

64

MINISTERIE VAN ECONOMISCHE ZAKEN
BESTUUR KWALITEIT EN VEILIGHEID - AFD. VEILIGHEID

TUSSENTIJD'S VERSLAG ONDERZOEKSOPDRACHT WESTBANK III

Prof. Dr. C. Vernemmen

met medewerking van

K. Degrendele, G. Moerkerke en T. Vande Wiele

Gent 1997
RUMACOG - Research Unit of Marine and Coastal Geomorphology

V

Inhoudstabel

Hoofdstuk 1. Bathymetrische data

1.1. Campagne ST9621

1.2. Campagne ST9631

Hoofdstuk 2. Verwerking van de bathymetrische data

2.1. Campagne ST9621

2.2. Campagne ST9631

2.3. Vergelijking van de bathymetrische profielen van de Kwintebank

Hoofdstuk 3. Volumetrische evolutie van de Kwintebank van september tot december 1996

3.1. Berekening van referentievolumes langs referentielijnen

3.2. Evolutie van de volumes van de Kwintebank

Hoofdstuk 1. Bathymetrische data

De bathymetrische data worden met het ODAS II systeem opgenomen om de seconde. Tijdens de opnames ligt de snelheid van het schip constant rond 10 knopen, wat ons ongeveer om de 5 meter een meting oplevert. De opnames gebeuren langs op voorhand vastgelegde referentielijnen. Voor beide campagnes worden de gevaren referentielijnen (raaien) met hun begin- en eindtijd in tabelvorm weergegeven. De Vlaamse banken worden in beide campagnes opgenomen langs de decca's, de Kwintebank afzonderlijk langs de halve decca's en langs de longitudinalen. In september (ST9621) werd verder nog de Gootebank langs de decca's bathymetrisch opgenomen.

1.1. Campagne ST9621

VLAAMSE BANKEN (Kwintebank - Buiten Ratel - Oost Dyck)

DECCA's

<i>Datum</i>	<i>Raai</i>	<i>Begin</i>	<i>Einde</i>
25/09/96	rH02	02:56:00	03:15:00
25/09/96	rH01	03:51:00	04:13:00
25/09/96	rH00	04:49:00	05:11:00
25/09/96	rG23	07:22:00	07:54:00
25/09/96	rG22	06:32:00	07:16:00
25/09/96	rG21	09:48:00	10:29:00
25/09/96	rG20	11:34:00	12:25:00
25/09/96	rG19	13:30:00	14:23:00
25/09/96	rG18	15:21:00	16:16:00

HALVE DECCA's

<i>Datum</i>	<i>Raai</i>	<i>Begin</i>	<i>Einde</i>
25/09/96	rH01.5	03:20:00	03:45:00
25/09/96	rH00.5	04:17:00	04:44:00
25/09/96	rG23.5	05:16:00	05:42:00
25/09/96	rG22.5	05:48:00	06:27:00
25/09/96	rG21.5	08:03:00	08:44:00
25/09/96	rG20.5	10:37:00	11:27:00
25/09/96	rG19.5	12:32:00	13:26:00
25/09/96	rG18.5	14:27:00	15:17:00
25/09/96	rG17.5	16:23:00	17:12:00

LONGITUDINALEN KWINTEBANK

<i>Datum</i>	<i>Raai</i>	<i>Begin</i>	<i>Einde</i>
25/09/96	L01	17:55:00	18:13:00
25/09/96	L02	18:15:00	18:29:00
25/09/96	L03	18:32:00	18:50:00
25/09/96	L04	18:53:00	19:28:00
25/09/96	L05	19:31:00	20:14:00
25/09/96	L06	20:18:00	20:55:00
25/09/96	L07	21:00:00	21:33:00
25/09/96	L08	21:38:00	22:17:00
25/09/96	L09	22:21:00	22:53:00
25/09/96	L10	22:56:00	23:37:00
25/09/96	L11	23:40:00	00:12:00

GOOTE BANK

DECCA's

<i>Datum</i>	<i>Raai</i>	<i>Begin</i>	<i>Einde</i>
26/09/96	rH04	02:01:00	02:21:00
26/09/96	rH05	02:31:00	02:50:00
26/09/96	rH06	02:58:00	03:16:00
26/09/96	rH07	03:25:00	03:48:00
26/09/96	rH08	03:54:00	04:10:00
26/09/96	rH09	04:18:00	04:37:00
26/09/96	rH10	04:45:00	05:01:00
26/09/96	rH11	05:12:00	05:29:00
26/09/96	rH12	05:37:00	05:51:00
26/09/96	rH13	06:01:00	06:16:00
26/09/96	rH14	06:24:00	06:36:00
26/09/96	rH15	06:46:00	06:59:00
26/09/96	rH16	07:06:00	07:19:00
26/09/96	rH17	07:29:00	07:40:00
26/09/96	rH18	07:48:00	07:58:00
26/09/96	rH19	08:05:00	08:15:00
26/09/96	rH20	08:22:00	08:33:00

1.2. Campagne ST9631

VLAAMSE BANKEN (Kwintebank - Buiten Ratel - Oost Dyck)

DECCA's

<i>Datum</i>	<i>Raai</i>	<i>Begin</i>	<i>Einde</i>
16/12/96	rH02	12:25:57	12:45:59
16/12/96	rH01	12:51:28	13:12:10
16/12/96	rH00	13:18:15	13:37:32
16/12/96	rG23	13:50:40	14:25:17
16/12/96	rG22	14:30:45	15:07:23
16/12/96	rG21	15:17:02	15:58:10
16/12/96	rG20	16:07:10	16:59:51
16/12/96	rG19	17:05:10	17:53:58
16/12/96	rG18	18:06:57	18:46:59
16/12/96	rG17	18:53:42	19:38:30
16/12/96	rG16	19:43:40	20:21:20

HALVE DECCA's

<i>Datum</i>	<i>Raai</i>	<i>Begin</i>	<i>Einde</i>
16/12/96	rH01.5	23:39:34	23:50:54
16/12/96	rH00.5	23:16:57	23:30:11
16/12/96	rG23.5	22:59:26	23:10:19
16/12/96	rG22.5	22:38:32	22:51:09
16/12/96	rG21.5	22:22:18	22:32:37
16/12/96	rG20.5	22:06:43	22:16:53
16/12/96	rG19.5	21:51:37	22:01:09
16/12/96	rG18.5	21:34:14	21:45:45
16/12/96	rG17.5	21:18:07	21:28:56
16/12/96	rG16.5	20:59:34	21:12:15

LONGITUDINALEN KWINTEBANK

<i>Datum</i>	<i>Raai</i>	<i>Begin</i>	<i>Einde</i>
17/12/96	L01	00:07:27	00:24:34
17/12/96	L02	00:27:14	00:40:44
17/12/96	L03	00:43:28	01:01:30
17/12/96	L04	01:03:58	01:38:39
17/12/96	L05	01:43:16	02:25:06
17/12/96	L06	02:28:44	03:06:50
17/12/96	L07	03:11:12	03:43:49
17/12/96	L08	03:47:17	04:26:00
17/12/96	L09	04:30:16	05:01:57
17/12/96	L10	05:05:48	05:45:10
17/12/96	L11	05:49:58	06:20:12

Hoofdstuk 2. Verwerking van de bathymetrische data

Voor beide campagnes worden de bathymetrische data gecorrigeerd voor de heading en voor het getij. De heading wordt aan boord digitaal om de seconde opgenomen. Voor de getijcorrectie worden eerst de getijkrommen gedigitaliseerd. De verwerking van beide correcties gebeurt door het programma *tij_cor*. Uit de aldus verkregen file met gecorrigeerde data worden door het ingeven van de begin- en eindtijd van elke track de gewenste profielen verkregen (zie hoofdstuk 2). Met het programma *volraai* worden van elke track het profiel, de track zelf, een aantal statistische gegevens en de volumes (zie hoofdstuk 3) berekend en weergegeven. Voorts wordt om beide campagnes voor de Kwintebank te kunnen vergelijken, een gebied gedefinieerd als afbakening van de Kwintebank waarvoor de profielen nog eens afzonderlijk worden berekend en vergeleken. Dit wordt gedaan om enkel het deel op de Kwintebank van de profielen van de gehele Vlaamse Banken te beschouwen en om eenzelfde begin- en eindpunt van de profielen te bekomen.

2.1. Campagne ST9621

- Profielen van de Kwintebank opgenomen langs de decca's en de halve decca's : bijlage 1
- Profielen van de Kwintebank langs de longitudinalen opgenomen : bijlage 2
- Profielen van de Gootebank langs de decca's opgenomen : bijlage 3

2.2. Campagne ST9631

- Profielen van de Kwintebank opgenomen langs de decca's en de halve decca's : bijlage 4
- Profielen van de Kwintebank opgenomen langs de longitudinalen : bijlage 5

Elk profiel bestaat uit vier vensters :

- In het eerste venster vinden we een tabel waarin van elke variabele afzonderlijk (x (UTM), y (UTM) en de diepte z (m)) de kleinste waarde (Min), de grootste waarde (Max), het gemiddelde (Avg) en de standaarddeviatie (Sigma) wordt vermeld.
- Het tweede venster daaronder bevat de oppervlakten S berekend onder het profiel t.o.v. een bepaald referentieniveau (-5, -10, -15, -20, -25m) en het verschil tussen deze waarden dS (dus de oppervlakte onder de kromme tussen twee referentievlakken).
- Een derde venster (rechtsboven) toont de track. De richting van deze tracks is voor de decca's en halve decca's NW-ZO en voor de longitudinale raaien NO-ZW.
- Het vierde en grootste venster toont tenslotte het profiel zelf. De profielen worden steeds volgens de vaarrichting afgebeeld (het eerst opgenomen punt links,

het laatst opgenomen punt rechts). Door het afwisselen van de vaarrichting (van NW naar ZO en omgekeerd) hebben deze profielen een verschillende oriëntatie (ze zijn a.h.w. gespiegeld). In de menubalk bovenaan dit venster staat de naam van de track.

2.3. Vergelijking van de bathymetrische profielen van de Kwintebank

Op basis van de profielen volgens de decca's en halve decca's kunnen we een eerste vergelijking maken tussen de twee campagnes. De profielen van beide campagnes werden voor elke track op eenzelfde grafiek voorgesteld zodat een visuele vergelijking van beide mogelijk is. Verder werd van elk profiel ook de gevaren track voorgesteld, waardoor eventuele verschillen tussen beide profielen t.g.v. het niet overeenkomen van de gevaren tracks duidelijker worden. Al deze grafieken zijn verzameld in bijlage 6.

Een eerste vergelijking maakt al snel duidelijk dat een groot deel van de verschillen in de profielen tussen beide campagnes te wijten is aan de eventuele afstand tussen de gevaren tracks. De profielen waarvan de tracks het best overeenkomen vertonen ook de geringste verschillen in profiel. Voor de profielen met een groter onderling verschil tussen de tracks is de verschuiving van de pieken (sandwaves) duidelijk. Een mogelijke verklaring hiervoor is het verschil in oriëntatie tussen de sandwaves en de profielen.

Algemeen valt voor de profielen rG17,5 tot rG21,5 (het zuidwestelijk en centrale deel van de Kwintebank) een lichte daling in volume op. Voor de overige profielen (rG22 tot rH02, het noordoostelijke deel van de Kwintebank) stellen we een lichte stijging van het volume vast. Een aantal profielen zijn echter moeilijk vergelijkbaar door het gedeeltelijk ontbreken van data, zoals bv. in profiel rG23,5 voor december (ST9631) waar een aantal pieken ontbreken.

3. Volumetrische evolutie van de Kwintebank van september tot december 1996

Naast het vergelijken van bathymetrische profielen kunnen we een numerieke methode gebruiken om de evolutie van de zandbanken te bestuderen. Hiervoor worden de referentievolumes langs de referentielijnen berekend. Deze volumes worden bepaald door de oppervlakte begrensd door het bankprofiel en de snijlijn met een referentievlak (hier opeenvolgend -5, -10, -15 en -20m) en met een vaste breedte van 1m. Ze worden dan ook uitgedrukt in m³/m. Als referentielijnen worden hier weerom de decca's en halve decca's beschouwd (van rg17,5 tot rh02).

3.1. Berekening van referentievolumes langs referentielijnen

De referentievolumes worden berekend met het programma *volraai* (zie 2.1. en 2.2.). Het volume wordt enerzijds berekend boven een referentievlak gelegd op een diepte van 5, 10, 15 en 20m en anderzijds berekenen we ook de volumes tussen de verschillende referentievlakken. Al deze waarden worden voor beide campagnes in onderstaande tabellen weergegeven.

st9621							
	> -5m	-5/-10m	> -10m	-10/-15m	> -15m	-15/-20m	> -20m
rg17,5	-	3949,85	3949,85	11512,16	15462,01	13766,81	29288,82
rg18	3,14	5028,13	5031,28	10390,24	15421,52	12769,89	28191,41
rg18,5	112,27	5170,65	5282,92	8828,16	14111,08	11708,48	25819,56
rg19	6,75	4444,79	4451,54	7717,54	12169,08	10716,54	22885,62
rg19,5	-	3248,06	3248,06	6473,75	9721,81	9291,56	19013,37
rg20	-	2044,93	2044,93	5674,26	7719,19	8532,01	16251,20
rg20,5	-	763,33	763,33	5058,64	5821,97	7943,62	13765,59
rg21	-	128,26	128,26	4191,26	4319,52	7754,58	12074,10
rg21,5	-	100,30	100,30	2807,65	2907,95	7122,94	10030,90
rg22	-	34,90	34,90	1879,52	1914,42	6419,42	8333,84
rg22,5	-	12,01	12,01	1298,93	1310,94	7008,33	8319,28
rg23	-	-	-	2140,68	2140,68	9363,55	11504,23
rg23,5	-	0,78	0,78	1834,19	1834,97	7520,60	9355,57
rh00	-	-	-	601,53	601,53	5915,88	6517,41
rh00,5	-	-	-	308,03	308,03	4513,59	4821,62
rh01	-	-	-	139,51	139,51	3494,11	3633,61
rh01,5	-	-	-	32,05	32,05	3517,06	3549,11
rh02	-	-	-	-	-	134,18	134,18

tabel 3.1. : Referentievolumes van de campagne ST9621 (september 1996).

De volumes zijn in m³/m.

st9631							
	> -5m	-5/-10m	> -10m	-10/-15m	> -15m	-15/-20m	> -20m
rg17,5	-	3720,04	3720,04	11449,27	15169,31	13769,78	28939,09
rg18	-	4784,04	4784,04	10104,7	14888,74	12671,31	27560,06
rg18,5	115,57	5130,98	5246,55	8716,64	13963,18	11618,02	25581,21
rg19	-	4206,69	4206,69	7412,15	11618,84	10508,15	22126,99
rg19,5	-	3290,64	3290,64	6422,22	9712,85	9255,28	18968,13
rg20	-	1920,15	1920,15	5474,14	7394,29	8241,61	15635,90
rg20,5	-	659,02	659,02	4767,39	5426,41	7720,10	13146,51
rg21	-	116,84	116,84	4106,39	4223,23	7648,57	11871,80
rg21,5	-	108,50	108,50	2405,38	2513,88	6934,54	9457,42
rg22	-	24,68	24,68	2120,72	2145,40	6295,37	8440,77
rg22,5	-	17,45	17,45	1335,27	1352,72	7545,10	8897,82
rg23	-	3,65	3,65	2296,92	2300,57	9343,86	11644,43
rg23,5	-	10,62	10,62	1810,73	1821,35	7816,20	9637,55
rh00	-	-	-	452,18	452,18	5676,65	6128,83
rh00,5	-	-	-	364,24	364,24	4647,56	5011,79
rh01	-	-	-	213,46	213,46	3732,18	3945,64
rh01,5	-	-	-	63,65	63,65	3837,44	3901,10
rh02	-	-	-	-	-	103,53	103,53

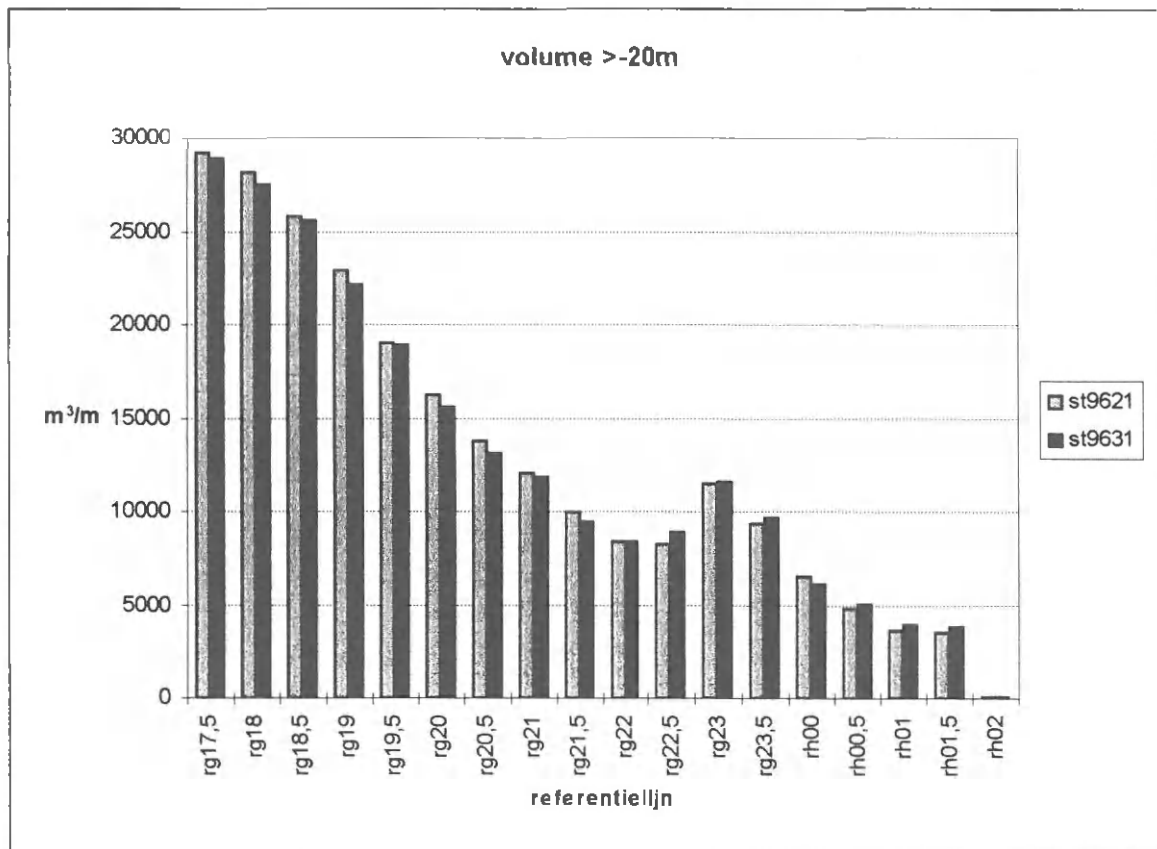
tabel 3.2. : Referentievolumes van de campagne ST9631 (december 1996).
De volumes zijn in m³/m.

3.2. Evolutie van de volumes van de Kwintebank

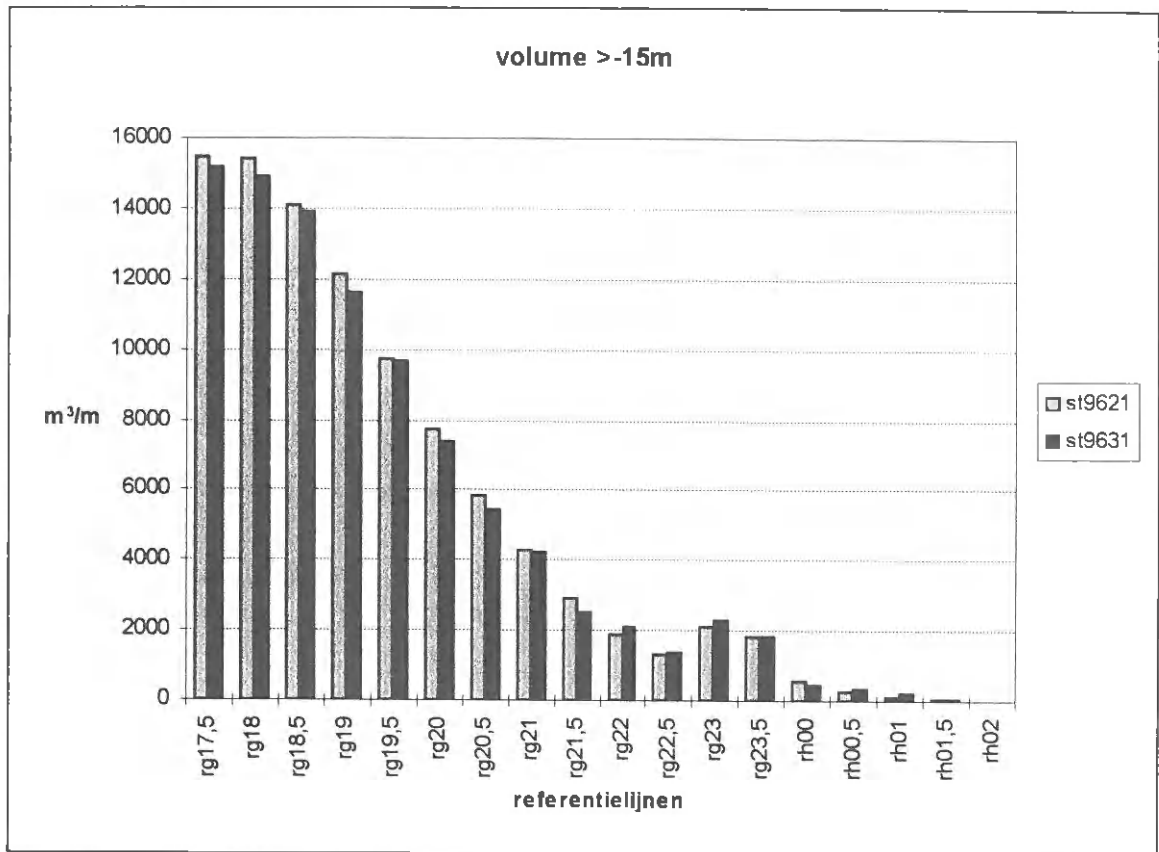
De berekende volumes uit tabellen 3.1 en 3.2 werden grafisch voorgesteld in grafieken 3.1, 3.2 en 3.3. Naarmate we verder naar het Noorden gaan neemt de bank sterk in volume af. Op deze grafieken valt verder de lichte volumedaling op in het zuidelijk deel van de Kwintebank en de lichte stijging in het noordelijke deel.

Tabel 3.3. geeft de verandering in volumes t.o.v. verschillende referentievlakken weer. In grafiek 3.4 tot 3.8 worden dit sedimentverlies of -aanwas voor een aantal klassen voorgesteld. Hierin valt op dat het volumeverlies vooral in de hogere delen van de bank plaatsvindt terwijl de volumetoename op grotere diepte gebeurt.

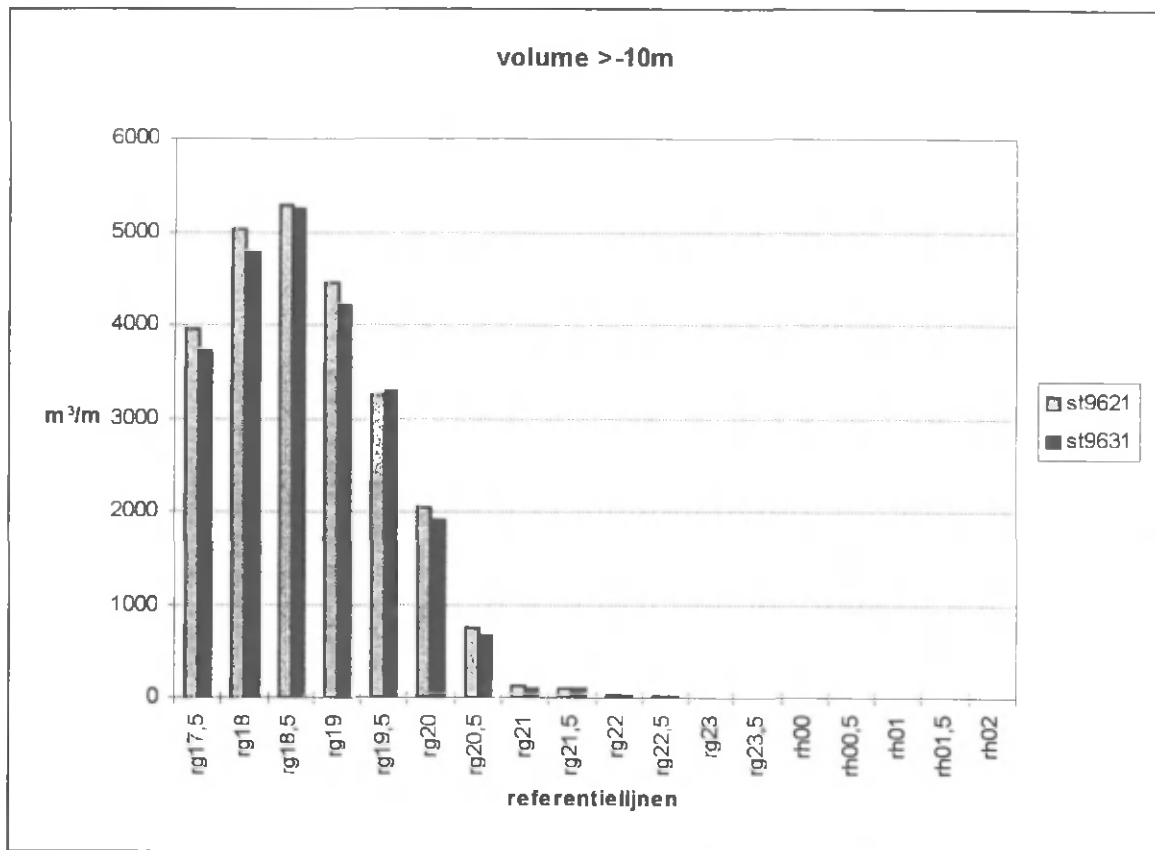
De waarden in deze grafieken en tabellen moeten echter met de nodige voorzichtigheid geïnterpreteerd worden door de fouten die te wijten zijn aan onvolledige datareeksen (zoals langs rG23,5) en verschillen tussen gevaren tracks.



Grafiek 3.1. : Volume hoger dan -20m langs de referentielijnen.



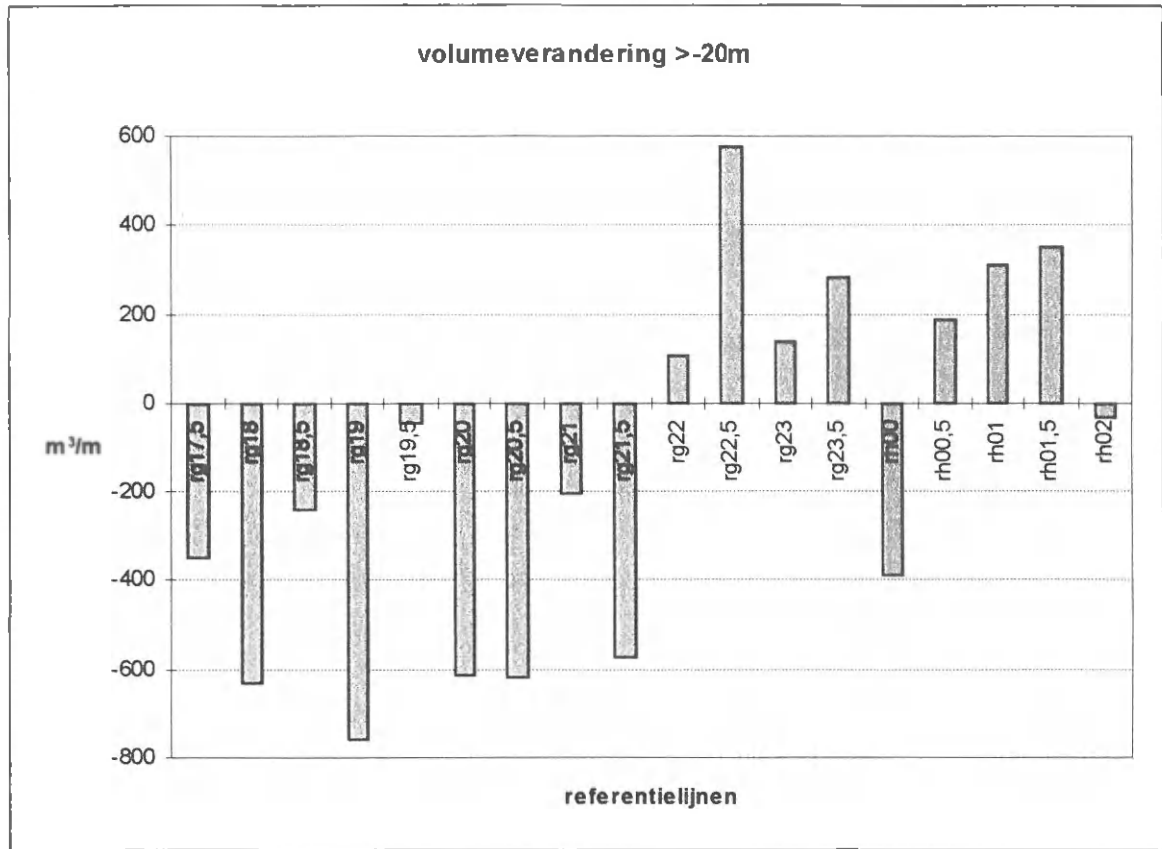
Grafiek 3.2. : Volume hoger dan -15m langs de referentielijnen.



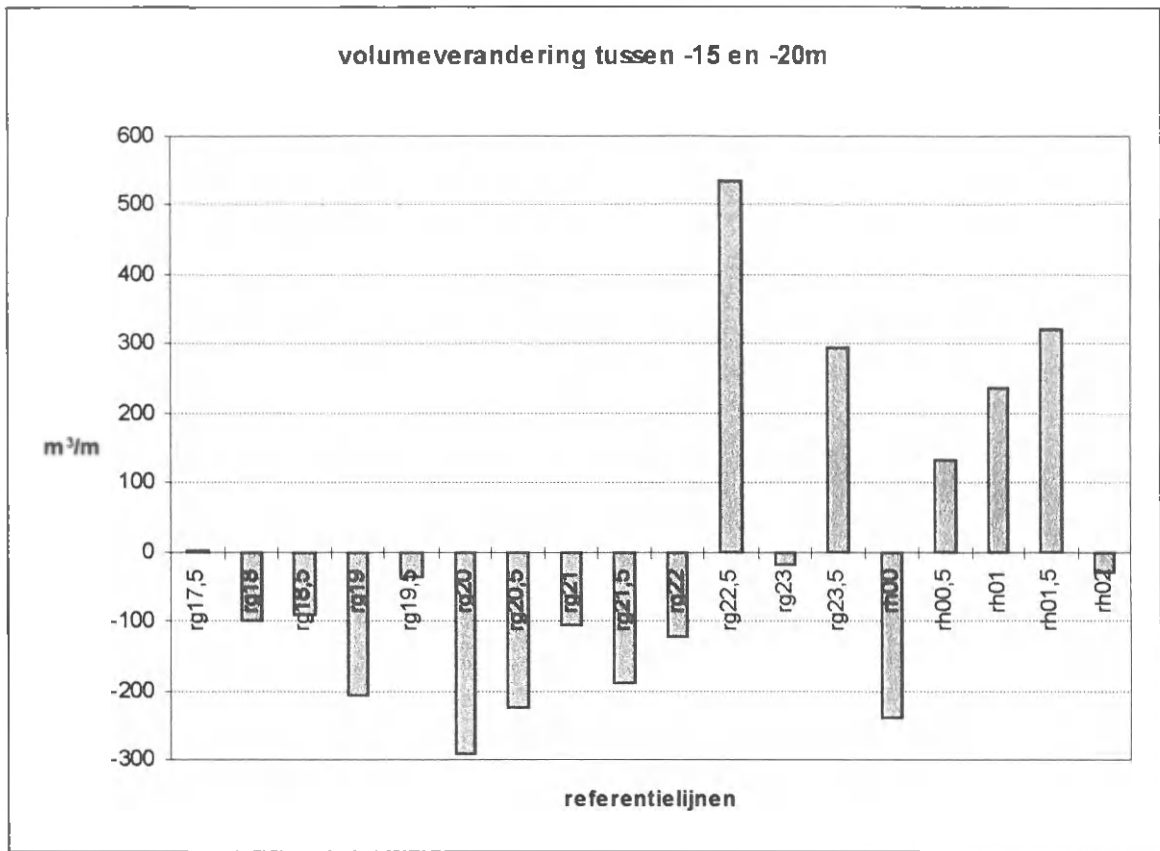
Grafiek 3.3. : Volume hoger dan -10m langs de referentielijnen.

Volumeverandering							
	> -5m	-5/-10m	> -10m	-10/-15m	> -15m	-15/-20m	> -20m
rg17,5	-	-229,81	-229,81	-62,89	-292,70	2,97	-349,73
rg18	-3,14	-244,09	-247,24	-285,54	-532,78	-98,58	-631,35
rg18,5	3,30	-39,67	-36,37	-111,52	-147,90	-90,46	-238,35
rg19	-6,75	-238,10	-244,85	-305,39	-550,24	-208,39	-758,63
rg19,5	-	42,58	42,58	-51,53	-8,96	-36,28	-45,24
rg20	-	-124,78	-124,78	-200,12	-324,90	-290,40	-615,30
rg20,5	-	-104,31	-104,31	-291,25	-395,56	-223,52	-619,08
rg21	-	-11,42	-11,42	-84,87	-96,29	-106,01	-202,30
rg21,5	-	8,20	8,20	-402,27	-394,07	-188,40	-573,48
rg22	-	-10,22	-10,22	241,20	230,98	-124,05	106,93
rg22,5	-	5,44	5,44	36,34	41,78	536,77	578,54
rg23	-	3,65	3,65	156,24	159,89	-19,69	140,20
rg23,5	-	9,84	9,84	-23,46	-13,62	295,60	281,98
rh00	-	-	-	-149,35	-149,35	-239,23	-388,58
rh00,5	-	-	-	56,21	56,21	133,97	190,17
rh01	-	-	-	73,95	73,95	238,07	312,03
rh01,5	-	-	-	31,60	31,60	320,38	351,99
rh02	-	-	-	-	-	-30,65	-30,65
totaal	-6,59	-932,69	-939,29	-1372,65	-2311,96	-127,90	-2490,85

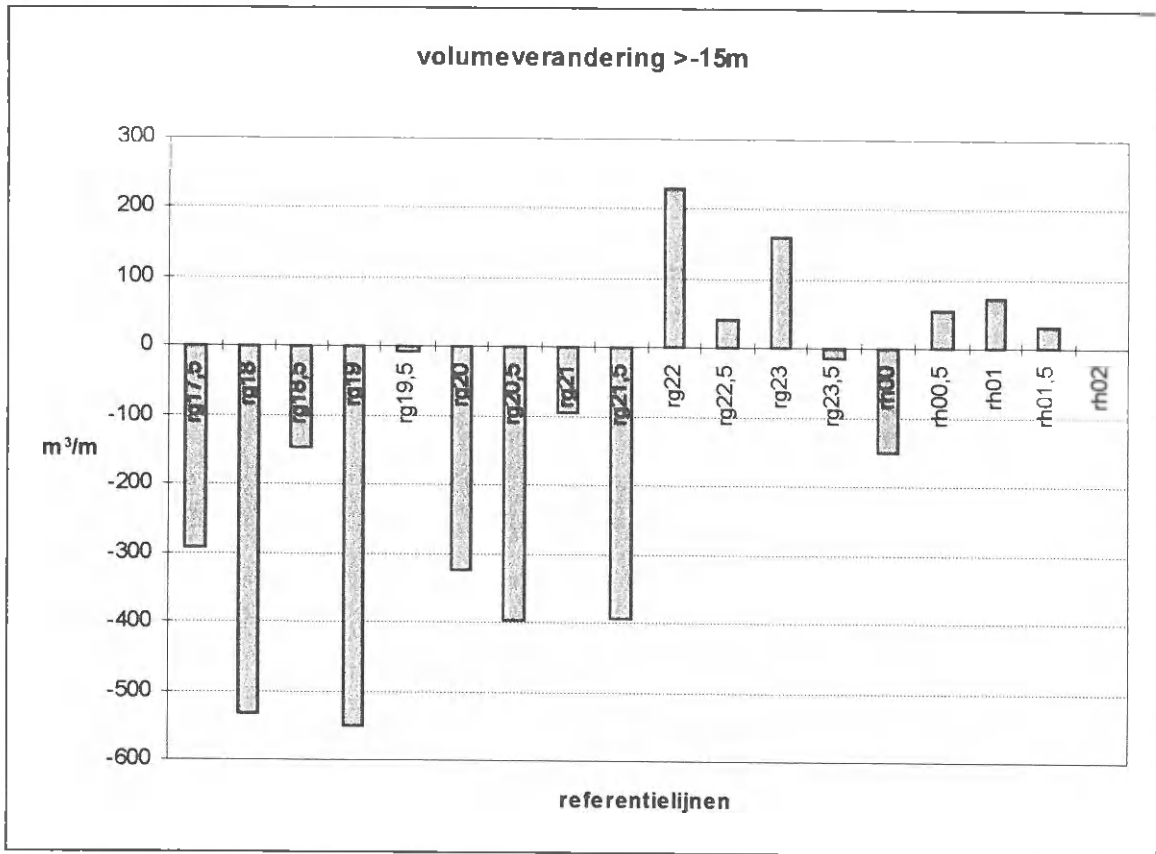
tabel 3.3. : Volumeverandering van de Kwintebank tussen september (ST9621) en december (ST9631) 1996. De waarden zijn in m³/m.



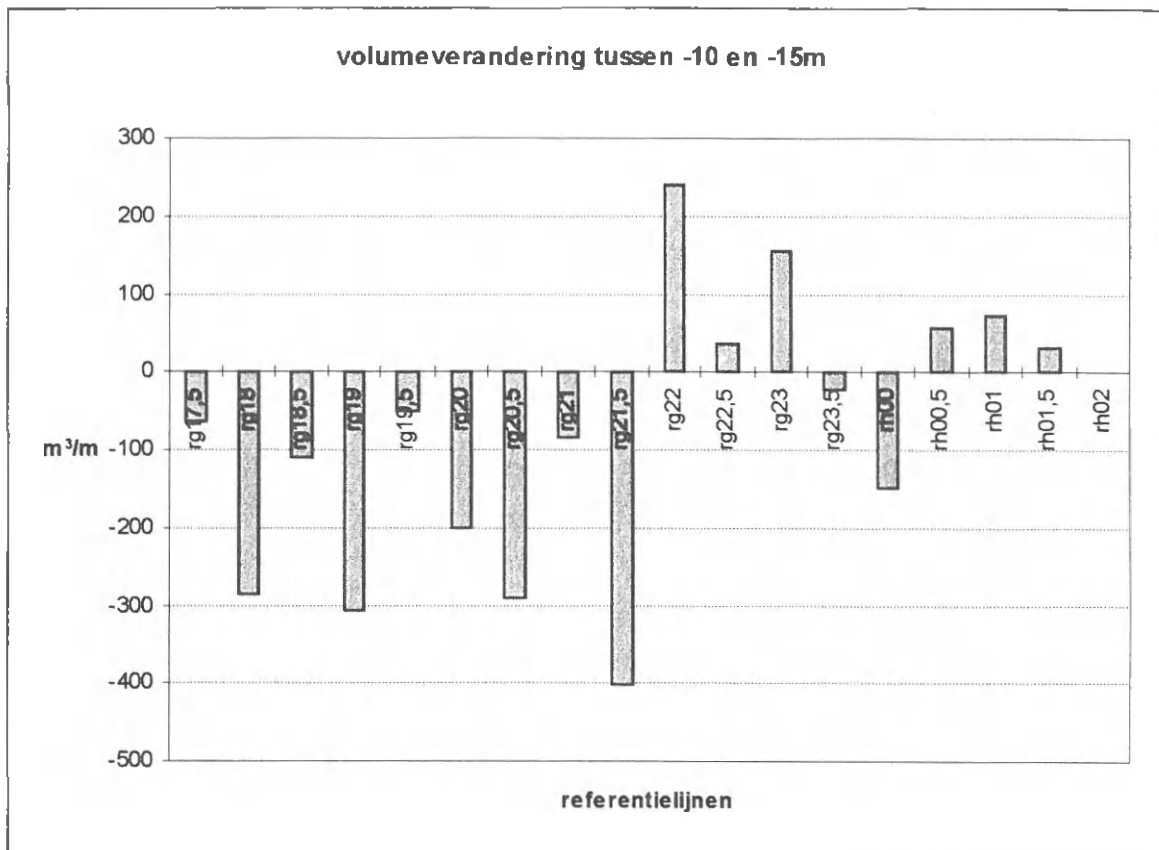
Grafiek 3.4 : Volumeverandering hoger dan -20m.



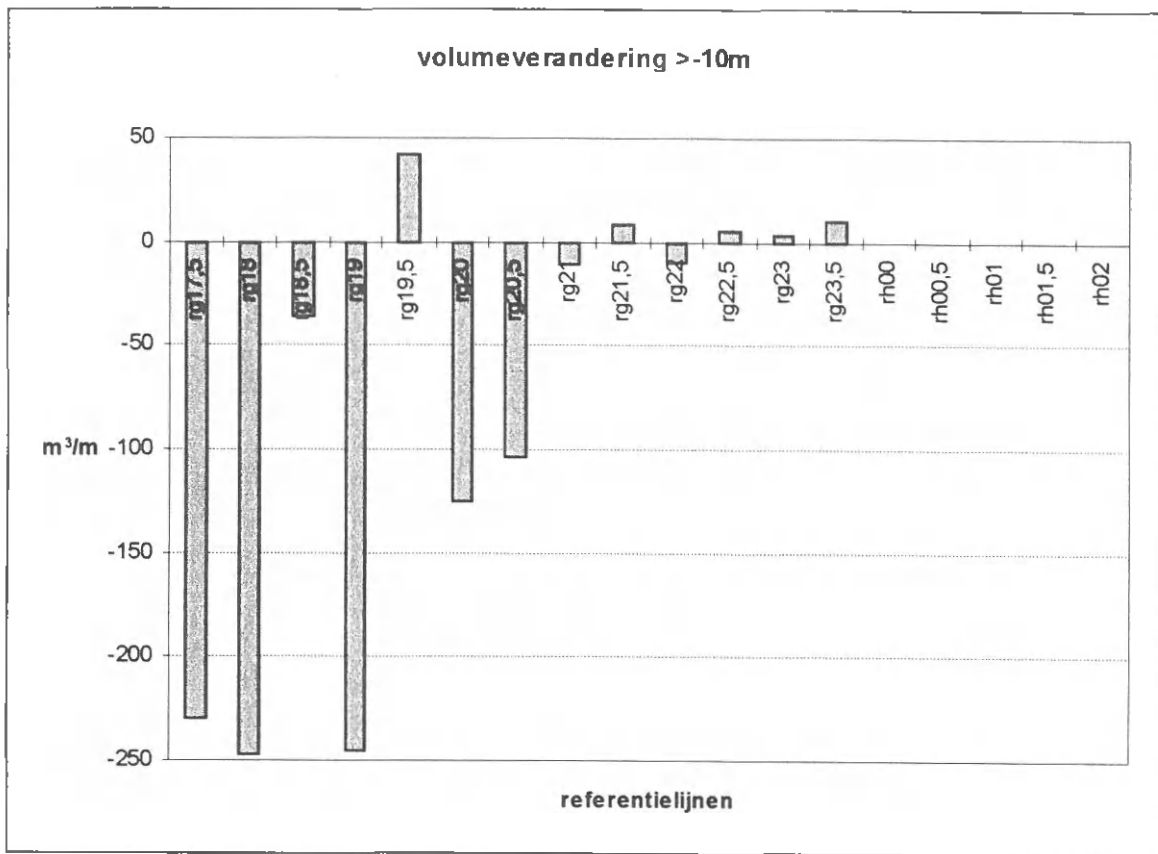
Grafiek 3.5 : Volumeverandering tussen -20m en -15m.



Grafiek 3.6. : Volumeverandering hoger dan -15m.

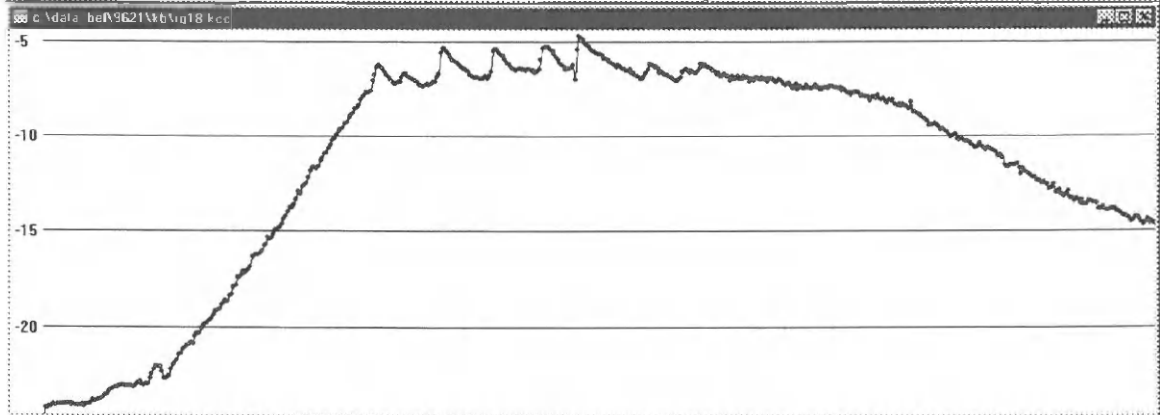
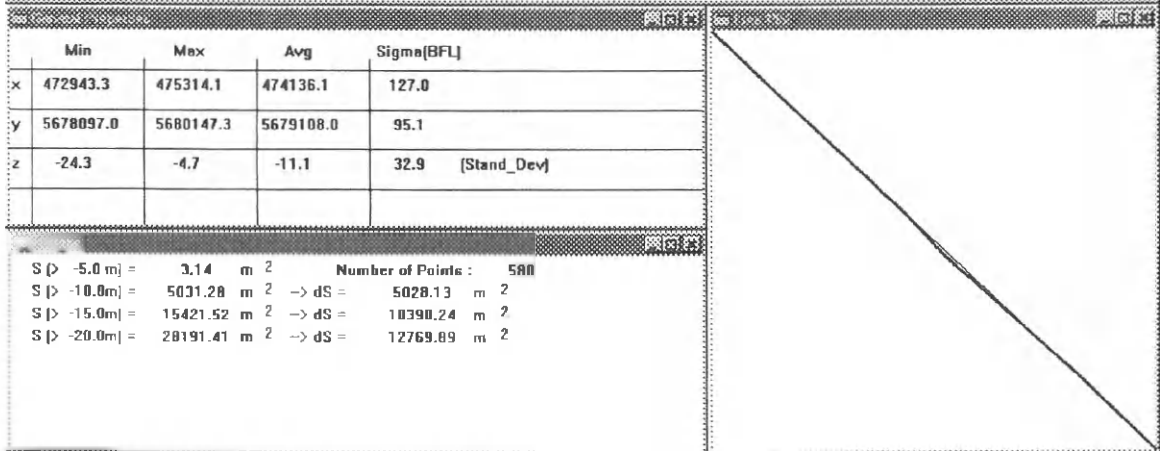
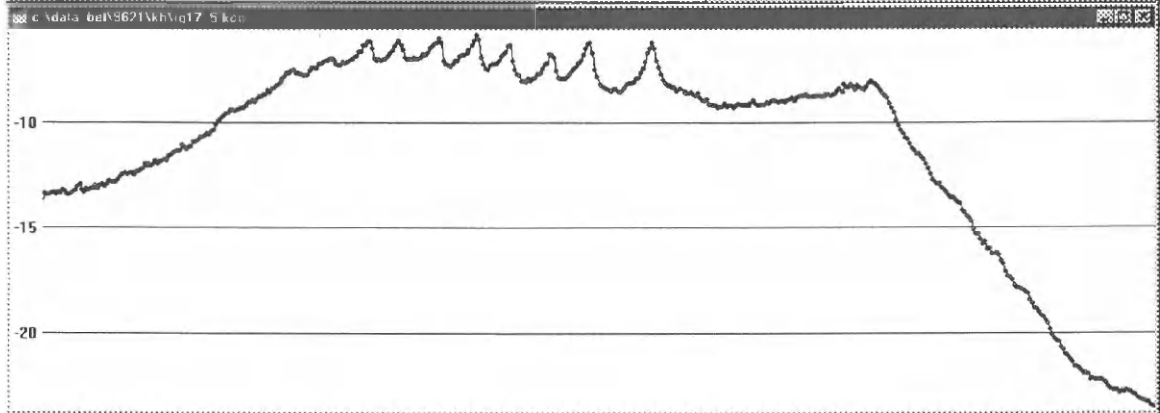
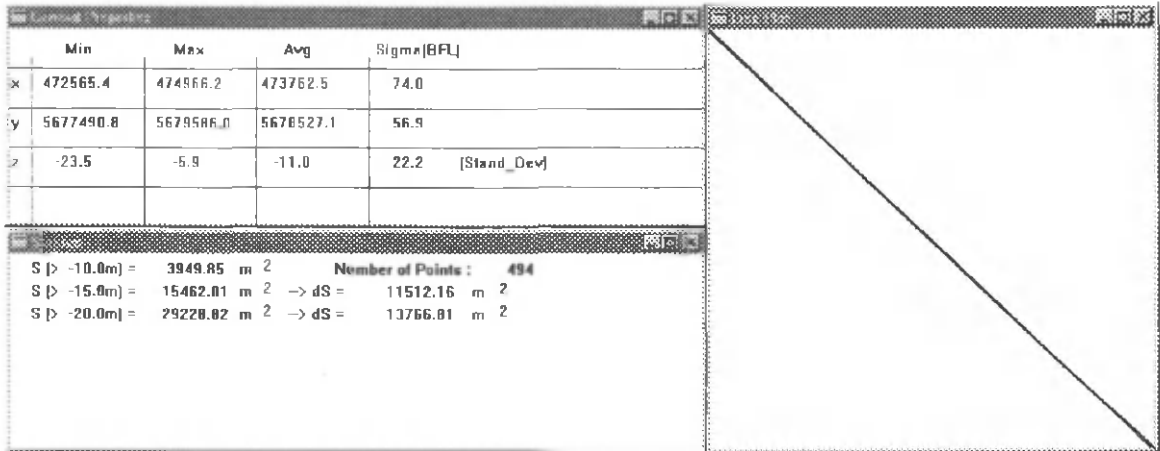


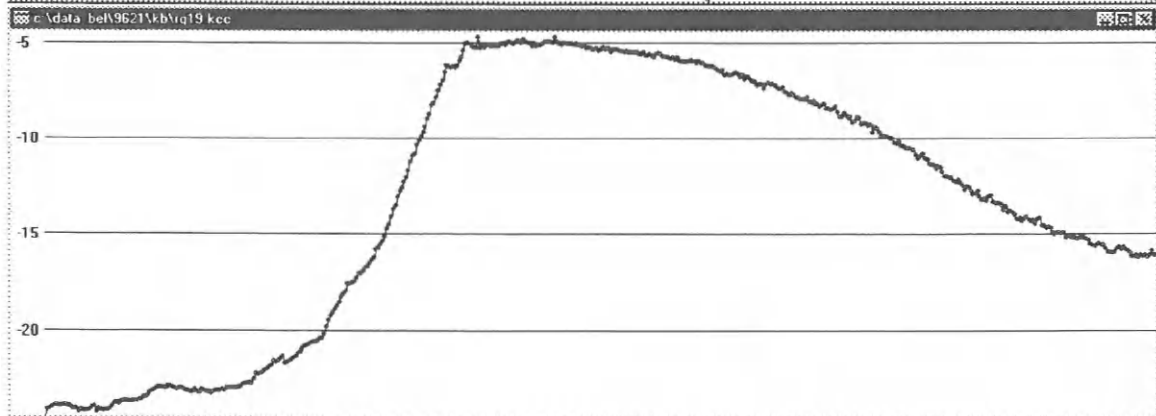
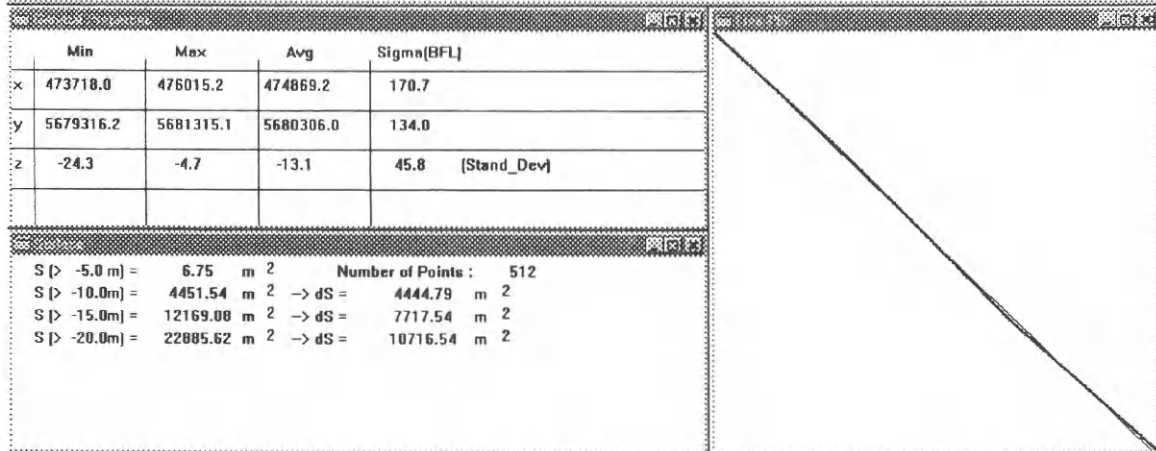
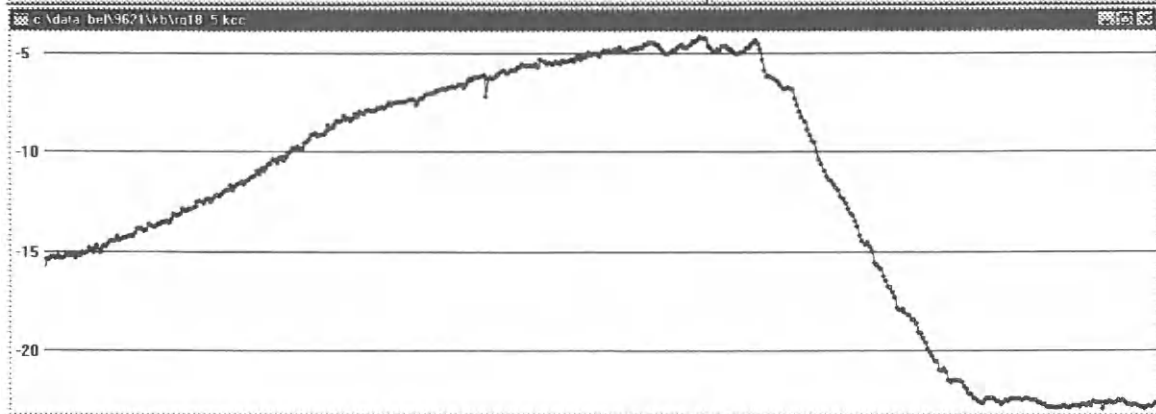
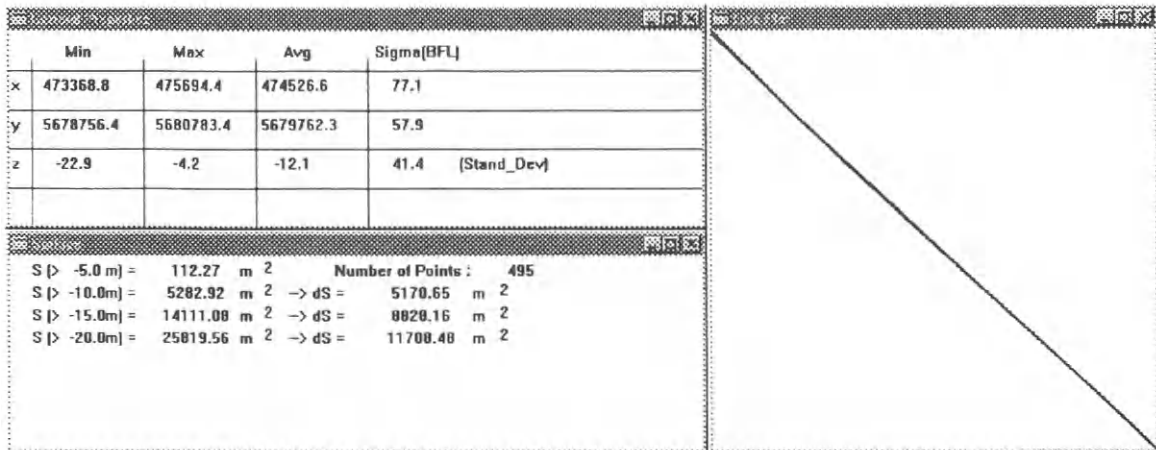
Grafiek 3.7. : Volumeverandering tussen -15m en -10m.

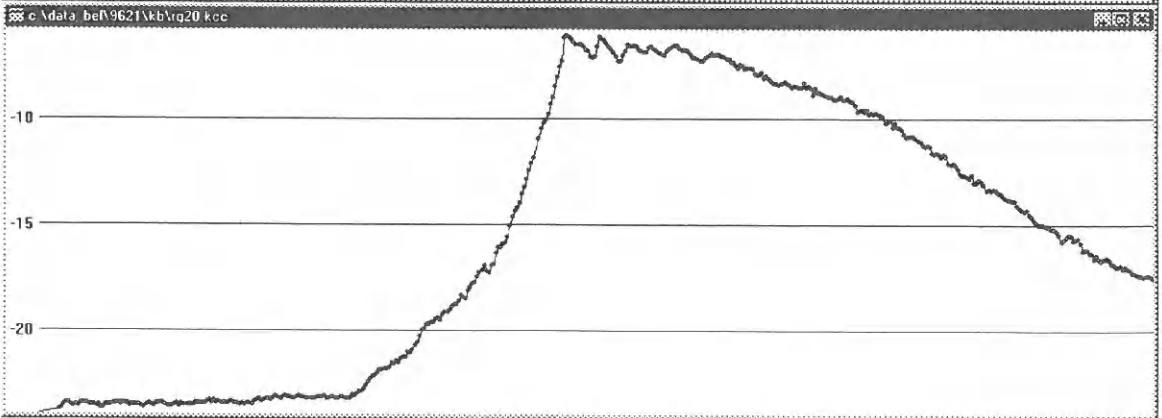
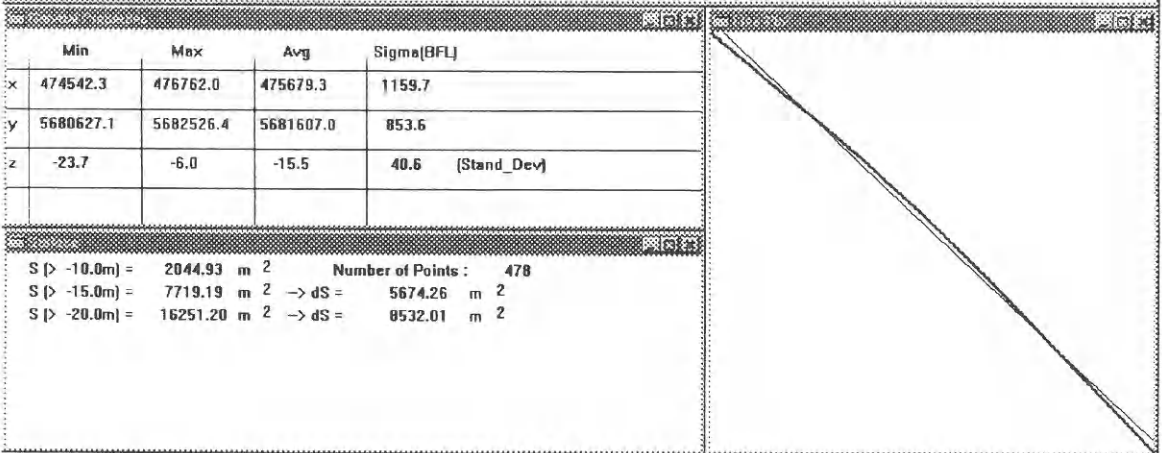
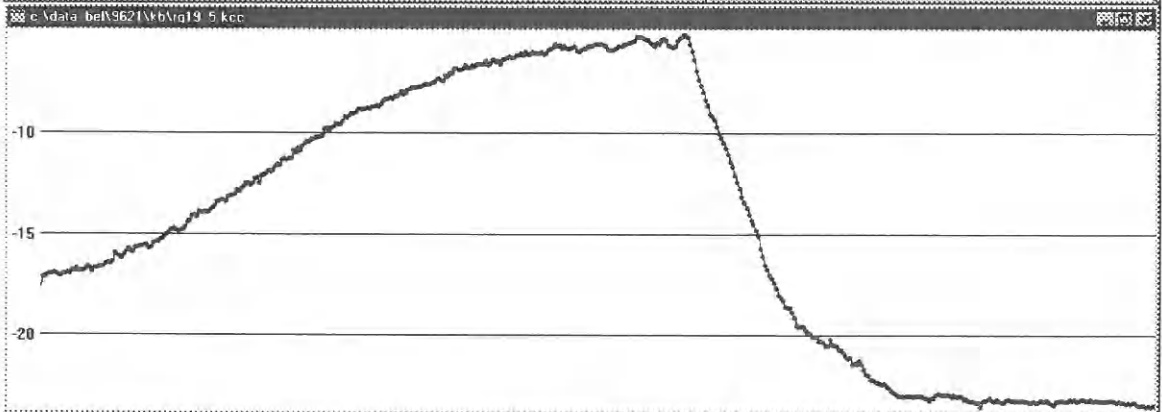
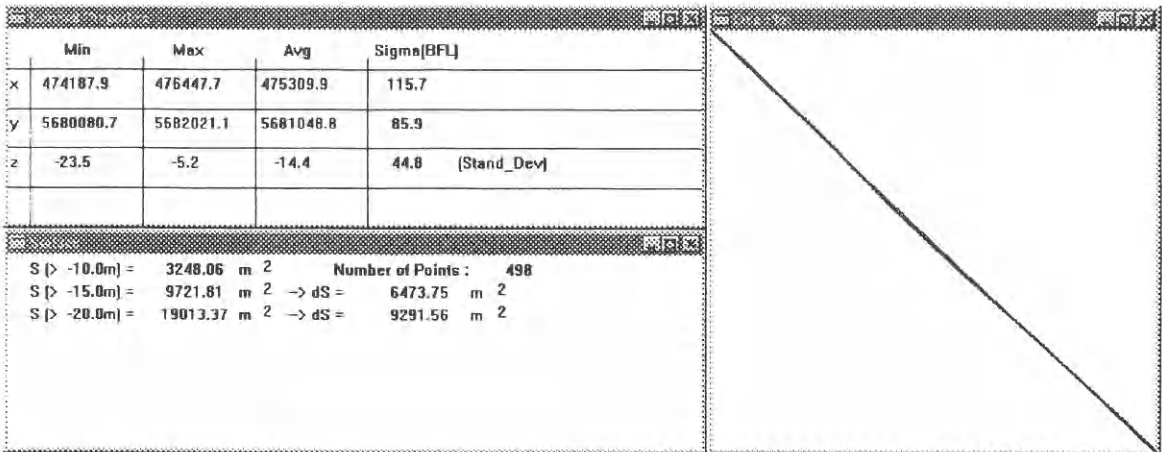


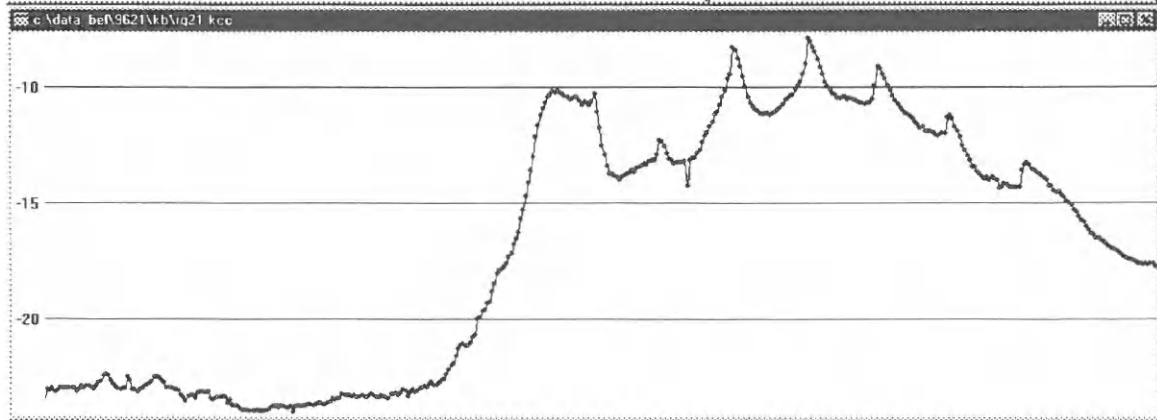
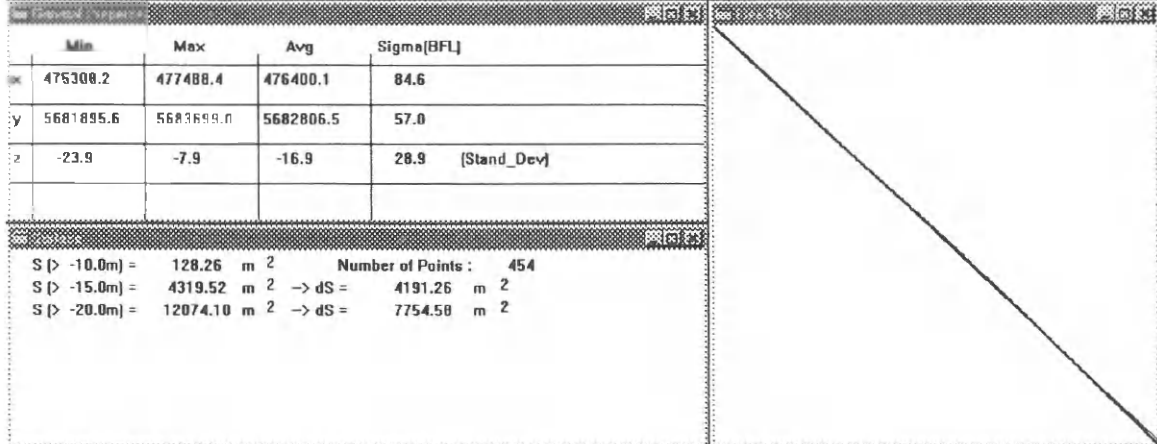
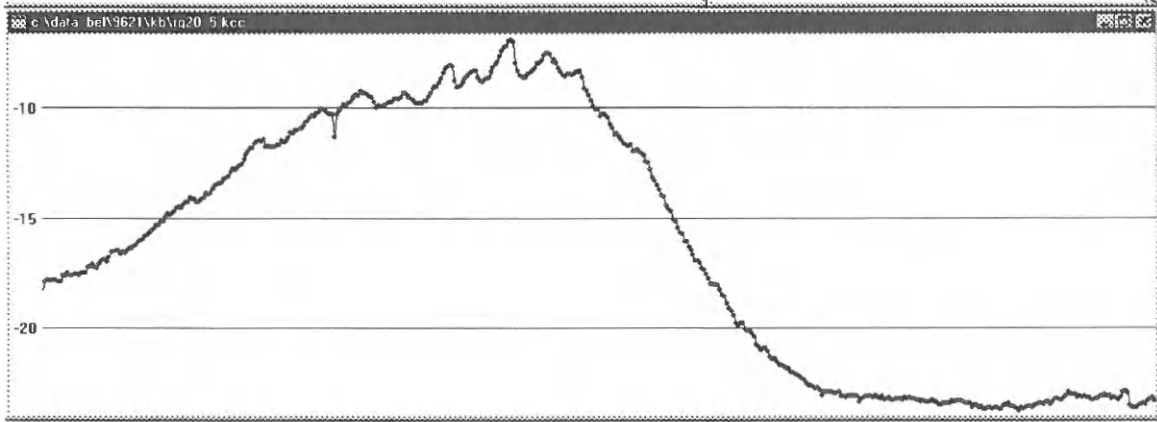
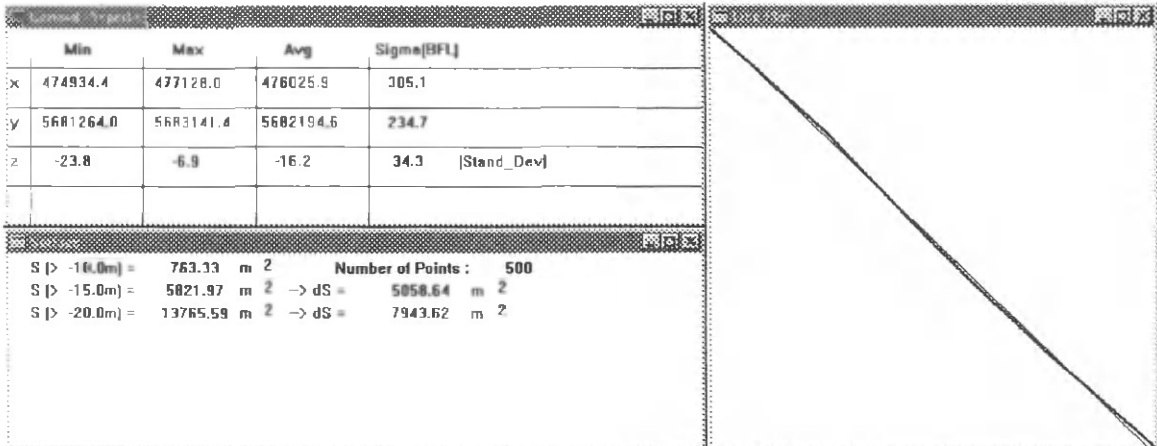
Grafiek 3.8. : Volumeverandering hoger dan -10m.

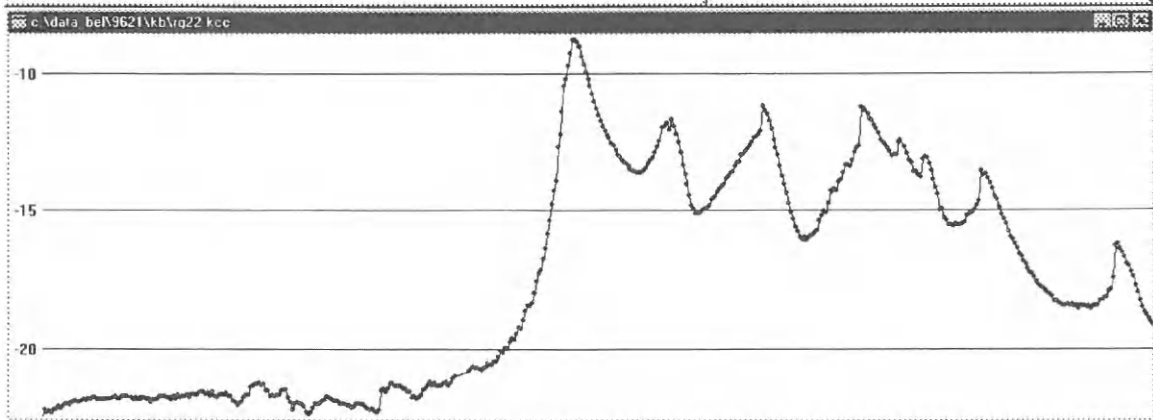
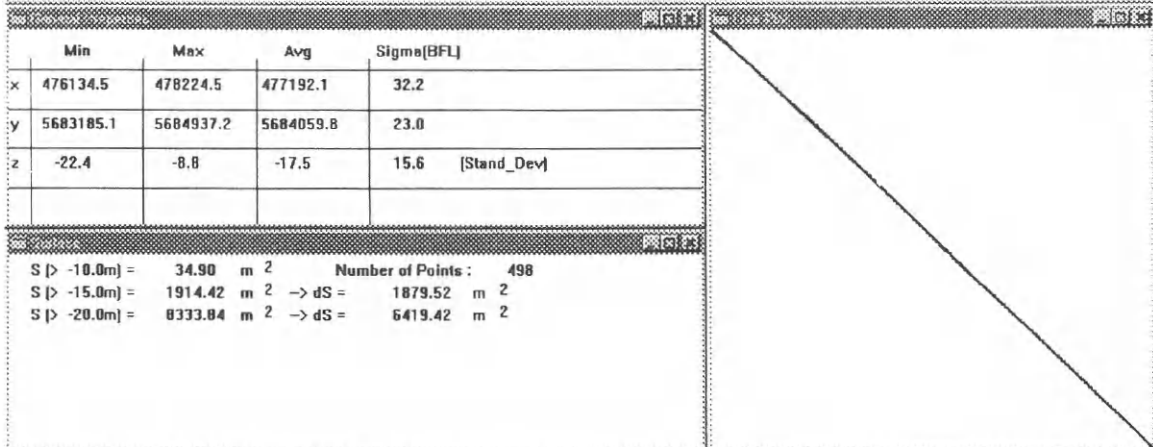
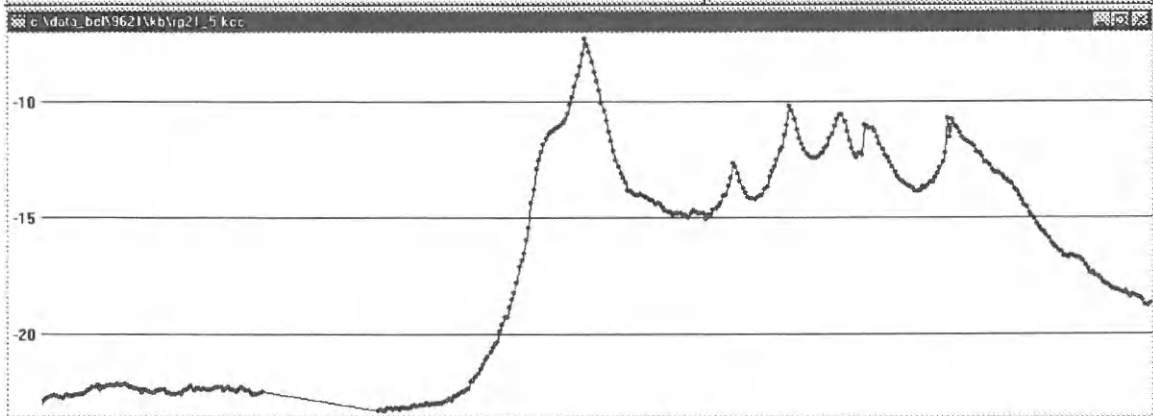
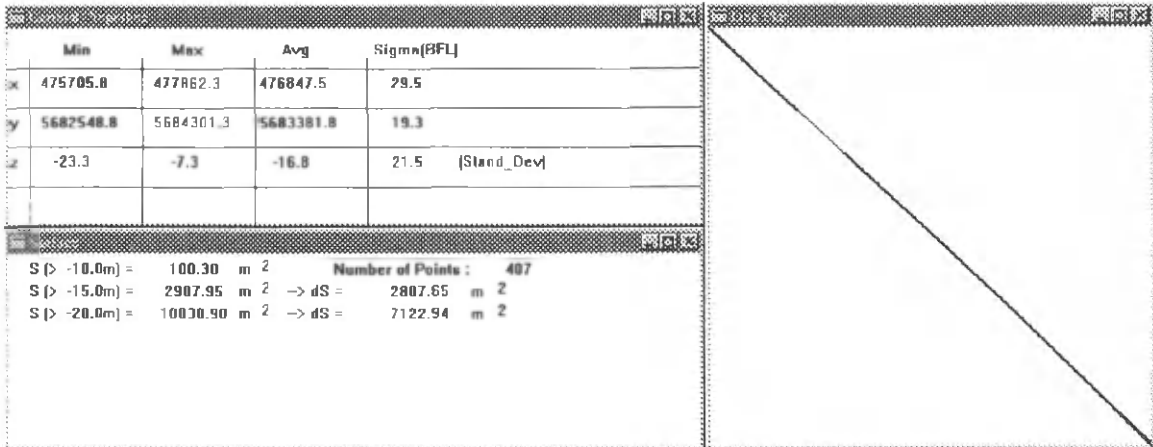
Biilage 1 : Profielen decca's en halve decca's Kwintebank (ST9621)

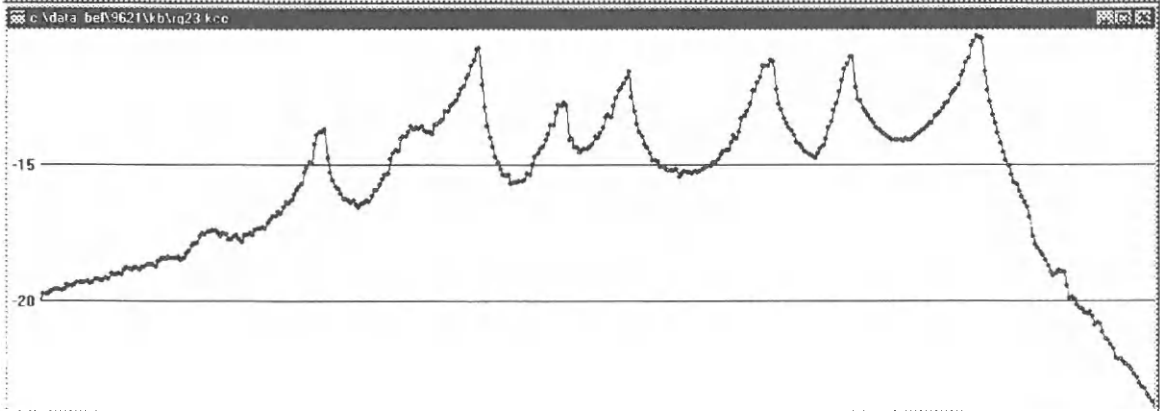
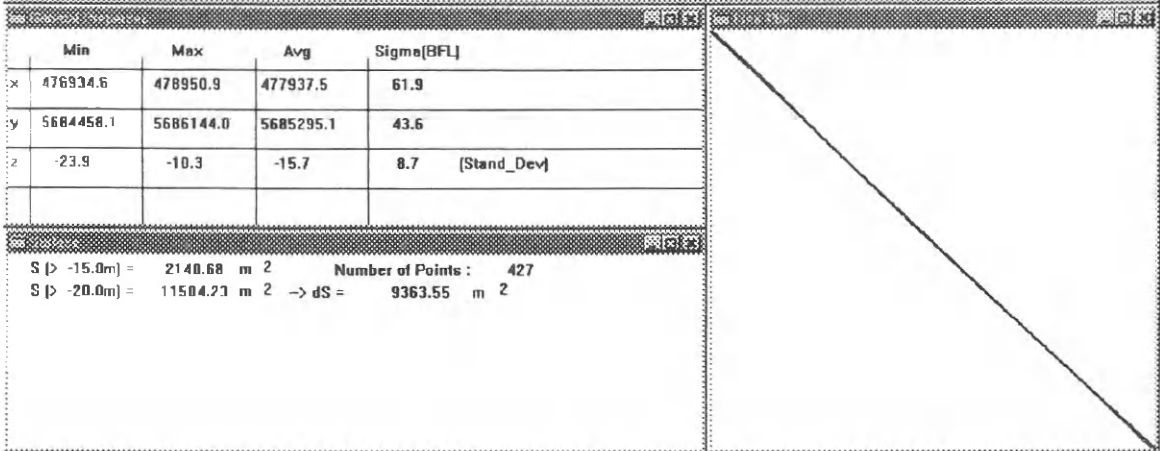
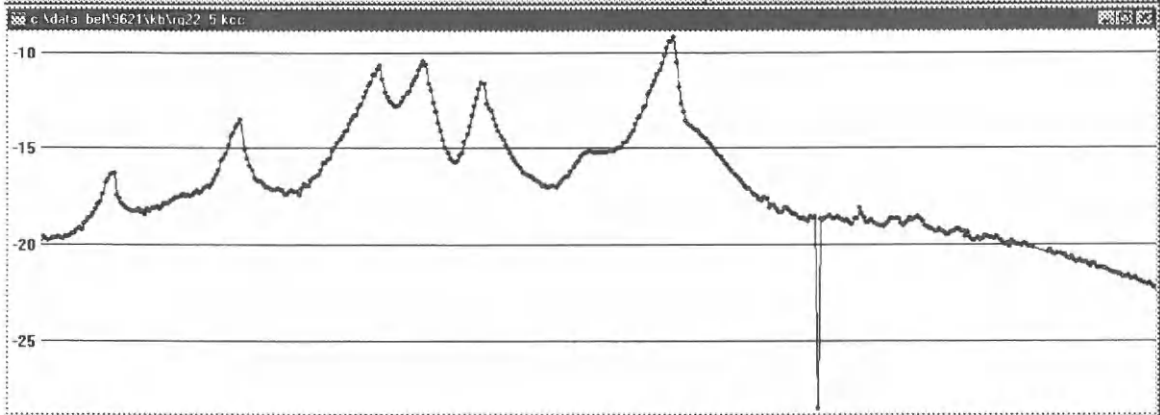
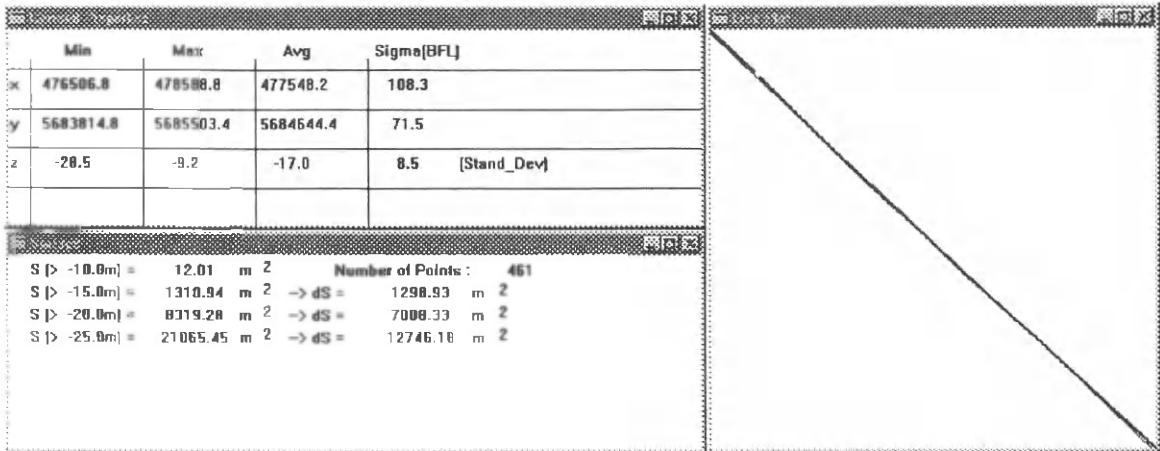




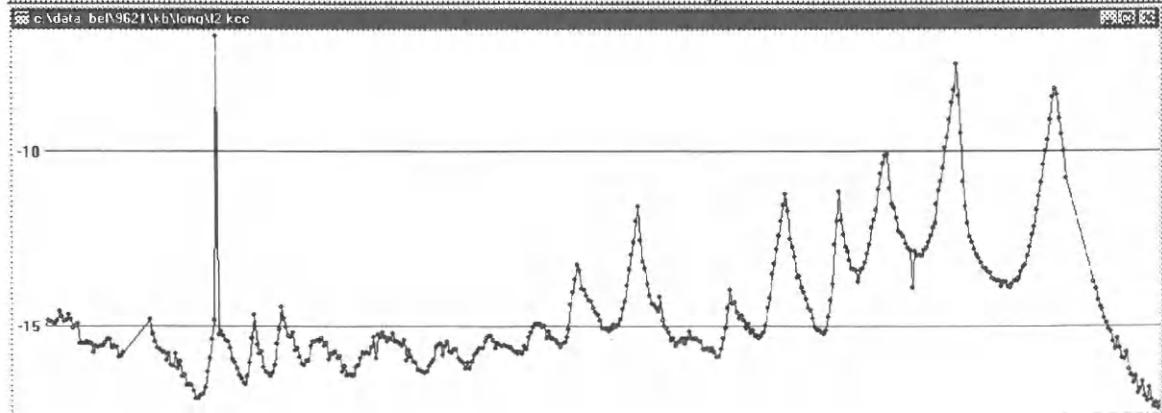
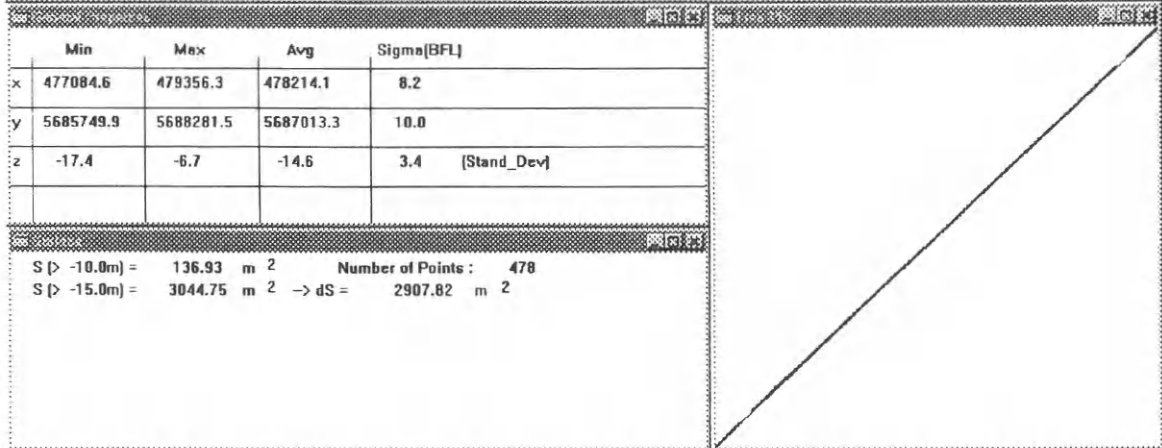
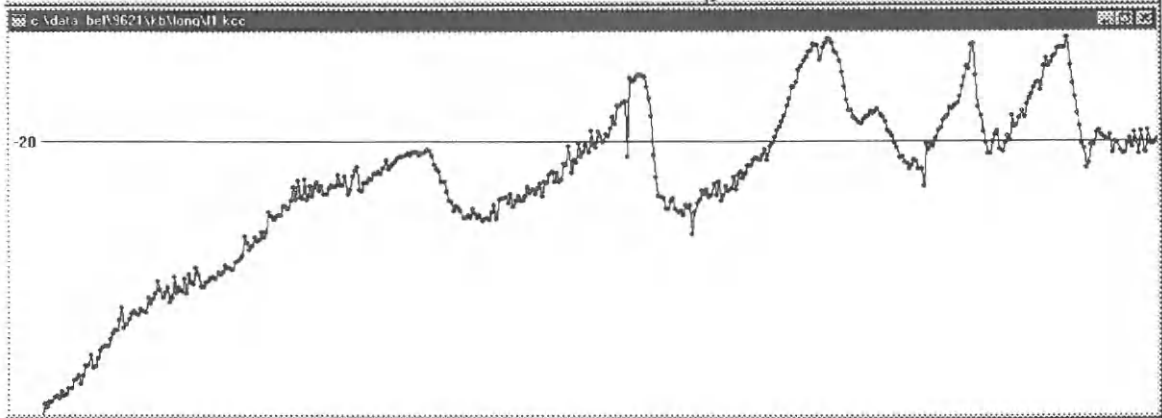
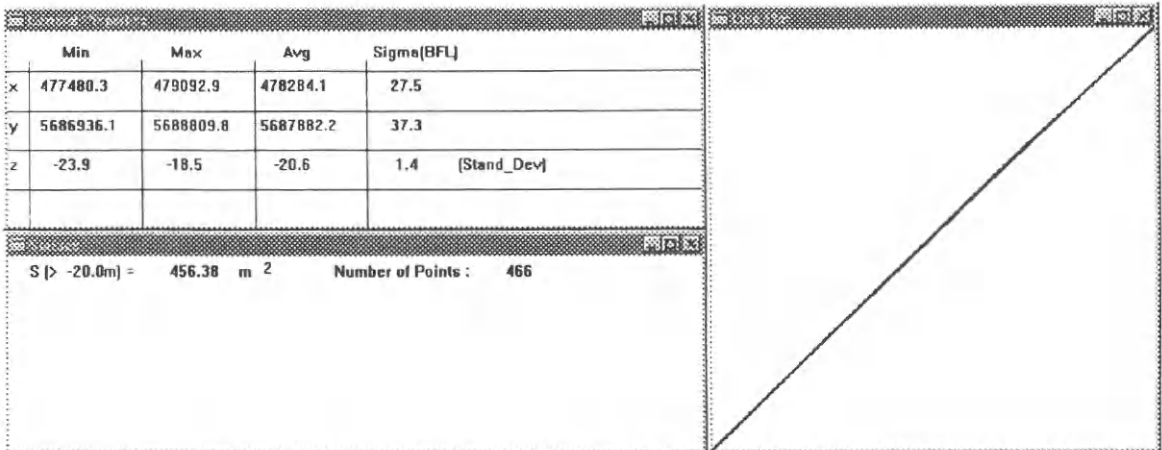


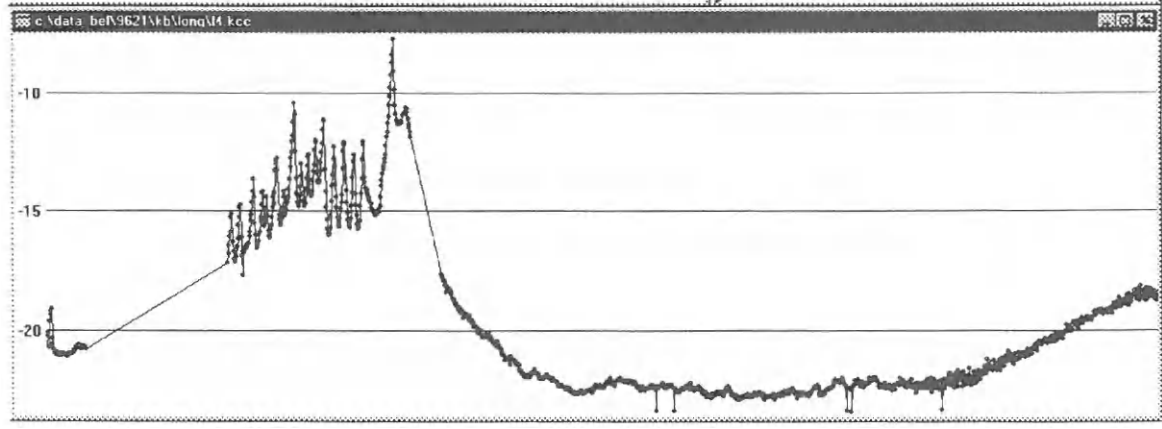
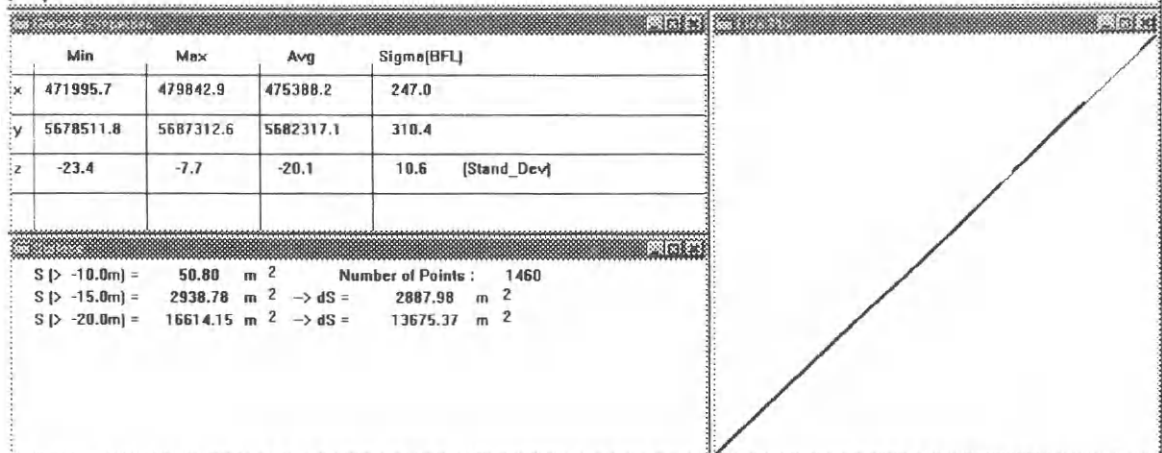
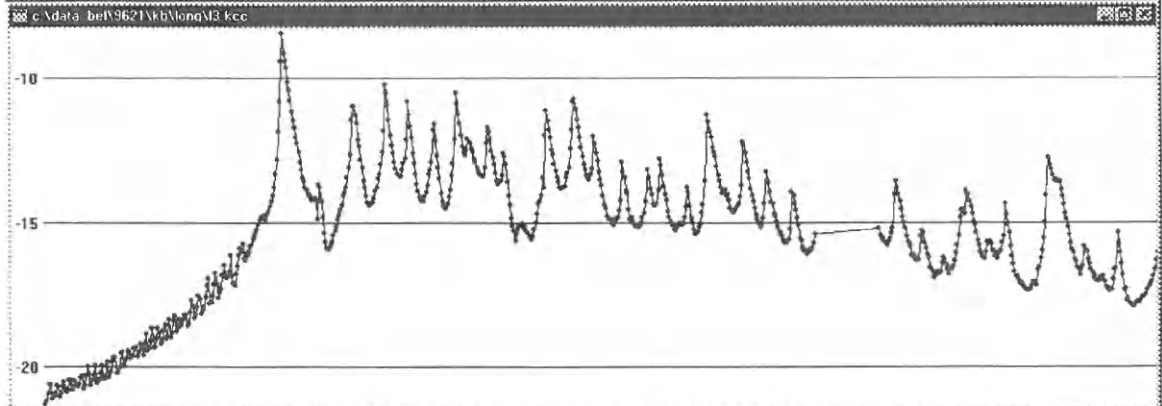
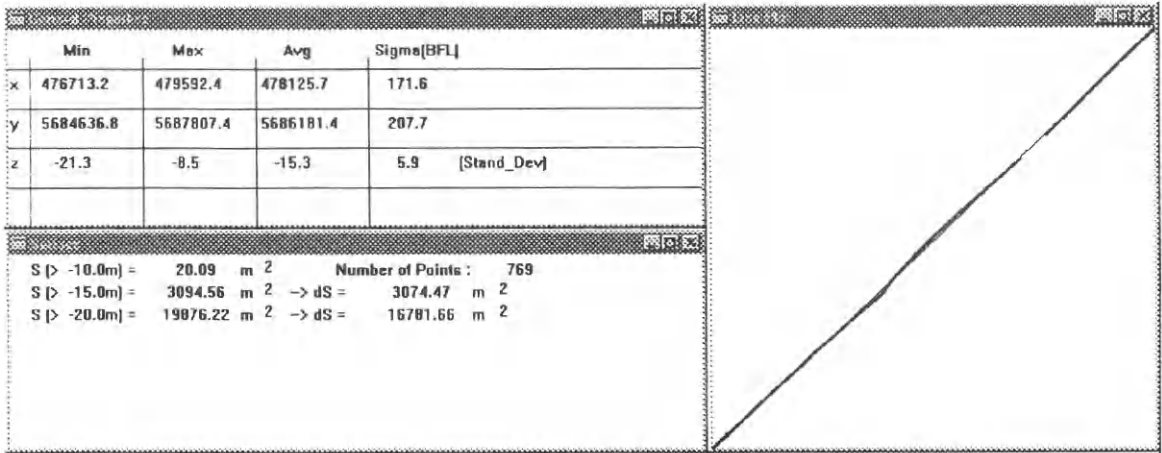


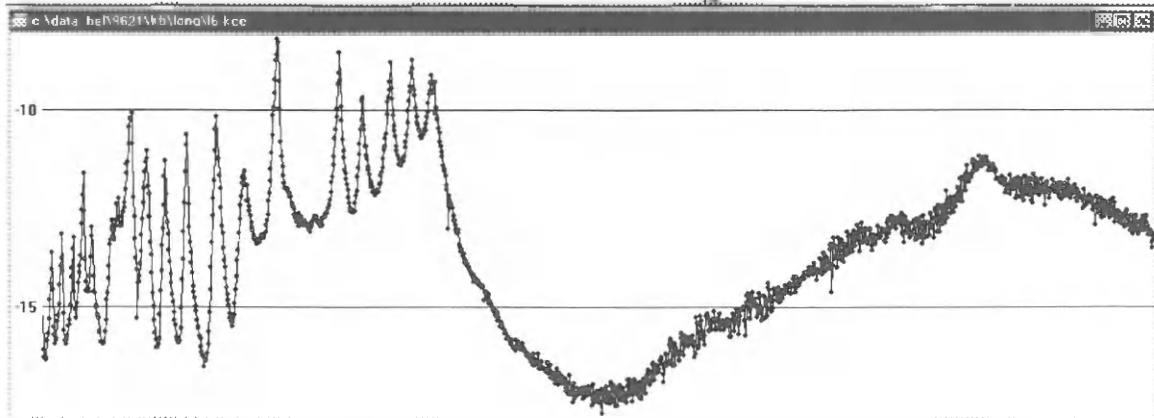
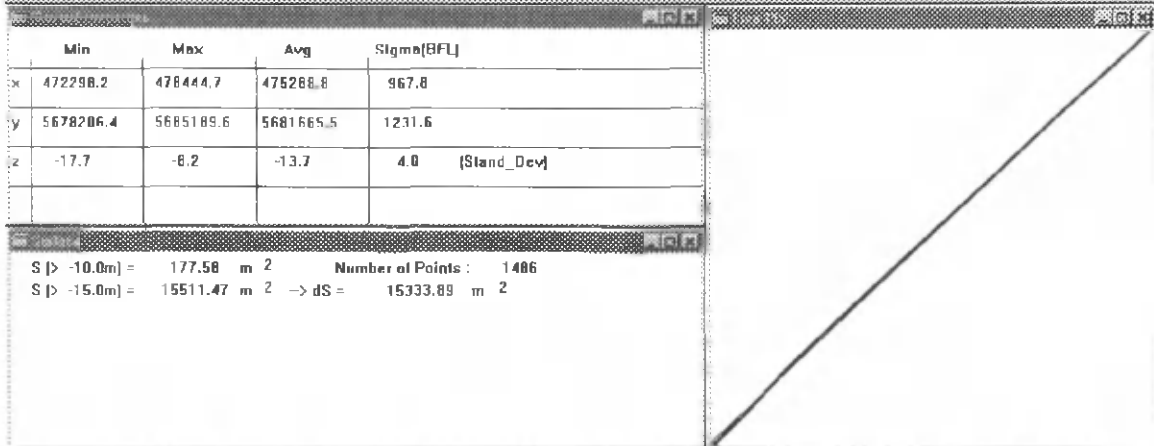
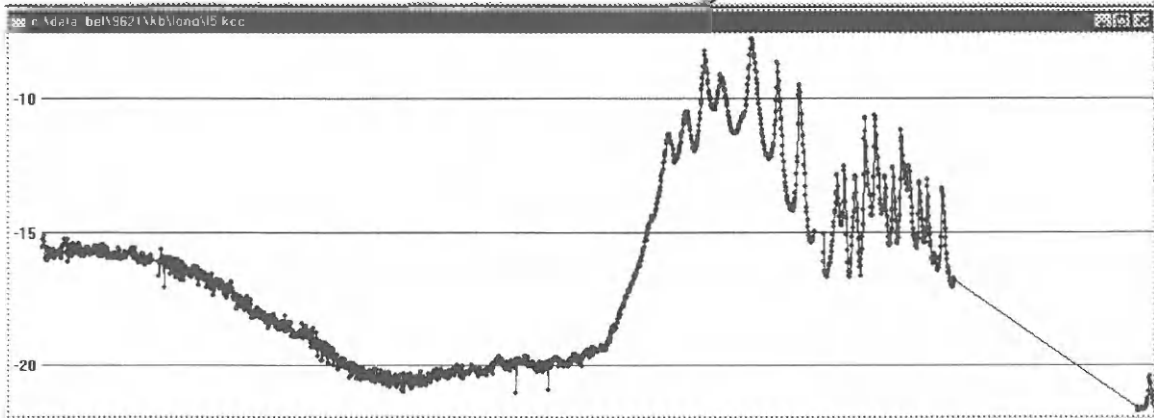
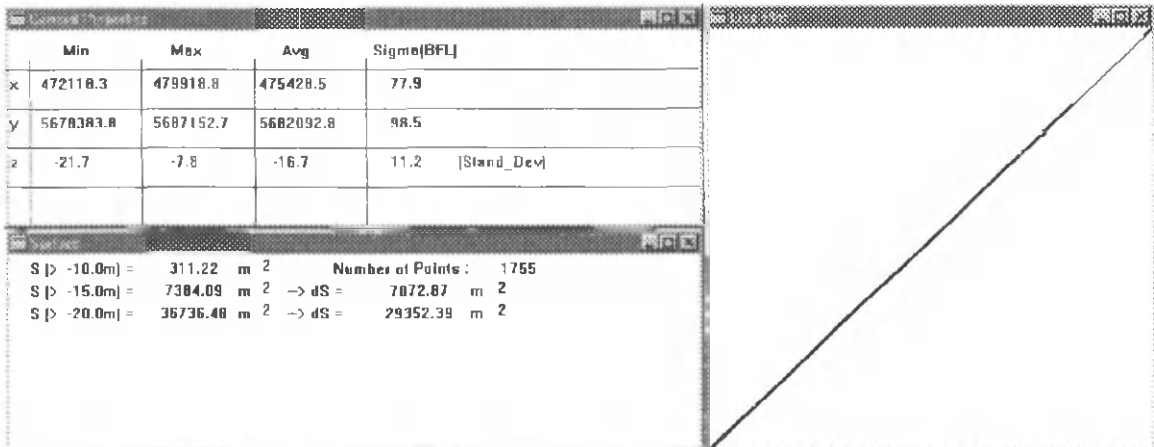


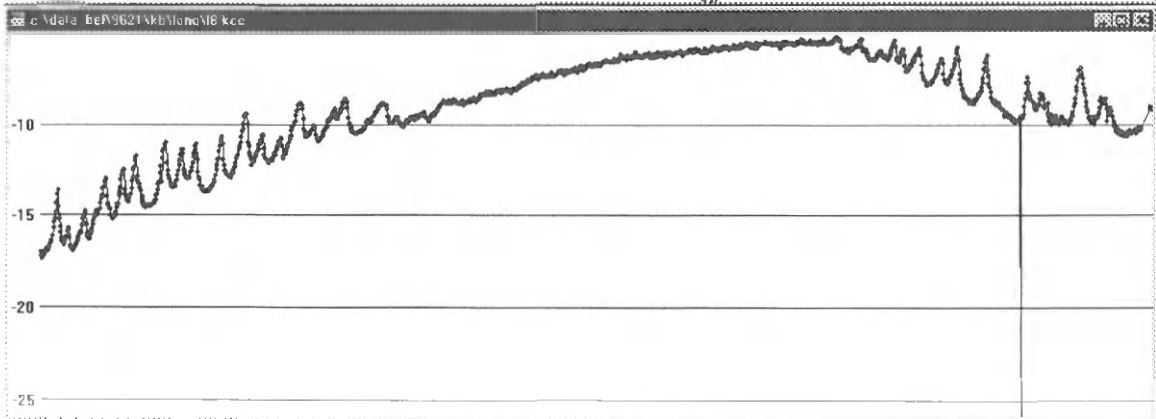
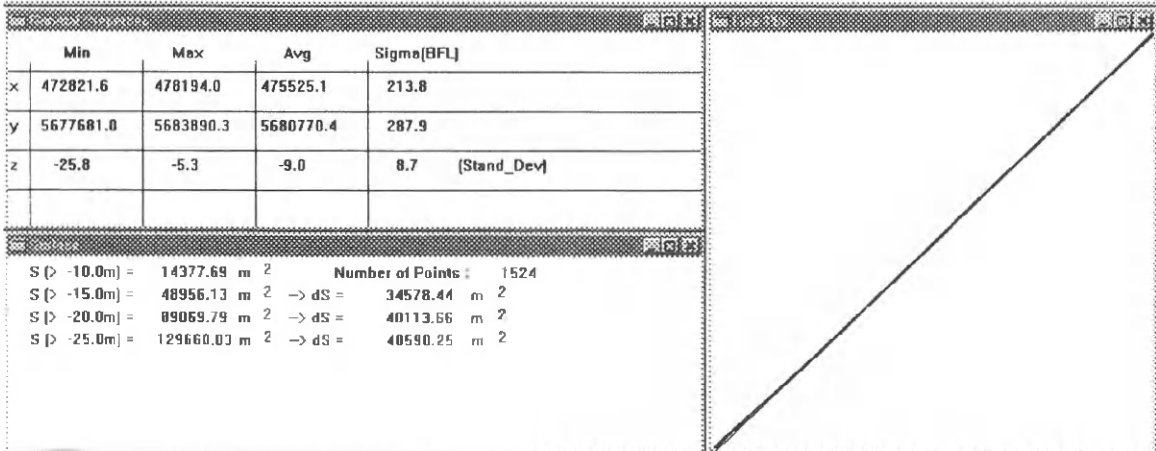
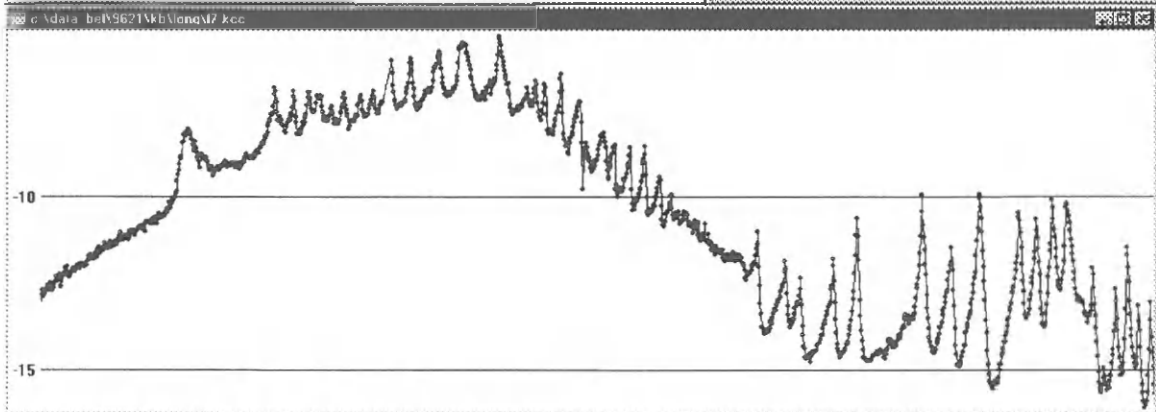
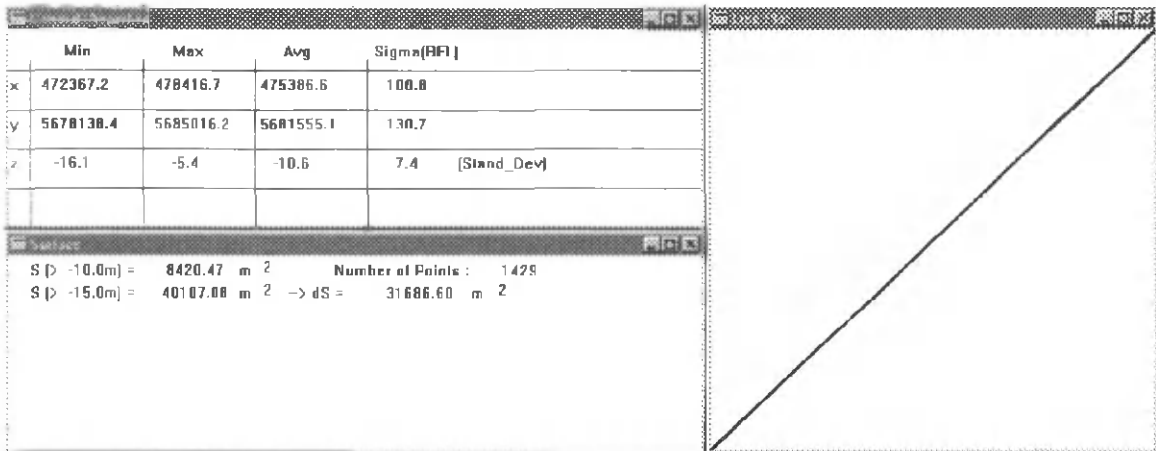


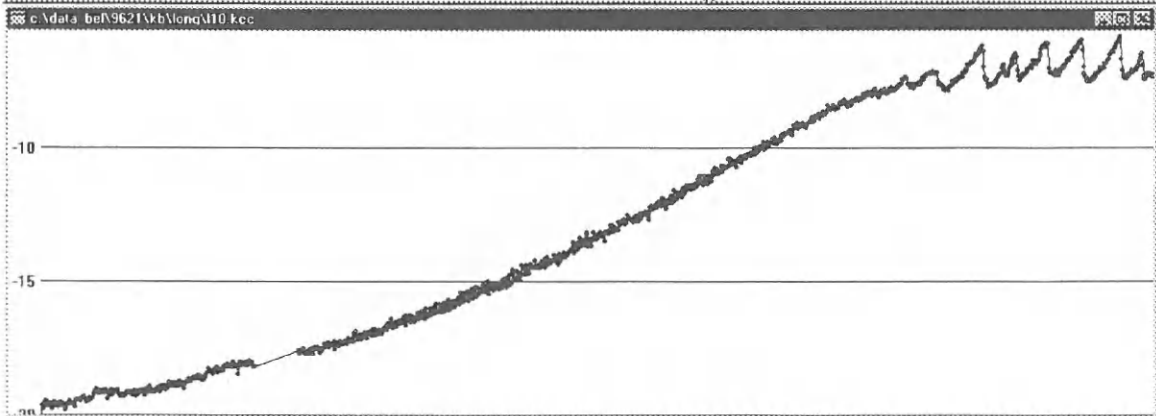
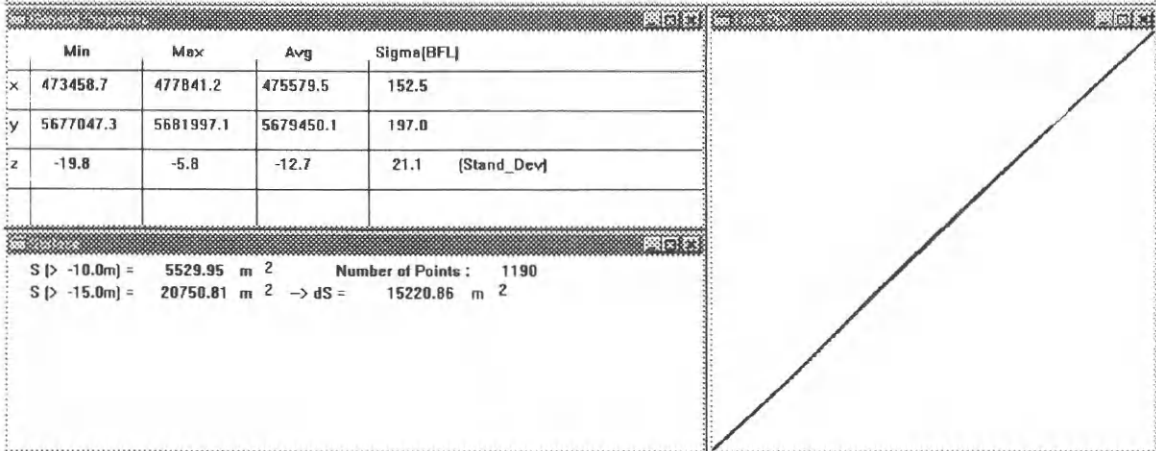
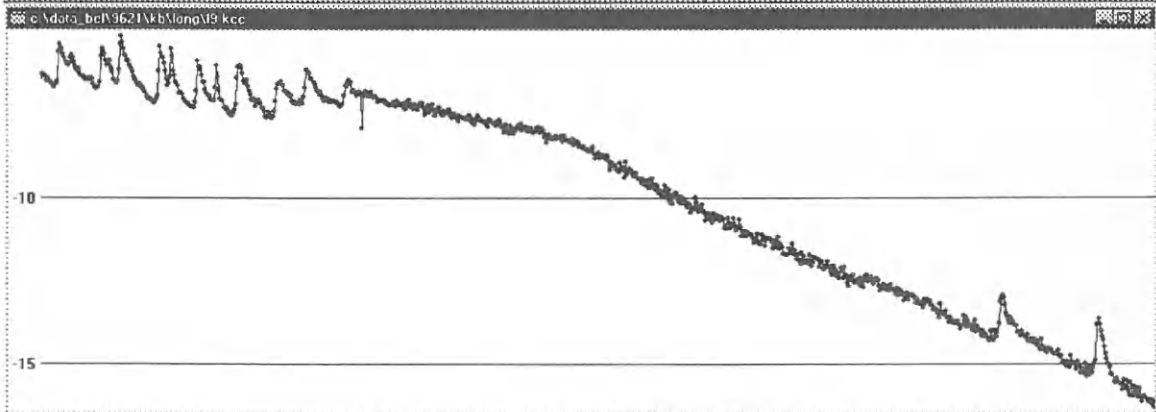
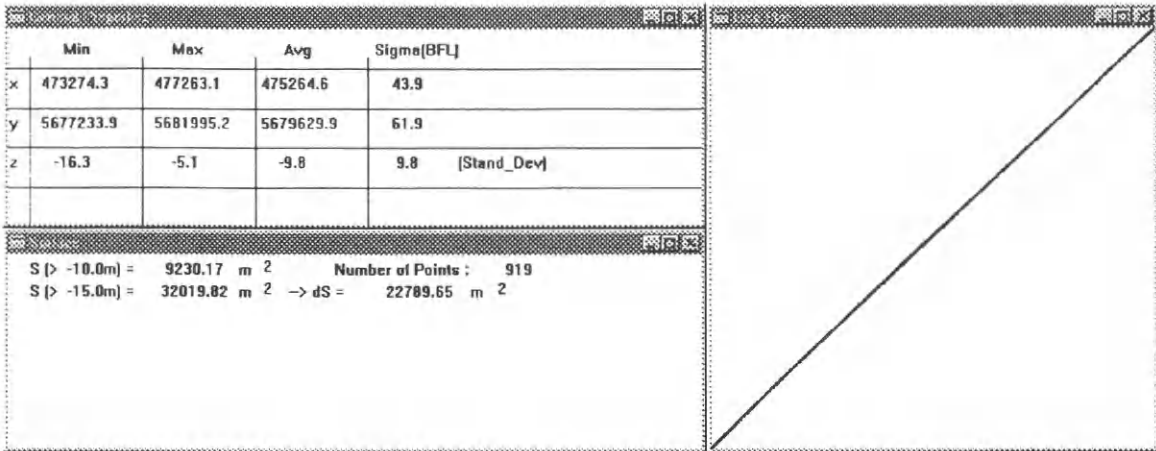
Bijlage 2 : Profielen longitudinale raaien Kwintebank (ST9621)





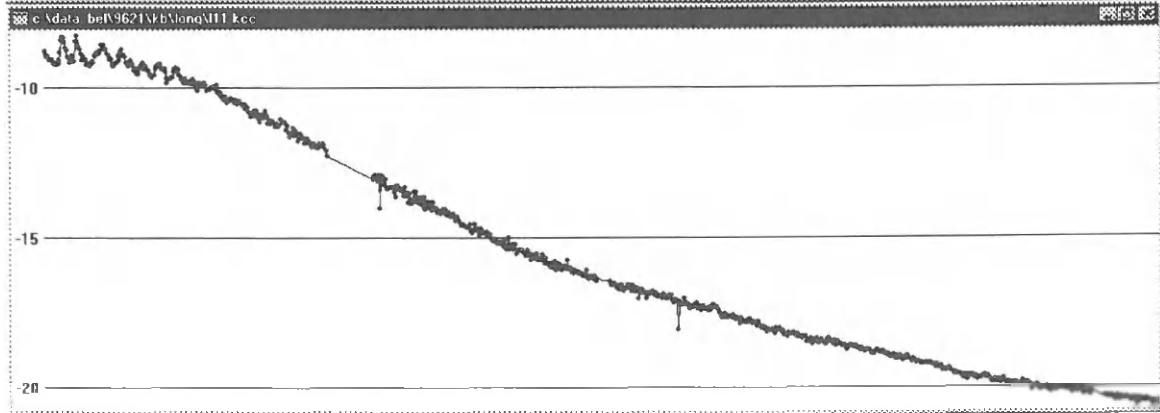




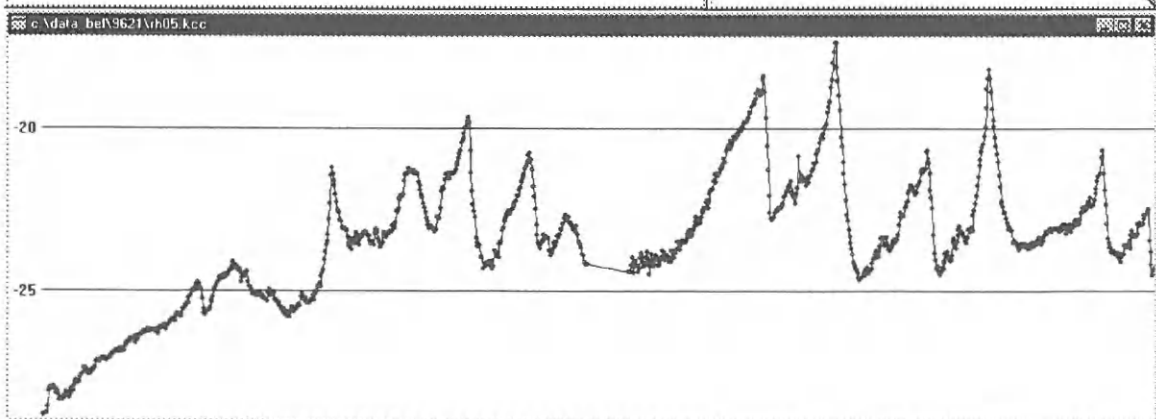
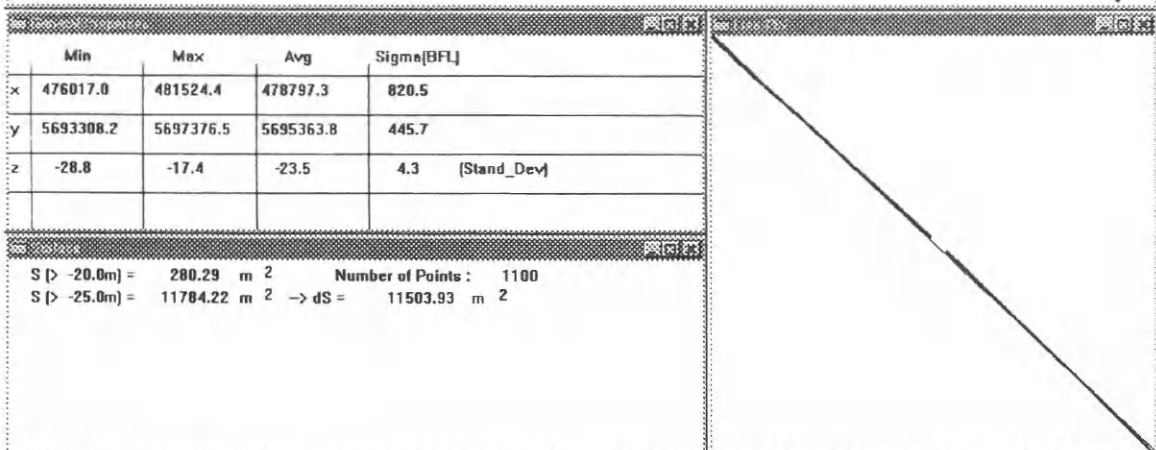
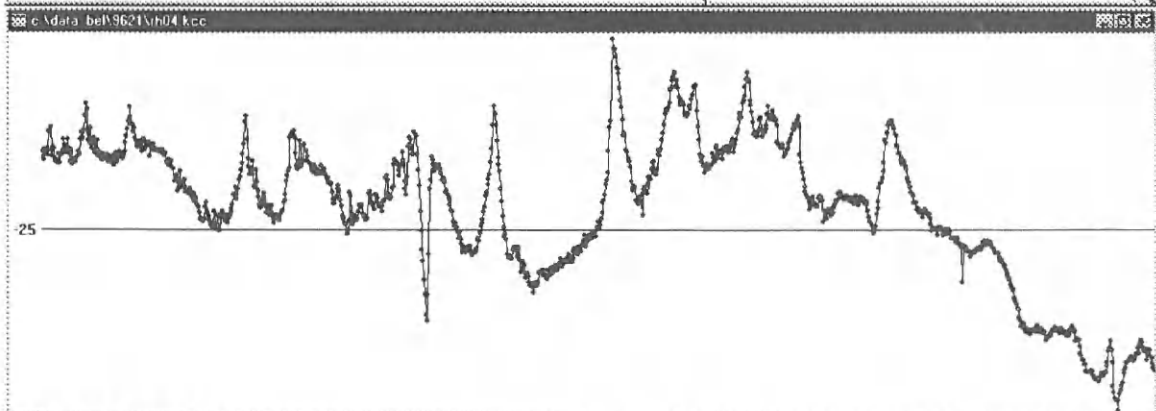
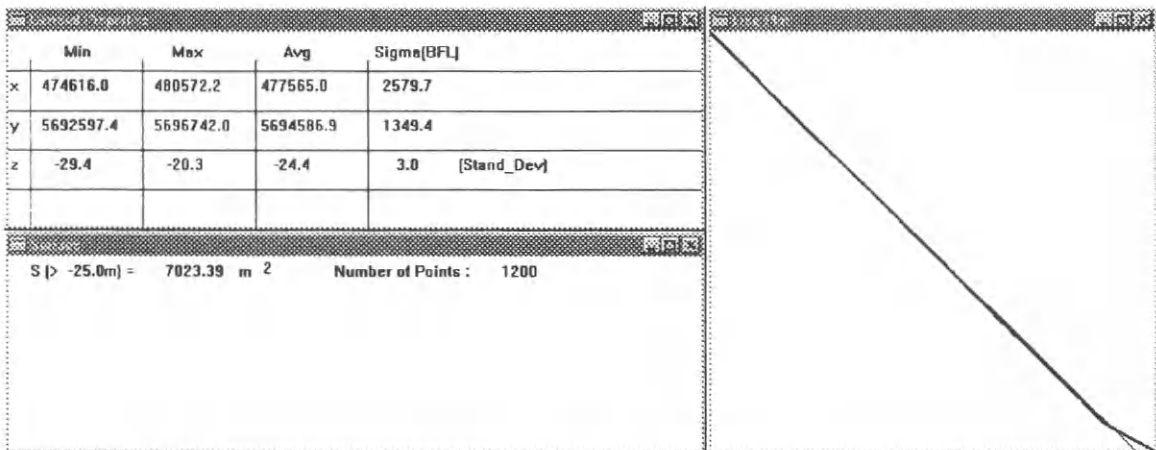


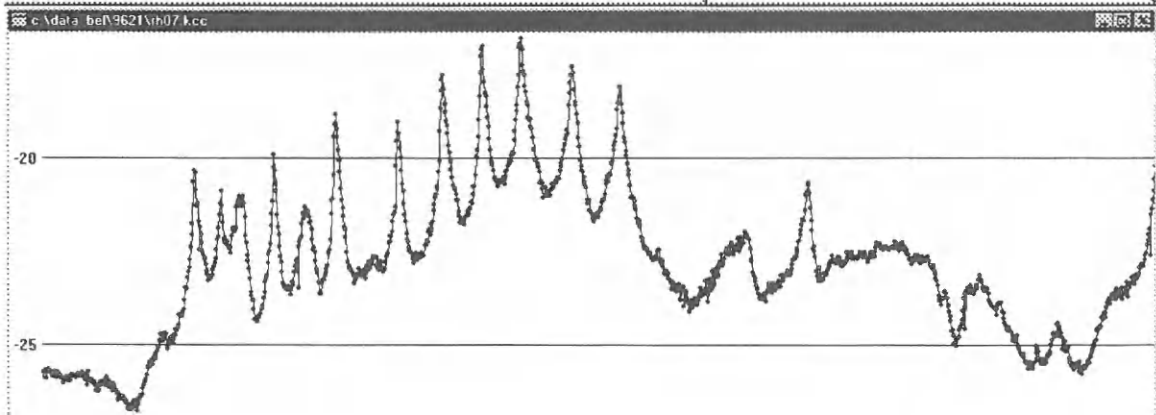
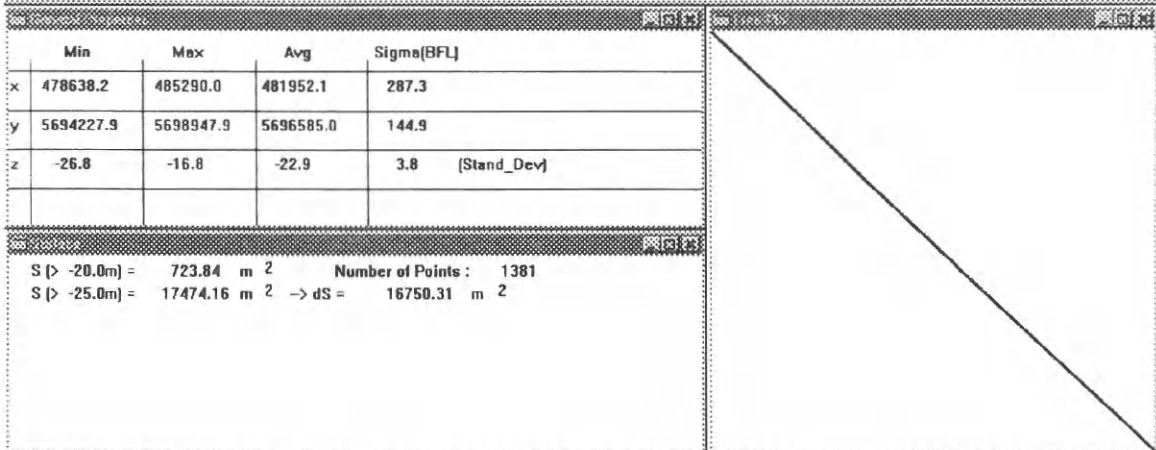
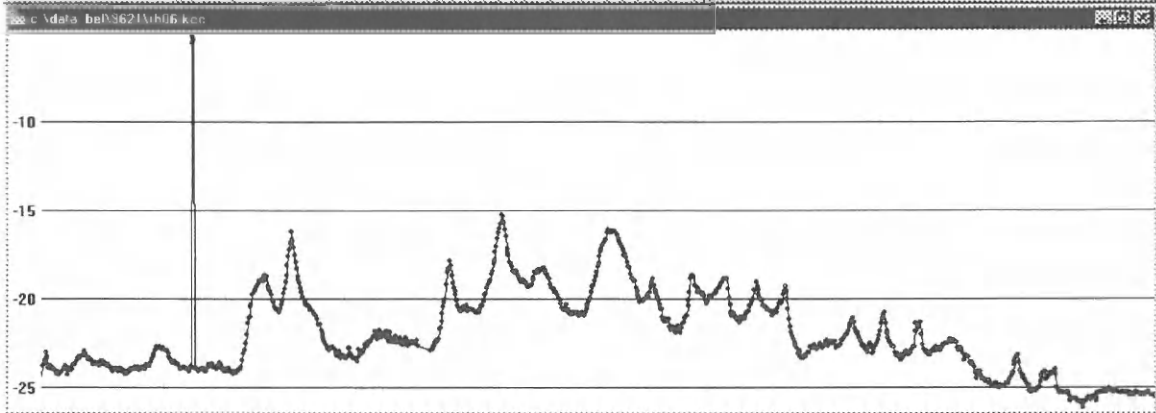
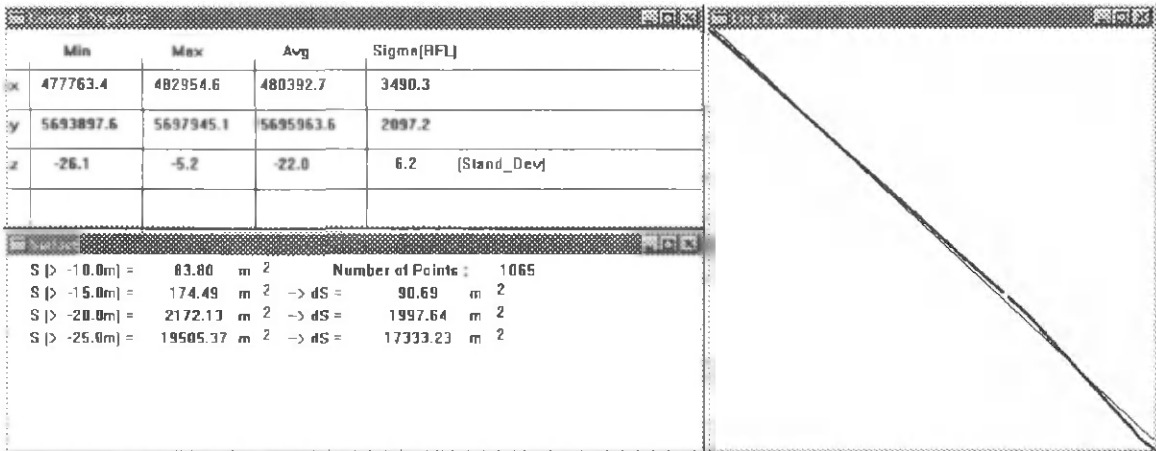
	Min	Max	Avg	Sigma(RFI)	
x	473746.7	478388.1	476087.7	22.2	
y	5676754.6	5682000.0	5679405.7	28.3	
z	-20.6	-8.3	-15.6	15.0	[Stand_Dev]

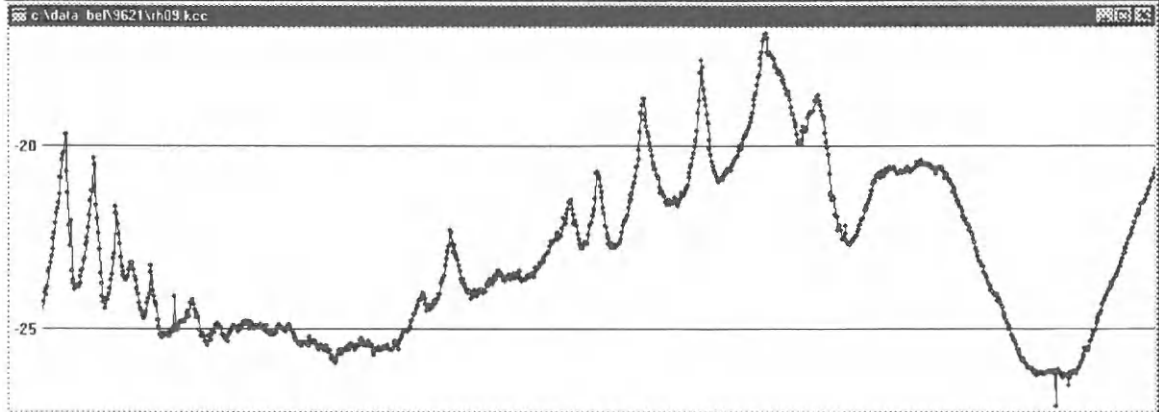
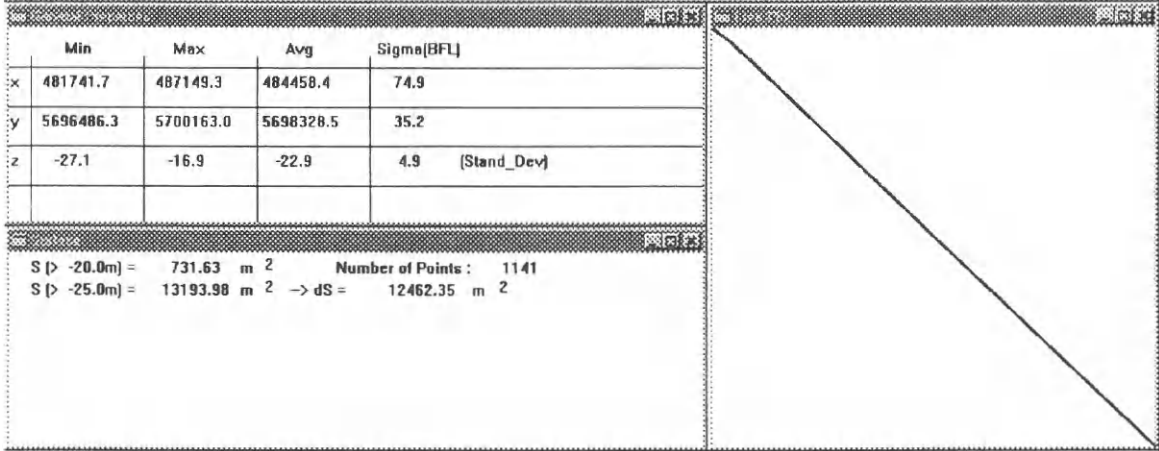
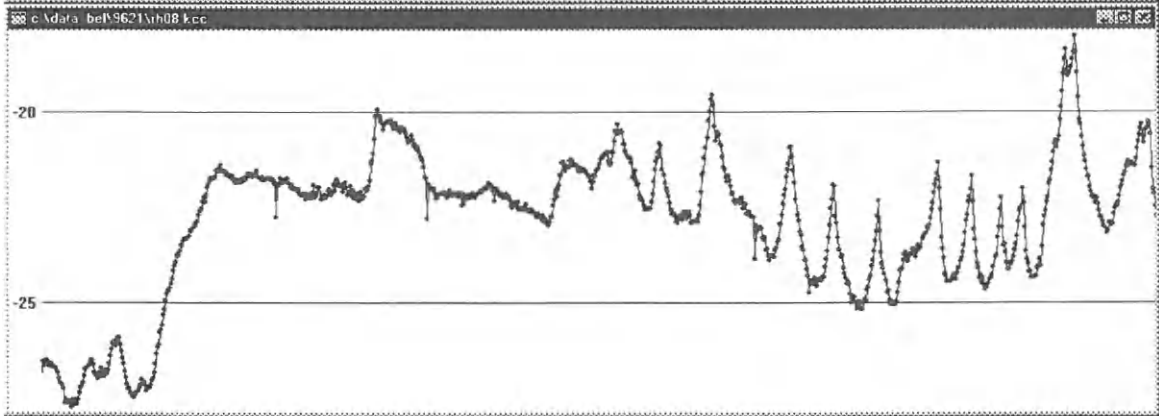
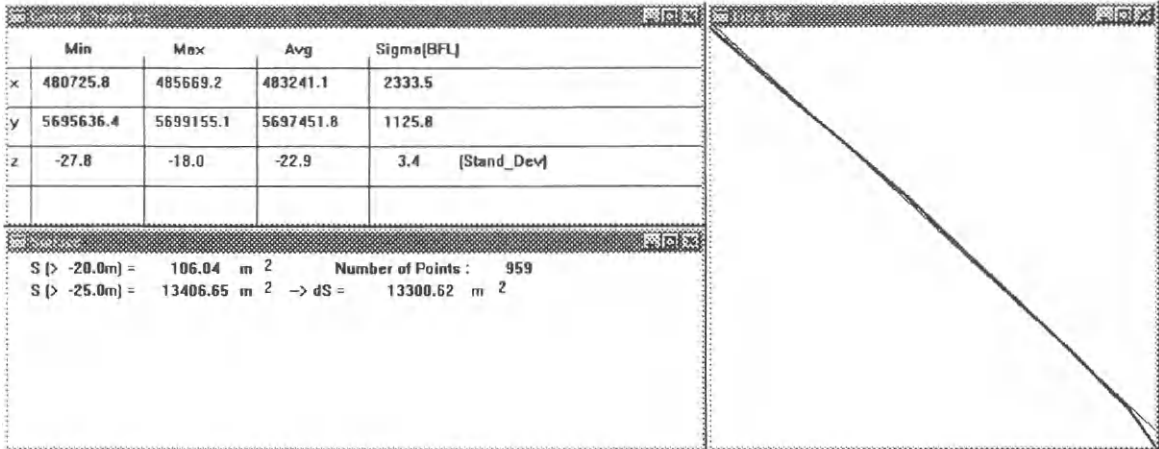
S (> -10.0m) =	752.85	m ²	Number of Points :	969
S (> -15.0m) =	10214.24	m ²	→ dS =	9461.39 m ²
S (> -20.0m) =	31564.98	m ²	→ dS =	21350.74 m ²

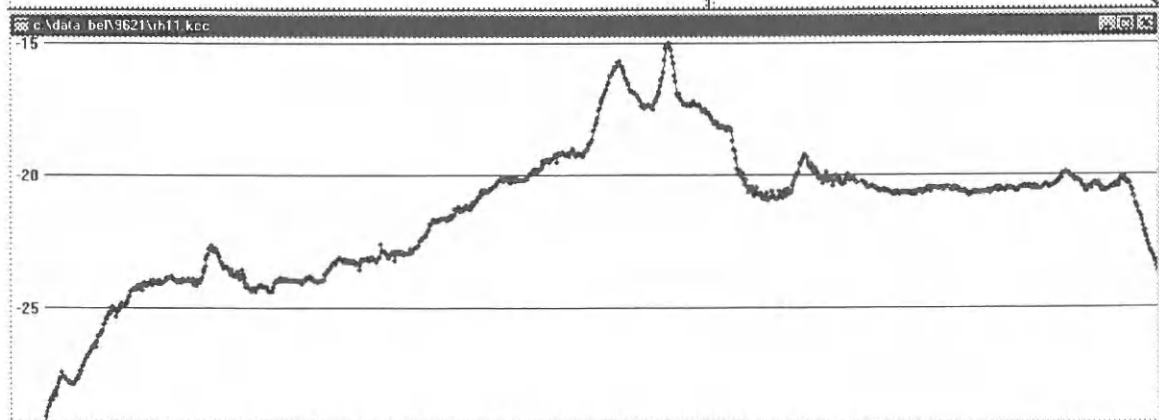
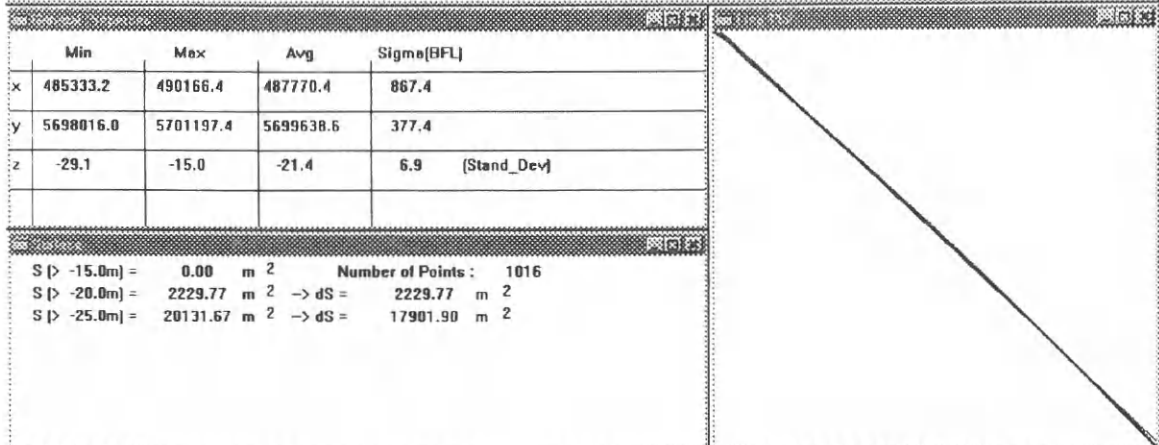
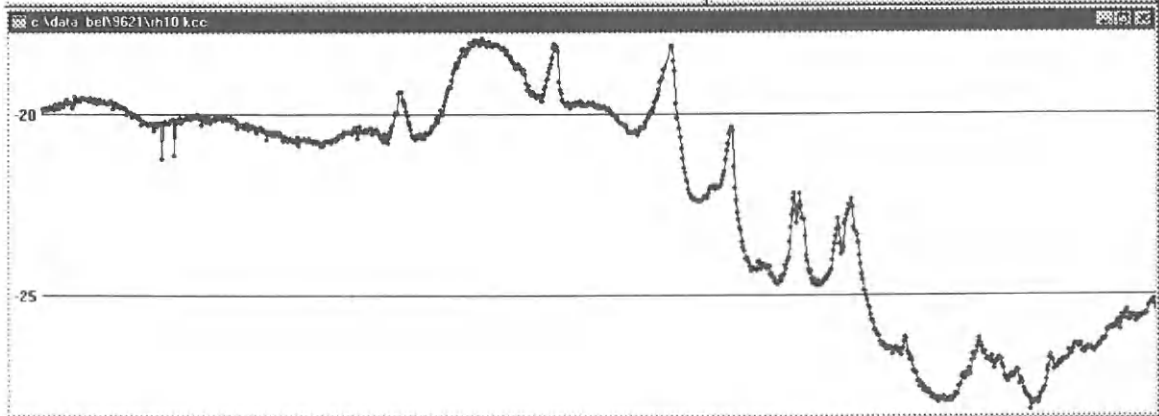
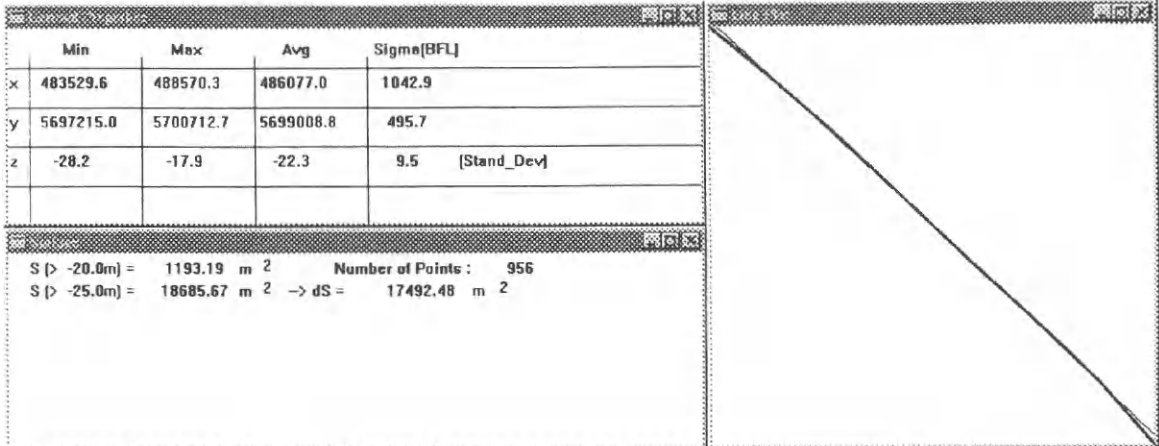


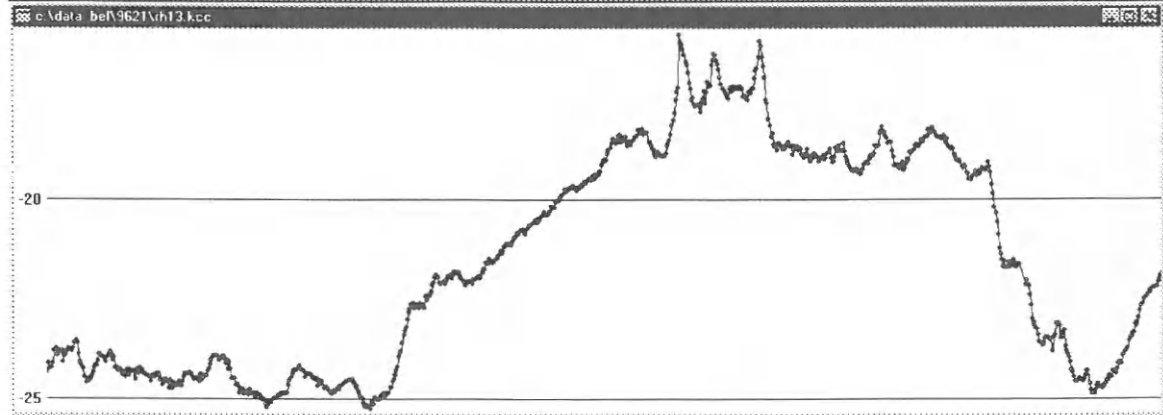
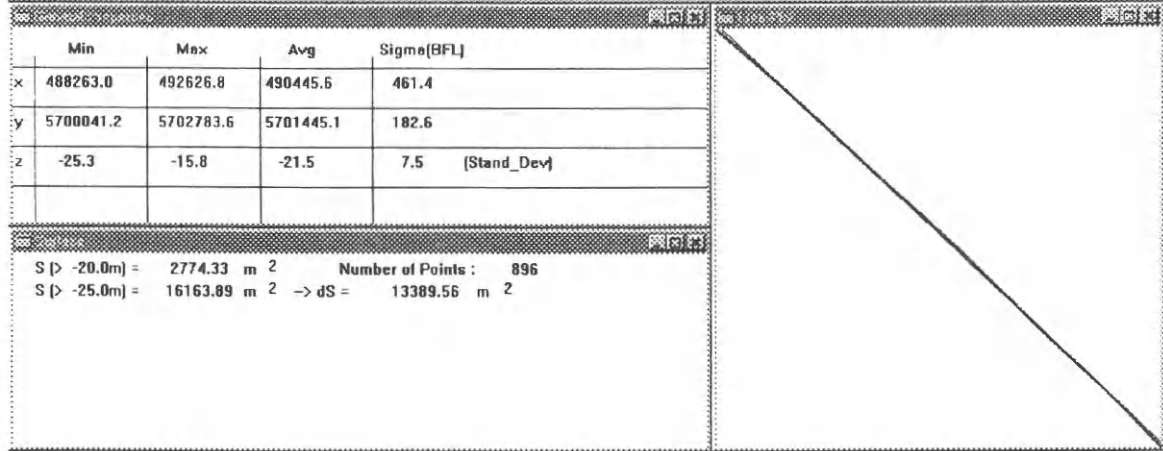
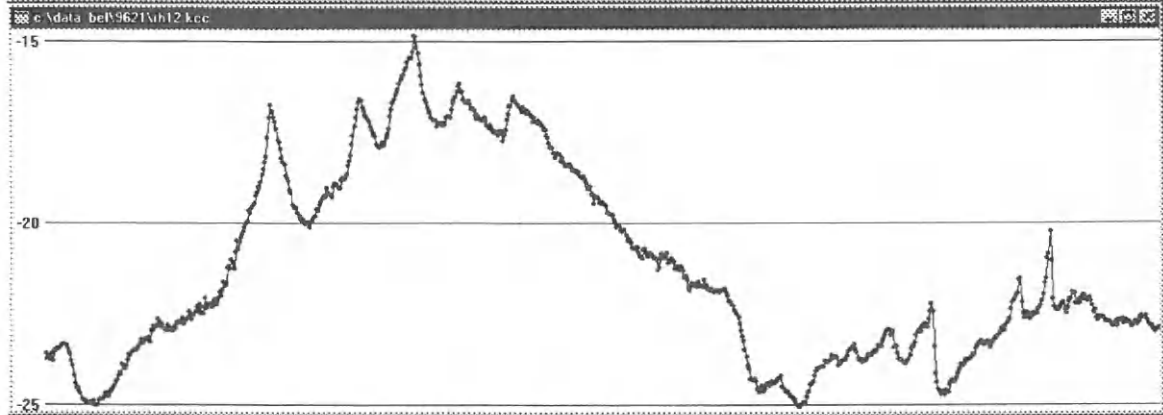
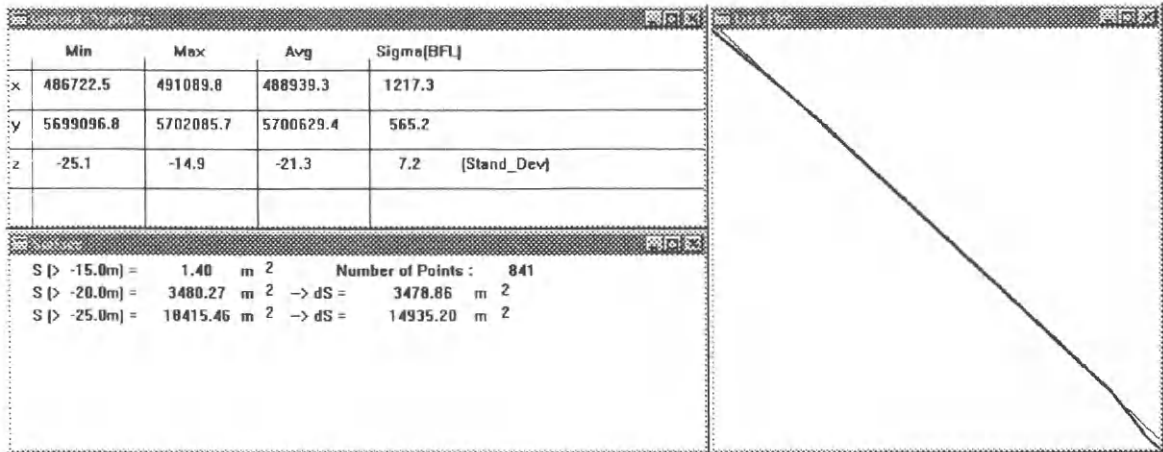
Bilage 3 : Profielen decca's Gootebank (ST9621)

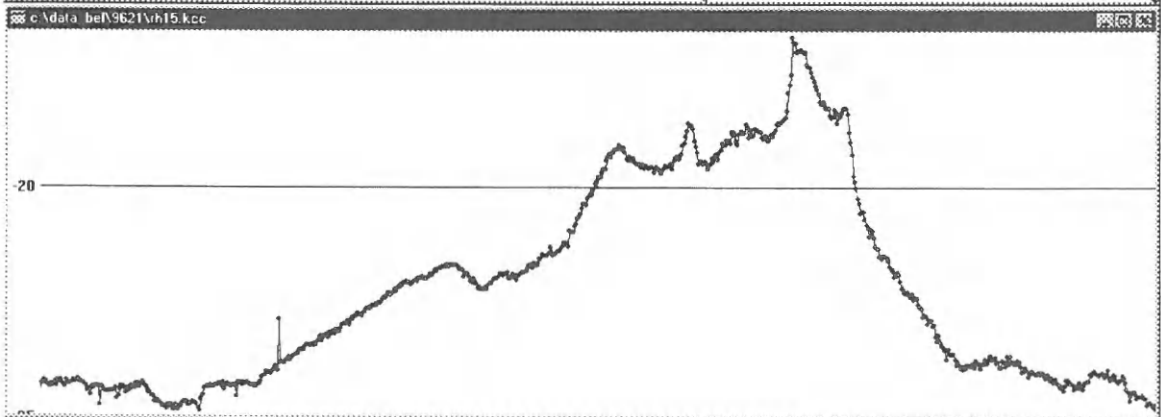
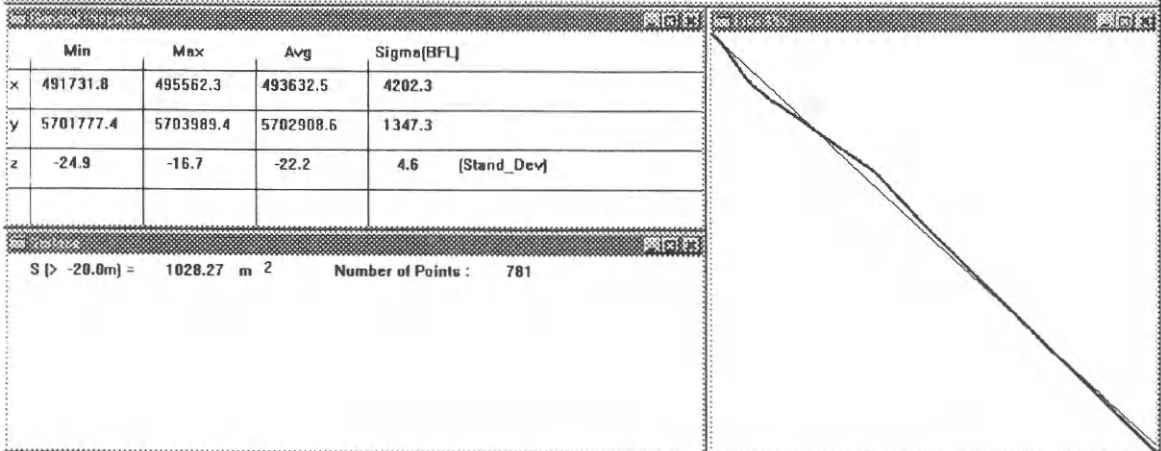
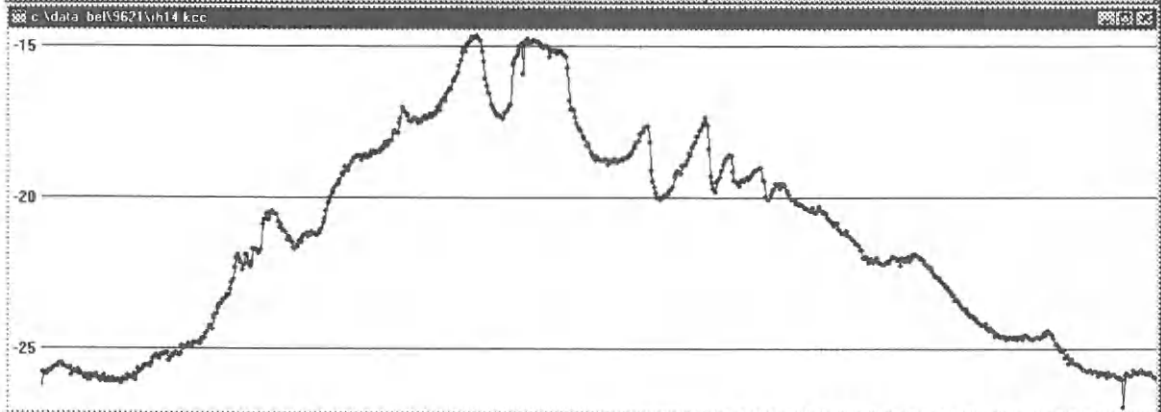
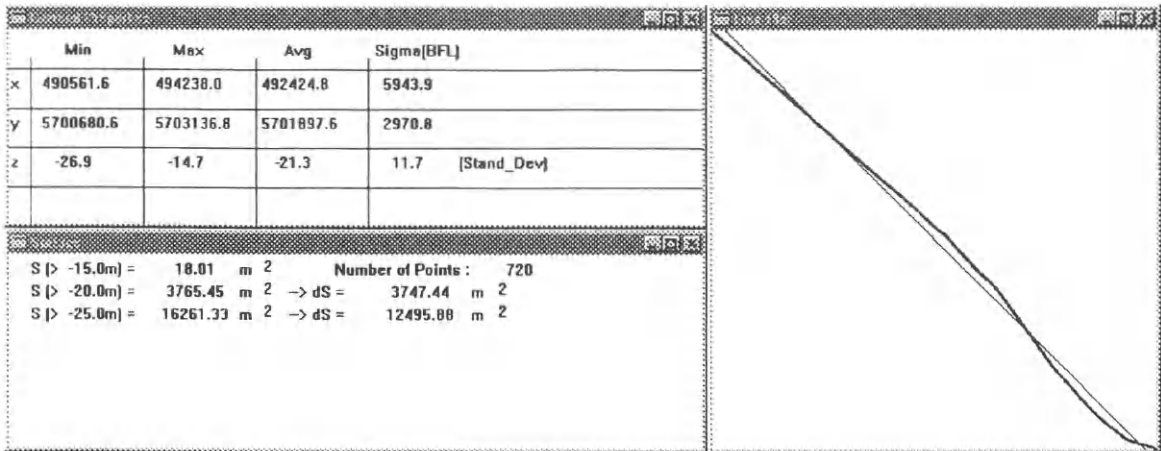


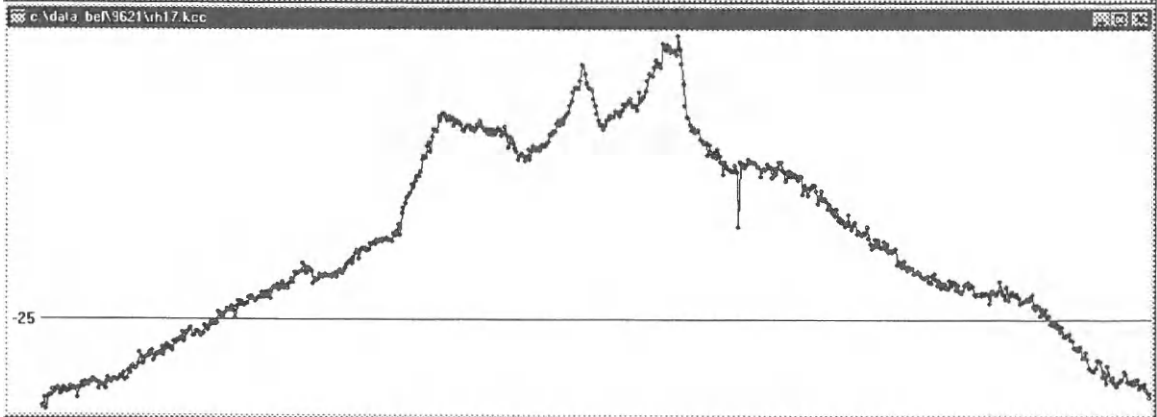
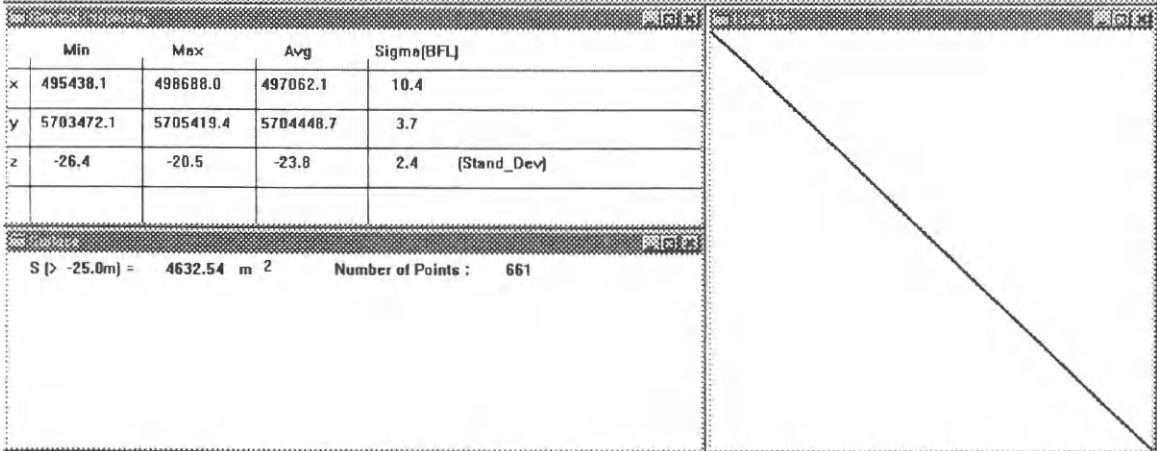
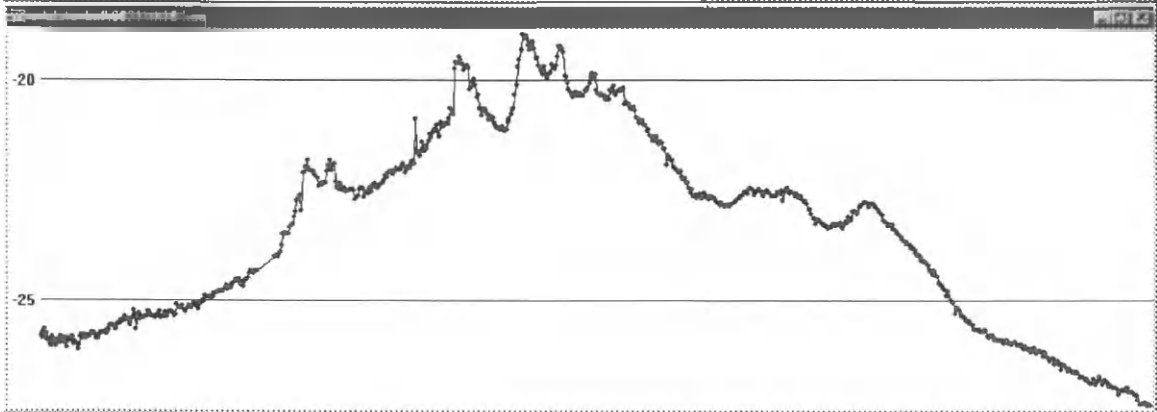
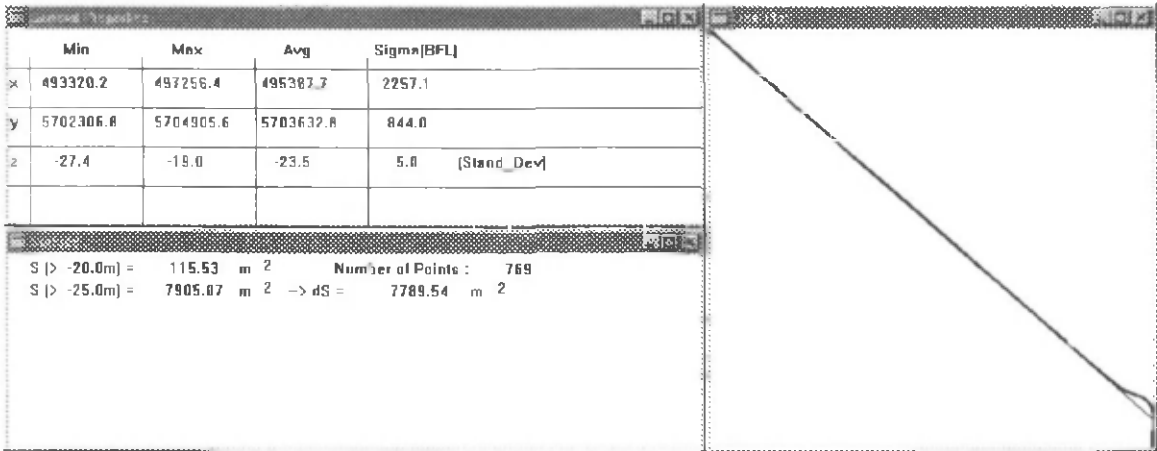


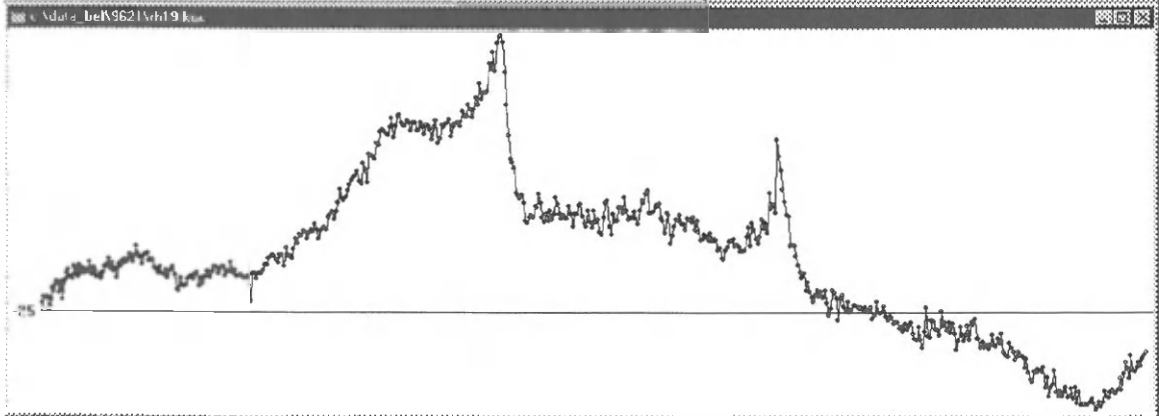
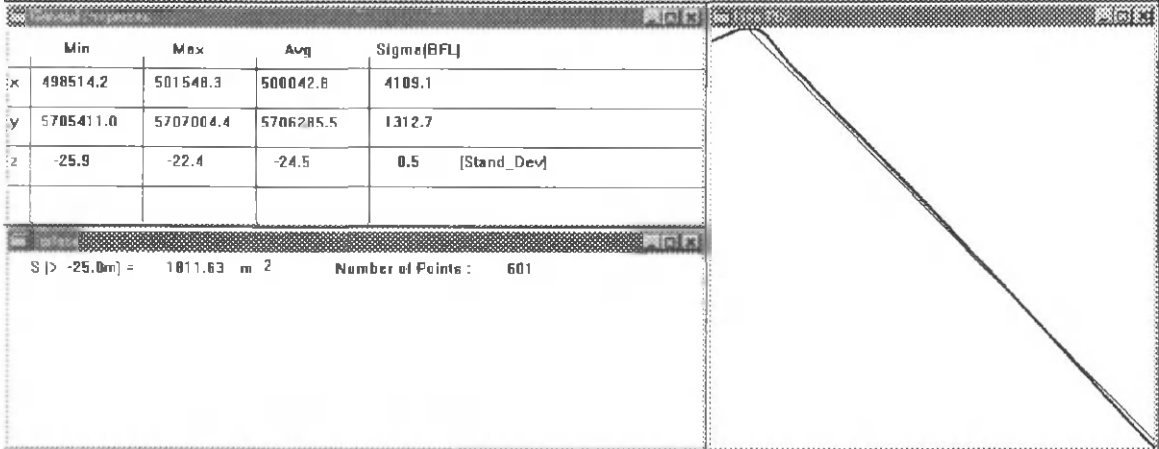
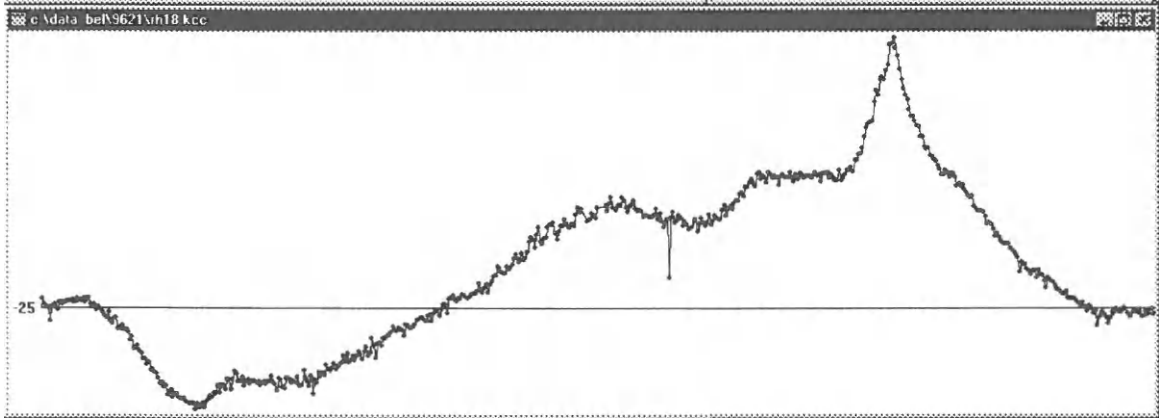
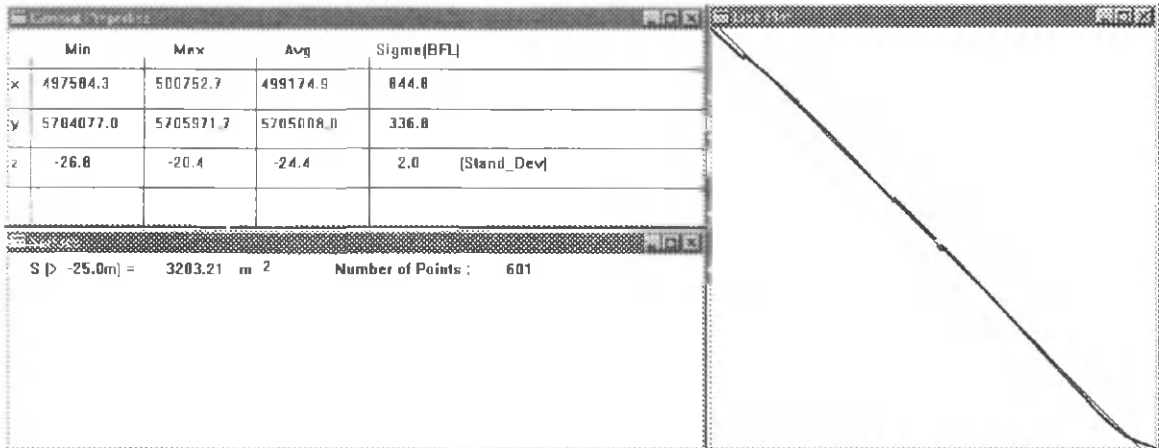


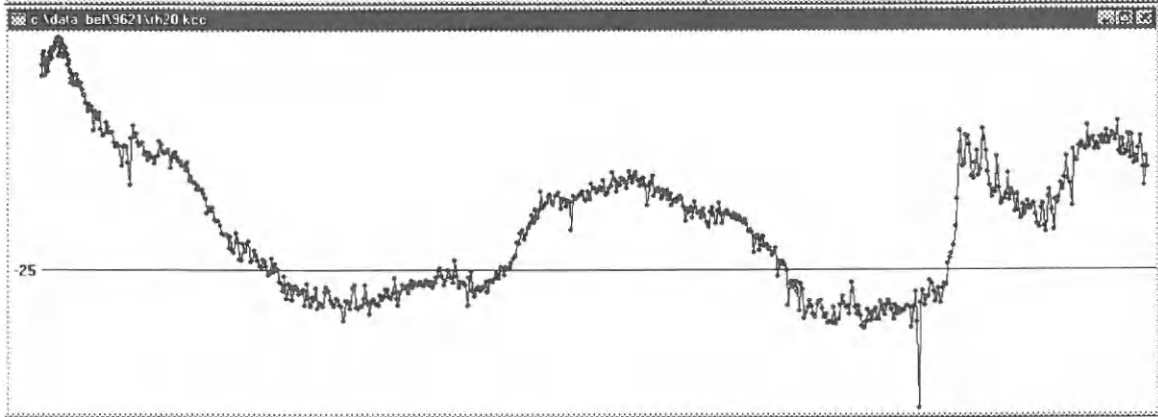
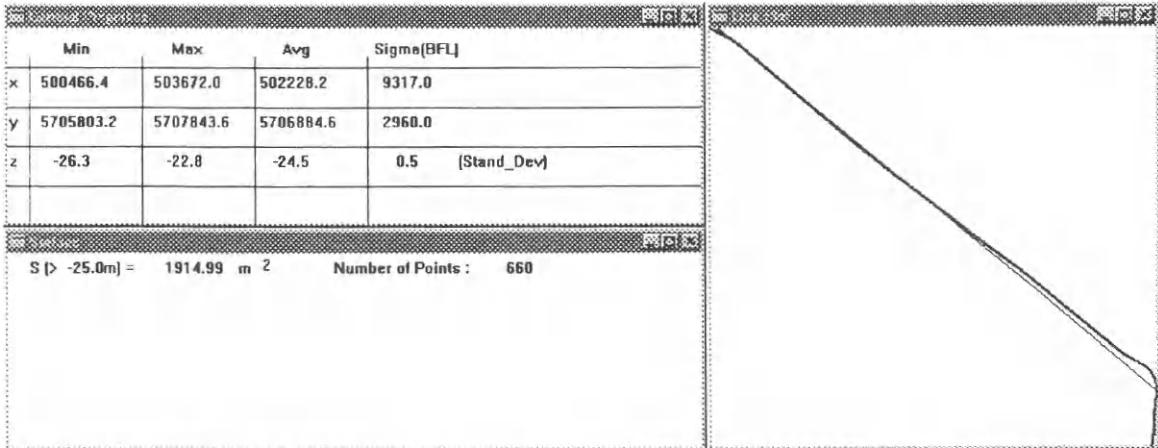




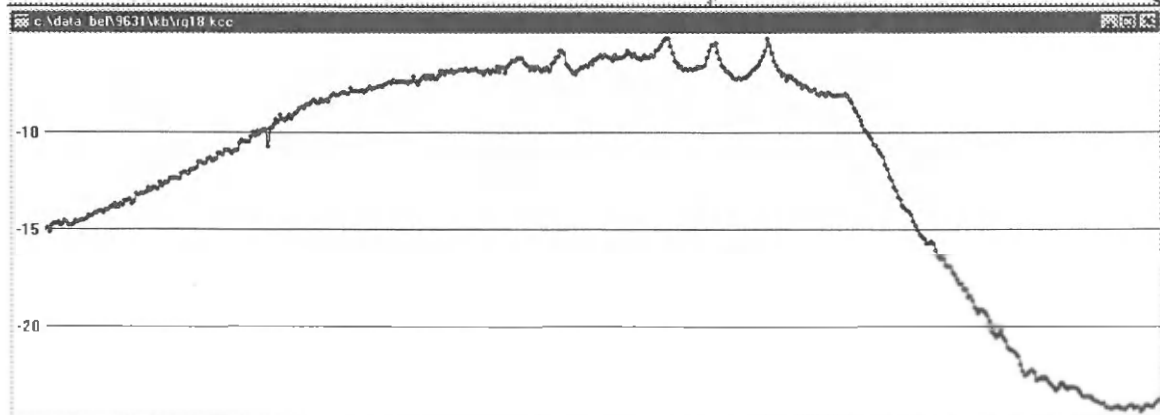
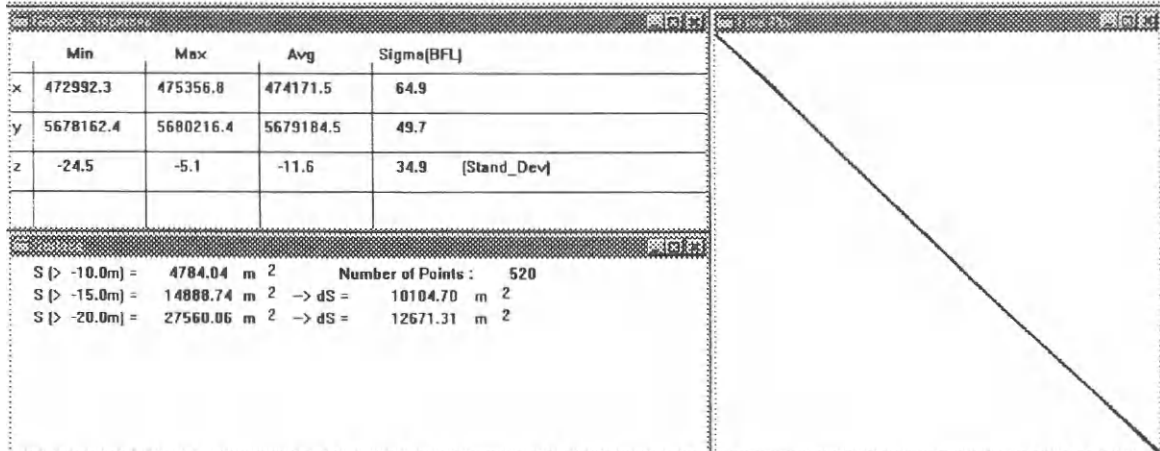
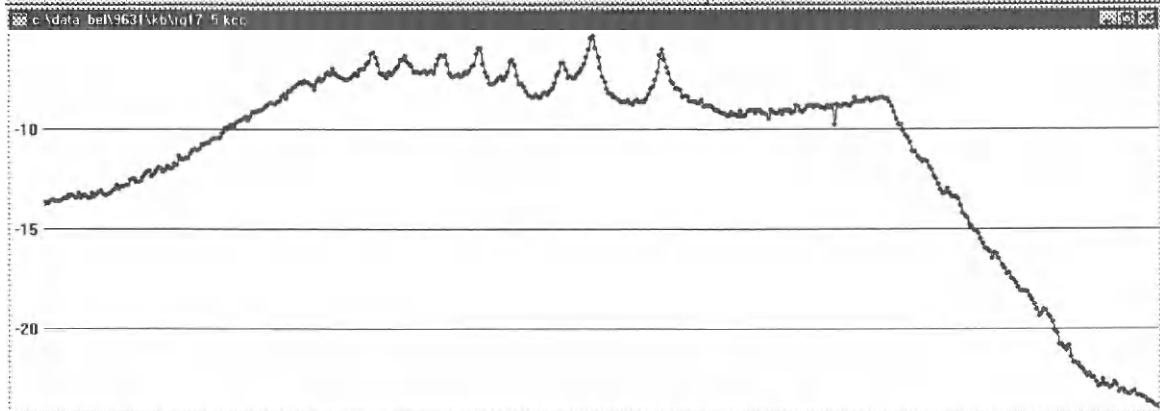
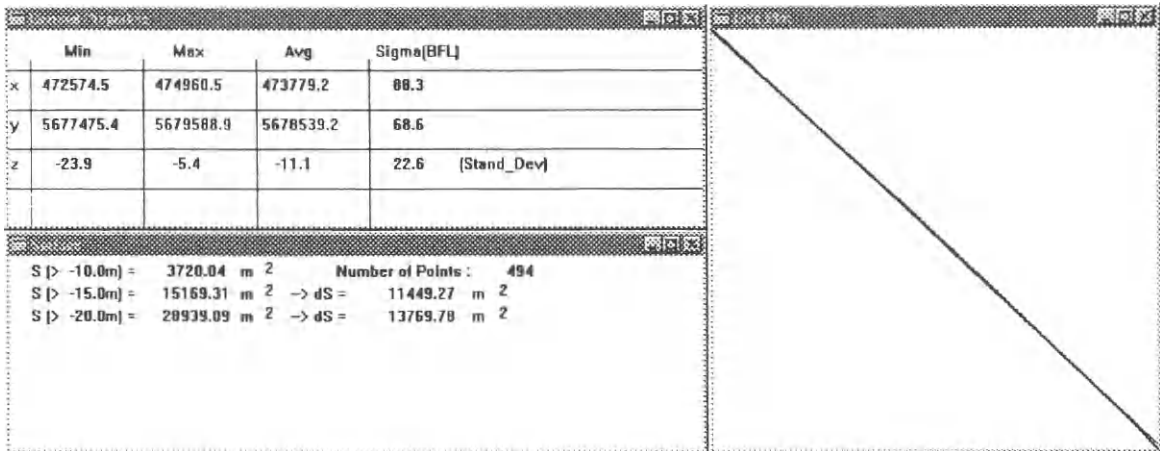


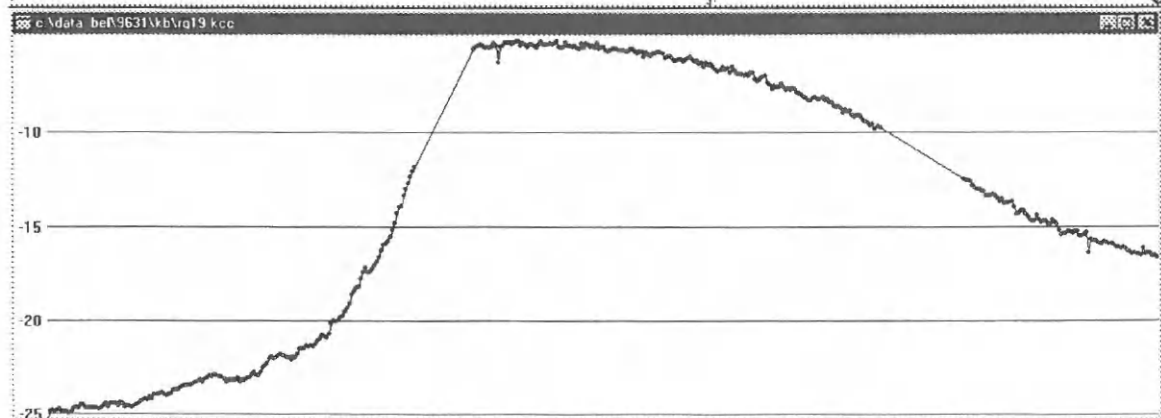
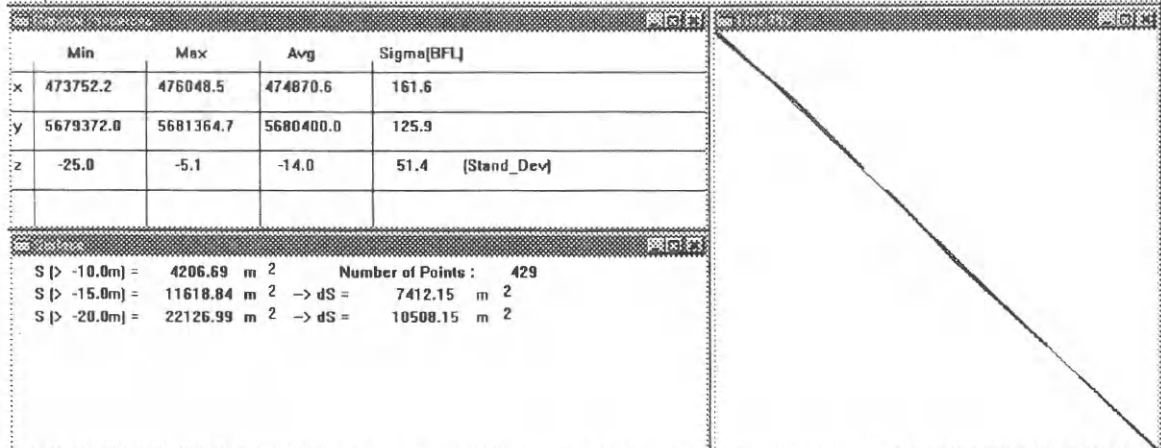
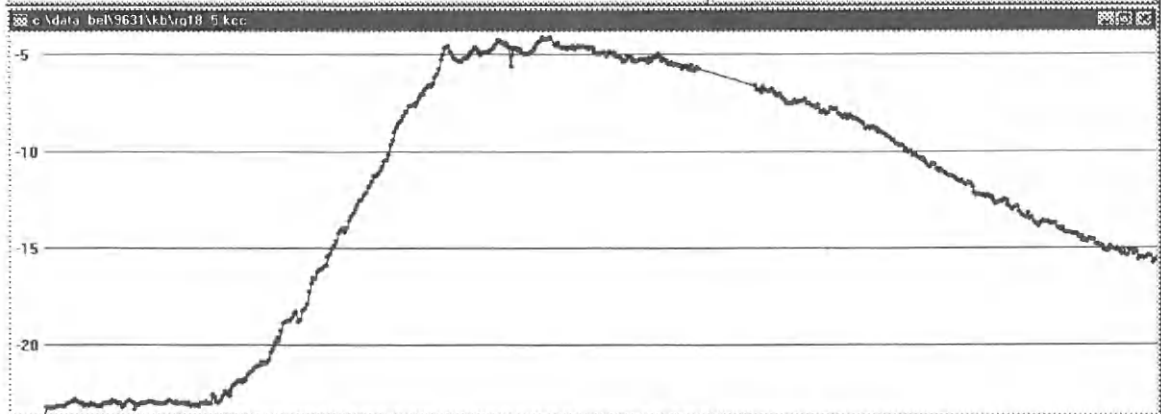
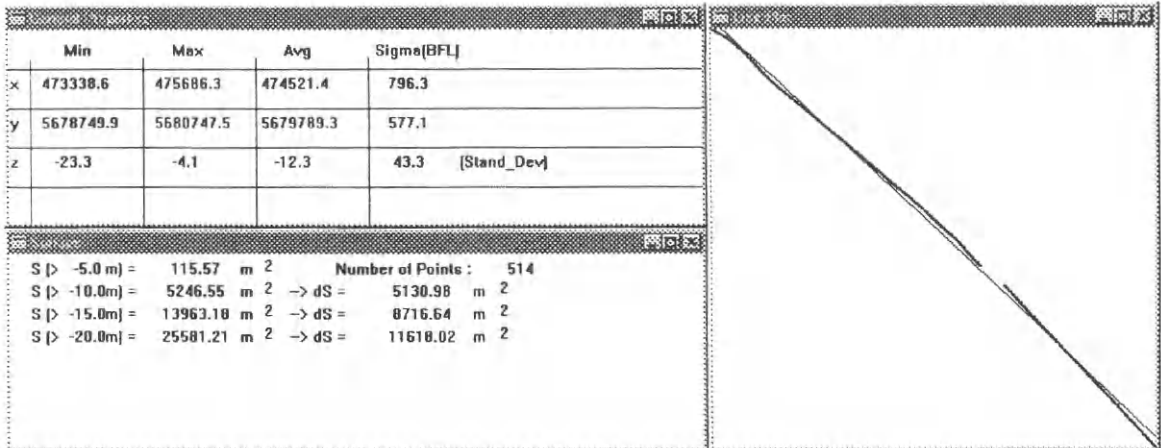


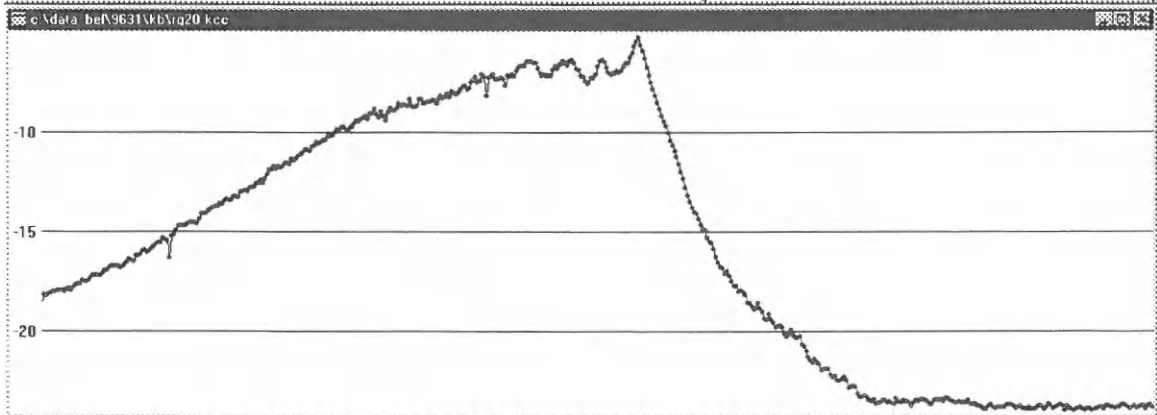
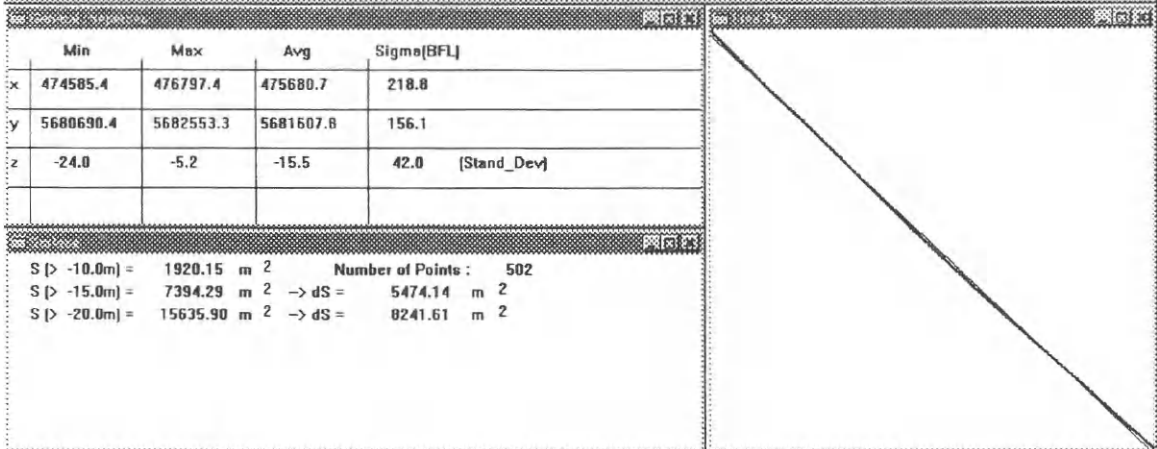
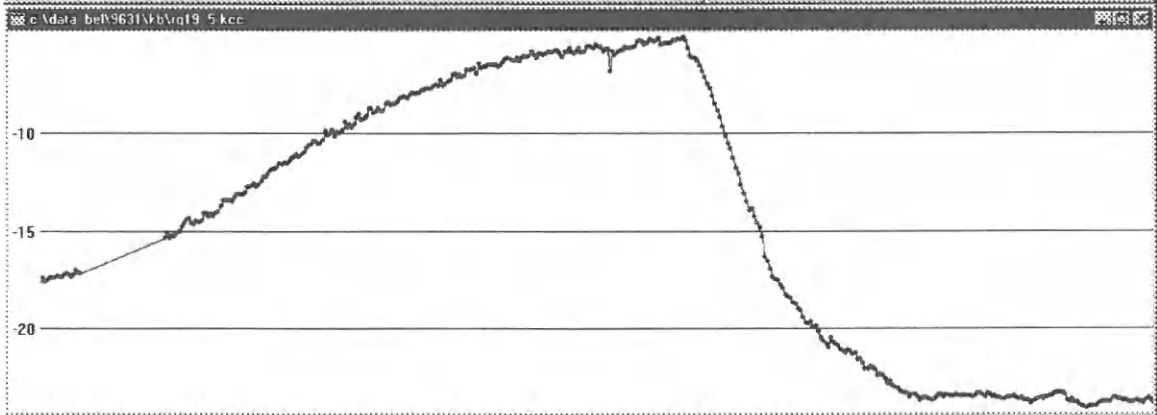
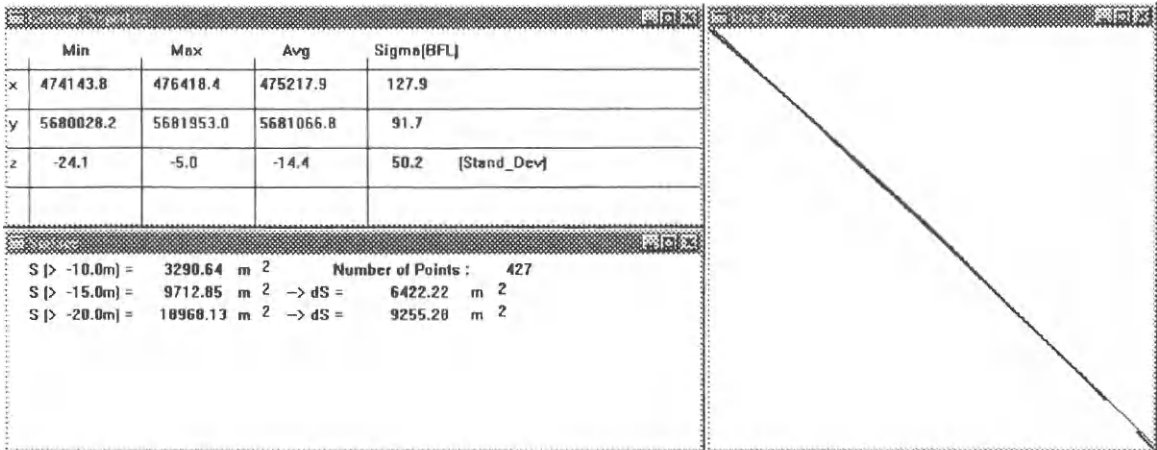


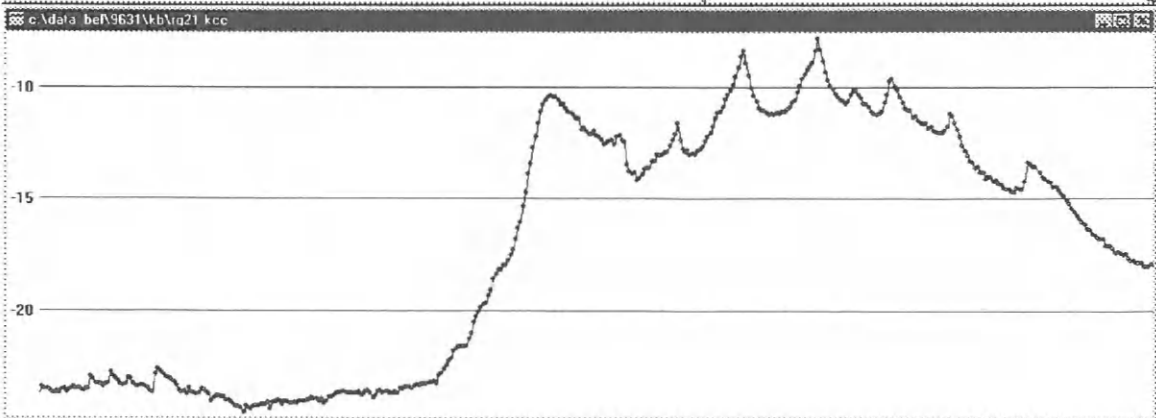
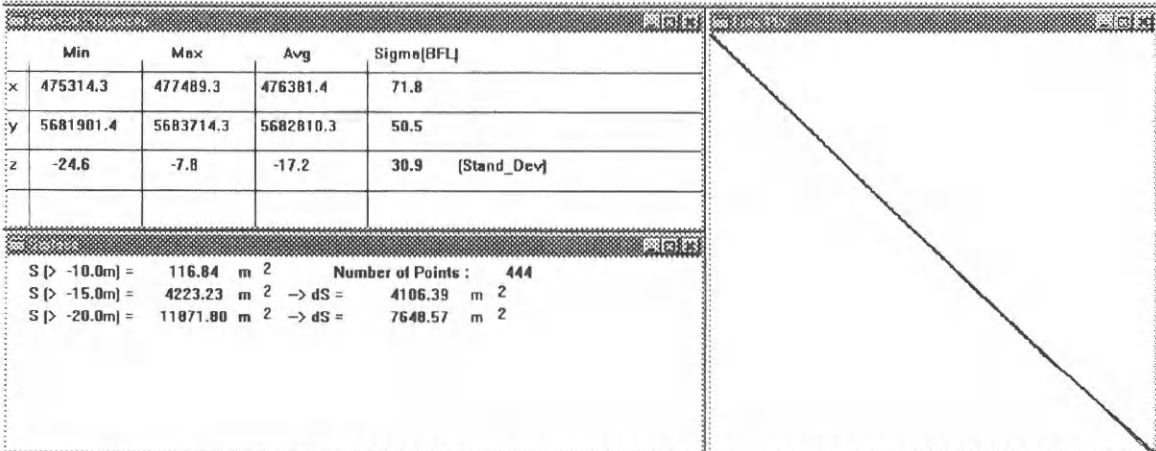
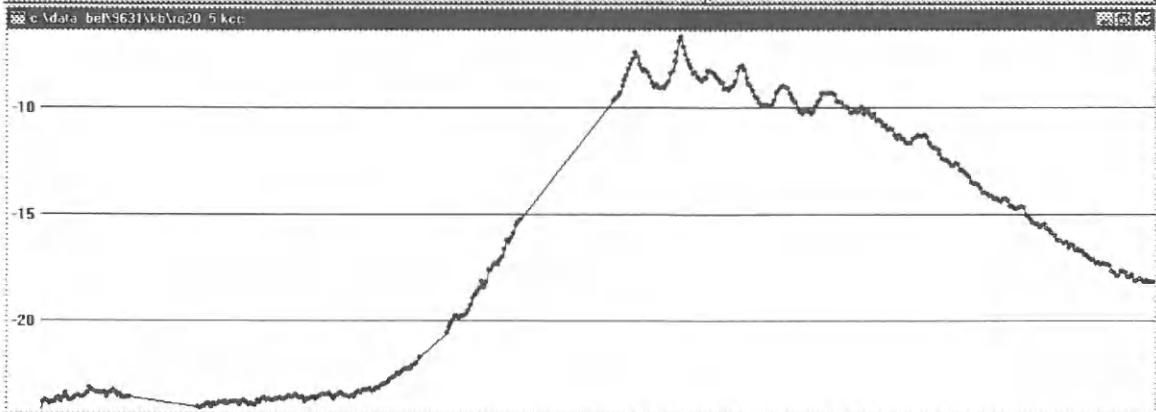
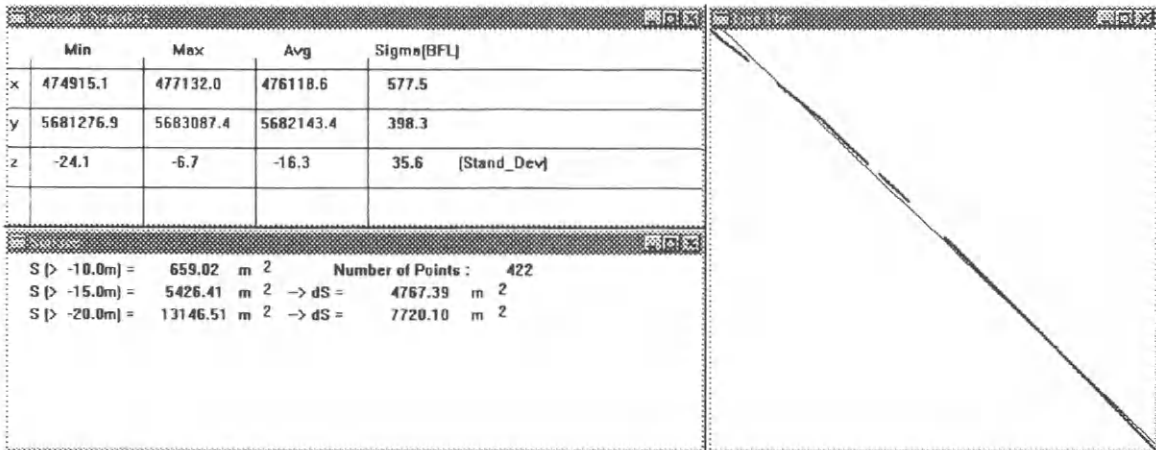


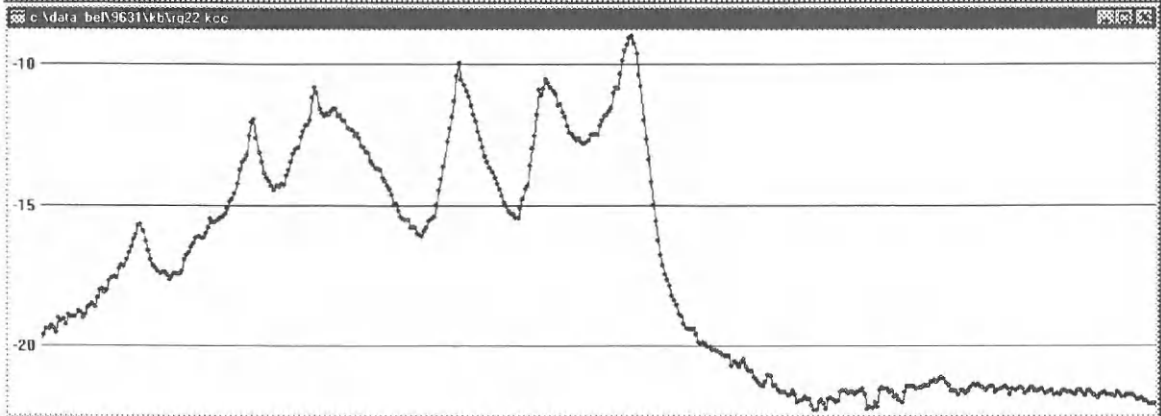
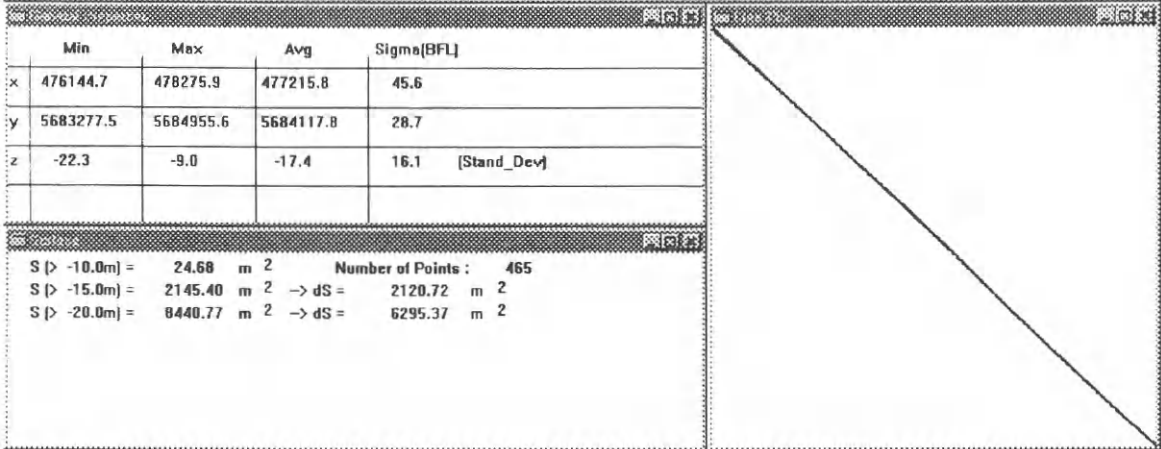
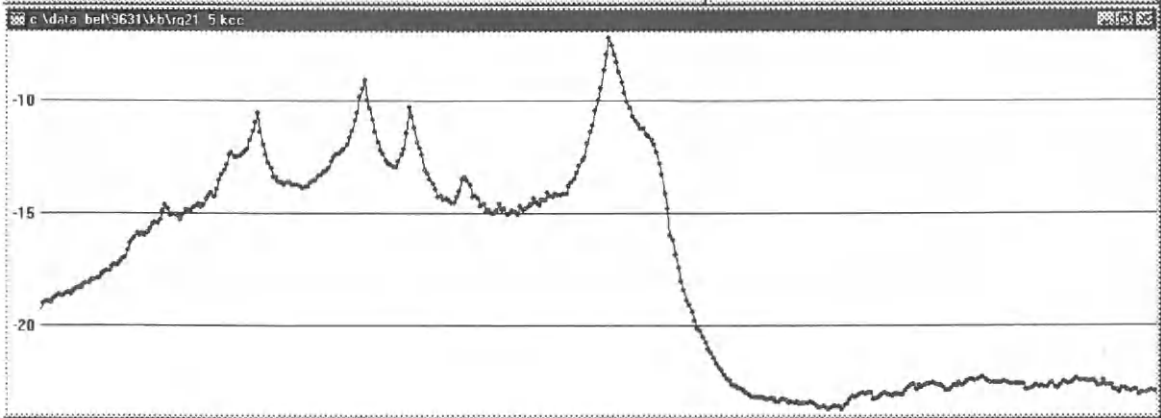
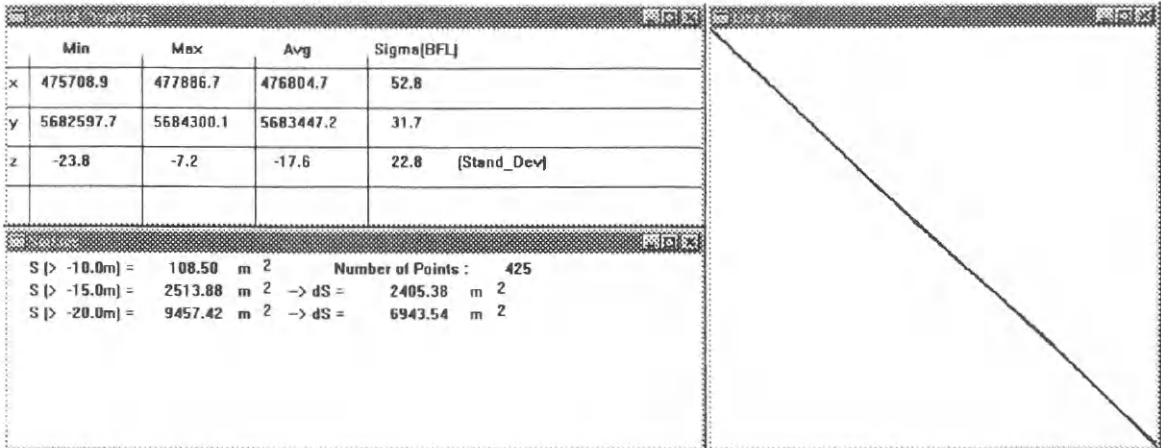
Biilage 4 : Profielen decca's en halve decca's Kwintebank (ST9631)

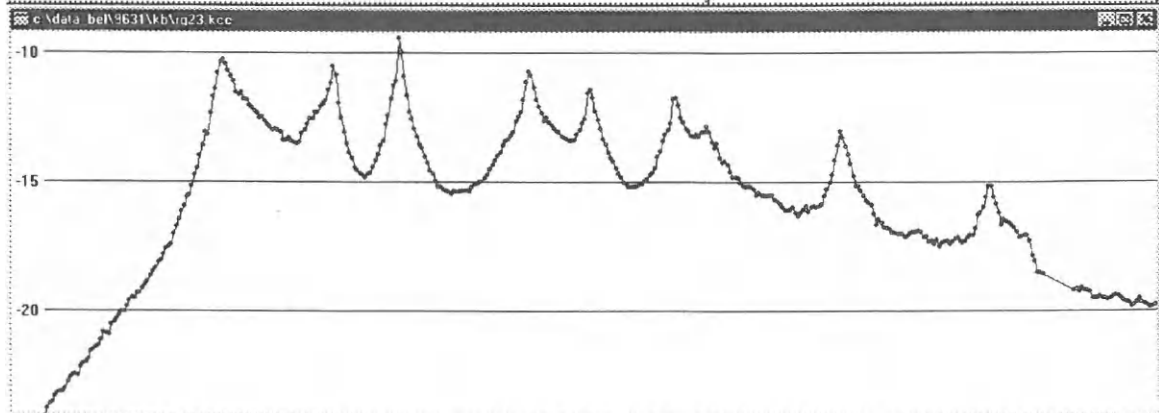
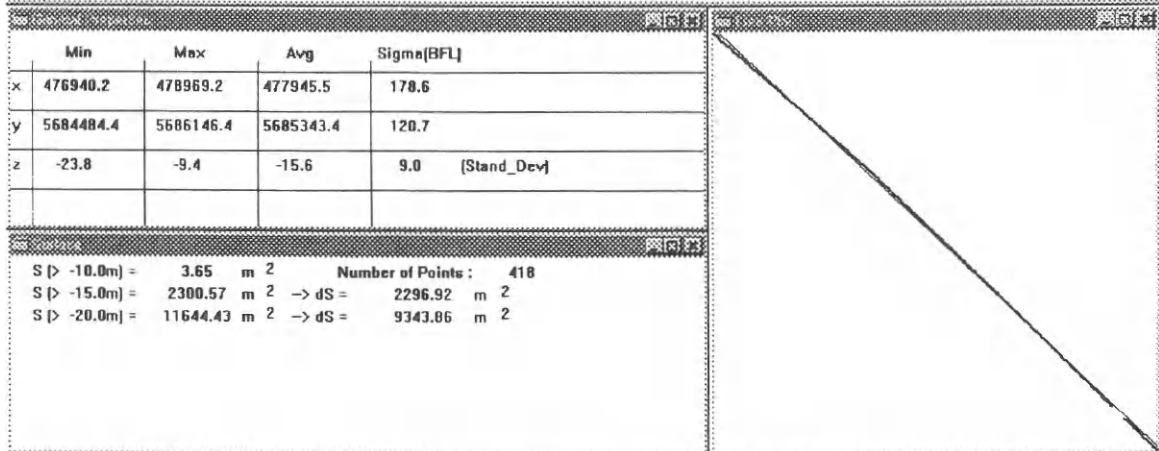
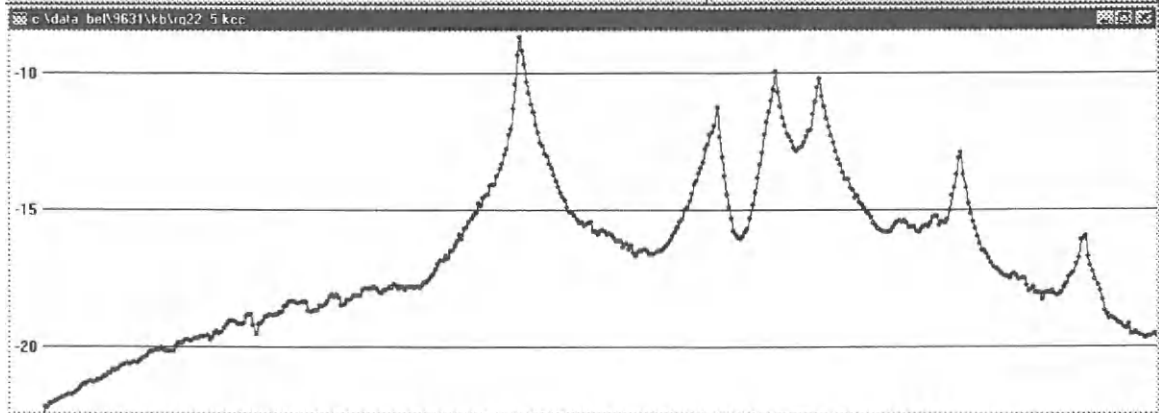
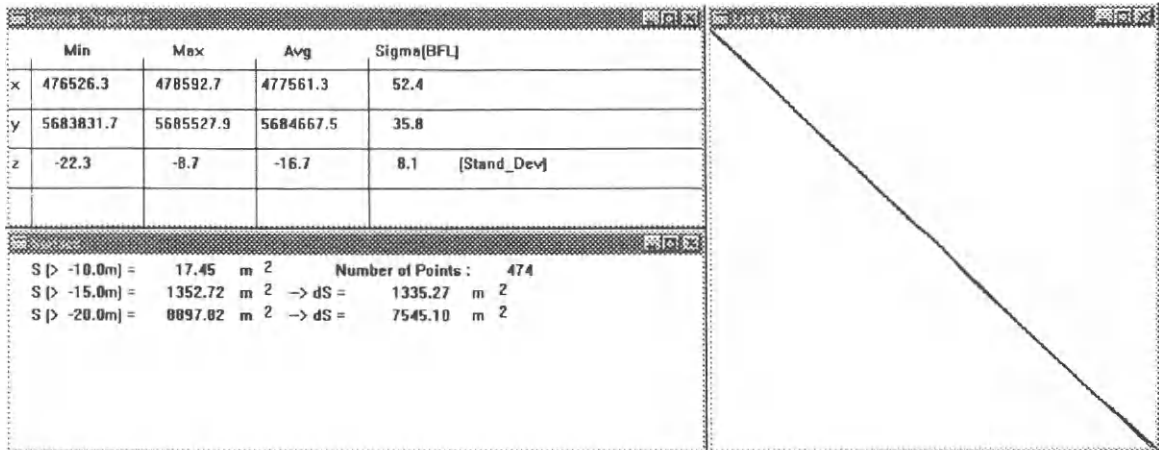


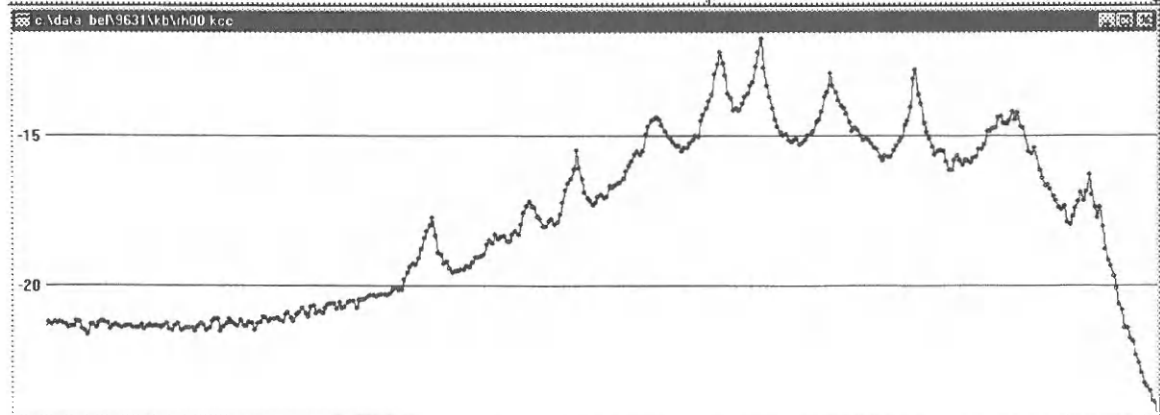
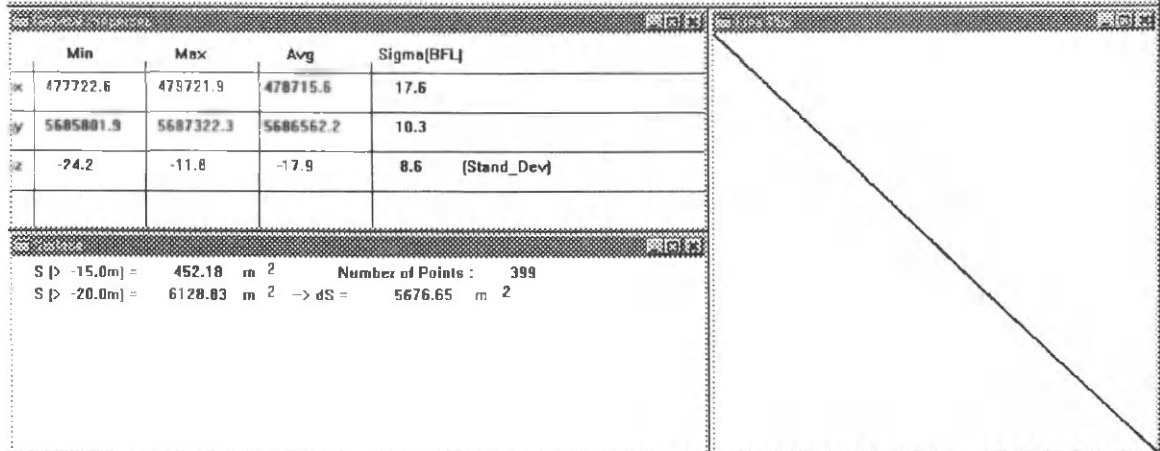
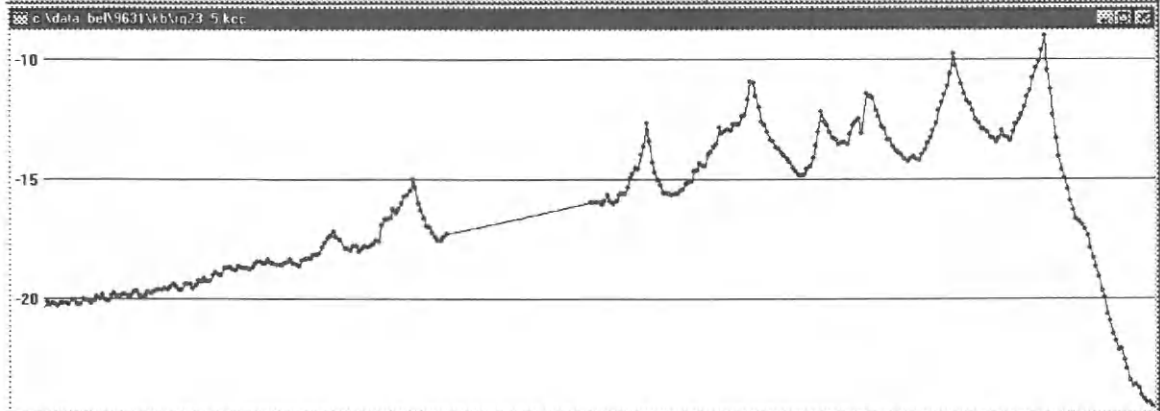
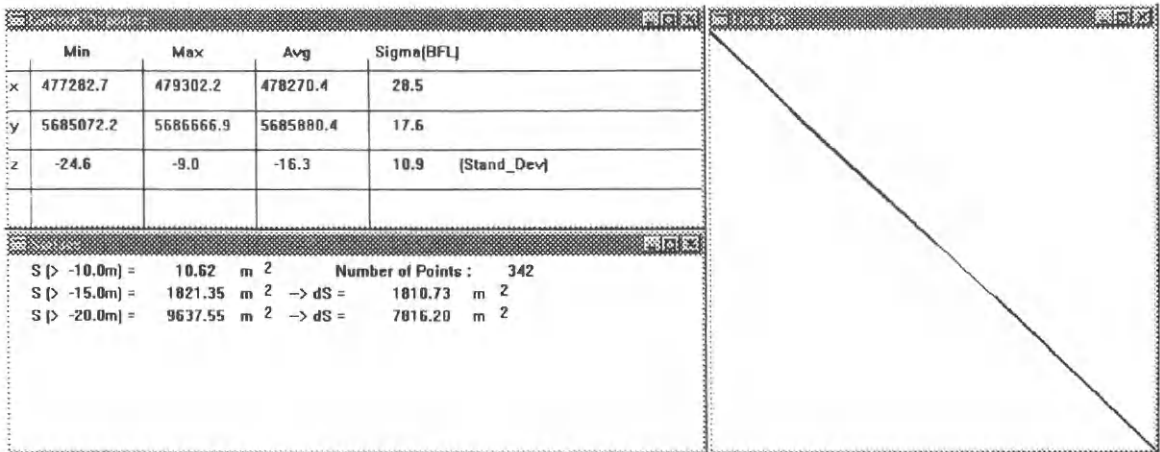


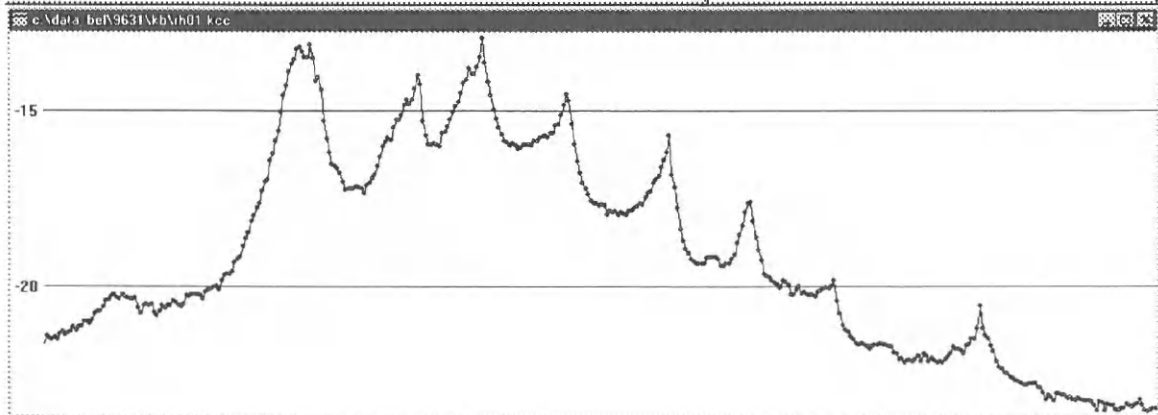
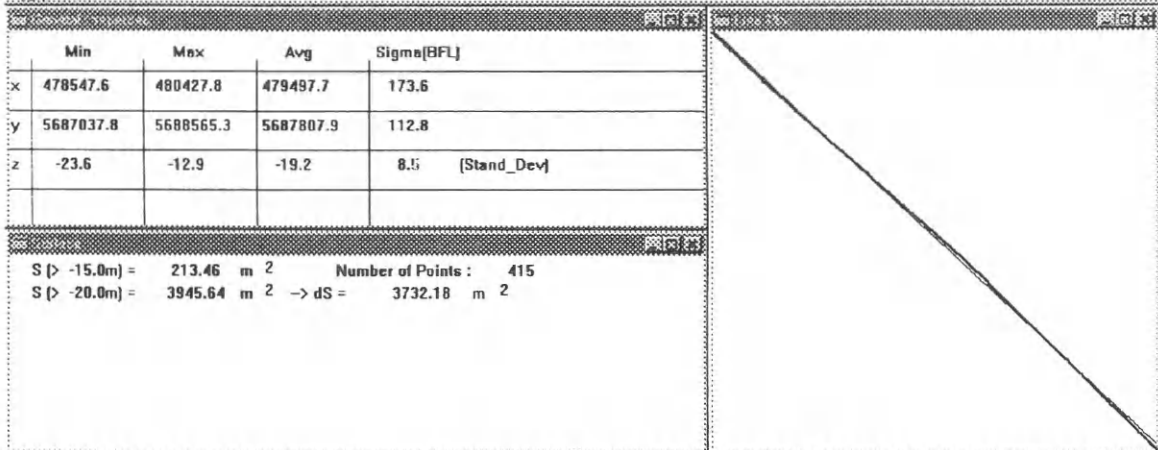
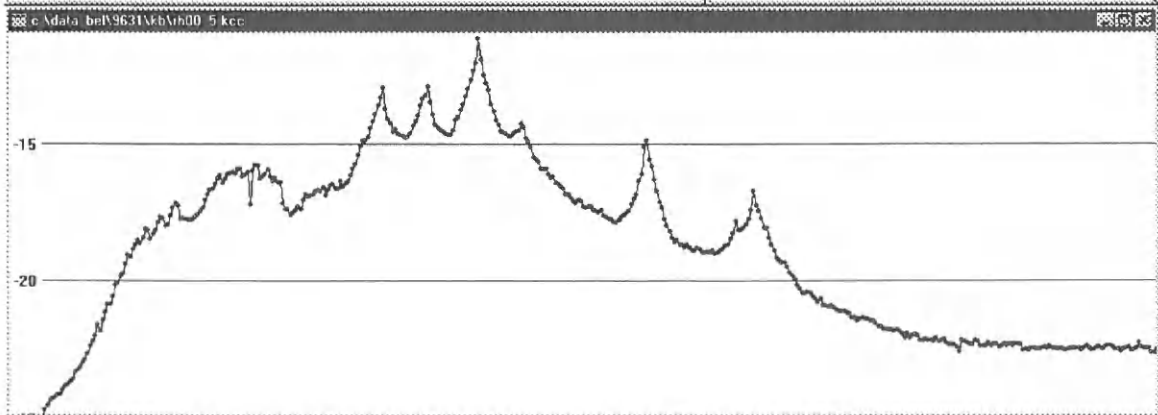
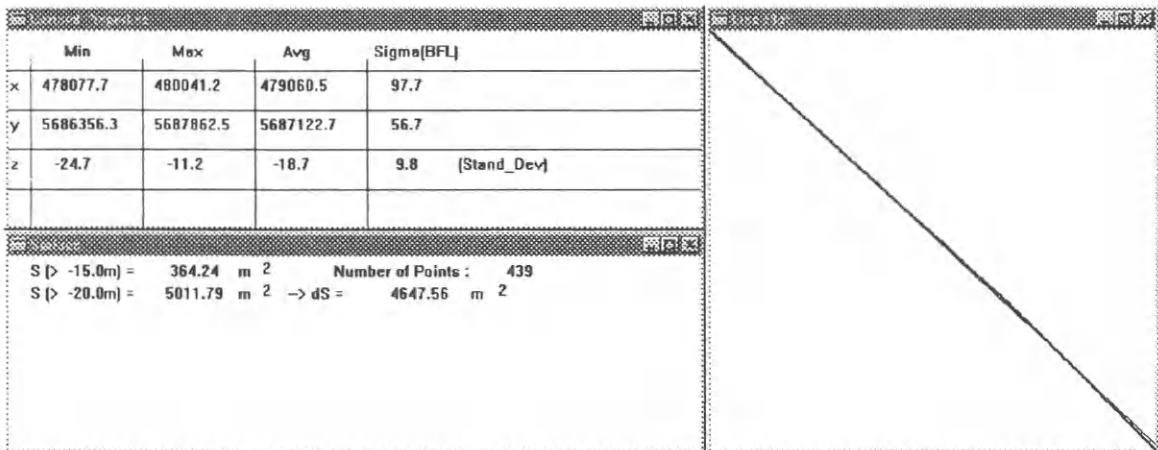


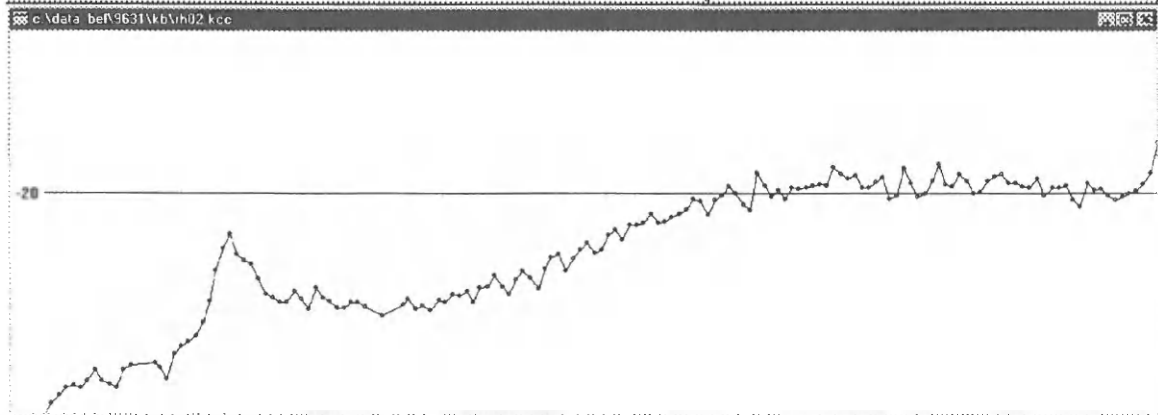
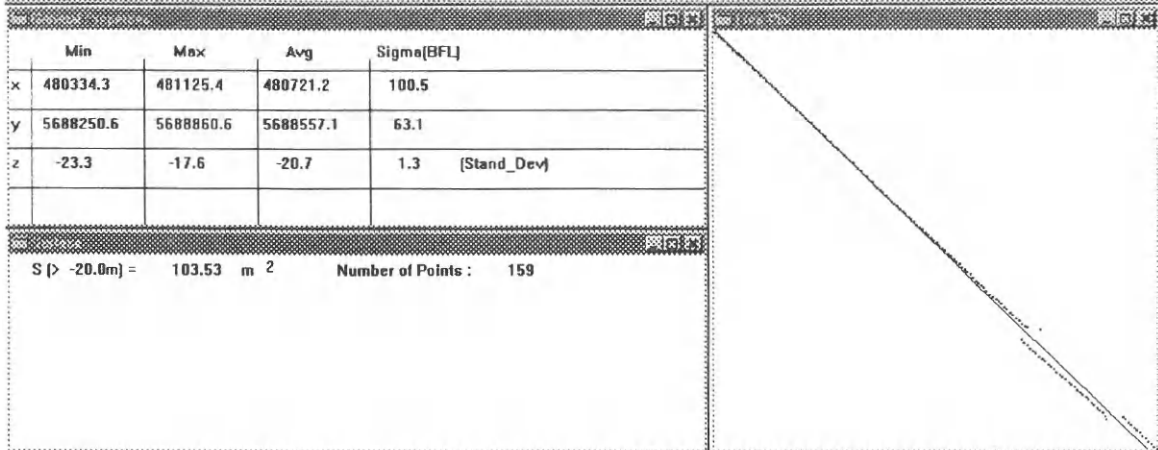
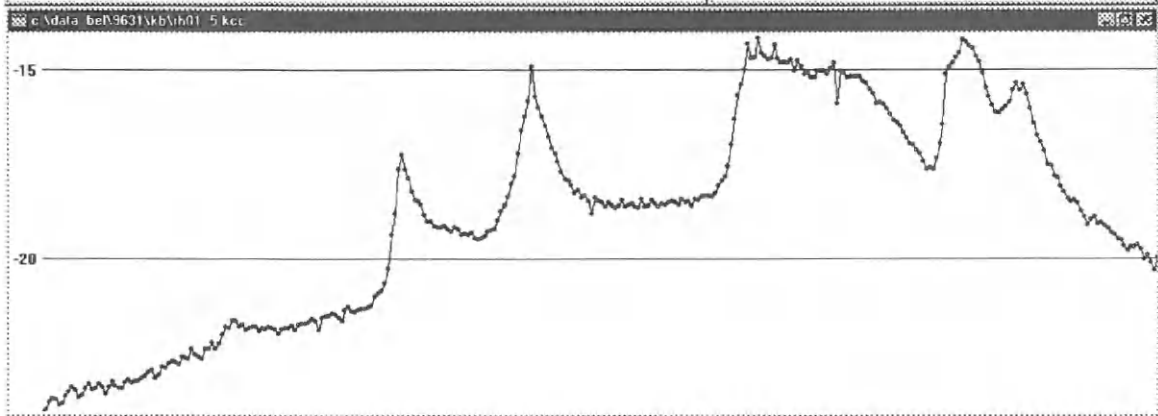
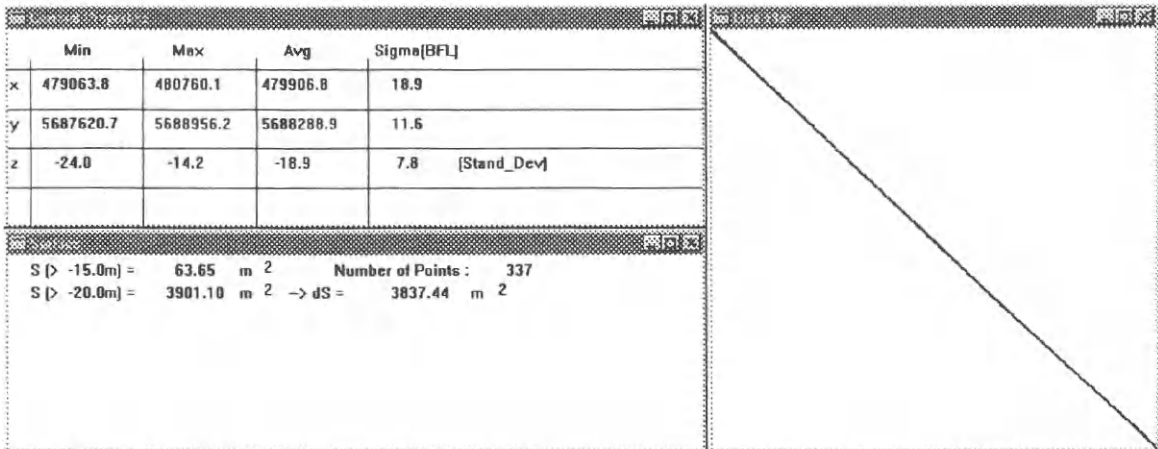




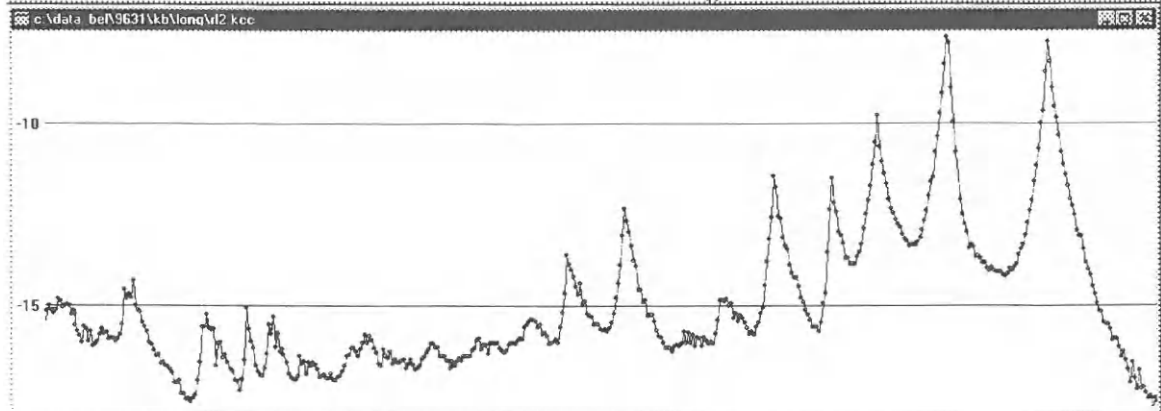
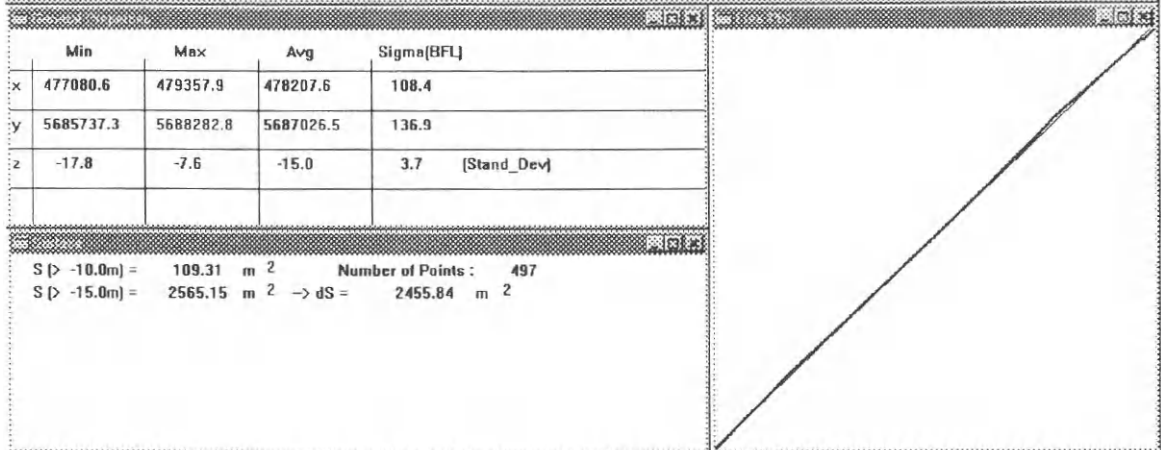
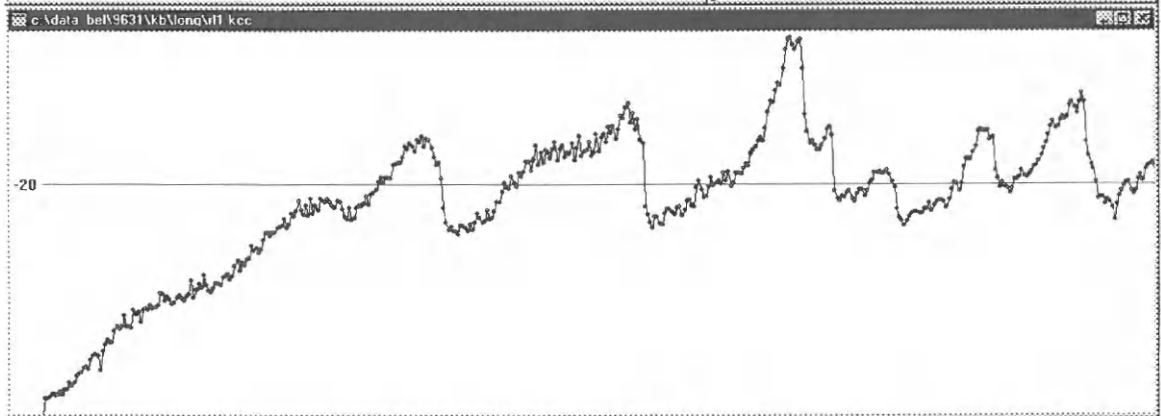
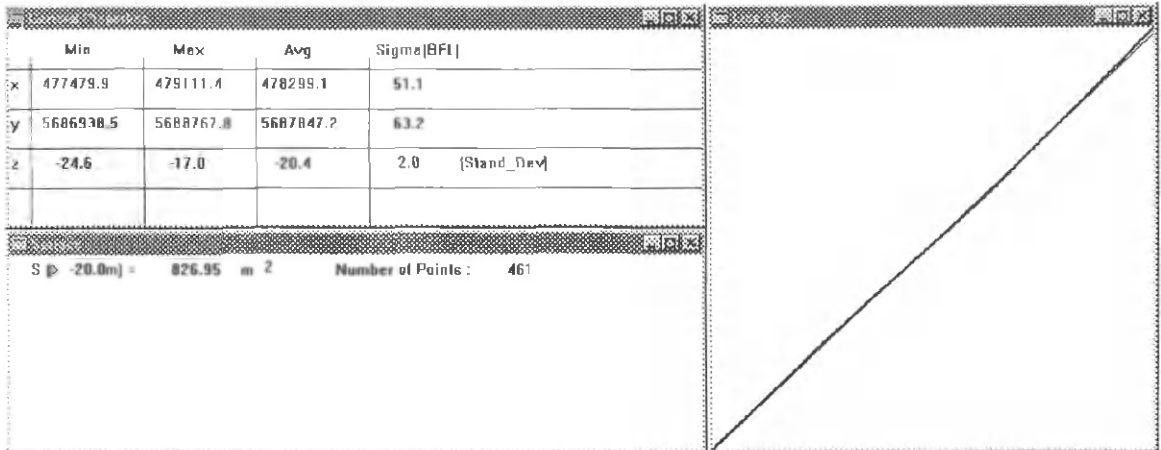


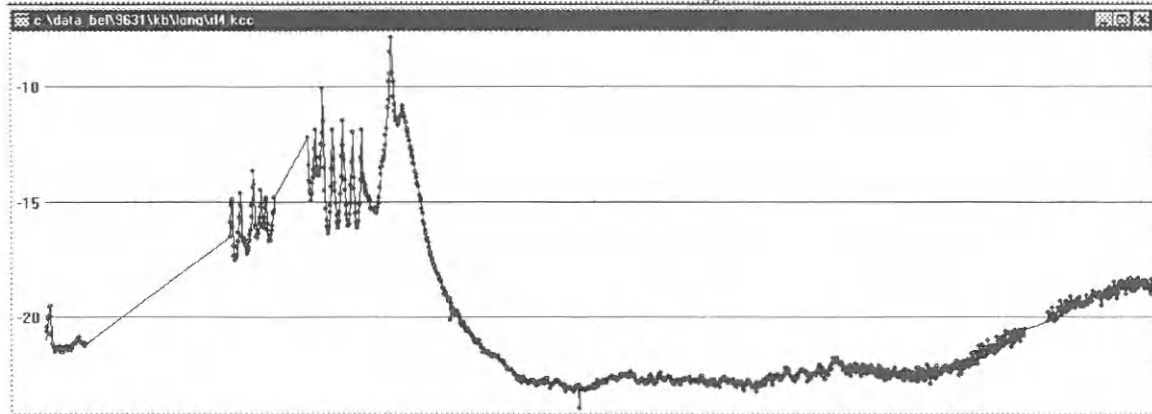
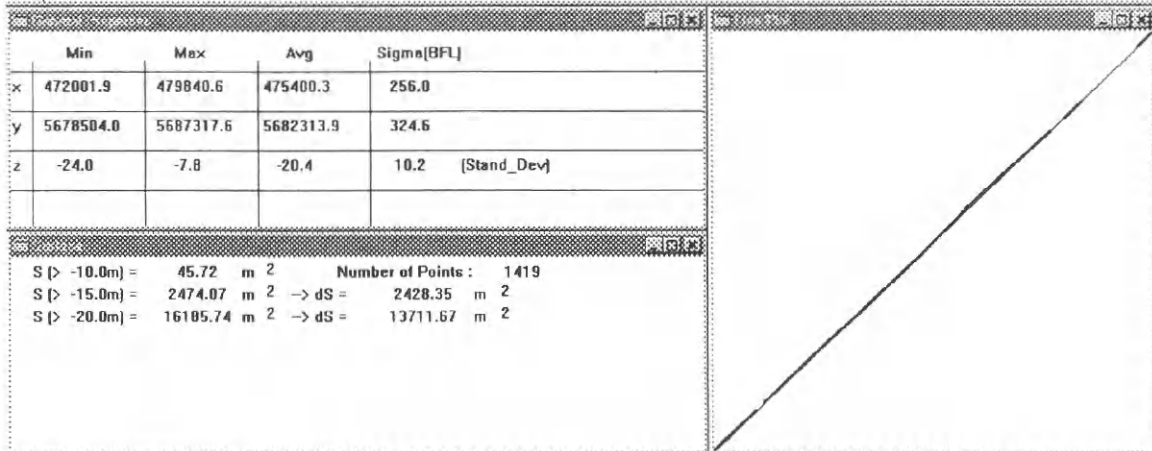
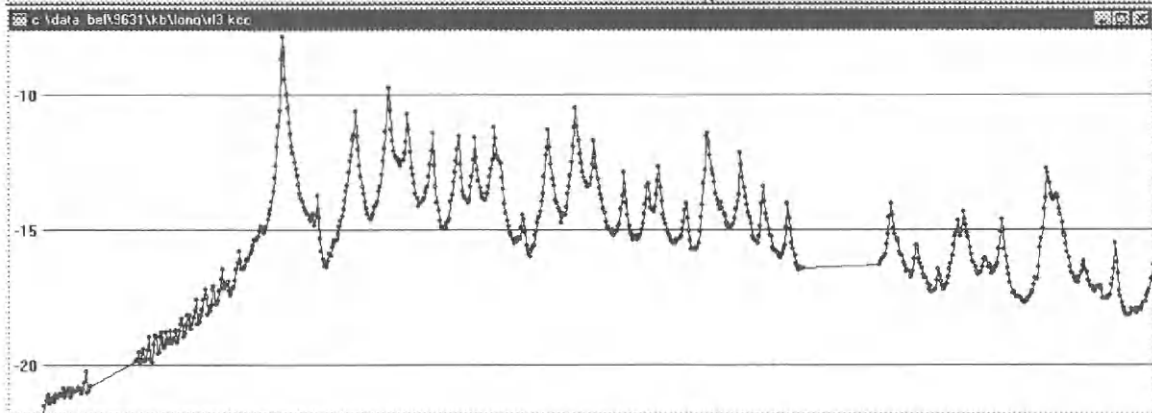
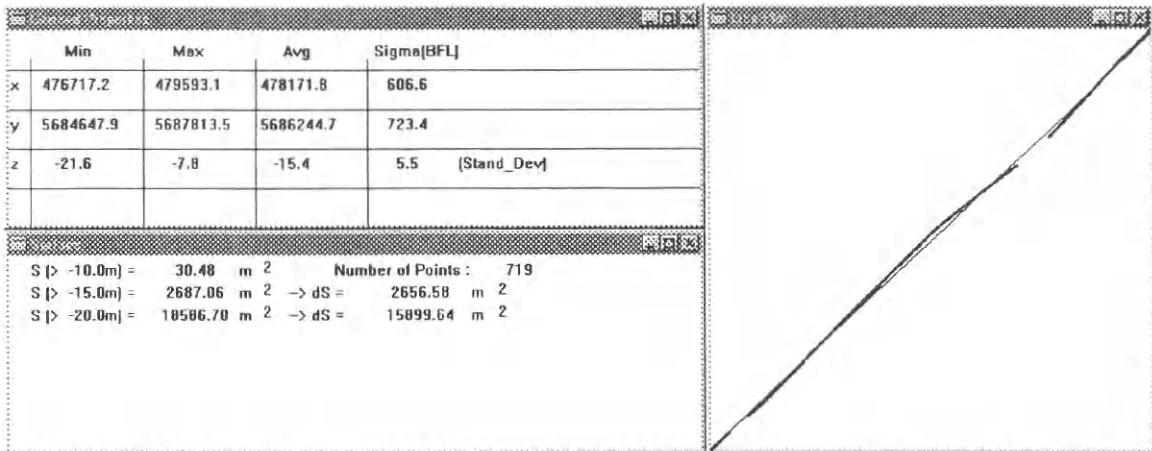


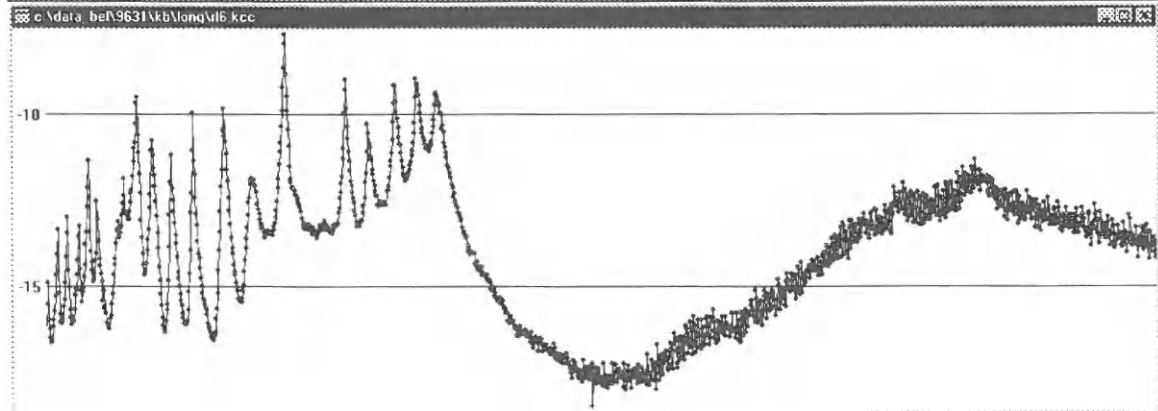
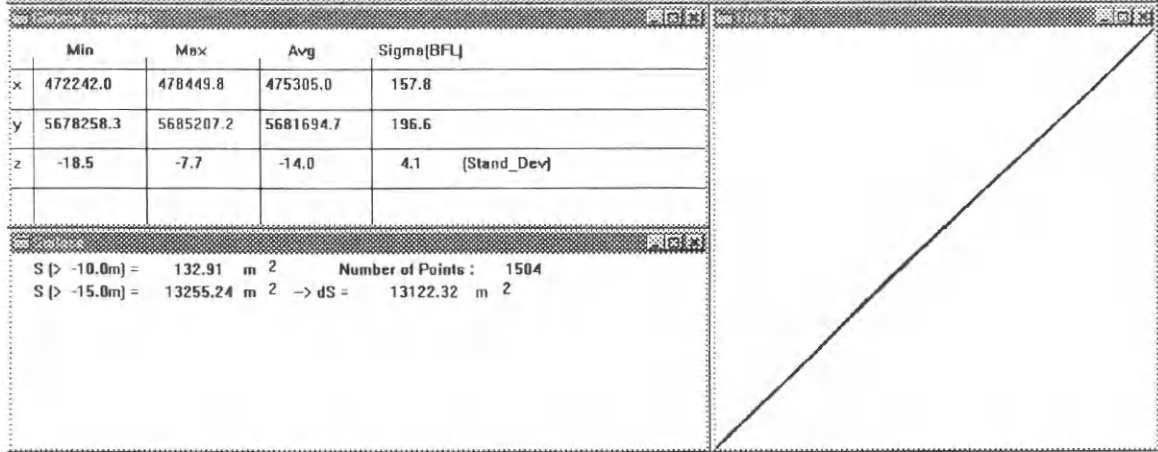
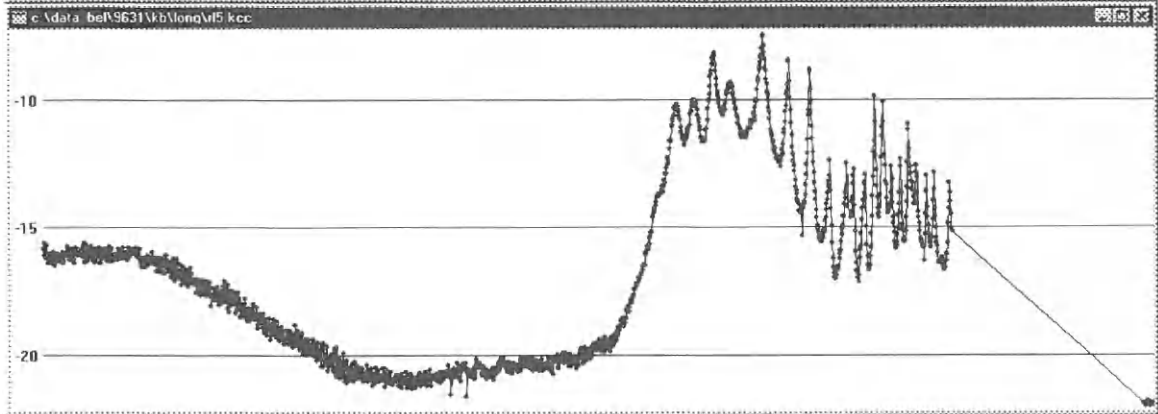
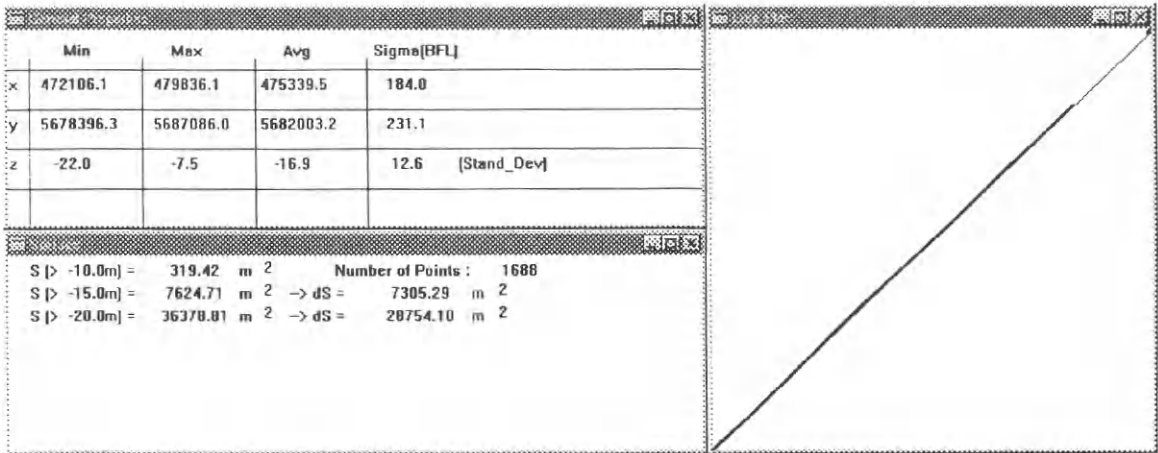


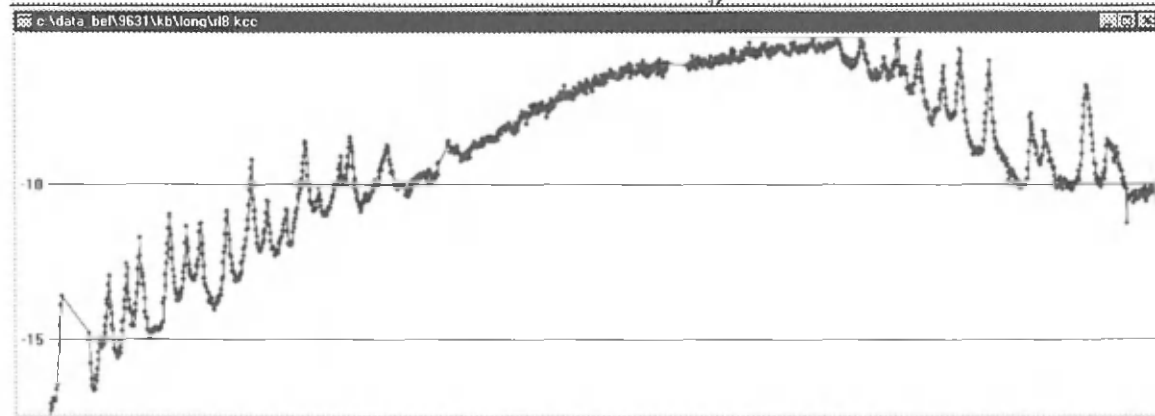
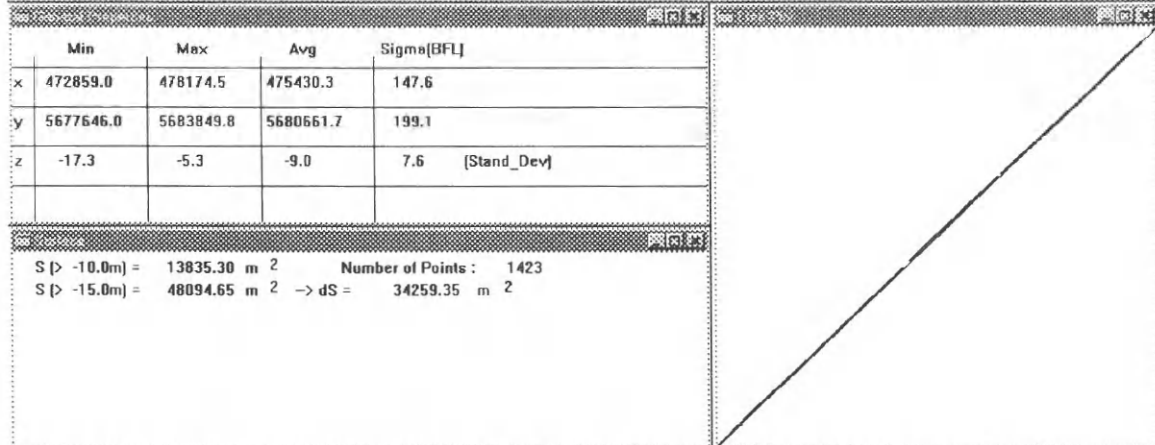
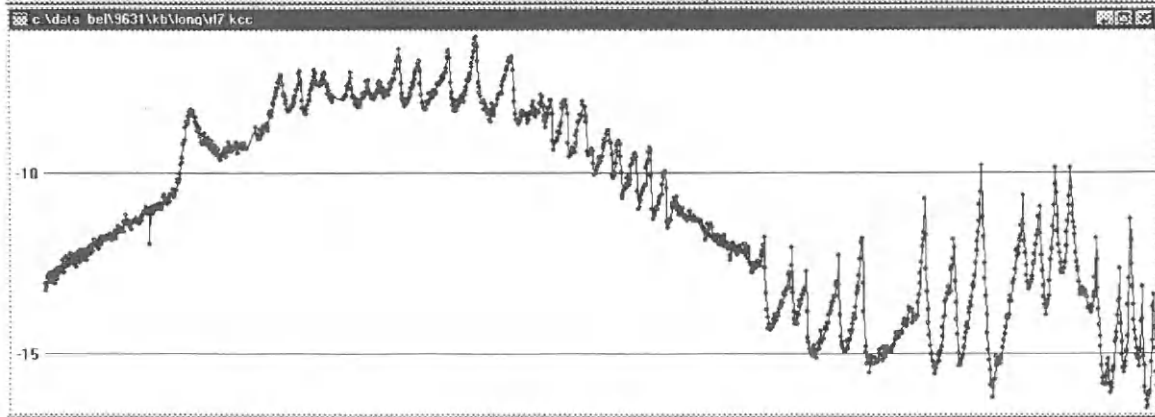
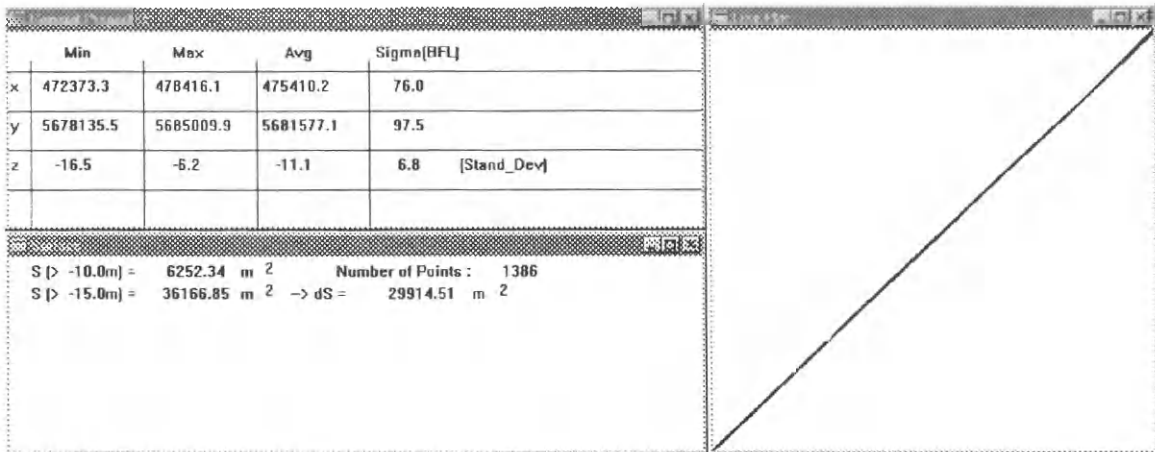


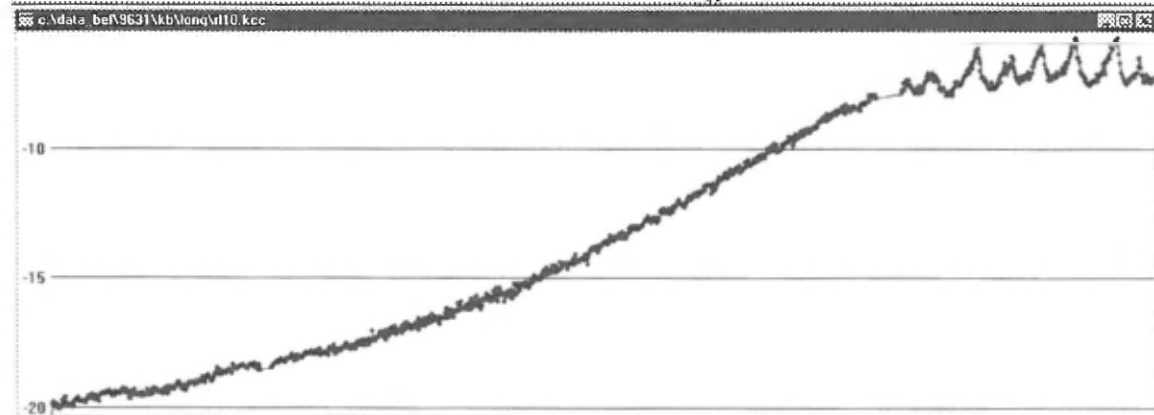
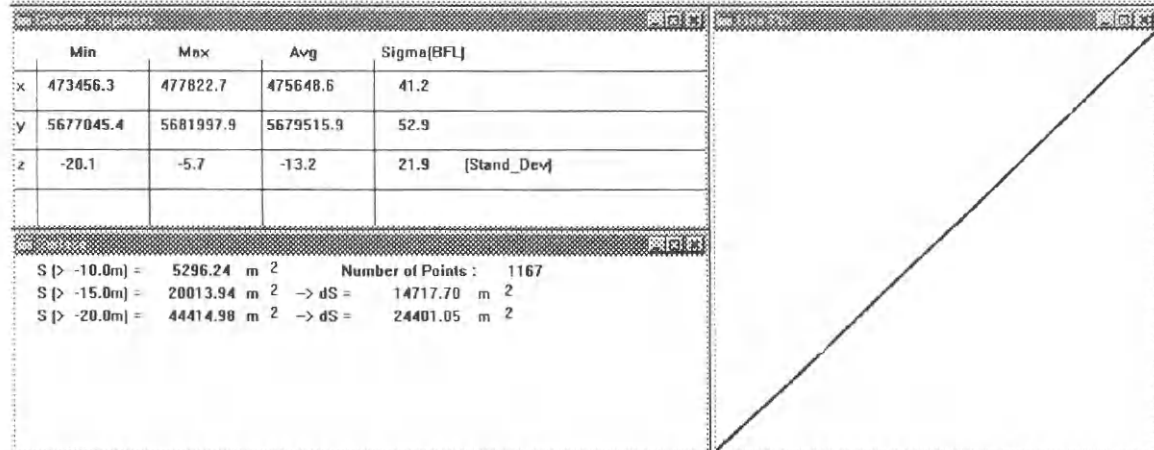
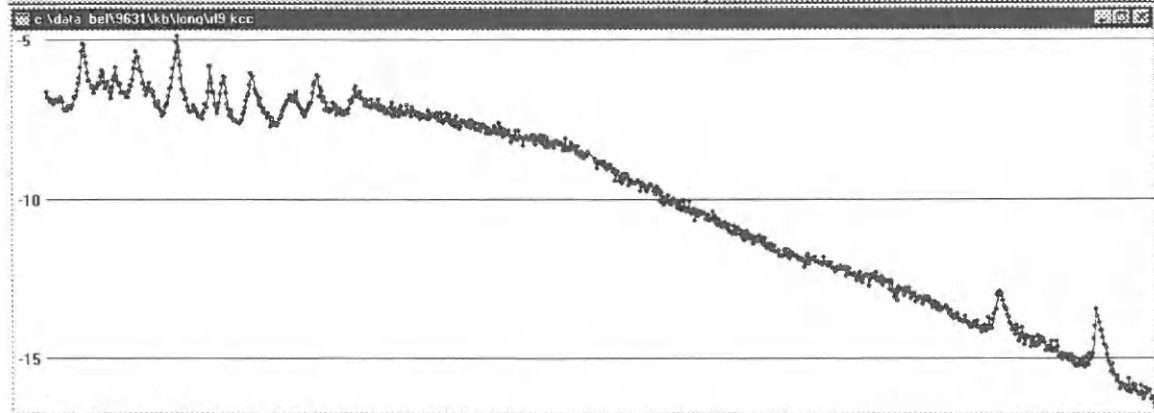
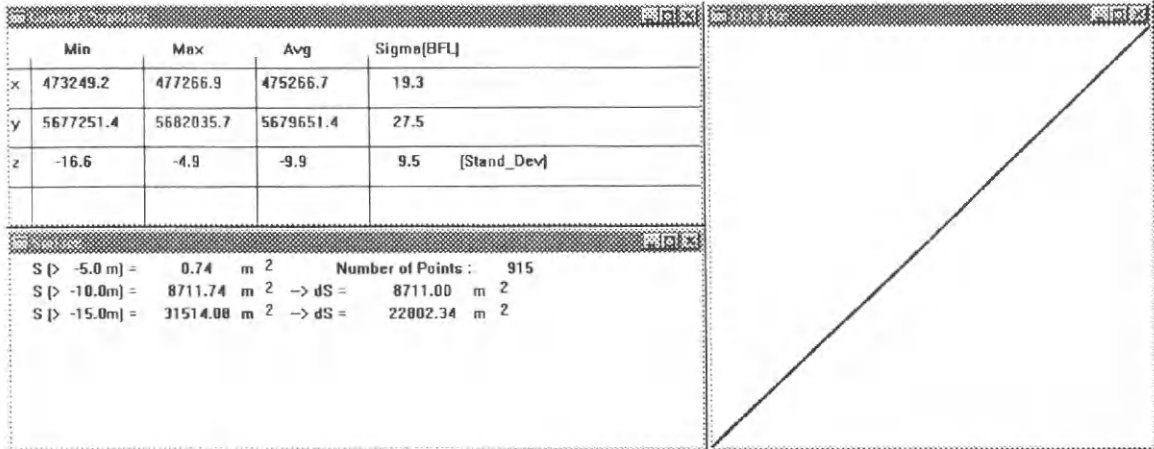
Bijlage 5 : Profielen logitudinale raaien Kwintebank (ST9631)





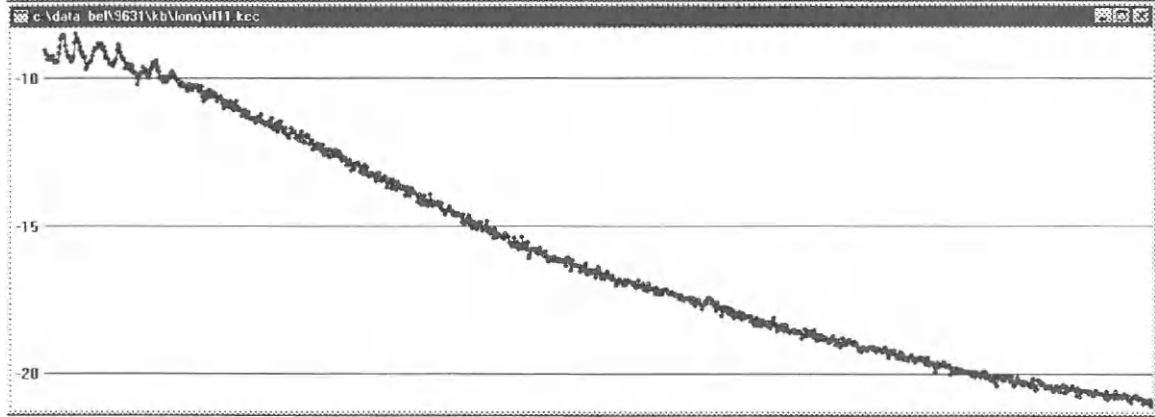
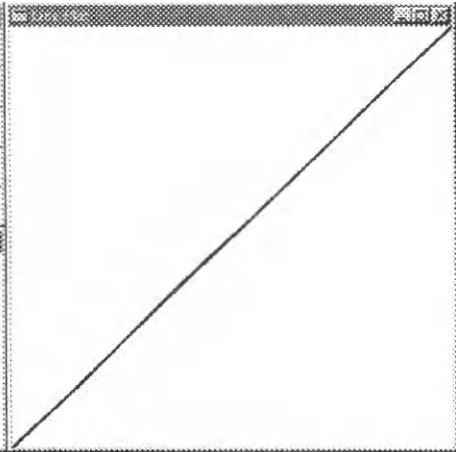




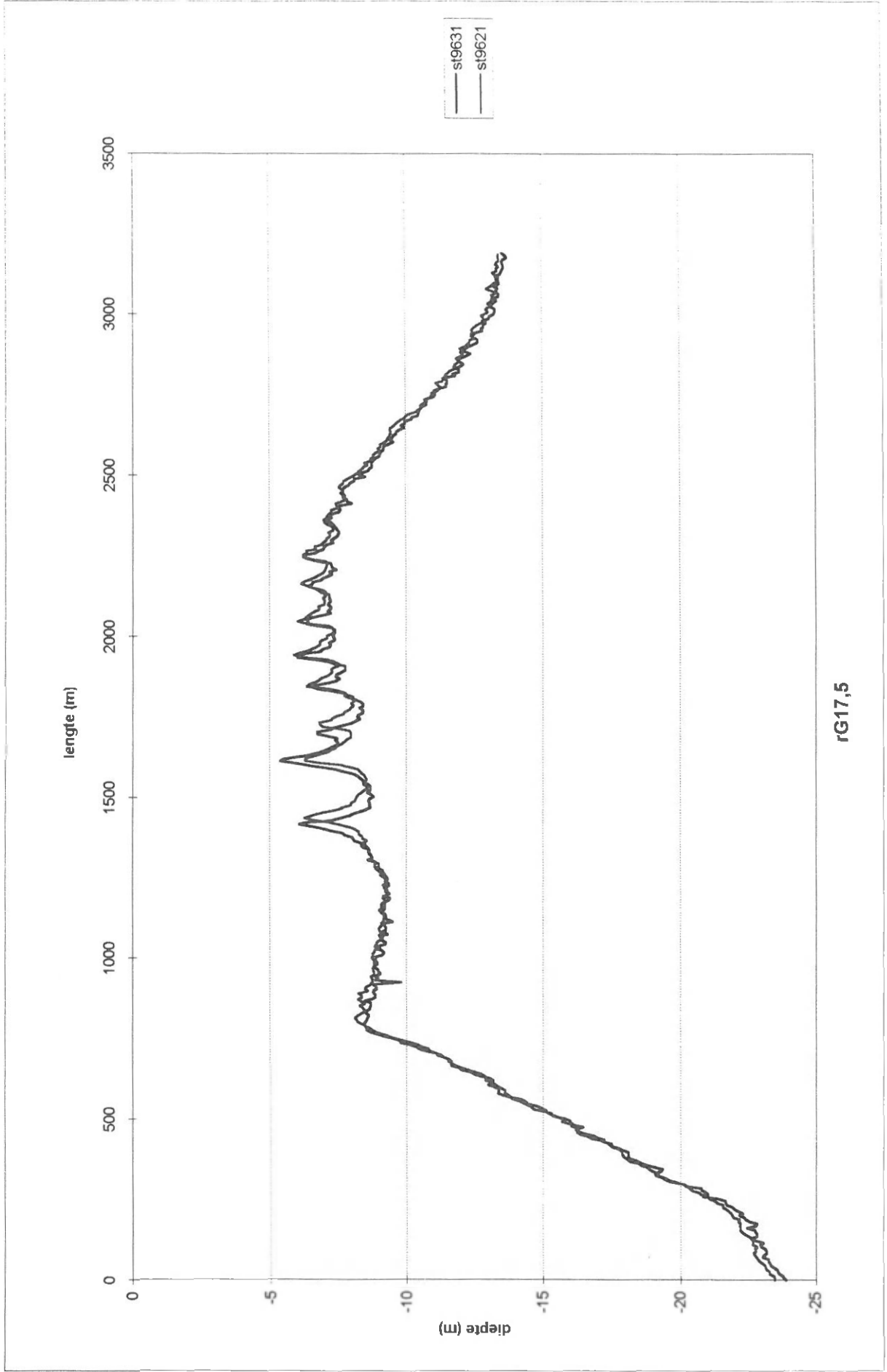


	Min	Max	Avg	Sigma[BFL]
x	473757.2	478399.3	476068.9	96.6
y	5676749.0	5681997.9	5679375.4	125.7
z	-21.1	-8.5	-15.8	14.6 [Stand_Dev]

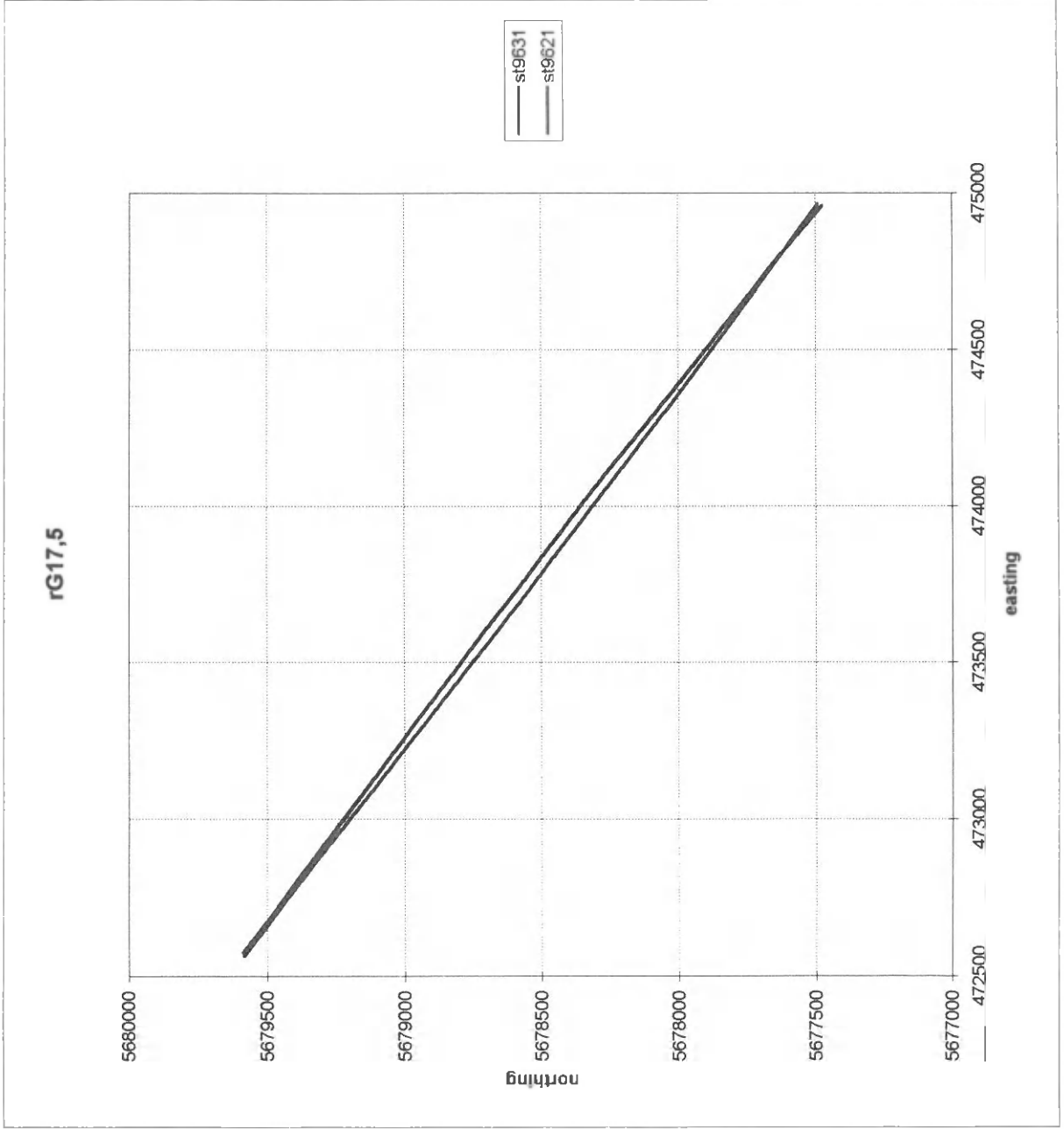
S (> -10.0m) =	475.53	m ²	Number of Points:	1030
S (> -15.0m) =	9335.18	m ²	→ dS =	8859.64 m ²
S (> -20.0m) =	29775.40	m ²	→ dS =	20440.22 m ²

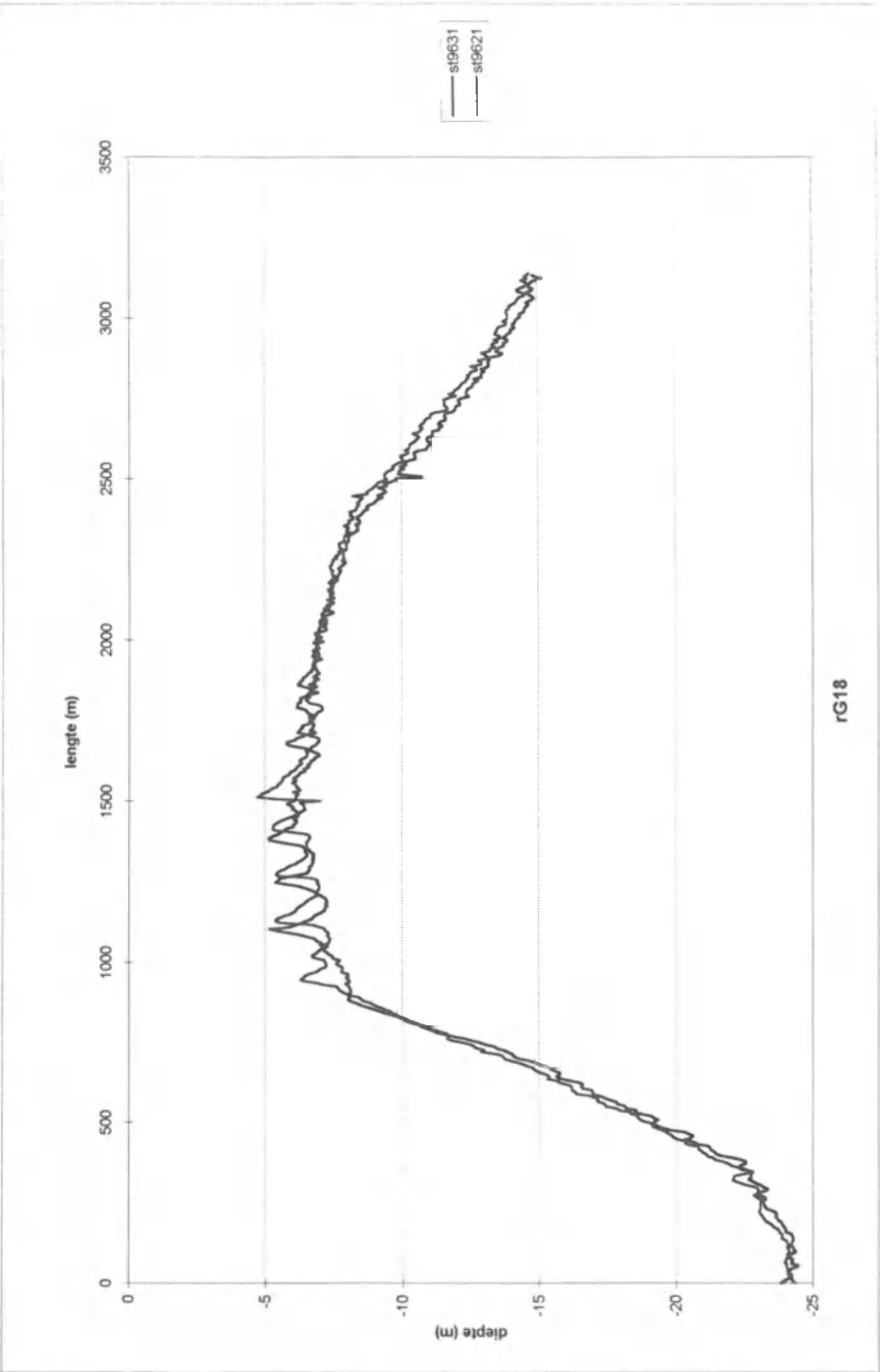


Bijlage 6 : Vergelijking van de profielen en tracks langsheen de decca's en halve decca's tussen september (ST9621) en december (ST9631) 1996 voor de Kwintebank.



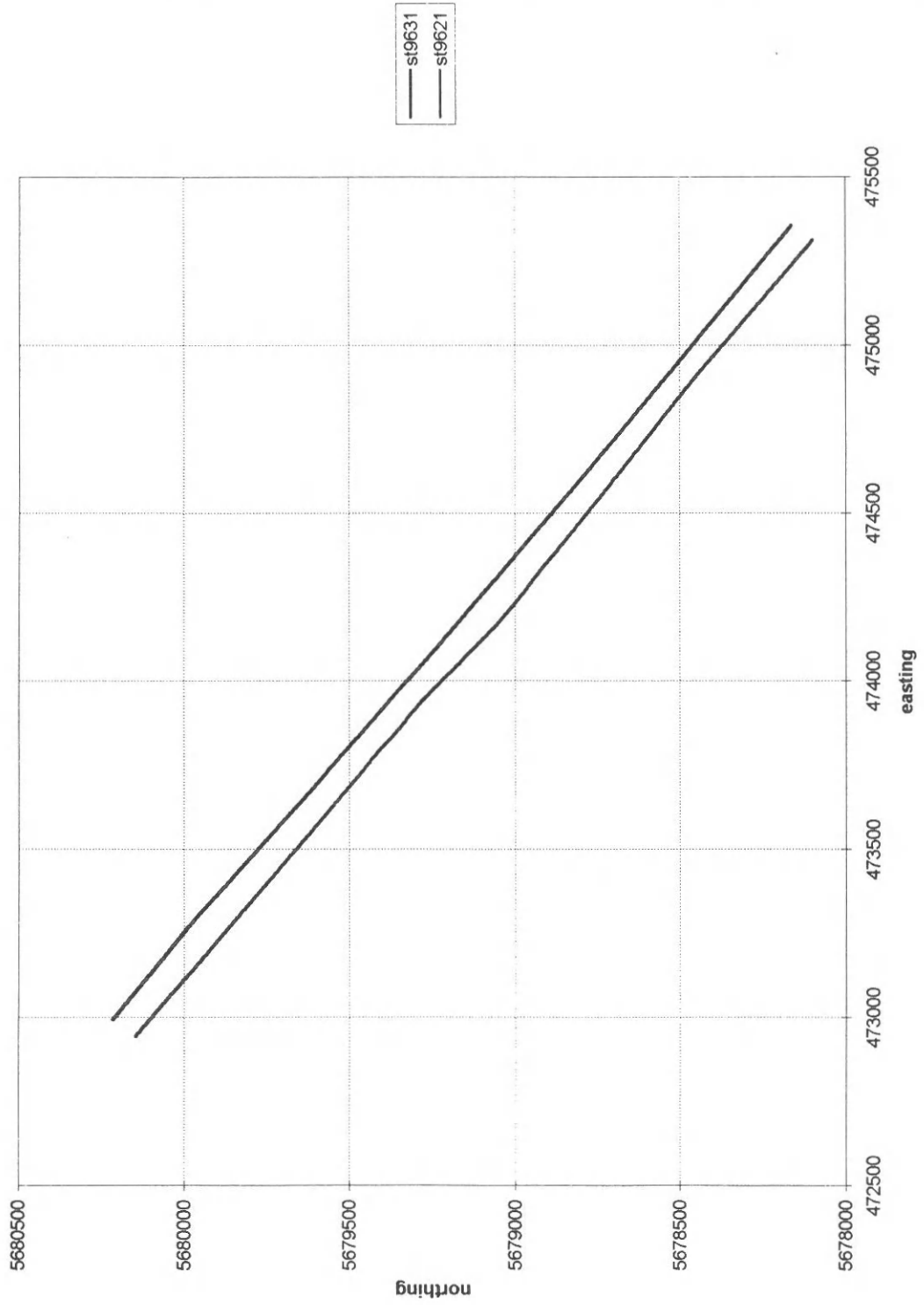
rG17,5

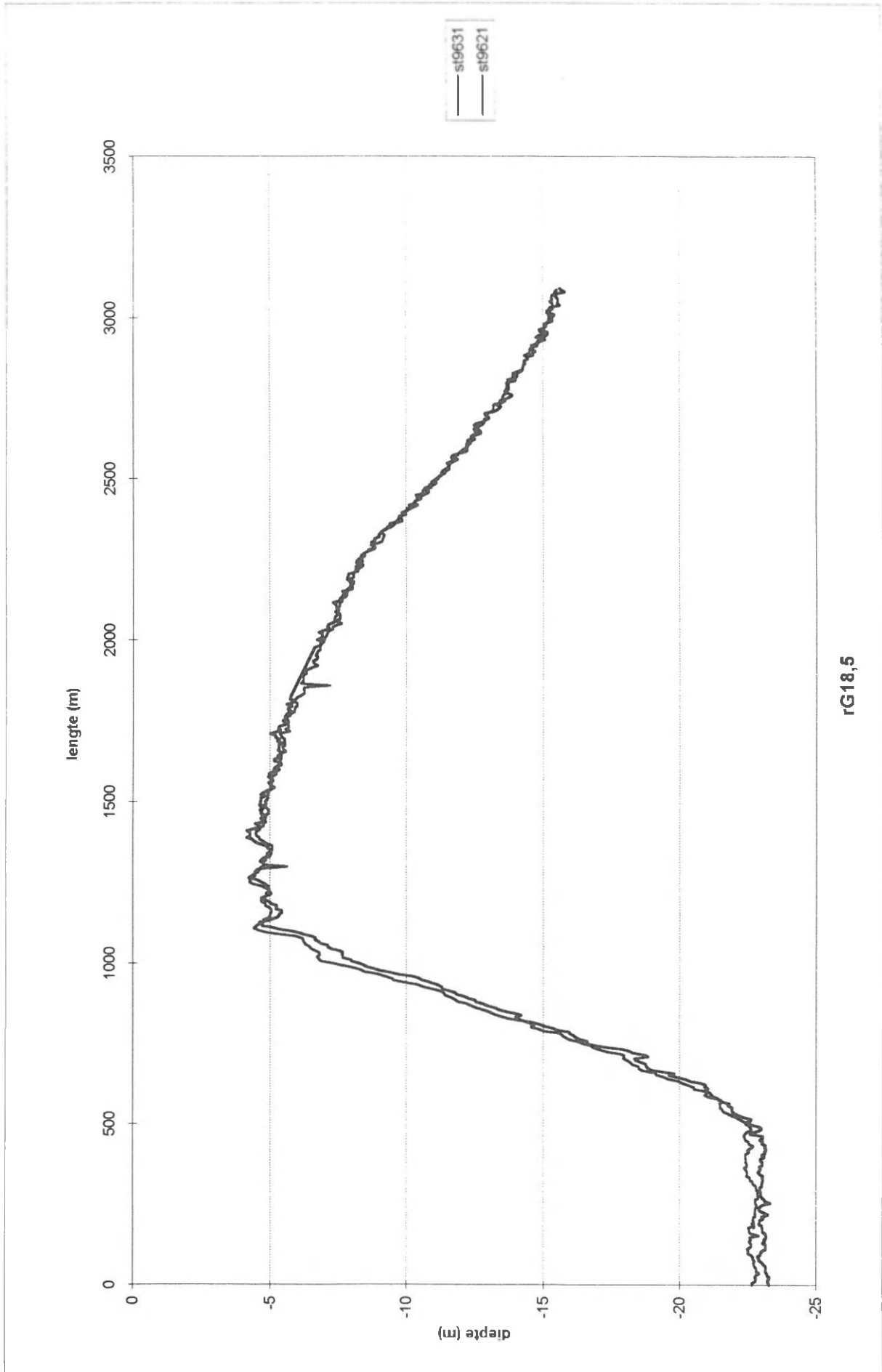




rG18

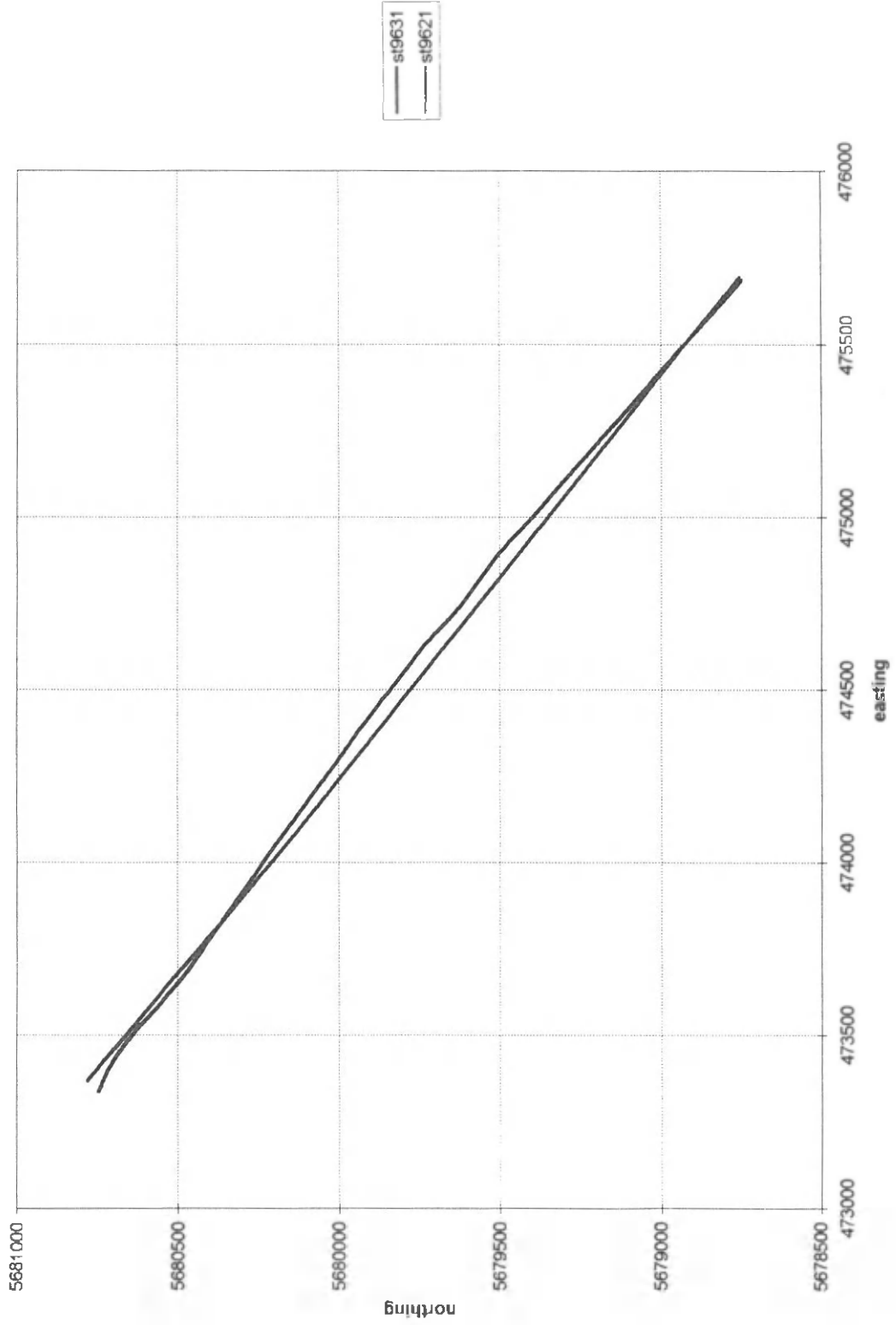
rG18

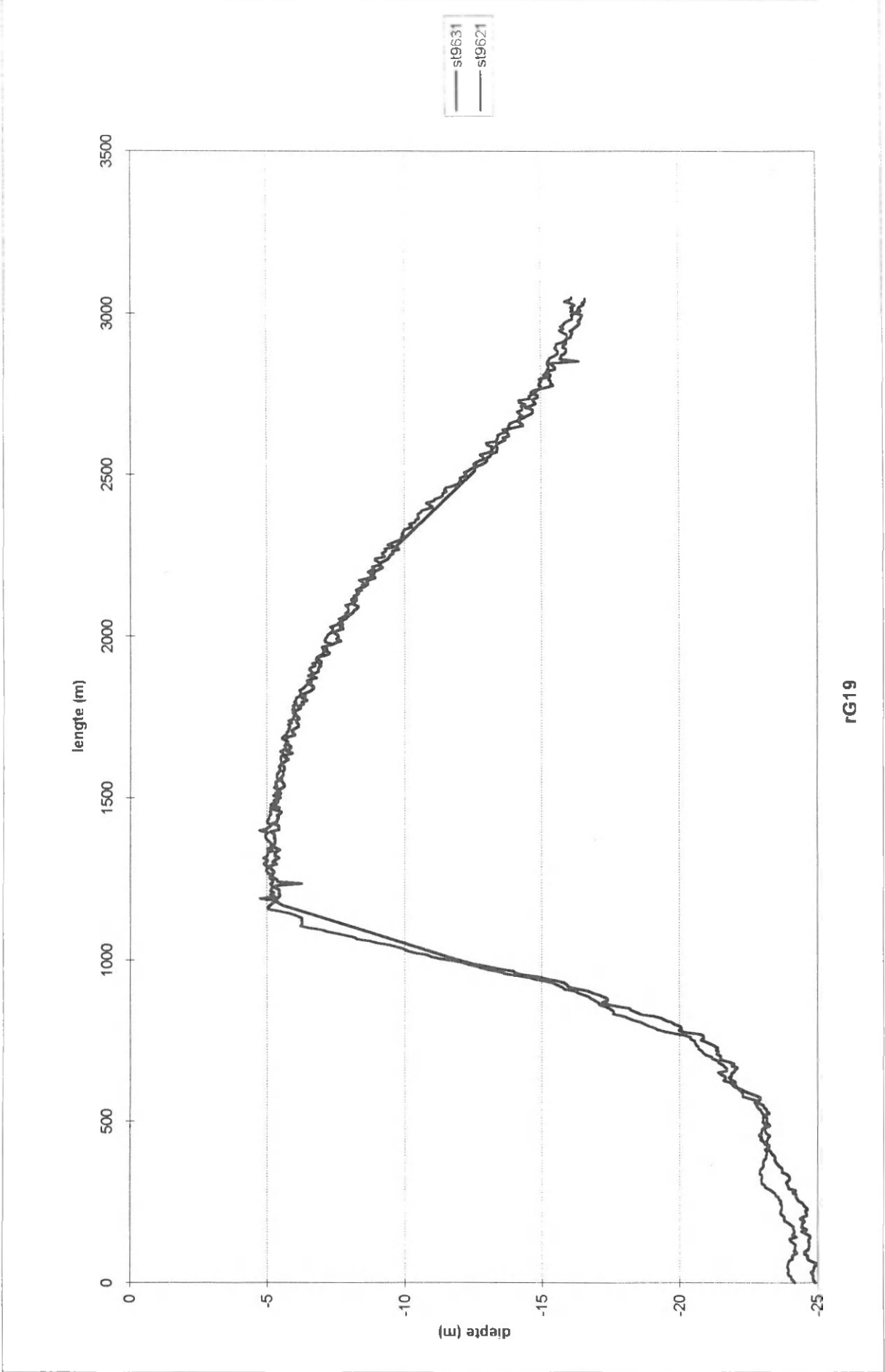




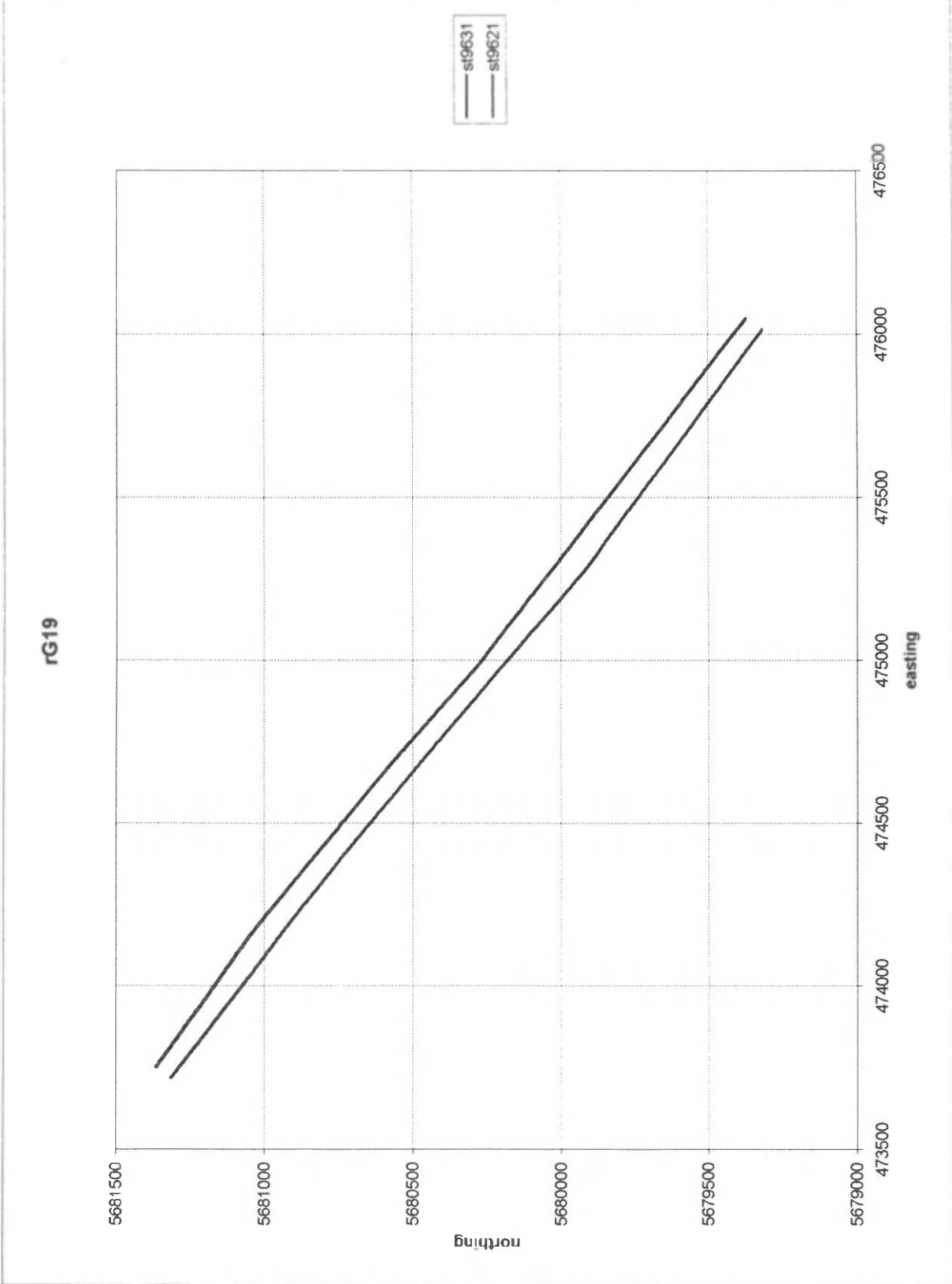
rG18,5

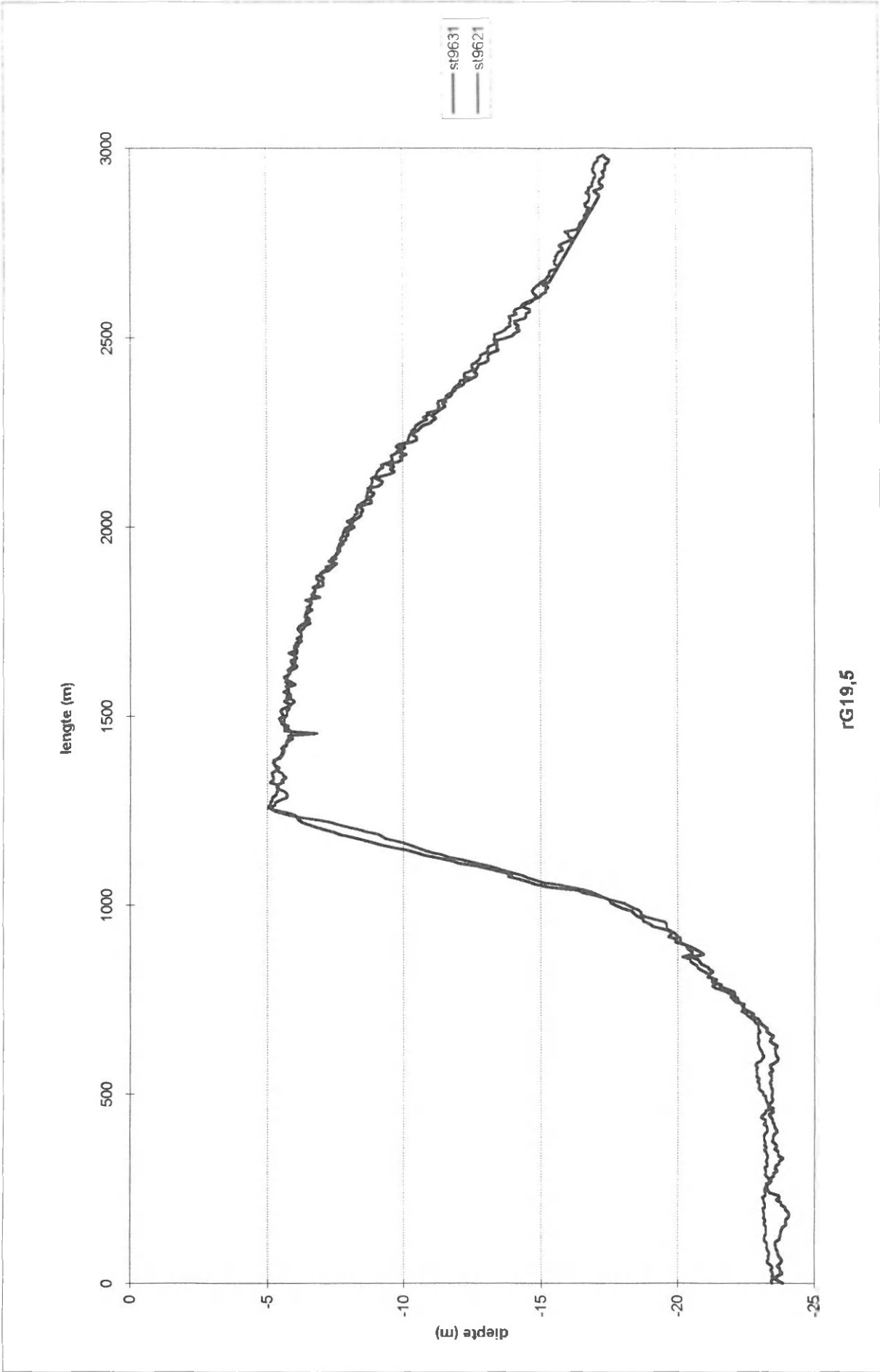
rG18,5





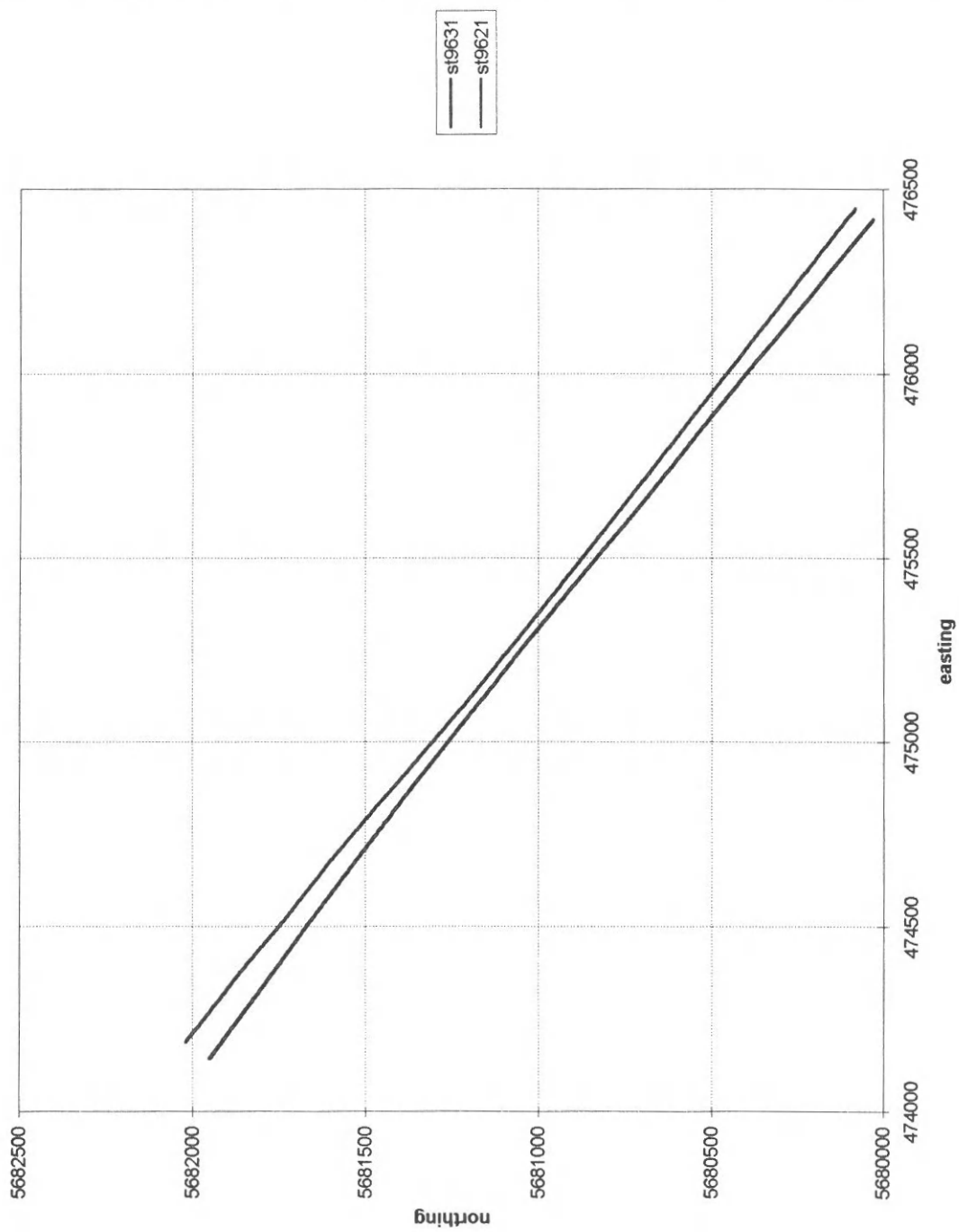
rG19

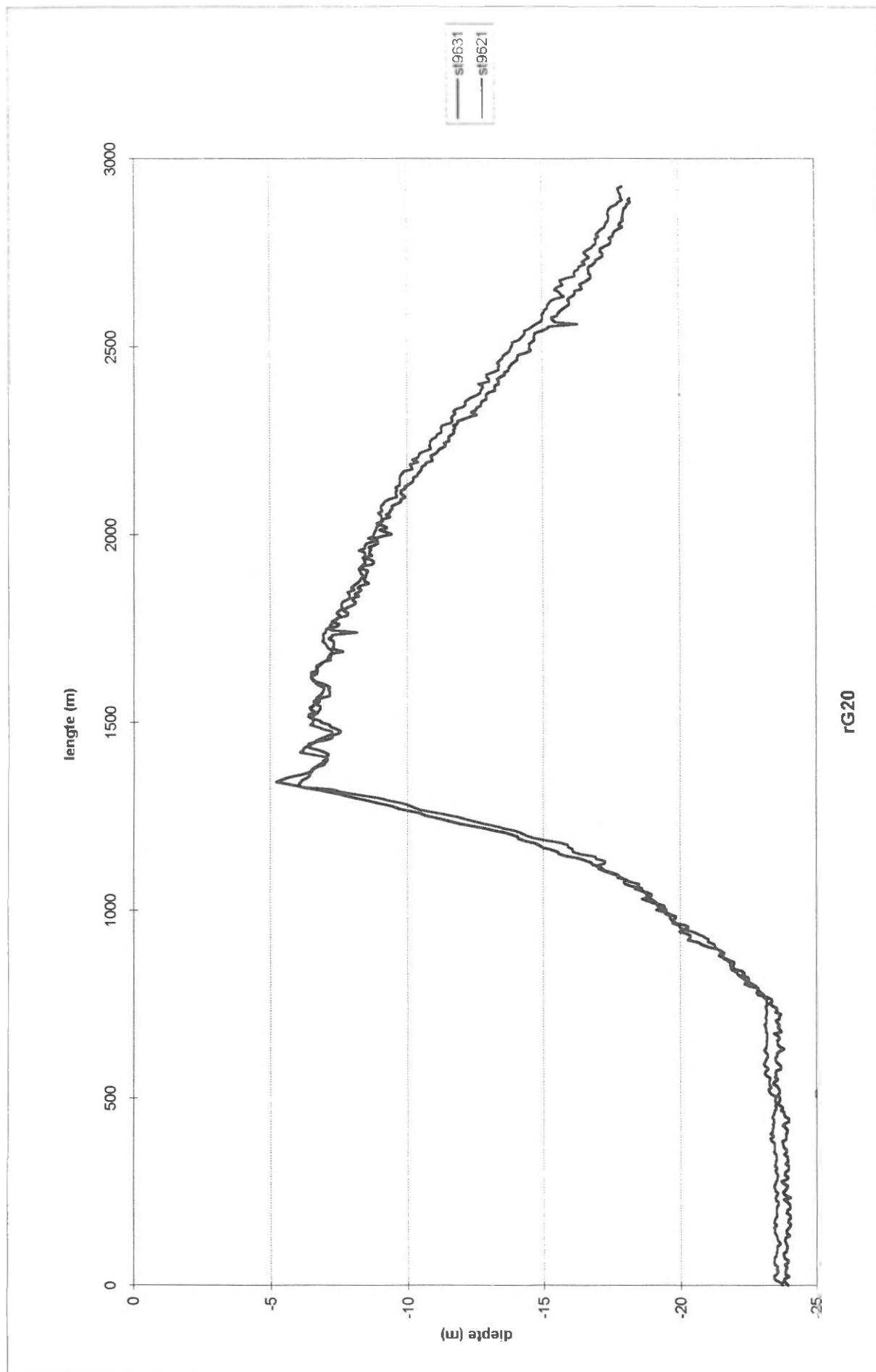




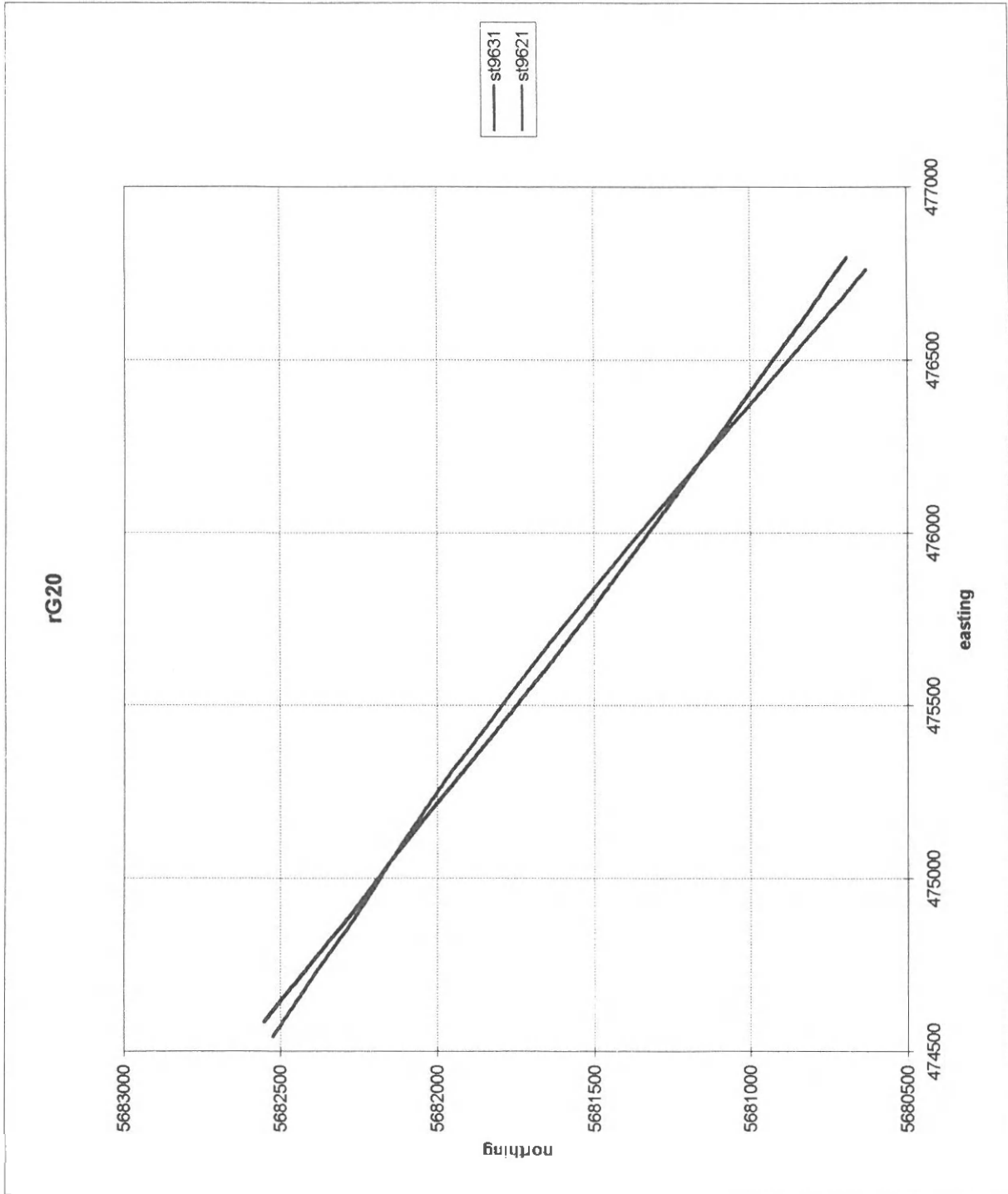
RG19,5

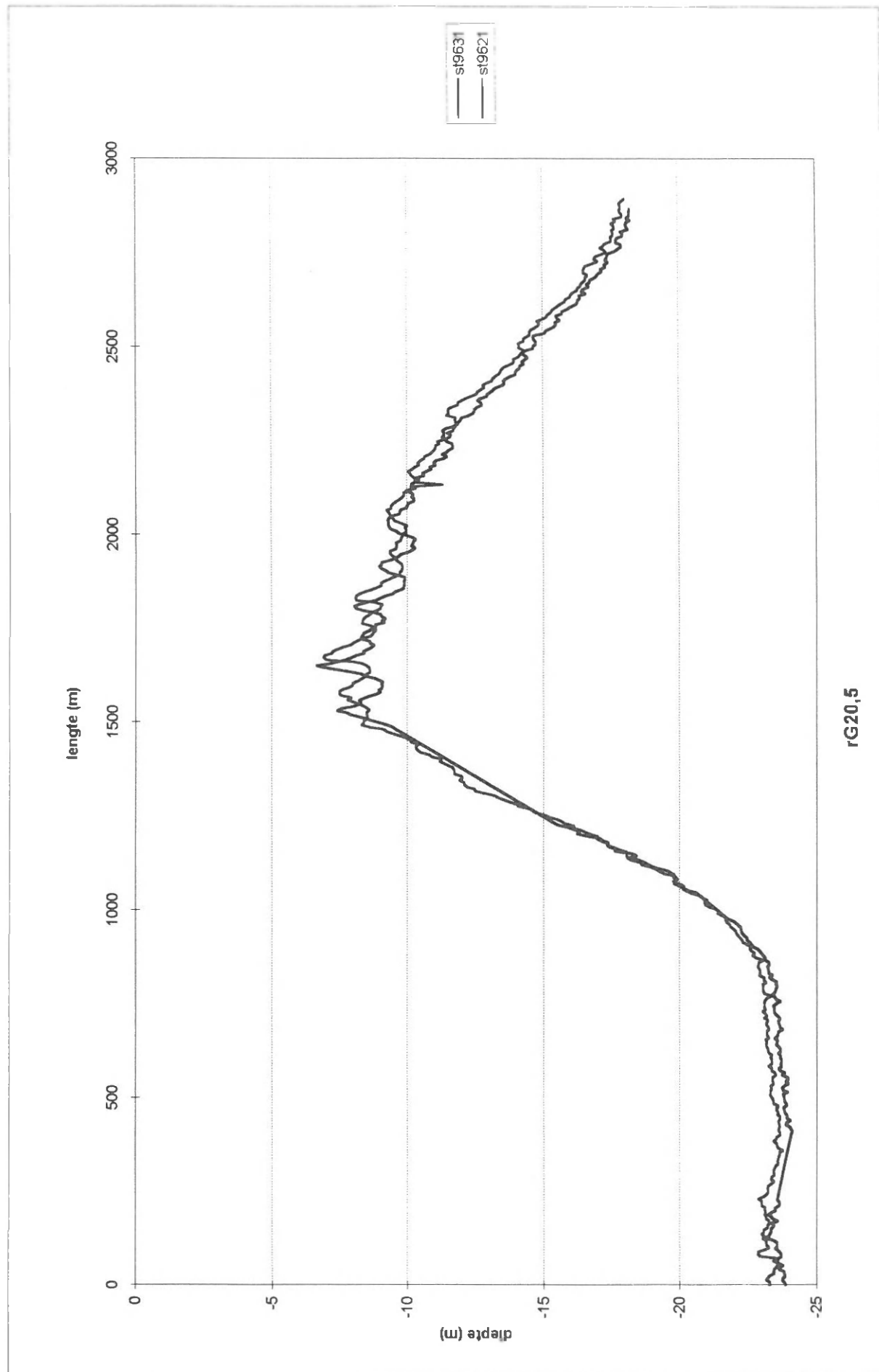
rG19,5



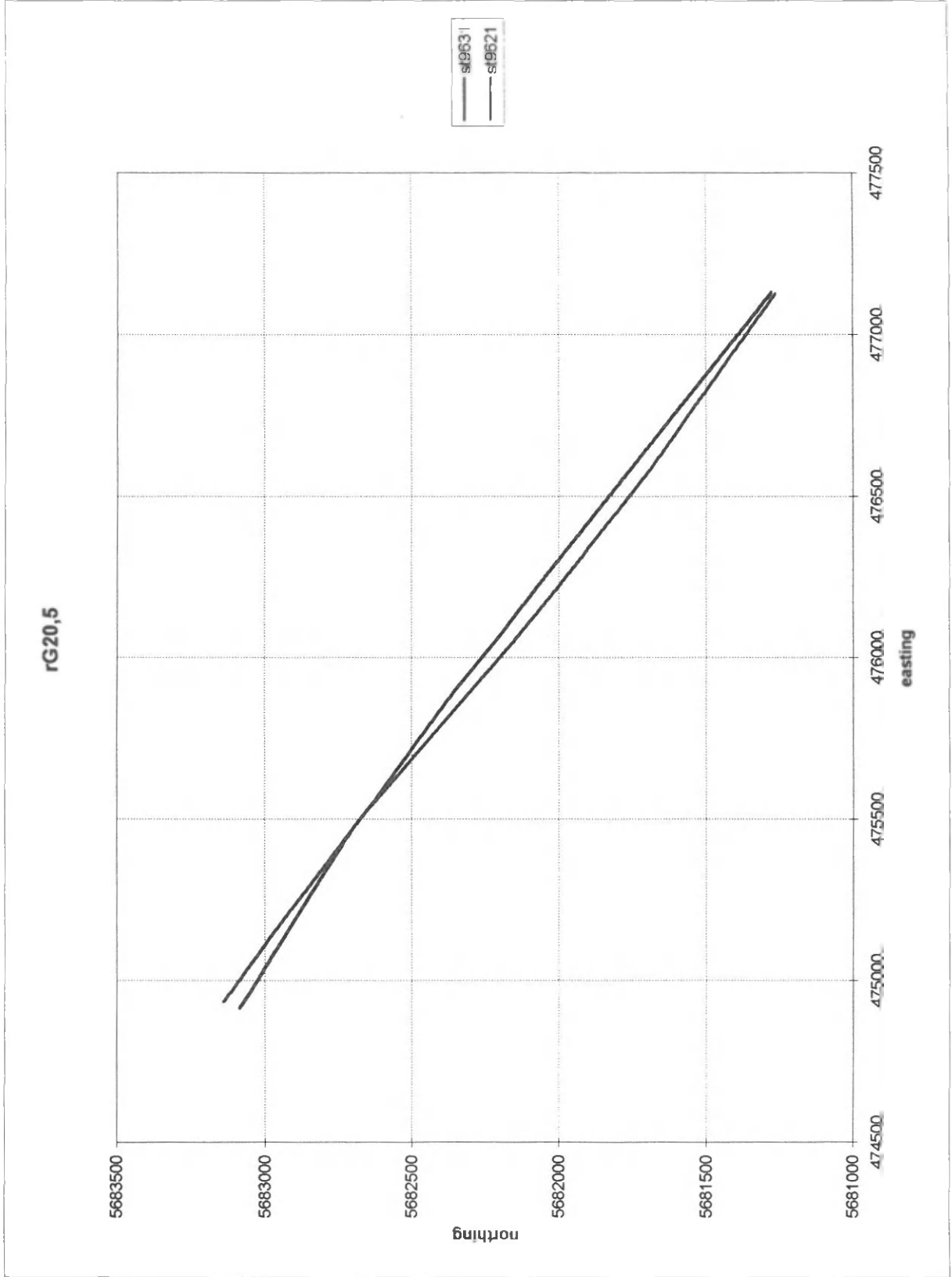


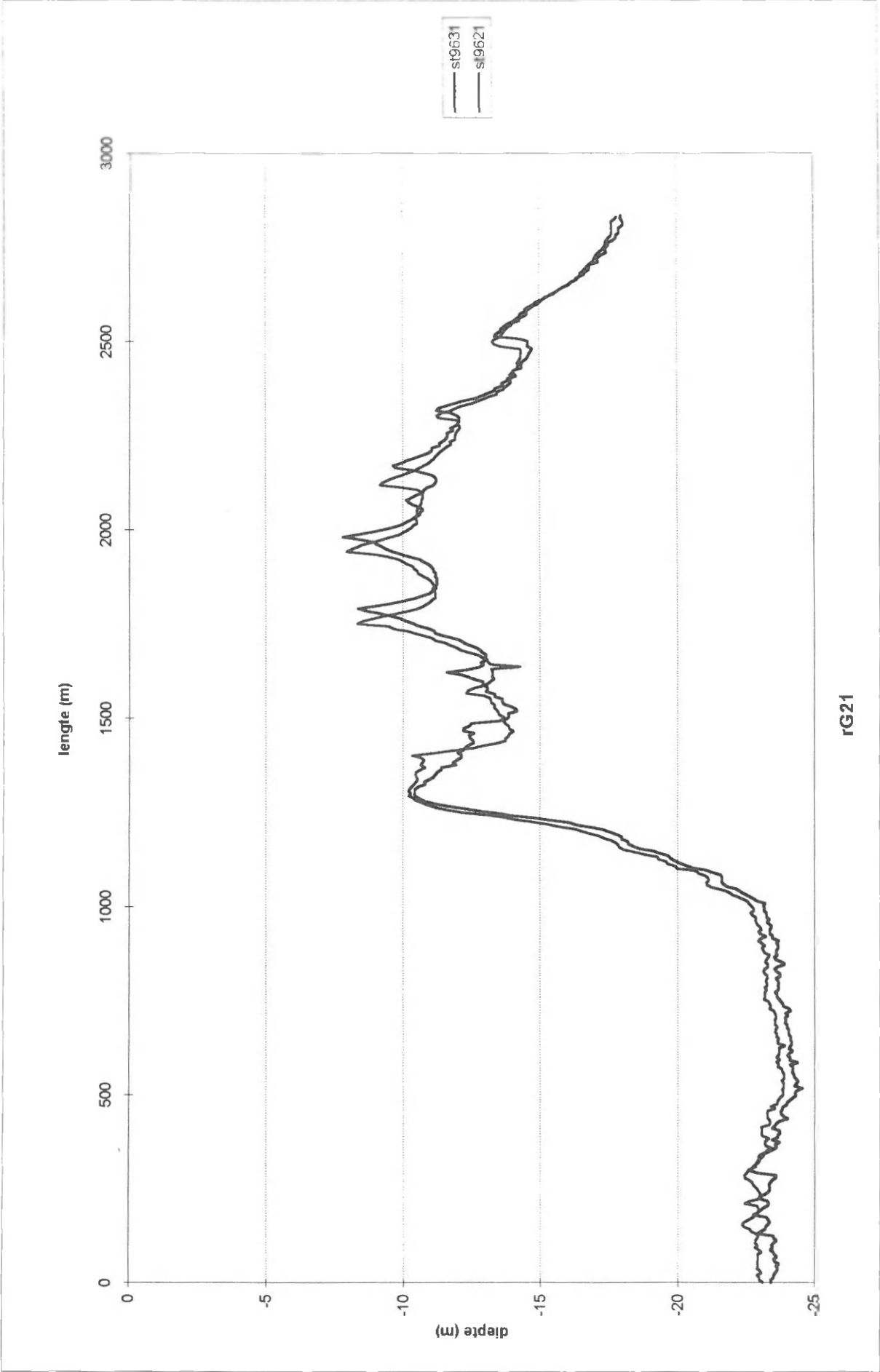
rG20



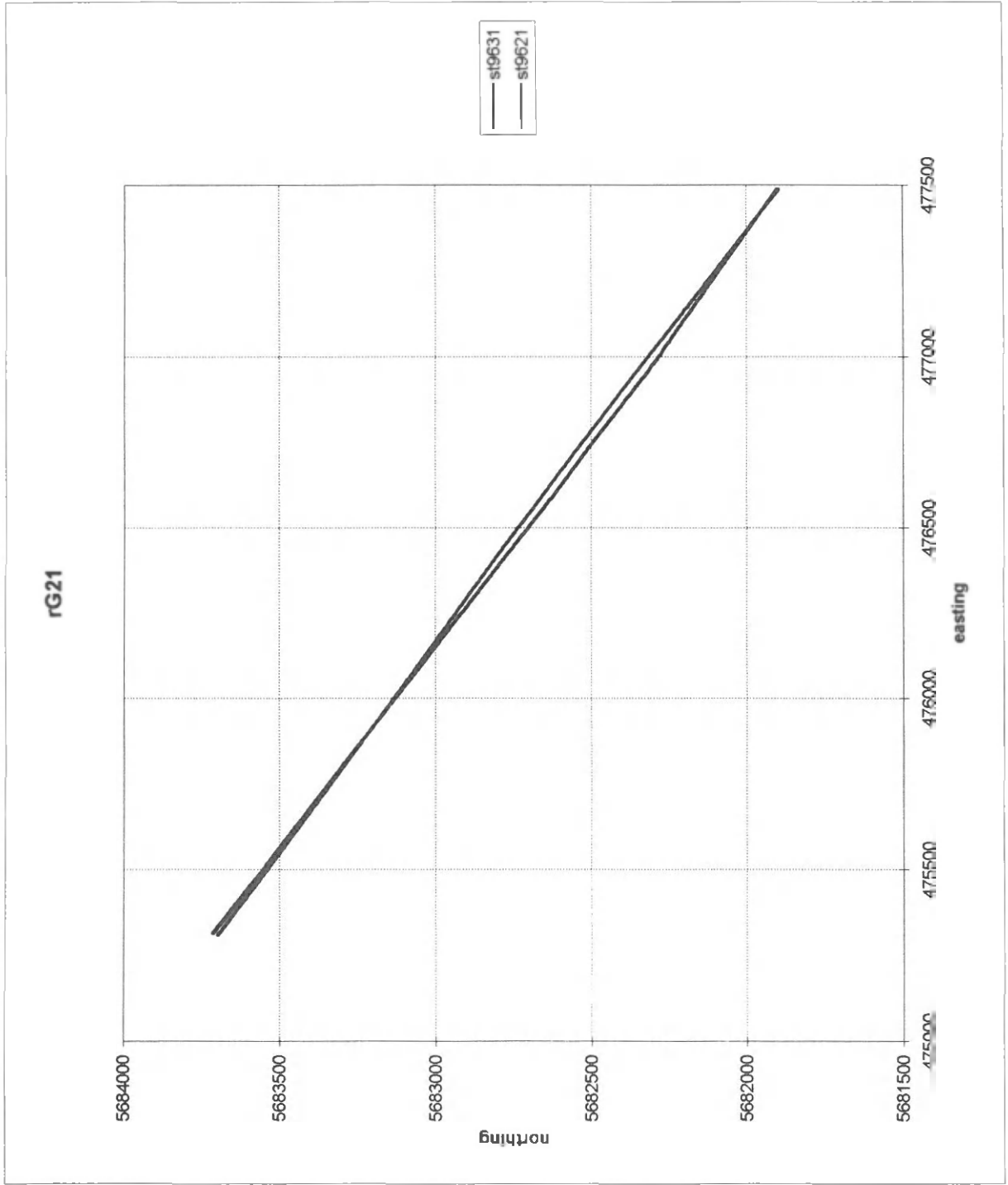


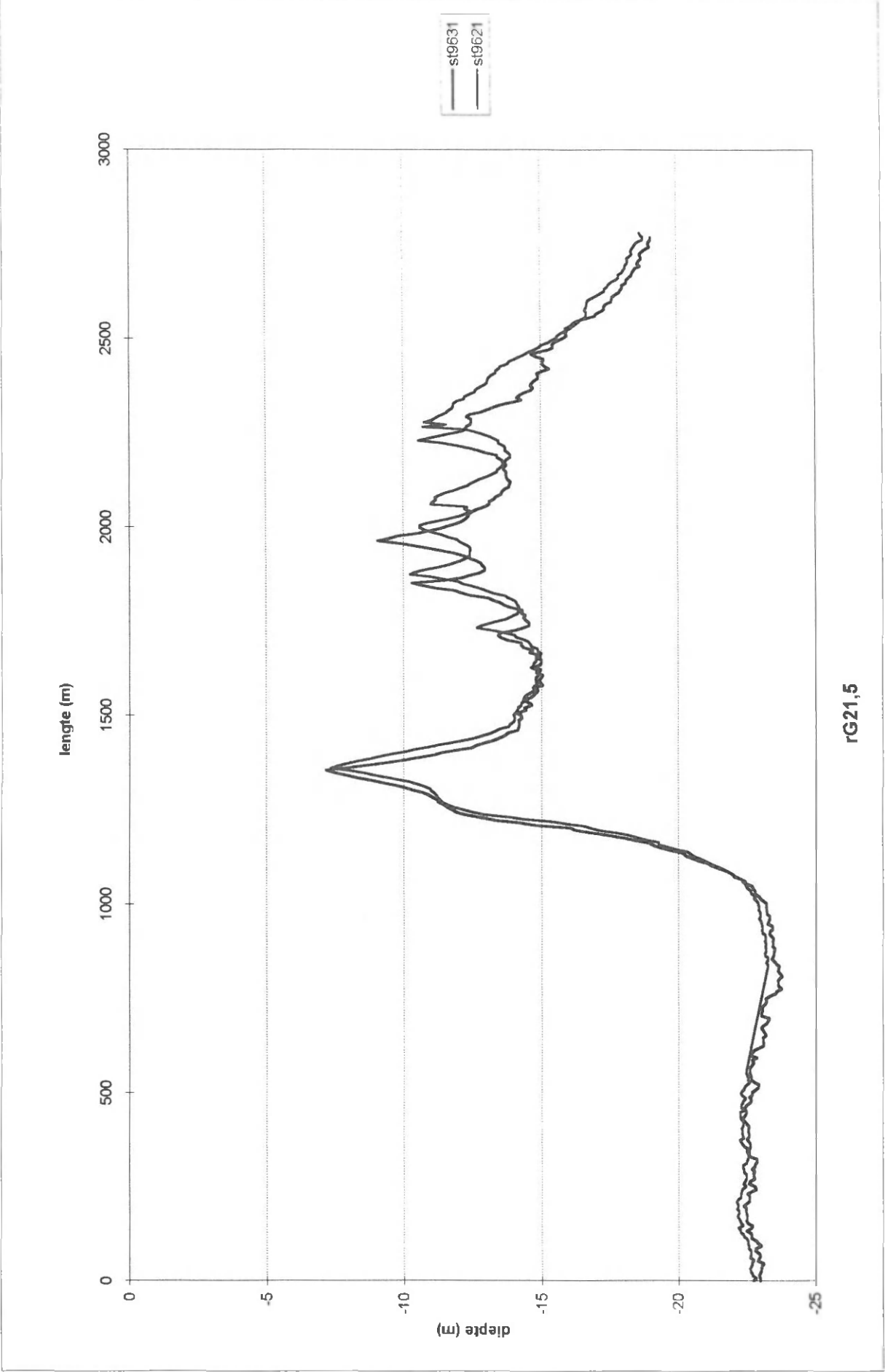
rG20,5





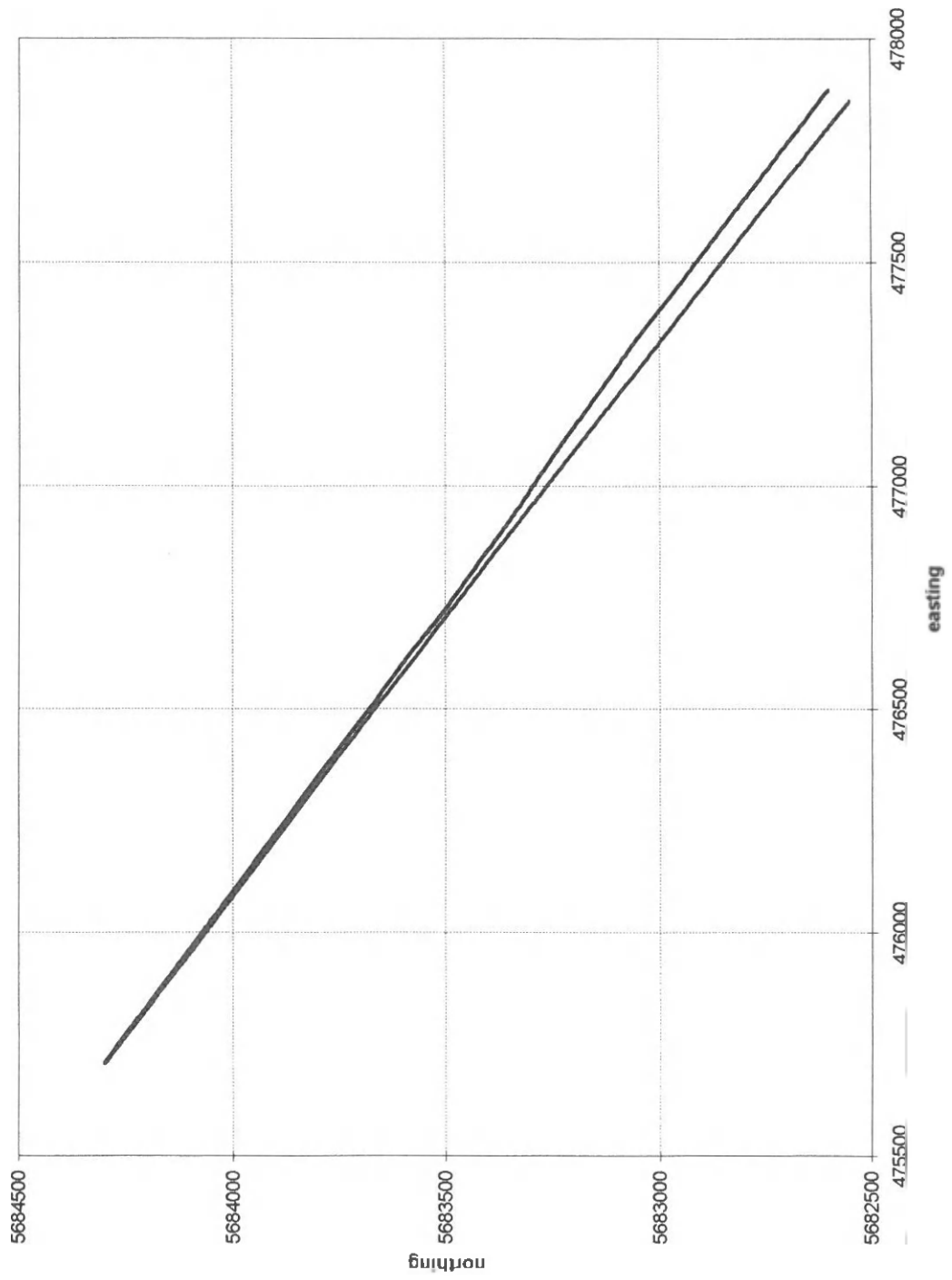
rG21



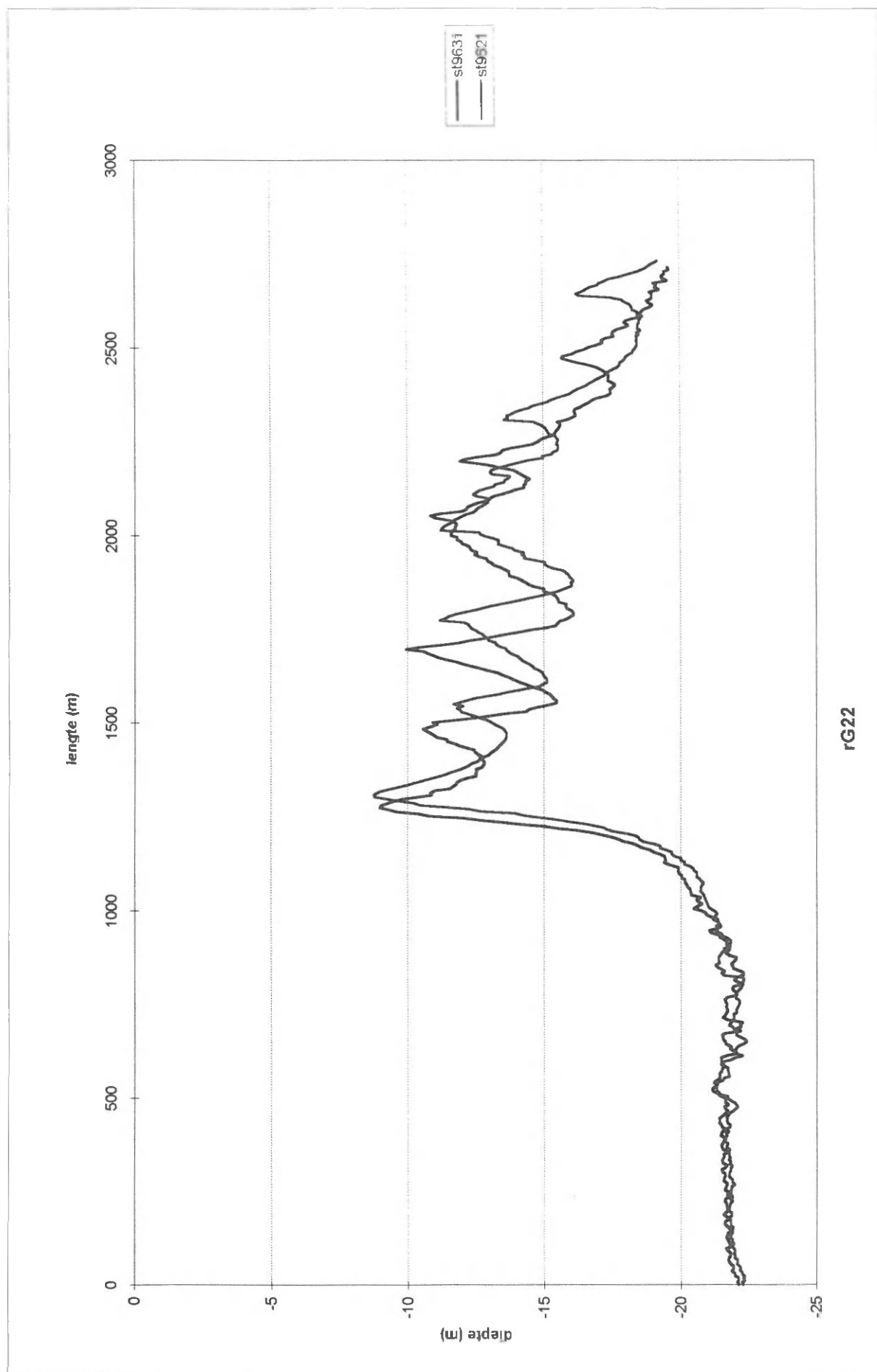


rG21,5

rG21,5

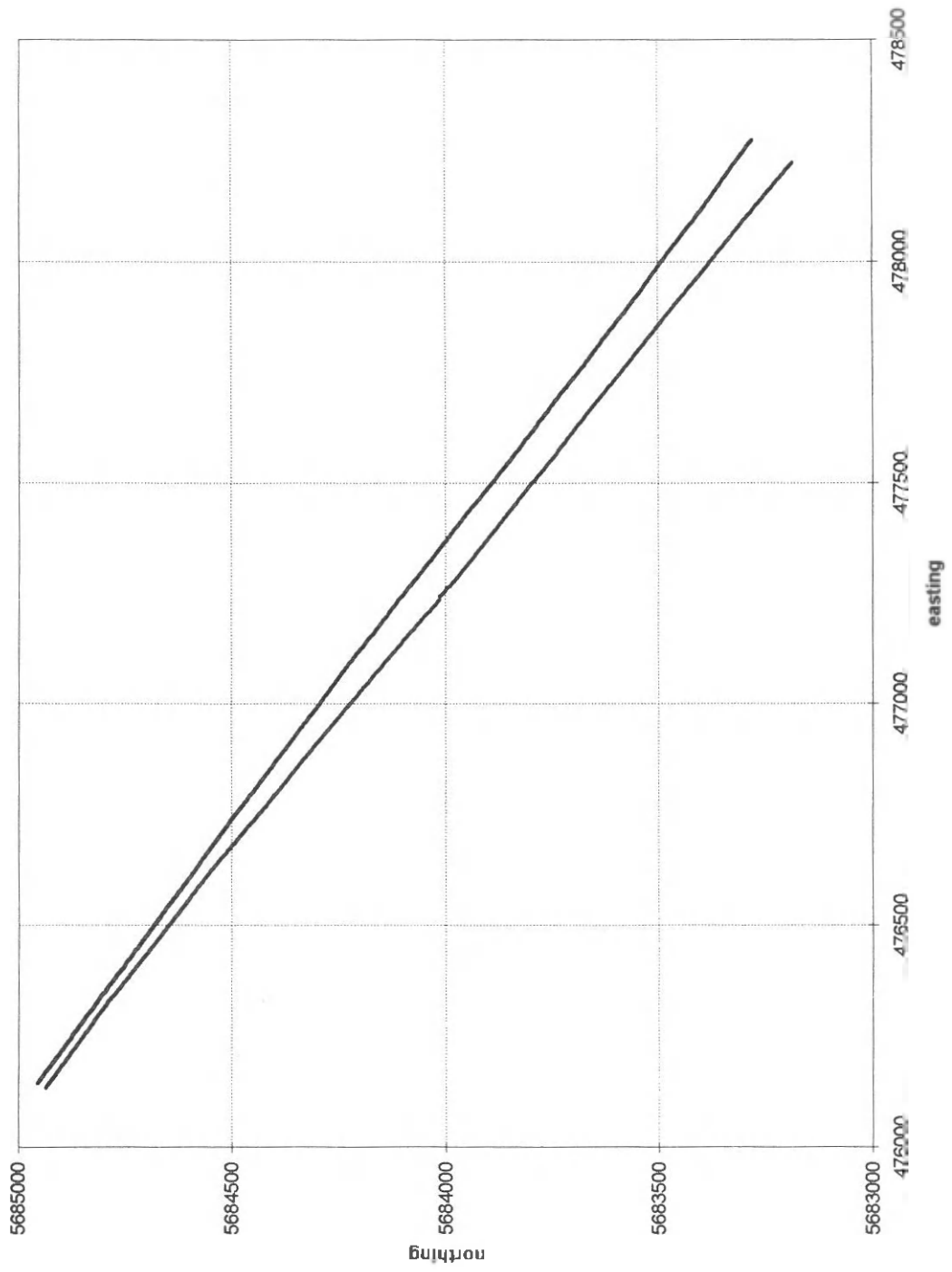


— st9631
- - - st9621

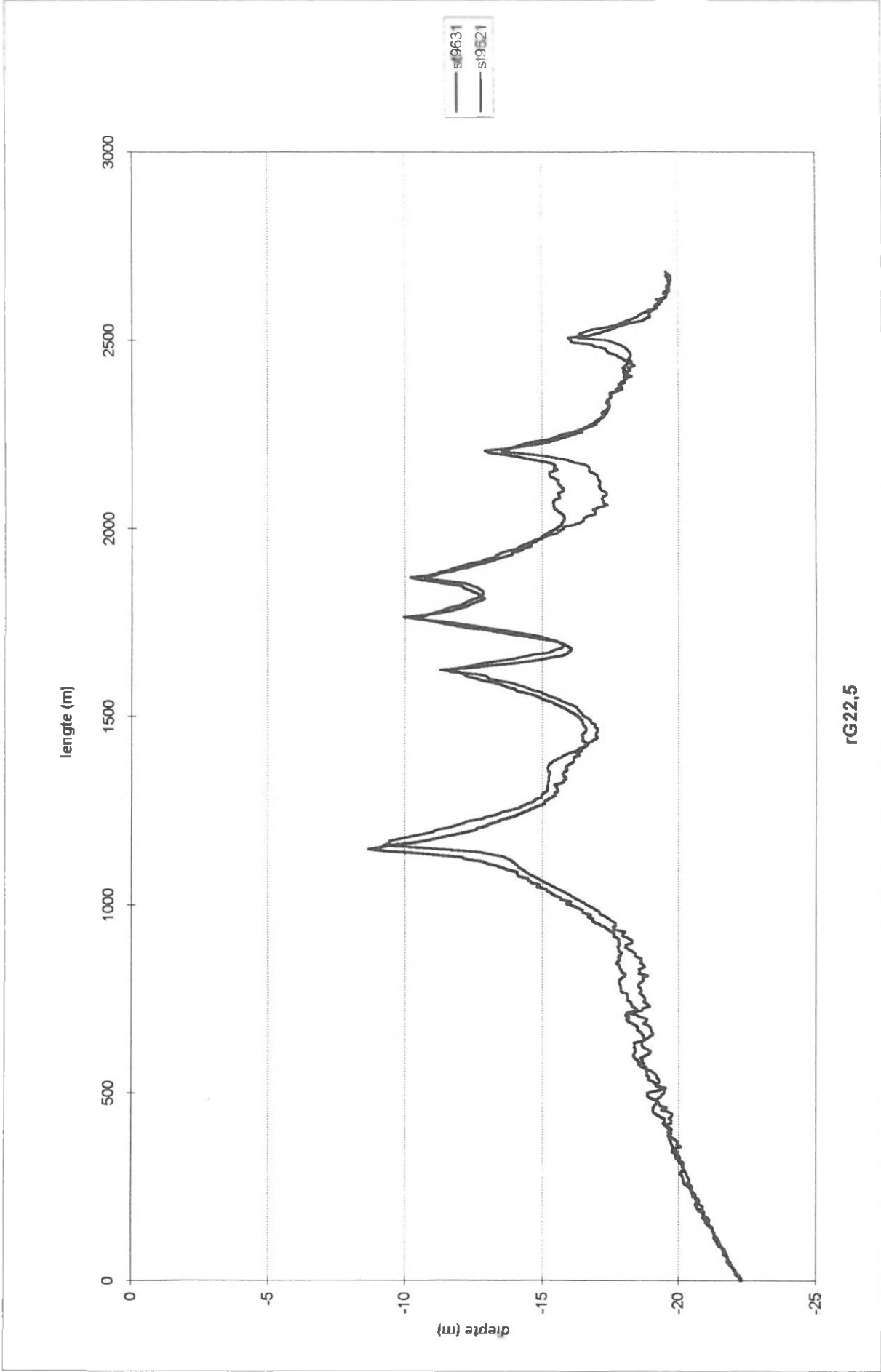


rG22

rG22

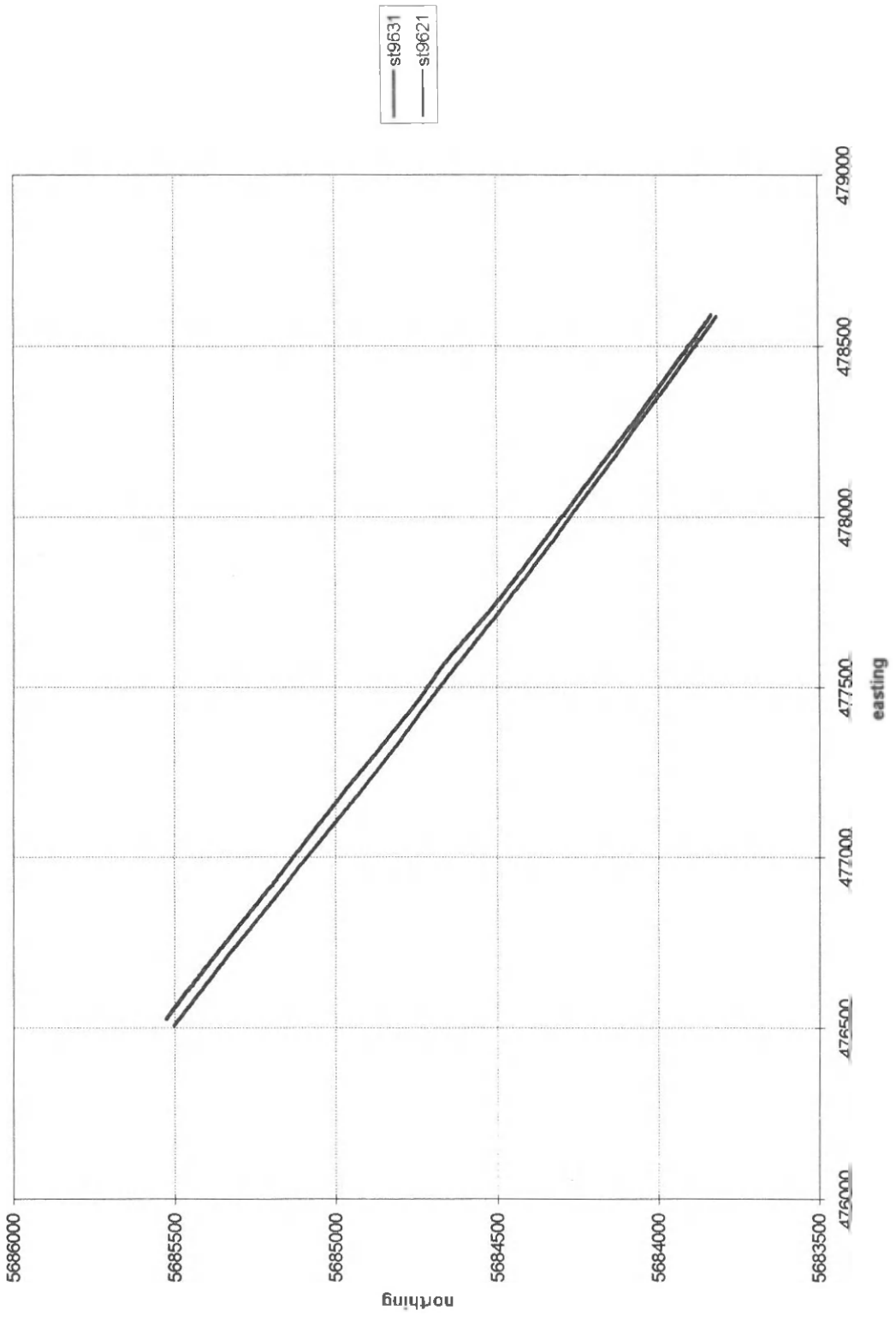


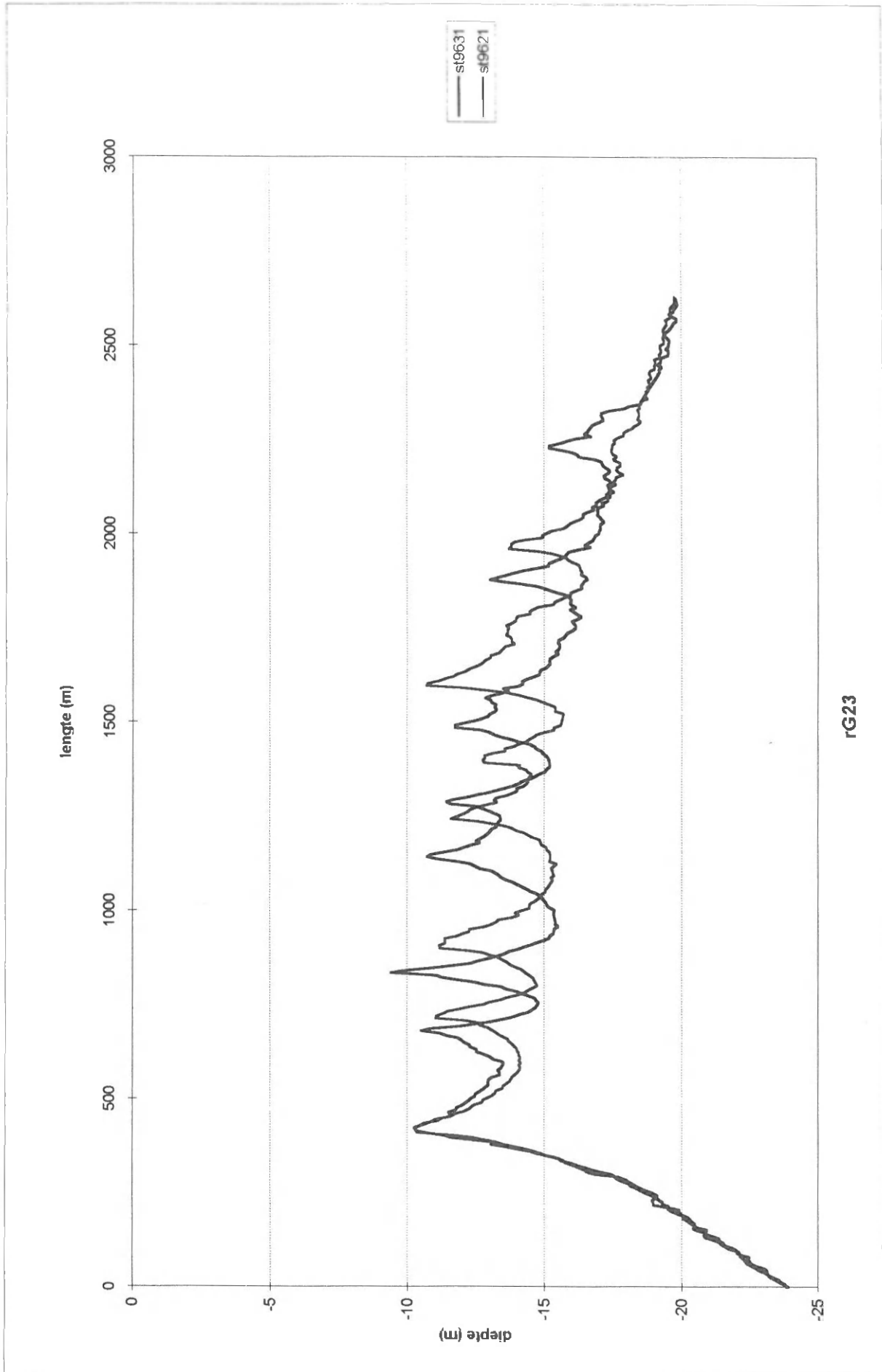
— st19631
- - st19621



RG22,5

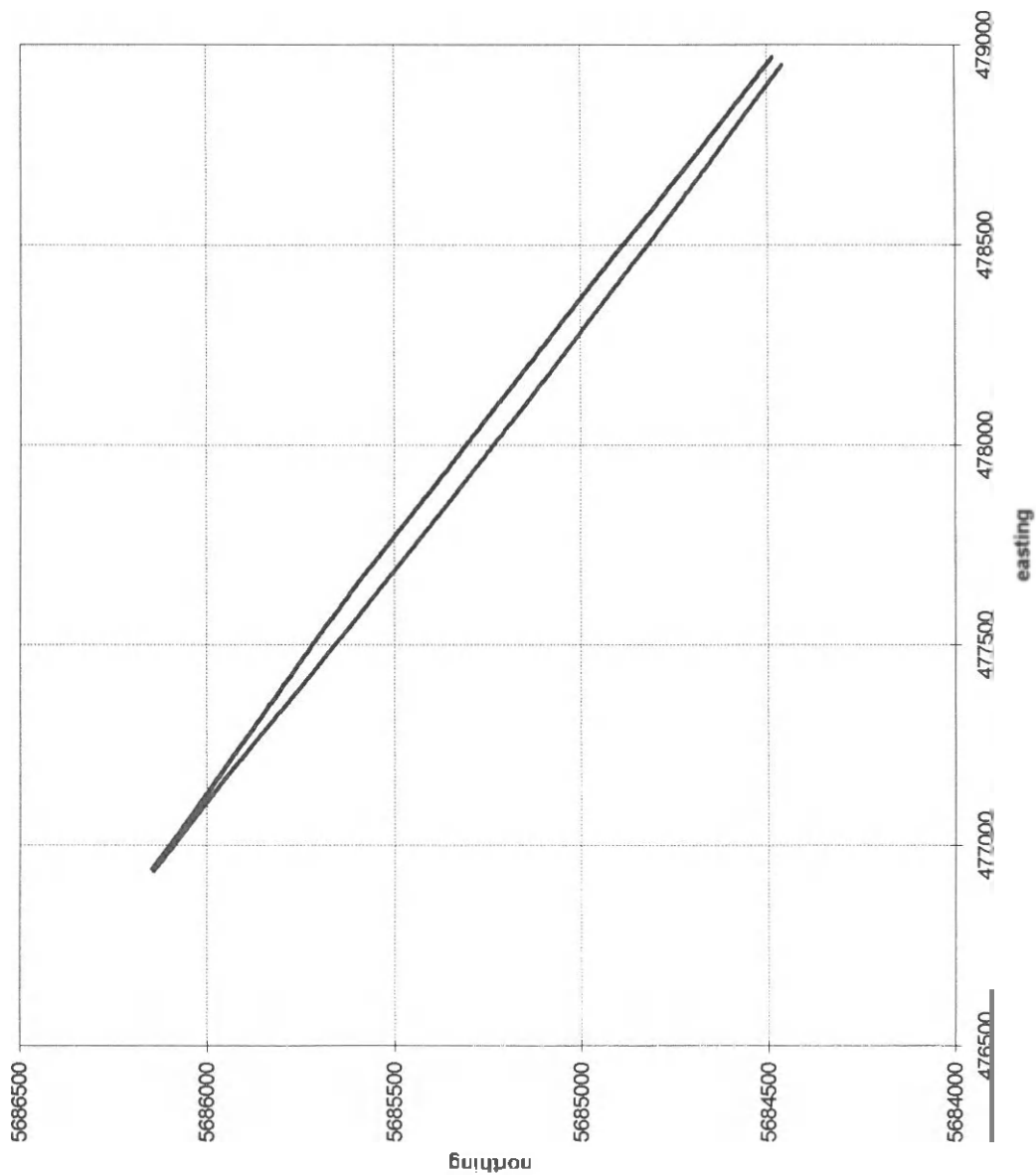
rG22,5



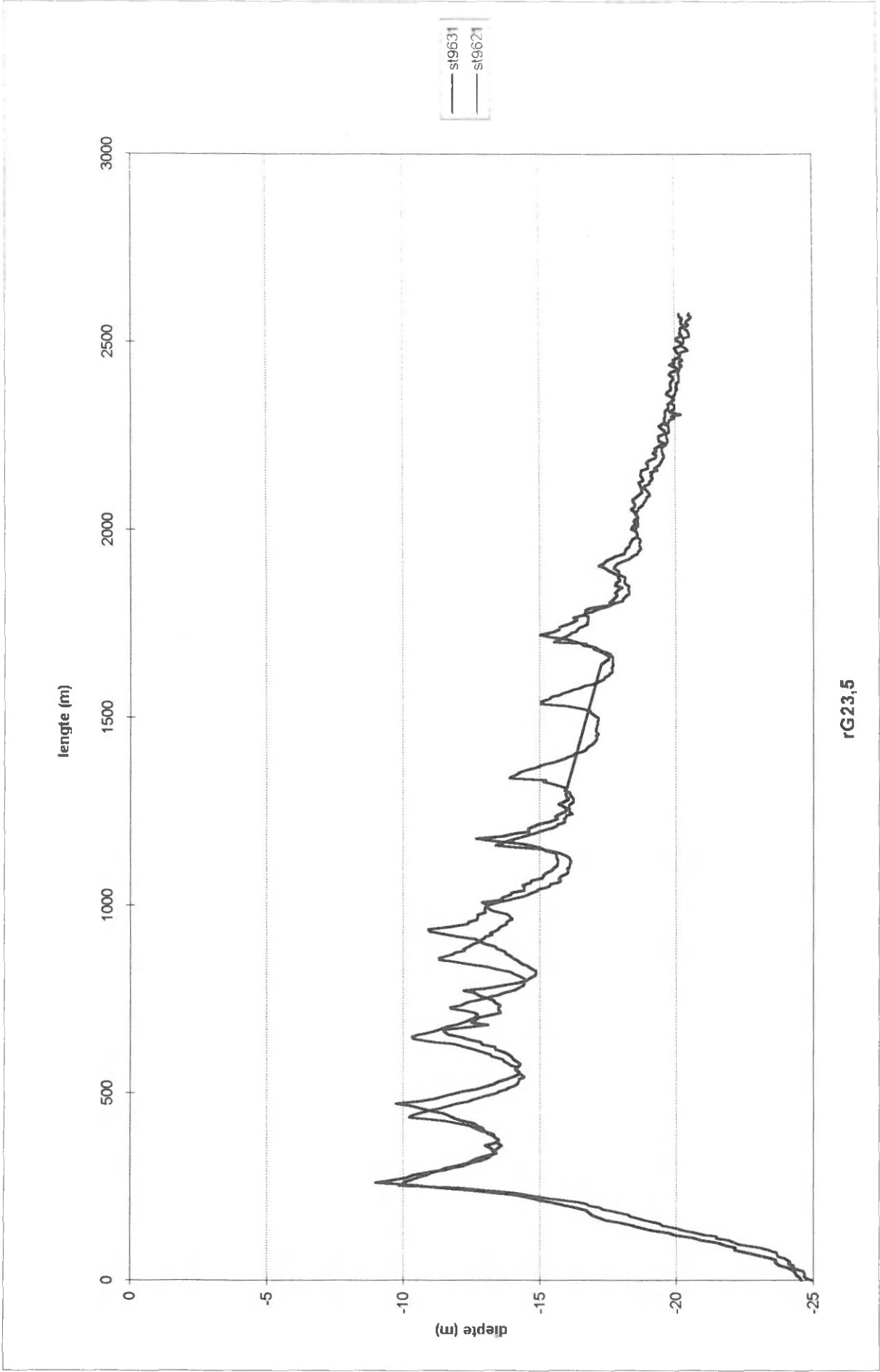


rG23

rG23

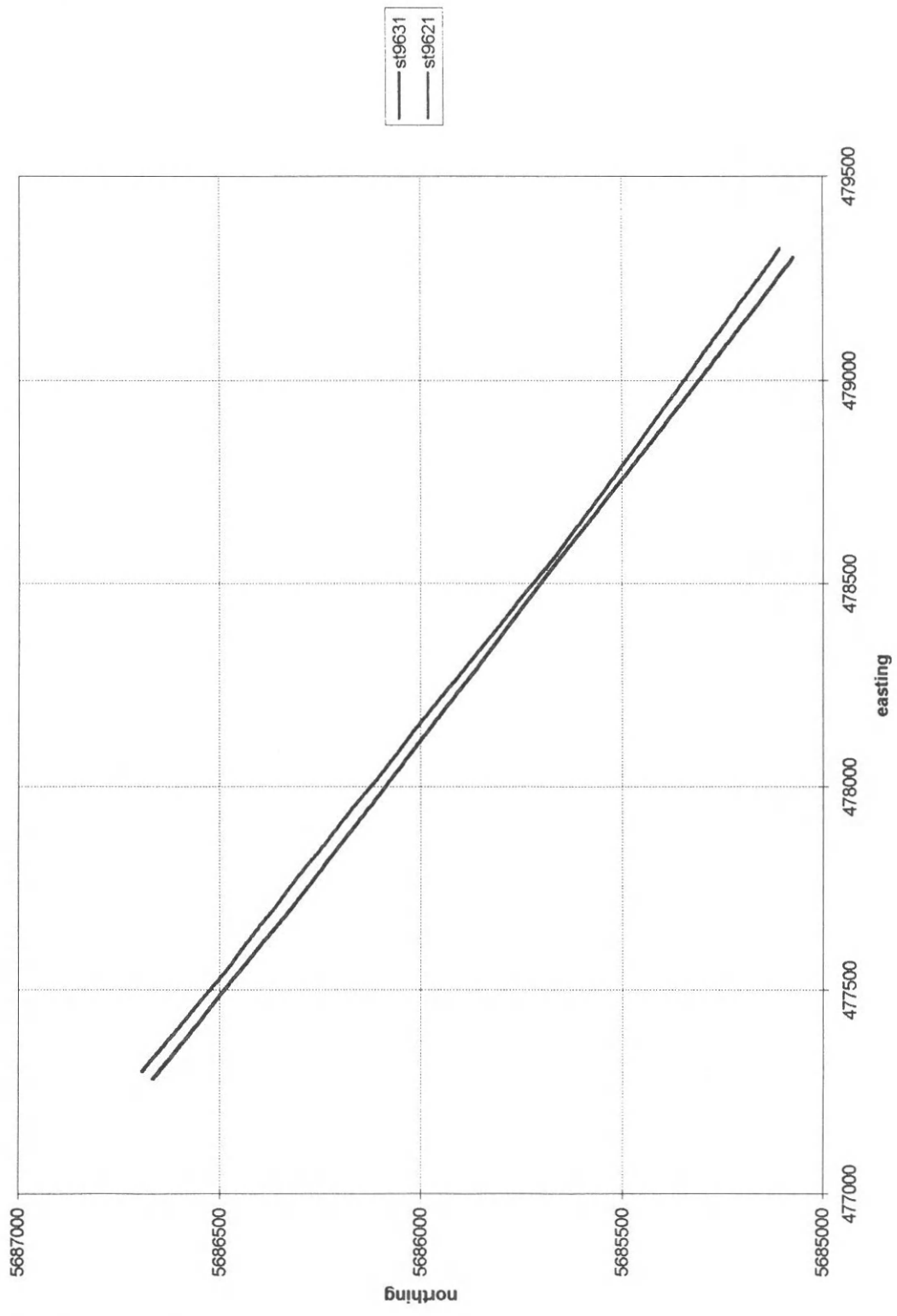


s19631
s19621

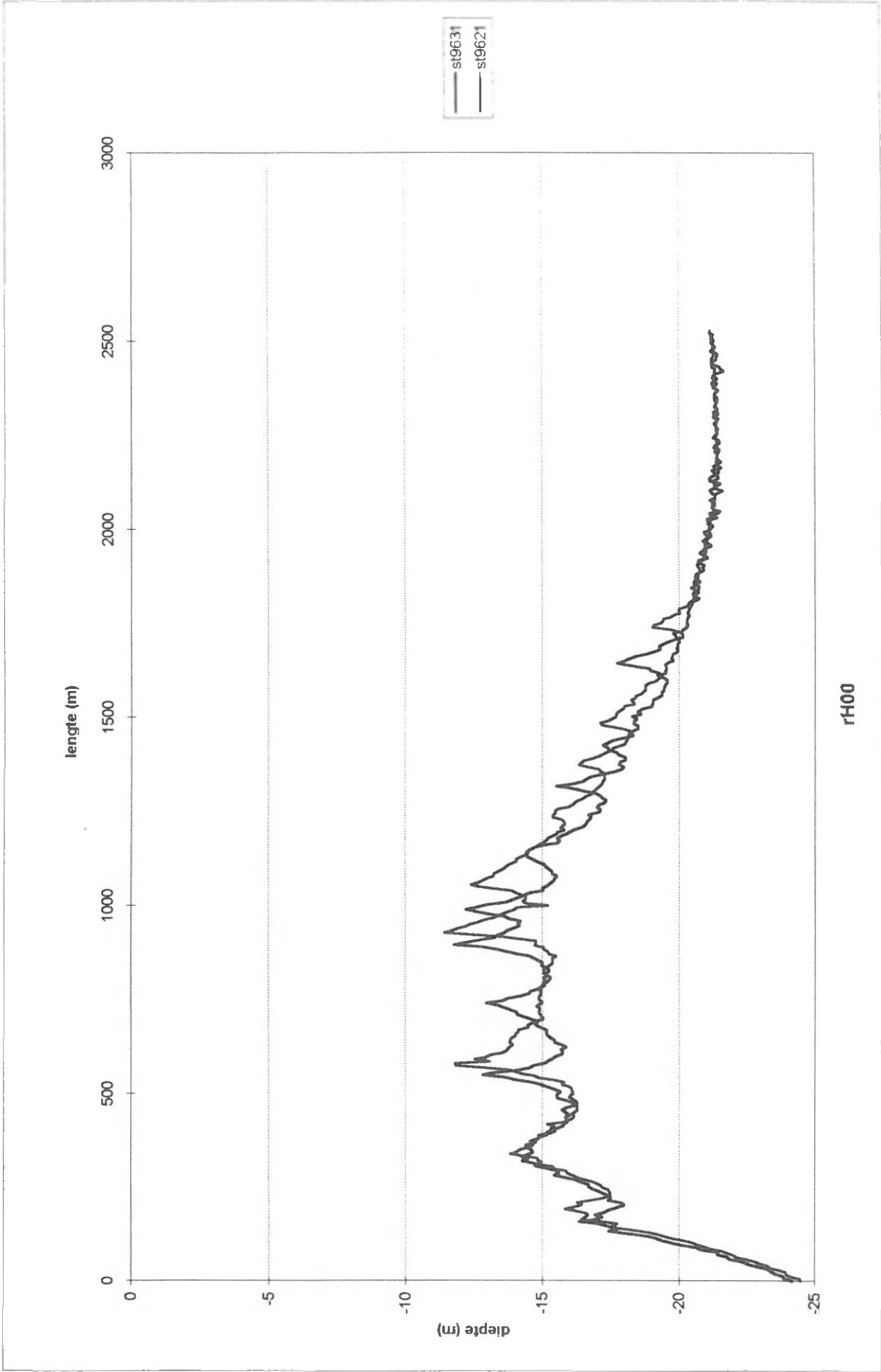


RG23,5

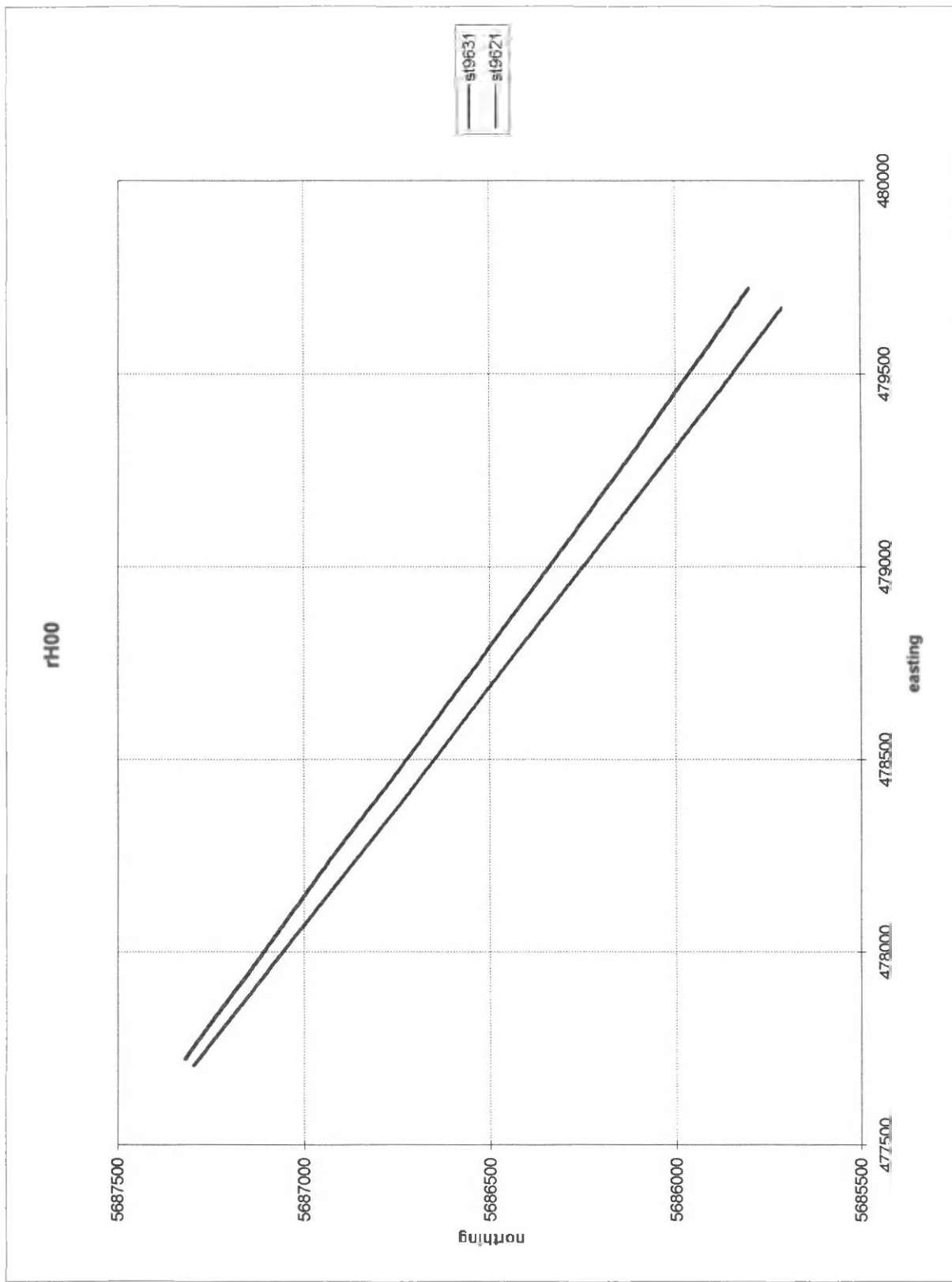
rG23,5

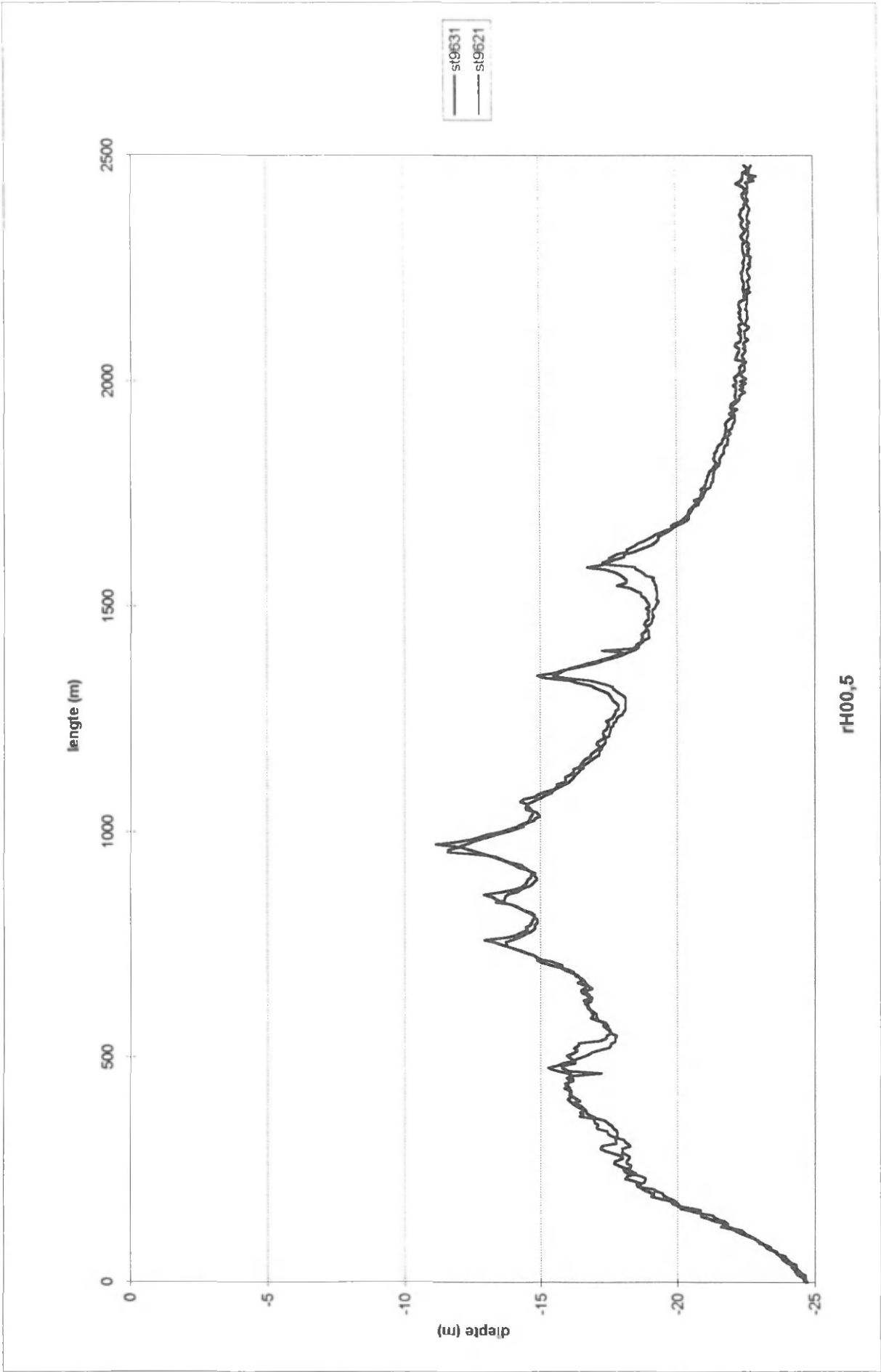


— st19631
- - st19621

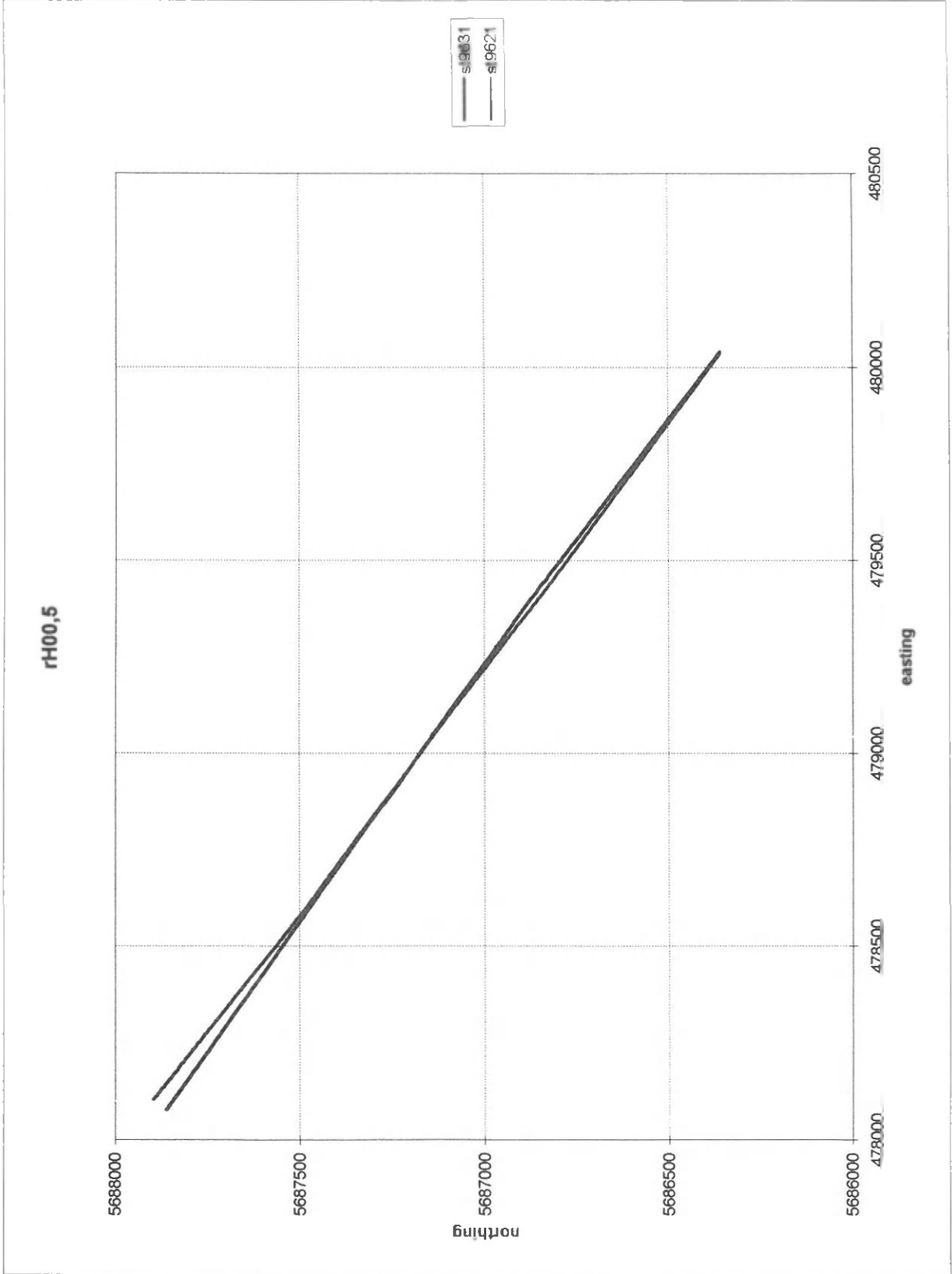


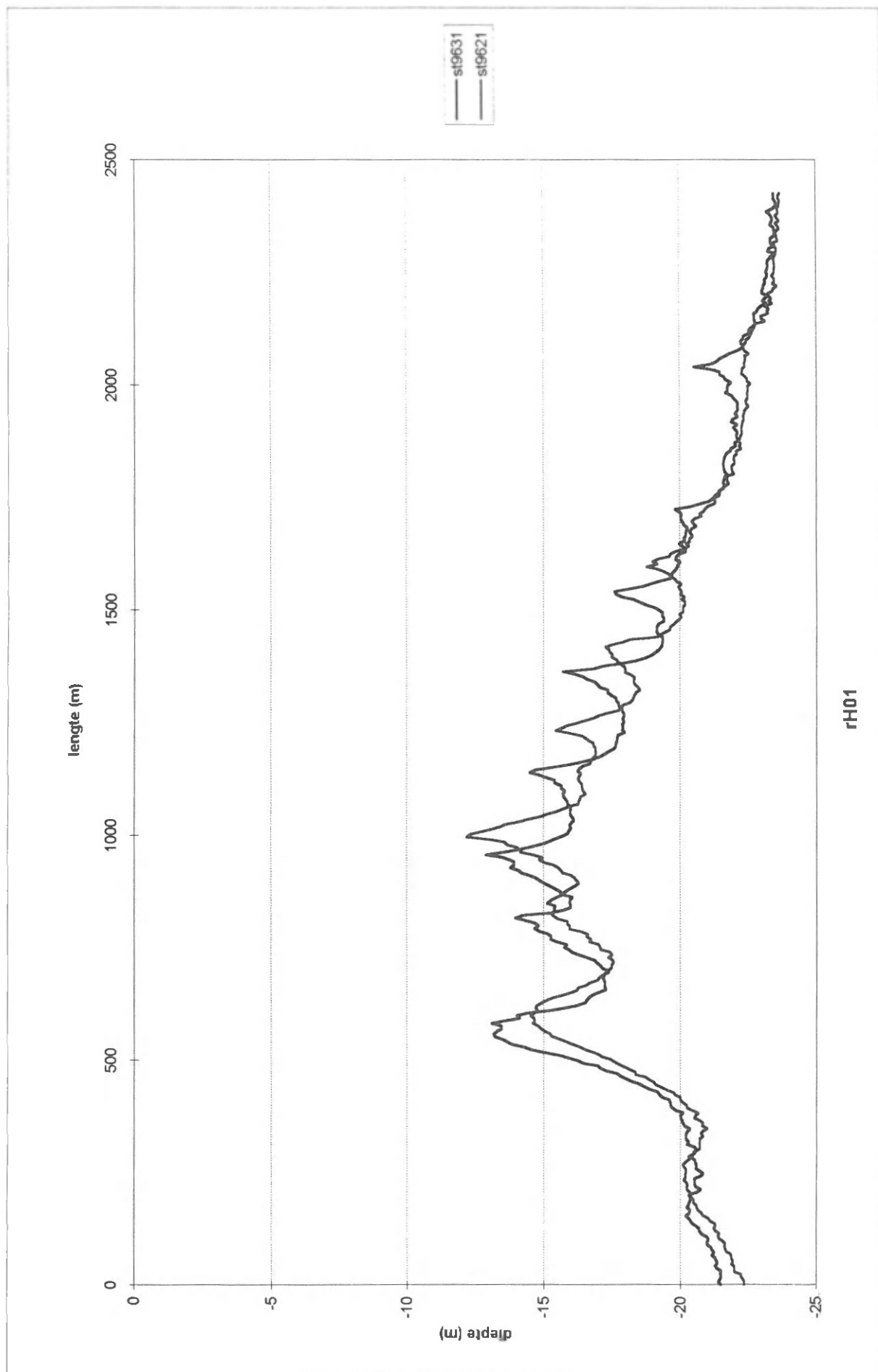
rH00



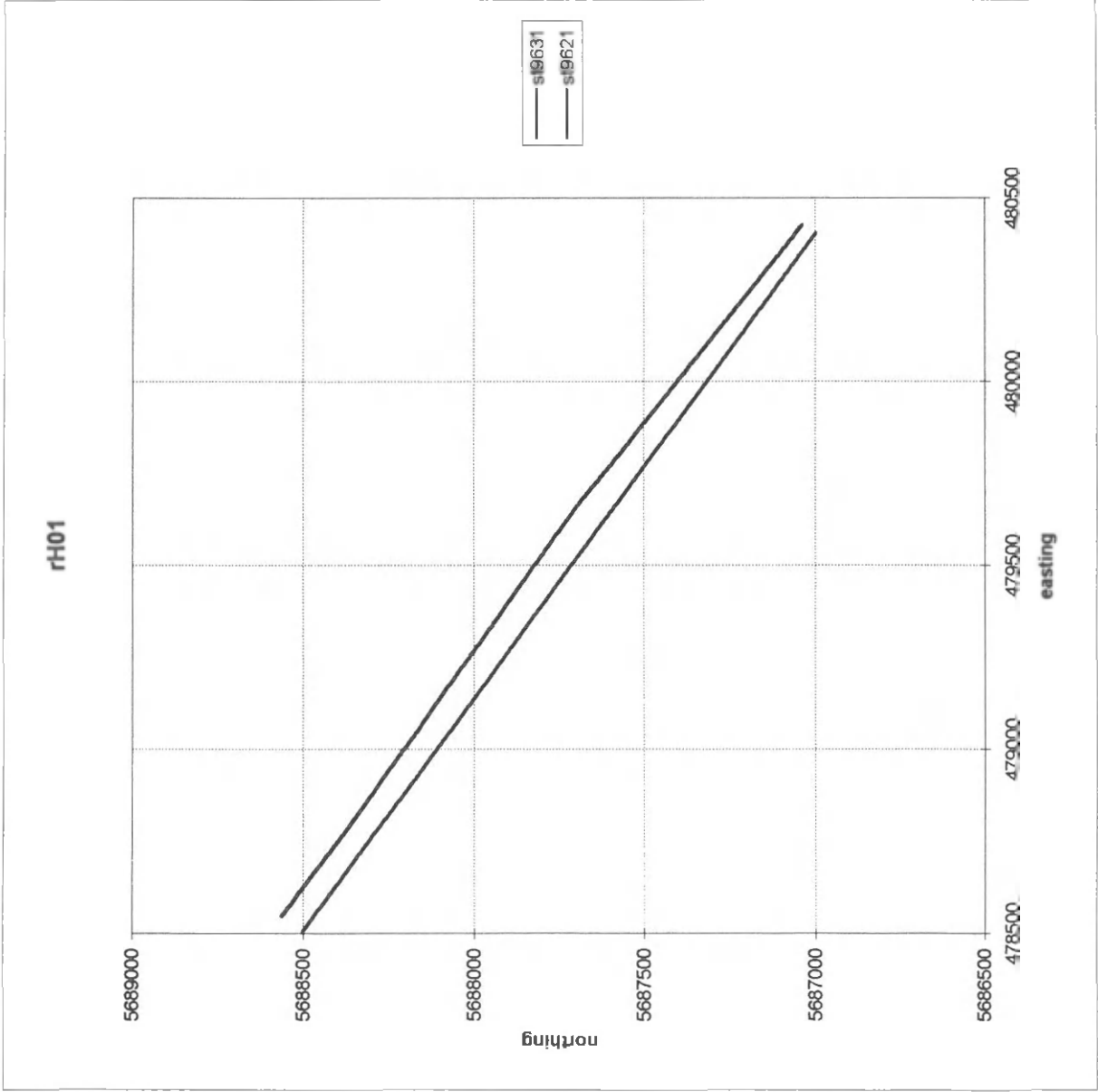


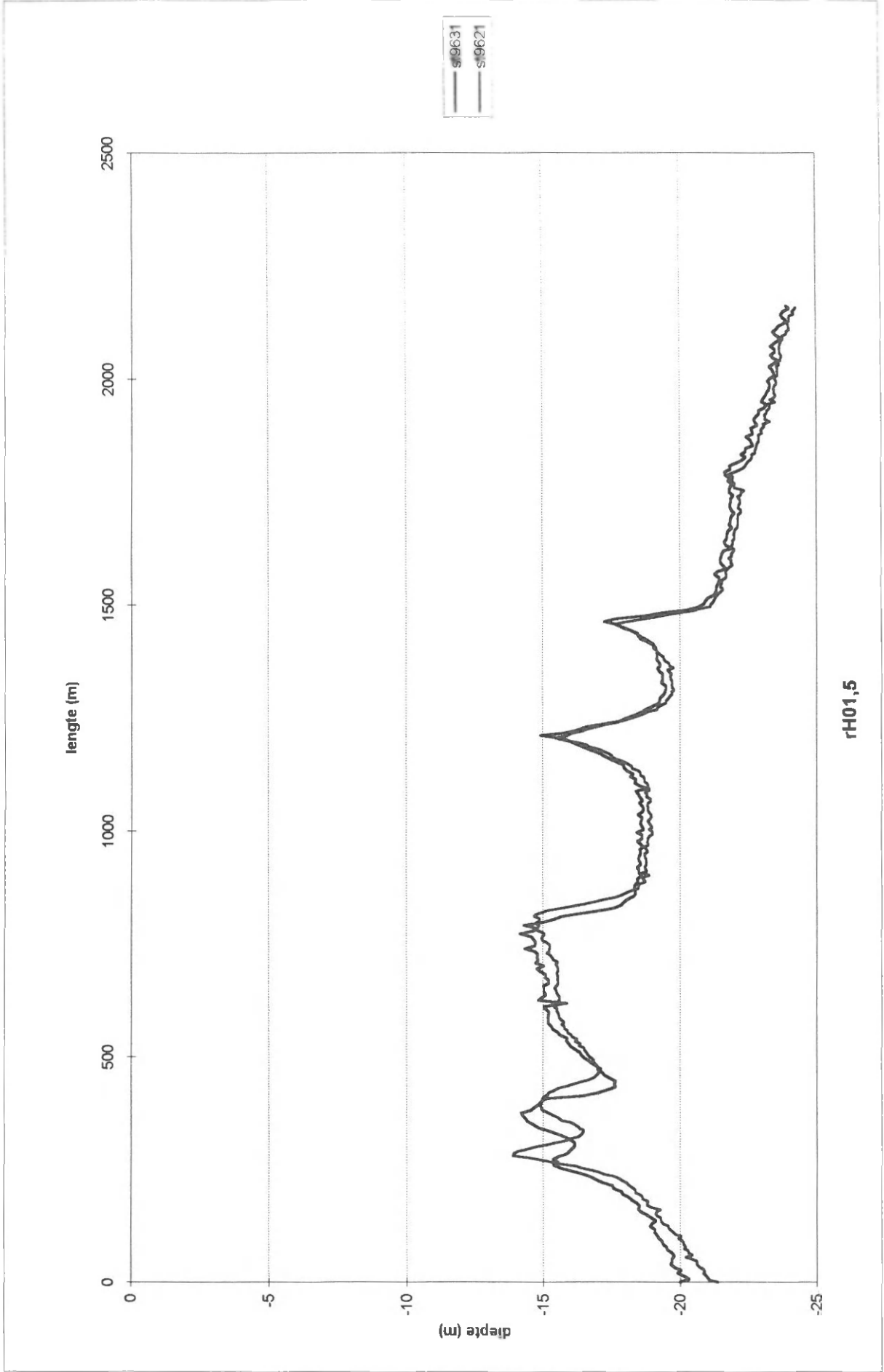
rH00,5



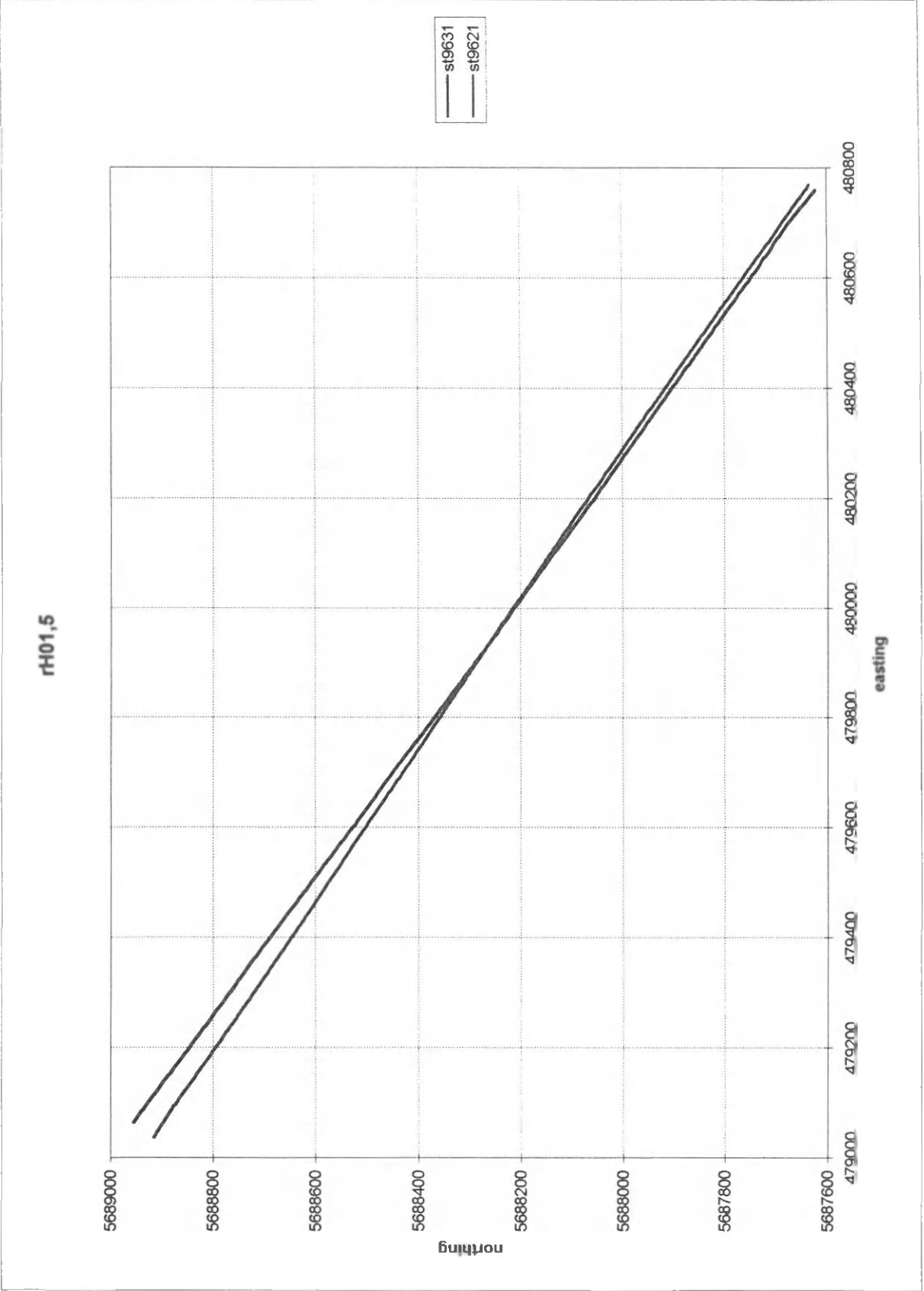


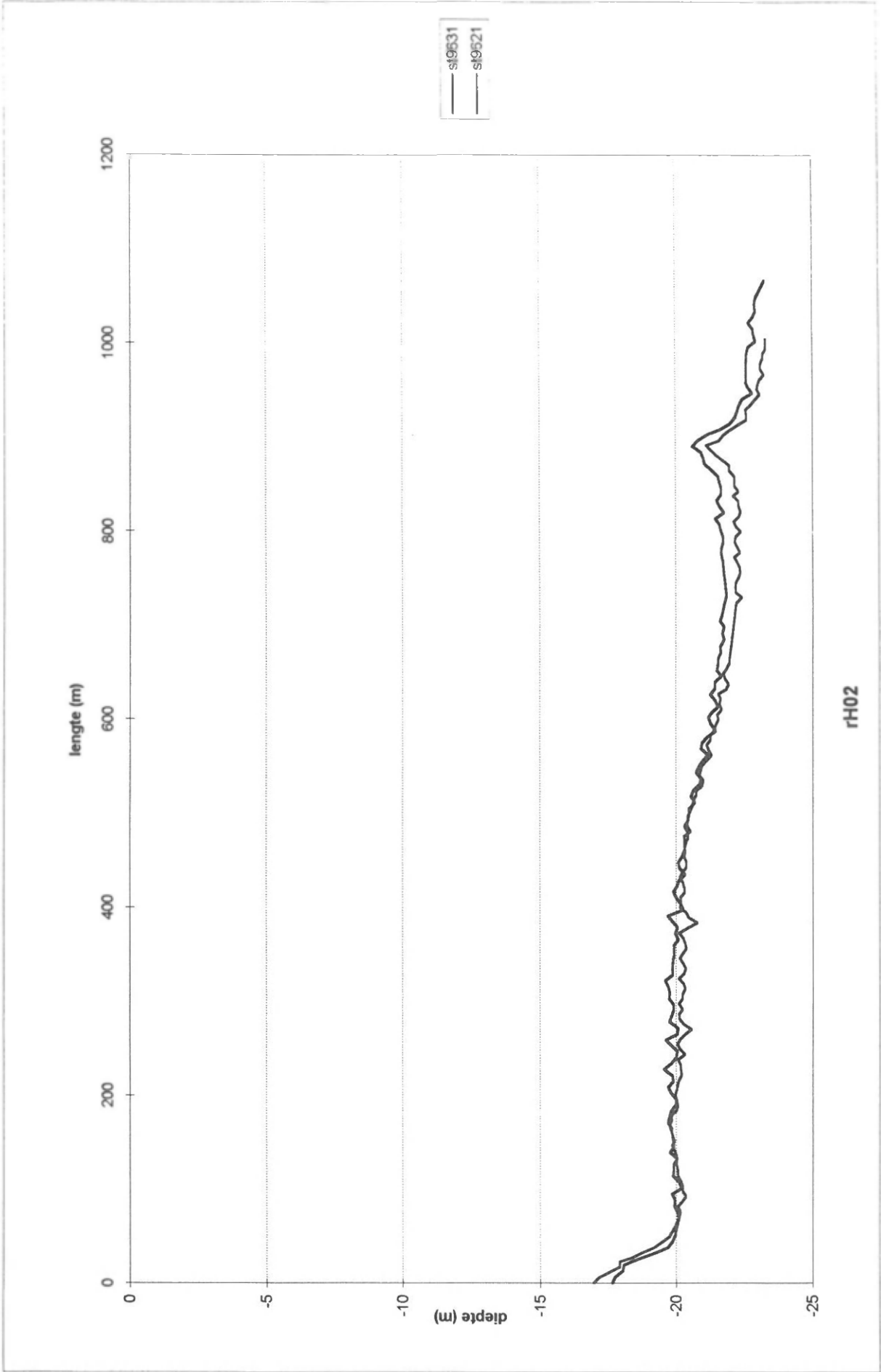
rH01



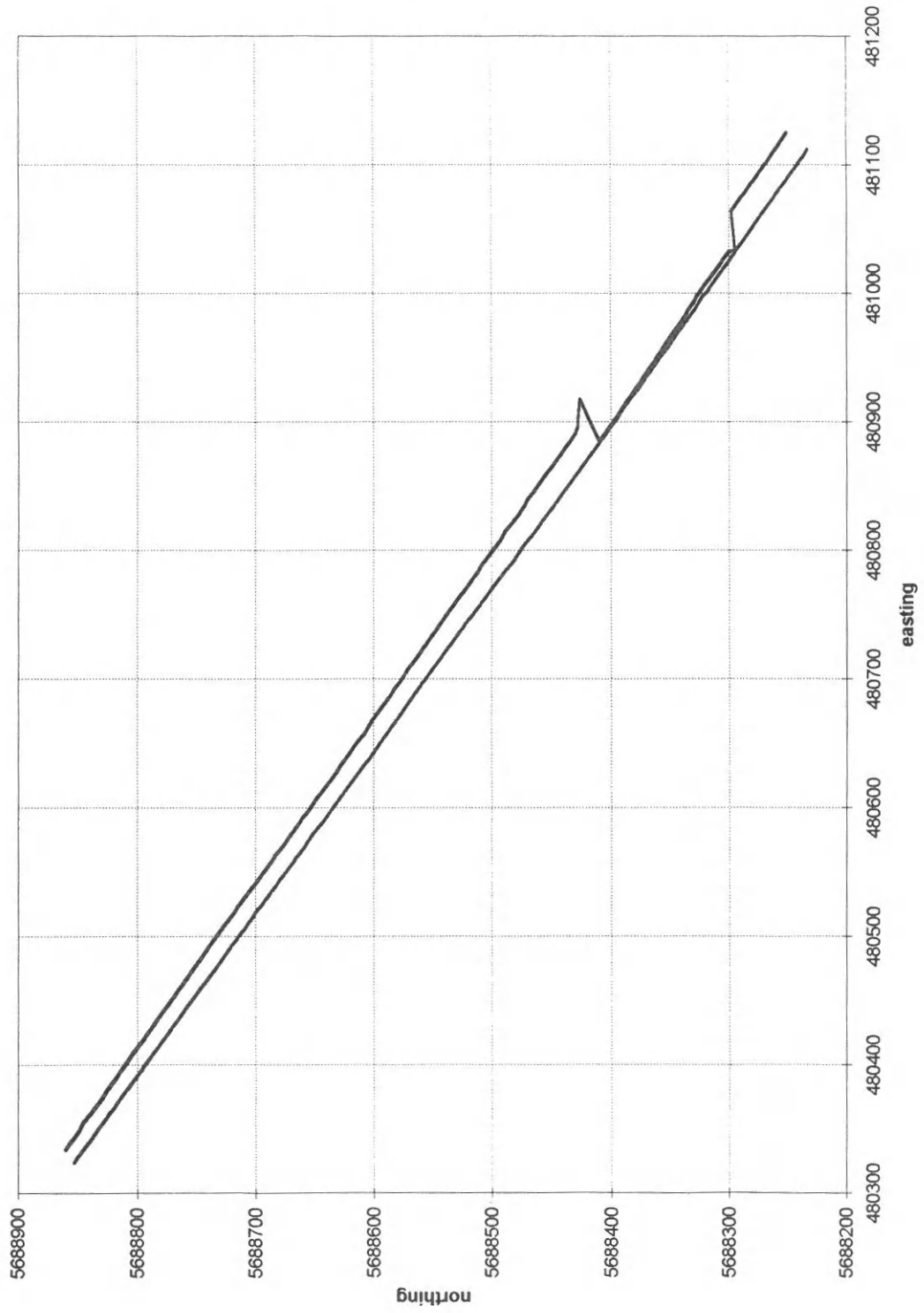


rh01,5





rH02



— st19631
- - - st19621