

*HR Wallingford*

---

Measurements of Flow and Sediment Dynamics over  
an Estuarine Sandwave - Data Report

R Atkins and R L Soulsby

Report SR 249  
February 1992

This report describes work funded by the Department of the Environment under Research Contract PECD 7/6/195 for which the DOE nominated officer was Mr P Woodhead. The report is published on behalf of the Department of the Environment, but any opinions expressed in this report are not necessarily those of the funding Department. The work was carried out by R L Soulsby and R Atkins in the Research Department of Hydraulics Research, Wallingford under the management of Dr W R White.

© Crown Copyright 1992

Published by permission of the Controller of Her Majesty's Stationery Office.

## ABSTRACT

A series of field measurements was carried out in 1988 to measure the migration rates of large scale bedforms (sandwaves) and to obtain simultaneous measurements of the flow velocities and suspended solids concentrations over the length of a suitable sandwave in a sand-bedded estuary. The results of these measurements and the initial conclusions drawn from the results are described in Hydraulics Research Report SR203. That report describes in more detail the methods of analysis used to reduce the data obtained in the field and summarises the parameters measured. The purpose of the present report is to tabulate the results of the field measurements of the hydrodynamic and sediment transport parameters over the sandwave, particularly for use in the validation of numerical models of large bedform dynamics.



## CONTENTS

	Page
1. INTRODUCTION	1
2. NOTATION	2
3. SUMMARY OF MEASUREMENTS	3
4. DATA REDUCTION AND ANALYSIS	7
5. PRESENTATION OF MEASURED PARAMETERS	9
6. BANDED AVERAGING	10
7. ACKNOWLEDGEMENTS	12
8. REFERENCES	13

## TABLES

IA	Summary of 5 minute averaged measured values, Position 1, z=0.8m (No rotation)
IIA	Summary of 5 minute averaged measured values, Position 1, z=0.4m (No rotation)
IIIA	Summary of 5 minute averaged measured values, Position 1, z=0.2m (No rotation)
IVA	Summary of 5 minute averaged measured values, Position 1, z=0.1m (No rotation)
IB	Summary of 5 minute averaged measured values, Position 1, z=0.8m (Rotated)
IIB	Summary of 5 minute averaged measured values, Position 1, z=0.4m (Rotated)
IIIB	Summary of 5 minute averaged measured values, Position 1, z=0.2m (Rotated)
IVB	Summary of 5 minute averaged measured values, Position 1, z=0.1m (Rotated)
V	Summary of 5 minute averaged measured values, Position 2, z=0.8m
VI	Summary of 5 minute averaged measured values, Position 2, z=0.4m
VII	Summary of 5 minute averaged measured values, Position 2, z=0.2m
VIII	Summary of 5 minute averaged measured values, Position 2, z=0.1m
IX	Summary of 5 minute averaged measured values, Position 3, z=0.8m
X	Summary of 5 minute averaged measured values, Position 3, z=0.4m
XI	Summary of 5 minute averaged measured values, Position 3, z=0.2m
XII	Summary of 5 minute averaged measured values, Position 3, z=0.1m
XIII	Summary of 5 minute averaged measured values, Position 4, z=0.8m
XIV	Summary of 5 minute averaged measured values, Position 4, z=0.4m
XV	Summary of 5 minute averaged measured values, Position 4, z=0.2m
XVI	Summary of 5 minute averaged measured values, Position 4, z=0.1m

## CONTENTS (CONT'D)

### TABLES (Cont'd)

XVII	Summary of 5 minute averaged measured values, Position 5, $z=0.8m$
XVIII	Summary of 5 minute averaged measured values, Position 5, $z=0.4m$
XIX	Summary of 5 minute averaged measured values, Position 5, $z=0.2m$
XX	Summary of 5 minute averaged measured values, Position 5, $z=0.1m$
XXIA	Banded averaged parameters, Position 1 (No rotation)
XXIB	Banded averaged parameters, Position 1 (Rotated)
XXII	Banded averaged parameters, Position 2
XXIII	Banded averaged parameters, Position 3
XXIV	Banded averaged parameters, Position 4
XXV	Banded averaged parameters, Position 5
XXVI	Ground survey data covering measurement period and "average" sandwave

### FIGURES

1. Location map
2. Particle size distribution of bed material
3. Particle size distribution of suspended sand,  $z = 0.8m$
4. Particle size distribution of suspended sand,  $z = 0.4m$
5. Particle size distribution of suspended sand,  $z = 0.2m$
6. Particle size distribution of suspended sand,  $z = 0.1m$
7. Schematic of recording and analysis system
8. Ground surveys of sandwaves during the experiments
9. Sandwave notation
10. Reference mast velocities at 0.4m
11. Velocity vectors for band 3
12. Velocity vectors for band 4
13. Overlaid sandwaves and "average" sandwave

## 1. INTRODUCTION

Between 1986 and 1988 the Department of the Environment (DOE) funded a strategic research project at Hydraulics Research (HR) into the dynamics of flows over large bedforms in sand-bedded estuaries (DOE Research Contract PECD 7/6/83). Large bedforms include the features known as dunes in river terminology, and sandwaves in the marine and estuarine terminology. The project involved detailed field measurements of the main mean and turbulent hydrodynamic and sedimentary parameters over the length of one sandwave. This fieldwork was carried out in August/September 1988 and the results of the initial analysis of the data obtained during the fieldwork conducted during the previous research contract are presented in Reference 1.

The present data report gives a tabulation of the data in a form which can be used for testing and validation of theories and numerical models of flow over sandwaves.

## 2. NOTATION

$C_d$	Chainage at down-flow crest (m)
$C_t$	Chainage at trough (m)
$C_u$	Chainage at up-flow crest (m)
$C_x$	Chainage at measurement point (m)
$C$	Concentration of suspended sand ( $\text{kgm}^{-3}$ )
$\bar{C}$	Time-averaged mean value of $C$ ( $\text{kgm}^{-3}$ )
$c$	Fluctuating part of $C$ ( $\text{kgm}^{-3}$ )
$L_d$	Bed level on down-flow crest (m LD)
$L_t$	Bed level at trough (m LD)
$L_u$	Bed level at up-flow crest (m LD)
$L_x$	Bed level at measurement point (m LD)
$U$	Longitudinal velocity ( $\text{ms}^{-1}$ )
$\bar{U}$	Time-average mean value of $U$ ( $\text{ms}^{-1}$ )
$u$	Fluctuating part of $U$ ( $\text{ms}^{-1}$ )
$W$	Vertical velocity ( $\text{ms}^{-1}$ )
$\bar{W}$	Time averaged mean value of $W$ ( $\text{ms}^{-1}$ )
$w$	Fluctuating part of $W$ ( $\text{ms}^{-1}$ )
$-\overline{uw}$	Kinematic momentum flux (Reynolds stress) ( $\text{m}^2\text{s}^{-2}$ )
$\overline{uc}$	Horizontal diffusive flux of sand ( $\text{kgm}^{-2}\text{s}^{-1}$ )
$\overline{wc}$	Vertical diffusive flux of sand ( $\text{kgm}^{-2}\text{s}^{-1}$ )
$\sigma_u$	Standard deviation of longitudinal velocity fluctuations ( $\text{ms}^{-1}$ )
$\sigma_w$	Standard deviation of vertical velocity fluctuations ( $\text{ms}^{-1}$ )
$\sigma_c$	Standard deviation of suspended sand concentration fluctuations ( $\text{kgm}^{-3}$ )
$U_{RO.4}$	Reference mast velocity at 0.4m above bed ( $\text{ms}^{-1}$ )
$z$	Height above bed (m)
$\bar{x}$	Mean of $x$ over a 5 minute record

### 3. SUMMARY OF MEASUREMENTS

The field measurements were made on drying sandflats in the River Taw in North Devon, see Figure 1. The bed of the estuary comprises fine sand with a median diameter of  $200\mu\text{m}$  and during spring tide periods there are high concentrations of suspended sands having a slightly smaller median diameter of  $165\mu\text{m}$  with a settling velocity of  $0.017\text{ms}^{-1}$ . The particle size distribution of a typical sample taken from the bed of the River Taw is shown in Figure 2 Figures 3 to 6 show size distributions of the sand in suspension at peak flood tide velocity on the upper flank of the sandwave. The size distribution is almost constant across the range of heights 0.1 to 0.8m. Ripples (wave length = 0.2m, height 0.02-0.03m) were observed to be present when the sandwaves were exposed, but it is not known if the ripples were maintained throughout the tide. All the measurements were made during flood tides when there was little suspended clay or silt in suspension. Due to the strong mixing both temperature and salinity are uniform throughout the depth, the mean kinematic viscosity of the water during previous measurements at the same site, and a similar time of year, was  $1.162 \times 10^{-6} \text{m}^2\text{s}^{-1}$ . This value was obtained from measured depth-averaged temperature and salinity values of  $16.2^\circ\text{C}$  and 33.6 ppt respectively.

The sandwaves migrate up-estuary due to the strongly dominant flood tide, with no evidence to suggest that the ebb tide makes a significant contribution to the shape of the sandwave. All the measurements were made during flood tides, and terms such as "down-flow" refer to flow in the flood (ie up-estuary) direction.

The measurements were made using instruments mounted on two streamlined masts rigidly attached to frameworks which were assembled on the sandflats during low water periods. Apart from the masts all the elements of the frameworks were circular in section. A 3m mast was mounted on one framework which was positioned daily on the down-flow crest of the selected sandwave and acted as a reference measurement position. Instrumentation on this reference mast comprised 0.15m diameter Braystoke propeller current meters (PCM's) at heights of 0.2, 0.4, 0.8 and 2.5m above the bed, and pumped sample nozzles positioned at the 0.4 and 0.8m heights. The overall height of the reference mast was increased to 5.5m by the addition of a bamboo cane which was graduated so that water depths could be recorded.

The instrumentation mast, 1m high, was clamped on the leading edge of a second framework and positioned daily at the point on the sandwave at which measurements were required. This mast carried the main instrumentation for the experiments. At heights of 0.1, 0.2, 0.4 and 0.8m above the bed a 50mm diameter electromagnetic current meter (ECM), PCM and pumped sample nozzle were mounted. An acoustic backscatter probe (ABP) was mounted at the top of the mast, pointing vertically downwards to measure concentrations of suspended sand.

The ABP was designed, built and operated by Dr P D Thorne of the Proudman Oceanographic Laboratory, Bidston. Its principle of operation is described in Reference 2. 3MHz sound is transmitted in a narrow, downward-pointing beam, and is scattered back from suspended sand. The concentration of sand is determined at as many levels as required from the intensity of a back-scattered signal, and the ranges of the levels from the transducer is determined from

the time delays. In this report measurements from four heights, matching those of the ECMs, have been analysed.

The ECMs were two component discus type orientated to measure velocities in the mean flow and vertical directions. The manner in which ECMs operate may be found elsewhere, for example Reference 3. In order to prevent interference between the magnetic fields generated by the ECM heads the frequency and switching of the magnetic fields were controlled by only one of the ECM monitors. The ABP was mounted 1m above the mast base and aligned with the vertical axes of the ECMs and displaced 0.1m laterally. The ABP beam was assumed to be close enough to the ECMs to effectively be measuring velocities and concentrations at the same point.

Recordings from the instruments on the masts were made on board a work barge anchored near the measurement position. All 12 analogue voltage signals, representing the turbulent records of concentration and two velocity components at each of the four measurement heights on the measurement mast were recorded on magnetic tape using a 14 channel Racal Store 14DS frequency modulated (FM) tape recorder, the use of an FM recorder ensuring the faithful recording of the important low frequency signals. The recording system is shown in schematic form in Figure 7.

In-situ measurements of suspended sand concentrations were obtained using in-line pump filtration systems. The sand/water mixture was extracted from the main flow at a sampling point and pumped to the surface where the sample was filtered on an individual 40 $\mu$ m filter whilst a record was made of the quantity of the mixture pumped. Bleed samples of the liquid passing through the filter were taken to check on the levels

of suspended fine material, which had a low and uniformly distributed concentration throughout the measured heights. Hose sizes and pumping rate were such that the mixture maintained a velocity sufficient to ensure that the sand remained in suspension.

After a suitable sandwave was selected at the start of the field work a survey line was set up aligned with the mean flow direction. The mean flow direction was assumed to be generally normal to the lines of the crests of the sandwaves in the locality. All measurements over the sandwave were made along this survey line. An arbitrary local datum for levels was established by driving a wooden stake far enough into the sand to be unaffected by the migration of the sandwave. Daily ground surveys were conducted along this survey line prior to the measurement period with bed levels, referred to the local datum (LD), being measured at 1m intervals shown in Figure 8. The results are summarised in Table XXVI. The reference mast was laterally displaced from the survey line by approximately 4m to avoid any wake effects from the measuring mast and its framework.

Every day the reference mast was moved as the sandwave migrated up-estuary, so that its position was always initially on the down-flow crest of the sandwave. The smaller mast was moved to a different horizontal position on the sandwave day by day, so that over a period of 5 days a series of 5 positions roughly equally spaced between the trough and the crest had been sampled. The order in which the individual experiments were carried out was such that measurements on the sandwave crest and trough, the most interesting positions, coincided with the peak tides of the spring tide period when the maximum sandwave migration and suspended sediment concentrations could be expected.

The measurements were made on five consecutive days, each of which followed the same pattern. On arrival at the site the boats were anchored and when the water level had fallen sufficiently to expose the sandwave the frameworks were dismantled and reassembled at the required positions. All the instruments were then checked and the ground survey carried out.

Recording data from the instruments began as soon as the incoming flood tide had submerged the instruments on the measuring mast and continued up to the slack water period at high water if possible. The PCMs were monitored by hand using a multi-channel counting unit recording a count period of 4 minutes at 5 minute intervals.

Pumped samples were taken in rotation from the four nozzles on the measurement mast at 5 minute intervals throughout the measurement period, ie each nozzle was sampled every 20 minutes. Pumped samples from the nozzles on the reference mast were taken at 10 minute intervals.

#### 4. DATA REDUCTION AND ANALYSIS

The data recorded in the field, in analogue form, were digitised back at Wallingford using an Earth Data Recorder EDR 8000 instrumentation tape recorder at a sampling frequency of 10Hz. Integral anti-aliasing filters within the recorder were set to a band-width of 4Hz and had a high frequency roll-off. The whole recording system gave negligible attenuation or amplification of the signals over the frequency range of 0-4Hz. The data were stored in individual computer files, each file containing the raw data from the three channels of information at one height above the

bed at a single position on the sandwave, ie a total of 20 data files.

A purpose written computer program was then used to examine visually each data file. This program allowed the user to remove any spurious data, usually a short period "spike", from the digital records and replace them with interpolated points.

Daily calibration of each of the ECMs were obtained using standard techniques which employed combinations of laboratory calibrations and zero data recorded in the field. Separate calibrations of the mean ABP signal versus the pumped sample concentration were made for each height and each day. The intensity of the backscattered signal (ie square of the logged voltage) was found to calibrate linearly with concentration, as had been found in laboratory tests. Slightly different calibration constants were found at each position on the sandwave, because the amount of attenuation of the signal between the transducer and the sample range depends on the intervening concentration profile. It is theoretically possible that the ABP could be calibrated using an algorithmic approach based on the strength of the backscattered signal and knowledge of the vertical profile of the concentration of suspended sand. As the ABP was in its early development stage when these measurements were made were it was considered that the direct calibration technique described above would be more reliable in this case.

The data were divided into 5 minute records. Calibrations were applied to the digital data to convert them into time series records of longitudinal velocity ( $U(t)$ ), vertical velocity ( $W(t)$ ) and suspended sand concentration ( $C(t)$ ). SI units were

used throughout, giving velocities in  $\text{ms}^{-1}$  and concentrations in  $\text{kgm}^{-3}$ . Following the application of the calibrations to the digital data the overall mean values of the two velocity components,  $\bar{U}$  and  $\bar{W}$  and suspended sand concentration,  $\bar{C}$ , were computed from the 5 minute record. The overbar denotes a mean over the 5 minute records. A co-ordinate rotation was then applied to the velocity data to bring them into a frame of reference such that  $\bar{W}=0$ , ie velocity data was aligned to the local streamline. The 5 minute mean values and the linear trends due to tidal variation were then removed from each of the digital records to leave time series of the fluctuating quantities  $u(t)$ ,  $w(t)$  and  $c(t)$ . From each record of fluctuations the standard deviations were calculated together with the time-averaged estimates of the momentum flux,  $-\bar{uw}$ , and the longitudinal,  $\bar{uc}$ , and vertical,  $\bar{wc}$ , diffusive fluxes of sand.

## 5. PRESENTATION OF MEASURED PARAMETERS

The parameters which were obtained from the analysis described in the preceding section are summarised in tabular form in Tables I to XX, each table containing the results from a single height at one measurement position. The tables are divided into five groups, one group for each measurement position, with a drawing showing the measurement position in relation to the sandwave printed on the blue sheets preceding each group of tables. The sandwave plots show the shape measured at the Low Water immediately preceding the measurement period.

The tables summarise the measured parameters and give information as to the relevant positioning of the measurement point on the sandwave along with measured sandwave parameters (see section on notation for

explanation of the symbols used, and Fig 9). In the data summaries time is written as the mid-block time relative to predicted high water at the site when the measurements were made. Also shown is the water level relative to the local datum established at the measurement site for this work and the local water depth at the measurement position. The column headed "Band" refers to the band into which the data along that particular row falls when the banding criteria are applied, as explained in the next section.

Tables I to IV contain the results at position 1 in the sandwave trough. The co-ordinate rotation was initially not applied to the data recorded at position 1 and these results are shown in Tables IA, IIA, IIIA and IVA. The data were subsequently re-analysed with a co-ordinate rotation and these results are shown in Tables IB, IIB, IIIB and IVB. Tables V to VIII show results from position 2 at 1/4 trough-crest, tables IX to XII position 3 at 1/2 trough-crest, tables XIII to XVI at 3/4 crest-crest and tables XVII to XX at the sandwave crest. Tables V to XX all have coordinate rotations applied. In Reference 1, the figures show the data without coordinate rotation for Position 1, but with rotation for Positions 2 to 5.

## 6. BANDED AVERAGING

In Reference 1 the resulting parameters from these experiments are shown in banded-average form in which velocities measured at 0.4m above the bed on the reference mast were used to determine in which band the results should lie. The velocity limits,  $ms^{-1}$ , of the bands were:-

Band 1	$0.1 \leq U_{RO.4} < 0.3$
Band 2	$0.3 \leq U_{RO.4} < 0.5$
Band 3	$0.5 \leq U_{RO.4} < 0.7$
Band 4	$0.7 \leq U_{RO.4} < 0.9$

The reference mast velocities recorded during the experiments at the five measurement positions are shown as time-series in Figure 10. It can be seen that during the flood tide velocities over the sandflats are distinctly asymmetric with time. Accelerating rapidly, peak velocities are usually attained within 45 minutes after starting the measurements. This is followed by a quasi steady state period during which velocities are slightly below their peak values. Velocities then fall continuously until slack water. The banded averaging process used to show the results obtained removes any effects of these temporal changes to the flow. Checks made subsequently to the banded-averaging showed that in general it was not possible to make any significant distinction between the accelerating and decelerating phases of the tide in the banded-averaged means of the parameters in the cases where blocks fell in both phases. This is not true however with water depths. Therefore in the parameters summarised in Tables XXI to XXV the distinction between the accelerating and decelerating phases is made only by the quoting of relevant water depths.

The average velocity vectors for bands 3 and 4 have been plotted over the "average" sandwave in Figures 11 and 12 respectively. A horizontal shift due to the net migration has been applied to the individual profiles, to make their crests and troughs coincide. These vectors show that in general the flow over the bed-form is as would be expected and give improved confidence in the data. The measured sandwave profiles have been overlaid and are shown with the "average" profile in Figure 13.

## 7. ACKNOWLEDGEMENTS

The authors would like to thank all their colleagues at HR who took part in the field experiments and in particular N Oliver who carried out the onerous task of preparing the field data for analysis and producing the data analysis programs.

We are grateful for the assistance of Dr P D Thorne of the Proudman Oceanographic Laboratory, Bidston for the design and construction of the acoustic backscatter probe and for his guidance in its use during the field experiments.

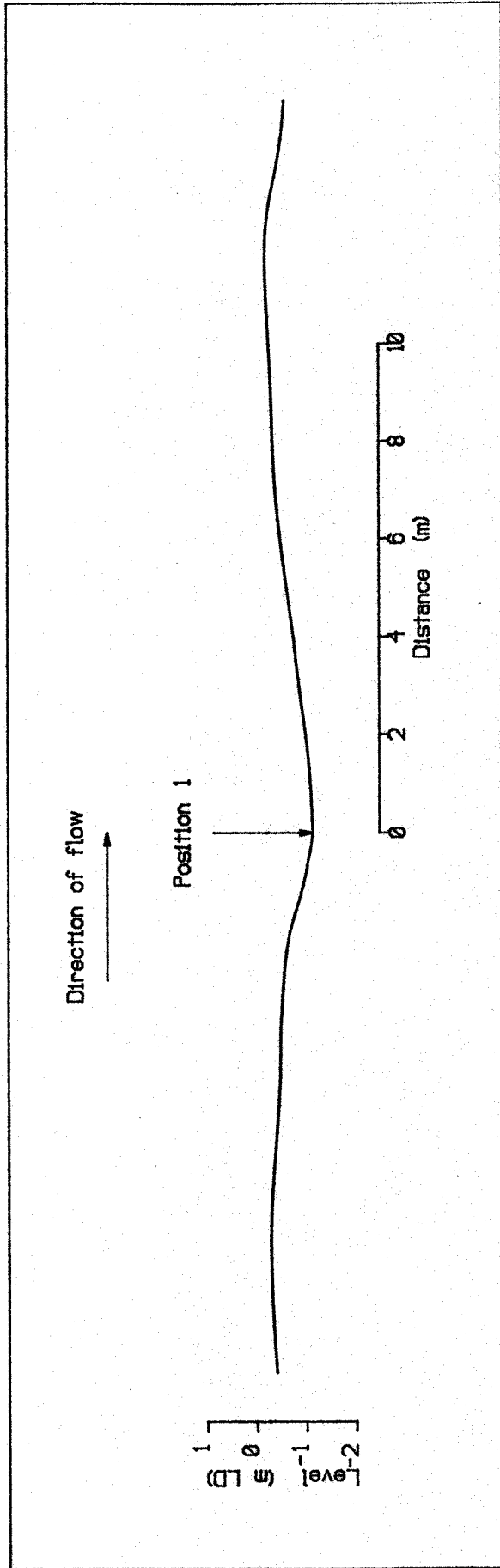
## 8. REFERENCES

1. Atkins R, Soulsby RL, Waters CB and Oliver N. Field measurements of sediment suspension above bedforms in a sandy estuary. Hydraulics Research Report No SR 203, March 1989.
2. Thorne, P D and Hardcastle, P J. Application of acoustic backscattering to measuring suspended sediment process. In "Sand Transport in Rivers, Estuaries and the Sea," R L Soulsby and R Bettess (eds), Balkema, Rotterdam, pp 111-116, 1991.
3. Atkins R. Turbulence measurements using a small electromagnetic current meter in open channel flows. Hydraulics Research Station Report IT 196, 1980.



## **Tables**





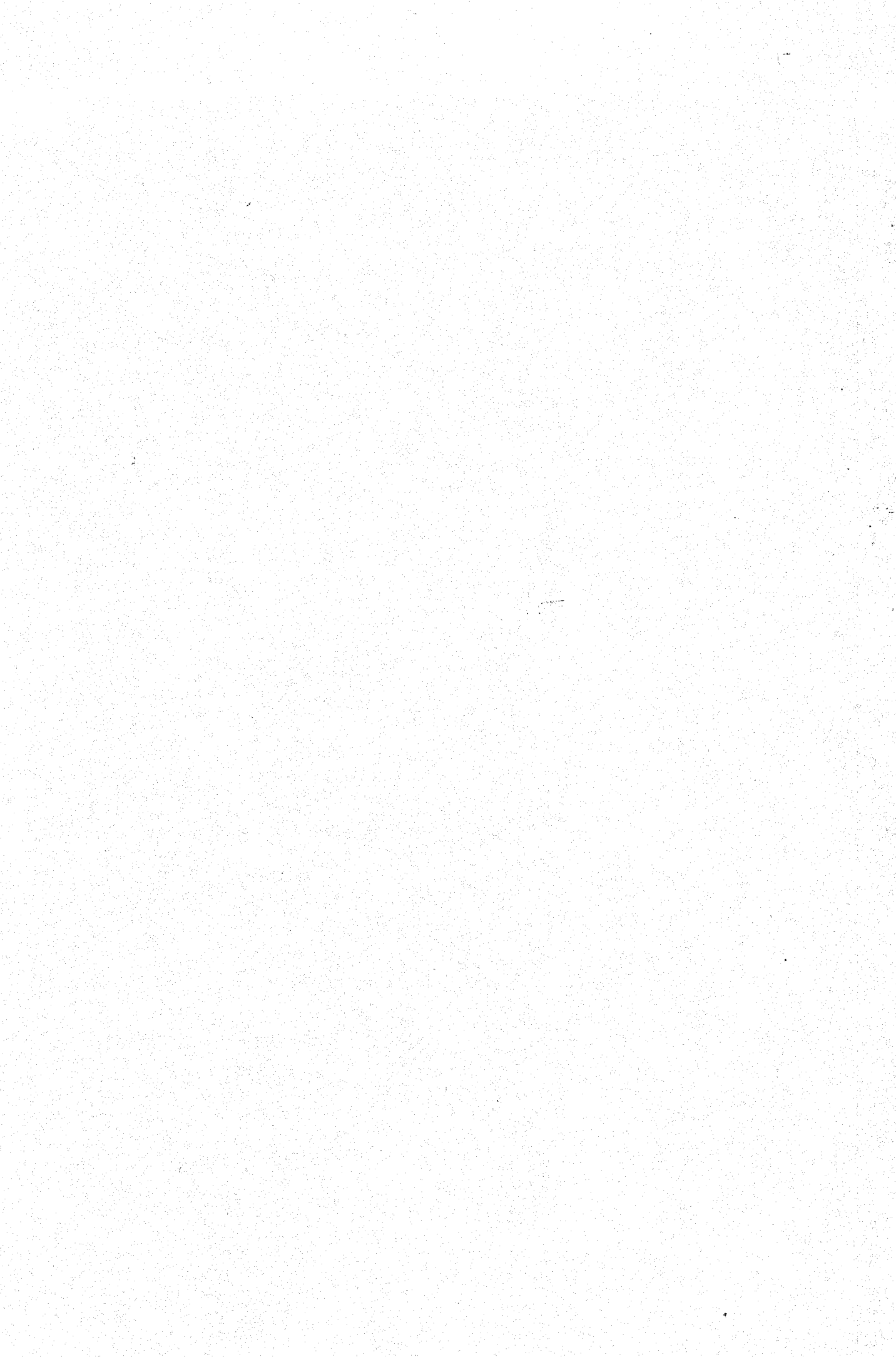


TABLE 1A Summary of 5 minute averaged measured values POSITION 1, z = 0.8 m NOT ROTATED

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	Cu=-3m		Ct=+5m		Cd=+17m		Cx=+5m		$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_U$ ( $\text{ms}^{-1}$ )	$\sigma_W$ ( $\text{ms}^{-1}$ )	$\overline{-UW}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_C$ ( $\text{kgm}^{-3}$ )	$\overline{-UC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{WC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
					Lu=-0.28m LD	Lt=-1.15m LD	Ld=-0.19m LD	Lx=-1.15m LD	$\sigma_U$	$\sigma_W$	$\overline{-UW}$	$\bar{C}$								
1	-2:42	0.52	1.69	3		0.287	0.081	0.085	-0.000057	0.086	0.069	0.002822	-0.000679							
2	-2:37	0.72	1.89	3		0.321	0.070	0.049	0.000567	0.095	0.069	0.001731	-0.000157							
3	-2:32	0.95	2.12	3		0.404	0.077	0.000	-0.000002	0.176	0.142	0.005330	0.000012							
4	-2:27	1.17	2.34	4		0.470	0.071	0.158	-0.000531	0.151	0.115	0.004166	0.003772							
5	-2:22	1.32	2.49	4		0.514	0.067	0.043	0.000554	0.154	0.118	0.004770	0.000316							
6	-2:17	1.57	2.74	4		0.602	0.062	0.028	0.000648	0.254	0.178	0.005196	0.001157							
7	-2:12	1.74	2.91	4		0.659	0.064	0.043	0.000484	0.361	0.228	0.007153	0.001560							
8	-2:07	1.94	3.11	4		0.672	0.067	0.047	0.001292	0.447	0.247	0.008324	0.003550							
9	-2:02	2.15	3.32	4		0.696	0.074	0.040	0.000831	0.607	0.293	0.009812	0.001869							
10	-1:57	2.38	3.55	4		0.652	0.066	0.033	0.000625	0.416	0.239	0.008088	0.001461							
11	-1:52	2.56	3.73	4		0.658	0.069	0.037	0.000732	0.330	0.200	0.005895	0.001267							
12	-1:47	2.73	3.90	4		0.658	0.071	0.034	0.001029	0.308	0.198	0.006933	0.001995							
13	-1:42	2.93	4.10	4		0.658	0.079	0.059	0.000605	0.288	0.182	0.007015	0.002085							
14	-1:37	3.10	4.27	4		0.654	0.071	0.044	0.000513	0.295	0.199	0.005699	0.000610							
15	-1:32	3.29	4.46	4		0.647	0.071	0.051	0.000371	0.216	0.175	0.005947	0.001617							
16	-1:27	3.49	4.66	3		0.545	0.068	0.052	0.000260	0.185	0.139	0.003695	0.002535							
17	-1:22	3.64	4.81	3		0.450	0.097	0.034	0.001411	0.150	0.121	0.004723	0.001151							
18	-1:17	3.81	4.98	3		0.424	0.075	0.082	0.001359	0.179	0.140	0.004805	0.002958							
19	-1:12	3.99	5.16	3		0.450	0.110	0.065	0.004201	0.225	0.191	0.011460	0.004440							
20	-1:07	4.13	5.30	3		0.435	0.079	0.039	0.001126	0.201	0.150	0.005859	0.001767							
21	-1:02	4.23	5.40	3		0.385	0.104	0.054	0.000685	0.168	0.138	0.006860	0.002393							
22	-0:57	4.38	5.55	2		0.365	0.079	0.060	0.002196	0.052	0.047	0.000783	0.000660							
23	-0:52	4.52	5.69	2		0.228	0.074	0.047	0.001312	0.019	0.021	0.000385	-0.000148							
24	-0:47	4.62	5.79	1		0.159	0.062	0.028	0.001096	0.001	0.000	0.000014	0.000006							
25	-0:42			1		0.132	0.062	0.028	0.001236	0.000	0.000	0.000002	0.000000							
26	-0:37			1		0.111	0.034	0.020	0.000311	0.000	0.000	0.000000	0.000000							
27	-0:32			1		0.068	0.032	0.018	0.000332	0.000	0.000	-0.000001	0.000000							
28	-0:27			1		0.030	0.035	0.031	0.000695	0.000	0.000	-0.000008	0.000000							
29	-0:22			1		-0.003	0.043	0.038	0.000221	0.000	0.000	0.000002	0.000000							
30	-0:17					-0.019	0.025	0.015	0.000224	0.000	0.000	0.000000	0.000006							

TABLE IIA Summary of 5 minute averaged measured values POSITION 1, z = 0.4 m NOT ROTATED

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-UW}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-UC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{WC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:42	0.52	1.69	3	0.178	0.084	0.050	0.002362	0.308	0.116	0.001368	0.001255
2	-2:37	0.72	1.89	3	0.197	0.079	0.046	0.001852	0.423	0.149	0.001816	0.001911
3	-2:32	0.95	2.12	3	0.261	0.090	0.051	0.002794	0.731	0.300	0.003369	0.001815
4	-2:27	1.17	2.34	4	0.352	0.094	0.049	0.002394	0.701	0.303	0.003786	0.002873
5	-2:22	1.32	2.49	4	0.429	0.108	0.043	0.002673	0.604	0.263	0.010975	0.002692
6	-2:17	1.57	2.74	4	0.482	0.104	0.047	0.002403	0.869	0.390	0.012903	0.003503
7	-2:12	1.74	2.91	4	0.548	0.103	0.046	0.001745	1.050	0.485	0.020704	0.005885
8	-2:07	1.94	3.11	4	0.532	0.118	0.056	0.002928	1.140	0.484	0.013586	0.004892
9	-2:02	2.15	3.32	4	0.503	0.139	0.064	0.004404	1.247	0.502	0.015067	0.004877
10	-1:57	2.38	3.55	4	0.469	0.121	0.062	0.003536	1.131	0.487	0.017039	0.006591
11	-1:52	2.56	3.73	4	0.476	0.111	0.059	0.002451	1.007	0.477	0.013121	0.004259
12	-1:47	2.73	3.90	4	0.478	0.128	0.060	0.003592	0.976	0.534	0.013458	0.005356
13	-1:42	2.93	4.10	4	0.472	0.114	0.061	0.002725	1.002	0.545	0.014088	0.006767
14	-1:37	3.10	4.27	4	0.439	0.145	0.069	0.004384	0.968	0.541	0.018887	0.006332
15	-1:32	3.29	4.46	4	0.423	0.137	0.070	0.004771	1.010	0.593	0.029161	0.010606
16	-1:27	3.49	4.66	3	0.336	0.120	0.064	0.004645	0.775	0.384	0.008241	0.003365
17	-1:22	3.64	4.81	3	0.199	0.117	0.074	0.005947	0.659	0.318	-0.002898	0.000335
18	-1:17	3.81	4.98	3	0.183	0.096	0.063	0.004023	0.745	0.303	-0.000346	0.001861
19	-1:12	3.99	5.16	3	0.197	0.115	0.071	0.006007	0.986	0.451	-0.011822	-0.002163
20	-1:07	4.13	5.30	3	0.179	0.102	0.068	0.004484	0.803	0.333	-0.001779	0.002588
21	-1:02	4.23	5.40	3	0.133	0.092	0.065	0.004316	0.688	0.398	-0.008551	-0.002729
22	-0:57	4.38	5.55	2	0.132	0.086	0.058	0.003547	0.341	0.183	-0.002777	-0.000510
23	-0:52	4.52	5.69	2	0.087	0.055	0.044	0.001360	0.051	0.046	-0.000533	-0.000314
24	-0:47	4.62	5.79	1	0.064	0.049	0.034	0.001130	0.003	0.001	-0.000009	0.000004
25	-0:42			1	0.051	0.051	0.036	0.001676	0.001	0.000	-0.000010	-0.000007
26	-0:37			1	0.061	0.039	0.028	0.000755	0.000	0.000	0.000000	0.000000
27	-0:32			1	0.045	0.033	0.023	0.000649	0.000	0.000	0.000000	0.000000
28	-0:27			1	0.034	0.029	0.021	0.000388	0.000	0.000	0.000000	0.000000
29	-0:22			1	0.017	0.022	0.129	0.001057	0.117	0.167	0.000898	0.032554
30	-0:17				0.028	0.016	0.011	0.000114	0.000	0.000	-0.000004	0.000005

TABLE IIIA Summary of 5 minute averaged measured values POSITION 1, z = 0.2 m NOT ROTATED

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	Ct=+5m		Cd=+17m		Cx=+5m		$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_U$ ( $\text{ms}^{-1}$ )	$\sigma_W$ ( $\text{ms}^{-1}$ )	$\overline{uW}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_C$ ( $\text{kgm}^{-3}$ )	$\overline{-uC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
					Lu=-0.28m LD	Lt=-1.15m LD	Lu=-0.19m LD	Lt=-1.15m LD	Lu=-0.28m LD	Lt=-1.15m LD								
1	-2:42	0.52	1.69	3	0.100	0.073	0.048	0.001188	0.379	0.156	-0.002341	-0.000005						
2	-2:37	0.72	1.89	3	0.118	0.074	0.045	0.001271	0.578	0.195	-0.001825	0.000585						
3	-2:32	0.95	2.12	3	0.155	0.086	0.051	0.001735	1.066	0.381	-0.003126	-0.000849						
4	-2:27	1.17	2.34	4	0.217	0.092	0.056	0.001638	1.151	0.429	0.000140	0.000047						
5	-2:22	1.32	2.49	4	0.282	0.113	0.057	0.002336	1.242	0.515	0.006262	0.002333						
6	-2:17	1.57	2.74	4	0.309	0.113	0.064	0.003083	1.745	0.857	0.017697	0.004111						
7	-2:12	1.74	2.91	4	0.346	0.133	0.067	0.003142	2.110	1.252	0.016391	0.001026						
8	-2:07	1.94	3.11	4	0.358	0.130	0.073	0.003599	2.074	1.271	-0.003573	-0.003538						
9	-2:02	2.15	3.32	4	0.332	0.136	0.080	0.005056	1.657	1.047	-0.018523	-0.005228						
10	-1:57	2.38	3.55	4	0.303	0.127	0.081	0.004903	1.849	1.089	-0.004942	-0.005330						
11	-1:52	2.56	3.73	4	0.309	0.120	0.083	0.004390	1.667	0.945	-0.000137	-0.001222						
12	-1:47	2.73	3.90	4	0.301	0.129	0.082	0.004958	1.721	1.063	-0.019148	-0.001264						
13	-1:42	2.93	4.10	4	0.307	0.115	0.080	0.004442	1.630	0.903	0.003125	0.008860						
14	-1:37	3.10	4.27	4	0.262	0.141	0.088	0.005550	1.566	0.977	-0.028691	-0.001969						
15	-1:32	3.29	4.46	4	0.227	0.133	0.093	0.005624	1.674	1.029	-0.026747	-0.001481						
16	-1:27	3.49	4.66	3	0.177	0.117	0.073	0.004613	1.216	0.668	-0.005560	-0.003548						
17	-1:22	3.64	4.81	3	0.090	0.094	0.065	0.002892	0.854	0.453	-0.008330	-0.003807						
18	-1:17	3.81	4.98	3	0.085	0.085	0.061	0.002104	0.928	0.434	-0.004600	-0.003997						
19	-1:12	3.99	5.16	3	0.065	0.083	0.062	0.002138	1.156	0.585	-0.011956	-0.003628						
20	-1:07	4.13	5.30	3	0.089	0.086	0.066	0.002313	0.973	0.487	-0.009787	-0.004268						
21	-1:02	4.23	5.40	3	0.048	0.076	0.056	0.001445	0.832	0.450	-0.006691	0.000092						
22	-0:57	4.38	5.55	2	0.035	0.066	0.050	0.000834	0.400	0.237	-0.005299	-0.001765						
23	-0:52	4.52	5.69	2	0.032	0.061	0.039	0.000518	0.056	0.058	-0.000924	-0.000314						
24	-0:47	4.62	5.79	1	0.022	0.053	0.030	0.000327	0.008	0.004	-0.000043	0.000002						
25	-0:42			1	0.013	0.049	0.036	0.000569	0.003	0.002	-0.000019	-0.000020						
26	-0:37			1	0.022	0.044	0.027	0.000194	0.002	0.001	-0.000003	0.000000						
27	-0:32			1	0.013	0.040	0.026	0.000186	0.001	0.001	-0.000001	0.000003						
28	-0:27			1	0.012	0.037	0.023	0.000057	0.000	0.000	0.000000	0.000000						
29	-0:22			1	0.007	0.037	0.022	0.000036	0.000	0.000	0.000000	0.000000						
30	-0:17				0.017	0.029	0.018	-0.000033	0.000	0.000	0.000000	0.000000						



TABLE 1B Summary of 5 minute averaged measured values POSITION 1, z = 0.8 m ROTATED

Block	Time (hh:mm)	WLevel (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:42	0.52	1.69	3	0.810	0.083	0.081	0.000349	0.086	0.069	0.000364	-0.002880
2	-2:37	0.72	1.89	3	0.984	0.055	0.066	-0.001240	0.095	0.069	0.000416	-0.001688
3	-2:32	0.95	2.12	3	1.223	0.025	0.073	-0.002092	0.176	0.142	0.001772	-0.005027
4	-2:27	1.17	2.34	4	1.028	0.144	0.097	0.010046	0.151	0.115	0.005259	-0.001980
5	-2:22	1.32	2.49	4	0.631	0.066	0.047	-0.001174	0.154	0.118	0.004070	-0.002507
6	-2:17	1.57	2.74	4	0.743	0.059	0.036	-0.001310	0.254	0.178	0.004888	-0.002108
7	-2:12	1.74	2.91	4	0.702	0.065	0.043	-0.000284	0.361	0.228	0.007252	-0.001002
8	-2:07	1.94	3.11	4	0.703	0.070	0.043	0.000378	0.447	0.247	0.009000	0.000945
9	-2:02	2.15	3.32	4	0.720	0.075	0.039	-0.000279	0.607	0.293	0.009962	-0.000716
10	-1:57	2.38	3.55	4	0.677	0.067	0.032	-0.000345	0.416	0.239	0.008185	-0.000747
11	-1:52	2.56	3.73	4	0.698	0.070	0.036	-0.000562	0.330	0.200	0.005980	-0.000772
12	-1:47	2.73	3.90	4	0.734	0.071	0.034	-0.001023	0.308	0.198	0.007100	-0.001279
13	-1:42	2.93	4.10	4	0.772	0.076	0.061	-0.000878	0.288	0.182	0.007071	-0.001885
14	-1:37	3.10	4.27	4	0.807	0.067	0.050	-0.001384	0.295	0.199	0.004975	-0.002847
15	-1:32	3.29	4.46	4	0.799	0.069	0.055	-0.001041	0.216	0.175	0.005764	-0.002181
16	-1:27	3.49	4.66	3	0.798	0.061	0.060	-0.000743	0.185	0.139	0.004376	-0.000966
17	-1:22	3.64	4.81	3	0.652	0.080	0.066	-0.004959	0.150	0.121	0.004096	-0.002618
18	-1:17	3.81	4.98	3	0.776	0.088	0.070	0.000347	0.179	0.140	0.005104	-0.002406
19	-1:12	3.99	5.16	3	0.751	0.100	0.082	-0.006319	0.225	0.191	0.010417	-0.006522
20	-1:07	4.13	5.30	3	0.673	0.067	0.057	-0.002847	0.201	0.150	0.005135	-0.003329
21	-1:02	4.23	5.40	3	0.488	0.093	0.071	-0.004241	0.168	0.138	0.006884	-0.002323
22	-0:57	4.38	5.55	2	0.420	0.086	0.050	-0.000158	0.052	0.047	0.001007	0.000186
23	-0:52	4.52	5.69	2	0.259	0.075	0.044	-0.000890	0.019	0.021	0.000270	-0.000312
24	-0:47	4.62	5.79	1	0.180	0.062	0.027	-0.000985	0.001	0.001	0.000015	-0.000001
25	-0:42			1	0.145	0.064	0.023	-0.000575	0.000	0.000	0.000003	0.000000
26	-0:37			1	0.133	0.034	0.019	-0.000280	0.000	0.000	0.000001	0.000000
27	-0:32			1	0.110	0.029	0.022	-0.000471	0.000	0.000	0.000000	0.000000
28	-0:27			1	0.089	0.036	0.029	-0.000658	0.000	0.000	0.000000	0.000000
29	-0:22			1	0.005	0.015	0.045	0.000271	0.000	0.000	-0.000003	-0.000008
30	-0:17				0.023	0.018	0.024	0.000331	0.000	0.000	0.000000	0.000000

TABLE IIB Summary of 5 minute averaged measured values POSITION 1, z = 0.4 m ROTATED

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:42	0.52	1.69	3	0.185	0.089	0.041	0.000713	0.308	0.116	0.001654	0.000843
2	-2:37	0.72	1.89	3	0.204	0.083	0.039	0.000454	0.423	0.149	0.002264	0.001351
3	-2:32	0.95	2.12	3	0.270	0.095	0.041	0.000924	0.731	0.300	0.003724	0.000877
4	-2:27	1.17	2.34	4	0.363	0.097	0.042	0.000490	0.701	0.303	0.004360	0.001892
5	-2:22	1.32	2.49	4	0.439	0.110	0.037	-0.000072	0.604	0.263	0.011298	0.000234
6	-2:17	1.57	2.74	4	0.494	0.107	0.040	0.000200	0.869	0.390	0.013359	0.000556
7	-2:12	1.74	2.91	4	0.564	0.104	0.043	-0.000443	1.050	0.485	0.021502	0.000977
8	-2:07	1.94	3.11	4	0.549	0.121	0.050	-0.000227	1.140	0.484	0.014378	0.001332
9	-2:02	2.15	3.32	4	0.527	0.142	0.056	-0.000932	1.247	0.502	0.015836	0.000179
10	-1:57	2.38	3.55	4	0.498	0.124	0.054	-0.000849	1.131	0.487	0.018261	0.000546
11	-1:52	2.56	3.73	4	0.508	0.113	0.055	-0.001193	1.007	0.477	0.013780	-0.000649
12	-1:47	2.73	3.90	4	0.516	0.130	0.056	-0.002207	0.976	0.534	0.014484	-0.000152
13	-1:42	2.93	4.10	4	0.513	0.116	0.058	-0.001646	1.002	0.545	0.015611	0.000740
14	-1:37	3.10	4.27	4	0.483	0.146	0.067	-0.003571	0.968	0.541	0.019805	-0.002140
15	-1:32	3.29	4.46	4	0.470	0.140	0.064	-0.002898	1.010	0.593	0.030873	-0.003121
16	-1:27	3.49	4.66	3	0.375	0.125	0.054	-0.001613	0.775	0.384	0.008880	-0.000630
17	-1:22	3.64	4.81	3	0.225	0.129	0.052	-0.000449	0.659	0.318	-0.002411	0.001643
18	-1:17	3.81	4.98	3	0.209	0.105	0.045	-0.000205	0.745	0.303	0.000587	0.001800
19	-1:12	3.99	5.16	3	0.225	0.127	0.050	-0.000917	0.986	0.451	-0.011407	0.003785
20	-1:07	4.13	5.30	3	0.205	0.112	0.049	-0.000287	0.803	0.333	-0.000293	0.003127
21	-1:02	4.23	5.40	3	0.152	0.104	0.045	0.000025	0.688	0.398	-0.008790	0.001817
22	-0:57	4.38	5.55	2	0.151	0.097	0.039	-0.000045	0.341	0.183	-0.002684	0.000878
23	-0:52	4.52	5.69	2	0.100	0.061	0.034	0.000179	0.051	0.046	-0.000618	-0.000019
24	-0:47	4.62	5.79	1	0.073	0.054	0.025	-0.000069	0.003	0.001	-0.000006	0.000008
25	-0:42			1	0.059	0.059	0.020	0.000009	0.001	0.001	-0.000012	0.000000
26	-0:37			1	0.070	0.044	0.020	0.000037	0.001	0.000	-0.000001	0.000000
27	-0:32			1	0.054	0.036	0.016	-0.000016	0.001	0.000	0.000001	0.000000
28	-0:27			1	0.040	0.032	0.015	-0.000046	0.000	0.000	0.000000	0.000000
29	-0:22			1	0.023	0.024	0.011	-0.000153	0.117	0.167	0.001217	0.000001
30	-0:17				0.032	0.017	0.009	-0.000006	0.000	0.000	0.000000	0.000000

TABLE III B Summary of 5 minute averaged measured values POSITION 1, z = 0.2 m ROTATED

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	Cu=-3m		Ct=+5m		Cd=+17m		Cx=+5m		$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )
					Lu=-0.28m LD	Lt=-1.15m LD	Lt=-1.15m LD	Ld=-0.19m LD	Lx=-1.15m LD	$\bar{u}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )				
1	-2:42	0.52	1.69	3	0.100	0.073	0.049	0.001292	0.379	0.156	-0.002340	-0.000075				
2	-2:37	0.72	1.89	3	0.119	0.076	0.043	0.000808	0.578	0.195	-0.001743	0.000798				
3	-2:32	0.95	2.12	3	0.156	0.088	0.047	0.000985	1.066	0.381	-0.003212	-0.000425				
4	-2:27	1.17	2.34	4	0.220	0.094	0.052	0.000746	1.151	0.429	0.000146	0.000025				
5	-2:22	1.32	2.49	4	0.286	0.115	0.053	0.000745	1.242	0.515	0.006547	0.001338				
6	-2:17	1.57	2.74	4	0.313	0.116	0.058	0.001428	1.745	0.857	0.018135	0.001096				
7	-2:12	1.74	2.91	4	0.353	0.136	0.062	0.000183	2.110	1.252	0.016259	-0.002315				
8	-2:07	1.94	3.11	4	0.365	0.133	0.066	0.001061	2.074	1.271	-0.004194	-0.002773				
9	-2:02	2.15	3.32	4	0.342	0.142	0.069	0.001545	1.657	1.047	-0.019237	-0.000601				
10	-1:57	2.38	3.55	4	0.317	0.134	0.069	0.001346	1.849	1.089	-0.006280	-0.003660				
11	-1:52	2.56	3.73	4	0.328	0.128	0.071	0.000880	1.667	0.945	-0.000542	-0.001103				
12	-1:47	2.73	3.90	4	0.324	0.136	0.069	-0.000009	1.721	1.063	-0.018252	0.005925				
13	-1:42	2.93	4.10	4	0.334	0.124	0.067	0.000554	1.630	0.903	0.006348	0.006926				
14	-1:37	3.10	4.27	4	0.290	0.148	0.077	-0.001546	1.566	0.977	-0.026747	0.010566				
15	-1:32	3.29	4.46	4	0.258	0.142	0.078	-0.000849	1.674	1.029	-0.024250	0.011382				
16	-1:27	3.49	4.66	3	0.202	0.124	0.060	-0.001408	1.216	0.668	-0.006584	-0.000389				
17	-1:22	3.64	4.81	3	0.102	0.100	0.055	-0.000554	0.854	0.453	-0.009130	0.000716				
18	-1:17	3.81	4.98	3	0.097	0.090	0.055	-0.000473	0.928	0.434	-0.005970	-0.001224				
19	-1:12	3.99	5.16	3	0.076	0.088	0.055	-0.000553	1.156	0.585	-0.012086	0.003169				
20	-1:07	4.13	5.30	3	0.101	0.093	0.056	0.000022	0.973	0.487	-0.010643	0.000849				
21	-1:02	4.23	5.40	3	0.056	0.079	0.052	-0.000610	0.832	0.450	-0.005716	0.003480				
22	-0:57	4.38	5.55	2	0.042	0.067	0.049	-0.000634	0.400	0.237	-0.005415	0.001369				
23	-0:52	4.52	5.69	2	0.041	0.057	0.044	-0.001027	0.056	0.058	-0.000919	0.000329				
24	-0:47	4.62	5.79	1	0.028	0.049	0.038	-0.000926	0.008	0.004	-0.000033	0.000028				
25	-0:42			1	0.017	0.049	0.036	-0.000416	0.003	0.002	-0.000027	-0.000004				
26	-0:37			1	0.028	0.041	0.032	-0.000538	0.002	0.001	-0.000002	0.000002				
27	-0:32			1	0.019	0.036	0.032	-0.000489	0.001	0.001	0.000002	0.000003				
28	-0:27			1	0.017	0.032	0.030	-0.000489	0.000	0.000	0.000001	0.000000				
29	-0:22			1	0.011	0.030	0.031	-0.000495	0.000	0.000	0.000000	0.000000				
30	-0:17				0.022	0.024	0.024	-0.000272	0.001	0.000	0.000001	0.000000				

TABLE IVB Summary of 5 minute averaged measured values POSITION 1, z = 0.1 m ROTATED

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_U$ ( $\text{ms}^{-1}$ )	$\sigma_W$ ( $\text{ms}^{-1}$ )	$\overline{-uW}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_C$ ( $\text{kgm}^{-3}$ )	$\overline{-uC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:42	0.52	1.69	3	0.087	0.054	0.028	-0.000225	0.313	0.105	-0.002012	0.000383
2	-2:37	0.72	1.89	3	0.097	0.051	0.031	-0.000404	0.500	0.166	-0.001768	0.000565
3	-2:32	0.95	2.12	3	0.127	0.065	0.037	-0.000507	0.745	0.301	-0.004119	0.001082
4	-2:27	1.17	2.34	4	0.170	0.071	0.040	-0.000409	0.891	0.313	-0.006732	0.001259
5	-2:22	1.32	2.49	4	0.213	0.090	0.044	-0.000504	0.983	0.346	-0.007429	0.000722
6	-2:17	1.57	2.74	4	0.229	0.092	0.050	-0.000398	1.217	0.491	-0.005034	0.000927
7	-2:12	1.74	2.91	4	0.254	0.111	0.053	-0.000812	1.313	0.594	-0.010037	-0.000097
8	-2:07	1.94	3.11	4	0.276	0.111	0.056	-0.000027	1.307	0.661	-0.010749	-0.001730
9	-2:02	2.15	3.32	4	0.252	0.116	0.059	0.000258	0.940	0.586	-0.010903	-0.002479
10	-1:57	2.38	3.55	4	0.230	0.107	0.060	0.000061	1.101	0.526	-0.007602	-0.001296
11	-1:52	2.56	3.73	4	0.244	0.109	0.062	-0.000061	0.981	0.506	-0.000612	-0.002191
12	-1:47	2.73	3.90	4	0.236	0.114	0.065	0.000326	1.004	0.520	-0.010737	-0.000069
13	-1:42	2.93	4.10	4	0.234	0.110	0.065	0.000702	0.890	0.460	-0.004368	-0.001644
14	-1:37	3.10	4.27	4	0.214	0.113	0.069	-0.000049	0.794	0.437	-0.008077	0.001675
15	-1:32	3.29	4.46	4	0.187	0.113	0.068	0.000848	0.819	0.436	-0.012957	0.004410
16	-1:27	3.49	4.66	3	0.141	0.092	0.056	0.000404	0.618	0.281	-0.006271	0.000915
17	-1:22	3.64	4.81	3	0.067	0.071	0.048	0.000047	0.413	0.194	-0.003827	0.001174
18	-1:17	3.81	4.98	3	0.067	0.073	0.048	0.000170	0.446	0.199	-0.002618	0.001092
19	-1:12	3.99	5.16	3	0.044	0.059	0.045	-0.000054	0.485	0.211	-0.001765	0.001145
20	-1:07	4.13	5.30	3	0.060	0.071	0.047	0.000234	0.442	0.194	-0.002427	0.001451
21	-1:02	4.23	5.40	3	0.034	0.050	0.040	0.000165	0.395	0.174	-0.002004	0.000463
22	-0:57	4.38	5.55	2	0.024	0.050	0.037	-0.000178	0.205	0.116	-0.001836	0.000571
23	-0:52	4.52	5.69	2	0.029	0.038	0.029	-0.000193	0.028	0.028	-0.000284	0.000110
24	-0:47	4.62	5.79	1	0.019	0.032	0.024	-0.000251	0.001	0.000	-0.000004	0.000002
25	-0:42			1	0.013	0.026	0.019	-0.000080	0.001	0.002	-0.000003	-0.000004
26	-0:37			1	0.019	0.023	0.016	-0.000041	0.000	0.000	0.000000	0.000000
27	-0:32			1	0.015	0.020	0.015	-0.000025	0.000	0.000	0.000000	0.000000
28	-0:27			1	0.011	0.017	0.013	-0.000012	0.000	0.000	0.000000	0.000000
29	-0:22			1	0.006	0.014	0.009	-0.000006	0.000	0.000	0.000000	0.000000
30	-0:17				0.016	0.015	0.009	0.000020	0.000	0.000	0.000000	0.000000

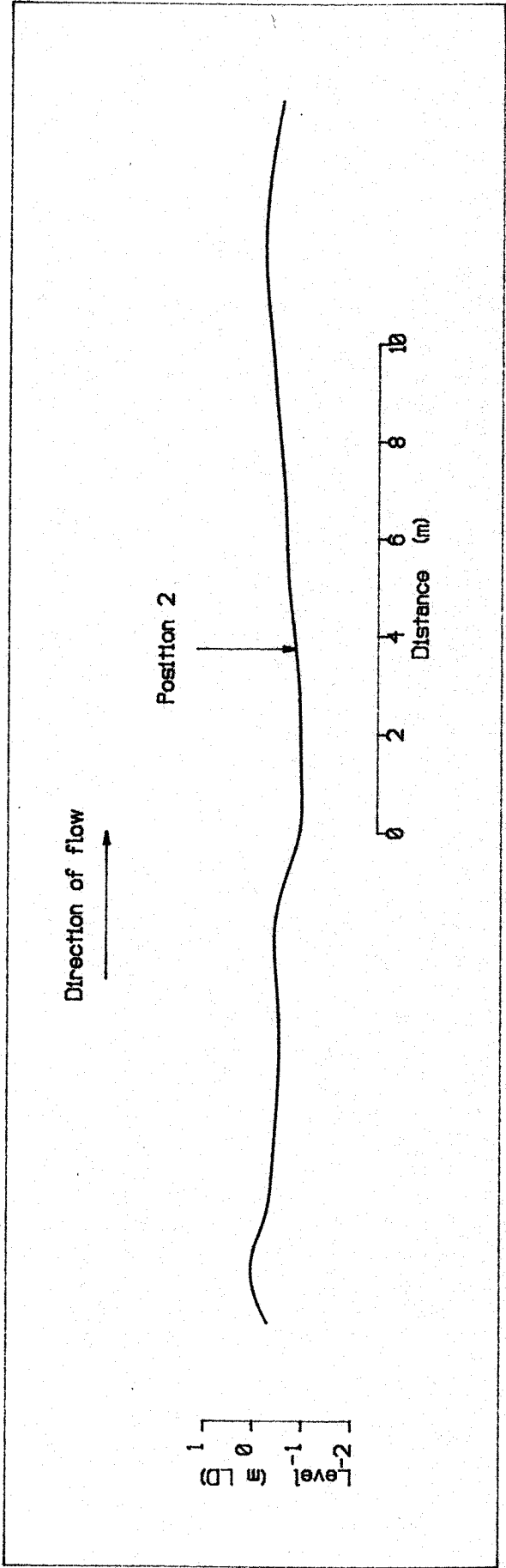








TABLE VII Summary of 5 minute averaged measured values POSITION 2, z = 0.2 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:34	0.72	1.55	3	0.299	0.067	0.050	0.001205	0.029	0.016	0.000174	0.000038
2	-2:29	0.91	1.74	3	0.276	0.077	0.051	0.000502	0.057	0.040	0.000203	0.000052
3	-2:24	1.07	1.90	3	0.375	0.105	0.068	0.001840	0.227	0.154	0.005176	-0.001027
4	-2:19	1.26	2.09	4	0.471	0.098	0.061	0.000595	0.378	0.370	0.007873	-0.000831
5	-2:14	1.47	2.30	4	0.561	0.109	0.088	0.003315	0.464	0.425	0.017319	-0.000998
6	-2:09	1.64	2.47	4	0.604	0.102	0.067	0.001486	0.577	0.557	0.021005	-0.000396
7	-2:04	1.84	2.67	4	0.693	0.099	0.069	0.001957	0.541	0.527	0.017092	0.000661
8	-1:59	2.01	2.84	4	0.709	0.089	0.056	0.000697	0.467	0.432	0.013067	-0.001405
9	-1:54	2.17	3.00	4	0.732	0.105	0.061	0.001333	0.478	0.521	0.016978	-0.001015
10	-1:49	2.33	3.16	4	0.747	0.104	0.064	0.000908	0.363	0.392	0.012540	-0.001296
11	-1:44	2.52	3.35	4	0.677	0.093	0.056	0.000693	0.329	0.364	0.015080	0.000565
12	-1:39	2.71	3.54	4	0.657	0.082	0.055	0.000330	0.344	0.393	0.013086	-0.000298
13	-1:34	2.84	3.67	4	0.646	0.080	0.043	0.000465	0.262	0.276	0.009817	-0.000450
14	-1:29	3.04	3.87	4	0.624	0.085	0.039	0.000148	0.267	0.292	0.009991	0.000753
15	-1:24	3.17	4.00		0.582	0.085	0.042	0.000201	0.211	0.219	0.006772	-0.000238
16	-1:19	3.33	4.16		0.541	0.088	0.037	-0.000261	0.170	0.208	0.008031	0.000604
17	-1:14	3.47	4.30		0.505	0.093	0.045	-0.000707	0.220	0.289	0.008060	-0.001196
18	-1:09	3.60	4.43		0.418	0.072	0.042	0.000301	0.049	0.052	0.001222	-0.000024
19	-1:04	3.72	4.55		0.399	0.072	0.046	0.000047	0.034	0.034	0.000726	0.000104
20	-0:59	3.82	4.65		0.402	0.085	0.050	-0.000212	0.034	0.037	0.000920	0.000230
21	-0:54	3.93	4.76		0.323	0.085	0.046	-0.000735	0.008	0.008	0.000170	0.000006
22	-0:49	4.03	4.86		0.310	0.073	0.042	-0.000458	0.008	0.009	0.000190	0.000005
23	-0:44	4.11	4.94		0.291	0.069	0.036	-0.000613	0.001	0.002	0.000033	0.000002
24	-0:39	4.18	5.01		0.177	0.040	0.030	-0.000350	0.000	0.000	0.000000	0.000000
25	-0:34				0.137	0.042	0.029	-0.000280	0.000	0.000	0.000000	0.000000
26	-0:29				0.153	0.037	0.029	-0.000518	0.000	0.000	0.000000	0.000000
27	-0:24				0.097	0.020	0.018	-0.000184	0.000	0.000	-0.000009	0.000000
28	-0:19				0.105	0.013	0.011	0.000046	0.000	0.000	0.000000	0.000000
29	-0:14				0.091	0.013	0.018	0.000040	0.000	0.000	0.000000	-0.000001

TABLE VIII Summary of 5 minute averaged measured values POSITION 2, z = 0.1 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $ms^{-1}$ )	$\sigma_u$ ( $ms^{-1}$ )	$\sigma_w$ ( $ms^{-1}$ )	$\overline{-uw}$ ( $m^2s^{-2}$ )	$\bar{C}$ ( $kgm^{-3}$ )	$\sigma_c$ ( $kgm^{-3}$ )	$\overline{-uc}$ ( $kgm^{-2}s^{-1}$ )	$\overline{wc}$ ( $kgm^{-2}s^{-1}$ )
1	-2:34	0.72	1.55	3	0.248	0.050	0.033	0.000520	0.471	0.122	0.000187	0.000212
2	-2:29	0.91	1.74	3	0.232	0.060	0.036	0.000978	0.177	0.077	0.000033	0.000168
3	-2:24	1.07	1.90	3	0.319	0.086	0.044	0.001234	0.359	0.190	0.002743	0.000410
4	-2:19	1.26	2.09	4	0.415	0.090	0.045	0.001572	0.552	0.436	0.005787	0.000224
5	-2:14	1.47	2.30	4	0.506	0.093	0.048	0.000958	0.628	0.450	0.012995	0.002009
6	-2:09	1.64	2.47	4	0.545	0.090	0.045	0.001043	0.671	0.453	0.013648	0.000804
7	-2:04	1.84	2.67	4	0.624	0.089	0.046	0.000889	0.636	0.453	0.013972	-0.000042
8	-1:59	2.01	2.84	4	0.643	0.085	0.043	0.000938	0.523	0.376	0.010212	0.000575
9	-1:54	2.17	3.00	4	0.672	0.090	0.044	0.000948	0.540	0.435	0.012857	0.000876
10	-1:49	2.33	3.16	4	0.684	0.091	0.043	0.000754	0.456	0.354	0.008982	0.000650
11	-1:44	2.52	3.35	4	0.626	0.084	0.040	0.000881	0.406	0.343	0.012400	0.001350
12	-1:39	2.71	3.54	4	0.606	0.076	0.042	0.000652	0.447	0.419	0.014242	0.001547
13	-1:34	2.84	3.67	4	0.615	0.075	0.042	0.000765	0.390	0.383	0.011468	0.001780
14	-1:29	3.04	3.87	4	0.599	0.078	0.041	0.000524	0.331	0.286	0.010400	0.002081
15	-1:24	3.17	4.00		0.568	0.083	0.042	0.000967	0.286	0.245	0.008157	0.000943
16	-1:19	3.33	4.16		0.528	0.081	0.043	0.000884	0.222	0.210	0.005930	0.001313
17	-1:14	3.47	4.30		0.480	0.078	0.044	0.000430	0.269	0.264	0.007051	0.000094
18	-1:09	3.60	4.43		0.380	0.069	0.040	0.001032	0.067	0.057	0.001039	0.000257
19	-1:04	3.72	4.55		0.356	0.064	0.042	0.000874	0.049	0.040	0.000736	0.000406
20	-0:59	3.82	4.65		0.354	0.073	0.043	0.001119	0.046	0.041	0.000731	0.000449
21	-0:54	3.93	4.76		0.284	0.075	0.037	0.000934	0.011	0.009	0.000175	0.000051
22	-0:49	4.03	4.86		0.272	0.063	0.039	0.000798	0.010	0.008	0.000113	0.000042
23	-0:44	4.11	4.94		0.263	0.061	0.032	0.000763	0.002	0.002	0.000017	0.000011
24	-0:39	4.18	5.01		0.143	0.032	0.026	0.000267	0.000	0.000	-0.000002	0.000000
25	-0:34				0.103	0.030	0.028	0.000366	0.000	0.000	0.000000	0.000000
26	-0:29				0.116	0.032	0.022	0.000227	0.000	0.000	-0.000005	0.000006
27	-0:24				0.037	0.016	0.014	0.000152	0.000	0.000	-0.000003	0.000001
28	-0:19				0.033	0.006	0.005	-0.000025	0.000	0.000	-0.000001	0.000007
29	-0:14				0.042	0.013	0.008	0.000038	0.000	0.000	-0.000004	0.000002

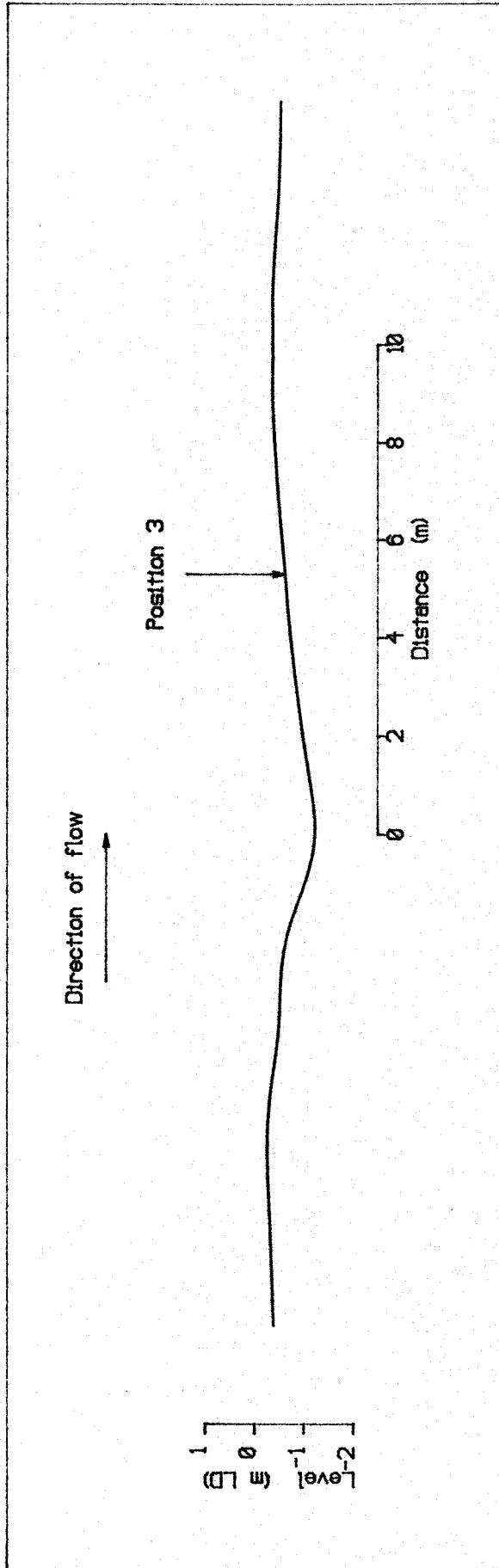




TABLE IX Summary of 5 minute averaged measured values POSITION 3, z = 0.8 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$-\overline{uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$-\overline{uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:32	0.92	1.55	3	0.293	0.073	0.060	0.002402	0.217	0.086	0.002418	0.002299
2	-2:27	1.13	1.78	3	0.244	0.086	0.043	0.001845	0.146	0.078	0.002555	0.001330
3	-2:22	1.35	1.98	3	0.486	0.069	0.043	0.001309	0.125	0.090	0.003402	0.001711
4	-2:17	1.54	2.17	3	0.605	0.079	0.043	0.001151	0.161	0.117	0.004594	0.001539
5	-2:12	1.71	2.34	4	0.614	0.086	0.048	0.001490	0.246	0.175	0.006301	0.003107
6	-2:07	1.92	2.55	4	0.610	0.090	0.050	0.002061	0.279	0.188	0.007687	0.003503
7	-2:02	2.10	2.73	4	0.661	0.087	0.049	0.002276	0.360	0.237	0.009987	0.004486
8	-1:57	2.27	2.90	4	0.625	0.078	0.048	0.001847	0.249	0.184	0.006452	0.002646
9	-1:52	2.47	3.10	4	0.606	0.071	0.041	0.001208	0.145	0.129	0.003375	0.001597
10	-1:47	2.64	3.27	4	0.574	0.074	0.042	0.001673	0.111	0.093	0.003136	0.001232
11	-1:42	2.83	3.46	4	0.594	0.069	0.045	0.001017	0.150	0.136	0.004491	0.001206
12	-1:37	3.01	3.64	3	0.587	0.068	0.040	0.001113	0.130	0.103	0.002851	0.001232
13	-1:32	3.18	3.81	3	0.539	0.068	0.042	0.001473	0.134	0.100	0.003264	0.001572
14	-1:27	3.34	3.97	3	0.499	0.072	0.043	0.001299	0.113	0.090	0.002735	0.001052
15	-1:22	3.53	4.16	3	0.477	0.070	0.043	0.001251	0.080	0.066	0.002110	0.001056
16	-1:17	3.71	4.34	2	0.430	0.070	0.043	0.001497	0.087	0.069	0.002601	0.001269
17	-1:12	3.89	4.52	2	0.433	0.087	0.051	0.002334	0.063	0.065	0.003465	0.001345
18	-1:07	4.06	4.69	2	0.439	0.099	0.059	0.002803	0.117	0.102	0.005095	0.002794
19	-1:02	4.18	4.81	2	0.406	0.076	0.042	0.001566	0.054	0.043	0.001508	0.000740
20	-0:57	4.27	4.90	1	0.369	0.093	0.056	0.003233	0.042	0.046	0.002920	0.001710
21	-0:52	4.39	5.02	1	0.237	0.088	0.043	0.001514	0.023	0.019	0.001210	0.000325
22	-0:47	4.53	5.16		0.202	0.063	0.035	0.000955	0.003	0.003	0.000094	0.000032
23	-0:42	4.64	5.27		0.164	0.058	0.038	0.001250	0.000	0.000	0.000007	0.000005
24	-0:37	4.73	5.36		0.139	0.052	0.032	0.000773	0.000	0.000	0.000000	0.000000
25	-0:32	4.81	5.44		0.080	0.035	0.024	0.000522	0.000	0.000	-0.000004	0.000005



TABLE XI Summary of 5 minute averaged measured values POSITION 3, z = 0.2 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_U$ ( $\text{ms}^{-1}$ )	$\sigma_W$ ( $\text{ms}^{-1}$ )	$\overline{-uW}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_C$ ( $\text{kgm}^{-3}$ )	$\overline{-uC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wC}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
		Cu=+1m	Ct=+7m		Cd=+16m	Cx=+12.3m						
		Lu=-0.25m LD	Lt=-1.30m LD		Lt=-0.36m LD	Lx=-0.63m LD						
1	-2:32	0.92	1.55	3	0.223	0.063	0.044	0.000877	0.219	0.157	0.001149	0.001868
2	-2:27	1.13	1.78	3	0.231	0.083	0.048	0.000925	0.235	0.159	-0.000279	0.001159
3	-2:22	1.35	1.98	3	0.377	0.081	0.044	0.001127	0.360	0.321	0.006224	0.004474
4	-2:17	1.54	2.17	3	0.515	0.099	0.050	0.000981	0.446	0.367	0.010897	0.003958
5	-2:12	1.71	2.34	4	0.534	0.091	0.050	0.001339	0.494	0.355	0.009689	0.004849
6	-2:07	1.92	2.55	4	0.534	0.091	0.048	0.001282	0.555	0.413	0.008253	0.001195
7	-2:02	2.10	2.73	4	0.579	0.088	0.050	0.000799	0.545	0.378	0.010685	0.000620
8	-1:57	2.27	2.90	4	0.553	0.079	0.044	0.000688	0.457	0.330	0.008708	0.001473
9	-1:52	2.47	3.10	4	0.547	0.076	0.043	0.000642	0.379	0.342	0.009459	0.001711
10	-1:47	2.64	3.27	4	0.512	0.078	0.047	0.000958	0.313	0.256	0.006605	0.001980
11	-1:42	2.83	3.46	4	0.527	0.078	0.044	0.000658	0.341	0.313	0.007149	0.001836
12	-1:37	3.01	3.64	3	0.522	0.076	0.045	0.000555	0.336	0.302	0.004990	0.001950
13	-1:32	3.18	3.81	3	0.478	0.078	0.046	0.000818	0.328	0.285	0.006773	0.001685
14	-1:27	3.34	3.97	3	0.431	0.075	0.046	0.000612	0.279	0.269	0.005323	0.002416
15	-1:22	3.53	4.16	3	0.379	0.078	0.045	0.000740	0.249	0.310	0.006016	0.002569
16	-1:17	3.71	4.34	2	0.362	0.077	0.044	0.000386	0.188	0.149	0.003202	0.000859
17	-1:12	3.89	4.52	2	0.350	0.095	0.056	0.001250	0.215	0.233	0.005686	0.002804
18	-1:07	4.06	4.69	2	0.373	0.097	0.061	0.000860	0.264	0.272	0.003702	0.003869
19	-1:02	4.18	4.81	2	0.313	0.080	0.046	0.001209	0.143	0.122	0.002324	0.001271
20	-0:57	4.27	4.90	1	0.256	0.093	0.049	0.001841	0.100	0.105	0.003021	0.001882
21	-0:52	4.39	5.02	1	0.161	0.074	0.039	0.001297	0.039	0.031	0.000822	0.000404
22	-0:47	4.53	5.16		0.128	0.060	0.036	0.000810	0.008	0.010	0.000158	0.000117
23	-0:42	4.64	5.27		0.109	0.050	0.034	0.000796	0.003	0.008	0.000092	0.000018
24	-0:37	4.73	5.36		0.080	0.049	0.033	0.000623	0.000	0.001	0.000010	0.000008
25	-0:32	4.81	5.44		0.066	0.042	0.026	-0.000064	0.000	0.000	0.000000	0.000000



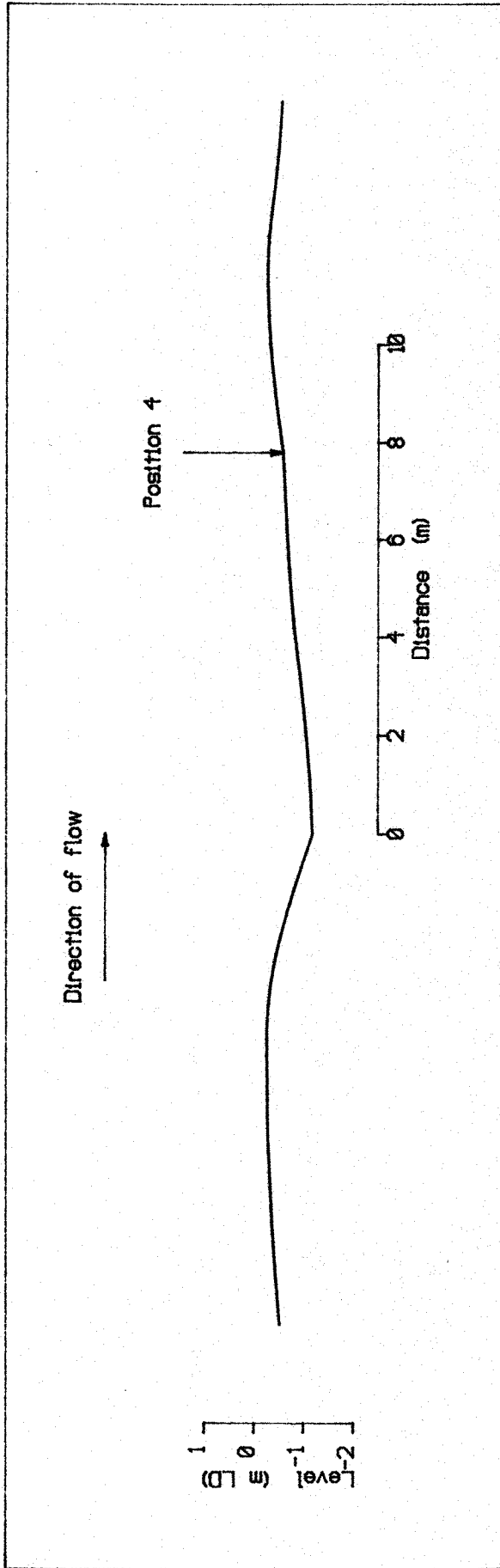




TABLE XIII Summary of 5 minute averaged measured values POSITION 4, z = 0.8 m

Cu=+3m      Ct=+7m      Cd=+19m      Cx=+13.8m  
 Lu=-0.24m LD      Lt=-1.18m LD      Ld=-0.26m LD      Lx=-0.58m LD

Block	Time (hh:mm)	WLevel (mLD)	Depth (m)	Band	$\bar{U}$ ( $m s^{-1}$ )	$\sigma_u$ ( $m s^{-1}$ )	$\sigma_w$ ( $m s^{-1}$ )	$\overline{-uw}$ ( $m^2 s^{-2}$ )	$\bar{C}$ ( $kg m^{-3}$ )	$\sigma_c$ ( $kg m^{-3}$ )	$\overline{-uc}$ ( $kg m^{-2} s^{-1}$ )	$\overline{wc}$ ( $kg m^{-2} s^{-1}$ )
1	-2:37	0.78	1.36	2	0.389	0.056	0.031	0.000344	0.094	0.031	-0.000011	0.000174
2	-2:32	0.94	1.52	3	0.474	0.073	0.039	0.000607	0.086	0.048	0.001442	0.000451
3	-2:27	1.08	1.66	3	0.531	0.093	0.049	0.001226	0.153	0.108	0.003251	0.001872
4	-2:22	1.28	1.86	4	0.694	0.094	0.048	0.001395	0.169	0.122	0.005051	0.002067
5	-2:17	1.42	2.00	4	0.718	0.071	0.042	0.000716	0.142	0.111	0.004132	0.001111
6	-2:12	1.61	2.19	3	0.716	0.070	0.042	0.000975	0.175	0.125	0.004965	0.001495
7	-2:07	1.78	2.36	3	0.679	0.083	0.045	0.001349	0.146	0.108	0.004905	0.001687
8	-2:02	1.99	2.57	3	0.638	0.085	0.043	0.001137	0.170	0.123	0.005594	0.001088
9	-1:57	2.15	2.73	3	0.668	0.084	0.043	0.000787	0.205	0.146	0.007592	0.001232
10	-1:52	2.29	2.87	3	0.678	0.076	0.043	0.000913	0.178	0.131	0.005782	0.002256
11	-1:47	2.48	3.06	3	0.674	0.075	0.040	0.000860	0.144	0.116	0.005119	0.001238
12	-1:42	2.69	3.27	3	0.682	0.069	0.037	0.000873	0.133	0.106	0.003591	0.001000
13	-1:37	2.79	3.37	3	0.714	0.064	0.035	0.000734	0.160	0.122	0.003996	0.001100
14	-1:32	2.89	3.47	3	0.685	0.068	0.034	0.000787	0.155	0.119	0.003768	0.001279
15	-1:27	3.08	3.66	3	0.684	0.070	0.036	0.000589	0.130	0.105	0.003988	0.000918
16	-1:22	3.23	3.81	3	0.666	0.061	0.037	0.000690	0.121	0.090	0.002802	0.000857
17	-1:17	3.36	3.92	3	0.601	0.070	0.035	0.000801	0.071	0.061	0.002378	0.000518
18	-1:12	3.49	4.07	3	0.581	0.071	0.045	0.000733	0.045	0.042	0.001409	0.000487
19	-1:07	3.59	4.17	3	0.559	0.072	0.043	0.000988	0.045	0.042	0.001630	0.000454
20	-1:02	3.69	4.27	3	0.509	0.059	0.038	0.000862	0.029	0.022	0.000547	0.000255
21	-0:57	3.84	4.42	2	0.509	0.067	0.037	0.000753	0.017	0.017	0.000552	0.000083
22	-0:52	3.99	4.57	2	0.471	0.061	0.033	0.000160	0.005	0.006	0.000161	0.000014
23	-0:47	4.19	4.77	2	0.426	0.054	0.033	0.000468	0.001	0.001	0.000025	0.000009
24	-0:42	4.33	4.91	2	0.362	0.053	0.030	0.000515	0.000	0.000	0.000003	0.000000
25	-0:37	4.38	4.96	1	0.336	0.057	0.034	0.000582	0.000	0.000	0.000002	0.000000
26	-0:32	4.44	5.02	1	0.283	0.058	0.031	0.000568	0.000	0.000	0.000000	0.000009
27	-0:27	4.49	5.07	1	0.236	0.044	0.030	0.000444	0.000	0.000	-0.000005	0.000001
28	-0:22	4.54	5.12	1	0.243	0.043	0.025	0.000232	0.000	0.000	-0.000001	0.000002

TABLE XIV Summary of 5 minute averaged measured values POSITION 4, z = 0.4 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2\text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )
1	-2:37	0.78	1.36	2	0.288	0.059	0.031	0.000589	0.043	0.019	0.000111	0.000022
2	-2:32	0.94	1.52	3	0.351	0.073	0.044	0.000326	0.090	0.049	0.000828	0.000456
3	-2:27	1.08	1.66	3	0.401	0.084	0.059	0.000570	0.178	0.113	0.001311	0.000113
4	-2:22	1.28	1.86	4	0.558	0.089	0.056	0.001372	0.225	0.135	0.002931	0.000790
5	-2:17	1.42	2.00	4	0.591	0.076	0.046	0.000918	0.201	0.134	0.005120	0.001287
6	-2:12	1.61	2.19	3	0.603	0.073	0.051	0.001325	0.222	0.148	0.004814	0.001644
7	-2:07	1.78	2.36	3	0.557	0.091	0.050	0.000880	0.201	0.128	0.006080	0.001857
8	-2:02	1.99	2.57	3	0.509	0.089	0.054	0.001534	0.207	0.129	0.004854	0.001225
9	-1:57	2.15	2.73	3	0.539	0.088	0.053	0.001631	0.255	0.163	0.007165	0.001406
10	-1:52	2.29	2.87	3	0.549	0.086	0.054	0.001306	0.238	0.168	0.007230	0.001935
11	-1:47	2.48	3.06	3	0.550	0.083	0.053	0.001207	0.202	0.137	0.005113	0.001304
12	-1:42	2.69	3.27	3	0.570	0.070	0.046	0.001018	0.192	0.142	0.004221	0.001942
13	-1:37	2.79	3.37	3	0.604	0.067	0.043	0.000890	0.218	0.140	0.004924	0.001604
14	-1:32	2.89	3.47	3	0.576	0.066	0.046	0.000799	0.200	0.131	0.004115	0.001537
15	-1:27	3.08	3.66	3	0.580	0.068	0.044	0.001202	0.188	0.126	0.004603	0.001812
16	-1:22	3.23	3.81	3	0.565	0.065	0.046	0.001029	0.160	0.111	0.004000	0.001515
17	-1:17	3.36	3.92	3	0.493	0.069	0.043	0.000927	0.117	0.093	0.003247	0.000908
18	-1:12	3.49	4.07	3	0.471	0.072	0.050	0.000938	0.067	0.059	0.001651	0.000764
19	-1:07	3.59	4.17	3	0.445	0.075	0.051	0.001250	0.060	0.052	0.001429	0.000829
20	-1:02	3.69	4.27	3	0.389	0.067	0.046	0.000809	0.036	0.027	0.000815	0.000380
21	-0:57	3.84	4.42	2	0.404	0.071	0.045	0.001448	0.024	0.024	0.000818	0.000357
22	-0:52	3.99	4.57	2	0.365	0.062	0.040	0.000757	0.006	0.009	0.000149	0.000098
23	-0:47	4.19	4.77	2	0.314	0.055	0.039	0.000666	0.002	0.003	0.000015	0.000009
24	-0:42	4.33	4.91	2	0.251	0.060	0.037	0.000525	0.000	0.002	0.000002	-0.000006
25	-0:37	4.38	4.96	1	0.226	0.055	0.038	0.000558	0.000	0.000	0.000008	0.000003
26	-0:32	4.44	5.02	1	0.179	0.045	0.039	0.000432	0.000	0.000	0.000000	0.000000
27	-0:27	4.49	5.07	1	0.139	0.034	0.036	0.000285	0.000	0.000	-0.000009	0.000002
28	-0:22	4.54	5.12	1	0.153	0.036	0.030	0.000257	0.000	0.000	-0.000001	0.000001

TABLE XV Summary of 5 minute averaged measured values POSITION 4, z = 0.2 m

Cu=+3m Cx=+13.8m  
 Lu=-0.24m LD Lt=-1.18m LD Ld=-0.26m LD Lx=-0.58m LD

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:37	0.78	1.36	2	0.375	0.055	0.034	0.000710	0.049	0.044	0.000437	0.000360
2	-2:32	0.94	1.52	3	0.429	0.069	0.040	0.001066	0.113	0.118	0.001613	0.000666
3	-2:27	1.08	1.66	3	0.483	0.083	0.046	0.000728	0.253	0.239	-0.001095	0.001513
4	-2:22	1.28	1.86	4	0.616	0.085	0.049	0.000777	0.398	0.399	0.001878	0.002074
5	-2:17	1.42	2.00	4	0.651	0.073	0.040	0.000941	0.357	0.336	0.008462	0.002688
6	-2:12	1.61	2.19	3	0.653	0.075	0.041	0.000872	0.428	0.409	0.011315	0.003120
7	-2:07	1.78	2.36	3	0.603	0.085	0.043	0.000704	0.370	0.329	0.007664	0.003022
8	-2:02	1.99	2.57	3	0.550	0.085	0.040	0.001282	0.359	0.318	0.009752	0.001774
9	-1:57	2.15	2.73	3	0.539	0.077	0.036	0.000769	0.482	0.415	0.007261	0.001549
10	-1:52	2.29	2.87	3	0.560	0.083	0.036	0.001031	0.434	0.432	0.008523	0.002621
11	-1:47	2.48	3.06	3	0.548	0.080	0.036	0.001015	0.398	0.382	0.011407	0.001960
12	-1:42	2.69	3.27	3	0.566	0.068	0.031	0.000653	0.433	0.488	0.010852	0.002388
13	-1:37	2.79	3.37	3	0.601	0.067	0.029	0.000538	0.474	0.454	0.012490	0.003418
14	-1:32	2.89	3.47	3	0.576	0.064	0.028	0.000532	0.464	0.462	0.010241	0.001492
15	-1:27	3.08	3.66	3	0.575	0.065	0.031	0.000620	0.436	0.489	0.012035	0.003127
16	-1:22	3.23	3.81	3	0.561	0.065	0.029	0.000504	0.318	0.299	0.007960	0.001831
17	-1:17	3.36	3.92	3	0.447	0.063	0.024	0.000477	0.244	0.266	0.006982	0.001243
18	-1:12	3.49	4.07	3	0.417	0.071	0.030	0.000401	0.149	0.183	0.004316	0.000841
19	-1:07	3.59	4.17	3	0.433	0.068	0.034	0.000748	0.124	0.175	0.001905	0.001348
20	-1:02	3.69	4.27	3	0.385	0.064	0.027	0.000629	0.074	0.091	0.001339	0.000449
21	-0:57	3.84	4.42	2	0.391	0.065	0.031	0.000722	0.050	0.077	0.001051	0.000443
22	-0:52	3.99	4.57	2	0.352	0.061	0.029	0.000428	0.028	0.084	0.000195	0.000943
23	-0:47	4.19	4.77	2	0.306	0.056	0.025	0.000346	0.008	0.020	0.000089	0.000028
24	-0:42	4.33	4.91	2	0.243	0.059	0.023	0.000586	0.004	0.012	0.000036	0.000068
25	-0:37	4.38	4.96	1	0.216	0.048	0.024	0.000208	0.001	0.005	0.000015	0.000015
26	-0:32	4.44	5.02	1	0.177	0.054	0.021	0.000105	0.000	0.000	0.000000	0.000000
27	-0:27	4.49	5.07	1	0.180	0.034	0.024	0.000313	0.000	0.000	0.000000	0.000002
28	-0:22	4.54	5.12	1	0.204	0.033	0.022	0.000223	0.000	0.000	0.000000	0.000000

TABLE XVI Summary of 5 minute averaged measured values POSITION 4, z = 0.1 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:37	0.78	1.36	2	0.267	0.055	0.025	0.000355	0.180	0.064	0.000198	0.000311
2	-2:32	0.94	1.52	3	0.314	0.070	0.029	0.000633	0.150	0.111	-0.000333	0.000414
3	-2:27	1.08	1.66	3	0.366	0.082	0.034	0.000313	0.212	0.151	-0.002312	0.000553
4	-2:22	1.28	1.86	4	0.469	0.080	0.033	0.000297	0.352	0.264	-0.001556	0.002025
5	-2:17	1.42	2.00	4	0.524	0.072	0.029	0.000519	0.333	0.250	0.004899	0.001379
6	-2:12	1.61	2.19	3	0.522	0.072	0.027	0.000312	0.390	0.306	0.005625	0.000292
7	-2:07	1.78	2.36	3	0.476	0.087	0.031	0.000439	0.392	0.304	0.000515	0.001644
8	-2:02	1.99	2.57	3	0.436	0.088	0.027	0.000430	0.327	0.258	0.002130	0.000504
9	-1:57	2.15	2.73	3	0.469	0.079	0.027	0.000359	0.444	0.313	0.000264	0.000140
10	-1:52	2.29	2.87	3	0.499	0.089	0.029	0.000416	0.383	0.328	-0.001976	0.000936
11	-1:47	2.48	3.06	3	0.493	0.086	0.030	0.000604	0.335	0.251	0.004578	0.000835
12	-1:42	2.69	3.27	3	0.493	0.068	0.025	0.000372	0.554	0.454	0.004350	0.002025
13	-1:37	2.79	3.37	3	0.536	0.069	0.023	0.000203	0.596	0.414	-0.000988	0.000653
14	-1:32	2.89	3.47	3	0.510	0.070	0.023	0.000187	0.571	0.360	-0.000095	0.000250
15	-1:27	3.08	3.66	3	0.506	0.068	0.022	0.000315	0.592	0.400	0.002040	0.000486
16	-1:22	3.23	3.81	3	0.491	0.071	0.024	0.000398	0.520	0.367	0.002891	0.000356
17	-1:17	3.36	3.92	3	0.418	0.070	0.022	0.000325	0.492	0.399	-0.002759	0.000522
18	-1:12	3.49	4.07	3	0.376	0.070	0.026	0.000370	0.347	0.302	-0.000579	0.000966
19	-1:07	3.59	4.17	3	0.395	0.071	0.028	0.000349	0.201	0.202	-0.000168	0.000840
20	-1:02	3.69	4.27	3	0.339	0.067	0.024	0.000235	0.158	0.157	-0.000492	0.000246
21	-0:57	3.84	4.42	2	0.345	0.076	0.024	0.000415	0.129	0.138	-0.001456	0.000326
22	-0:52	3.99	4.57	2	0.315	0.066	0.023	0.000203	0.065	0.142	0.000664	0.001483
23	-0:47	4.19	4.77	2	0.273	0.059	0.022	0.000258	0.032	0.055	-0.000276	0.000093
24	-0:42	4.33	4.91	2	0.217	0.062	0.020	0.000333	0.007	0.014	-0.000157	0.000007
25	-0:37	4.38	4.96	1	0.200	0.048	0.020	0.000234	0.003	0.008	-0.000057	0.000019
26	-0:32	4.44	5.02	1	0.156	0.044	0.019	0.000168	0.003	0.016	-0.000018	-0.000033
27	-0:27	4.49	5.07	1	0.124	0.034	0.017	0.000200	0.000	0.000	0.000000	0.000000
28	-0:22	4.54	5.12	1	0.137	0.037	0.016	0.000147	0.000	0.000	0.000000	0.000000

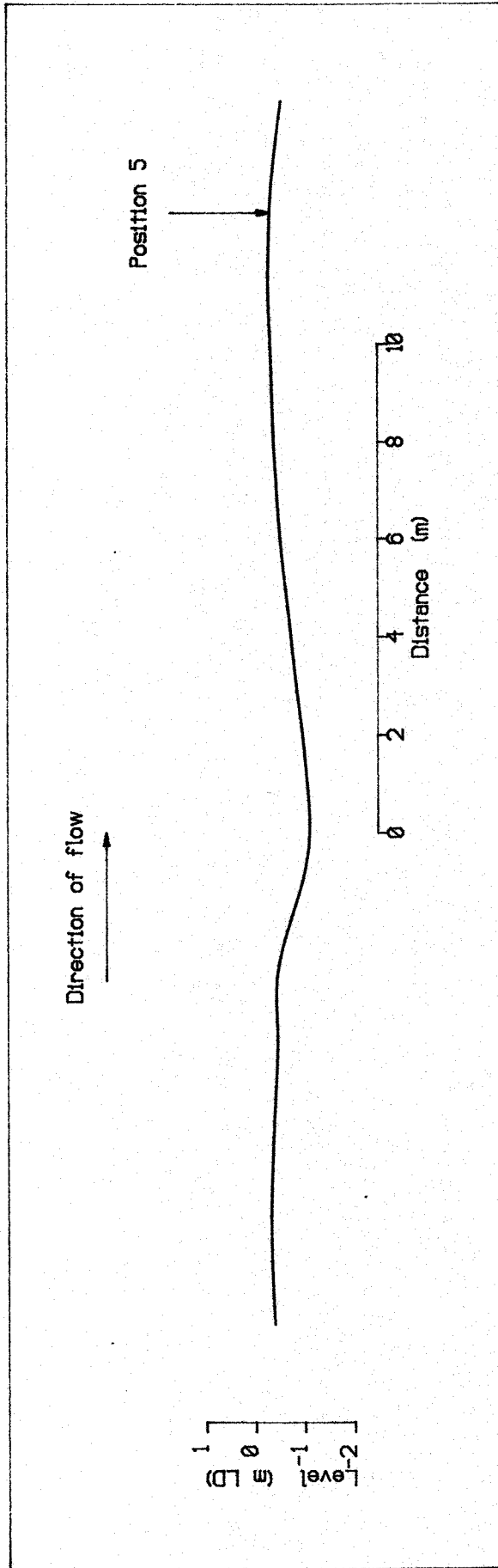




TABLE XVII Summary of 5 minute averaged measured values POSITION 5, z = 0.8 m

Cu=+3m      Ct=+6m      Cd=+17m      Cx=+18.7m  
 Lu=-0.38m LD    Lt=-1.16m LD    Ld=-0.28m LD    Lx=-0.32m LD

Block	Time (h:m:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:29	1.07	1.39	3	0.517	0.090	0.029	0.000189	0.043	0.034	0.000631	0.000123
2	-2:24	1.20	1.52	3	0.579	0.065	0.031	0.000606	0.071	0.053	0.001605	0.000538
3	-2:19	1.37	1.69	3	0.638	0.071	0.034	0.000714	0.124	0.106	0.004216	0.001251
4	-2:14	1.54	1.86	4	0.707	0.065	0.040	0.000952	0.162	0.121	0.003221	0.001665
5	-2:09	1.74	2.06	4	0.755	0.077	0.043	0.001125	0.214	0.157	0.005951	0.002165
6	-2:04	1.96	2.28	4	0.757	0.080	0.044	0.001725	0.307	0.205	0.009132	0.003367
7	-1:59	2.15	2.47	4	0.787	0.075	0.043	0.001376	0.371	0.246	0.009416	0.003998
8	-1:54	2.32	2.64	4	0.725	0.072	0.043	0.001328	0.279	0.185	0.006018	0.003594
9	-1:49	2.53	2.85	4	0.656	0.071	0.045	0.001342	0.208	0.142	0.004892	0.002567
10	-1:44	2.74	3.06	4	0.627	0.064	0.039	0.000987	0.179	0.129	0.003836	0.001929
11	-1:39	2.94	3.26	4	0.635	0.067	0.041	0.001181	0.185	0.136	0.004841	0.002446
12	-1:34	3.14	3.46	4	0.650	0.066	0.044	0.001225	0.213	0.144	0.004394	0.002310
13	-1:29	3.35	3.67	4	0.634	0.063	0.039	0.000966	0.254	0.165	0.004481	0.002475
14	-1:24	3.48	3.80	3	0.550	0.061	0.039	0.001016	0.140	0.097	0.002957	0.001499
15	-1:19	3.64	3.96	3	0.498	0.064	0.033	0.000910	0.067	0.054	0.001945	0.000774
16	-1:14	3.83	4.15		0.495	0.057	0.028	0.000556	0.019	0.019	0.000542	0.000236
17	-1:09	3.96	4.28		0.456	0.060	0.034	0.000855	0.043	0.035	0.000995	0.000463
18	-1:04	4.10	4.42		0.493	0.069	0.044	0.001563	0.103	0.078	0.002898	0.001652
19	-0:59	4.23	4.55		0.485	0.059	0.034	0.000815	0.047	0.037	0.001032	0.000447
20	-0:54	4.35	4.67		0.449	0.075	0.032	0.000716	0.013	0.014	0.000541	0.000171
21	-0:49	4.51	4.83		0.242	0.054	0.034	0.000690	0.008	0.005	0.000098	0.000066
22	-0:44	4.64	4.96		0.198	0.052	0.029	0.000601	0.000	0.000	0.000011	0.000006
23	-0:39	4.75	5.07		0.126	0.037	0.022	0.000268	0.001	0.000	0.000004	0.000001
24	-0:34	4.86	5.18		0.090	0.038	0.025	0.000297	0.000	0.000	0.000001	0.000000
25	-0:29	4.95	5.27		0.038	0.028	0.017	0.000179	0.000	0.000	0.000000	0.000000
26	-0:24	5.01	5.33		0.036	0.028	0.015	0.000100	0.006	0.039	0.000141	-0.000012

TABLE XVIII Summary of 5 minute averaged measured values POSITION 5, z = 0.4 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:29	1.07	1.39	3	0.430	0.083	0.027	0.000404	0.504	0.015	0.000052	-0.000014
2	-2:24	1.20	1.52	3	0.509	0.069	0.031	0.000403	0.506	0.013	-0.000012	0.000015
3	-2:19	1.37	1.69	3	0.585	0.075	0.034	0.000613	0.506	0.013	-0.000009	0.000010
4	-2:14	1.54	1.86	4	0.650	0.070	0.038	0.000641	0.505	0.015	-0.000025	-0.000006
5	-2:09	1.74	2.06	4	0.702	0.080	0.041	0.001082	0.505	0.016	-0.000058	-0.000011
6	-2:04	1.96	2.28	4	0.706	0.073	0.037	0.000532	0.506	0.014	-0.000007	-0.000002
7	-1:59	2.15	2.47	4	0.742	0.076	0.038	0.000630	0.507	0.012	0.000002	-0.000005
8	-1:54	2.32	2.64	4	0.687	0.072	0.037	0.000772	0.506	0.014	-0.000010	-0.000017
9	-1:49	2.53	2.85	4	0.622	0.068	0.039	0.000635	0.505	0.016	-0.000014	0.000016
10	-1:44	2.74	3.06	4	0.594	0.063	0.037	0.000412	0.506	0.015	0.000004	-0.000011
11	-1:39	2.94	3.26	4	0.599	0.070	0.035	0.000540	0.488	0.073	0.001779	0.000380
12	-1:34	3.14	3.46	4	0.618	0.068	0.037	0.000402	0.421	0.254	0.007200	0.002152
13	-1:29	3.35	3.67	4	0.606	0.067	0.033	0.000525	0.469	0.269	0.008458	0.001892
14	-1:24	3.48	3.80	3	0.525	0.063	0.031	0.000446	0.265	0.153	0.003666	0.001170
15	-1:19	3.64	3.96	3	0.458	0.068	0.031	0.000663	0.159	0.113	0.004848	0.001041
16	-1:14	3.83	4.15		0.462	0.068	0.030	0.000382	0.058	0.059	0.001966	0.000445
17	-1:09	3.96	4.28		0.431	0.070	0.033	0.000557	0.109	0.091	0.003416	0.001023
18	-1:04	4.10	4.42		0.451	0.072	0.036	0.000841	0.222	0.148	0.005146	0.001770
19	-0:59	4.23	4.55		0.449	0.069	0.032	0.000410	0.122	0.091	0.002771	0.000752
20	-0:54	4.35	4.67		0.424	0.076	0.032	0.000682	0.044	0.053	0.001763	0.000784
21	-0:49	4.51	4.83		0.226	0.056	0.030	0.000481	0.015	0.010	0.000235	0.000129
22	-0:44	4.64	4.96		0.193	0.049	0.025	0.000340	0.002	0.001	0.000009	0.000005
23	-0:39	4.75	5.07		0.118	0.037	0.019	0.000192	0.001	0.000	0.000005	0.000000
24	-0:34	4.86	5.18		0.077	0.041	0.022	0.000151	0.000	0.000	0.000003	0.000000
25	-0:29	4.95	5.27		0.029	0.026	0.016	0.000220	0.000	0.000	0.000000	0.000000
26	-0:24	5.01	5.33		0.032	0.033	0.014	0.000173	0.000	0.000	-0.000005	0.000002

TABLE XIX Summary of 5 minute averaged measured values POSITION 5, z = 0.2 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $m s^{-1}$ )	$\sigma_u$ ( $m s^{-1}$ )	$\sigma_w$ ( $m s^{-1}$ )	$\overline{-uw}$ ( $m^2 s^{-2}$ )	$\bar{C}$ ( $kg m^{-3}$ )	$\sigma_c$ ( $kg m^{-3}$ )	$\overline{-uc}$ ( $kg m^{-2} s^{-1}$ )	$\overline{wc}$ ( $kg m^{-2} s^{-1}$ )
1	-2:29	1.07	1.39	3	0.462	0.082	0.032	0.000577	0.291	0.270	-0.004691	0.000932
2	-2:24	1.20	1.52	3	0.529	0.081	0.029	0.000544	0.391	0.280	0.003147	0.001422
3	-2:19	1.37	1.69	3	0.592	0.077	0.032	0.000557	0.564	0.469	0.012163	0.002684
4	-2:14	1.54	1.86	4	0.670	0.069	0.036	0.000602	0.561	0.438	0.008400	0.002647
5	-2:09	1.74	2.06	4	0.719	0.073	0.040	0.000499	0.595	0.451	0.011412	0.002317
6	-2:04	1.96	2.28	4	0.722	0.076	0.036	0.000394	0.677	0.500	0.011257	0.001180
7	-1:59	2.15	2.47	4	0.769	0.074	0.035	0.000322	0.714	0.558	0.010952	0.000264
8	-1:54	2.32	2.64	4	0.707	0.067	0.033	0.000339	0.606	0.449	0.008764	0.002420
9	-1:49	2.53	2.85	4	0.647	0.066	0.034	0.000324	0.492	0.376	0.006930	0.001828
10	-1:44	2.74	3.06	4	0.619	0.069	0.033	0.000081	0.452	0.348	0.007006	0.001516
11	-1:39	2.94	3.26	4	0.630	0.067	0.032	0.000219	0.474	0.378	0.006882	0.001213
12	-1:34	3.14	3.46	4	0.664	0.064	0.036	0.000091	0.467	0.377	0.007326	0.001720
13	-1:29	3.35	3.67	4	0.640	0.067	0.030	0.000322	0.511	0.375	0.007683	0.001026
14	-1:24	3.48	3.80	3	0.547	0.059	0.032	0.000255	0.321	0.249	0.003479	0.000375
15	-1:19	3.64	3.96	3	0.493	0.069	0.028	0.000485	0.198	0.181	0.005945	0.000862
16	-1:14	3.83	4.15		0.467	0.071	0.035	0.000446	0.119	0.158	0.004127	0.000494
17	-1:09	3.96	4.28		0.419	0.062	0.029	0.000354	0.150	0.157	0.002615	0.000973
18	-1:04	4.10	4.42		0.391	0.057	0.028	0.000390	0.312	0.284	0.004429	0.001407
19	-0:59	4.23	4.55		0.341	0.056	0.024	-0.000167	0.198	0.215	0.004024	-0.000150
20	-0:54	4.35	4.67		0.296	0.059	0.019	-0.000005	0.102	0.161	0.002942	0.000185
21	-0:49	4.51	4.83		0.156	0.047	0.019	-0.000046	0.010	0.015	0.000142	0.000048
22	-0:44	4.64	4.96		0.126	0.051	0.018	-0.000095	0.002	0.002	0.000006	0.000000
23	-0:39	4.75	5.07		0.086	0.057	0.014	-0.000358	0.002	0.001	0.000003	0.000000
24	-0:34	4.86	5.18		0.050	0.057	0.021	-0.000295	0.000	0.000	0.000004	0.000001
25	-0:29	4.95	5.27		0.023	0.048	0.015	0.000003	0.000	0.000	0.000000	0.000000
26	-0:24	5.01	5.33		0.027	0.037	0.018	0.000022	0.000	0.000	0.000000	0.000005

TABLE XX Summary of 5 minute average measured values POSITION 5, z = 0.1 m

Block	Time (hh:mm)	W Level (m LD)	Depth (m)	Band	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
1	-2:29	1.07	1.39	3	0.398	0.080	0.021	0.000357	0.580	0.402	-0.014652	0.000345
2	-2:24	1.20	1.52	3	0.466	0.083	0.021	0.000338	0.703	0.420	-0.007731	0.000419
3	-2:19	1.37	1.69	3	0.539	0.077	0.021	0.000289	0.763	0.494	0.006816	0.001016
4	-2:14	1.54	1.86	4	0.629	0.073	0.024	0.000345	0.608	0.383	0.004420	0.000715
5	-2:09	1.74	2.06	4	0.671	0.073	0.026	0.000344	0.544	0.332	0.004653	0.001126
6	-2:04	1.96	2.28	4	0.677	0.080	0.023	0.000199	0.555	0.326	0.004705	-0.000103
7	-1:59	2.15	2.47	4	0.732	0.077	0.023	0.000194	0.594	0.384	0.006405	-0.000222
8	-1:54	2.32	2.64	4	0.686	0.070	0.024	0.000127	0.529	0.334	0.004164	0.000242
9	-1:49	2.53	2.85	4	0.624	0.067	0.024	0.000216	0.470	0.326	0.004219	0.000261
10	-1:44	2.74	3.06	4	0.587	0.072	0.023	0.000200	0.441	0.280	0.006030	0.000524
11	-1:39	2.94	3.26	4	0.595	0.068	0.023	0.000207	0.461	0.320	0.002558	-0.000609
12	-1:34	3.14	3.46	4	0.627	0.068	0.023	0.000197	0.430	0.298	0.004914	0.000030
13	-1:29	3.35	3.67	4	0.603	0.069	0.022	0.000163	0.401	0.252	0.004499	-0.000301
14	-1:24	3.48	3.80	3	0.505	0.065	0.021	0.000186	0.316	0.208	0.001918	0.000145
15	-1:19	3.64	3.96	3	0.411	0.072	0.020	0.000407	0.208	0.156	0.005240	0.000411
16	-1:14	3.83	4.15		0.335	0.059	0.021	0.000665	0.191	0.181	0.001946	0.000205
17	-1:09	3.96	4.28		0.307	0.056	0.020	0.000577	0.225	0.180	0.001014	0.000383
18	-1:04	4.10	4.42		0.316	0.060	0.021	0.000542	0.342	0.244	0.001254	0.000767
19	-0:59	4.23	4.55		0.309	0.060	0.021	0.000447	0.250	0.202	0.001456	0.000338
20	-0:54	4.35	4.67		0.321	0.065	0.020	0.000454	0.155	0.176	0.000283	0.000015
21	-0:49	4.51	4.83		0.191	0.047	0.018	0.000177	0.013	0.014	0.000061	0.000049
22	-0:44	4.64	4.96		0.157	0.047	0.018	0.000258	0.002	0.001	-0.000006	0.000002
23	-0:39	4.75	5.07		0.100	0.033	0.013	0.000102	0.001	0.000	0.000001	0.000000
24	-0:34	4.86	5.18		0.055	0.032	0.014	0.000199	0.000	0.000	0.000001	0.000000
25	-0:29	4.95	5.27		0.024	0.023	0.011	0.000137	0.000	0.000	0.000000	0.000000
26	-0:24	5.01	5.33		0.018	0.024	0.014	0.000313	0.000	0.000	-0.000007	0.000004

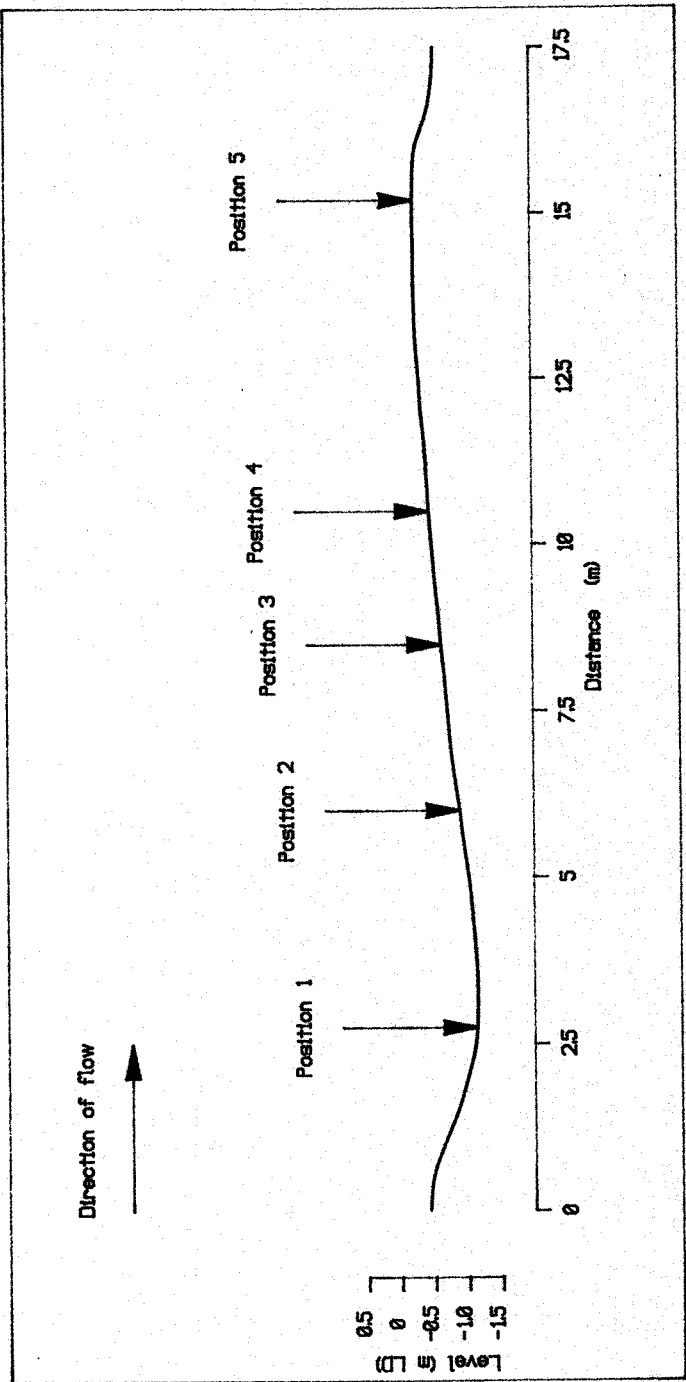




TABLE XXIA Summary of banded-averaged measured data, POSITION 1 NOT ROTATED

Height (m)	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2\text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )
Band 1 Water depth:								
0.8	0.083	0.045	0.027	0.000640	0	0	0	0
0.4	0.045	0.037	0.045	0.000940	0.020	0.028	0.000140	0.005425
0.2	0.015	0.043	0.027	0.000220	0.002	0.001	-0.000011	0
0.1	0.010	0.020	0.018	0.000150	0	0	0	0
Band 2 Water depth: 5.62 m								
0.8	0.297	0.077	0.054	0.001750	0.036	0.034	0.000580	0.000256
0.4	0.110	0.071	0.051	0.002450	0.196	0.115	-0.001655	-0.000410
0.2	0.034	0.064	0.045	0.000670	0.228	0.148	-0.003111	-0.001030
0.1	0.019	0.040	0.037	0.000500	0.117	0.072	-0.000974	-0.000530
Band 3 Water depth: accelerating 1.90 m, decelerating 5.05 m								
0.8	0.411	0.085	0.051	0.001060	0.163	0.129	0.005250	0.001602
0.4	0.207	0.099	0.061	0.004040	0.680	0.306	-0.001178	0.000915
0.2	0.103	0.086	0.059	0.002180	0.886	0.423	-0.006024	-0.002150
0.1	0.068	0.059	0.050	0.001180	0.484	0.203	-0.002998	-0.000850
Band 4 Water depth: 3.41 m								
0.8	0.628	0.069	0.051	0.000590	0.319	0.198	0.006580	0.001771
0.4	0.467	0.119	0.057	0.003160	0.975	0.467	0.015230	0.005386
0.2	0.296	0.124	0.075	0.004060	1.674	0.948	-0.004845	-0.000300
0.1	0.210	0.099	0.067	0.002750	1.020	0.490	-0.007330	-0.003090

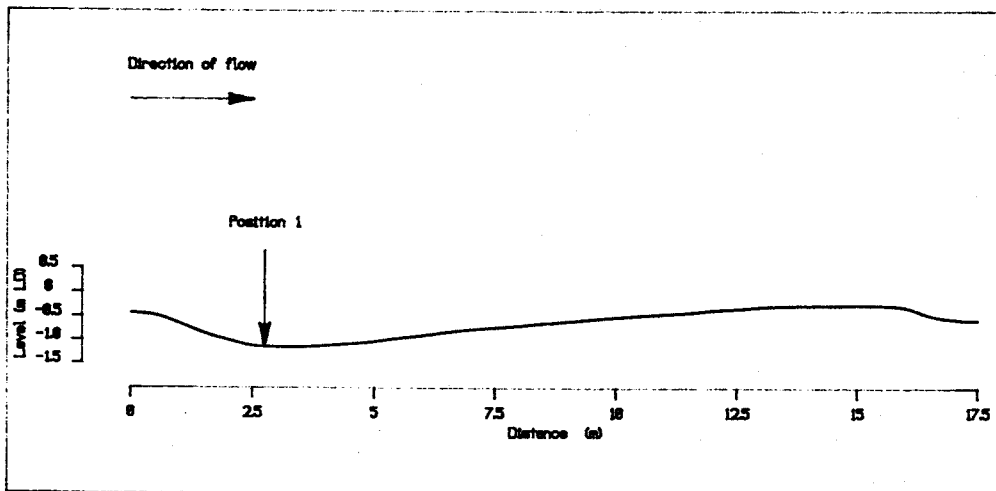


TABLE XXIB Summary of banded-averaged measured data, POSITION 1 ROTATED

Height (m)	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2\text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )
Band 1 Water depth:								
0.8	0.098	0.037	0.027	-0.000450	0	0	0.000003	-0.000002
0.4	0.050	0.038	0.017	-0.000040	0.020	0.028	0.000200	0.000002
0.2	0.020	0.037	0.032	-0.000559	0.002	0.001	-0.000010	0.000004
0.1	0.014	0.021	0.015	-0.000069	0	0	-0.000001	0
Band 2 Water depth: 5.62 m								
0.8	0.340	0.081	0.047	-0.000524	0.036	0.034	0.000639	-0.000063
0.4	0.126	0.079	0.037	0.000067	0.196	0.115	-0.001651	0.000430
0.2	0.042	0.062	0.047	-0.000831	0.228	0.148	-0.003167	0.000849
0.1	0.027	0.044	0.033	-0.000186	0.117	0.072	-0.001060	0.000341
Band 3 Water depth: accelerating 1.90 m, decelerating 5.05 m								
0.8	0.795	0.072	0.070	-0.002416	0.163	0.129	0.004285	-0.003084
0.4	0.228	0.108	0.046	-0.000151	0.680	0.306	-0.006440	0.001624
0.2	0.112	0.090	0.052	-0.000055	0.886	0.423	-0.006380	0.000767
0.1	0.080	0.065	0.042	-0.000019	0.484	0.203	-0.002979	0.000919
Band 4 Water depth: 3.41 m								
0.8	0.751	0.075	0.048	0.000179	0.319	0.198	0.006625	-0.001423
0.4	0.494	0.121	0.052	-0.001112	0.975	0.467	0.016129	0.000033
0.2	0.311	0.129	0.066	0.000507	1.674	0.948	-0.004339	0.002234
0.1	0.228	0.105	0.058	-0.000005	1.020	0.490	-0.007936	-0.000043

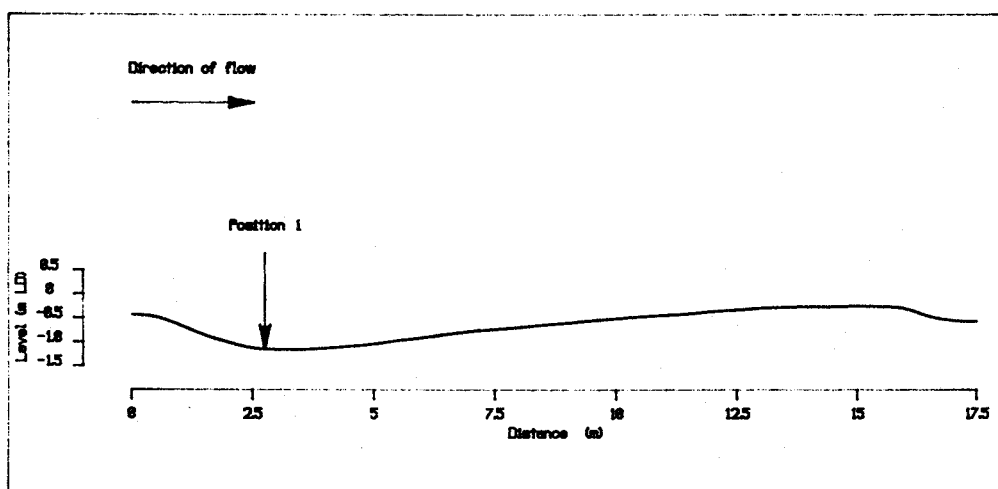


TABLE XXII Summary of banded-averaged measured data, POSITION 2

Height (m)	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-u'w'}$ ( $\text{m}^2 \text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-u'c'}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )	$\overline{w'c'}$ ( $\text{kgm}^{-2} \text{s}^{-1}$ )
Band 1								
0.8								
0.4								
0.2								
0.1								
Band 2								
0.8								
0.4								
0.2								
0.1								
Band 3 Water depth: accelerating 1.73 m								
0.8	0.455	0.065	0.036	0.001220	0.115	0.087	-0.003060	0.001284
0.4	0.302	0.088	0.045	0.001920	0.115	0.058	0.002490	0.000965
0.2	0.317	0.083	0.056	0.001180	0.104	0.070	0.001850	-0.000310
0.1	0.266	0.065	0.038	0.000910	0.268	0.134	0.001380	0.000289
Band 4 Water depth: 3.00 m								
0.8	0.721	0.068	0.040	0.001400	0.235	0.208	0.006590	0.003042
0.4	0.631	0.092	0.045	0.001500	0.307	0.224	0.009200	0.001480
0.2	0.647	0.095	0.060	0.001080	0.406	0.414	0.013980	-0.000420
0.1	0.594	0.086	0.044	0.000900	0.507	0.399	0.011540	0.001077

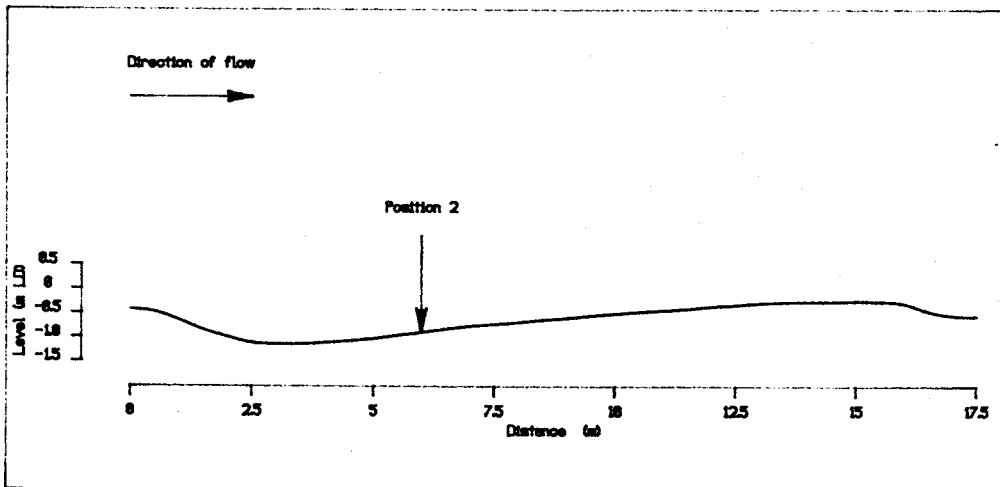


TABLE XXIII Summary of banded-averaged measured data, POSITION 3

Height (m)	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2\text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )
Band 1 Water depth: 4.96 m								
0.8	0.303	0.091	0.050	0.002370	0.033	0.033	0.002060	0.001017
0.4	0.247	0.083	0.049	0.001790	0.079	0.062	0.000990	0.000276
0.2	0.209	0.084	0.044	0.001560	0.070	0.068	0.001920	0.001143
0.1	0.234	0.077	0.038	0.000720	0.097	0.116	0.001400	0.001017
Band 2 Water depth: 4.59 m								
0.8	0.427	0.083	0.049	0.002050	0.080	0.070	0.003160	0.001537
0.4	0.350	0.088	0.052	0.001590	0.140	0.100	0.003370	0.001735
0.2	0.350	0.087	0.052	0.000920	0.203	0.194	0.003720	0.002200
0.1	0.348	0.081	0.042	0.000750	0.267	0.258	0.003200	0.001424
Band 3 Water depth: accelerating 1.87 m, decelerating 3.90 m								
0.8	0.466	0.073	0.045	0.001480	0.124	0.094	-0.003150	0.001360
0.4	0.407	0.078	0.045	0.000950	0.205	0.125	0.004070	0.001682
0.2	0.395	0.079	0.046	0.000820	0.307	0.271	0.005130	0.002509
0.1	0.390	0.076	0.035	0.000670	0.525	0.379	0.004450	0.001499
Band 4 Water depth: 2.91 m								
0.8	0.612	0.079	0.046	0.001650	0.220	0.163	0.005910	0.002539
0.4	0.547	0.081	0.044	0.001140	0.327	0.191	0.006880	0.001856
0.2	0.541	0.083	0.047	0.000900	0.441	0.341	0.008640	0.001952
0.1	0.541	0.079	0.036	0.000710	0.507	0.343	0.007580	0.001358

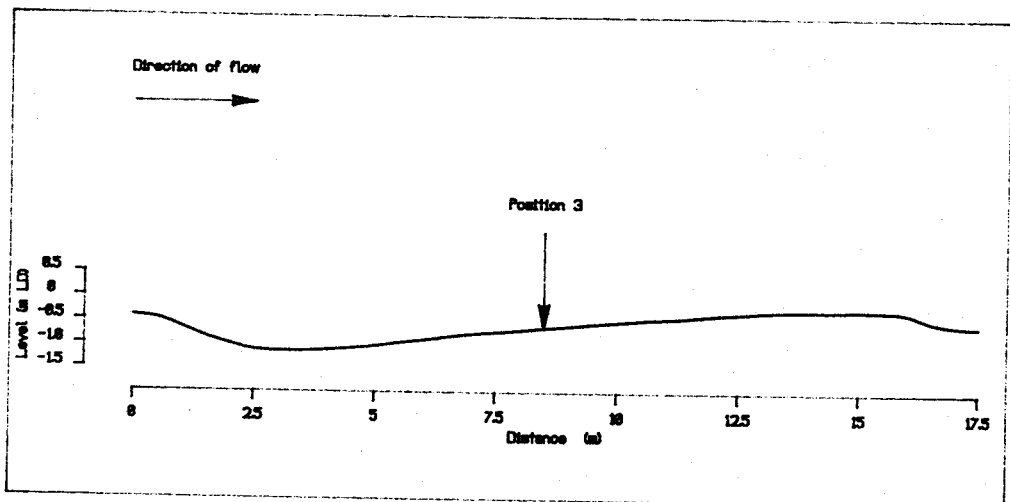


TABLE XXIV Summary of banded-averaged measured data, POSITION 4

Height (m)	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$-\overline{uw}$ ( $\text{m}^2\text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$-\overline{uc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )
Band 1 Water depth: 5.04 m								
0.8	0.275	0.051	0.030	0.000450	0	0	0	0
0.4	0.174	0.043	0.036	0.000380	0	0	0	0
0.2	0.194	0.042	0.023	0.000210	0	0	0	0
0.1	0.154	0.041	0.018	0.000180	0.002	0.006	-0.000018	0
Band 2 Water depth: accelerating 1.36 m, decelerating 4.67 m								
0.8	0.431	0.058	0.033	0.000440	0.006	0.006	0.000180	0.000026
0.4	0.324	0.061	0.038	0.000790	0.015	0.011	0.000210	0.000096
0.2	0.333	0.059	0.028	0.000550	0.028	0.047	0.000360	0.000368
0.1	0.283	0.064	0.023	0.000310	0.058	0.087	-0.000306	0.000477
Band 3 Water depth: accelerating 1.59 m, decelerating 3.32 m								
0.8	0.632	0.073	0.040	0.000870	0.126	0.095	0.003690	0.001069
0.4	0.515	0.076	0.049	0.001030	0.167	0.113	0.003900	0.001248
0.2	0.525	0.072	0.034	0.000730	0.327	0.326	0.007320	0.001903
0.1	0.449	0.075	0.027	0.000360	0.392	0.299	0.000740	0.000686
Band 4 Water depth: 1.93 m								
0.8	0.706	0.083	0.045	0.001050	0.156	0.117	0.004590	0.001589
0.4	0.575	0.083	0.051	0.001140	0.213	0.135	0.004020	0.001038
0.2	0.634	0.079	0.045	0.000850	0.378	0.368	0.005170	0.002381
0.1	0.497	0.076	0.031	0.000400	0.343	0.257	0.001670	0.001702

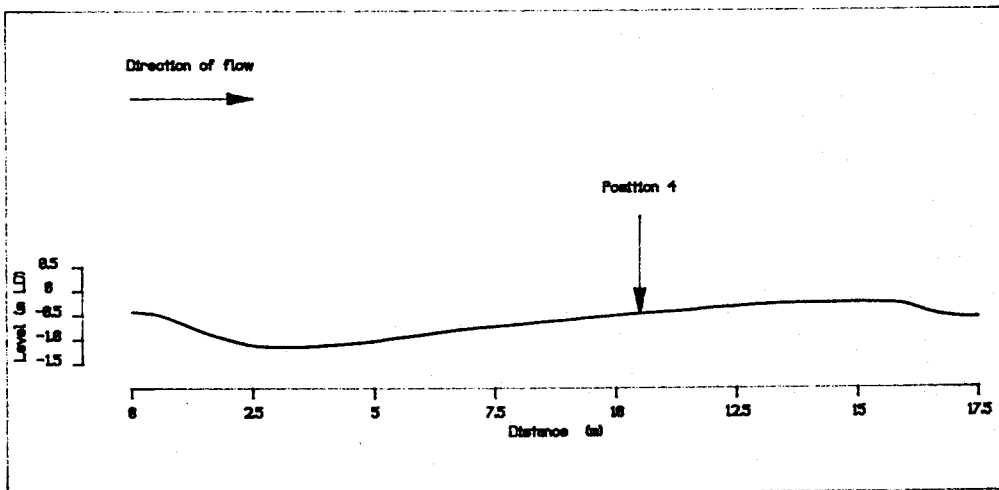


TABLE XXV Summary of banded-averaged measured data, POSITION 5

Height (m)	$\bar{U}$ ( $\text{ms}^{-1}$ )	$\sigma_u$ ( $\text{ms}^{-1}$ )	$\sigma_w$ ( $\text{ms}^{-1}$ )	$\overline{-uw}$ ( $\text{m}^2\text{s}^{-2}$ )	$\bar{C}$ ( $\text{kgm}^{-3}$ )	$\sigma_c$ ( $\text{kgm}^{-3}$ )	$\overline{-uc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )	$\overline{wc}$ ( $\text{kgm}^{-2}\text{s}^{-1}$ )
Band 1								
0.8								
0.4								
0.2								
0.1								
Band 2								
0.8								
0.4								
0.2								
0.1								
Band 3								
	Water depth: accelerating 1.53 m, decelerating 3.88 m							
0.8	0.556	0.070	0.033	0.000680	0.089	0.069	0.002270	0.000837
0.4	0.501	0.072	0.031	0.000500	0.212	0.133	0.004250	0.001105
0.2	0.525	0.074	0.031	0.000480	0.353	0.290	0.004000	0.001255
0.1	0.464	0.075	0.021	0.000310	0.514	0.336	-0.001681	0.000467
Band 4								
	Water depth: 2.76 m							
0.8	0.693	0.070	0.042	0.001220	0.237	0.163	0.005610	0.002651
0.4	0.653	0.071	0.037	0.000610	0.469	0.269	0.008450	0.001892
0.2	0.679	0.069	0.035	0.000310	0.555	0.425	0.008660	0.001613
0.1	0.643	0.072	0.024	0.000210	0.503	0.324	0.004650	0.000166

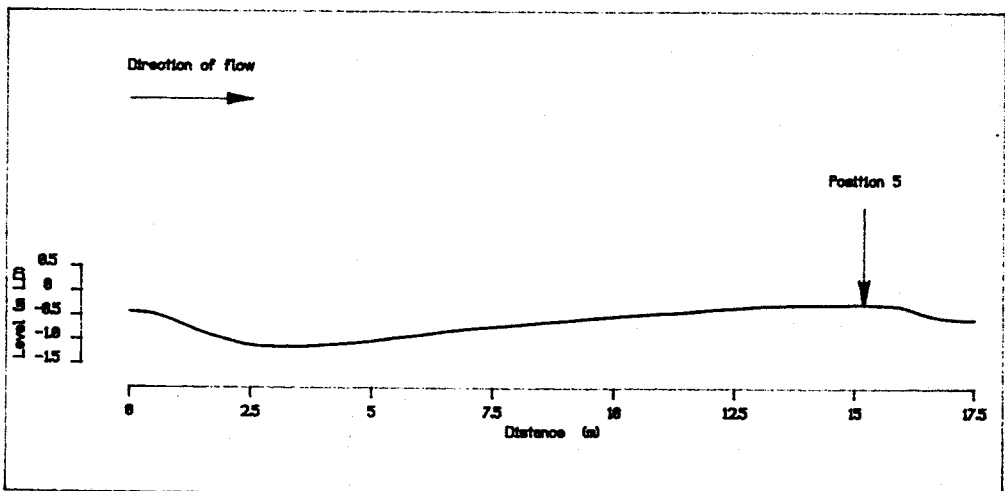


TABLE XXVI Ground survey data covering measurement period and "average" sandwave

27/8/88 Prior to Pos 2		28/8/88 After Pos 2 Prior to Pos 1		29/8/88 After Pos 1 Prior to Pos 5		30/8/88 After Pos 5 Prior to Pos 3		31/8/88 After Pos 3 Prior to Pos 4		1/9/88 After Pos 4		"Average" sandwave	
Chainage (m)	Bed level (m LD)	Chainage (m)	Bed level (m LD)	Chainage (m)	Bed level (m LD)	Chainage (m)	Bed level (m LD)	Chainage (m)	Bed level (m LD)	Chainage (m)	Bed level (m LD)	Chainage (m)	Bed level (m LD)
-15	-0.77	-15	-0.66	-15	-0.40	-15	-0.53	-15	-0.71	-15	-0.77		
-14	-0.75	-14	-0.79	-14	-0.47	-14	-0.41	-14	-0.61	-14	-0.75		
-13	-0.72	-13	-0.79	-13	-0.73	-13	-0.44	-13	-0.50	-13	-0.67		
-12	-0.68	-12	-0.74	-12	-0.81	-12	-0.71	-12	-0.46	-12	-0.57		
-11	-0.62	-11	-0.70	-11	-0.77	-11	-0.82	-11	-0.59	-11	-0.51		
-10	-0.52	-10	-0.66	-10	-0.74	-10	-0.78	-10	-0.87	-10	-0.66		
-9	-0.47	-9	-0.62	-9	-0.67	-9	-0.77	-9	-0.93	-9	-0.96		
-8	-0.39	-8	-0.55	-8	-0.65	-8	-0.82	-8	-0.97	-8	-1.04		
-7	-0.30	-7	-0.41	-7	-0.60	-7	-0.78	-7	-0.93	-7	-1.05		
-6	-0.27	-6	-0.40	-6	-0.54	-6	-0.70	-6	-0.83	-6	-0.97		
-5	-0.30	-5	-0.33	-5	-0.46	-5	-0.60	-5	-0.71	-5	-0.85	-5	-0.31
-4	-0.38	-4	-0.29	-4	-0.38	-4	-0.49	-4	-0.61	-4	-0.75	-4	-0.30
-3	-0.45	-3	-0.28	-3	-0.33	-3	-0.38	-3	-0.52	-3	-0.63	-3	-0.32
-2	-0.52	-2	-0.34	-2	-0.30	-2	-0.35	-2	-0.43	-2	-0.54	-2	-0.35
-1	-0.53	-1	-0.42	-1	-0.33	-1	-0.32	-1	-0.36	-1	-0.44	-1	-0.37
0	-0.46	0	-0.49	0	-0.37	0	-0.26	0	-0.32	0	-0.37	0	-0.42
1	-0.37	1	-0.48	1	-0.43	1	-0.25	1	-0.27	1	-0.30	1	-0.64
2	-0.59	2	-0.56	2	-0.47	2	-0.34	2	-0.28	2	-0.28	2	-0.99
3	-1.00	3	-0.63	3	-0.38	3	-0.51	3	-0.24	3	-0.24	3	-1.14
4	-0.96	4	-1.02	4	-0.64	4	-0.53	4	-0.33	4	-0.23	4	-1.11
5	-0.94	5	-1.15	5	-0.99	5	-0.63	5	-0.54	5	-0.35	5	-1.02
6	-0.92	6	-1.12	6	-1.16	6	-1.05	6	-0.84	6	-0.66	6	-0.89
7	-0.82	7	-1.02	7	-1.07	7	-1.30	7	-1.18	7	-1.05	7	-0.76
8	-0.67	8	-0.87	8	-0.99	8	-1.15	8	-1.15	8	-1.07	8	-0.68
9	-0.64	9	-0.77	9	-0.85	9	-0.99	9	-1.05	9	-1.08	9	-0.59
10	-0.61	10	-0.63	10	-0.75	10	-0.85	10	-0.96	10	-1.07	10	-0.50
11	-0.51	11	-0.50	11	-0.64	11	-0.73	11	-0.82	11	-0.99	11	-0.43
12	-0.41	12	-0.40	12	-0.52	12	-0.65	12	-0.74	12	-0.87	12	-0.35
13	-0.35	13	-0.35	13	-0.46	13	-0.56	13	-0.67	13	-0.75	13	-0.28
14	-0.22	14	-0.33	14	-0.39	14	-0.48	14	-0.62	14	-0.67	14	-0.25
15	-0.17	15	-0.28	15	-0.36	15	-0.41	15	-0.55	15	-0.60	15	-0.24
16	-0.22	16	-0.22	16	-0.33	16	-0.36	16	-0.42	16	-0.57	16	-0.29
17	-0.35	17	-0.19	17	-0.28	17	-0.38	17	-0.32	17	-0.48	17	-0.54
18	-0.53	18	-0.25	18	-0.30	18	-0.36	18	-0.27	18	-0.37	18	-0.57
19	-0.52	19	-0.55	19	-0.33	19	-0.41	19	-0.26	19	-0.34	19	-0.54
20	-0.48	20	-0.60	20	-0.42	20	-0.49	20	-0.37	20	-0.27	20	-0.50
21	-0.45	21	-0.55	21	-0.55	21	-0.52	21	-0.50	21	-0.30		
22	-0.40	22	-0.46	22	-0.53	22	-0.54	22	-0.55	22	-0.59		
23	-0.36	23	-0.52	23	-0.53	23	-0.55	23	-0.54	23	-0.63		
24	-0.36	24	-0.38	24	-0.52	24	-0.47	24	-0.56	24	-0.61		
25	-0.40	25	-0.39	25	-0.52	25	-0.45	25	-0.51	25	-0.54		
26	-0.59	26	-0.41	26	-0.45	26	-0.44	26	-0.45	26	-0.51		
27	-0.78	27	-0.53	27	-0.38	27	-0.44	27	-0.42	27	-0.46		
28	-0.80	28	-0.74	28	-0.39	28	-0.42	28	-0.38	28	-0.42		
29	-0.76	29	-0.74	29	-0.62	29	-0.54	29	-0.42	29	-0.41		
30	-0.75	30	-0.75	30	-0.72	30	-0.58	30	-0.48	30	-0.41		
31	-0.67	31	-0.73	31	-0.72	31	-0.61	31	-0.51	31	-0.42		
32	-0.58	32	-0.68	32	-0.70	32	-0.74	32	-0.64	32	-0.54		
33	-0.56	33	-0.62	33	-0.69	33	-0.70	33	-0.67	33	-0.65		
34	-0.54	34	-0.56	34	-0.60	34	-0.65	34	-0.67	34	-0.65		
35	-0.53	35	-0.56	35	-0.58	35	-0.56	35	-0.68	35	-0.67		



## Figures



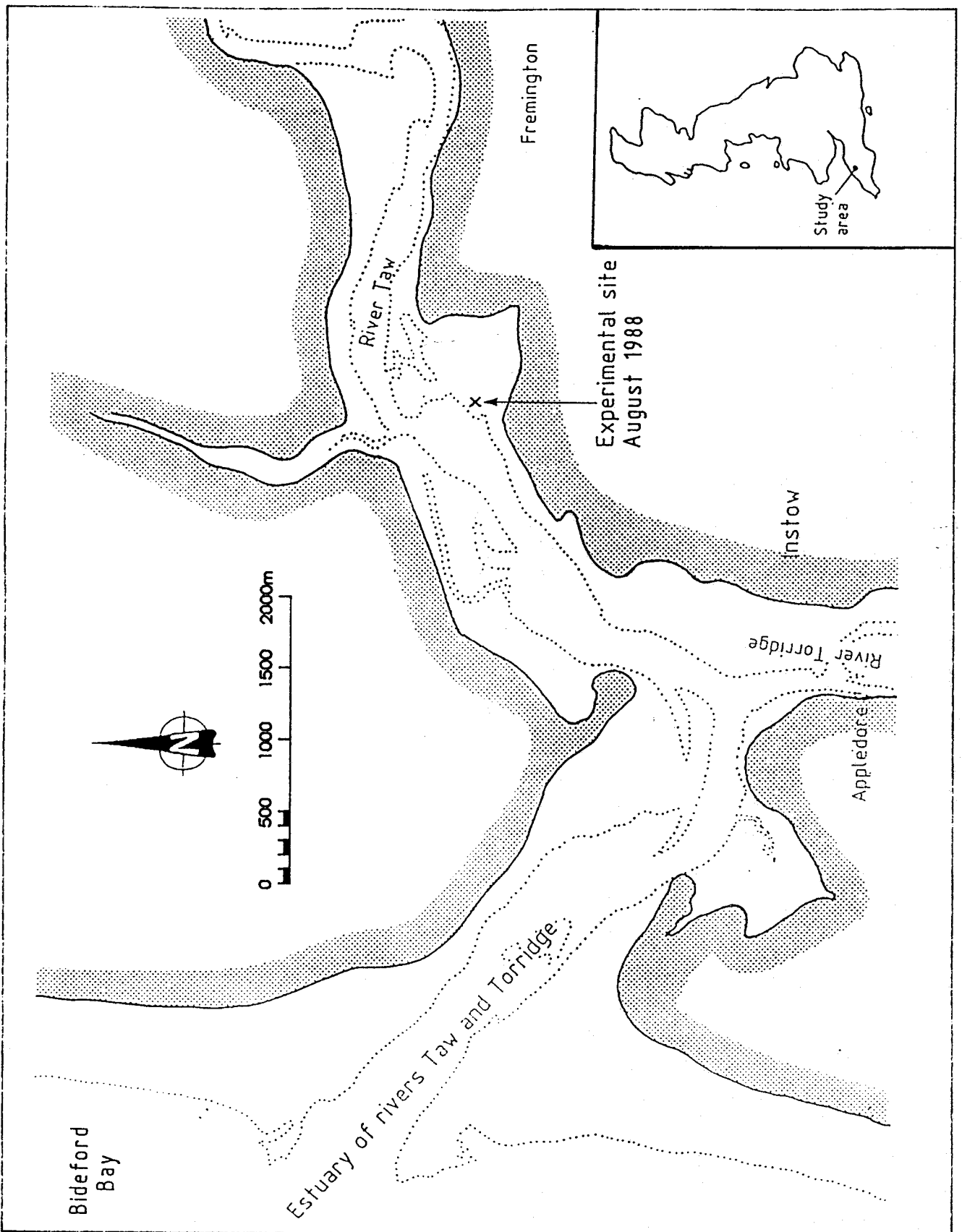


Fig 1 Location map

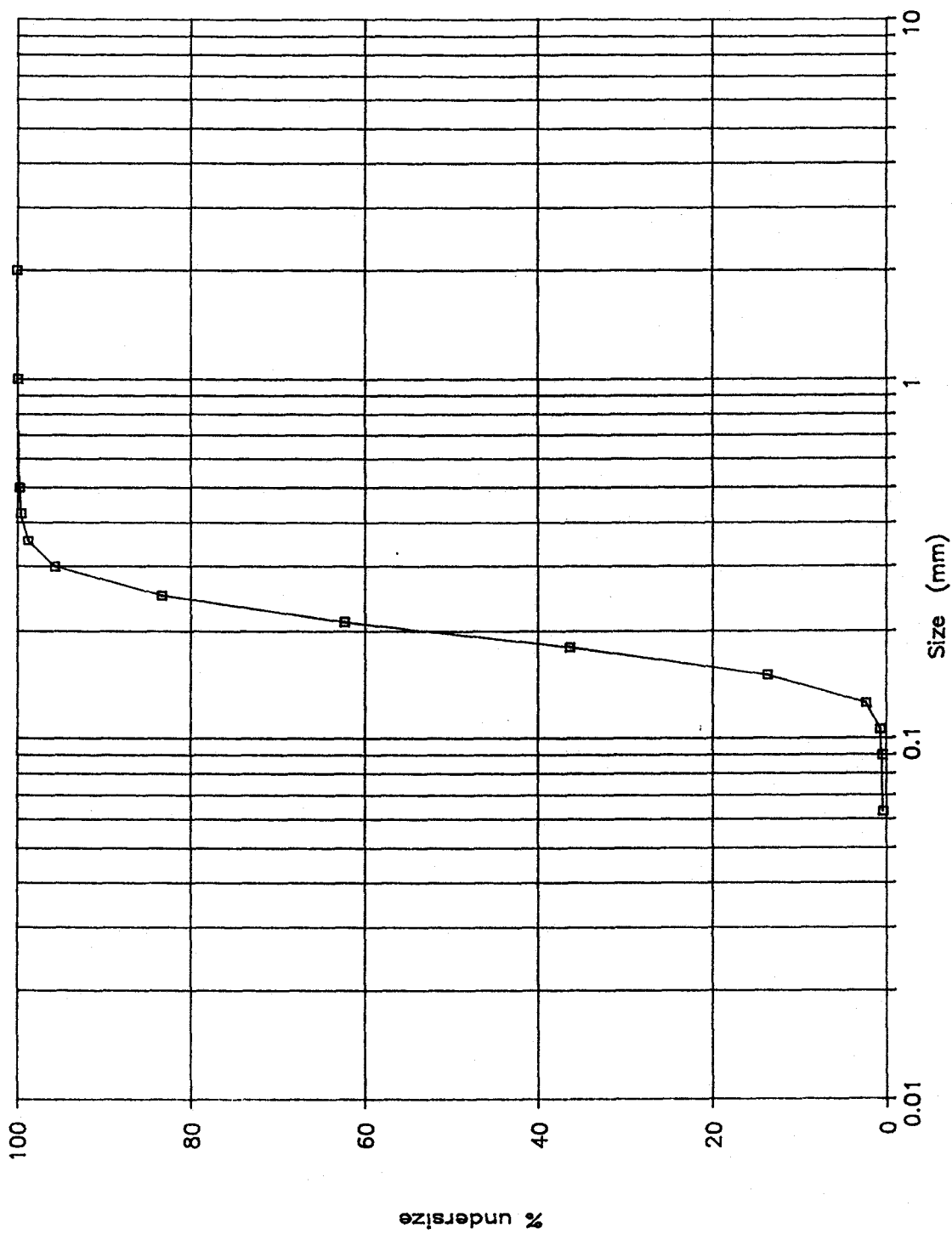


Fig 2 Particle size distribution of bed material

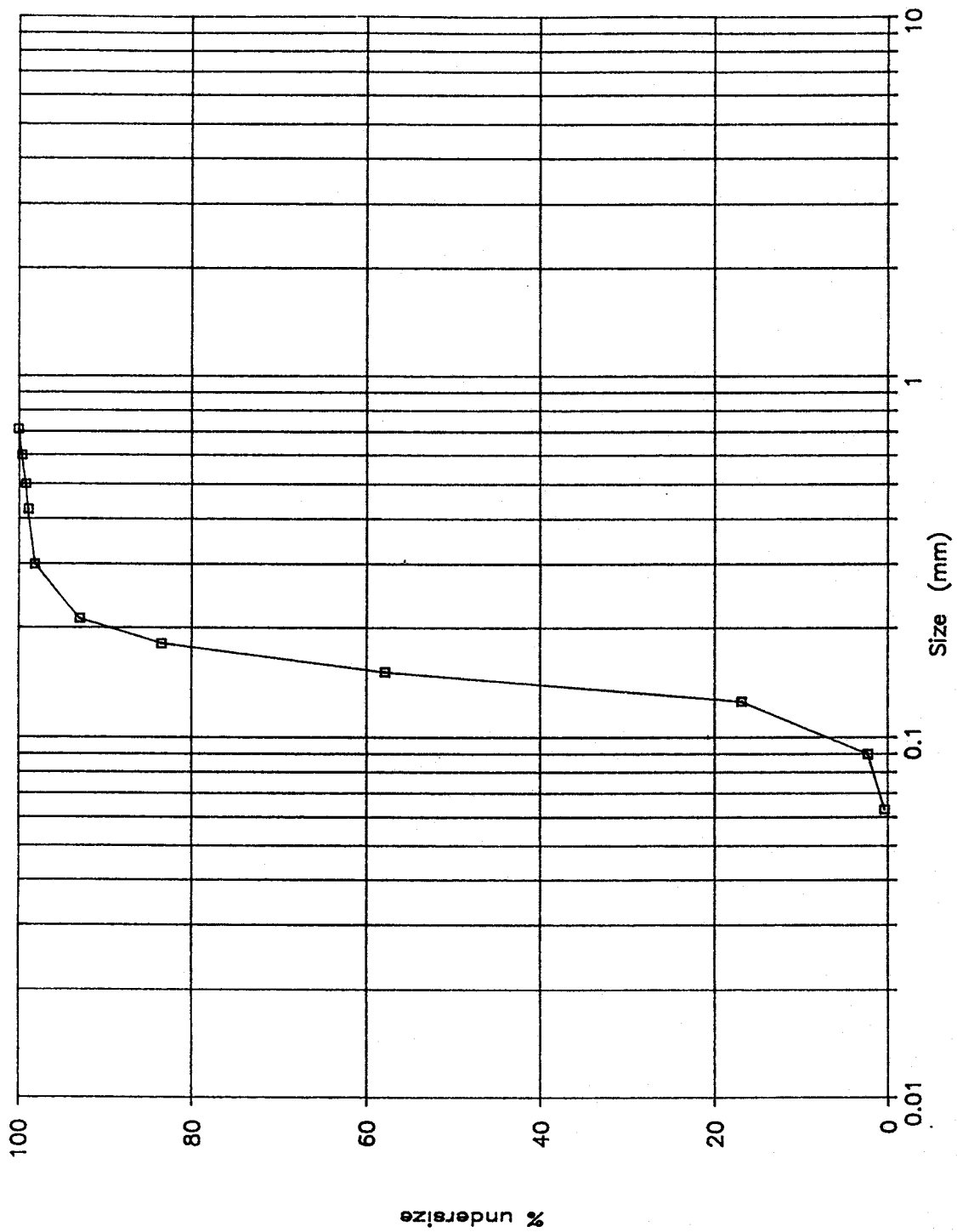


Fig 3 Particle size distribution of suspended sand  $z=0.8m$

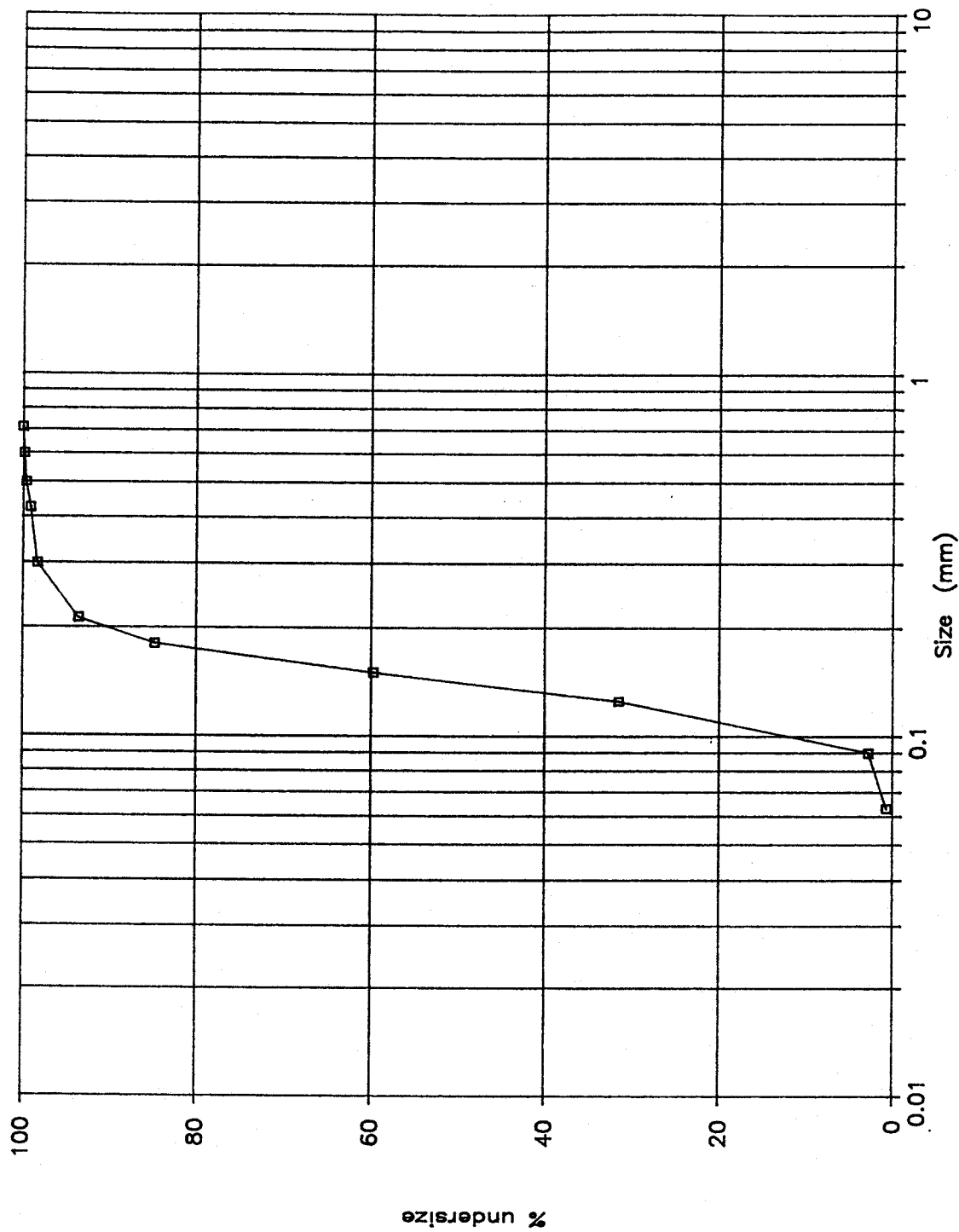


Fig 4 Particle size distribution of suspended sand  $z=0.4m$

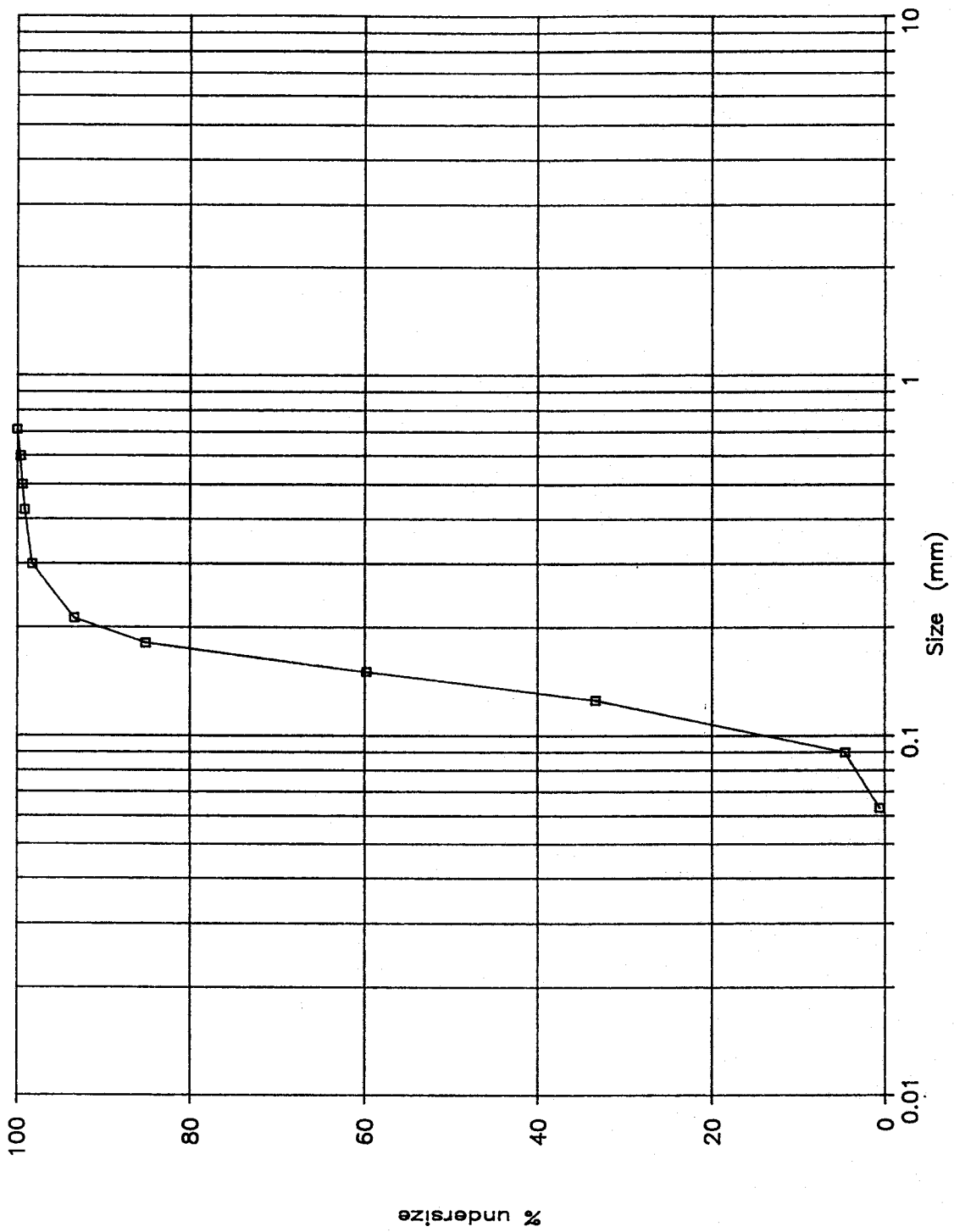


Fig 5 Particle size distribution of suspended sand  $z=0.2m$

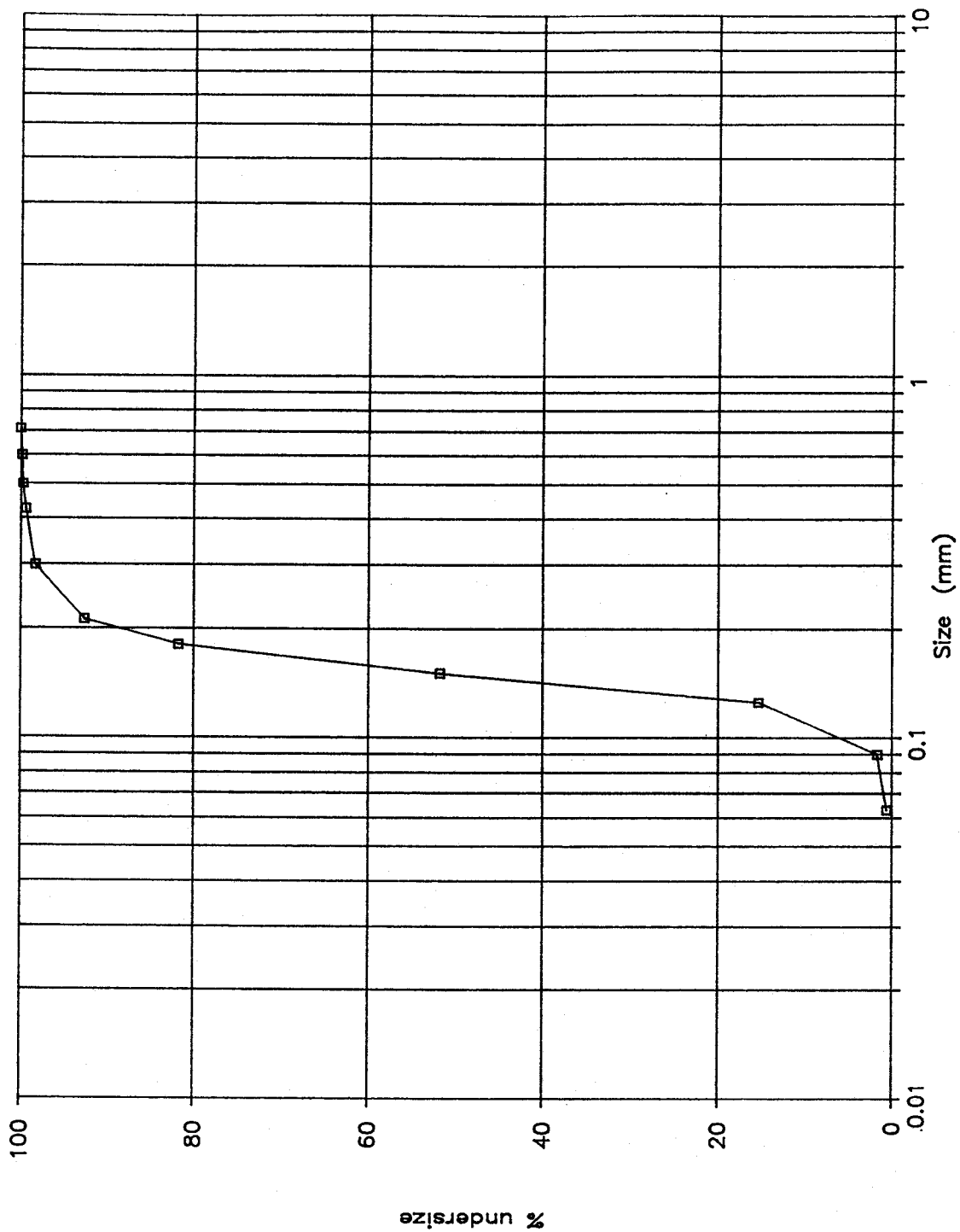


Fig 6 Particle size distribution of suspended sand  $z=0.1\text{m}$

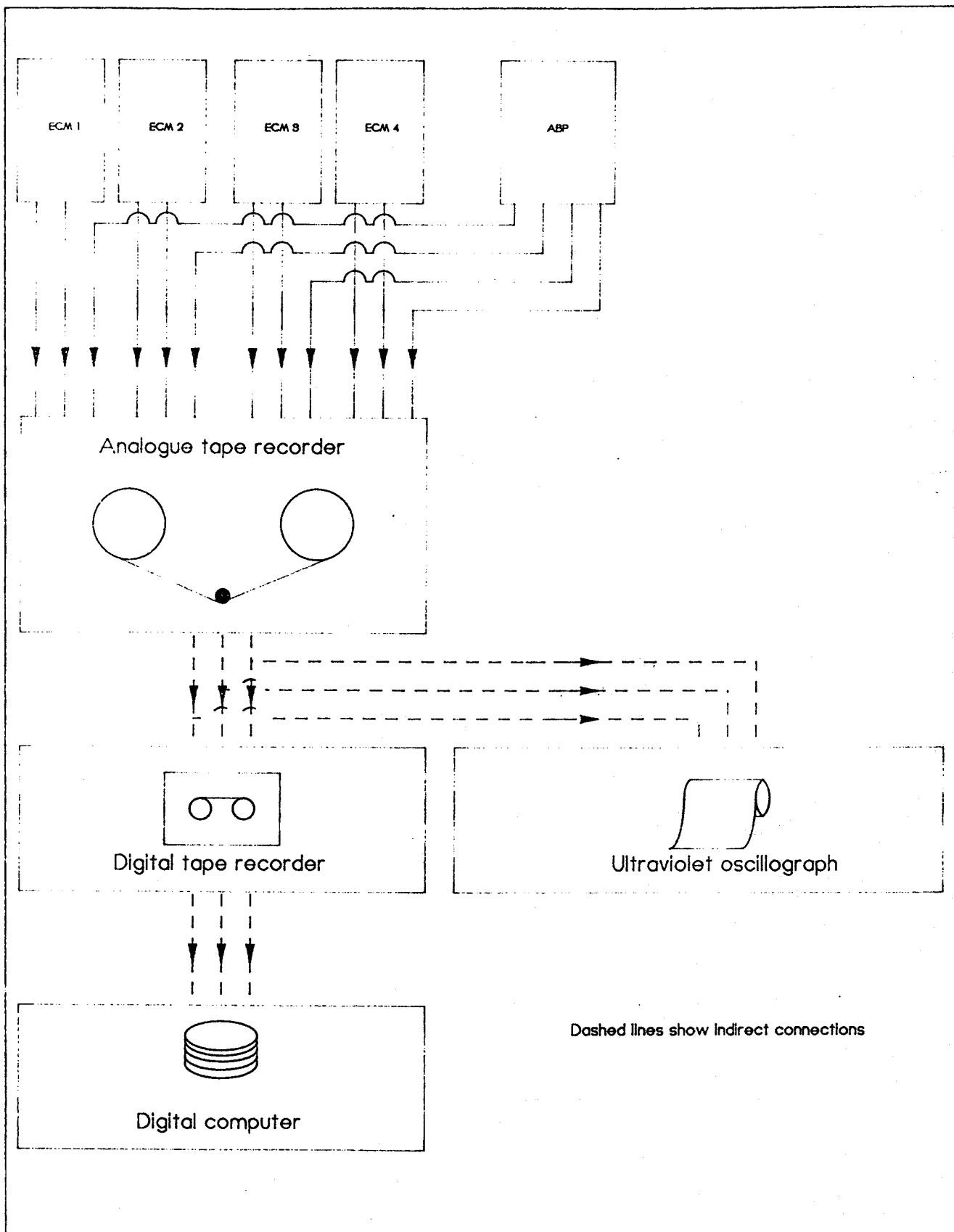


Fig 7 Schematic of recording and analysis system

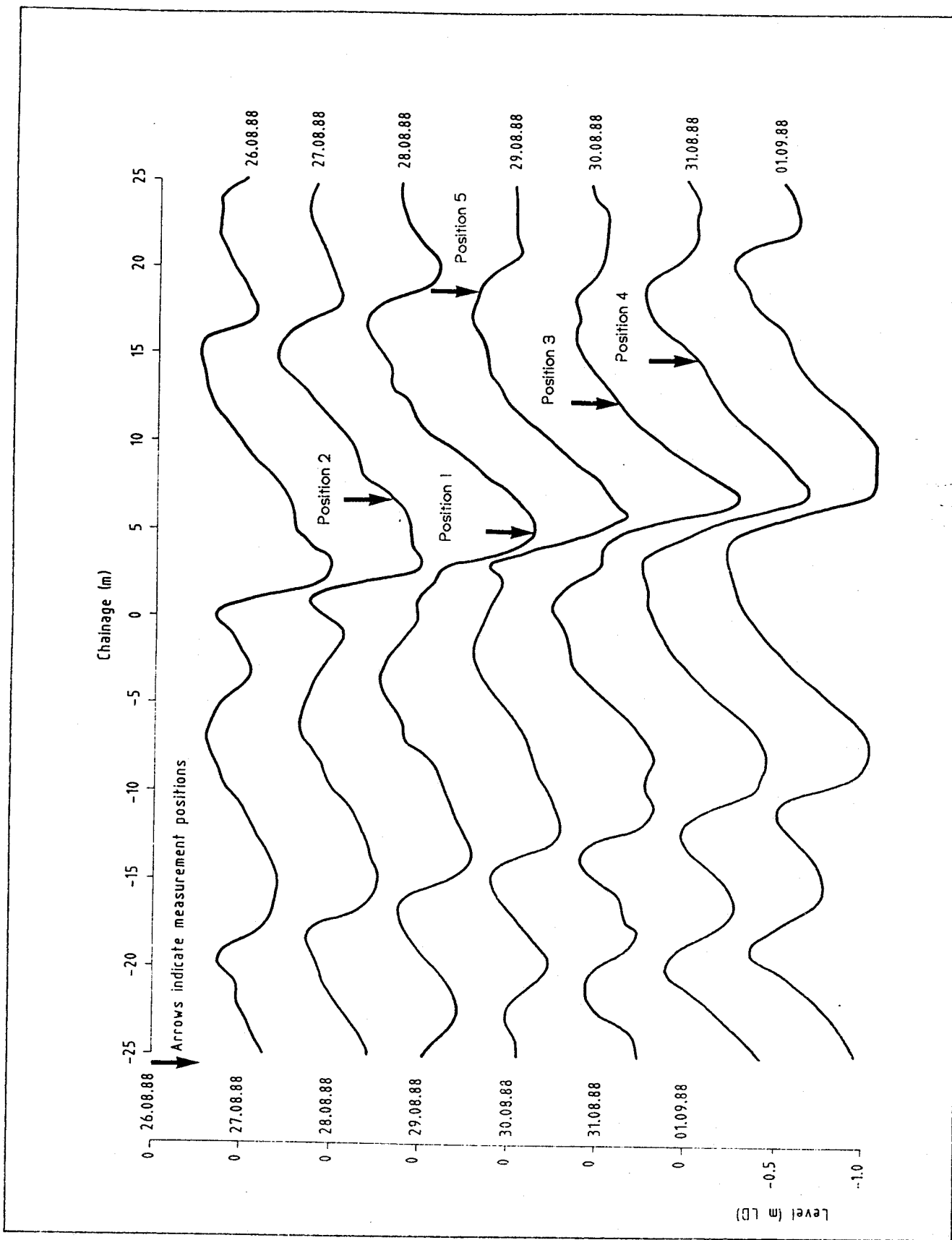


Fig 8 Ground surveys of sandwaves during the experiments

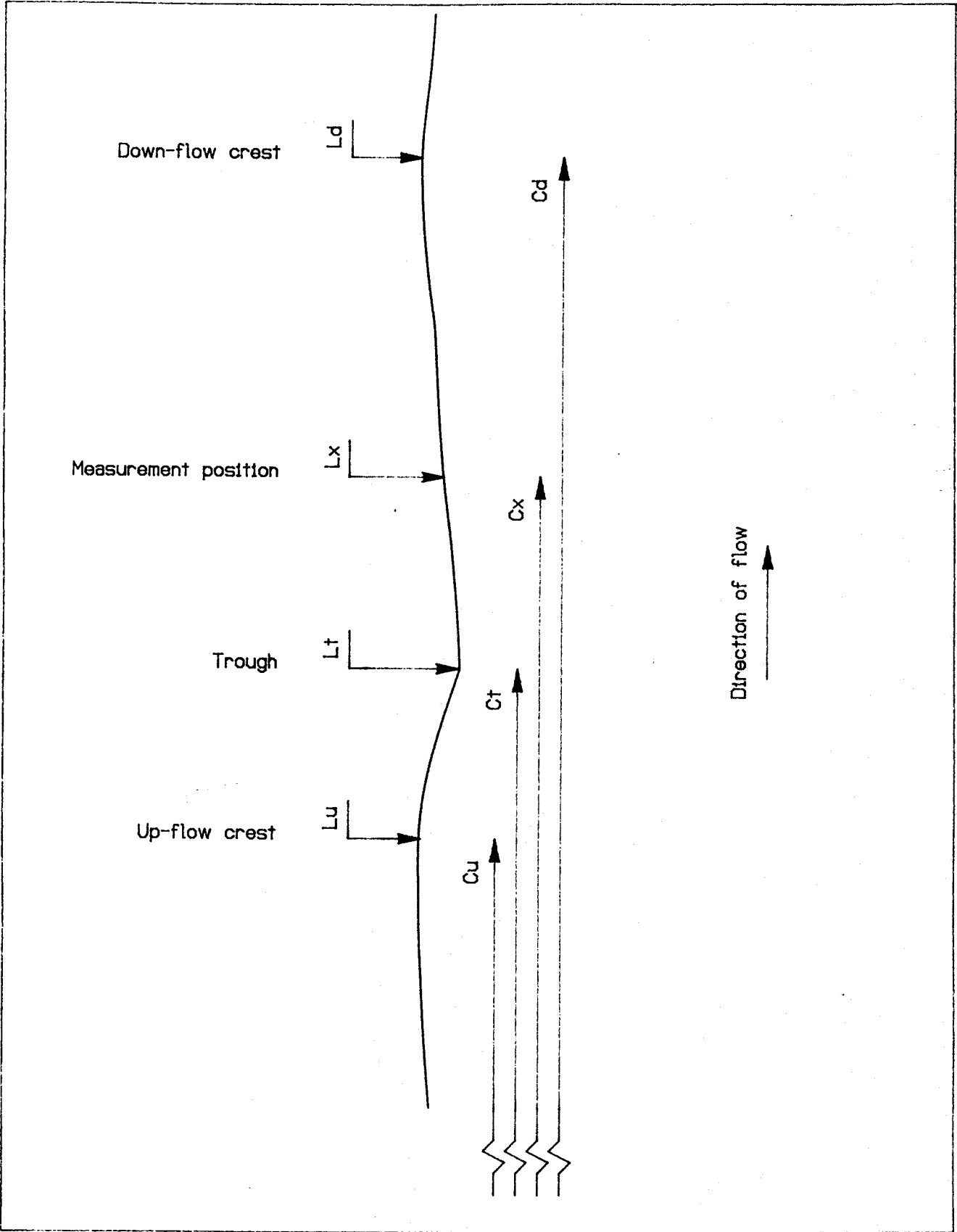


Fig 9 Sandwave notation

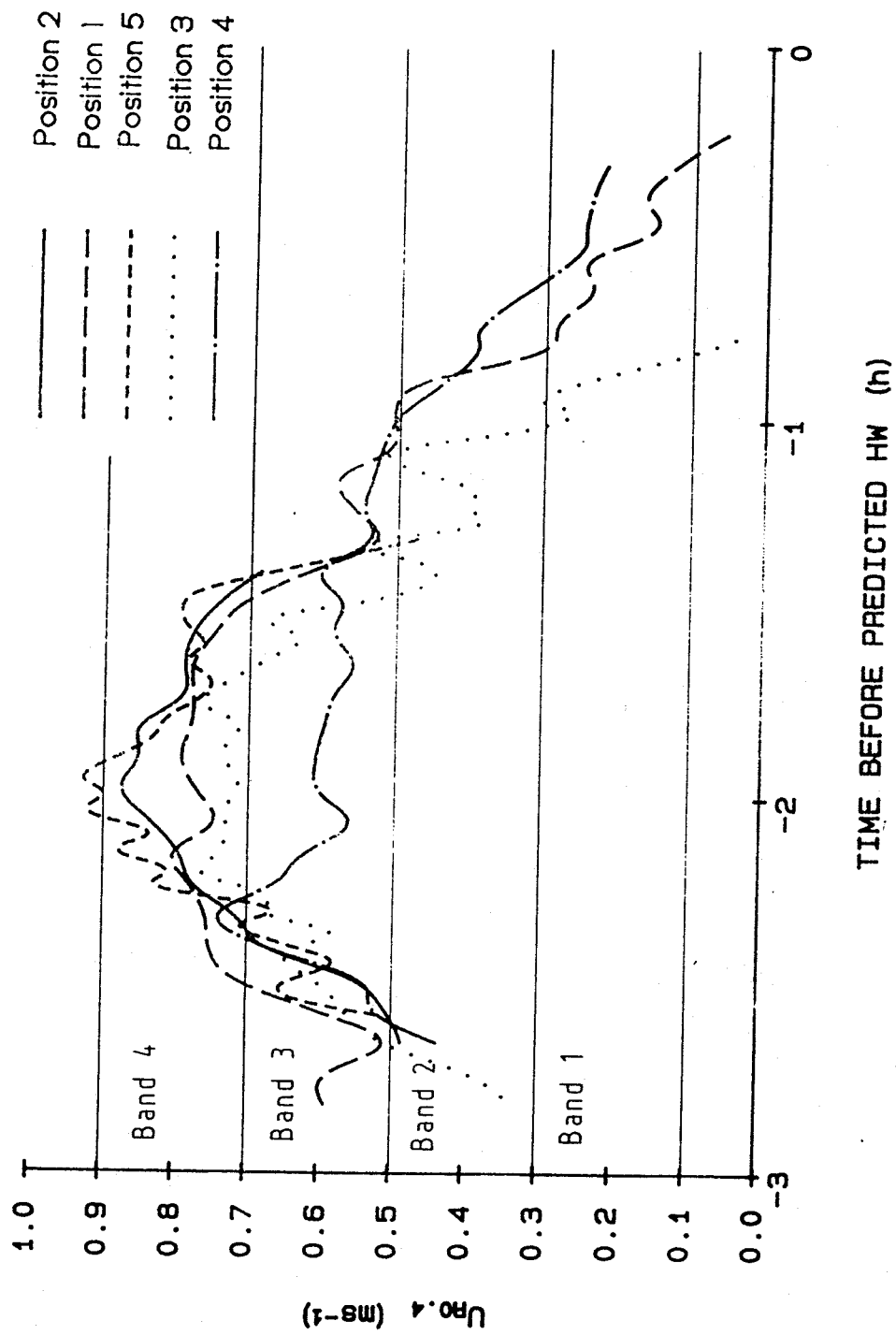


Fig 10 Reference mast velocities at 0.4m

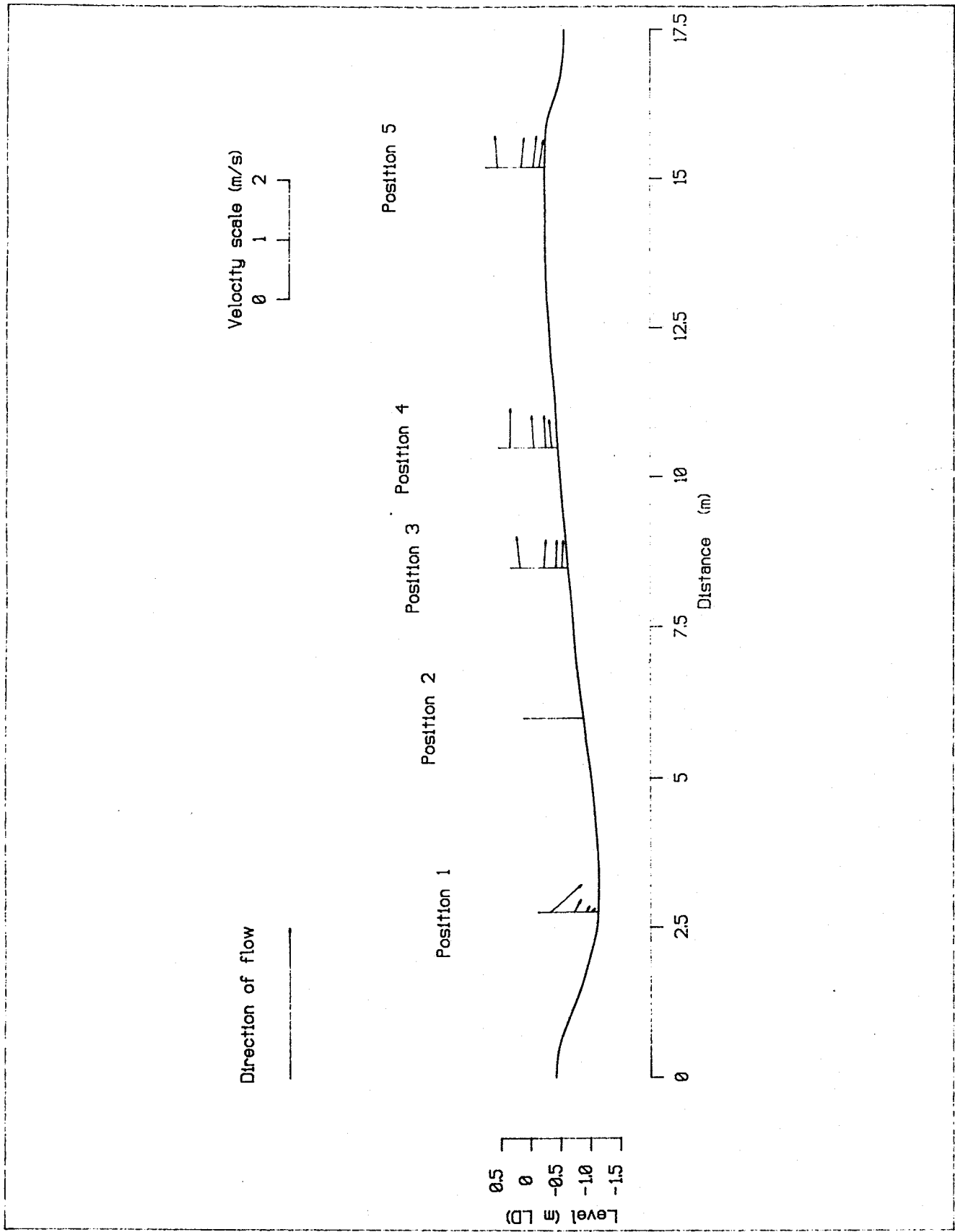


Fig 11 Velocity vectors for band 3

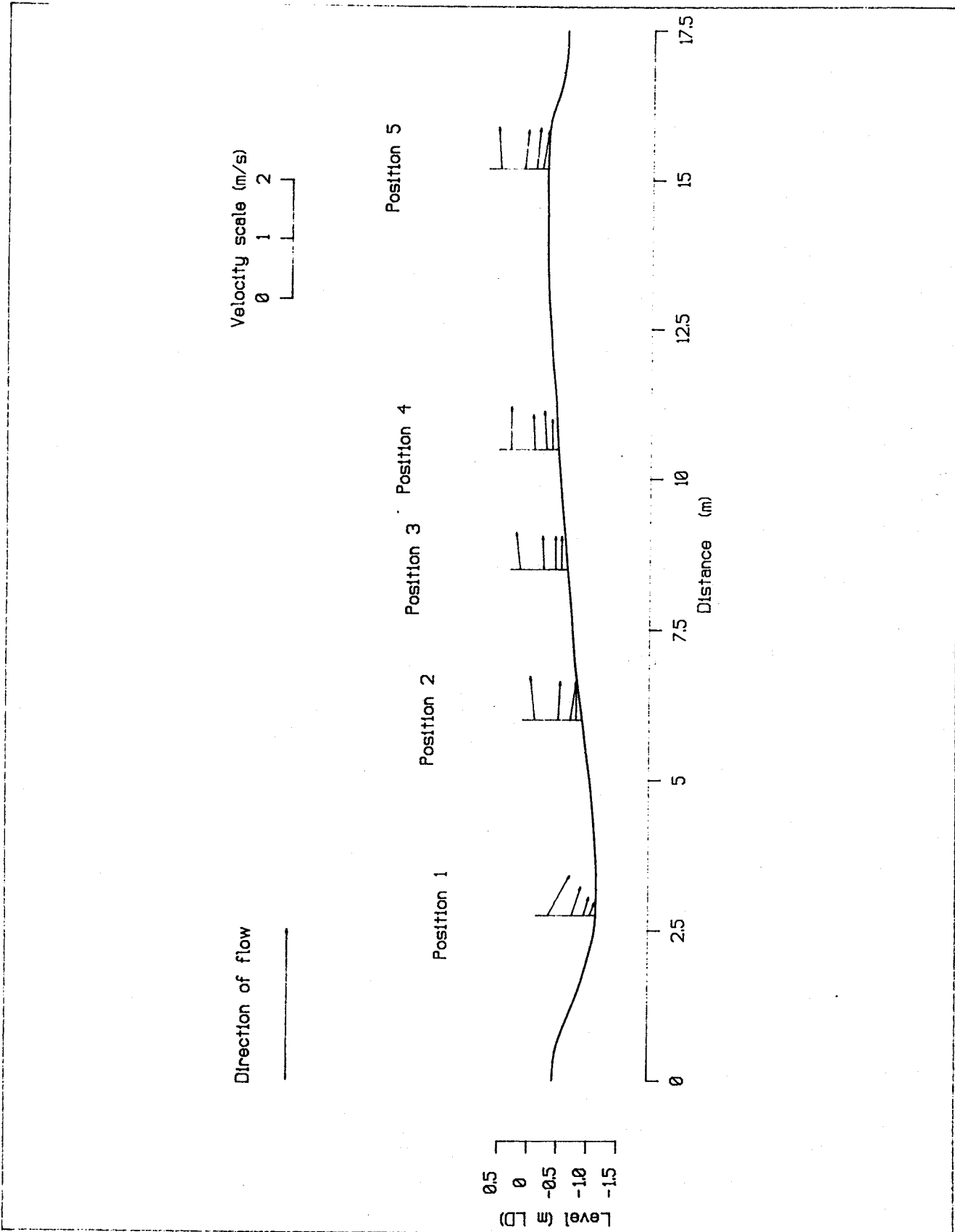


Fig 12 Velocity vectors for band 4

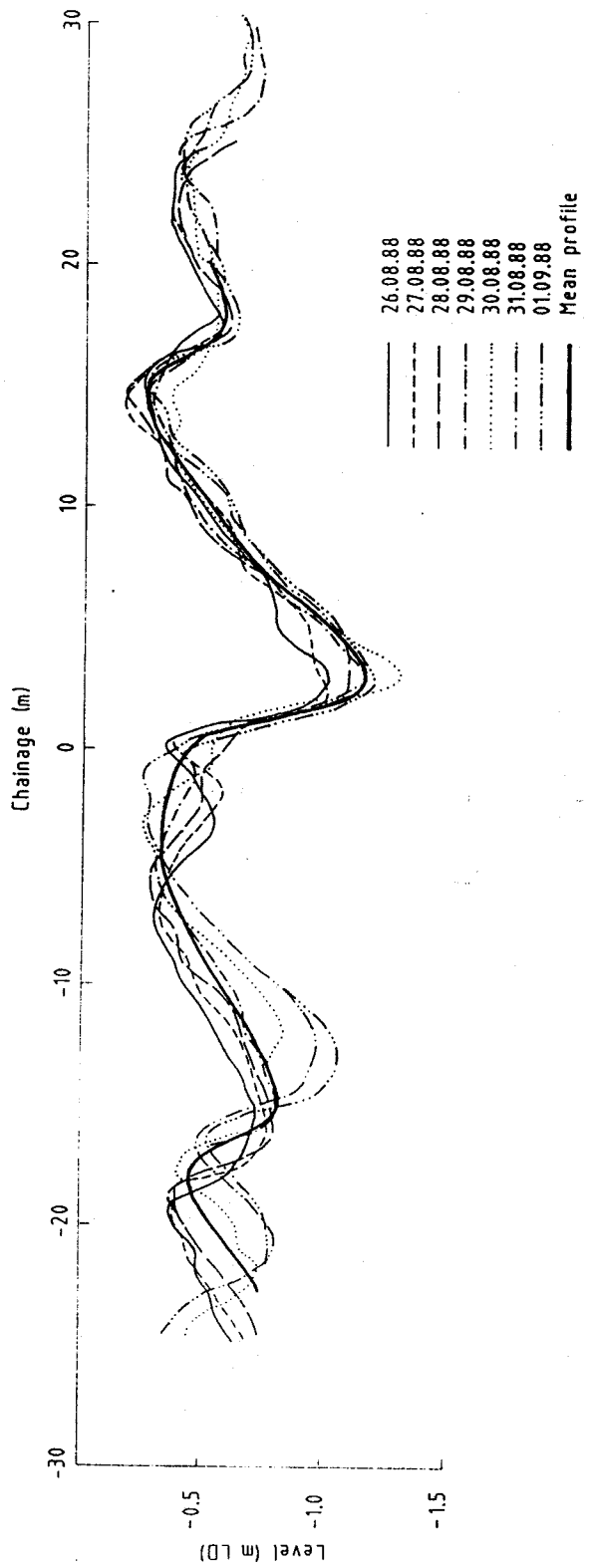


Fig 13 Overlaid sandwaves and "average" sandwave

