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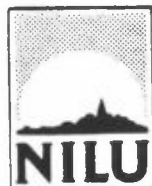
## APPENDIX REPORT 9

# SF<sub>6</sub> TRACER DATA COLLECTED DURING THE EXPERIMENTS IN TERUEL, MAY 1985

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## 1 INTRODUCTION

The Norwegian Institute for Air Research (NILU) has been asked to provide technical assistance in planning, preparing and performing environmental studies at the Andorra (Teruel) power plant site in Spain. A detailed plan for the experiments was established for the "Ministerio de Obras Publicas y Urbanismo" (MOPU) in February 1985 (Sivertsen 1985 a).

The comprehensive field experiments were carried out during 3 May - 14 May 1985. Several institutions participated with NILU in the study, carrying out different tasks. A list of participants is presented in the main report from these studies (Sivertsen 1985 b).

This Appendix report was created to give a comprehensive documentation of the SF<sub>6</sub>-tracer measurements carried out along automobile traverses during the experiments.

The objectives of the study as defined by the "agreement for co-operation" was to study the dispersion and impact of atmospheric emissions from the Andorra (Teruel) power station. The scope of work was defined by NILU as to:

- investigate the transport and dispersion of emissions from the power station,
- measure the concentration of pollutants at ground level in the zones of maximum potential impact,
- measure the concentrations of pollutants in areas where damage has been detected,
- define the areas of potential impact,
- estimate the probabilities of concentrations which might cause acute and chronic damage and
- design a follow-up program for the future.

## 2 INSTRUMENTATION

The properties of SF<sub>6</sub>, the flexibility inherent in the sampling methods, and the sensitivity of the analysis technique yields a simple, but powerful tool for studying the transport and dispersion of gases. In many cases where flow patterns are complex, SF<sub>6</sub> tracer techniques represent the most straight-forward means of understanding the transport and dispersion of gases. The equipment designed and used by NILU has been widely demonstrated in several dispersion experiments on various scales. (Heggen and Sivertsen 1983, Sivertsen 1978, Sivertsen et. al 1983, Sivertsen 1983.)

A more detailed description of the SF<sub>6</sub> tracer instrumentation and experimental procedures is presented in Appendix A, including the following parts:

- the tracer release system
- the sampling system including battery operated time average samplers and sequential samplers
- the tracer analysis and calibration system including portable electron capture gas chromatographs, integrators and exponential dilution chamber

## 3 THE FIELD STUDY

To achieve the objectives of the study, NILU suggested to use tracer techniques, combined with aircraft measurements and intensive ground level sampling of tracer and SO<sub>2</sub>.

The tracer technique including release equipment, samplers, a calibration unit and portable gas chromatographs, developed at NILU for use in field experiments, produced results which were available for discussion and further planning only a few hours after each experiment.

In addition, SF<sub>6</sub> and SO<sub>2</sub> concentration profiles were measured from air craft and from a mobile unit at the surface, driving along selected sampling traverses. SO<sub>2</sub> was also sampled as 30 min average concentrations at permanent stations in the study area. (Appendix report 8 and 10.)

During part of the study, from 8 to 14 May, a Barringer Type Correlation Spectrometer (COSPEC) was employed to obtain remote sensing estimates of vertical integrated  $\text{SO}_2$  concentrations along the traverses. (Appendix report 6.)

During the field experiment a comprehensive meteorological measurement program was undertaken. (Appendix report 1-4.)

A map of the study area is shown in Figure 1. On the map is also indicated sampling traverses and some major villages frequently referred to during the experiments.

A total of 11 experiments were carried out from 3 May to 14 May 1985. The  $\text{SF}_6$  measurements undertaken during these experiments are described in ch. 4. A summary of sampling hours and average  $\text{SF}_6$  release rates during the sampling periods are given in Table 1.

Table 1: Summary of wind conditions,  $\text{SF}_6$  release and sampling start hour during the experiments.

Exper. no.	Date	Sampling start (GMT)	WIND		$\text{SF}_6$ -RELEASE	
			Direction (deg)	Speed (m/s)	Rate (g/s)	Period (GMT)
1	1985-05-03	12:00	304	10.5	16.1	09:00-12:30
2	1985-05-04	12:00	296	9.7	9.0	09:45-12:15
3	1985-05-05	13:00	40	4.4	9.4	10:15-13:20
4	1985-05-06	12:00	290	19.8	10.0	10:30-12:30
5	1985-05-07	12:00	284	17.0	9.5	10:30-12:30
6	1985-05-08	12:00	302	16.4	16.4	10:30-12:30
7	1985-05-09	12:00	314	11.9	15.0	10:30-12:30
8	1985-05-10	15:00	315	10.4	14.8	13:00-15:30
9	1985-05-11	11:00	296	2.2	10.0	09:00-11:30
10	1985-05-13	12:00	286	4.9	13.5	08:30-12:30
11	1985-05-14	14:00	180	3.0*	9.9	10:00-14:30



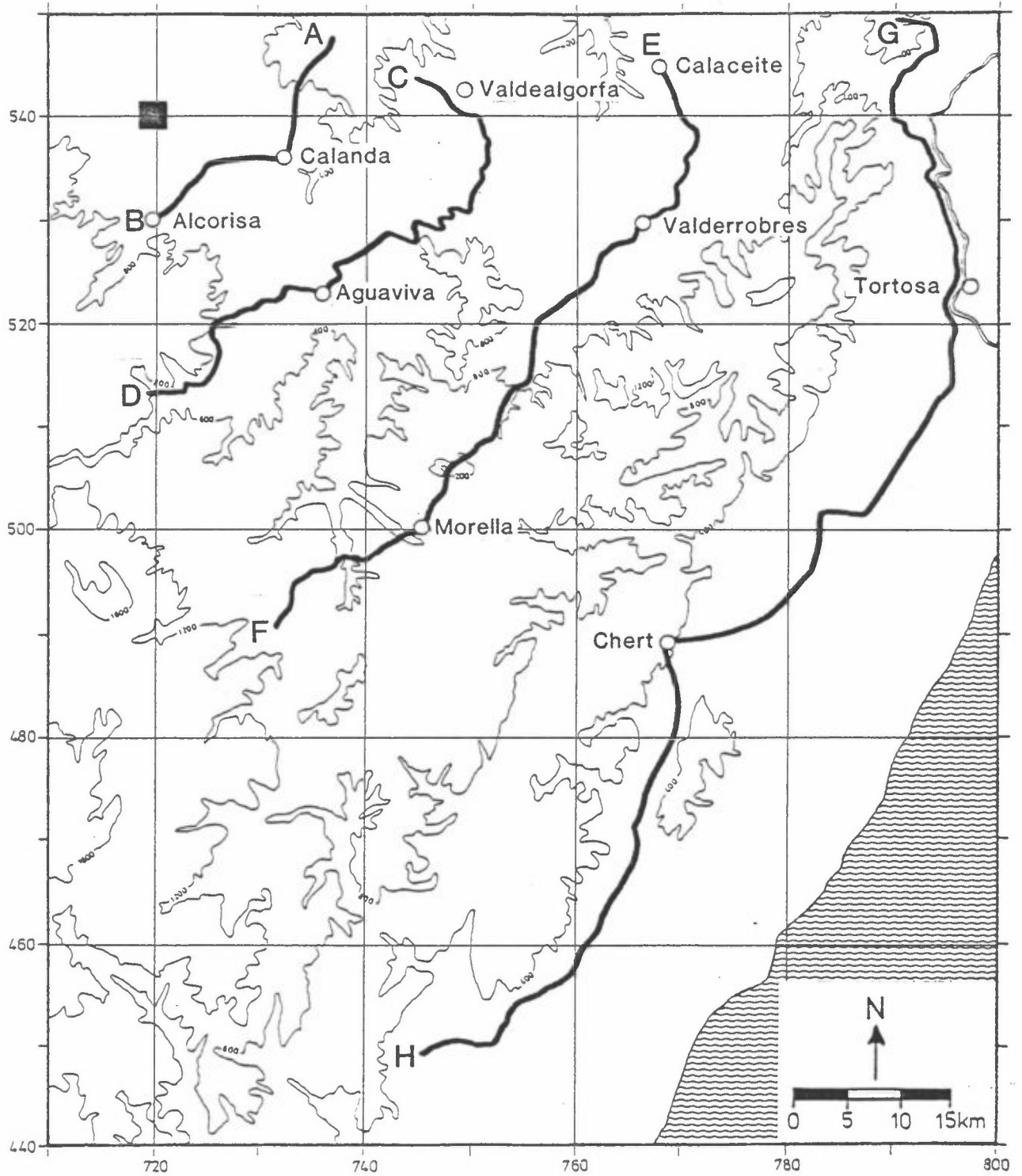


Figure 1: The study area south east of the Andorra (Teruel) power plant. Sampling traverses are indicated.

A more detailed and description of the experiments can be found in the main report (Sivertsen 1985 b).

A summary of plume trajectories during the experiments is presented in Figure 2.

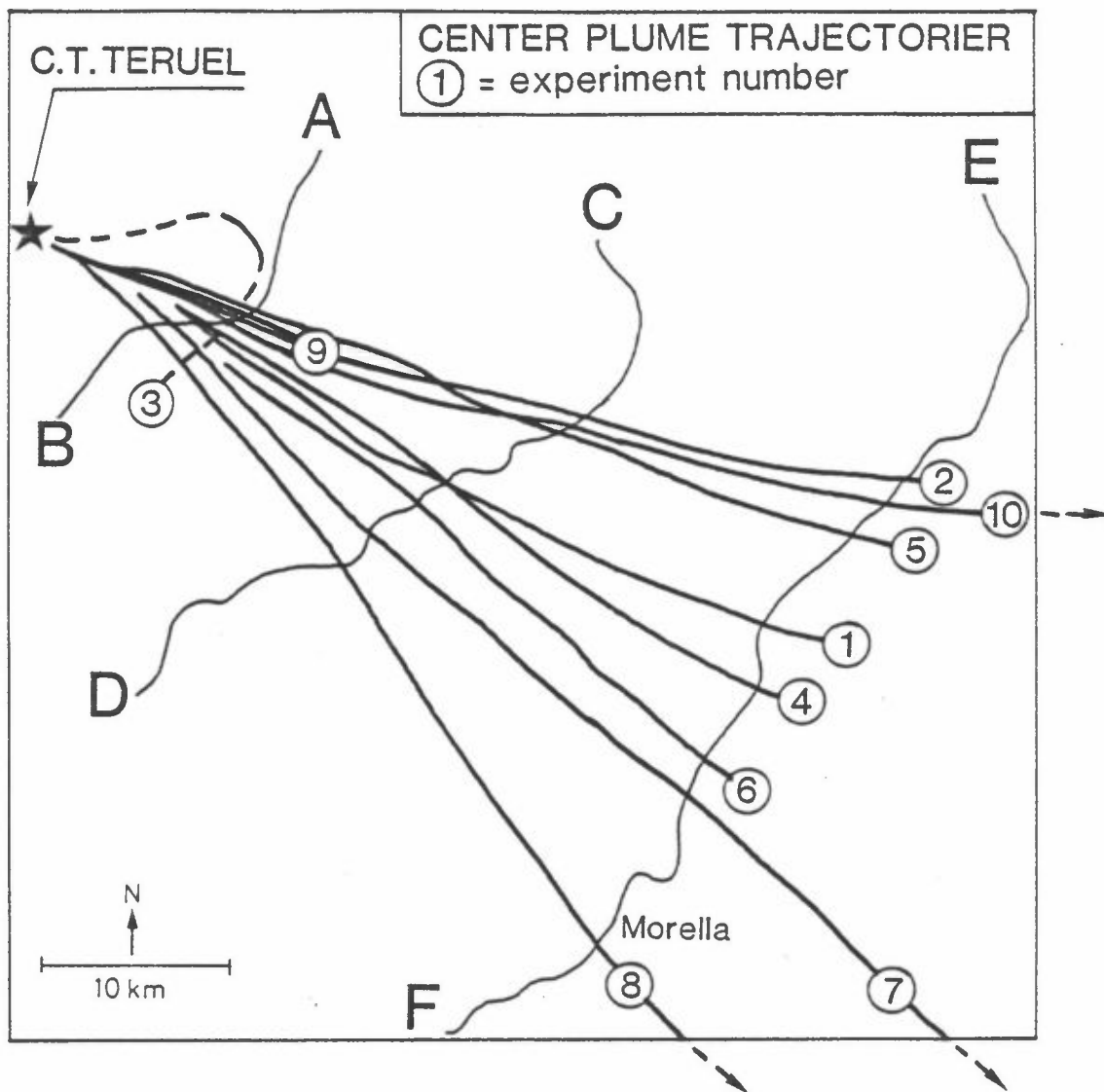


Figure 2: A summary of center plume trajectories during the experiments. The experiment numbers (see Table 1) is given at the end of each plume trajectory. The length of each trajectory indicates the end point at which  $SF_6$  and/or  $SO_2$  was detected, at the surface.

During all experiments, the plume was transported into the design experiment sector, which was south east ( $SE \pm 45^0$ ) from the power plant.

During experiment 3 and 11 problems appeared, as the wind direction changed during the experiment period. In experiment 3 a return flow from the north developed due to a "local low pressure" developing on the Iberian mountains as the effect of sun heating increased during the day. This is a typical summer situation, which might be critical for development of high surface concentrations as described in earlier meteorological studies in the Andorra area (Sivertsen, 1979).

#### 4 THE EXPERIMENTS

The following chapters present  $SF_6$ -tracer concentration data collected during the 11 experiments carried out from 3 May 1985 to 14 May 1985. Complete listings of the  $SF_6$  data are also presented in Appendix B.

To understand and read the  $SF_6$  concentration maps included as examples for each experiment in chapters 4.1 to 4.11, figure 3 explains the set up of these maps.

All  $SF_6$ -concentrations are given with an averaging time of 15 min, usually with 2 sequential samples at each location (in some cases 4 sequential samples). Plume meander can be studied by analyzing sequential samples from the same traverse.

The concentrations on the maps are for practical reasons given in tenths of a microgram per  $m^3$  ( $0.1 \mu g/m^3$ ). In all cross section plots and in tables (Appendix B) the concentrations are given in  $\mu g/m^3$ . Only concentrations above  $0.02 \mu g/m^3$  can be considered significant greater than the detection limit.

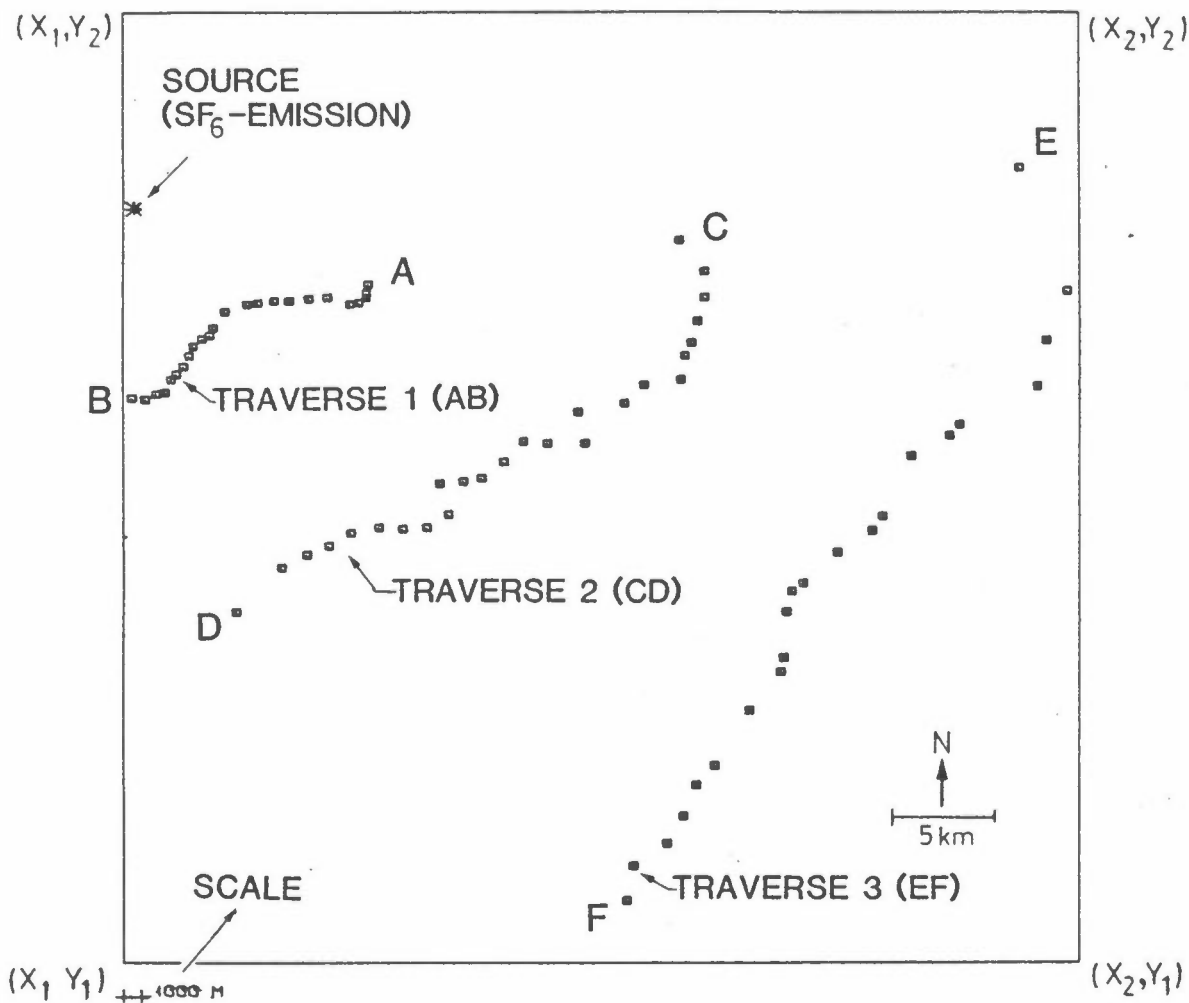


Figure 3: Example of plotted results from  $\text{SF}_6$  experiments in the Teruel area (see also Figure 1). Plotted squares indicates points where  $\text{SF}_6$  samples were taken, but where the concentration was less than the detection limit of  $\sim 0.01 \mu\text{g}/\text{m}^3$ . The coordinates in all experiments are given in the UTM (Universal Transverse Mercator) system. The source of  $\text{SF}_6$ -emission (the power plant stack) is indicated by \* on the maps and is located with coordinates  $(x_0, y_0)$ : 720.600, 541.300 (scale in meters). In the same way the corners of the map are given by:  
 $(x_1, x_2)$ : 720.000, 772.000  
 $(y_1, y_2)$ : 720.000, 500.000 and  $(x_2, y_2)$ : 772.000, 552.000  
 The map thus covers: 52 km x 52 km.

In the cross section plots, traverse 1 corresponds to traverse AB, which is located about 8-12 km from the power plant. Correspondingly:

traverse 2 = CD, distance ~24 km

traverse 3 = EF, distance ~48 km

traverse 4 = GH, distance ~80 km

The power plant stack height, where  $SF_6$  was released, is 343 m. Other emission data, as gas volume and exit gas temperatures are given in Appendix report 5.

4.1 EXPERIMENT 1, DATE: 1985-05-03, START TIME: 12:00 GMT

Two sequential  $\text{SF}_6$  samples were collected, 1A and 1B. Figure 4 shows concentrations from test 1A. Further information from traverse 1-3 is given in figure 5.

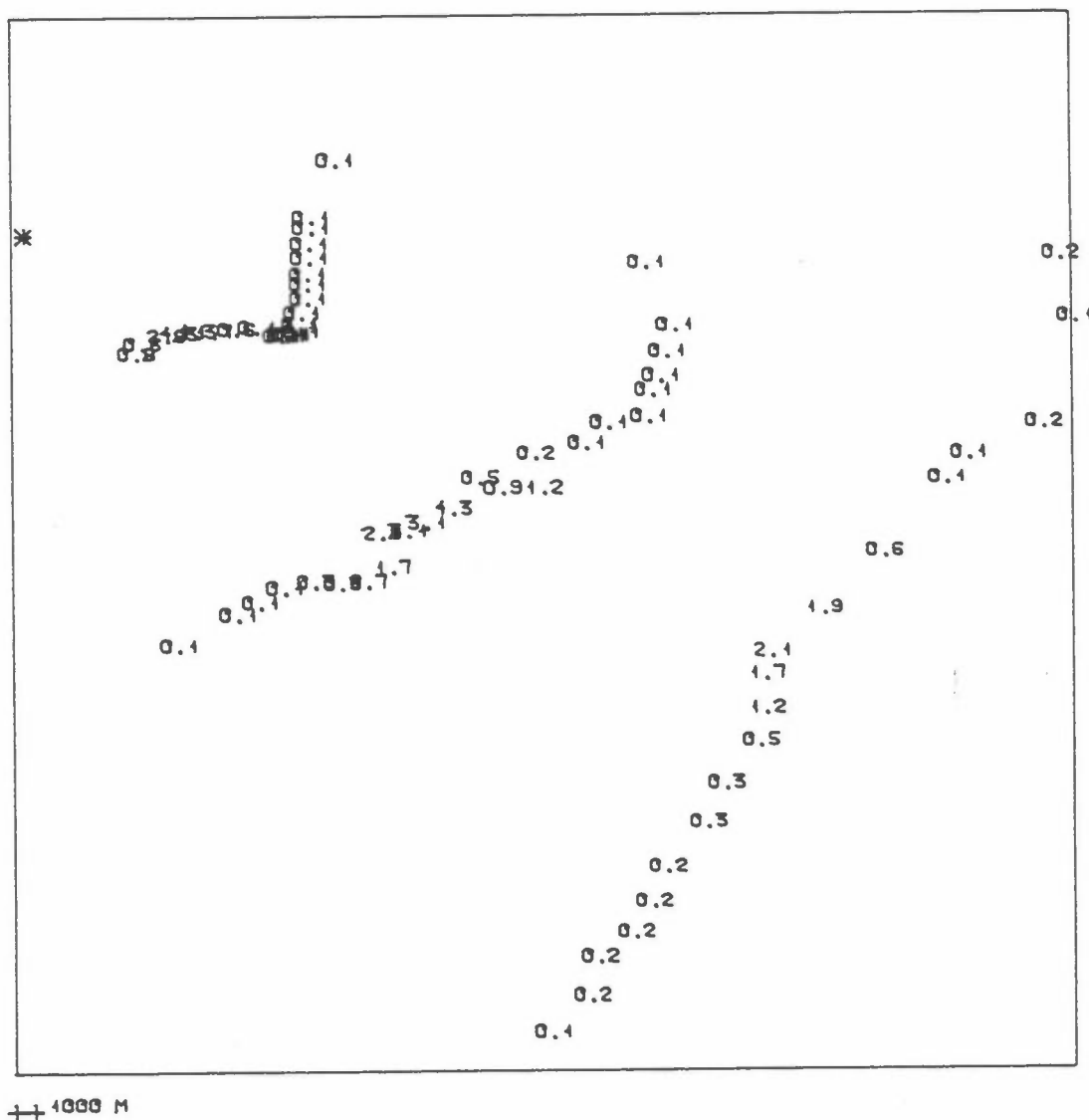


Figure 4: Experiment 1, 1985-05-03.  $\text{SF}_6$ -concentrations from test 1A.

Concentration unit:	0.1 $\mu\text{g}/\text{m}^3$ .
Release rate	16.1 g/s
Wind velocity	10.5 m/s
Wind direction	304. deg
Mixing height	1500. m

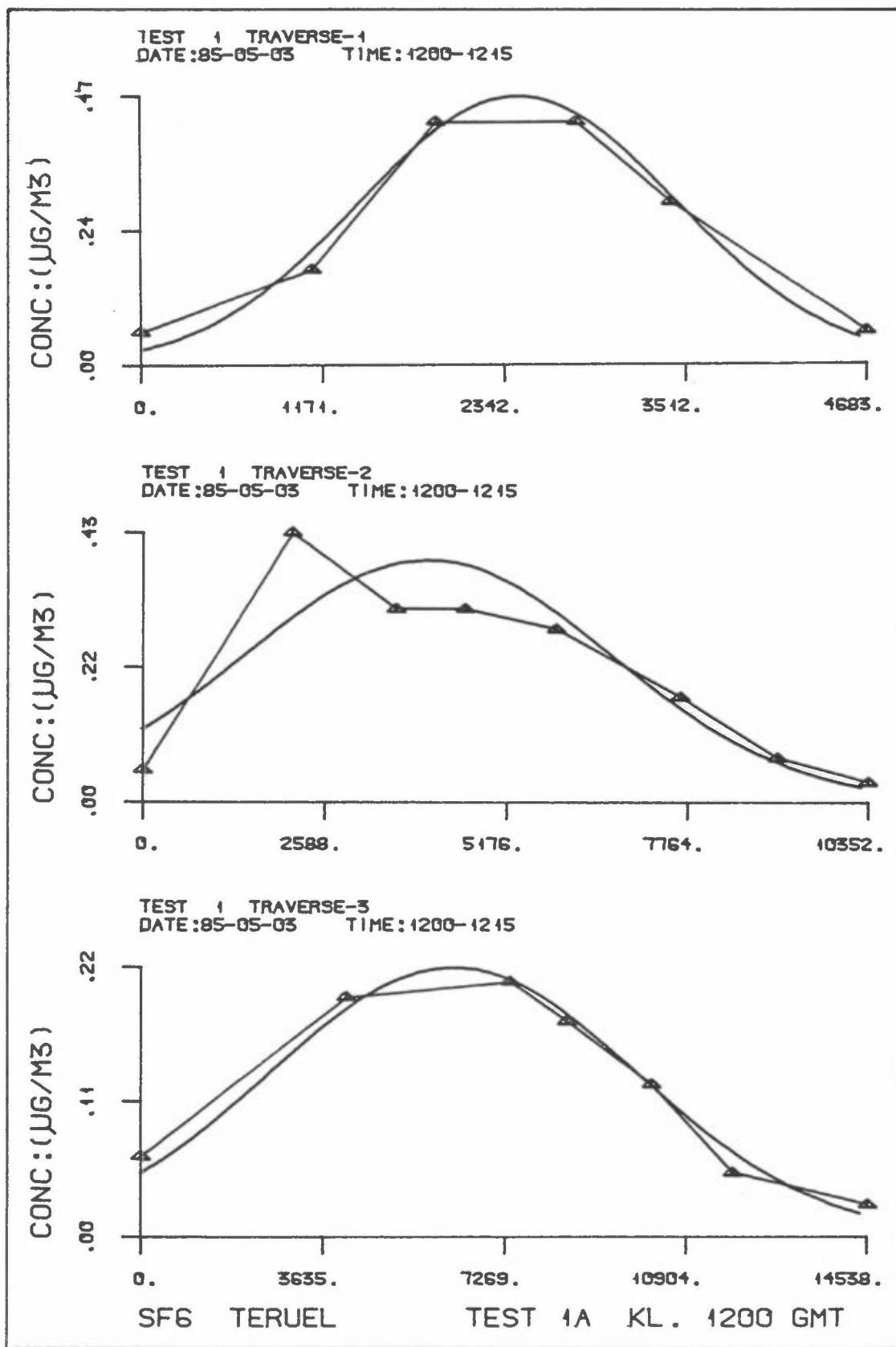


Figure 5a: Concentrations along traverses 1-3, test 1A.

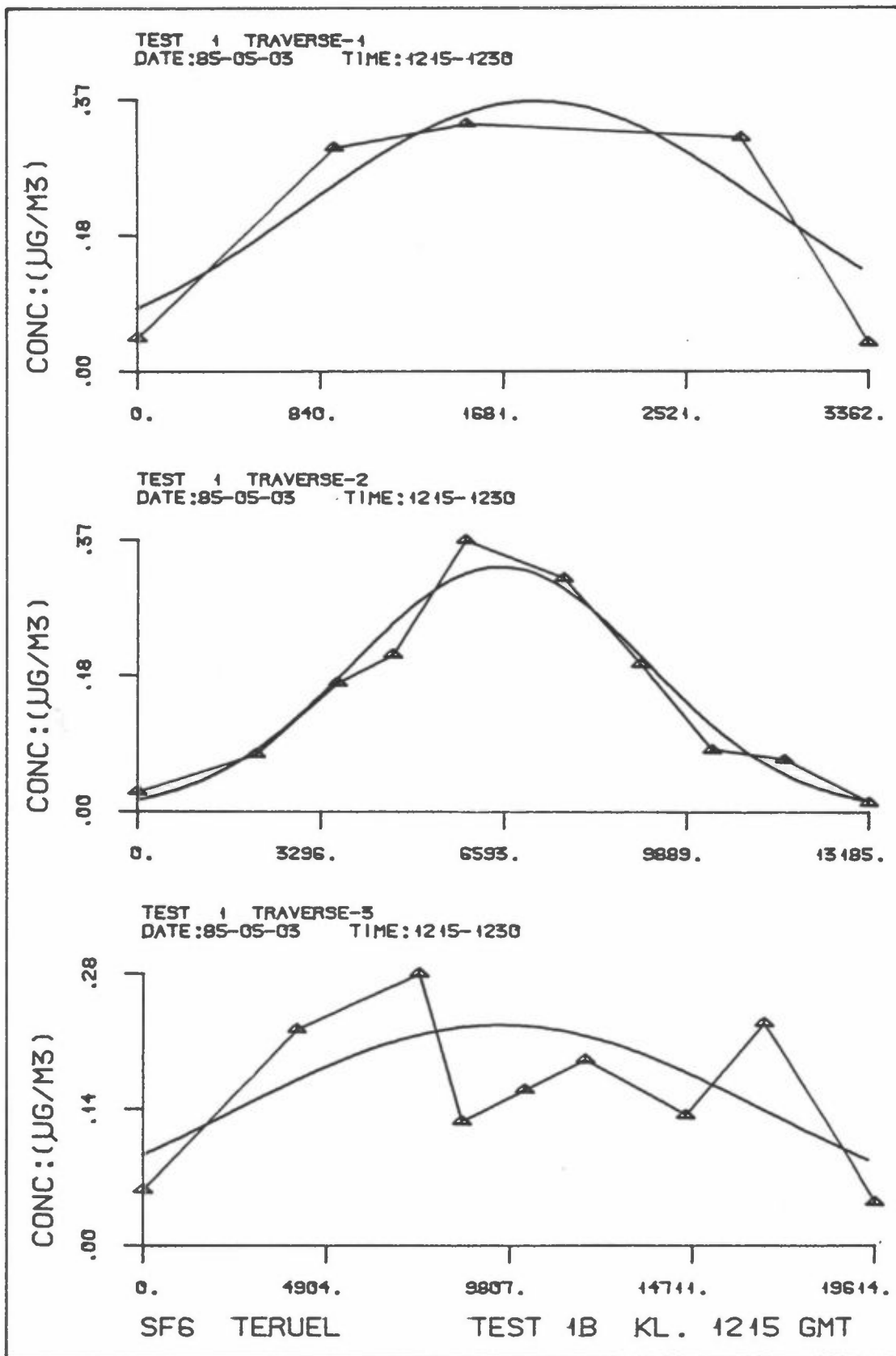


Figure 5b: Concentrations along traverses 1-3, test 1B.



4.2 EXPERIMENT 2, DATE: 1985-05-04, START TIME: 12:00 GMT

Four sequential SF<sub>6</sub> samples were collected during this experiment; test 2A-2D. Figure 6 shows concentrations from test 2A, and further information from traverse 1-3 are given in figure 7.

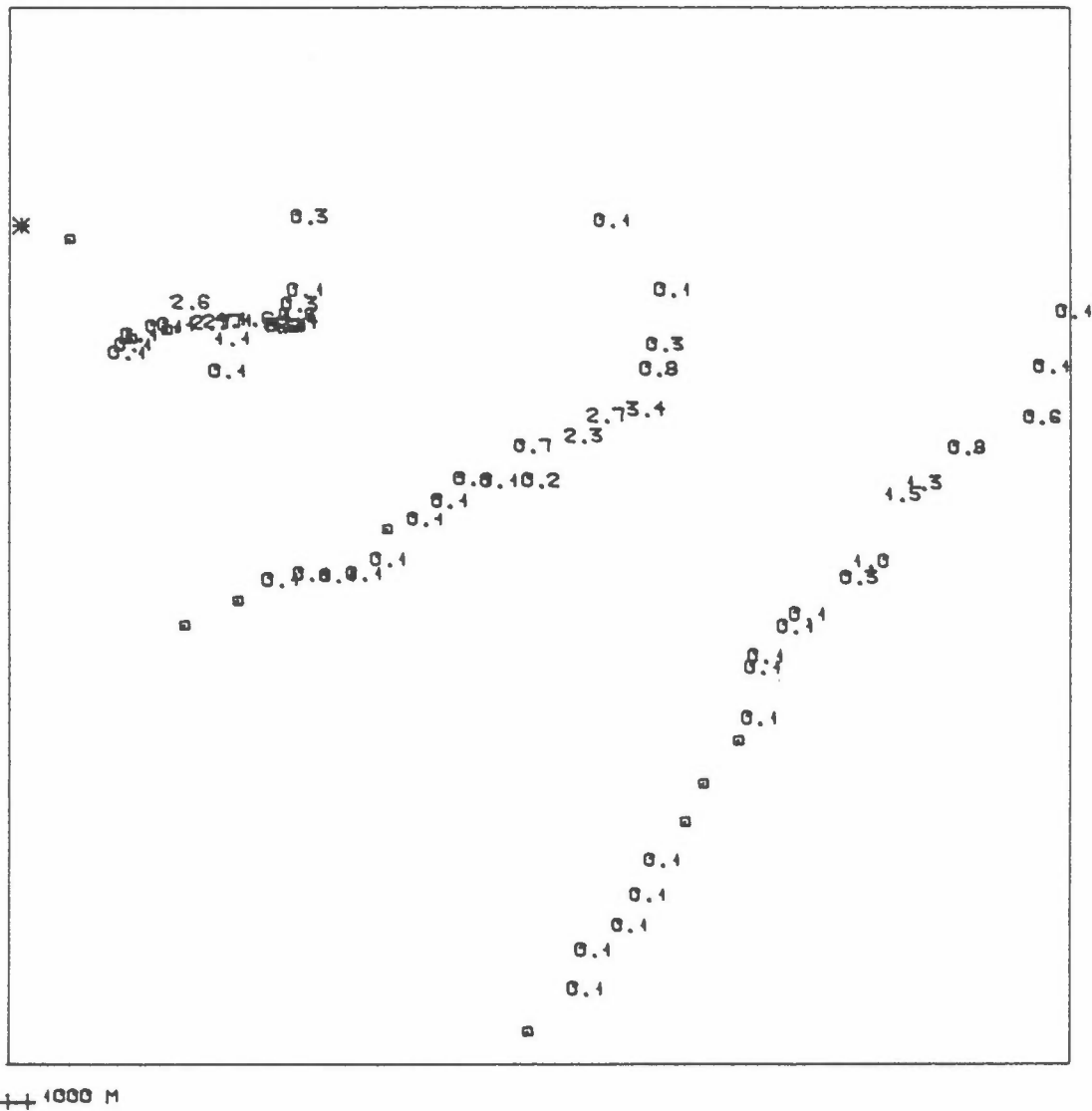


Figure 6: The figure shows SF<sub>6</sub>-concentrations from test 2A.

Concentration unit:	0.1 $\mu\text{g}/\text{m}^3$ .
Release rate	9.0 g/s
Wind velocity	9.7 m/s
Wind direction	296. deg
Mixing height	1590. m

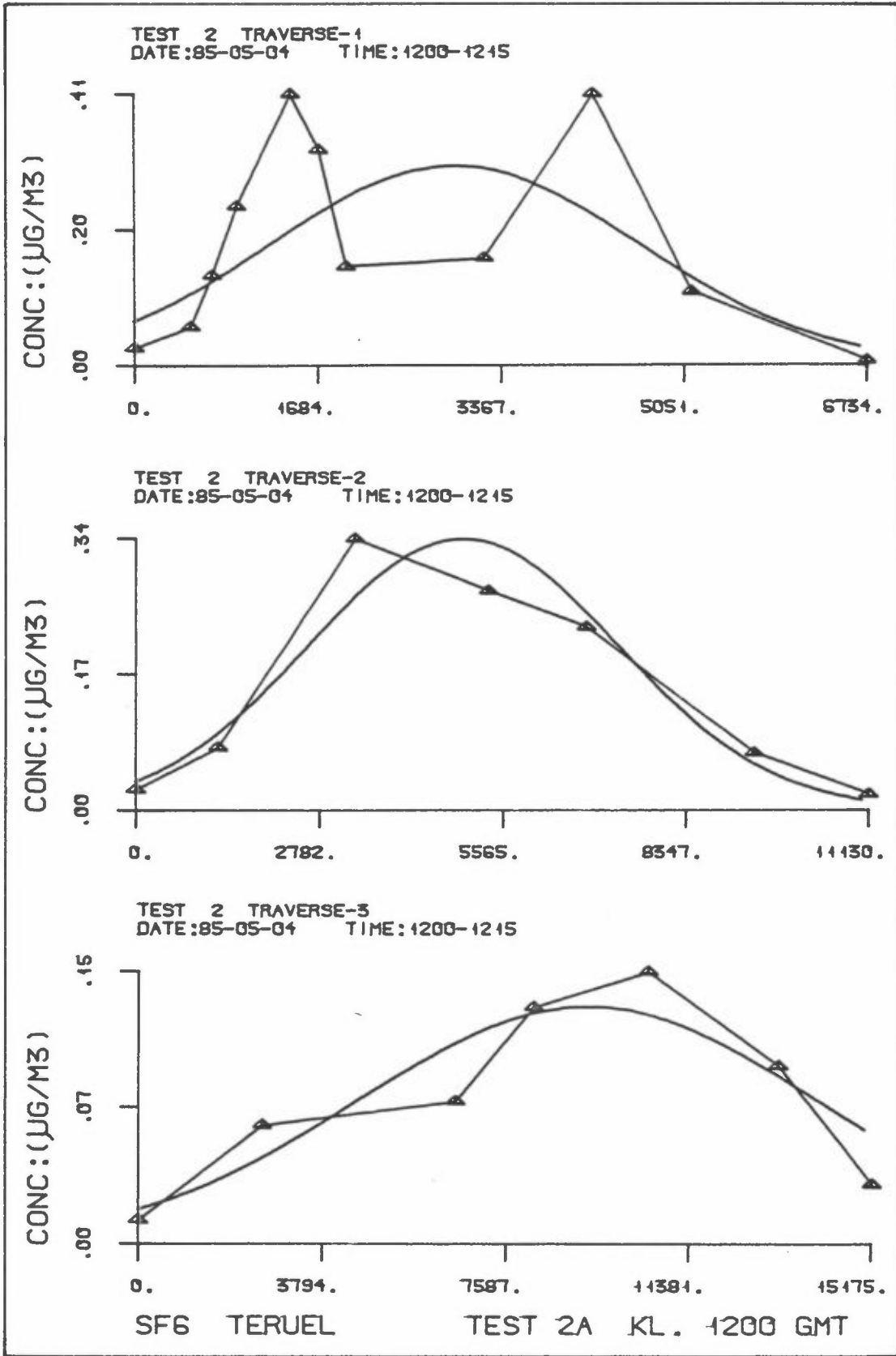


Figure 7a: Concentrations along traverse 1-3, test 2A.

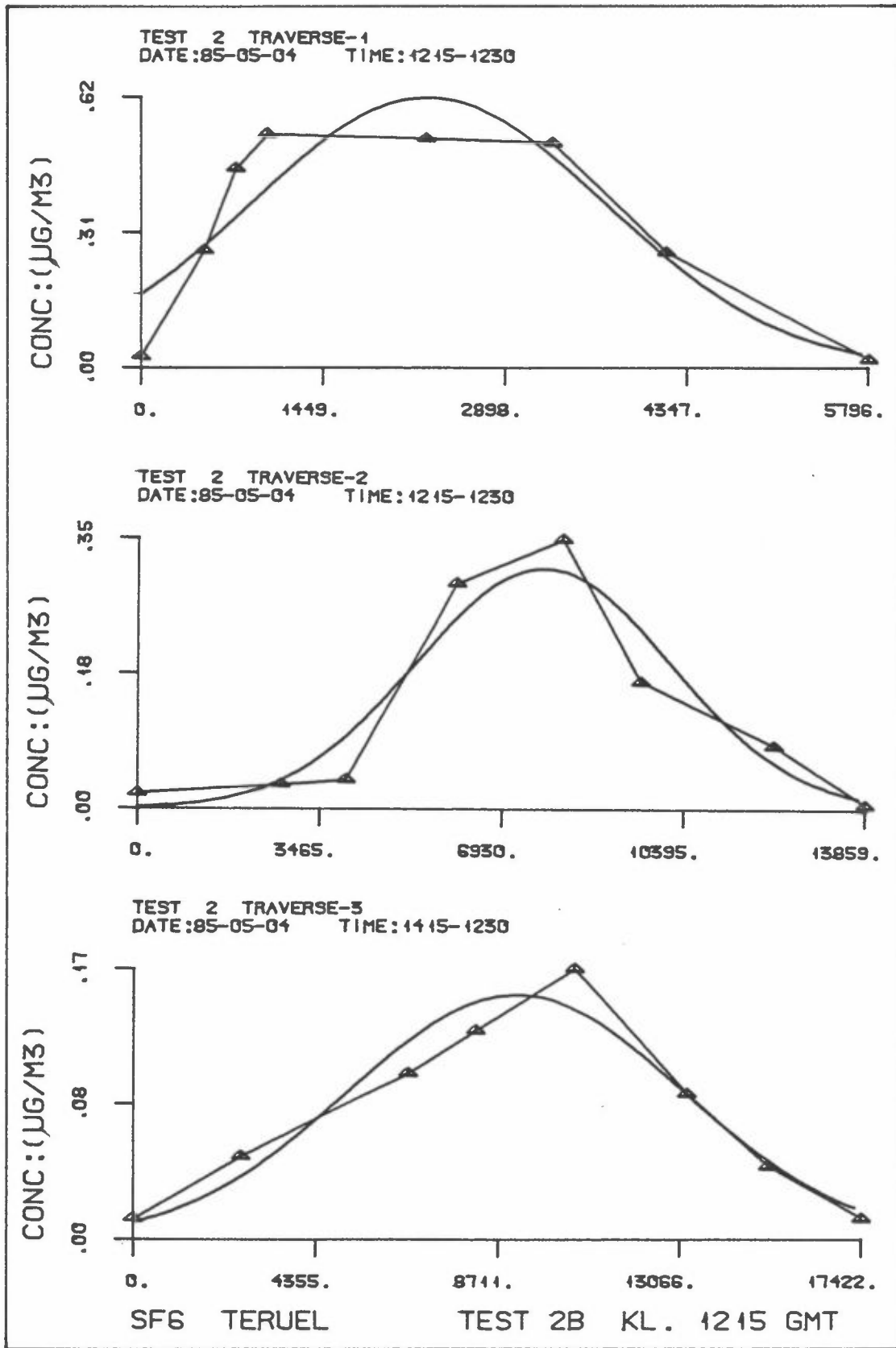


Figure 7b: Concentrations along traverse 1-3, test 2B.

4.3 EXPERIMENT 4, DATE: 1985-05-05, START TIME: 12:00 GMT

Two sequential SF<sub>6</sub>-concentration samples were collected; 4A and 4B. Figure 8 show the concentrations from test 4A, and further information from traverse 1-3 are given in figure 9.

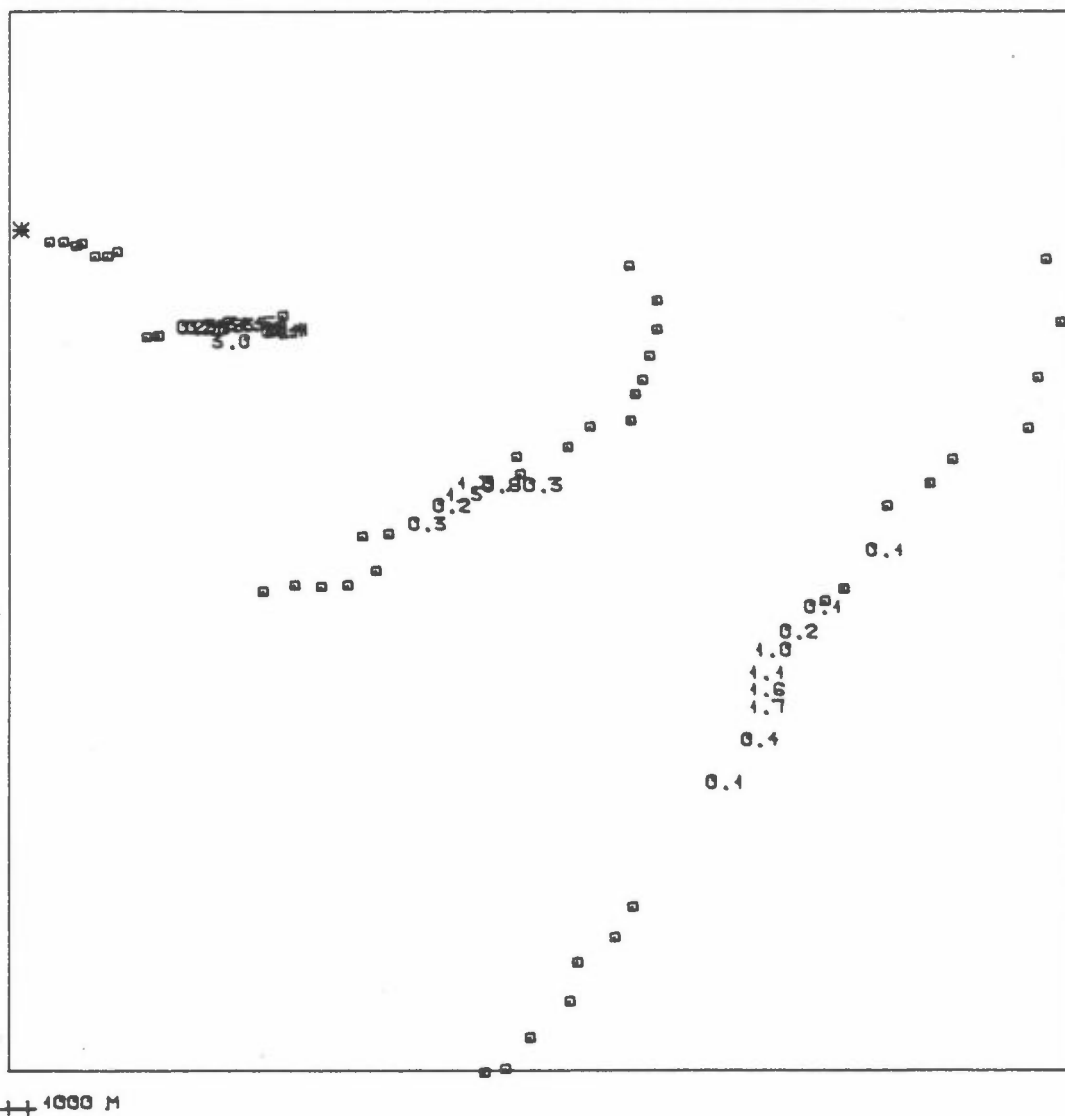


Figure 8: SF<sub>6</sub>-concentrations from test 4A.

Concentration unit:	0.1 μg/m <sup>3</sup>
Release rate	10.0 g/s
Wind velocity	20.0 m/s
Wind direction	290. deg
Mixing height	1450. m

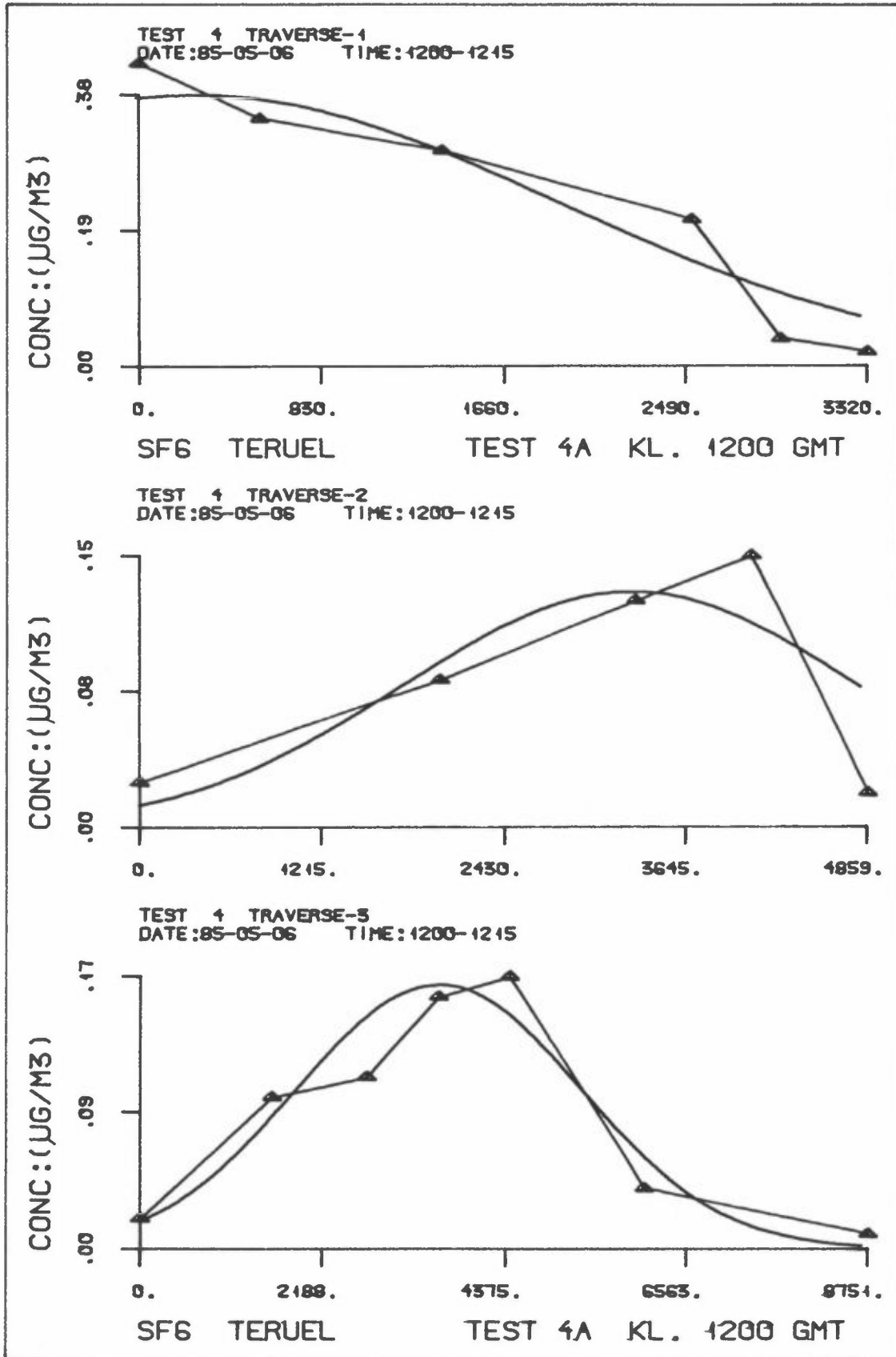


Figure 9a: Concentrations along traverse 1-3, test 4A.

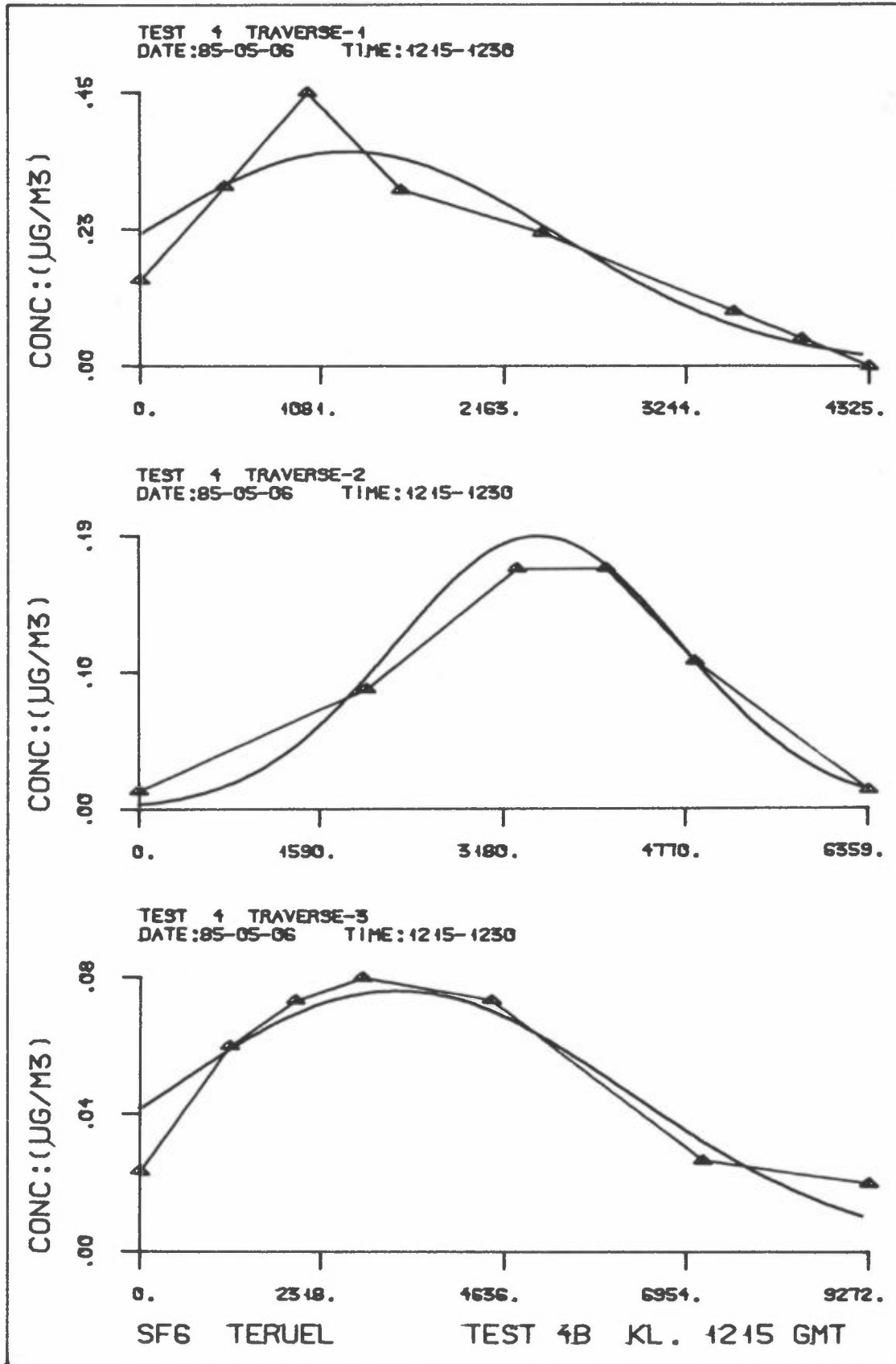


Figure 9b: Concentrations along traverse 1-3, test 4B.

4.4 EXPERIMENT 5, DATE: 1985-05-06, START TIME: 12:00 GMT

Two SF<sub>6</sub> samples were collected during experiments 5, 5A and 5B. Figure 10 shows concentrations from test 5A. Further information from traverse 1-3 are given in figure 11.

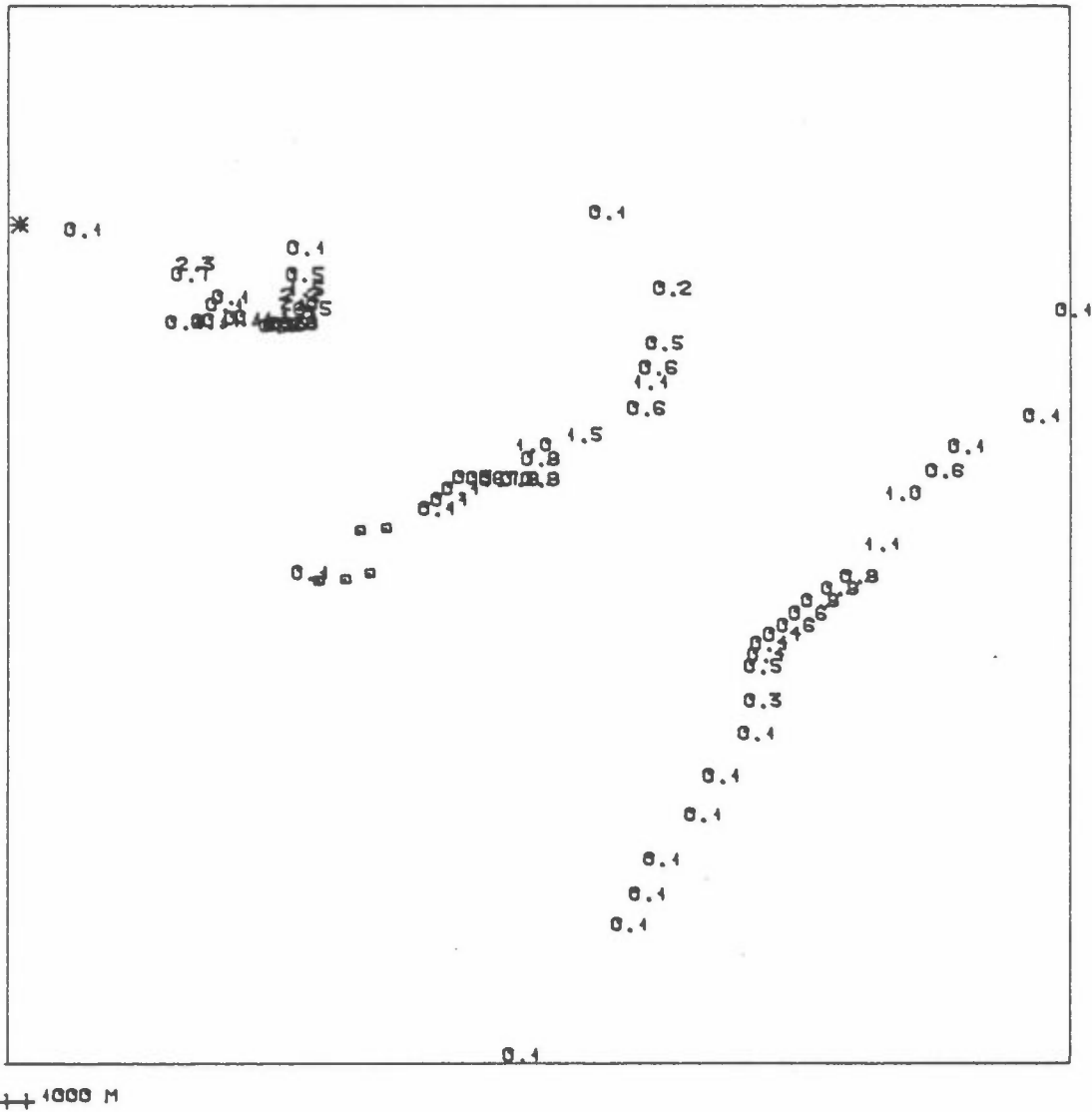


Figure 10: The figure shows SF<sub>6</sub>-concentration from test 5A.

Concentration unit:	0.1 μg/m <sup>3</sup> .
Release rate	9.5 g/s
Wind velocity	17.0 m/s
Wind direction	284. deg
Mixing height	1050. m

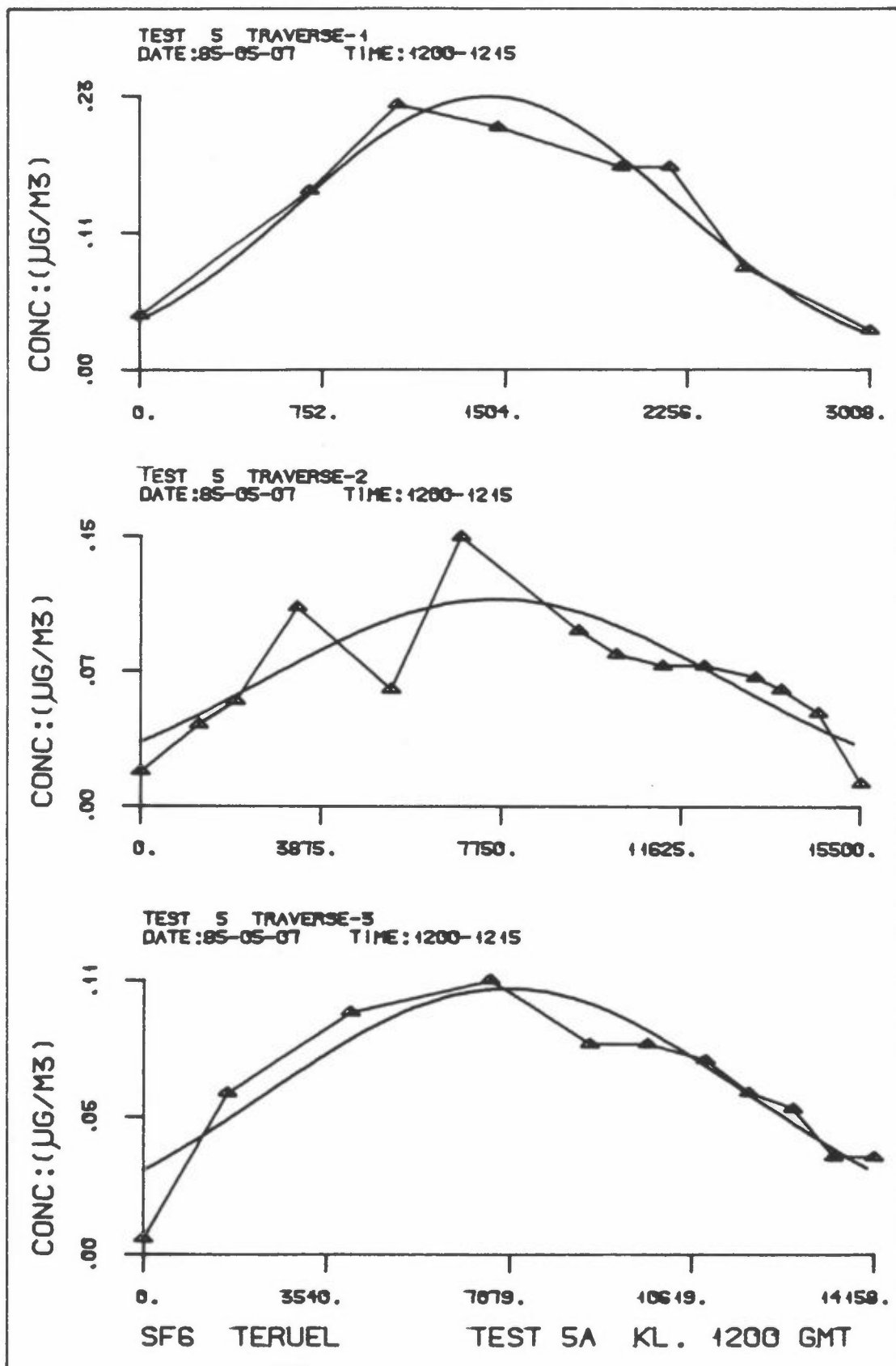


Figure 11A: Concentrations along traverse 1-3, test 5A.



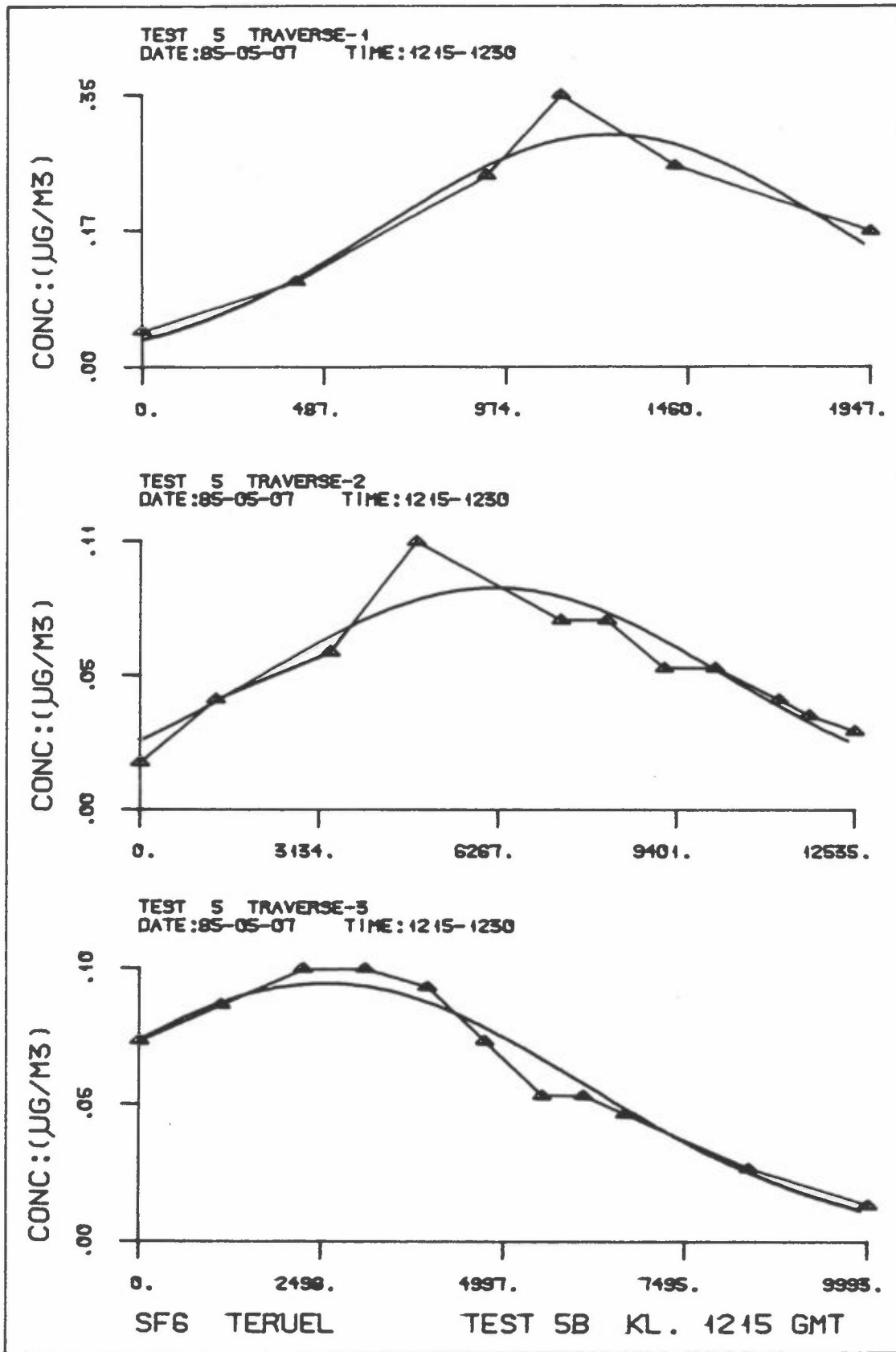


Figure 11b: Concentrations along traverse 1-3, test 5B.

4.5 EXPERIMENT 6, DATE: 1985-05-08, START TIME: 12:00 GMT

Two sequential SF<sub>6</sub> samples were collected; 6A and 6B. Figure 12 shows concentrations from test 6A. During experiment 6 the plume centerline position changed (meandering) from the first SF<sub>6</sub> sample (test 6A) to the second (test 6B). This is illustrated in Figure 13. Figure 14 show an example of instantaneous SF<sub>6</sub> sampler collected with a mobile SF<sub>6</sub> sampler along traverse 1 (AB). This mobile van was always sampling prior to the time integrated sampling to obtain information about the SF<sub>6</sub>-plume location.

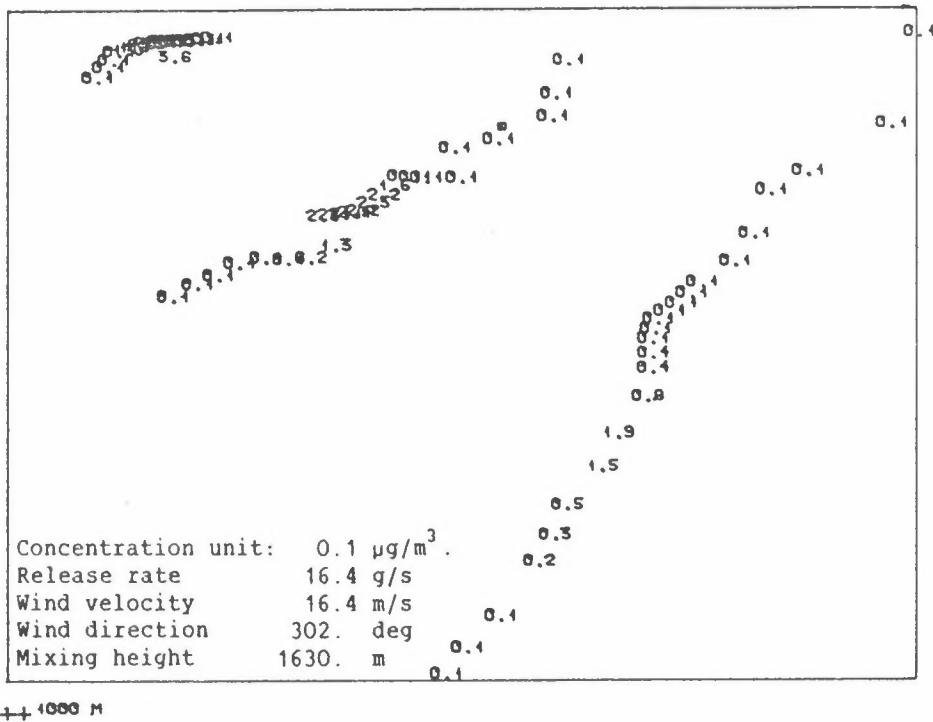


Figure 12: SF<sub>6</sub>-concentrations from test 6A.

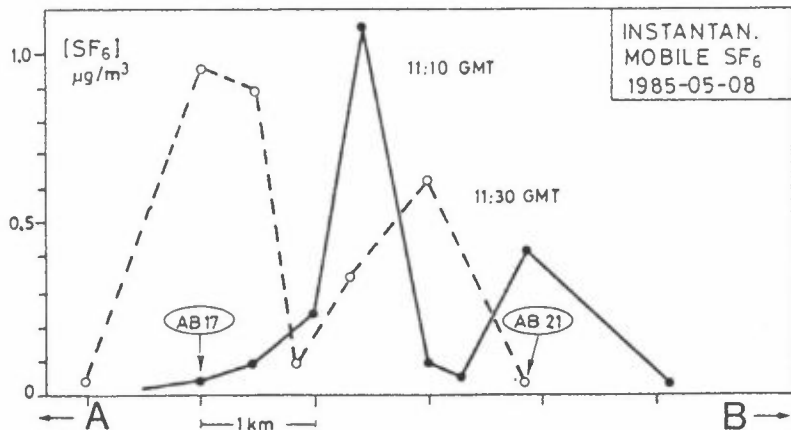


Figure 13: Instantaneous SF<sub>6</sub> samples collected along traverse 1 (AB) at 11:10-11:30 GMT.

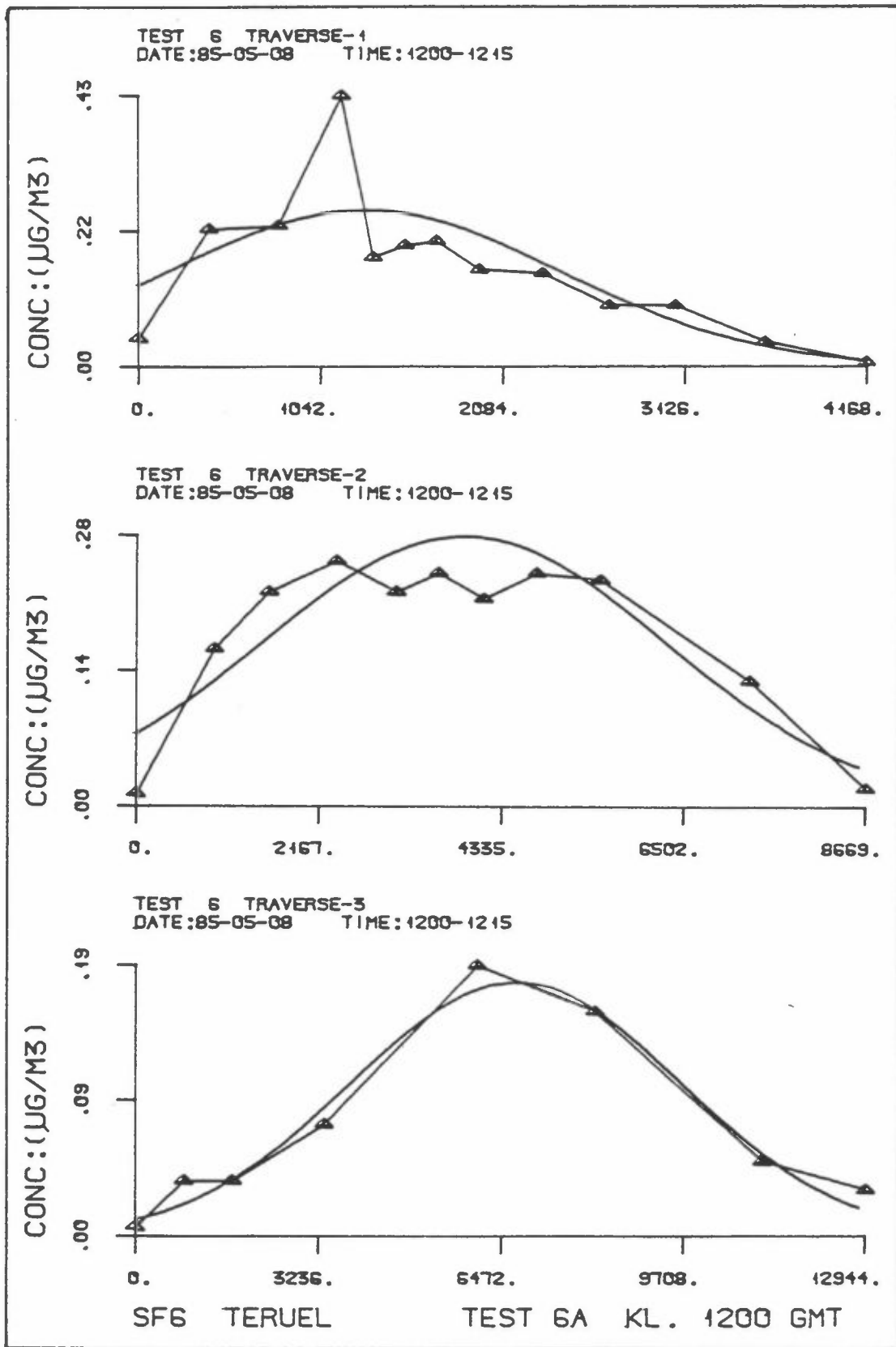


Figure 14A: Concentrations along traverse 1-3, test 6A

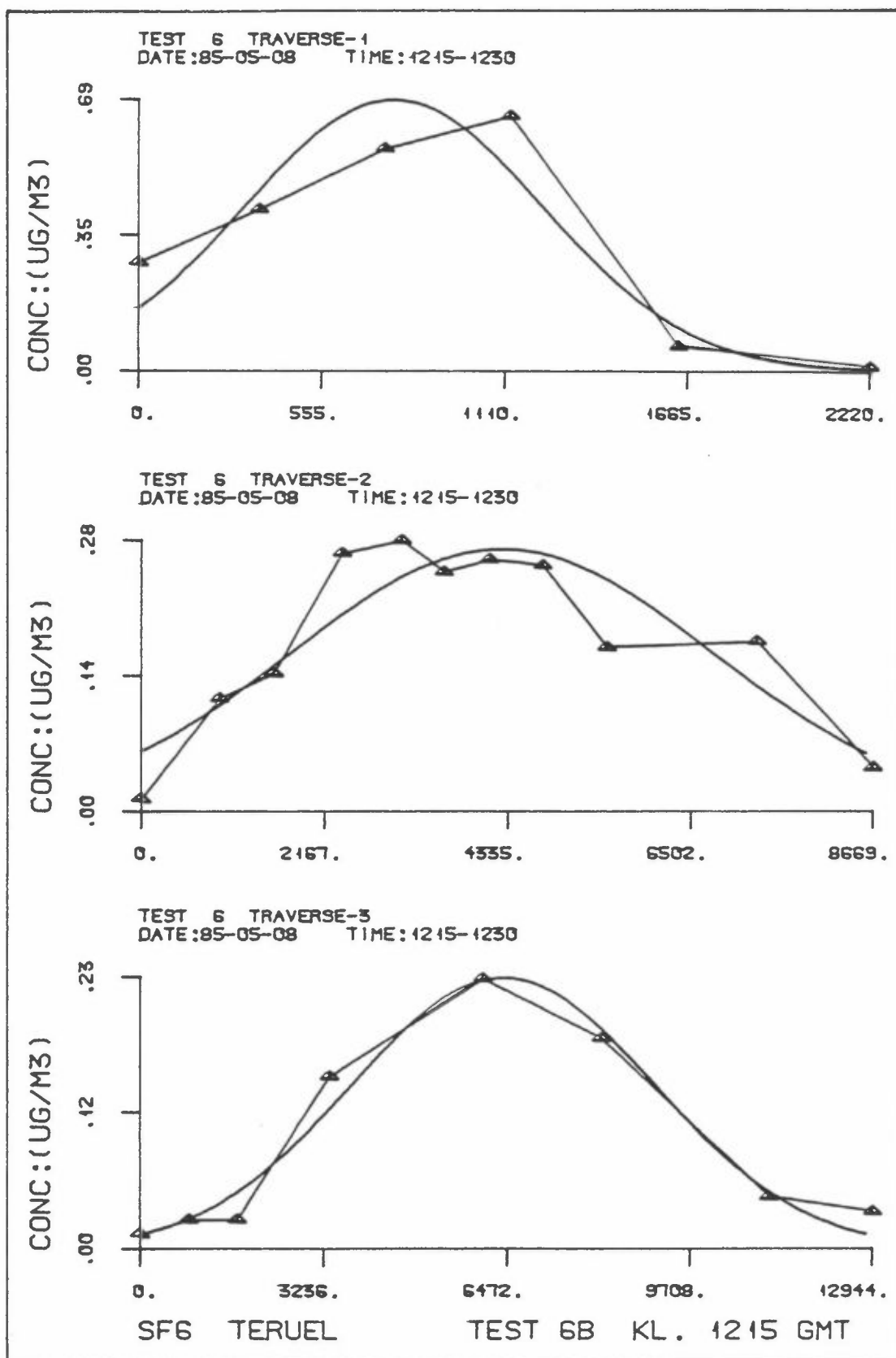


Figure 14B: Concentrations along traverse 1-3, test 6B

4.6 EXPERIMENT 7, DATE: 1985-05-09, START TIME: 12:00 GMT

Two sequential SF<sub>6</sub> tracer samples were collected; 7A and 7B. Figure 15 shows concentrations from test 7A. Further information from traverse 1-3 are given in Figure 16. During experiment 7, SF<sub>6</sub> was also detected on traverse GH (4) as instantaneous samples. These concentrations are shown in Figure 17.

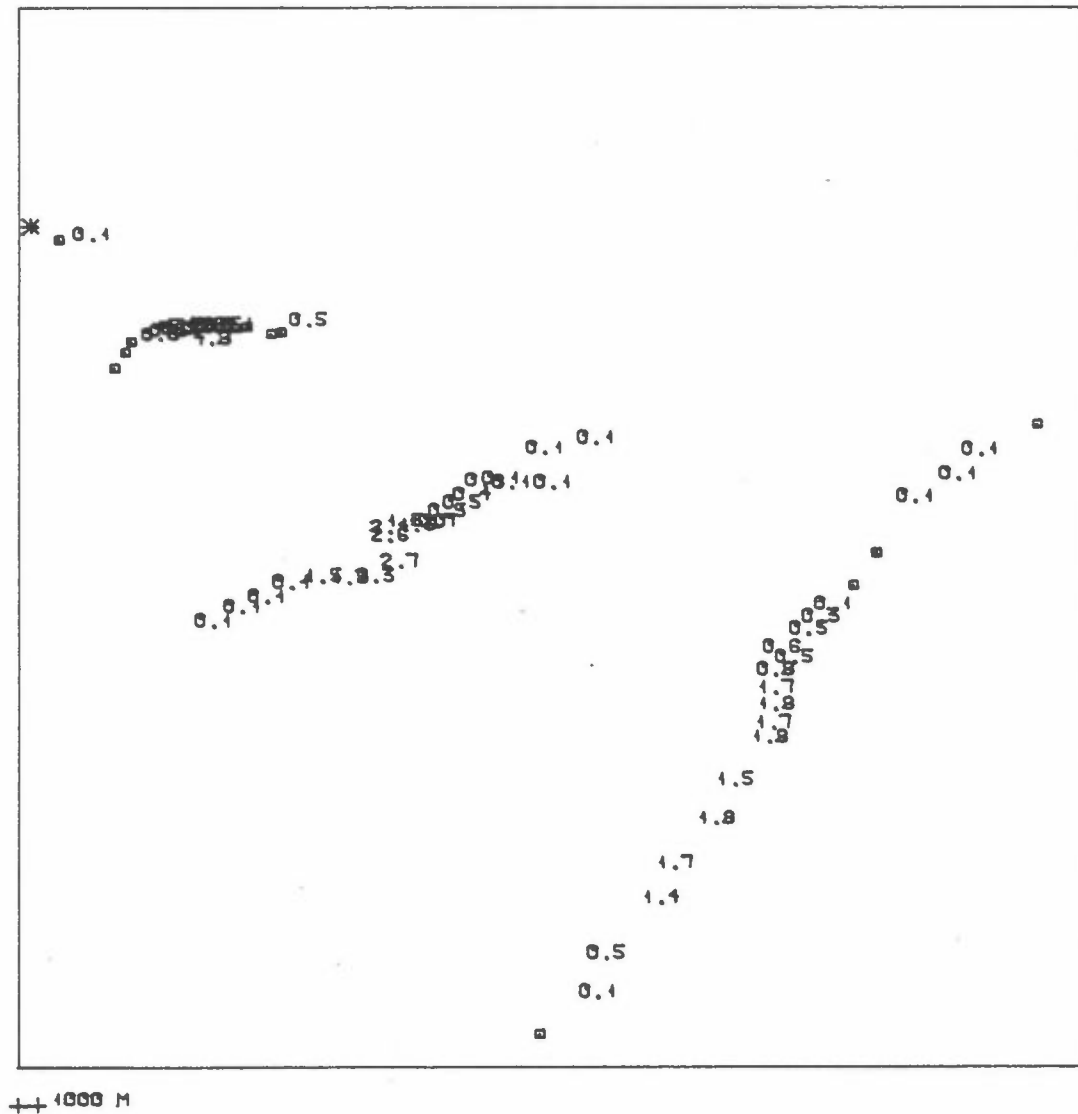


Figure 15: SF<sub>6</sub>-concentrations from test 7A.

Concentration unit:	0.1 µg/m <sup>3</sup> .
Release rate	15.0 g/s
Wind velocity	11.9 m/s
Wind direction	314. deg
Mixing height	900. m

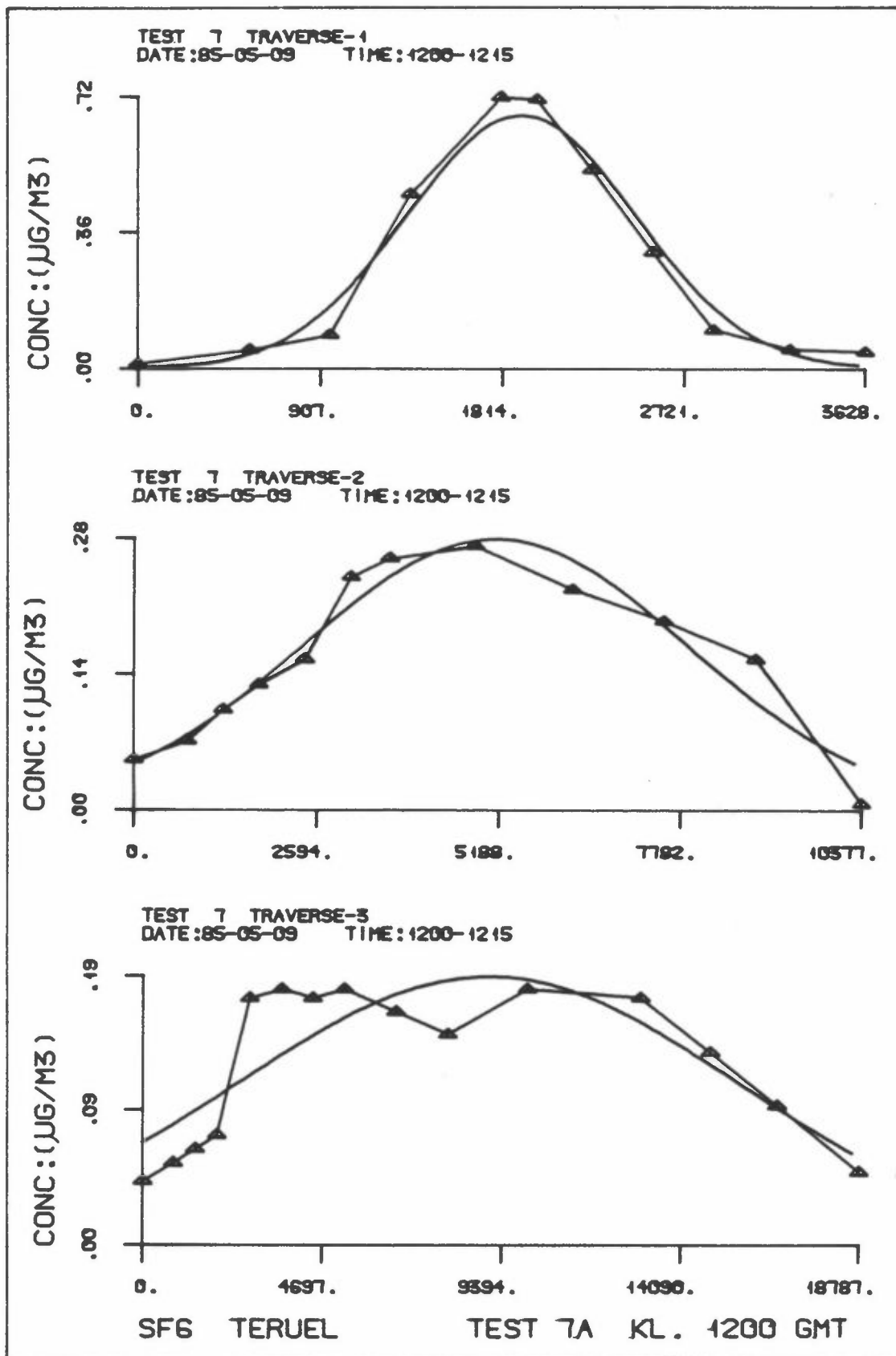


Figure 16a: Concentrations along traverse 1-3, test 7A.

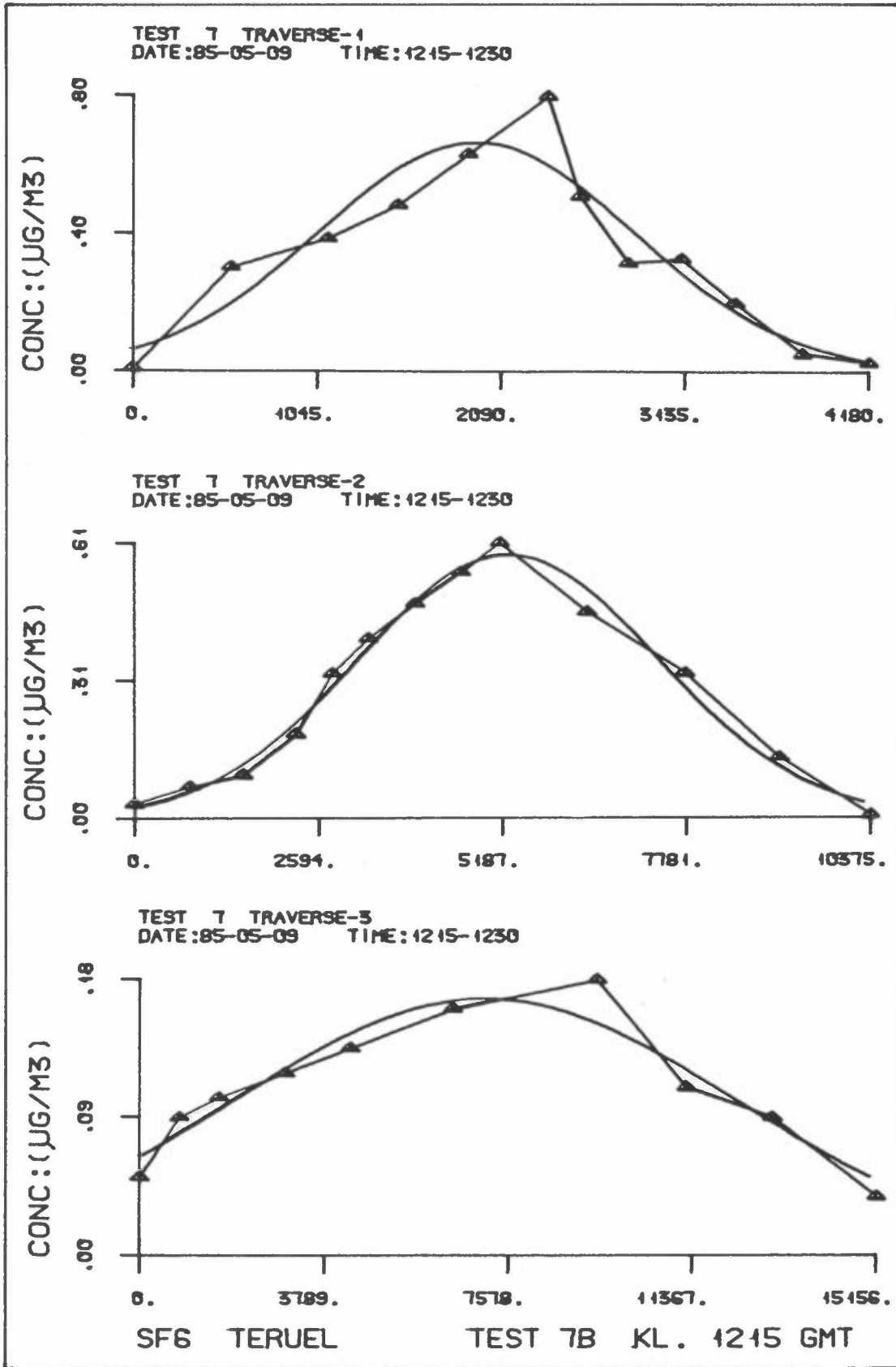


Figure 16b: Concentrations along traverse 1-3, test 7B.

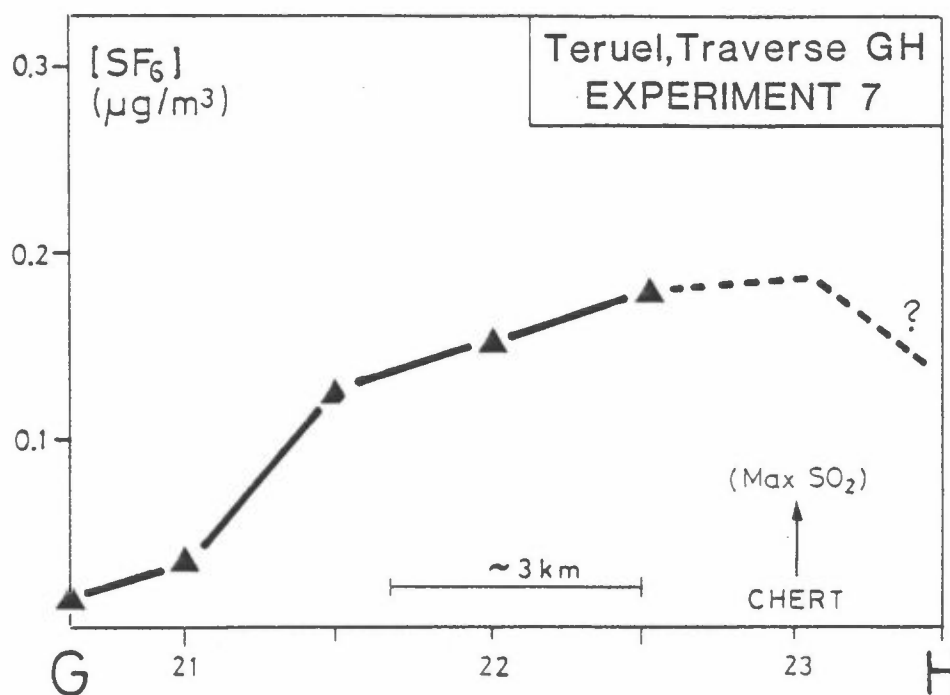


Figure 17: Instantaneous SF<sub>6</sub>-concentrations collected along traverse GH at 12:30 to 13:00 GMT during experiment 7.



4.7 EXPERIMENT 8, DATE: 1985-05-10, START TIME: 15:00 GMT

Two sequential  $SF_6$  samples were collected; 8A and 8B. Figure 18 shows concentrations from test 8A. Further information about concentration cross sections from traverse 1-3 are given in Figure 19.

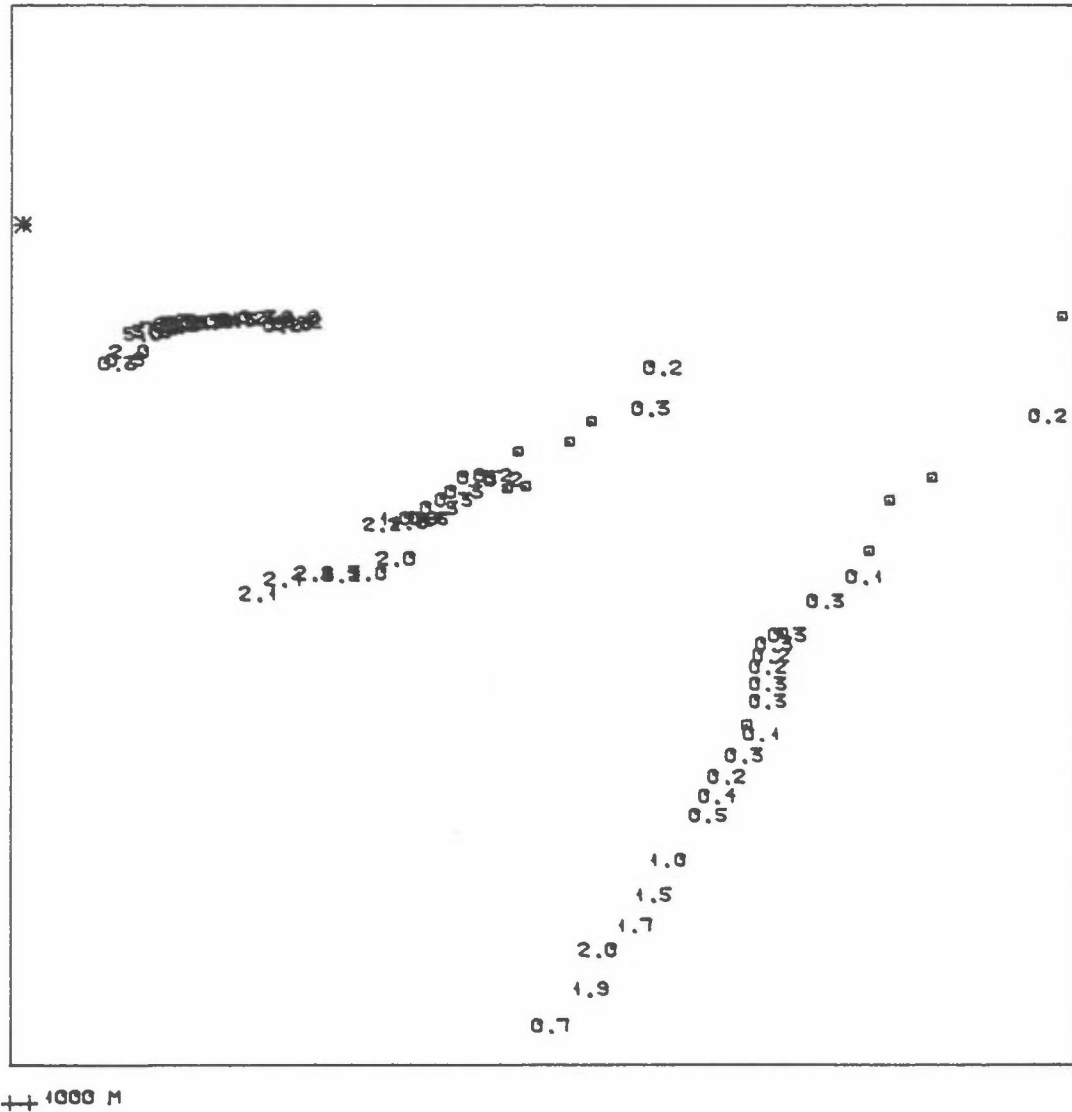


Figure 18: The figure shows  $SF_6$ -concentrations from test 8A.

Concentration unit:	0.1 $\mu\text{g}/\text{m}^3$ .
Release rate	14.8 g/s
Wind velocity	10.4 m/s
Wind direction	315. deg
Mixing height	2700. m

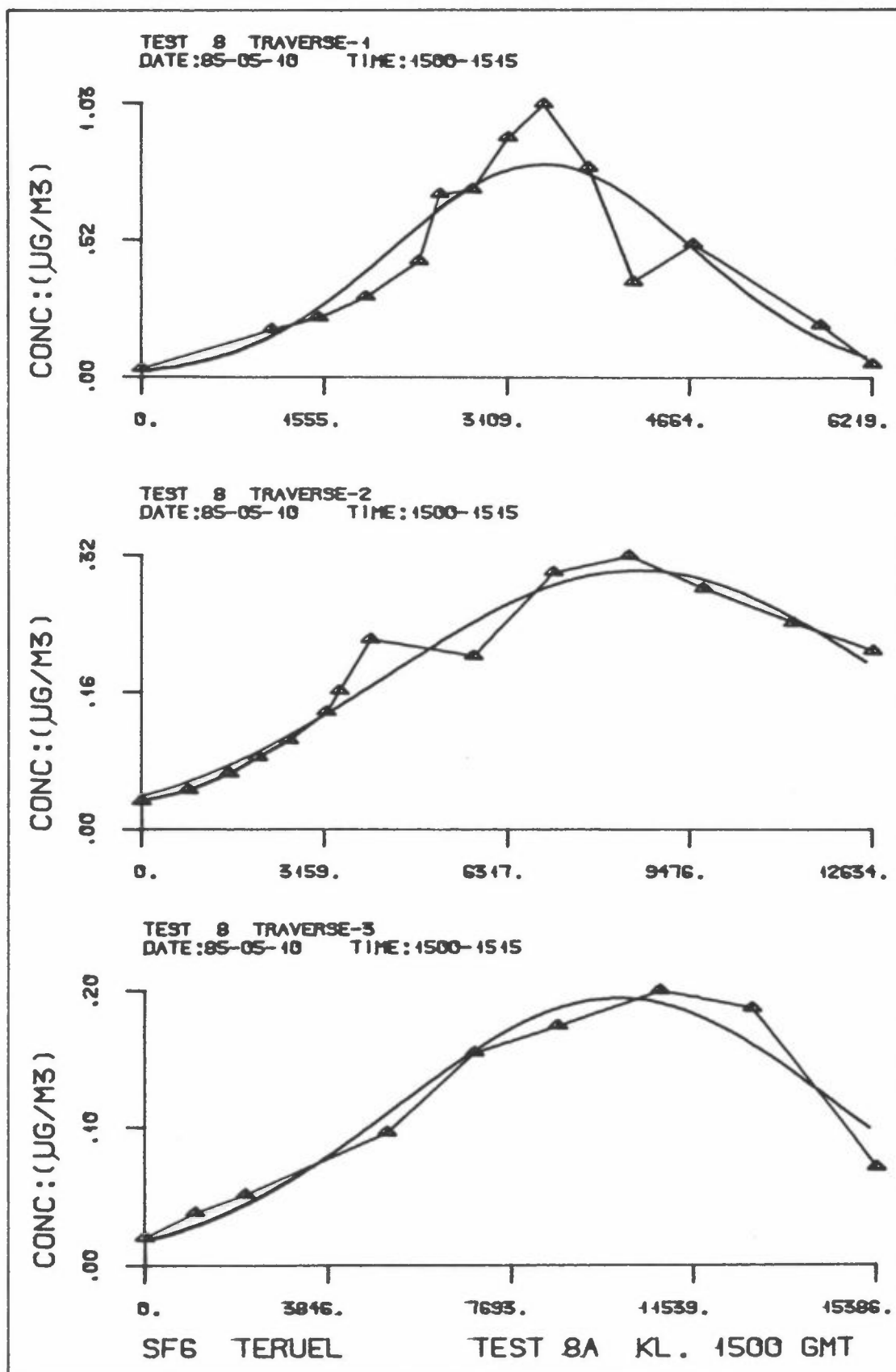


Figure 19a: Concentrations along traverse 1-3, test 8A.

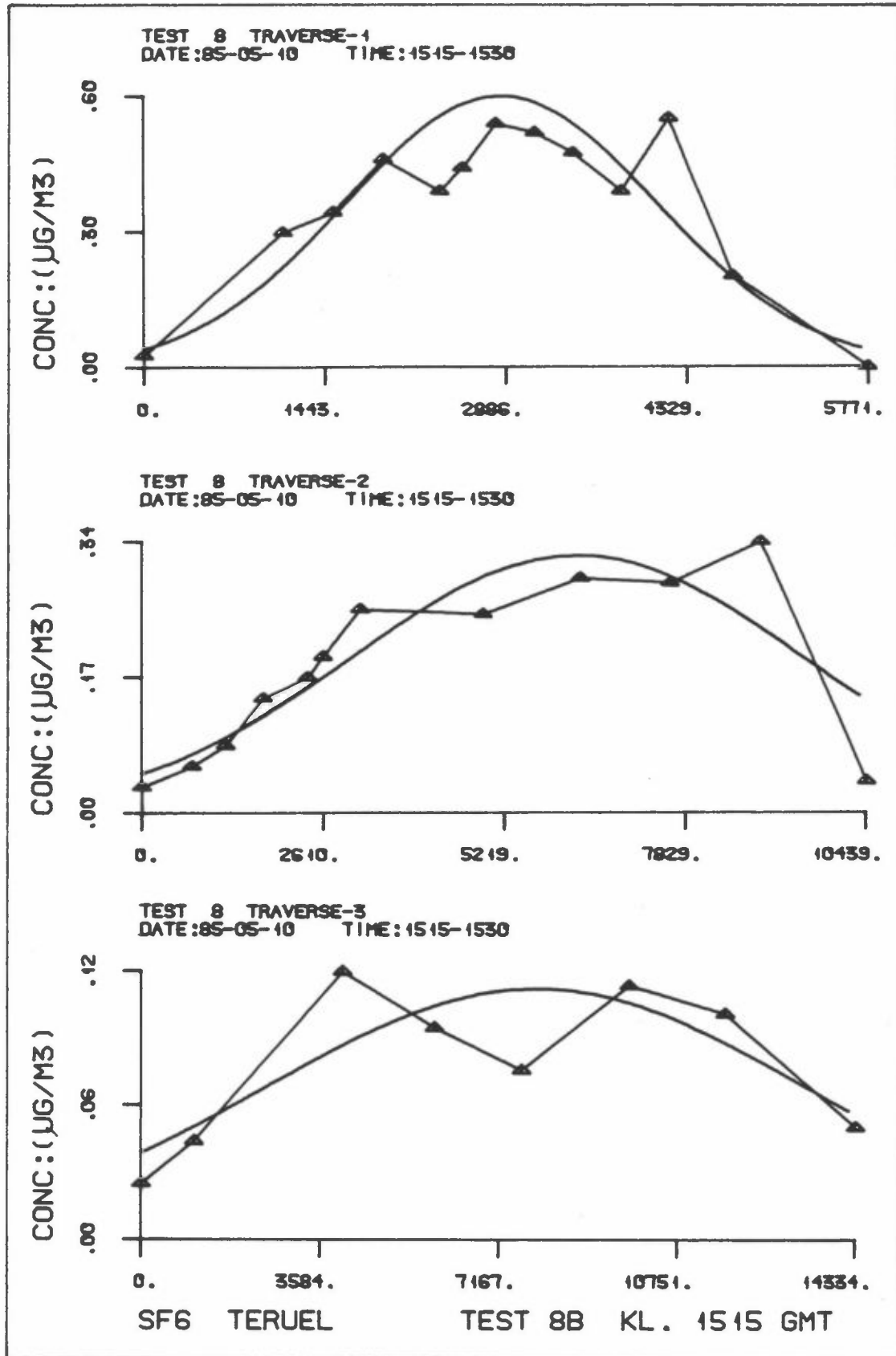


Figure 19b: Concentrations along traverse 1-3, test 8B.

4.8 EXPERIMENT 9, DATE: 1985-05-11, START TIME: 11:00 GMT

Two sequential  $\text{SF}_6$  samples were collected during experiment 9, test 9A and 9B. Figure 20 shows concentrations from test 9A.  $\text{SF}_6$ -concentrations collected along traverse 1 (AB) is shown for the two sequential 15 minute average samples in Figure 21.

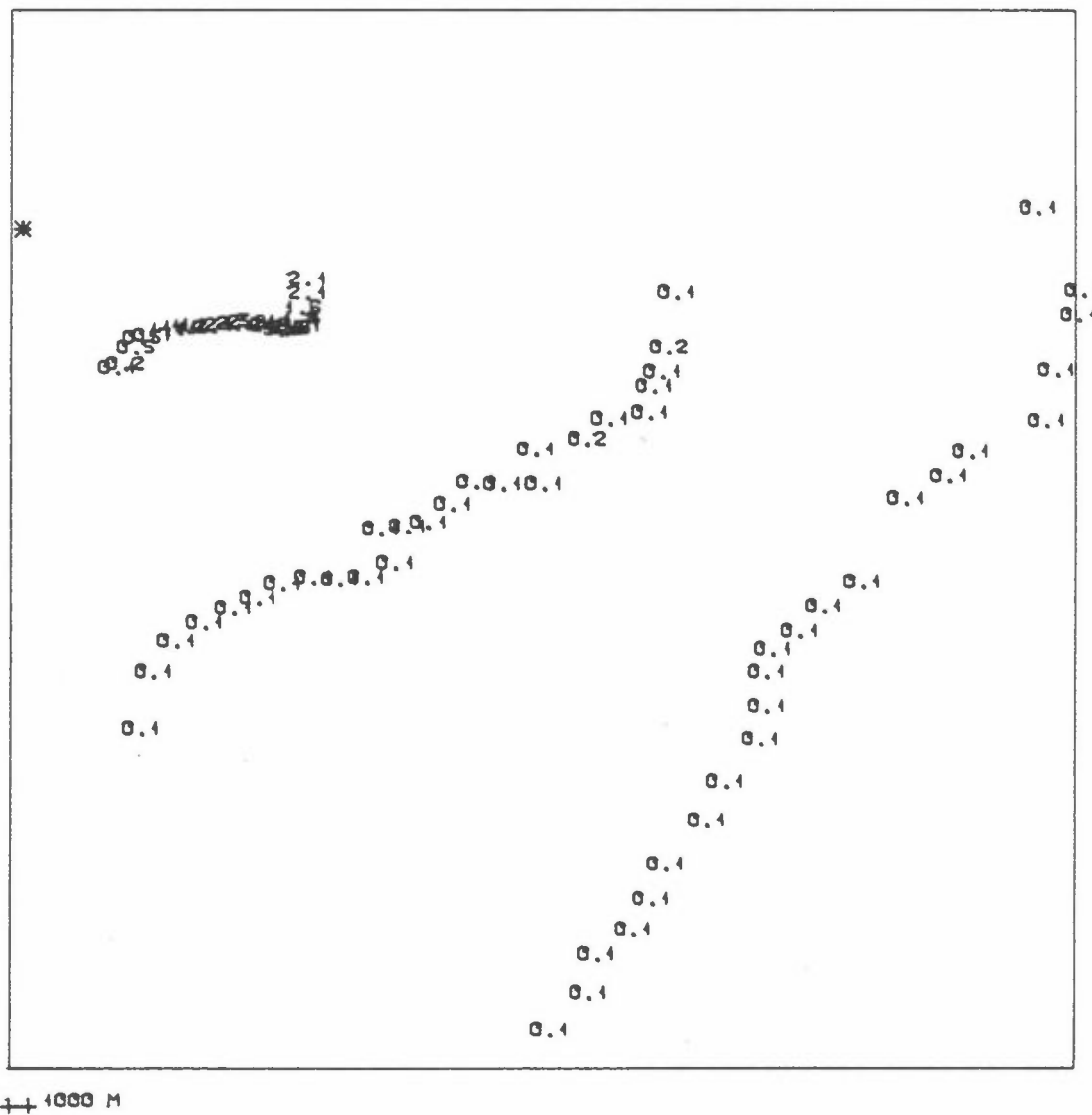


Figure 20:  $\text{SF}_6$ -concentrations from test 9A.

Concentration unit:	0.1 $\mu\text{g}/\text{m}^3$ .
Release rate	10.0 g/s
Wind velocity	2.2 m/s
Wind direction	296. deg
Mixing height	2100. m

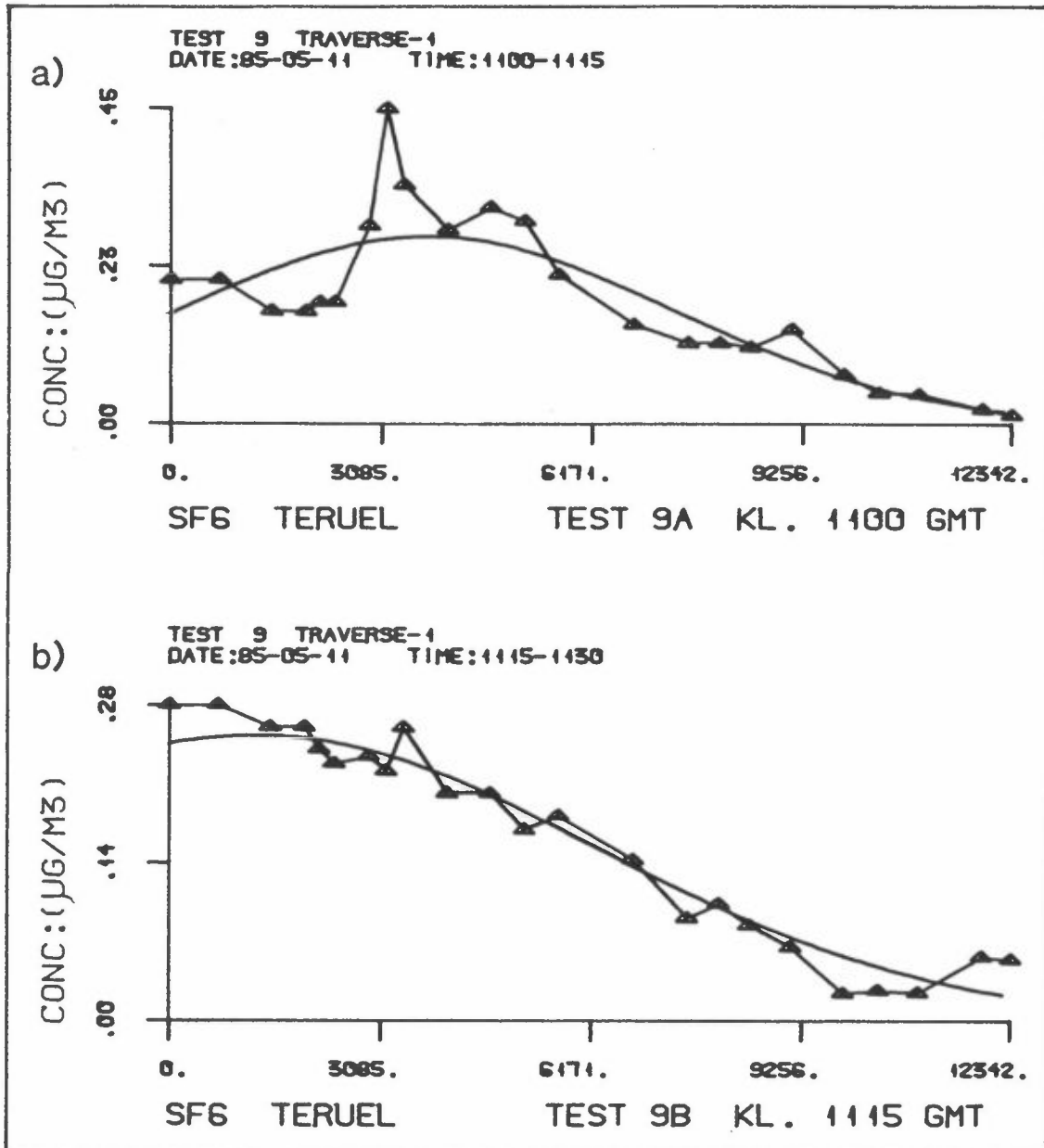


Figure 21: Concentrations along traverse 1 (AB)

a) Sampling time 11:00-11:15 GMT

b) Sampling time 11:15-11:30 GMT

## 4.9 EXPERIMENT 10, DATE: 1985-05-13, START TIME: 12:00 GMT

Two sequential SF<sub>6</sub> samples were collected; 10A and 10B. Figure 22 shows concentrations from test 10A. SF<sub>6</sub> plume cross sections are shown in Figure 23.

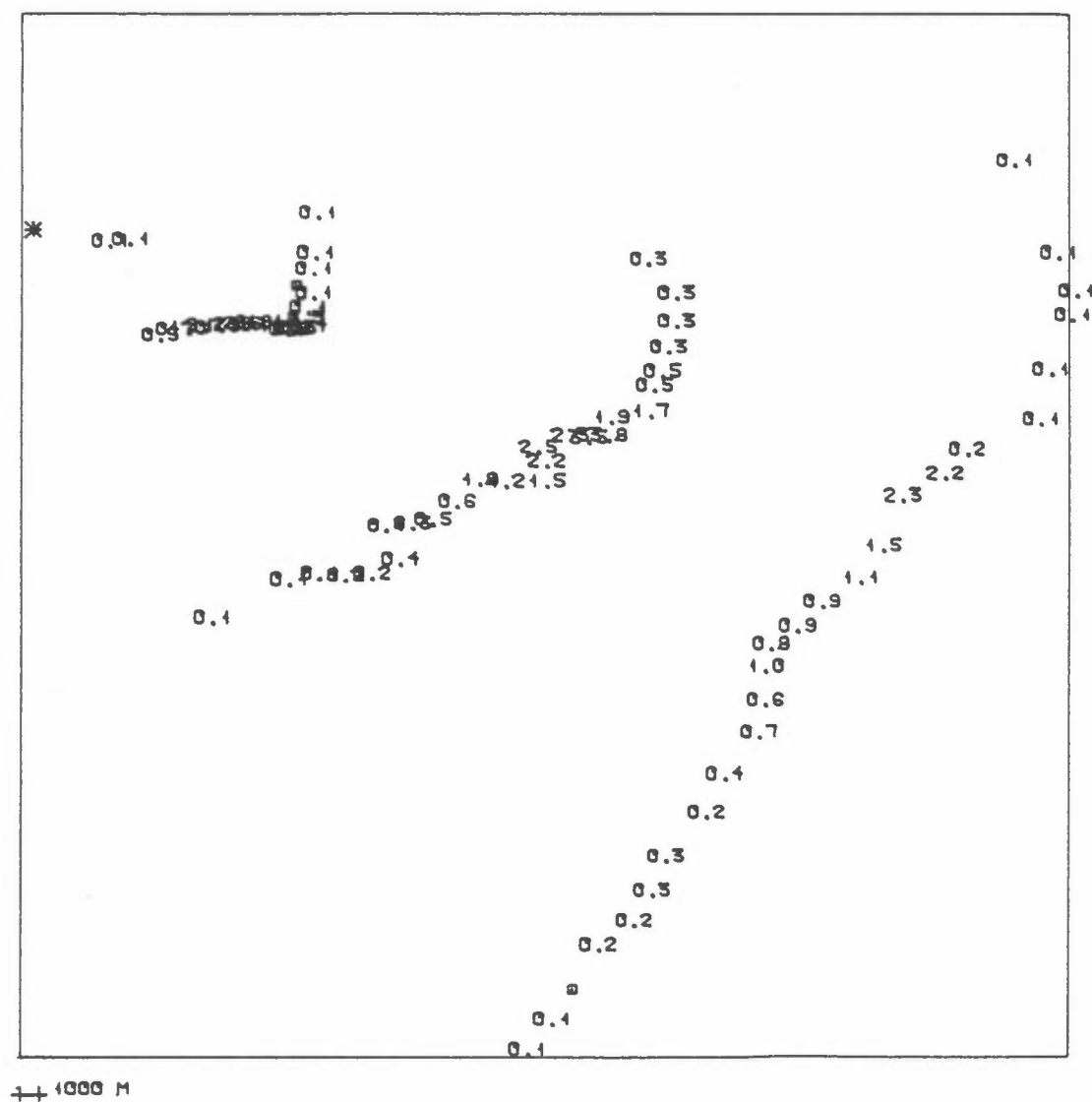


Figure 22: SF<sub>6</sub>-concentrations from test 10A.

Concentration unit:	0.1 µg/m <sup>3</sup> .
Release rate	13.5 g/s
Wind velocity	4.9 m/s
Wind direction	286. deg
Mixing height	1510. m

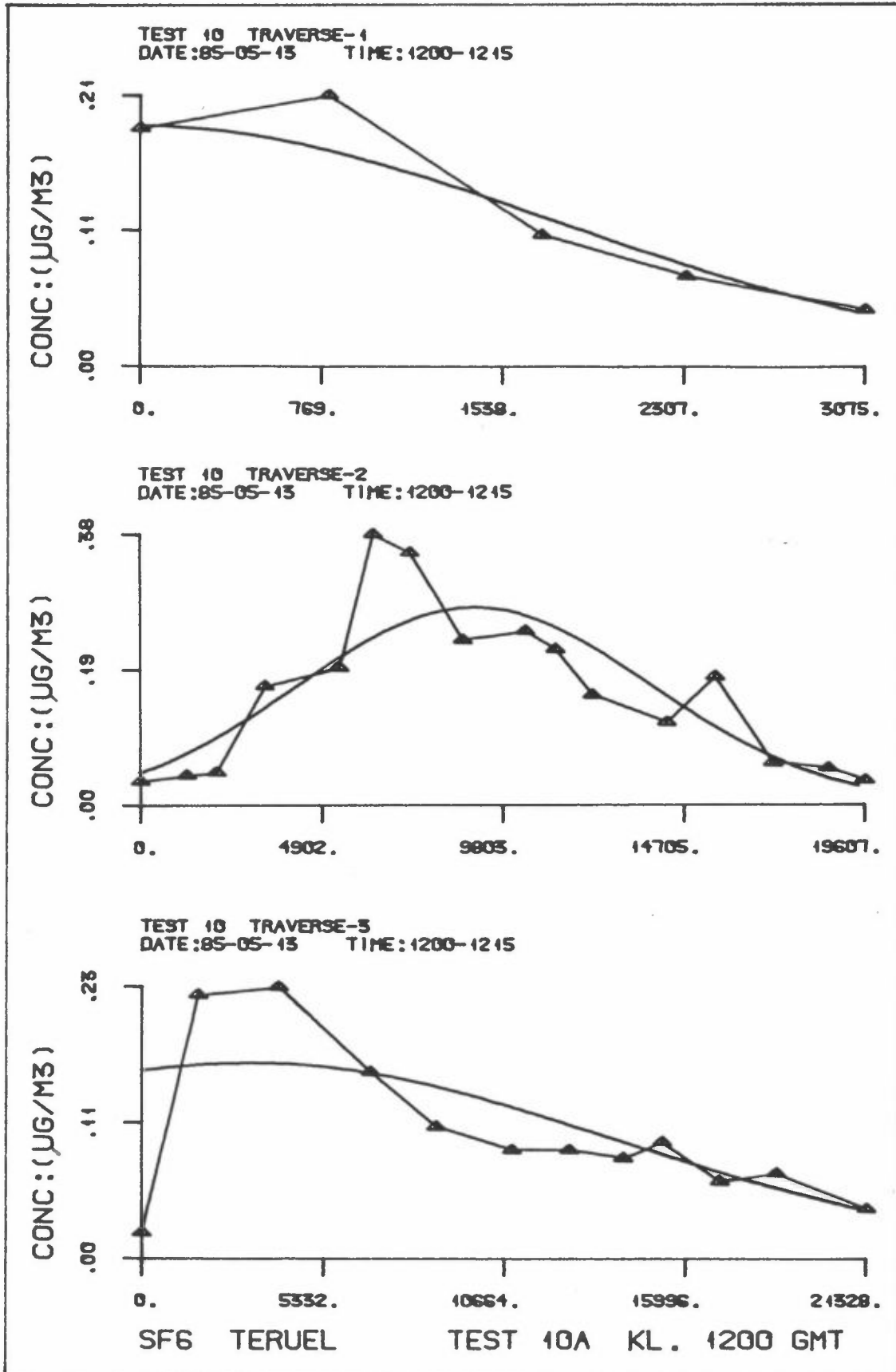


Figure 23a: Concentrations along traverse 1-3, test 10A.

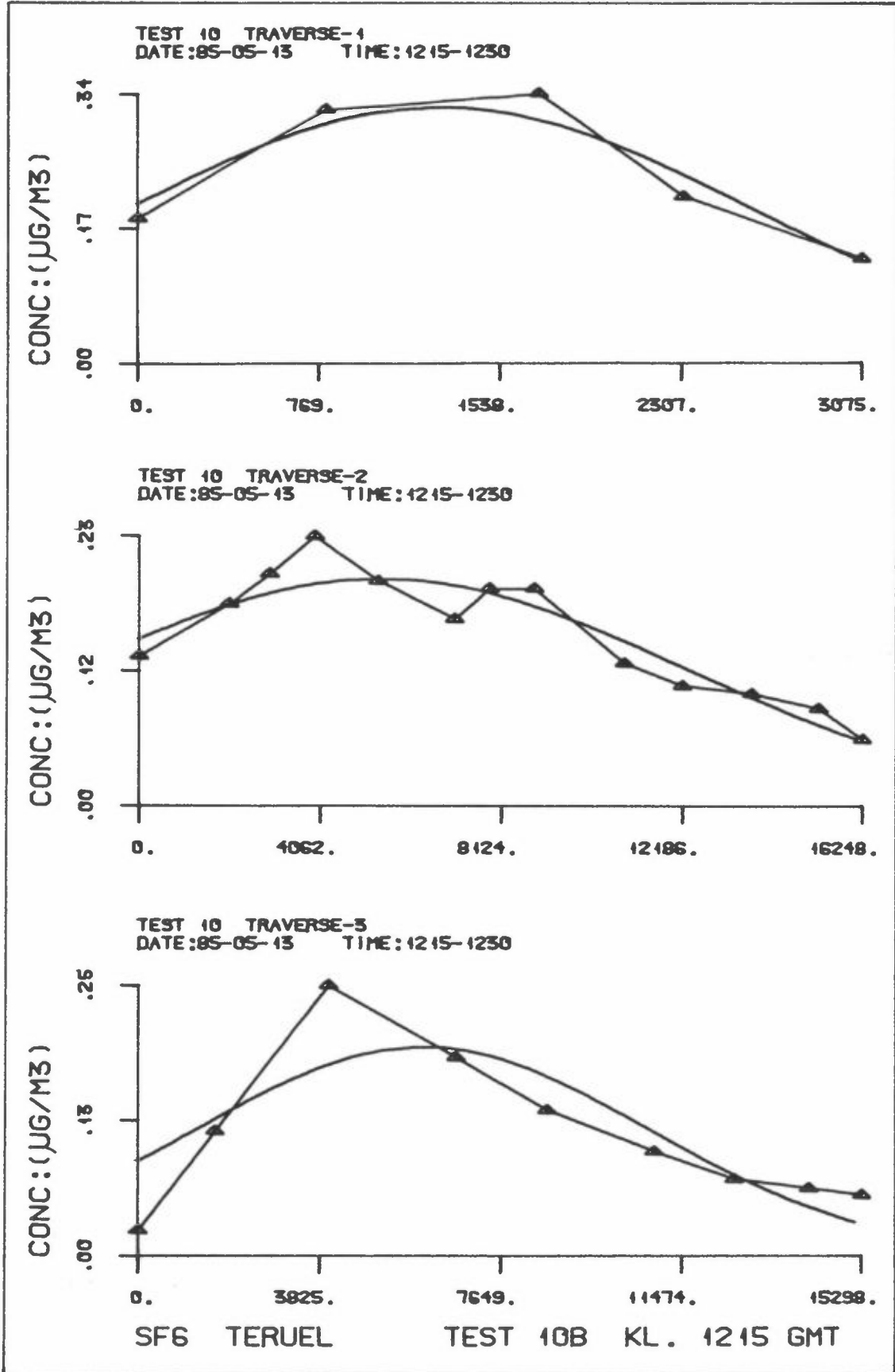


Figure 23b: Concentrations along traverse 1-3, test 10B.





## 5 DISCUSSION

SF<sub>6</sub> was measured as 15 min average concentrations along at least 3 traverses in all 11 experiments carried out from 3 May to 14 May 1985.

A summary of measured maximum concentrations and the position of these are shown in Table 2. The coordinate transformation from AB - CD - EF - GH to the UTM reference system is given in Appendix C.

The maximum SF<sub>6</sub>-concentrations at traverse AB (8-10 km from the source) varied from 0.22 to 1.03 µg/m<sup>3</sup>, at traverse CD from .11 to .61 µg/m<sup>3</sup> and at traverse EF from 0.8 to .28 µg SF<sub>6</sub>/m<sup>3</sup>. The location of these maxima are shown in Figure 2. Further discussions about area of maxima and relations to SO<sub>2</sub>-concentrations are presented in the main report (Sivertsen 1985 b).

Table 2: A summary of maximum SF<sub>6</sub>-concentrations (15 min averages) measured along the traverses and the location of maxima.

Experiment	Start (GMT)	Traverse	First 15 min (SF <sub>6</sub> ) <sub>max</sub> (μg/m <sup>3</sup> )	Position	Second 15 min (SF <sub>6</sub> ) <sub>max</sub> (μg/m <sup>3</sup> )	Position
1	12:00	1	.43	AB18.5	.34	AB20
		2	.43	CD17	.37	CD20
		3	.21	EF15	.28*	EF15+20
2	12:00	1	.41	AB16	.54	AB14
		2	.34	CD10	.35	CD11
		3	.15	EF10	.17	EF10
4	12:00	1	.43	AB16	.45	AB16
		2	.15	CD16.5	.17	CD16.5
		3	.17	EF17	.08	EF17
5	12:00	1	.22	AB8	.35	CD12
		2	.15	CD12	.11	CD12
		3	.11	EF11	.10	EF13.3
6	12:00	1	.43	AB18.5	.65	AB21
		2	.25*	CD17	.28	CD18
		3	.19	EF19	.23	EF19
7	12:00	1	.72	AB17.5	.80	AB17.5
		2	.27	CD20.5	.61	CD20
		3	.18*	EF17-20	.18	EF21
		4	.17	GH23	← instant.	
8	15:00	1	1.03	AB20	.55	AB21
		2	.32	CD23	.34	CD24
		3	.20	EF24	.12	EF21+24
9	11:00	1	.41	AB13.5	.28	AB5
10	12:00	1	.26	AB16	.34	AB19
		2	.38	CD11.5	.26	CD8+12
		3	.23	EF10	.25	EF10
		4	.39*	GH10+14	← instant.	

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*APPENDIX A*

SF<sub>6</sub> TRACER INSTRUMENTATION AND  
EXPERIMENTAL PROCEDURES



### 1 Tracer release systems

The tracer gases are usually released from 10 liters cylinders containing the liquefied gas. Through a reduction valve and a flow-meter the gas release is kept constant at the desired rate.

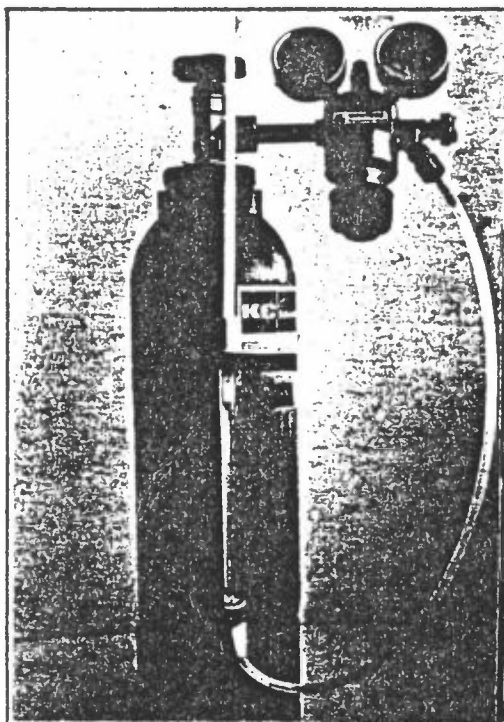


Figure 1: Tracer gas cylinder and gas flow meter.

At high release rates it is often necessary to supply heat to the cylinder to compensate for the heat loss due to evaporation. Syringe-pumps may be used for small gas releases ( $0-10 \text{ cm}^3/\text{min}$ ).

### 2 Sampling systems

Air samples are collected in inexpensive plastic syringes on either instantaneous or time-averaged basis. Time averages are usually taken over 15 minutes with automatic battery powered samplers.



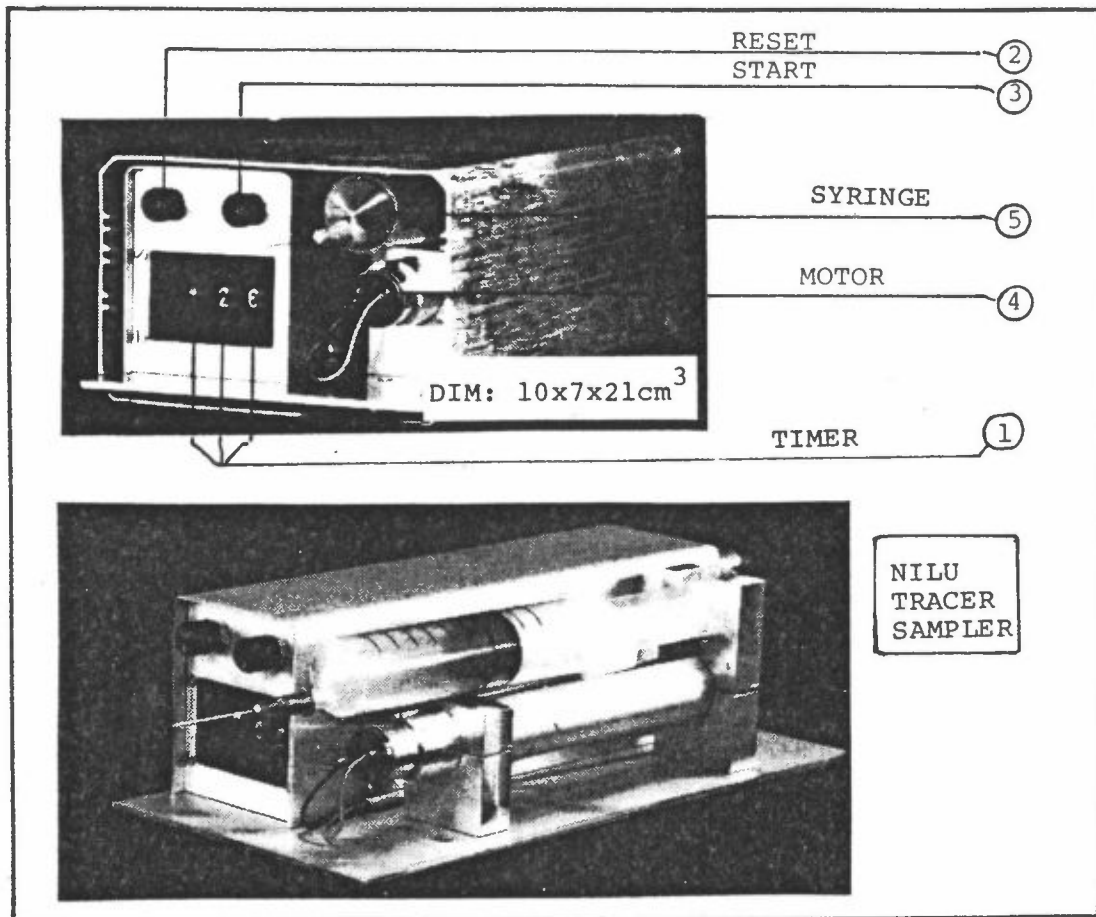


Figure 2: NILU automatic battery powered tracer sampler with electronic timer.

The desired number of automatic samplers are loaded with one syringe each. The air is pulled through a small bore hypodermic needle at the end of each syringe intake to prevent back-diffusion of the sample air. The samplers are programmed to start at a given time, before being put out at the desired location in the test area.

Another automatic sampler has been designed for collecting several instantaneous air samples. Up to 90 samples can be taken at a predetermined interval. The shortest interval is 2 seconds and the sampling time is about 0.5 sec.

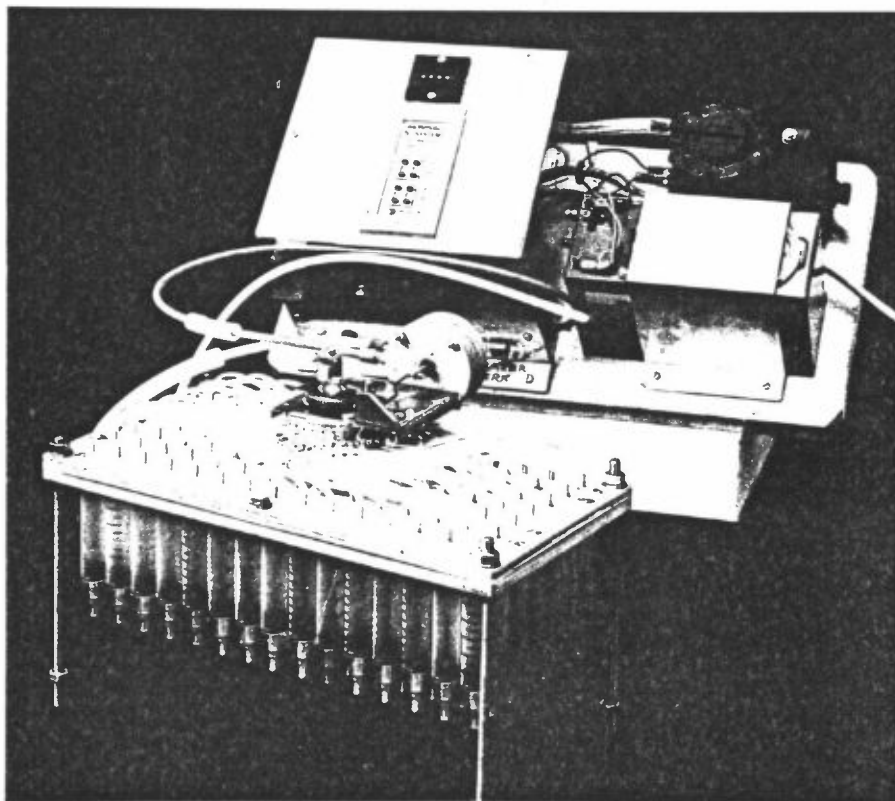


Figure 3: Automatic sequential sampler (0.5 sec averages at preset intervals).

The samples are usually analyzed immediately after each experiment using the portable electron capture gas chromatographs. If the analysis are not carried out within the first few hours, the hypodermic needles on all syringes are exchanged with caps. The simple sampling and analysis methods permit the collection of a large number of samples during a tracer experiment. In a tracer field study, these techniques allow the results of one experiment to be used in the design of succeeding experiments.

### 3 Tracer sample analysis

Air samples are analyzed using electron capture gas chromatography. The analysis and calibration system is shown in Figure 4.

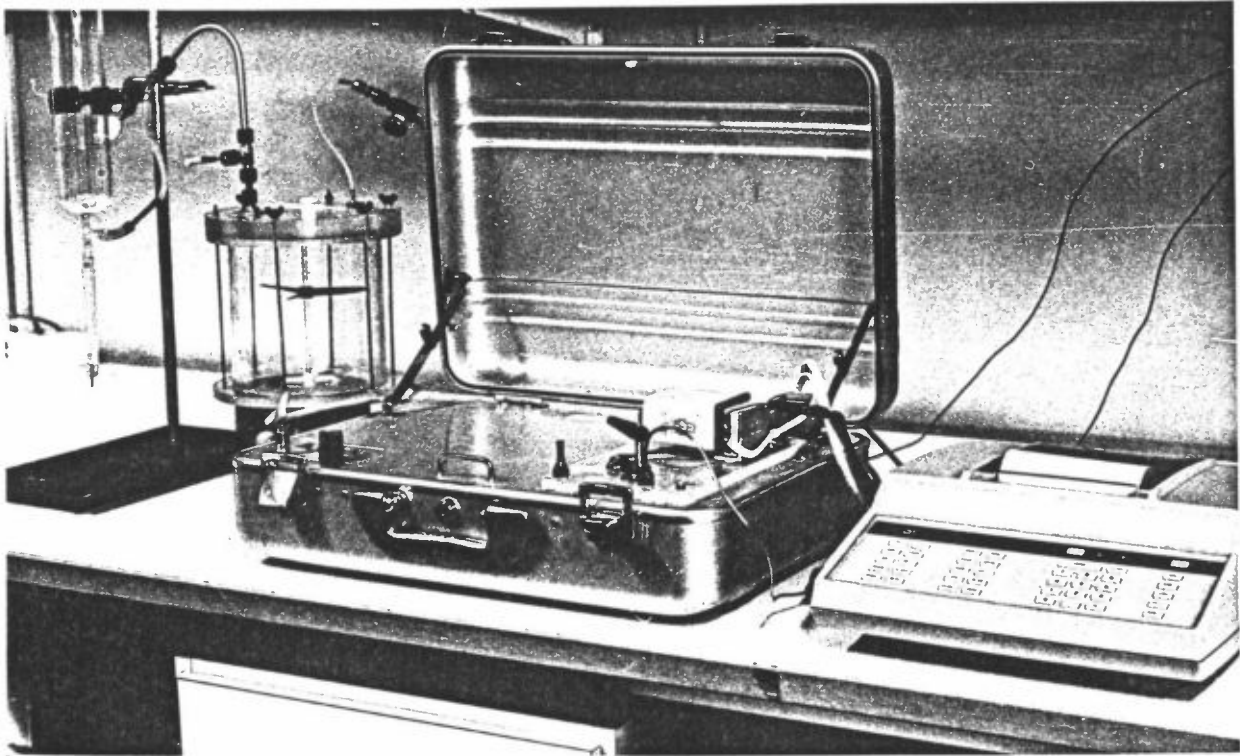


Figure 4: Tracer analysis and calibration system: portable electron capture gas chromatograph, integrator and exponential dilution chamber.

A stainless steel coaxial electron capture detector, electrically insulated with teflon and nylon plugs, is pulsed every 200  $\mu\text{sec}$  with a 1  $\mu\text{sec}$  wide pulse. The radio-active source used is a 200 mCi  $\text{H}^3$  source bonded to a titanium substrate (U.S. Radium Corp., Bloomsberg, Pennsylvania). Analysis for

$\text{SF}_6$  is achieved using a stainless steel column (106 cm x 0.6 cm OD, 0.5 cm ID) packed with 5 A 80-100 mesh Alumina F-1 (Supelco Inc., Crans, Switzerland). Columns are filled with alumina and lightly vibrated before being coiled. The columns are conditioned at  $300^\circ\text{C}$  overnight with  $\text{N}_2$  flowing continuously. Using prepurified  $\text{N}_2$  at  $100\text{ cm}^3/\text{min}$  as a carrier gas,  $\text{O}_2$  elutes in 4 seconds and  $\text{SF}_6$  in about 14 seconds. A typical chromatogram for  $\text{SF}_6$  is shown in Figure 5 (see also Appendix A).

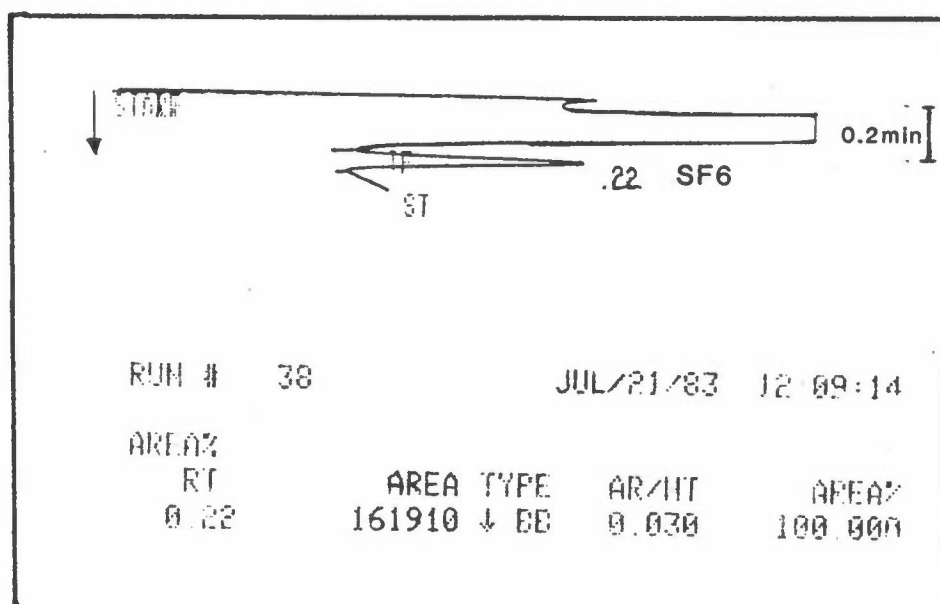


Figure 5: Typical  $\text{SF}_6$  chromatogram.

$[\text{SF}_6] = 200\text{ ppt } (\approx 1.3\text{ }\mu\text{g}/\text{m}^3)$ .

Columns for the separation of  $\text{SF}_6$  and  $\text{CBrF}_3$  are prepared by filling a 205 cm x 2.3 mm OD stainless steel tube with molecular sieve 5A, 80/100 mesh, washed, from Alltech Associates. Nitrogen gas at 2 bar is used for proper compaction of the fillings. After 12 hours conditioning at  $280^\circ\text{C}$  the columns are ready for use.

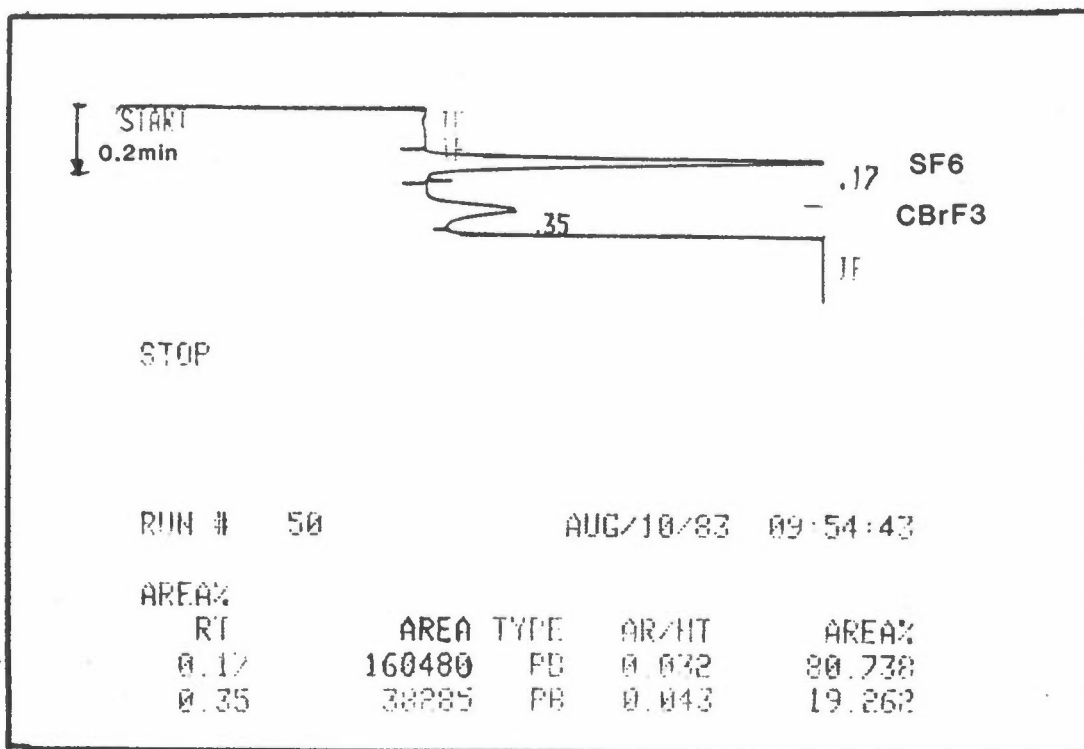


Figure 6: Typical SF<sub>6</sub> and CBrF<sub>3</sub> chromatogram.

[SF<sub>6</sub>] ≈ 200 ppt, [CBrF<sub>3</sub>] ≈ 1000 ppt.

Figure 6 shows a chromatogram using a molecular sieve column at 45<sup>0</sup>C and a nitrogen pressure of 5.0 bar. SF<sub>6</sub> elutes at about 0.2 minutes and CBrF<sub>3</sub> elutes at about 0.4 minutes.

The detection limit is about 10 ppt for SF<sub>6</sub>, and about 50 ppt for CBrF<sub>3</sub>. Analysis of SF<sub>6</sub> can be carried out with a sensitivity which is about 20 times better than that for CBrF<sub>3</sub>.

The gas chromatographs are equipped with 6-port gas sampling valves (Valco, Inc., Houston, Texas) and 1.0 cm<sup>3</sup> sampling loops. The columns and detectors are kept at a temperature of about 45<sup>0</sup>C. As many as 100 samples can be analyzed per hour. Concentrations are determined from the area output on a HP reporting integrator (see Fig. 5 and 6).

#### 1.4 Calibration of the gas chromatographs

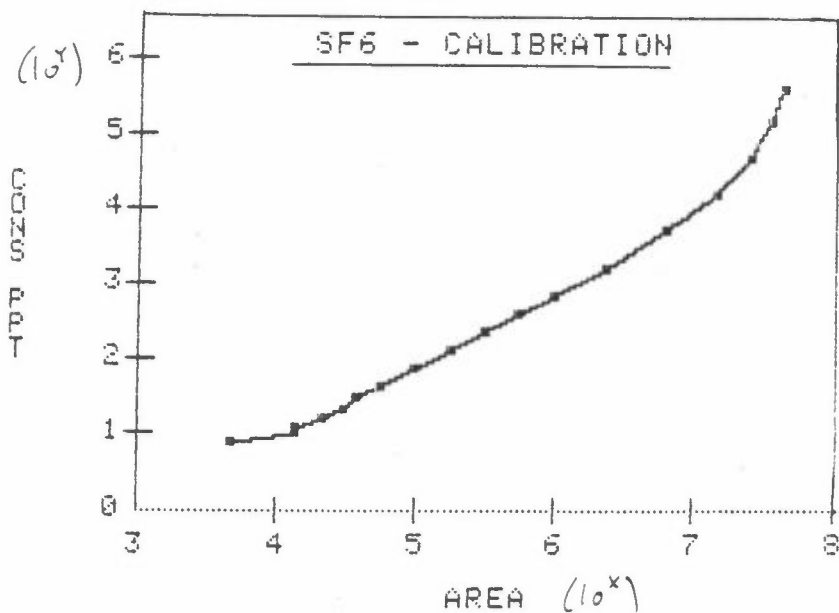
The proportionality constant between area and concentration, termed the calibration factor (KF), is determined using an exponential dilution calibration method. For a well-mixed vessel, the concentration,  $C$ , decreases according to:

$$C = C_0 \cdot \exp(-qt/V) \quad (1)$$

where  $C_0$  is the initial concentration,  $q$  is the constant flow rate,  $V$  is the vessel volume, and  $t$  is the time since flow began. At any given time, the number of air changes,  $N$ , in the chamber since  $t = 0$ , is  $qt/V$ . If the chamber is perfectly mixed and flow is steady, a plot of  $\ln C$  versus  $N$  will yield a slope of  $-1$ . Using a lucite cylinder ( $V = 2393 \text{ cm}^3$ ) equipped with a magnetically driven fan and flowing clean, dry air through the cube at  $270 \text{ cm}^3/\text{min}$  typically yielded slopes within  $\pm 0.01$  of the prescribed value. The calibration system is shown in Figure 5. A microliter syringe, accurate to approximately  $\pm 1\%$ , was used to inject  $3.0 \mu\text{l}$  of  $\text{SF}_6$  into the cube. This method produced calibration samples ranging from approximately  $10^{-6}$  parts  $\text{SF}_6$ /part air to  $10^{-11}$  parts  $\text{SF}_6$ /part air ( $10^6$  to 10 parts per trillion, ppt). Samples are drawn from the cylinder exhaust line through a septum and into a  $20 \text{ cm}^3$  syringe. The content is then injected into the sampling loop of the GC. A typical result of the calibration obtained with the dilution method is shown in Table 2 and in Figure 7.

Table 2: Calibration of chromatographic system for SF<sub>6</sub> - determination. Exponential dilution chamber 2393 cm<sup>3</sup> air flow 272 cm<sup>3</sup>/minute.

Calculated concentrations ppt	Area measured by integrator	Calculated concentrations ppt	Area measured by integrator
384472	42526000	130.7	175790
141675	34715000	75.0	97128
46725	24688000	43.1	56486
15410	14119000	30.9	38058
5082	6010200	22.2	30741
1576	2188500	15.9	21607
690	927160	12.7	13637
396	530410	10.2	13574
228	304800	8.2	4802



Figur 7: SF<sub>6</sub> calibration curve.

This procedure allows calibration of a gas chromatograph over five orders of magnitude of the concentration. The curves become nonlinear at high concentrations because the detector becomes saturated with sample at those levels. In some cases the curves also become nonlinear near the detection limit. This results from the desorption of tracer from the walls of the cube.

A potentially serious problem associated with prolonged use of the gas chromatographs is contamination of the radioactive foil by deposition of eluted contaminants. As the foil becomes contaminated, the detector operating characteristics change. The concentrations of samples analyzed under these conditions can be in error as much as 15% to 25%. One way of monitoring changes in the detector response is to crosscheck samples between the gas chromatographs. Calibration cross-check data for these tests indicate that concentrations are accurate to within 15%.

### 3.5 Uncertainties

According to a standard error analysis, errors associated with the calculated calibration concentrations ranged from less than 3% at high concentrations to less than 7% near the detection limit. Calibrations repeated on consecutive days generally agree within less than 5%. The exponential dilution calibration system was used by Lamb and Shair (2) to determine the solubility of  $SF_6$  in water. Since their results were within +6% of results obtained by very accurate volumetric-manometric methods, the absolute accuracy of the calibration appears to be approximately +6%.



The reproducibility in SF<sub>6</sub> analysis was examined from several samples taken in lab-conditions. A standard deviation of about 1% was found when analyzing 10 samples taken from a given gas mixture. Also when analysing alternating concentration levels the reproducibility at each level was about 1 to 2%.

The total uncertainty in the determination of individual SF<sub>6</sub> concentrations, including calibration, reproducibility, reading and sample handling, has been estimated to about 8-10%.

**APPENDIX B**

Complete table of SF<sub>6</sub>-data



STED : SF6-TEST TERUEL  
 TEST NR. : 1A  
 DATO : 03-05-85  
 TIOSPKT. : 1200-1215(GMT)  
 ANT.OBS. : 66  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 1B  
 DATO : 03-05-85  
 TIOSPKT. : 1215-1230(GMT)  
 ANT.OBS. : 65  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
735.00	544.60	.01
733.80	541.80	.01
733.80	541.30	.01
733.70	540.50	.01
733.70	539.80	.01
733.60	539.00	.01
733.60	538.50	.01
733.30	537.10	.01
733.20	536.60	.01
733.60	537.80	.01
733.20	536.40	.01
733.29	536.19	.01
732.80	536.10	.01
732.55	536.05	.01
732.30	536.00	.01
731.10	536.40	.01
730.10	536.30	.06
729.00	536.20	.17
728.20	536.20	.43
727.30	536.10	.43
726.70	536.00	.28
725.50	535.60	.06
725.20	535.10	.08
750.20	539.50	.01
751.60	536.40	.01
751.20	535.10	.01
750.90	533.90	.01
750.50	533.20	.01
750.30	531.90	.01
748.30	531.60	.01
747.20	530.60	.01
744.70	530.10	.02
745.10	528.40	.12
743.10	528.40	.09
742.00	528.90	.05
740.70	527.40	.43
739.40	526.70	.31
738.50	526.30	.31
737.20	526.20	.28
737.70	524.50	.17
736.50	523.80	.07
735.20	523.70	.03
733.90	523.80	.03
732.40	523.50	.01
731.20	522.80	.01
730.10	522.20	.01
727.20	520.70	.01
770.60	539.80	.02
771.30	536.70	.01
769.70	531.50	.02
766.00	530.00	.01
764.90	528.80	.01
761.80	525.20	.06
745.40	501.60	.01
758.80	522.40	.19
756.30	520.30	.21
756.00	519.20	.17
756.00	517.50	.12
755.70	515.90	.05
754.00	513.80	.03
753.10	511.90	.03
751.10	509.70	.02
750.40	508.00	.02
749.50	506.50	.02
747.70	505.30	.02
747.30	503.40	.02

KOORDINATER		SF6
X	Y	UG/M3
735.00	544.60	.01
733.80	541.80	.01
733.80	541.30	.01
733.70	540.50	.01
733.70	539.80	.01
733.60	539.00	.01
733.60	538.50	.01
733.30	537.10	.01
733.20	536.60	.01
733.60	537.80	.01
733.20	536.40	.01
733.29	536.19	.01
732.80	536.10	.01
732.55	536.05	.01
732.30	536.00	.01
731.10	536.40	.01
730.10	536.30	.02
729.00	536.20	.02
728.20	536.20	.05
727.30	536.10	.30
726.70	536.00	.34
725.50	535.60	.32
725.20	535.10	.04
750.20	539.50	.01
751.60	536.40	.01
751.20	535.10	.01
750.90	533.90	.01
750.50	533.20	.01
750.30	531.90	.01
748.30	531.60	.01
747.20	530.60	.01
744.70	530.10	.01
745.10	528.40	.02
743.10	528.40	.03
742.00	528.90	.03
740.70	527.40	.08
739.40	526.70	.17
738.50	526.30	.21
737.20	526.20	.37
737.70	524.50	.32
736.50	523.80	.20
735.20	523.70	.08
733.90	523.80	.07
732.40	523.50	.01
731.20	522.80	.01
730.10	522.20	.01
727.20	520.70	.01
770.60	539.80	.02
771.30	536.70	.01
769.70	531.50	.01
766.00	530.00	.01
764.90	528.80	.01
761.80	525.20	.06
745.40	501.60	.01
758.80	522.40	.23
756.30	520.30	.28
756.00	519.20	.13
755.70	515.90	.19
754.00	513.80	.14
753.10	511.90	.23
751.10	509.70	.05
750.40	508.00	.04
749.50	506.50	.02
747.70	505.30	.02
747.30	503.40	.01

STED : SF6-TEST TERUEL  
 TEST NR. : 2A  
 DATO : 04-05-85  
 TIDSPKT. : 1200-1215 (GMT)  
 ANT.OBS. : 67  
 MIN.MAKS X : 720.000 772.000  
 MIN.MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 28  
 DATO : 04-05-85  
 TIDSPKT. : 1215-1230 (GMT)  
 ANT.OBS. : 62  
 MIN.MAKS X : 720.000 772.000  
 MIN.MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
733.60	537.80	.01
733.30	537.10	.03
733.20	536.60	.06
733.20	536.40	.14
733.29	536.19	.24
732.80	536.10	.41
732.55	536.05	.32
732.30	536.00	.15
731.10	536.40	.16
730.10	536.30	.41
730.00	535.40	.11
729.80	533.80	.01
729.55	536.25	.27
729.00	536.20	.27
728.00	537.20	.26
733.80	541.40	.03
727.75	536.15	.00
727.30	536.10	.01
726.70	536.00	.01
726.00	535.70	.00
725.50	535.60	.01
725.20	535.10	.01
724.90	534.70	.01
723.00	540.60	.00
738.50	526.30	.00
748.60	541.20	.01
737.70	524.50	.01
736.50	523.80	.01
735.20	523.70	.01
733.90	523.80	.01
732.40	523.50	.01
731.20	522.80	.00
728.60	521.60	.00
751.60	537.80	.01
751.20	535.10	.03
750.90	533.90	.08
750.30	531.90	.34
748.30	531.60	.27
747.20	530.60	.23
744.70	530.10	.07
745.10	528.40	.02
743.10	528.40	.01
741.80	528.50	.01
740.70	527.40	.01
739.50	526.50	.01
771.30	536.70	.01
770.20	534.00	.01
769.70	531.50	.06
766.00	530.00	.08
763.85	528.25	.13
762.80	527.70	.15
761.25	524.40	.10
760.70	523.60	.03
758.20	521.80	.01
757.60	521.20	.01
756.15	519.75	.01
756.00	519.20	.01
755.85	516.70	.01
755.70	515.90	.00
754.00	513.80	.00
753.10	511.90	.00
751.10	509.70	.01
750.40	508.00	.01
749.50	506.50	.01
747.70	505.30	.01
747.30	503.40	.01
745.40	501.60	.00

KOORDINATER		SF6
X	Y	UG/M3
733.60	537.80	.01
733.30	537.10	.02
733.20	536.60	.01
733.20	536.40	.02
733.29	536.19	.03
732.80	536.10	.27
732.55	536.05	.46
732.30	536.00	.54
730.10	536.30	.52
730.00	535.40	.26
729.80	533.80	.02
729.55	536.25	.52
729.00	536.20	.23
728.00	537.20	.06
733.80	541.40	.00
727.75	536.15	.01
727.30	536.10	.01
726.70	536.00	.01
726.00	535.70	.01
725.50	535.60	.00
725.20	535.10	.01
724.90	534.70	.01
723.00	540.60	.00
738.50	526.30	.00
737.20	526.20	.01
736.50	523.80	.01
735.20	523.70	.00
733.90	523.80	.01
732.40	523.50	.01
731.20	522.80	.01
728.60	521.60	.01
751.60	537.80	.02
751.20	535.10	.03
750.90	533.90	.04
750.30	531.90	.30
748.30	531.60	.35
747.20	530.60	.17
744.70	530.10	.08
745.10	528.40	.01
743.10	528.40	.01
741.80	528.50	.01
740.70	527.40	.01
739.50	526.50	.01
771.30	536.70	.01
770.20	534.00	.01
769.70	531.50	.05
766.00	530.00	.10
762.80	527.70	.17
761.25	524.40	.09
760.70	523.60	.05
758.20	521.80	.01
757.60	521.20	.01
756.00	519.20	.01
755.85	516.70	.03
755.70	515.90	.00
754.00	513.80	.00
753.10	511.90	.01
751.10	509.70	.01
750.40	508.00	.01
749.50	506.50	.01
747.30	503.40	.02
745.40	501.60	.01

STED : SF6-TEST TERUEL  
 TEST NR. : 2C  
 DATO : 04-05-85  
 TIDSPKT. : 1230-1245(GMT)  
 ANT.OBS. : 9  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 2D  
 DATO : 04-05-85  
 TIDSPKT. : 1245-1300(GMT)  
 ANT.OBS. : 9  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
739.50	526.50	.00
737.20	526.20	.01
748.30	531.60	.32
744.70	530.10	.26
741.80	528.50	.01
747.75	531.10	.08
744.90	529.25	.02
742.45	528.45	.01
740.10	526.95	.01

KOORDINATER		SF6
X	Y	UG/M3
739.50	526.50	.01
737.20	526.20	.00
744.70	530.10	.35
741.80	528.50	.01
750.40	532.55	.23
747.75	531.10	.10
744.90	529.25	.03
742.45	528.45	.01
740.10	526.95	.01

STED : SF6-TEST TERUEL  
 TEST NR. : JA  
 DATO : 05-05-85  
 TIOSPKT. : 1300-1315 (GMT)  
 ANT.OBS. : 72  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : JB  
 DATO : 05-05-85  
 TIOSPKT. : 1315-1330 (GMT)  
 ANT.OBS. : 70  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
720.50	530.90	.00
721.20	530.80	.00
721.80	531.10	.00
722.30	531.20	.00
722.60	531.90	.00
722.90	532.20	.01
723.30	532.60	.00
723.60	533.20	.00
723.80	533.70	.00
724.30	534.10	.00
724.70	534.30	.00
724.90	534.70	.00
725.50	535.60	.01
726.70	536.00	.01
727.30	536.10	.01
728.20	536.20	.01
729.00	536.20	.00
730.10	536.30	.00
731.10	536.40	.01
732.30	536.00	.01
732.80	536.10	.01
733.20	536.40	.00
733.30	537.10	.01
733.20	536.60	.00
745.10	528.40	.00
744.70	530.10	.00
747.20	530.60	.00
748.30	531.60	.00
750.30	531.90	.00
750.50	533.20	.00
750.90	533.90	.01
751.20	535.10	.01
751.60	536.40	.01
751.60	537.80	.01
750.20	539.50	.01
726.10	519.20	.01
728.60	521.60	.01
730.00	522.30	.01
731.20	522.80	.01
732.40	523.50	.01
733.90	523.80	.01
735.20	523.70	.00
736.50	523.80	.01
737.70	524.50	.01
737.20	526.20	.01
738.50	526.30	.01
739.50	526.50	.01
740.70	527.40	.01
741.80	528.50	.01
743.10	528.40	.01
771.30	536.70	.00
770.20	534.00	.00
769.70	531.50	.01
765.45	529.40	.01
764.90	528.80	.00
762.80	527.70	.00
761.25	524.40	.00
760.70	523.60	.00
758.80	522.40	.00
768.76	543.44	.00
756.95	520.75	.00
756.30	520.30	.00
756.00	519.20	.00
755.85	516.70	.00
755.70	515.90	.00
754.00	513.80	.00
752.10	510.80	.00
751.10	509.70	.00
750.40	508.00	.00
749.50	506.50	.00
747.70	505.30	.00
747.30	503.40	.00

KOORDINATER		SF6
X	Y	UG/M3
721.20	530.80	.00
721.80	531.10	.00
722.30	531.20	.00
722.60	531.90	.01
722.90	532.20	.01
723.30	532.60	.00
723.60	533.20	.00
723.80	533.70	.00
724.30	534.10	.00
724.70	534.30	.00
724.90	534.70	.00
725.50	535.60	.01
726.70	536.00	.01
727.30	536.10	.01
728.20	536.20	.01
729.00	536.20	.00
730.10	536.30	.00
731.10	536.40	.01
732.30	536.00	.01
732.80	536.10	.01
733.20	536.40	.00
733.30	537.10	.01
733.20	536.60	.00
745.10	528.40	.01
744.70	530.10	.00
747.20	530.60	.00
748.30	531.60	.00
750.30	531.90	.01
750.50	533.20	.01
750.90	533.90	.01
751.20	535.10	.00
751.60	536.40	.01
751.60	537.80	.01
750.20	539.50	.01
726.10	519.20	.01
728.60	521.60	.01
730.00	522.30	.01
731.20	522.80	.01
732.40	523.50	.01
733.90	523.80	.01
735.20	523.70	.00
736.50	523.80	.01
737.70	524.50	.01
737.20	526.20	.01
738.50	526.30	.01
739.50	526.50	.01
740.70	527.40	.01
741.80	528.50	.01
743.10	528.40	.01
771.30	536.70	.00
770.20	534.00	.00
769.70	531.50	.01
765.45	529.40	.01
764.90	528.80	.00
762.80	527.70	.00
761.25	524.40	.00
760.70	523.60	.00
758.80	522.40	.00
756.95	520.75	.00
756.30	520.30	.00
756.00	519.20	.00
755.85	516.70	.00
755.70	515.90	.00
754.00	513.80	.00
752.10	510.80	.00
751.10	509.70	.00
750.40	508.00	.00
749.50	506.50	.00
747.70	505.30	.00
747.30	503.40	.00

STED : SF6-TEST TERUEL  
 TEST NR. : 4A  
 DATO : 06-05-85  
 TIDSPKT. : 1200-1215(GMT)  
 ANT.OBS. : 72  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 48  
 DATO : 06-05-85  
 TIDSPKT. : 1215-1230(GMT)  
 ANT.OBS. : 71  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
725.30	540.20	.00
724.80	540.00	.00
724.20	540.00	.00
723.60	540.60	.00
723.30	540.50	.00
722.70	540.70	.00
722.00	540.70	.00
733.30	537.10	.00
733.20	536.60	.00
733.20	536.40	.00
732.80	536.10	.01
732.55	536.05	.04
732.30	536.00	.04
731.10	536.40	.15
730.60	536.35	.34
730.10	536.30	.43
729.90	535.50	.30
729.55	536.25	.35
729.00	536.20	.21
728.60	536.20	.04
728.20	536.20	.02
727.30	536.10	.00
726.70	536.00	.00
747.20	530.60	.00
748.30	531.60	.00
750.30	531.90	.00
750.50	533.20	.00
750.90	533.90	.00
751.20	535.10	.00
751.60	536.40	.00
751.60	537.80	.00
750.20	539.50	.00
732.40	523.50	.00
733.90	523.80	.00
735.20	523.70	.00
736.50	523.80	.00
737.90	524.50	.00
737.20	526.20	.00
738.50	526.30	.00
739.50	526.50	.03
740.70	527.40	.02
741.25	527.95	.15
741.80	528.50	.13
743.10	528.40	.08
745.10	528.40	.03
744.90	529.25	.00
744.70	530.10	.00
756.00	517.50	.17
755.70	515.90	.04
754.00	513.80	.01
750.40	508.00	.00
749.50	506.50	.00
747.70	505.30	.00
747.30	503.40	.00
745.40	501.60	.00
744.20	500.10	.00
743.20	499.90	.00
770.60	539.80	.00
771.30	536.70	.00
770.20	534.00	.00
769.70	531.50	.00
766.00	530.00	.00
766.00	530.00	.00
764.90	528.80	.00
762.80	527.70	.00
761.80	525.20	.01
760.70	523.60	.00
759.75	523.00	.00
758.80	522.40	.01
757.60	521.20	.02
756.30	520.30	.10
756.00	519.20	.11
756.00	518.35	.16

KOORDINATER		SF6
X	Y	UG/M3
725.30	540.20	.00
724.80	540.00	.00
724.20	540.00	.00
723.60	540.60	.00
723.30	540.50	.00
722.70	540.70	.00
722.00	540.70	.00
733.30	537.10	.00
733.20	536.60	.00
733.20	536.40	.00
732.80	536.10	.03
732.55	536.05	.03
732.30	536.00	.05
731.10	536.40	.14
730.10	536.30	.45
729.90	535.50	.22
729.55	536.25	.29
728.20	536.20	.00
727.30	536.10	.00
726.70	536.00	.00
747.20	530.60	.00
748.30	531.60	.00
750.30	531.90	.00
750.50	533.20	.00
750.90	533.90	.00
751.20	535.10	.00
751.60	536.40	.00
751.60	537.80	.00
750.20	539.50	.02
732.40	523.50	.00
733.90	523.80	.00
735.20	523.70	.00
736.50	523.80	.00
737.90	524.50	.00
737.20	526.20	.00
738.50	526.30	.00
739.50	526.50	.01
740.70	527.40	.10
741.25	527.95	.17
741.80	528.50	.17
743.10	528.40	.08
745.10	528.40	.01
744.90	529.25	.00
744.70	530.10	.00
756.00	517.50	.08
755.70	515.90	.07
754.00	513.80	.03
753.10	511.90	.02
751.10	509.70	.00
750.40	508.00	.02
749.50	506.50	.00
747.70	505.30	.00
747.30	503.40	.00
745.40	501.60	.00
744.20	500.10	.00
743.20	499.90	.00
770.60	539.80	.00
771.30	536.70	.00
770.20	534.00	.00
769.70	531.50	.00
766.00	530.00	.00
764.90	528.80	.00
762.80	527.70	.00
761.80	525.20	.00
760.70	523.60	.00
759.75	523.00	.00
758.80	522.40	.01
757.60	521.20	.01
756.30	520.30	.03
756.00	519.20	.06
756.00	518.35	.07



STED : SF6-TEST TERUEL  
 TEST NR. : 5A  
 DATO : 07-05-85  
 TIDSPKT. : 1200-1215(GMT)  
 ANT.OBS. : 68  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 5B  
 DATO : 07-05-85  
 TIDSPKT. : 1215-1230(GMT)  
 ANT.OBS. : 68  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
728.00	538.50	.07
728.30	539.00	.23
722.80	540.70	.01
729.70	537.00	.01
730.00	537.40	.01
733.70	539.80	.01
733.60	538.50	.05
733.60	537.80	.15
733.40	537.50	.22
733.30	537.10	.20
733.20	536.60	.17
733.20	536.40	.17
733.32	536.12	.08
734.00	536.80	.05
732.80	536.10	.03
732.55	536.05	.02
732.30	536.00	.03
731.10	536.40	.01
730.60	536.35	.01
729.55	536.25	.01
729.00	536.20	.01
727.75	536.15	.02
745.10	529.40	.08
744.70	530.10	.10
747.20	530.60	.15
750.30	531.90	.06
750.50	533.20	.11
750.90	533.90	.06
751.20	535.10	.05
751.80	537.80	.02
733.90	523.80	.01
735.20	523.70	.00
736.50	523.80	.00
737.70	524.10	.00
737.20	526.20	.00
738.50	526.30	.00
748.44	541.54	.01
740.10	526.95	.01
740.70	527.40	.01
741.25	527.95	.01
741.80	528.50	.05
742.45	528.45	.06
743.10	528.40	.07
744.10	528.40	.08
745.10	528.40	.08
771.30	536.70	.01
769.70	531.50	.01
766.00	530.00	.01
764.90	528.80	.06
762.80	527.70	.10
761.80	525.20	.11
760.70	523.60	.08
759.75	523.00	.08
758.80	522.40	.08
758.20	521.80	.06
757.60	521.20	.06
756.95	520.75	.04
756.30	520.30	.04
756.15	519.75	.04
756.00	519.20	.05
756.00	517.50	.03
755.70	515.90	.01
754.00	513.80	.01
753.10	511.90	.01
751.10	509.70	.01
750.40	508.00	.01
749.50	506.50	.01
744.20	500.10	.01

KOORDINATER		SF6
X	Y	UG/M3
728.00	538.50	.04
728.30	539.00	.16
722.80	540.70	.01
729.70	537.00	.05
730.00	537.40	.06
733.60	539.00	.01
733.60	538.50	.01
733.60	537.80	.03
733.40	537.50	.05
733.30	537.10	.11
733.20	536.60	.25
733.20	536.40	.35
733.32	536.12	.26
734.00	536.80	.15
732.80	536.10	.17
732.55	536.05	.12
732.30	536.00	.10
731.10	536.40	.07
730.60	536.35	.10
730.10	536.30	.05
729.55	536.25	.01
729.00	536.20	.01
727.75	536.15	.02
745.10	529.40	.08
744.70	530.10	.08
747.20	530.60	.11
748.30	531.60	.06
750.30	531.90	.05
750.50	533.20	.02
750.90	533.90	.01
751.20	535.10	.01
751.60	537.80	.01
733.90	523.80	.00
735.20	523.70	.00
736.50	523.80	.00
737.70	524.10	.00
737.20	526.20	.00
738.50	526.30	.01
739.50	526.50	.01
740.10	526.95	.01
740.70	527.40	.01
741.25	527.95	.01
741.80	528.50	.03
742.45	528.45	.04
743.10	528.40	.05
744.10	528.40	.06
745.10	528.40	.06
771.30	536.70	.01
769.70	531.50	.01
766.00	530.00	.03
764.90	528.80	.08
762.80	527.70	.08
761.80	525.20	.08
760.70	523.60	.07
759.75	523.00	.08
758.80	522.40	.10
758.20	521.80	.10
757.60	521.20	.09
756.95	520.75	.07
756.30	520.30	.05
756.15	519.75	.05
756.00	519.20	.05
756.00	517.50	.03
755.70	515.90	.01
753.10	511.90	.01
750.40	508.00	.01
749.50	506.50	.01
744.20	500.10	.01

STED : SF6-TEST TERUEL  
 TEST NR. : 6A  
 DATO : 08-05-85  
 TIDSPKT. : 1200-1215(GMT)  
 ANT.OBS. : 73  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 6B  
 DATO : 08-05-85  
 TIDSPKT. : 1215-1230(GMT)  
 ANT.OBS. : 71  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
731.10	536.40	.01
730.60	536.35	.01
730.10	536.30	.01
729.55	536.25	.01
729.00	536.20	.05
728.60	536.20	.22
728.20	536.20	.23
727.84	536.16	.43
727.66	536.14	.17
727.48	536.12	.19
727.30	536.10	.20
727.06	536.06	.15
726.70	536.00	.15
726.35	535.85	.10
726.00	535.70	.10
725.50	535.60	.04
725.20	535.10	.01
724.90	534.70	.01
724.30	534.10	.01
728.70	535.30	.36
723.30	540.50	.01
722.70	540.60	.00
722.00	540.60	.01
751.20	535.10	.01
750.50	533.20	.01
750.30	531.90	.01
748.30	531.60	.00
747.20	530.60	.01
744.70	530.10	.01
745.10	528.40	.01
743.10	528.40	.01
742.45	528.45	.01
741.80	528.50	.01
741.25	527.95	.12
740.70	527.40	.14
740.10	526.95	.26
739.50	526.50	.28
739.00	526.50	.22
739.00	526.40	.25
738.50	526.30	.24
737.85	526.25	.21
737.20	526.20	.24
737.20	526.20	.23
737.90	524.50	.13
736.50	523.80	.02
735.20	523.70	.01
733.90	523.80	.01
732.40	523.50	.01
731.20	522.80	.01
730.00	522.30	.01
728.60	521.60	.01
756.00	517.50	.04
755.70	515.90	.08
754.00	513.80	.19
753.10	511.90	.15
751.10	509.70	.05
750.40	508.00	.03
749.50	506.50	.02
747.30	503.40	.01
745.40	501.60	.01
744.20	500.10	.01
771.30	536.70	.01
769.70	531.50	.01
764.90	528.80	.01
762.80	527.70	.01
761.80	525.20	.01
760.70	523.60	.01
758.80	522.40	.01
758.20	521.80	.01
757.60	521.20	.01
756.95	520.75	.01
756.30	520.30	.01
756.15	519.75	.01
756.00	519.20	.01
756.00	518.35	.04

KOORDINATER		SF6
X	Y	UG/M3
731.10	536.40	.01
730.60	536.35	.01
730.10	536.30	.01
729.55	536.25	.04
729.00	536.20	.07
728.60	536.20	.09
727.84	536.16	.17
727.66	536.14	.23
727.48	536.12	.32
727.30	536.10	.31
727.06	536.06	.28
726.70	536.00	.41
726.35	535.85	.57
726.00	535.70	.65
725.50	535.60	.06
725.20	535.10	.01
724.90	534.70	.01
724.30	534.10	.01
728.70	535.30	.36
723.30	540.50	.01
722.70	540.60	.01
722.00	540.60	.01
751.20	535.10	.01
750.50	533.20	.01
750.30	531.90	.01
748.30	531.60	.00
747.20	530.60	.01
744.70	530.10	.01
745.10	528.40	.01
743.10	528.40	.01
742.45	528.45	.01
741.80	528.50	.01
741.25	527.95	.12
740.70	527.40	.14
740.10	526.95	.26
739.50	526.50	.28
739.00	526.50	.22
739.00	526.40	.25
738.50	526.30	.26
737.85	526.25	.25
737.20	526.20	.17
737.20	526.20	.17
737.90	524.50	.17
736.50	523.80	.05
735.20	523.70	.02
733.90	523.80	.01
732.40	523.50	.01
730.00	522.30	.01
728.60	521.60	.01
756.00	517.50	.03
755.70	515.90	.15
754.00	513.80	.23
753.10	511.90	.18
751.10	509.70	.05
750.40	508.00	.03
749.50	506.50	.01
749.82	541.12	.01
747.30	503.40	.01
745.40	501.60	.01
744.20	500.10	.01
771.30	536.70	.01
769.70	531.50	.01
764.90	528.80	.01
762.80	527.70	.01
761.80	525.20	.01
760.70	523.60	.01
758.80	522.40	.01
758.20	521.80	.01
756.95	520.75	.01
756.30	520.30	.01
756.15	519.75	.01
756.00	519.20	.01
756.00	518.35	.03

STED : SF6-TEST TERUEL  
 TEST NR. : 7A  
 DATO : 09-05-85  
 TIDSPKT. : 1200-1215(GMT)  
 ANT.OBS. : 69  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 7B  
 DATO : 09-05-85  
 TIDSPKT. : 1215-1230(GMT)  
 ANT.OBS. : 64  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
733.20	536.40	.05
732.80	536.10	.00
732.30	536.00	.00
731.10	536.40	.00
730.60	536.30	.00
730.10	536.30	.00
729.60	536.20	.01
729.00	536.20	.05
728.60	536.20	.09
728.20	536.20	.46
728.80	536.10	.72
727.60	536.10	.72
727.30	536.10	.53
727.00	536.00	.31
726.70	536.00	.10
726.40	535.90	.05
726.00	535.70	.05
725.50	535.80	.00
725.20	535.10	.00
724.70	534.30	.00
728.50	535.50	.48
722.70	540.60	.01
722.00	540.60	.00
747.20	530.60	.01
744.70	530.10	.01
745.10	528.40	.01
743.10	528.40	.01
742.60	528.60	.01
741.80	528.50	.01
741.20	527.80	.04
740.70	527.40	.05
740.00	527.00	.05
739.50	526.50	.07
739.00	526.50	.10
738.50	526.30	.13
737.90	526.50	.15
737.20	526.20	.24
737.20	525.80	.26
737.70	524.50	.27
736.50	523.80	.23
735.20	523.70	.19
733.90	523.80	.15
732.40	523.50	.01
731.20	522.80	.01
730.00	522.30	.01
728.60	521.60	.01
769.70	531.50	.00
766.00	530.00	.00
764.90	528.80	.01
762.80	527.70	.01
761.80	525.20	.00
760.70	523.60	.01
758.80	522.40	.02
758.20	521.80	.05
757.60	521.20	.04
756.90	520.70	.05
756.00	520.30	.03
756.20	519.70	.04
756.00	519.20	.05
756.00	518.30	.06
756.00	517.50	.05
755.90	516.60	.09
755.70	515.90	.10
755.90	516.60	.17
755.70	515.90	.18
754.00	513.80	.15
753.10	511.90	.18
751.10	509.70	.17
750.40	508.00	.14
747.70	505.30	.05
747.30	503.40	.01
745.40	501.60	.00

KOORDINATER		SF6
X	Y	UG/M3
733.20	536.40	.00
731.10	536.40	.01
730.60	536.30	.00
730.10	536.30	.01
729.60	536.20	.30
729.00	536.20	.39
728.60	536.20	.48
728.80	536.10	.80
727.60	536.10	.51
727.30	536.10	.32
727.00	536.00	.33
726.70	536.00	.20
726.40	535.90	.05
726.00	535.70	.03
725.50	535.60	.03
725.20	535.10	.01
724.70	534.30	.00
728.50	535.50	.46
722.70	540.60	.14
722.00	540.60	.00
747.20	530.60	.01
744.70	530.10	.01
745.10	528.40	.01
743.10	528.40	.01
742.60	528.60	.01
741.80	528.50	.01
741.20	527.80	.03
740.70	527.40	.07
740.00	527.00	.10
739.50	526.50	.19
739.00	526.50	.32
738.50	526.30	.40
737.90	526.50	.48
737.20	526.20	.55
737.20	525.80	.61
737.70	524.50	.46
736.50	523.80	.32
735.20	523.70	.14
733.90	523.80	.01
732.40	523.50	.01
731.20	522.80	.01
730.00	522.30	.01
728.60	521.60	.01
769.70	531.50	.00
766.00	530.00	.00
764.90	528.80	.01
762.80	527.70	.01
761.80	525.20	.00
760.70	523.60	.01
758.80	522.40	.02
758.20	521.80	.05
757.60	521.20	.04
756.90	520.70	.05
756.00	520.30	.03
756.20	519.70	.04
756.00	519.20	.05
756.00	518.30	.06
756.00	517.50	.05
755.90	516.60	.09
755.70	515.90	.10
755.90	516.60	.17
755.70	515.90	.18
754.00	513.80	.15
753.10	511.90	.18
751.10	509.70	.17
750.40	508.00	.14
747.70	505.30	.05
747.30	503.40	.01
745.40	501.60	.00

STED : SF6-TEST TERUEL  
 TEST NR. : 8A  
 DATO : 10-05-85  
 TIDSPKT. : 1500-1515(GMT)  
 ANT.OBS. : 72  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 8B  
 DATO : 10-05-85  
 TIDSPKT. : 1515-1530(GMT)  
 ANT.OBS. : 71  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
724.30	534.10	.03
724.70	534.30	.05
724.90	534.70	.20
725.50	535.60	.50
726.00	535.70	.36
726.35	535.85	.79
726.70	536.00	1.03
727.00	536.05	.90
727.30	536.10	.71
727.57	536.13	.69
727.75	536.15	.44
728.20	536.20	.30
728.60	536.20	.23
729.00	536.20	.18
730.10	536.30	.03
730.60	536.35	.12
731.10	536.40	.03
732.30	536.00	.02
732.80	536.10	.03
733.29	536.19	.02
733.20	536.40	.02
733.20	536.60	.00
731.20	522.80	.21
732.40	523.50	.24
733.90	523.80	.28
735.20	523.70	.32
736.50	523.80	.30
737.90	524.50	.20
737.20	526.20	.22
737.90	526.50	.14
738.50	526.30	.10
739.00	526.50	.08
739.50	526.50	.06
740.00	527.00	.05
740.70	527.40	.03
741.20	527.80	.03
741.80	528.50	.03
742.60	528.60	.02
743.10	528.40	.02
744.20	528.30	.00
745.10	528.40	.00
744.70	530.10	.00
747.20	530.60	.00
748.30	531.60	.00
750.30	531.90	.03
750.90	533.90	.02
771.30	536.70	.00
769.70	531.50	.02
764.90	528.80	.00
762.80	527.70	.00
781.80	525.20	.00
760.70	523.60	.01
758.80	522.40	.03
757.60	521.20	.00
756.95	520.75	.03
756.30	520.30	.03
756.15	519.75	.03
756.00	519.20	.02
756.00	518.35	.03
756.00	517.50	.03
755.85	516.70	.00
755.70	515.90	.01
754.85	514.85	.03
754.00	513.80	.01
753.55	512.85	.03
753.10	511.90	.05
751.10	509.70	.12
750.40	508.00	.10
749.50	506.50	.08
747.70	505.30	.12
747.30	503.40	.10
747.30	503.40	.19
745.40	501.60	.07

KOORDINATER		SF6
X	Y	UG/M3
724.30	534.10	.03
724.70	534.30	.00
724.90	534.70	.00
725.50	535.60	.20
726.00	535.70	.55
726.35	535.85	.39
726.70	536.00	.47
727.00	536.05	.52
727.30	536.10	.54
727.57	536.13	.44
727.75	536.15	.39
728.20	536.20	.46
728.60	536.20	.34
729.00	536.20	.30
730.10	536.30	.03
730.60	536.35	.03
731.10	536.40	.03
732.30	536.00	.02
732.80	536.10	.02
733.29	536.19	.02
733.20	536.40	.02
733.20	536.60	.00
731.20	522.80	.03
732.40	523.50	.04
733.90	523.80	.34
735.20	523.70	.28
736.50	523.80	.29
737.90	524.50	.25
737.20	526.20	.25
737.90	526.40	.19
737.90	526.50	.17
738.50	526.30	.14
739.00	526.50	.08
739.50	526.50	.06
740.00	527.00	.06
740.70	527.40	.03
741.20	527.80	.04
741.80	527.80	.05
741.80	528.50	.02
742.60	528.60	.02
743.10	528.40	.03
744.20	528.30	.00
745.10	528.40	.00
744.70	530.10	.00
747.20	530.60	.00
748.30	531.60	.00
750.30	531.90	.00
750.90	533.90	.02
771.30	536.70	.00
769.70	531.50	.00
764.90	528.80	.00
761.80	525.20	.00
762.80	527.70	.00
760.70	523.60	.00
758.80	522.40	.00
756.95	520.75	.03
756.30	520.30	.03
756.15	519.75	.03
756.00	519.20	.02
756.00	518.35	.03
756.00	517.50	.03
755.85	516.70	.01
755.70	515.90	.01
754.85	514.85	.01
754.00	513.80	.01
753.55	512.85	.03
753.10	511.90	.05
751.10	509.70	.12
750.40	508.00	.10
749.50	506.50	.08
747.70	505.30	.12
747.30	503.40	.10
745.40	501.60	.05

STED : SF6-TEST TERUEL  
 TEST NR. : 9A  
 DATO : 11-05-85  
 TIDSPKT. : 1100-1115(GMT)  
 ANT.OBS. : 72  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 9B  
 DATO : 11-05-85  
 TIDSPKT. : 1115-1130(GMT)  
 ANT.OBS. : 72  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
724.30	534.10	.01
724.70	534.30	.02
725.20	535.10	.05
725.50	535.60	.05
726.00	535.70	.07
726.70	536.00	.14
727.30	536.10	.11
727.75	536.15	.12
728.20	536.20	.12
729.00	536.20	.14
730.10	536.30	.21
730.60	536.35	.29
731.10	536.40	.31
731.70	536.20	.28
732.30	536.00	.34
732.55	536.05	.45
732.80	536.10	.28
733.29	536.19	.17
733.20	536.40	.17
733.20	536.60	.16
733.30	537.10	.16
733.60	537.80	.21
733.60	538.50	.21
751.60	537.80	.01
751.20	535.10	.02
750.90	533.90	.01
750.50	533.20	.01
750.30	531.90	.01
748.30	531.60	.01
747.20	530.60	.02
744.70	530.10	.01
745.10	528.40	.01
743.10	528.40	.01
740.70	527.40	.01
740.70	527.40	.01
739.50	526.50	.01
738.50	526.30	.01
737.20	526.20	.01
737.90	524.50	.01
736.50	523.80	.01
735.20	523.70	.01
733.90	523.80	.01
732.40	523.50	.01
731.20	522.80	.01
730.00	522.30	.01
728.60	521.60	.01
727.20	520.70	.01
726.10	519.20	.01
725.50	516.40	.01
751.10	509.70	.01
750.40	508.00	.01
749.50	506.50	.01
747.70	505.30	.01
747.30	503.40	.01
747.30	503.40	.01
745.40	501.60	.01
753.10	511.90	.01
754.00	513.80	.01
755.70	515.90	.01
756.00	517.50	.01
756.00	519.20	.01
756.30	520.30	.01
757.60	521.20	.01
758.80	522.40	.01
760.70	523.60	.01
760.70	523.60	.01
762.80	527.70	.01
764.90	528.80	.01
766.00	530.00	.01
769.70	531.50	.01
770.20	534.00	.01
771.30	536.70	.01
771.50	537.90	.01
769.30	542.00	.01

KOORDINATER		SF6
X	Y	UG/M3
724.30	534.10	.05
724.70	534.30	.06
725.20	535.10	.03
725.50	535.60	.03
726.00	535.70	.03
726.70	536.00	.06
727.30	536.10	.08
727.75	536.15	.10
728.20	536.20	.09
729.00	536.20	.14
730.10	536.30	.18
730.60	536.35	.17
731.10	536.40	.20
731.70	536.20	.20
732.30	536.00	.26
732.55	536.05	.22
732.80	536.10	.23
733.29	536.19	.23
733.20	536.40	.24
733.20	536.60	.26
733.30	537.10	.26
733.60	537.80	.28
733.60	538.50	.28
751.60	537.80	.01
751.20	535.10	.01
750.90	533.90	.01
750.50	533.20	.01
750.30	531.90	.01
748.30	531.60	.01
747.20	530.60	.01
744.70	530.10	.01
745.10	528.40	.01
743.10	528.40	.01
740.70	527.40	.01
739.50	526.50	.01
738.50	526.30	.01
737.20	526.20	.01
737.90	524.50	.01
736.50	523.80	.01
735.20	523.70	.01
733.90	523.80	.01
732.40	523.50	.01
731.20	522.80	.01
730.00	522.30	.01
728.60	521.60	.01
727.20	520.70	.01
726.10	519.20	.01
725.50	516.40	.01
751.10	509.70	.01
750.40	508.00	.01
749.50	506.50	.01
747.70	505.30	.01
747.30	503.40	.01
745.40	501.60	.01
753.10	511.90	.01
754.00	513.80	.01
755.70	515.90	.01
756.00	517.50	.01
756.00	519.20	.01
756.30	520.30	.01
757.60	521.20	.01
758.80	522.40	.01
760.70	523.60	.01
761.80	525.20	.01
762.80	527.70	.01
764.90	528.80	.01
766.00	530.00	.01
769.70	531.50	.01
770.20	534.00	.01
771.30	536.70	.01
771.50	537.90	.01
769.30	542.00	.01

STED : SF6-TEST TERUEL  
 TEST NR. : 10A  
 DATO : 13-05-85  
 TIOSPKT. : 1200-1215(GMT)  
 ANT.OBS. : 76  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

STED : SF6-TEST TERUEL  
 TEST NR. : 10B  
 DATO : 13-05-85  
 TIOSPKT. : 1215-1230(GMT)  
 ANT.OBS. : 75  
 MIN,MAKS X : 720.000 772.000  
 MIN,MAKS Y : 500.000 552.000

KOORDINATER		SF6
X	Y	UG/M3
733.80	541.80	.01
733.70	539.80	.01
733.60	539.00	.01
733.60	538.50	.00
733.60	537.80	.01
733.30	537.10	.01
733.20	536.60	.03
733.20	536.40	.07
733.29	536.19	.04
732.80	536.10	.03
732.55	536.05	.06
732.30	536.00	.05
731.70	536.20	.11
731.10	536.40	.11
730.60	536.35	.09
730.10	536.30	.26
729.55	536.25	.25
729.00	536.20	.19
728.20	536.20	.21
727.30	536.10	.10
726.70	536.00	.07
726.00	535.70	.05
724.50	540.50	.01
723.50	540.40	.01
750.20	539.50	.03
751.60	537.80	.03
751.60	536.40	.03
751.20	535.10	.03
750.90	533.90	.05
750.50	533.20	.05
750.30	531.90	.17
748.30	531.60	.19
748.20	530.70	.38
747.20	530.60	.35
746.30	530.70	.23
744.70	530.10	.25
745.10	529.40	.22
745.10	528.40	.15
743.10	528.40	.12
741.80	528.50	.18
740.70	527.40	.06
739.50	526.50	.05
738.50	526.30	.03
737.20	526.20	.04
737.90	524.50	.04
736.50	523.80	.02
735.20	523.70	.02
733.90	523.80	.01
732.40	523.50	.01
728.60	521.60	.01
768.40	544.40	.01
770.60	539.80	.01
771.50	537.90	.01
771.30	536.70	.01
770.20	534.00	.01
769.70	531.50	.01
766.00	530.00	.02
764.90	528.80	.22
762.80	527.70	.23
761.80	525.20	.15
760.70	523.60	.11
758.80	522.40	.09
757.60	521.20	.09
756.30	520.30	.08
756.00	519.20	.10
756.00	517.50	.06
755.70	515.90	.07
754.00	513.80	.04
753.10	511.90	.02
751.10	509.70	.03
750.40	508.00	.03
749.50	506.50	.02
747.70	505.30	.02
747.30	503.40	.01
745.40	501.60	.01
744.20	500.10	.01

KOORDINATER		SF6
X	Y	UG/M3
733.80	541.80	.01
733.70	539.80	.01
733.60	539.00	.01
733.60	538.50	.01
733.60	537.80	.01
733.30	537.10	.01
733.20	536.60	.01
733.20	536.40	.02
733.29	536.19	.01
732.80	536.10	.07
732.55	536.05	.03
732.30	536.00	.03
731.70	536.20	.03
731.10	536.40	.04
730.60	536.35	.10
730.10	536.30	.14
729.55	536.25	.32
729.00	536.20	.18
728.20	536.20	.32
727.30	536.10	.34
726.70	536.00	.21
726.00	535.70	.13
724.50	540.50	.01
723.50	540.40	.02
750.20	539.50	.03
751.60	537.80	.03
751.60	536.40	.04
751.20	535.10	.26
750.90	533.90	.20
750.50	533.20	.17
750.30	531.90	.13
748.30	531.60	.17
748.20	530.70	.20
747.20	530.60	.23
746.30	530.70	.19
744.70	530.10	.16
745.10	529.40	.19
745.10	528.40	.19
743.10	528.40	.12
741.80	528.50	.10
740.70	527.40	.10
739.50	526.50	.08
738.50	526.30	.06
737.20	526.20	.06
737.90	524.50	.06
736.50	523.80	.05
735.20	523.70	.02
733.90	523.80	.01
732.40	523.50	.01
728.60	521.60	.01
768.40	544.40	.01
770.60	539.80	.01
771.50	537.90	.01
771.30	536.70	.01
770.20	534.00	.01
769.70	531.50	.02
766.00	530.00	.03
764.90	528.80	.12
762.80	527.70	.25
760.70	523.60	.14
758.80	522.40	.10
757.60	521.20	.07
756.30	520.30	.06
756.00	519.20	.06
756.00	517.50	.03
755.70	515.90	.04
754.00	513.80	.04
753.10	511.90	.01
751.10	509.70	.01
750.40	508.00	.01
749.50	506.50	.04
747.70	505.30	.02
747.30	503.40	.01
745.40	501.60	.01
744.20	500.10	.01



**APPENDIX C**

Sampling point coordinates





## COORDINATE SYSTEM, SAMPLING POINTS

Traverse A3 distance: 10-12km

Sample -point	UTM ref. coordinate	
	X	Y
A 1	737.3	548.8
A 2	737.6	547.4
A 3	737.2	547.0
A 4	736.5	546.6
A 5	735.9	546.2
A 6	735.5	545.5
A 7	735.1	544.7
A 8	734.3	543.7
A 9	734.2	543.2
A 10	733.9	542.4
AB 1	733.8	541.8
AB 2	733.8	541.3
AB 3	733.7	540.5
AB 4	733.7	539.8
AB 5	733.6	539.0
AB 6	733.6	538.5
AB 7	733.6	537.8
AB 8	733.4	537.5
AB 9	733.3	537.1
AB 10	733.2	536.6
AB 11	733.2	536.4
AB 12	733.5	535.7
AB 13	732.8	536.1
AB 14	732.3	536.0
AB 15	731.1	536.4
AB 16	730.1	536.3
AB 17	729.0	536.2
AB 18	728.2	536.2
AB 19	727.3	536.1
AB 20	726.7	536.0
AB 21	726.0	535.7
AB 22	725.5	535.6
AB 23	725.2	535.1
AB 24	724.9	534.7
AB 25	724.7	534.3
AB 26	724.3	534.1
AB 27	723.8	533.7
AB 28	723.6	533.2
AB 29	723.3	532.6
AB 30	722.9	532.2
AB 31	722.6	531.9
AB 32	722.3	531.2
AB 33	721.8	531.1
AB 34	721.2	530.8
AB 35	720.8	530.6
AB 36	720.5	530.9

## COORDINATE SYSTEM, SAMPLING POINTS

Traverse CD distance: 30km

Sample	UTM	ref. coordinate	
-point		X	Y
CD 1		747.8	542.9
CD 2		748.6	541.2
CD 3		749.7	540.3
CD 4		750.2	539.5
CD 5		751.6	537.8
CD 6		751.6	536.4
CD 7		751.2	535.1
CD 8		750.9	533.9
CD 9		750.5	533.2
CD 10		750.3	531.9
CD 11		748.3	531.6
CD 12		747.2	530.6
CD 13		744.7	530.1
CD 14		745.1	528.4
CD 15		743.1	528.4
CD 16		741.8	528.5
CD 17		740.7	527.4
CD 18		739.5	526.5
CD 19		738.5	526.3
CD 20		737.2	526.2
CD 21		737.9	524.5
CD 22		736.5	523.8
CD 23		735.2	523.7
CD 24		733.9	523.8
CD 25		732.4	523.5
CD 26		731.2	522.8
CD 27		730.0	522.3
CD 28		728.6	521.6
CD 29		727.2	520.7
CD 30		725.6	519.5
CD 31		725.5	516.4
CD 32		723.4	514.9
CD 33		721.9	513.7
CD 34		720.6	513.8

## COORDINATE SYSTEM, SAMPLING POINTS

Traverse EF distance: 40-50km

Sample -point	UTM ref. coordinate	
	X	Y
EF 1	768.4	544.4
EF 2	769.3	542.0
EF 3	770.6	539.8
EF 4	771.5	537.9
EF 5	771.3	536.7
EF 6	770.2	534.0
EF 7	769.7	531.5
EF 8	766.0	530.0
EF 9	764.9	528.8
EF 10	762.8	527.7
EF 11	761.8	525.2
EF 12	760.7	523.6
EF 13	758.8	522.4
EF 14	757.6	521.2
EF 15	756.3	520.3
EF 16	756.0	519.2
EF 17	756.0	517.5
EF 18	755.7	515.9
EF 19	754.0	513.8
EF 20	753.1	511.9
EF 21	751.1	509.7
EF 22	750.4	508.0
EF 23	749.5	506.5
EF 24	747.7	505.3
EF 25	747.3	503.4
EF 26	744.2	500.1
EF 27	743.2	499.9
EF 28	741.9	499.3
EF 29	740.8	497.9
EF 30	738.8	497.5
EF 31	736.4	496.4
EF 32	734.3	495.9
EF 33	733.1	494.9
EF 34	732.2	492.2
EF 35	745.4	501.6

## COORDINATE SYSTEM, SAMPLING POINTS

Traverse GH distance: 75km

Sample -point	UTM ref. coordinate	
	X	Y
GH 1	791.3	550.9
GH 2	794.8	546.9
GH 3	791.8	545.3
GH 4	790.9	539.6
GH 5	793.5	537.4
GH 6	794.5	535.2
GH 7	794.8	531.8
GH 8	796.5	527.3
GH 9	796.2	523.5
GH 10	796.4	520.0
GH 11	796.1	517.3
GH 12	796.3	513.5
GH 13	794.5	511.6
GH 14	792.2	508.9
GH 15	790.6	505.8
GH 16	788.8	502.9
GH 17	785.9	500.9
GH 18	783.3	499.9
GH 19	783.1	497.1
GH 20	780.8	493.5
GH 21	777.2	490.5
GH 22	773.2	489.7
GH 23	768.4	483.9
GH 24	769.8	484.9
GH 25	769.4	479.7
GH 26	767.7	476.3
GH 27	765.6	471.3
GH 28	764.5	466.4
GH 29	763.0	462.9
GH 30	761.1	460.1
GH 31	758.1	456.3
GH 32	752.9	452.6
GH 33	749.2	450.6
GH 34	746.3	450.1

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NORWEGIAN INSTITUTE FOR AIR RESEARCH**

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ABSTRACT (max. 300 characters, 7 lines)  A description of the NILU tracer technique used in Teruel, and a presentation of all SF <sub>6</sub> concentrations measured from the ground level sampling stations is presented.

\* Kategorier: Åpen - kan bestilles fra NILU                   A  
                   Må bestilles gjennom oppdragsgiver            B  
                   Kan ikke utleveres                                C