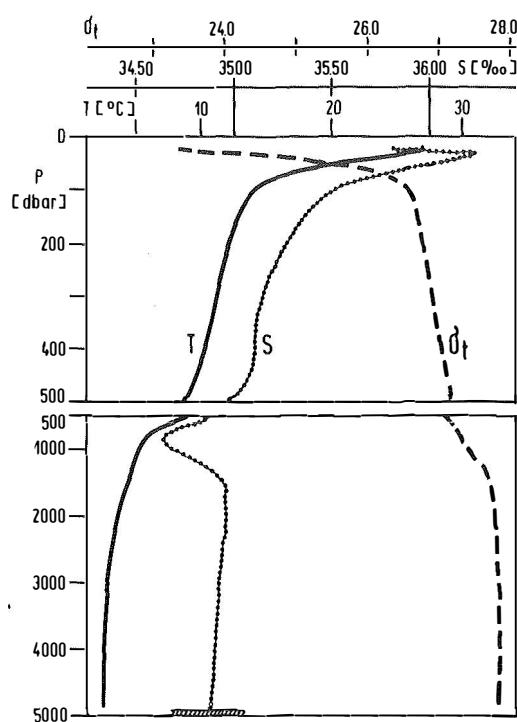


Fig. 4. Averaged vertical distribution of temperature T, salinity S and  $\sigma_t$  for the upper 500 meters from 110 CTD-stations obtained by "Planet". The data are supplemented by a deep ( $\geq 500$  m) CTD-cast taken from "Meteor". For locations see fig. 1.

Abb. 4. Gemittelte Vertikalverteilungen der Temperatur T, des Salzgehaltes S und von  $\sigma_t$  aus den oberen 500 Metern nach 110 CTD-Stationen, die von „Planet“ aufgenommen wurden. Die Daten werden durch eine tiefe ( $\geq 500$  m) CTD-Station der „Meteor“ ergänzt. Die Positionen sind Abb. 1 zu entnehmen.

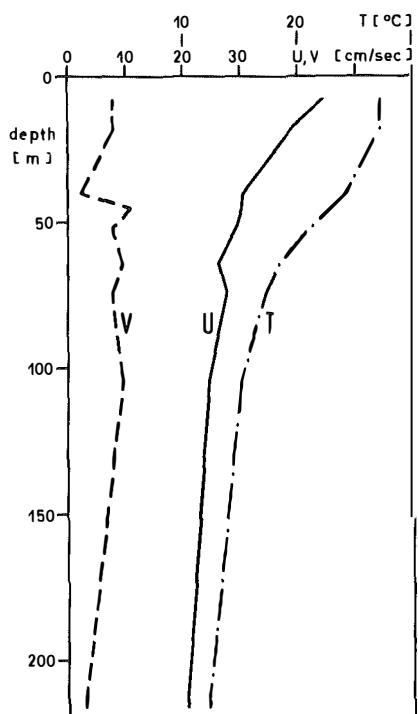


Fig. 6. Mean profiles of zonal and meridional current components U and V, and temperature T according to averaged data from mooring F 1. The averages were taken over the whole sampling period.

Abb. 6. Mittlerer Profile der zonalen und meridionalen Strömungskomponente U und V und der Temperatur T aufgrund von gemittelten Daten aus der F 1-Verankerung. Die Mittelwerte wurden aus dem gesamten Meßintervall berechnet.

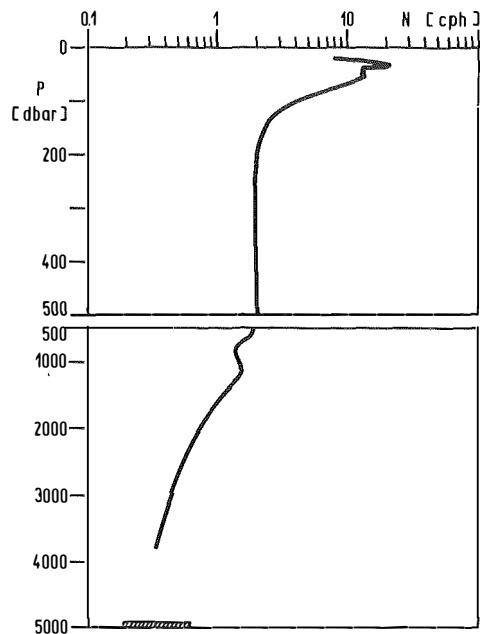


Fig. 5. Vertical distributions of the Brunt-Väisälä frequency N resulting from data shown in fig. 4.

Abb. 5. Vertikalverteilung der Brunt-Väisälä Frequenz N, errechnet aus den Daten, die in Abb. 4 dargestellt sind.

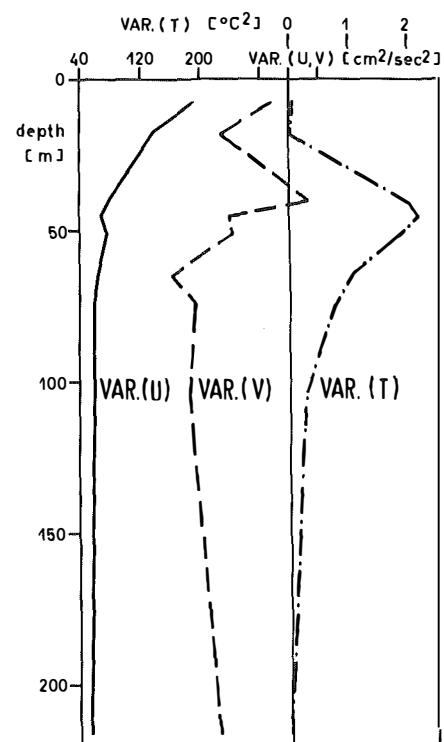


Fig. 7. Mean profiles of variances obtained with averaged data shown in fig. 6.

Abb. 7. Mittlere Profile der Varianzen der zugehörigen gemittelten Daten aus Abb. 6.

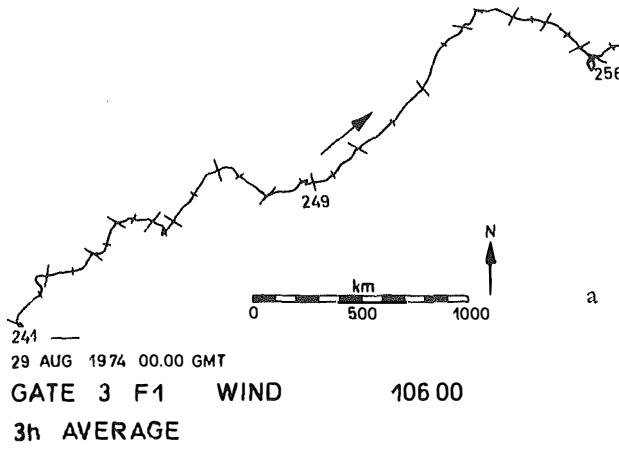


Fig. 8. Progressive vector diagram from mooring F 1  
12-hourly dashes are included. The longer dashes  
count days. a) Wind vectors were averaged over  
three hours prior to plotting. b) Current vectors  
are shown as two-hourly averages.

Abb. 8. Fortschreitende Vektordiagramme für die  
F 1-Verankerung. Striche im zwölfstündigen Ab-  
stand sind eingezeichnet. Die längeren Striche zählen  
die Tage. a) Vor dem Zeichnen wurden die Wind-  
vektoren dreistündlich gemittelt. b) Die Strömungs-  
vektoren sind als zweistündliche Mittel dargestellt.

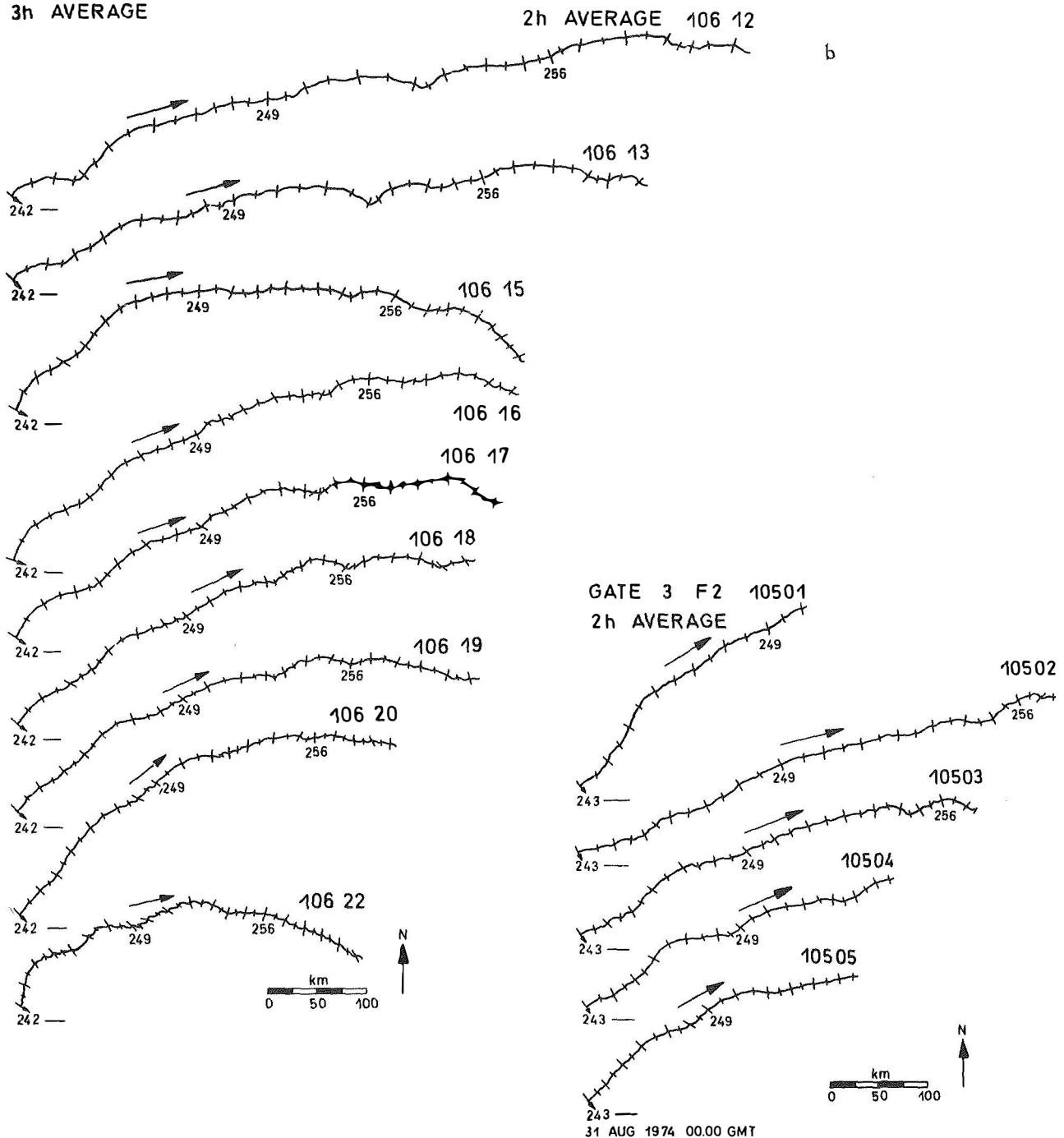


Fig. 9. Two-hourly averaged progressive vector  
diagram for mooring F 2. Note that the top instru-  
ment recorded only part of the total mooring  
period.

Abb. 9. Zweistündlich gemittelte fortschreitende  
Vektordiagramme für die F 2-Verankerung. Man  
beachte, daß das oberste Gerät nur einen Bruchteil  
der gesamten Verankerungsdauer registriert hat.

Mooring	GATE	F1			Cross correlation	East - North		
Reference nr.	10600				Covariance	+	.1841	
Sample size	384 pts,	Interval	60	min	Std err covar	+	.2992	
Spanning range	from 00:30 Z 29 Aug 74 (241)				Std dev covar	+	5.863	
(Jul.days)	to 23:30 Z 13 Sept74 (256)				Corr coefficient	+	.05541	
Duration	15 d,	23 hours,	0	min	Vector mean	+	2.271	
Nominal depth	-2	meters			Vector variance	+	3.532	
Instrument - type					Std dev vec var	+	1.879	
parameter	mean	var	std err	std dev	skew	kurt	min	max
U ( m/s)	+2.038	+2.335	+0.07798	+1.528	- .7810	+2.131	-4.706	+5.676
V ( m/s)	+1.004	+4.728	+1.110	+2.174	- .01885	-0.4882	-4.992	+6.427

Fig. 10

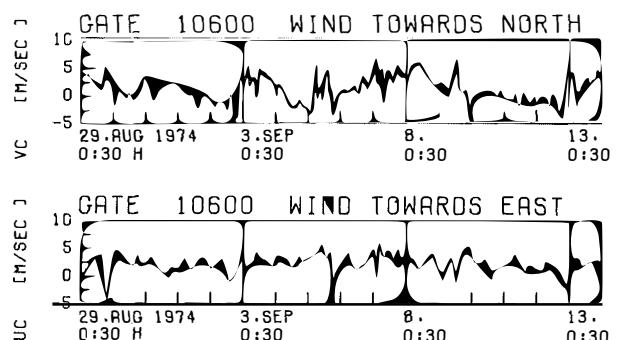
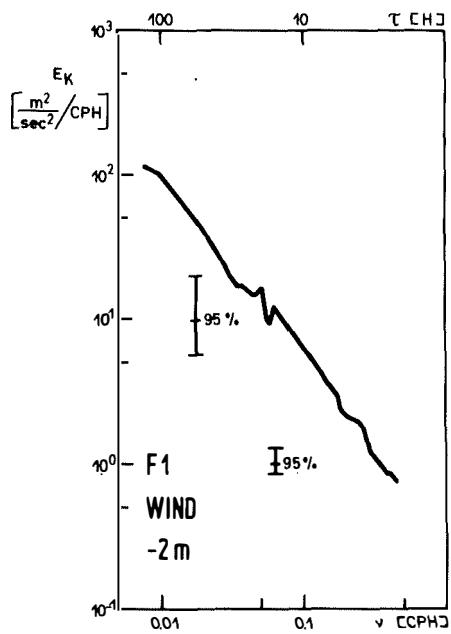
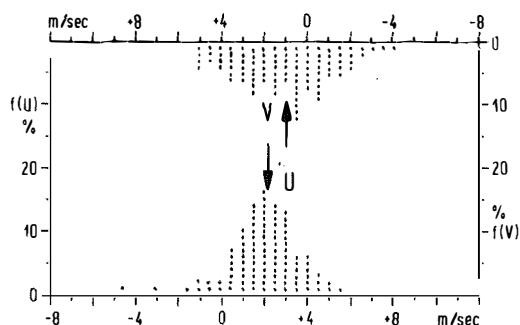
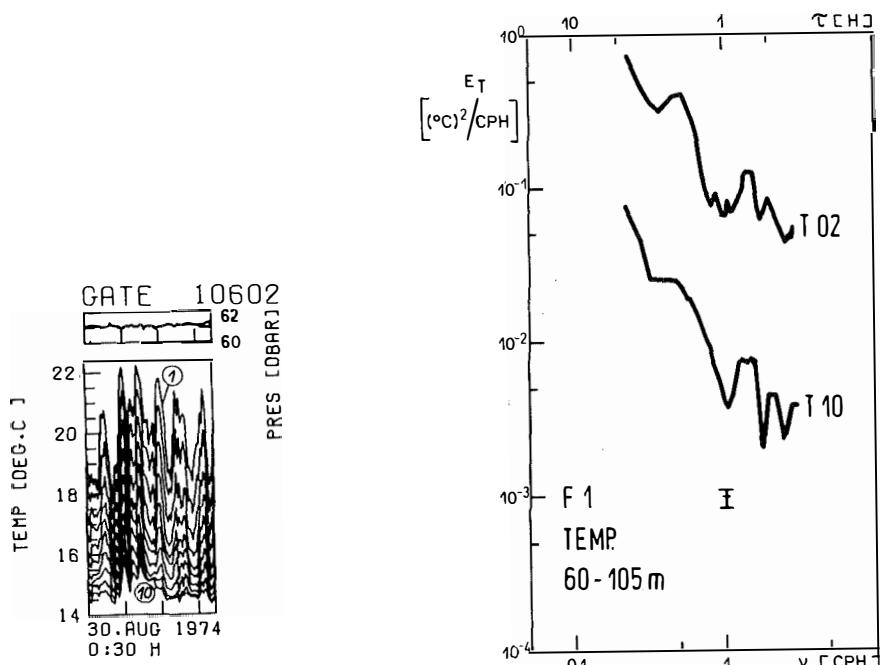


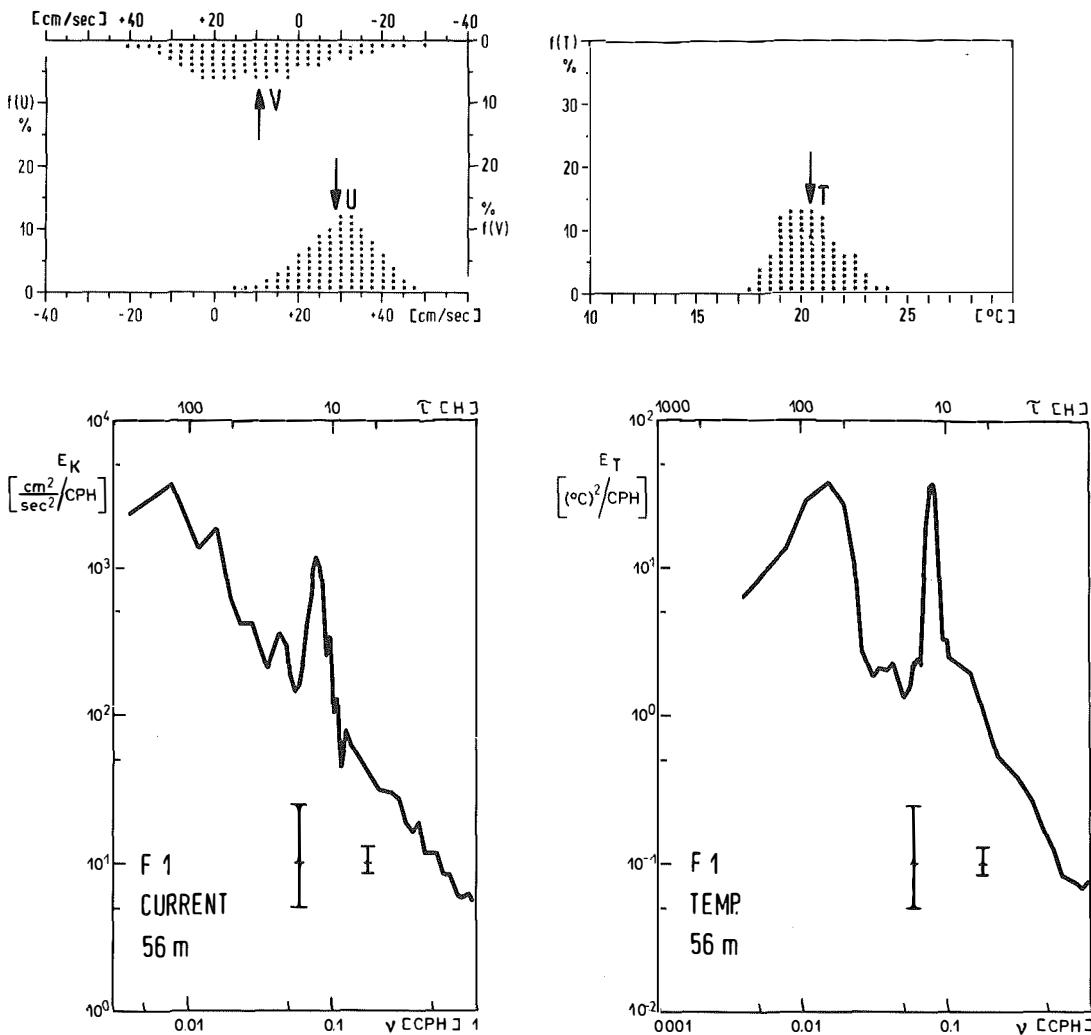
Fig. 11

Mooring GATE F1 Reference nr. 10602 Sample size 509 pts, Interval 10 min Spanning from 00:00 Z 30 Aug 74 (242) range (Jul.days) to 12:40 Z 3 Sept 74 (246) Duration 4 d, 12 hours, 40 min Nominal depth 60-105 meters (No. 1-10) Instrument - type Aanderaa-Therm. chain								
parameter	mean	var	std err	std dev	skew	kurt	min	max
T <sub>60</sub> (°C)	+19.94	+1.712	.0579	+1.308	.+1.269	-.8374	+17.15	+23.35
T <sub>65</sub> (°C)	+19.03	+1.449	.0534	+1.204	+.4408	-.5422	+16.58	+22.17
T <sub>70</sub> (°C)	+18.07	+1.211	.0488	+1.100	+.6298	-.0270	+15.95	+21.35
T <sub>75</sub> (°C)	+17.32	.9771	.0438	.9885	+.7829	+.2446	+15.58	+20.59
T <sub>80</sub> (°C)	+16.69	.7680	.0388	.8763	+.8882	+.7140	+15.19	+19.81
T <sub>85</sub> (°C)	+16.26	.5774	.0337	.7599	+.9236	+1.026	+14.88	+19.27
T <sub>90</sub> (°C)	+15.77	.4269	.0290	.6534	+.8632	+.7093	+14.66	+18.55
T <sub>95</sub> (°C)	+15.35	.3174	.0250	.5634	+1.100	+1.098	+14.51	+17.32
T <sub>100</sub> (°C)	+15.02	.2323	.0214	.4820	+1.349	+1.955	+14.35	+16.85
T <sub>105</sub> (°C)	+14.81	.1464	.0170	.3826	+1.358	+2.237	+14.18	+16.37
P (dbar)	+61.12	.0200	.0063	.1414	-.2324	-13.08	+60.41	+61.60



Mooring GATE F1	Cross correlation East - North							
Reference nr. 10603	Covariance - 16.36							
Sample size 5578pts, Interval 5.0 min	Std err covar + 5.966							
Spanning from 00:00 Z 30 Aug 74 (242) range (Jul.days)	Std dev covar +445.6							
to 08:45 Z 18 Sept 74 (261)	Corr coefficient - 0.1153							
Duration 19 d, 8 hours, 45 min	Vector mean + 30.44							
Nominal depth 56 meters	Vector variance +163.2							
Instrument - type Aanderaa	Std dev vec var + 12.78							
parameter	mean	var	std err	std dev	skew	kurt	min	max
U (cm/s)	+28.79	+ 82.58	.1217	+9.087	-.5990	+1.084	-23.32	+58.00
V (cm/s)	+ 9.899	+243.9	.2091	+15.62	-.3795	+.337	-90.00	+49.36
T (°C)	+20.36	+ 1.86	.0183	+ 1.36	+.3405	-.333	+16.99	+25.46
P (dbar)	+55.25	+.4107	.0086	.6408	-.2654	-.3703	+.5327	+.5688

Fig. 12



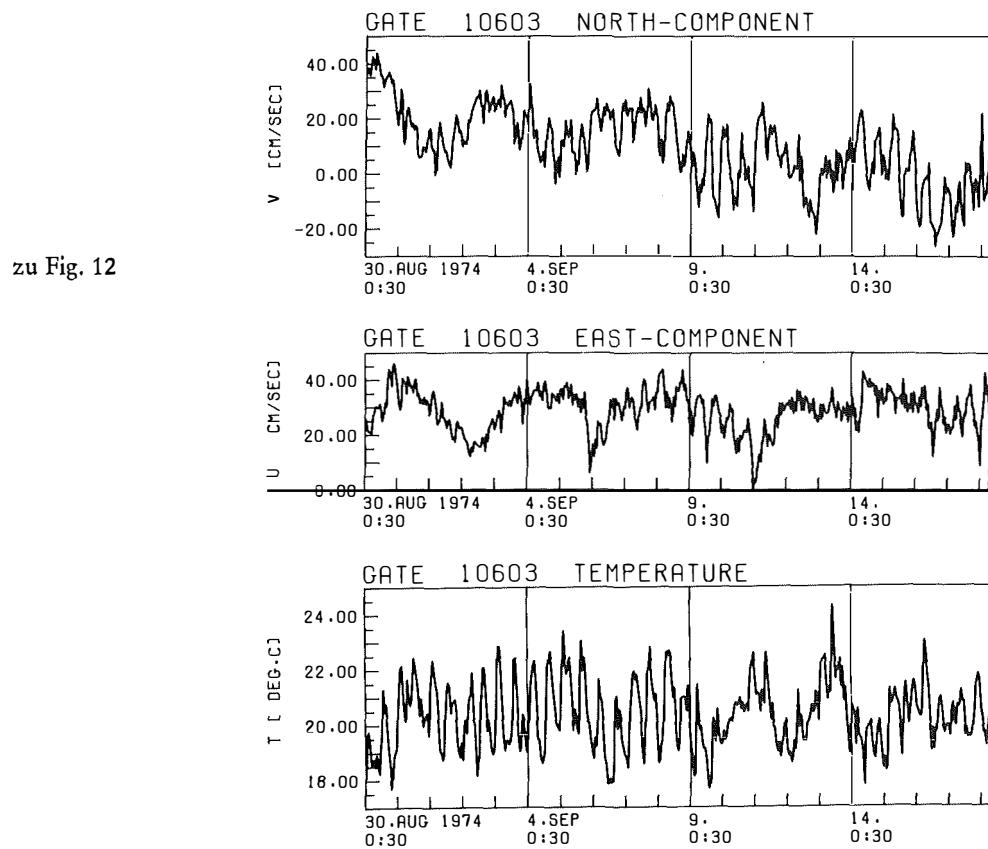
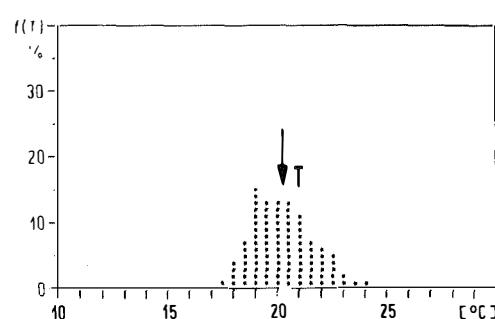


Fig. 13

Moorring	GATE F1
Reference nr.	10604
Sample size	5578 pts, Interval 5.0 min
Spanning	from 00:00 Z 30 Aug 74 (242)
range	(Jul.days) to 08:45 Z 18 Sept74 (261)
Duration	19 d, 8 hours, 45 min
Nominal depth	56 meters
Instrument - type	Aanderaa
parameter	mean
T (°C)	+20.22
	var
	.+1.845
	std err
	.+.01819
	std dev
	+1.358
	skew
	+.3853
	kurt
	-.2762
	min
	+16.93
	max
	+25.61



Mooring	GATE F1	Cross correlation	East - North					
Reference nr.	10605	Covariance	+ 4.444					
Sample size	5578 pts, Interval 5.0 min	Std err covar	+ 6.077					
Spanning range	from 00:00 Z 30 Aug 74 (242) to 08:45 Z 18 Sept 74 (261) (Jul.days)	Std dev covar	+453.9					
Duration	19 d, 8 hours, 45 min	Corr coefficient	+ 0.03156					
Nominal depth	56 meters	Vector mean	+ 30.46					
Instrument - type	Aanderaa	Vector variance	+160.2					
		Std dev vec var	+ 12.66					
parameter	mean	var	std err std dev skew kurt min max					
U (cm/s)	+29.35	+ 83.73	+ .1225	+ 9.151	- .6145	+1.364	-18.40	+59.29
V (cm/s)	+ 8.162	+236.8	+ .2060	+15.39	- .01776	-0.4786	-31.23	+53.64
T (°C)	+20.04	+ 1.78	+ .01789	+ 1.336	+ .4314	-0.1862	+16.80	+25.51
P (dbar)	+60.15	+ 0.12	+ .00467	+ 0.349	-2.037	+8.684	+57.99	+60.99

Fig. 14

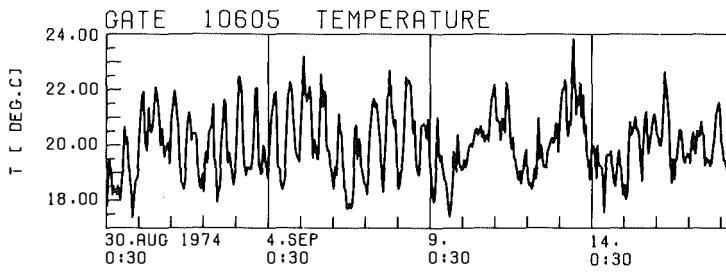
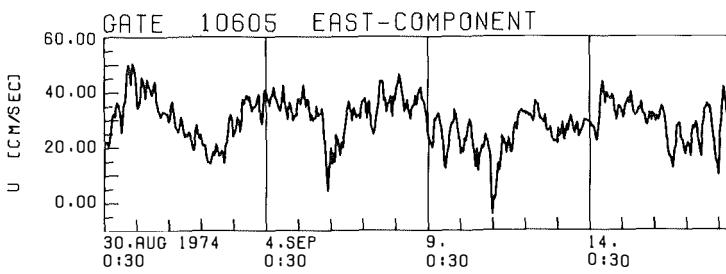
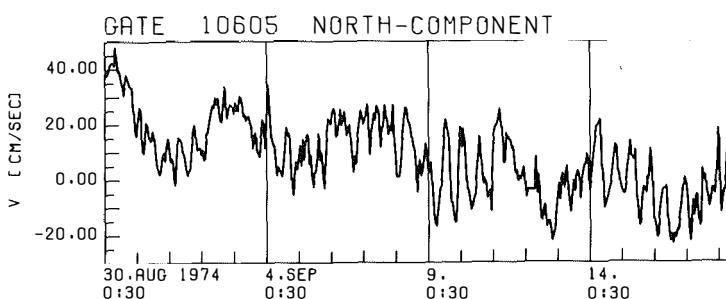
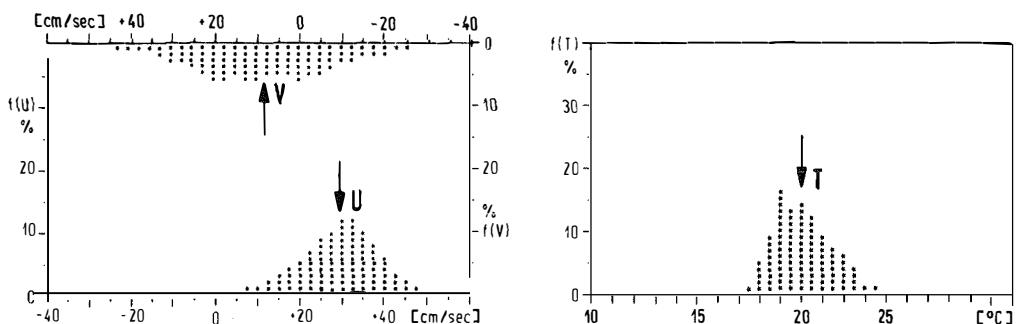
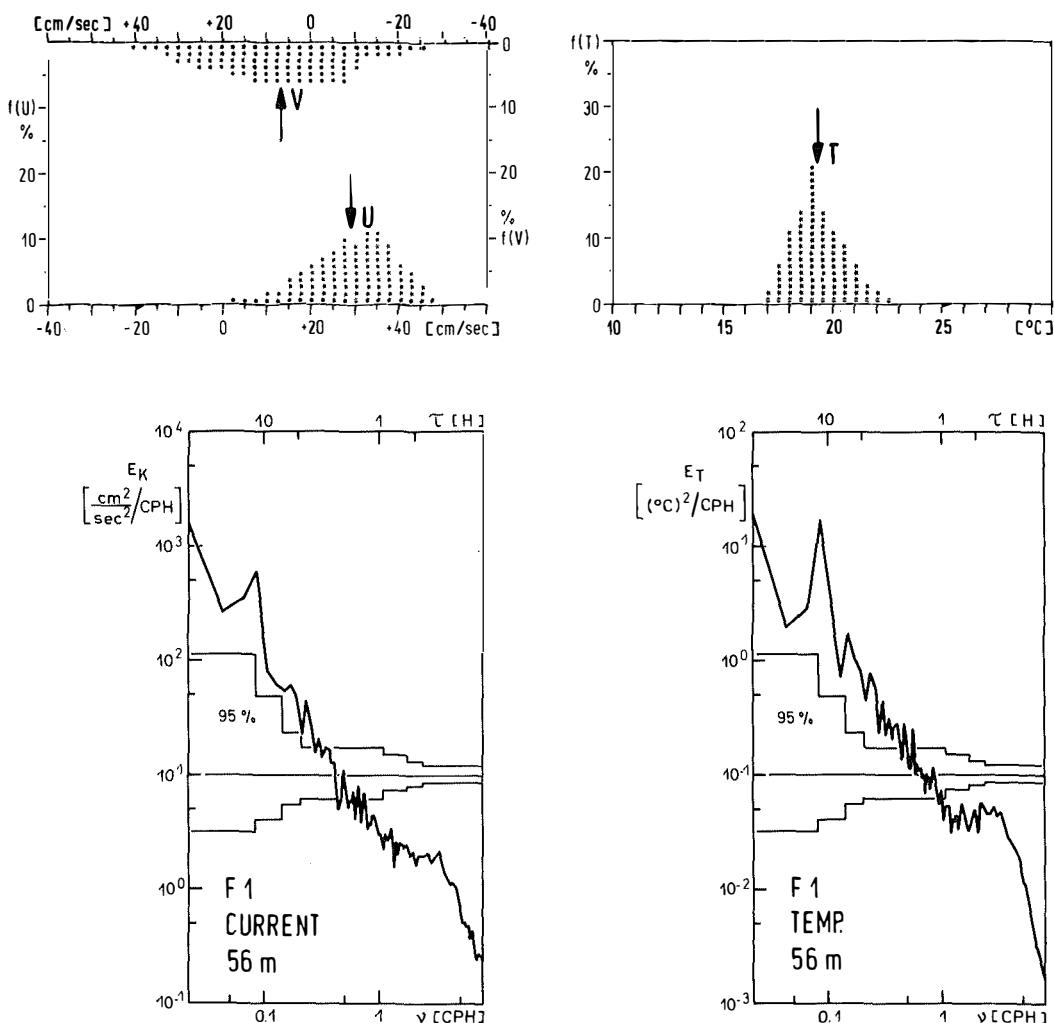
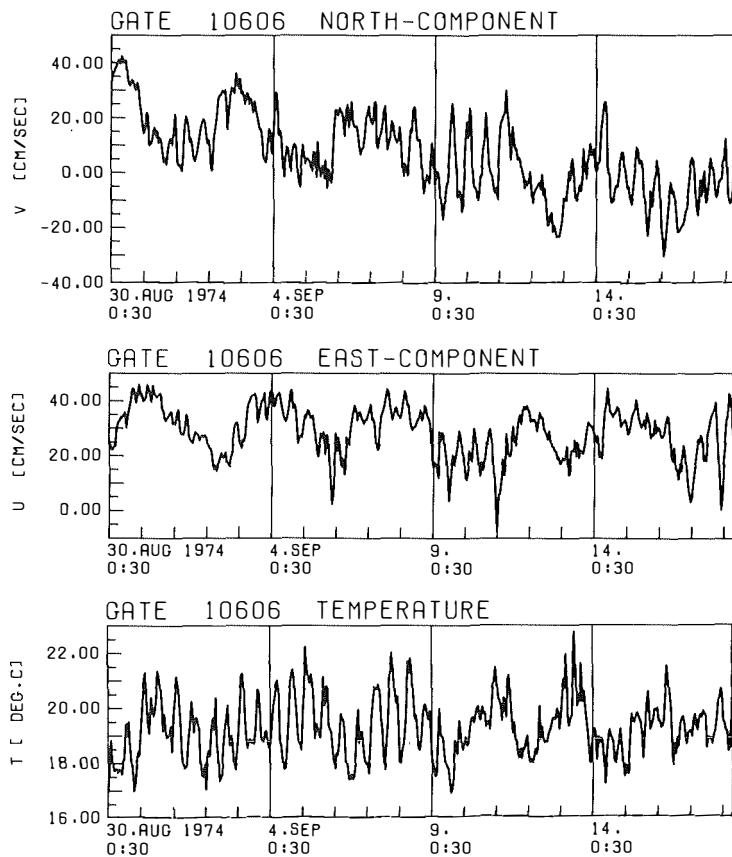


Fig. 15

Mooring GATE F1				Cross correlation East - North				
Reference nr. 10606				Covariance + 14.94				
Sample size 7437pts, Interval 3.75 min				Std err covar + 5.028				
Spanning from 00:00 Z 30 Aug 74 (242) range				Std dev covar +433.6				
(Jul.days) to 08:45 Z 18 Sept74 (261)				Corr coefficient + 0.1028				
Duration 19 d, 8 hours, 45 min				Vector mean + 29.39				
Nominal depth 56 meters				Vector variance +157.6				
Instrument - type VACM				Std dev vec var + 12.55				
parameter	mean	var	std err	std dev	skew	kurt	min	max
U (cm/s)	+28.58	+ 96.72	+ .1140	+ 9.835	- .6587	+ .5193	-15.25	+51.70
V (cm/s)	+ 6.853	+218.4	+ .1714	+14.78	+ .1021	- .4852	-32.34	+45.45
T (°C)	+19.30	+ 1.38	+ .01361	+ 1.173	+ .4615	+ .03016	+15.88	+24.40

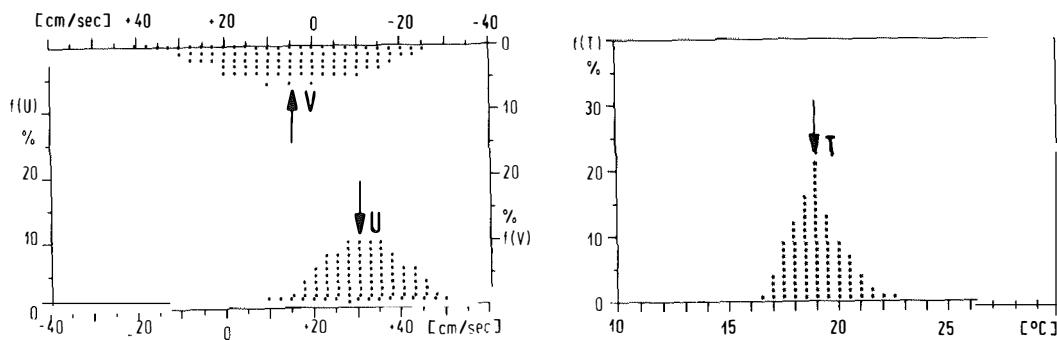




zu Fig. 15

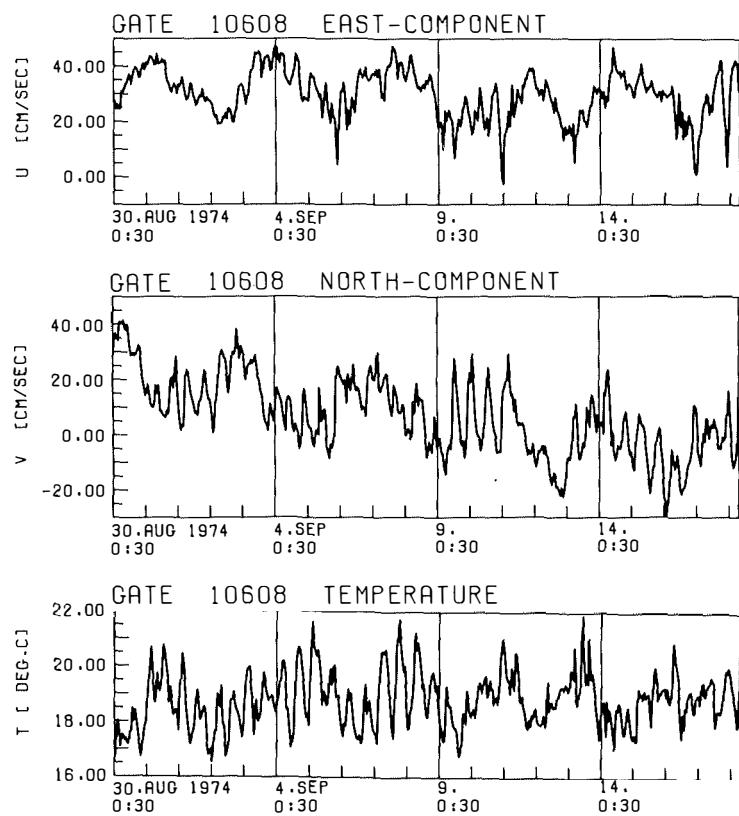
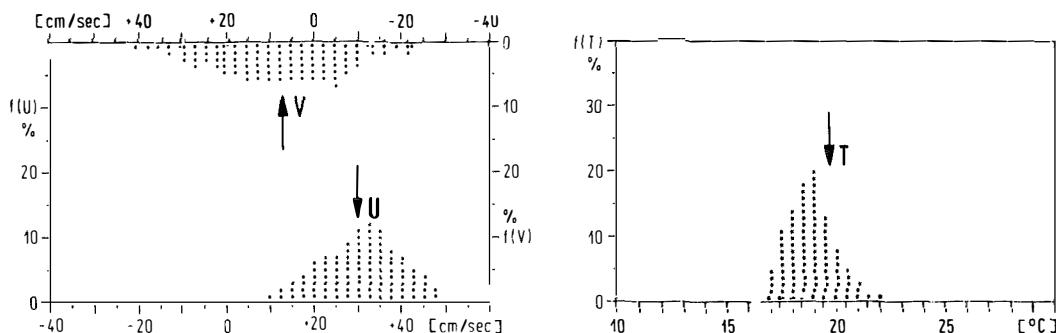
Mooring	GATE F1		Cross correlation	East - North
Reference nr.	10607		Covariance	+ 33.80
Sample size	5578pts, Nom. interv. 5.0 min		Std err covar	+ 9.316
Spanning range	Record starts at 30 Aug 74 (Jul.days)		Std dev covar	+695.8
Duration	Time base questionable		Corr coefficient	+ 0.1761
Nominal depth	unknown		Vector mean	+ 31.50
Instrument - type	56 meters Aanderaa		Vector variance	+201.3
parameter	mean	var	std err	std dev
U (cm/s)	+31.11	+140.8	.1589	+11.86
V (cm/s)	+49.43	+261.8	.2167	+16.18
T ( $^{\circ}$ C)	+19.02	+1.371	.01568	+ 1.171
P (dbar)	+62.00	+1.065	.0138	+1.032
				skew
				kurt
				min
				max

Fig. 16



Mooring	GATE F1	Cross correlation	East - North
Reference nr.	10608	Covariance	+ 16.13
Sample size	7437 pts, Interval 3.75 min	Std err covar	+ 5.020
Spanning	from 00:00 Z 30 Aug 74 (242) range (Jul.days) to 08:45 Z 18 Sept 74 (261)	Std dev covar	+432.9
Duration	19 d, 8 hours, 45 min	Corr coefficient	+ 0.1198
Nominal depth	56 meters	Vector mean	+ 30.81
Instrument - type	VACM	Vector variance	+146.2
		Std dev vec var	+ 12.09
parameter	mean	var	std err
U (cm/s)	+29.99	+ 89.10	+ .1095
V (cm/s)	+ 7.08	+203.3	+ .1654
T (°C)	+18.81	+ 1.173	+ .01256
	std dev		
	skew	kurt	min
			max

Fig. 17



Mooring	GATE F1	Cross correlation	East - North
Reference nr.	10609	Covariance	+ 18.60
Sample size	7437 pts, Interval 3.75 min	Std err covar	+ 5.102
Spanning range	from 00:00 Z 30 Aug 74 (242) to 08:45 Z 18 Sept 74 (261)	Std dev covar	+440.0
(Jul.days)	Duration 19 d, 8 hours, 45 min	Corr coefficient	+ 0.1279
Nominal depth	56 meters	Vector mean	+ 29.22
Instrument - type	VACM	Vector variance	+159.2
		Std dev vec var	+ 12.62
parameter	mean	var	std err
U (cm/s)	+27.85	+ 94.50	.1127
V (cm/s)	+ 8.847	+223.8	.1735
T (°C)	+19.33	+ 1.33	.01337
	std dev	skew	kurt
U (cm/s)	+ 9.721	-.7437	.6780
V (cm/s)	+14.96	.04535	-.4484
T (°C)	+ 1.153	.4567	-.00285
	min		
U (cm/s)	-13.67		
V (cm/s)	-31.55		
T (°C)	+16.31		
	max		
U (cm/s)	+47.83		
V (cm/s)	+53.25		
T (°C)	+24.23		

Fig. 18

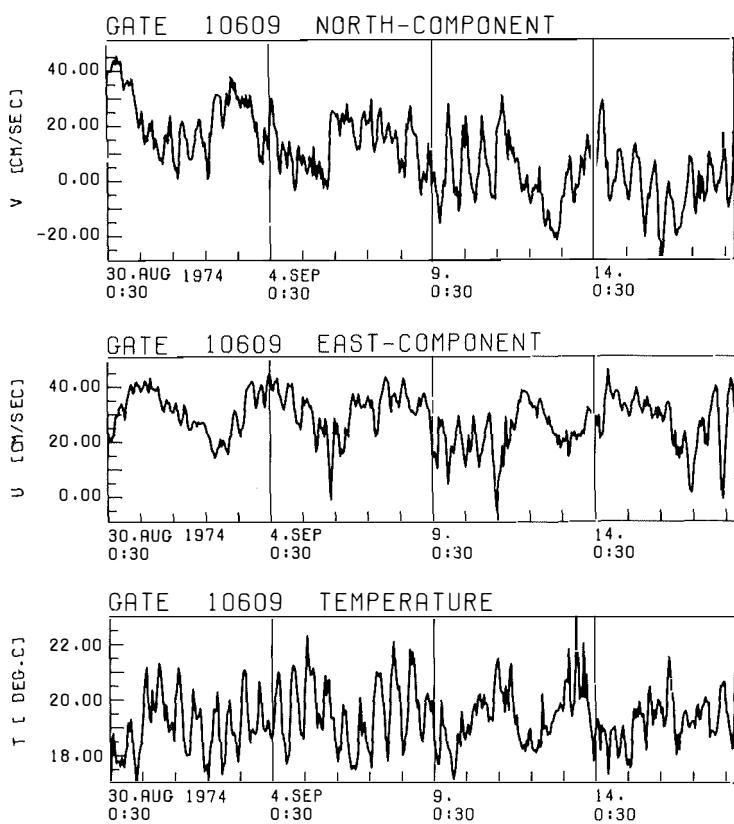
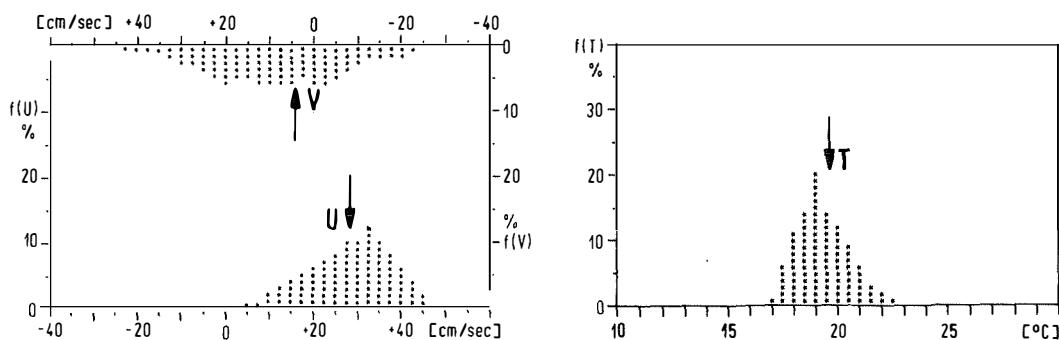
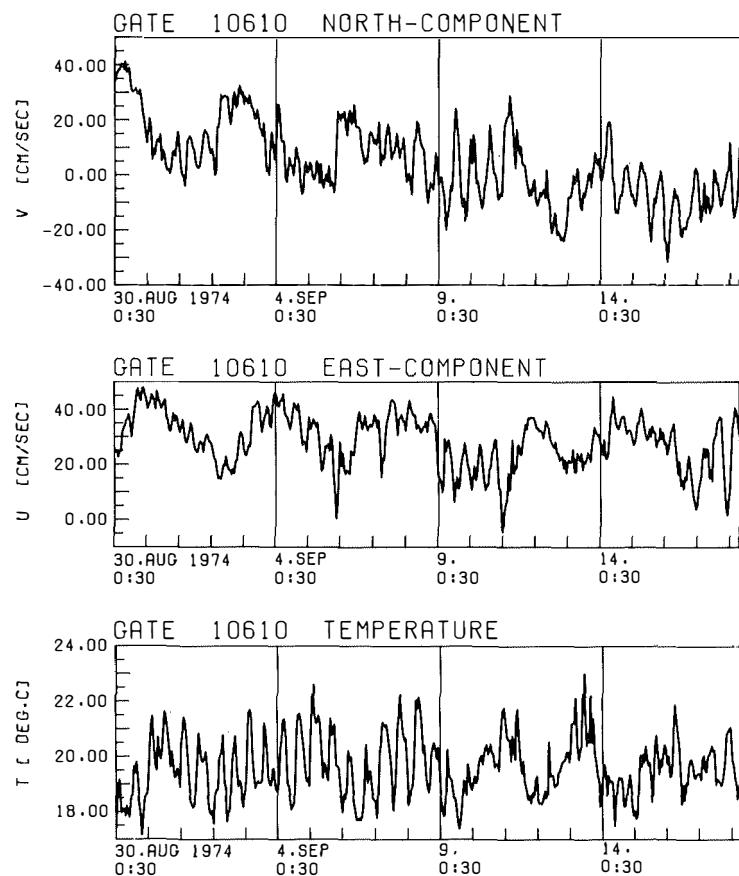
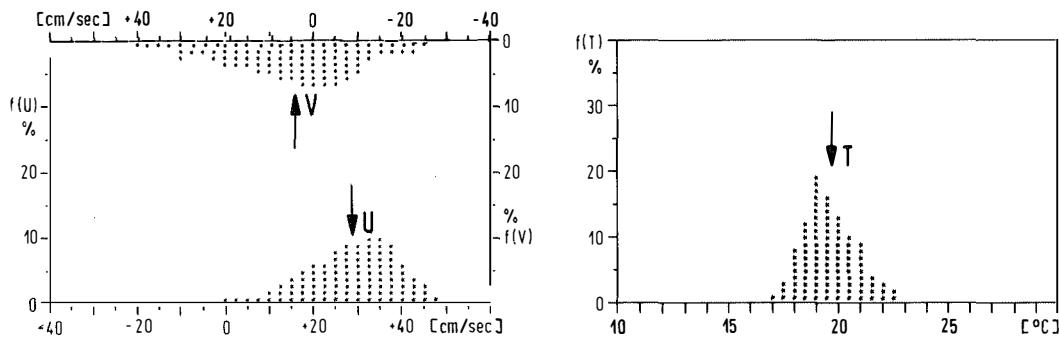


Fig. 19

Mooring	GATE F1	Cross correlation	East - North					
Reference nr.	10610	Covariance	+ 18.56					
Sample size	7437 pts, Interval 3.75 min	Std err covar	+ 4.946					
Spanning range	from 00:00 Z 30 Aug 74 (242) to 08:45 Z 18 Sept 74 (261)	Std dev covar	+426.5					
Duration	19 d, 8 hours, 45 min	Corr coefficient	+ 0.1243					
Nominal depth	56 meters	Vector mean	+ 28.90					
Instrument - type	VACM	Vector variance	+158.5					
		Std dev vec var	+ 12.59					
parameter	mean	var	std err	std dev	skew	kurt	min	max
U (cm/s)	+28.55	+105.2	+.1190	+10.26	-.5534	+.1612	-12.10	+54.77
V (cm/s)	+ 4.513	+211.7	+.1687	+14.55	+.2316	-.3628	-35.71	+46.44
T ( $^{\circ}$ C)	+19.62	+ 1.39	+.0137	+ 1.182	+.4390	-.1480	+16.70	+24.71



Mooring	GATE F1	Cross correlation	East - North					
Reference nr.	10611	Covariance	+ 5.78					
Sample size	5578 pts, Interval 5.0 min	Std err covar	+ 6.217					
Spanning range	from 00:00 Z 30 Aug 74 (242) to 08:45 Z 18 Sept 74 (261)	Std dev covar	+464.3					
(Jul.days)	Duration 19 d, 8 hours, 45 min	Corr coefficient	+ 0.03731					
Nominal depth	56 meters	Vector mean	+ 29.48					
Instrument - type	Aanderaa	Vector variance	+179.8					
parameter		Std dev vec var	+ 13.41					
parameter	mean	var	std err	std dev	skew	kurt	min	max
U (cm/s)	+28.77	+ 88.60	.1260	+ 9.413	-0.6957	+1.253	-18.57	+54.65
V (cm/s)	+ 6.398	+270.9	.2204	+16.46	-0.0836	-0.5558	-34.89	+50.35
T (°C)	+19.97	+ 1.72	.01754	+ 1.310	+0.4299	-0.2467	+16.87	+25.28
P (dbar)	+58.98	+ .00646	.00107	.08038	-9.243	+266.00	+58.24	+58.99

Fig. 20

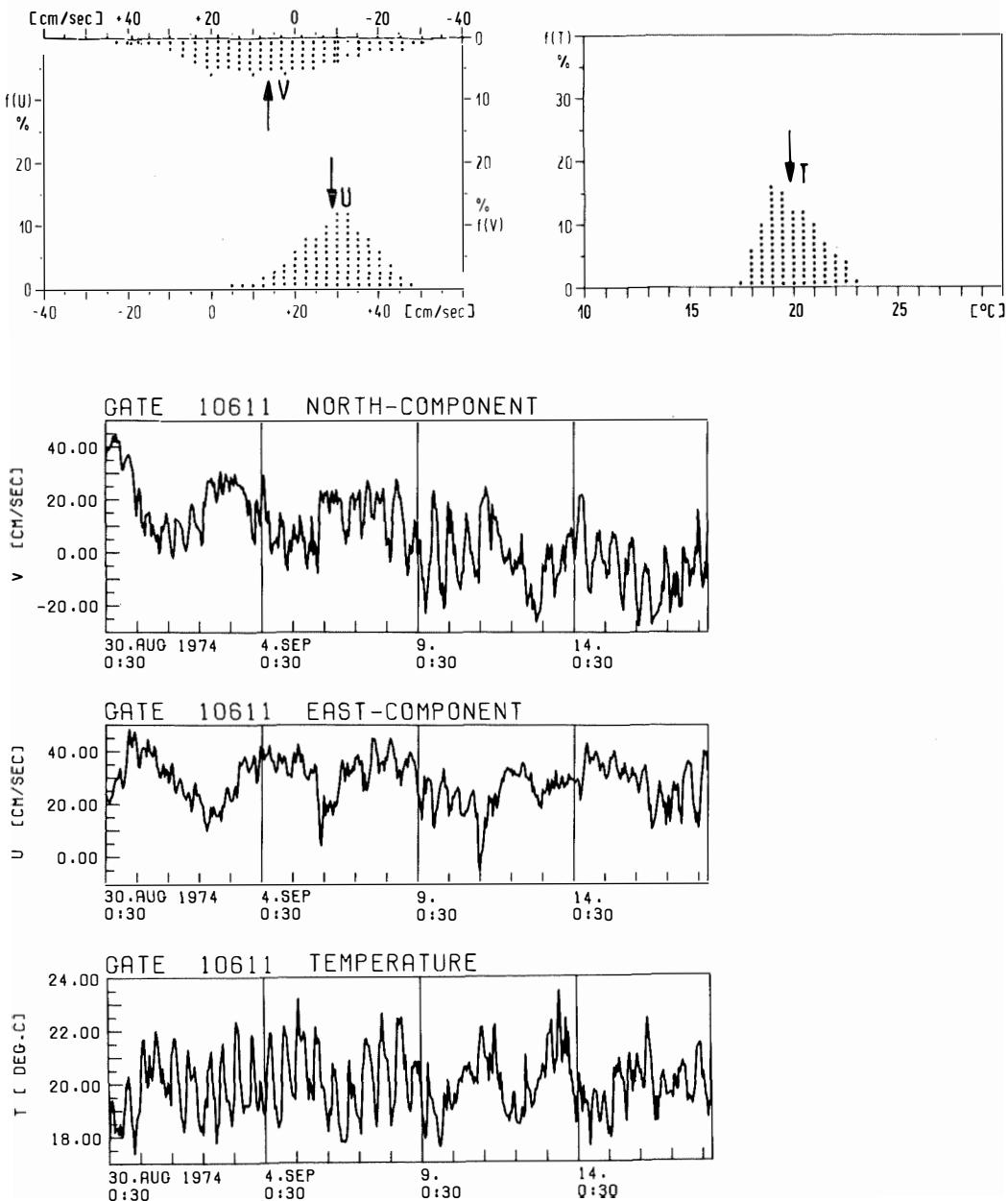
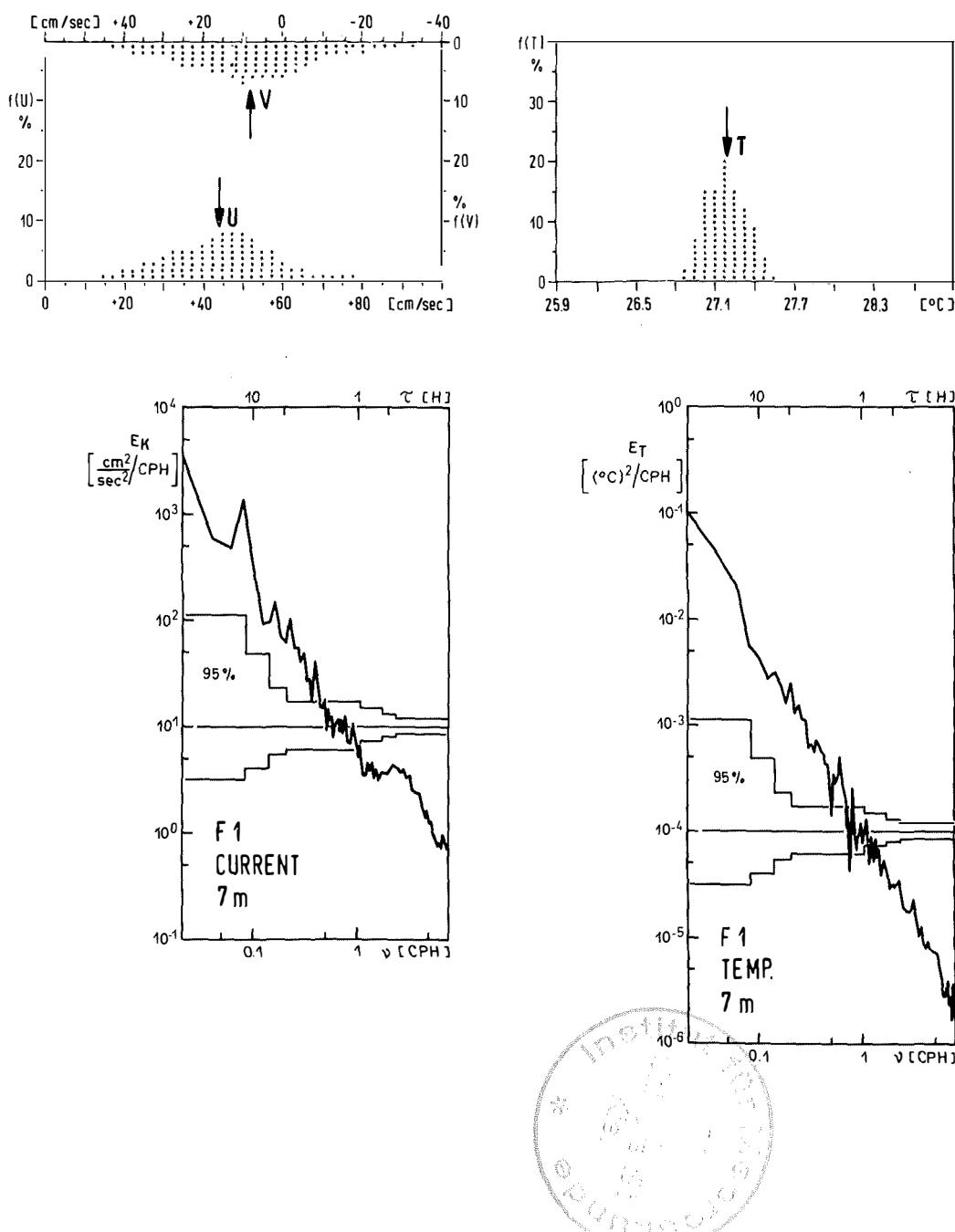
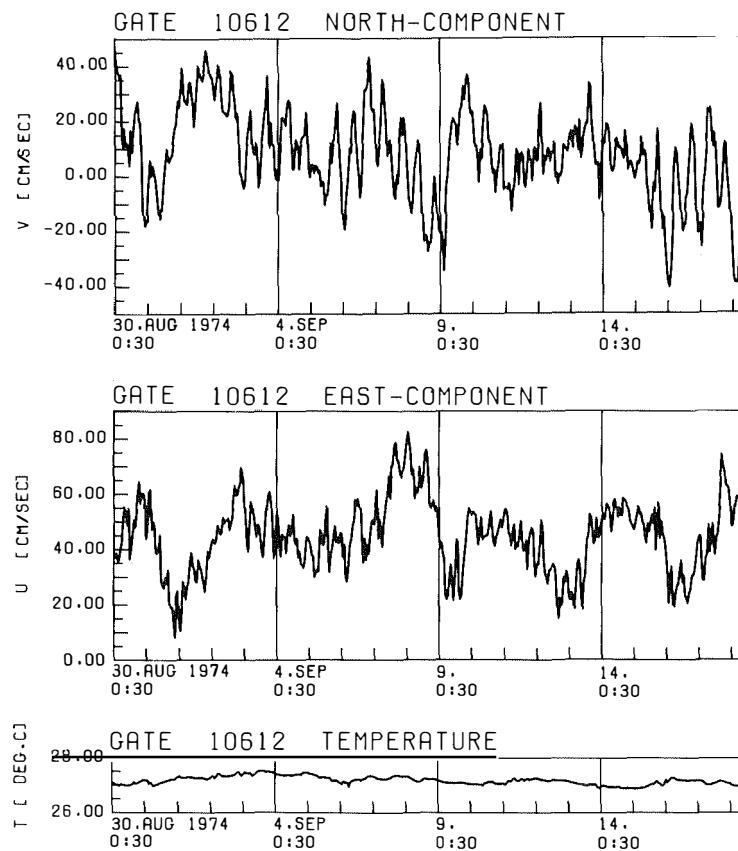


Fig. 21

Mooring	GATE F1	Cross correlation	East - North
Reference nr.	10612	Covariance	- 46.40
Sample size	7437 pts, Interval 3.75 min	Std err covar	+ 8.887
Spanning	from 00:00 Z 30 Aug 74 (242) range (Jul.days) to 08:45 Z 18 Sept 74 (261)	Std dev covar	+766.4
Duration	19 d, 8 hours, 45 min	Corr coefficient	- 0.1945
Nominal depth	7 meters	Vector mean	+ 45.26
Instrument - type	VACM	Vector variance	+243.9
		Std dev vec var	+ 15.62
parameter	mean	var	std err
U (cm/s)	+44.56	+193.0	+ .1611
V (cm/s)	+ 7.943	+294.8	+ .1991
T (°C)	+27.19	+0.0221	+ .00172
	std dev	skew	kurt
	min		
	max		





zu Fig. 21

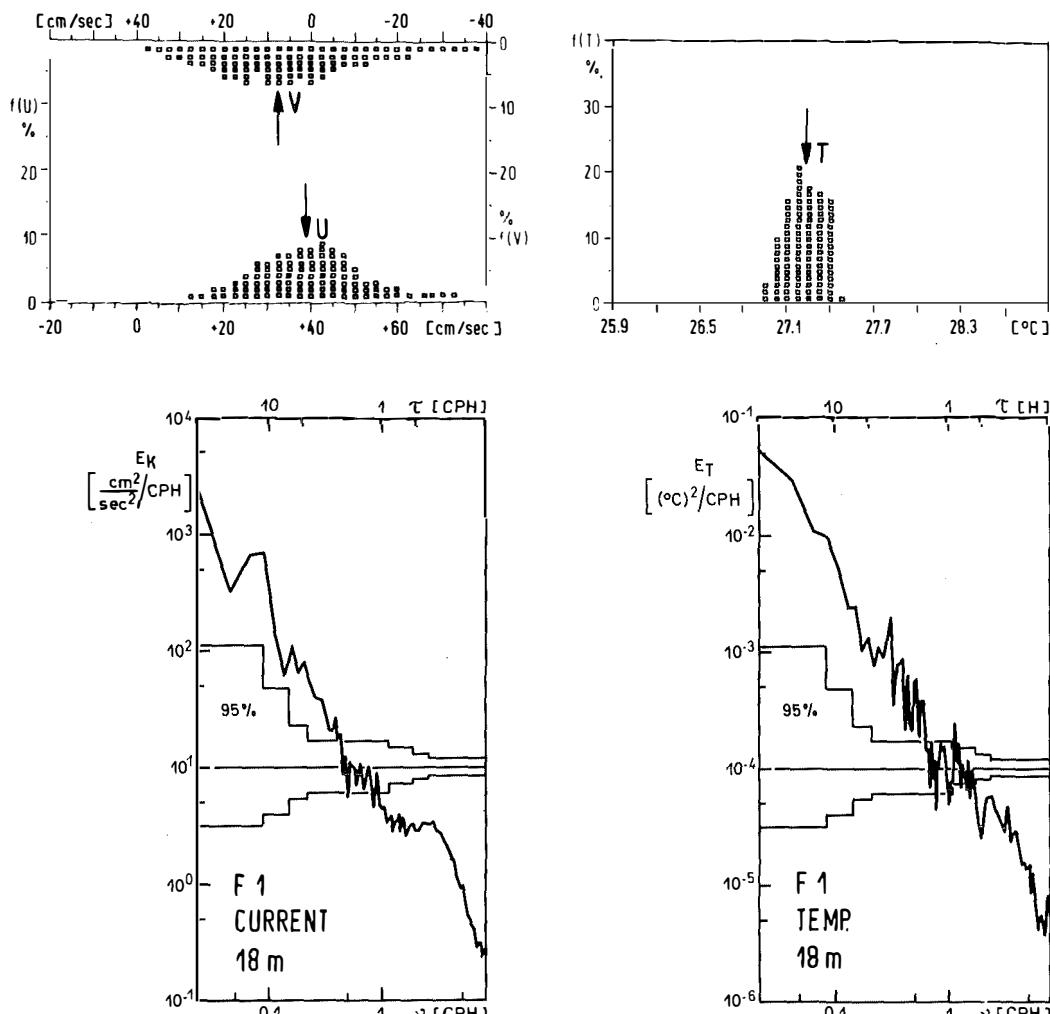
Record 106 13 had to be devided into two subsamples

Mooring	GATE F1				Cross correlation	East - North
Reference nr.	10613				Covariance	- 22.57
Sample size	2113pts, Interval 3.75 min				Std err covar	+ 10.66
Spanning	from 00:00 Z 30 Aug 74 (242) range (Jul.days) to 12:00 Z 4 Sept74 (247)				Std dev covar	+490.1
Duration	5 d, 12 hours, 0 min				Corr coefficient	- 0.1811
Nominal depth	18 meters				Vector mean	+ 40.35
Instrument - type	VACM				Vector variance	+133.1
parameter	mean	var	std err	std dev	Std dev vec var	+ 11.54
U (cm/s)	+37.92	+ 86.42	+ .2022	+ 9.296	-.2006	+3.719 +61.55
V (cm/s)	+13.81	+179.7	+ .2916	+13.41	-.3337	-.5114 -22.66 +46.25
T (°C)	+27.31	+ .00979	+ .002153	+ 0.0989	-.7824	-.7738 +27.05 +27.49

Fig. 22

Time base between 4 Sept 12:00 Z end 5 Sept 12:00 Z questionable

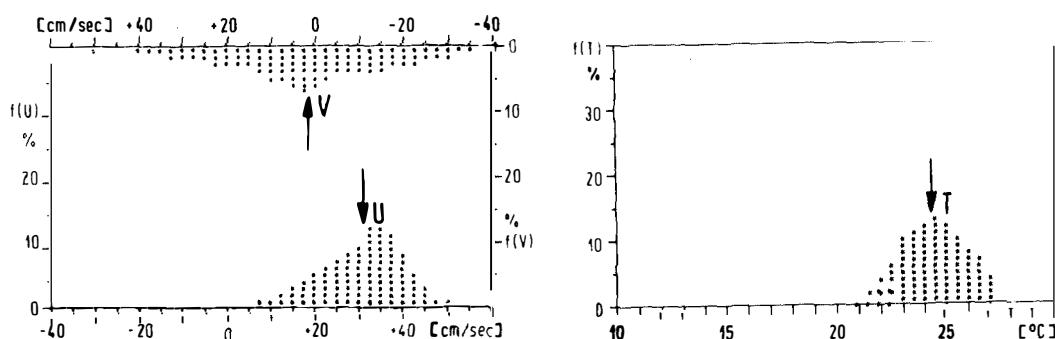
Mooring	GATE F1				Cross correlation	East - North
Reference nr.	10613				Covariance	- 22.96
Sample size	4941pts, Interval 3.75 min				Std err covar	+ 9.469
Spanning	from 12:00 Z 5 Sept74 (248) range (Jul.days) to 08:45 Z 18 Sept74 (261)				Std dev covar	+665.6
Duration	12 d, 20 hours, 45 min				Corr coefficient	- 0.09935
Nominal depth	18 meters				Vector mean	+ 39.06
Instrument - type	VACM				Vector variance	+234.9
parameter	mean	var	std err	std dev	Std dev vec var	+ 15.33
U (cm/s)	+39.02	+192.8	+ .1975	+13.88	-.07215	+0.1555 -11.37 +79.81
V (cm/s)	+ 1.702	+277.1	+ .2368	+16.65	-.4316	-0.1203 -48.56 +41.94
T (°C)	+27.17	+ .01463	+ .001721	+ 0.121	-.3794	+1.373 +26.54 +27.43

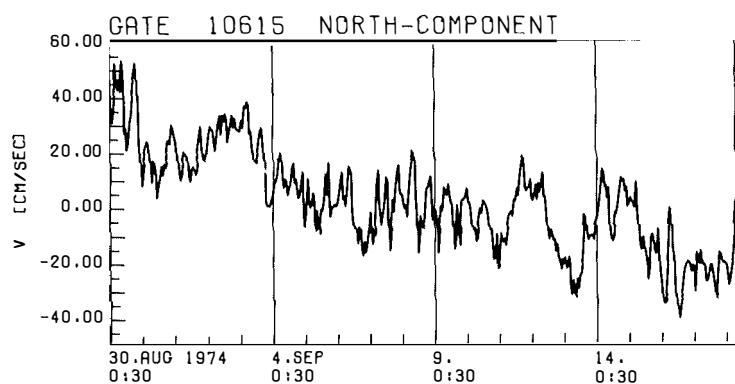
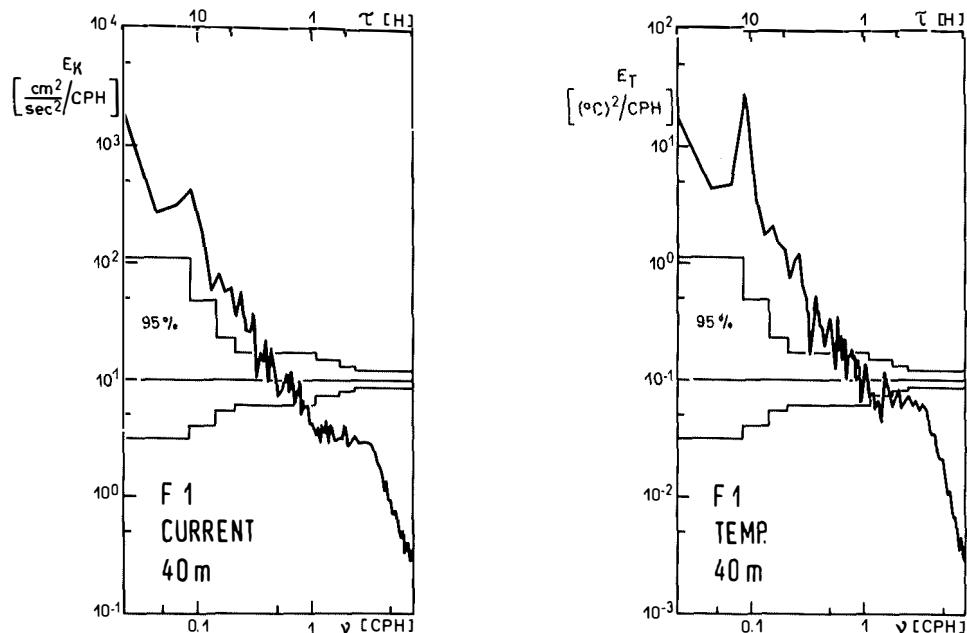


zu Fig. 22

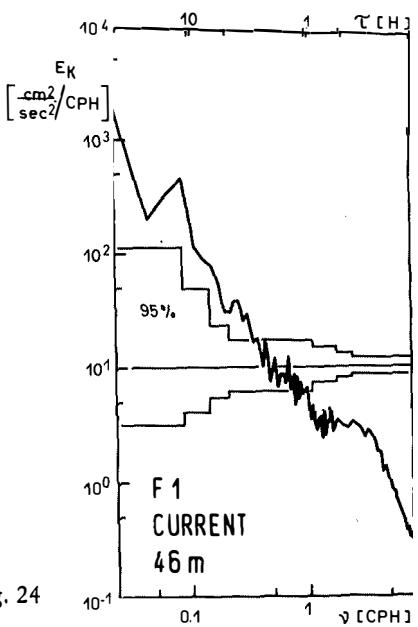
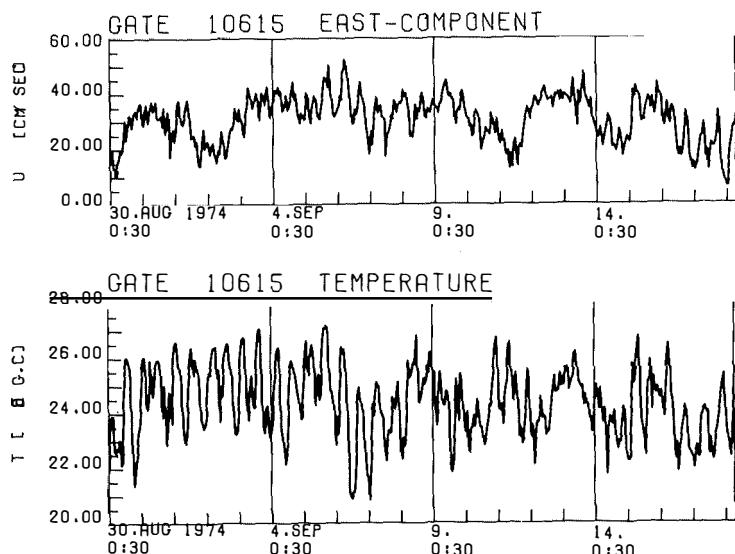
Fig. 23

Mooring	GATE F1	Cross correlation	East - North
Reference nr.	10615	Covariance	- 3.343
Sample size	7437 pts, Interval 3.75 min	Std err covar	+ 6.213
Spanning	from 00:00 Z 30 Aug 74 (242)	Std dev covar	+535.8
range	range (Jul.days) to 08:45 Z 18 Sept 74 (261)	Corr coefficient	- 0.0199
Duration	19 d, 8 hours, 45 min	Vector mean	+ 30.75
Nominal depth	40 meters	Vector variance	+216.1
Instrument - type	VACM	Std dev vec var	+ 14.70
parameter	mean	var	std err
U (cm/s)	+30.65	+ 80.14	+ .1038
V (cm/s)	+ 2.391	+352.0	+ .2176
T (°C)	+24.37	+ 2.02	+ .01648
std dev	skew	kurt	min
+ 8.952	-.4001	-.008545	-13.36
+18.76	.2560	.1852	+45.06
+ 1.421	-.1664	.5022	+19.52
max			+60.28
			+59.64
			+27.22





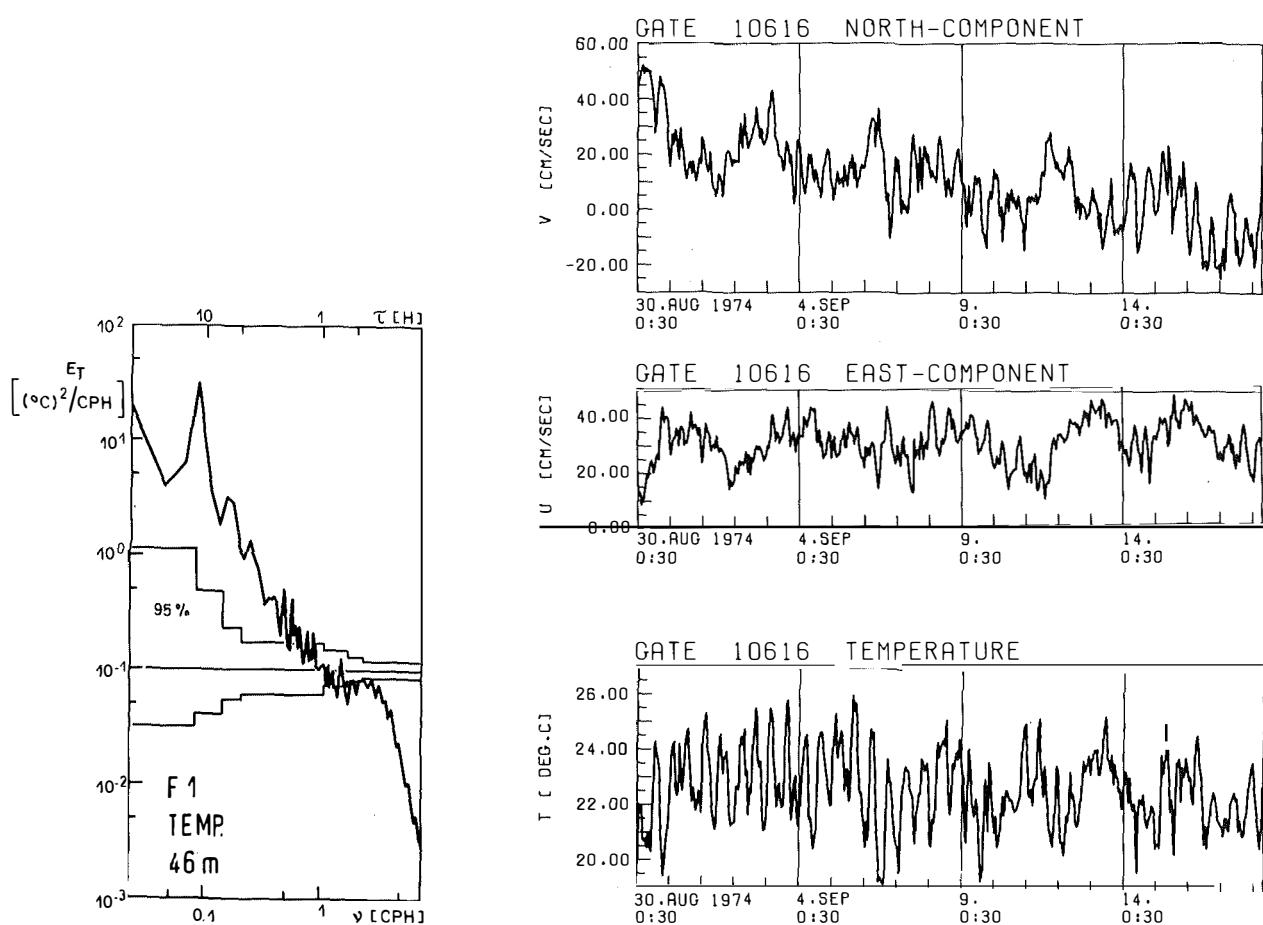
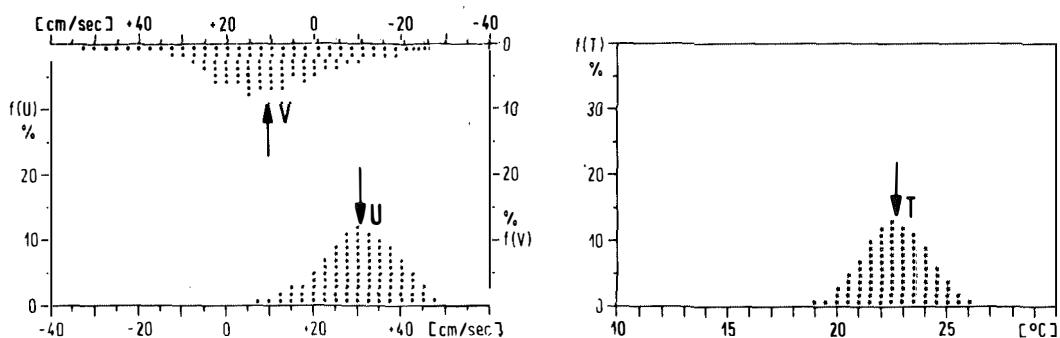
zu Fig. 23



zu Fig. 24

Fig. 24

Moorings	GATE F1	Cross correlation	East - North
Reference nr.	10616	Covariance	- 21.68
Sample size	7437 pts, Interval 3.75 min	Std err covar	+ 5.235
Spanning range	from 00:00 Z 30 Aug 74 (242) to 08:45 Z 18 Sept 74 (261)	Std dev covar	+451.5
(Jul.days)	Duration 19 d, 8 hours, 45 min	Corr coefficient	- 0.1681
Nominal depth	45.5 meters	Vector mean	+ 32.09
Instrument - type	VACM	Vector variance	+154.6
		Std dev vec var	+ 12.43
parameter	mean	var	std err
U (cm/s)	+30.23	+ 69.38	+ .09659
V (cm/s)	+10.77	+239.9	+ .1796
T ( $^{\circ}$ C)	+22.66	+ 2.18	+ .01713
		std dev	
		.8.329	
		-.3513	
		-.03307	
		-18.74	+52.79
		.15.49	
		+.1728	
		.1.408	-32.18
			+58.33
		.0.02589	
		-.3293	
		+18.50	+26.70
	skew	kurt	min
			max



Mooring GATE F1	Cross correlation East - North
Reference nr. 10617	Covariance + 8.030
Sample size 7437 pts, Interval 3.75 min	Std err covar + 5.445
Spanning from 00:00 Z 30 Aug 74 (242) range	Std dev covar +469.6
(Jul.days) to 08:45 Z 18 Sept 74 (261)	Corr coefficient + 0.05869
Duration 19 d, 8 hours, 45 min	Vector mean + 30.54
Nominal depth 51 meters	Vector variance +159.6
Instrument - type VACM	Std dev vec var + 12.63
parameter	mean
U (cm/s)	+29.53
V (cm/s)	+ 7.803
T (°C)	+21.18
var	+ 77.44
std err	+ .1020
std dev	+ 8.80
skew	-.5125
kurt	+.1596
min	- 5.43
max	+53.57
	-32.49
	+54.08
	+17.82
	+26.03

Fig. 25

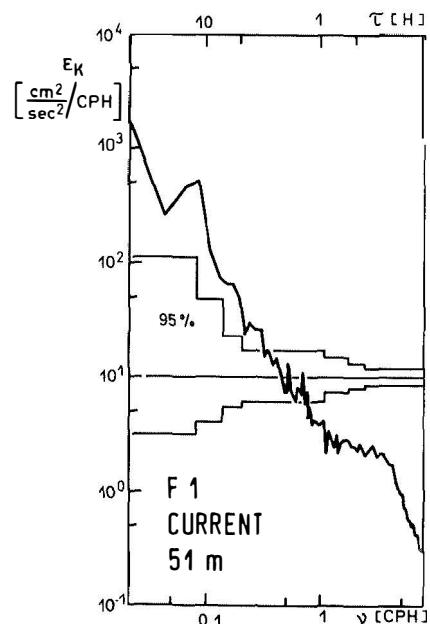
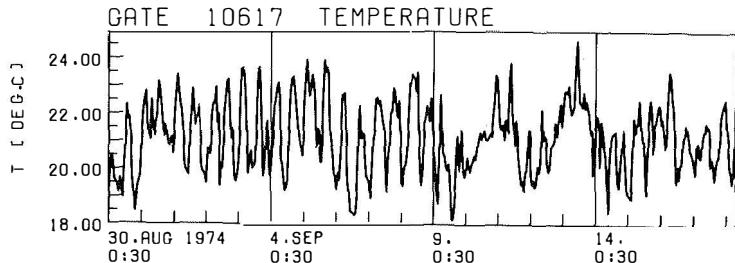
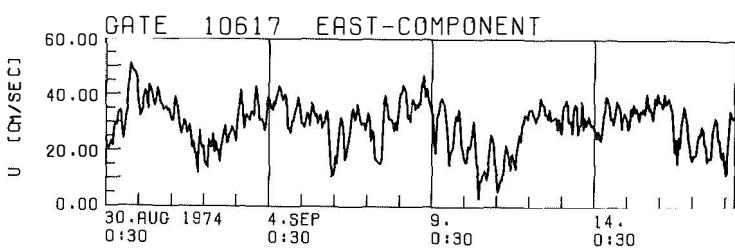
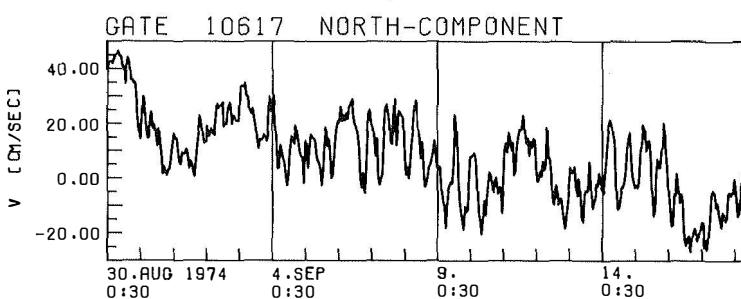
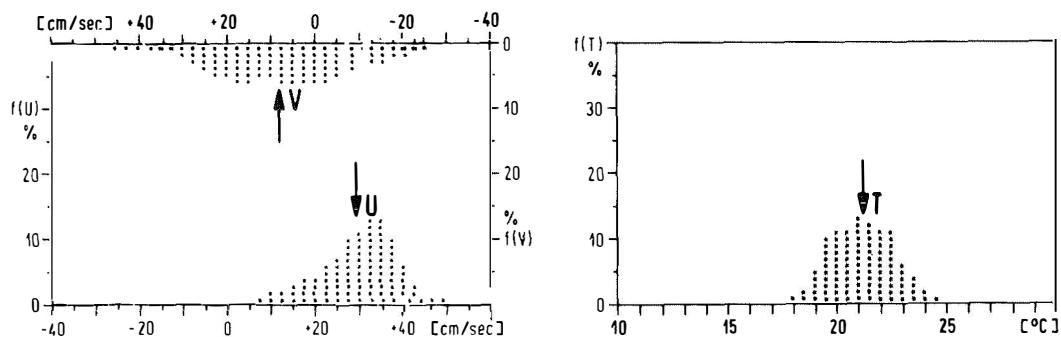
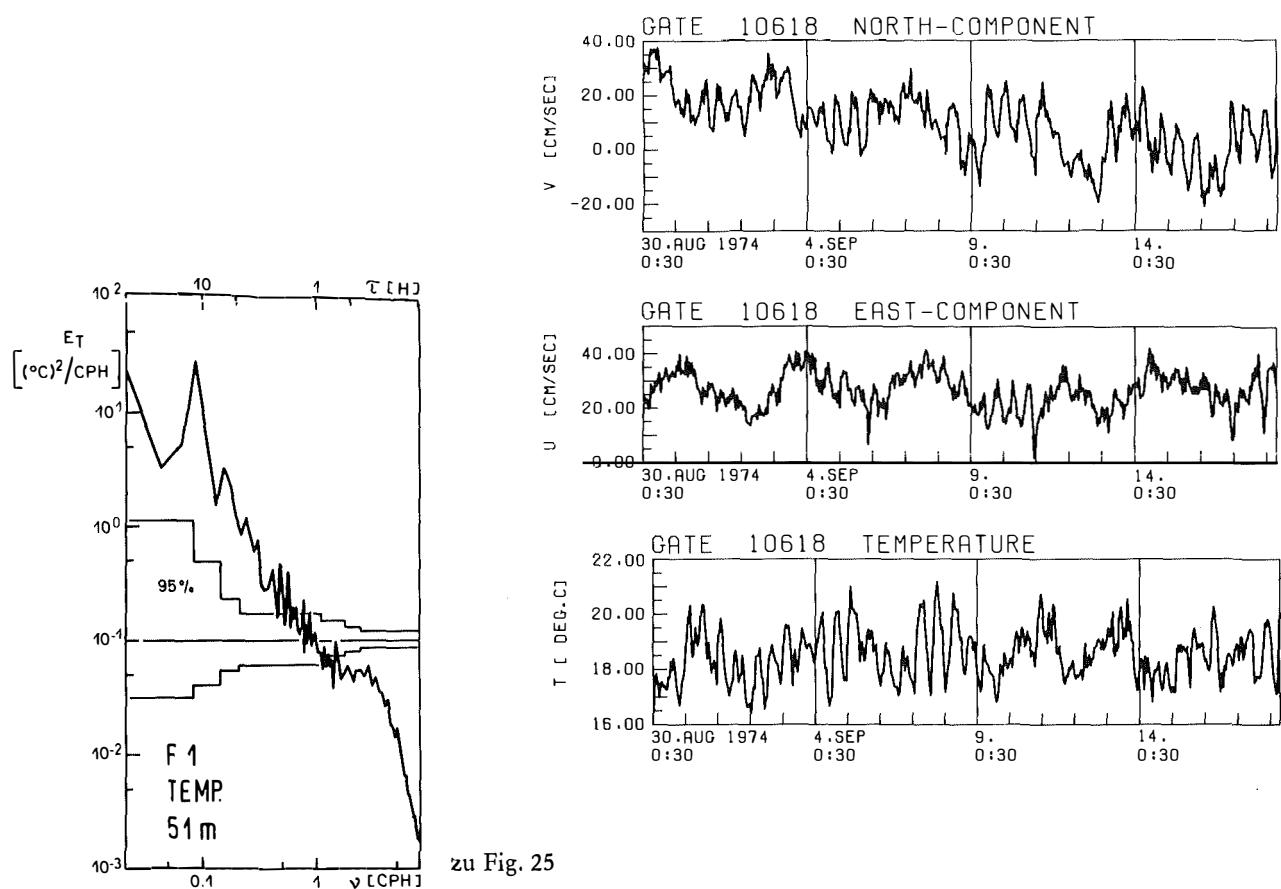
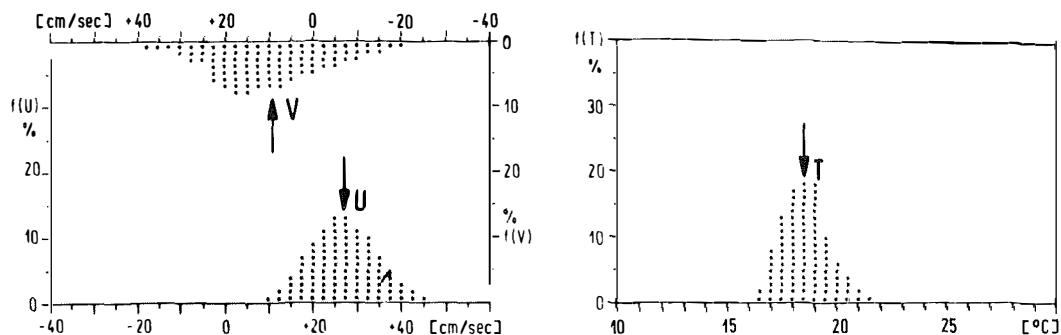


Fig. 26

Mooring GATE F1					Cross correlation East - North			
Reference nr. 10618					Covariance	-	3.028	
Sample size 5578 pts, Interval 5.0 min					Std err covar	+	4.758	
Spanning from 00:00 Z 30 Aug 74 (242) range (Jul.days) to 08:45 Z 18 Sept 74 (261)					Std dev covar	+	355.3	
Duration 19 d, 8 hours, 45 min					Corr coefficient	-	0.03034	
Nominal depth 64 meters					Vector mean	+	28.08	
Instrument - type Aanderaa					Vector variance	+	111.4	
					Std dev vec var	+	10.55	
parameter	mean	var	std err	std dev	skew	kurt	min	max
U (cm/s)	+26.44	+ 61.96	+.1054	+ 7.871	-.2139	+.9359	-19.22	+59.89
V (cm/s)	+ 9.451	+160.8	+.1698	+12.68	-.2377	-.2013	-66.45	+44.43
T ( $^{\circ}$ C)	+18.53	+ 1.09	+.01402	+ 1.047	+.3650	-.1112	+15.67	+22.43
P (dbar)	+64.47	+.3346	+.00775	.5785	-.0065	+.2065	+62.50	+66.69



zu Fig. 25

Mooring GATE F1	Cross correlation East - North
Reference nr. 10619	Covariance - 15.24
Sample size 5578pts, Interval 5.0 min	Std err covar + 4.863
Spanning from 00:00 Z 30 Aug 74 (242)	Std dev covar +363.2
range (Jul.days) to 08:45 Z 18 Sept74 (261)	Corr coefficient - 0.1587
Duration 19 d, 8 hours, 45 min	Vector mean + 28.97
Nominal depth 74 meters	Vector variance +118.6
Instrument - type Aanderaa	Std dev vec var + 10.89
parameter	mean
U (cm/s)	+27.91
V (cm/s)	+ 7.753
T ( $^{\circ}$ C)	+17.23
var	+ 49.05
std err	+ .09377
std dev	+ 7.003
skew	+ .1392
kurt	+1.432
min	-28.23
max	+53.23

Fig. 27

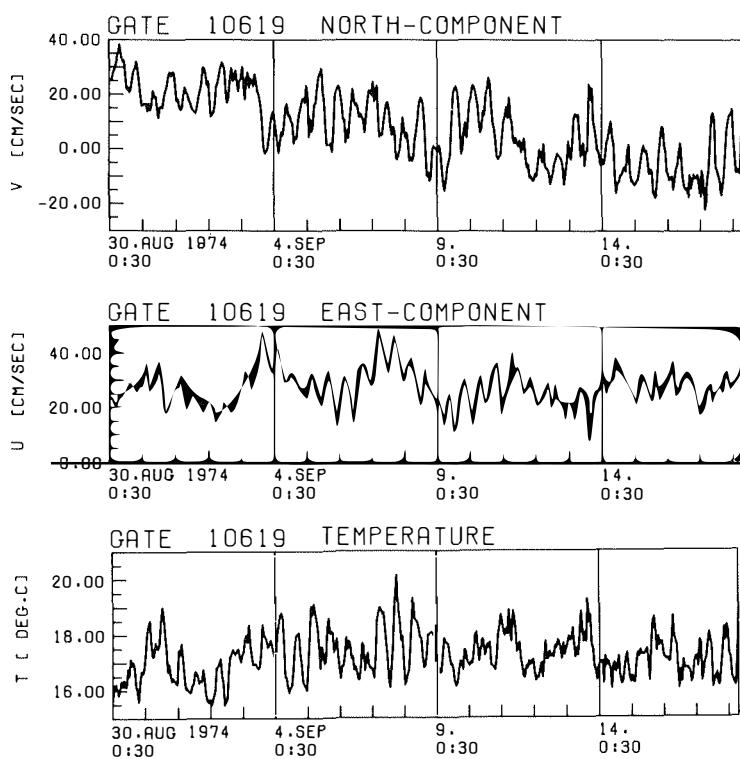
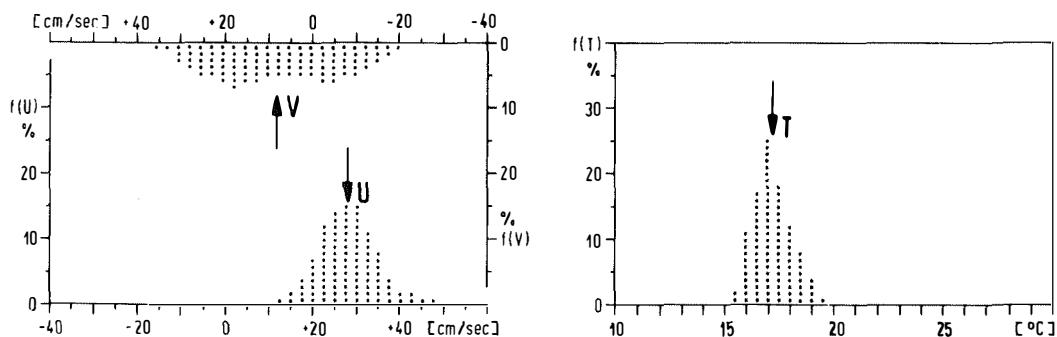
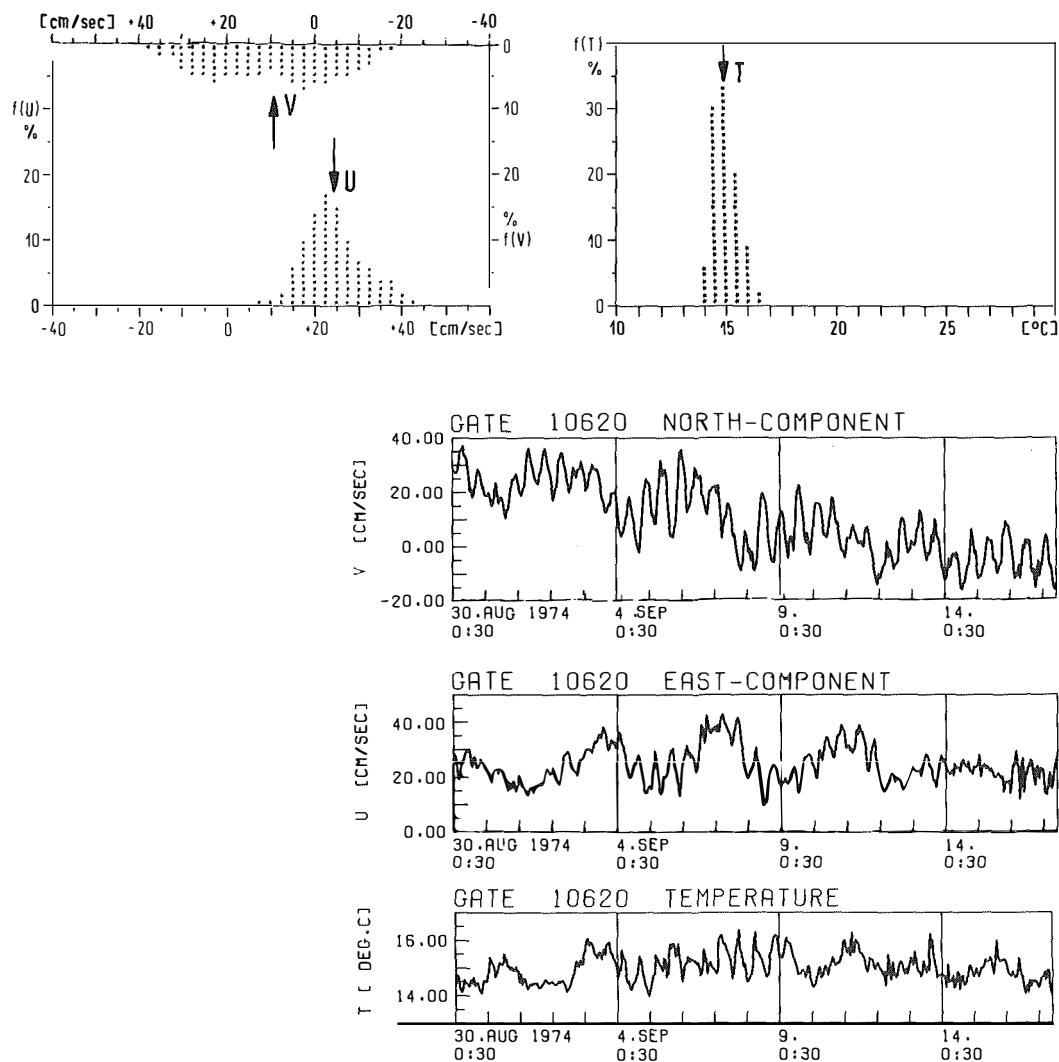


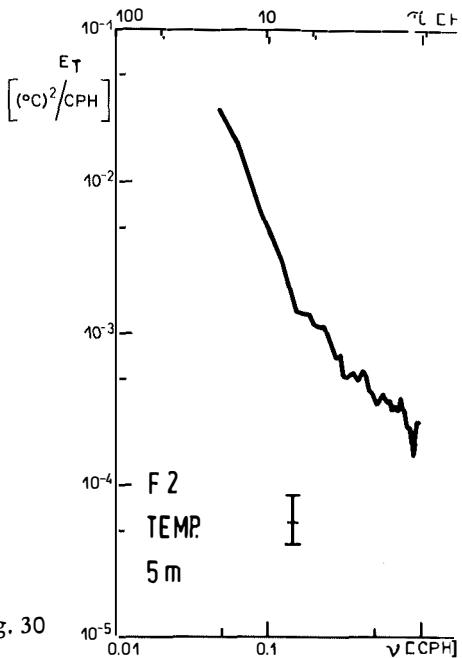
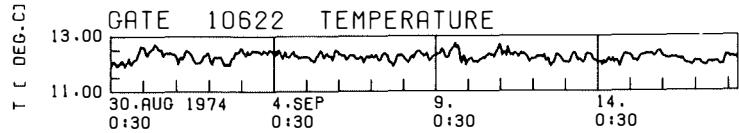
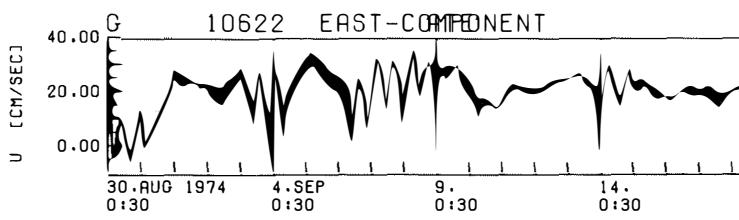
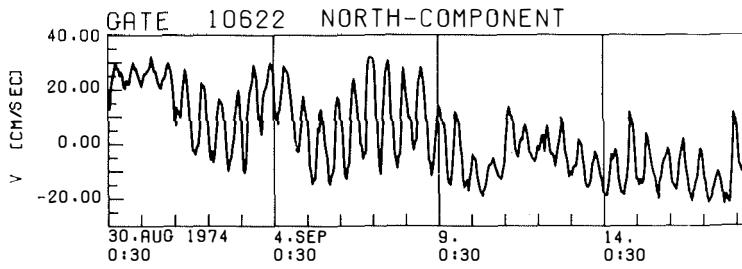
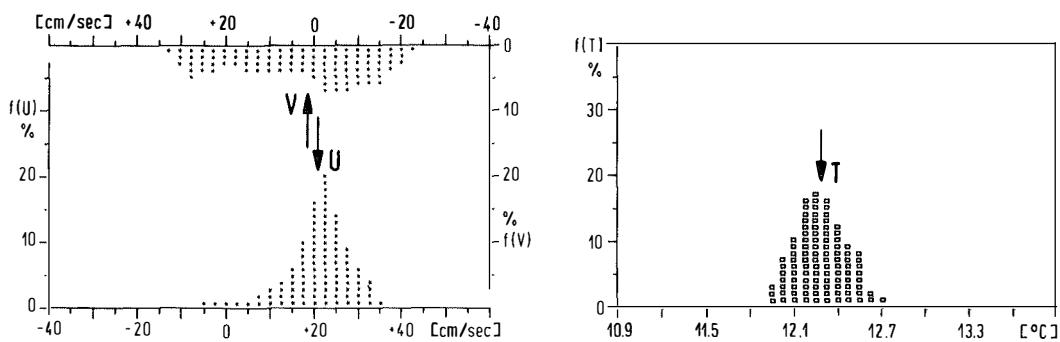
Fig. 28

Mooring	GATE F1	Cross correlation	East - North					
Reference nr.	10620	Covariance	- 4.124					
Sample size	5323pts, Interval 5.0 min	Std err covar	+ 4.642					
Spanning range	from 00:00 Z 30 Aug 74 (242) to 11:30 Z 17 Sept 74 (260) (Jul.days)	Std dev covar	+338.7					
Duration	18 d, 11 hours, 30 min	Corr coefficient	- 0.04284					
Nominal depth	104 meters	Vector mean	+ 26.35					
Instrument - type	Aanderaa	Vector variance	+117.1					
		Std dev vec var	+ 10.82					
parameter	mean	var	std err std dev skew kurt min max					
U (cm/s)	+24.43	+ 50.40	.09730	+ 7.099	.3107	+0.1115	- 0.00	+46.98
V (cm/s)	+ 9.887	+183.9	.1859	+13.56	.05131	-1.027	-19.89	+39.71
T (°C)	+15.01	+ 0.29	.00738	+ 0.5388	.4849	-0.1948	+13.74	+17.24



Mooring	GATE F1	Cross correlation	East - North					
Reference nr.	10622	Covariance	- 41.66					
Sample size	5578pts, Interval 5.0 min	Std err covar	+ 3.50					
Spanning	from 00:00 Z 30 Aug 74 (242) range (Jul.days)	Std dev covar	+261.4					
Duration	to 08:45 Z 18 Sept 74 (261) hours, 45 min	Corr coefficient	- 0.3775					
Nominal depth	216 meters	Vector mean	+ 20.84					
Instrument - type	Aanderaa	Vector variance	+139.1					
		Std dev vec var	+ 11.79					
parameter	mean	var	std err	std dev	skew	kurt	min	max
U (cm/s)	+20.64	+ 54.45	+ .0988	+ 7.379	-1.162	+2.098	-18.07	+36.85
V (cm/s)	+ 2.90	+223.7	+ .2002	+14.96	+0.2953	-1.042	-28.23	+35.00
T ( $^{\circ}$ C)	+12.25	+0.0288	+ .00227	+ 0.1698	+0.2023	-0.2489	+11.83	+12.79
P (dbar)	+216.0	+8.523	+ .03909	+2.919	+ .4451	+3.746	+206.66	+253.4

Fig. 29



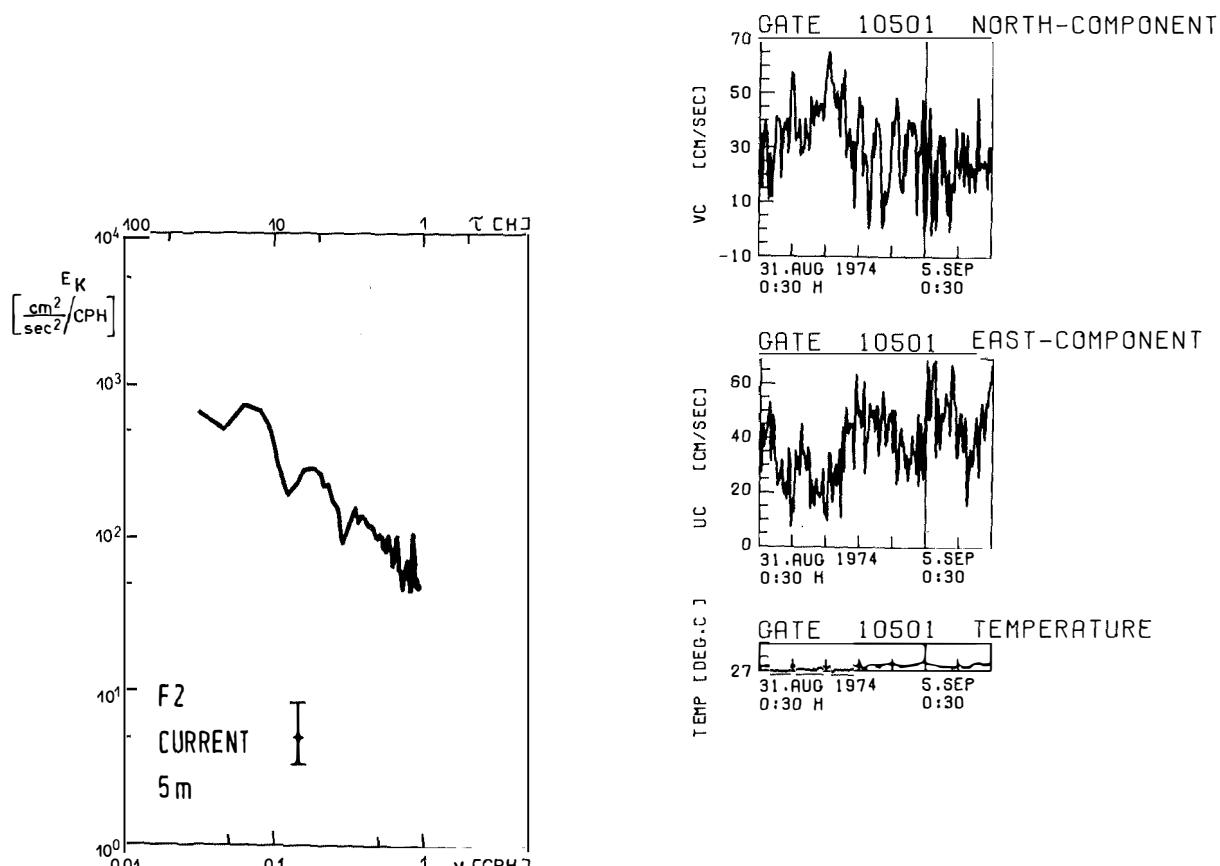
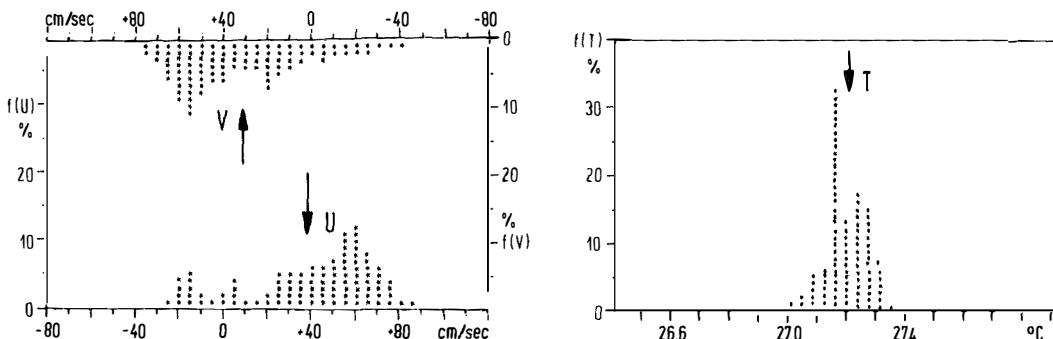
zu Fig. 30

Fig. 30

Mooring GATE F2				Cross correlation East - North				
Reference nr. 10501				Covariance - 542.9				
Sample size 2038pts, Interval 5.0 min				Std err covar + 28.83				
Spanning from 00:00 Z 31 Aug 74 (243) range (Jul.days) to 01:45 Z 7 Sept 74 (250)				Std dev covar +1302.				
Duration 7 d, 1 hours, 45 min				Corr coefficient - 0.6326				
Nominal depth 5 meters				Vector mean + 49.84				
Instrument - type Aanderaa				Vector variance + 859.8				
				Std dev vec var + 29.32				
parameter	mean	var	std err	std dev	skew	kurt	min	max
U (cm/s)	+39.12	+807.7	.+6296	+28.42	-.7611	-.4897	-56.53	+90.19
V (cm/s)	+30.88	+911.8	.+6689	+30.20	-.8206	+.2192	-80.79	+89.53
T (°C) *	+27.15	+.01130	+.001832	+.1063	-.9918	+.8988	+26.07	+27.38

\*) Record ends 16:15 Z 11 Sept 74 (254)

Duration 11 d, 16 hours, 15 min



Mooring GATE F2	Cross correlation East - North
Reference nr. 10502	Covariance - 46.36
Sample size 3364pts, Interval 5.0 min	Std err covar + 12.92
Spanning from 00:00 Z 31 Aug 74 (243)	Std dev covar +749.5
range (Jul.days) to 16:15 Z 11 Sept 74 (254)	Corr coefficient - 0.2045
Duration 11 d, 16 hours, 15 min	Vector mean + 43.99
Nominal depth 30 meters	Vector variance +264.4
Instrument - type Aanderaa	Std dev vec var + 16.26
parameter	mean
U (cm/s)	+41.80
V (cm/s)	+13.69
T ( $^{\circ}$ C)	+26.19
var	+128.4
std err	+.1954
std dev	+11.33
skew	-0.7035
kurt	+1.877
min	-33.05
max	+73.40
	-0.4753
	-0.00231
	-60.78
	+64.35
	-1.604
	+2.608
	+21.10
	+27.21

Fig. 31

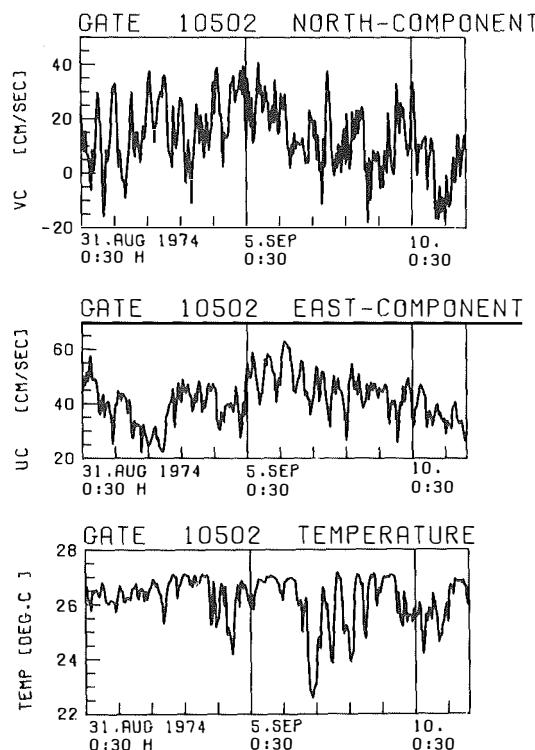
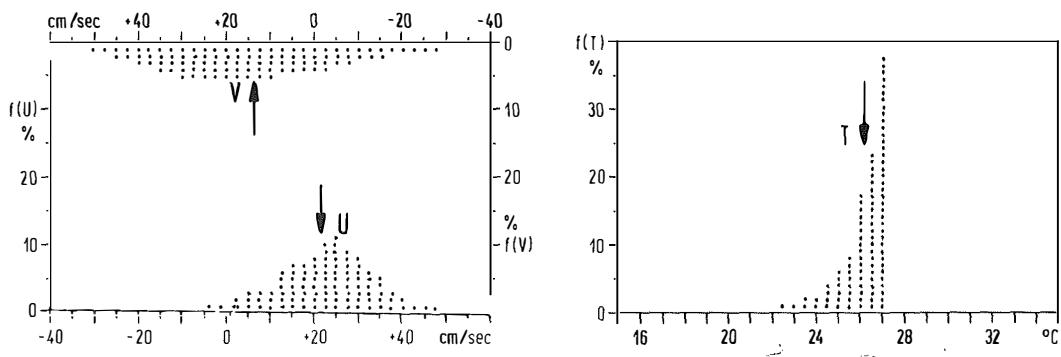
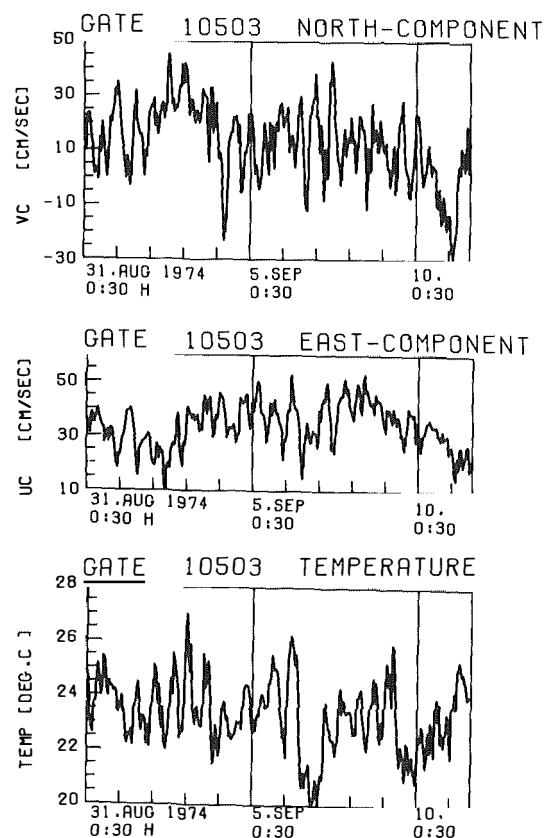
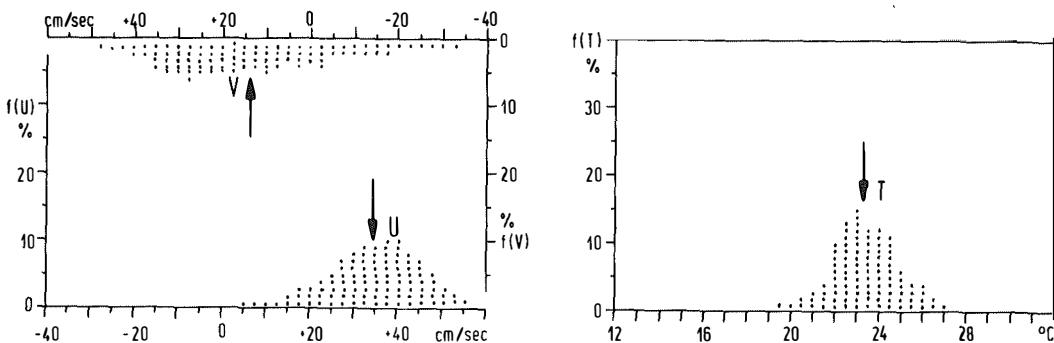


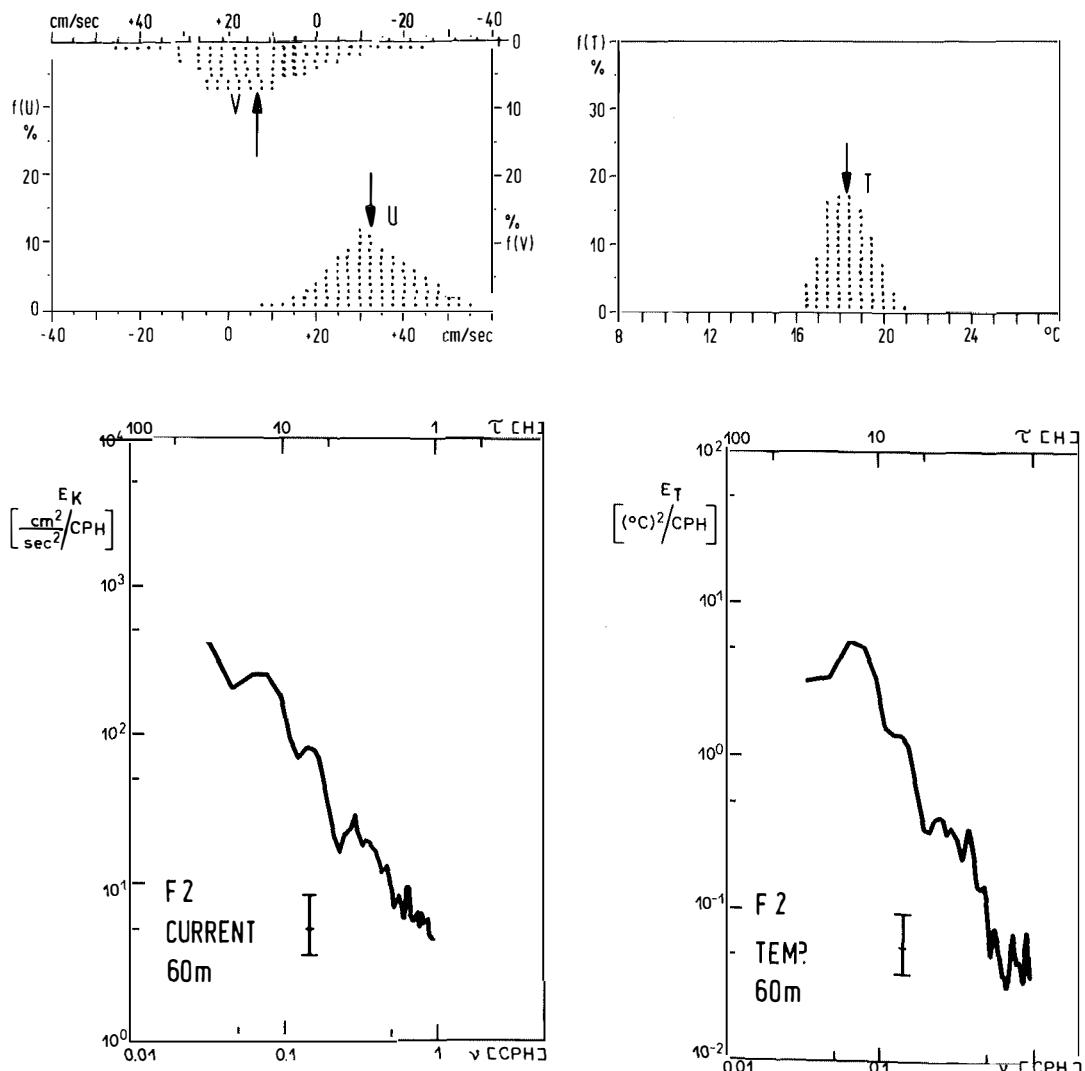
Fig. 32

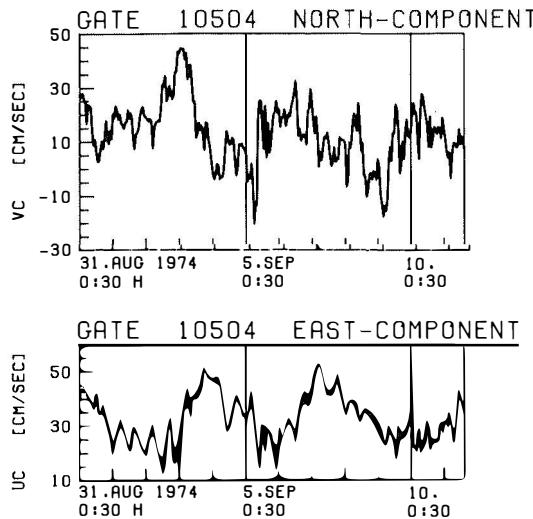
Mooring	GATE F2	Cross correlation	East - North
Reference nr.	10503	Covariance	- 53.80
Sample size	3364pts, Interval 5.0 min	Std err covar	+ 9.968
Spanning	from 00:00 Z 31 Aug 74 (243) range (Jul.days) to 16:15 Z 11 Sept 74 (254)	Std dev covar	+578.1
Duration	11 d, 16 hours, 15 min	Corr coefficient	- 0.2578
Nominal depth	40 meters	Vector mean	+ 36.61
Instrument - type	Aanderaa	Vector variance	+241.7
		Std dev vec var	+ 15.55
parameter	mean	var	std err
U (cm/s)	+34.15	+119.8	+1.887
V (cm/s)	+13.19	+363.5	+3.287
T ( $^{\circ}$ C)	+23.35	+ 2.07	+0.02481
		std dev	
		.7270	
		.5207	
		.00678	
		-0.05861	
		+18.95	
		+27.16	
	skew	kurt	min
	-1.267	-0.2788	-41.02
	-0.05861	+18.95	+60.31
		+57.49	
	max		



Mooring	GATE F2	Cross correlation	East - North	
Reference nr.	10504	Covariance	- 44.06	
Sample size	3364pts, Interval 5.0 min	Std err covar	+ 7.733	
Spanning range	from 00:00 Z 31 Aug 74 (243) to 16:15 Z 11 Sept 74 (254) (Jul.days)	Std dev covar	+448.5	
Duration	11 d, 16 hours, 15 min	Corr coefficient	- 0.3118	
Nominal depth	60 meters	Vector mean	+ 35.20	
Instrument - type	Aanderaa	Vector variance	+152.2	
		Std dev vec var	+ 12.34	
parameter	mean	var	std err	
U (cm/s)	+32.61	+ 95.80	+1.688	
V (cm/s)	+13.26	+ 208.5	+2.490	
T (°C)	+18.44	+ 1.086	+0.01797	
std dev	skew	kurt	min	max

Fig. 33





zu Fig. 33

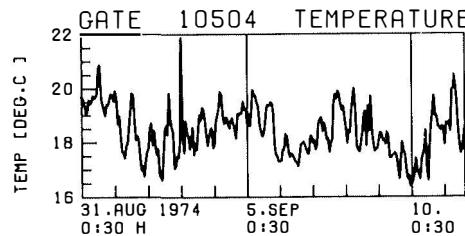
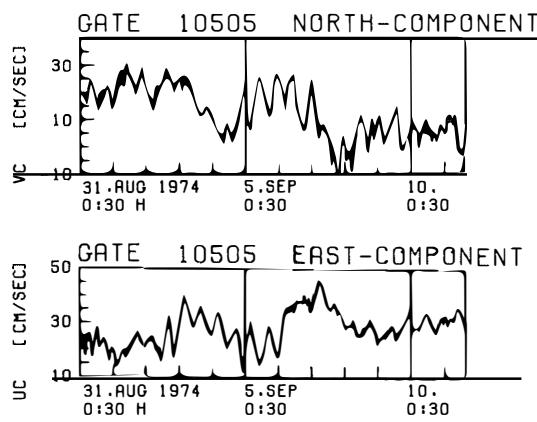
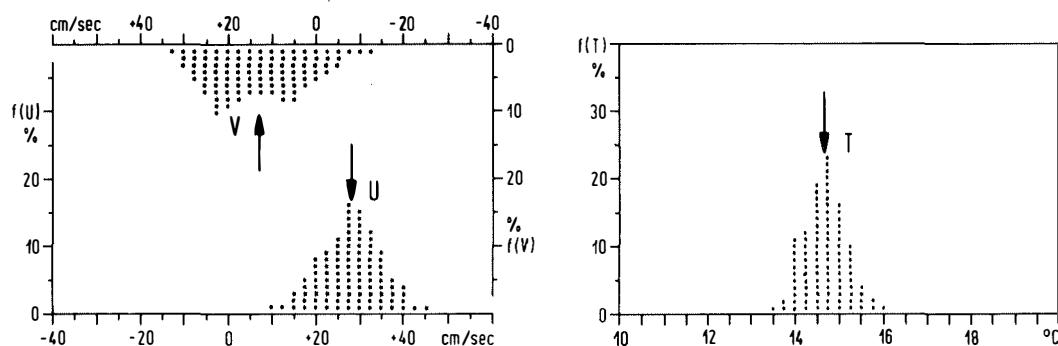


Fig. 34

Mooring	GATE F2		Cross correlation	East - North
Reference nr.	10505		Covariance	- 34.95
Sample size	3364pts, Interval 5.0 min		Std err covar	+ 4.732
Spanning range	from 00:00 Z 31 Aug 74 (243) (Jul.days) to 16:15 Z 11 Sept74 (254)		Std dev covar	+274.4
Duration	11 d, 16 hours, 15 min		Corr coefficient	- 0.4808
Nominal depth	100 meters		Vector mean	+ 30.74
Instrument - type	Aanderaa		Vector variance	+ 78.21
			Std dev vec var	+ 8.844
parameter	mean	var	std err	std dev
U (cm/s)	+27.95	+ 49.35	+ .1211	+ 7.025
V (cm/s)	+12.80	+107.1	+ .1784	+10.35
T (°C)	+14.68	+0.2108	+ .007916	+ 0.4591
				+ .07532
				- .1905
				+13.43
				+16.04



Mooring GATE F2	
Reference nr. 10506	
Sample size 3364pts, Interval 5.0 min	
Spanning from 00:00 Z 31 Aug 74 (243)	
range (Jul.days) to 16:15 Z 11 Sept74 (254)	
Duration 11 d, 16 hours, 15 min	
Nominal depth 150 meters	
Instrument - type Aanderaa	
parameter	mean
T ( $^{\circ}$ C)	+13.20
var	.0598
std err	.004216
std dev	.2445
skew	.2336
kurt	-.4482
min	+12.61
max	+14.04

Fig. 35

