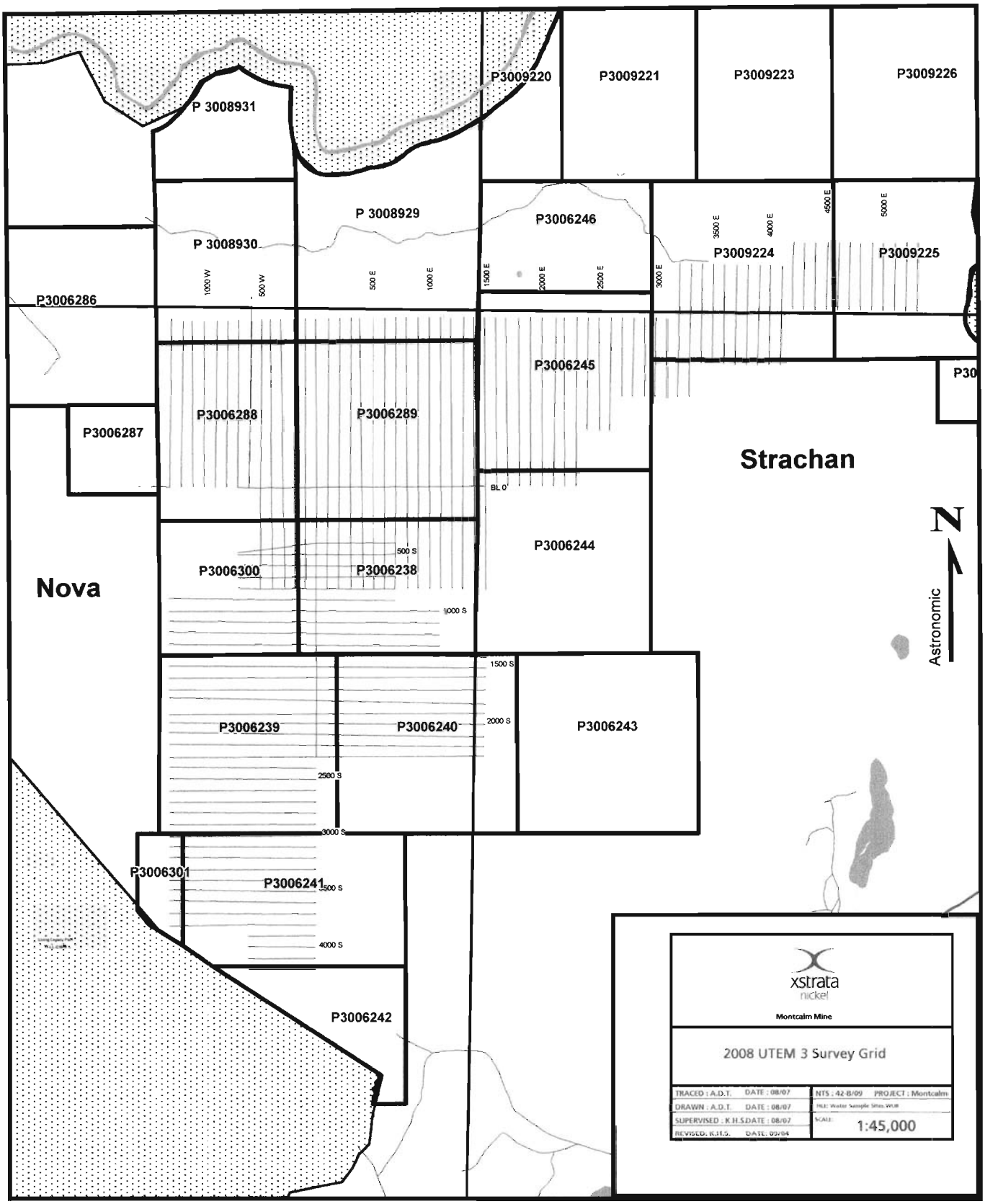
2.41334

Logistics Report
2008 UTEM 3 Survey
Timmins Ontario
for
Xstrata Nickel Ltd.

LAMONTAGNE GEOPHYSICS LTD
GEOPHYSIQUE LTEE

September 2008

Tyler Gallant
Rob Langridge


P3009220
P3009221
P3009223
P3009226
P 3008931
P 3008929
P3006246
P 3008930
P3009224
P3009225
P3006286
P3006245
P3006288
P3006289
P3006287
Strachan
P3006244
P3006300
P3006238
Nova
N
Astronomic
P3006239
P3006240
P3006243
P3006301
P3006241
P3006242
xstrata
nickel
Montcalm Mine
2008 UTEM 3 Survey Grid
1:45,000

CONTENTS

Figures

Appendices

INTRODUCTION

A UTEM 3 surface survey was conducted in Timmins, Ontario in two separate phases in 2008 (Figure 1). Phase one was from March 24th to April 14th, phase two was from July 14th to August 11th. Personnel employed by Lamontagne Geophysics conducted the survey on behalf of the client, Xstrata Nickel Ltd. The survey was carried out to test for EM responses in the immediate survey area.

At the Montcalm grid a total of 123.400 kilometres of UTEM data was collected from 12 different Loops. All Loops were surveyed using the vertical component, Hz. Some of the loops were also surveyed using the horizontal component, Hx or Hy. A transmitter frequency of 3.872Hz was used for surveying from all loops in the first phase of the project and a transmitter frequency of 30.972Hz in the second phase of the project. Lines were spaced approximately every 100m with a nominal station spacing of 50m.

Phase 1: Six Loops were surveyed during the first phase of the project. Loop 04 and Loop 05 were ~800x800m. Loop 17 and Loop 18 were ~800x1000m. Loop 19 was ~800x900m and Loop 20 was ~900x1000m. All loops were surveyed at a frequency of 3.872Hz. All of the loops were surveyed using the vertical Hz component. Loops 04 and 05 were also surveyed using the horizontal component, Hx. Lines ranged in length from 450m to 1200m.

Phase 2: Six Loops were surveyed for this part of the survey. Loop 30 was ~1000x2000m, Loop 31 was ~700x800m, Loop 32 was ~800x800m, Loop 33 was ~900x900m, Loop 34 ~1000x1400m and Loop 35 was ~900x1800m. All of the loops were surveyed at a frequency of 30.974Hz and using both vertical Hz and horizontal Hx or Hy components.

This report documents the UTEM survey in terms of logistics, survey parameters, and field personnel. Appendix A contains the data presented in profile form. Other appendices contain:

- The Production Log (Appendix B)
- An outline of the UTEM System (Appendix C)
- Note on sources of anomalous CH1 (Appendix D)

LAMONTAGNE GEOPHYSICS LTD
GEOPHYSIQUE LTEE

Xstrata Nickel Ltd.

Timmins, Ontario
UTEM Survey Location Map

Scale / Échelle
100 km 0 100 200 300 km

Figure 1

SURVEY DESIGN

The survey parameters are as follows:

-line spacing of ~100m
-station interval of ~50m
-three UTEM receivers where used when possible

Phase 1
-outside-the-loop coverage
-transmitter Loop 04 ~800x800m, Hx, Hz components
-transmitter Loop 05 ~800x800m, Hx, Hz components
-transmitter Loop 17 ~800x1000m, Hz component
-transmitter Loop 18 ~800x1000m, Hz component
-transmitter Loop 19 ~800x900m, Hz component
-transmitter Loop 20 ~900x1100m, Hz component
-frequency of 3.872 Hz used for all loops
-minimum 512 stacking (512 full-cycles/1024 half-cycles) for all the data
-stacking increased where noise levels dictated to maintain data quality

Phase 2
-outside-the-loop coverage
-transmitter Loop 30 ~1000x2000m, Hx, Hz components
-transmitter Loop 31 ~700x8000m, Hy, Hz components
-transmitter Loop 32 ~800x850m, Hy, Hz components
-transmitter Loop 33 ~900x900m, Hx, Hz components
-transmitter Loop 34 ~1000x1400m, Hx, Hz components
-transmitter Loop 35 ~900x1800m, Hx, Hz components
-frequency of 30.974 Hz used for all loops
-minimum 512 stacking (512 full-cycles/1024 half-cycles) for all the data
-stacking increased where noise levels dictated to maintain data quality

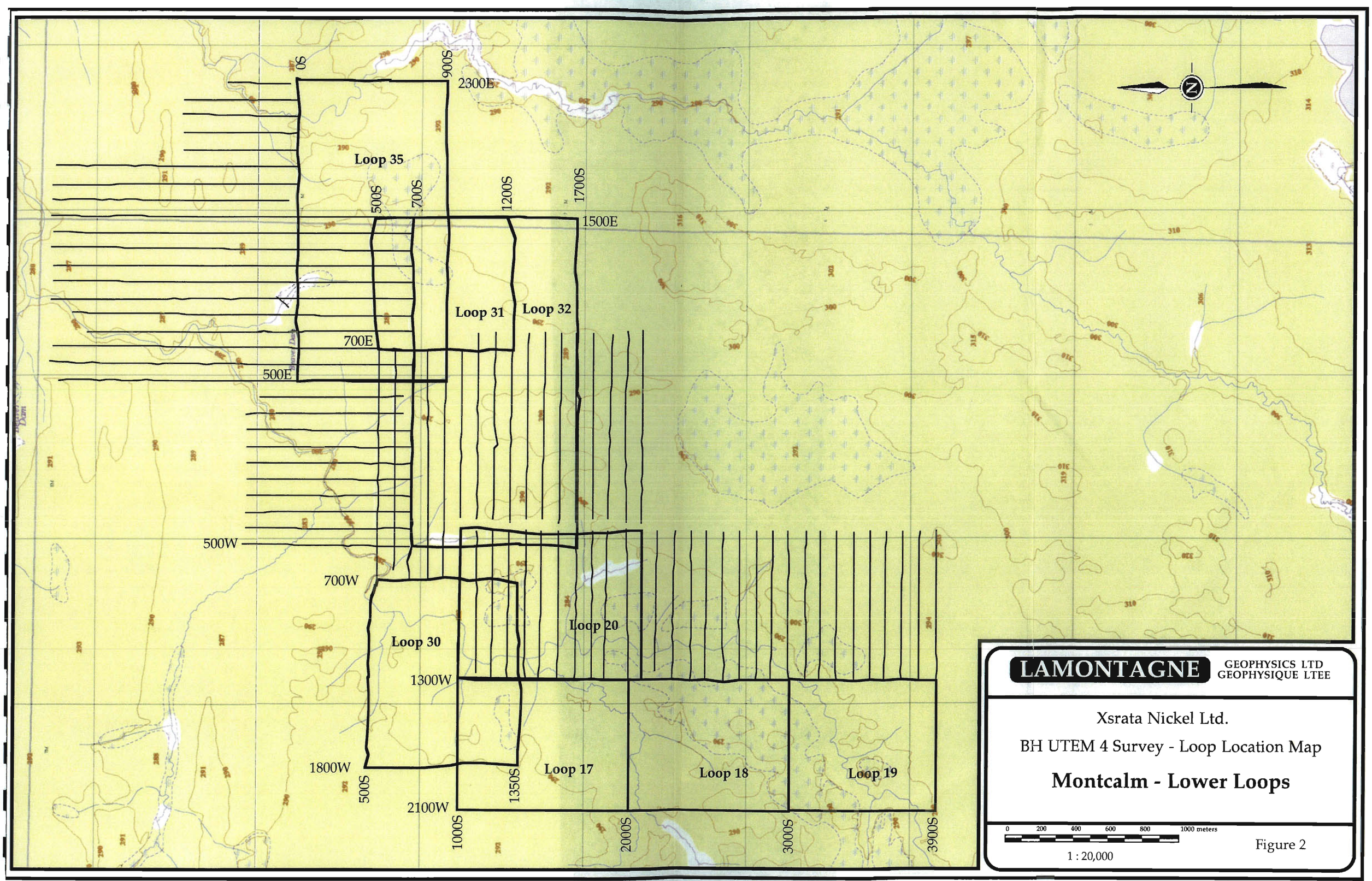
(Refer to Figures 2 and 3 for Loop Location Maps)

These parameters were selected to provide good coupling with targets located near or on the grid.

In the three grid areas, Ch1 responses may indicate the presence of a basement conductor or conductive mineralization. Any anomalous Ch1 features are therefore of interest. Ch1 UTEM anomalies can reflect:

i) the presence of a basement conductor
ii) the presence of a magnetic anomaly or conductive mineralization
iii) poor geometric control - either station location or loop location

From a field point of view this means that precise geometric control should be part of any UTEM survey. Poor geometric control has the potential to both mask and invent Ch1 conductors. Refer to Appendix D.



LAMONTAGNE GEOPHYSICS LTD GEOPHYSIQUE LTEE

Xsrata Nickel Ltd.

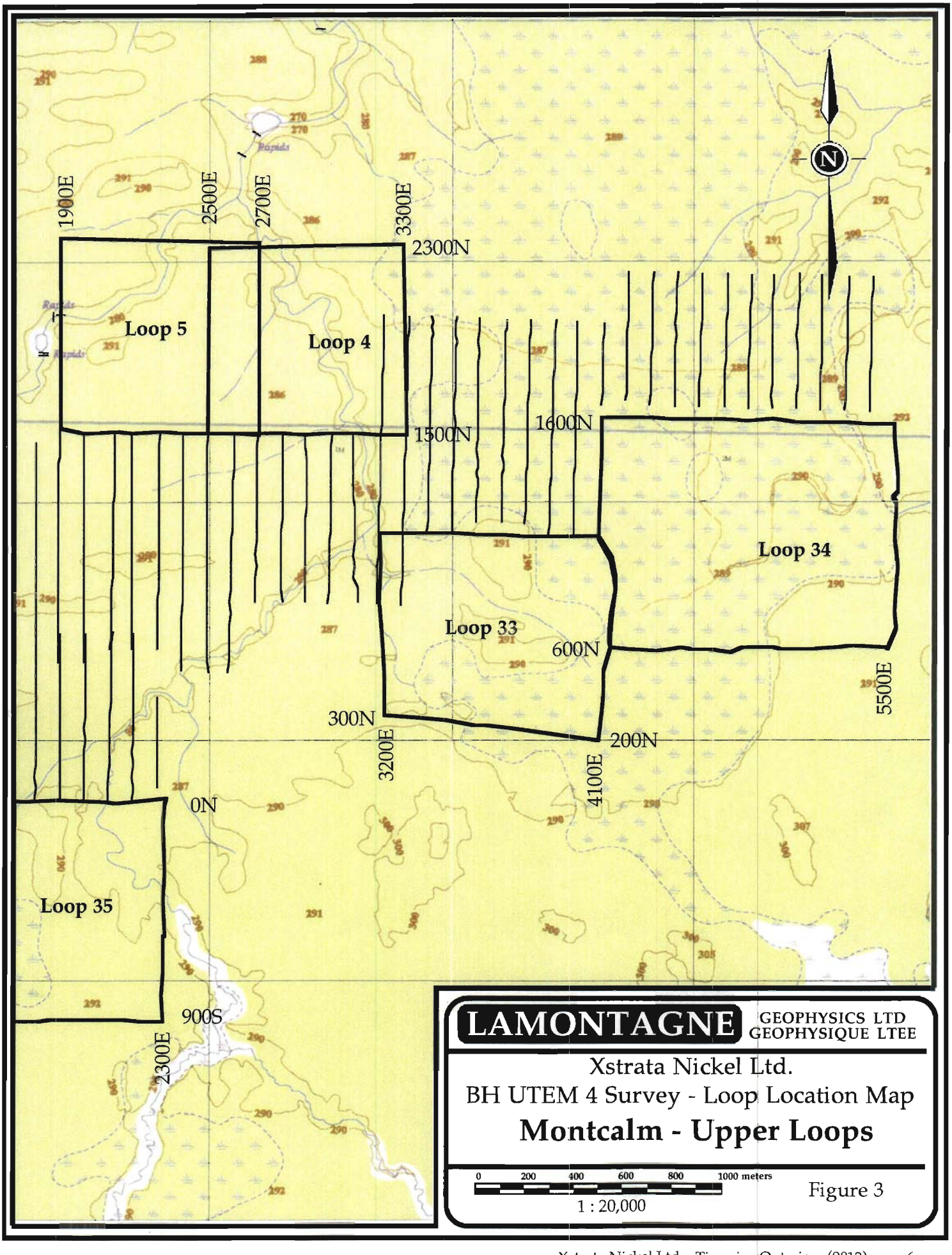
BH UTEM 4 Survey - Loop Location Map

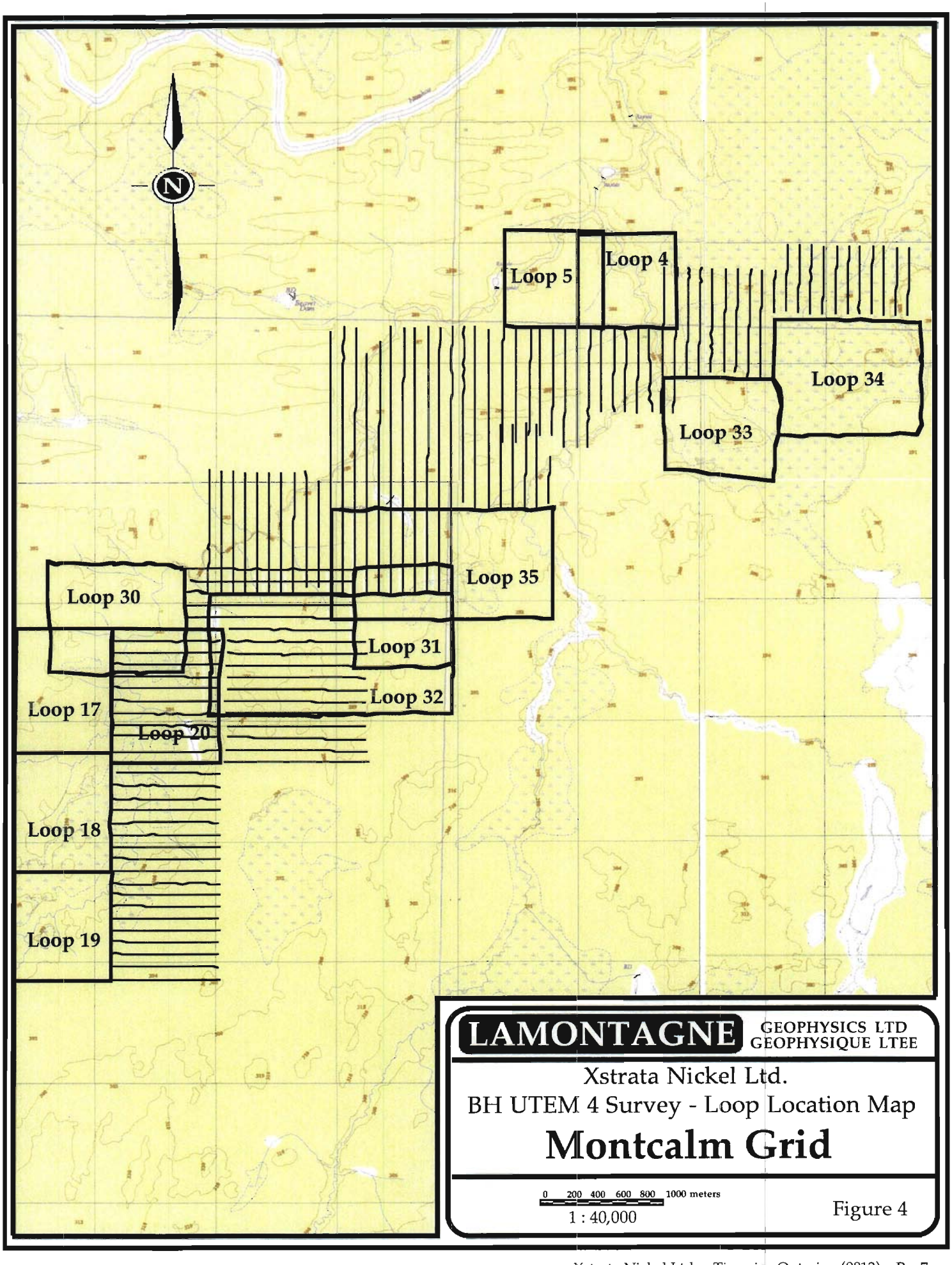
Montcalm - Lower Loops

0 200 400 600 800 1000 meters

1 : 20,000

Figure 2


1900E
2500E
2700E
3300E
2300N
Loop 5
Loop 4
1500N
1600N
Loop 34
Loop 33
600N
5500E
300N
3200E
200N
4100E
0N
Loop 35
900S
2300E
N
LAMONTAGNE
GEOPHYSICS LTD
GEOPHYSIQUE LTEE
Xstrata Nickel Ltd.
BH UTEM 4 Survey - Loop Location Map
Montcalm - Upper Loops
0 200 400 600 800 1000 meters
1 : 20,000
Figure 3



LAMONTAGNE GEOPHYSICS LTD GEOPHYSIQUE LTEE

Xstrata Nickel Ltd.

BH UTEM 4 Survey - Loop Location Map

Montcalm Grid

0 200 400 600 800 1000 meters

1 : 40,000

Figure 4

FIELD WORK

The Lamontagne Geophysics crew carried out the survey over the period of March 24th to Augest 11th. The location of the Montcalm grid was west of Timmins, accessed by the Malette logging road, a 85km or 80 min drive from the Bon Air Motel where the crew based operations.

The Lamontagne crew consisted of P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine, G. Lafortune, A. Van Roon, JP. Swart, R. Lahaye, N. Bastarache, J. Frost. The Production Log in Appendix B outlines the day-to-day operations of the survey.

The Survey equipment employed in the field consisted of:

- one UTEM 3 transmitter
- three UTEM 3 receivers and three coils
- necessary accessories, support equipment and backup equipment

A PowerBook G4 field computer was used to reduce and plot the data while on site. The preliminary results were reduced with an idealized grid as estimated and delivered to Xstrata Nickel Ltd. on a timely basis.

Discussion of the Grid

The following is a discussion of the geometric control used to reduce the data for the surveyed grid; as presented in Appendix A.

Phase 1: A total of 53.450km was surveyed using six loops. Loops 04 and 05 were located on the north side of the Montcalm property with lines extending between 700m to 1000m south of the loop. Loop 04 and Loop 05 were surveyed using both vertical Hz, and horizontal Hx components at a frequency of 3.872Hz. Loops 17, 18 and 19 were at the south west of the property. Lines from these loops run east to west from 550m to 900m. Loop 20 was located to the east of Loop 17. Lines 1200S to 2100S were surveyed from Loop 20 and were all 1200m in length. Loops 17, 18, 19 and 20 were all surveyed using vertical Hz component only at a frequency of 3.872Hz.

Phase 2: A total of 69.950km was surveyed using six loops. All Loops were surveyed using a frequency of 30.974Hz and both vertical Hz and horizontal Hx or Hy components. Twenty one Lines were surveyed using Loop 30 running north south with lengths ranging from 1000m to 1050m. Loops 31 and 32 were used to survey the same lines. Loop 31 was east of Lines 500S to 900S and Loop 32 was to the west of the lines. Lines range in lengths of 1275m to 1400m. Loops 33 and 34 were located at the north west corner of the Montcalm grid and were used to survey lines 3200E to 5500E. Lines extended north south from Loops 33 and 34 in a range of 600m to 900m.

SURVEY RESULTS

The results of the survey are summarized and presented as UTEM profiles in Appendix A. The final grid and loop locations are presented in Figure 2. Overall the UTEM data quality is good. Although every effort was taken to shelter the receiver coil, minor wind noise may be evident in some profiles.

Outline of profile type

Hz continuous norm ***Ch1 reduced***

Continuous normalization is useful for detection of the presence of anomalies at any position on a profile. The anomaly shape is distorted by the normalization to the local field. As the field gets very big near the wire the continuously normalized Ch1 tends towards zero.

top axis - Ch5-10
middle axis - Ch2-5
bottom axis - Ch1

Note that point normalized profiles are not included in the report since geometric control is based largely on idealized grids. However, point normalized geosoft data are included in the attached CD.

Appendix A

0812 UTEM Profiles

UTEM Survey

Timmins, Ontario
Montcalm Grid

2008

for

Xstrata Nickel Ltd.

List of Data Collected and Plotted
Xstrata Nickel Ltd. (0812)
2008 Montcalm Grid

	Line	Coverage	
Loop 04	Line 2500E	500N - 1500N	**Hx, Hz**
	Line 2600E	500N - 1500N	
	Line 2700E	800N - 1500N	
	Line 2800E	800N - 1500N	
	Line 2900E	800N - 1500N	
	Line 3000E	800N - 1500N	
	Line 3100E	800N - 1500N	
	Line 3200E	800N - 1500N	
	Line 3300E	800N - 1500N	3.872 Hz
		Loop 04 Total	6.900 km
Loop 05	Line 1900E	600N - 1500N	**Hx, Hz**
	Line 2000E	600N - 1500N	
	Line 2100E	600N - 1500N	
	Line 2200E	600N - 1500N	
	Line 2300E	600N - 1500N	
	Line 2400E	500N - 1500N	3.872 Hz
		Loop 05 Total	5.500 km
Loop 17	Line 1000S	1300W - 400W	**Hz**
	Line 1100S	1300W - 400W	
	Line 1200S	1300W - 400W	
	Line 1300S	1300W - 400W	
	Line 1400S	1300W - 400W	
	Line 1500S	1300W - 400W	
	Line 1600S	1300W - 400W	
	Line 1700S	1300W - 400W	
	Line 1800S	1300W - 400W	
	Line 1900S	1300W - 400W	3.872 Hz
		Loop 17 Total	9.000 km
Loop 18	Line 2000S	1300W - 400W	**Hz**
	Line 2100S	1300W - 400W	
	Line 2200S	1300W - 400W	
	Line 2300S	1300W - 400W	
	Line 2400S	1300W - 400W	
	Line 2500S	1300W - 400W	
	Line 2600S	950W - 400W	
	Line 2700S	1300W - 400W	
	Line 2800S	1300W - 400W	

List of Data Collected and Plotted

Xstrata Nickel Ltd. (0812)
2008 Montcalm Grid

	Line	Coverage	
Loop 18 con't	Line 2900S	1300W - 400W	
	Line 3000S	1300W - 400W	3.872 Hz
		Loop 18 Total	9.550 km
Loop 19	Line 3100S	1300W - 400W	**Hz**
	Line 3200S	1300W - 400W	
	Line 3300S	1300W - 400W	
	Line 3400S	1300W - 400W	
	Line 3500S	1300W - 400W	
	Line 3600S	1300W - 400W	
	Line 3700S	1300W - 400W	
	Line 3800S	1300W - 400W	
	Line 3900S	1300W - 400W	3.872 Hz
		Loop 19 Total	8.100 km
Loop 20	Line 1000S	400W - 800E	**Hz**
	Line 1100S	400W - 800E	
	Line 1200S	400W - 800E	
	Line 1300S	400W - 800E	
	Line 1400S	400W - 800E	
	Line 1500S	400W - 800E	
	Line 1600S	400W - 800E	
	Line 1700S	400W - 800E	
	Line 1800S	400W - 800E	
	Line 1900S	400W - 800E	
	Line 2000S	400W - 800E	
	Line 2100S	400W - 800E	3.872 Hz
		Loop 20 Total	14.400 km
Loop 30	Line 500W	700S - 325S	**Hx, Hz**
	Line 400W	700S - 350S	
	Line 300W	700S - 300S	
	Line 200W	700S - 250S	
	Line 100W	700S - 225S	
	Line 0	700S - 250S	
	Line 100E	700S - 300N	
	Line 200E	700S - 300N	
	Line 300E	700S - 300N	
	Line 400E	700S - 300N	
	Line 500E	700S - 300N	
	Line 600E	700S - 300N	

List of Data Collected and Plotted

Xstrata Nickel Ltd. (0812)
2008 Montcalm Grid

	Line	Coverage	
Loop 30 con't	Line 700E	700S - 300N	
	Line 800E	700S - 300N	
	Line 900E	700S - 300N	
	Line 1000E	700S - 300N	
	Line 1100E	700S - 300N	
	Line 1200E	700S - 300N	
	Line 1300E	700S - 300N	
	Line 1400E	700S - 300N	
	Line 1500E	700S - 300N	30.974 Hz
		Loop 30 Total	17.450 km
Loop 31	Line 500S	700E - 575W	**Hy, Hz**
	Line 600S	700E - 700W	
	Line 700S	700E - 700W	
	Line 800S	700E - 700W	
	Line 900S	700E - 700W	30.974 Hz
		Loop 31 Total	6.875 km
Loop 32	Line 500S	550W - 700E	**Hy, Hz**
	Line 600S	650W - 700E	
	Line 700S	650W - 700E	
	Line 800S	650W - 700E	
	Line 900S	650W - 700E	30.974 Hz
		Loop 32 Total	5.850 km
Loop 33	Line 3200E	1100N - 2000N	**Hx, Hz**
	Line 3300E	1100N - 2000N	
	Line 3400E	1100N - 2000N	
	Line 3500E	1100N - 2000N	
	Line 3600E	1100N - 2000N	
	Line 3700E	1100N - 1975N	
	Line 3800E	1100N - 2000N	
	Line 3900E	1100N - 2000N	
	Line 4000E	1100N - 2000N	30.974 Hz
		Loop 33 Total	8.075 km

List of Data Collected and Plotted
Xstrata Nickel Ltd. (0812)
2008 Montcalm Grid

	Line	Coverage	
Loop 34	Line 4100E	1600N - 2200N	**Hx, Hz**
	Line 4200E	1600N - 2200N	
	Line 4300E	1600N - 2200N	
	Line 4400E	1600N - 2200N	
	Line 4500E	1600N - 2200N	
	Line 4600E	1600N - 2200N	
	Line 4700E	1600N - 2200N	
	Line 4800E	1600N - 2200N	
	Line 4900E	1600N - 2200N	
	Line 5000E	1600N - 2200N	
	Line 5100E	1600N - 2200N	
	Line 5200E	1600N - 2200N	
	Line 5300E	1600N - 2200N	30.974 Hz
		Loop 34 Total	7.800 km
Loop 35	Line 500E	0 - 1500N	**Hx, Hz**
	Line 600E	0 - 1500N	
	Line 700E	0 - 1500N	
	Line 800E	0 - 1300N	
	Line 900E	0 - 1375N	
	Line 1000E	0 - 1500N	
	Line 1100E	0 - 1500N	
	Line 1200E	0 - 1500N	
	Line 1300E	0 - 1500N	
	Line 1400E	0 - 1500N	
	Line 1500E	0 - 1500N	
	Line 1600E	0 - 1500N	
	Line 1700E	0 - 1500N	
	Line 1800E	0 - 1500N	
	Line 1900E	0 - 700N	
	Line 2000E	0 - 700N	
	Line 2100E	0 - 700N	
	Line 2200E	0 - 700N	
	Line 2300E	0 - 425N	30.974 Hz
		Loop 35 Total	23.900 km

Montcalm

Loop 04

Hx

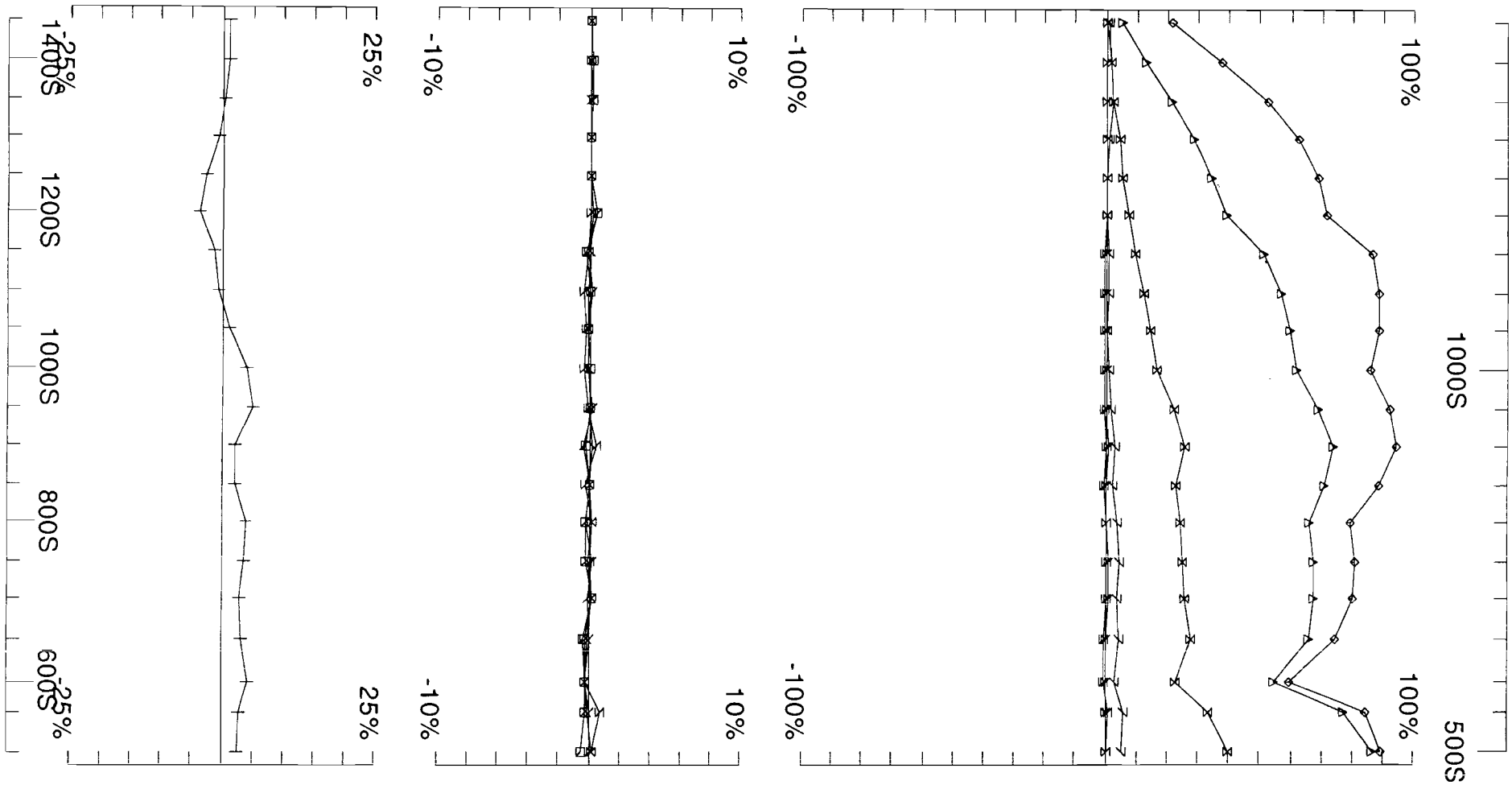
@3.872 Hz frequency

continuous norm

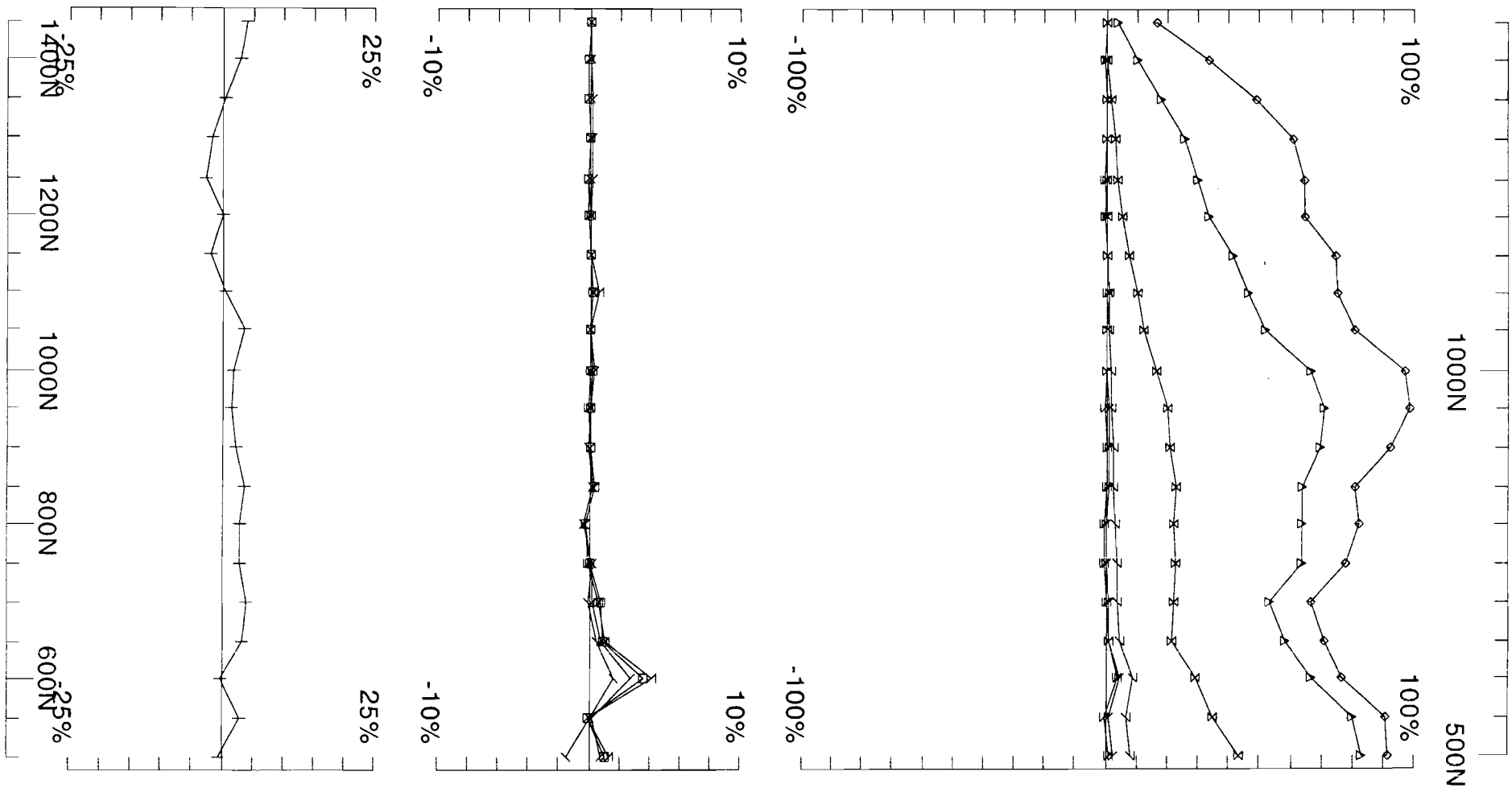
Ch1 reduced

Line 2500E	500N - 1500N
Line 2600E	500N - 1500N
Line 2700E	800N - 1500N
Line 2800E	800N - 1500N
Line 2900E	800N - 1500N
Line 3000E	800N - 1500N
Line 3100E	800N - 1500N
Line 3200E	800N - 1500N
Line 3300E	800N - 1500N

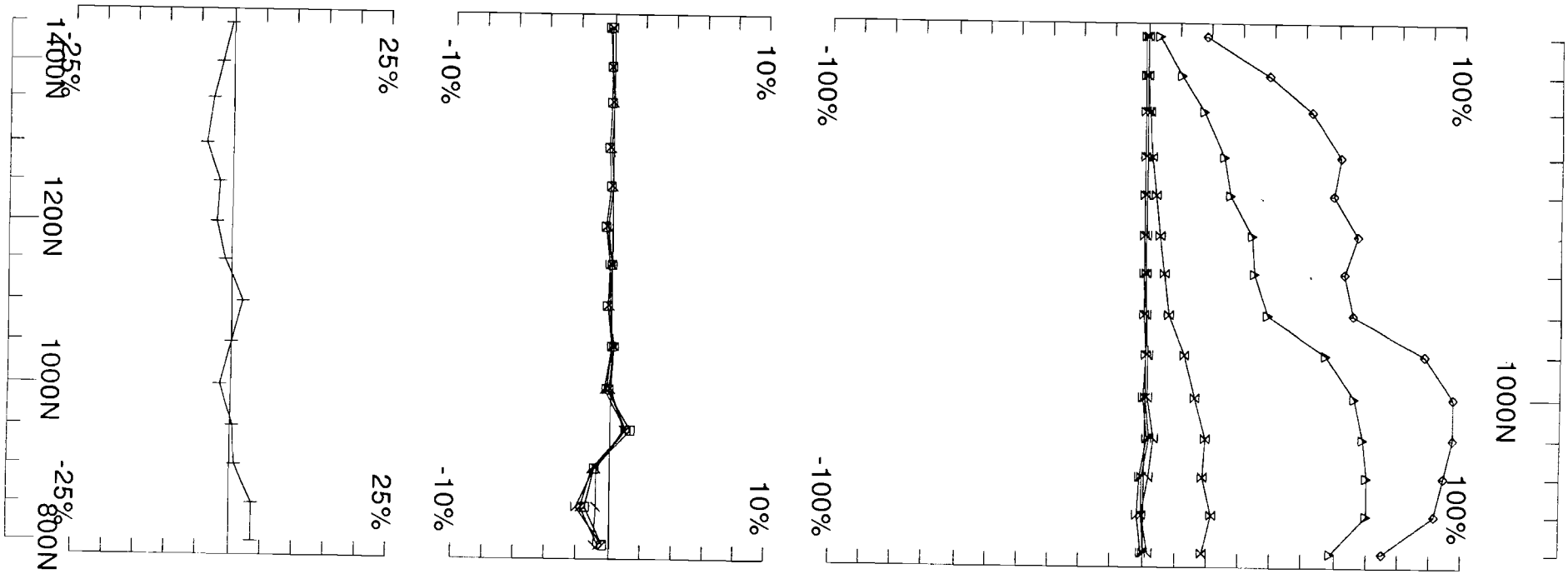
Loop 04 - continuous norm



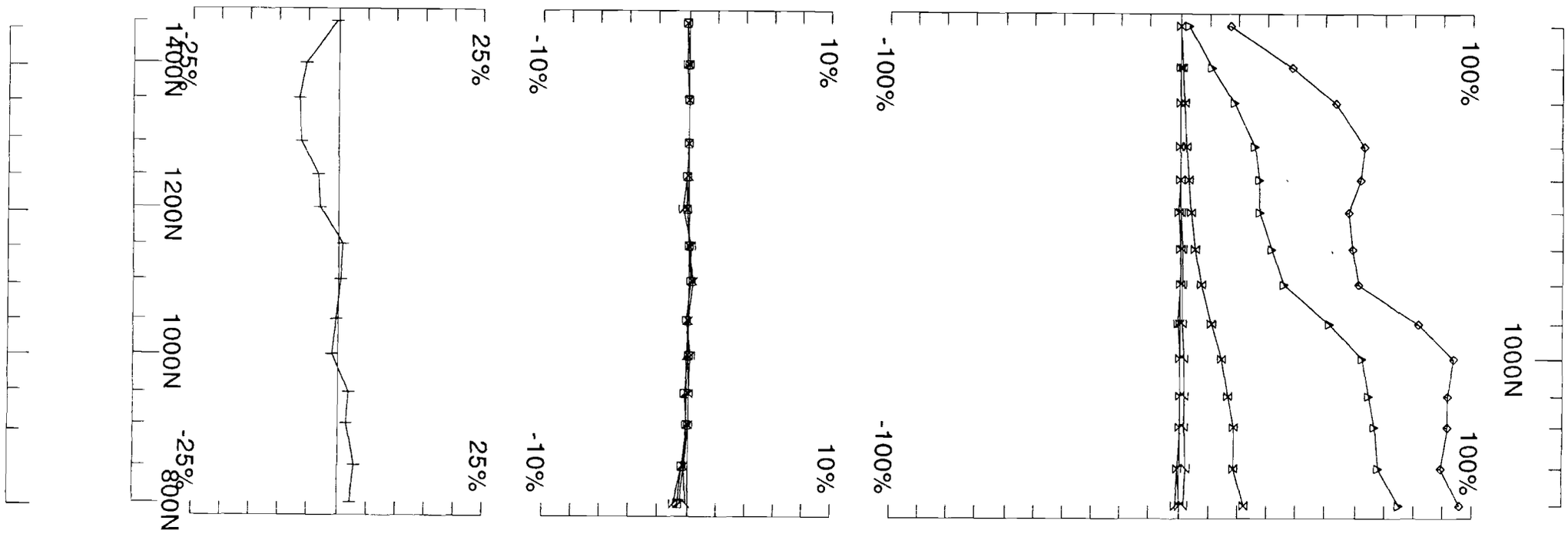
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 29/3/8, Reduced : 2/10/8, Plotted : 20/10/8



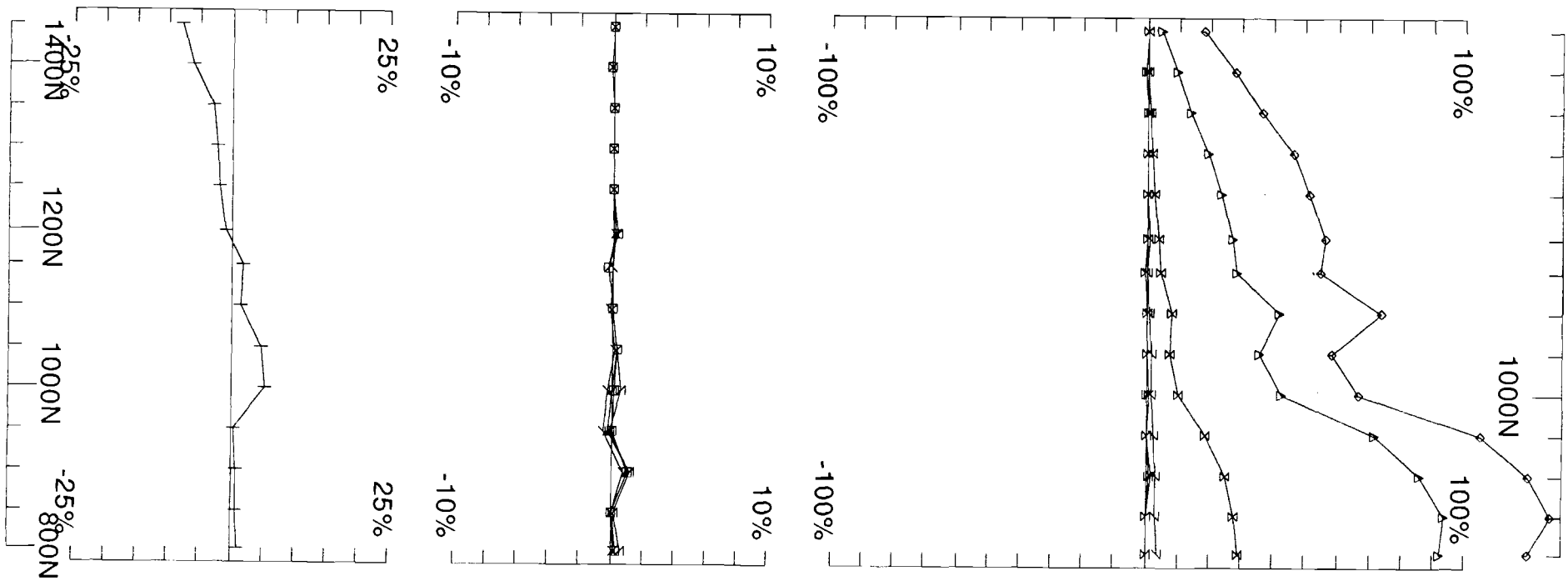
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 29/3/8, Reduced : 2/10/8, Plotted : 20/10/8



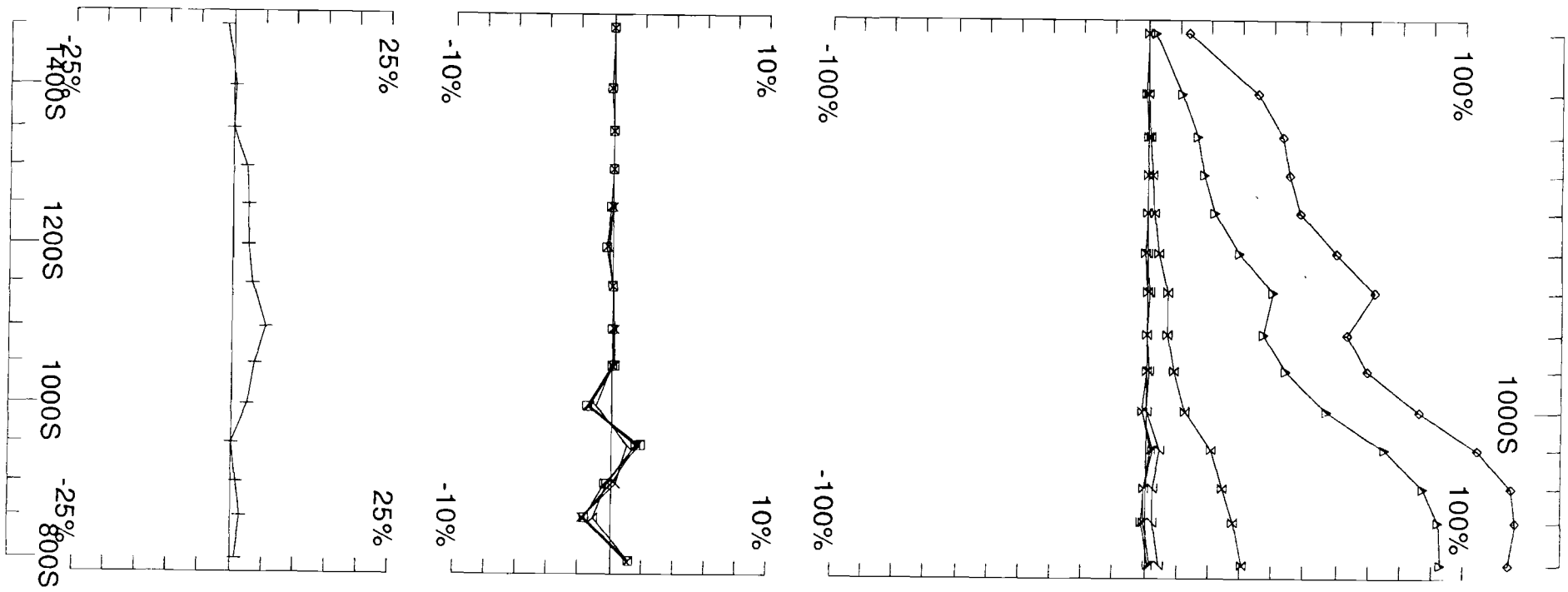
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 29/3/8, Reduced : 2/10/8, Plotted : 20/10/8



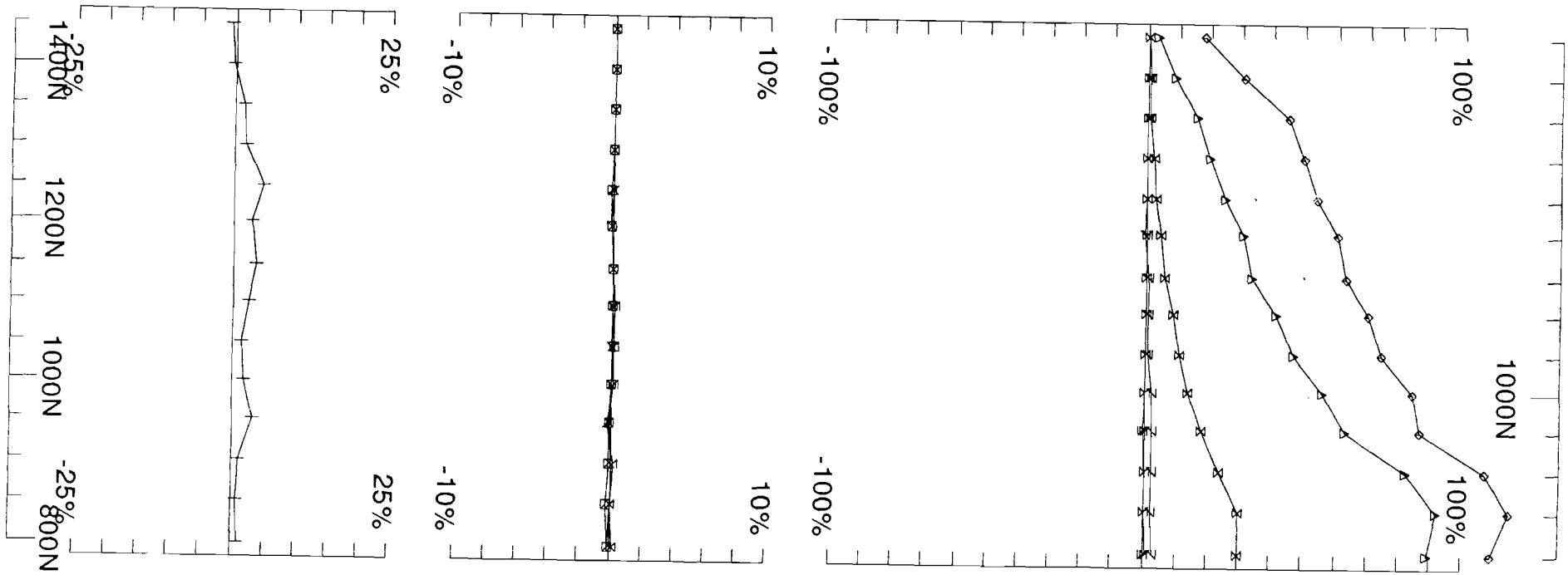
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 2/10/8, Plotted : 20/10/8



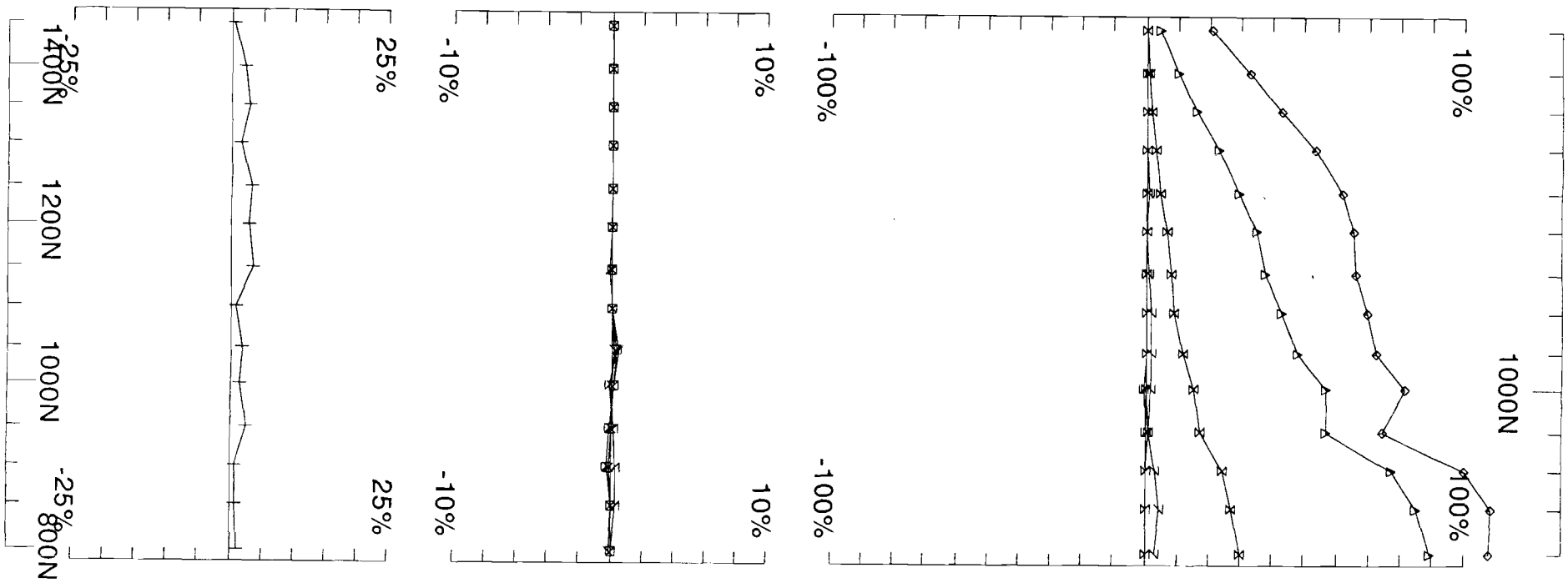
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 6/10/8, Plotted : 20/10/8



Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 2/10/8, Plotted : 22/10/8

Montcalm

Loop 04

Hz

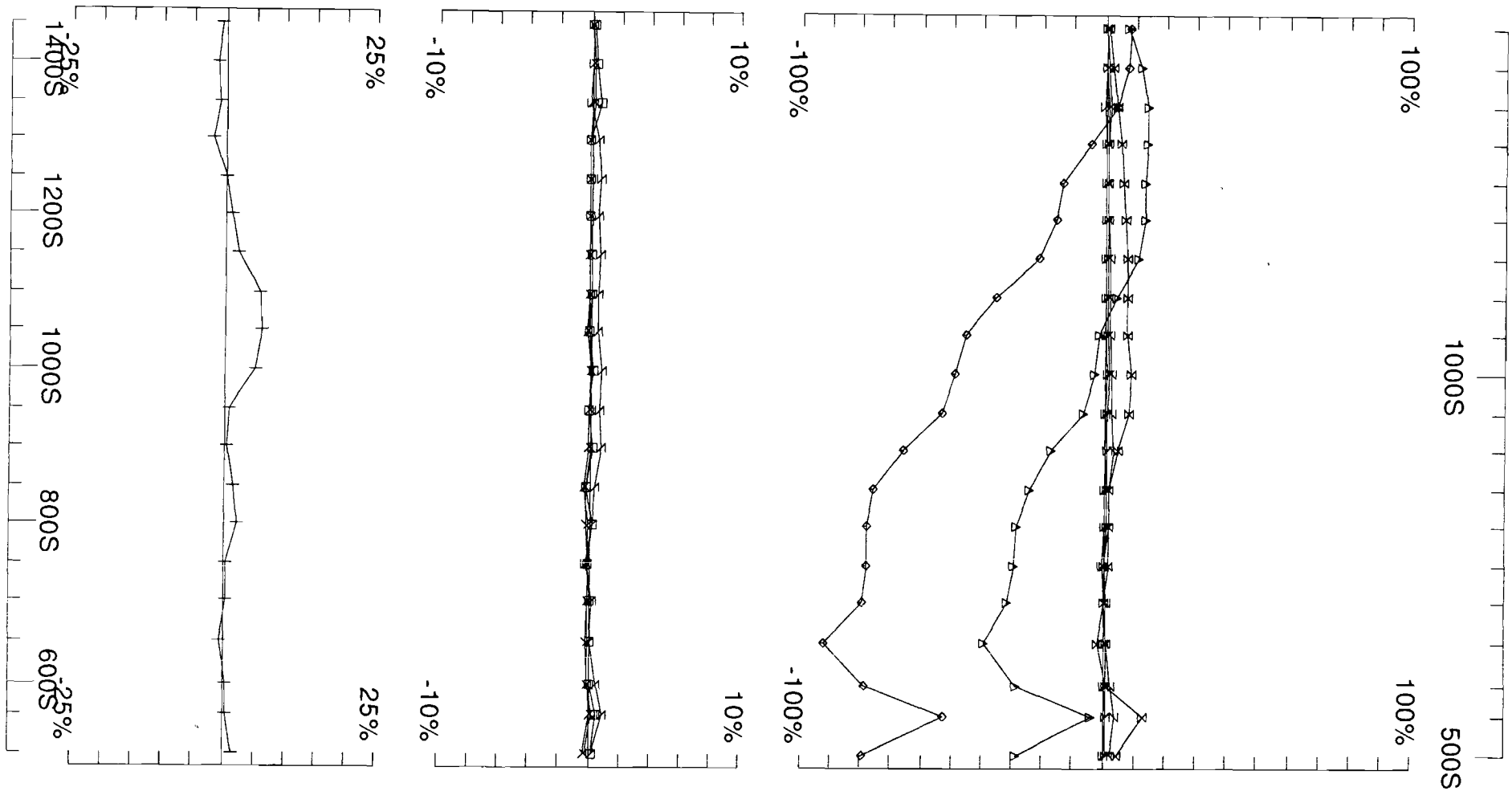
@3.872 Hz frequency

continuous norm

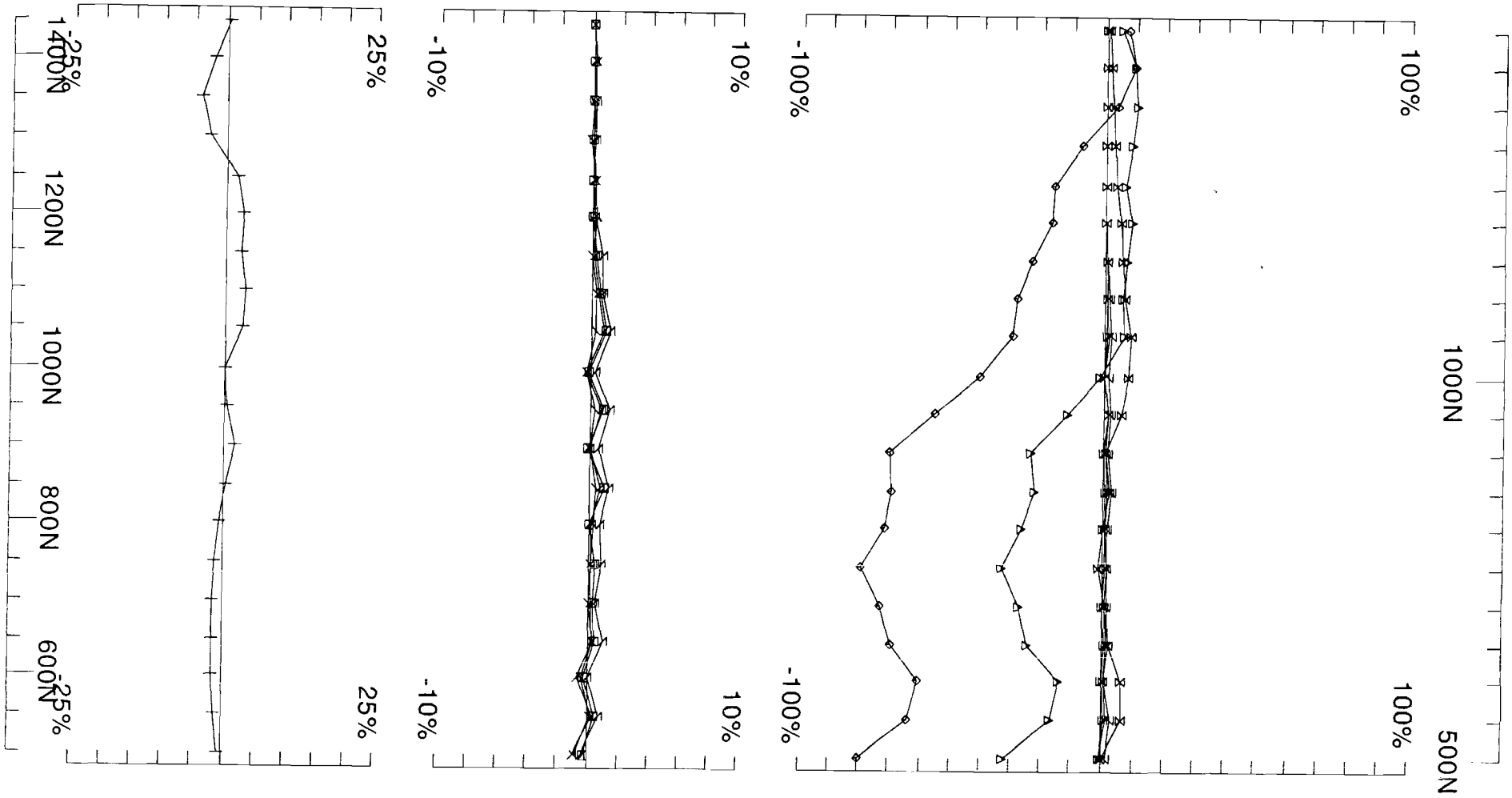
Ch1 reduced

Line 2500E	500N - 1500N
Line 2600E	500N - 1500N
Line 2700E	800N - 1500N
Line 2800E	800N - 1500N
Line 2900E	800N - 1500N
Line 3000E	800N - 1500N
Line 3100E	800N - 1500N
Line 3200E	800N - 1500N
Line 3300E	800N - 1500N

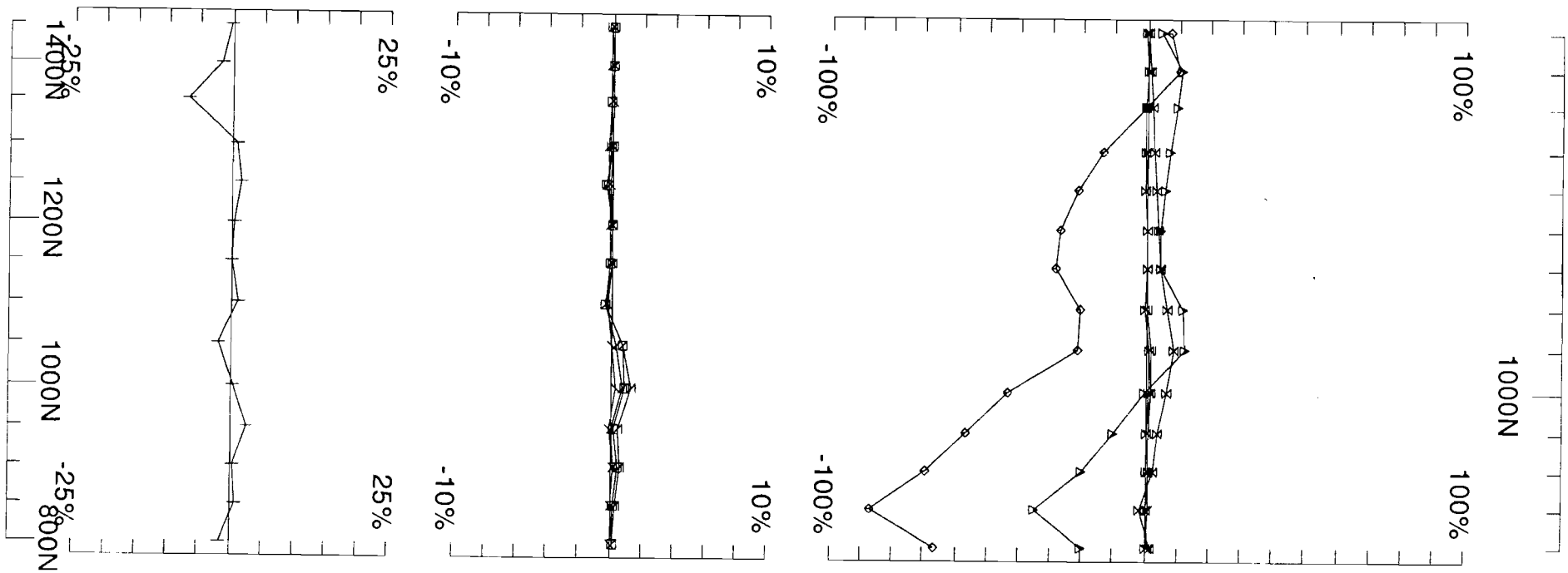
Loop 04 - continuous norm



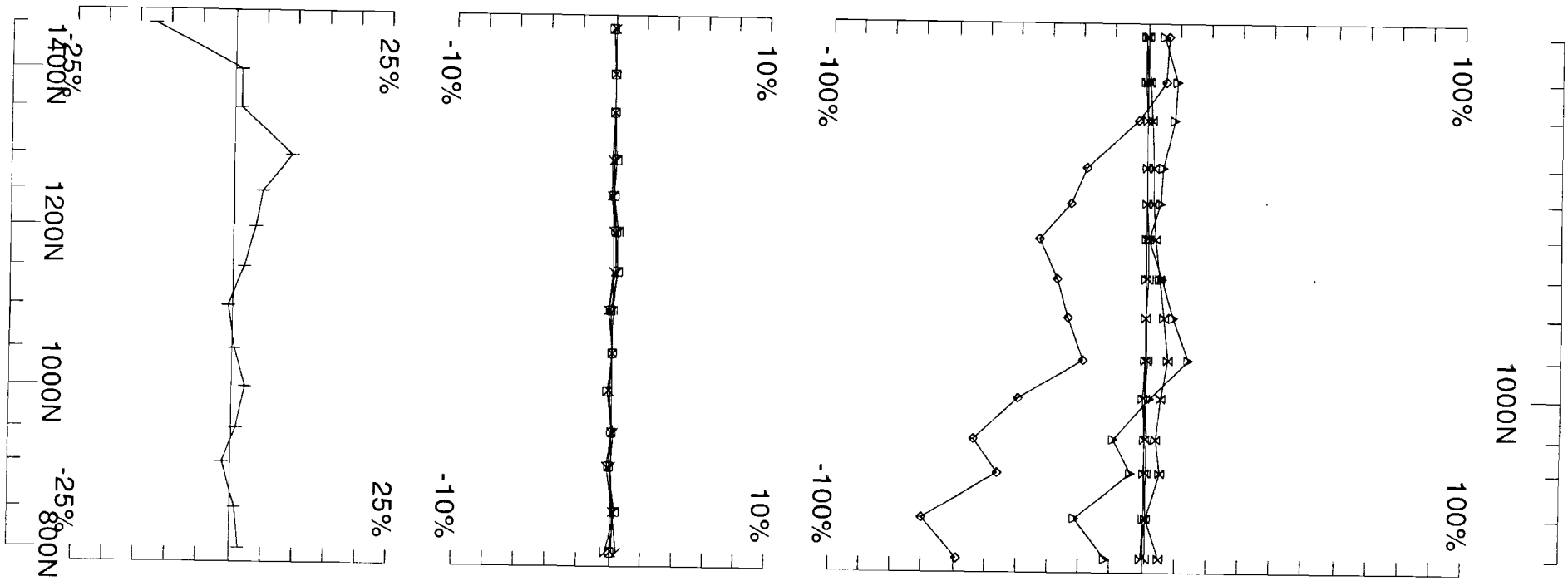
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 29/3/8, Reduced : 2/10/8, Plotted : 20/10/8



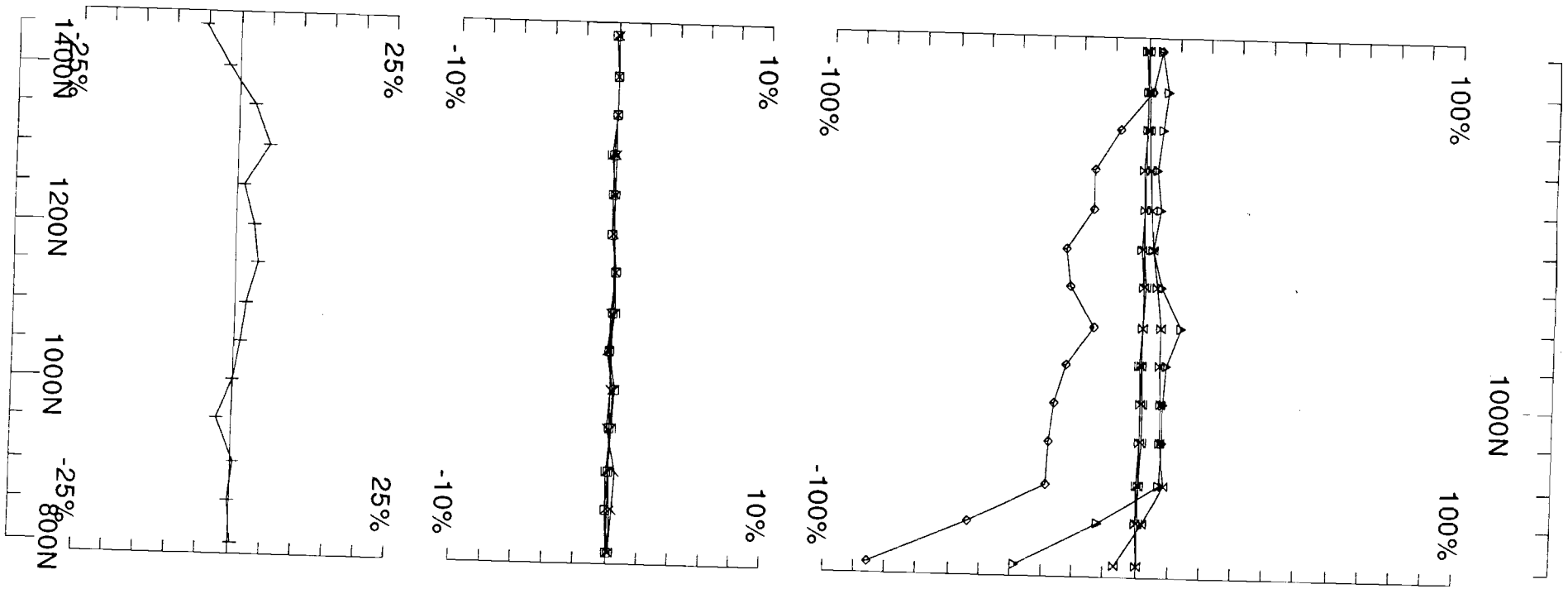
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 29/3/8, Reduced : 2/10/8, Plotted : 20/10/8



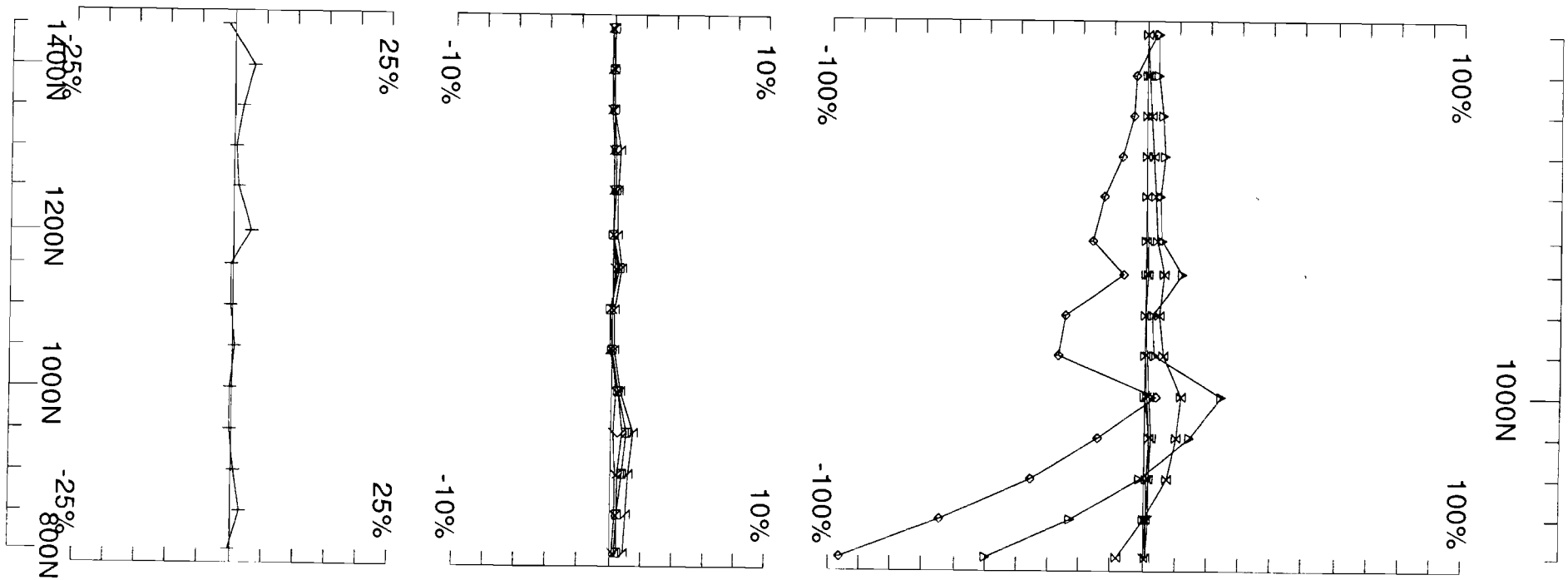
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 29/3/8, Reduced : 2/10/8, Plotted : 20/10/8



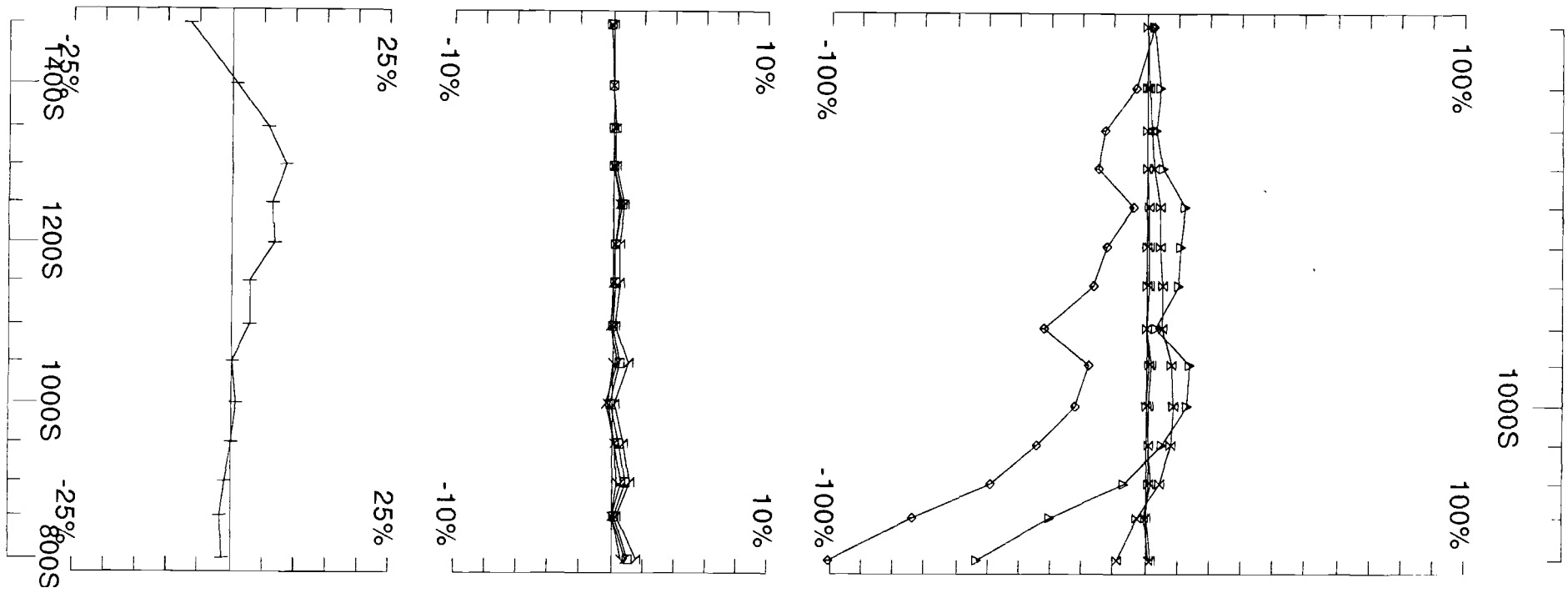
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 2/10/8, Plotted : 20/10/8



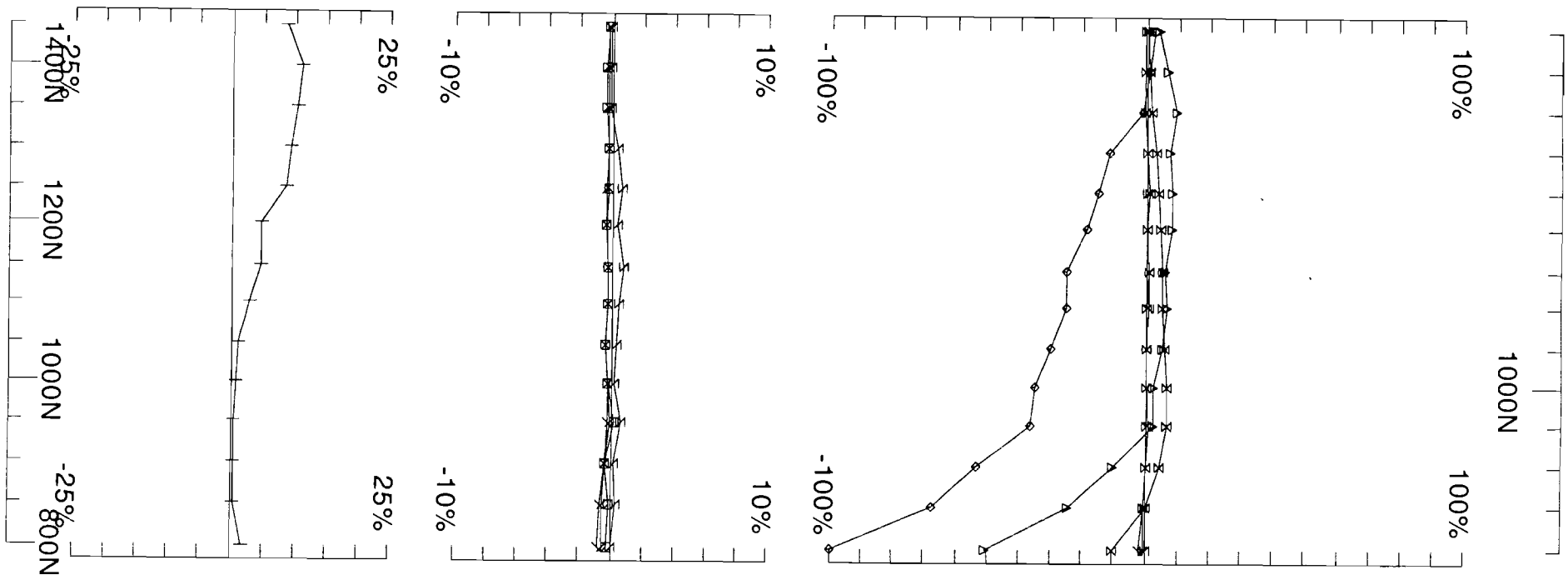
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 2/10/8, Plotted : 20/10/8



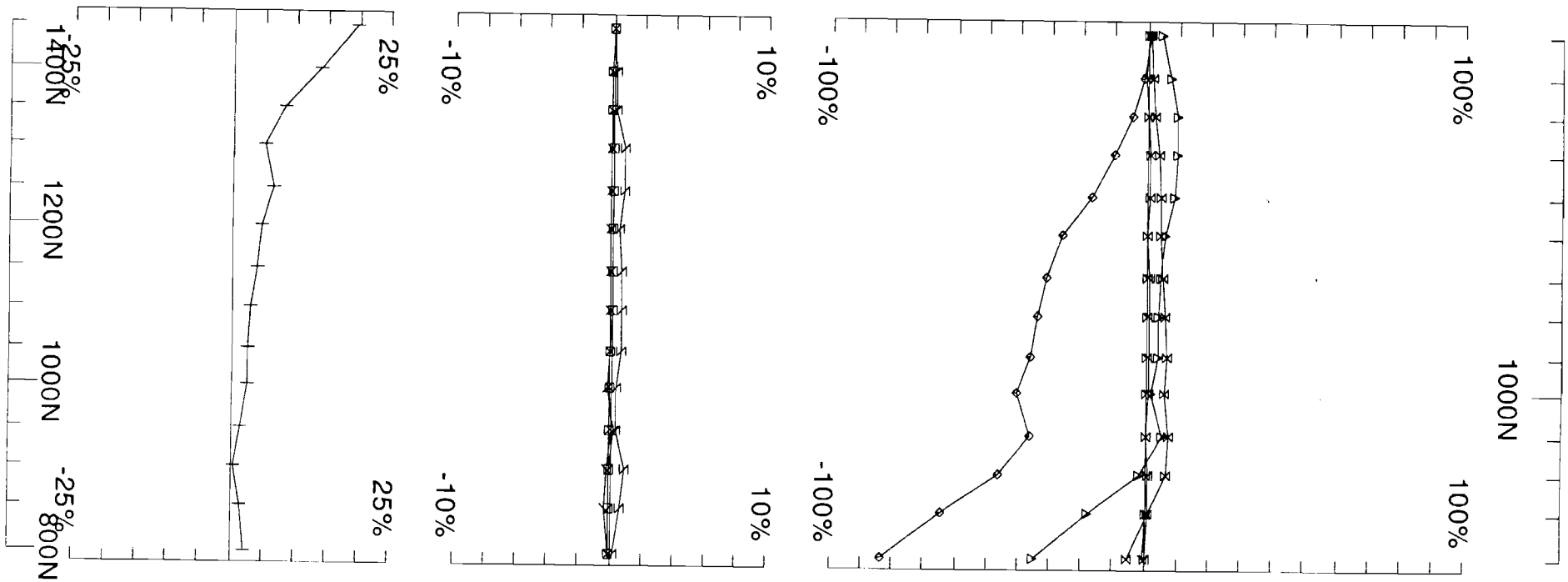
Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 28/3/8, Reduced : 6/10/8, Plotted : 20/10/8



Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812 Surveyed : 28/3/8 Reduced : 2/10/8 Plotted : 20/10/8



Loop: 4	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812 Surveyed : 28/3/8 Reduced : 2/10/8 Plotted : 20/10/8

Montcalm

Loop 05

Hx

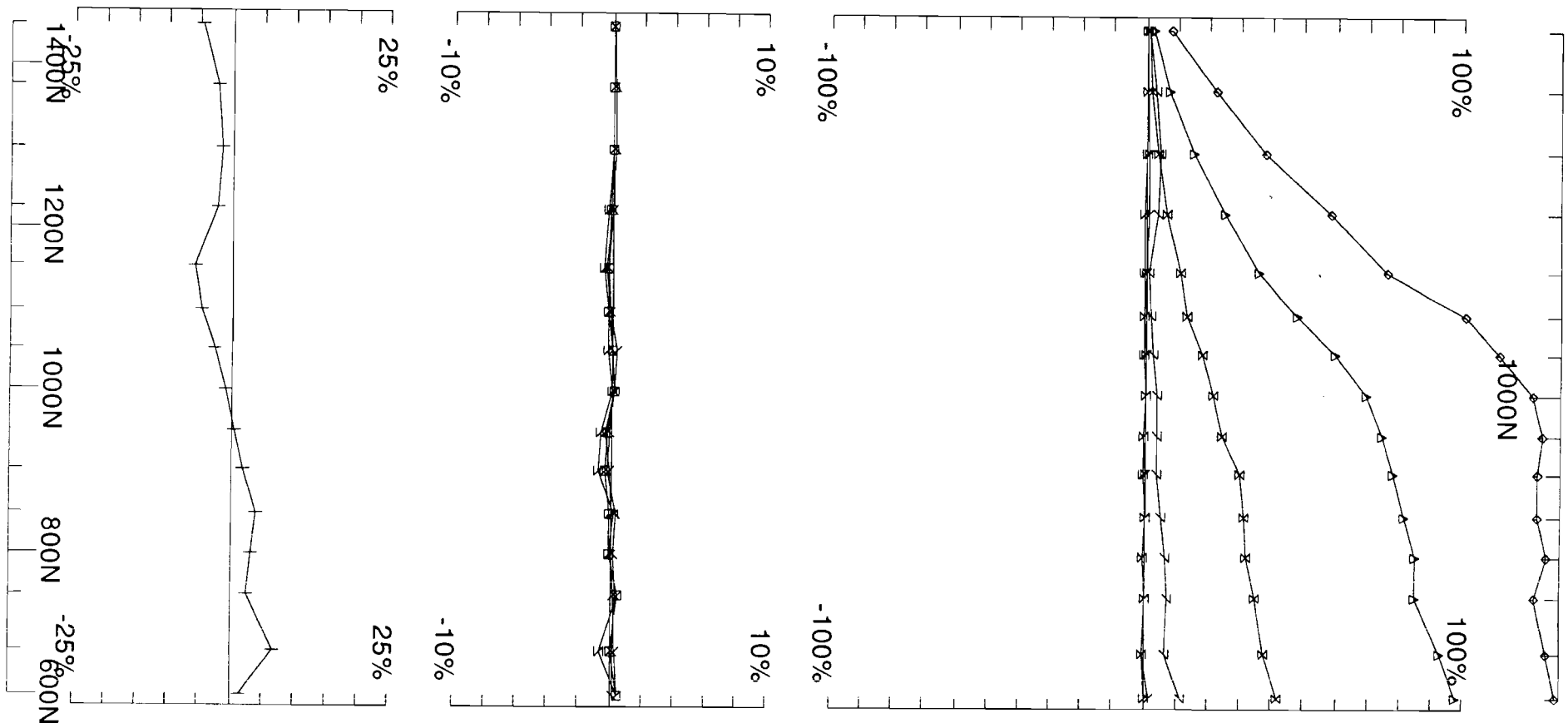
@3.872 Hz frequency

continuous norm

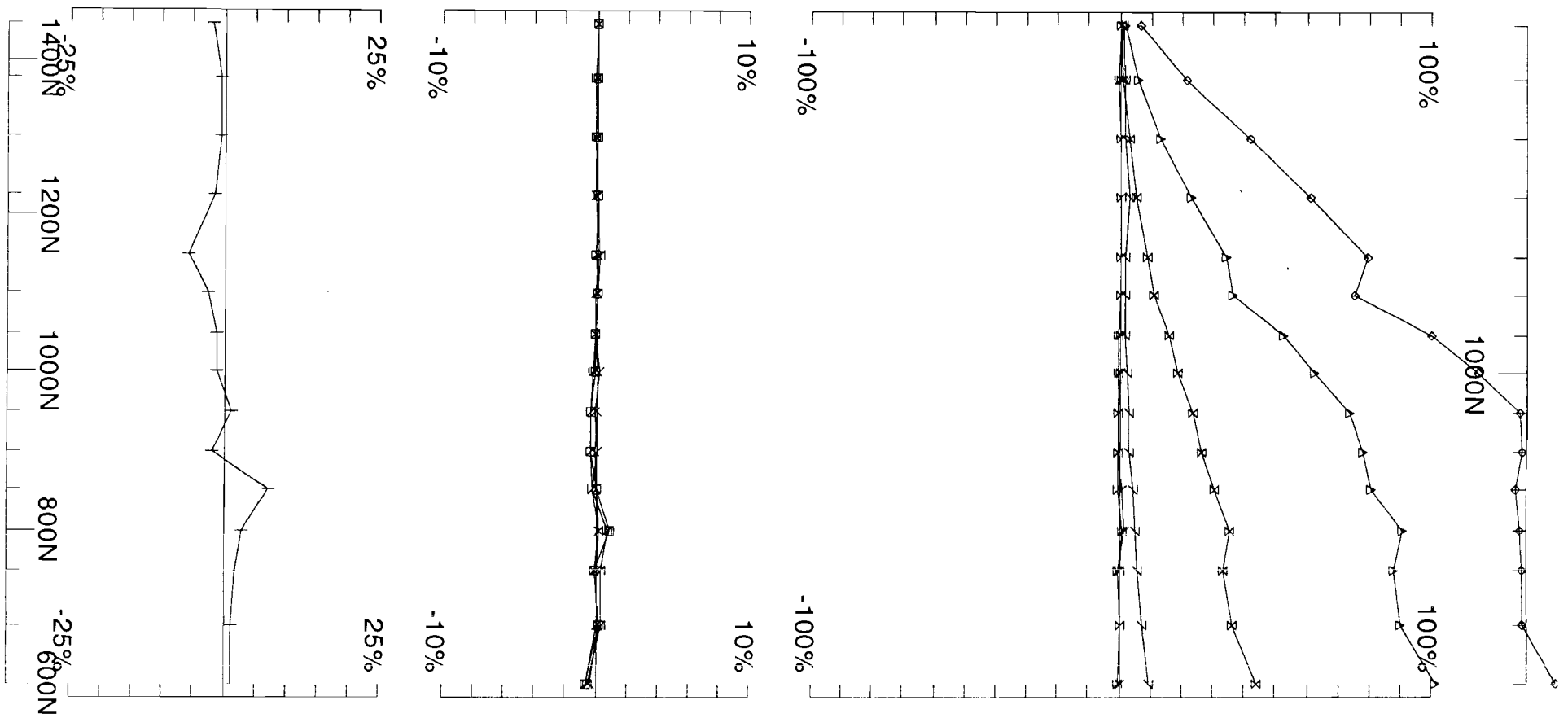
Ch1 reduced

Line 1900E	600N - 1500N
Line 2000E	600N - 1500N
Line 2100E	600N - 1500N
Line 2200E	600N - 1500N
Line 2300E	600N - 1500N
Line 2400E	500N - 1500N

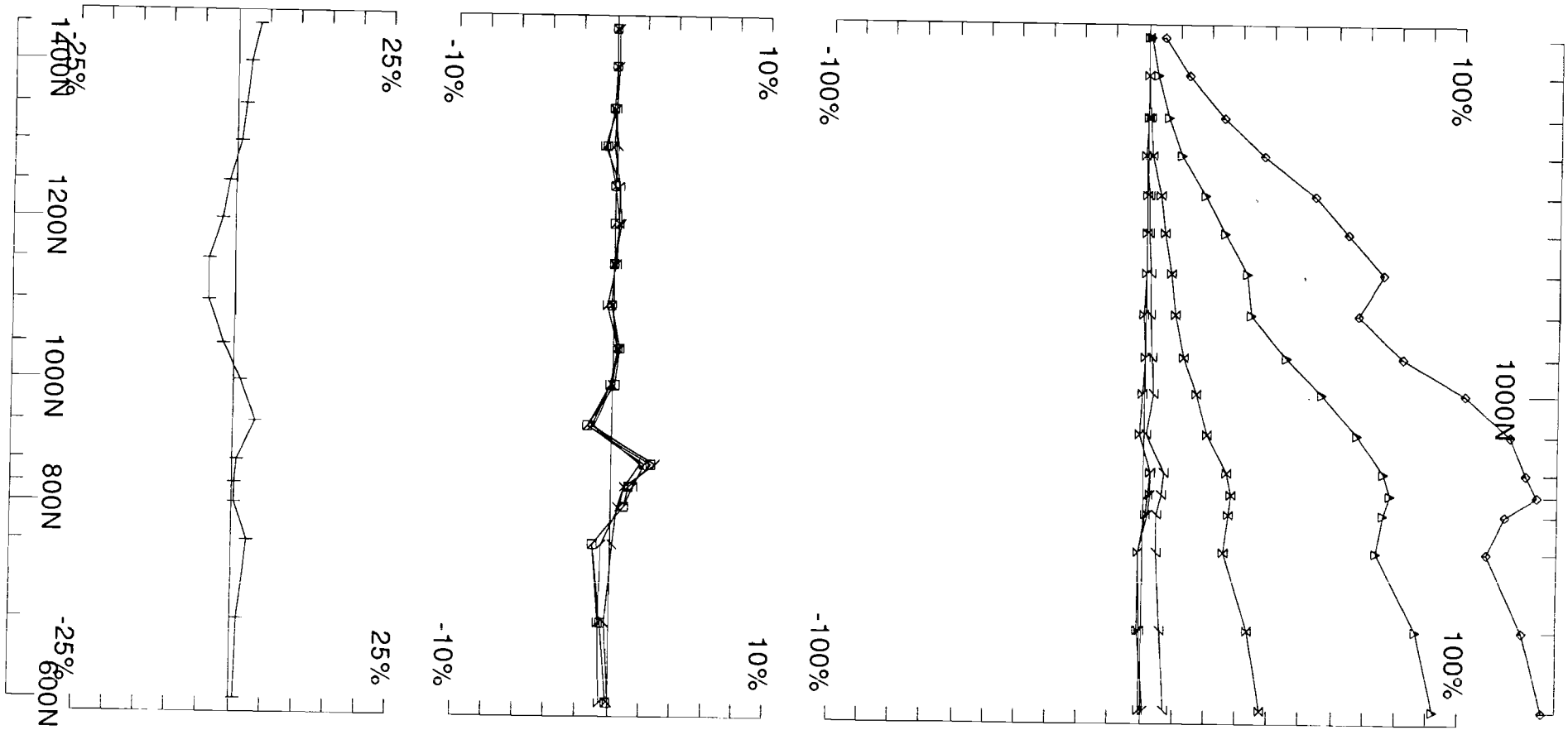
Loop 05 - continuous norm



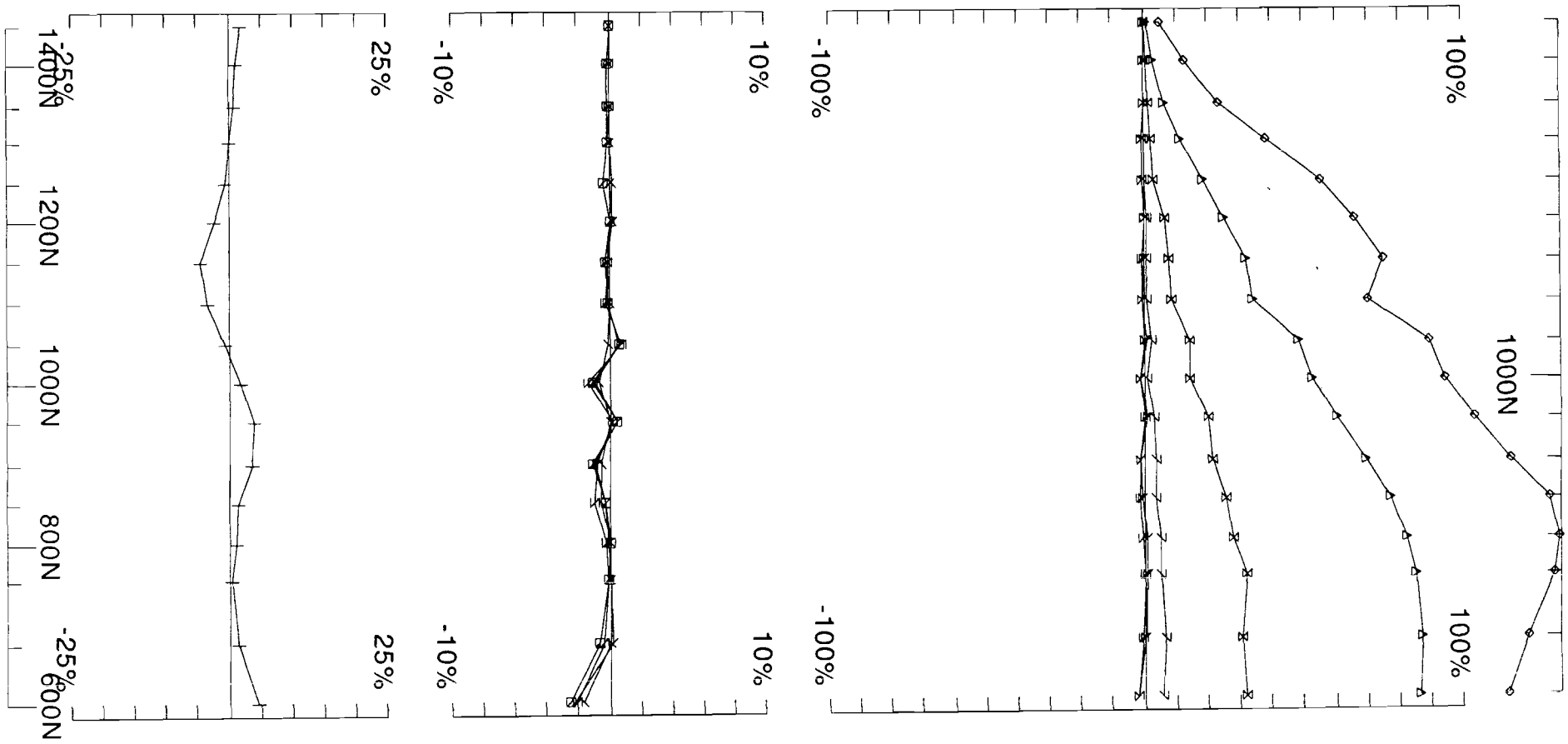
Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



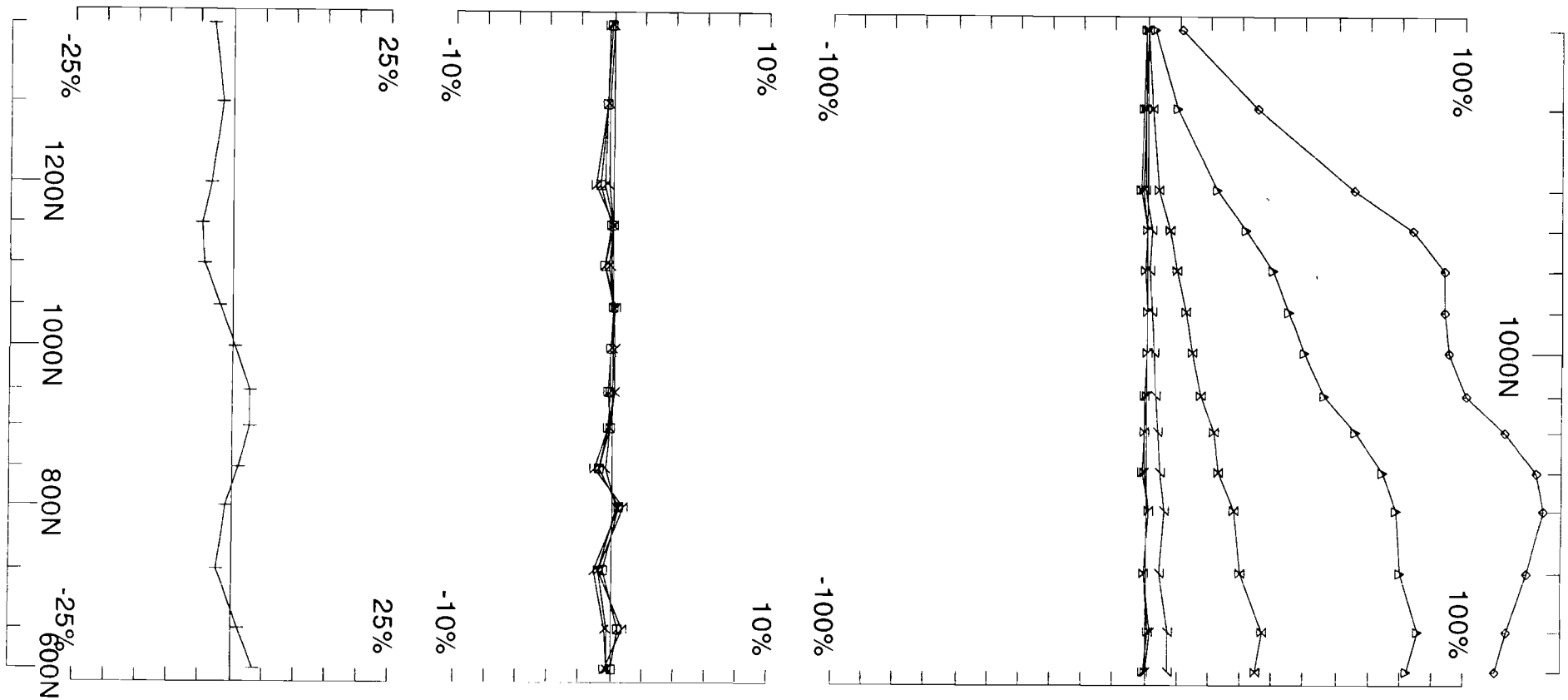
Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



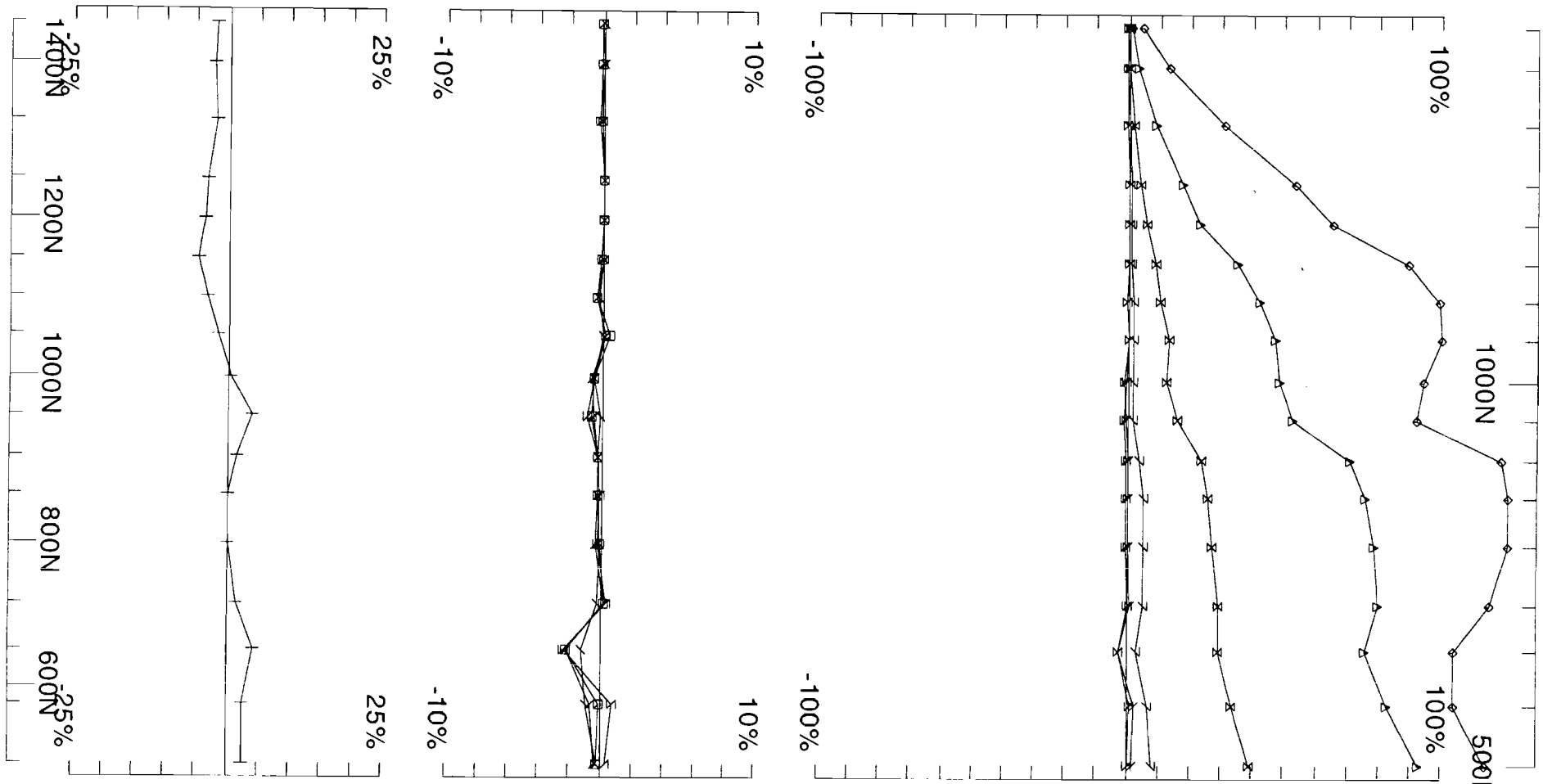
Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2100E	Contin. Norm at depth of 0 m	For: Xtrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8

Montcalm

Loop 05

Hz

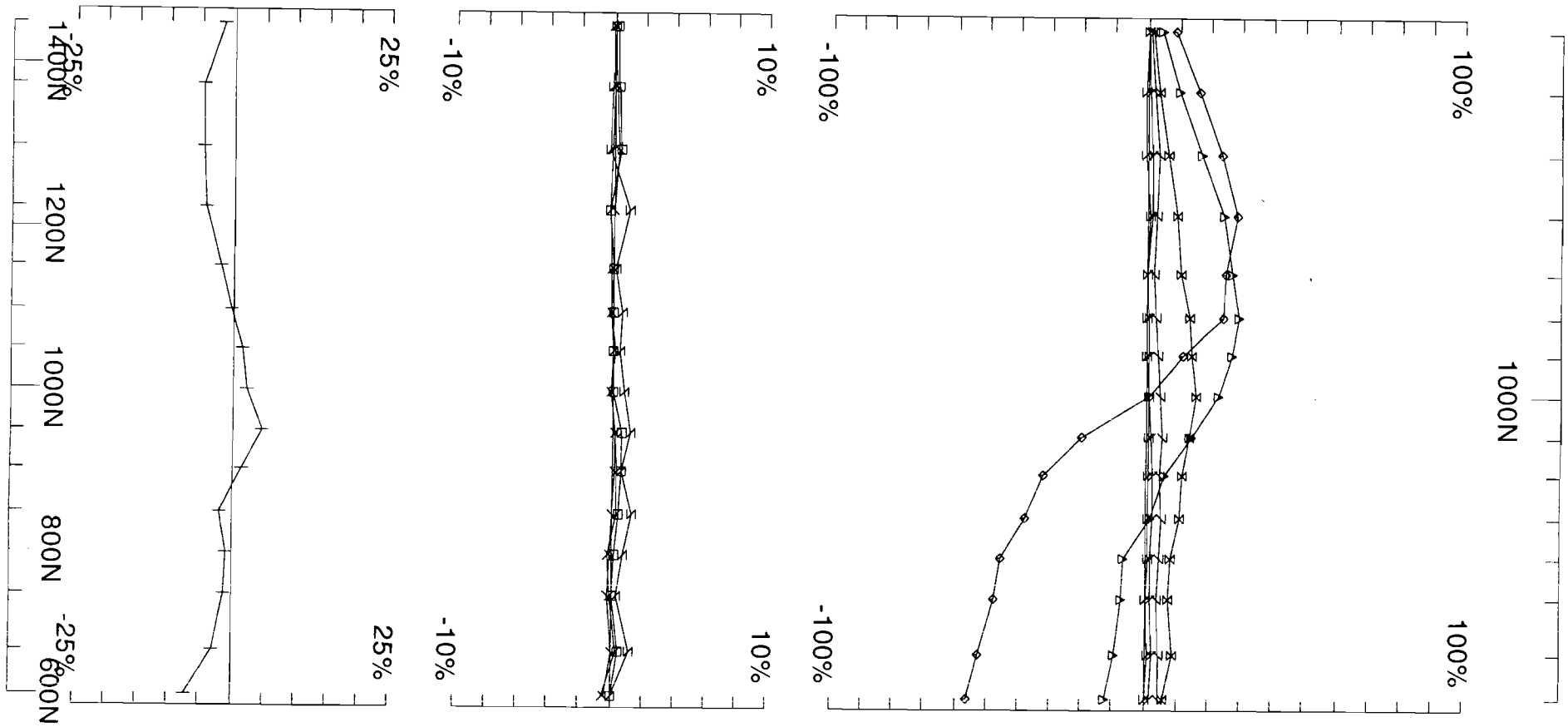
@3.872 Hz frequency

continuous norm

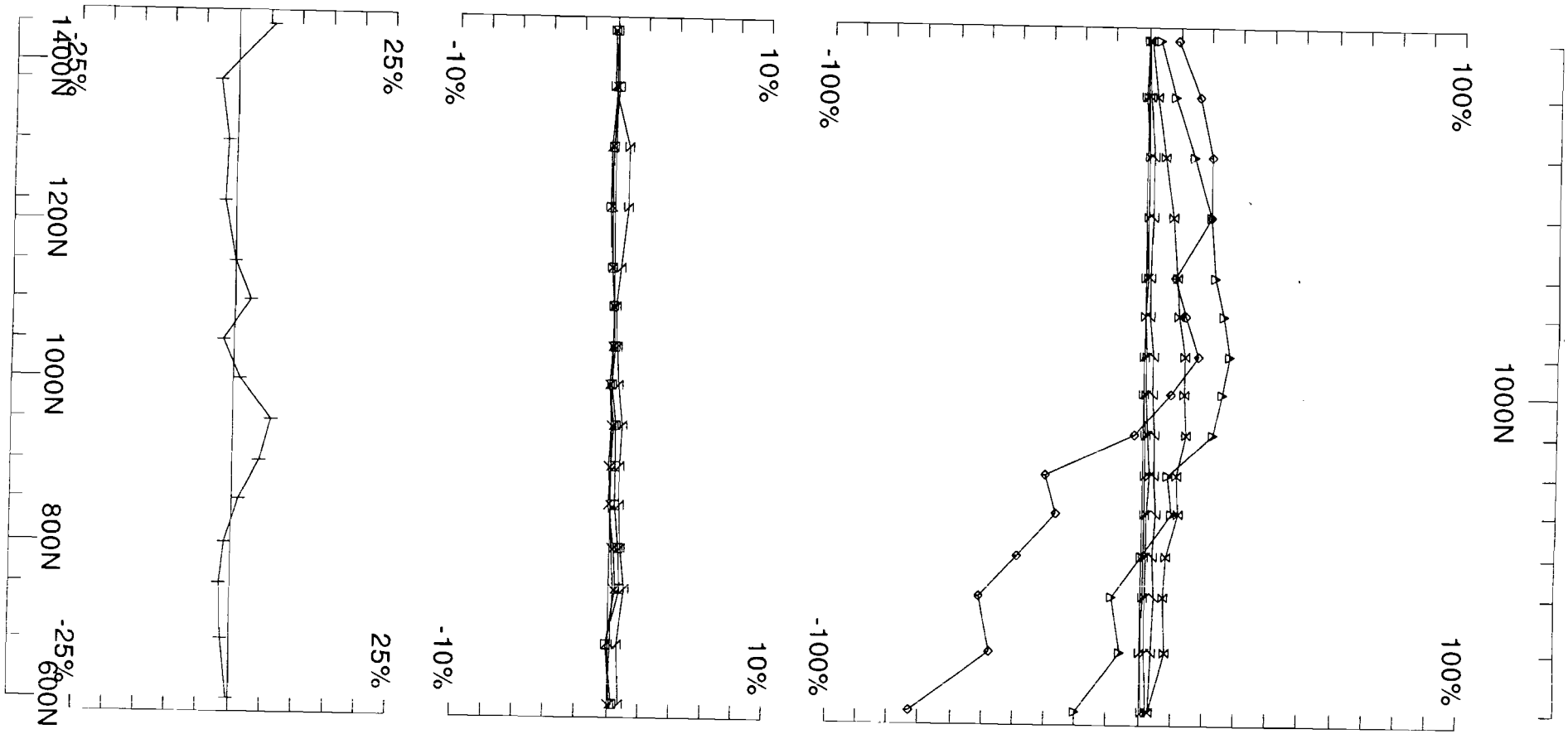
Ch1 reduced

Line 1900E	600N - 1500N
Line 2000E	600N - 1500N
Line 2100E	600N - 1500N
Line 2200E	600N - 1500N
Line 2300E	600N - 1500N
Line 2400E	500N - 1500N

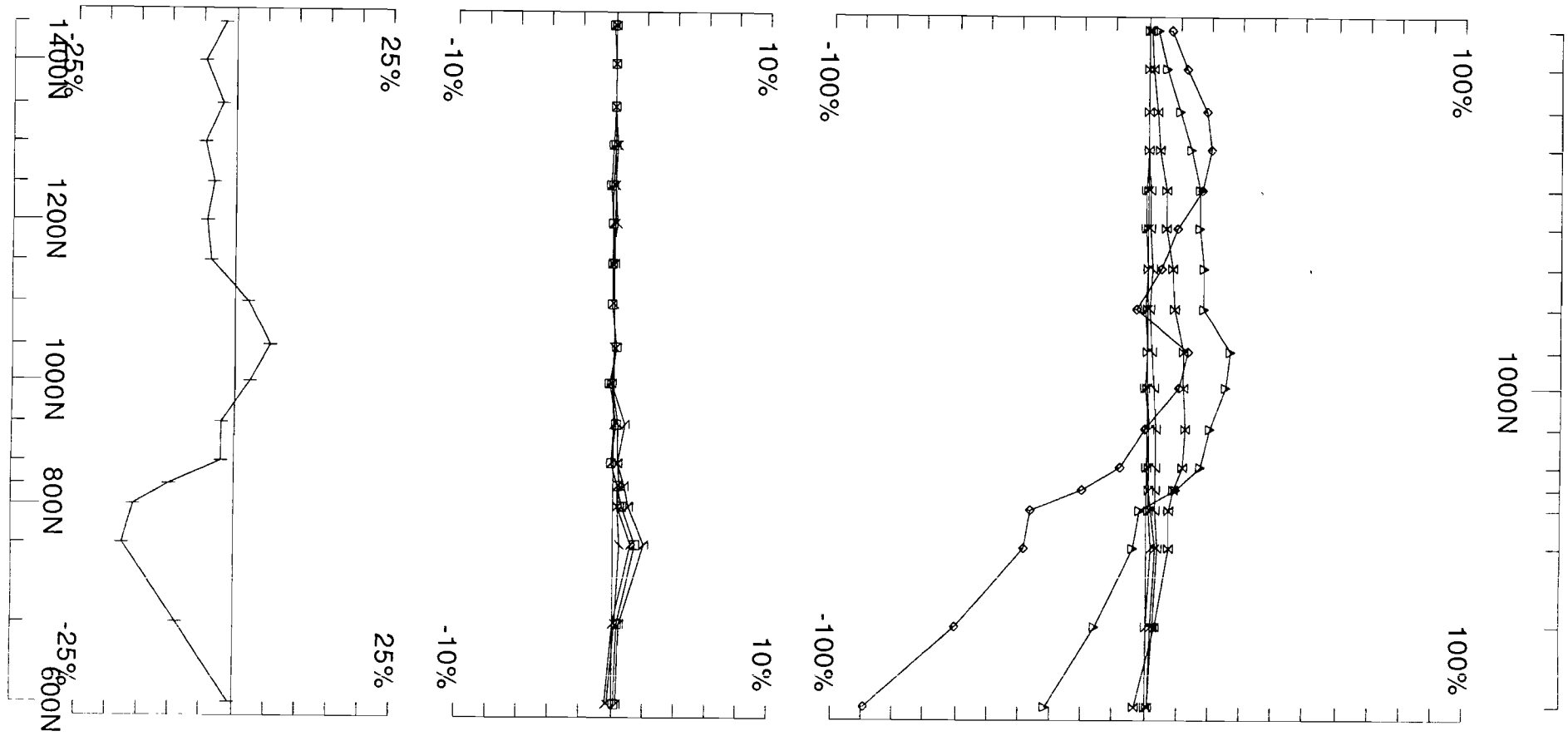
Loop 05 - continuous norm



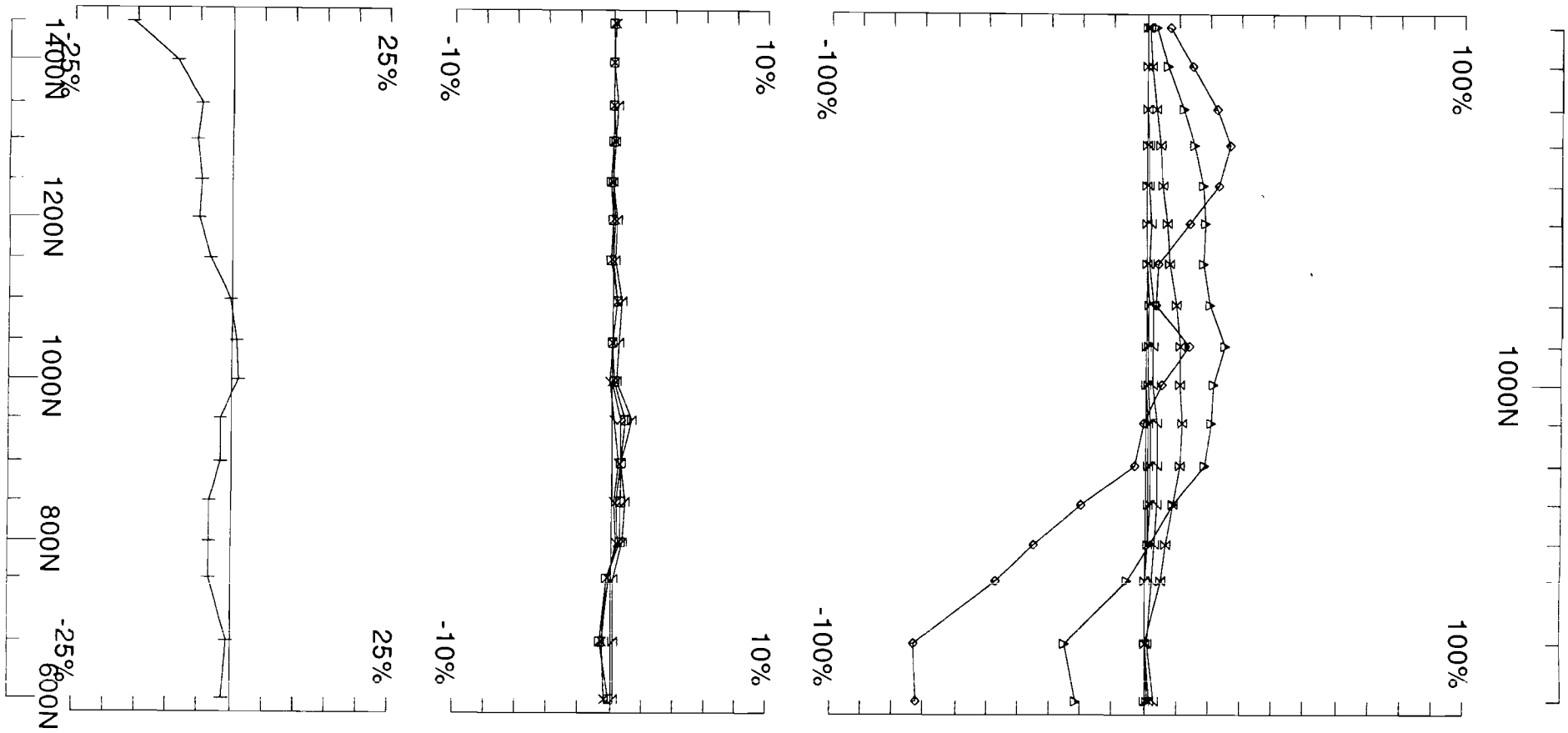
Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



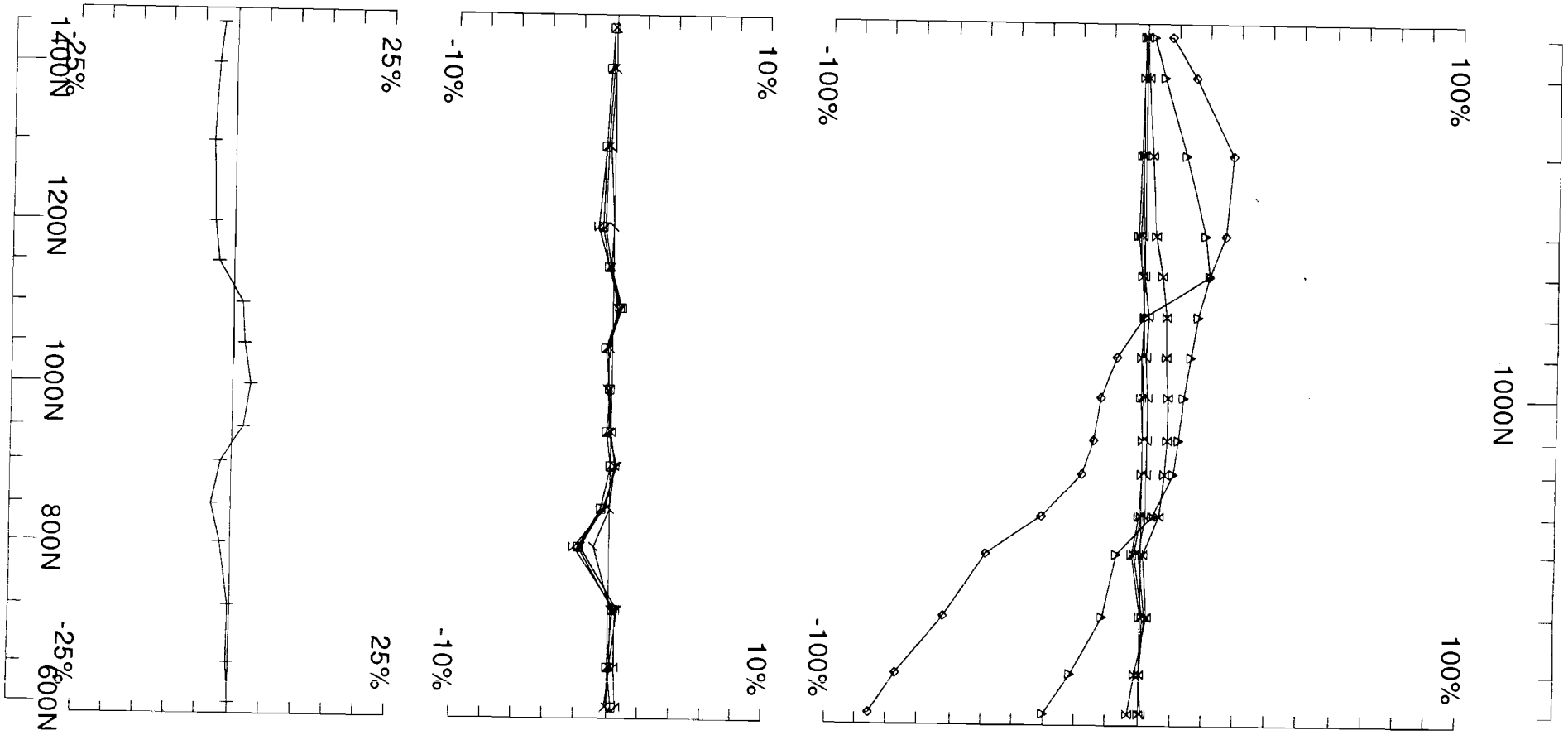
Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



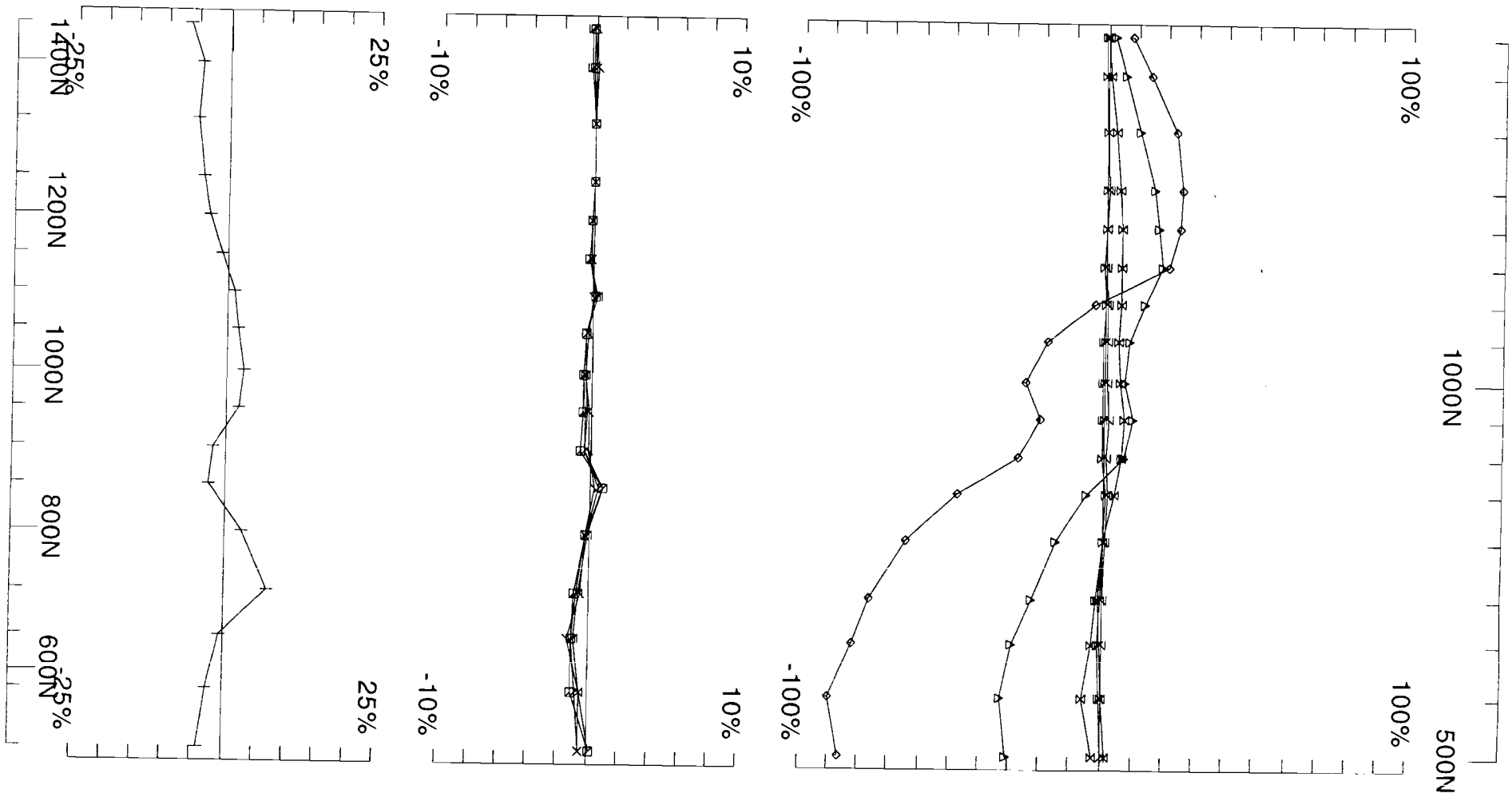
Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 5	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 30/3/8, Reduced : 2/10/8, Plotted : 20/10/8

Montcalm

Loop 17

Hz

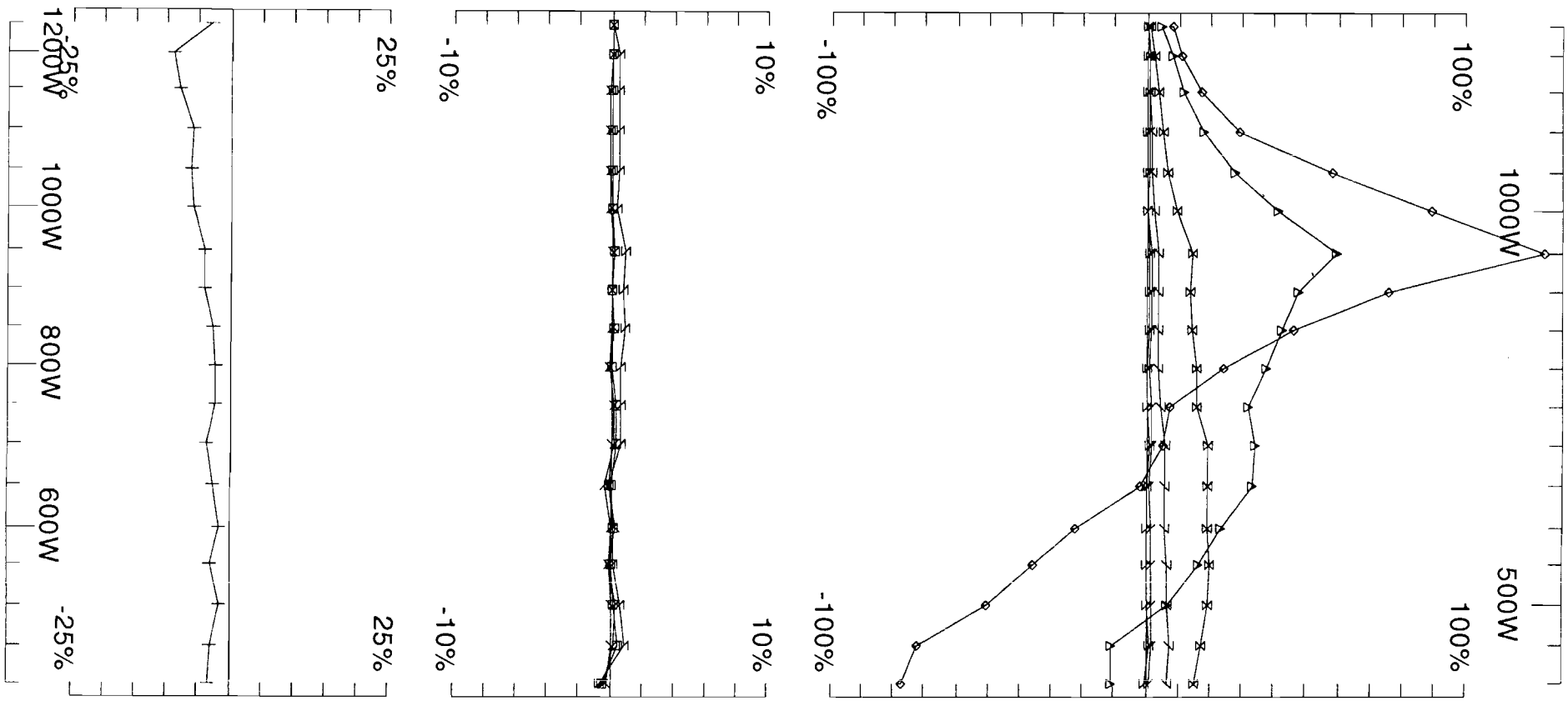
@3.872 Hz frequency

continuous norm

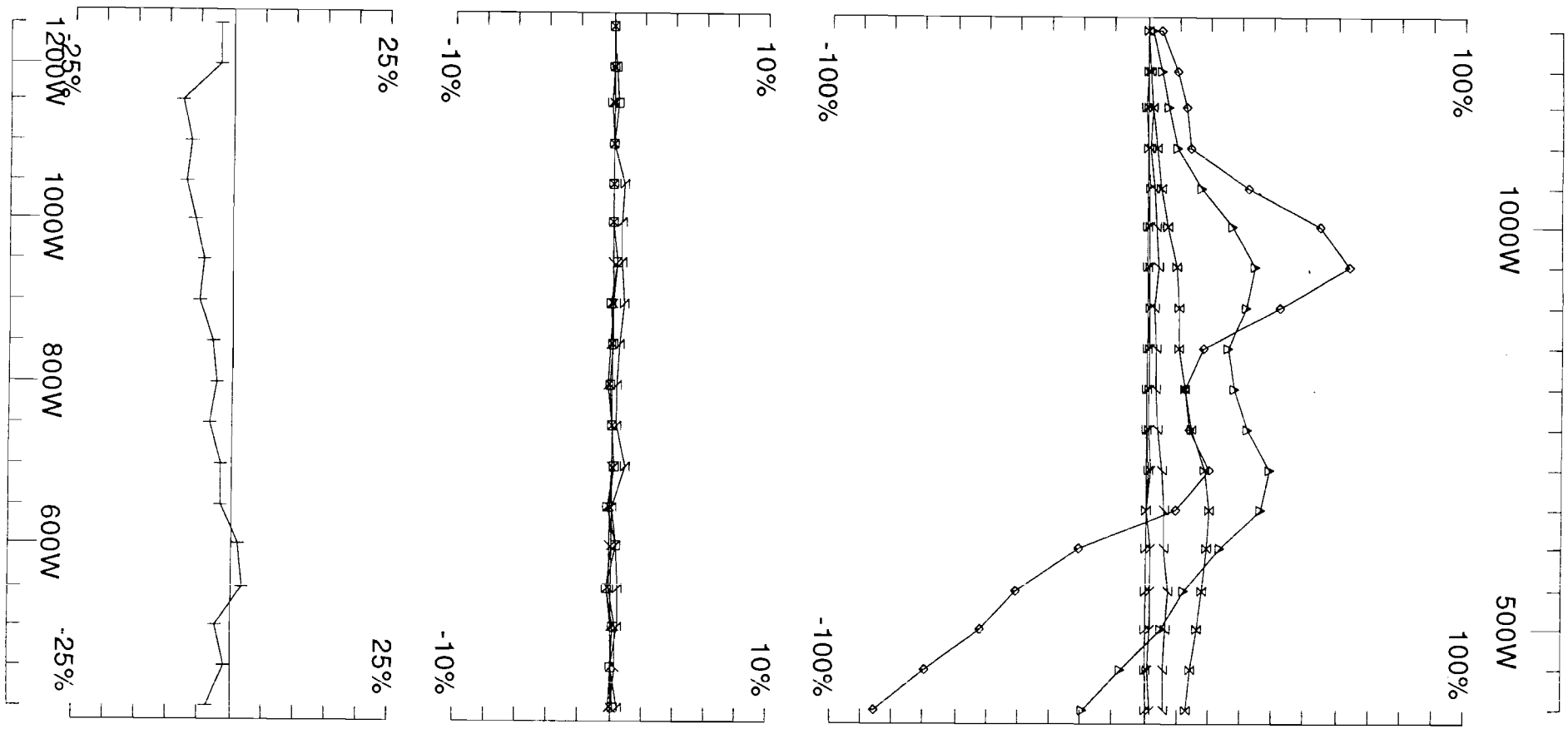
Ch1 reduced

Line 1000S	1300W - 400W
Line 1100S	1300W - 400W
Line 1200S	1300W - 400W
Line 1300S	1300W - 400W
Line 1400S	1300W - 400W
Line 1500S	1300W - 400W
Line 1600S	1300W - 400W
Line 1700S	1300W - 400W
Line 1800S	1300W - 400W
Line 1900S	1300W - 400W

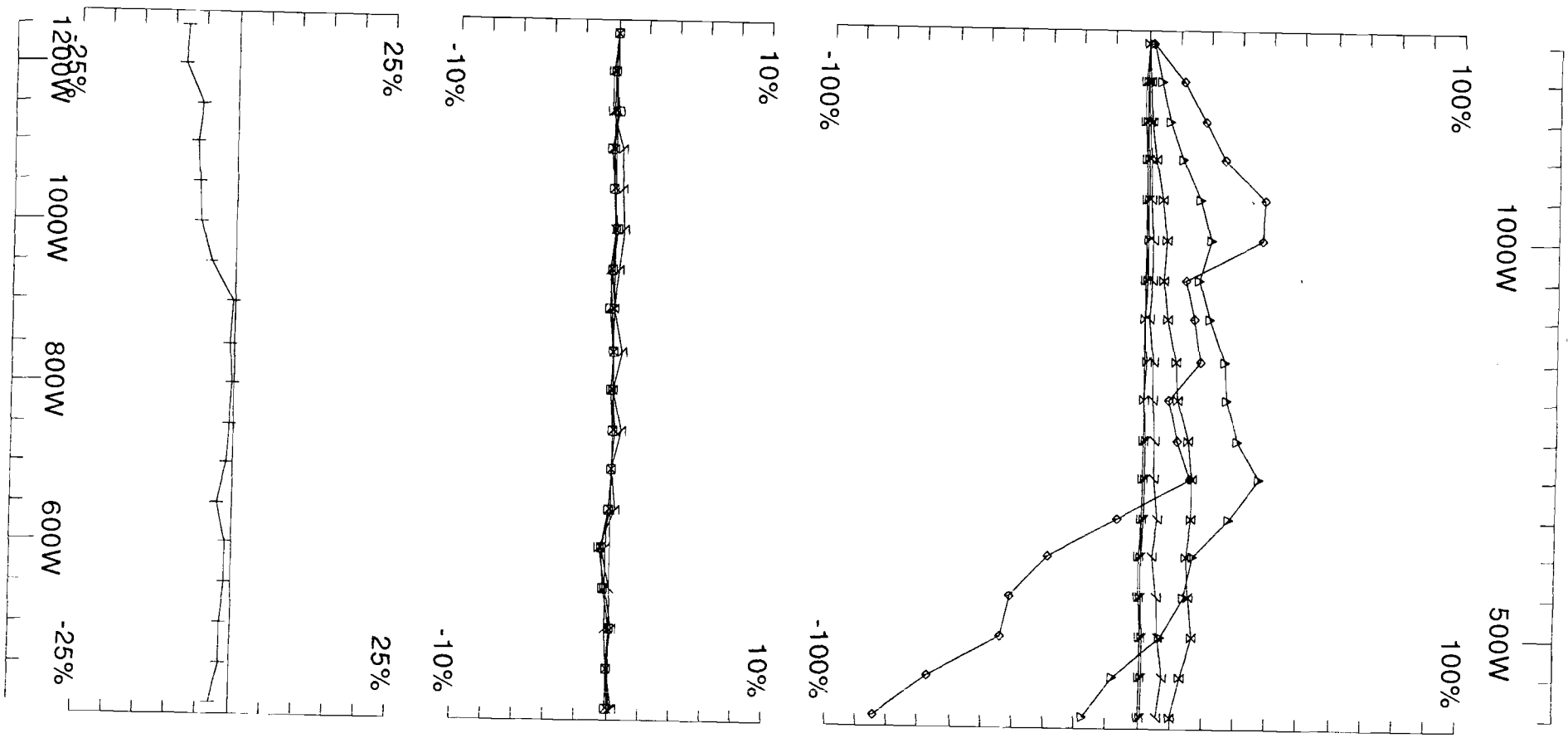
Loop 17 - continuous norm



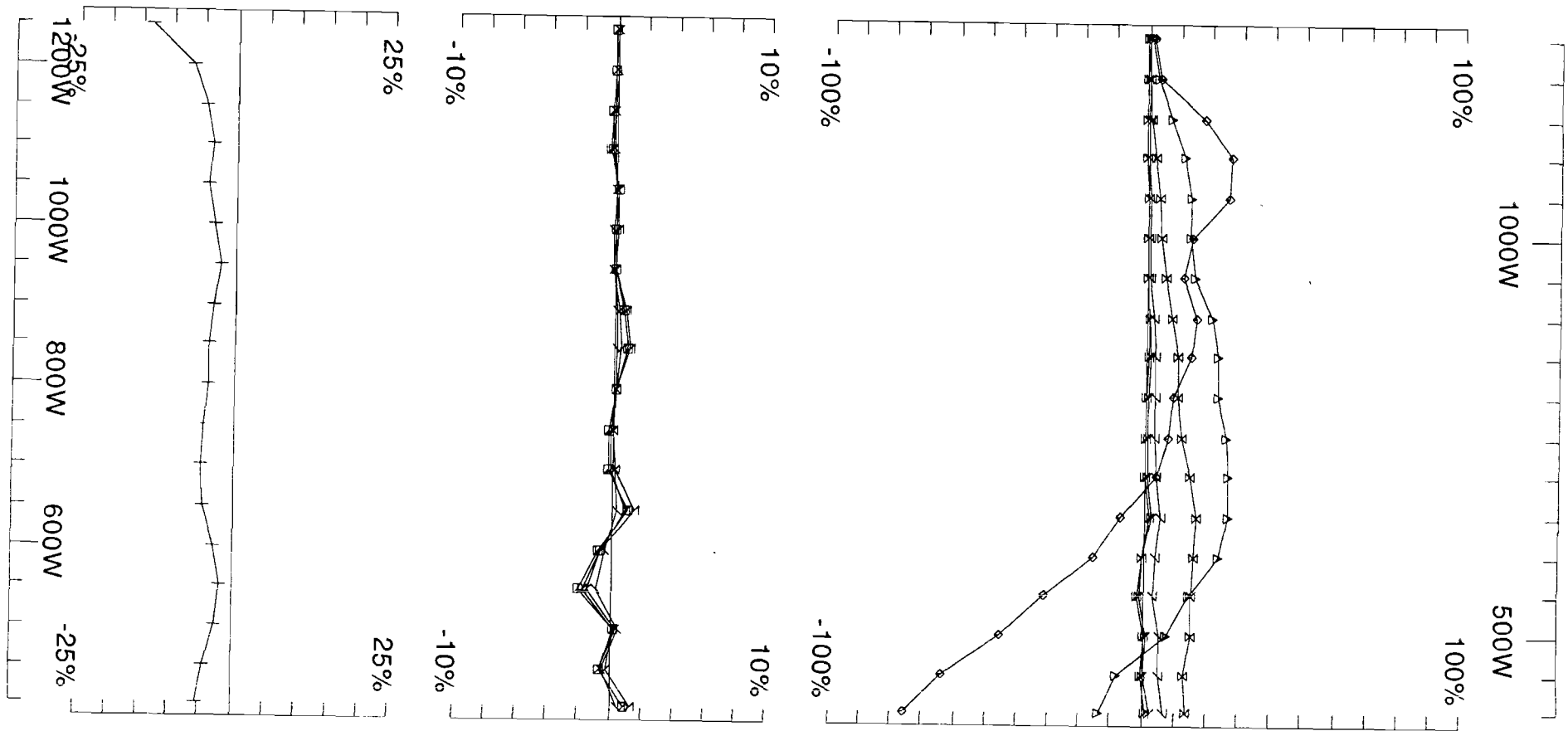
Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1000S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/3/8, Reduced : 2/10/8, Plotted : 20/10/8



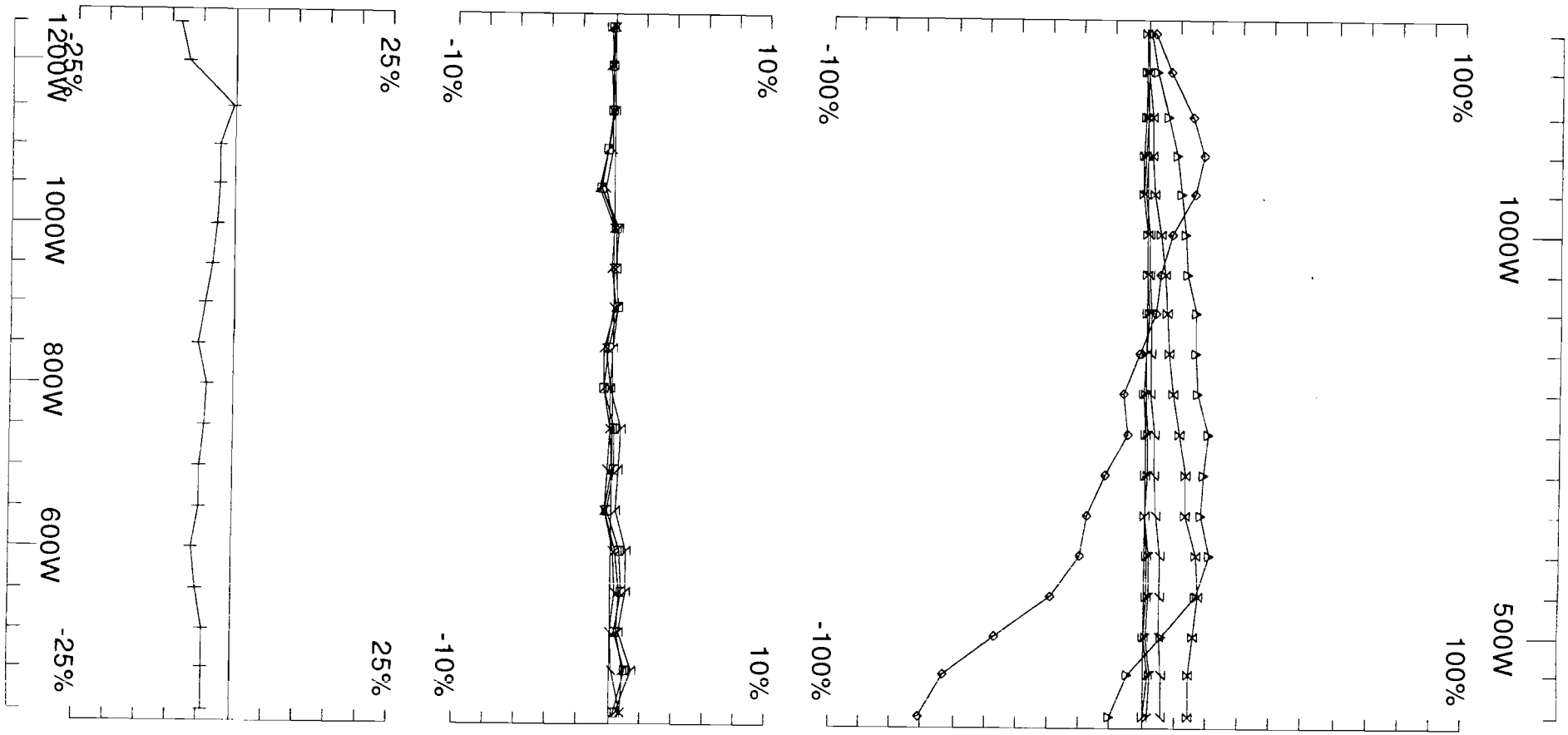
Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1100S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/3/8, Reduced : 2/10/8, Plotted : 20/10/8



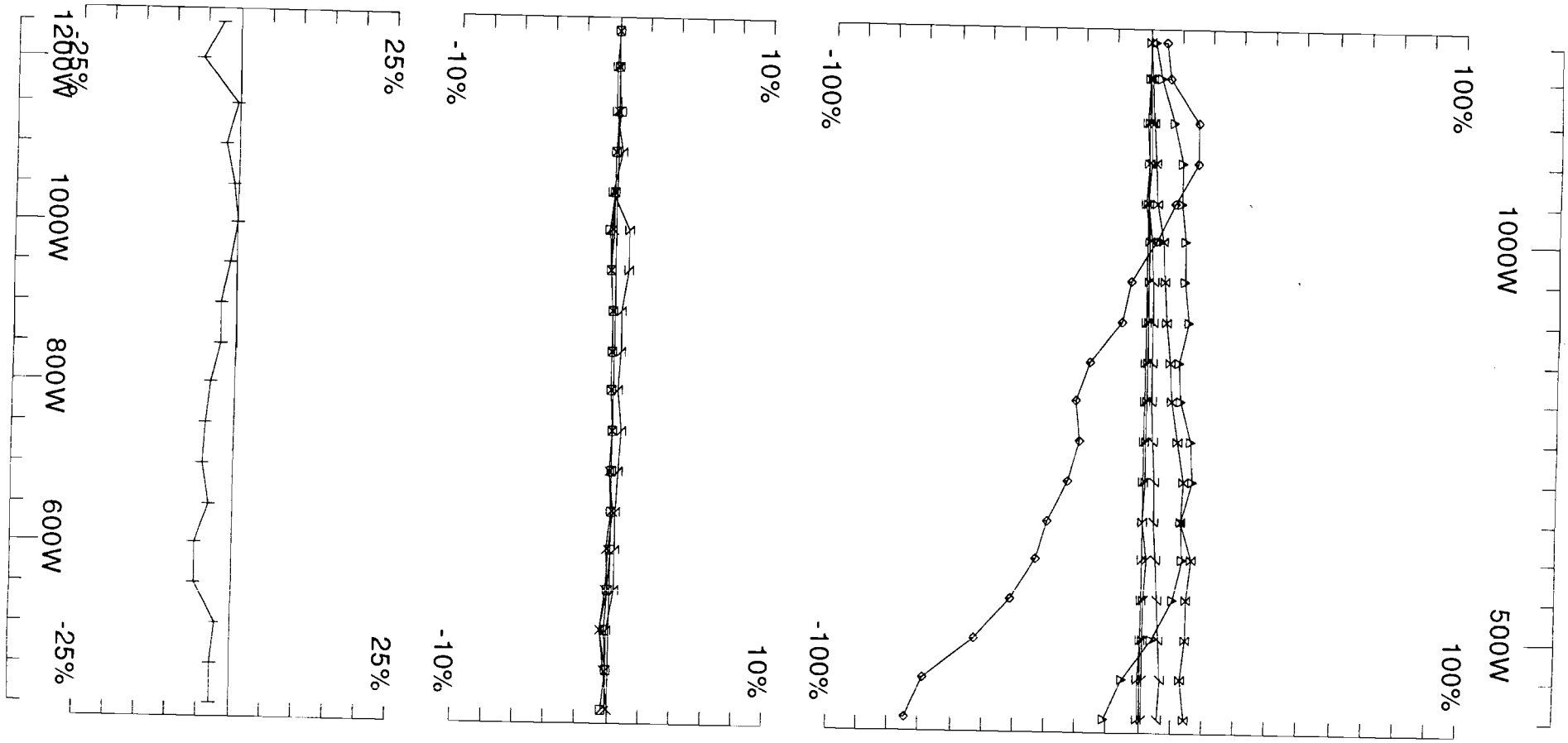
Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1200S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/4/8, Reduced : 2/10/8, Plotted : 20/10/8



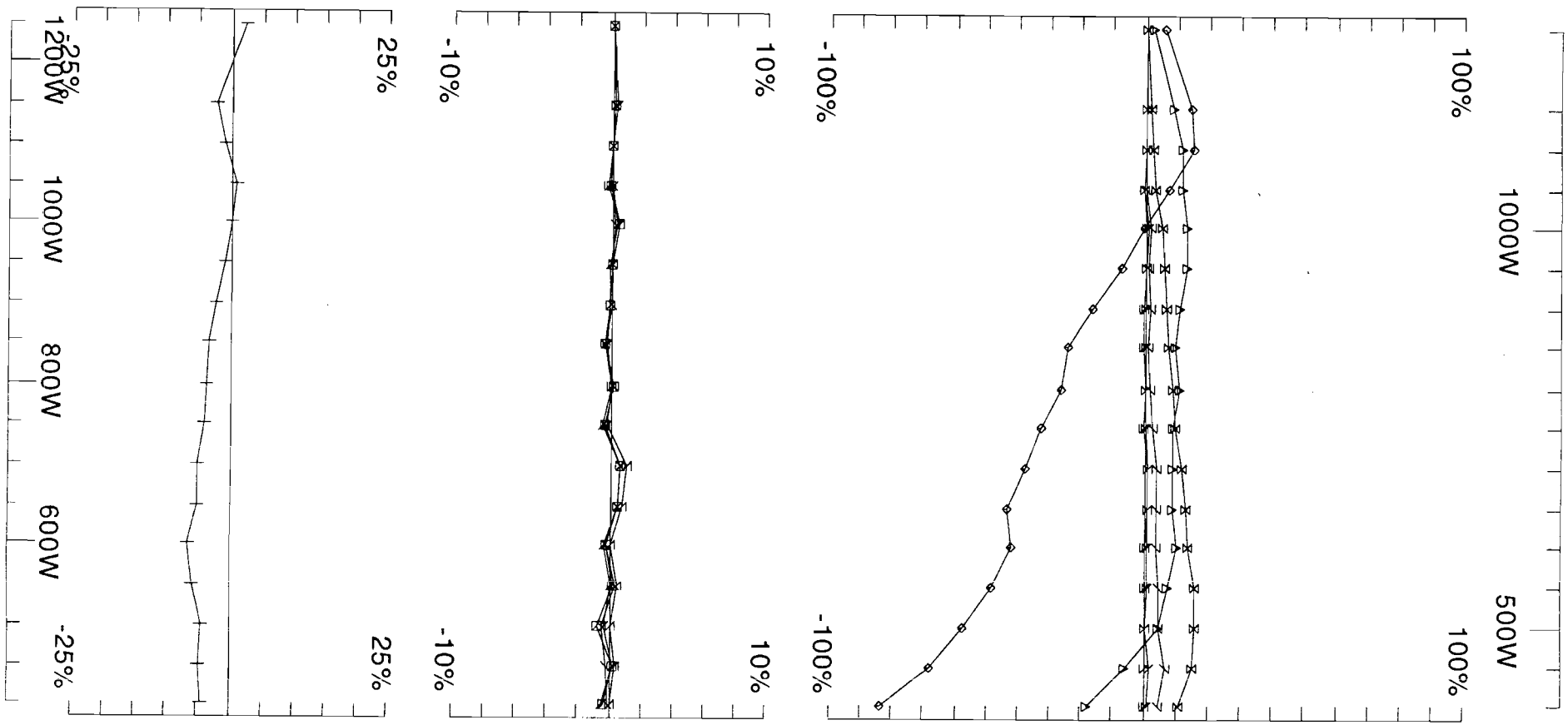
Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1300S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/3/8, Reduced : 2/10/8, Plotted : 20/10/8



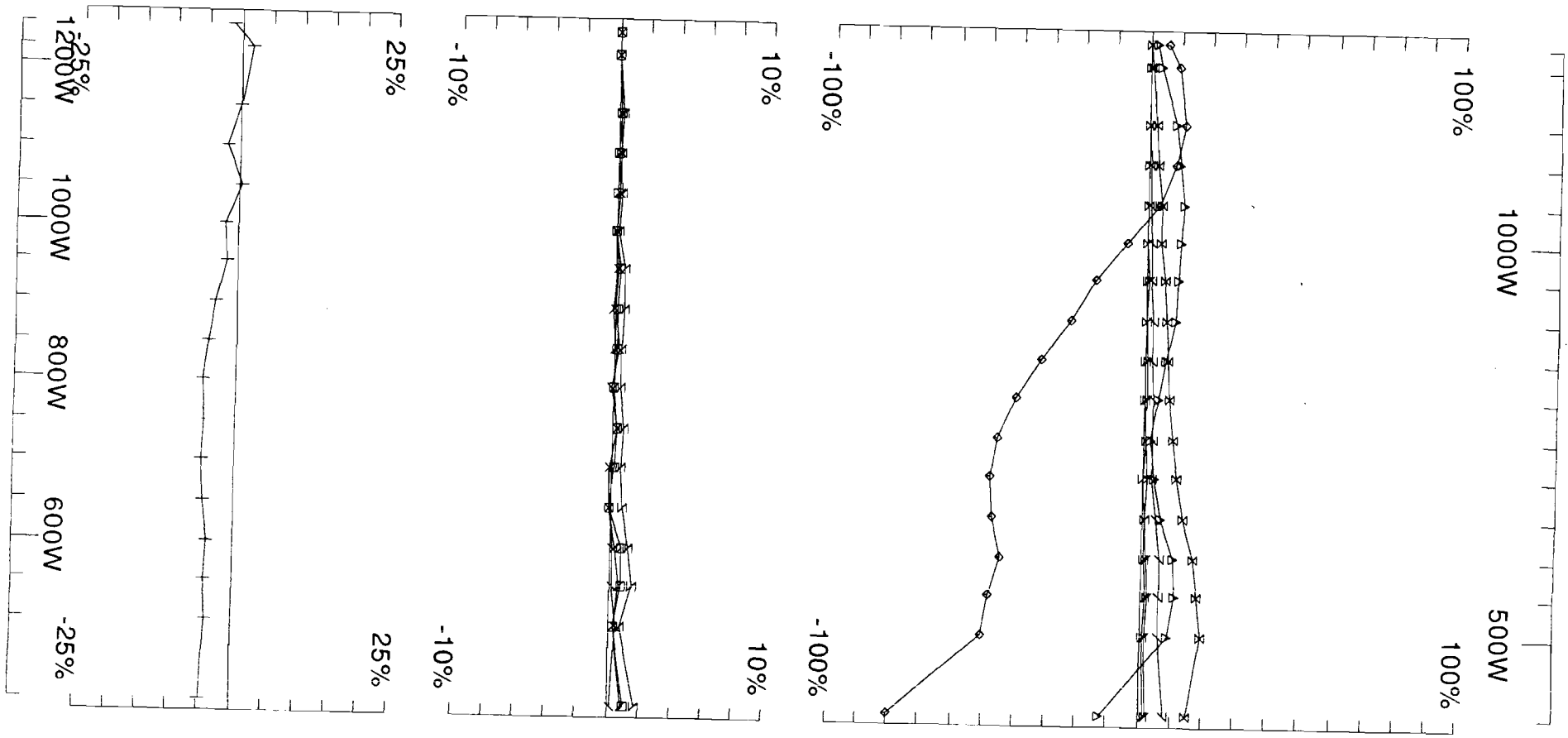
Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1400S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/3/8, Reduced : 2/10/8, Plotted : 20/10/8



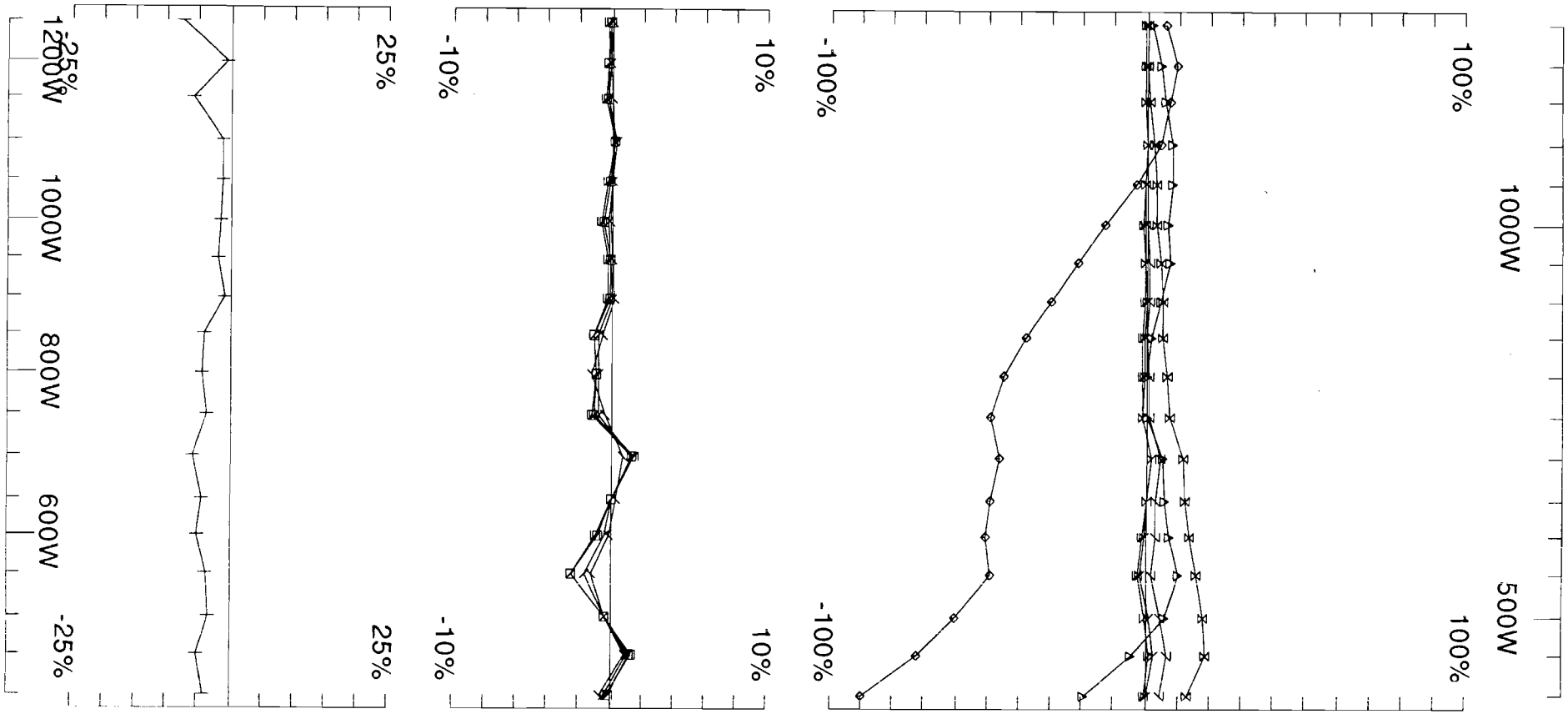
Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/4/8, Reduced : 2/10/8, Plotted : 20/10/8



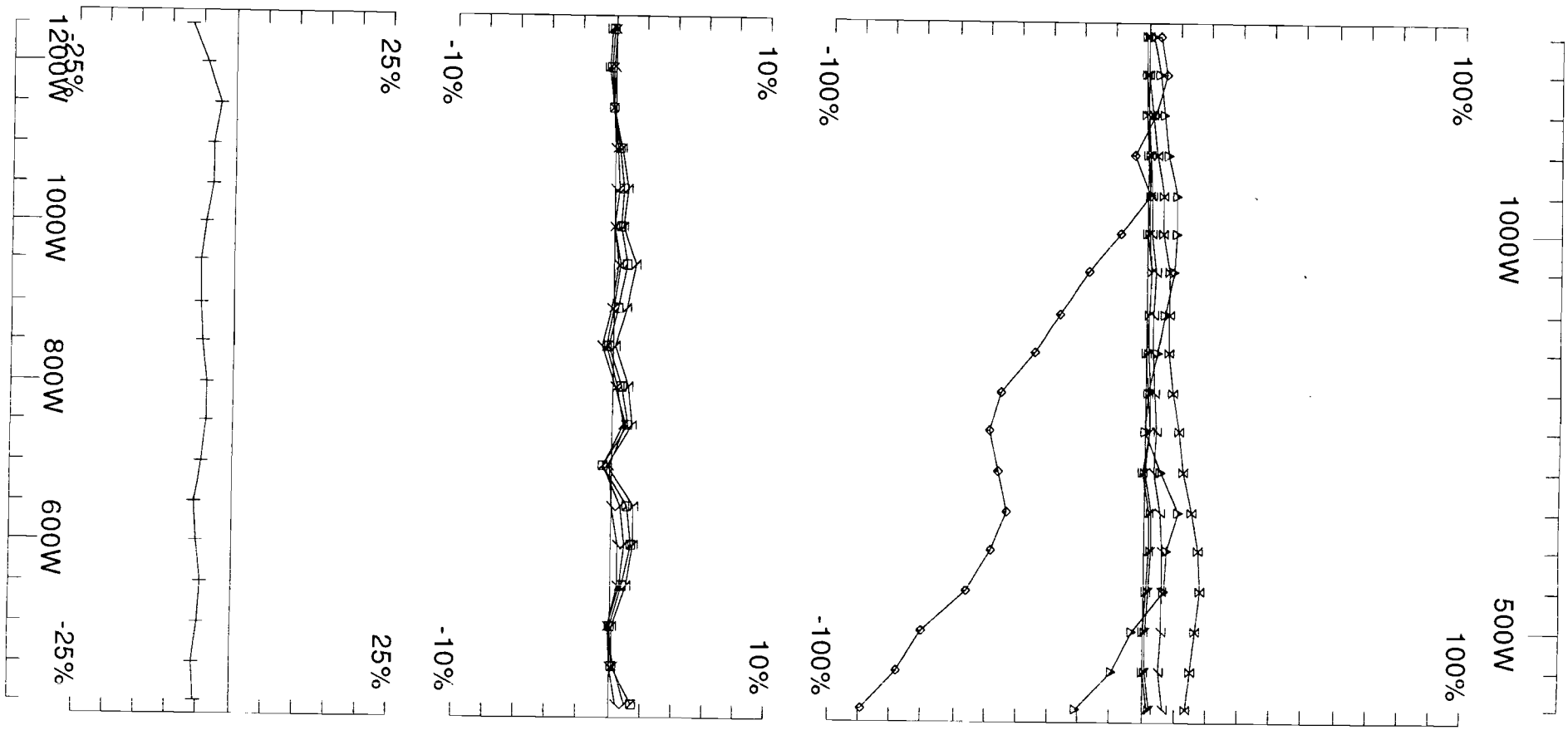
Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 3/4/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1700S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 3/4/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/4/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 17	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1900S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 4/4/8, Reduced : 2/10/8, Plotted : 20/10/8

Montcalm

Loop 18

Hz

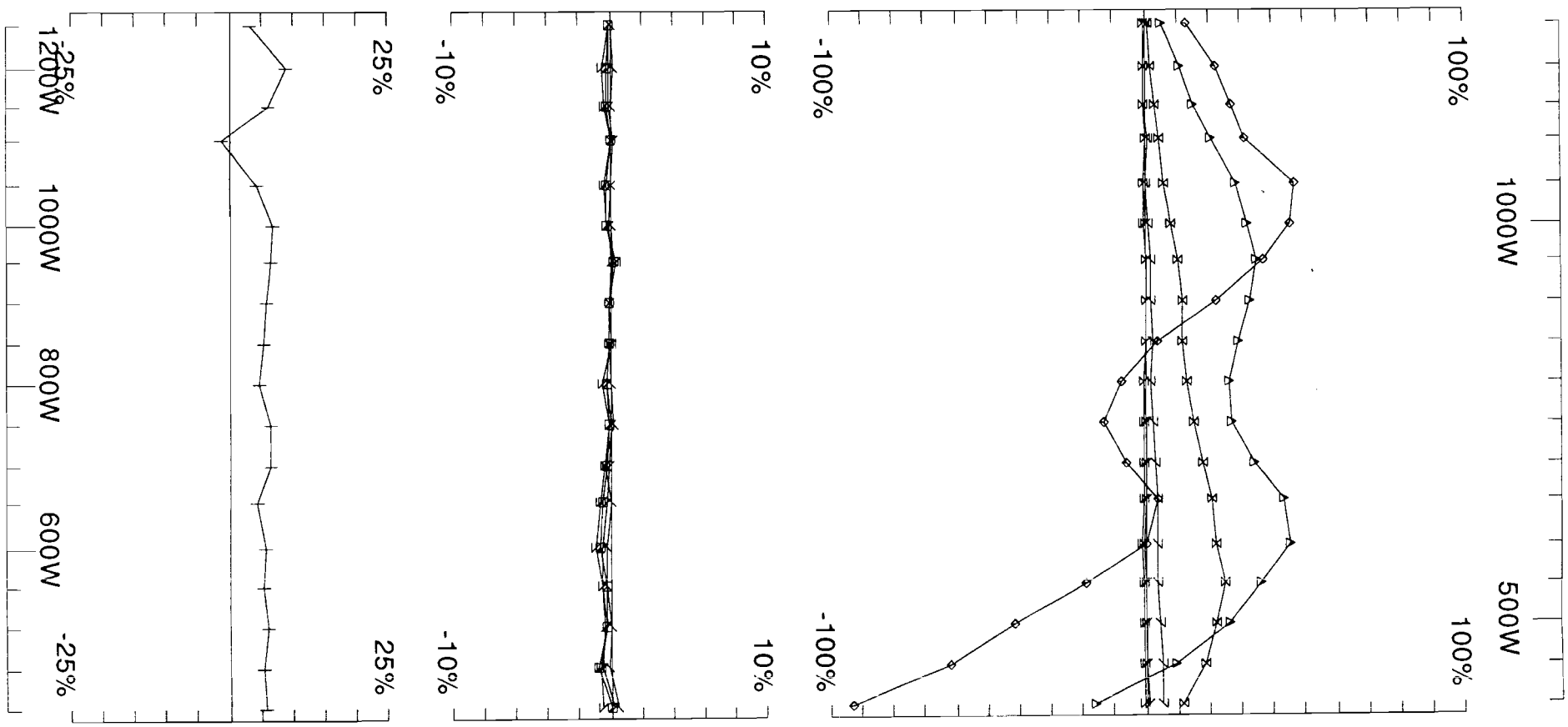
@3.872 Hz frequency

continuous norm

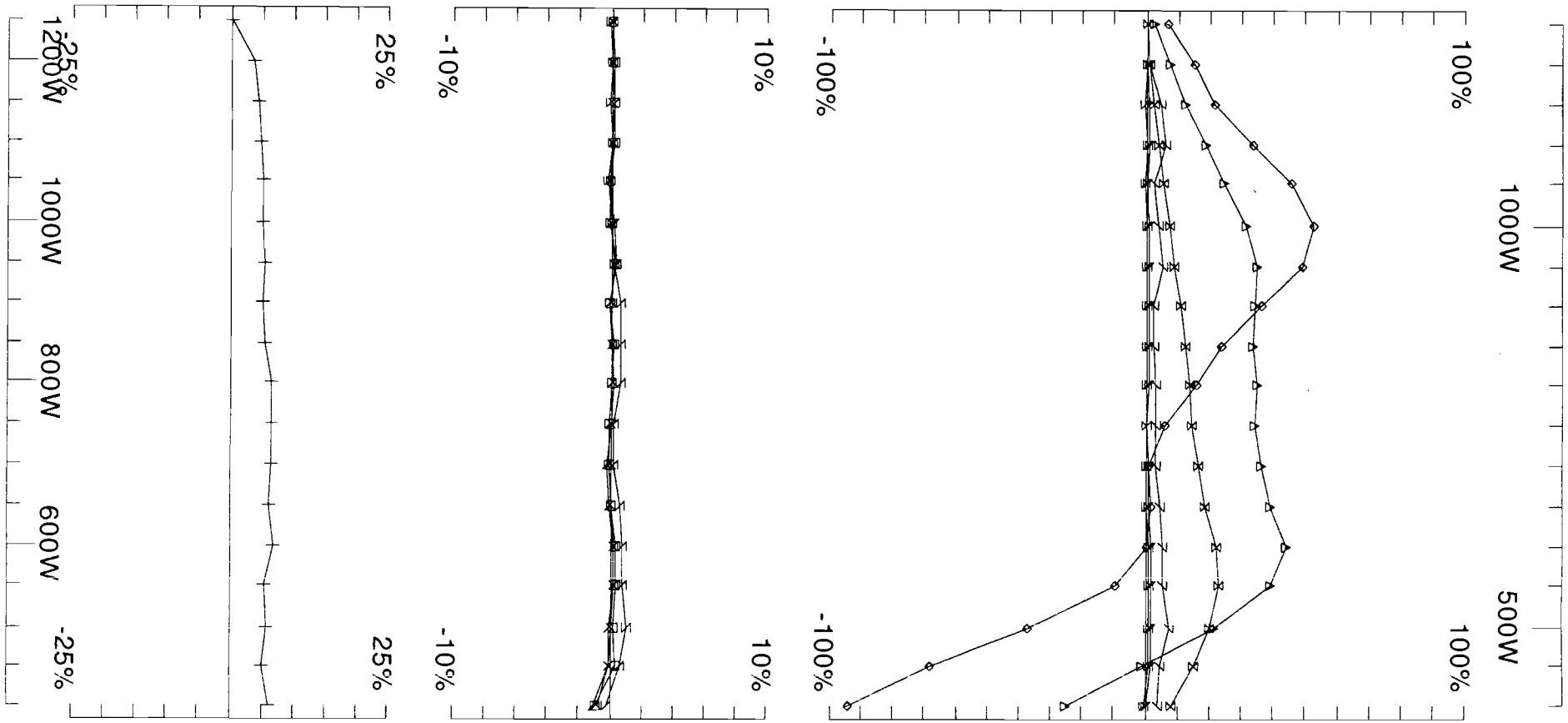
Ch1 reduced

Line 2000S	1300W - 400W
Line 2100S	1300W - 400W
Line 2200S	1300W - 400W
Line 2300S	1300W - 400W
Line 2400S	1300W - 400W
Line 2500S	1300W - 400W
Line 2600S	950W - 400W
Line 2700S	1300W - 400W
Line 2800S	1300W - 400W
Line 2900S	1300W - 400W
Line 3000S	1300W - 400W

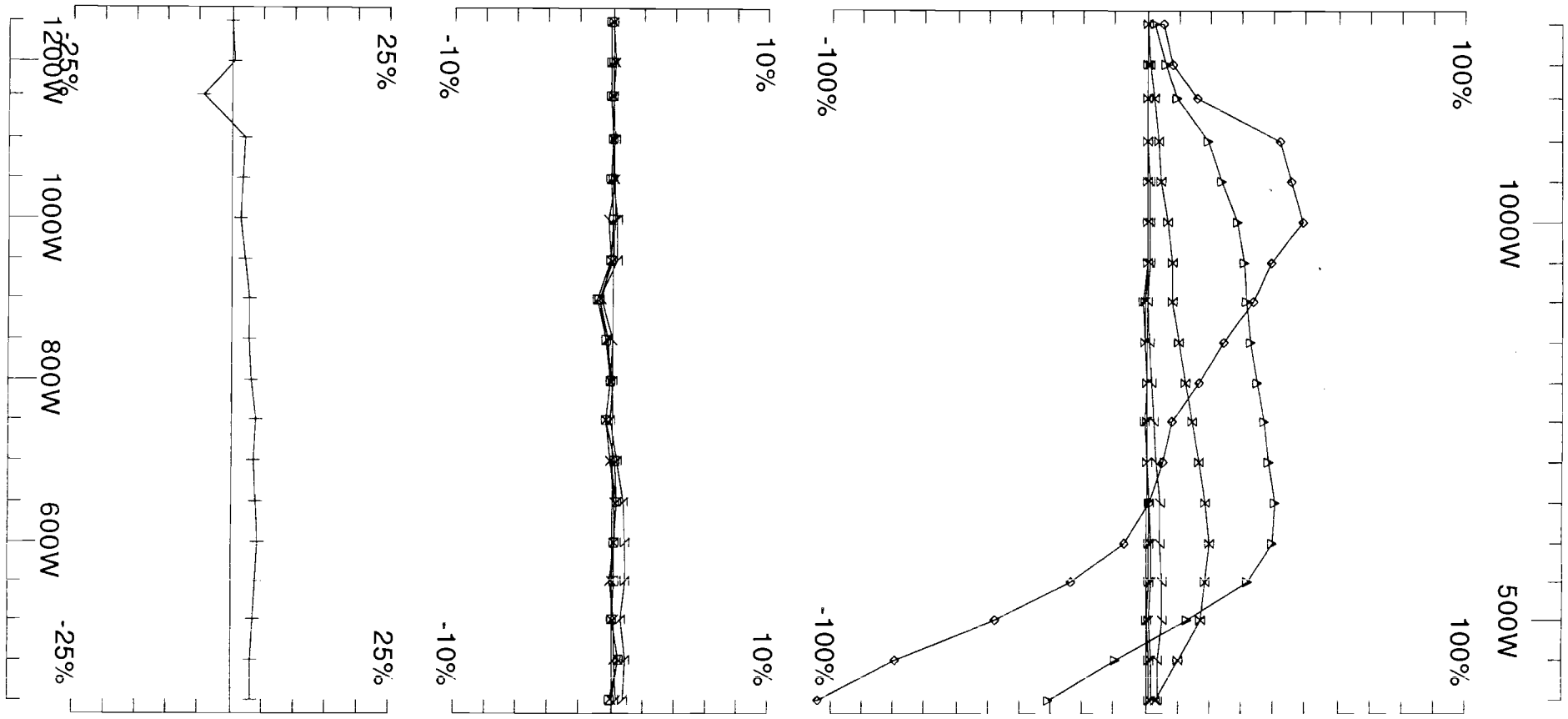
Loop 18 - continuous norm



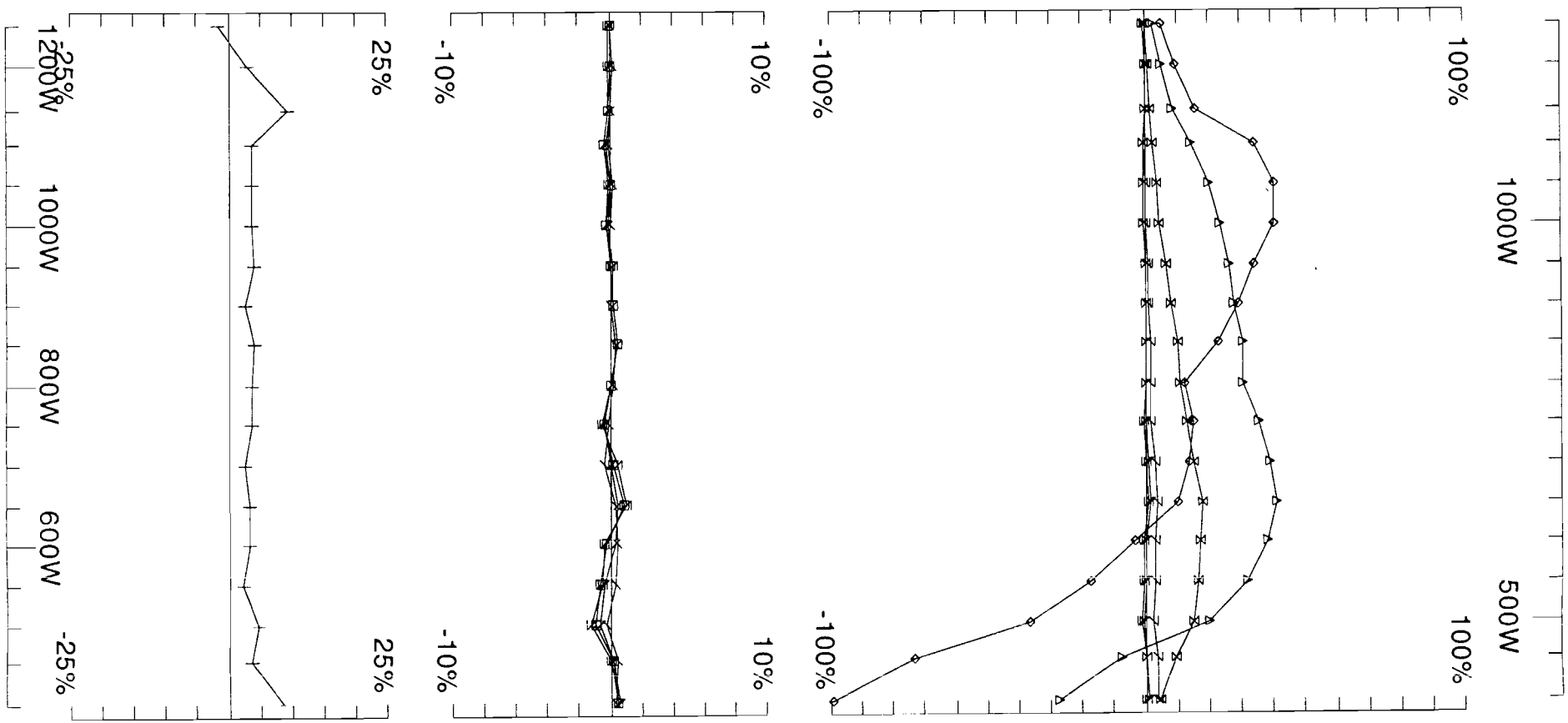
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2000S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 5/4/8, Reduced : 14/10/8, Plotted : 20/10/8



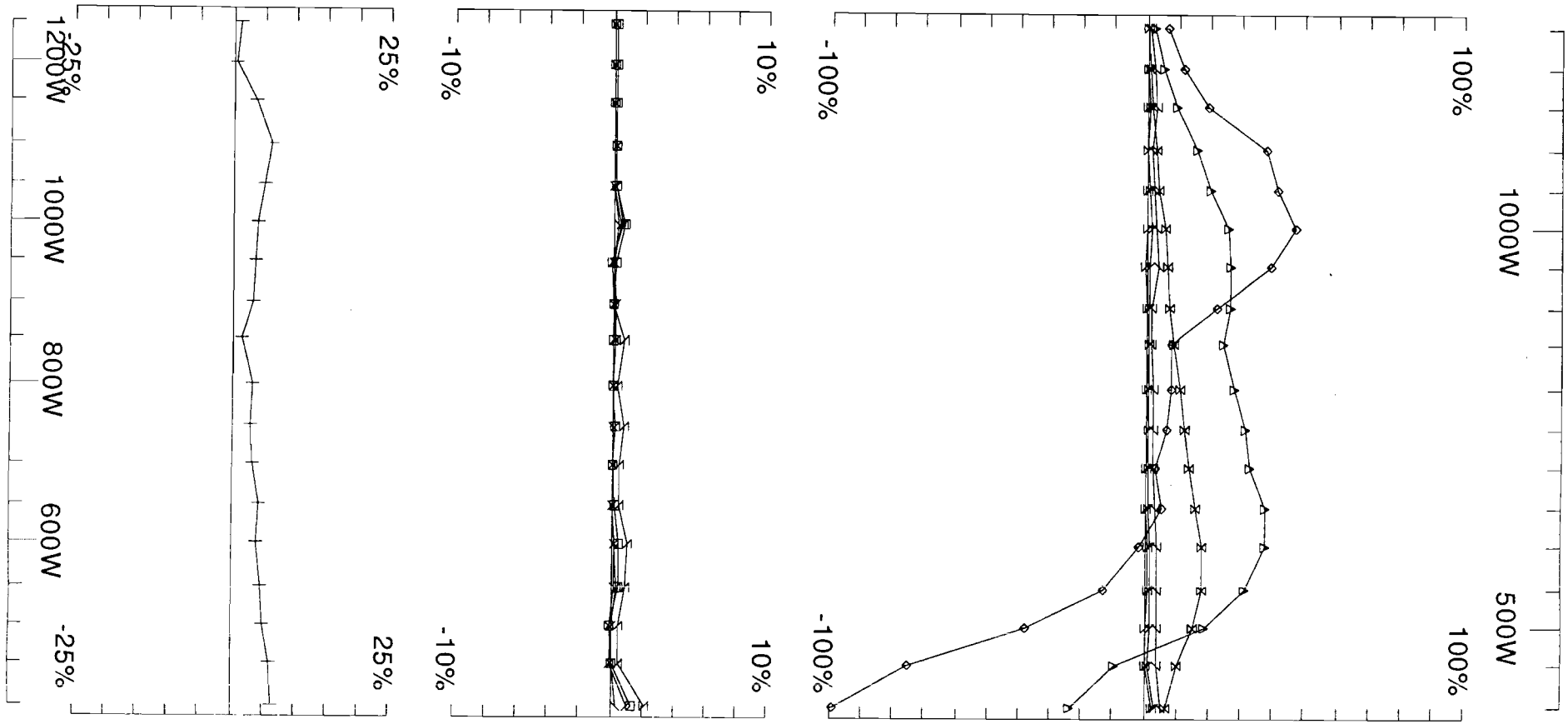
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2100S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 14/10/8, Plotted : 20/10/8



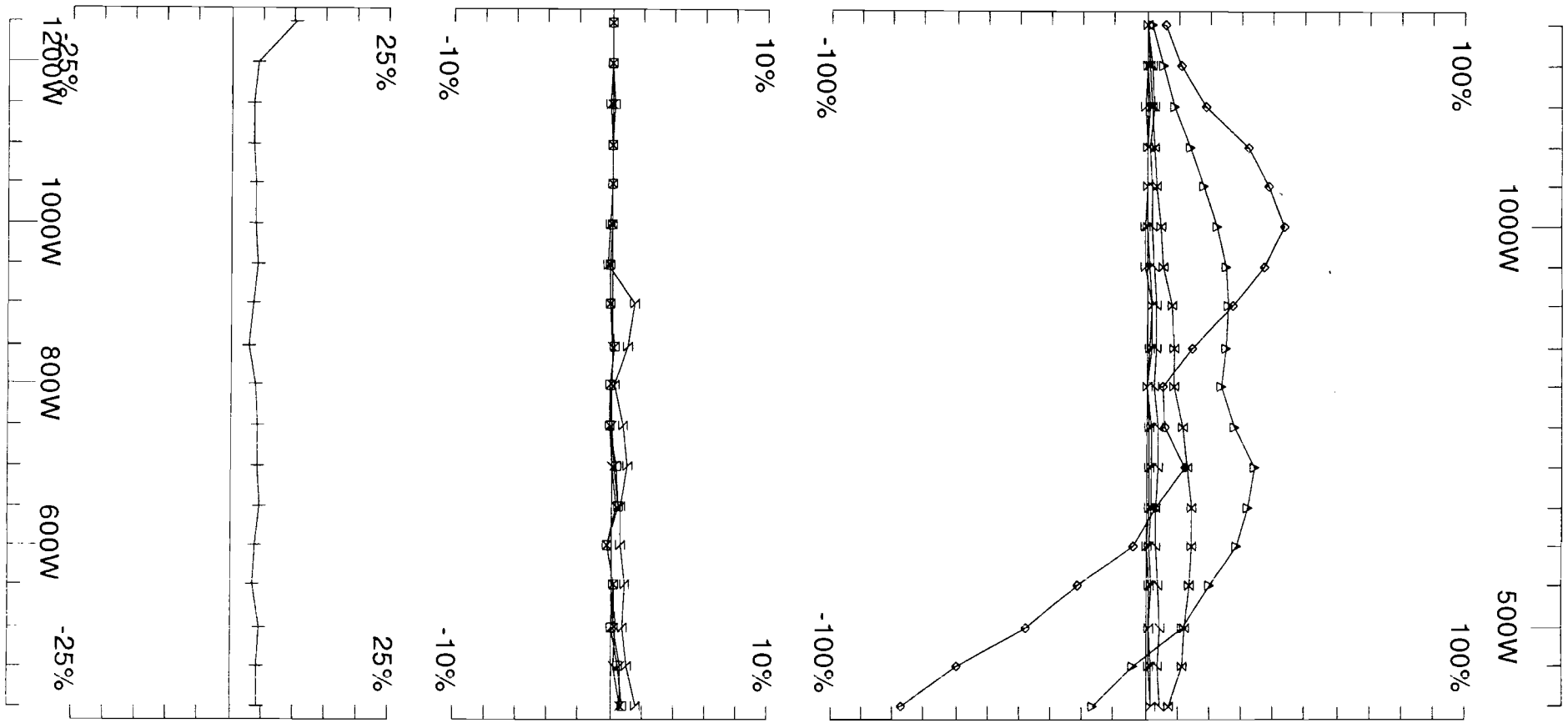
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2200S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 5/4/8, Reduced : 14/10/8, Plotted : 20/10/8



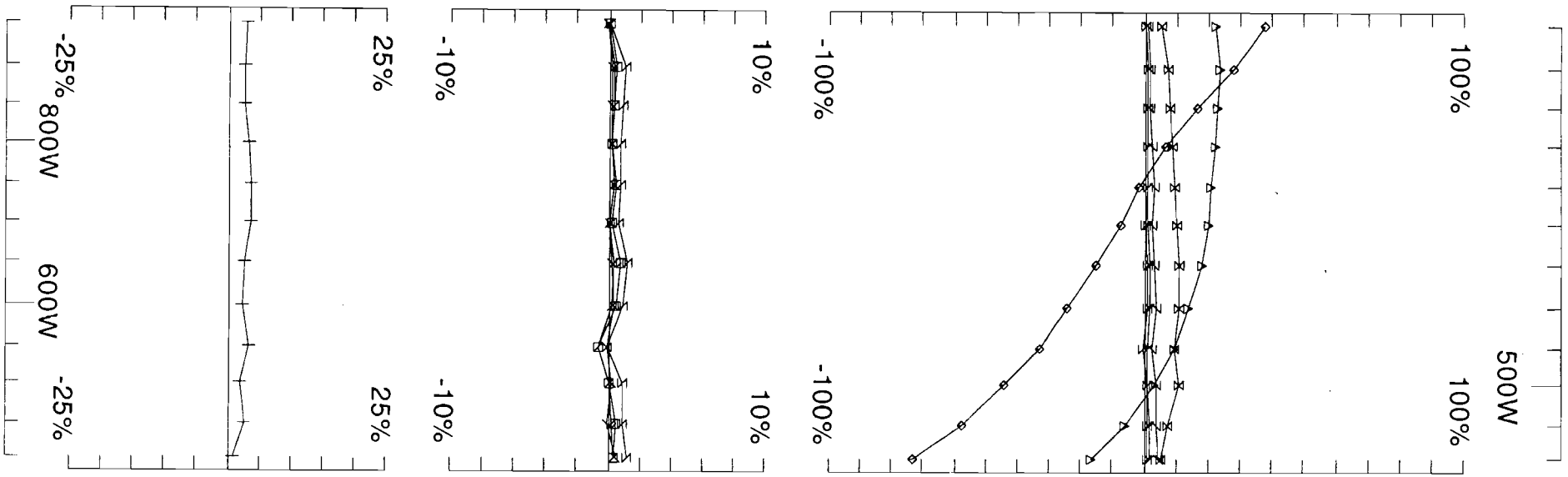
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2300S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 5/4/8, Reduced : 14/10/8, Plotted : 20/10/8



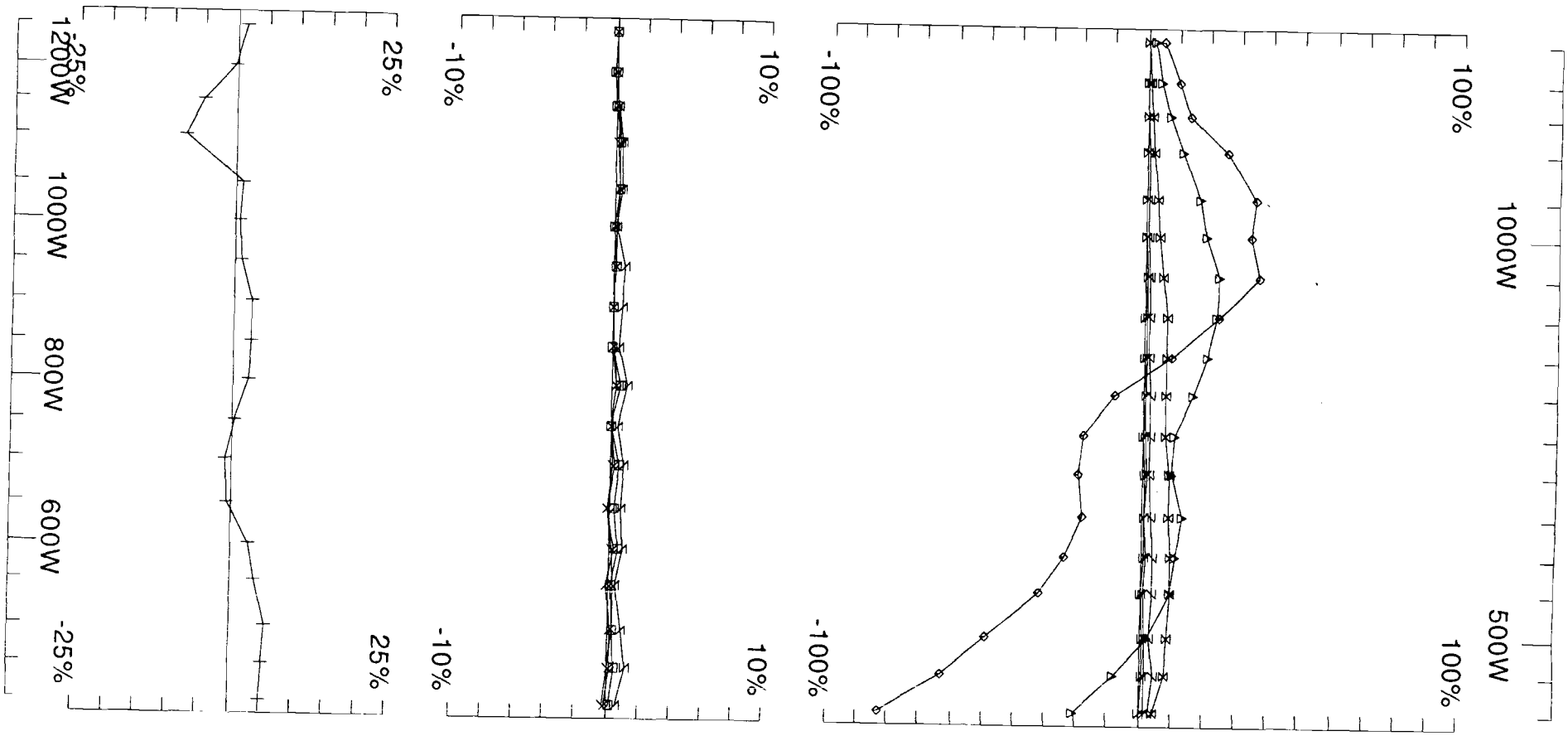
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2400S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 14/10/8, Plotted : 20/10/8



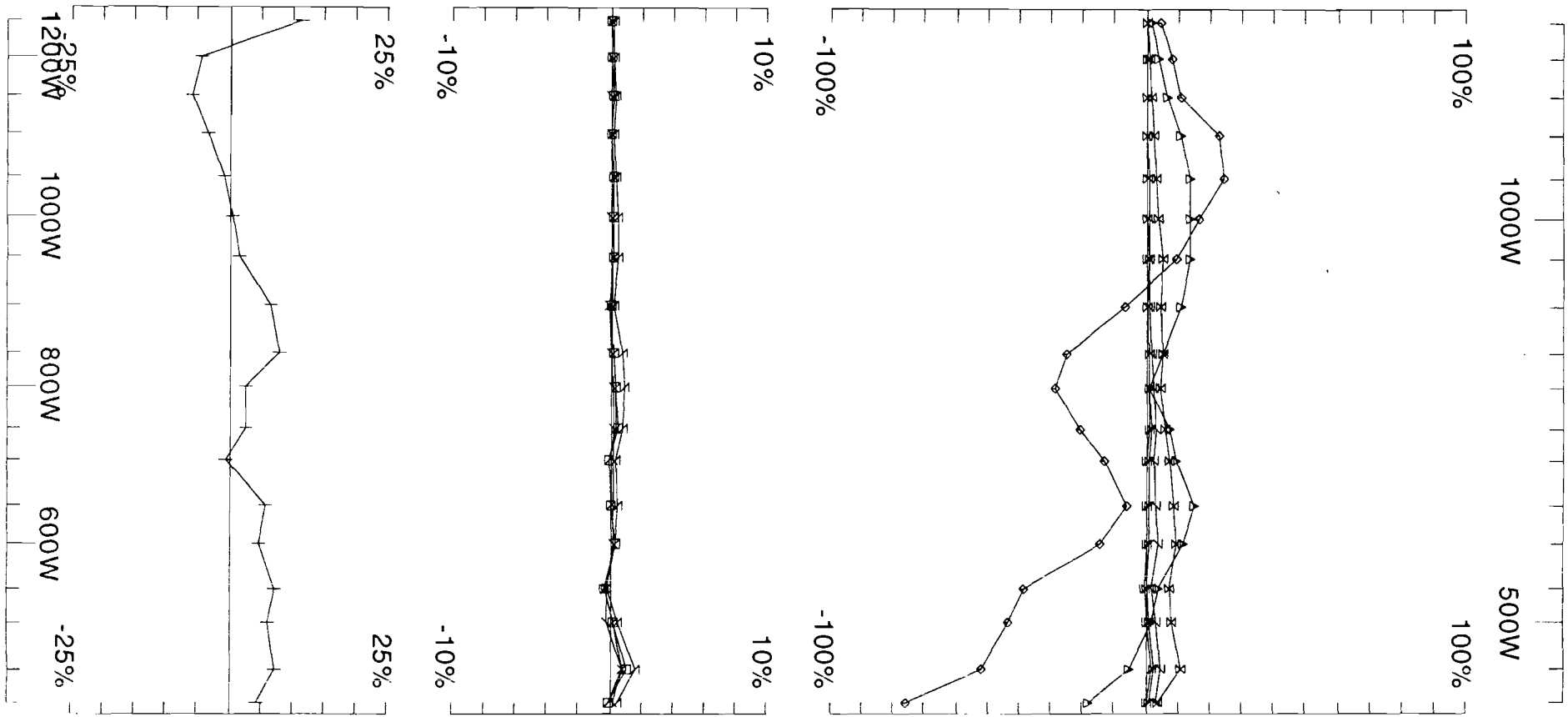
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 14/10/8, Plotted : 20/10/8



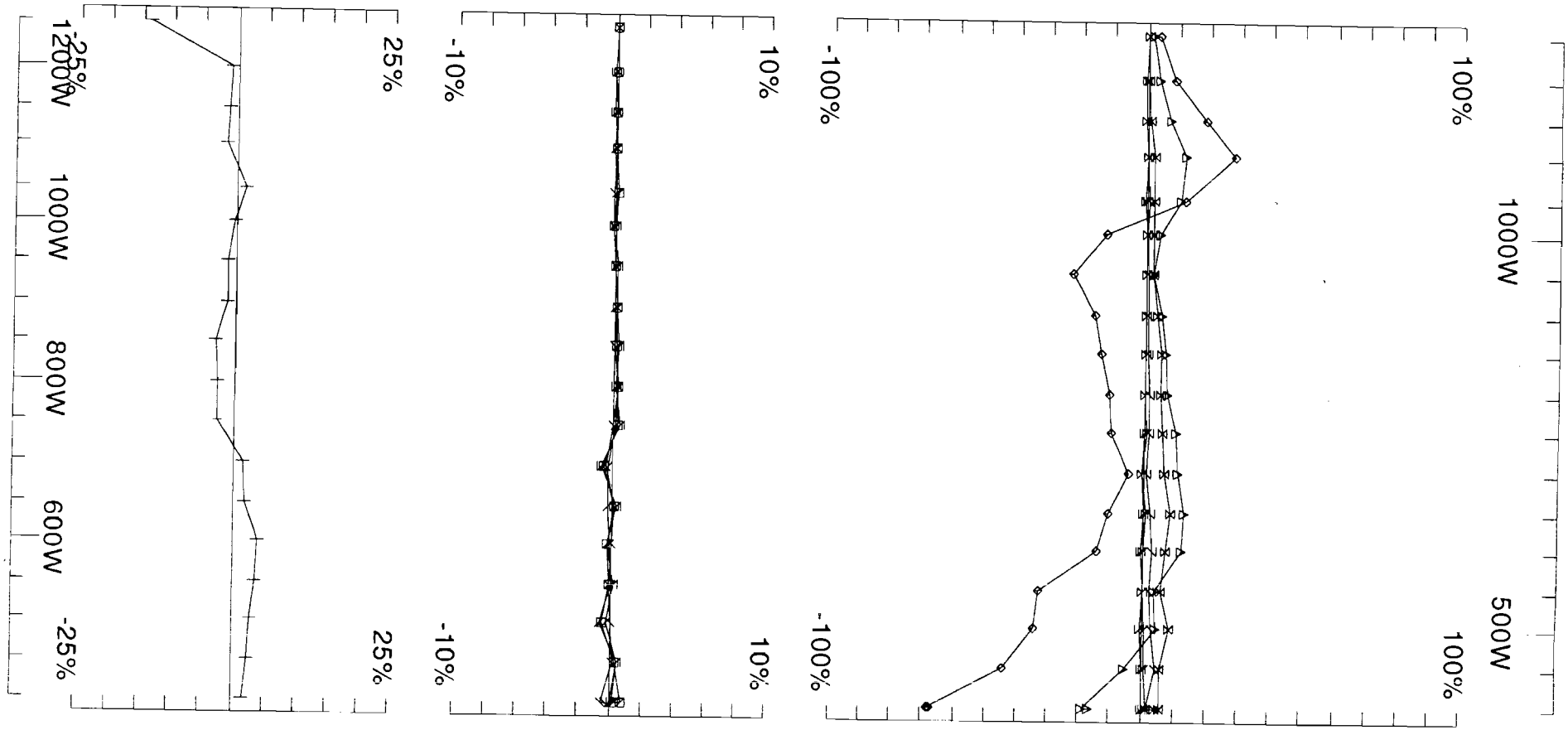
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812 Surveyed : 8/4/8 Reduced : 14/10/8 Plotted : 20/10/8



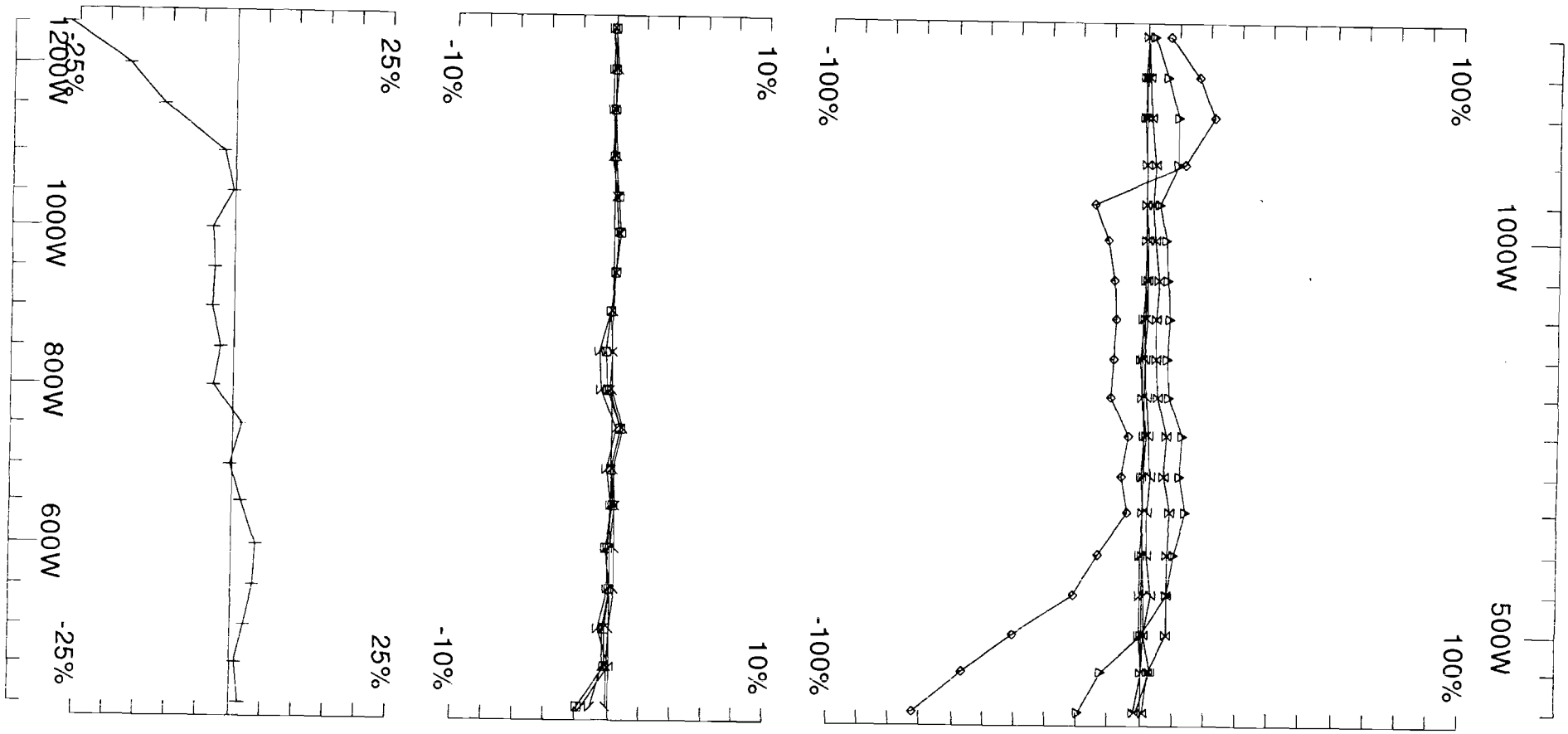
Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2700S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 6/4/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 6/4/8, Reduced : 15/10/8, Plotted : 20/10/8



Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2900S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 6/4/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 18	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3000S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 6/4/8, Reduced : 14/10/8, Plotted : 20/10/8

Montcalm

Loop 19

Hz

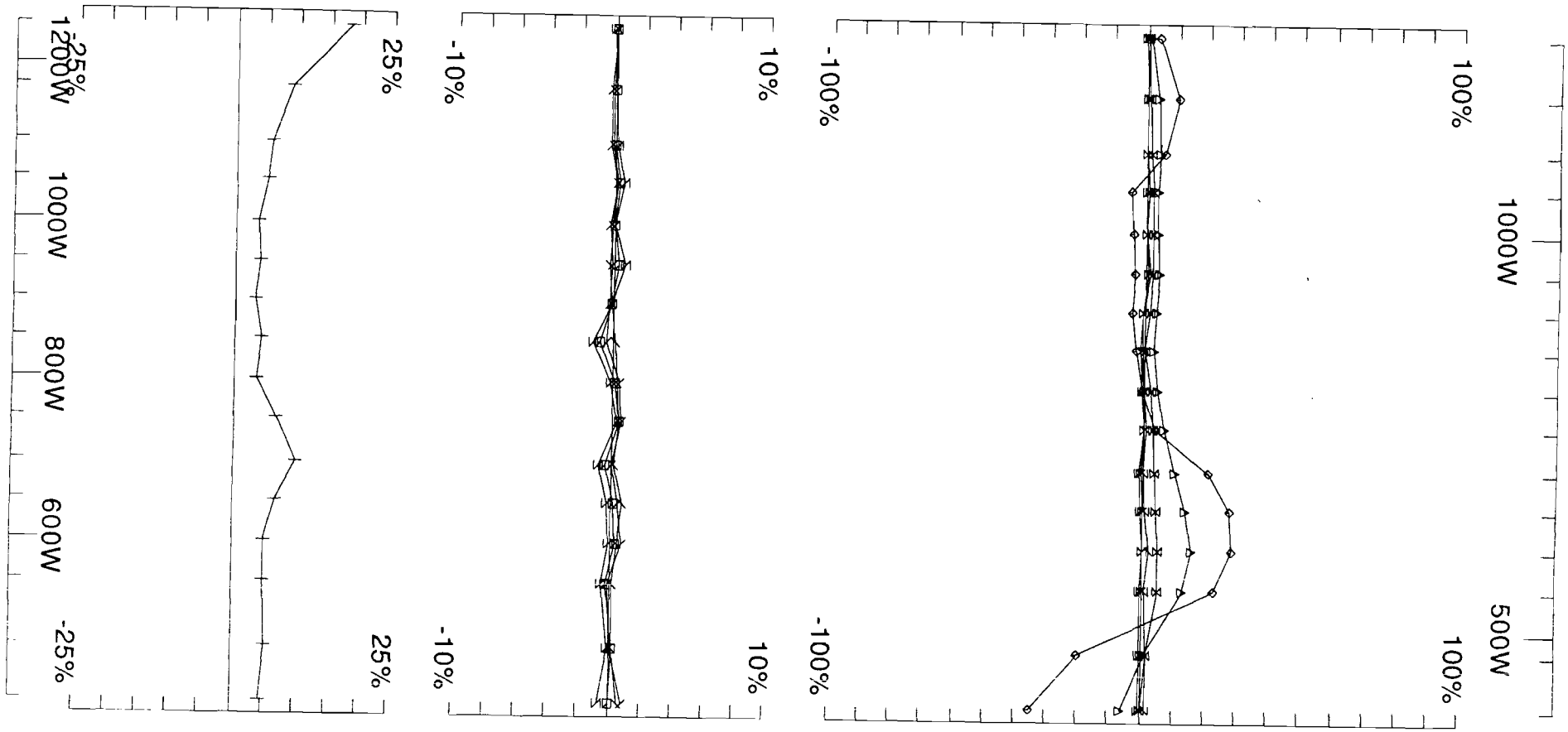
@3.872 Hz frequency

continuous norm

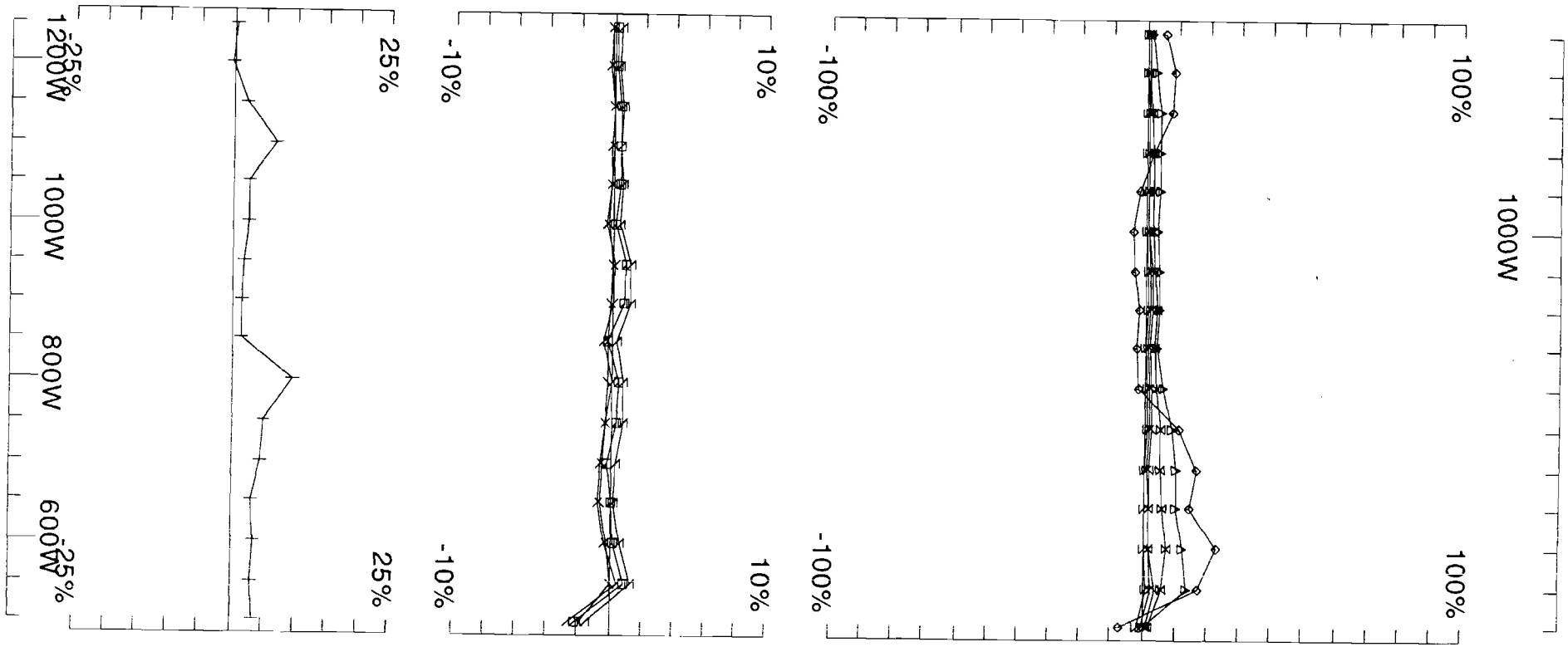
Ch1 reduced

Line 3100S	1300W - 400W
Line 3200S	1300W - 400W
Line 3300S	1300W - 400W
Line 3400S	1300W - 400W
Line 3500S	1300W - 400W
Line 3600S	1300W - 400W
Line 3700S	1300W - 400W
Line 3800S	1300W - 400W
Line 3900S	1300W - 400W

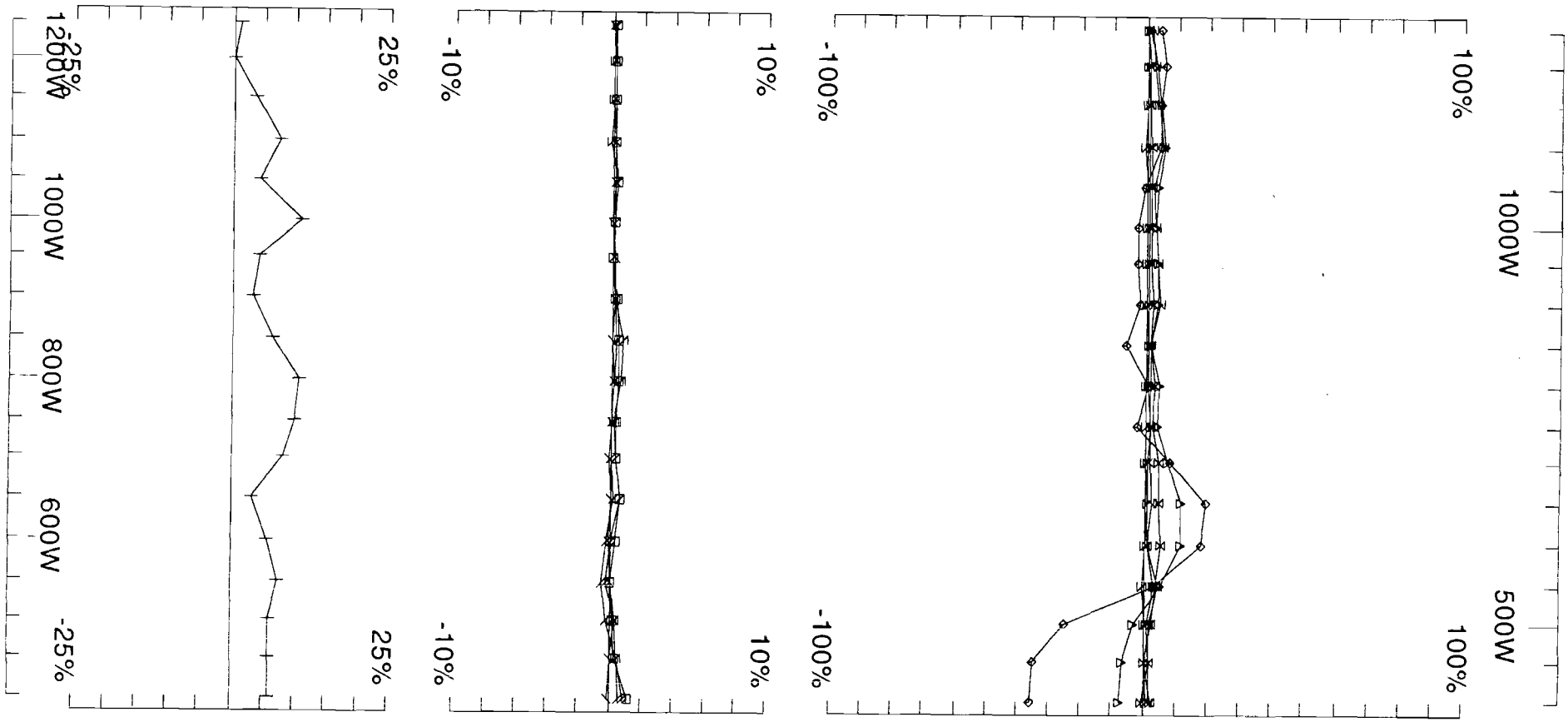
Loop 19 - continuous norm



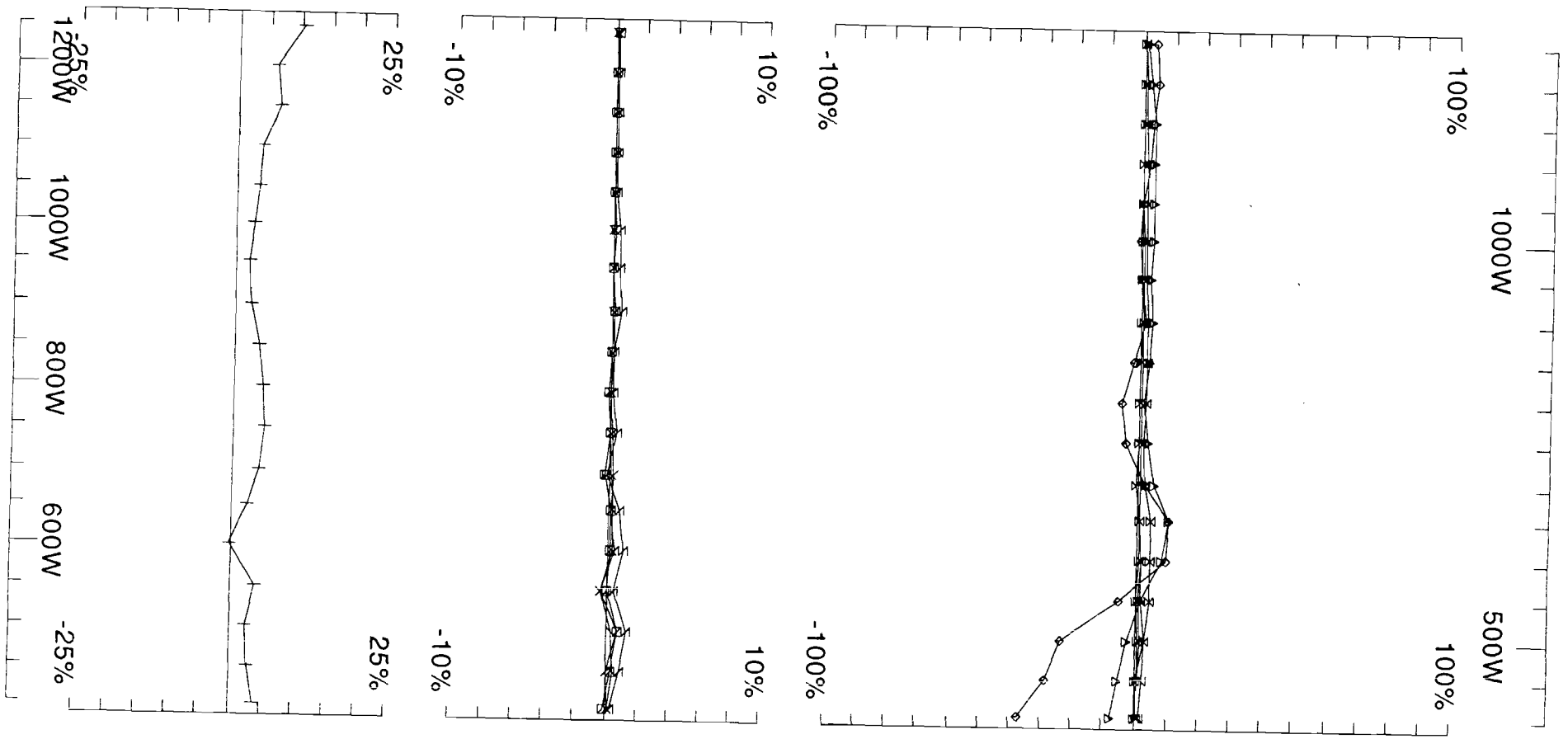
Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3100S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 15/10/8, Plotted : 20/10/8



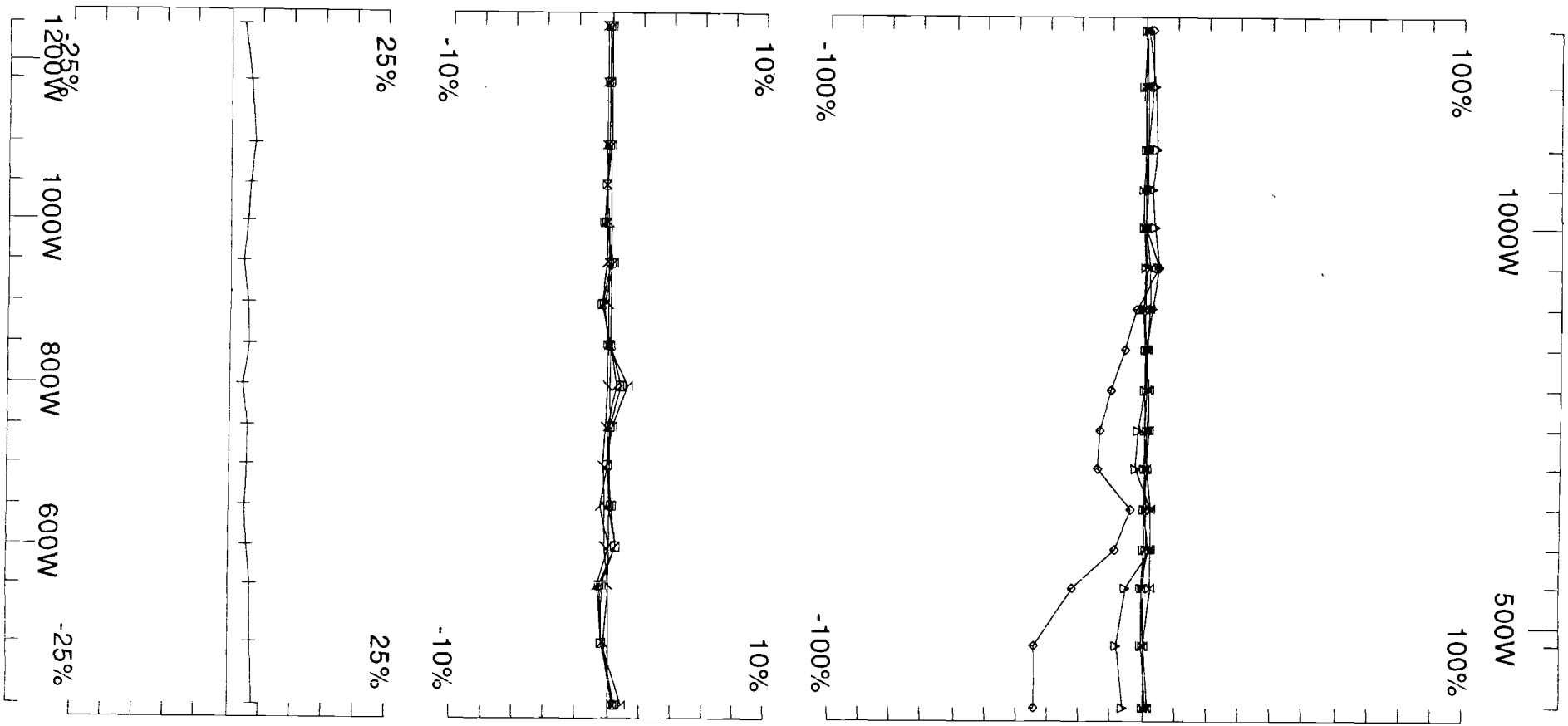
Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3200S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 7/4/8, Reduced : 2/10/8, Plotted : 20/10/8



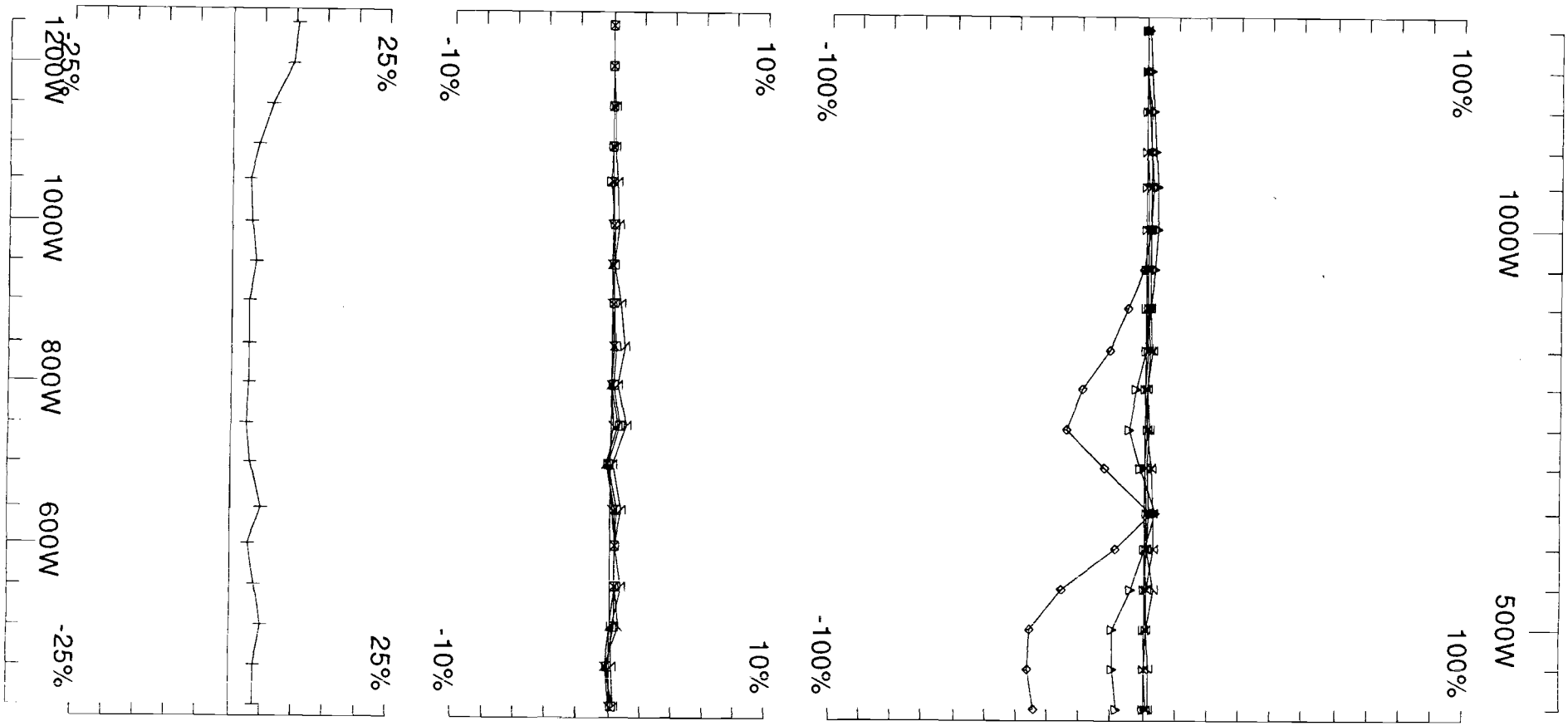
Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3300S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 7/4/8, Reduced : 2/10/8, Plotted : 20/10/8



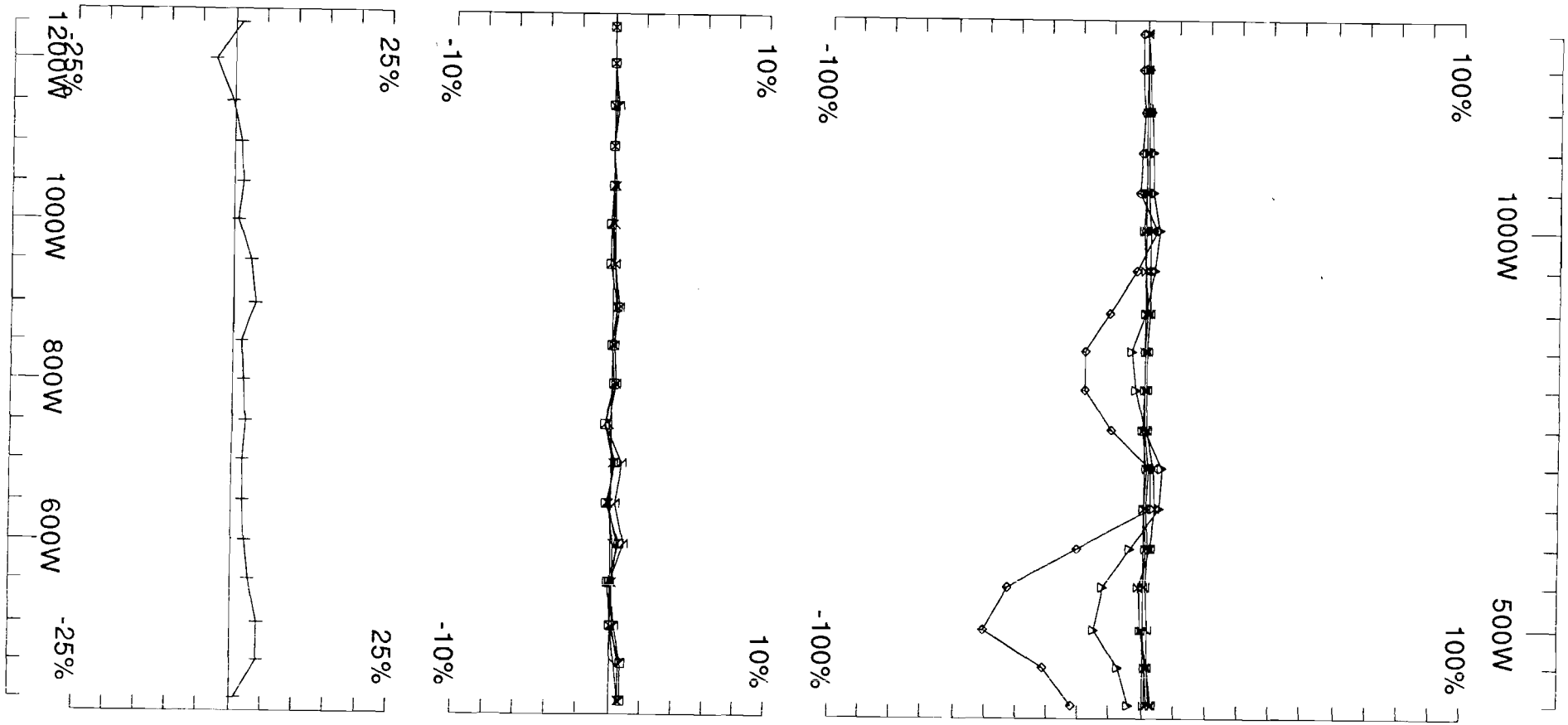
Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3400S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 7/4/8, Reduced : 2/10/8, Plotted : 20/10/8



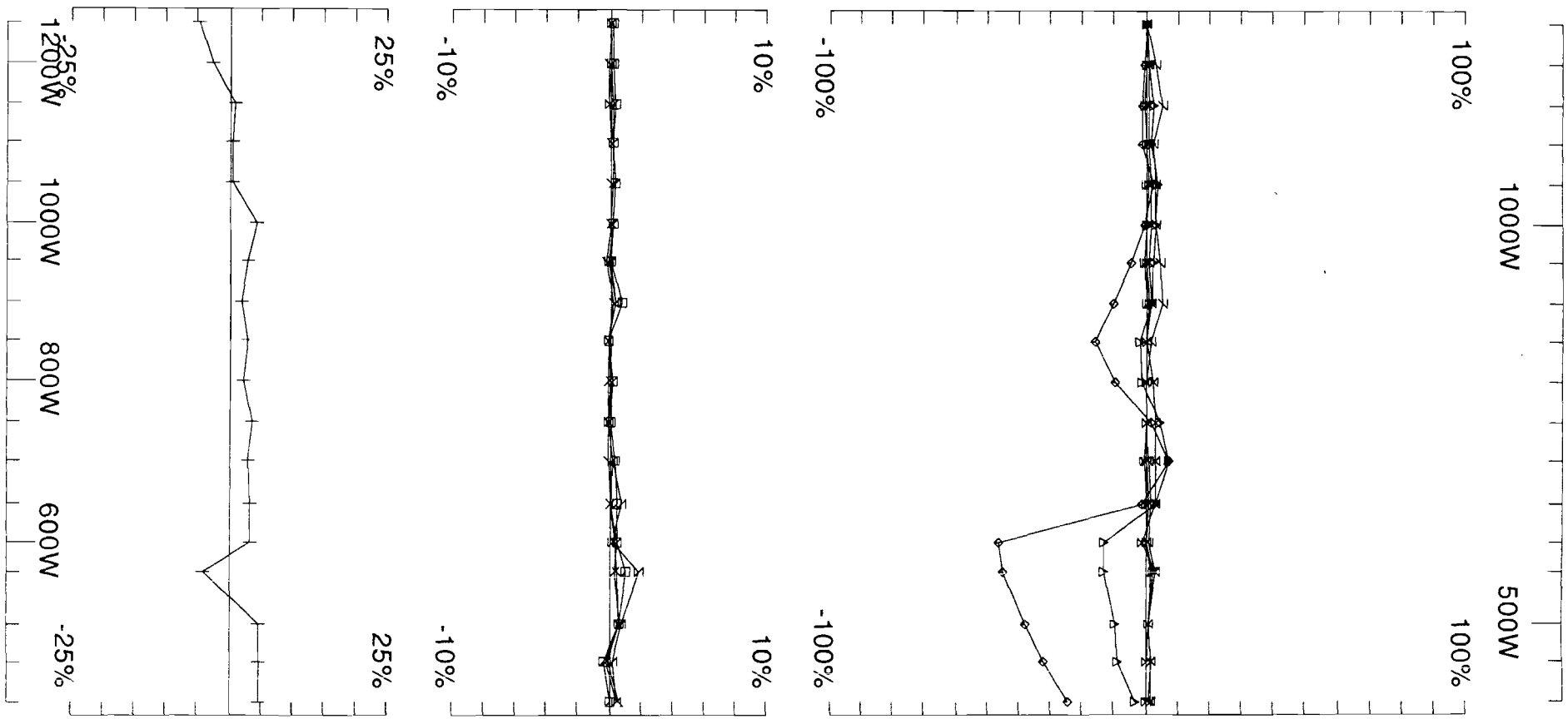
Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 2/10/8, Plotted : 20/10/8



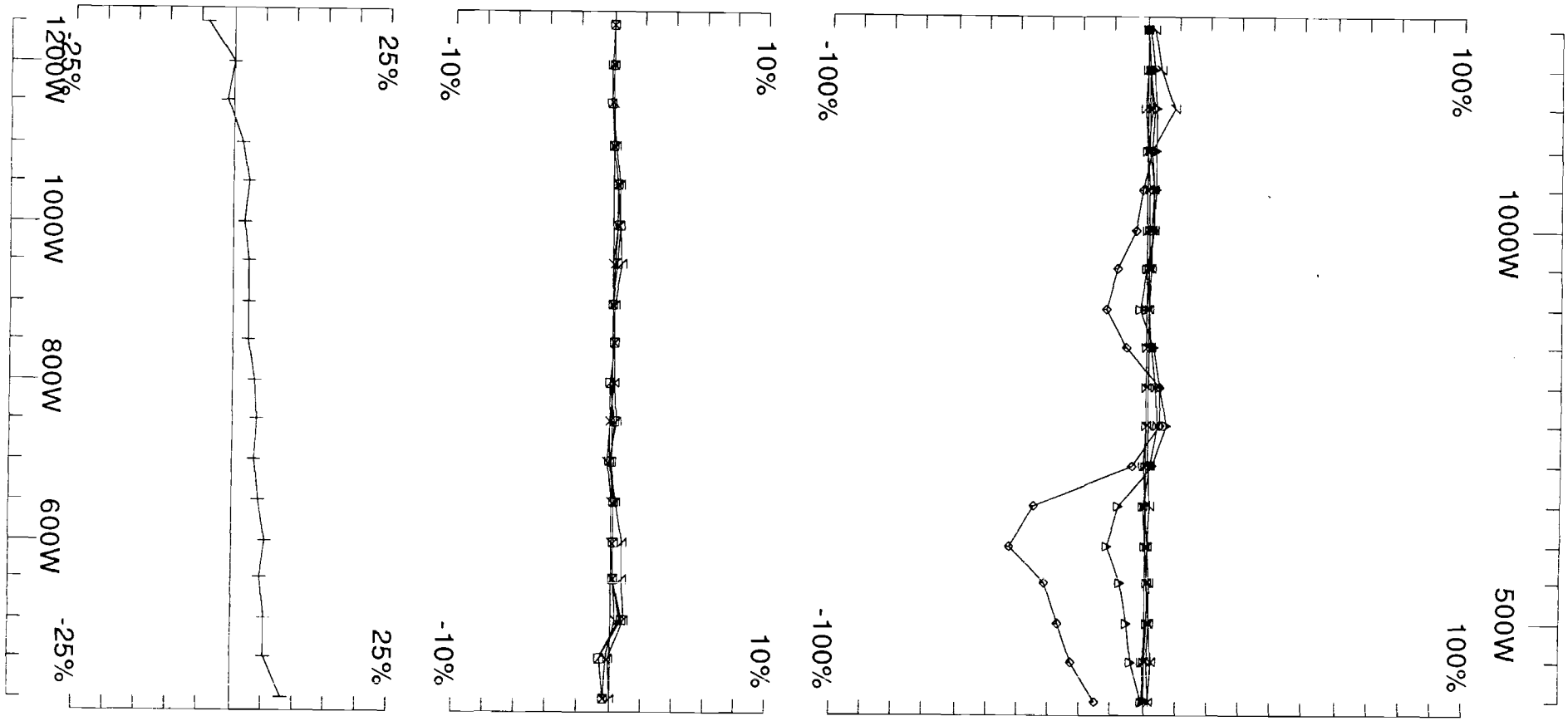
Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 2/10/8, Plotted : 20/10/8



Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3700S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 2/10/8, Plotted : 21/10/8



Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 19	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3900S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 8/4/8, Reduced : 2/10/8, Plotted : 20/10/8

Montcalm

Loop 20

Hz

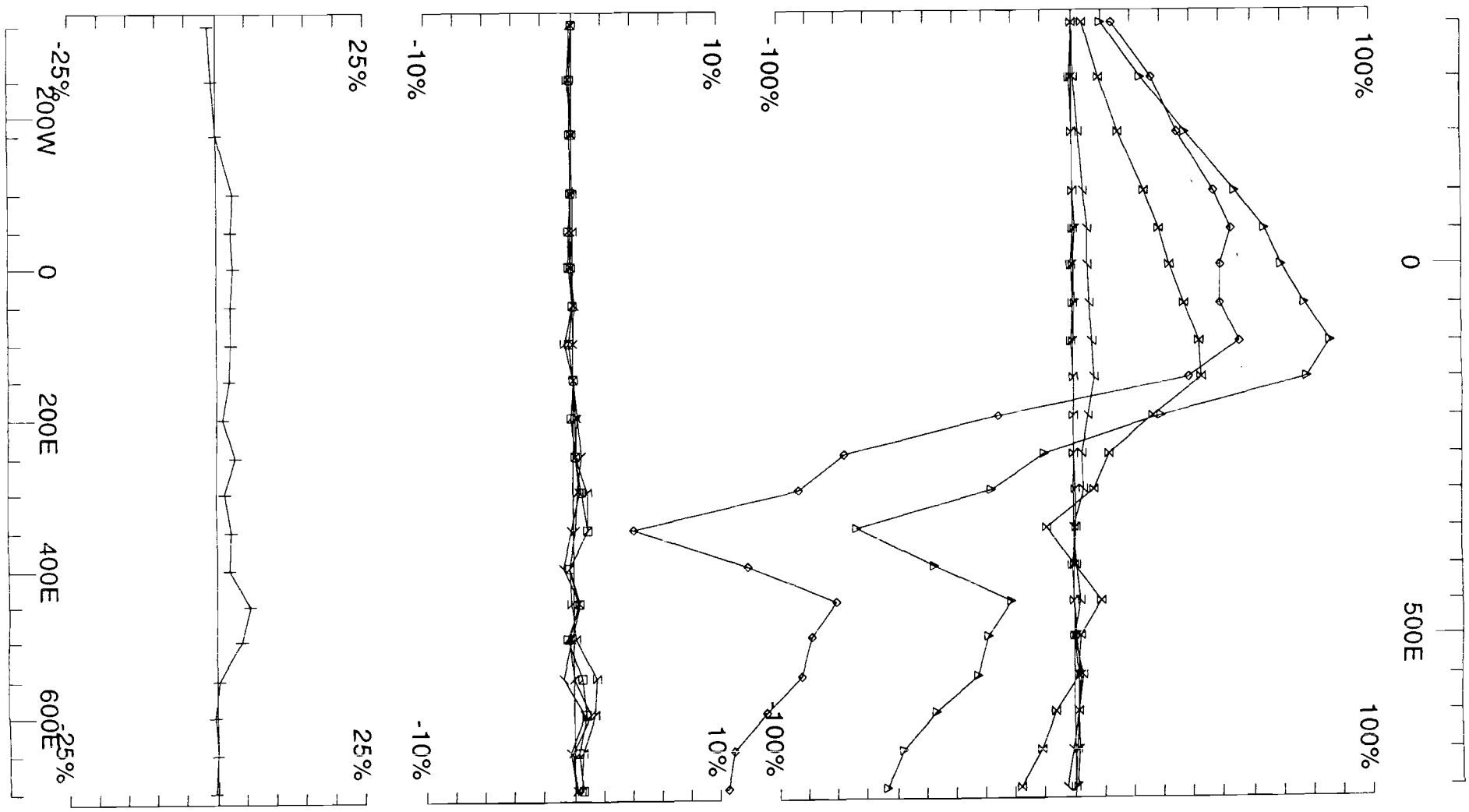
@3.872 Hz frequency

continuous norm

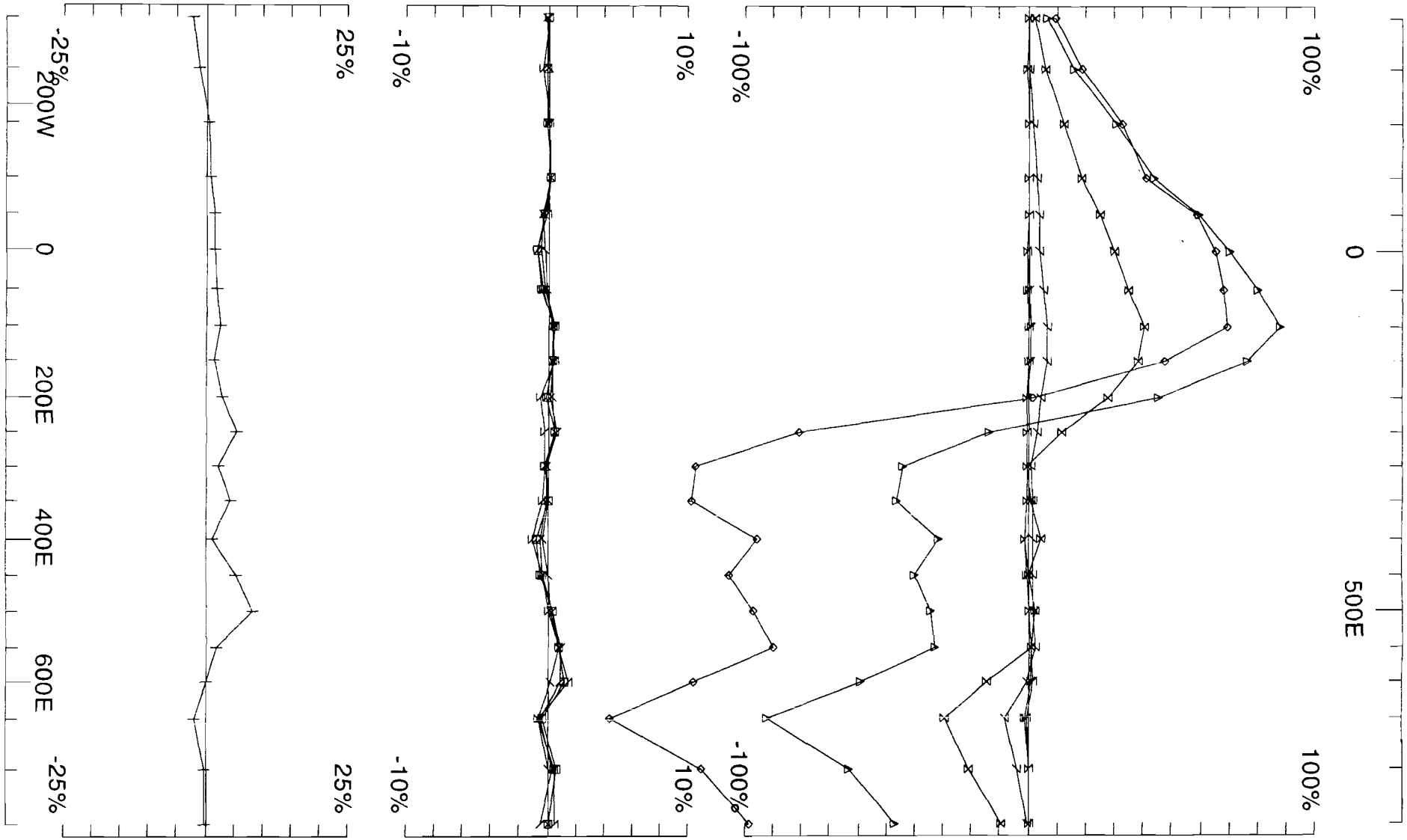
Ch1 reduced

Line 1000S	400W - 800E
Line 1100S	400W - 800E
Line 1200S	400W - 800E
Line 1300S	400W - 800E
Line 1400S	400W - 800E
Line 1500S	400W - 800E
Line 1600S	400W - 800E
Line 1700S	400W - 800E
Line 1800S	400W - 800E
Line 1900S	400W - 800E
Line 2000S	400W - 800E
Line 2100S	400W - 800E

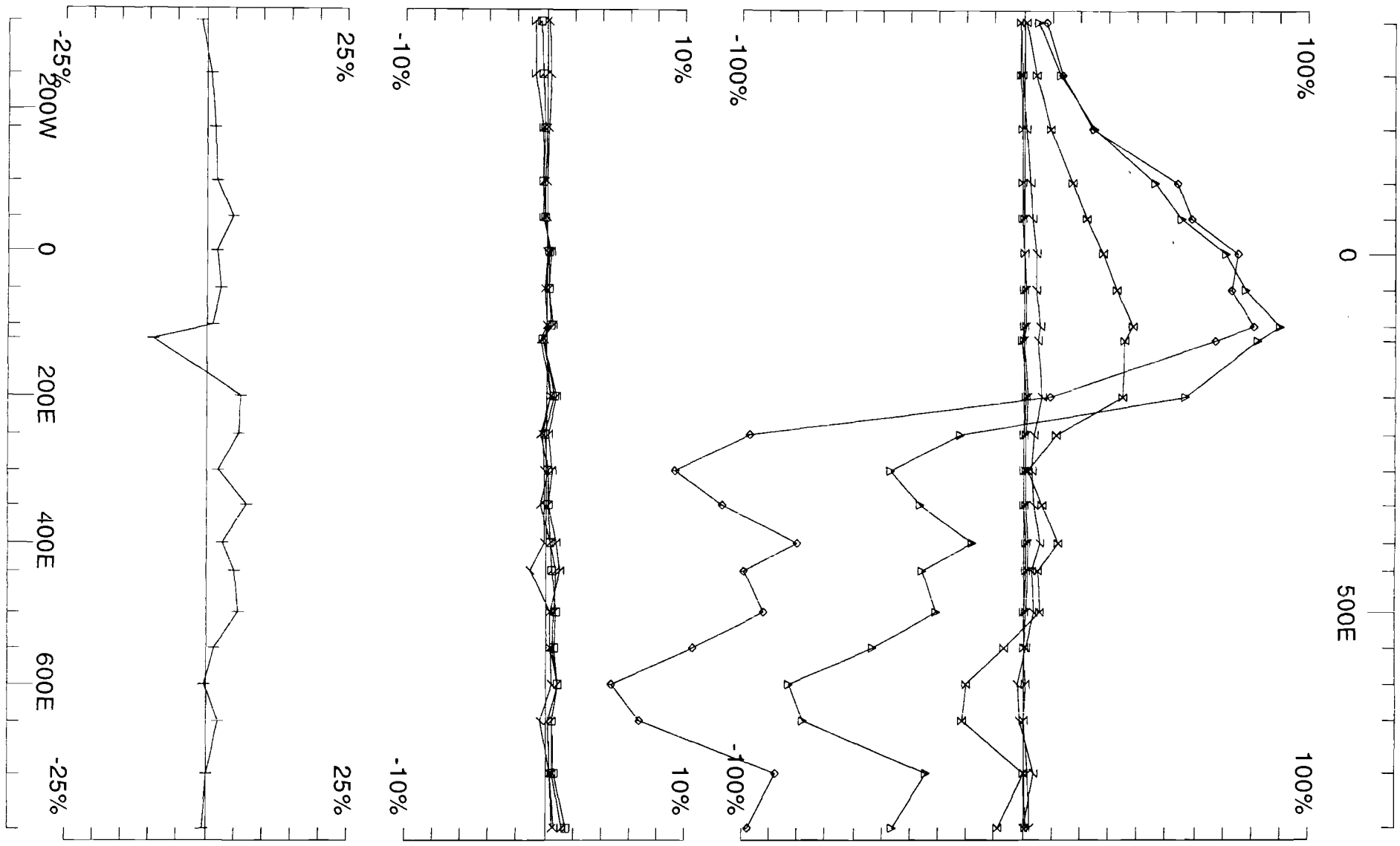
Loop 20 - continuous norm



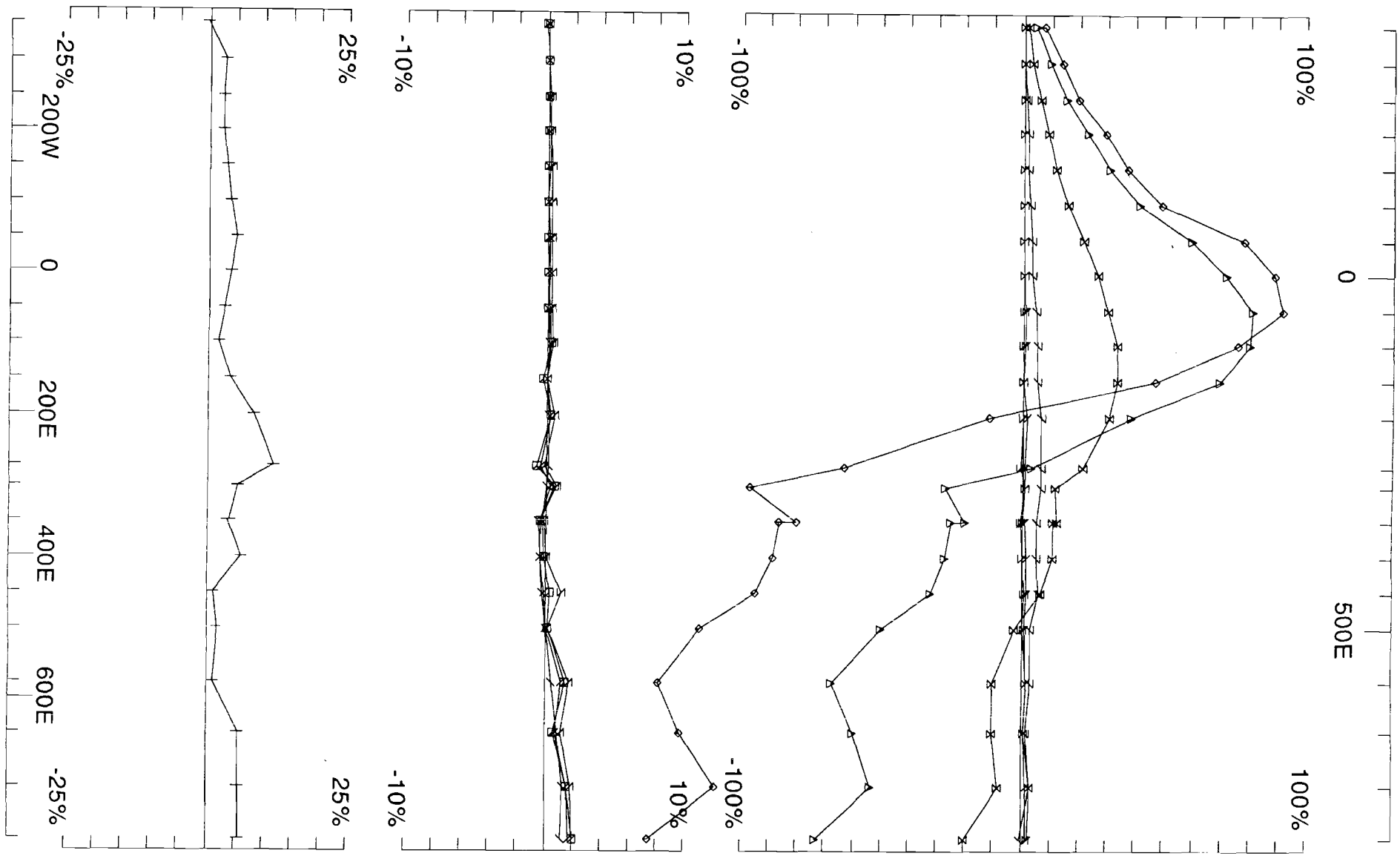
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1000S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 11/4/8, Reduced : 14/10/8, Plotted : 20/10/8



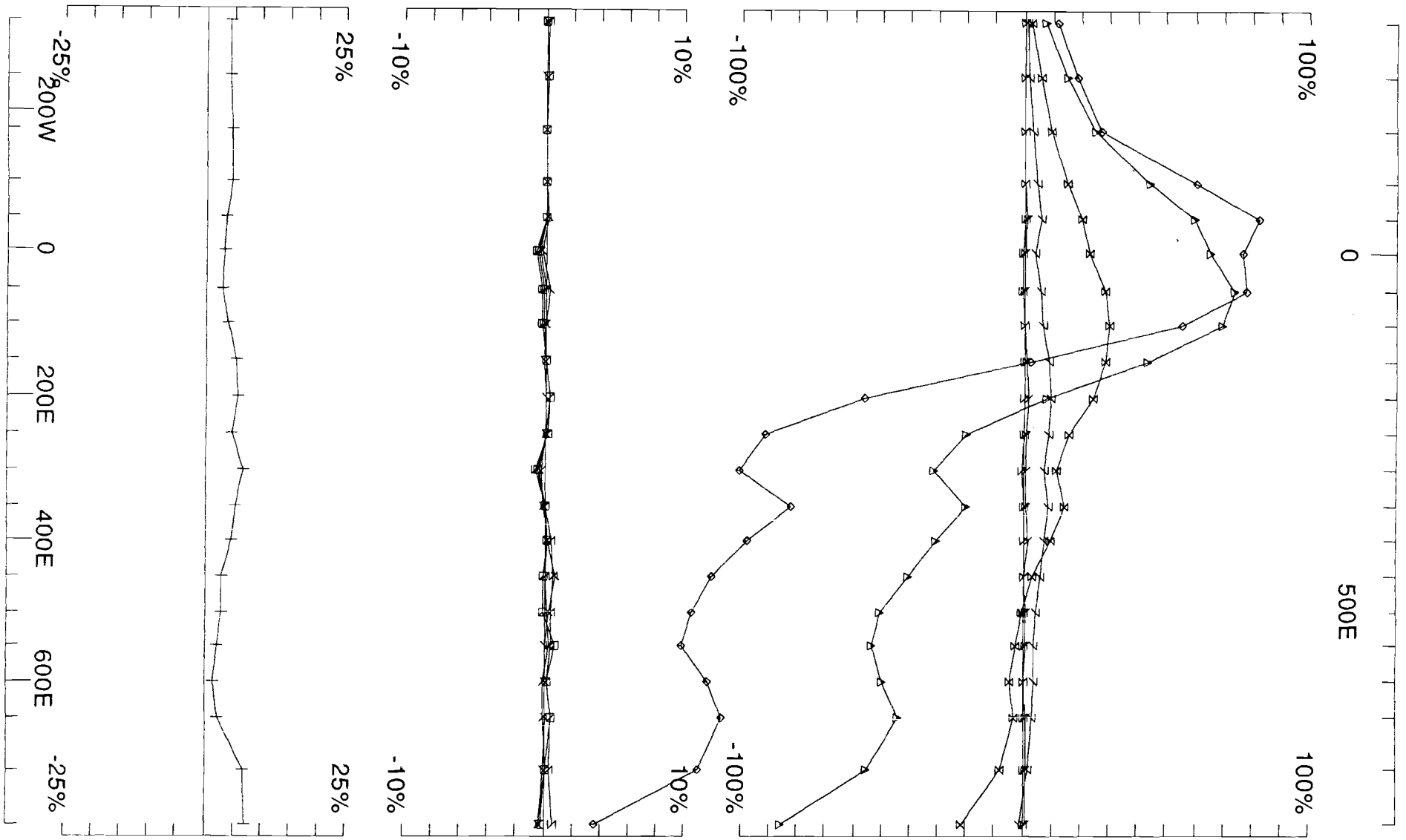
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1100S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 11/4/8, Reduced : 14/10/8, Plotted : 20/10/8



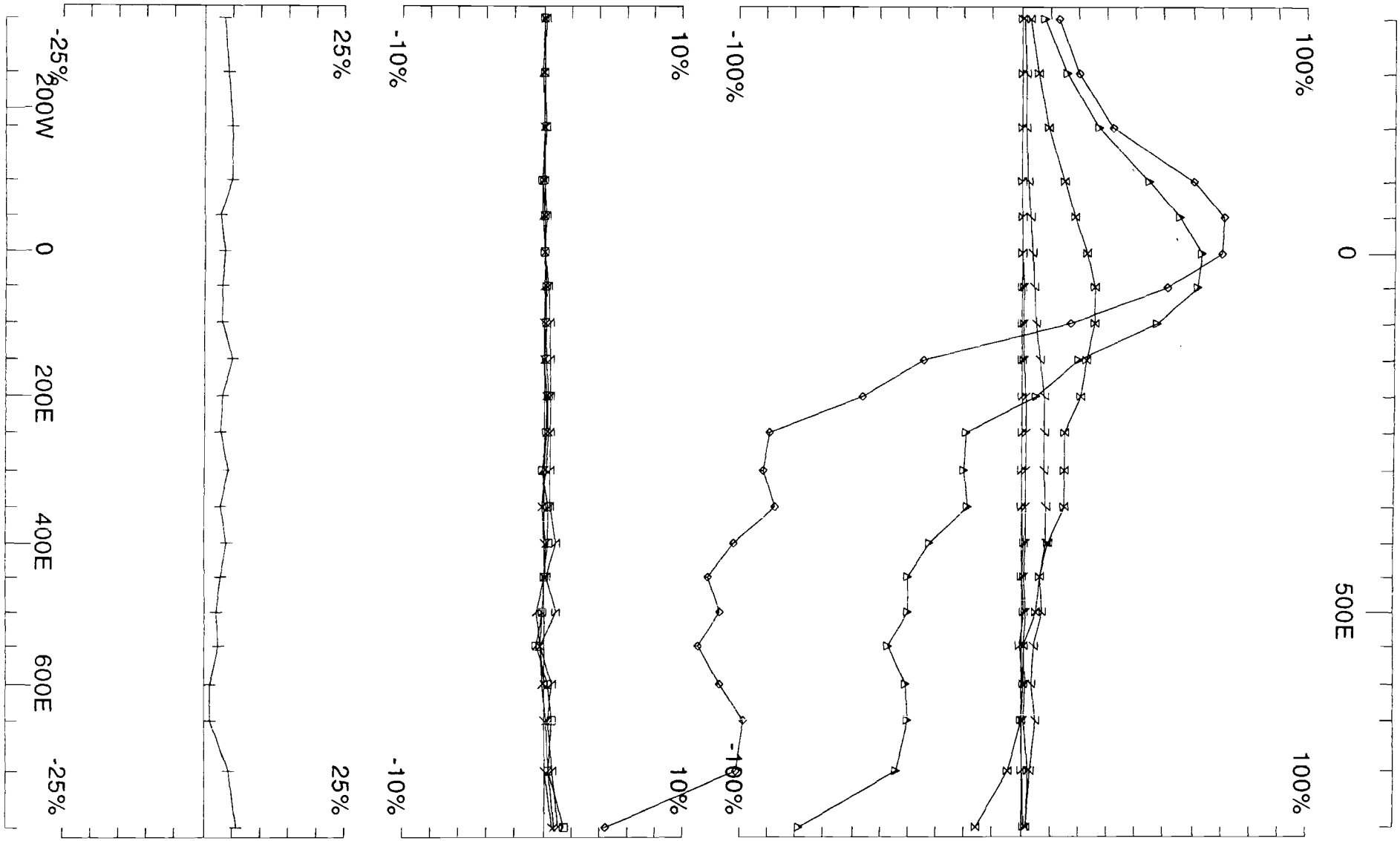
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1200S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 12/4/8, Reduced : 14/10/8, Plotted : 20/10/8



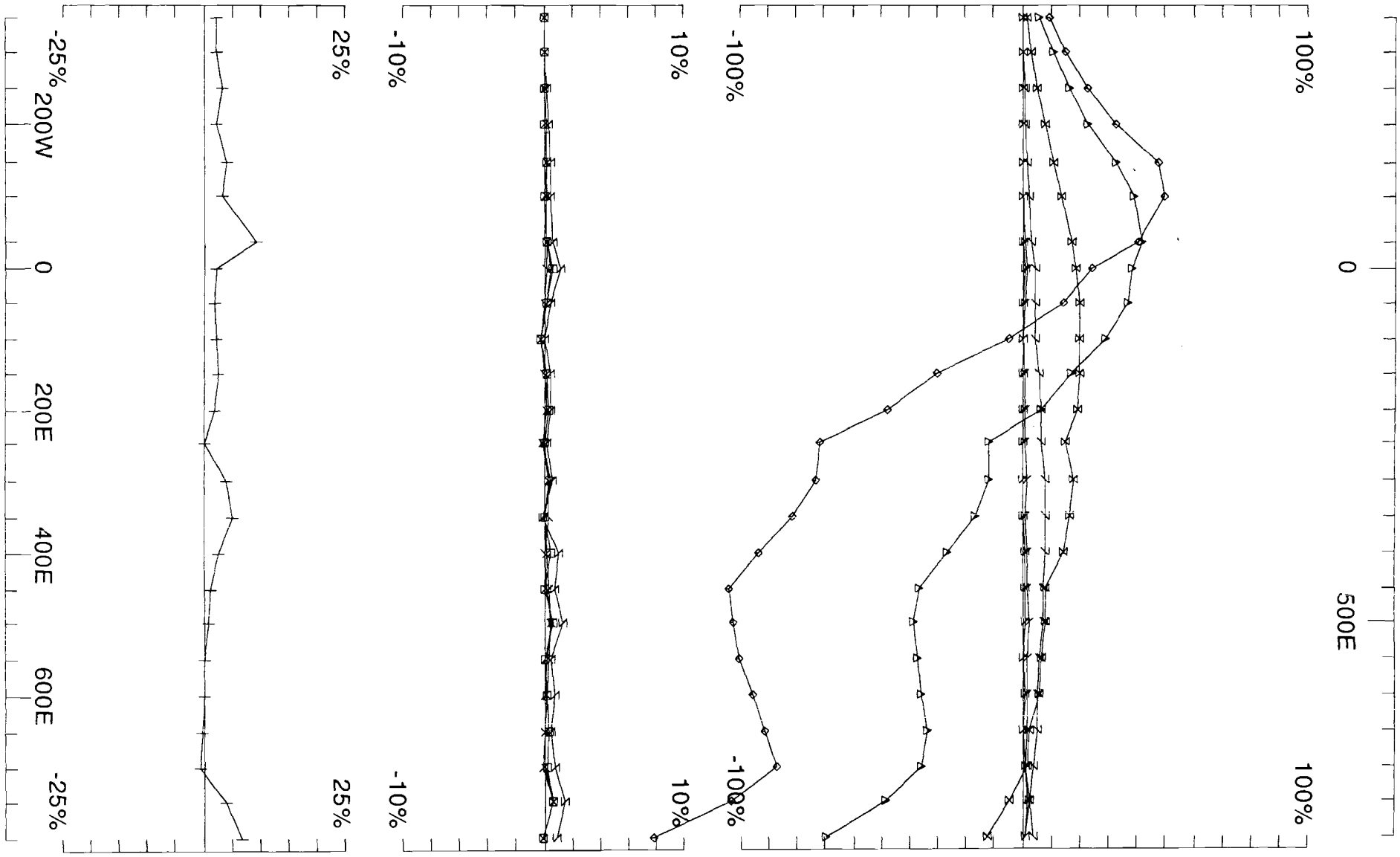
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1300S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812 Plotted : 20/10/8



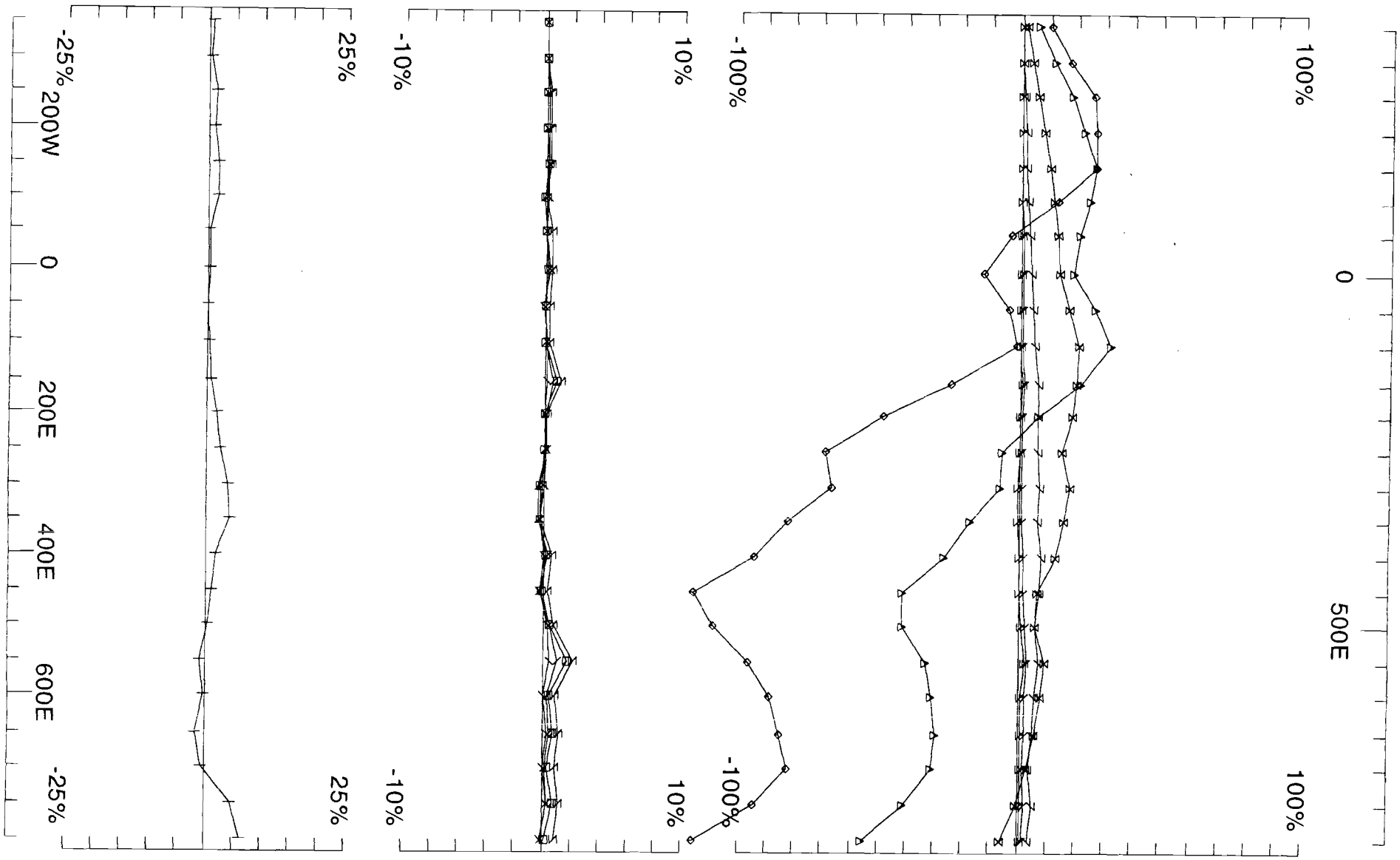
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1400S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 12/4/8, Reduced : 14/10/8, Plotted : 20/10/8



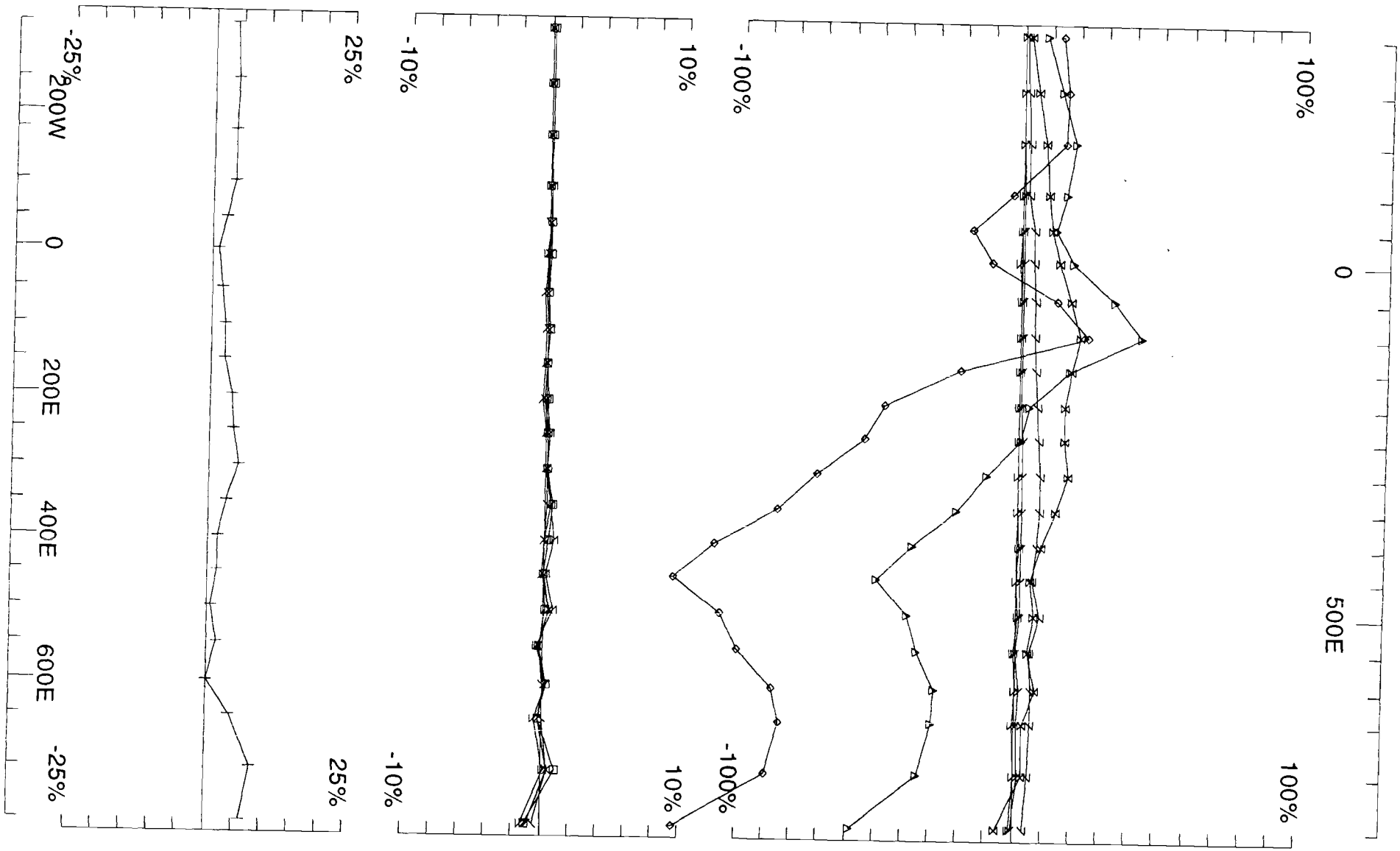
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 12/4/8, Reduced : 14/10/8, Plotted : 20/10/8



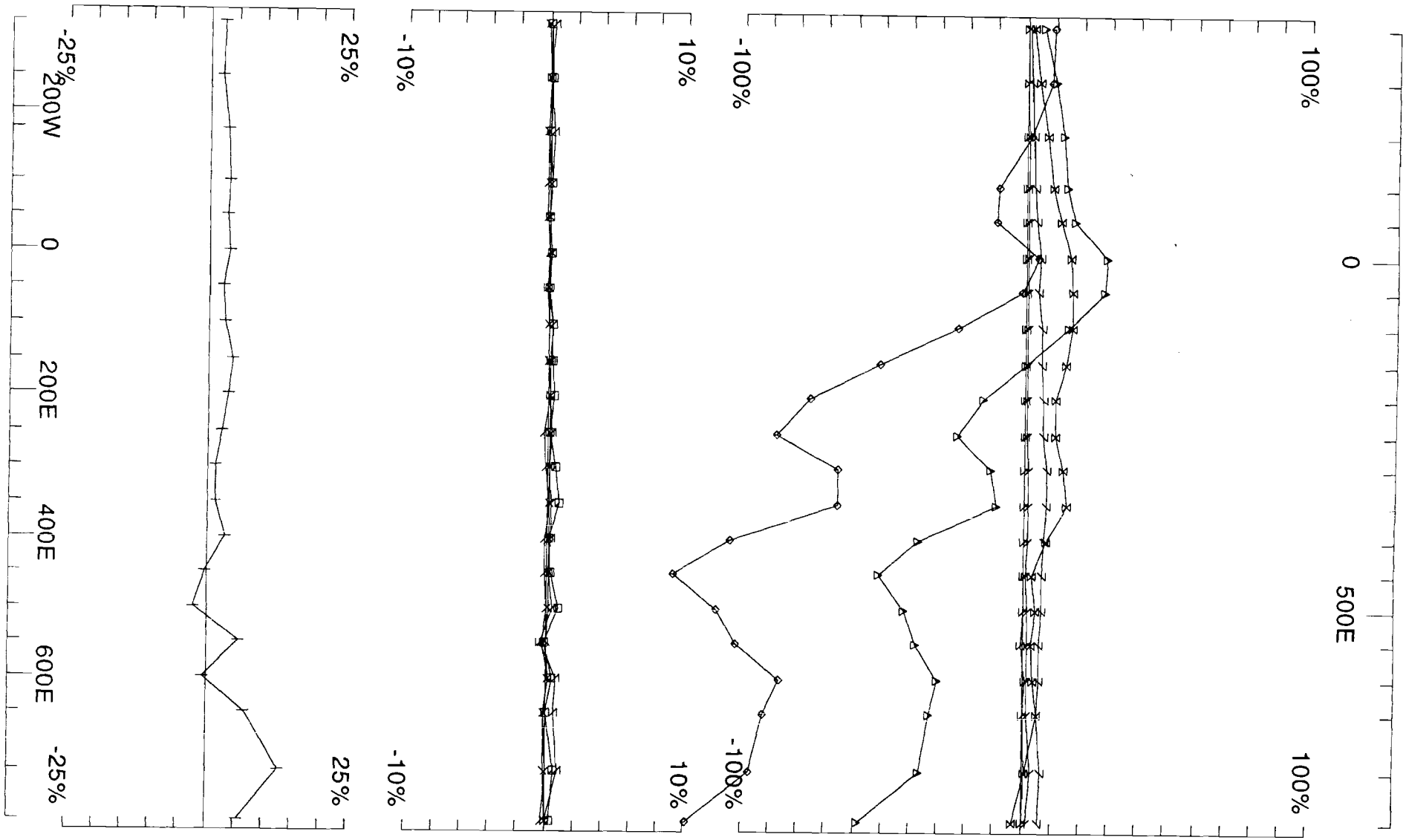
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812 Surveyed : 11/4/8 Reduced : 14/10/8 Plotted : 20/10/8



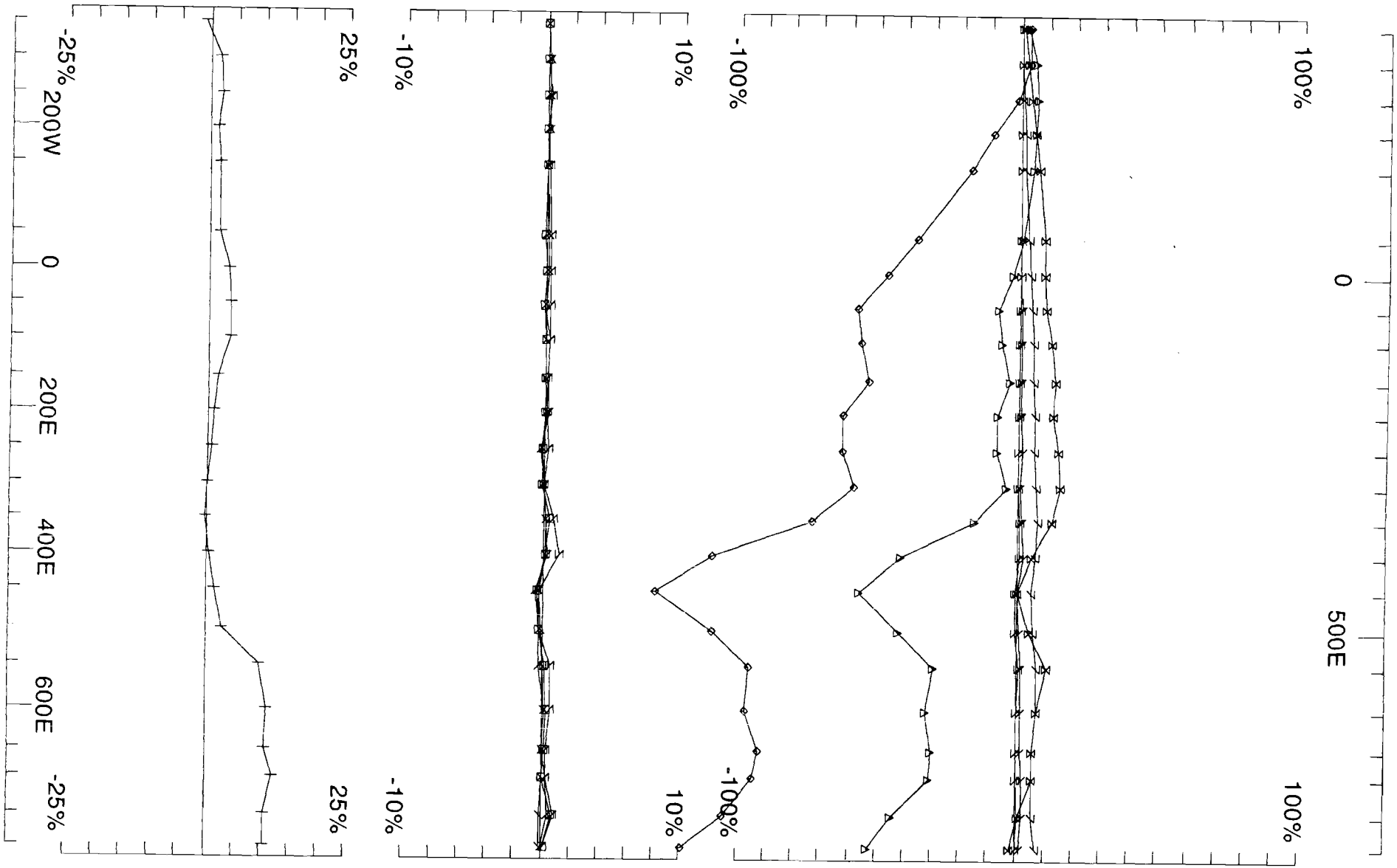
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1700S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 11/4/8, Reduced : 14/10/8, Plotted : 20/10/8



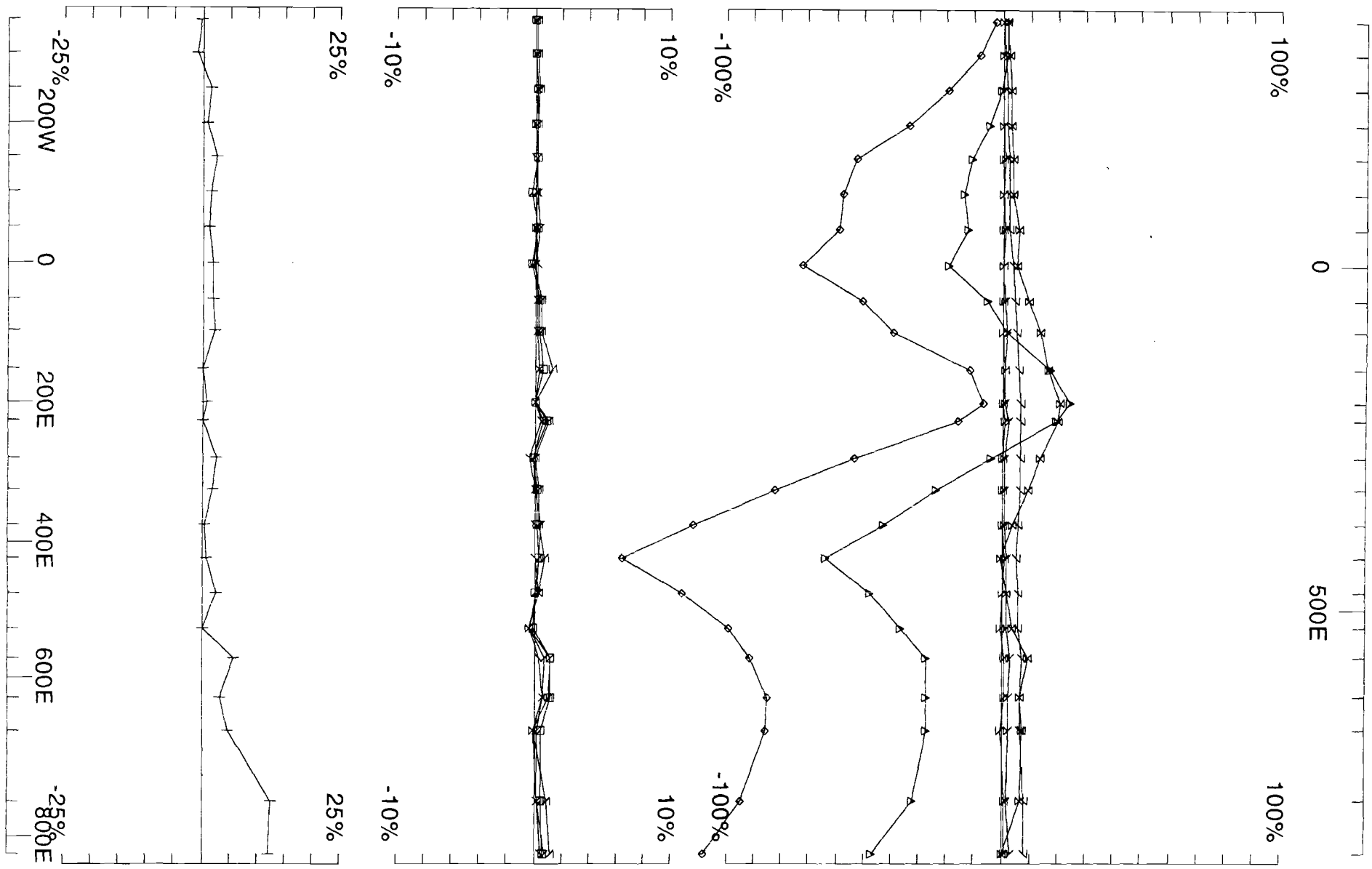
Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 11/4/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1900S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 11/4/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2000S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 11/4/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 20	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2100S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 3.872 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812 — Surveyed : 11/4/8, Reduced : 15/10/8, Plotted : 20/10/8

Montcalm

Loop 30

Hx

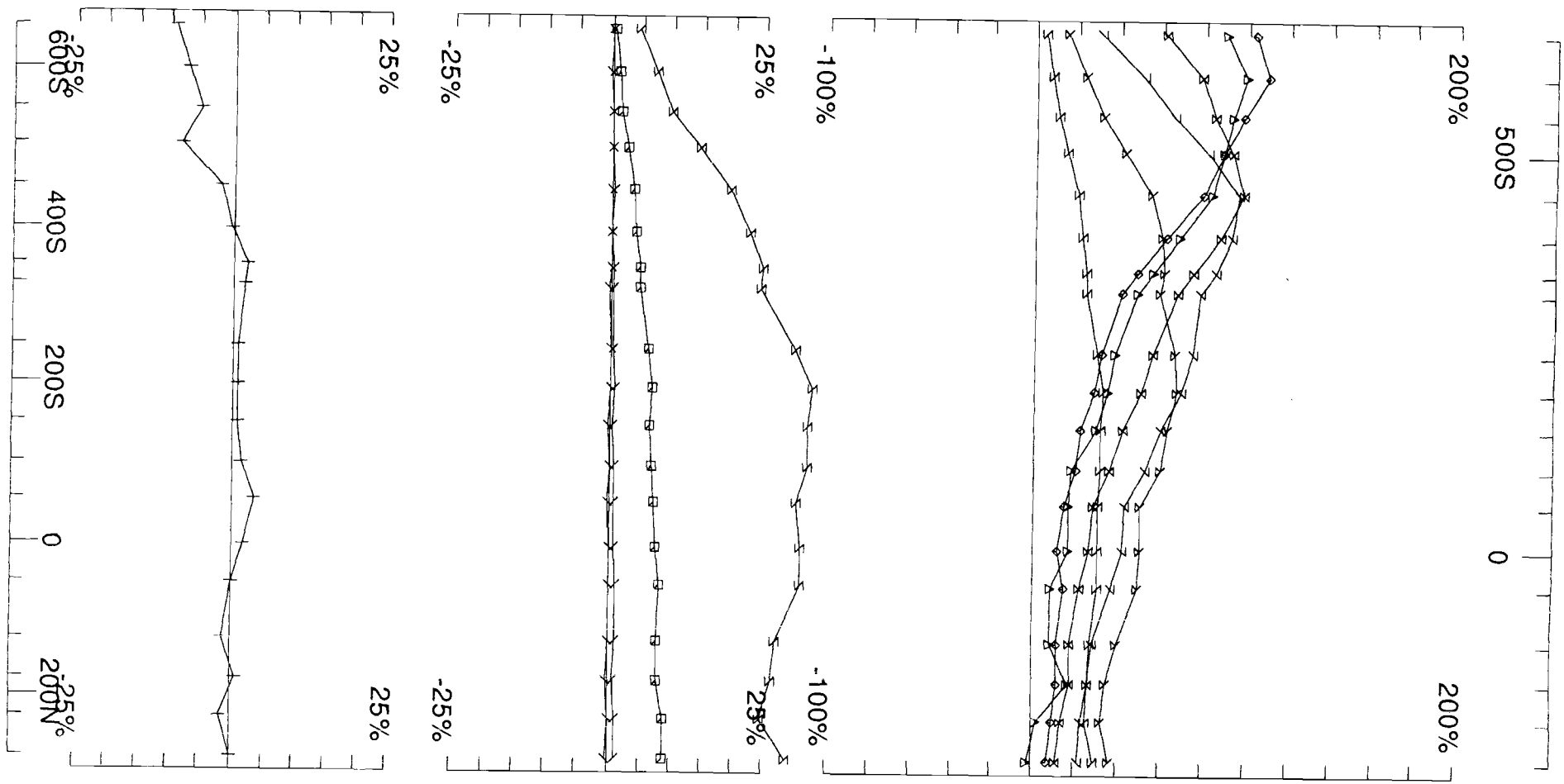
@30.974 Hz frequency

continuous norm

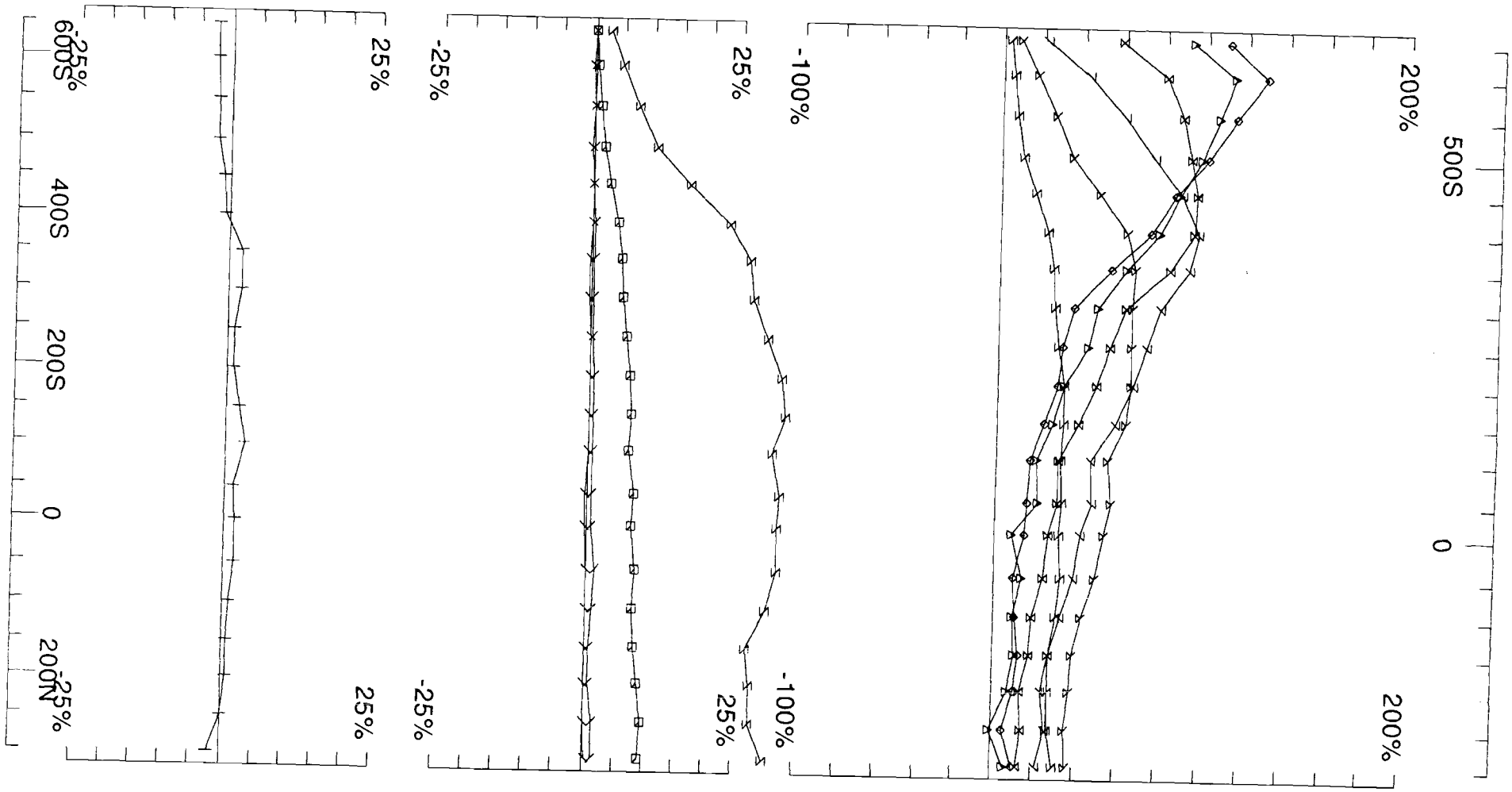
Ch1 reduced

Line 500W	700S - 325S
Line 400W	700S - 350S
Line 300W	700S - 300S
Line 200W	700S - 250S
Line 100W	700S - 225S
Line 0	700S - 250S
Line 100E	700S - 300N
Line 200E	700S - 300N
Line 300E	700S - 300N
Line 400E	700S - 300N
Line 800E	700S - 300N
Line 900E	700S - 300N

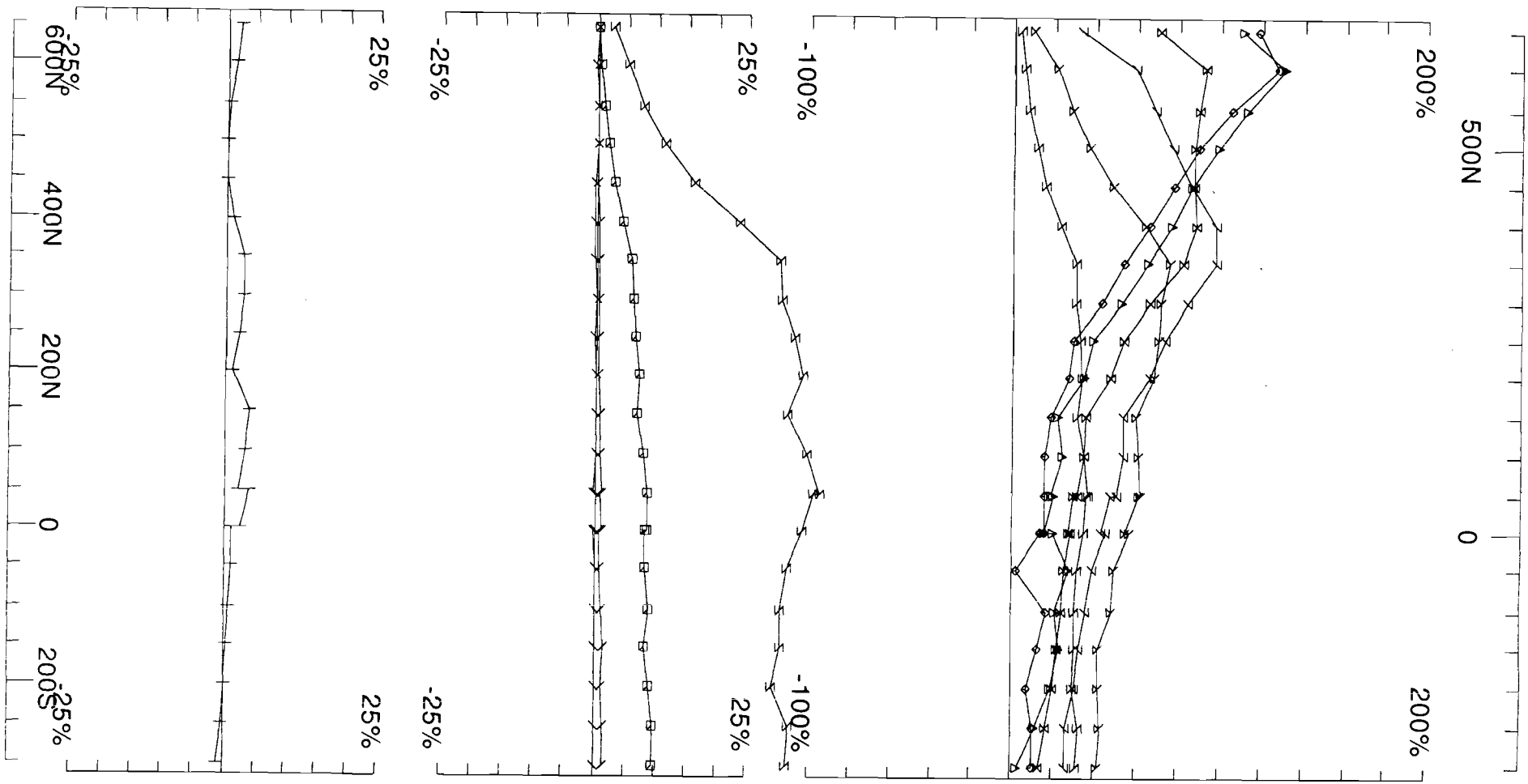
Loop 30 - continuous norm



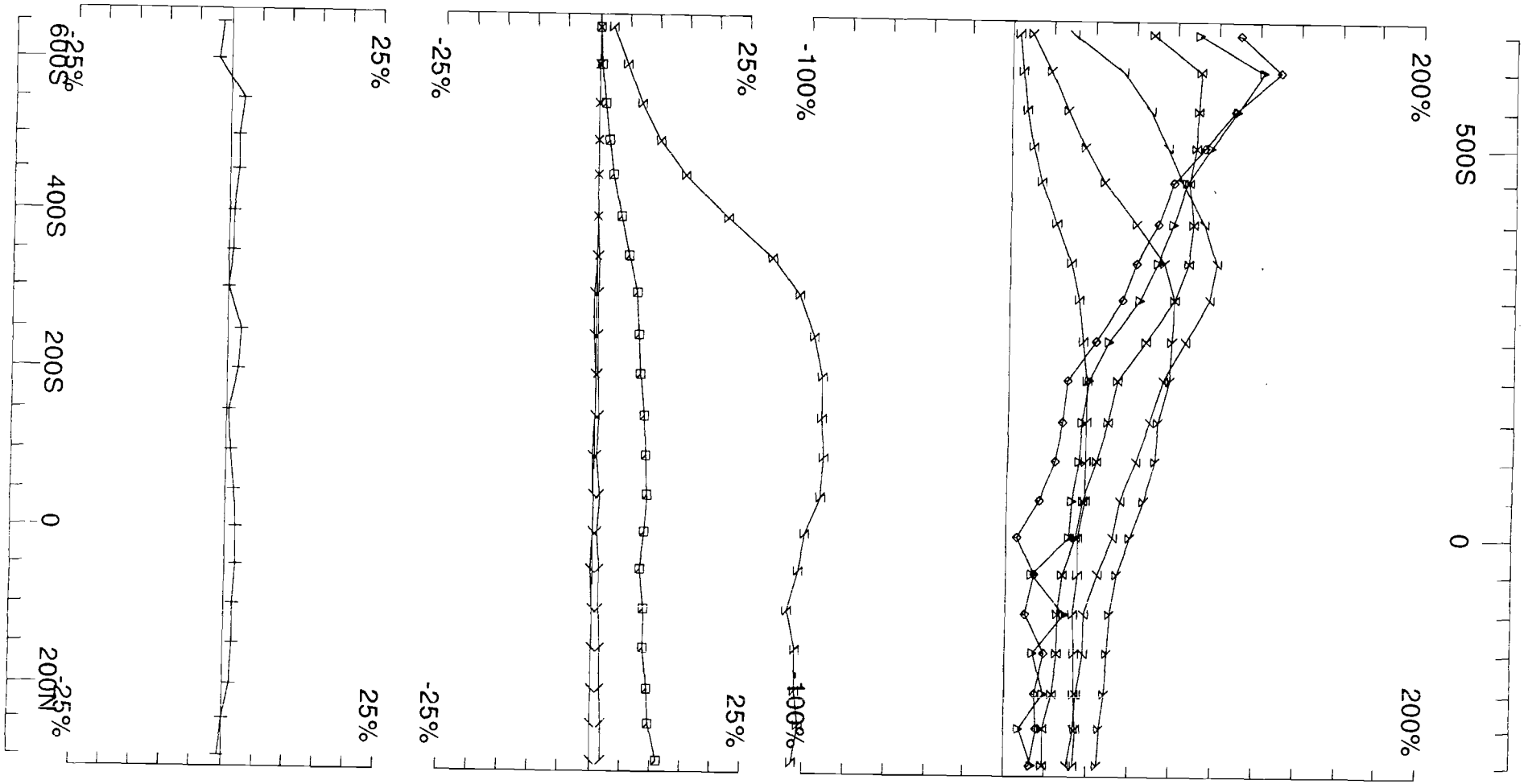
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 20/10/8



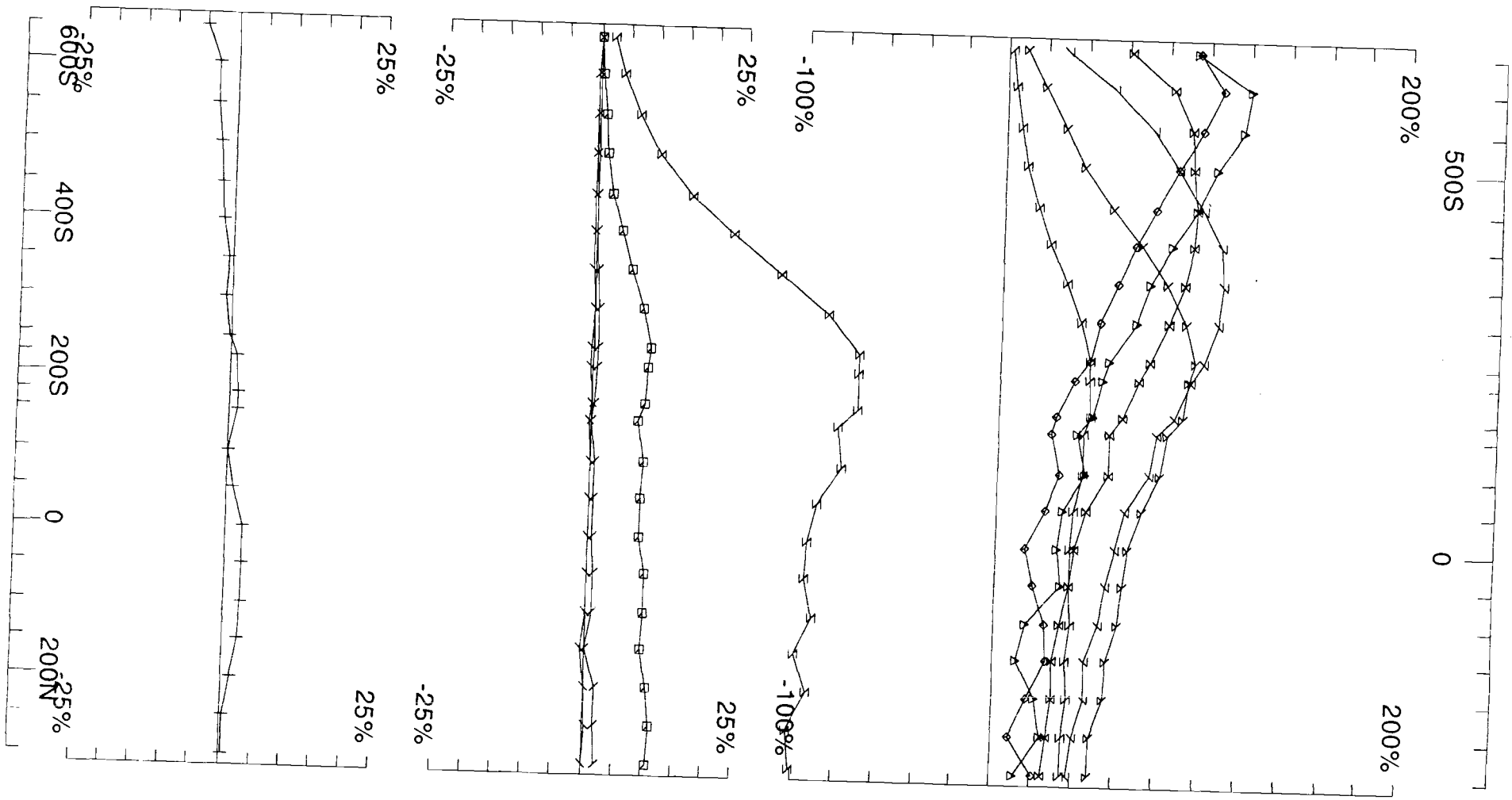
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 400W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 22/7/8, Reduced : 22/7/8, Plotted : 20/10/8



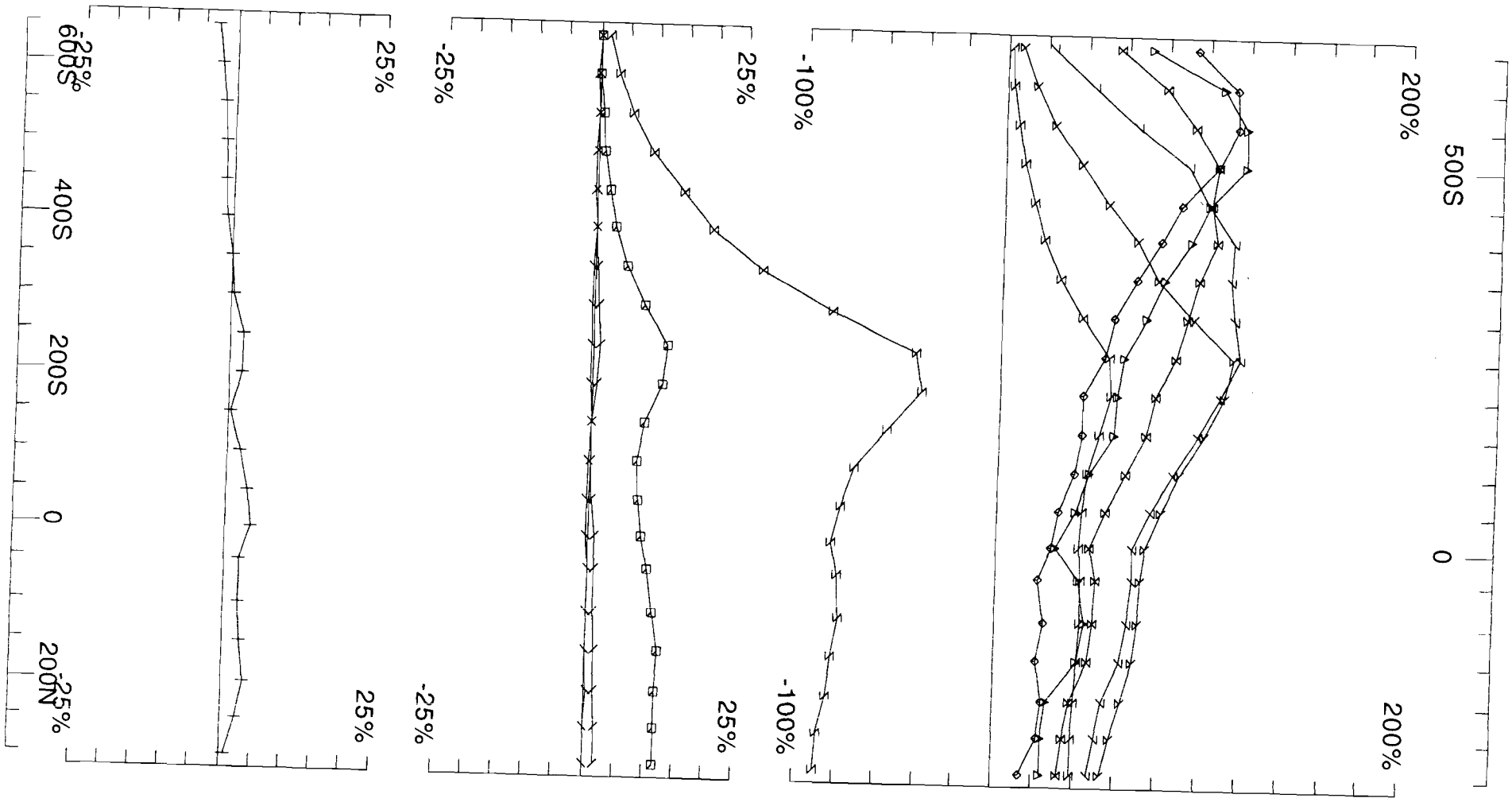
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 300W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 22/7/8, Reduced : 22/7/8, Plotted : 20/10/8



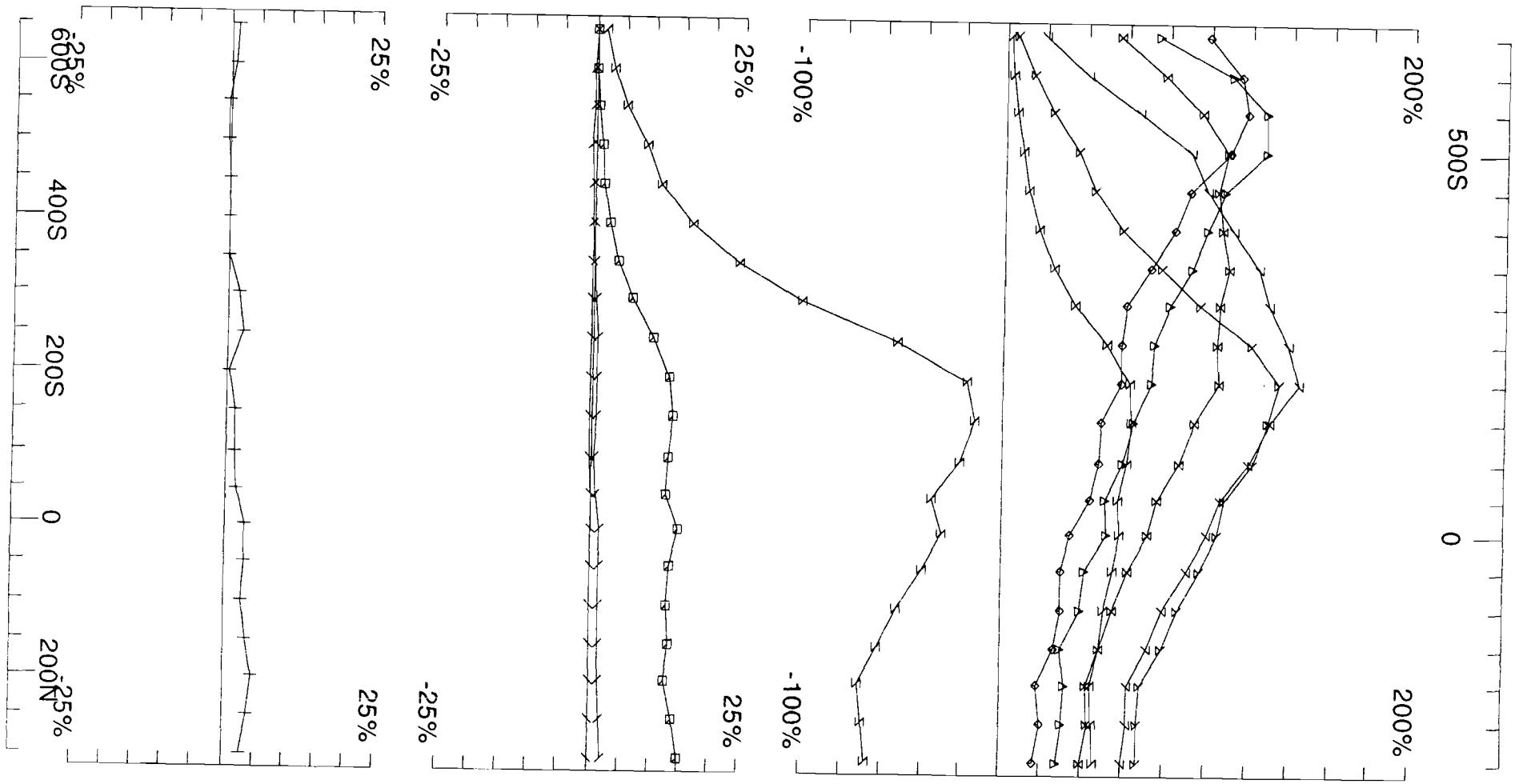
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 200W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 Plotted : 20/10/8



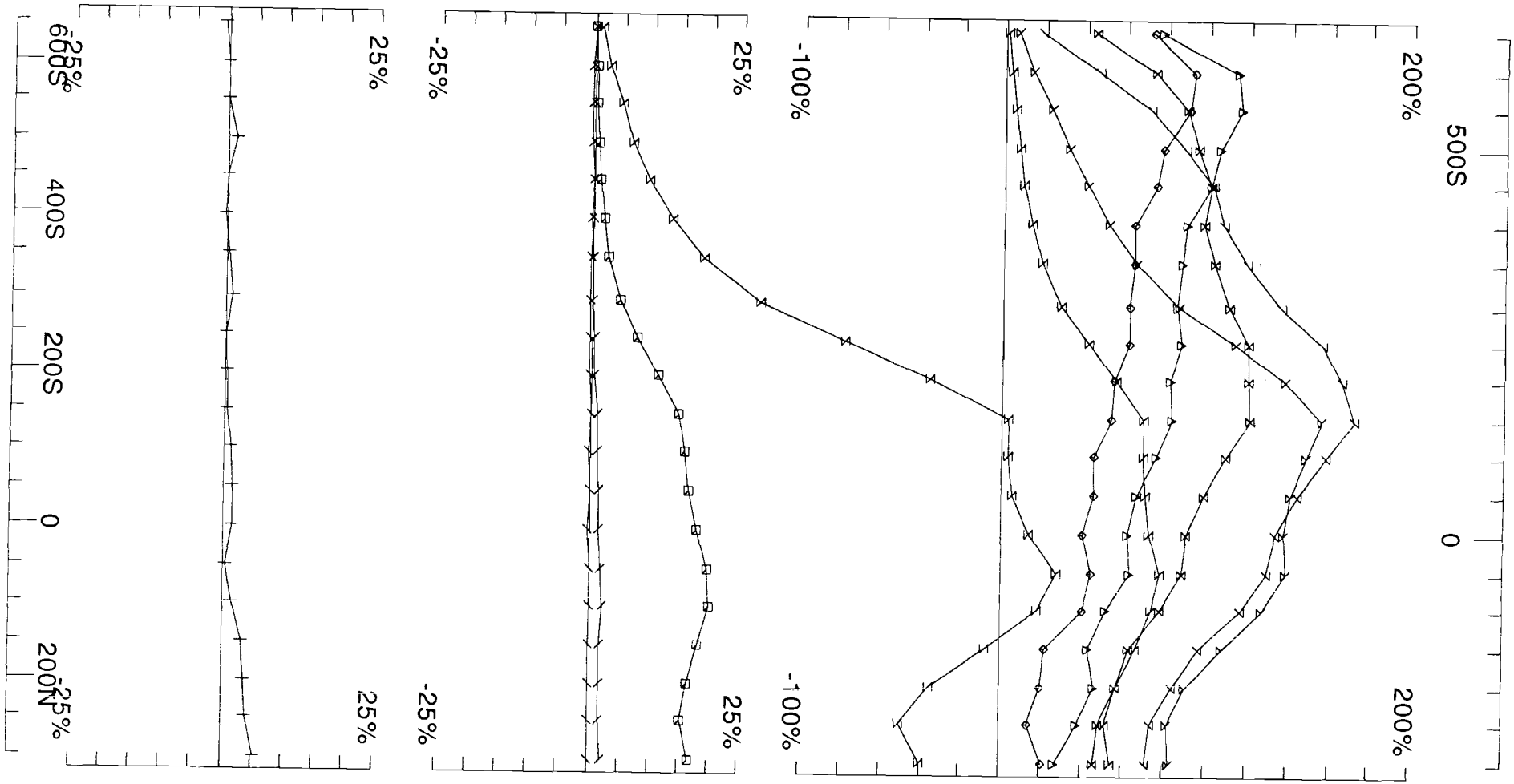
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 100W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 20/10/8



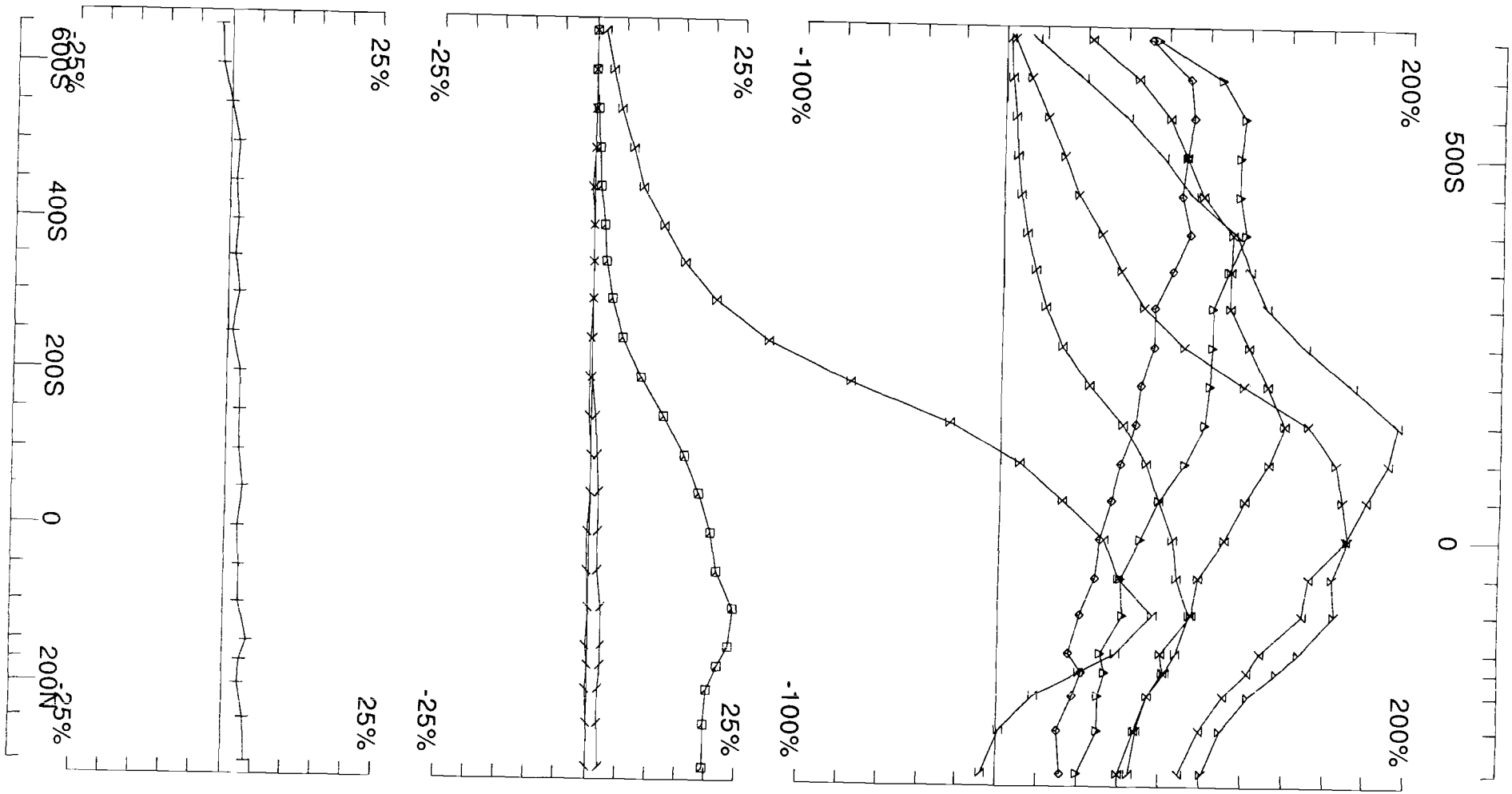
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 0	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 Plotted : 20/10/8



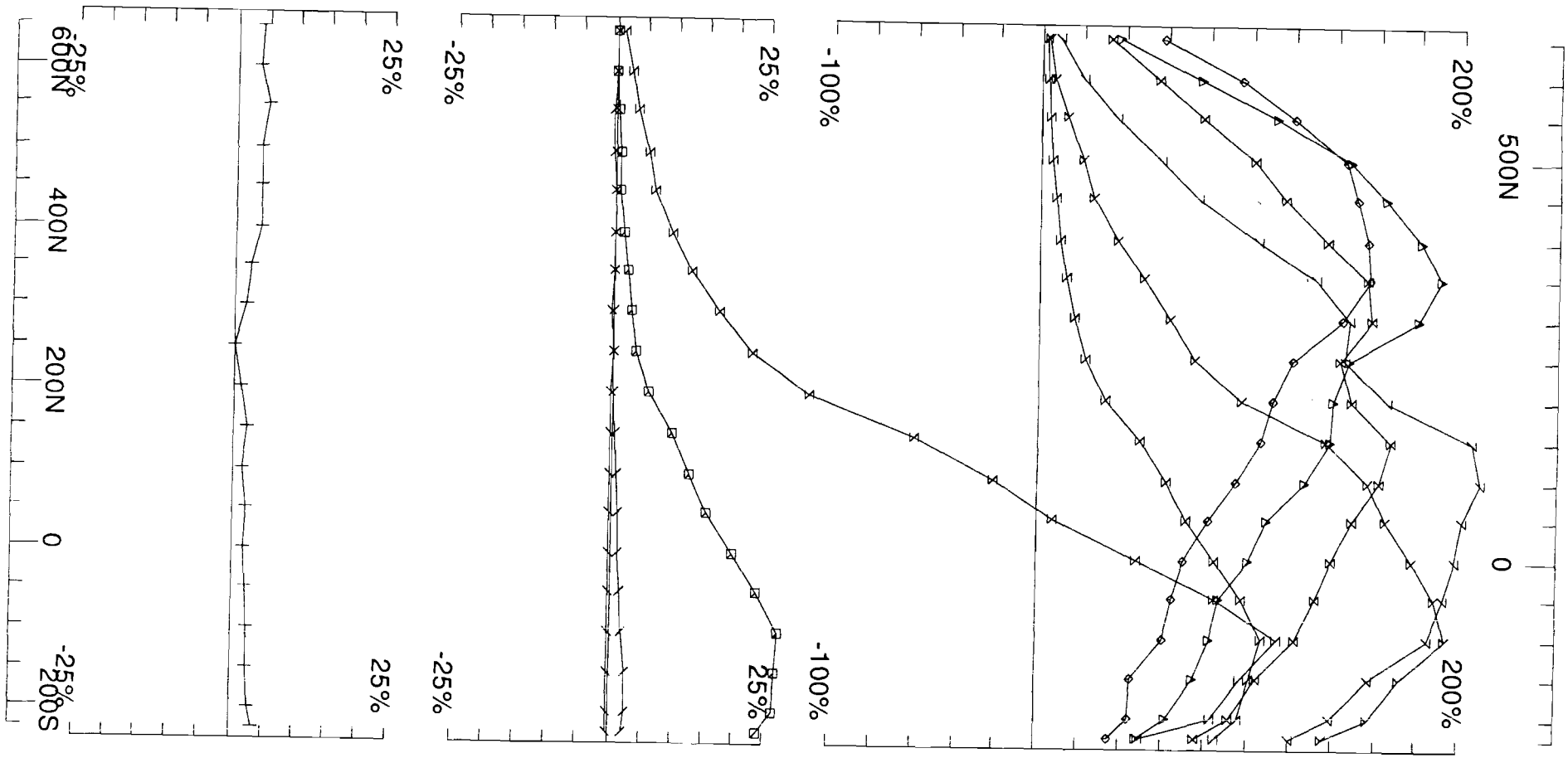
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 14/10/8, Plotted : 20/10/8



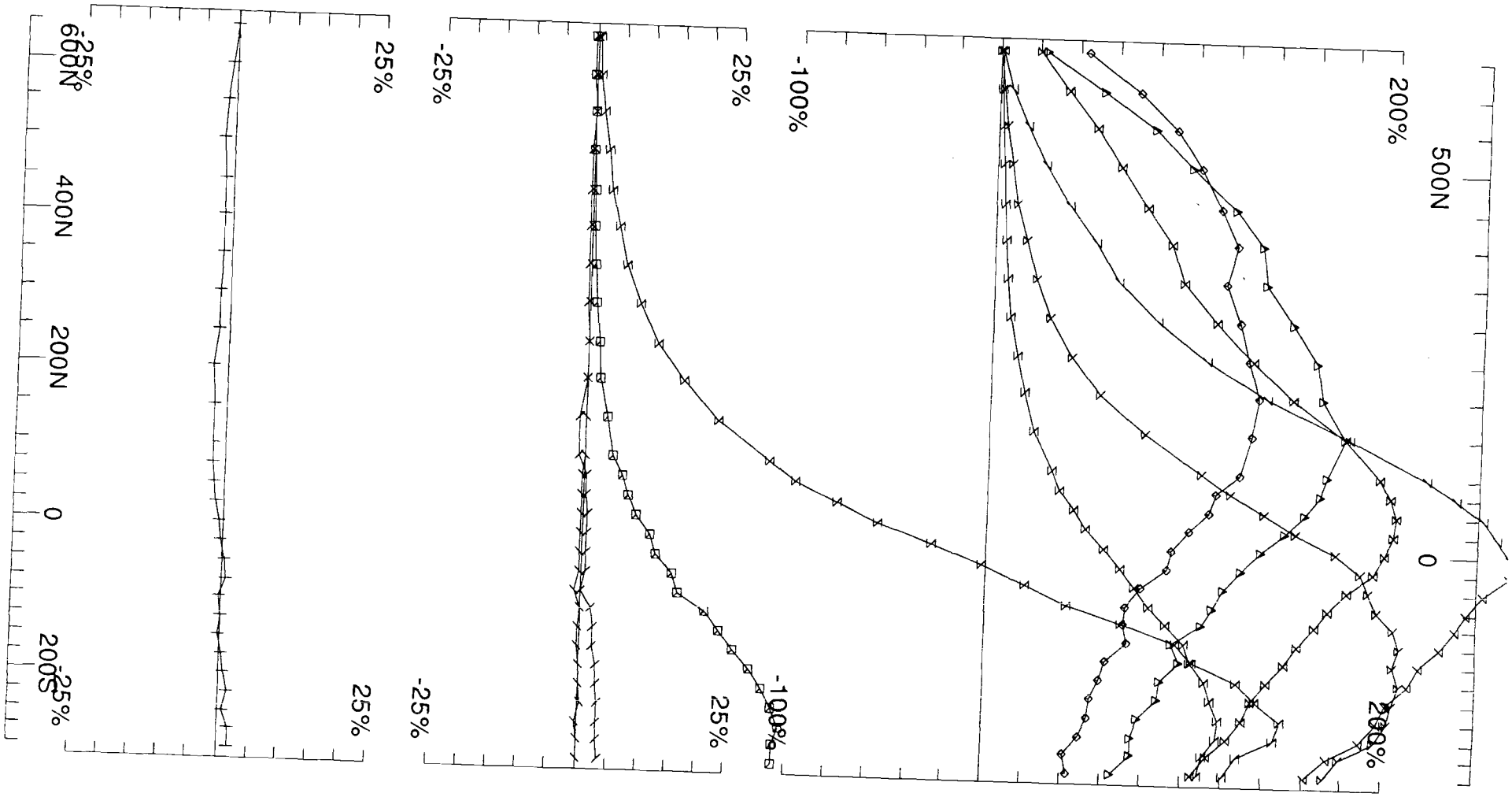
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 14/10/8, Plotted : 20/10/8



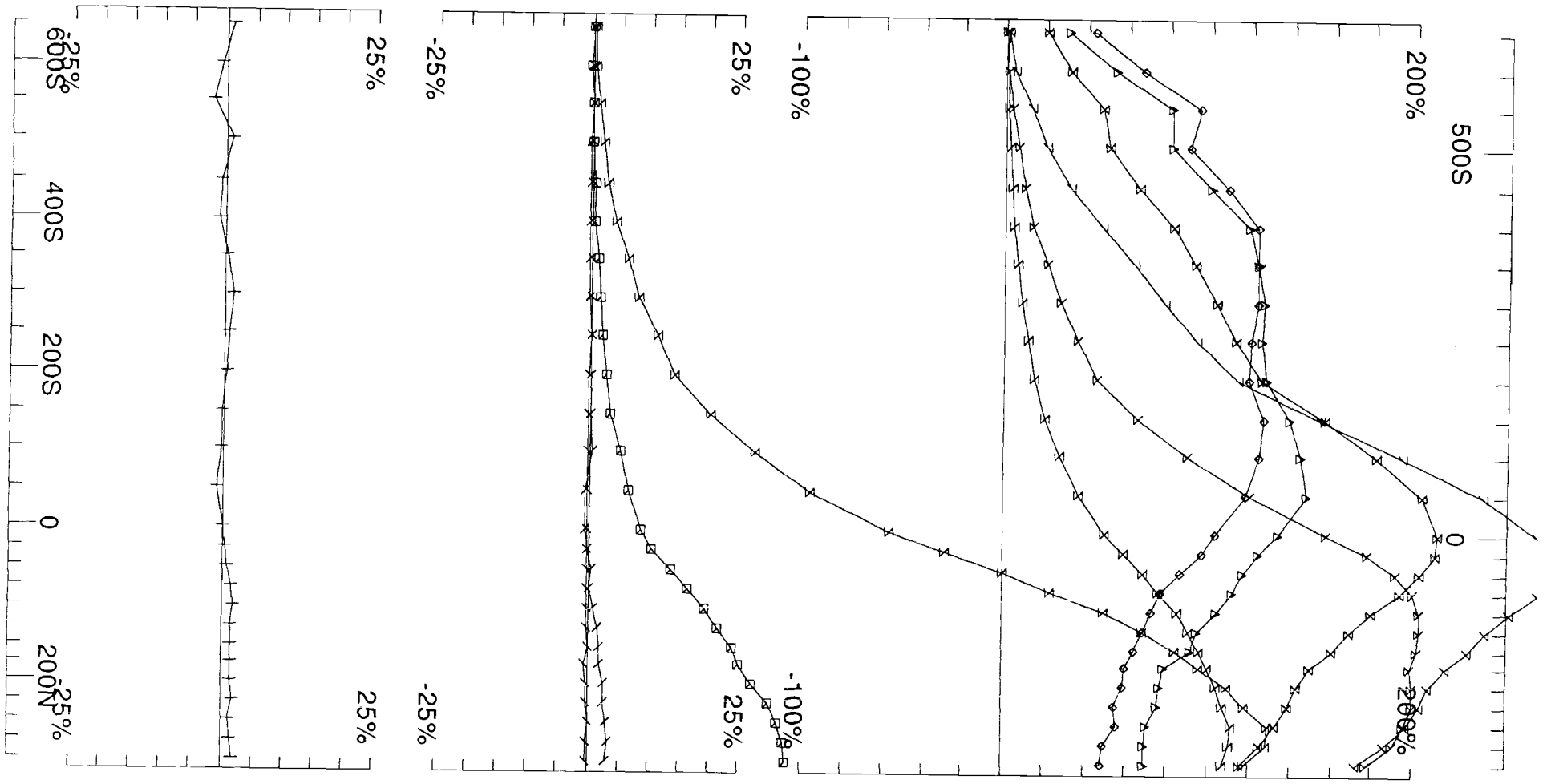
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 20/7/8, Plotted : 20/10/8



Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 19/7/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 19/7/8, Reduced : 14/10/8, Plotted : 20/10/8

Montcalm

Loop 30

Hz

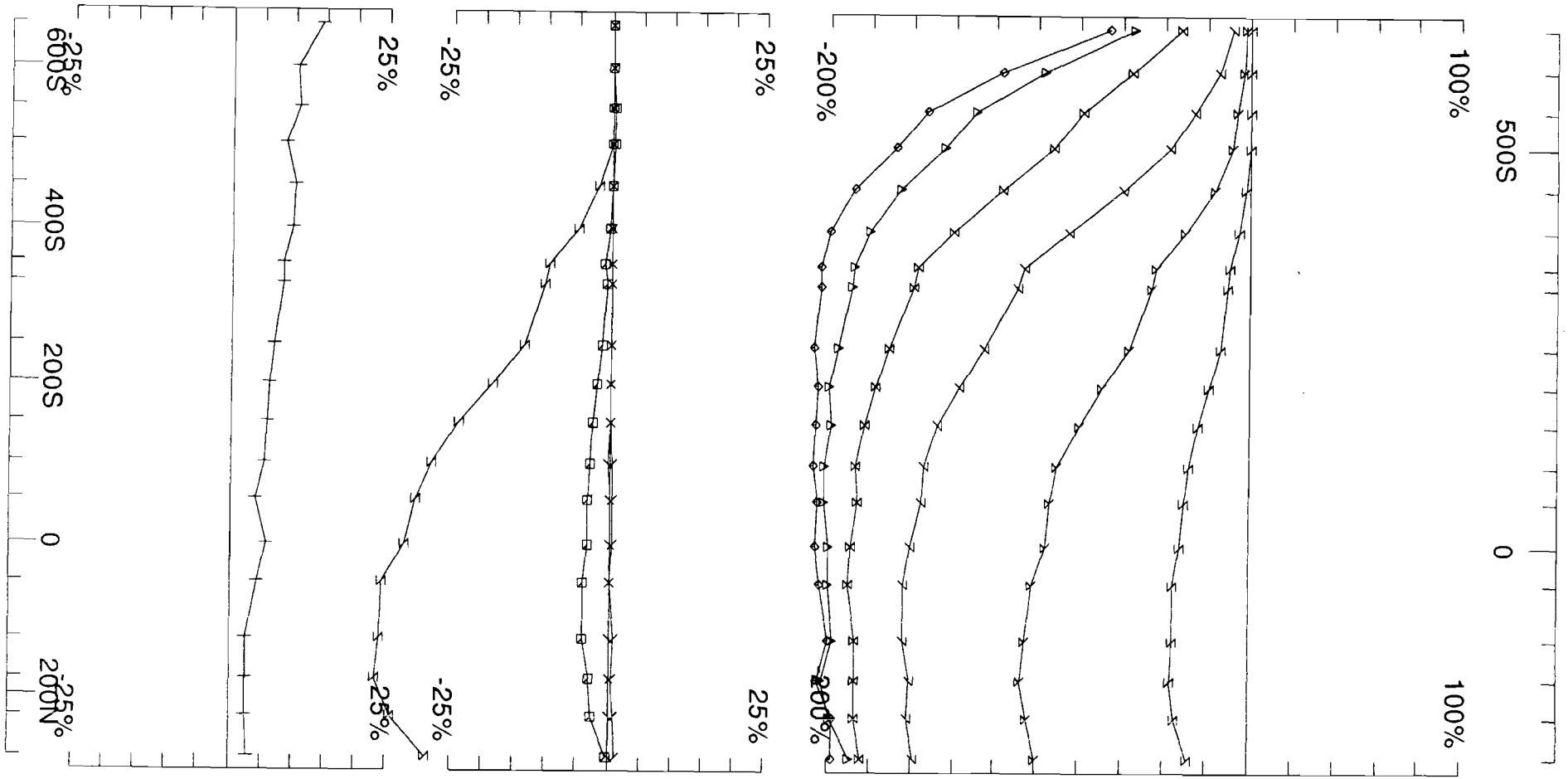
@30.974 Hz frequency

continuous norm

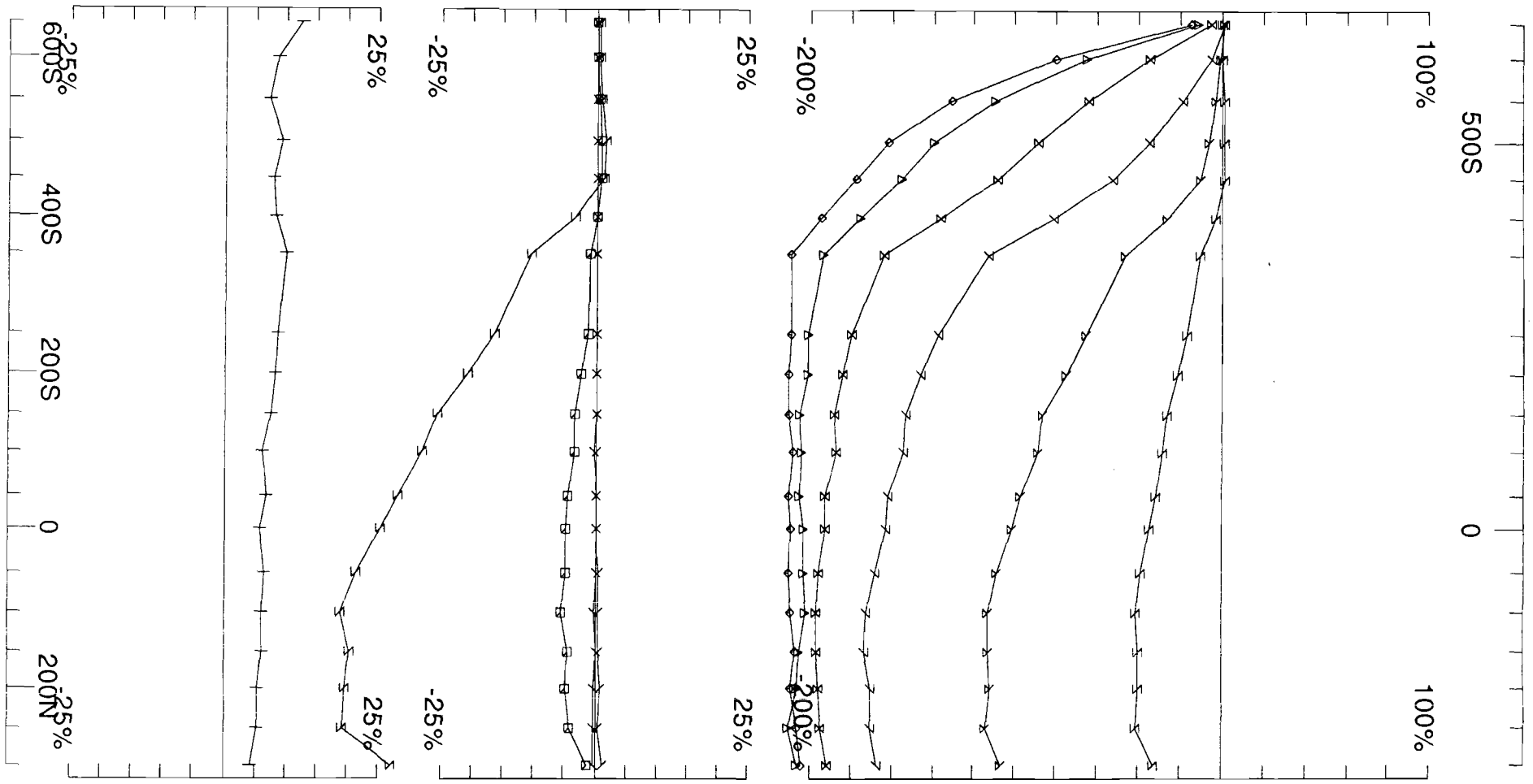
Ch1 reduced

Line 500W	700S - 325S
Line 400W	700S - 350S
Line 300W	700S - 300S
Line 200W	700S - 250S
Line 100W	700S - 225S
Line 0	700S - 250S
Line 100E	700S - 300N
Line 200E	700S - 300N
Line 300E	700S - 300N
Line 400E	700S - 300N
Line 500E	700S - 300N
Line 600E	700S - 300N
Line 700E	700S - 300N
Line 800E	700S - 300N
Line 900E	700S - 300N
Line 1000E	700S - 300N
Line 1100E	700S - 300N
Line 1200E	700S - 300N
Line 1300E	700S - 300N
Line 1400E	700S - 300N
Line 1500E	700S - 300N

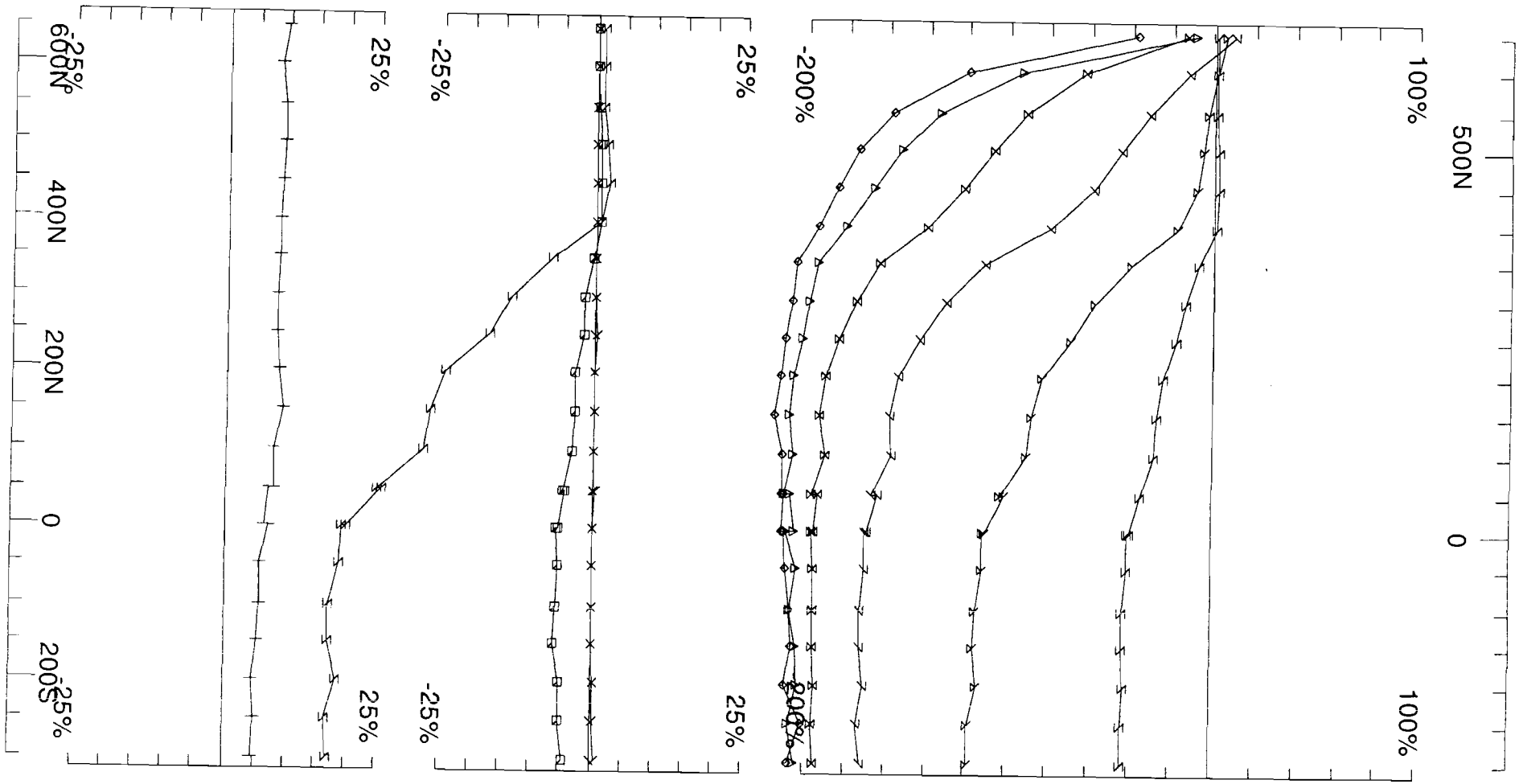
Loop 30 - continuous norm



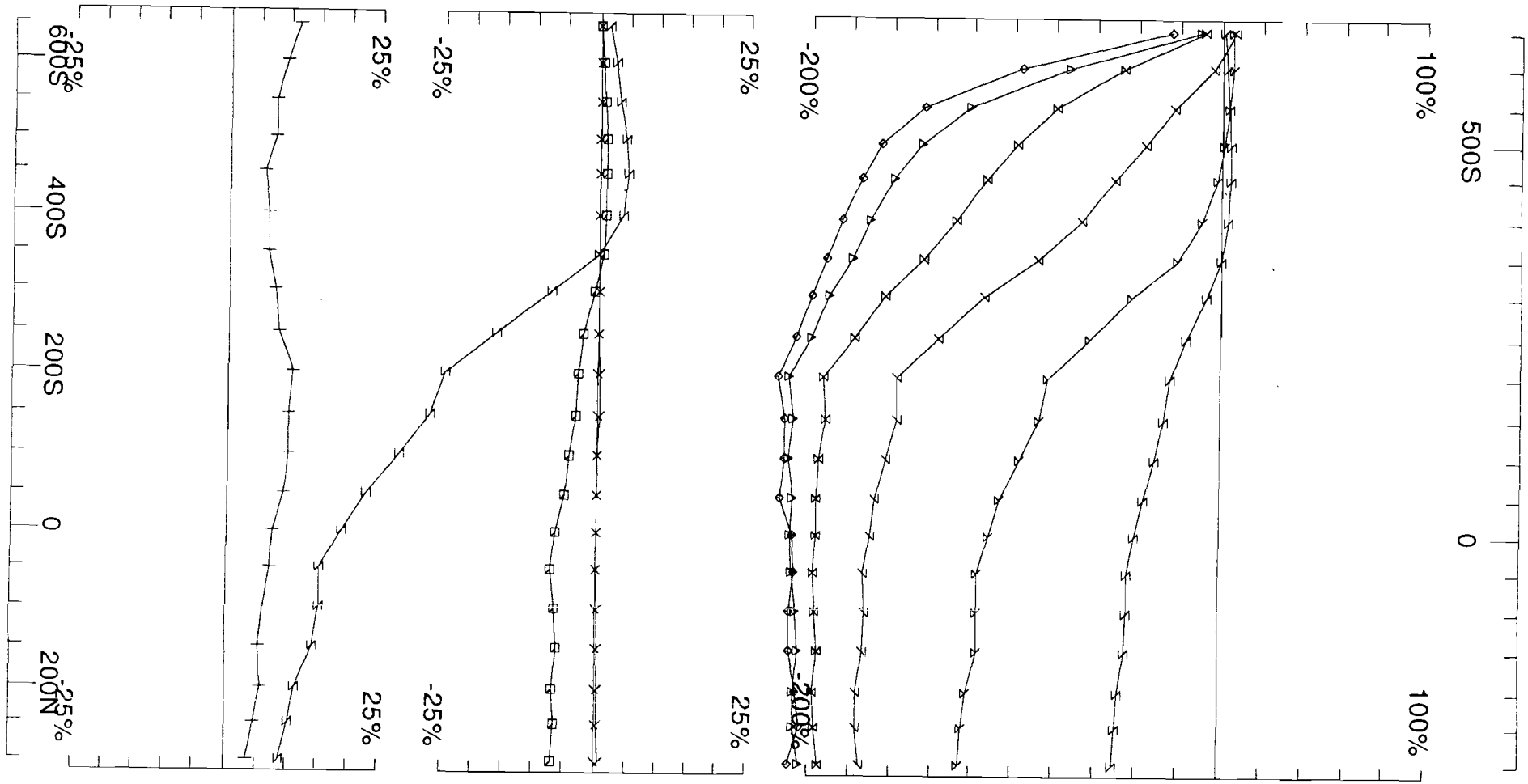
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 20/10/8



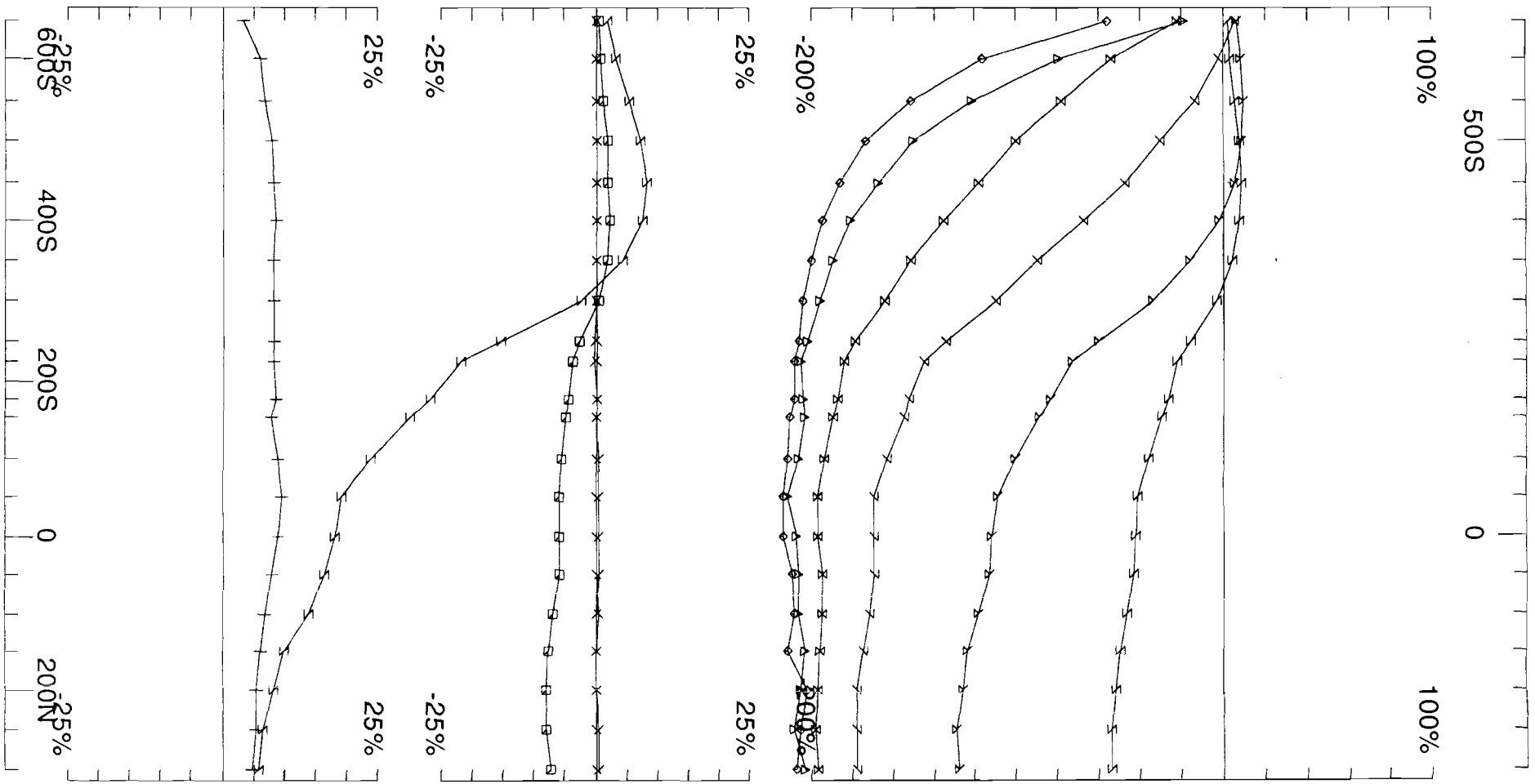
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 400W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 22/7/8, Reduced : 22/7/8, Plotted : 20/10/8



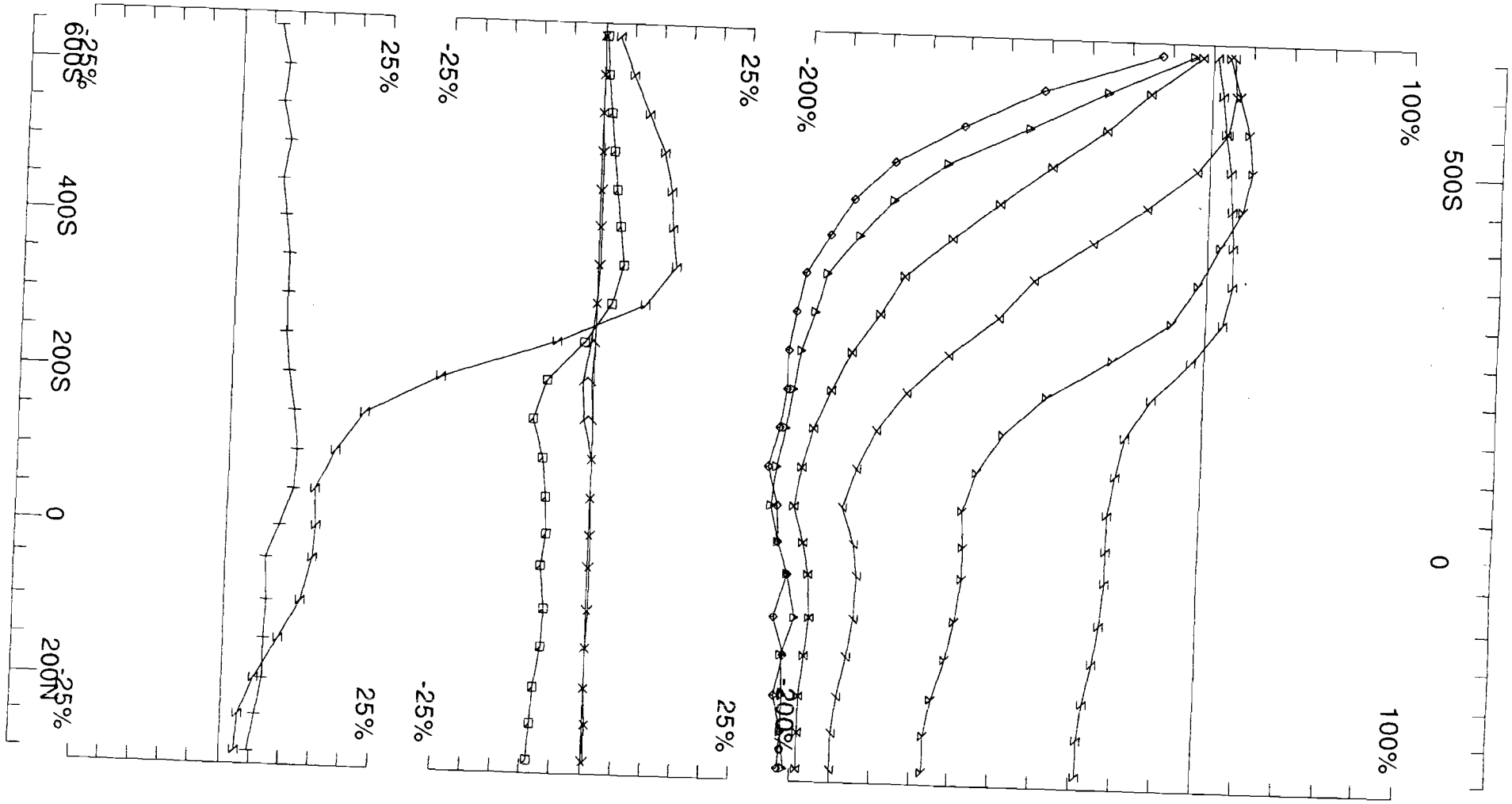
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 300W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 22/7/8, Reduced : 22/7/8, Plotted : 20/10/8



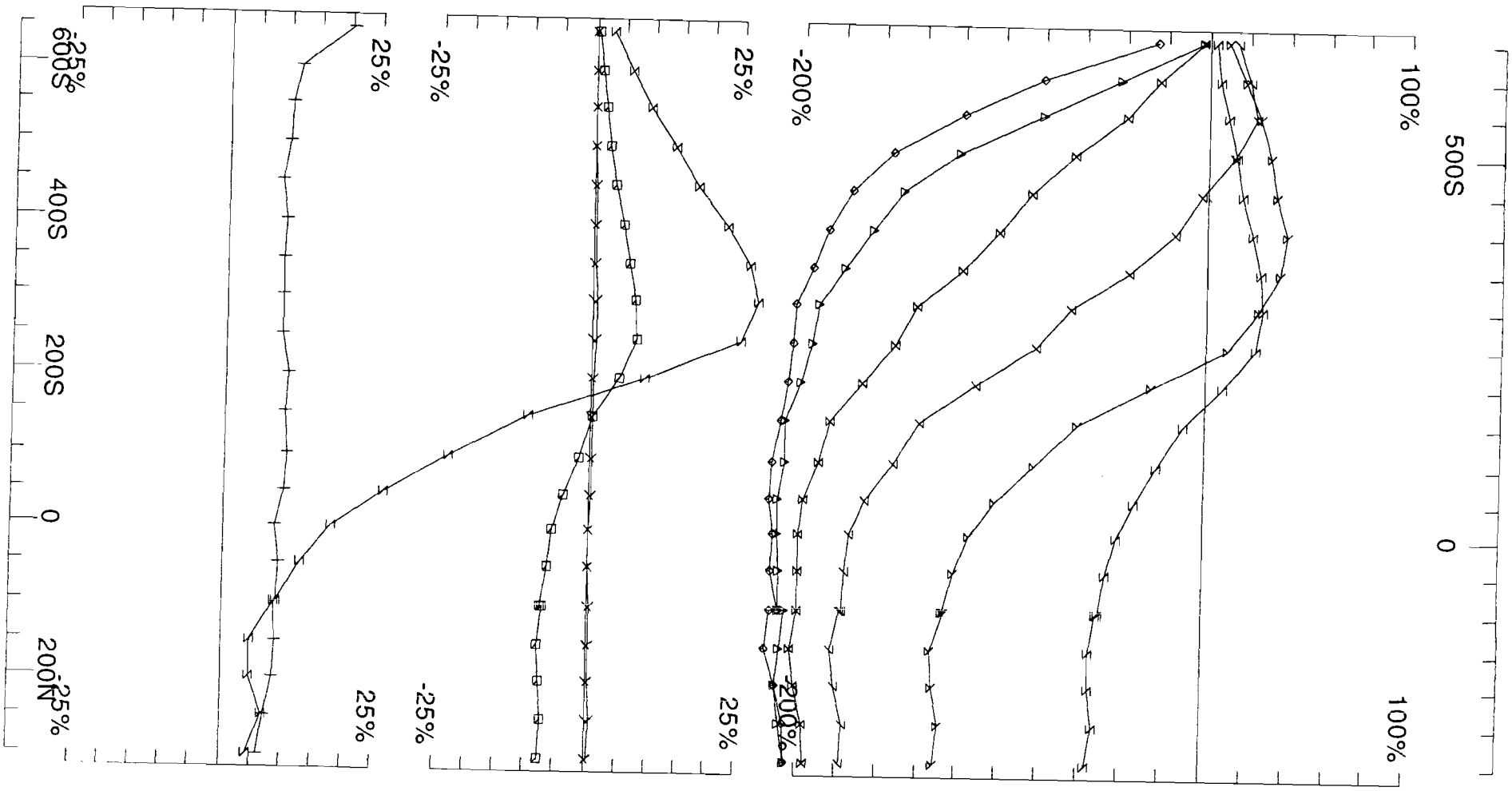
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 200W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 20/10/8



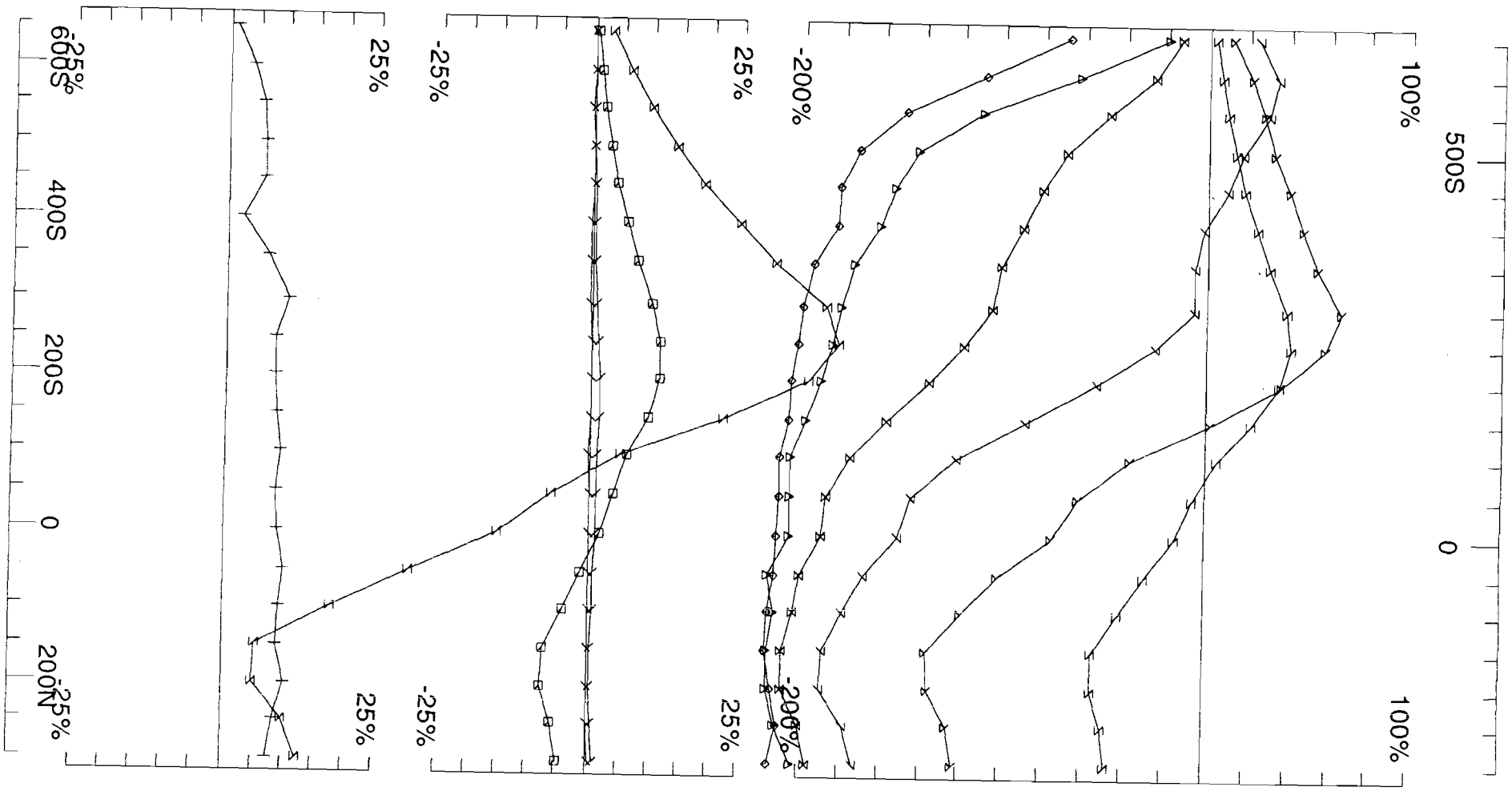
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 100W	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 20/10/8



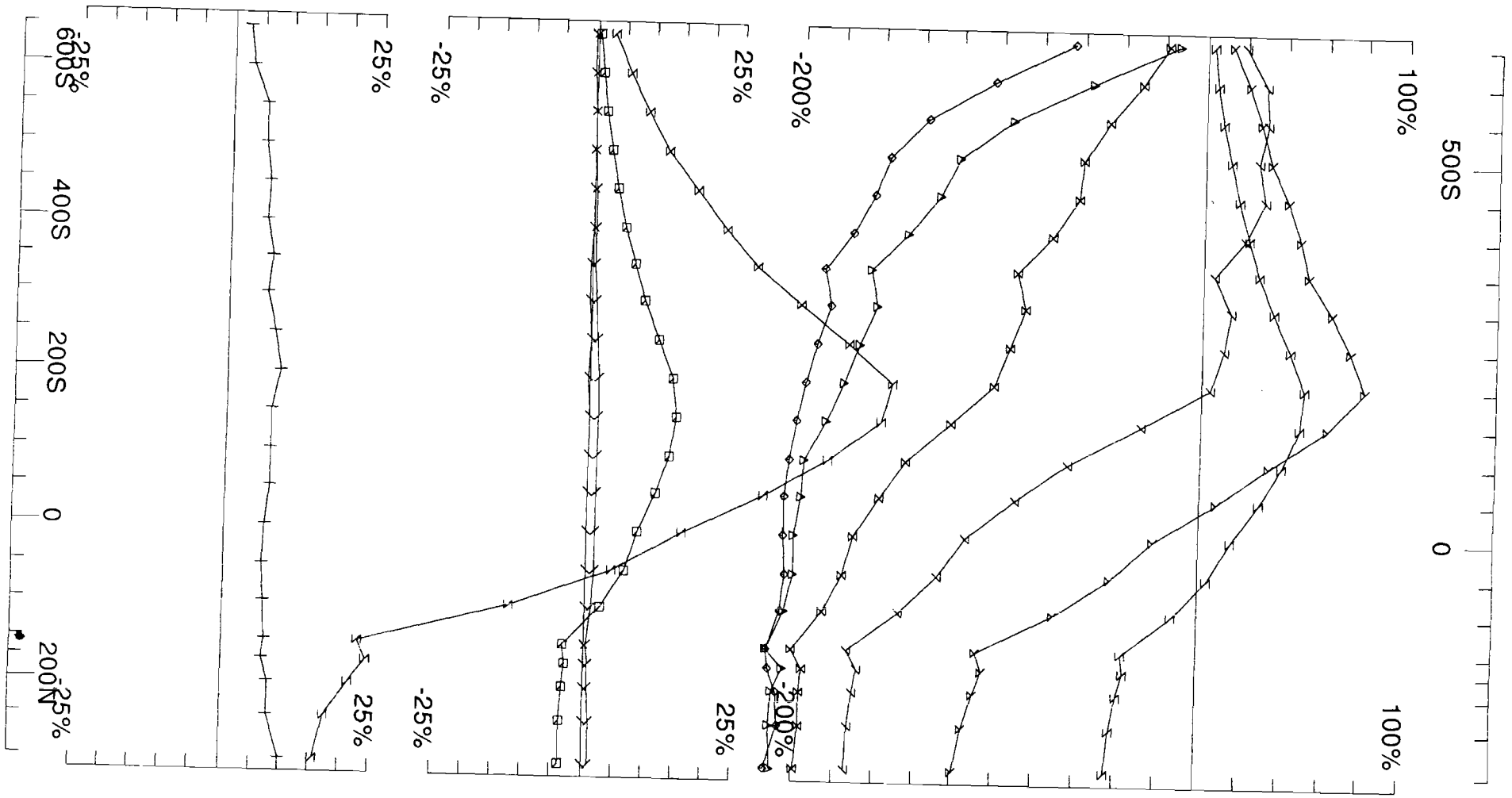
Loop: 30 Line: 0 Compt: Hz	Secondary, (Chn - Ch1)/|Hp| Contin. Norm at depth of 0 m Base Freq. 30.974 Hz	UTEM Survey at: Montcalm For: Xstrata Nickel LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 20/10/8



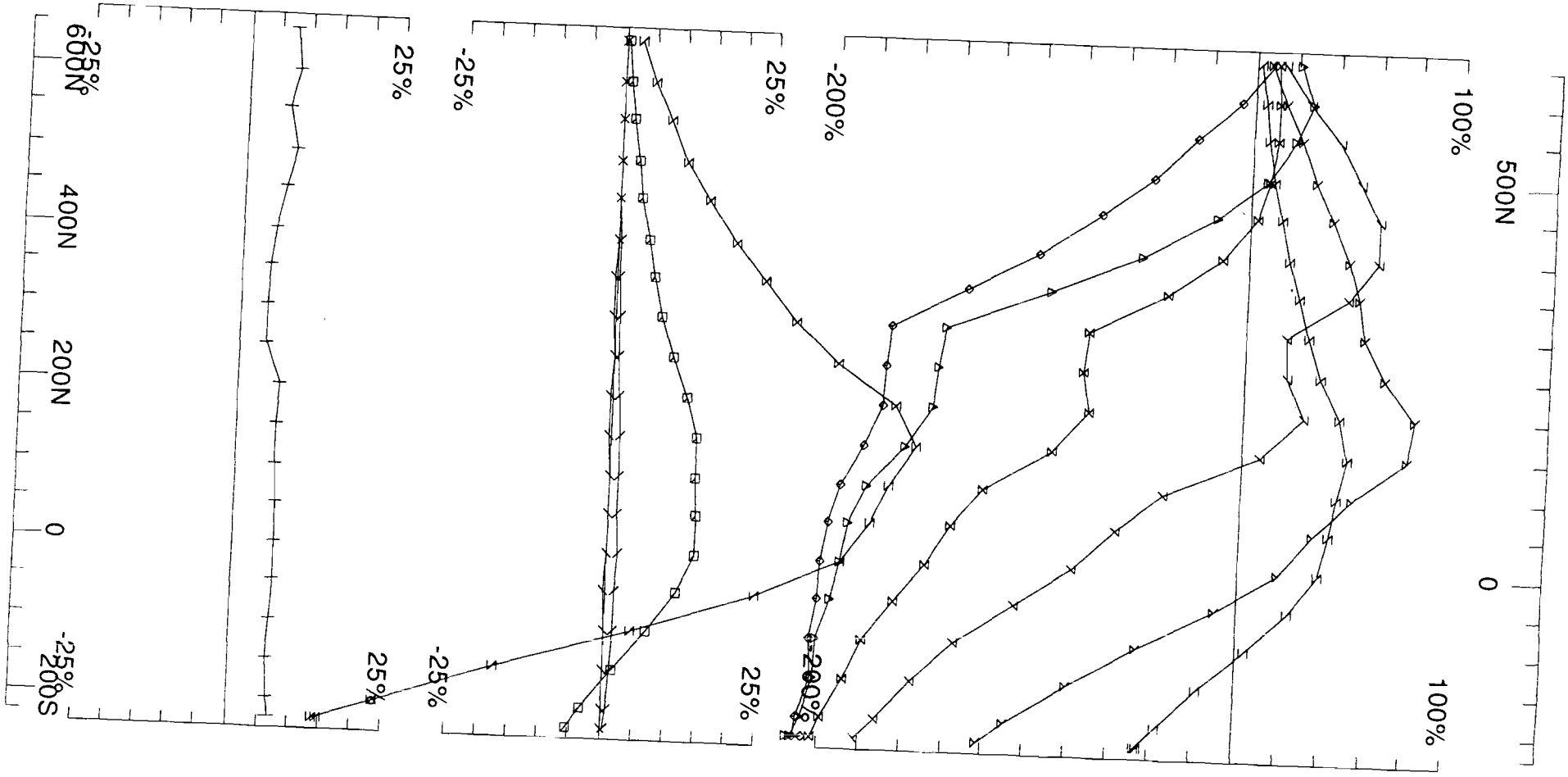
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 14/10/8, Plotted : 20/10/8



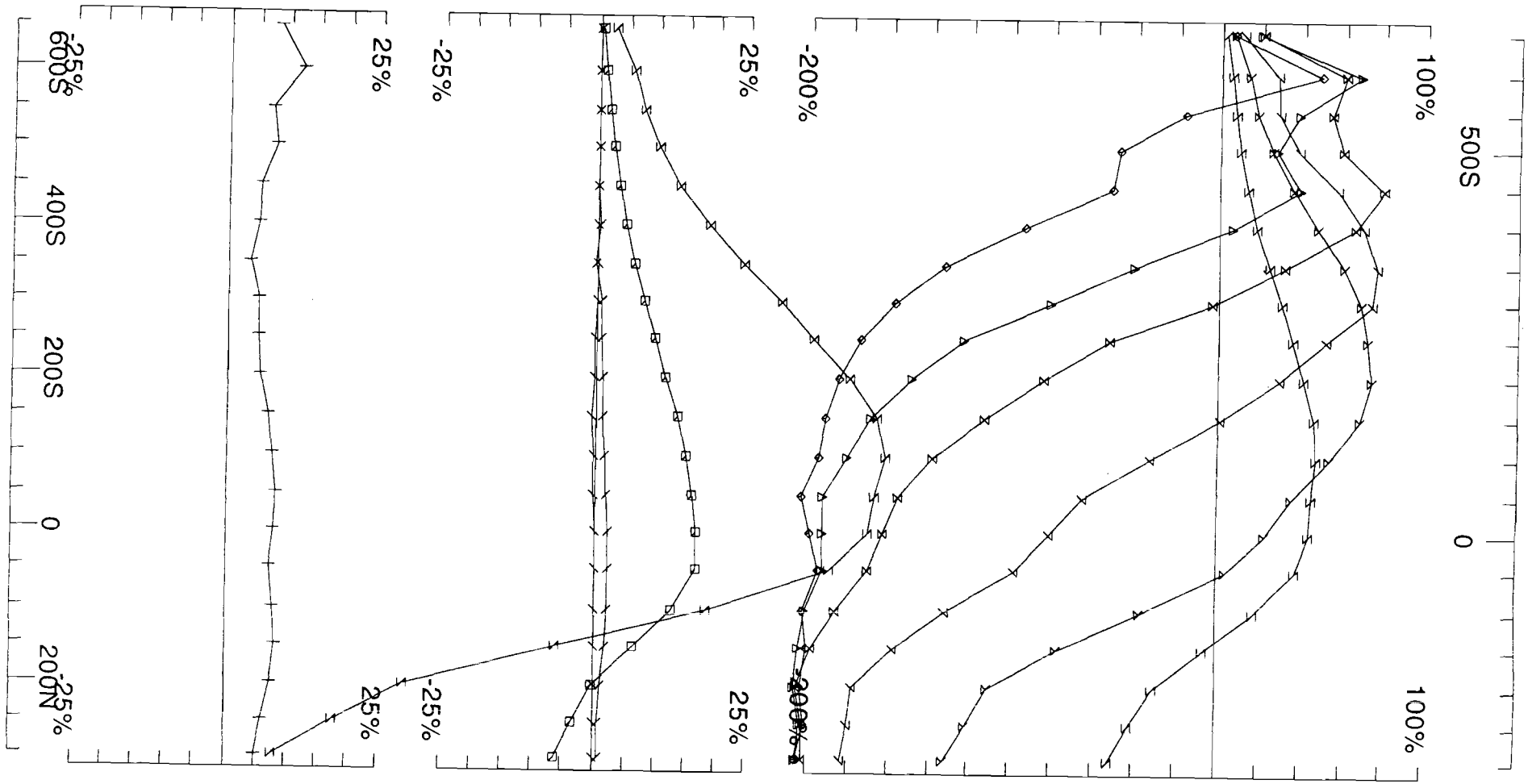
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 14/10/8, Plotted : 20/10/8



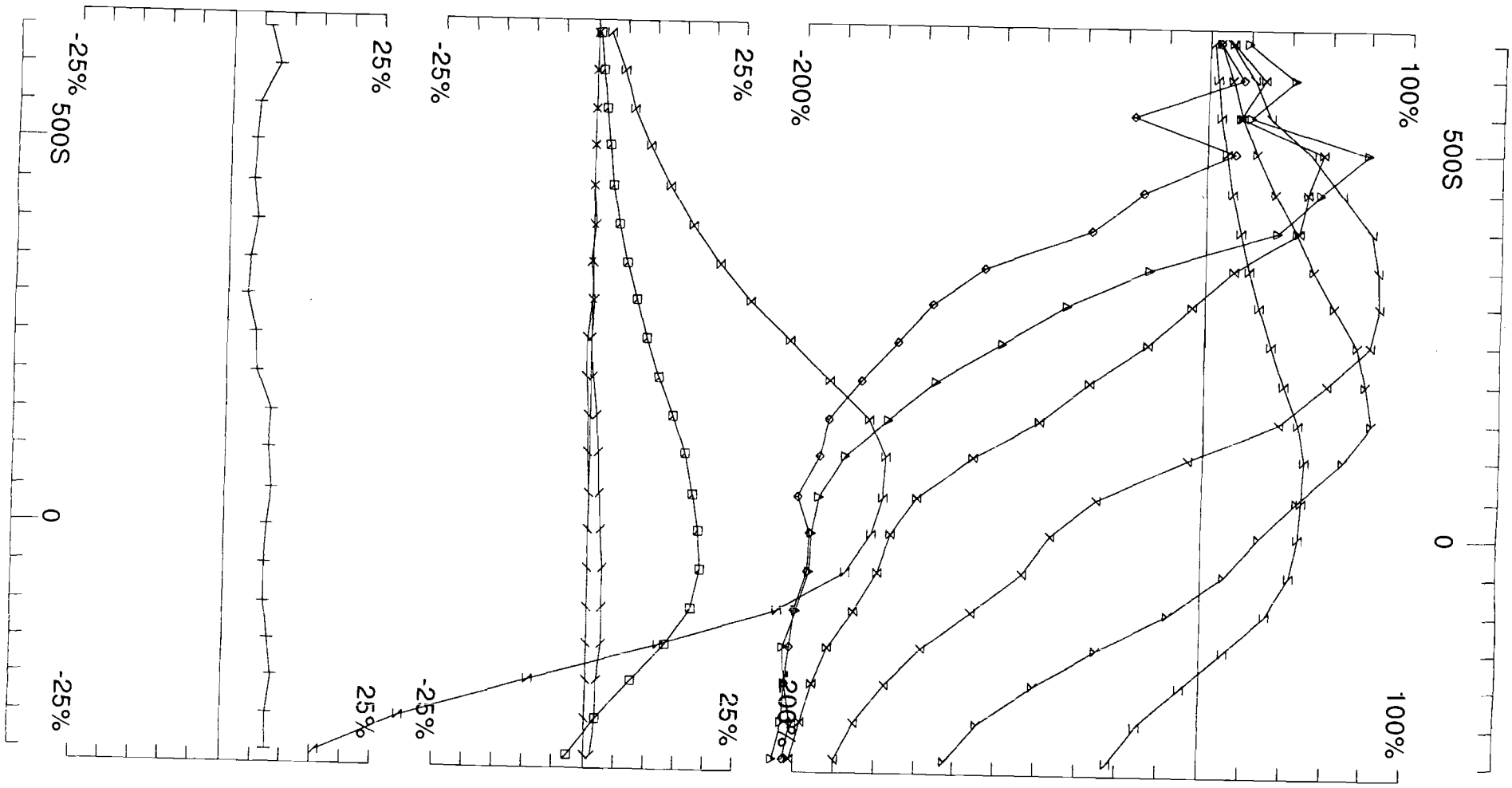
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 20/7/8, Plotted : 20/10/8



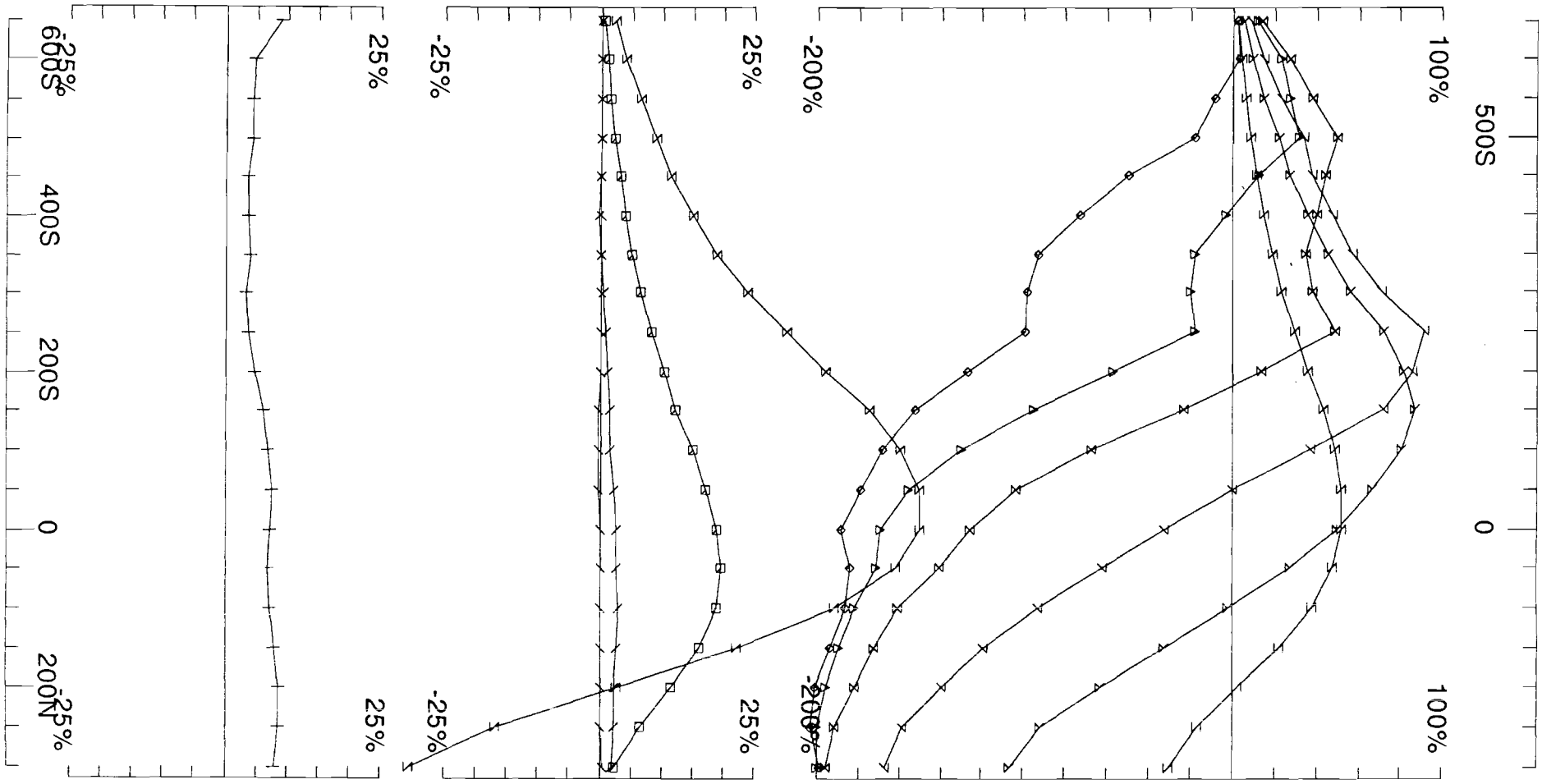
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 20/7/8, Reduced : 14/10/8, Plotted : 20/10/8



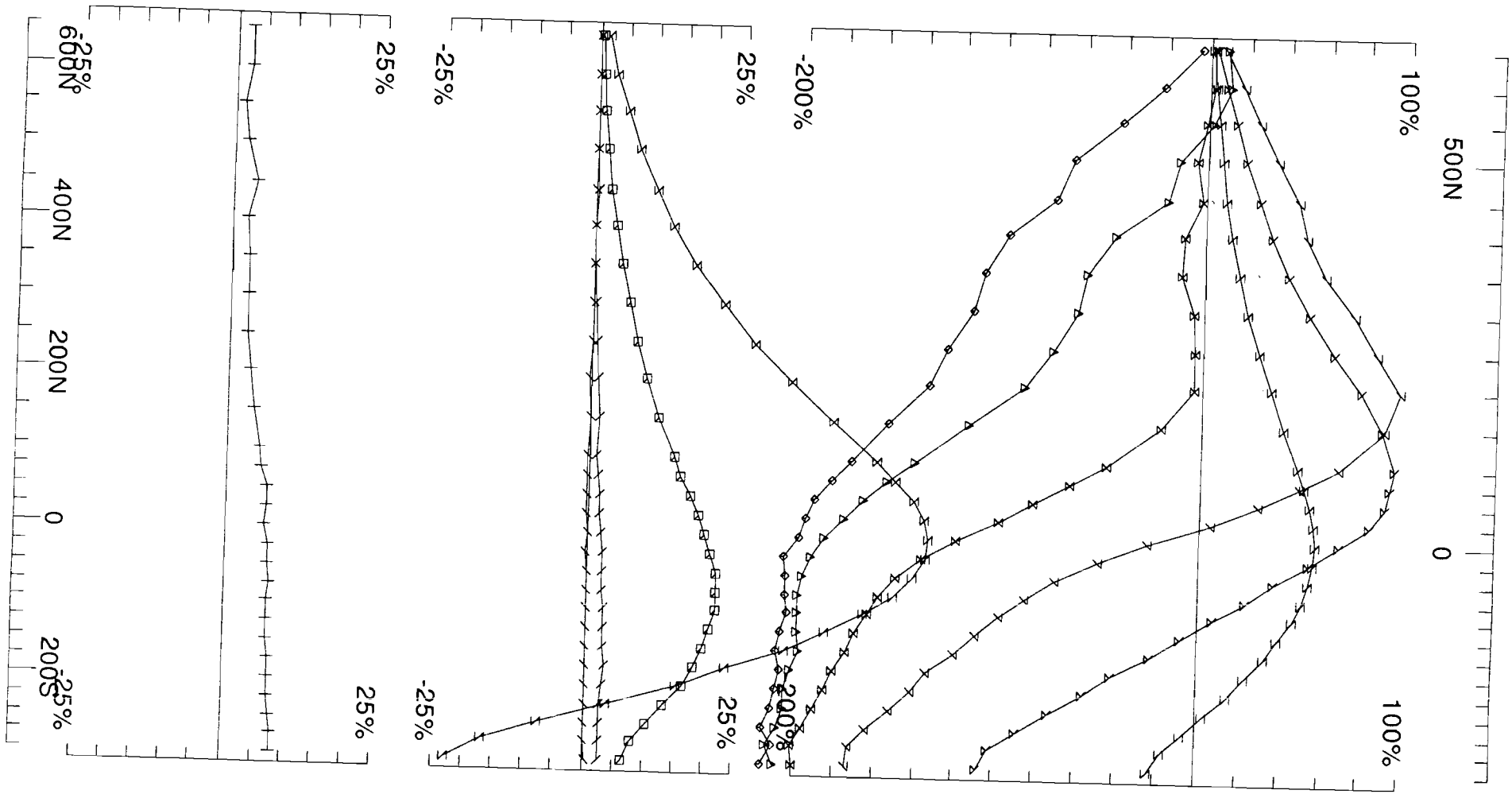
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 18/7/8, Reduced : 14/10/8, Plotted : 20/10/8



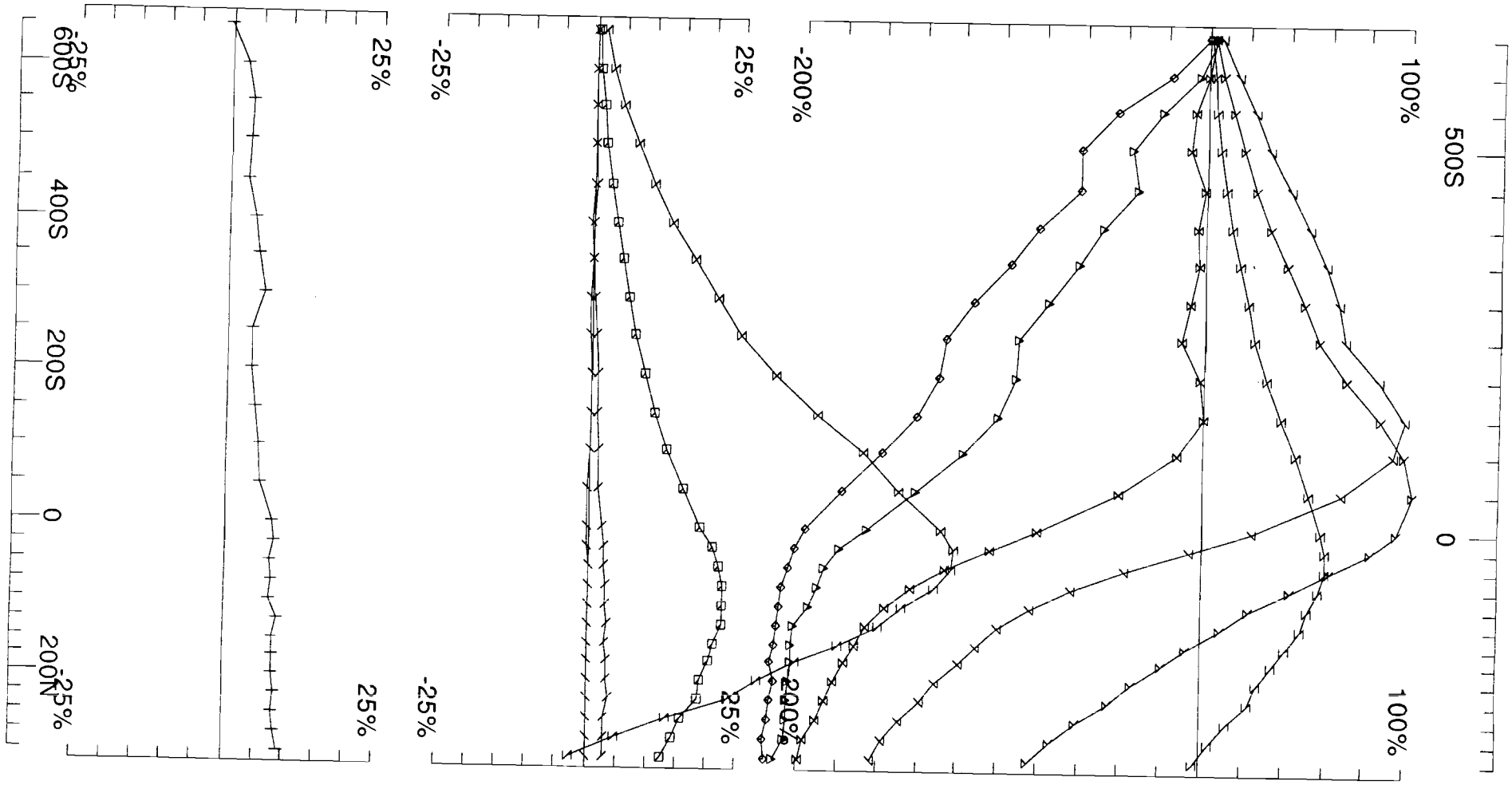
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 18/7/8, Reduced : 14/10/8, Plotted : 21/10/8



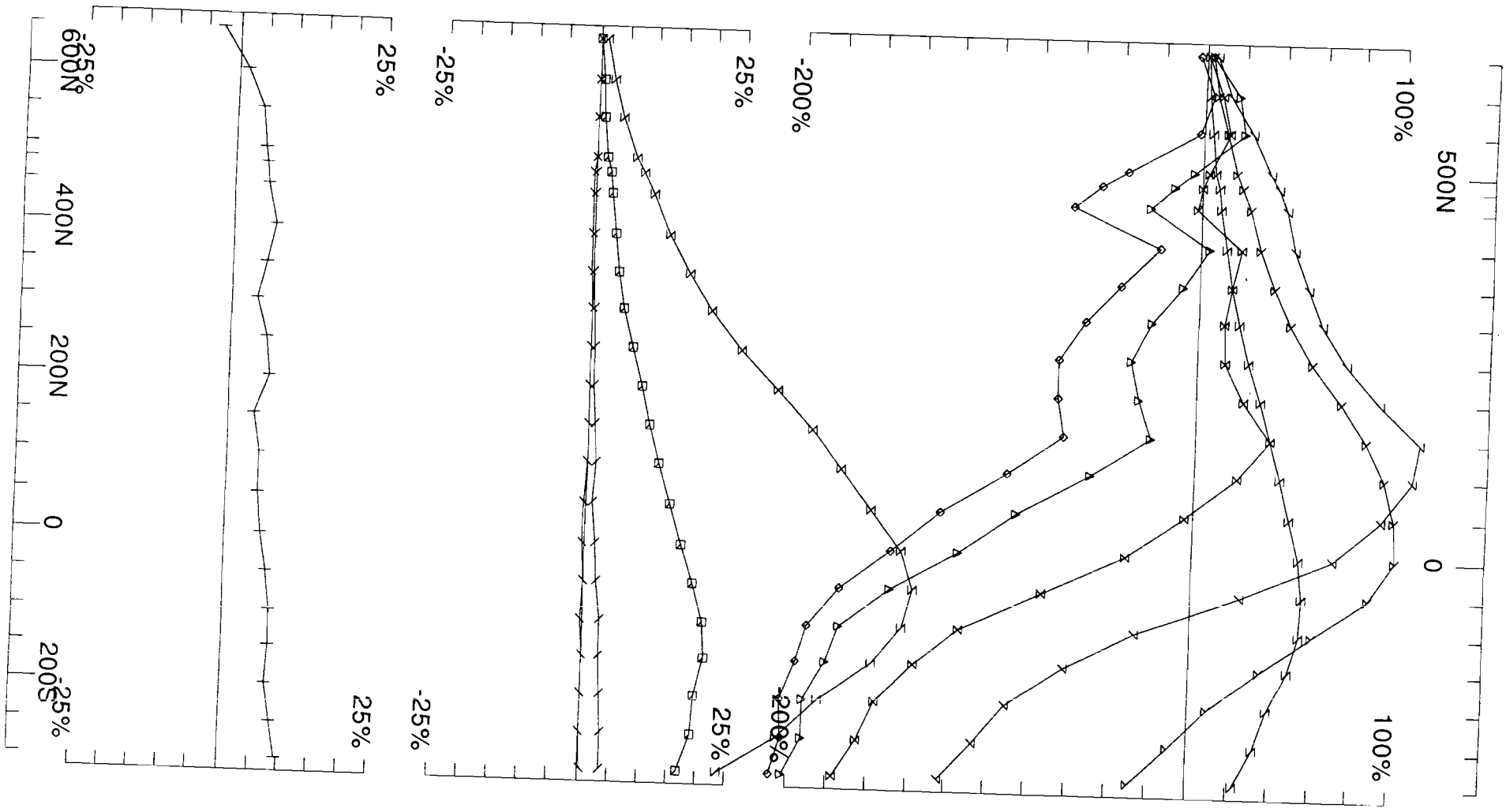
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 18/7/8, Reduced : 14/10/8, Plotted : 20/10/8



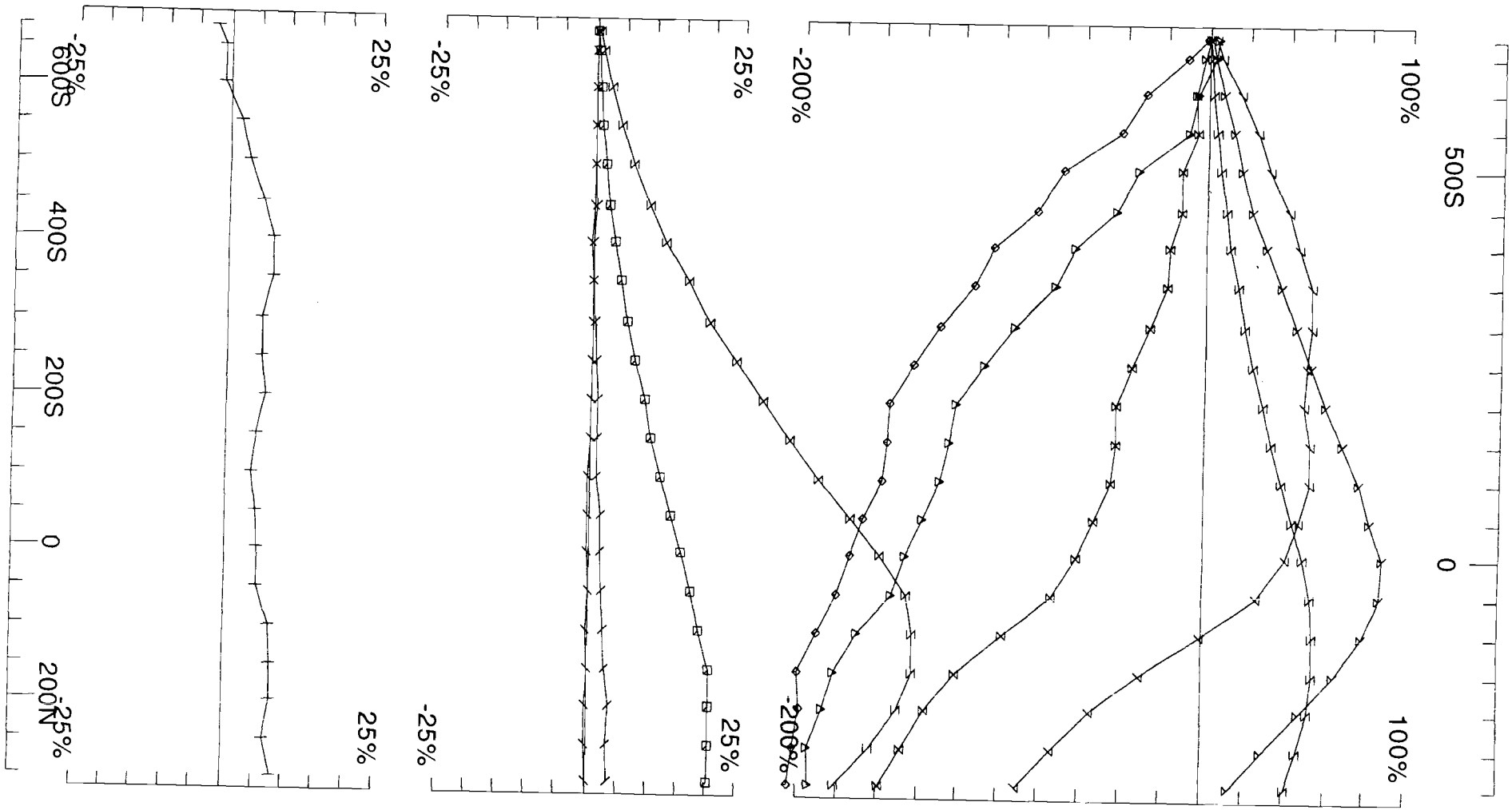
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 19/7/8, Reduced : 14/10/8, Plotted : 20/10/8



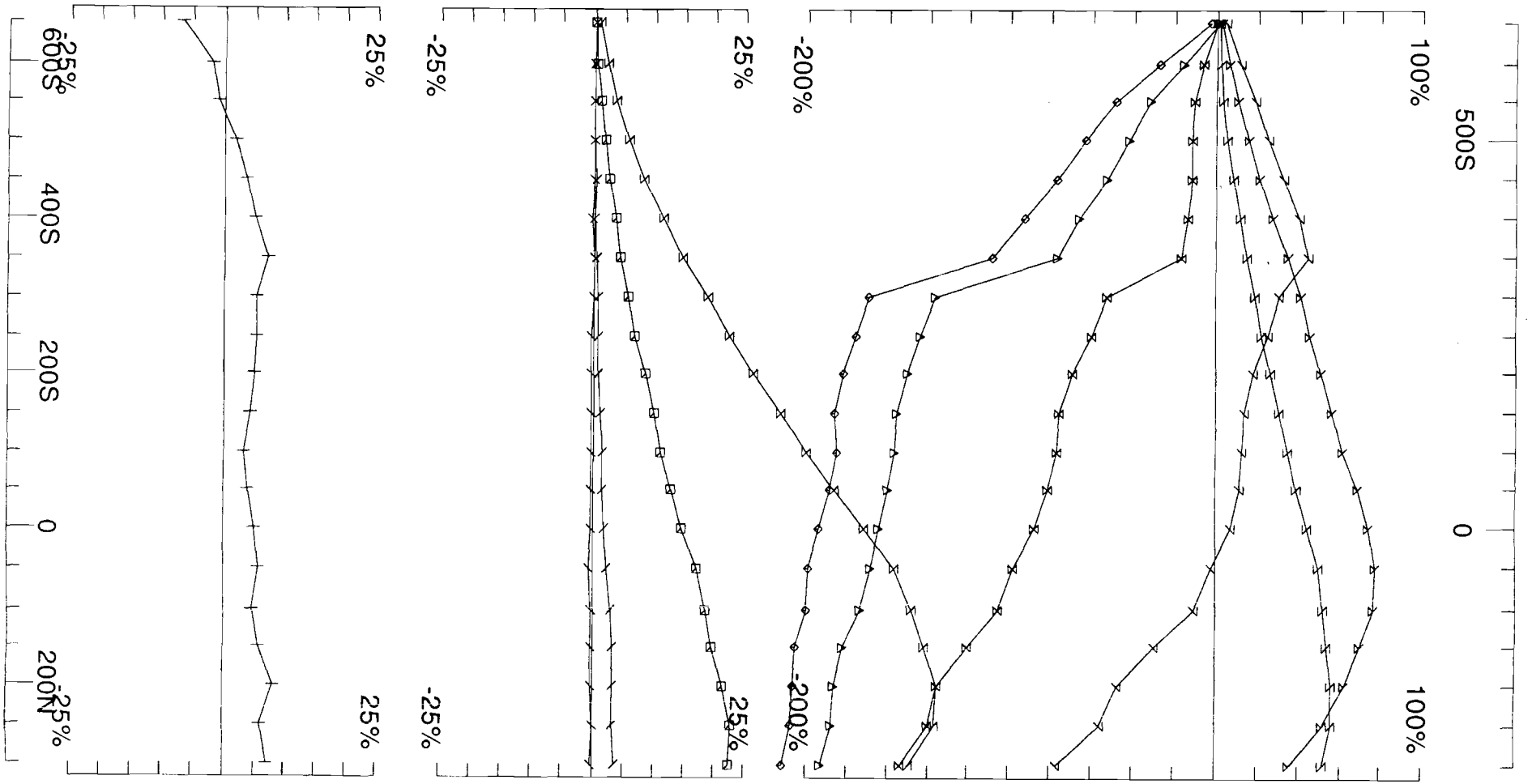
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 19/7/8, Reduced : 14/10/8, Plotted : 20/10/8



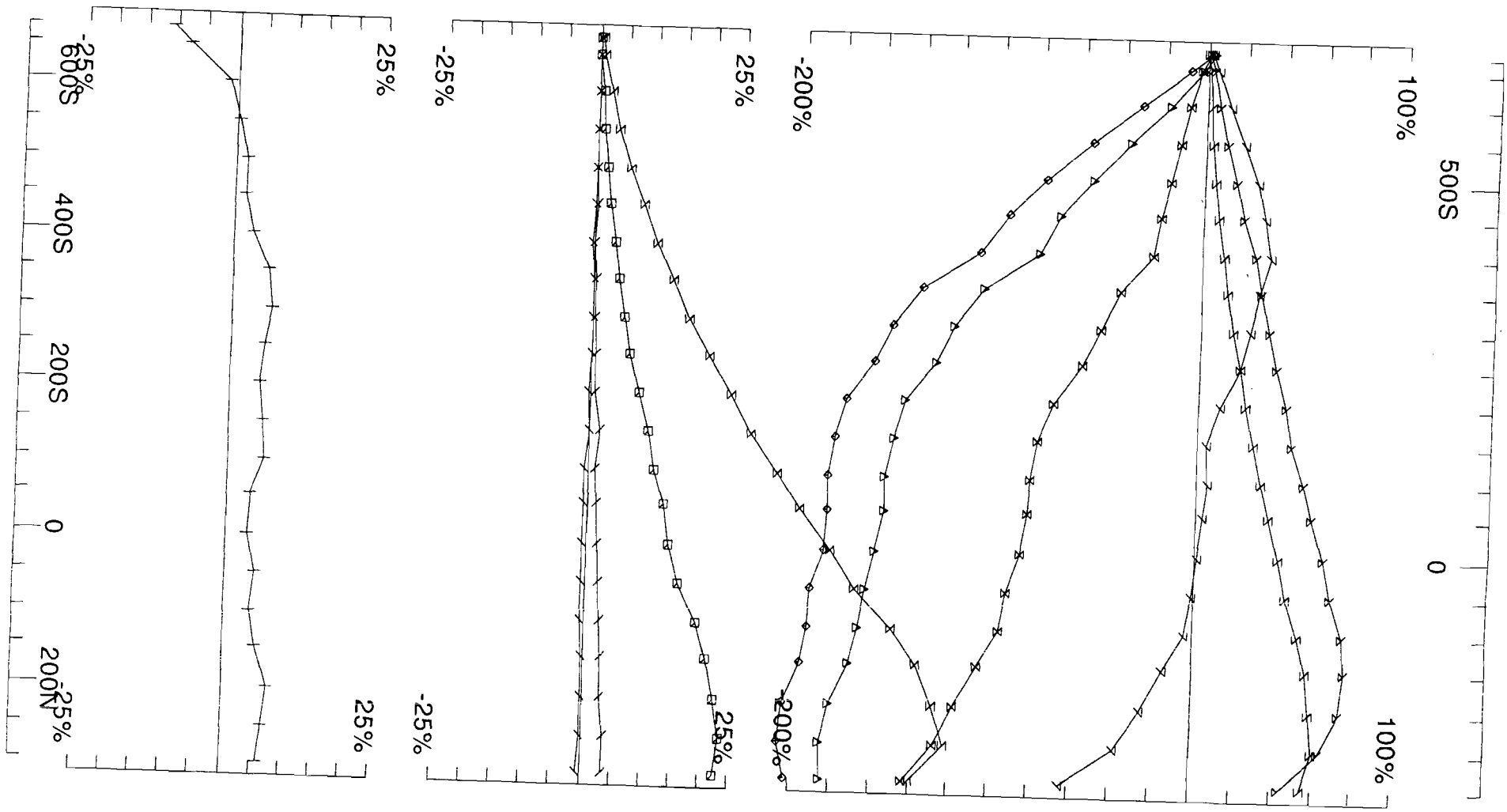
Loop: 30 Line: 1000E Compt: Hz	Secondary, (Chn - Ch1)/|Hp| Contin. Norm at depth of 0 m Base Freq. 30.974 Hz	UTEM Survey at: Montcalm For: Xstrata Nickel LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 18/7/8 Reduced : 14/10/8 Plotted : 20/10/8



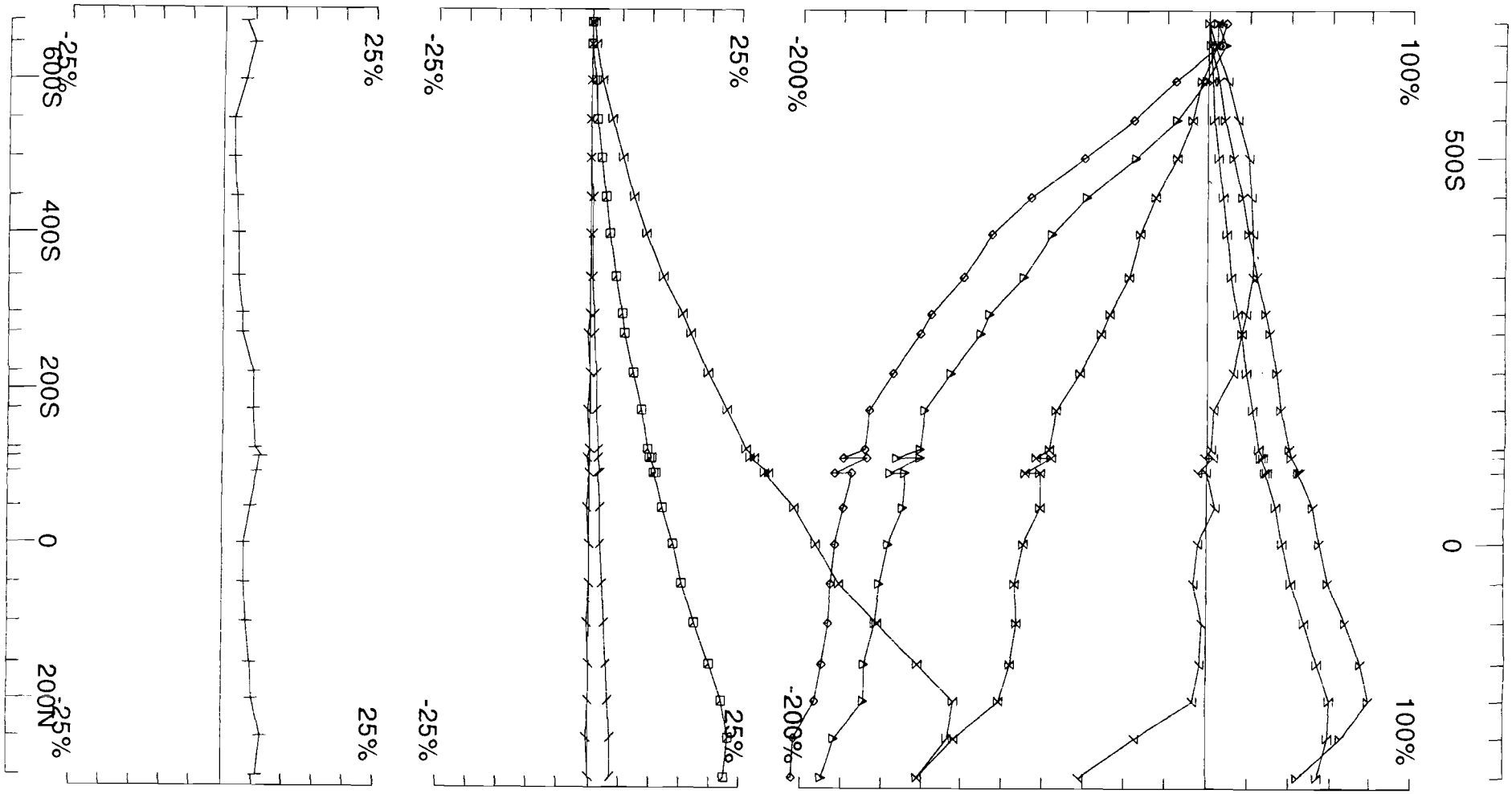
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 18/7/8, Reduced : 15/10/8, Plotted : 20/10/8



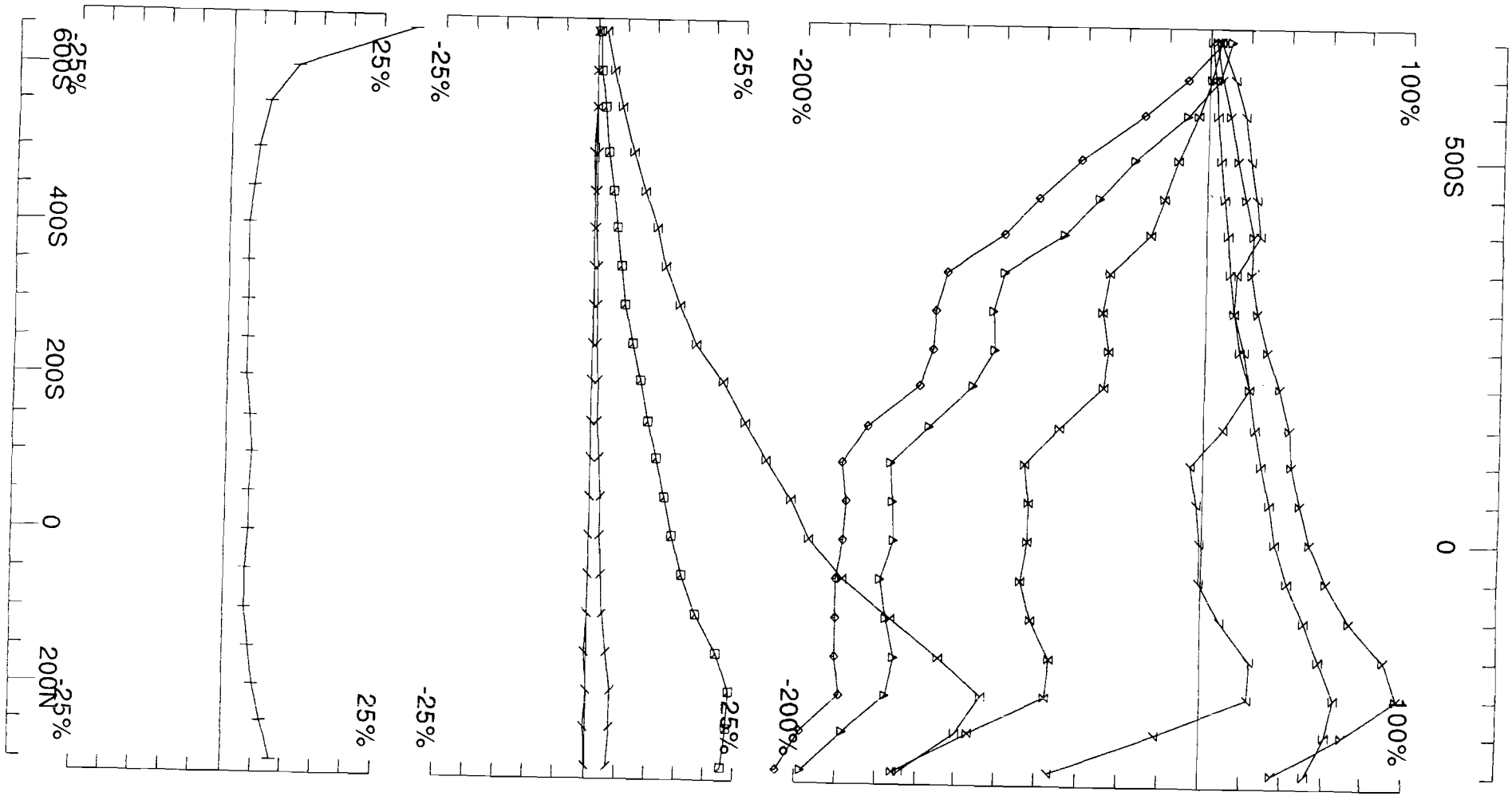
Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 16/7/8, Reduced : 14/10/8, Plotted : 20/10/8



Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 16/7/8, Reduced : 15/10/8, Plotted : 20/10/8



Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 16/7/8, Reduced : 15/10/8, Plotted : 20/10/8



Loop: 30	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 16/7/8, Reduced : 14/10/8, Plotted : 20/10/8

Montcalm

Loop 31

Hy

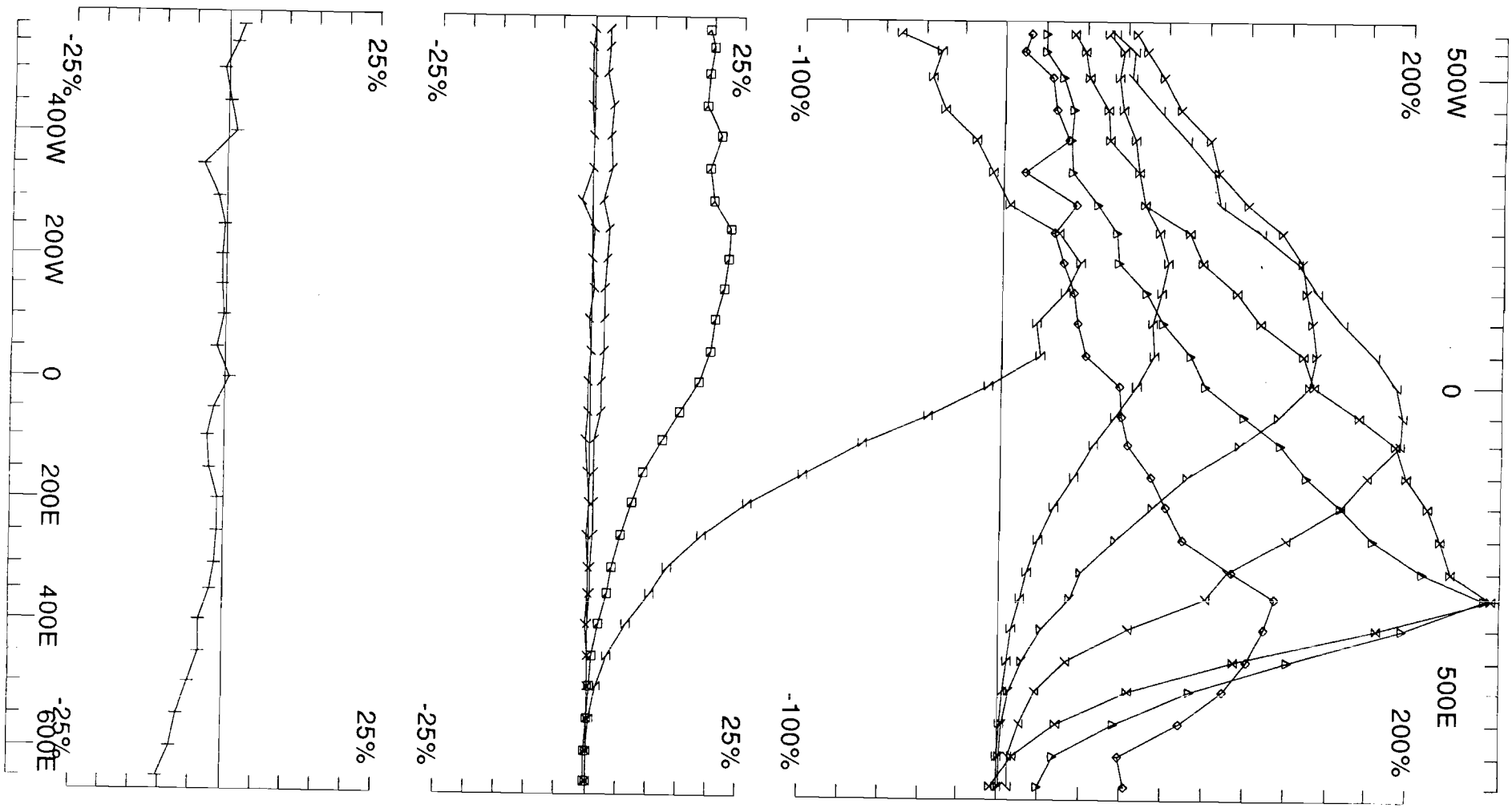
@30.974 Hz frequency

continuous norm

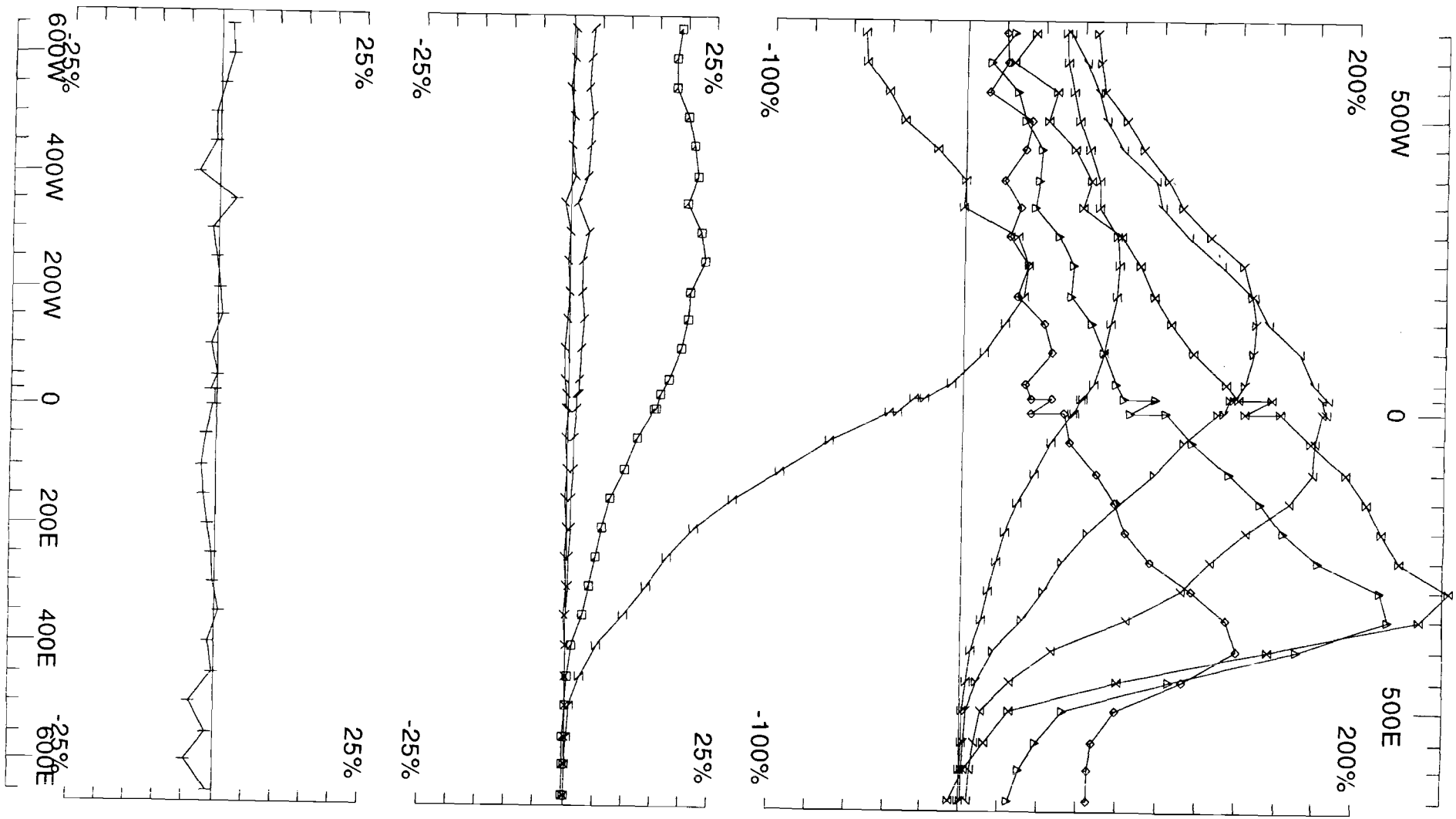
Ch1 reduced

Line 500S	700E - 575W
Line 600S	700E - 700W
Line 700S	700E - 700W
Line 800S	700E - 700W
Line 900S	700E - 700W

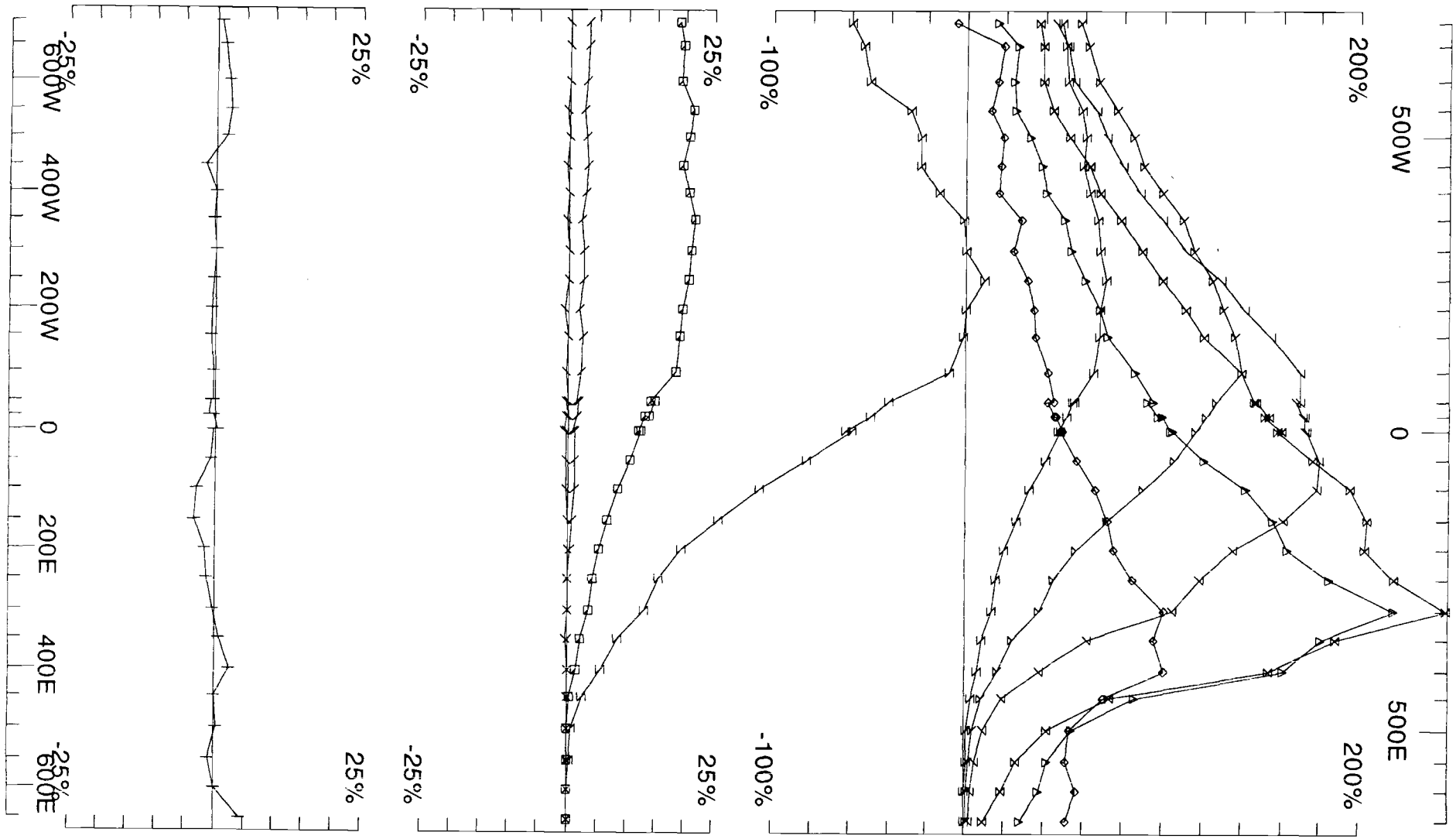
Loop 31 - continuous norm



Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 23/7/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8

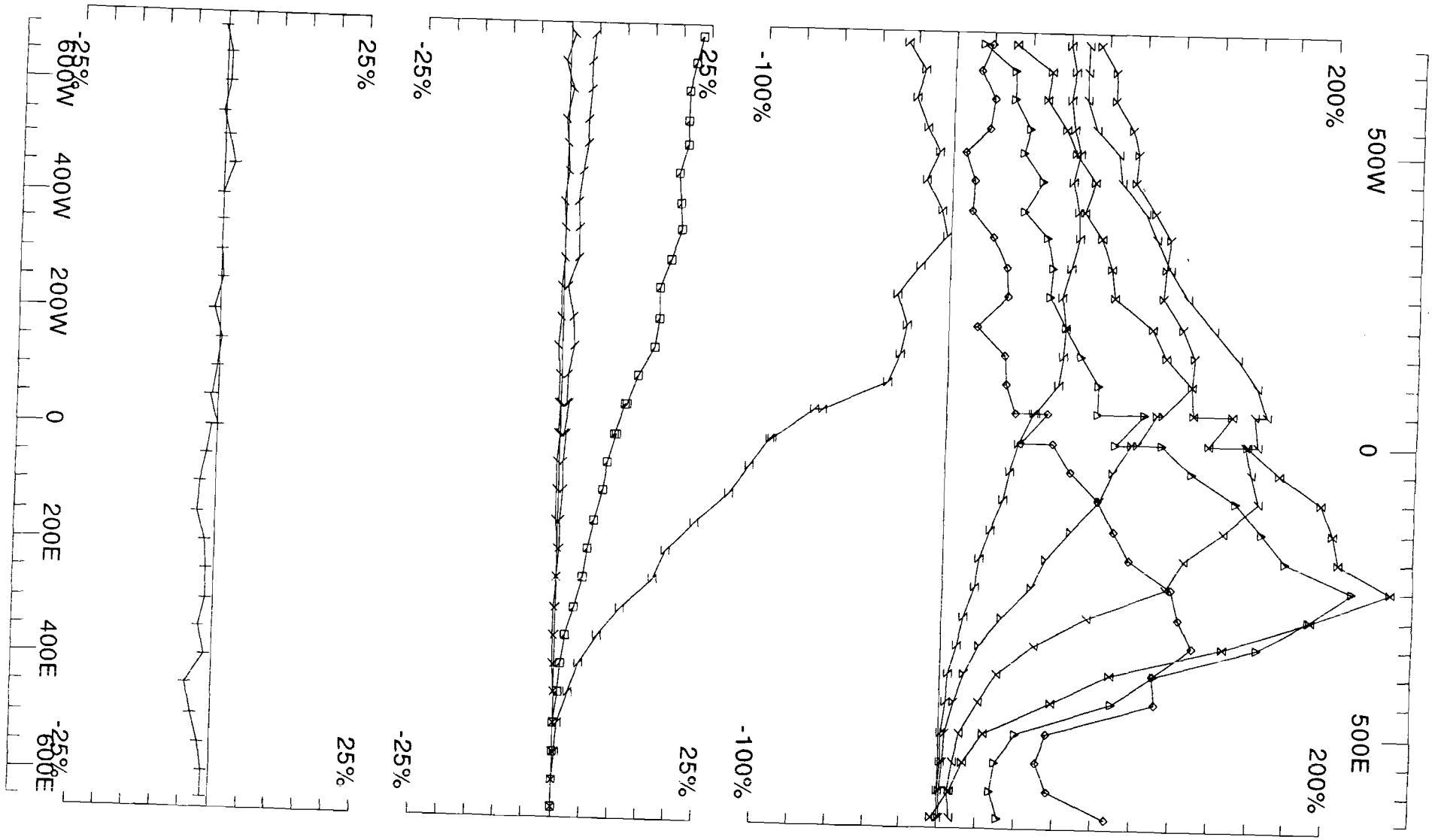


Loop: 31	Secondary, (Chn - Ch1)/|Hp|
Line: 700S	Contin. Norm at depth of 0 m
Compt: Hy	Base Freq. 30.974 Hz

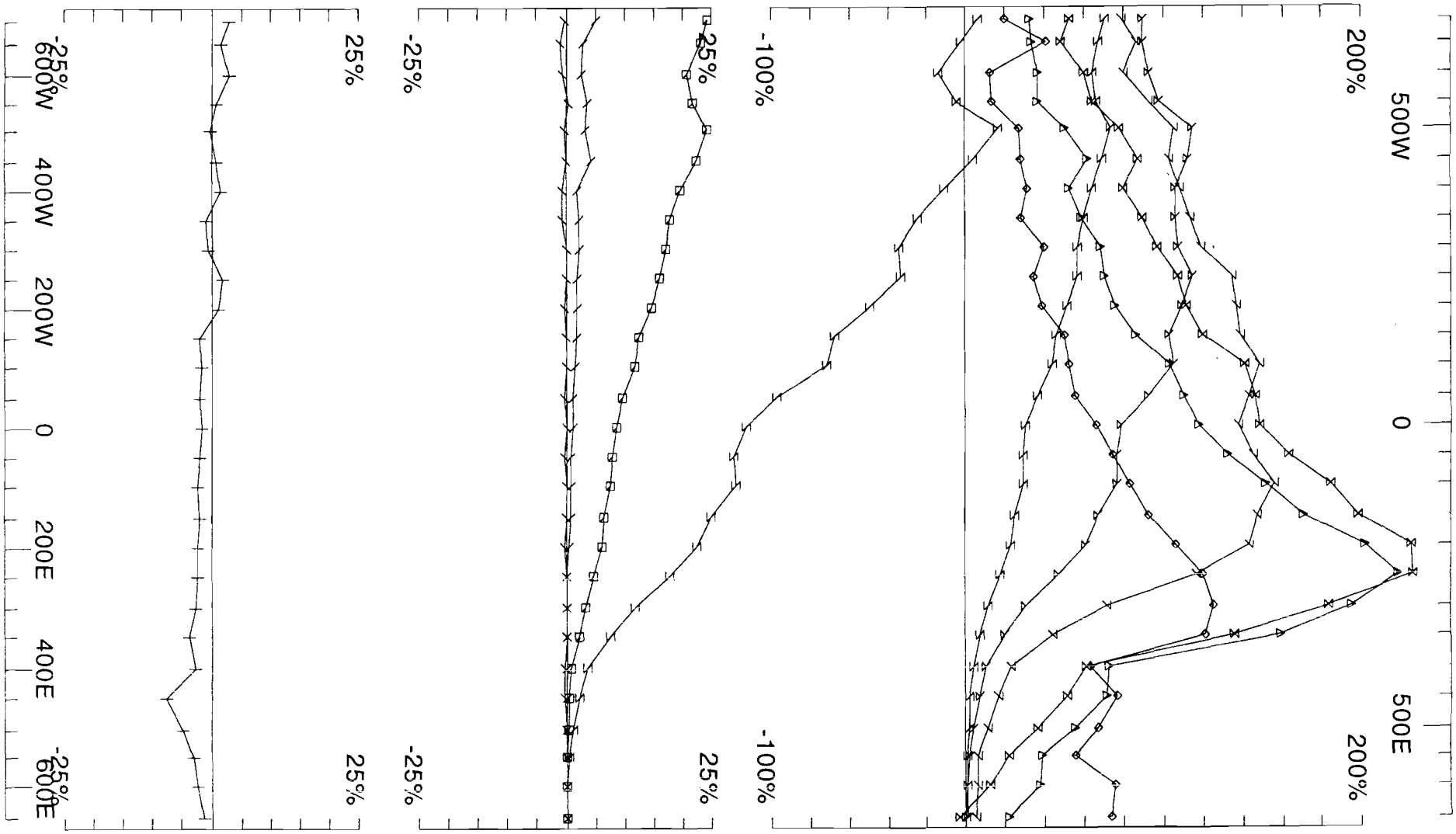
UTEM Survey at: Montcalm
For: Xstrata Nickel

LAMONTAGNE GEOPHYSICS LTD
GEOPHYSIQUE LTEE

Job 0812-2 Plotted : 21/10/8



Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 900S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 23/7/8, Reduced : 14/10/8, Plotted : 21/10/8

Montcalm

Loop 31

Hz

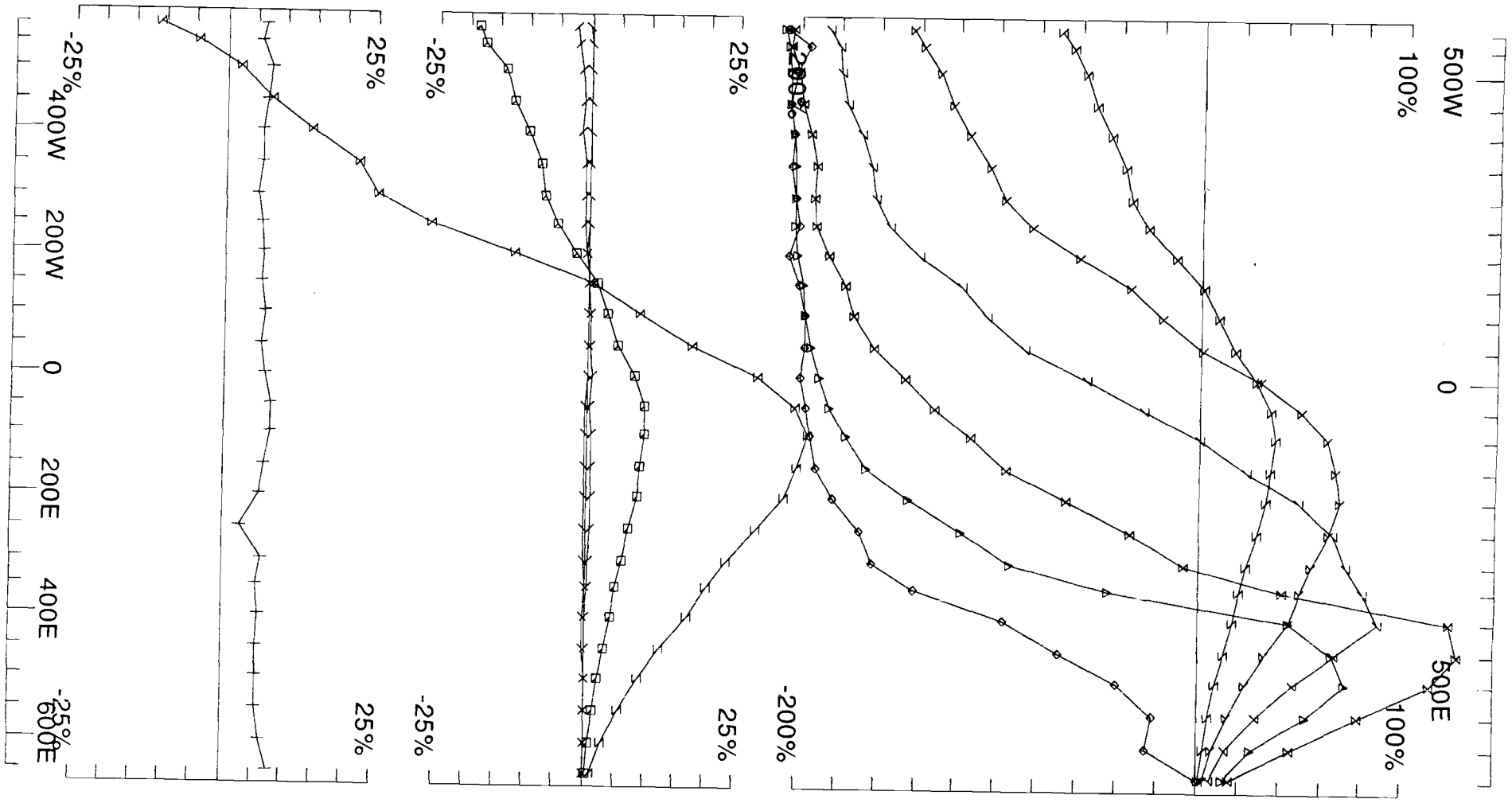
@30.974 Hz frequency

continuous norm

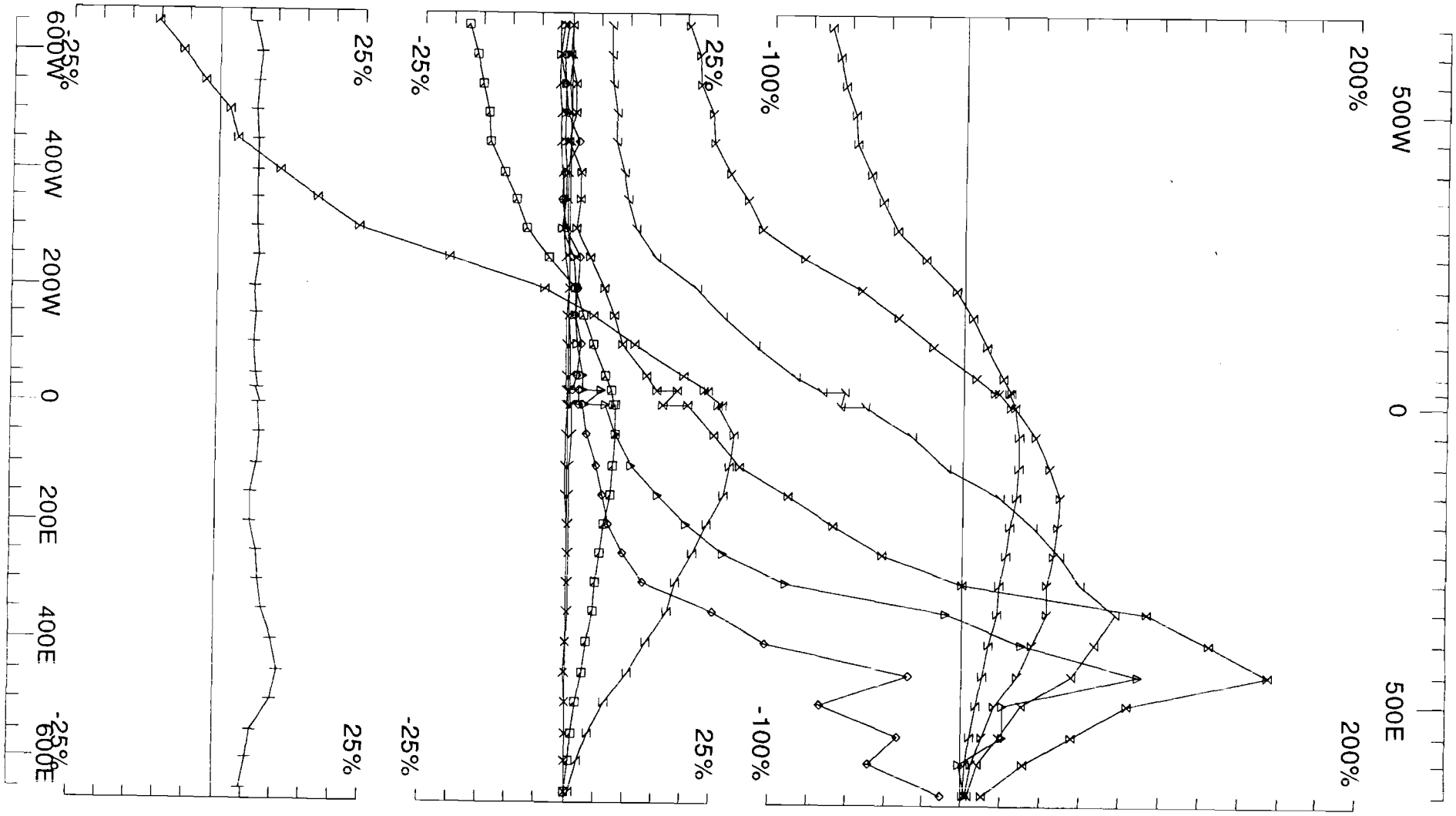
Ch1 reduced

Line 500S	700E - 575W
Line 600S	700E - 700W
Line 700S	700E - 700W
Line 800S	700E - 700W
Line 900S	700E - 700W

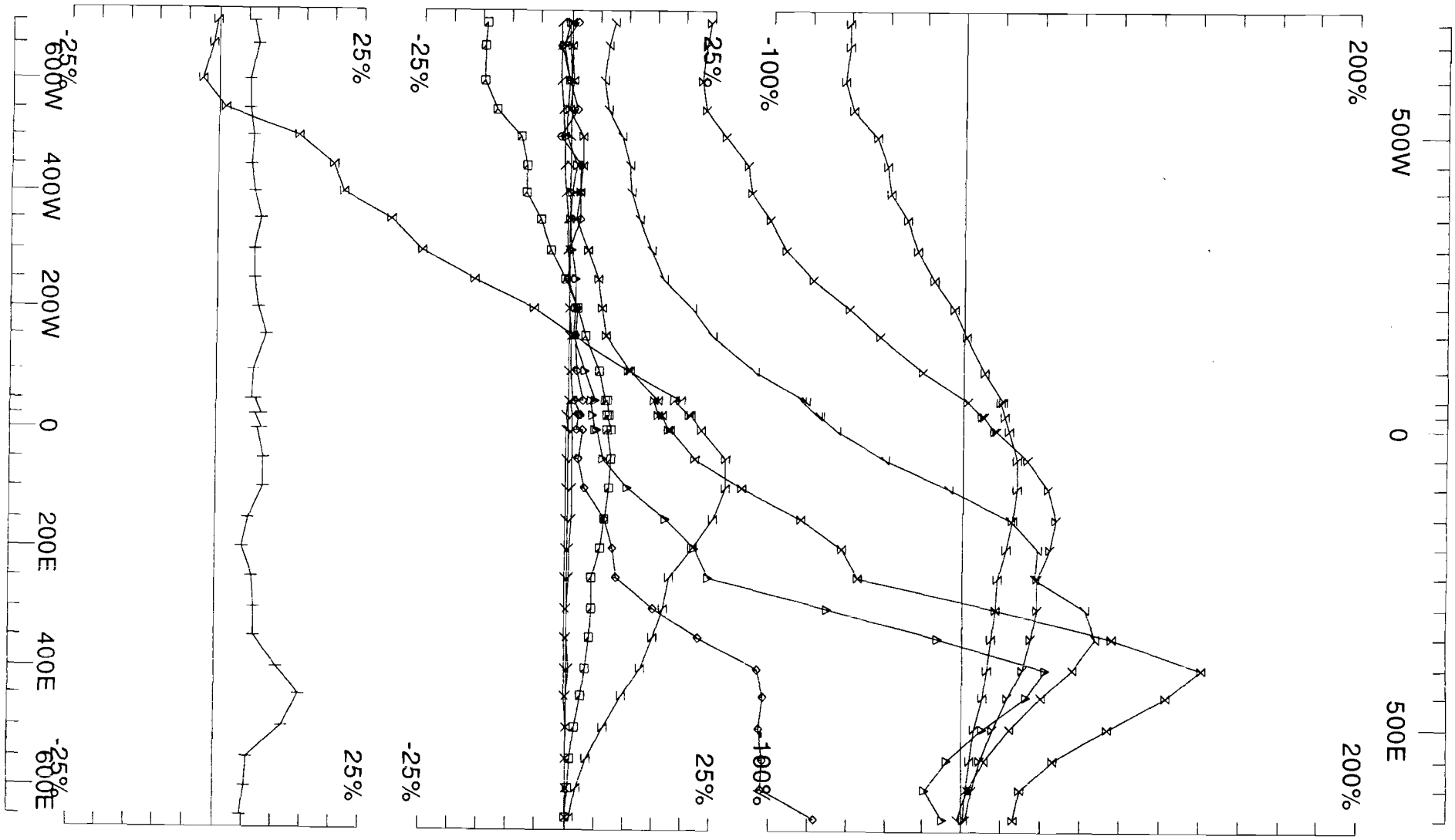
Loop 31 - continuous norm



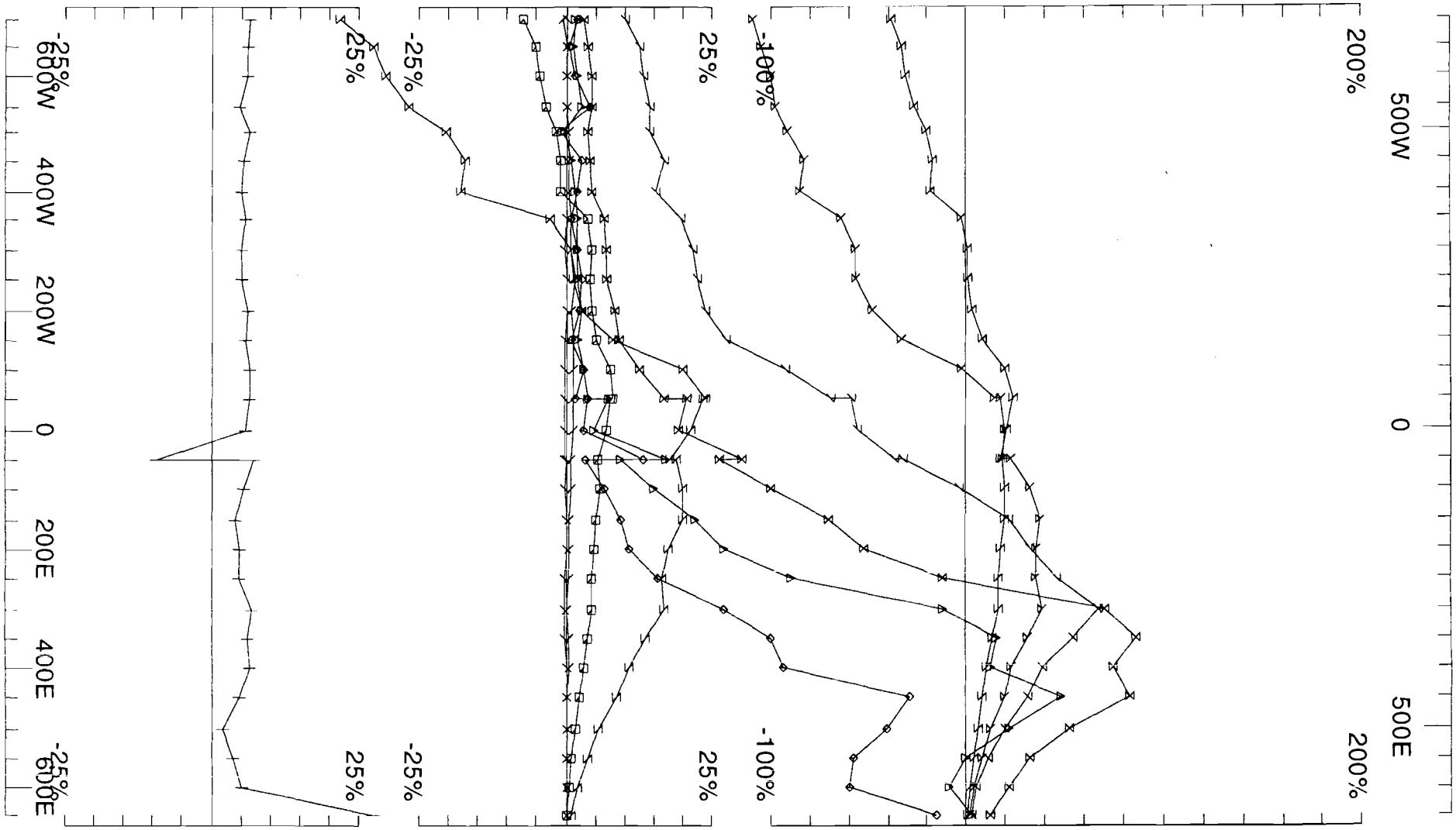
Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 23/7/8, Reduced : 14/10/8, Plotted : 21/10/8



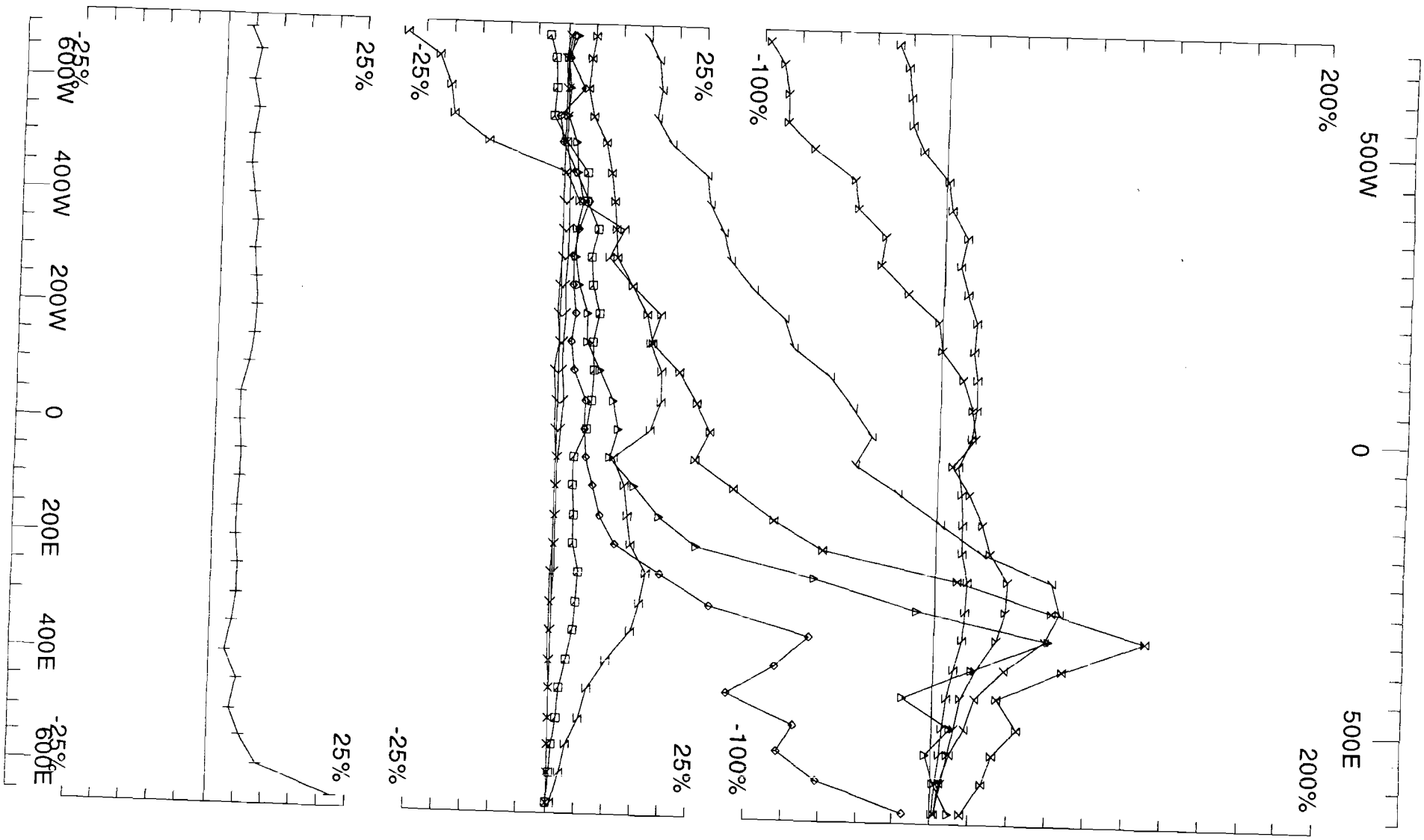
Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 700S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 31	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 Plotted : 21/10/8



Loop: 31 Line: 900S Compt: Hz	Secondary, (Chn - Ch1)/|Hp| Contin. Norm at depth of 0 m Base Freq. 30.974 Hz	UTEM Survey at: Montcalm For: Xstrata Nickel LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 23/7/8 Reduced : 14/10/8 Plotted : 21/10/8

Montcalm

Loop 32

Hy

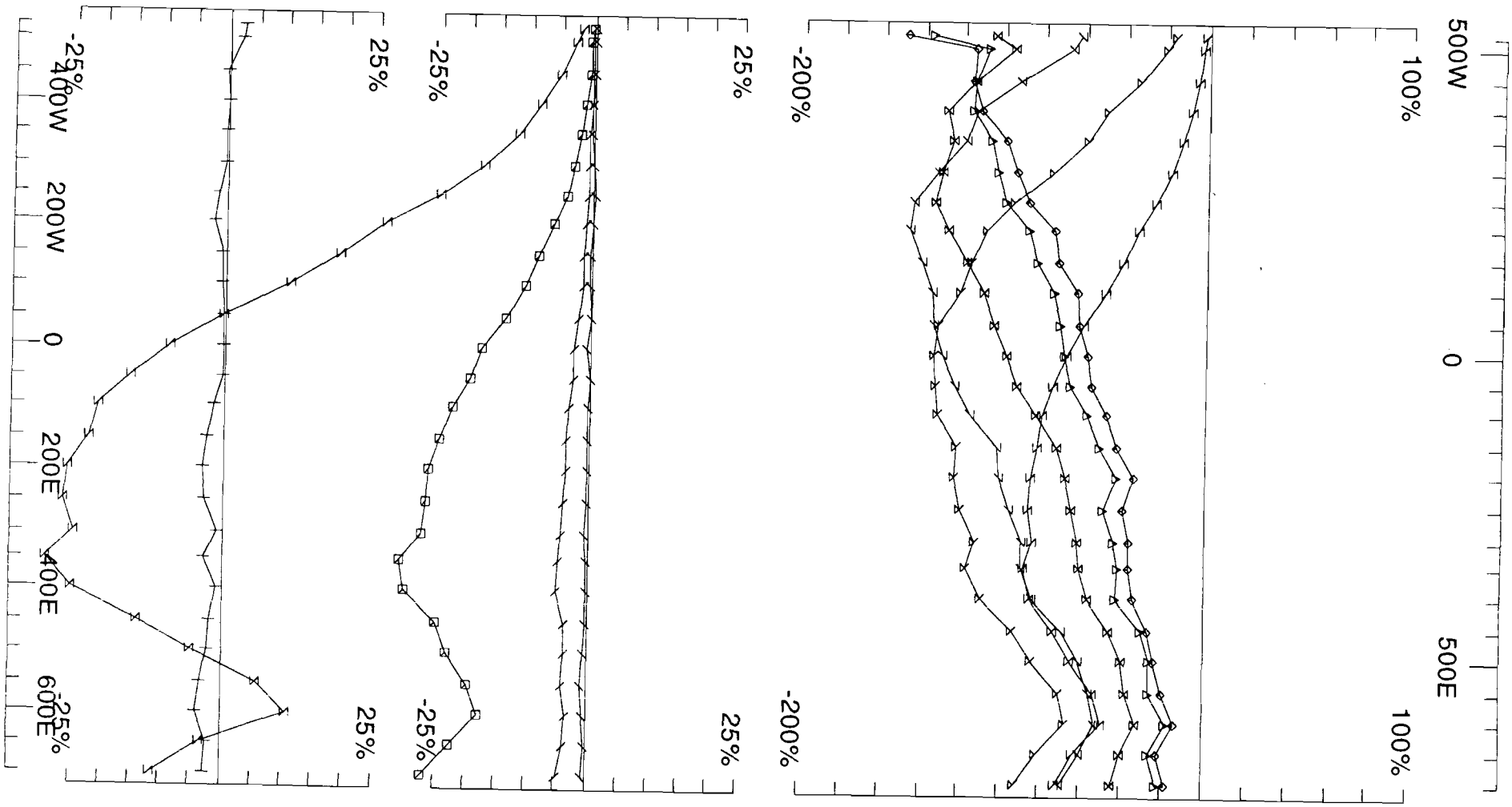
@30.974 Hz frequency

continuous norm

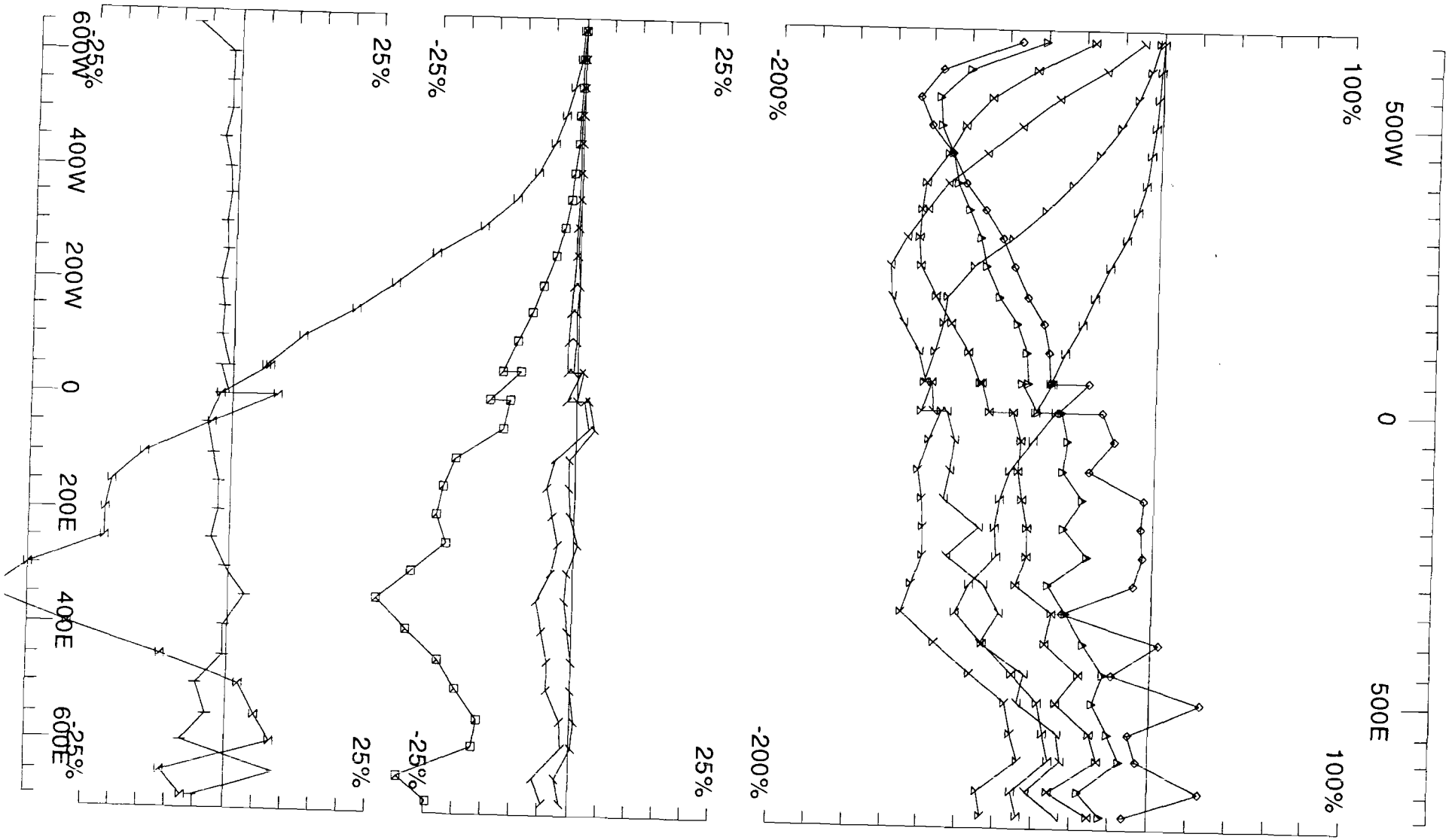
Ch1 reduced

Line 500S	550W - 700E
Line 600S	650W - 700E
Line 700S	650W - 700E
Line 800S	650W - 700E
Line 900S	650W - 700E

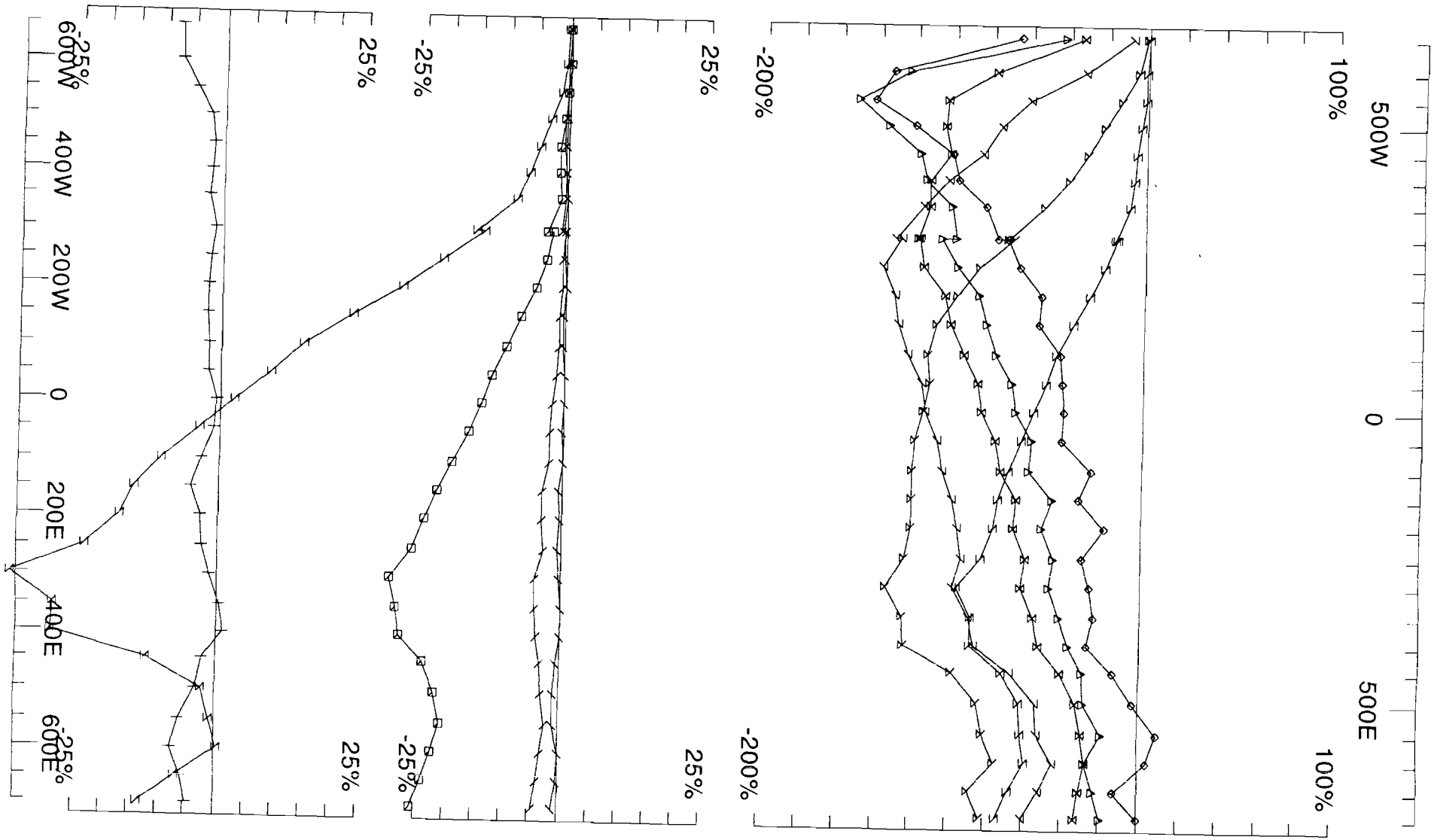
Loop 32 - continuous norm



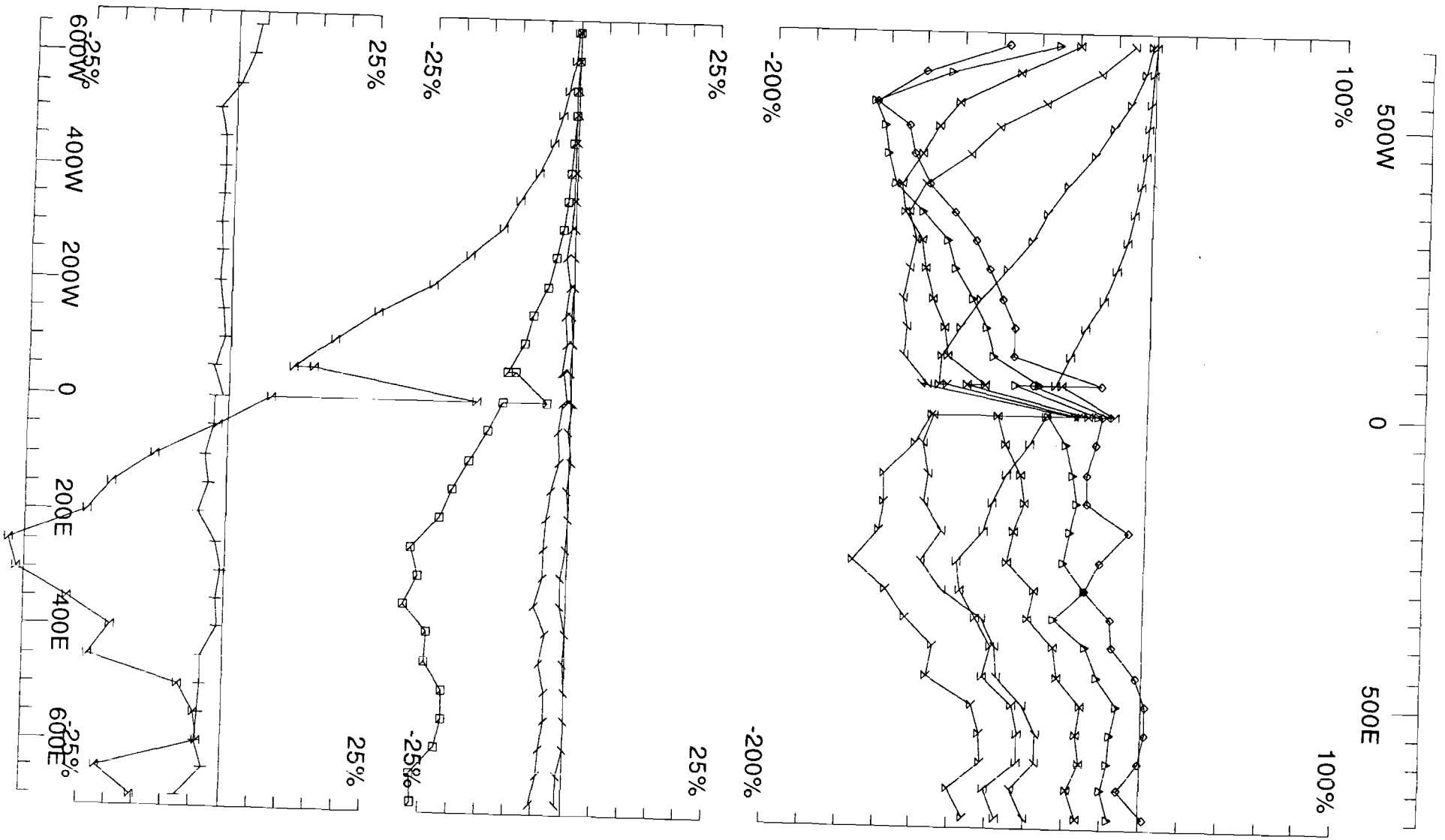
Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 29/7/8, Reduced : 14/10/8, Plotted : 21/10/8



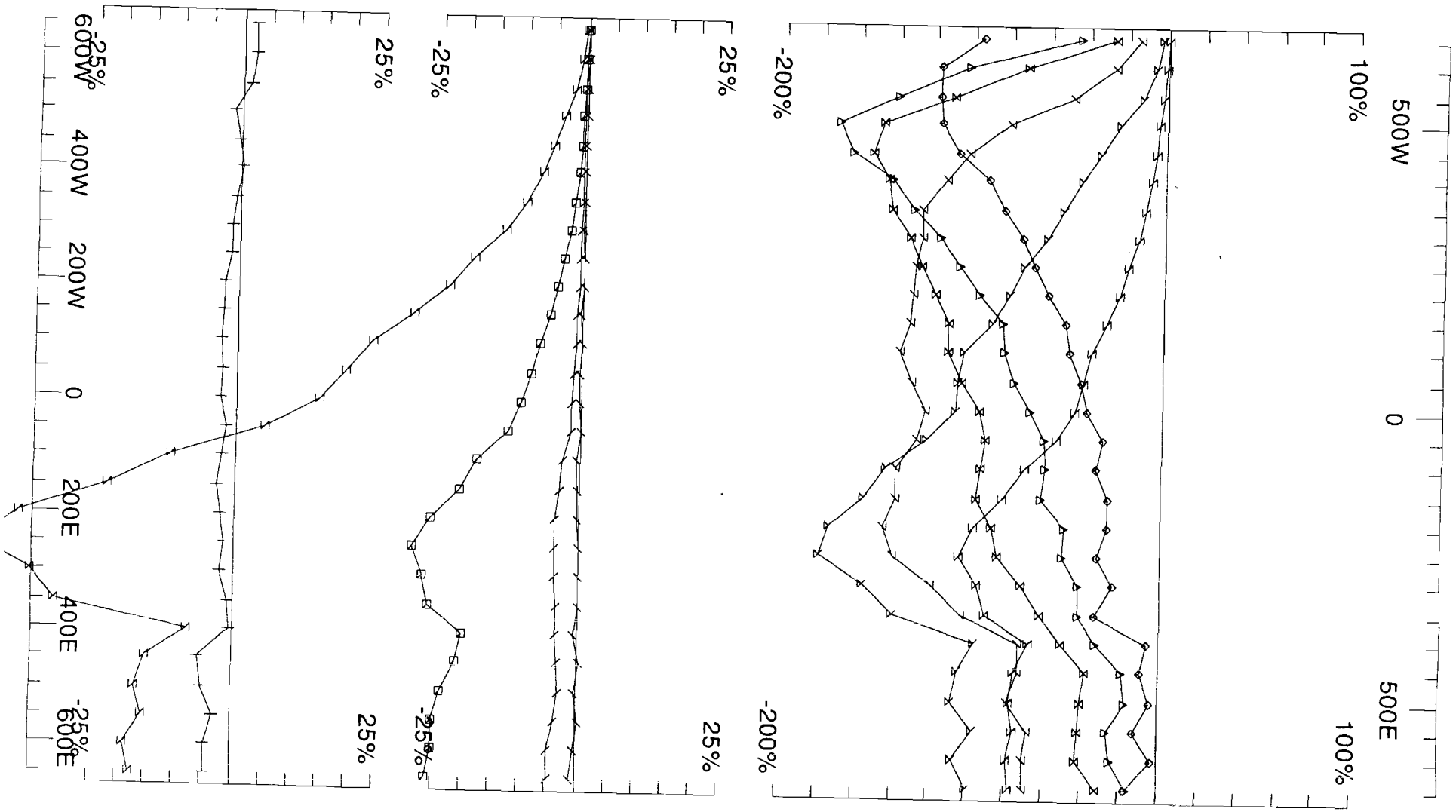
Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 29/7/8, Reduced : 29/7/8, Plotted : 21/10/8



Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 700S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 900S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hy	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 29/7/8, Reduced : 14/10/8, Plotted : 21/10/8

Montcalm

Loop 32

Hz

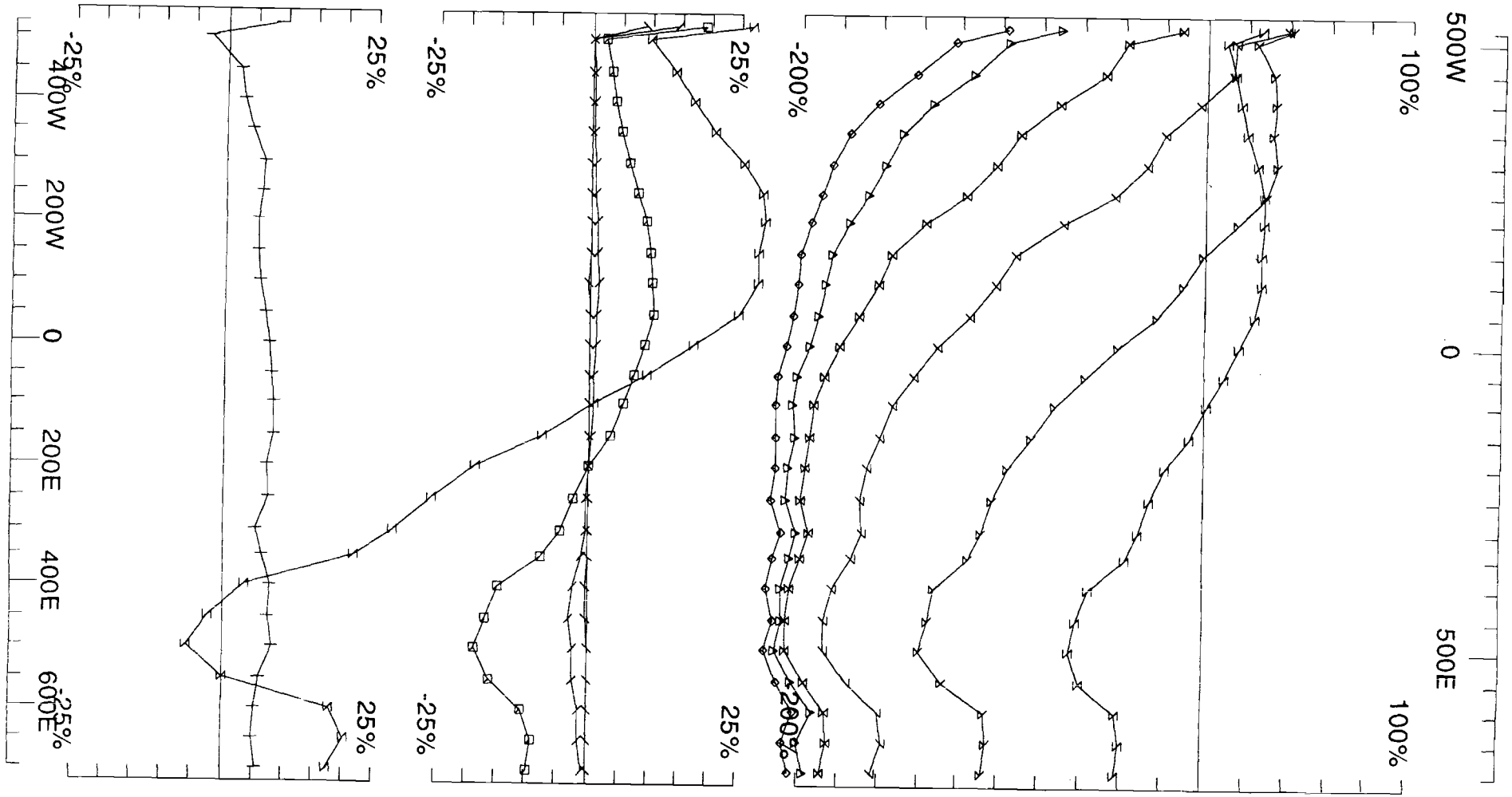
@30.974 Hz frequency

continuous norm

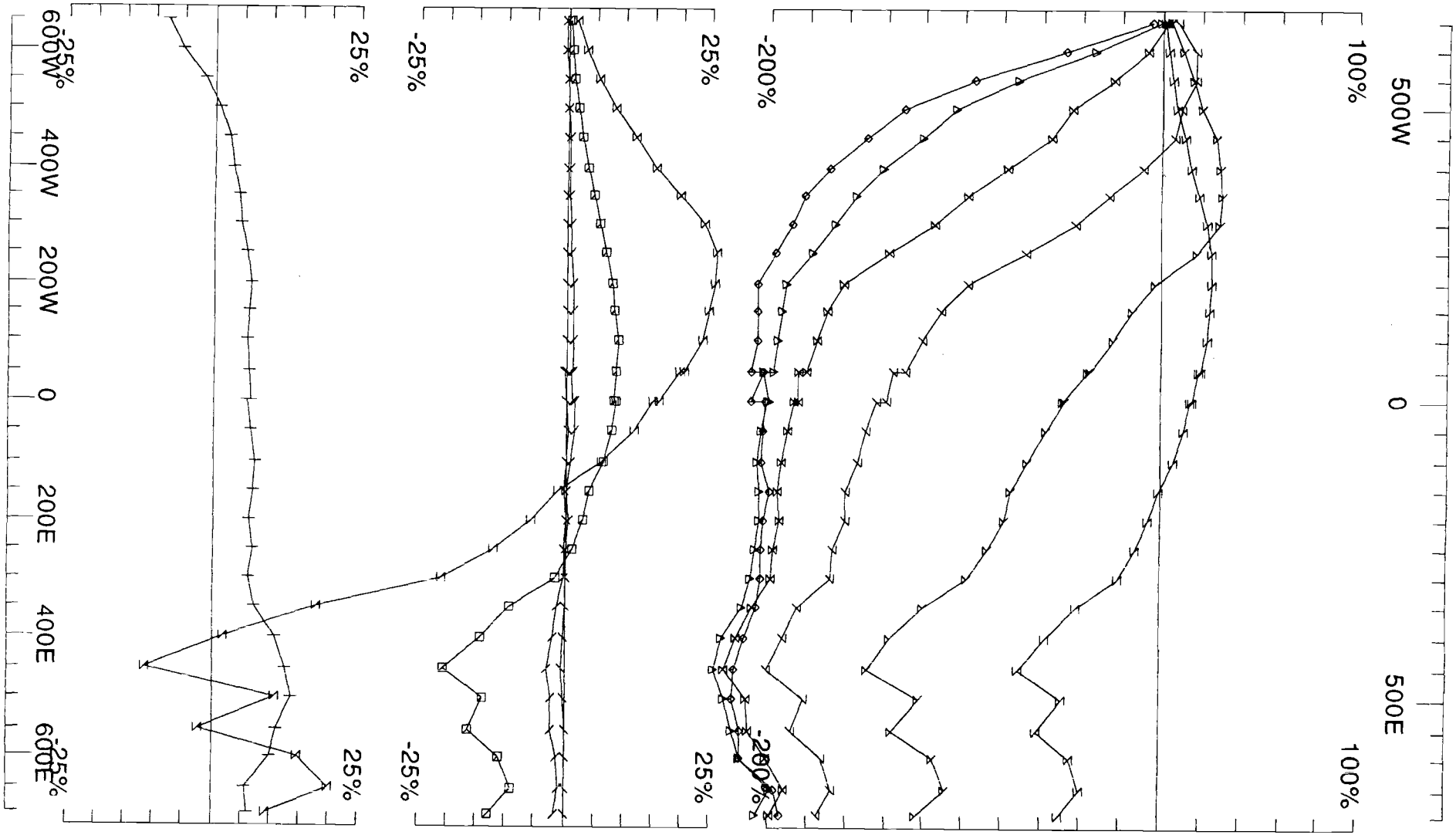
Ch1 reduced

Line 500S	550W - 700E
Line 600S	650W - 700E
Line 700S	650W - 700E
Line 800S	650W - 700E
Line 900S	650W - 700E

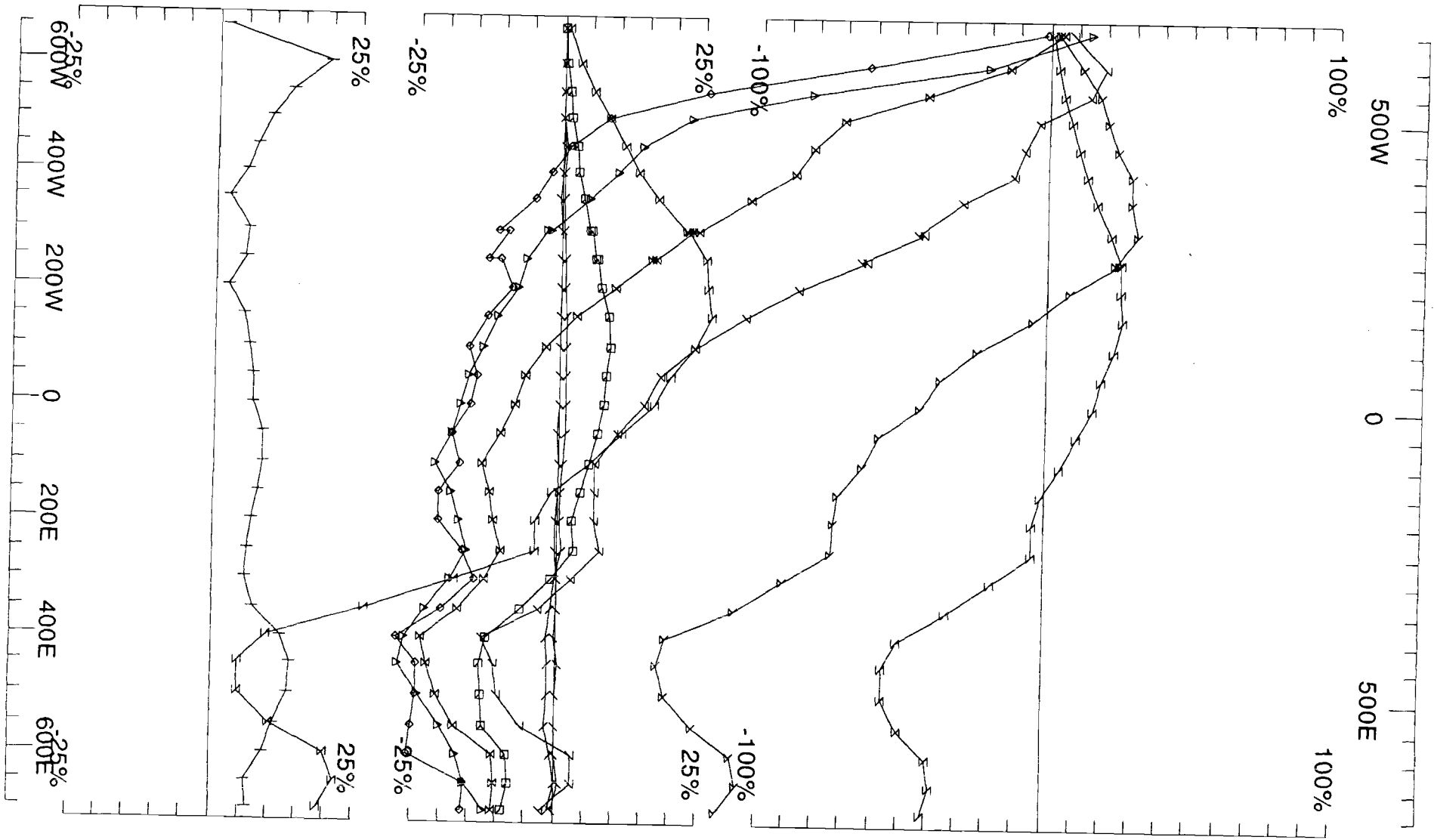
Loop 32 - continuous norm



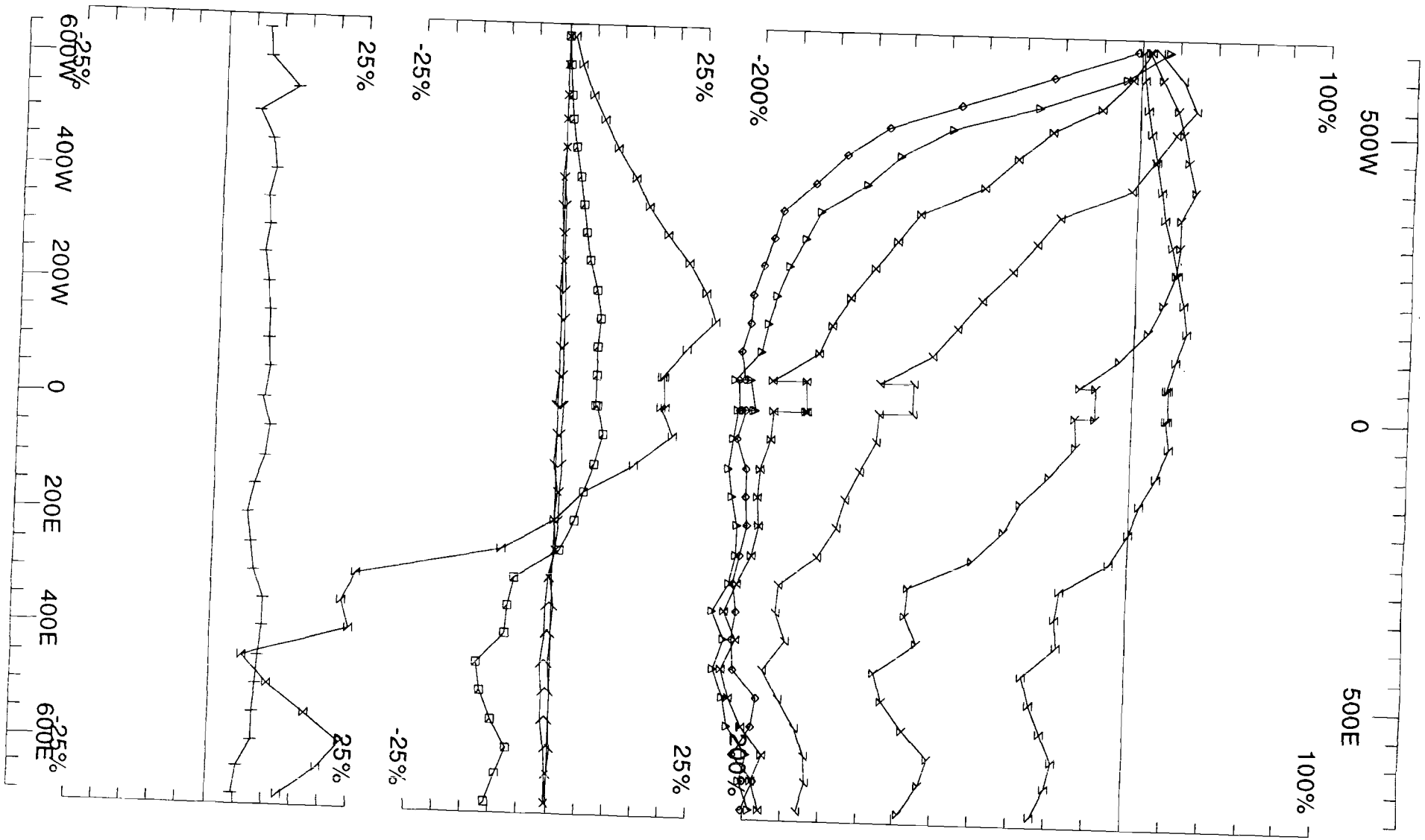
Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 29/7/8, Reduced : 14/10/8, Plotted : 21/10/8



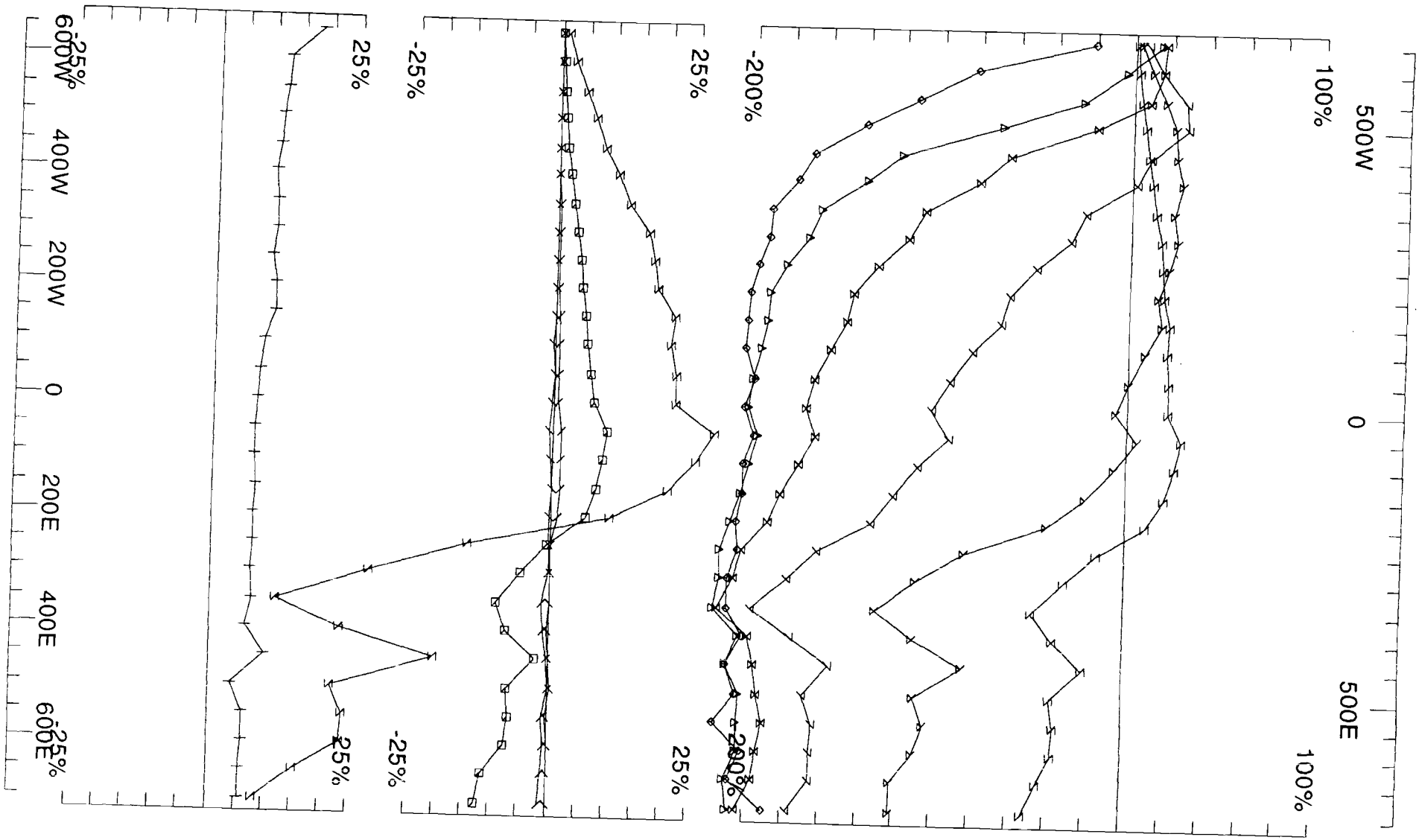
Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 600S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 29/7/8, Reduced : 29/7/8, Plotted : 21/10/8



Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 700S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 29/7/8, Reduced : 29/7/8, Plotted : 21/10/8



Loop: 32	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 900S	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 29/7/8, Reduced : 14/10/8, Plotted : 21/10/8

Montcalm

Loop 33

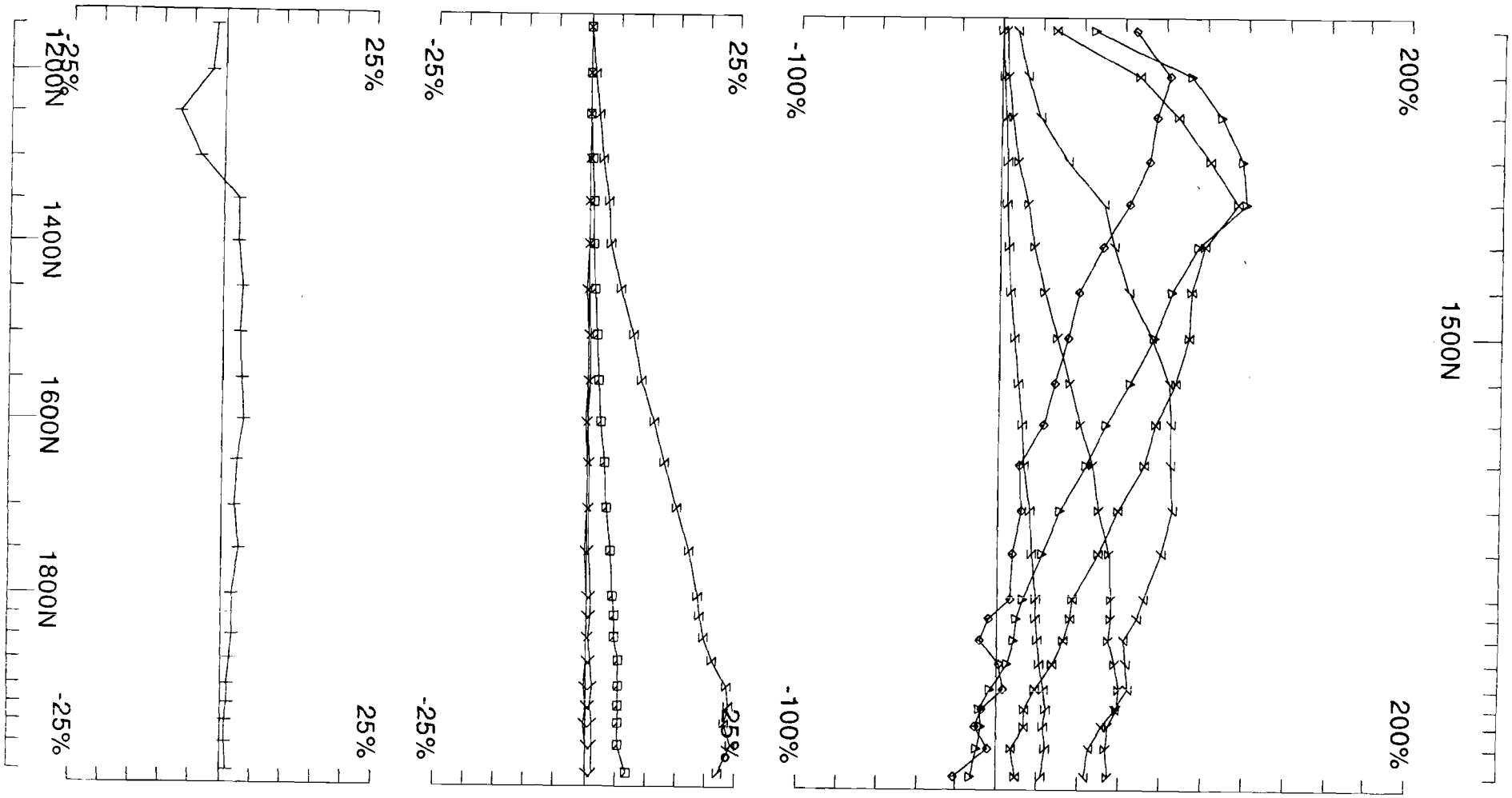
Hx

@30.974 Hz frequency

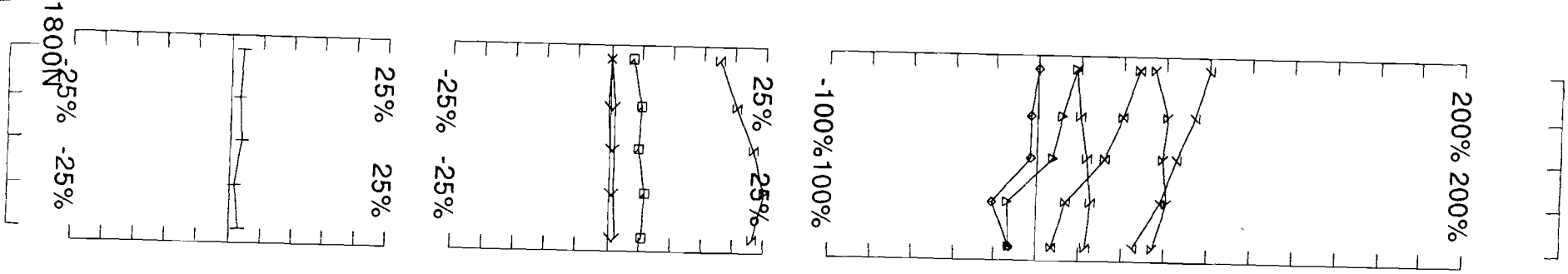
continuous norm

Ch1 reduced

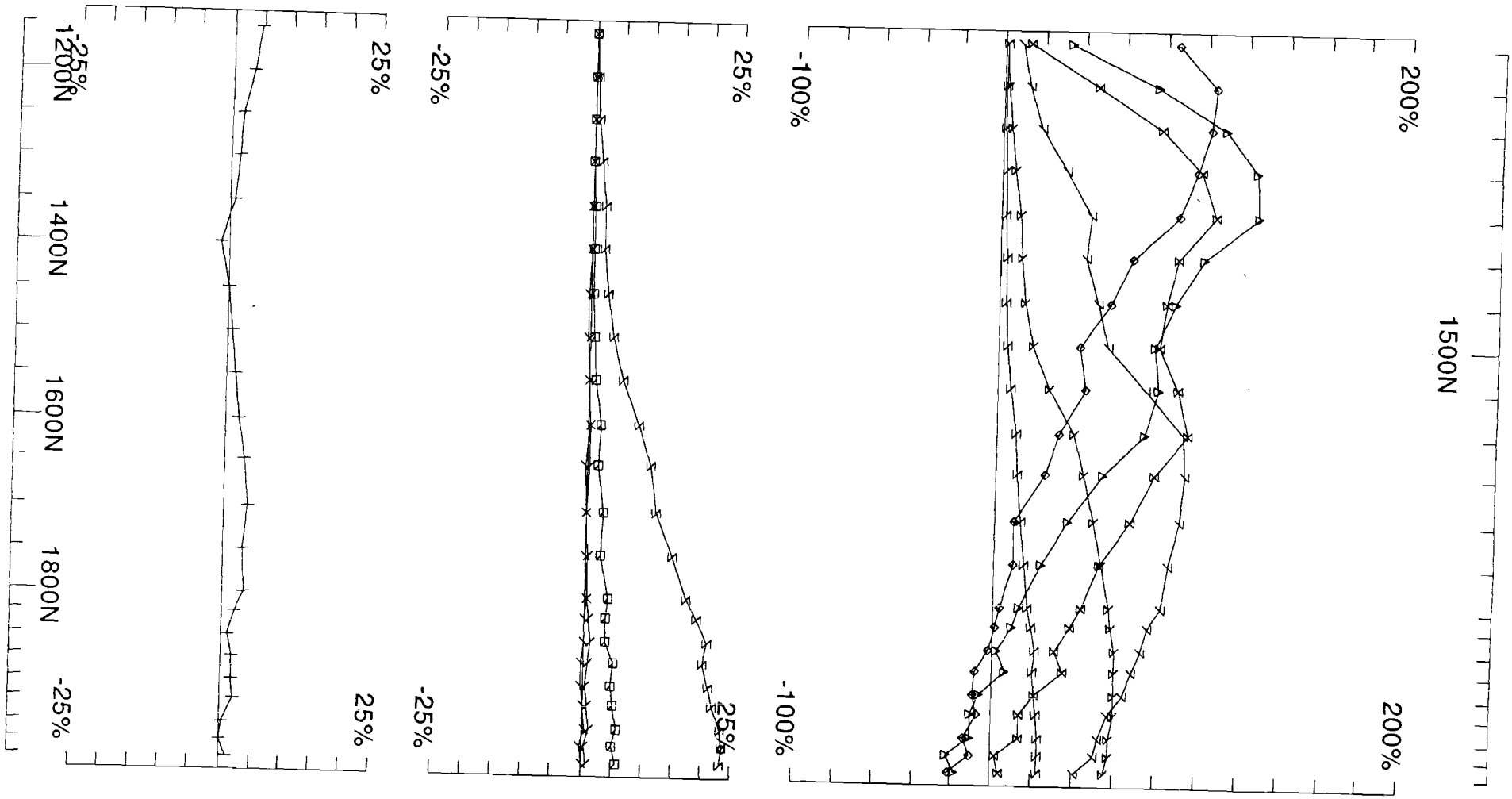
Line 3200E	1100N - 2000N
Line 3300E	1100N - 2000N
Line 3400E	1100N - 2000N
Line 3500E	1100N - 2000N
Line 3600E	1100N - 2000N
Line 3700E	1100N - 1975N
Line 3800E	1100N - 2000N
Line 3900E	1100N - 2000N
Line 4000E	1100N - 2000N



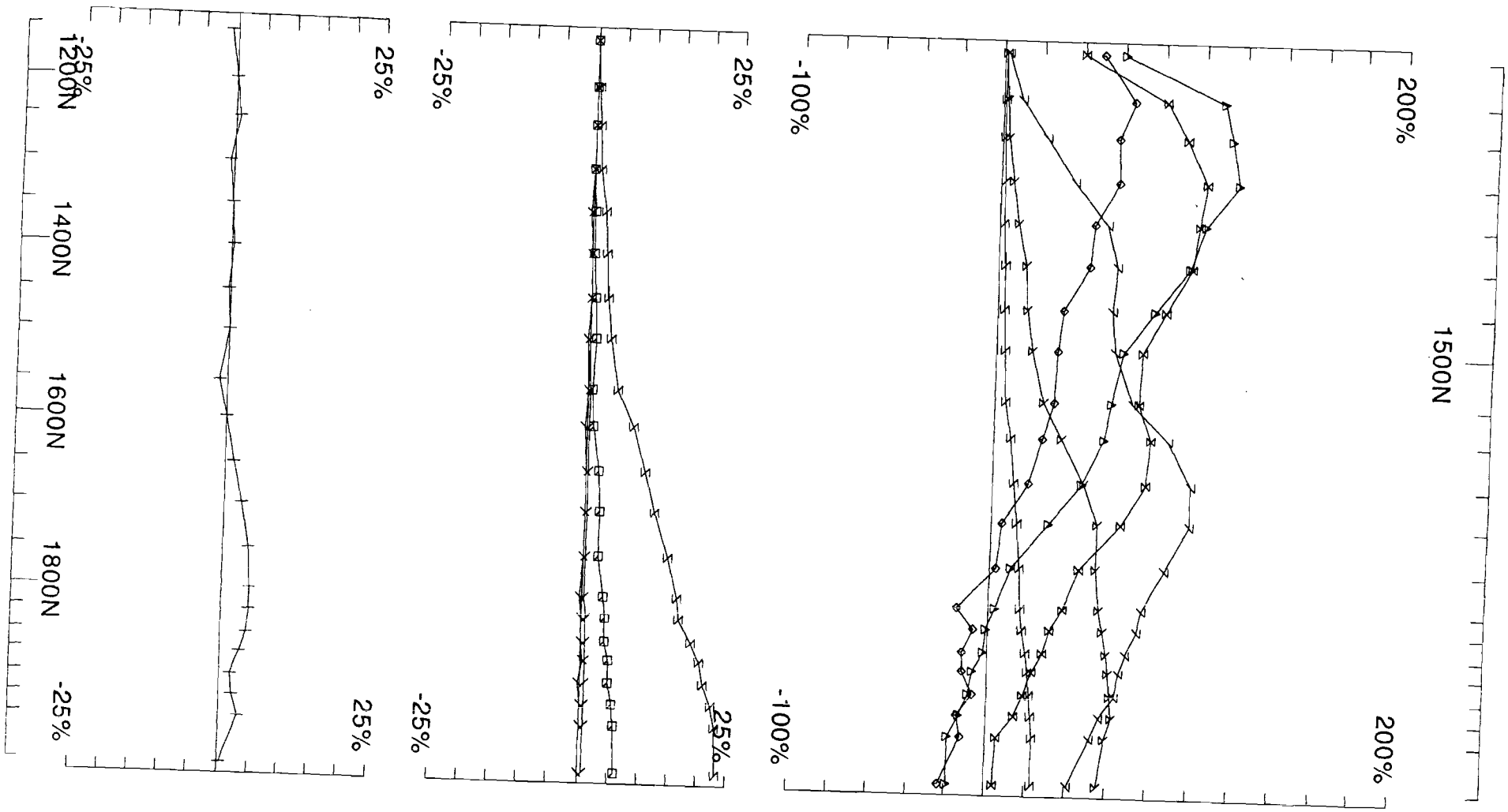
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 25/7/8, Reduced : 14/10/8, Plotted : 21/10/8



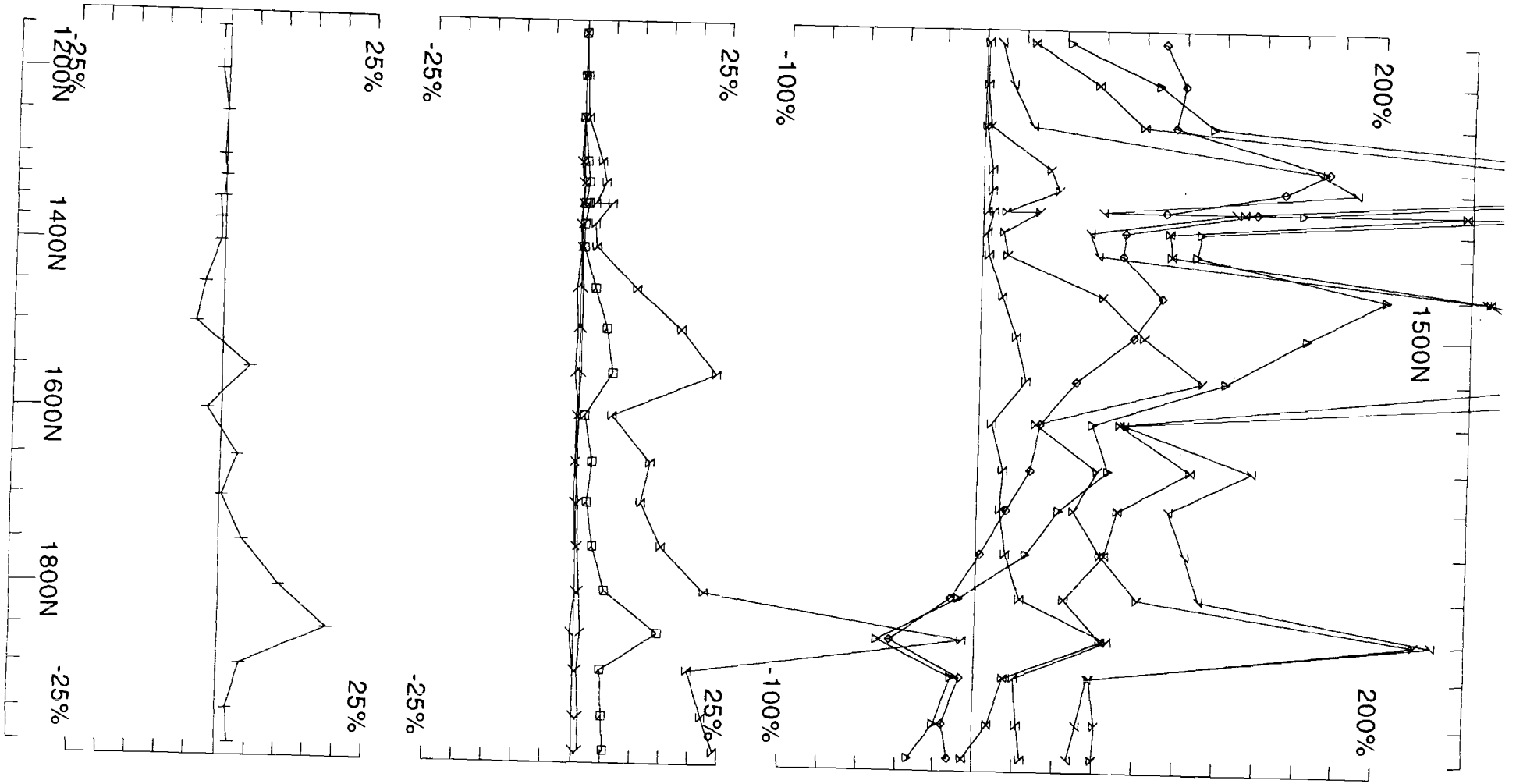
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 25/7/8, Reduced : 14/10/8, Plotted : 21/10/8



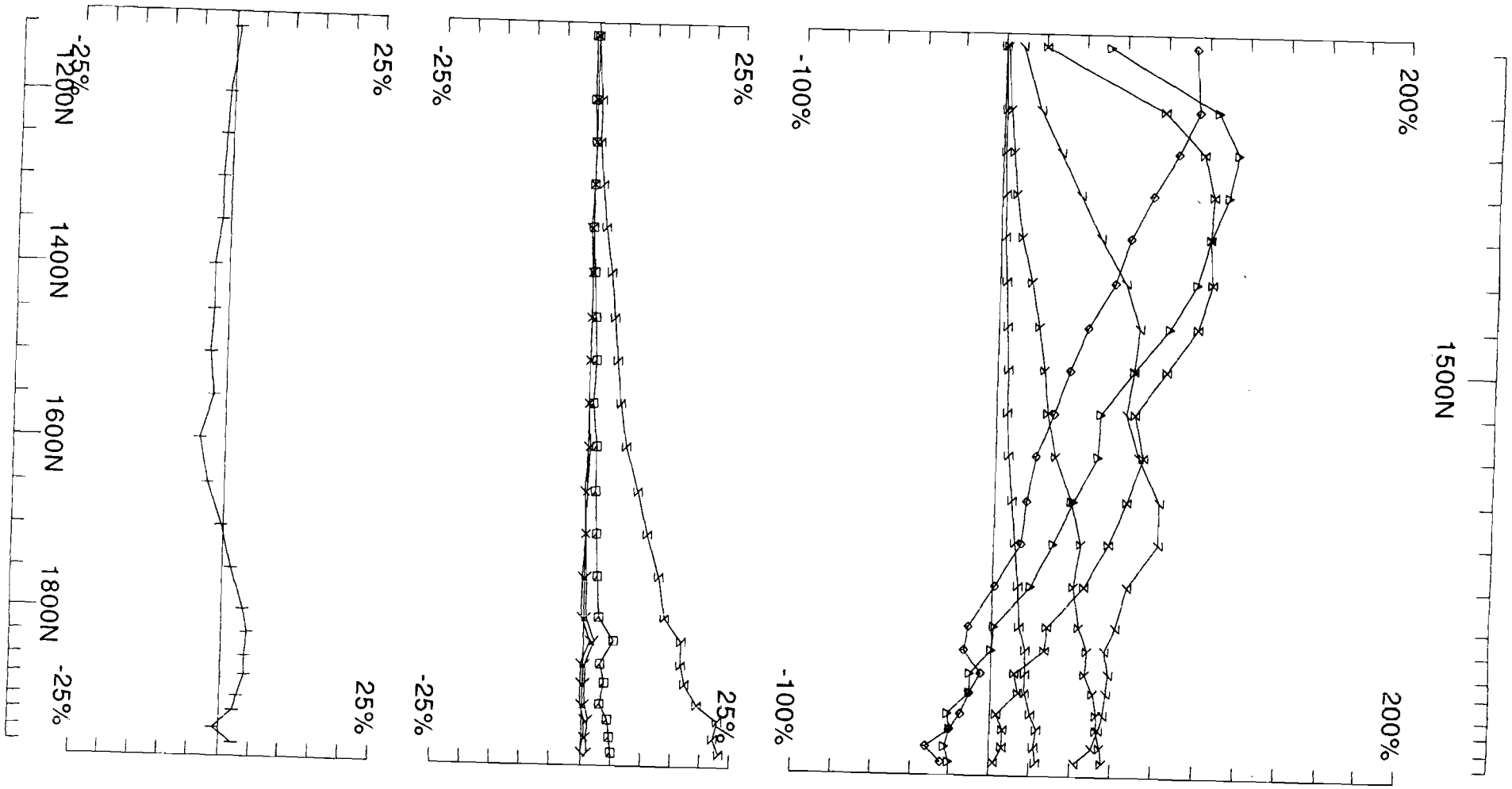
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 26/7/8, Reduced : 14/10/8, Plotted : 21/10/8



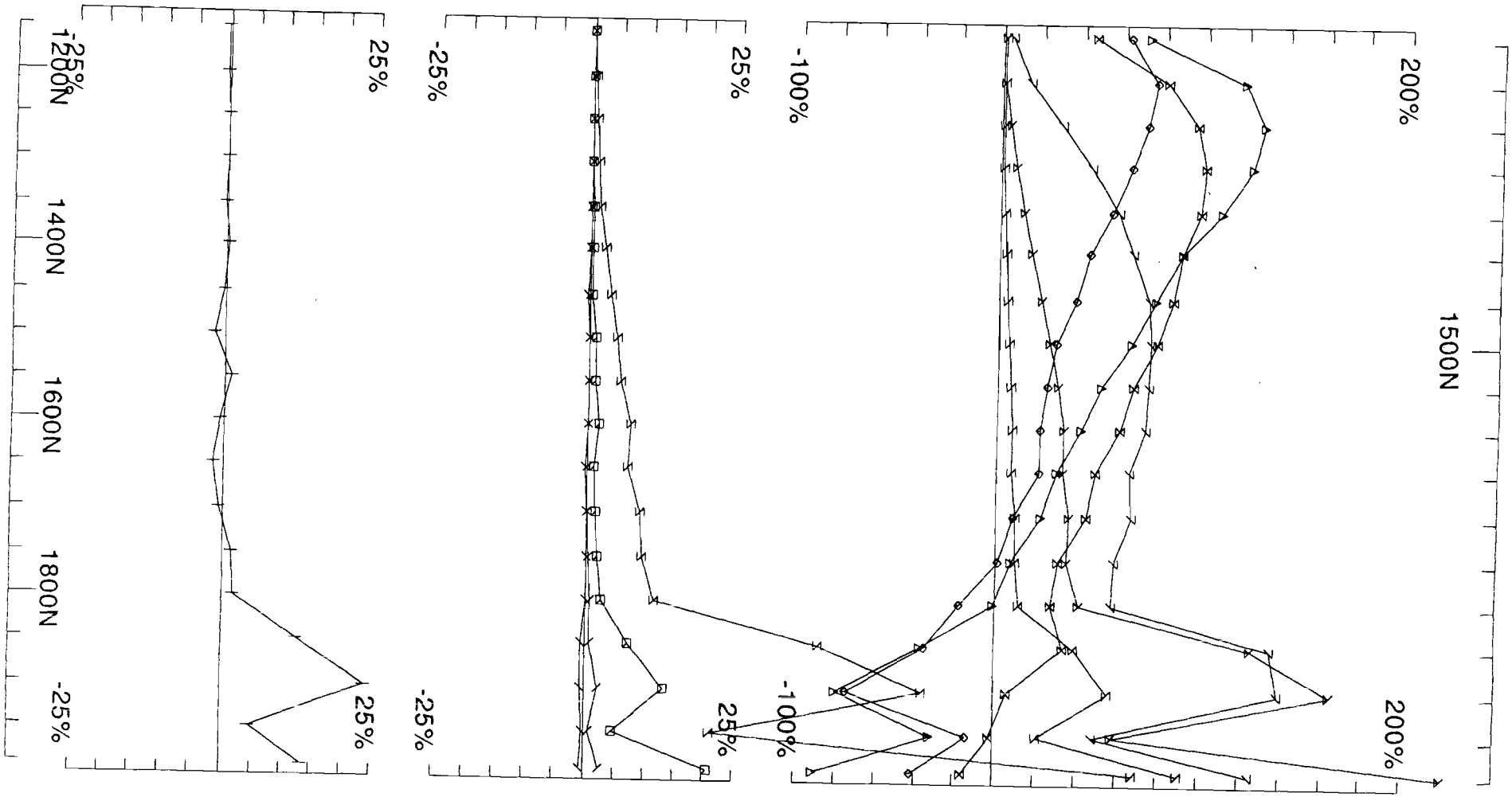
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 26/7/8, Reduced : 14/10/8, Plotted : 21/10/8



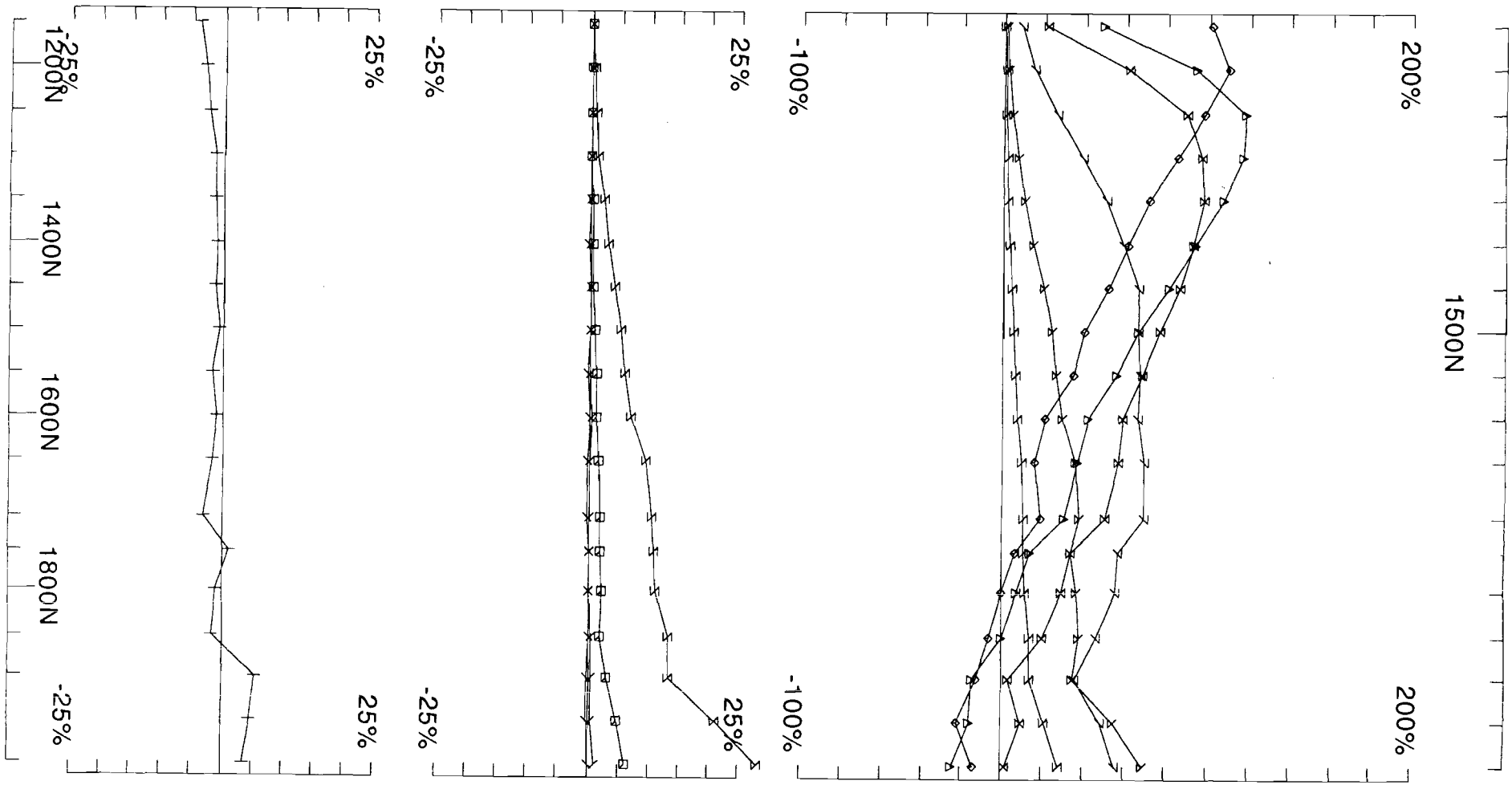
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 27/7/8, Reduced : 14/10/8, Plotted : 21/10/8



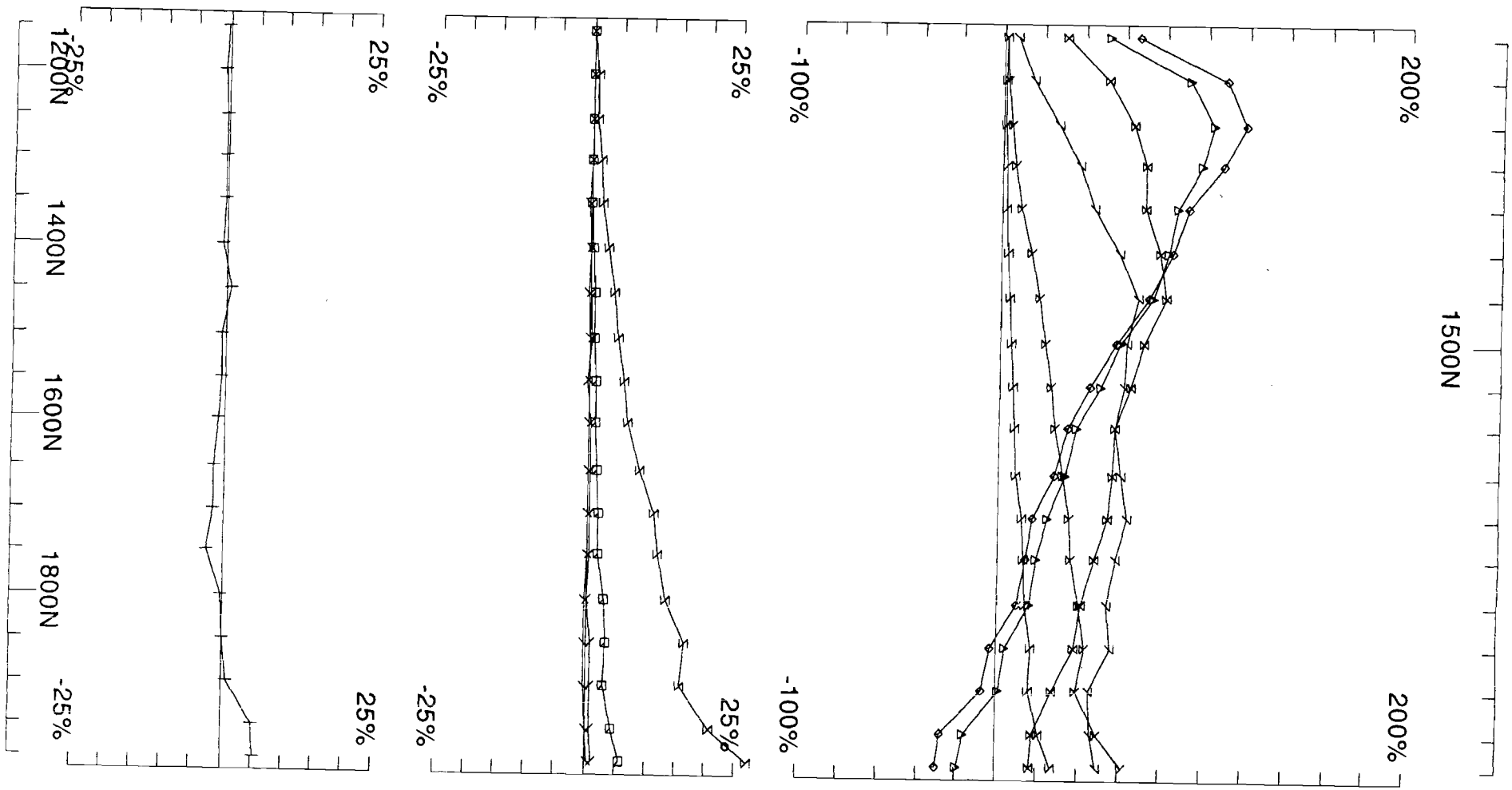
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 26/7/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 27/7/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 28/7/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 28/7/8, Reduced : 14/10/8, Plotted : 21/10/8

Montcalm

Loop 33

Hz

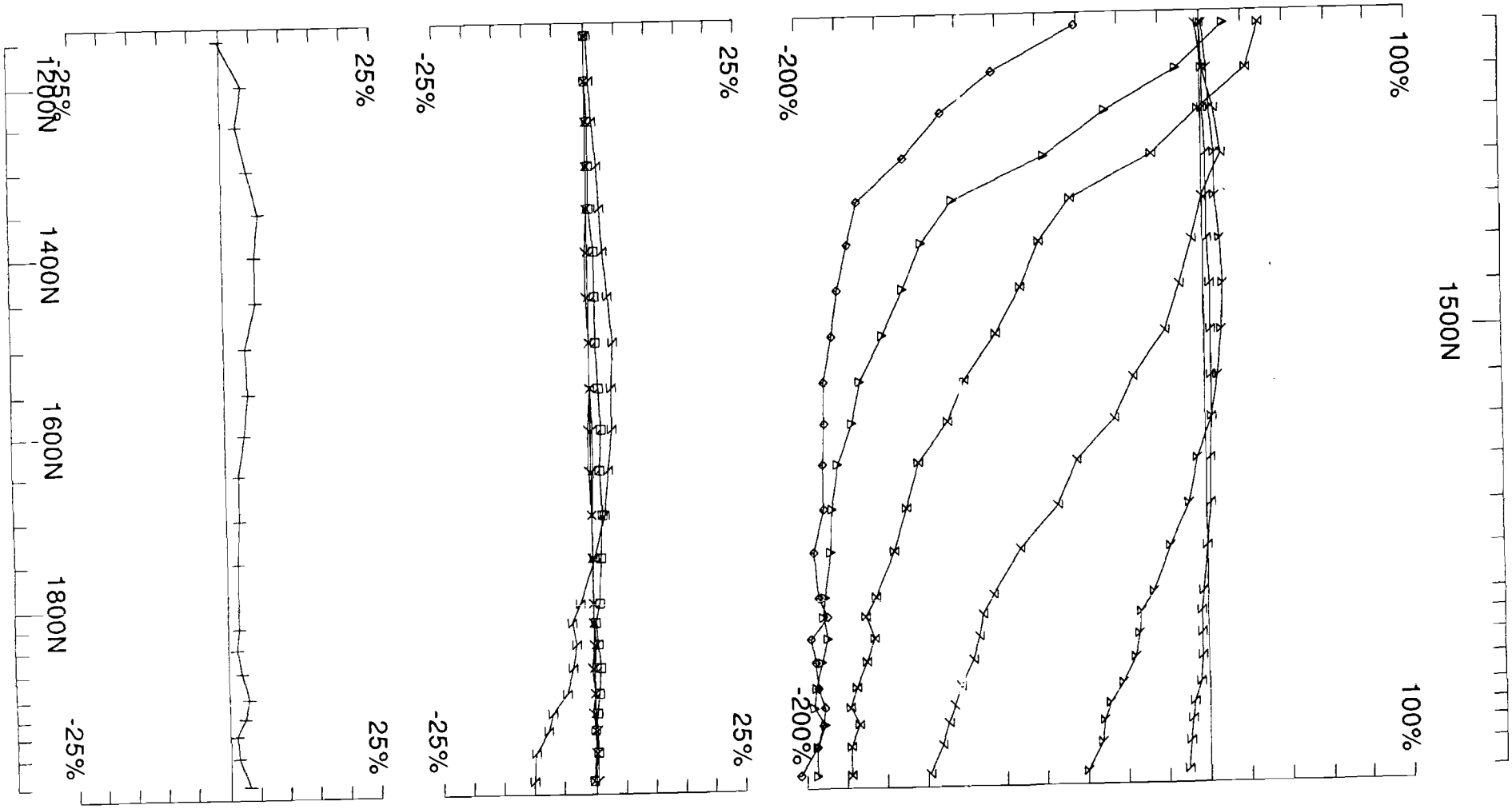
@30.974 Hz frequency

continuous norm

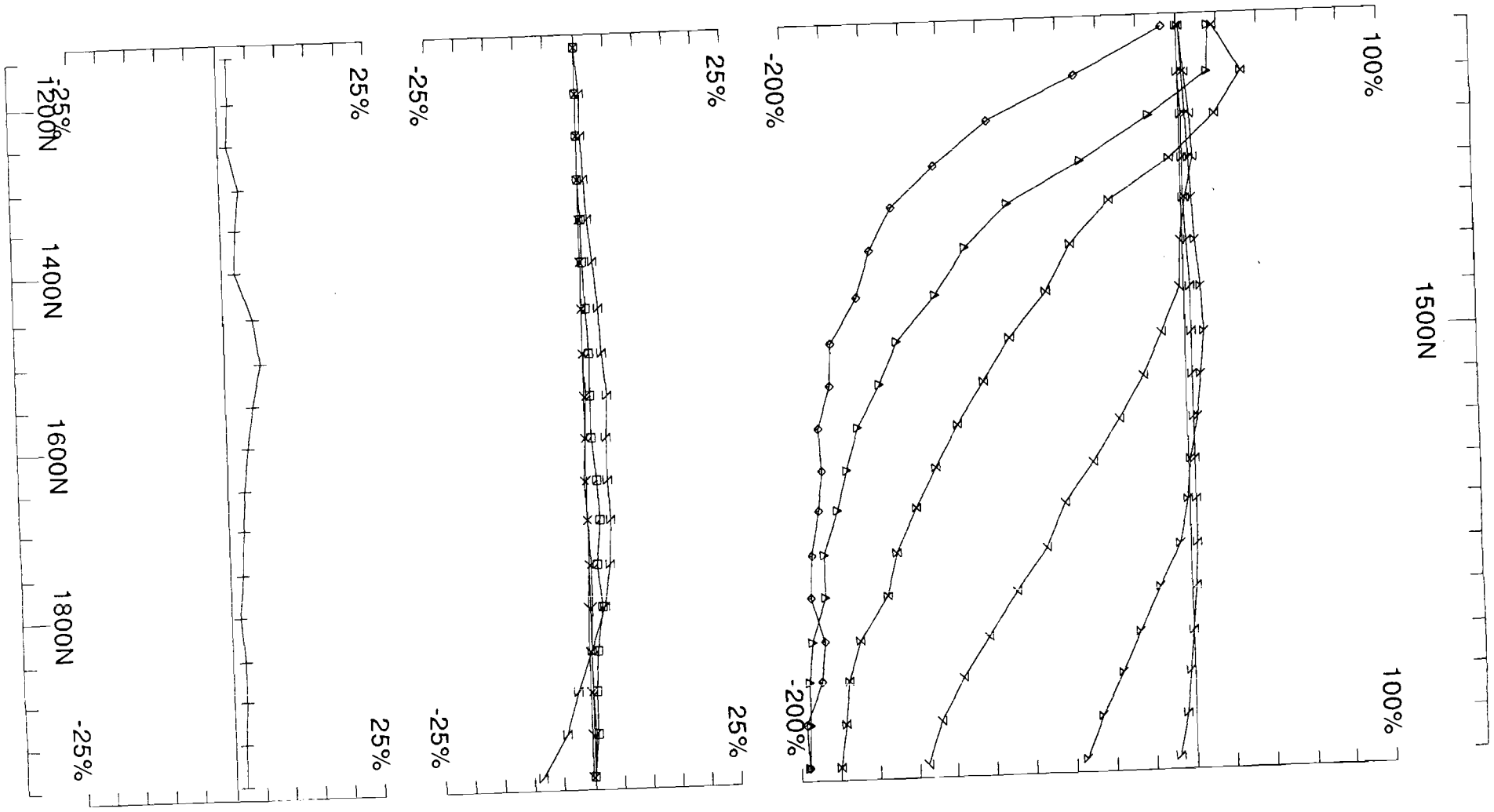
Ch1 reduced

Line 3200E	1100N - 2000N
Line 3300E	1100N - 2000N
Line 3400E	1100N - 2000N
Line 3500E	1100N - 2000N
Line 3600E	1100N - 2000N
Line 3700E	1100N - 1975N
Line 3800E	1100N - 2000N
Line 3900E	1100N - 2000N
Line 4000E	1100N - 2000N

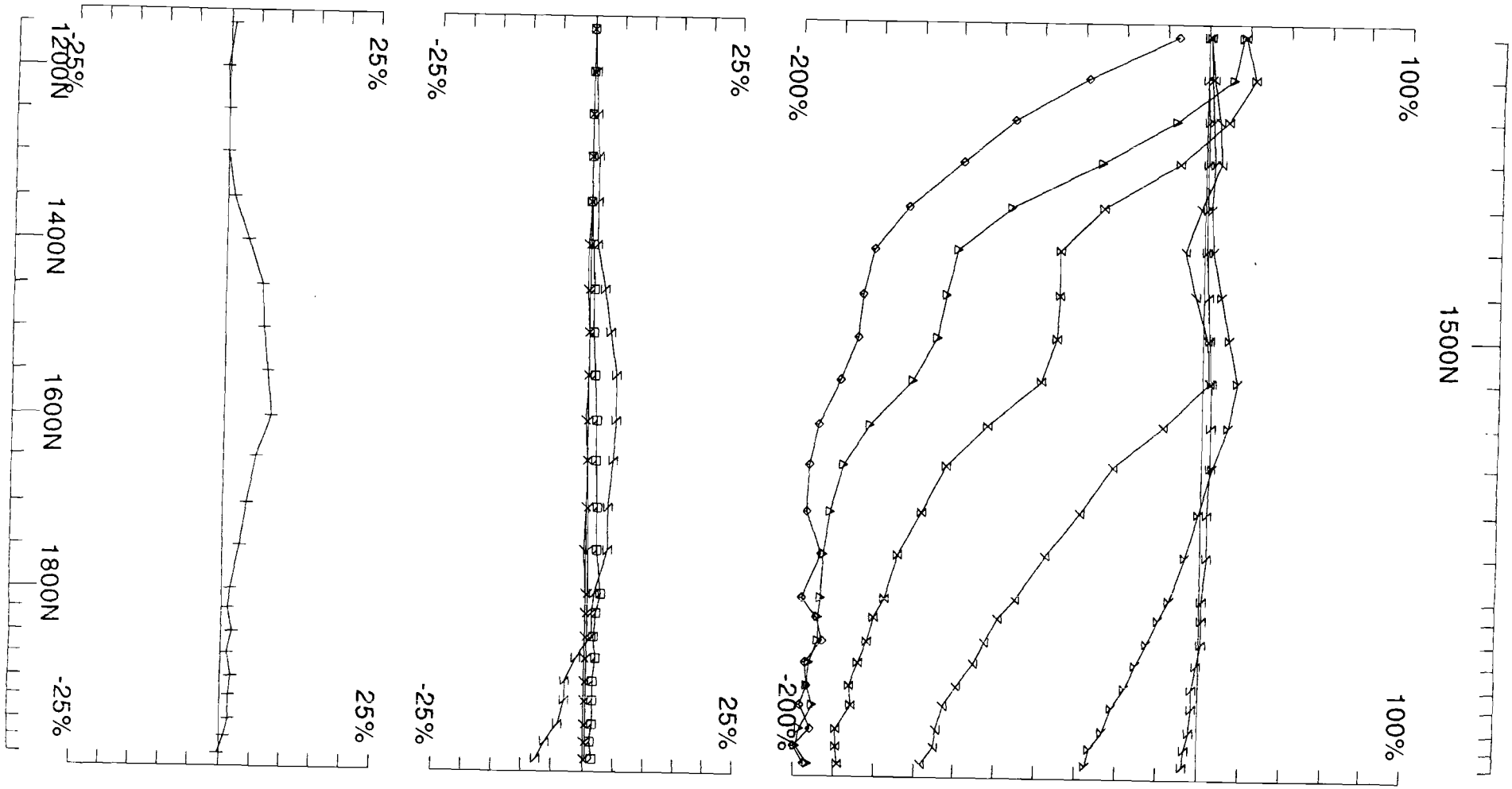
Loop 33 - continuous norm



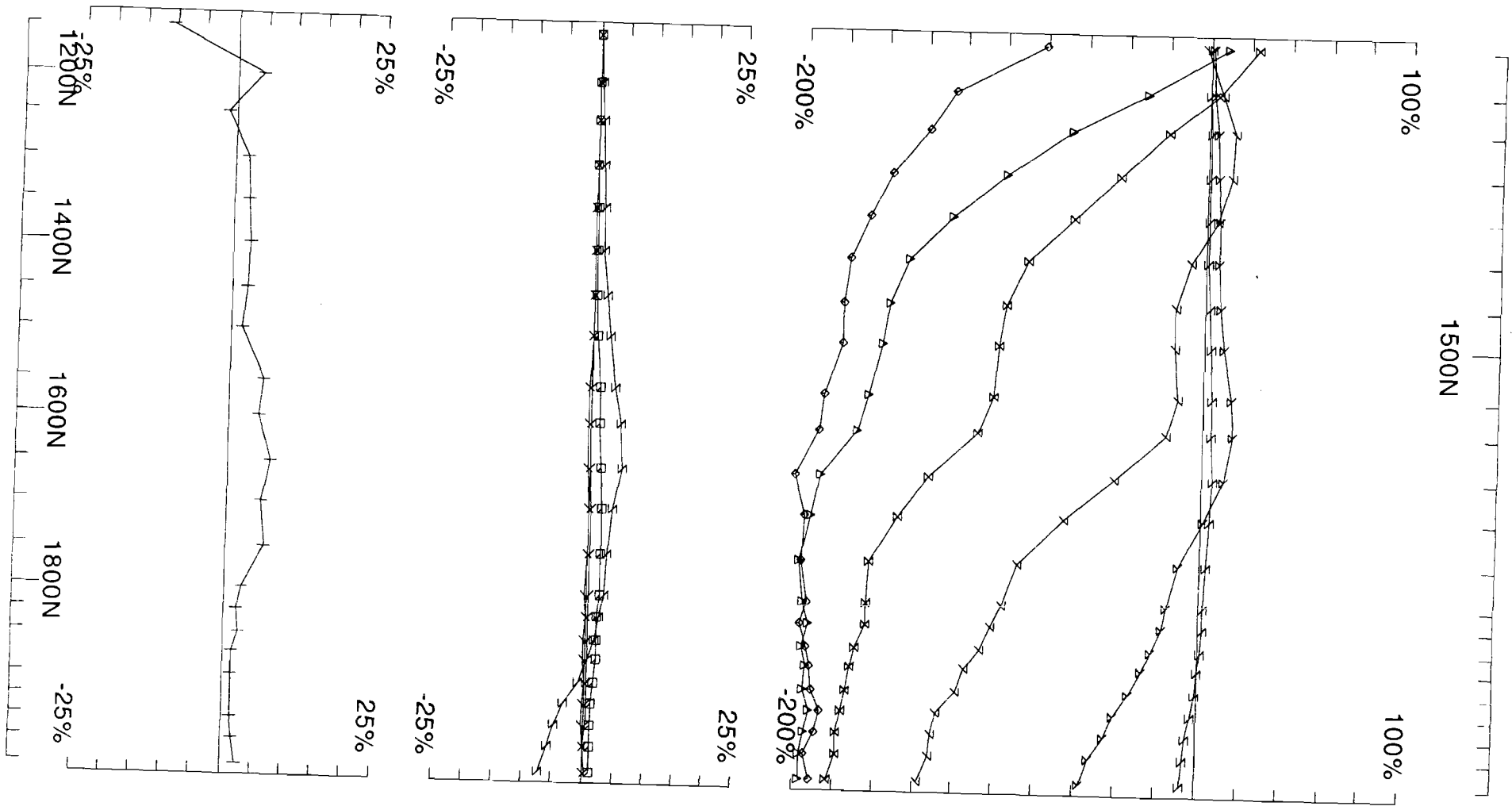
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 25/7/8 Reduced : 14/10/8 Plotted : 21/10/8



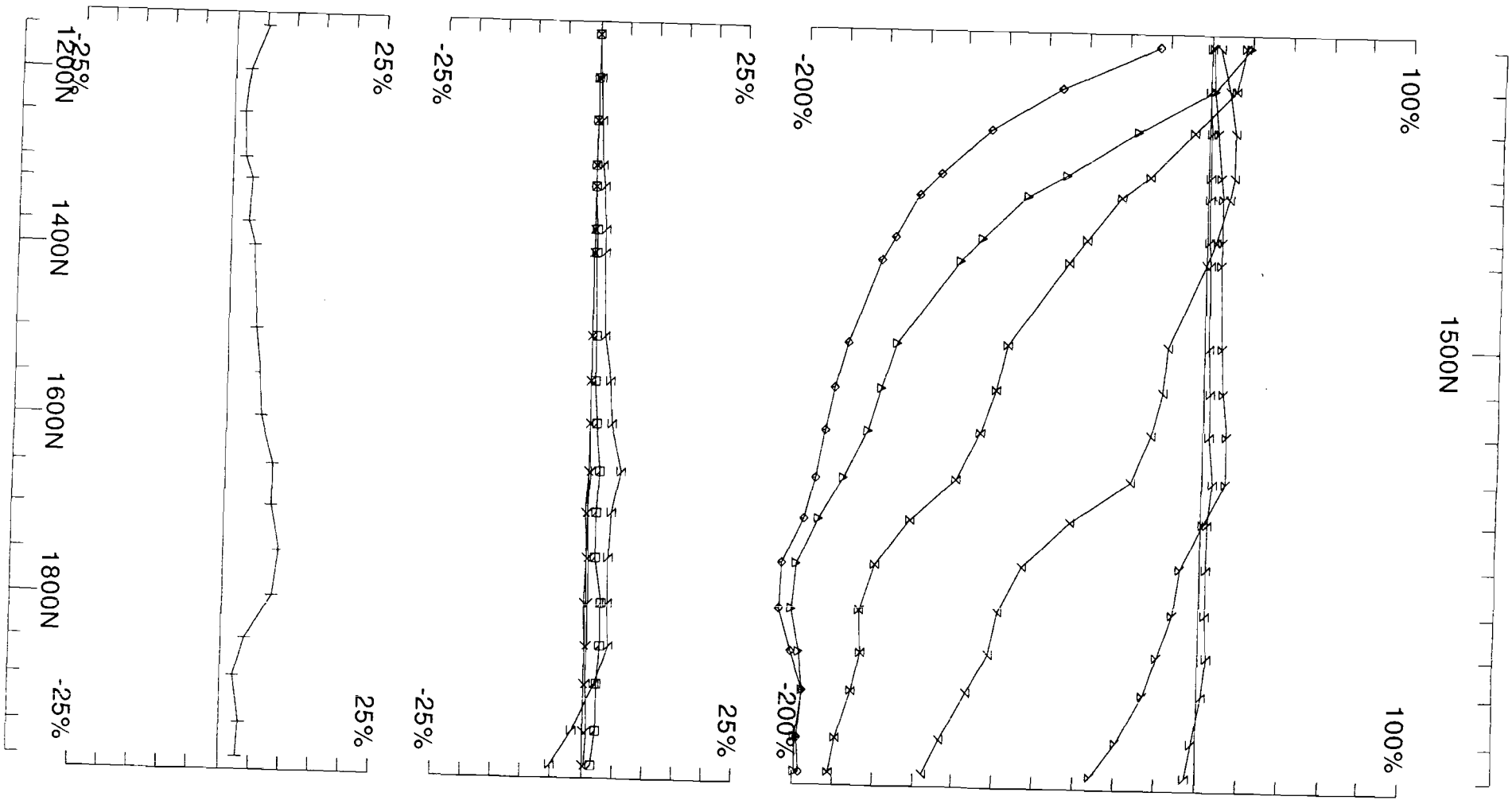
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 25/7/8, Reduced : 14/10/8, Plotted : 21/10/8



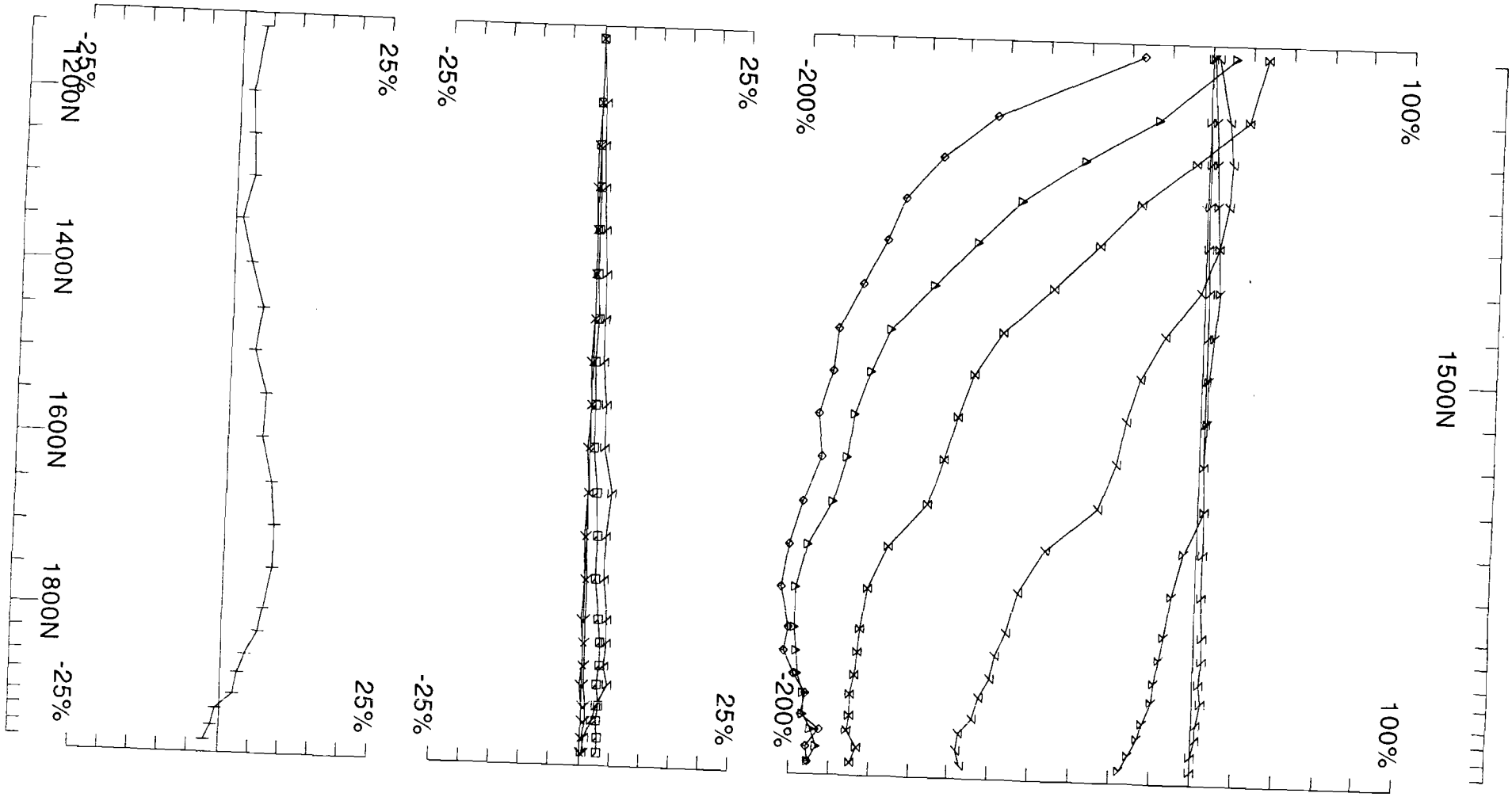
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 26/7/8, Reduced : 14/10/8, Plotted : 21/10/8



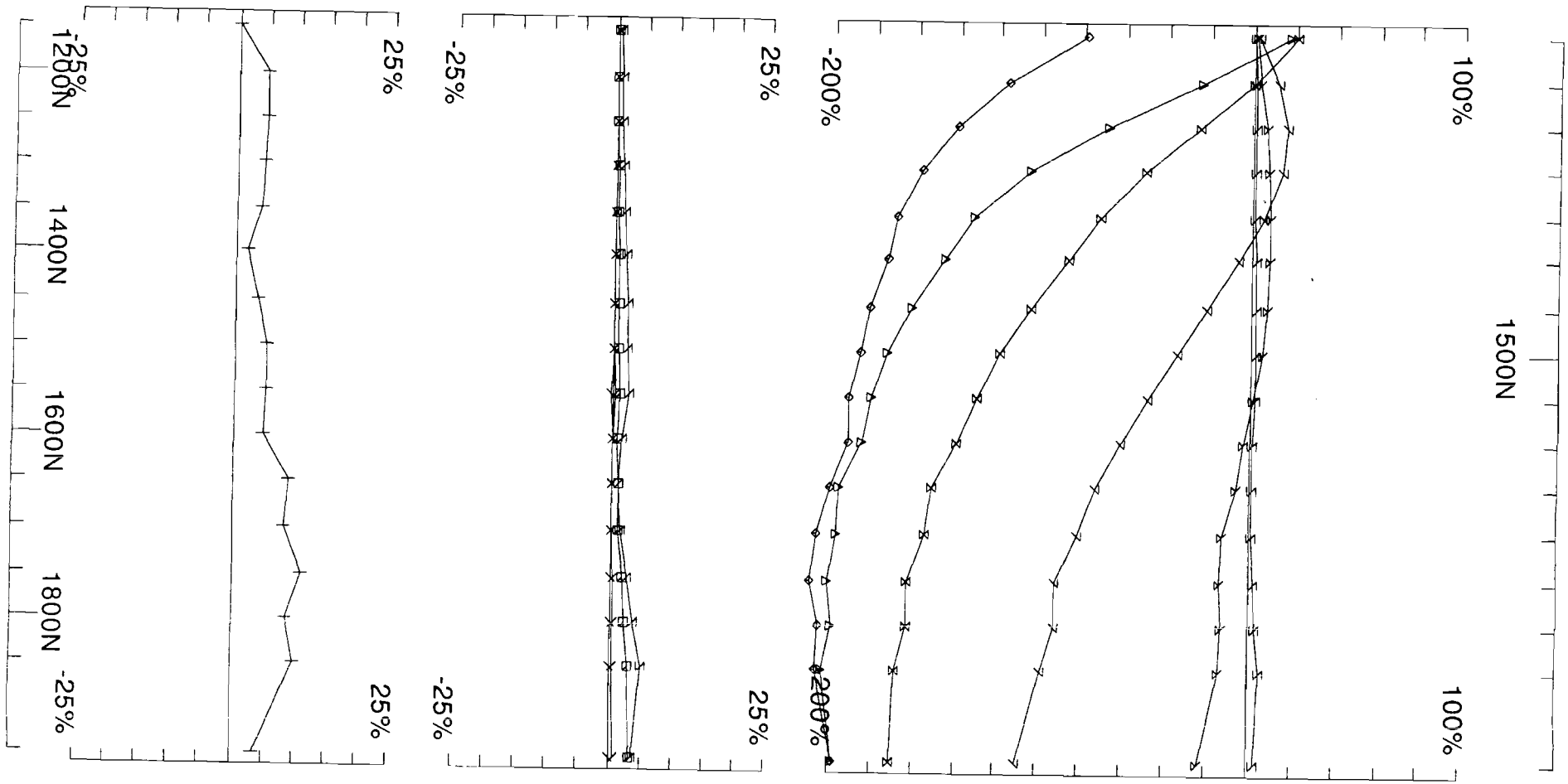
Loop: 33 Line: 3500E Compt: Hz	Secondary, (Chn - Ch1)/|Hp| Contin. Norm at depth of 0 m Base Freq. 30.974 Hz	UTEM Survey at: Montcalm For: Xstrata Nickel LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 26/7/8 Reduced : 14/10/8 Plotted : 21/10/8



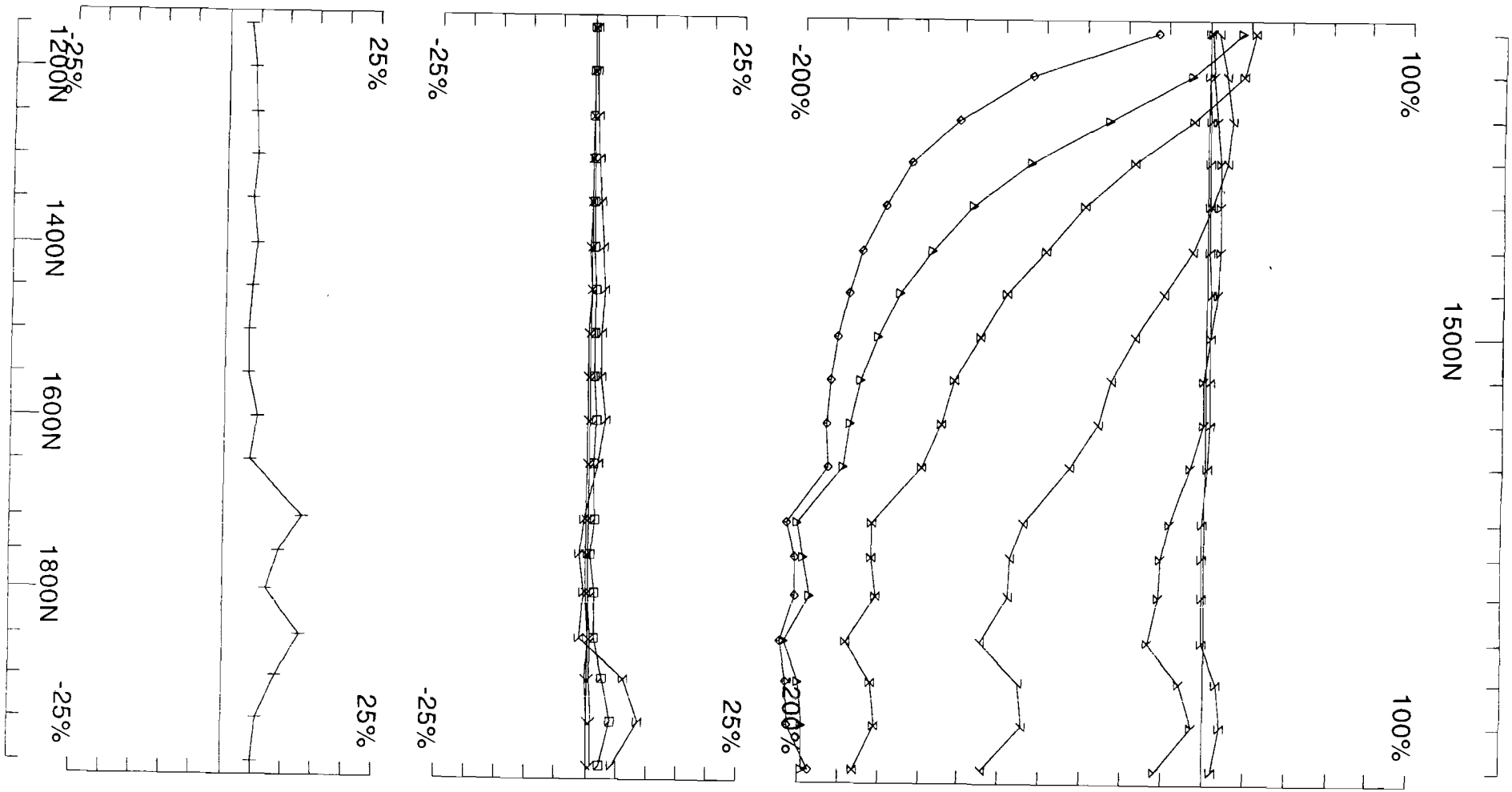
Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 27/7/8, Reduced : 14/10/8, Plotted : 21/10/8



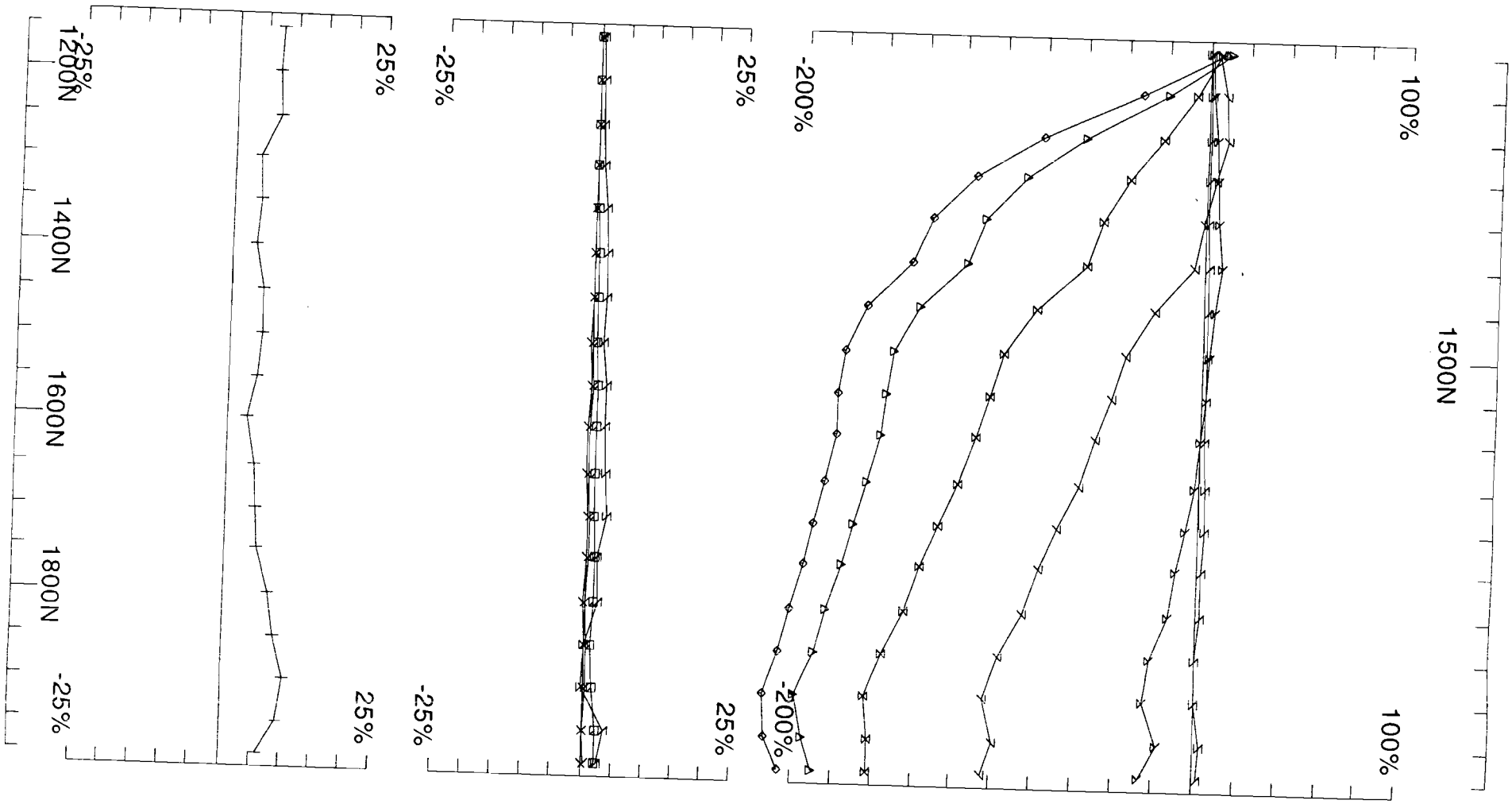
Loop: 33 Line: 3700E Compt: Hz	Secondary, (Chn - Ch1)/|Hp| Contin. Norm at depth of 0 m Base Freq. 30.974 Hz	UTEM Survey at: Montcalm For: Xstrata Nickel LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 26/7/8 Reduced : 14/10/8 Plotted : 21/10/8



Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 27/7/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 33	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 3900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 26/7/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 33 Line: 4000E Compt: Hz	Secondary, (Chn - Ch1)/|Hp| Contin. Norm at depth of 0 m Base Freq. 30.974 Hz	UTEM Survey at: Montcalm For: Xstrata Nickel LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 28/7/8 Reduced : 14/10/8 Plotted : 21/10/8

Montcalm

Loop 34

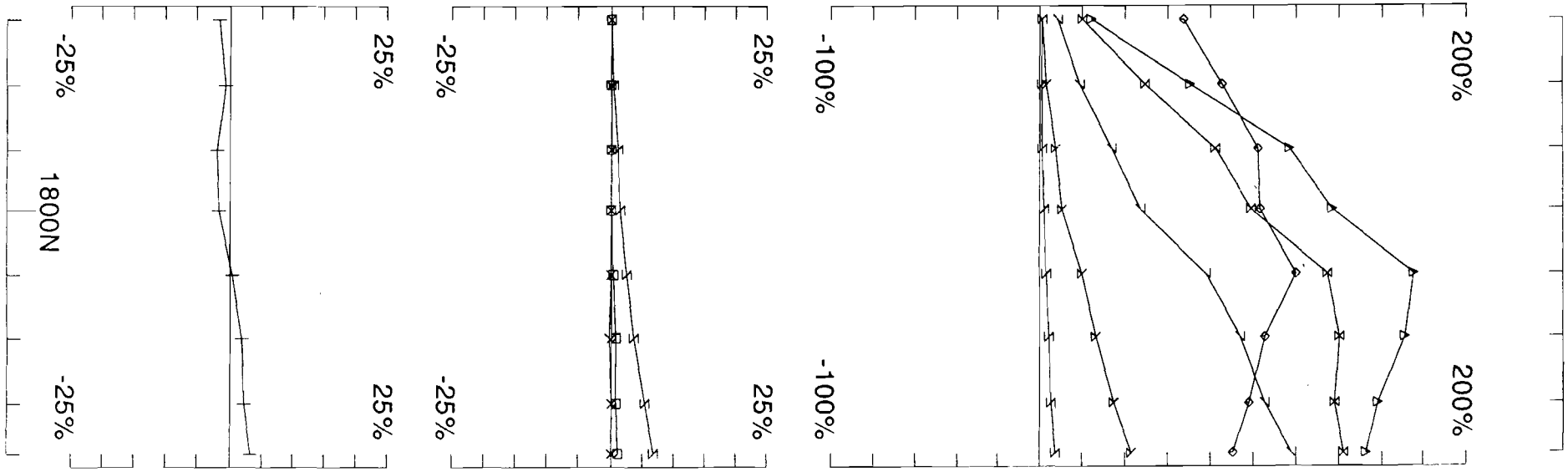
Hx

@30.974 Hz frequency

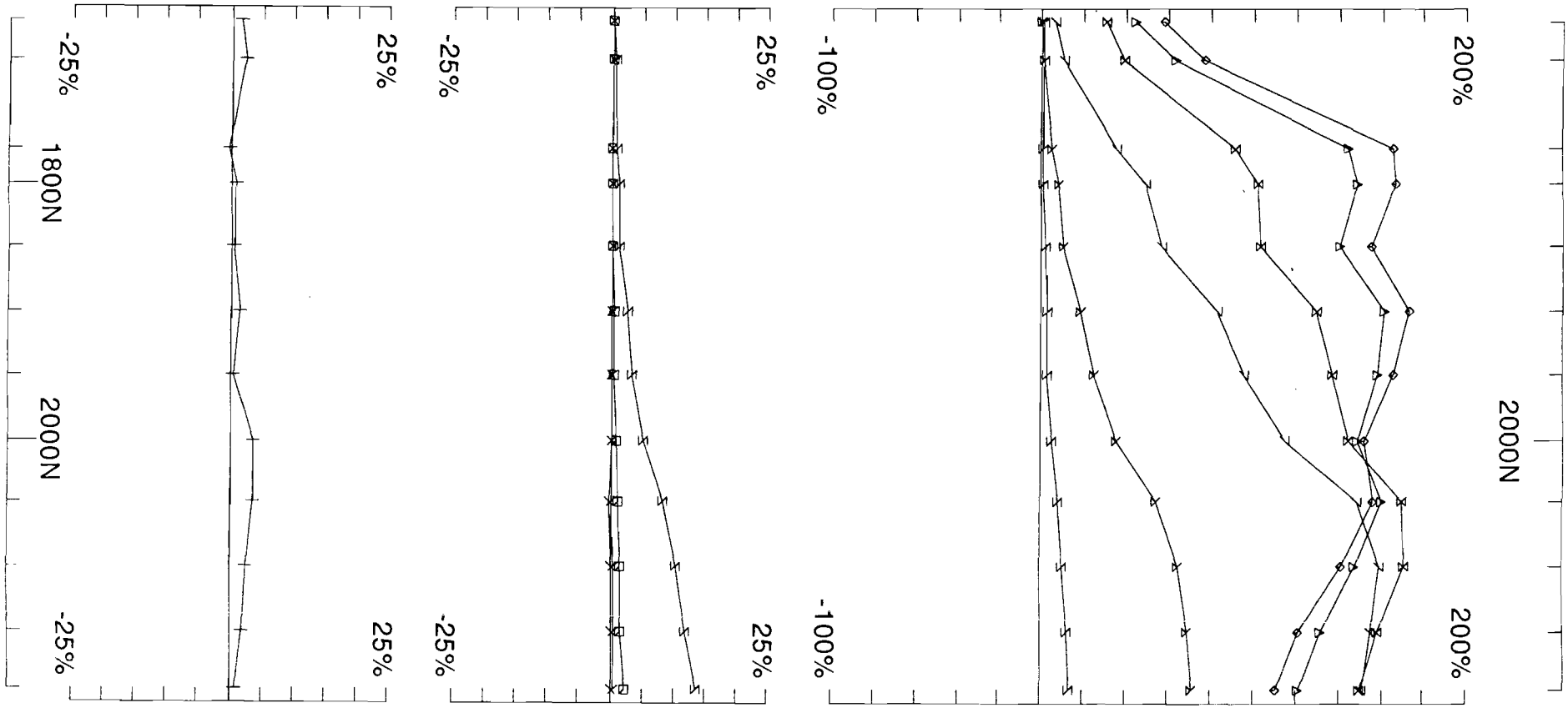
continuous norm

Ch1 reduced

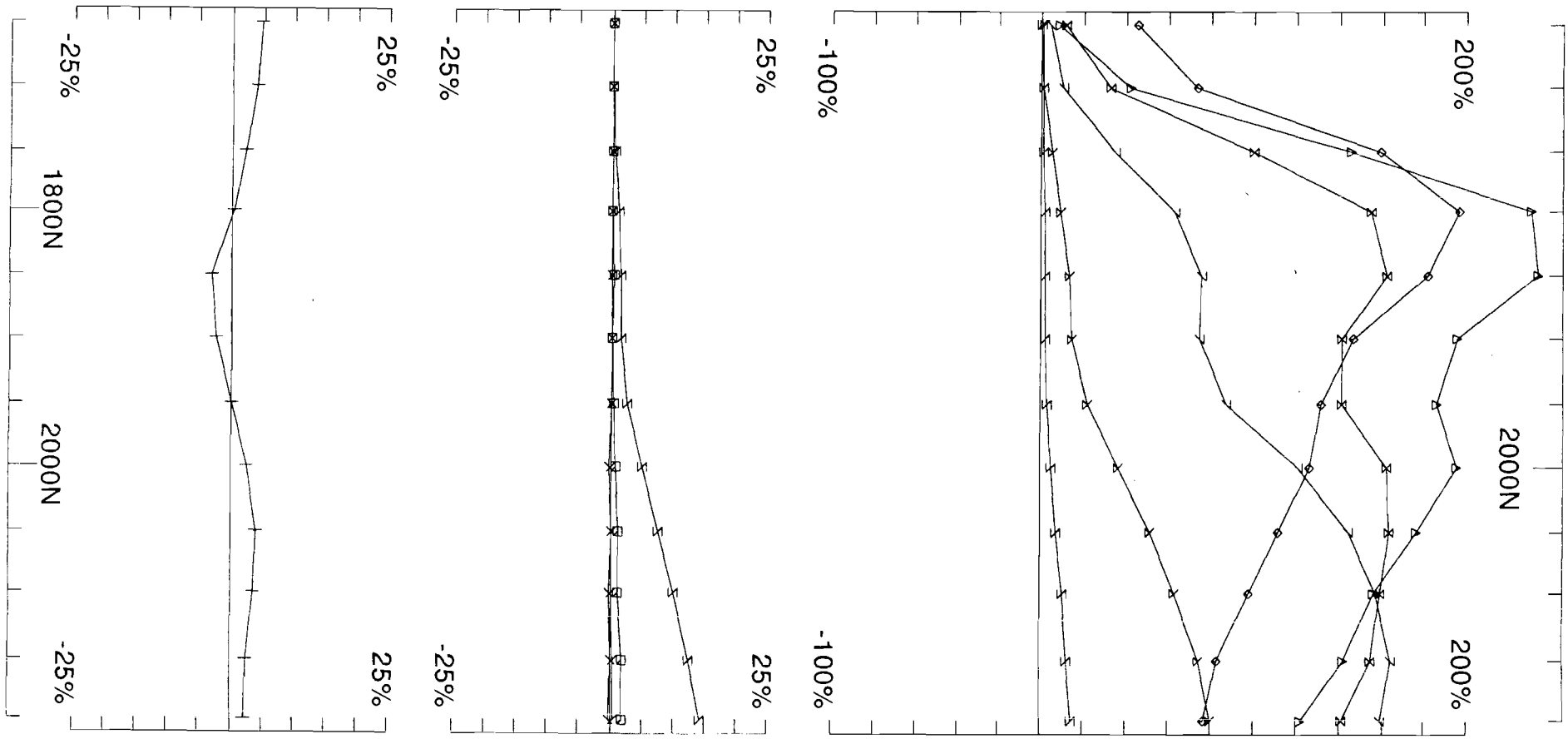
Line 4100E	1600N - 2200N
Line 4200E	1600N - 2200N
Line 4300E	1600N - 2200N
Line 4400E	1600N - 2200N
Line 4500E	1600N - 2200N
Line 4600E	1600N - 2200N
Line 4700E	1600N - 2200N
Line 4800E	1600N - 2200N
Line 4900E	1600N - 2200N
Line 5000E	1600N - 2200N
Line 5100E	1600N - 2200N
Line 5200E	1600N - 2200N
Line 5300E	1600N - 2200N



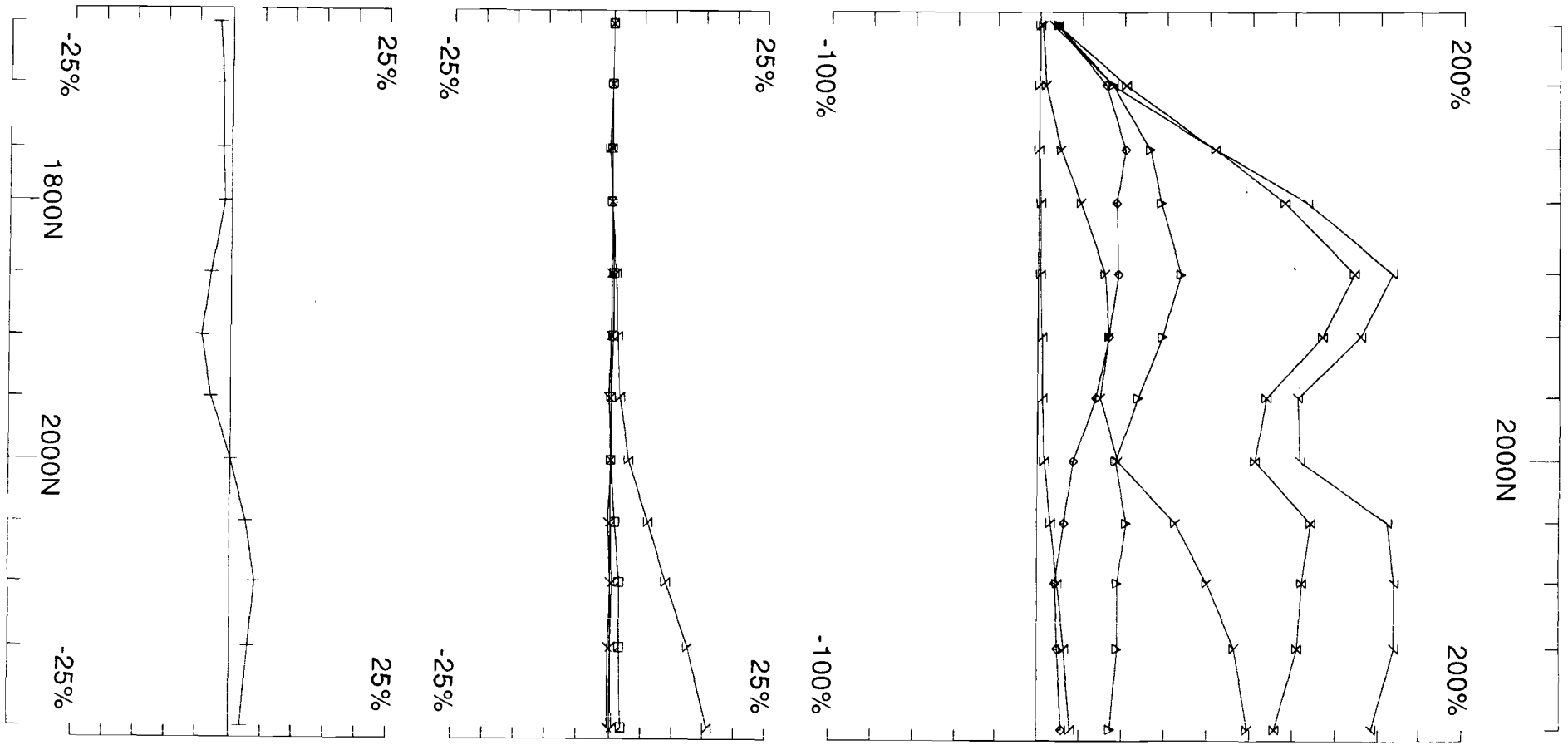
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 3/8/8, Reduced : 14/10/8, Plotted : 21/10/8



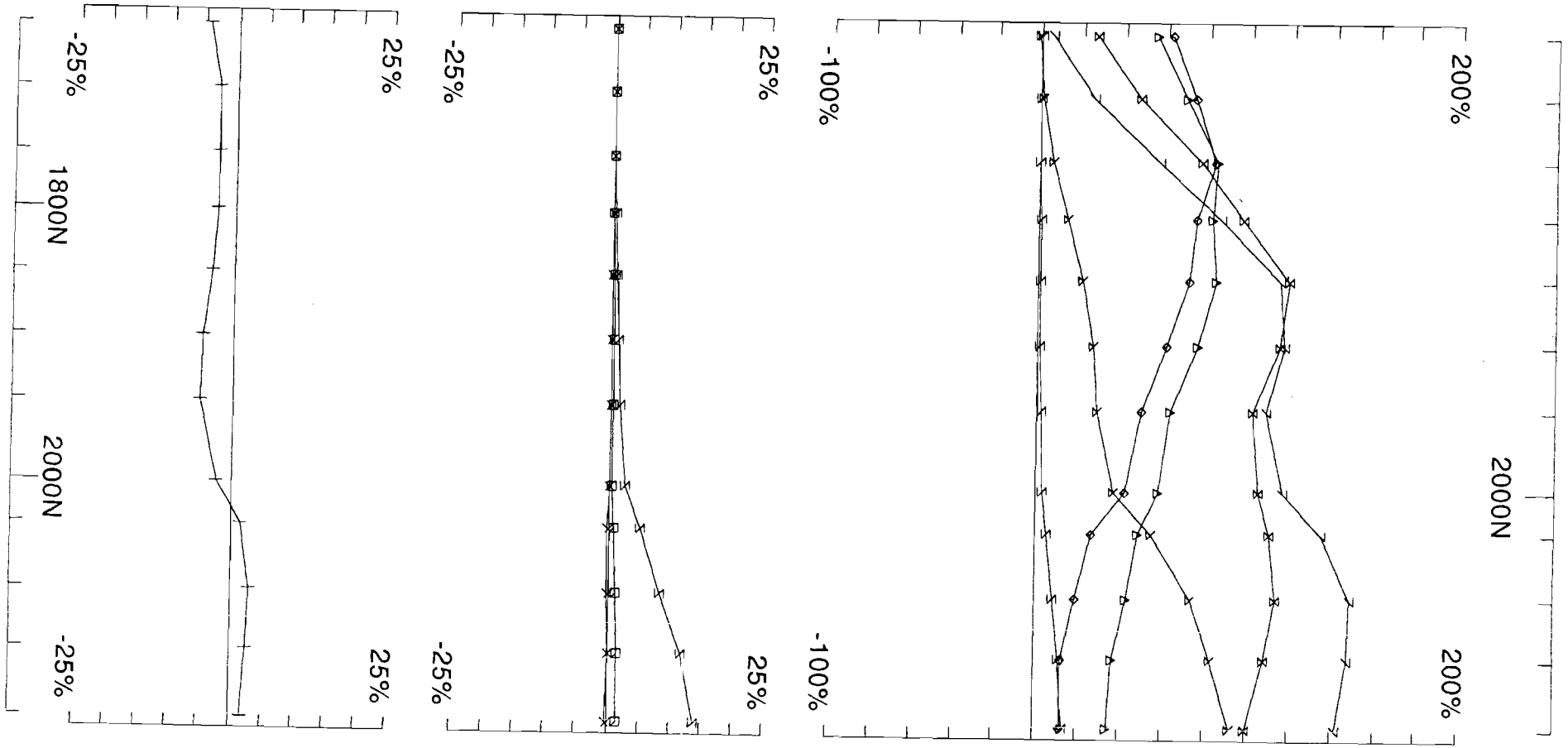
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 3/8/8, Reduced : 14/10/8, Plotted : 21/10/8



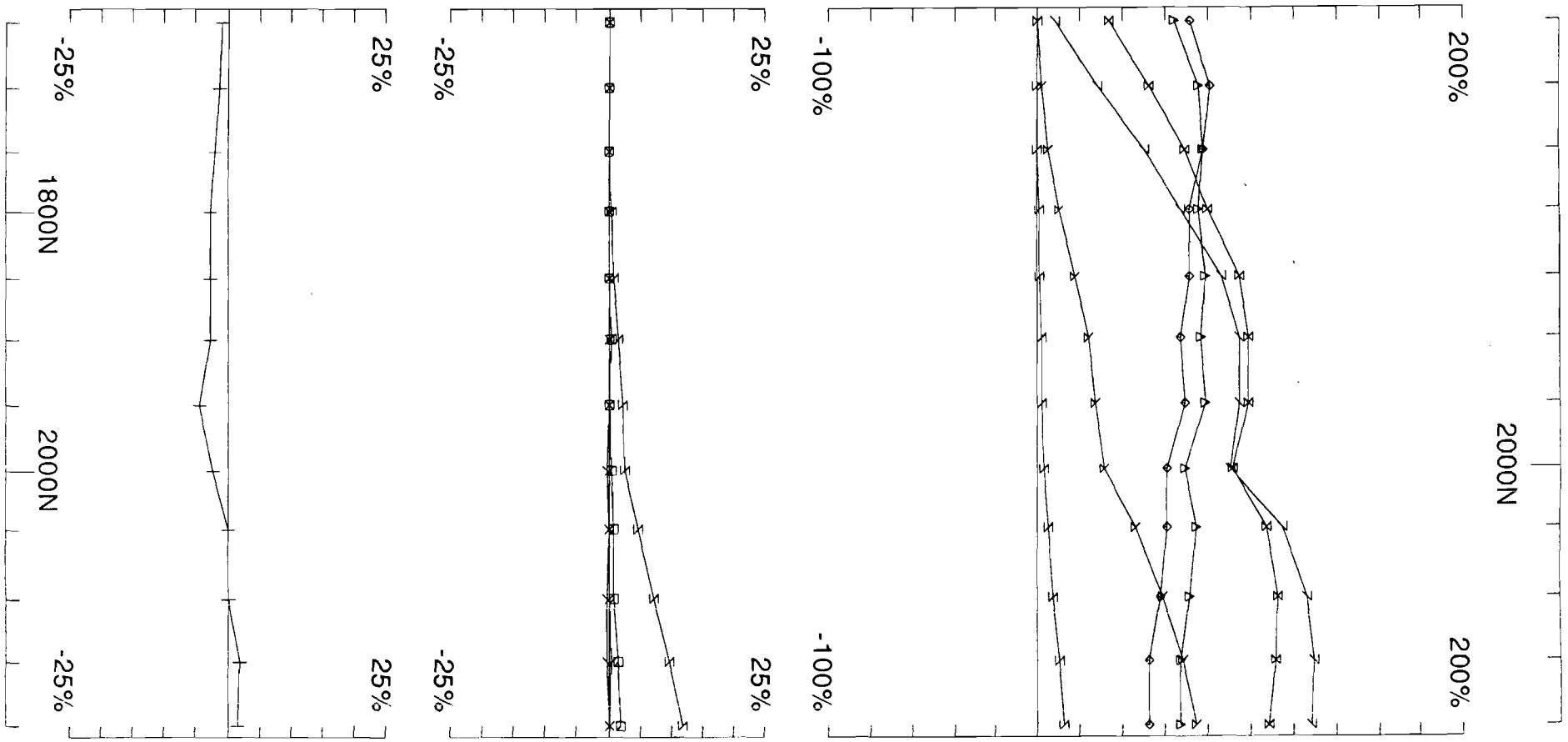
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 3/8/8, Reduced : 14/10/8, Plotted : 21/10/8



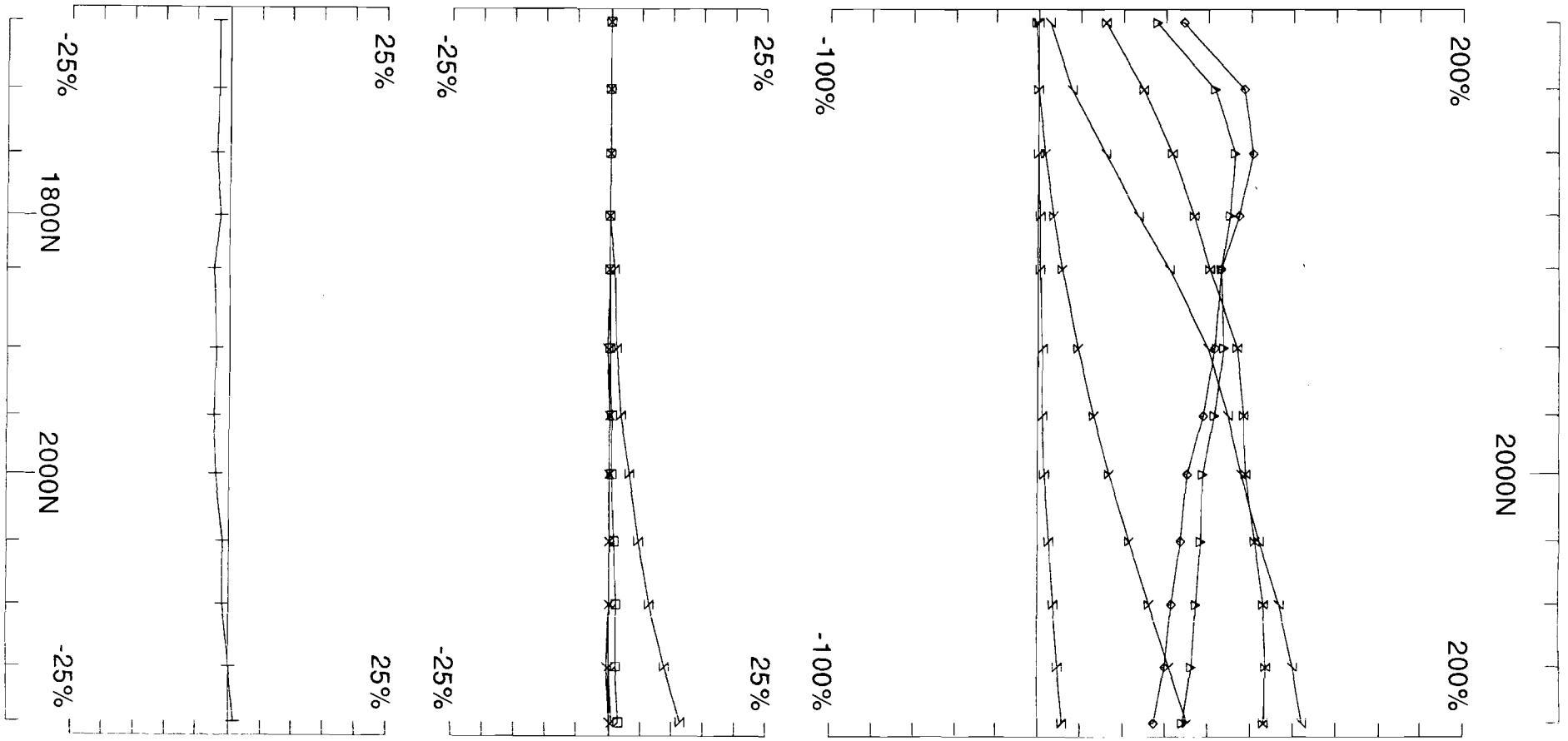
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



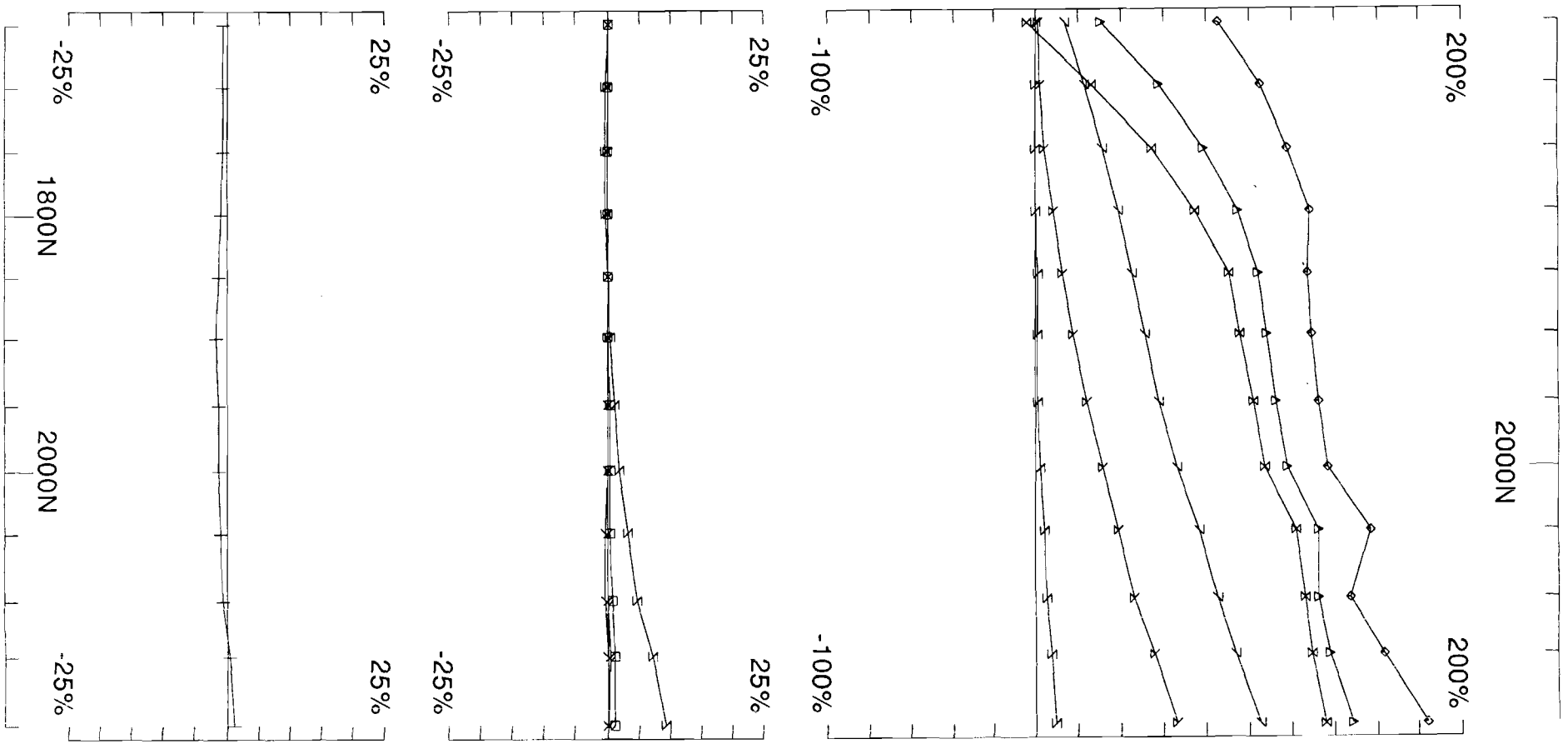
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



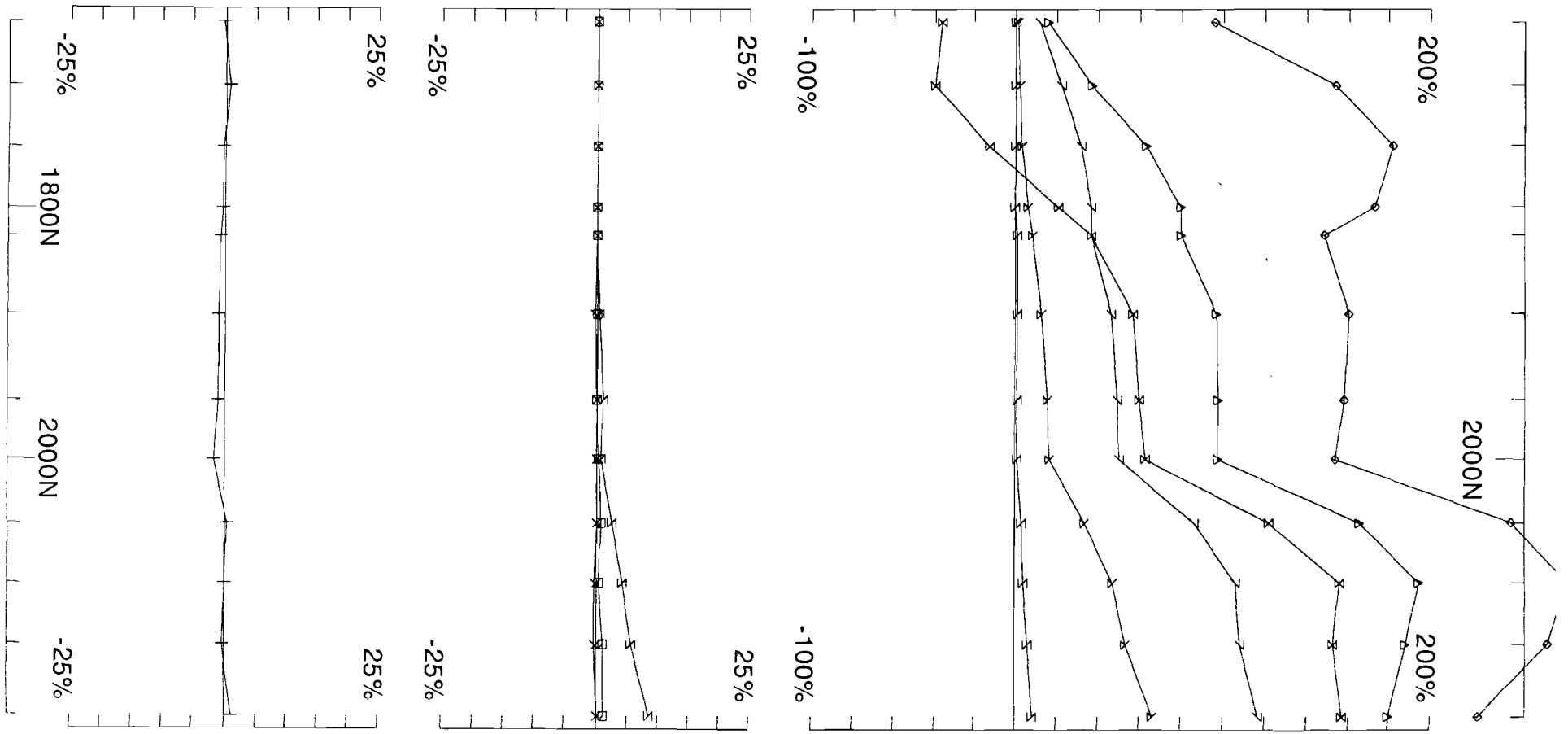
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



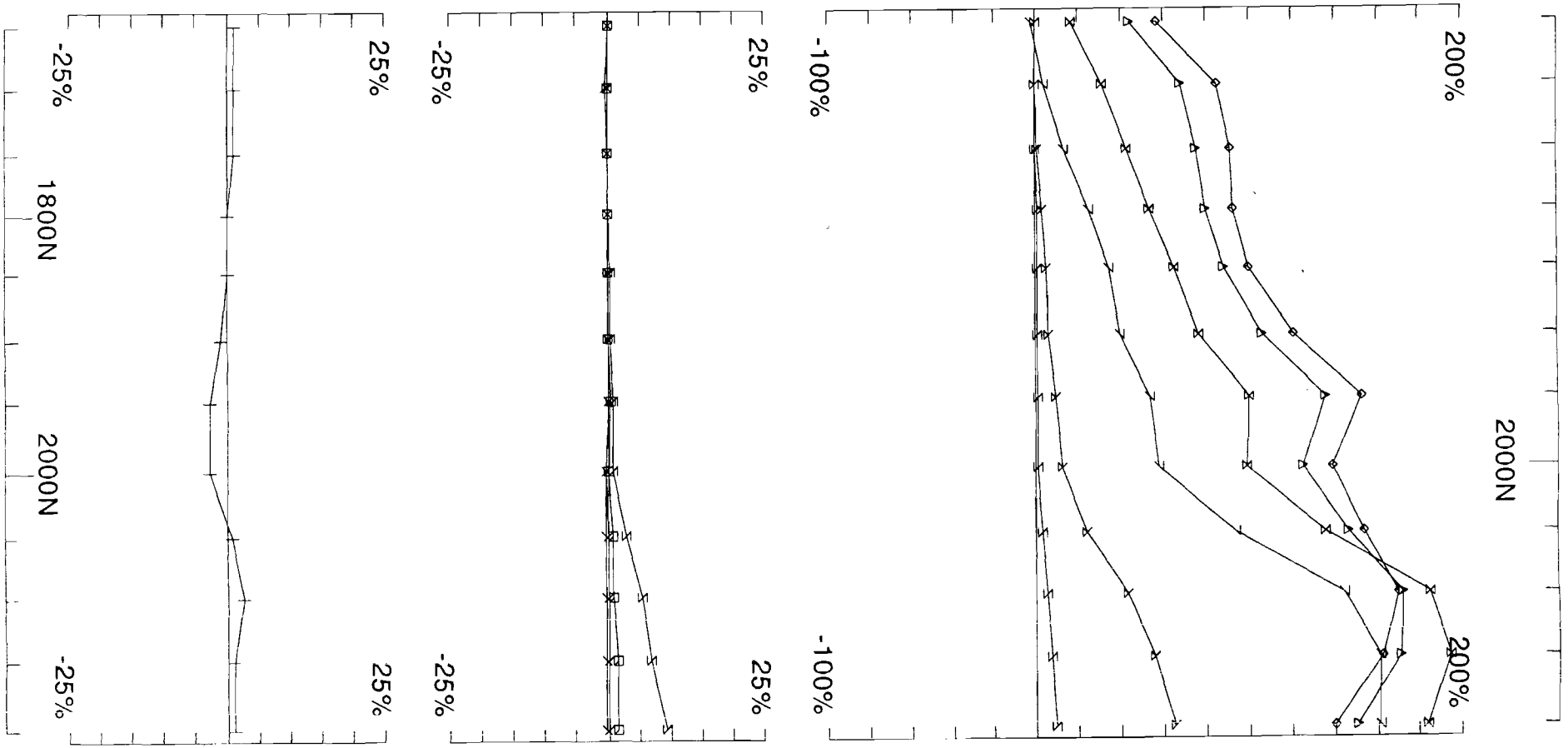
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



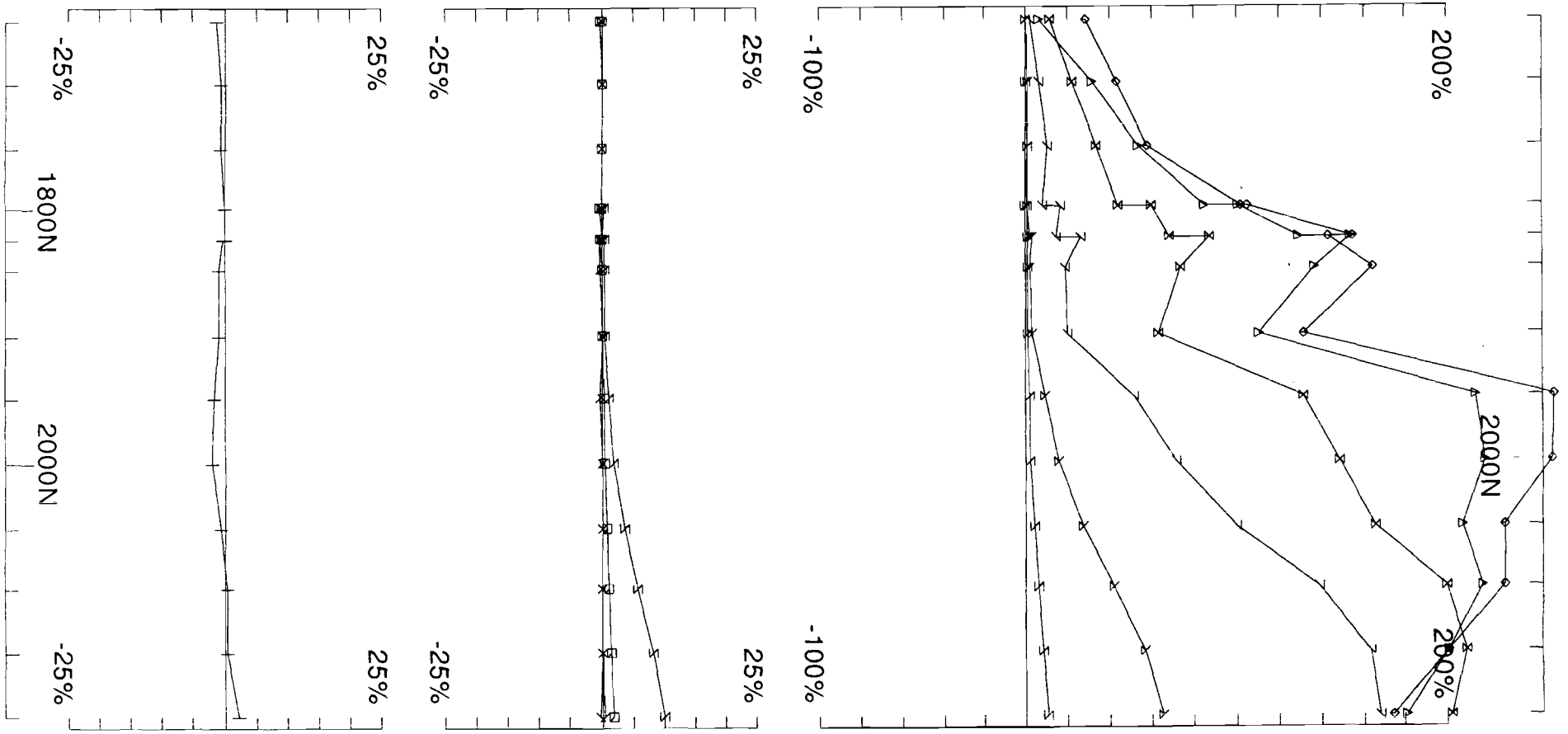
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



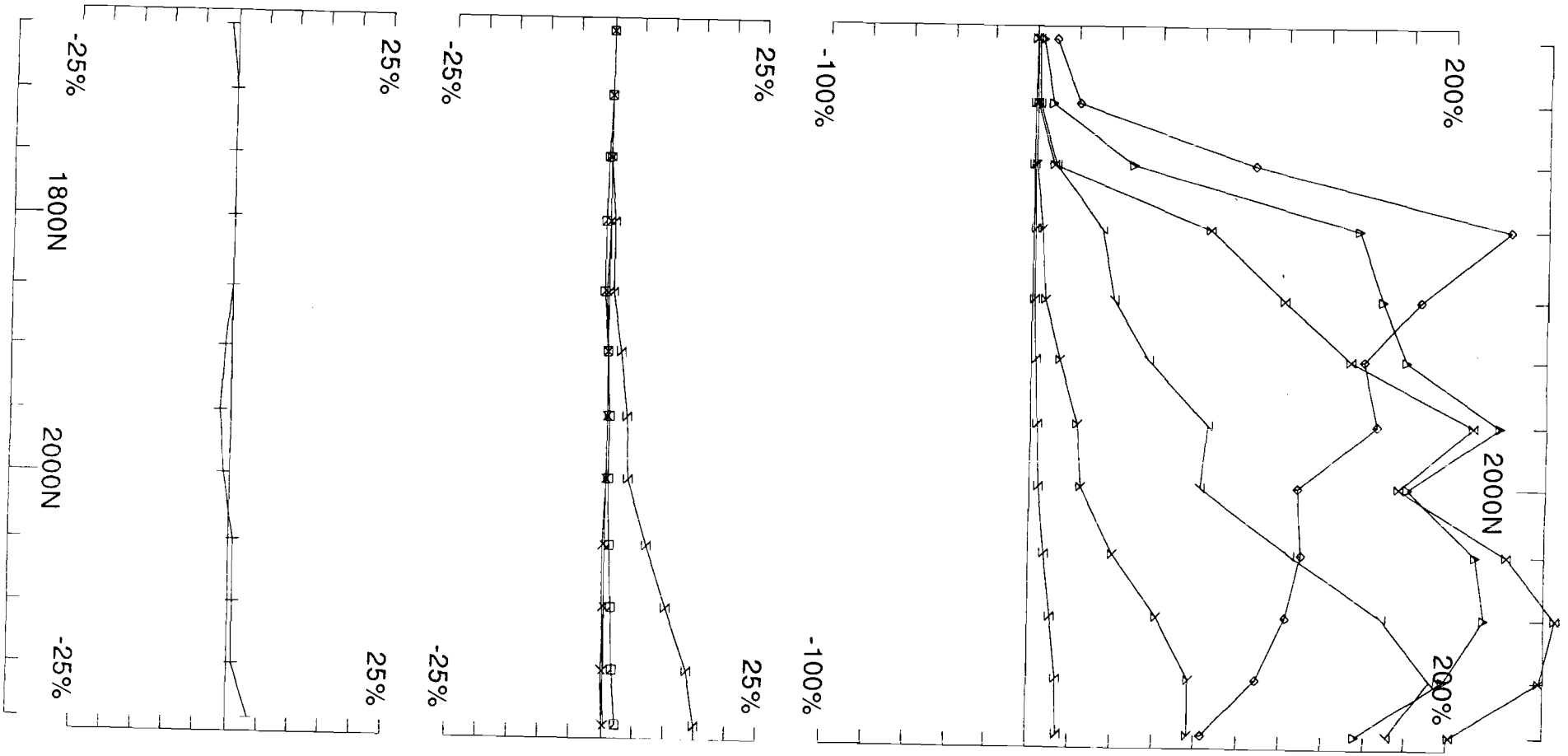
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



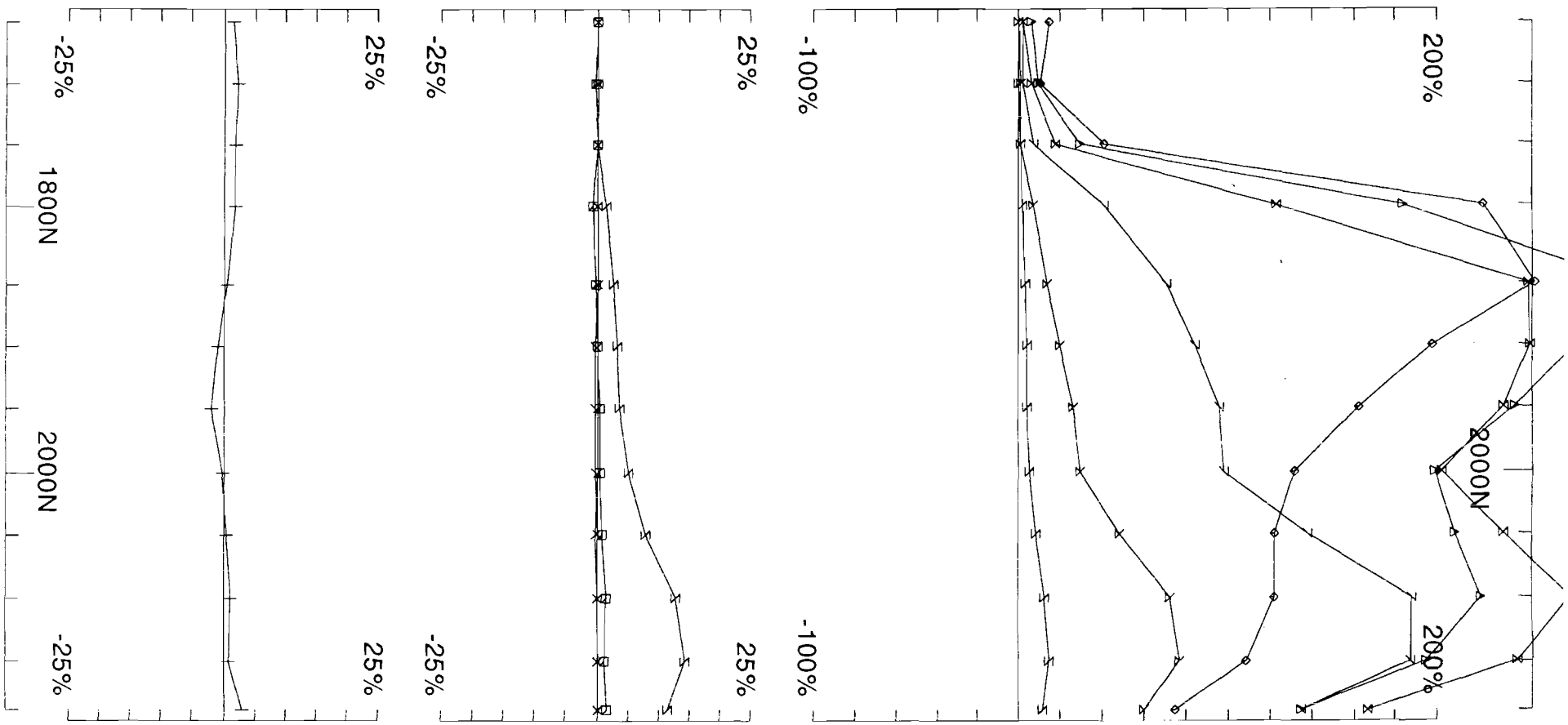
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 1/8/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 1/8/8, Reduced : 14/10/8, Plotted : 21/10/8

Montcalm

Loop 34

Hz

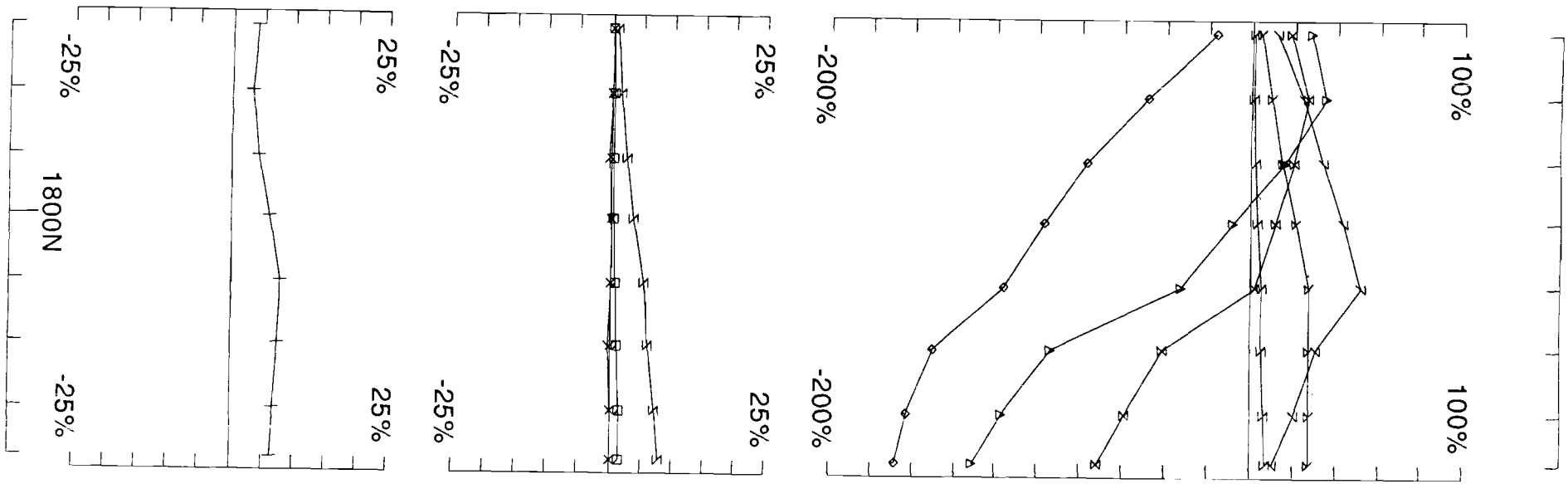
@30.974 Hz frequency

continuous norm

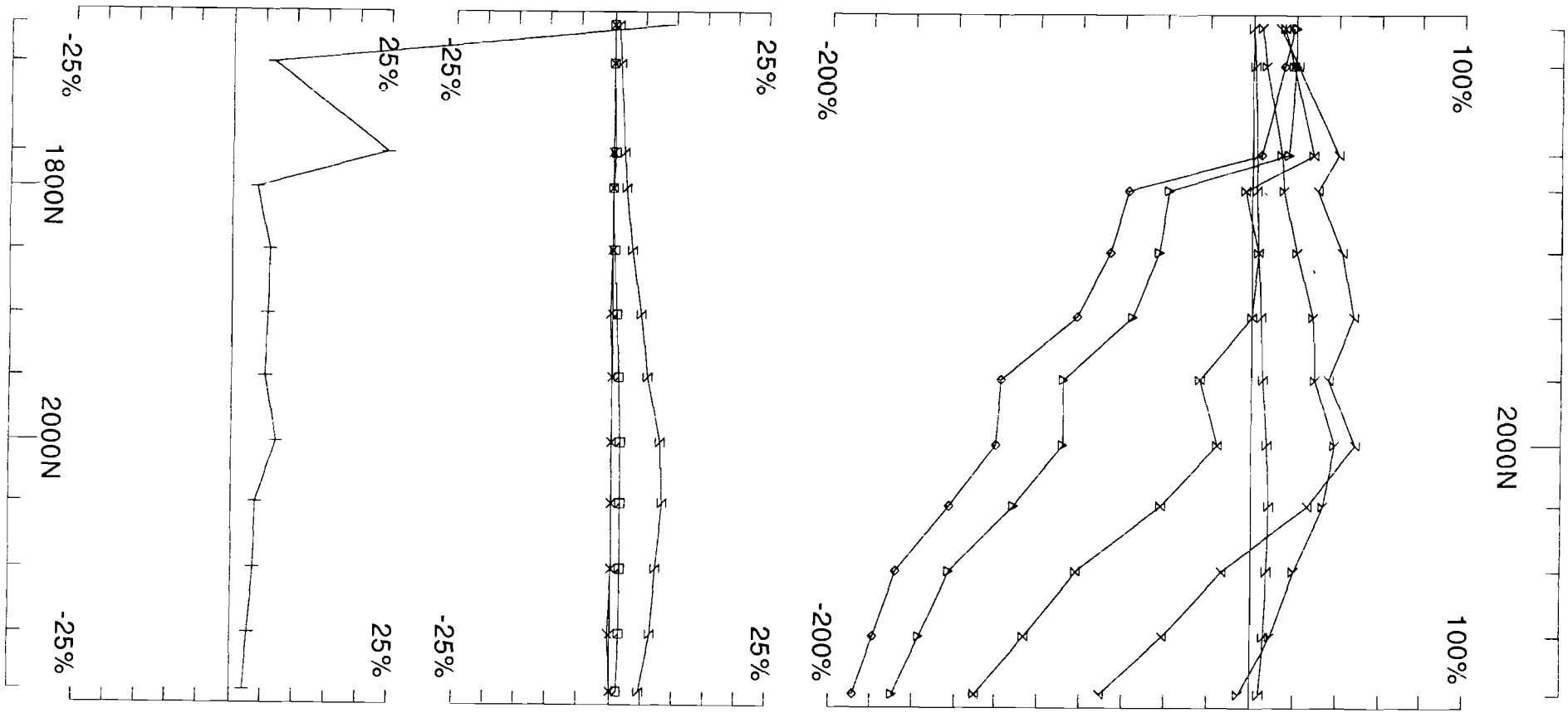
Ch1 reduced

Line 4100E	1600N - 2200N
Line 4200E	1600N - 2200N
Line 4300E	1600N - 2200N
Line 4400E	1600N - 2200N
Line 4500E	1600N - 2200N
Line 4600E	1600N - 2200N
Line 4700E	1600N - 2200N
Line 4800E	1600N - 2200N
Line 4900E	1600N - 2200N
Line 5000E	1600N - 2200N
Line 5100E	1600N - 2200N
Line 5200E	1600N - 2200N
Line 5300E	1600N - 2200N

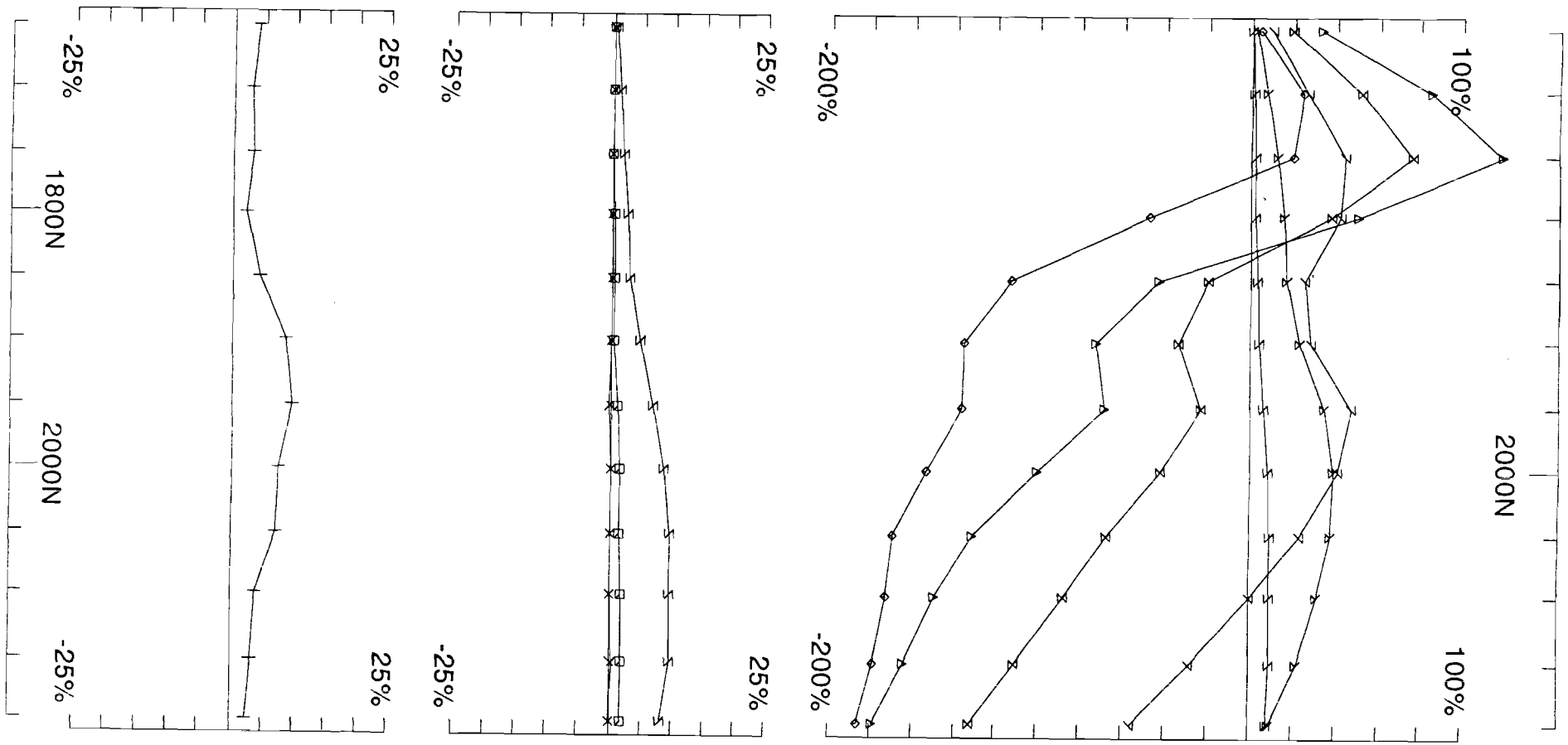
Loop 34 - continuous norm



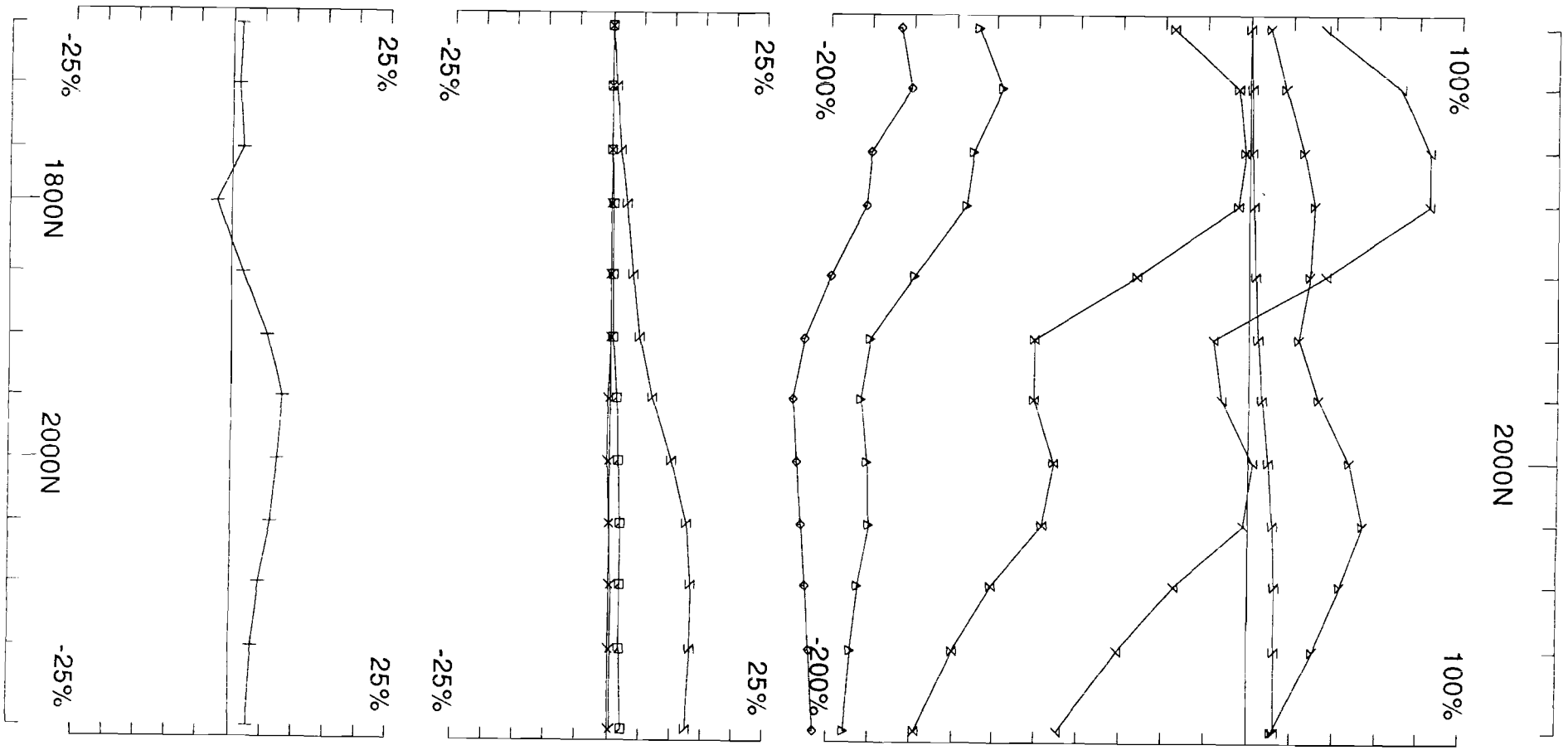
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 3/8/8, Reduced : 14/10/8, Plotted : 21/10/8



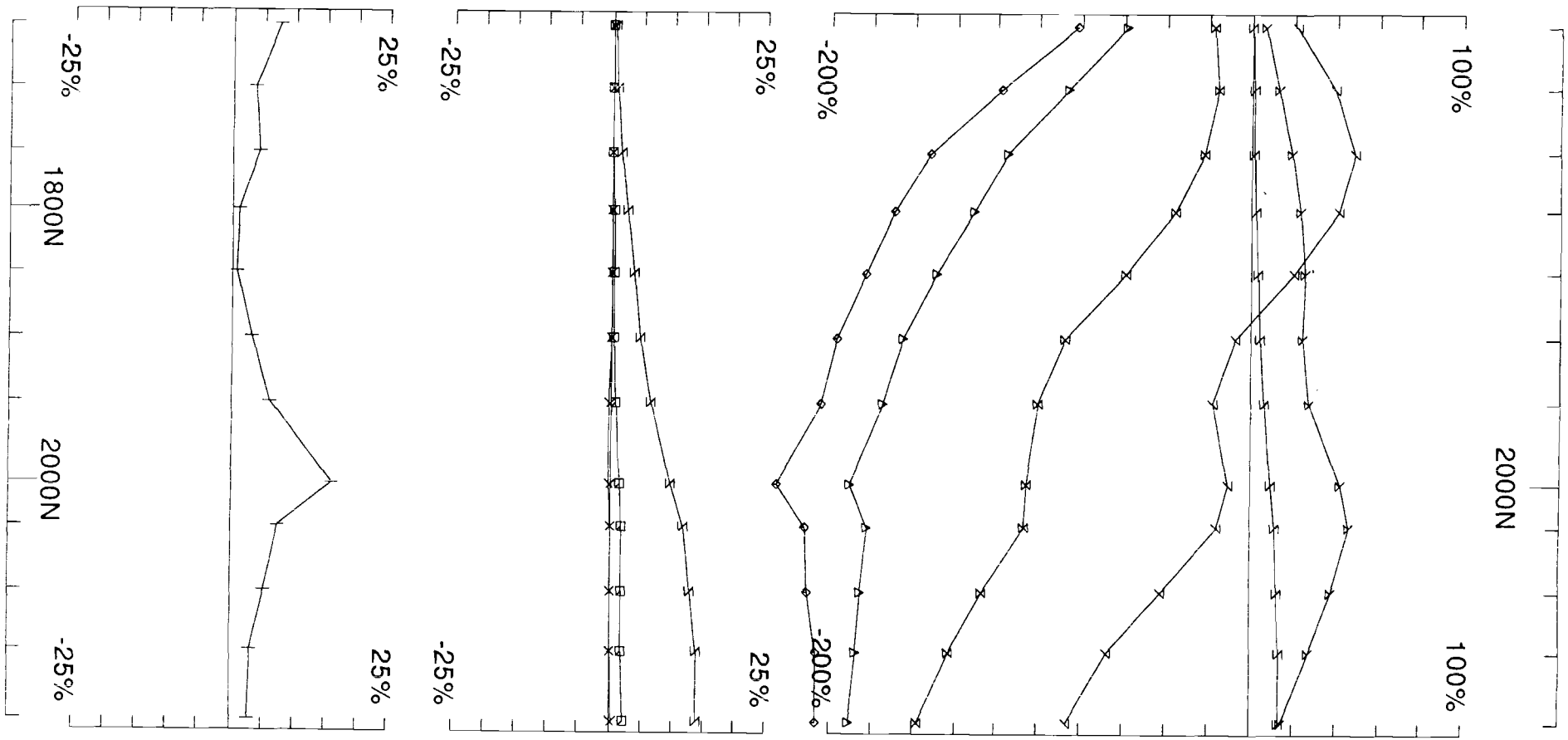
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 3/8/8, Reduced : 14/10/8, Plotted : 21/10/8



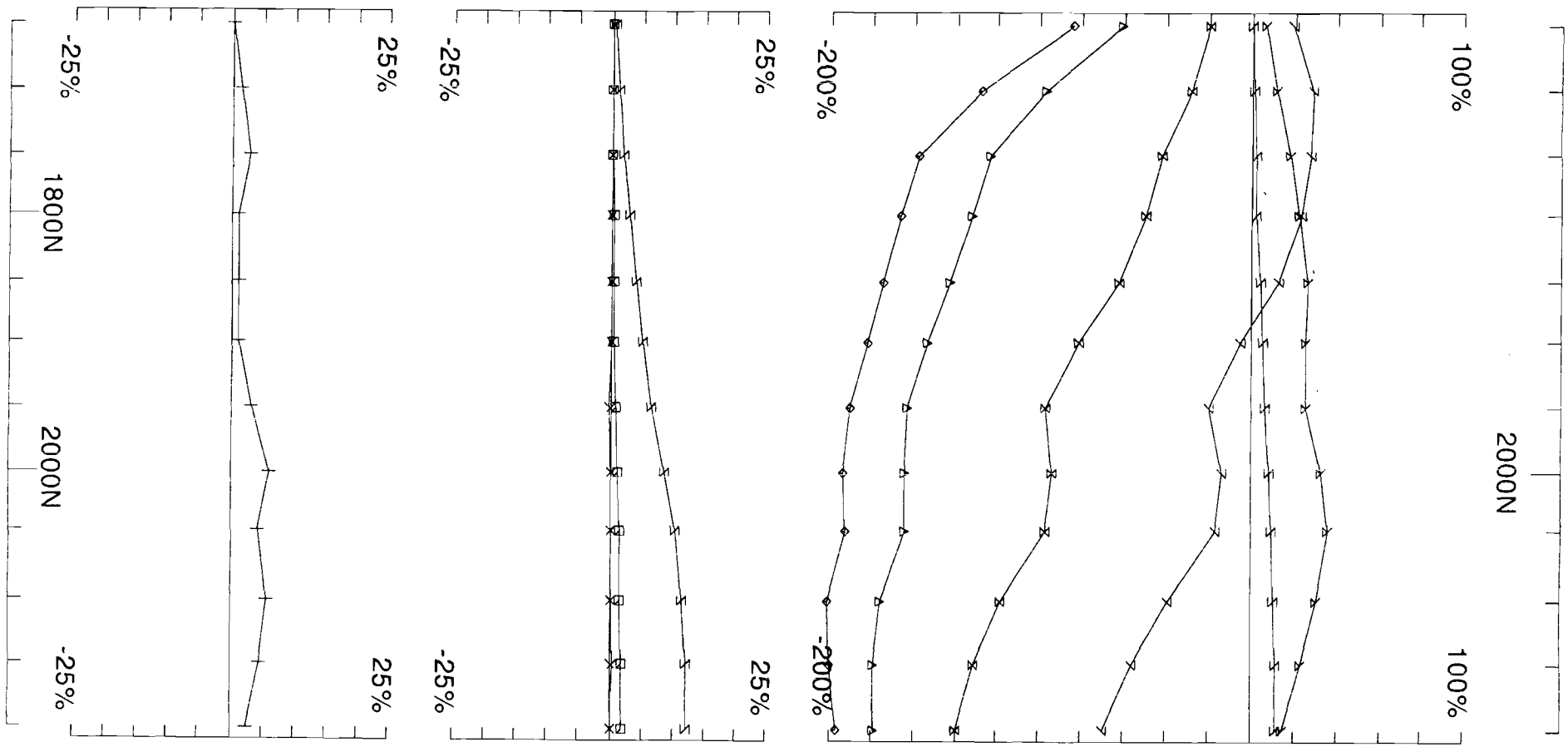
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 3/8/8 Reduced : 14/10/8 Plotted : 21/10/8



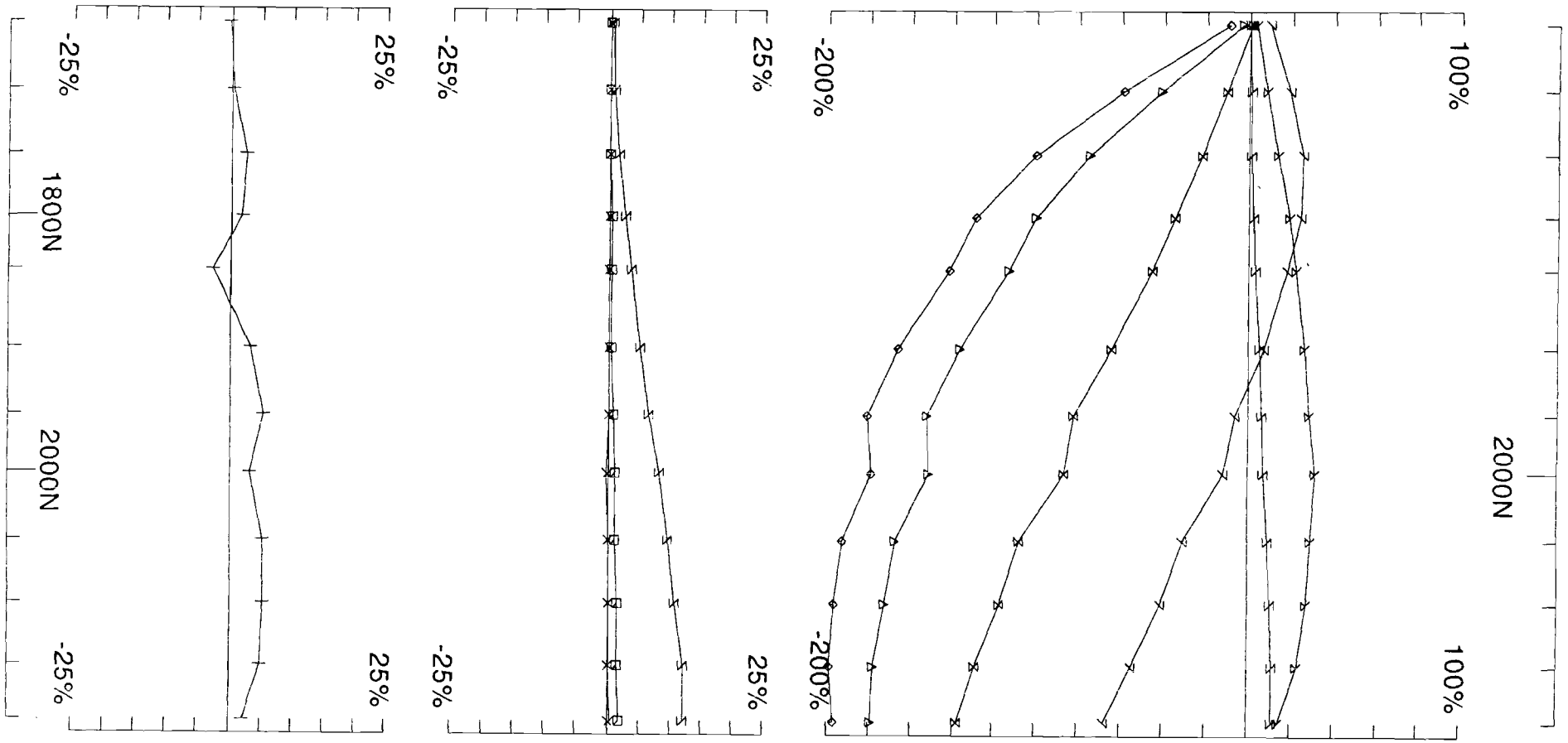
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



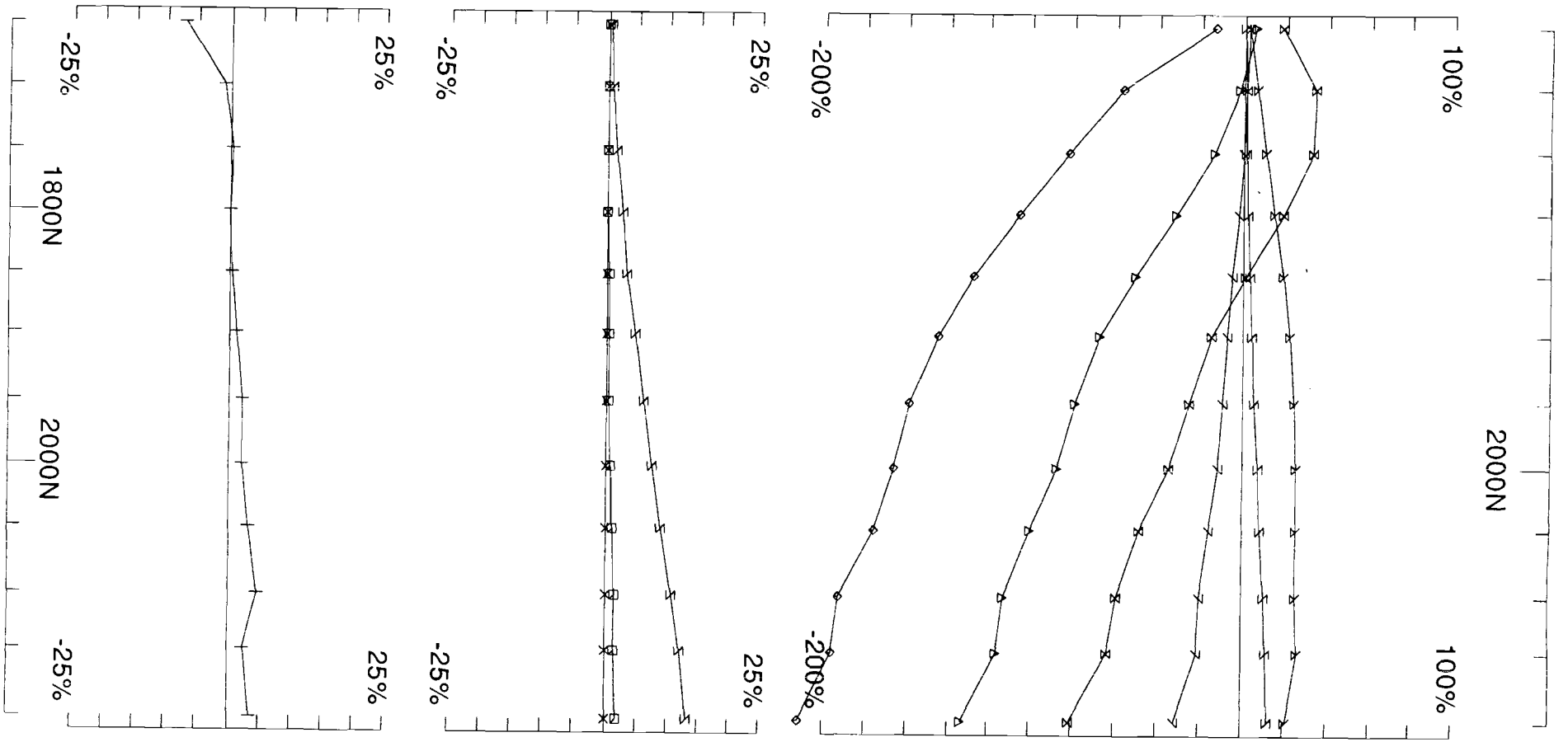
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



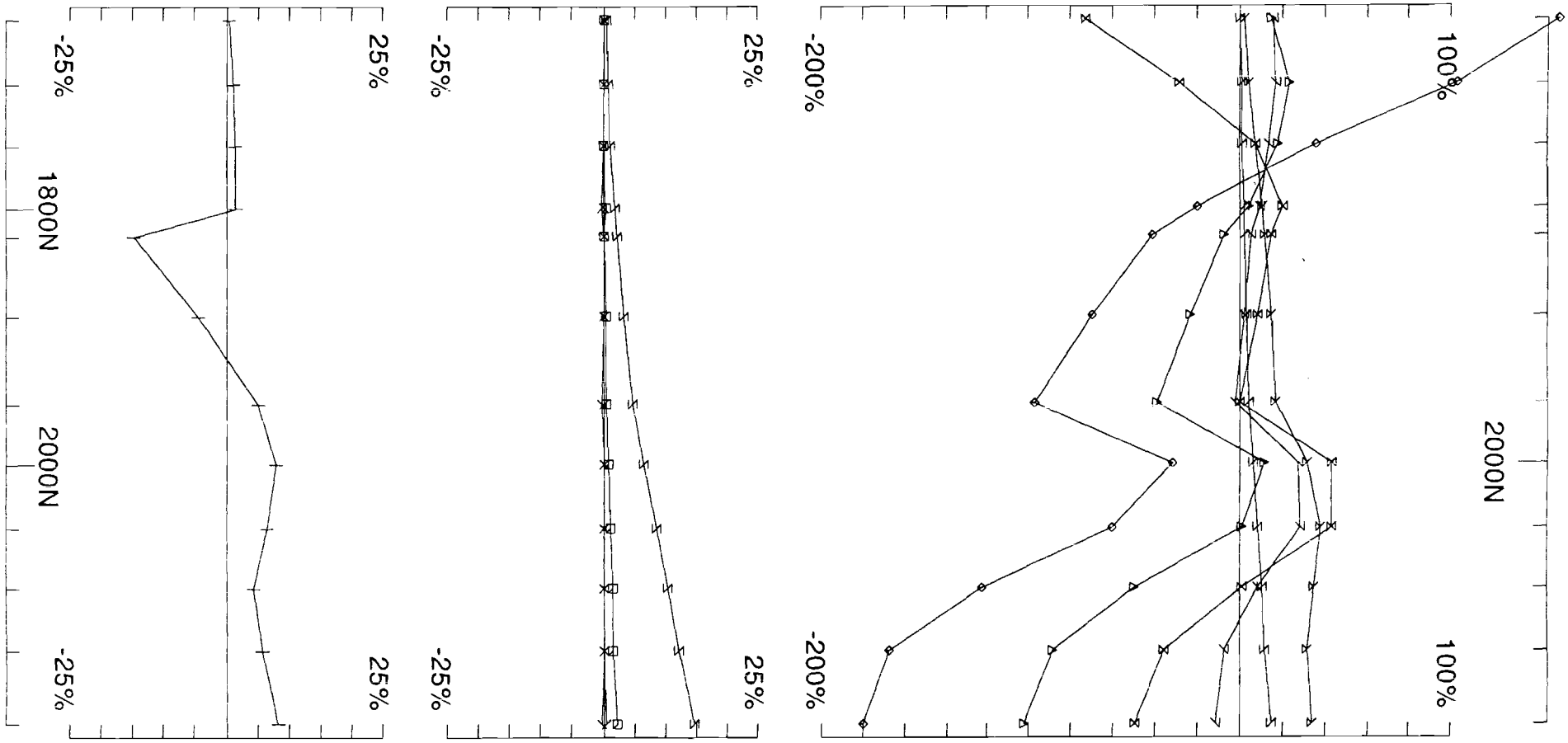
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



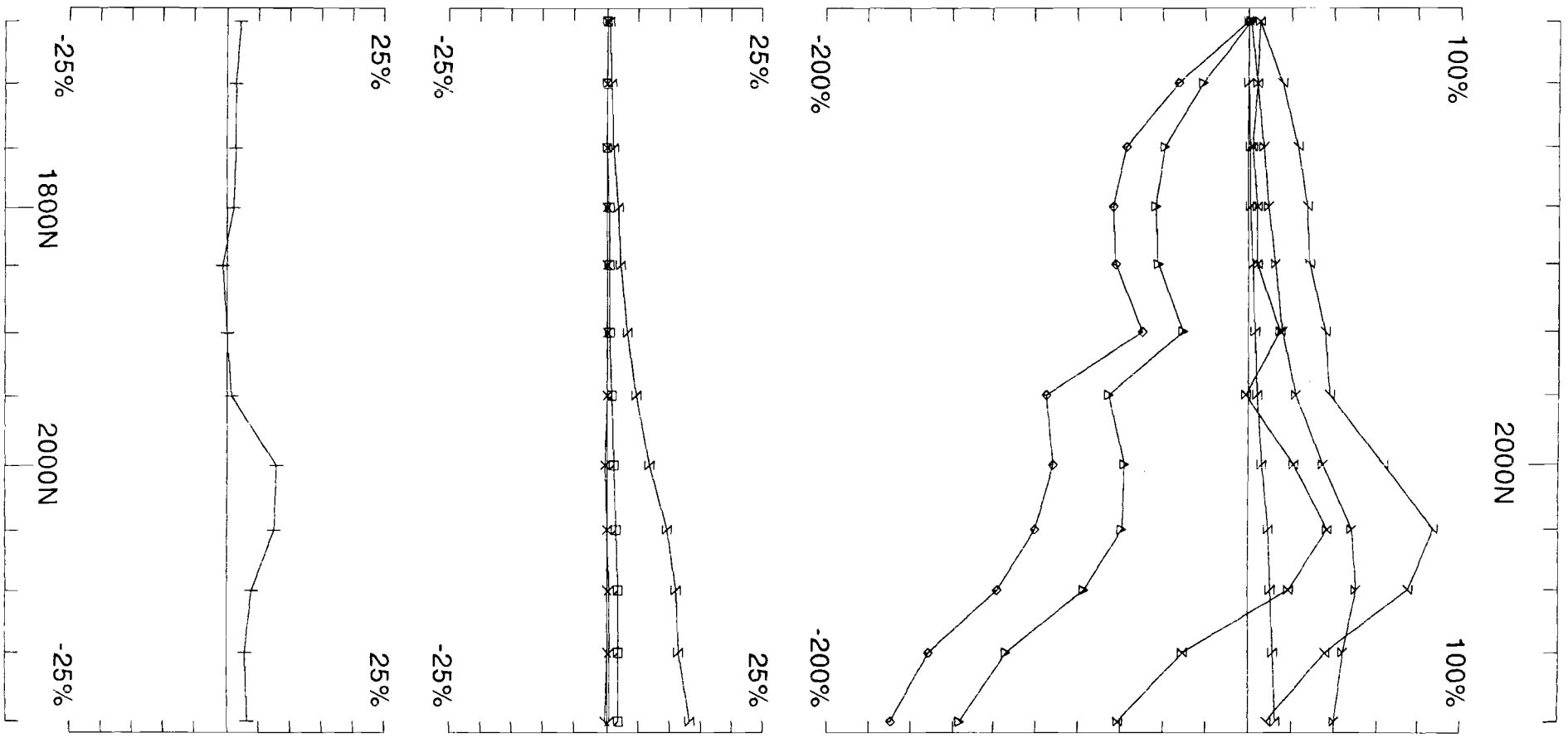
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 22/10/8



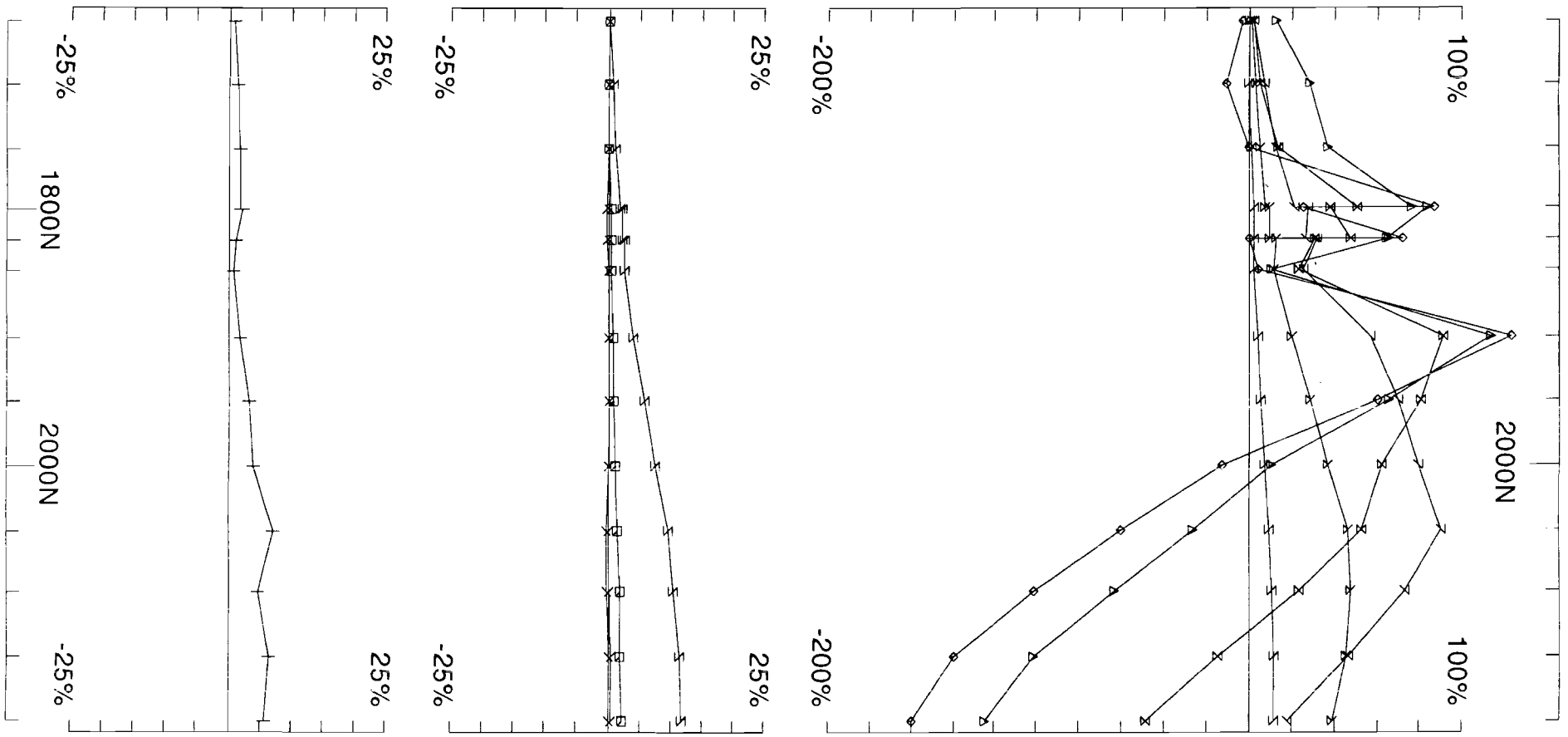
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



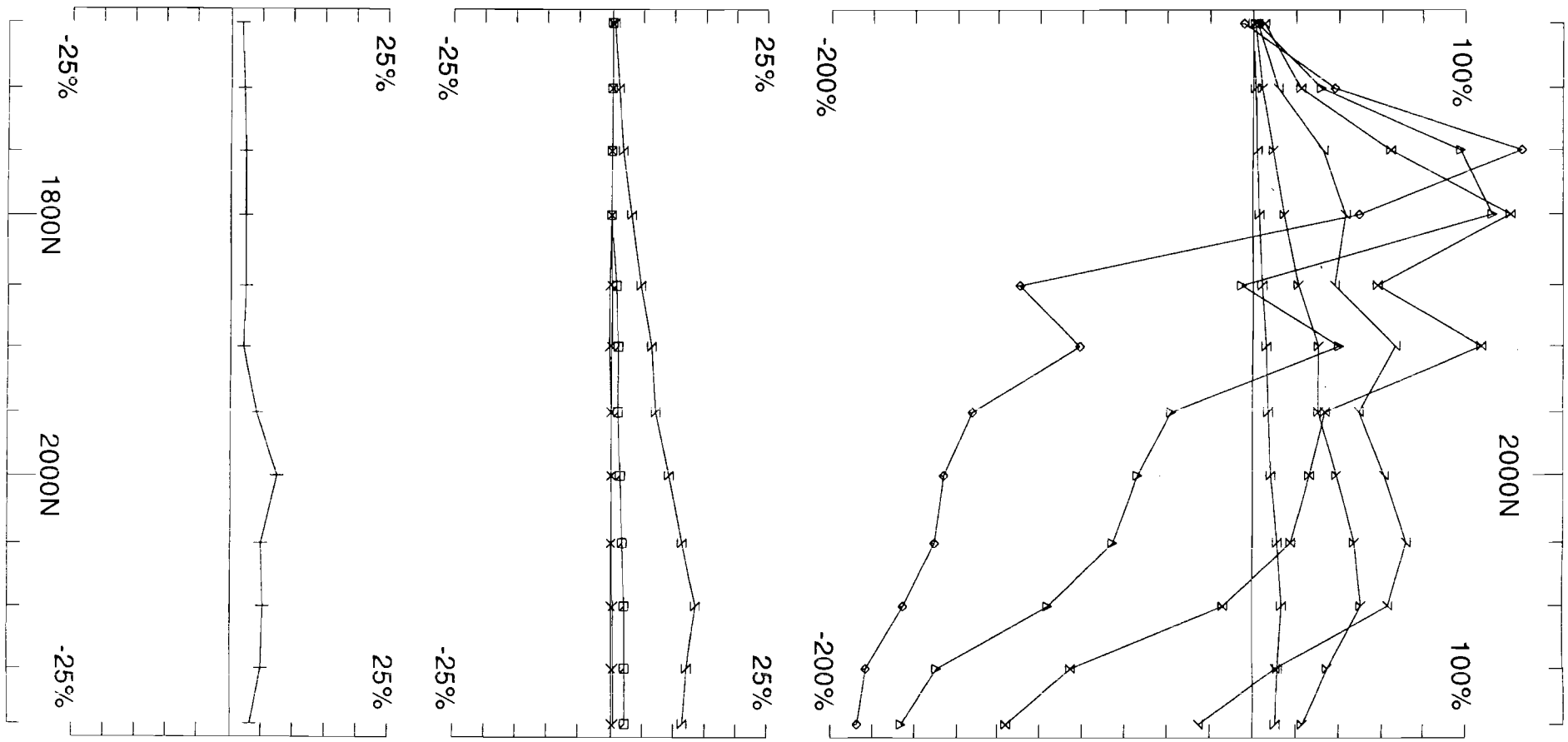
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 4900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 21/10/8



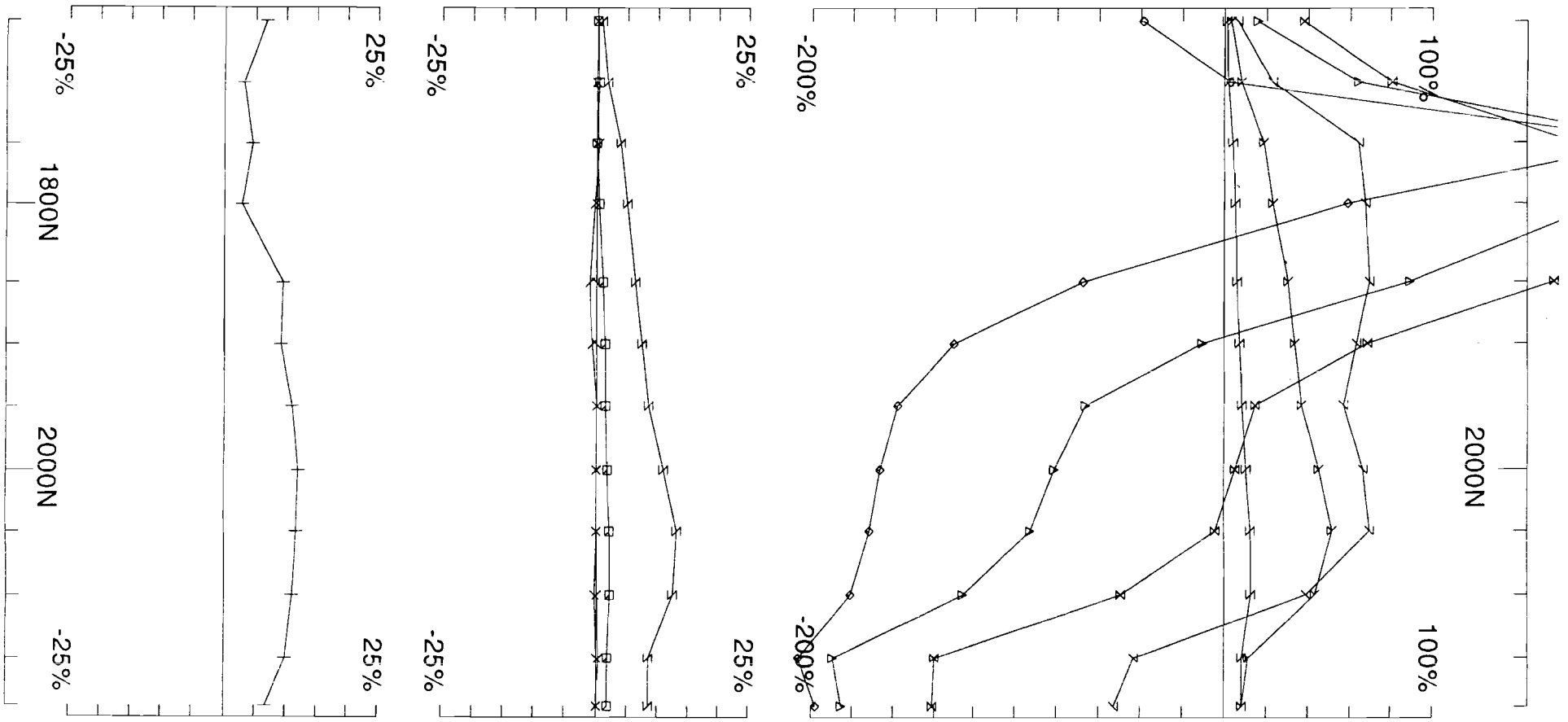
Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 2/8/8, Reduced : 14/10/8, Plotted : 22/10/8



Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 1/8/8, Reduced : 14/10/8, Plotted : 21/10/8



Loop: 34	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 5300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 1/8/8, Reduced : 14/10/8, Plotted : 21/10/8

Montcalm

Loop 35

Hx

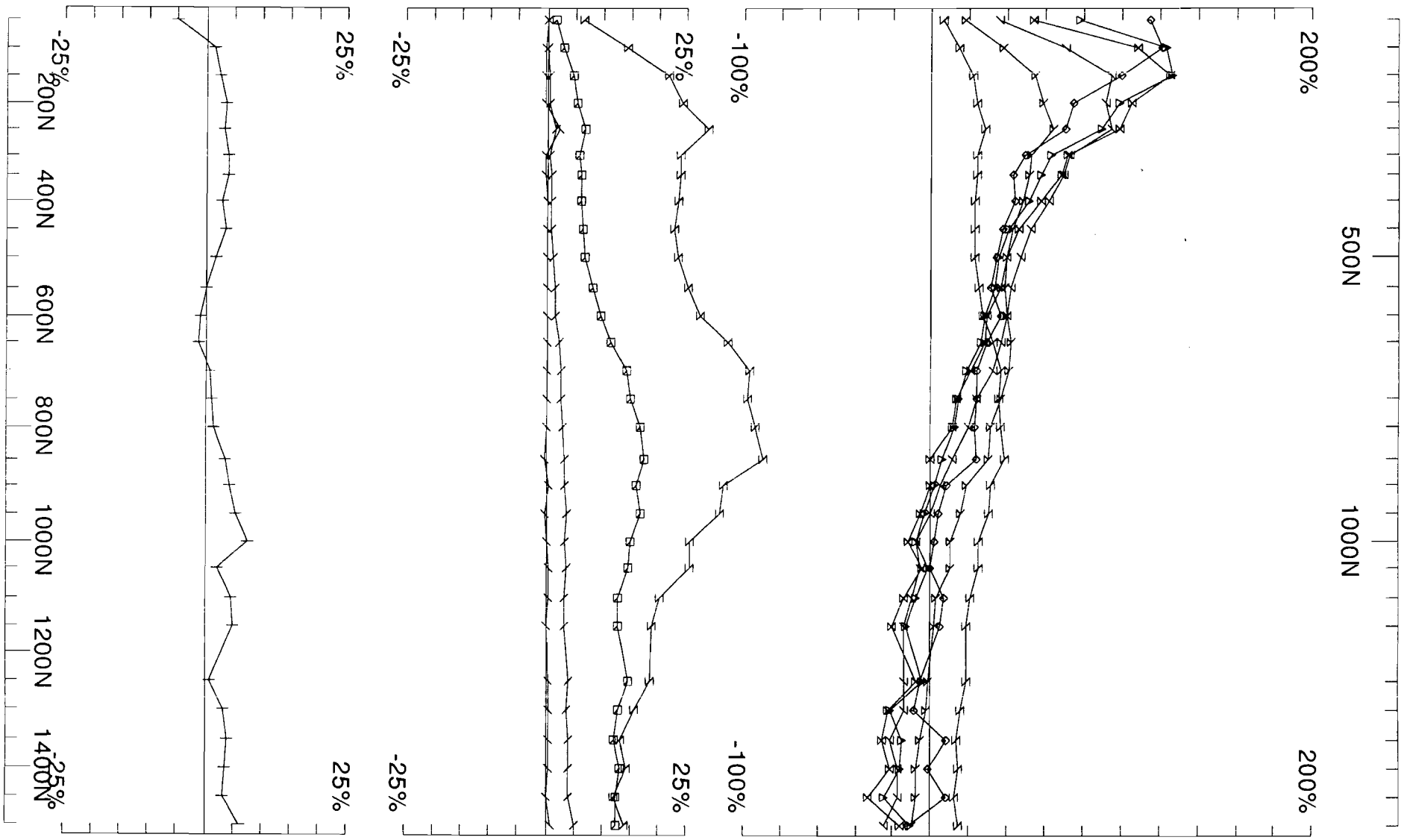
@30.974 Hz frequency

continuous norm

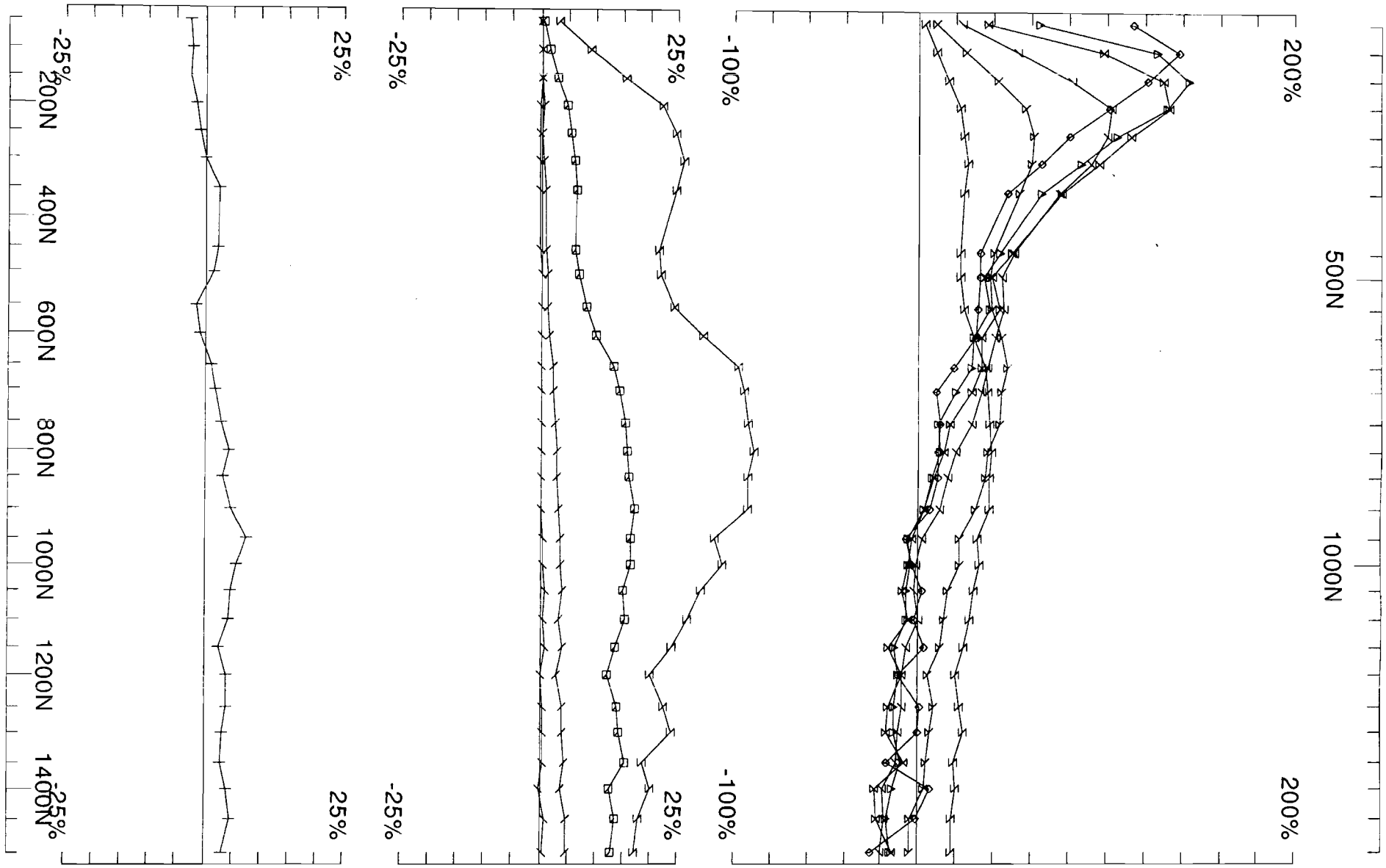
Ch1 reduced

Line 500E	0 - 1500N
Line 600E	0 - 1500N
Line 700E	0 - 1500N
Line 800E	0 - 1300N
Line 900E	0 - 1375N
Line 1000E	0 - 1500N
Line 1100E	0 - 1500N
Line 1200E	0 - 1500N
Line 1300E	0 - 1500N
Line 1400E	0 - 1500N
Line 1500E	0 - 1500N
Line 1600E	0 - 1500N
Line 1700E	0 - 1500N
Line 1800E	0 - 1500N
Line 1900E	0 - 700N
Line 2000E	0 - 700N
Line 2100E	0 - 700N
Line 2200E	0 - 700N
Line 2300E	0 - 425N

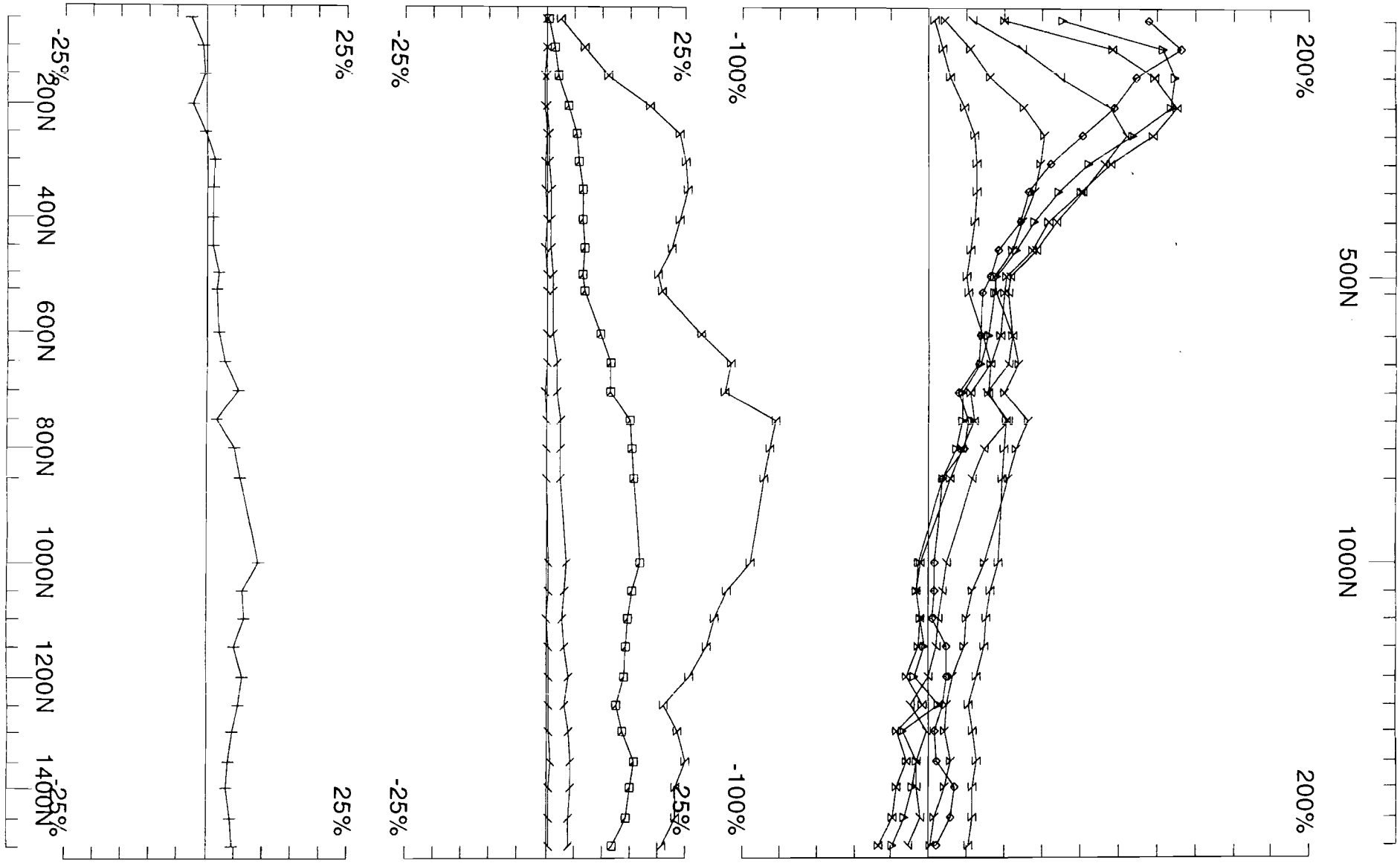
Loop 35 - continuous norm



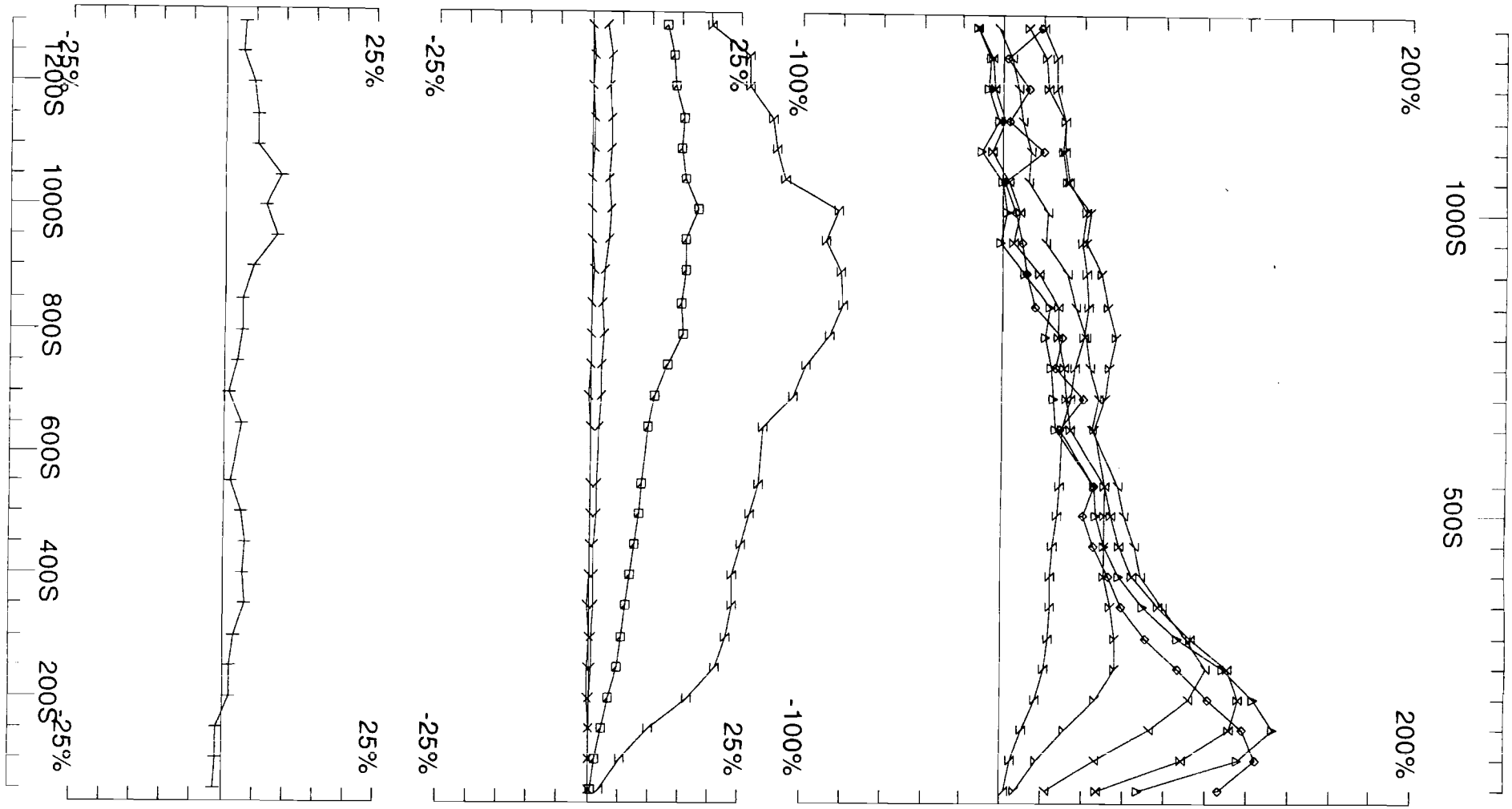
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 8/8/8, Reduced : 10/10/8, Plotted : 21/10/8



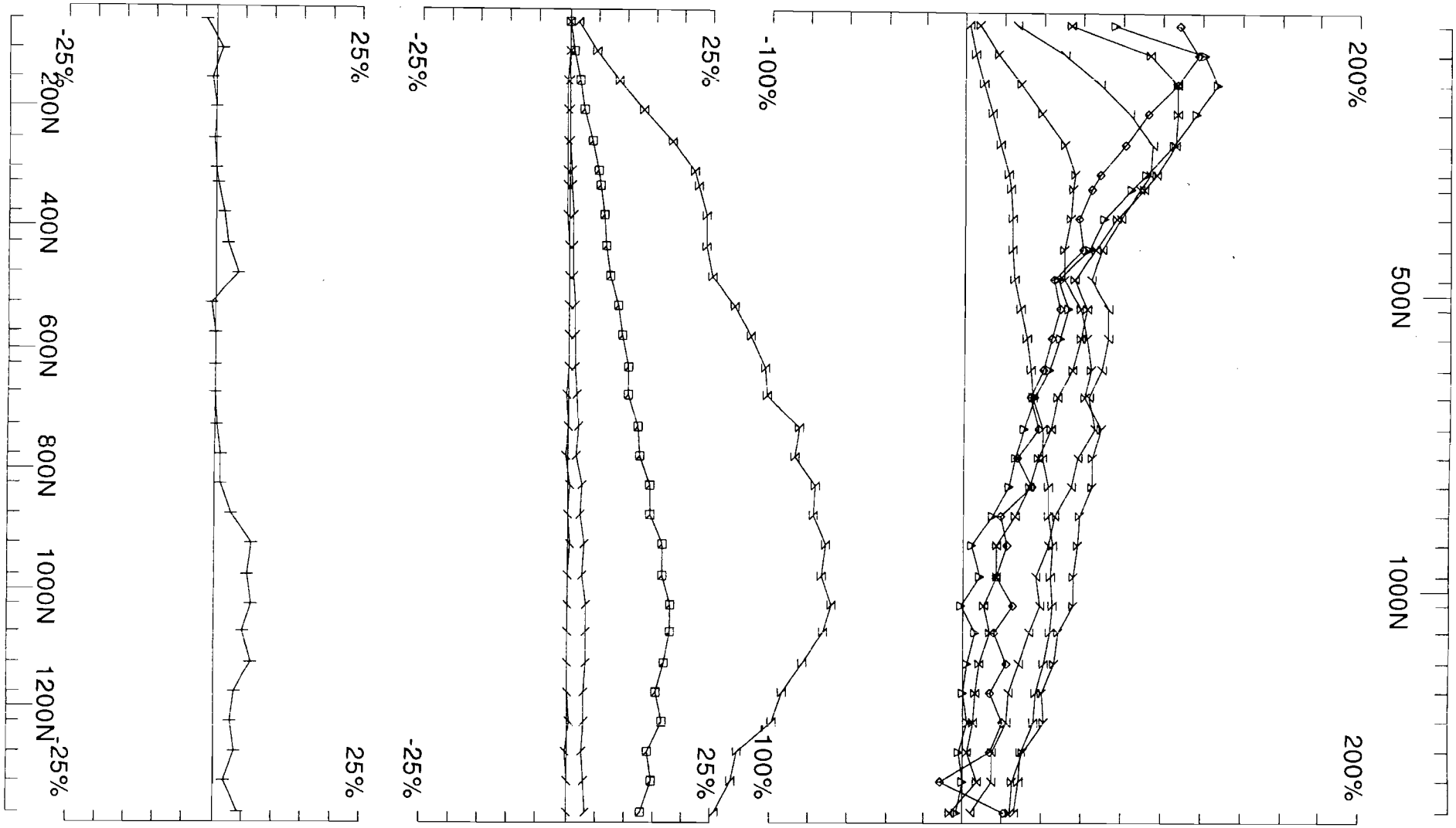
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 8/8/8, Reduced : 10/10/8, Plotted : 21/10/8



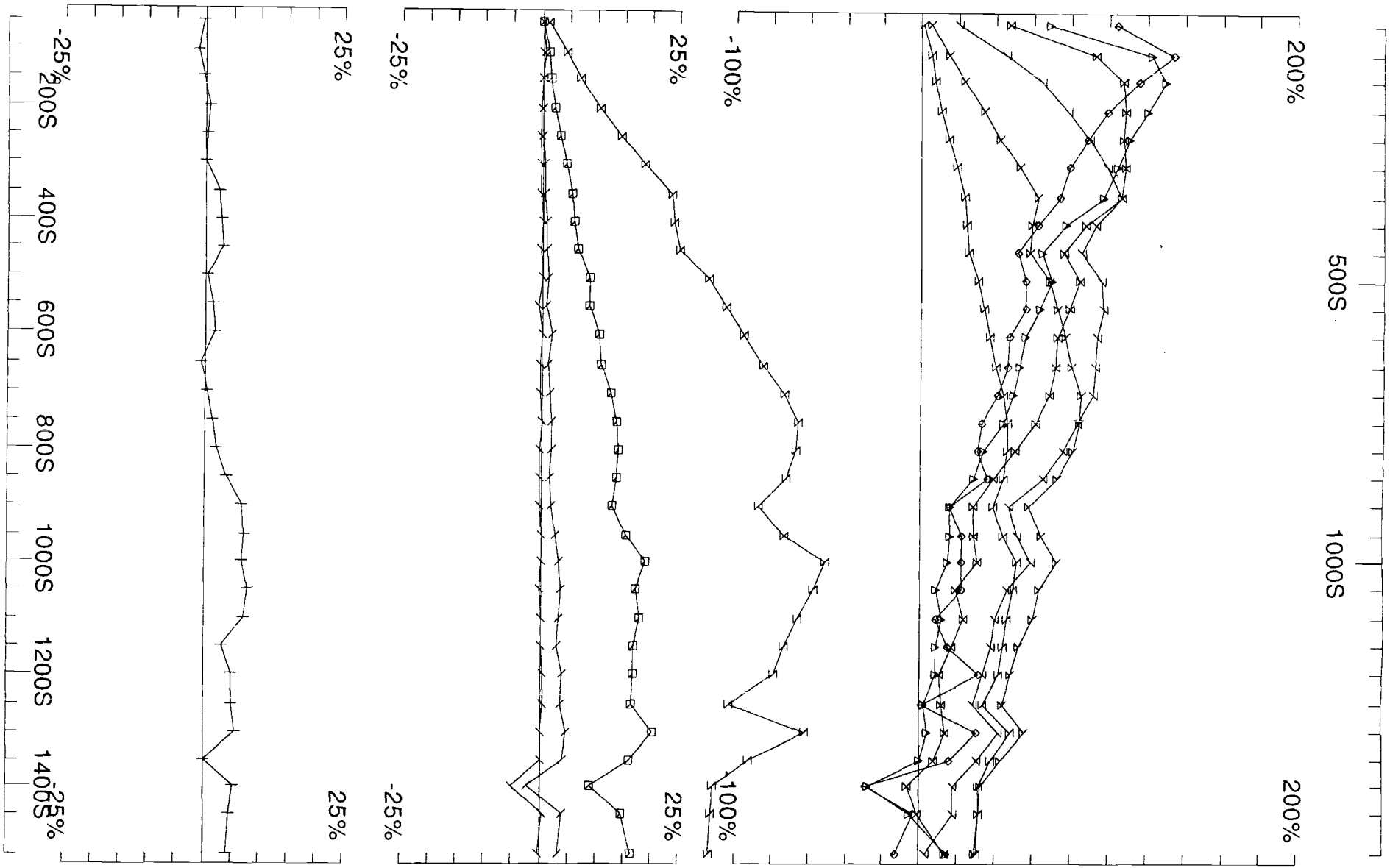
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 8/8/8, Reduced : 10/10/8, Plotted : 21/10/8



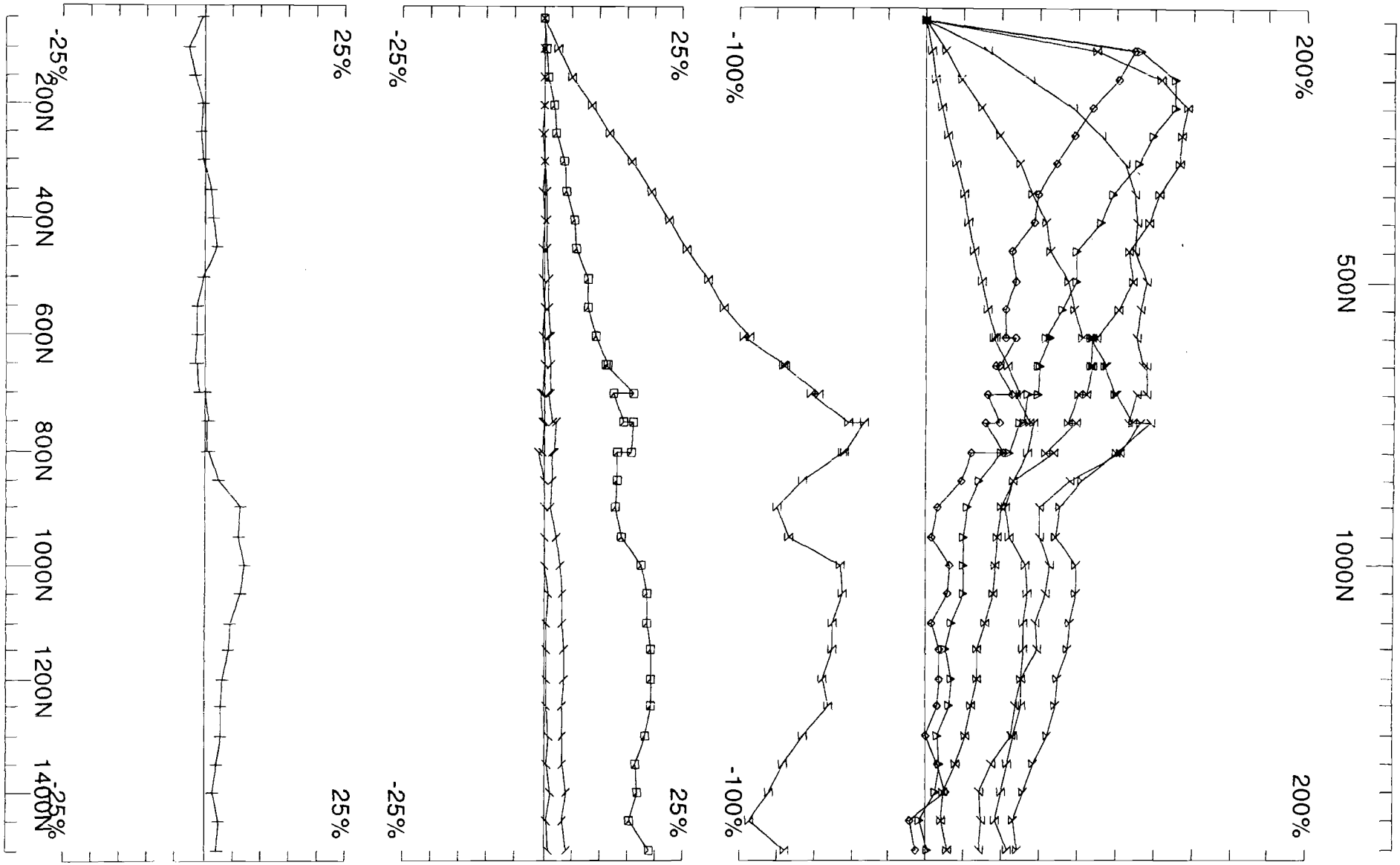
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 7/8/8, Reduced : 10/10/8, Plotted : 21/10/8



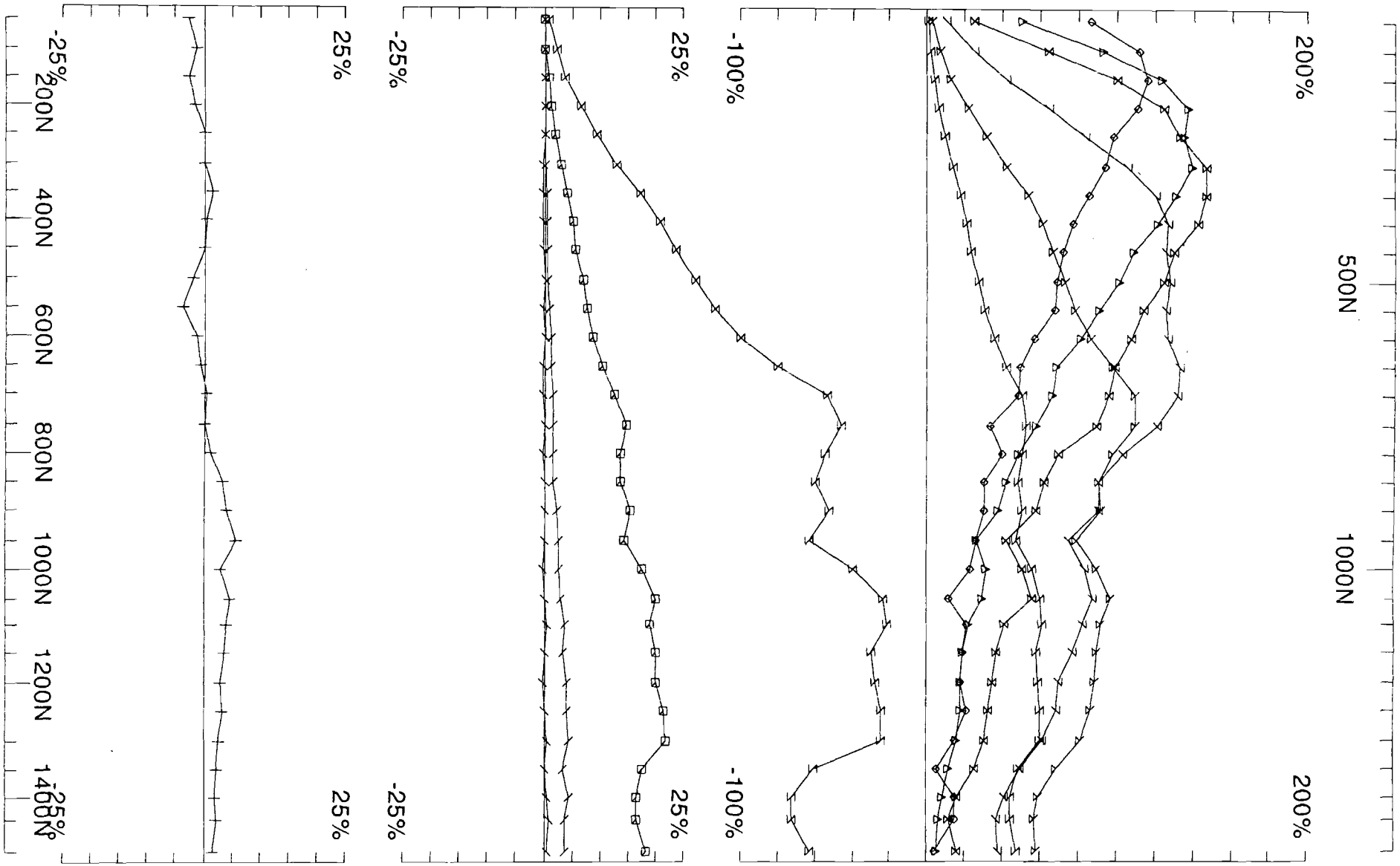
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 7/8/8, Reduced : 10/10/8, Plotted : 21/10/8



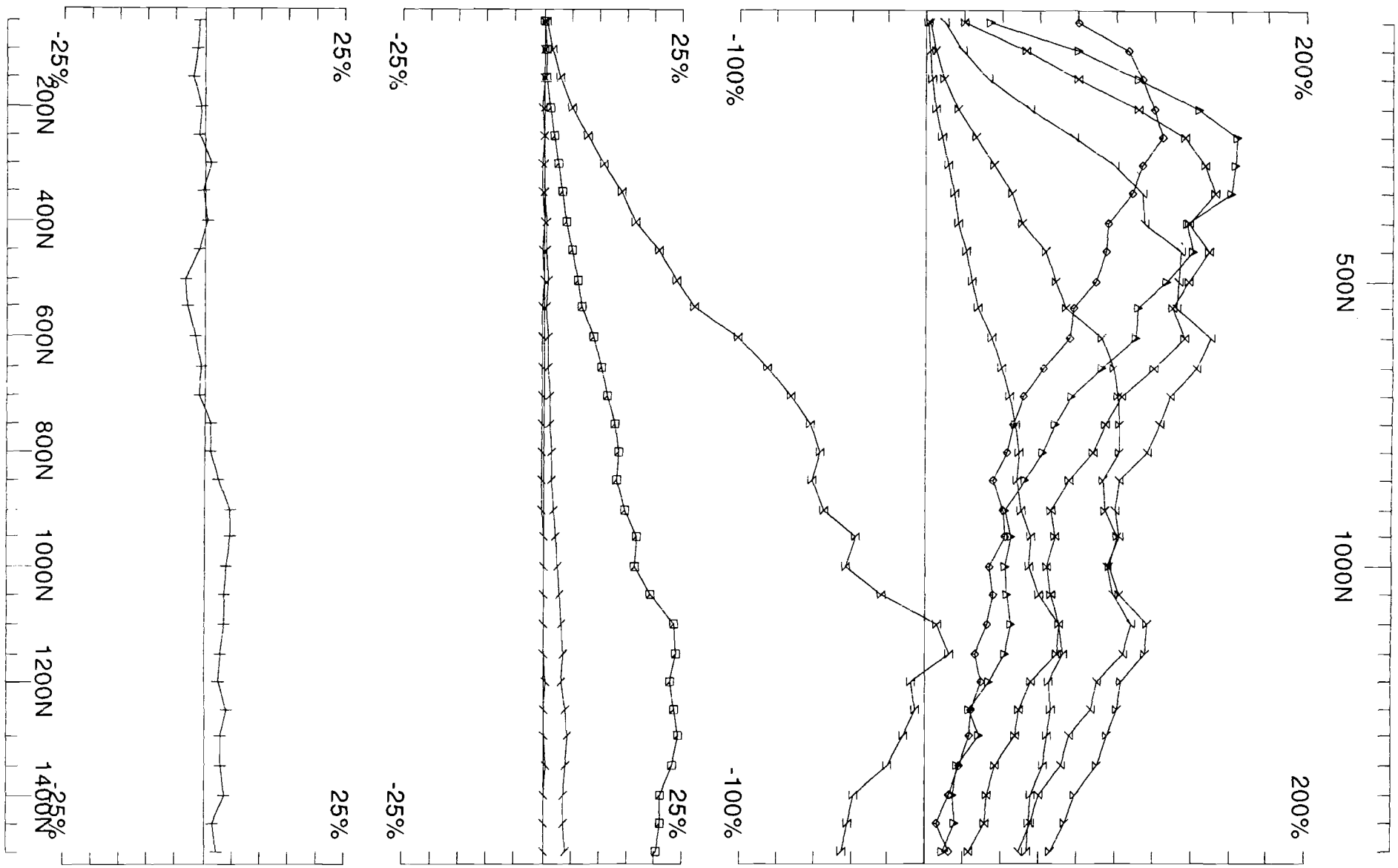
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 7/8/8, Reduced : 10/10/8, Plotted : 22/10/8



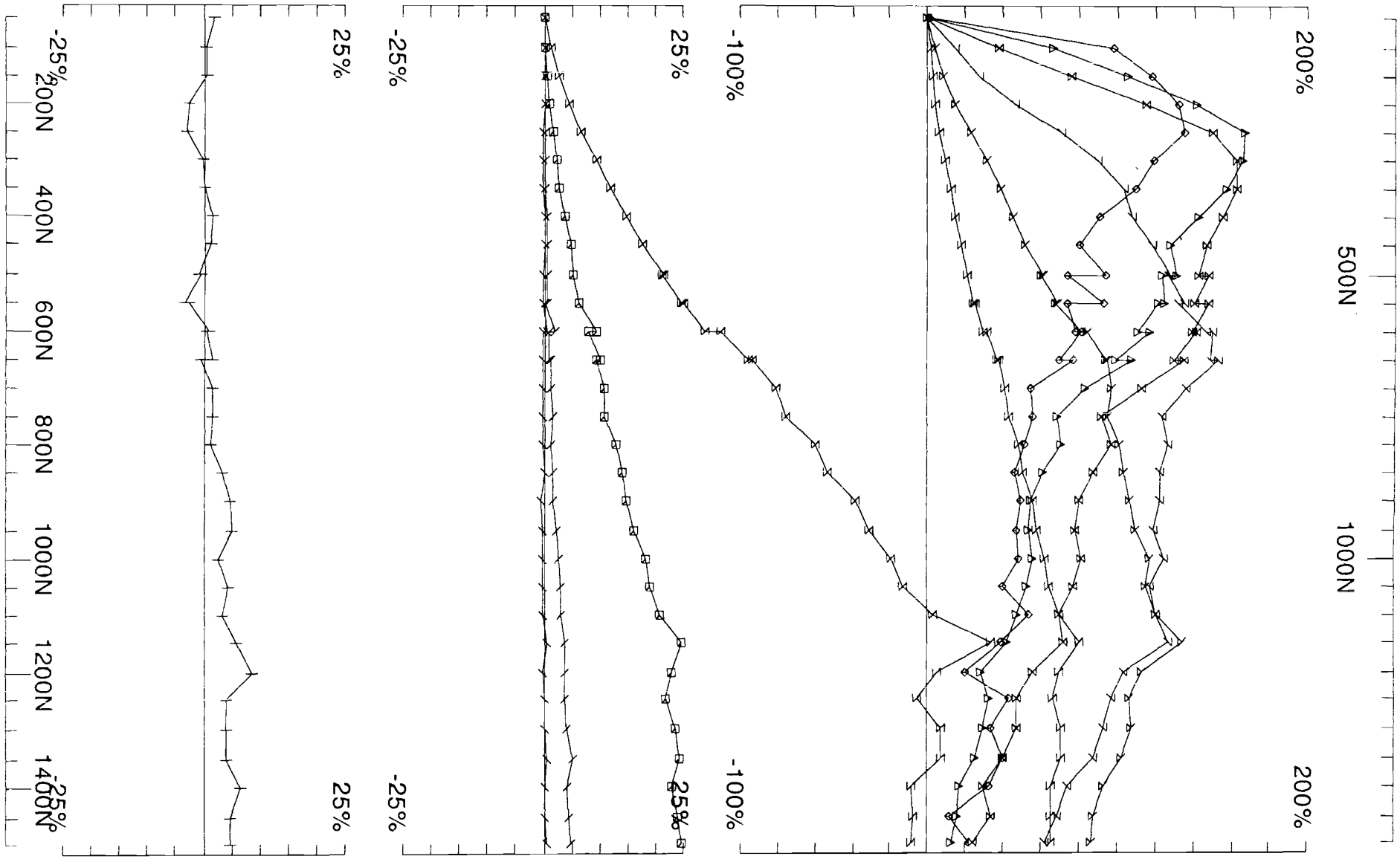
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



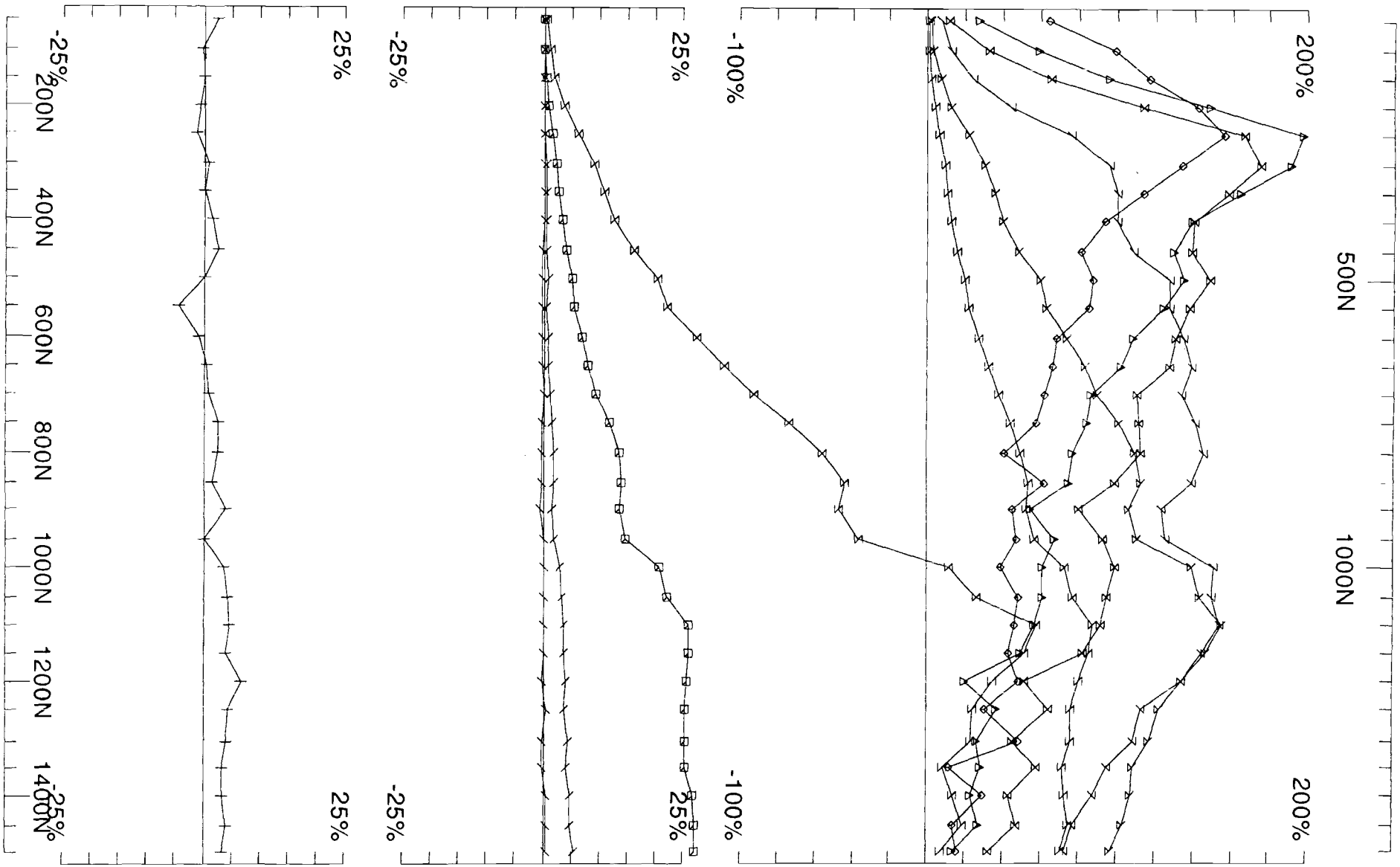
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 6/8/8, Reduced : 10/10/8, Plotted : 21/10/8



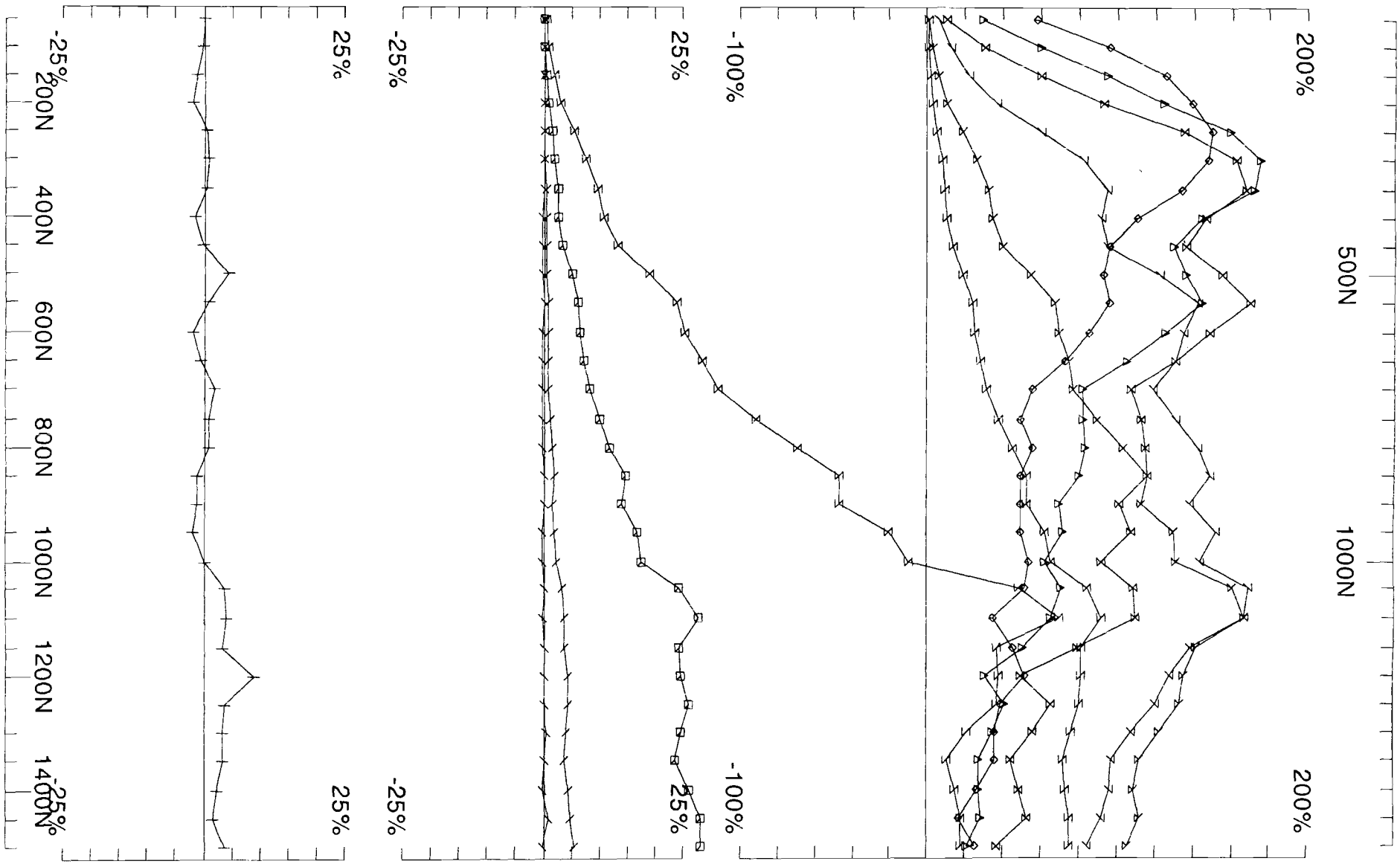
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 4/8/8, Reduced : 10/10/8, Plotted : 21/10/8



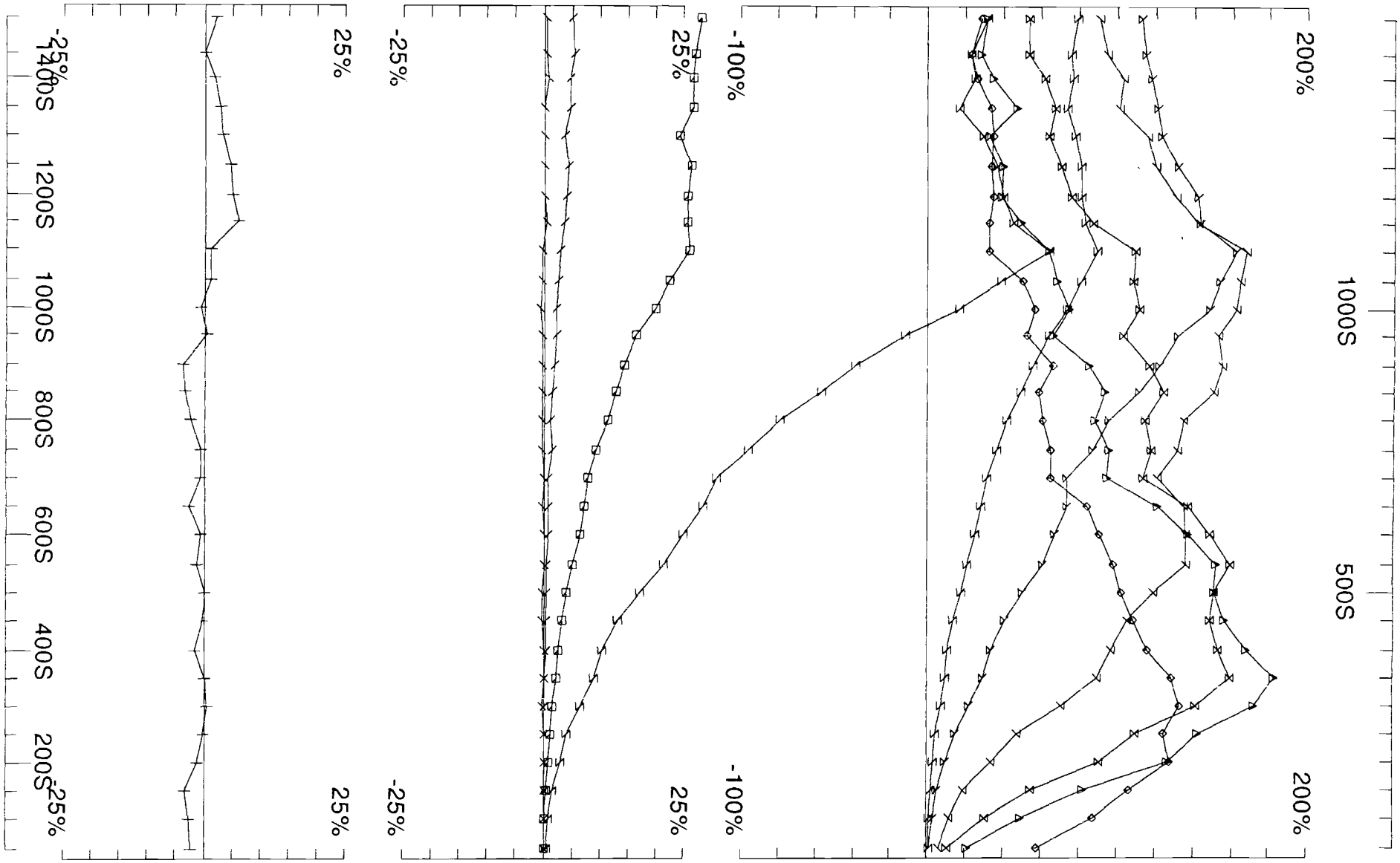
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



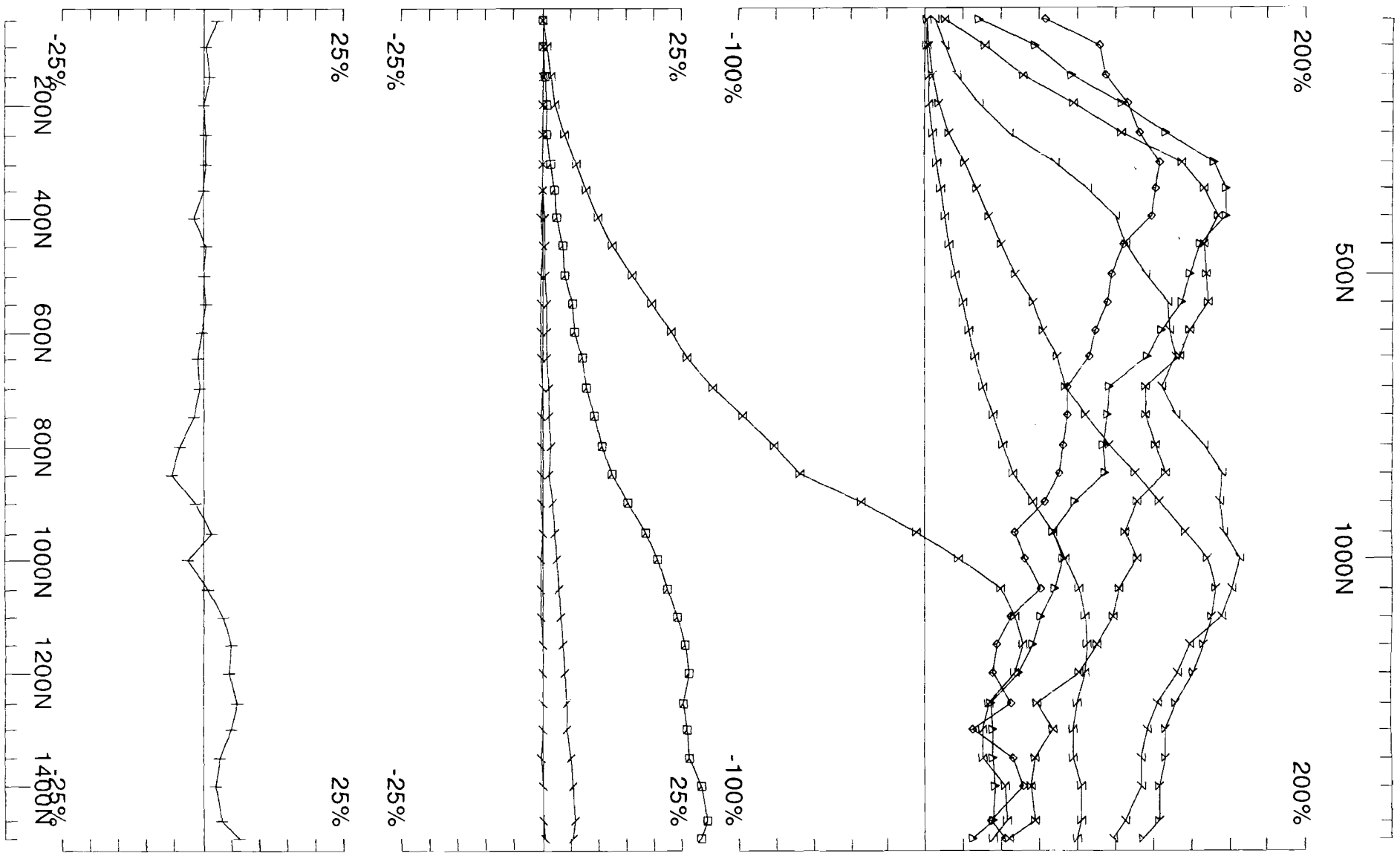
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 6/8/8, Reduced : 10/10/8, Plotted : 21/10/8



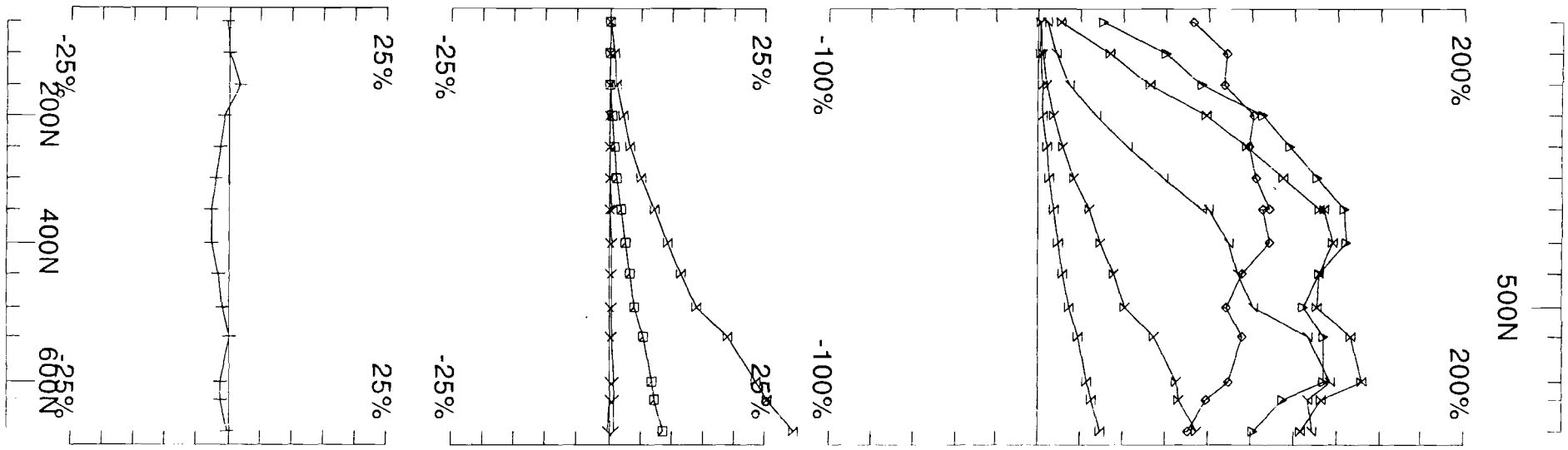
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



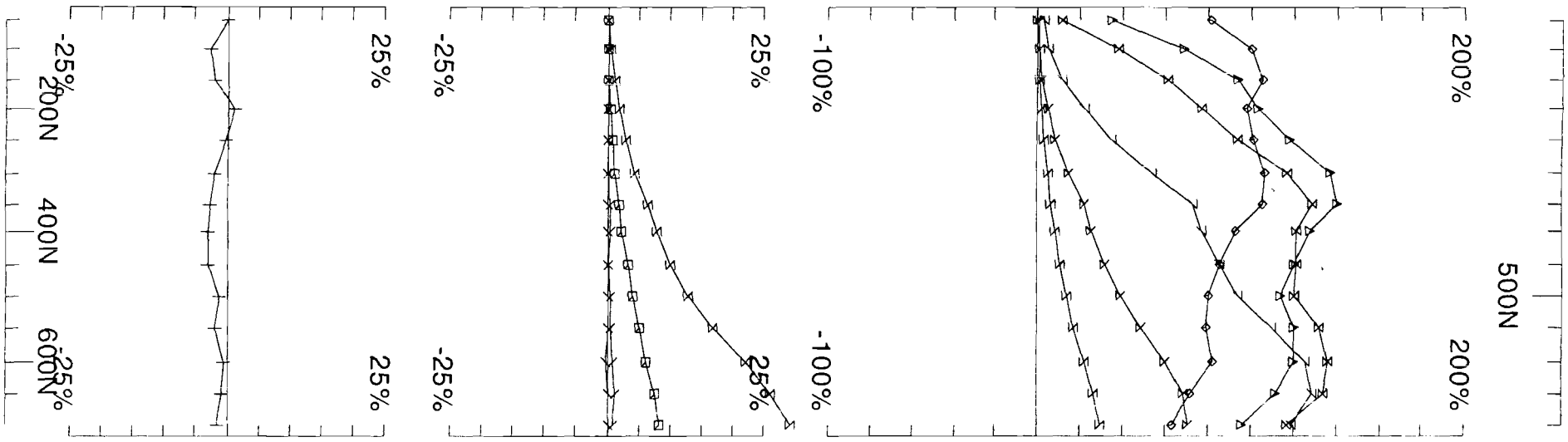
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 4/8/8, Reduced : 10/10/8, Plotted : 21/10/8



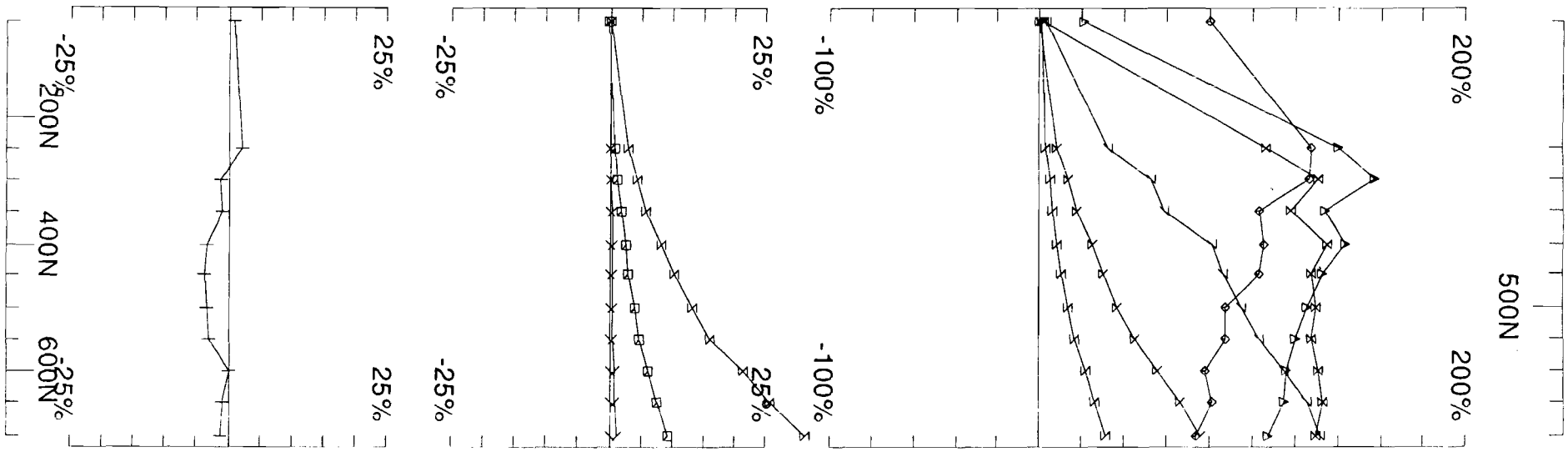
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



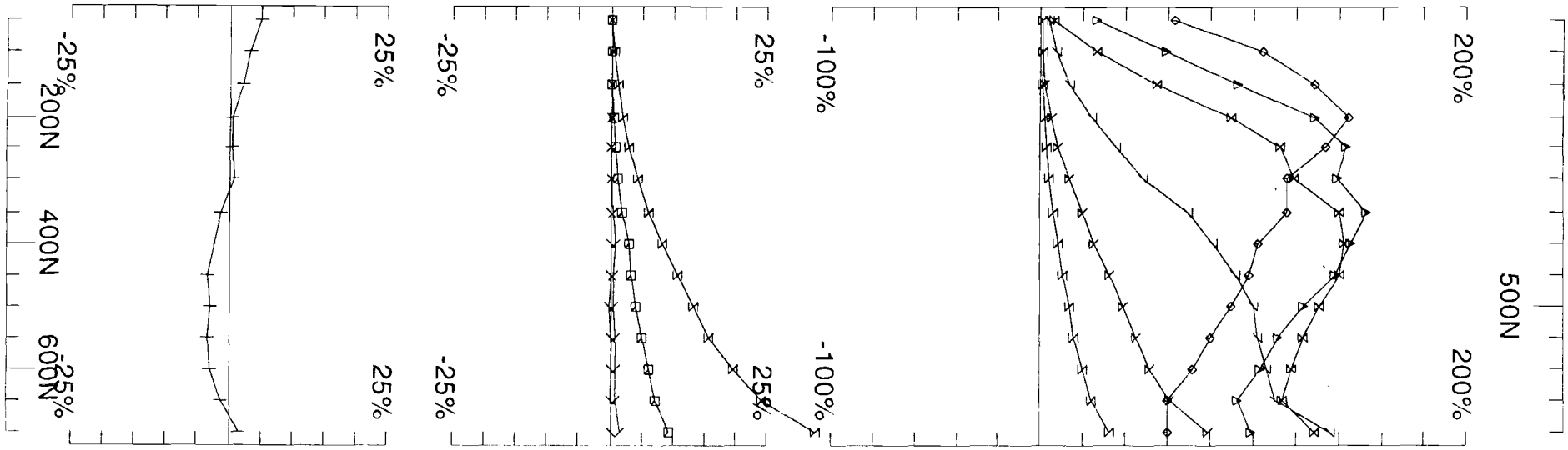
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Surveyed : 9/8/8 Reduced : 10/10/8 Plotted : 21/10/8



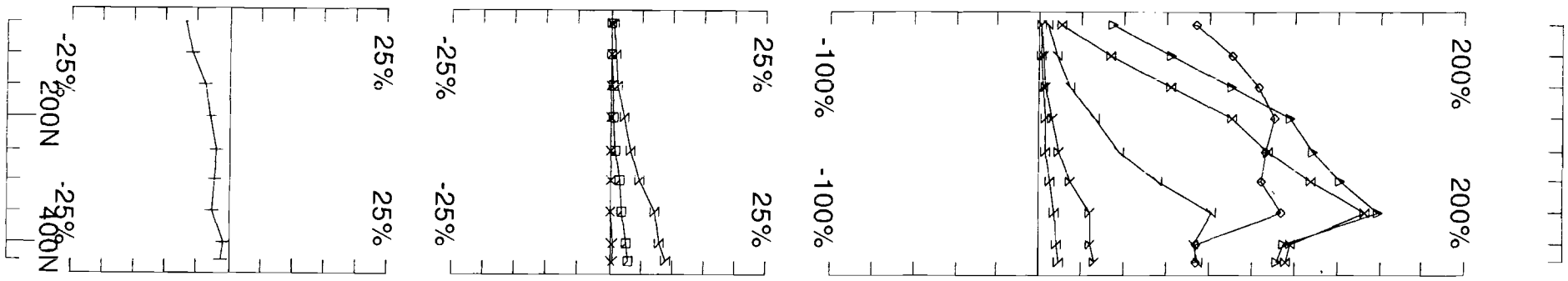
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hx	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8

Montcalm

Loop 35

Hz

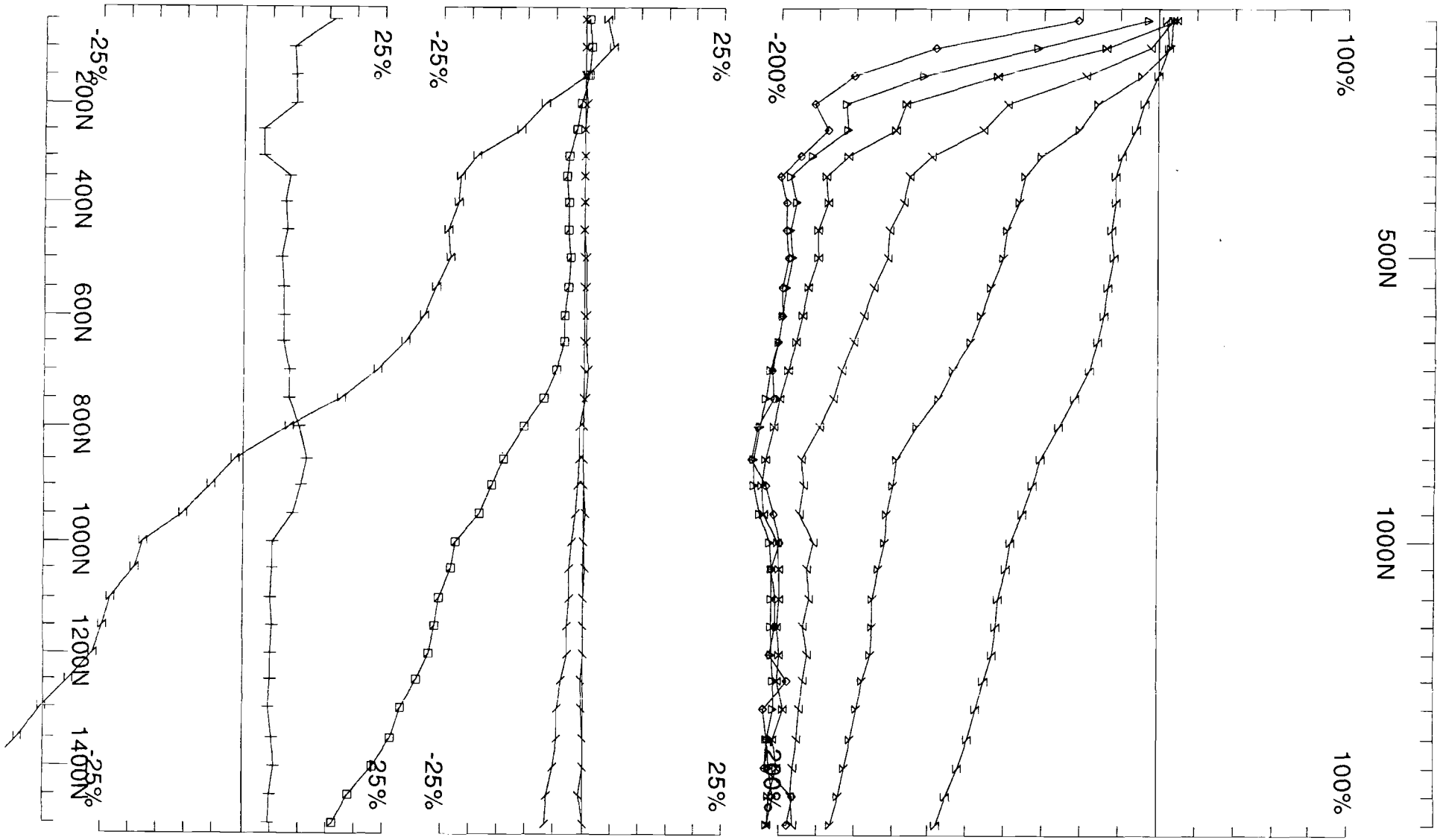
@30.974 Hz frequency

continuous norm

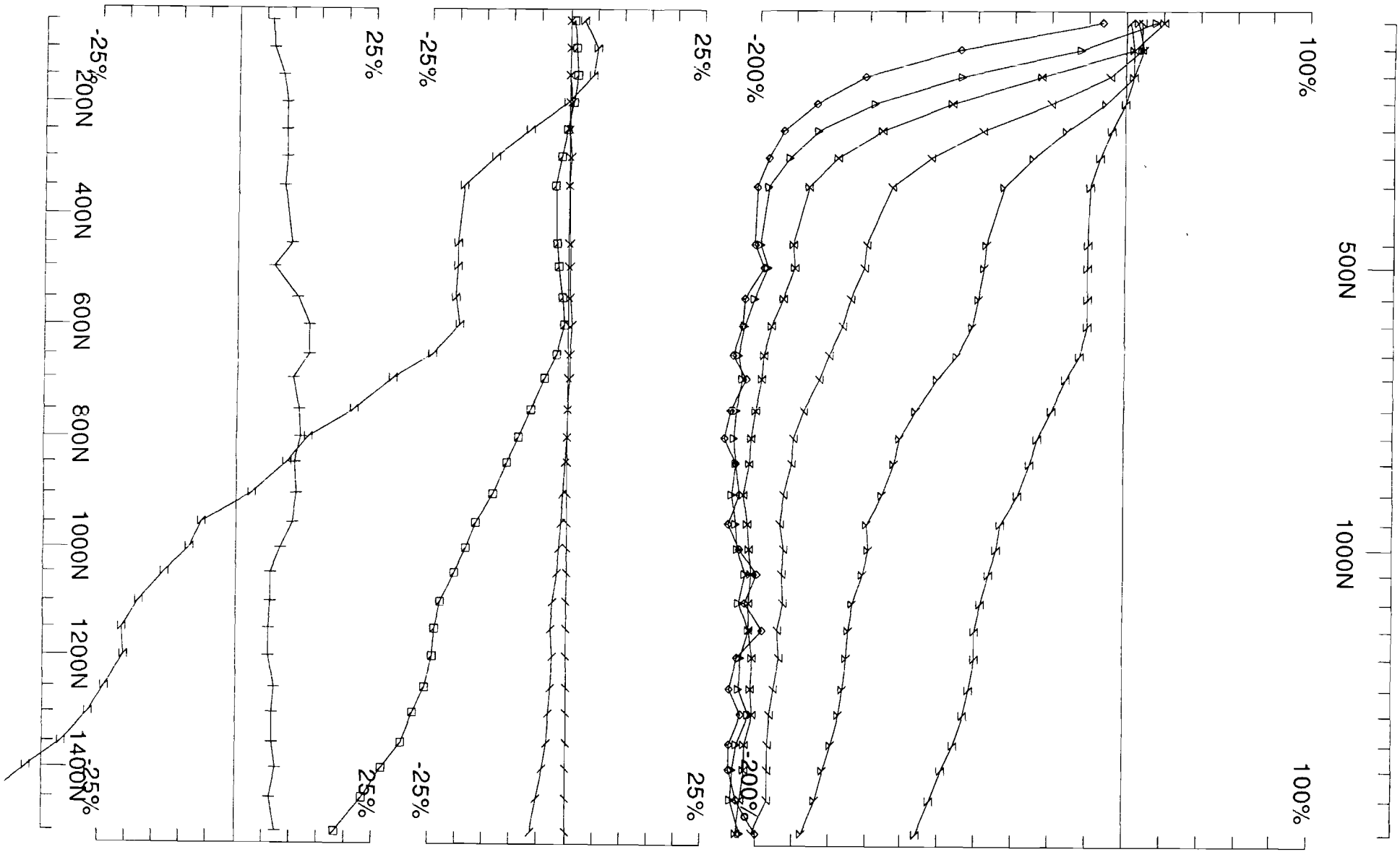
Ch1 reduced

Line 500E	0 - 1500N
Line 600E	0 - 1500N
Line 700E	0 - 1500N
Line 800E	0 - 1300N
Line 900E	0 - 1375N
Line 1000E	0 - 1500N
Line 1100E	0 - 1500N
Line 1200E	0 - 1500N
Line 1300E	0 - 1500N
Line 1400E	0 - 1500N
Line 1500E	0 - 1500N
Line 1600E	0 - 1500N
Line 1700E	0 - 1500N
Line 1800E	0 - 1500N
Line 1900E	0 - 700N
Line 2000E	0 - 700N
Line 2100E	0 - 700N
Line 2200E	0 - 700N
Line 2300E	0 - 425N

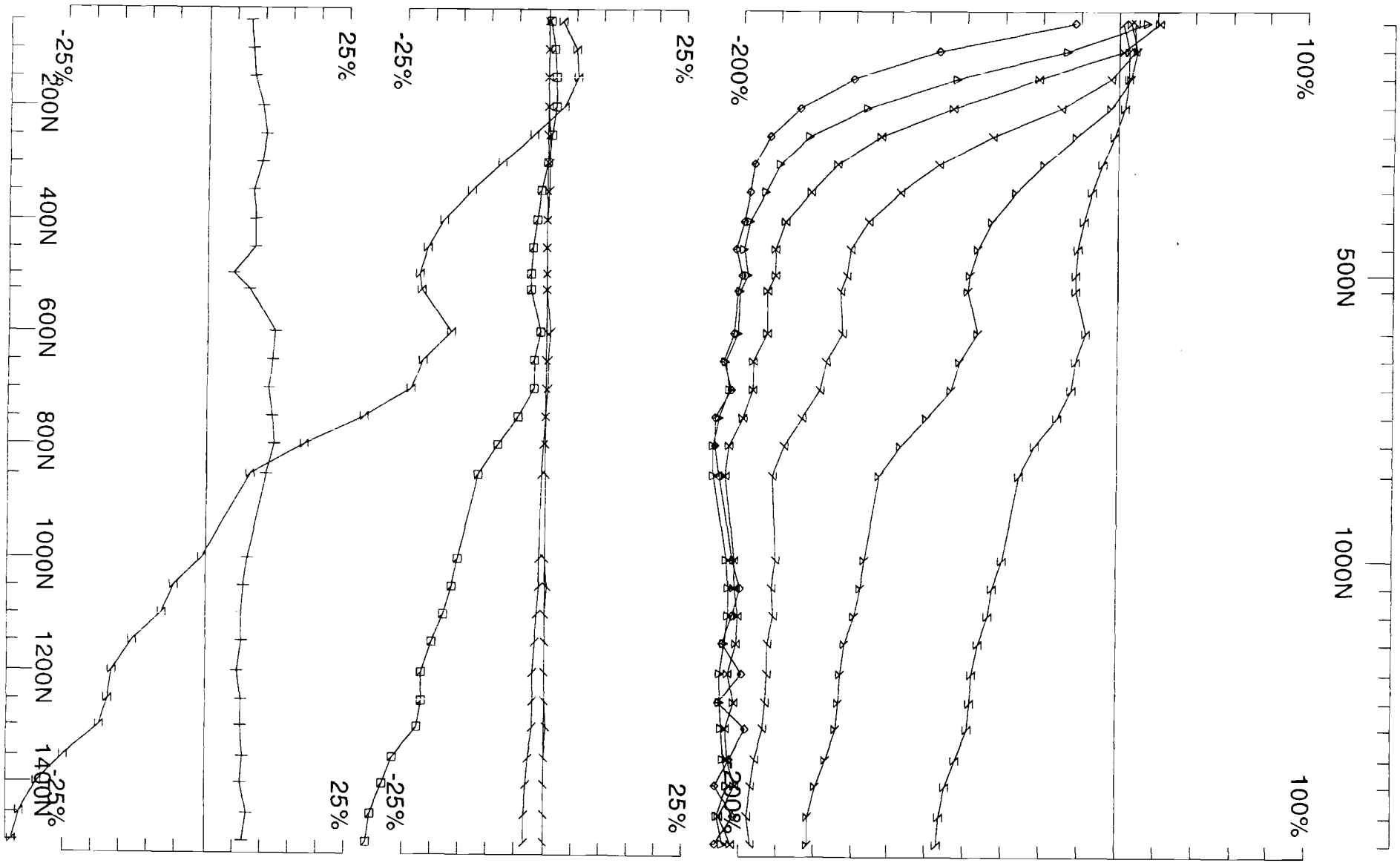
Loop 35 - continuous norm



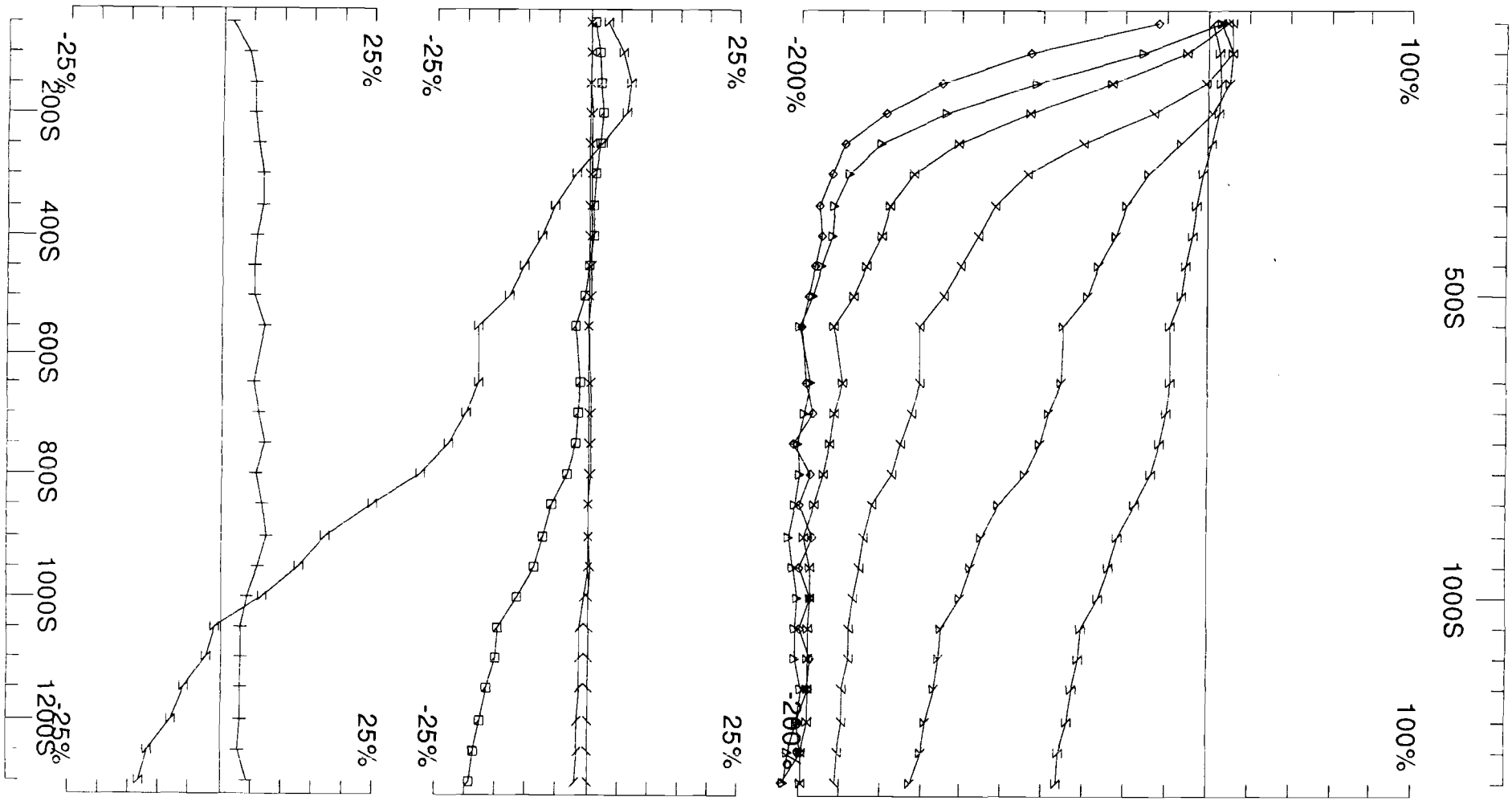
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 8/8/8, Reduced : 10/10/8, Plotted : 21/10/8



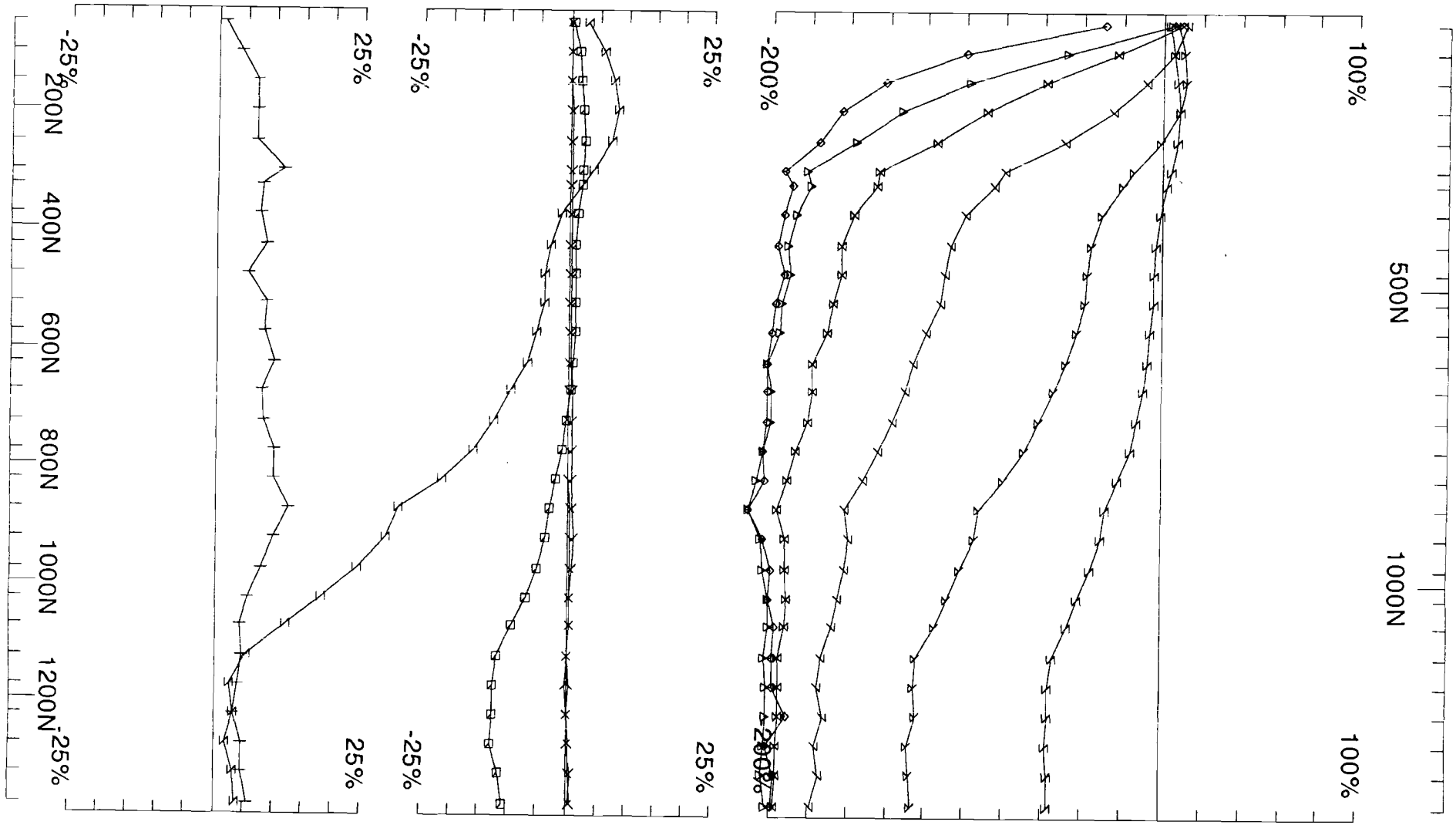
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 8/8/8, Reduced : 10/10/8, Plotted : 21/10/8



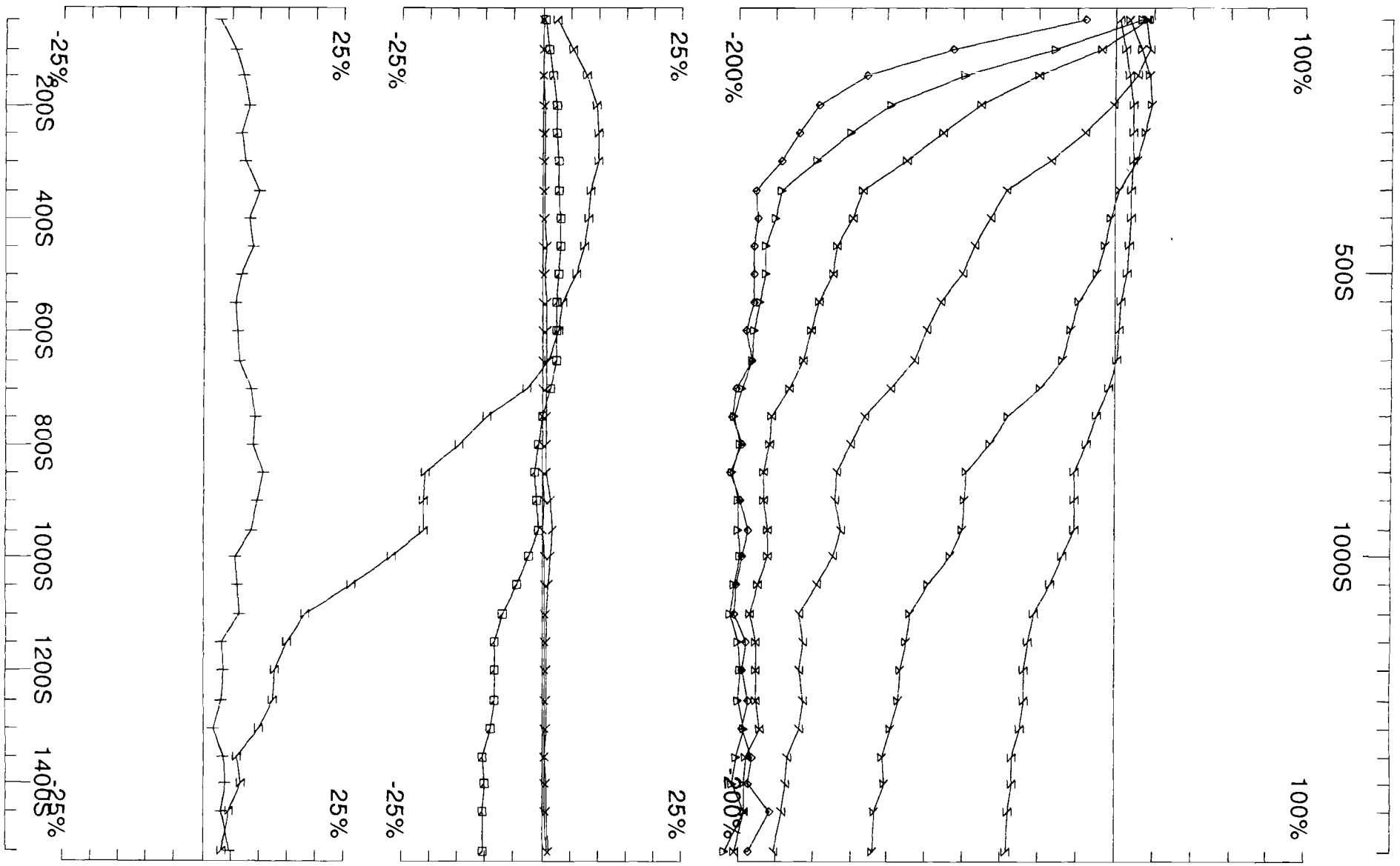
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 8/8/8, Reduced : 10/10/8, Plotted : 21/10/8



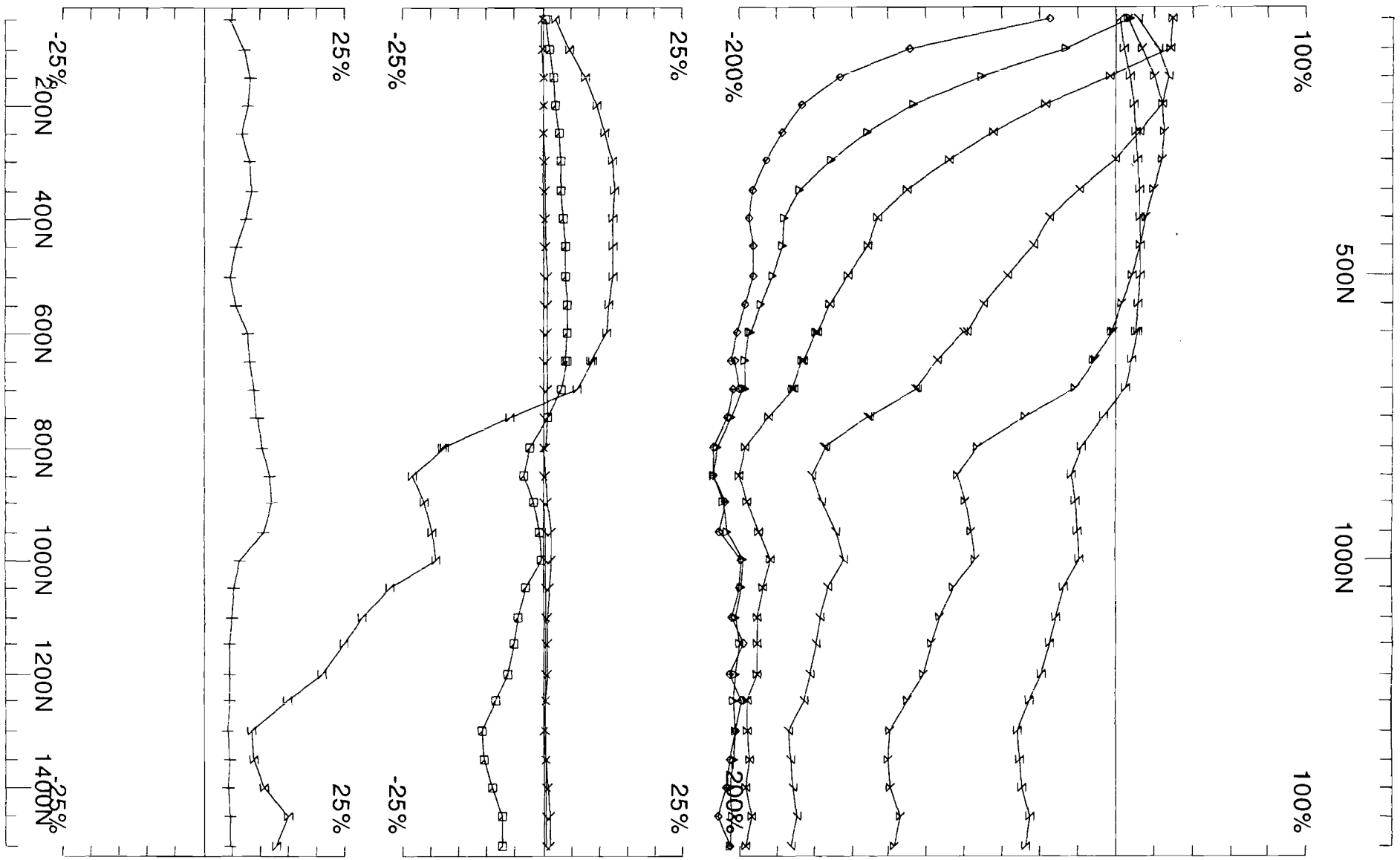
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 7/8/8, Reduced : 10/10/8, Plotted : 21/10/8



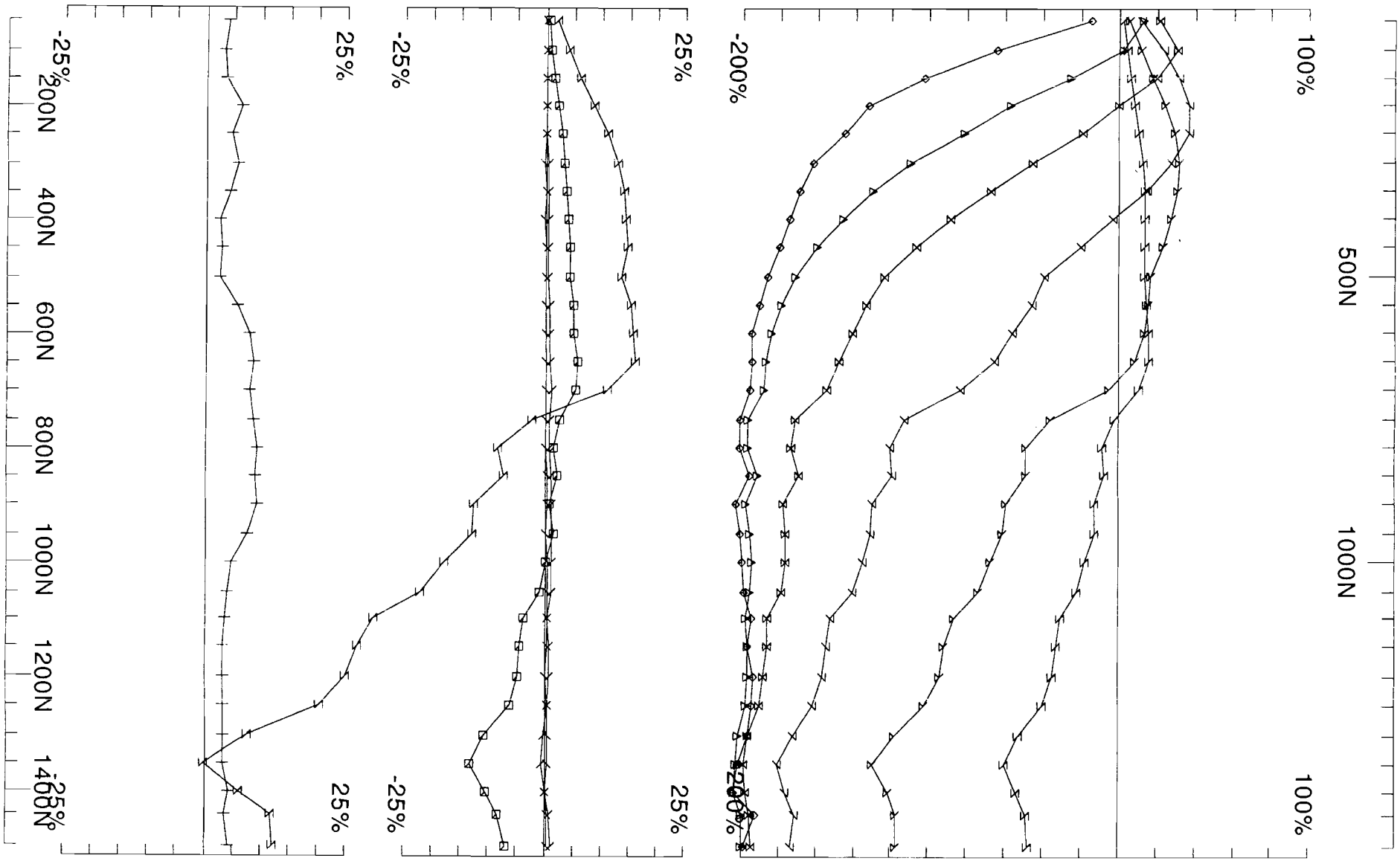
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 7/8/8, Reduced : 10/10/8, Plotted : 21/10/8



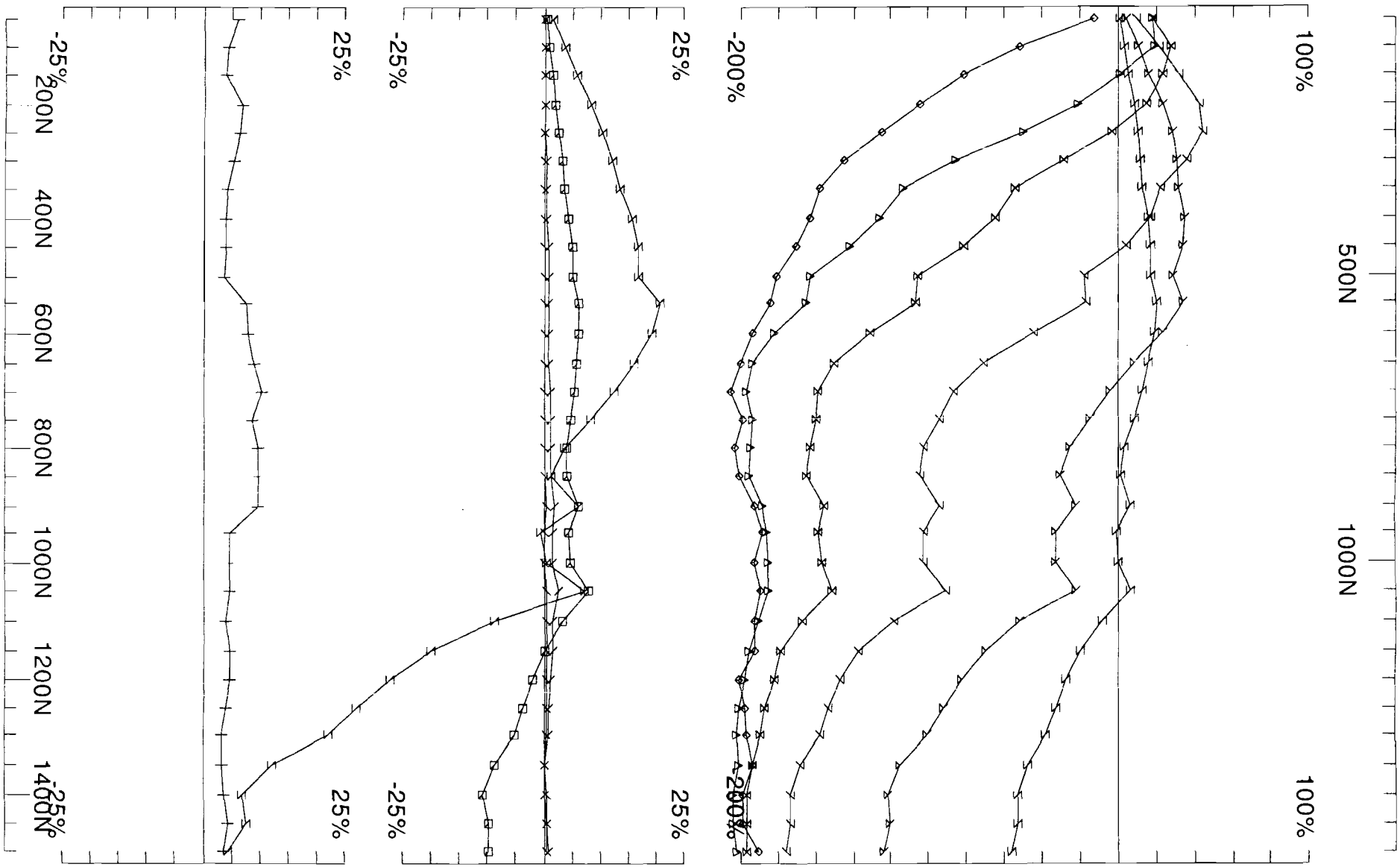
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 7/8/8, Reduced : 10/10/8, Plotted : 21/10/8



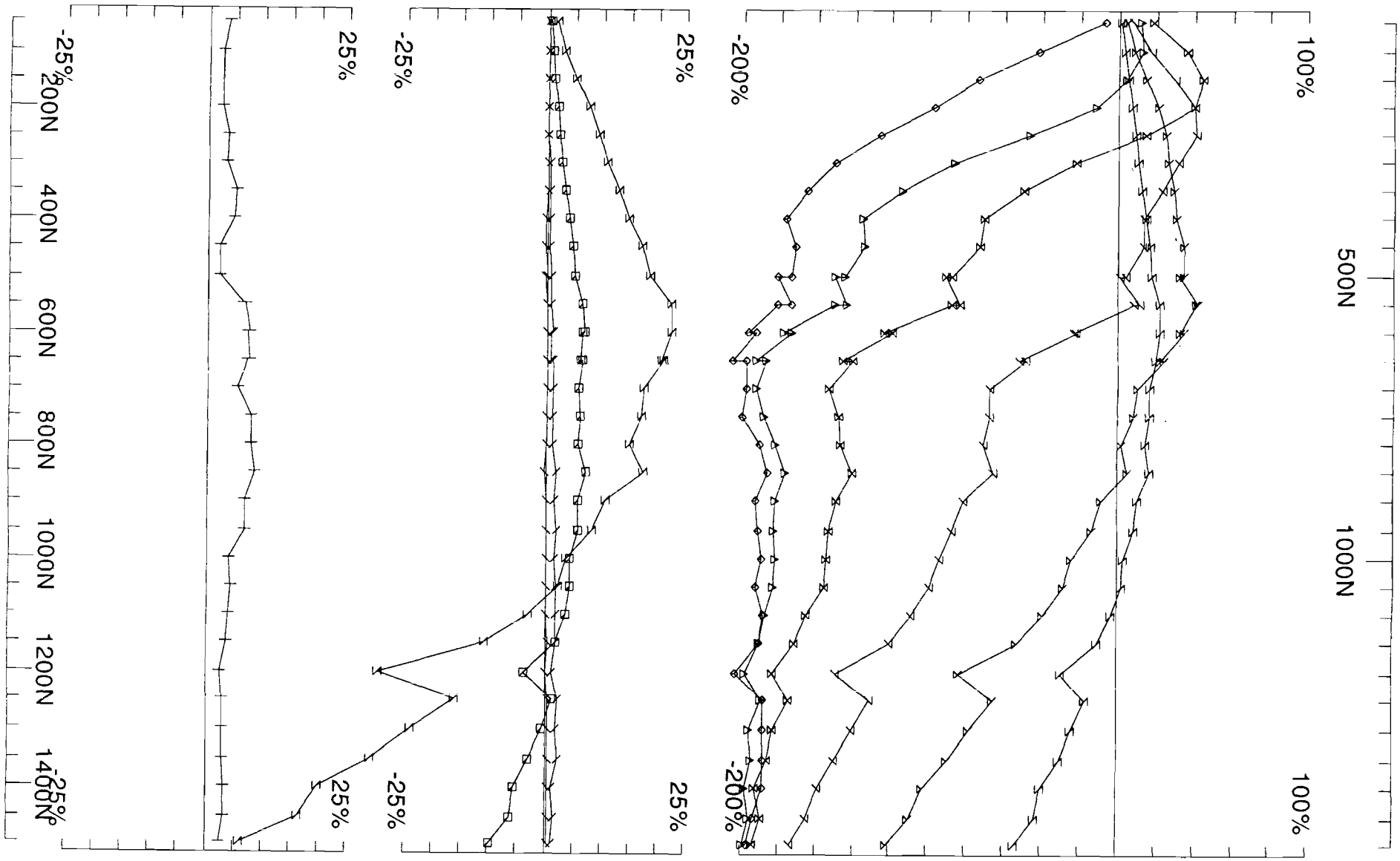
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



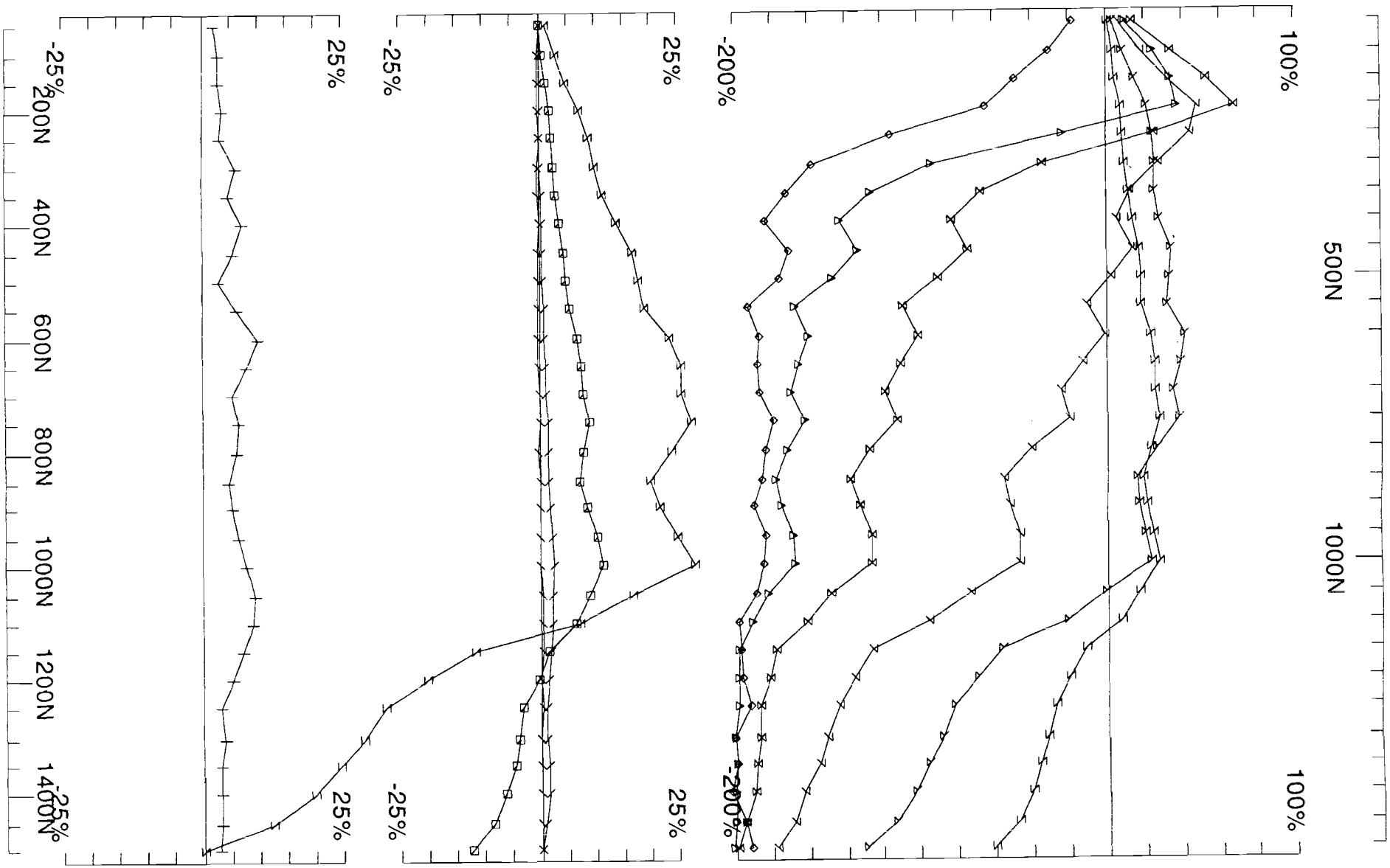
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 4/8/8, Reduced : 10/10/8, Plotted : 21/10/8



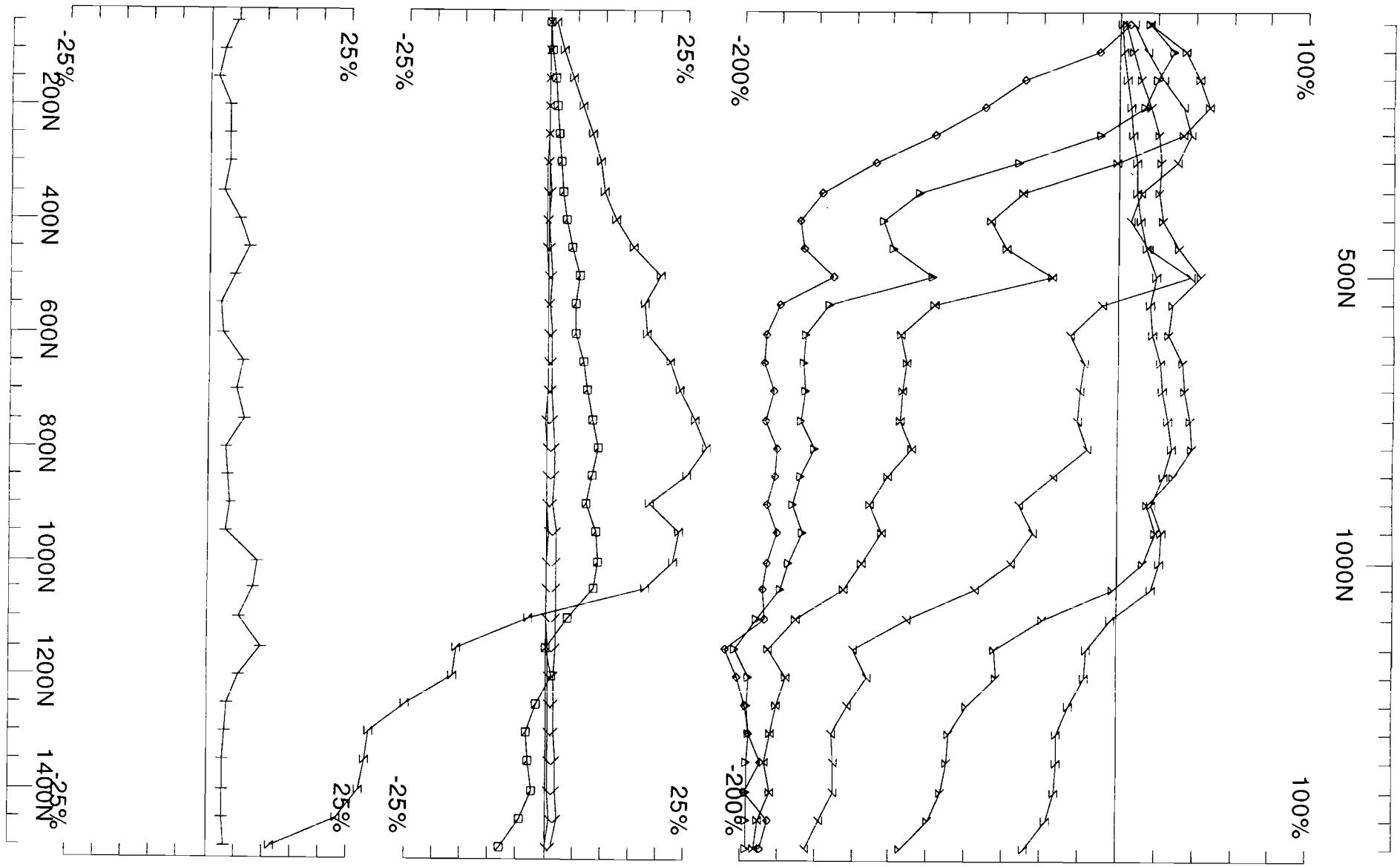
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 4/8/8, Reduced : 10/10/8, Plotted : 21/10/8



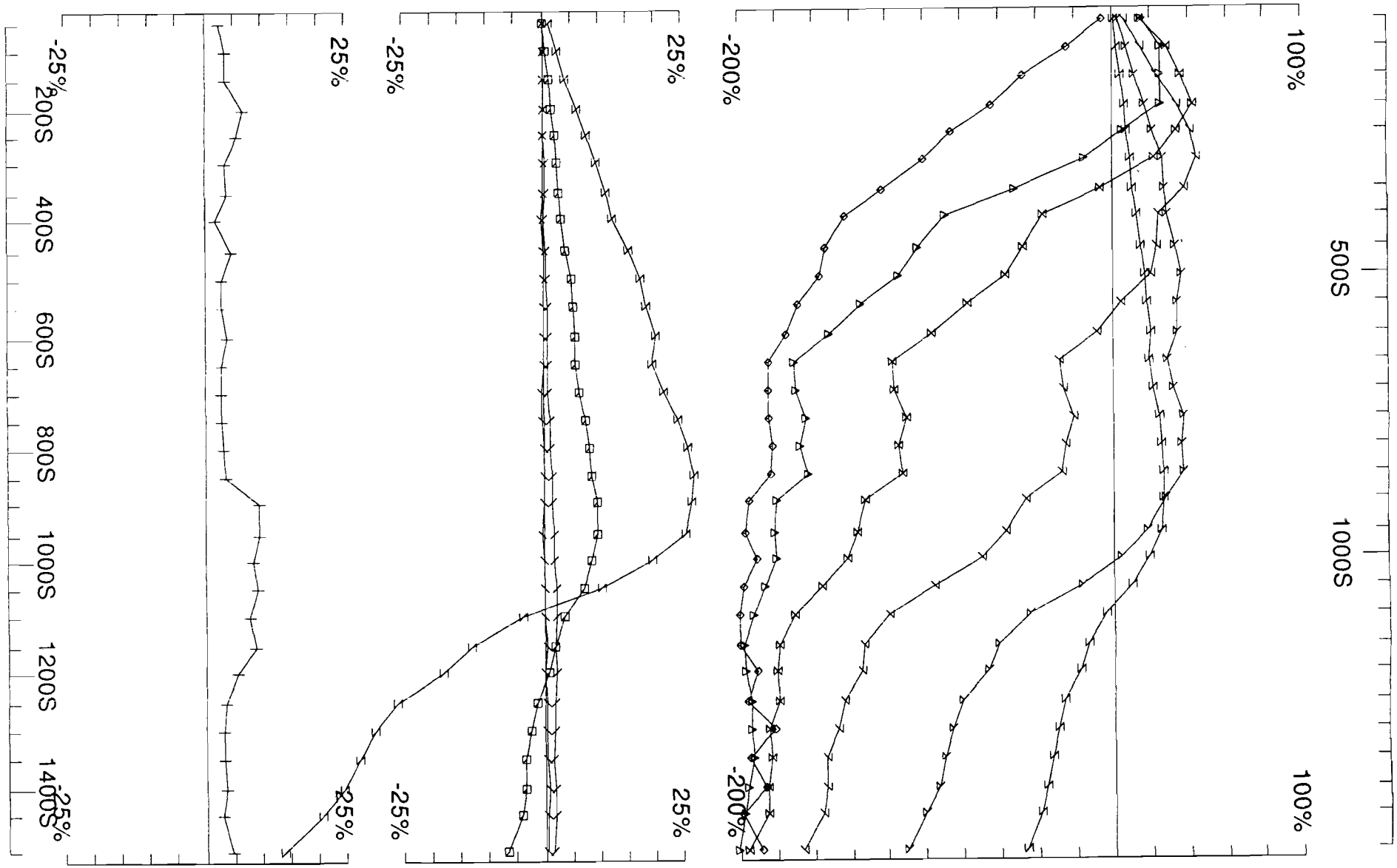
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1400E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE Job 0812-2 Plotted : 21/10/8



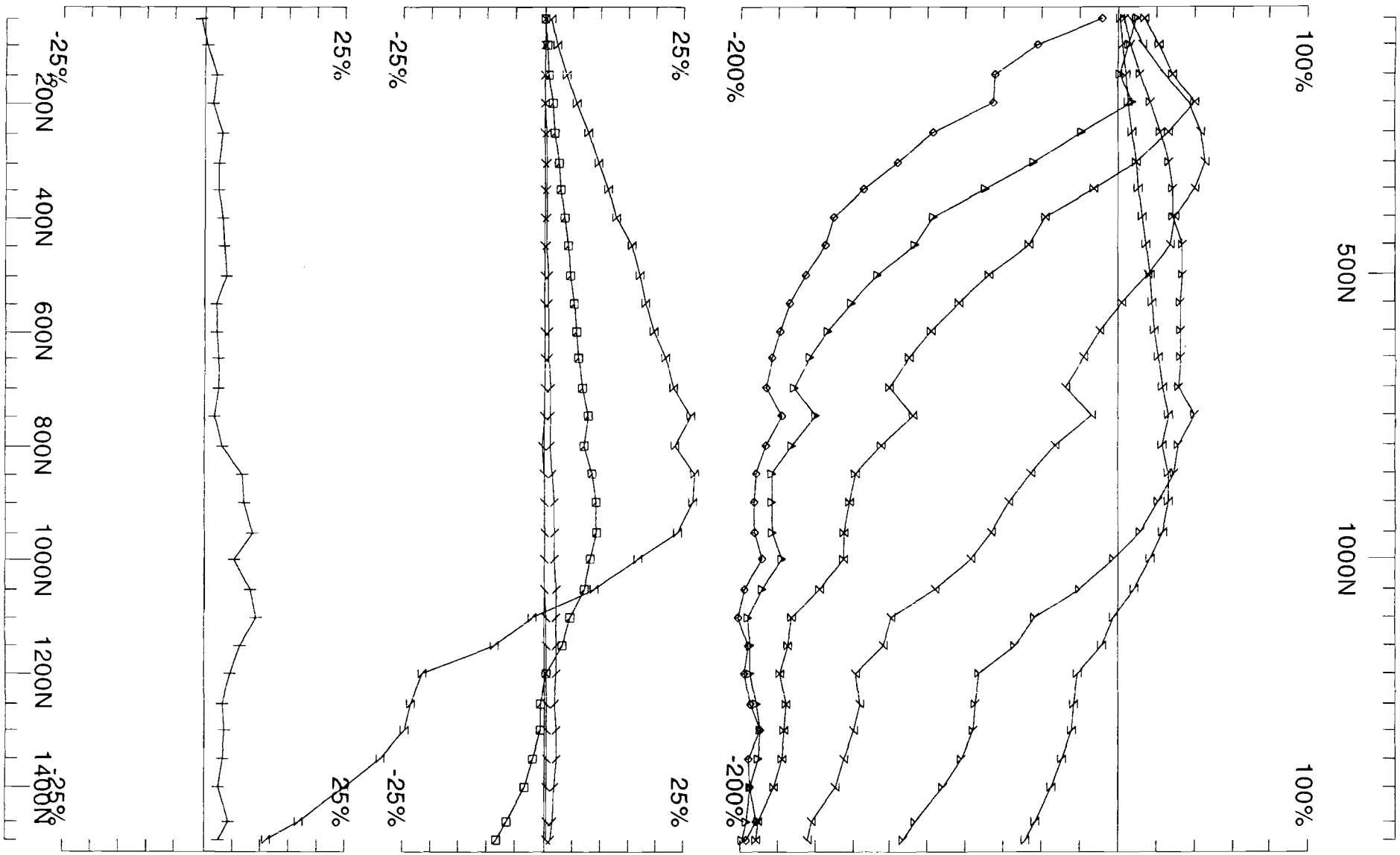
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1500E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 6/8/8, Reduced : 10/10/8, Plotted : 21/10/8



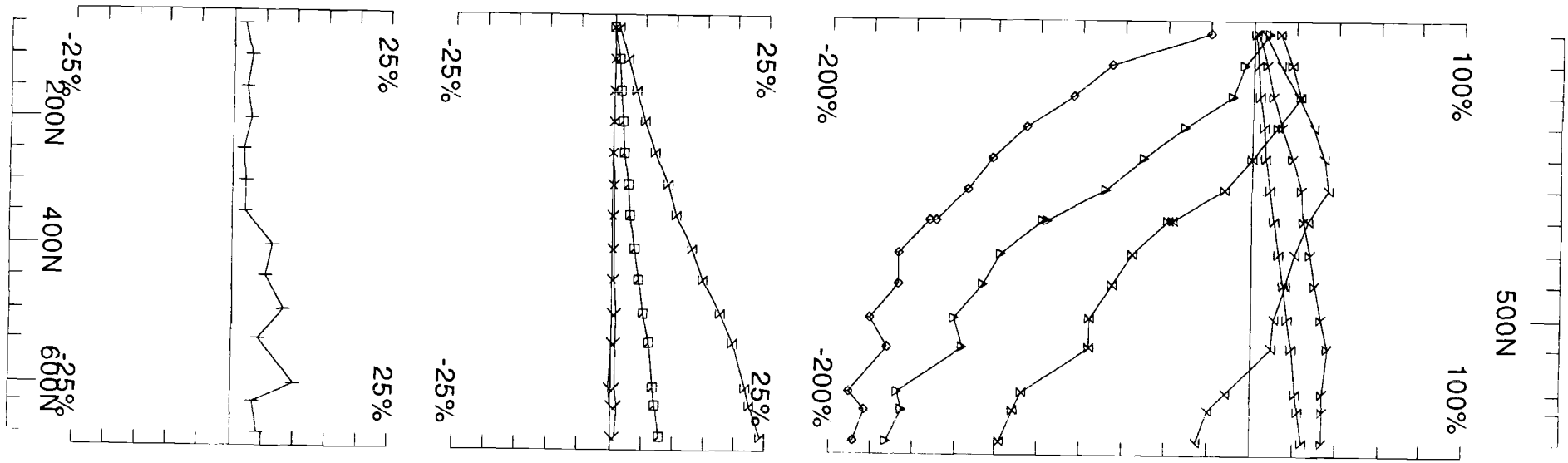
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1600E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 4/8/8, Reduced : 10/10/8, Plotted : 21/10/8



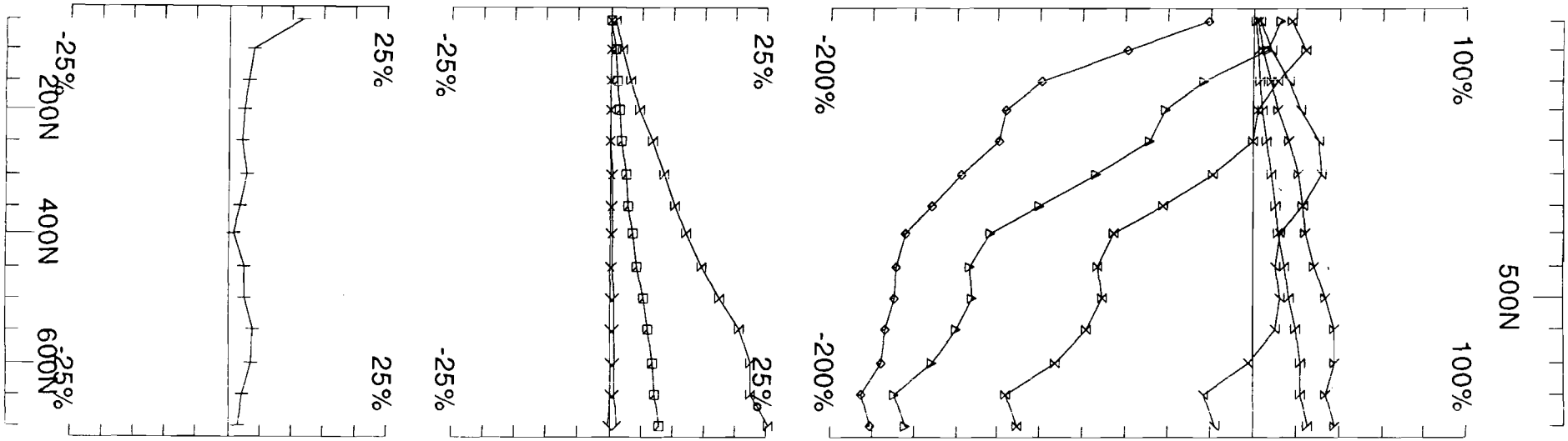
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1700E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 4/8/8, Reduced : 10/10/8, Plotted : 21/10/8



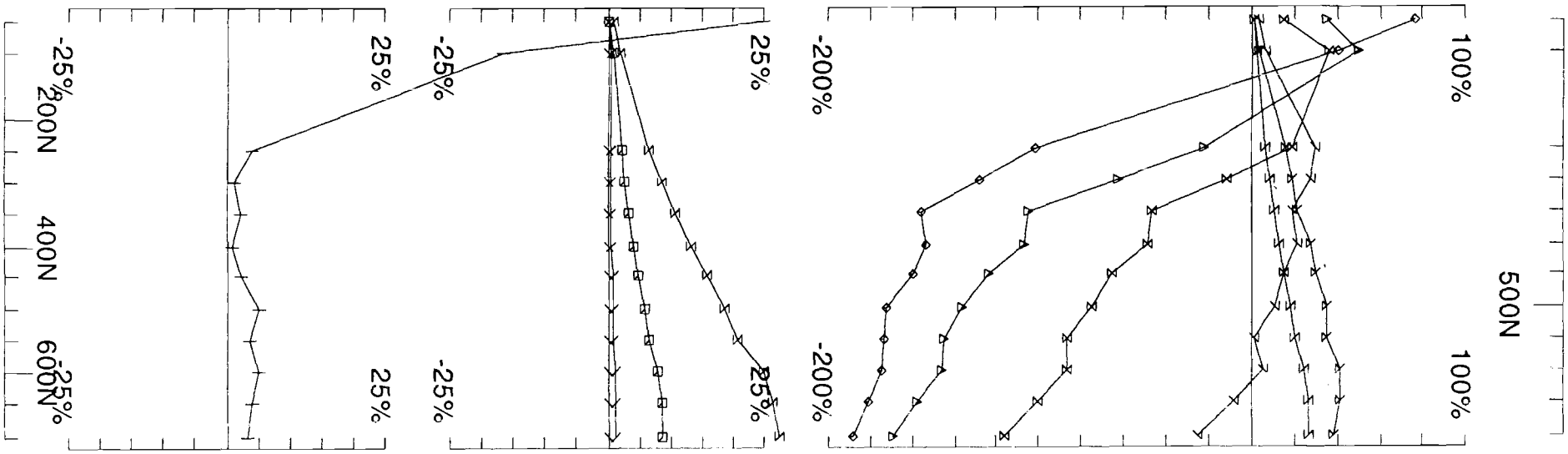
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1800E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



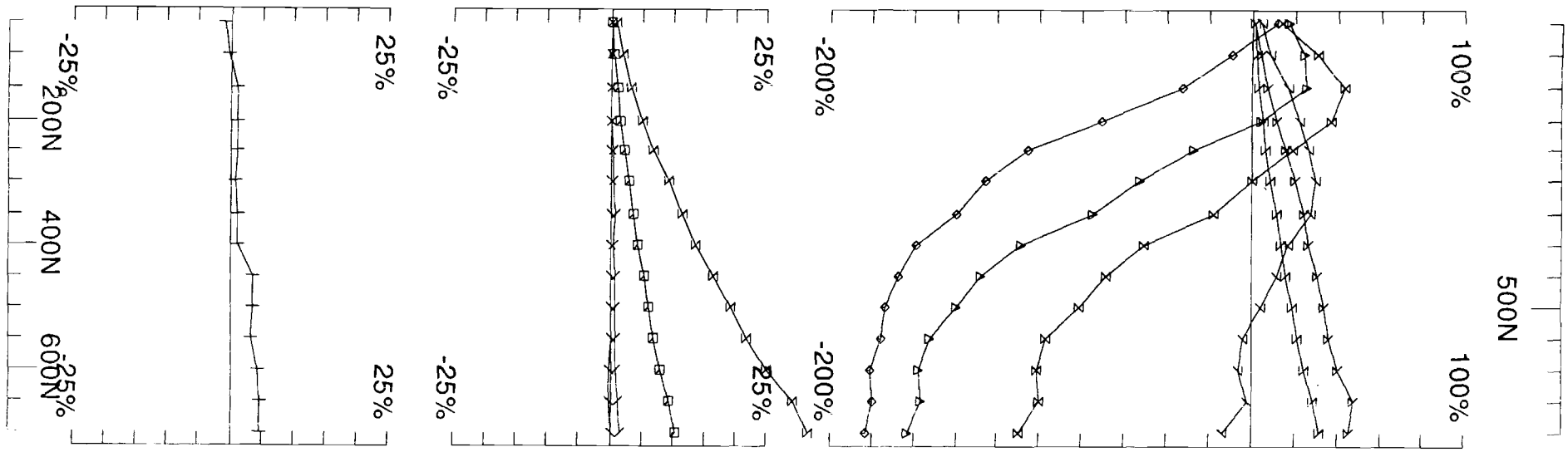
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 1900E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



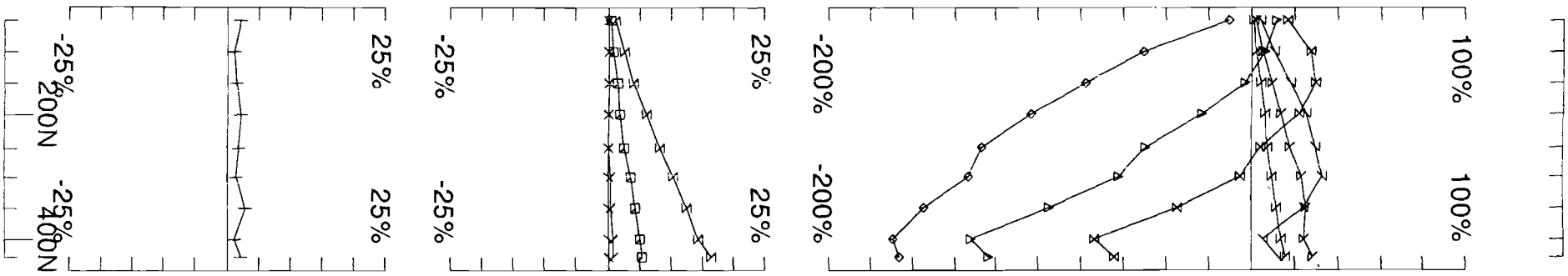
Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2000E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2100E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2200E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8



Loop: 35	Secondary, (Chn - Ch1)/|Hp|	UTEM Survey at: Montcalm
Line: 2300E	Contin. Norm at depth of 0 m	For: Xstrata Nickel
Compt: Hz	Base Freq. 30.974 Hz	LAMONTAGNE GEOPHYSICS LTD / GEOPHYSIQUE LTEE — Job 0812-2 — Surveyed : 9/8/8, Reduced : 10/10/8, Plotted : 21/10/8

Appendix B

0812 Production Log

UTEM Survey

Timmins Ontario

2008

for

Xstrata Nickel Ltd.

Production Log (0812)
UTEM Survey - Montcalm Property
Xstrata Nickel

Date	Rate	Production	Comments
March 24	Mob	-	Raymond Tremblay and Ryan Roberts travel from La Ronge to Saskatoon, SK. Crew: R. Tremblay, R. Roberts.
March 25	Mob	-	Raymond Tremblay and Ryan Roberts depart Saskatoon at 06:00 am and fly to Toronto. The rest of the crew depart Kingston. Raymond and Ryan are met at Pearson Airport by Phil Guimond and drive as far as Sudbury before a snowstorm forces them to overnight.p Kris Bulmer and Britta Hanewinkel overnight in Chelmsford. Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts.
March 26	Mob	-	Travel from Sudbury to Timmins, arriving at noon. The crew undergoes safety orientation at the Redpath Mining office in the afternoon Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts.
March 27	S(3)-5	-	Out to the grid in the morning. Access is by the Malette logging road (85km, 1hr 20m from Bon Air Motel). Check out skidder and skidoo trails in the morning. Lay all of Loop 04. Leave the cube van in the field. Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts.
March 28	P(3)-5	4200m	Read 6 lines of Loop 04, 2 components. Read : **Loop 04** at Montcalm. **3.872 Hx, Hz** **Line 2800E** **800N - 1500N** **Hx, Hz** **Line 2900E** **800N - 1500N** **Hx, Hz** **Line 3000E** **800N - 1500N** **Hx, Hz** **Line 3100E** **800N - 1500N** **Hx, Hz** **Line 3200E** **800N - 1500N** **Hx, Hz** **Line 3300E** **800N - 1500N** **Hx, Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts **Total: 4.200km**

Date	Rate	Production	Comments
March 29	P(3)-5	2700m	Read final 3 lines of Loop 04 to complete the loop. Two loopers lay Loop 05, operators work solo Read : **Loop 04** at Montcalm. **3.872 Hx, Hz** **Line 2500E** **500N - 1500N** **Hx, Hz** **Line 2600E** **500N - 1500N** **Hx, Hz** **Line 2700E** **800N - 1500N** **Hx, Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts **Total: 6.900km**
March 30	P(3)-5	5500m	Read all of Loop 05, 2 components. Read : **Loop 05** at Montcalm. **3.872 Hx, Hz** **Line 1900E** **600N - 1500N** **Hx, Hz** **Line 2000E** **600N - 1500N** **Hx, Hz** **Line 2100E** **600N - 1500N** **Hx, Hz** **Line 2200E** **600N - 1500N** **Hx, Hz** **Line 2300E** **600N - 1500N** **Hx, Hz** **Line 2400E** **500N - 1500N** **Hx, Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts **Total : 12.400km**
March 31	P(3)-5 Mob	-	Pick up all of Loop 04 and 05 and lay Loop 06 and 07. Ron Metansinine leaves Thunder Bay at 21:30 by bus. Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts. **Total : 12.400km**
April 1	S(3)-6	-	Pick up Ron Metansinine at the bus depot in the morning. Drive out to the grid in a snowstorm. Snow on the logging road from Km57 to Km69 is very deep. Because more snow has been forecasted for the day, accompanied by drifting conditions making the road impassable, the crew decides to return immediately to the motel. Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine. **Total : 12.400km**
April 2	S(3)-6	-	The crew undergoes an Xstrata mine safety orientation at the Montcalm Mine in the morning. Gerry Lafortune joins the crew for the day, R. Metansinine works for another crew. Told by Kristan Straub that the southern grid is a priority. Lay Loop 17 on the southern grid in the afternoon. Because of deteriorating snow conditions it is decided to drop the Hx component (after discussions with Daryl Ball) Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, G. Lafortune. **Total : 12.400km**

Date	Rate	Production	Comments
April 3	P(3)-6	5400m	Read 6 lines of Loop 17, Hz component only. Read : **Loop 17** at Montcalm. **3.872 Hz** **Line 1000S** **1300W - 400W** **Hz** **Line 1100S** **1300W - 400W** **Hz** **Line 1300S** **1300W - 400W** **Hz** **Line 1400S** **1300W - 400W** **Hz** **Line 1600S** **1300W - 400W** **Hz** **Line 1700S** **1300W - 400W** **Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine. **Total: 17.800km**
April 4	P(3)-6	3600m	Read 4 lines of Loop 17 with 2 Rx's to complete the loop. Two loopers lay one side of Loop 18 and compass in the back of the loop. Read : **Loop 17** at Montcalm. **3.872 Hz** **Line 1200S** **1300W - 400W** **Hz** **Line 1500S** **1300W - 400W** **Hz** **Line 1800S** **1300W - 400W** **Hz** **Line 1900S** **1300W - 400W** **Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine. **Total: 21.400km**
April 5	P(3)-6	4500m	Lay the back of Loop 18 first thing in the morning. Carry the Tx, generator and all gear 650m south along TL1300W to the Loop 18 corner. Read 5 lines of Loop 18 with 3 Rx. Two loopers pick up the back and north side of Loop 17 in the afternoon. Read : **Loop 18** at Montcalm. **3.872 Hz** **Line 2000S** **1300W - 400W** **Hz** **Line 2100S** **1300W - 400W** **Hz** **Line 2200S** **1300W - 400W** **Hz** **Line 2300S** **1300W - 400W** **Hz** **Line 2400S** **1300W - 400W** **Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine. **Total: 25.900km**

Date	Rate	Production	Comments
April 6	P(3)-8	5050m	Two more men join the crew. Read 6 lines of Loop 18 with 3 Rx's to complete the Loop. Drop 250m of Line 2600S because it was getting late. Three men lay 2 sides of Lp 19 and compass the front of the next loop to the east. Back at the motel by 8:00 pm. Read : **Loop 18** at Montcalm. **3.872 Hz** **Line 2500S** **1300W - 400W** **Hz** **Line 2600S** **950W - 400W** **Hz** **Line 2700S** **1300W - 400W** **Hz** **Line 2800S** **1300W - 400W** **Hz** **Line 2900S** **1300W - 400W** **Hz** **Line 3000S** **1300W - 400W** **Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine, G. Lafortune, A Van Roon. **Total: 30.950km**
April 7	P(3)-7	2700m	Out to the field with 4 Rx's but only 3 are working. Carry the Tx and generator 1 km to Loop 19 and lay the loop front in the morning. Start reading by noon in the rain. Read 3 lines. Andrew remains back at the motel to do office work. Read : **Loop 19** at Montcalm. **3.872 Hz** **Line 3200S** **1300W - 400W** **Hz** **Line 3300S** **1300W - 400W** **Hz** **Line 3400S** **1300W - 400W** **Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine, G. Lafortune. **Total: 33.650km**
April 8	P(3)-7	5400m	Read 6 lines of Loop 19 to complete the loop. One looper picks up the south side of Loop 17 in the afternoon and collects GPS data along 2 sides. Gerry remains back at the motel to have his back treated by a chiropractor. Read : **Loop 19** at Montcalm. **3.872 Hz** **Line 3100S** **1300W - 400W** **Hz** **Line 3500S** **1300W - 400W** **Hz** **Line 3600S** **1300W - 400W** **Hz** **Line 3700S** **1300W - 400W** **Hz** **Line 3800S** **1300W - 400W** **Hz** **Line 3900S** **1300W - 400W** **Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine, A Van Roon. **Total: 39.050km**

Date	Rate	Production	Comments
April 9	P(3)-7	-	Pick up Loops 06 and 07 that were laid on March 31. These loops will not be read because of deteriorating snow conditions. Wet snow and rain all day. Gerry remains back at the motel for another session with a chiropractor. Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, R. Metansinine, A Van Roon. **Total: 39.050km**
April 10	P(3)-6	-	Because of impending spring breakup it is decided (after discussions with Daryl Ball), that only 1 more loop will be read. Pick up Loop 19 and lay a final Loop 20 east of Loop 17. Phil remains at the motel to do office work. Ron is absent from work today. Crew: K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, G. Lafortune, A Van Roon. **Total: 39.050km**
April 11	P(3)-6 Demob	7200m	Read 6 lines of Loop 20. Pack up 3 skidoos and drive the cube van back to Timmins. Andrew takes the bus home in the morning. Ron is absent from work today. Read : **Loop 20** at Montcalm. **3.872 Hz** **Line 1000S 400W - 800E Hz** **Line 1100S 400W - 800E Hz** **Line 1800S 400W - 800E Hz** **Line 1900S 400W - 800E Hz** **Line 2000S 400W - 800E Hz** **Line 2100S 400W - 800E Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, G. Lafortune. **Total: 46.250km**
April 12	P(3)-6	7200m	Read remaining 6 lines of Loop 20 to complete the loop. Pick up all the wire for Loop 20 and all the remaining gear and skidoos are brought back to Timmins. Pack up the cube van in the evening. Ron takes the bus to Thunder Bay in the morning. Read : **Loop 20** at Montcalm. **3.872 Hz** **Line 1200S 400W - 800E Hz** **Line 1300S 400W - 800E Hz** **Line 1400S 400W - 800E Hz** **Line 1500S 400W - 800E Hz** **Line 1600S 400W - 800E Hz** **Line 1700S 400W - 800E Hz** Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, G. Lafortune. **Total: 53.450km**

Date	Rate	Production	Comments
April 13	Demob	-	Kris and Britta depart for Kingston and Gerry departs for Sudbury early in the morning. Phil packs up the crew cab and drives to Toronto with Ryan and Raymond. Kris and Britta arrive in Kingston in the evening. Crew: P. Guimond, K. Bulmer, B. Hanewinkel, R. Tremblay, R. Roberts, G. Lafortune.
April 14	Demob	-	Phil drives to Kingston with the crew cab. Ryan and Raymond fly to Saskatoon and drive to La Ronge. Crew: P. Guimond, R. Tremblay, R. Roberts.
July 14	Mob	-	Crew departs home arrives in Timmins. Crew: G. Lafortune, R. Lahaye, N. Bastarache, JP. Swart, K. Bulmer and B. Hanewinkel.
July 15	L(2)-6	-	Crew receives orientation at Moncalm Mine. Laid Loop 30 (I). Crew: G. Lafortune, R. Lahaye, N. Bastarache, JP. Swart, K. Bulmer and B. Hanewinkel.
July 16	P(2)-6	4000m	Read: **Loop 30 (I)** **at Montcalm** **30.974 Hz** **Lines:** **15+00E** **7+00S - 3+00N** **14+00E** **7+00S - 3+00N** **13+00E** **7+00S - 3+00N** **12+00E** **7+00S - 3+00N** Part of Loop 31(H) was laid. Rainy day. Crew: G. Lafortune, R. Lahaye, N. Bastarache, JP. Swart, K. Bulmer and B. Hanewinkel.
July 17	D-5 Demob	4000m	Loop 30 (I) was broken and repaired. Problem with the transmitter and rain, no surveying was done. JP Swart returns home. Crew: G. Lafortune, R. Lahaye, N. Bastarache, K. Bulmer and B. Hanewinkel.
July 18	P(2)-5	5000m	Read: **Loop 30 (I)** **at Montcalm** **30.974 Hz** **Lines:** **11+00E** **7+00S - 3+00N** **10+00E** **7+00S - 3+00N** **7+00E** **7+00S - 3+00N** **6+00E** **7+00S - 3+00N** **5+00E** **7+00S - 3+00N** Half of Loop 31 (H) is now laid. A thunderstorm interrupted the day. Crew: G. Lafortune, R. Lahaye, N. Bastarache, K. Bulmer and B. Hanewinkel.

Date	Rate	Production	Comments
July 19	P(2)-5	4000m	Read: **Loop 30 (I)** **at Montcalm** **30.974 Hz** **Lines:** **8+00E** **7+00S - 3+00N** **Hz, Hx** **9+00E** **7+00S - 3+00N** **Hz, Hx** Loop 30(I) was broken in the morning and repaired. Finished laying Loop 31. Rain in morning. Crew: G. Lafortune, R. Lahaye, N. Bastarache, K. Bulmer and B. Hanewinkel.
July 20	P(2)-5	4000m	Read: **Loop 30 (I)** **at Montcalm** **30.974 Hz** **Lines:** **4+00E** **7+00S - 3+00N** **Hz, Hx** **3+00E** **7+00S - 3+00N** **Hz, Hx** **2+00E** **7+00S - 3+00N** **Hz, Hx** **1+00E** **7+00S - 3+00N** **Hz, Hx** Half of Loop 32 (G) was laid. There was a thunderstorm during the day. N. Bastarache falls and hurts leg but is fine by the next morning. Crew: G. Lafortune, R. Lahaye, N. Bastarache, K. Bulmer and B. Hanewinkel.
July 21	P(2)-5 Mob	2500m	Read: **Loop 30 (I)** **at Montcalm** **30.974 Hz** **Lines:** **0+00** **7+00S - 2+50S** **Hz, Hx** **1+00W** **7+00S - 2+25S** **Hz, Hx** **2+00W** **7+00S - 2+50S** **Hz, Hx** **3+00W** **7+00S - 3+00S** **Hz, Hx** **4+00W** **7+00S - 3+50S** **Hz, Hx** **5+00W** **7+00S - 3+25S** **Hz, Hx** Creek flooded overnight prevented the crew from crossing it, caused delays. J. Frost arrives today. Crew: G. Lafortune, R. Lahaye, N. Bastarache, K. Bulmer and B. Hanewinkel.
July 22	P(2)-6	3225m	Read: **Loop 30 (I)** **at Montcalm** **30.974 Hz** **Lines:** **0+00** **2+00S - 3+00N** **Hz, Hx** **1+00W** **1+75S - 3+00N** **Hz, Hx** **2+00W** **2+00S - 3+00N** **Hz, Hx** **3+00W** **2+50S - 3+00N** **Hz, Hx** **4+00W** **3+00S - 3+00N** **Hz, Hx** **5+00W** **2+75S - 3+25N** **Hz, Hx** Laid Loop 33. Loop 32 will wait until 14 gauge wire is available. Crew: G. Lafortune, R. Lahaye, J. Frost, N. Bastarache, K. Bulmer and B. Hanewinkel.

Date	Rate	Production	Comments		
July 23	P(2)-6	4025m	Read: **Loop 31 (H)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			5+00S	**7+00E - 5+75W**	**Hz, Hx**
			6+00S	**0+00 - 6+50W**	**Hz, Hx**
			8+00S	**0+00 - 7+00W**	**Hz, Hx**
			9+00S	**7+00E - 7+00W**	**Hz, Hx**
			Picked up ~one third of Loop 30		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		
July 24	P(2)-6	2800m	Read: **Loop 31 (H)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			6+00S	**7+00E - 0+00**	**Hz, Hx**
			7+00S	**7+00E- 7+00W**	**Hz, Hx**
			8+00S	**0+00 - 7+00E**	**Hz, Hx**
			Picked up part of Loop 30 and laid part of Loop 32. Tried to find the roads that were marked on the map for Loop 33(C).		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		
July 25	P(2)-6	1800m	Read: **Loop 33 (C)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			32+00E	**11+00N - 20+00N**	**Hz, Hx**
			33+00E	**11+00N- 20+00N**	**Hz, Hx**
			One receiver was used today.		
			Finished picking up Loop 30 because wire was needed for the next loop as a common side. Most of Loop 31 was picked up.		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		

G. Lafortune did not survey but went to the field in the morning to start crew.

July 26	0.75 P(2)-6 0.25 D	2675m	Read: **Loop 33 (C)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			34+00E	**11+00N - 20+00N**	**Hz, Hx**
			35+00E	**11+00N- 20+00N**	**Hz, Hx**
			37+00E	**11+00N- 19+75N**	**Hz, Hx**
			Almost all of Loop 32 was laid.		
			The operator decided to read a line with both Rx's and compare the data to see if there were any Rx problems.		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		

Date	Rate	Production	Comments		
July 27	P(2)-5	1800m	Read: **Loop 33 (C)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			36+00E	**11+00N - 20+00N**	**Hz**
			38+00E	**11+00N- 20+00N**	**Hz**
			One receiver was used today.		
			Finished laying Loop 32 and finished picking up Loop 31.		
			N. Bastarache took the day off.		
			Crew: G. Lafortune, R. Lahaye, J. Frost, K. Bulmer and B. Hanewinkel.		

G. Lafortune went to field but drive in bothered back a l;ot so did not survey.

July 28	P(2)-6	1800m	Read: **Loop 33 (C)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			39+00E	**11+00N - 20+00N**	**Hz,Hx**
			40+00E	**11+00N- 120+00N**	**Hz,Hx**
			One receiver was used today.		
			Laid most of Loop 34 (D).		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		

G. Lafortune went to field in the morning buit the drive in was still bothering back.

July 29	P(2)-6	4100m	Read: **Loop 32 (G)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			5+00S	**5+50W - 7+00E**	**Hz, Hx**
			6+00S	**6+50W - 0+00**	**Hz, Hx**
			8+00S	**0+50W - 7+00E**	**Hz, Hx**
			9+00S	**6+50W - 7+00E**	**Hz, Hx**
			Finished laying Loop 34		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		

G. Lafortune did not survey or go to field.

July 30	P(2)-6	4100m	Read: **Loop 32 (G)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			6+00S	**0+00W - 7+00E**	**Hz, Hx**
			7+00S	**6+50W - 2+50W**	**Hz, Hx**
			8+00S	**6+50W - 0+50W**	**Hz, Hx**
			Due to thunderstorm activity the loop was not finished.		
			Started laying Loop 35(F).		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		

G. Lafortune did not survey or go to field

Date	Rate	Production	Comments		
July 31	P(2)-6	1000m	Read: **Loop 32 (G)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			7+00S	**3+00W - 7+00E**	**Hz, Hx**
			One receiver was used today.		
			Due to a problem with the map supplied wire was laid on the wrong line on Loop 35. This wire was picked up and relayed today. Approximately half the loop was relaid by the end of the day. Also, Loop 33 had to be repaired		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		
G. lafortune did not survey but went to Mine with J. Frost and talked to Xstrata about back injury.					
Aug 1	P(2)-6	1400m	Read: **Loop 34 (D)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			51+00E	**16+00N - 18+00N**	**Hz, Hx**
			52+00E	**16+00N - 22+00N**	**Hz, Hx**
			53+00E	**16+00N - 22+00N**	**Hz, Hx**
			Picked up Loop 32 (G). Day cut short due to rain and a thunderstorm.		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		
Aug 2	P(2)-6	4600m	Read: **Loop 34 (D)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			51+00E	**18+00N - 22+00N**	**Hz, Hx**
			50+00E	**16+00N - 22+00N**	**Hz, Hx**
			49+00E	**16+00N - 22+00N**	**Hz, Hx**
			48+00E	**16+00N - 22+00N**	**Hz, Hx**
			47+00E	**16+00N - 22+00N**	**Hz, Hx**
			46+00E	**16+00N - 22+00N**	**Hz, Hx**
			45+00E	**16+00N - 22+00N**	**Hz, Hx**
			44+00E	**16+00N - 22+00N**	**Hz, Hx**
			Finished laying Loop 35 (F).		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		
Aug 3	P(2)-6	2500m	Read: **Loop 33 (C)**	**at Montcalm**	**30.974 Hz**
			Lines:		
			41+00E	**16+00N - 20+00N**	**Hz,Hx**
			42+00E	**16+00N - 22+00N**	**Hz,Hx**
			43+00E	**16+00N - 22+00N**	**Hz,Hx**
			41+00E	**11+00N - 20+00N**	**Hz,Hx**
			Loop 33 was repaired. Then corners had to be flipped so Loop 33 could be finished		
			Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.		

Date	Rate	Production	Comments
Aug 4	P(2)-6	4300m	Read: **Loop 35 (F)** **at Montcalm** **30.974 Hz** **Lines:** **12+00E** **0+00 - 15+00N** **Hz** **13+00E** **0+00 - 15+00N** **Hz,Hx** **16+00E** **0+000 - 15+00N** **Hz** **17+00E** **0+000 - 15+00N** **Hz,Hx** Loop 33 was picked up and one side of Loop 34. Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.
Aug 5	P(2)-6	1450m	Read: **Loop 35 (F)** **at Montcalm** **30.974 Hz** **Lines:** **11+00E** **0+00 - 8+00N** **Hz,Hx** **14+00E** **0+00 - 6+50N** **Hz,Hx** Loop 35 was broken soon after survey was started and took long time to repair and long time for people to come out of the bush. Then a thunderstorm came in. Not a good day. One side of Loop 34 was picked up. Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.

G. Lafortune stayed back due to back and visits chiro.

Aug 6	P(2)-6	3800m	Read: **Loop 35 (F)** **at Montcalm** **30.974 Hz** **Lines:** **11+00E** **8+00 - 15+00N** **Hz,Hx** **12+00E** **0+00 - 15+00N** **Hx** **14+00E** **6+50N - 15+00N** **Hz,Hx** **15+00E** **0+00 - 15+00N** **Hz,Hx** Another side of Loop 34 was picked up. Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.

G. Lafortune was back due to visiting chiro.

Aug 7	P(2)-6	4175m	Read: **Loop 35 (F)** **at Montcalm** **30.974 Hz** **Lines:** **8+00E** **0+00 - 13+00N** **Hz,Hx** **9+00E** **0+00 - 13+75N** **Hz,Hx** **10+00E** **0+00 - 15+00N** **Hz,Hx** Finished picking up Loop 34 (D). Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.

Date	Rate	Production	Comments
Aug 8	P(2)-6	4500m	Read: **Loop 35 (F)** **at Montcalm** **30.974 Hz** **Lines:** **5+00E** **0+00 - 15+00N** **Hz,Hx** **6+00E** **0+00 - 15+00N** **Hz,Hx** **7+00E** **0+00 - 15+00N** **Hz,Hx** Creek is high and very difficult to cross. A rubber boat was brought in to get across river. Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.
Aug 9	P(2)-6	5475m	Read: **Loop 35 (F)** **at Montcalm** **30.974 Hz** **Lines:** **16+00E** **0+00 - 15+00N** **Hx** **18+00E** **0+00 - 15+00N** **Hz,Hx** **19+00E** **0+00 - 7+00N** **Hz,Hx** **20+00E** **0+00 - 7+00N** **Hz,Hx** **21+00E** **0+00 - 7+00N** **Hz,Hx** **22+00E** **0+00 - 7+00N** **Hz,Hx** **23+00E** **0+00 - 4+25N** **Hz,Hx** Very wet day due to rain. Creek caused a problem with the survey. Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.
Aug 10	L-6		Picked up Loop 35. Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.
Aug 11	Demob		Crew leaves and arrives home. Crew: G. Lafortune, R. Lahaye, N. Bastarache, J. Frost, K. Bulmer and B. Hanewinkel.

LEGEND

P(r)-x - Production (# of receivers) - # of personnel
S(r)-x - Standby (# of receivers) - # of personnel
D-x - Down - # of personnel

Appendix C

The UTEM SYSTEM

The UTEM System

UTEM Data Reduction and Plotting Conventions

Data Presentation

The UTEM SYSTEM

UTEM uses a large, fixed, horizontal transmitter loop as its source. Loops range in size from 300m x 300m up to as large as 4km x 4km. Smaller loops are generally used over conductive terrain or for shallow sounding work. The larger loops are only used over resistive terrain. The UTEM receiver is typically syncronized with the transmitter at the beginning of a survey day and operates remotely after that point. The clocks employed - one in each of the receiver and transmitter - are sufficiently accurate to maintain synchronisation.

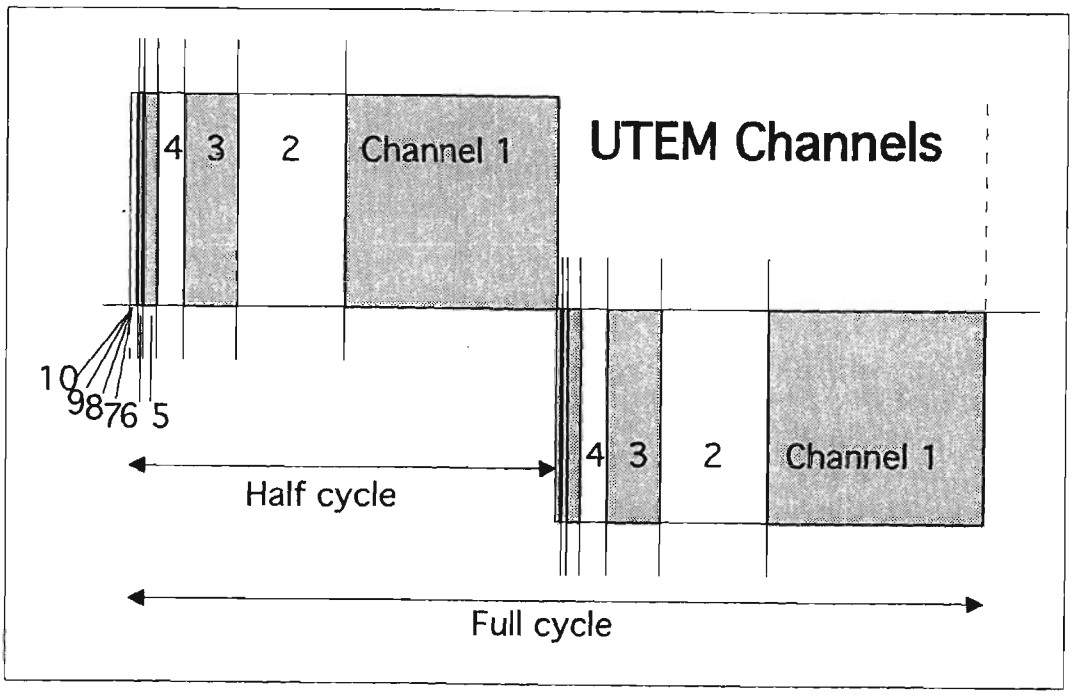
Measurements are routinely taken to a distance of 1.5 to twice the loop dimensions, depending on the local noise levels, and can be continued further. Lines are typically surveyed out from the edge of the loop but may also be read across the loop wire and through the centre of the loop, a configuration used mainly to detect horizontal conductors. BHUTEM - the borehole version of UTEM -surveys have been carried out to depths up to 3000+ metres.

System Waveform

The UTEM transmitter passes a low-frequency (4 Hz to 90 Hz) current of a precisely regulated triangular waveform through the transmitter loop. The frequency can be set to any value within the operating range of the transmitter, however, it is usually set at 31 Hz to minimise power line (60 Hz in North America) effects. Since a receiver coil responds to the time derivative of the magnetic field, the UTEM system really "sees" the step response of the ground. UTEM is the only time domain system which measures the step response of the ground. All other T.D.E.M. systems to date transmit a modified step current and "see" the (im)pulse response of the ground at the receiver. In practice, the transmitted UTEM waveform is tailored to optimize signal-to-noise. Deconvolution techniques are employed within the system to produce an equivalent to the conceptual "step response" at the receiver.

System Sampling

The UTEM receiver measures the time variation of the magnetic field in the direction of the receiver coil at 10 delay times (channels). UTEM channels are spaced in a binary, geometric progression across each half-cycle of the received waveform. Channel **10** is the earliest channel and it is $1/2^{10}$ of the half-cycle wide. Channel **1**, the latest channel, is $1/2^{1}$ of the half-cycle wide (see Figure below). The measurements obtained for each of 10 channels are accumulated over many half-cycles. Each final channel value, as stored, is the average of the measurements for that time channel. The number of half-cycles averaged generally ranges between 2048 (1024 full-cycles - 1K in UTEM jargon) to 32768 (16K) depending on the level of ambient noise and the signal strength.



System Configurations

For surface work the receiver coil is mounted on a portable tripod and oriented. During a surface UTEM survey the vertical component of the magnetic field (Hz) of the transmitter loop is always measured. Horizontal in-line (Hx) and cross-line (Hy) components are also measured if more detailed information is required. The UTEM System is also capable of measuring the two horizontal components of the electric field, Ex and Ey. A dipole sensor comprised of two electrodes is used to measure the electric field components. This is generally used for outlining resistive features to which the magnetic field is not very sensitive.

BHUTEM surveys employ a receiver coil that is smaller in diameter than the surface coil. The borehole receiver coil forms part of a down-hole receiver package used to measure the axial (along-borehole) component of the magnetic field of the transmitter loop. Due to the distance between coil and receiver in borehole surveys the signal must be transmitted up to the receiver. In BHUTEM the signal is transmitted to surface digitally using a kevlar-reinforced fibre-optic cable as a data link. Using a fibre-optic link avoids signal degradation problems and allows surveying of boreholes to 3000+m. The cable is also very light - the specific gravity is nearly 1.0 - making the cable handling hardware quite portable.

The EM Induction Process

Any time-varying transmitted ("primary") field induces current flow in conductive regions of the ground below and around the transmitter loop (i.e. in the earth or "half-space"). This current flow produces a measurable EM field, the secondary field, which has an inherent "inertia" that resists the change in primary field direction. This "inertial" effect is called self-inductance; it limits the rate at which current can change and is only dependent on the shape and size of a conductive path.

It takes a certain amount of time for the transmitted current flow to be redirected (reversed) and reestablished to full amplitude after the rate-of-change of the primary field reverses direction. This measurable reversal time is characteristic for a given conductor. In general, for a good conductor this time is greater than that of a poor conductor. This is because in a good conductor the terminal current level is greater, whereas its rate of change is limited by the inductance of the current path. The time-varying current causes an Emf in the sensor proportional to the time derivative of the current. This Emf decays with time - it vanishes when the reversal is complete - and the characteristic time of the Emf decay as measured by the sensor is referred to as the **decay time** of the conductor.

The large-scale current which is induced in the half-space by the primary field produces the half-space response as seen in typical UTEM profiles. This background response is influenced by the finite conductivity of the surrounding rock. Other currents may be induced in locally more conductive zones (conductors) that have longer decay times than the half-space response. The responses of these conductors are superimposed upon the background response. The result is that the UTEM receiver detects:

- the primary field waveform, a square-wave
- the half-space (background) response of the surrounding rock
- a slight-to-large response due to any conductors present.

The result is that in the presence of conductors the primary field waveform is substantially (and anomalously) distorted.

UTEM DATA REDUCTION and PLOTTING CONVENTIONS

The UTEM data as it appears in the data files is in total field, continuously normalized form. In this form, the magnetic field data collected by the receiver is expressed as a % of the calculated primary magnetic field vector magnitude at the station. These are total field values - the UTEM system measures during the "on-time" and as such samples both the primary and secondary fields.

For plotting purposes, the reduced magnetic field data (as it appears in the data file) are transformed to other formats as required. The following is provided as a description of the various plotting formats used for the display of UTEM data. A plotting format is defined by the choice of the *normalization* and *field type* parameters selected for display.

NORMALIZATION

UTEM results are always expressed as a % of a normalizing field at some point in space.

In **continuously normalized** form the normalizing factor (the denominator) is the magnitude of the computed local primary field vector. As the primary exciting field magnitude diminishes with increasing distance from the transmitter loop the response is continuously amplified as a function of offset from the loop. Although this type of normalization considerably distorts the response shape, it permits anomalies to be easily identified at a wide range of distances from the loop.

Note: An optional form of continuous normalization permits the interpreter to normalize the response to the magnitude of the primary field vector at a fixed depth below each station. This is useful for surface profiles which come very close to the loop. Without this adjustment option, the normalizing field is so strong near the loop that the secondary effects become too small in the presence of such a large primary component. In such circumstances interpretation is difficult, however; by "normalizing at some depth" the size of the normalizing field, near the loop in particular, is reduced and the resulting profile can be more effectively interpreted to a very close distance from the transmitter wire. The usual choice for the depth is the estimated target depth is used.

In **point normalized form** the normalizing factor is the magnitude of the computed primary field vector at a single point in space. When data is presented in this form, the point of normalization is displayed in the title block of the plot. Point normalized profiles show the non-distorted shape of the field profiles. Unfortunately, the very large range in magnitude of anomalies both near and far from the loop means that small anomalies, particularly those far from the loop, may be overlooked on this type of plot in favor of presenting larger amplitude anomalies.

Note: Selecting the correct plot scales is critical to the recognition of conductors over the entire length of a point normalized profile. Point normalized data is often used for interpretation where an analysis of the shape of a specific anomaly is required. Point normalized profiles are therefore plotted selectively as required during interpretation. An exception to this procedure occurs where surface data has been collected entirely inside a transmitter loop. The primary field does not vary greatly inside the loop, therefore, the benefits of continuous normalization are not required in the display of such results. In these cases data is often point normalized to a fixed point near the loop centre.

FIELD TYPE

The type of field may be either the **Total field** or the **Secondary field.** In general, it is the secondary field that is most useful for the recognition and interpretation of discrete conductors.

UTEM Results as Secondary Fields

Because the UTEM system measures during the transmitter on-time the determination of the secondary field requires that an estimate of the primary signal be subtracted from the observations. Two estimates of the primary signal are available:

1) UTEM Channel 1

   One estimate of the primary signal is the value of the latest time channel observed by the UTEM System, channel 1. When Channel 1 is subtracted from the UTEM data the resulting data display is termed ***Channel 1 Reduced.*** This reduction formula is used in situations where it can be assumed that all responses from any target bodies have decayed away by the latest time channel sampled. The Channel 1 value is then a reasonable estimate of the primary signal present during Channels 2....10.

   In practice the ***Channel 1 Reduced*** form is most useful when the secondary response is very small at the latest delay time. In these cases channel 1 is indeed a good estimate of the primary field and using it avoids problems due to geometric errors or transmitter loop current/system sensitivity errors.

2) Calculated primary field

An alternate estimate of the primary field is obtained by computing the primary field from the known locations of the transmitter loop and the receiver stations. When the computed primary field is subtracted from the UTEM data the resulting data display is termed ***Primary Field Reduced*** .

The calculated primary field will be in error if the geometry is in error - mislocation of the survey stations or the loop vertices - or if the transmitter loop current/system sensitivity is in error. Mislocation errors from loop/station geometry may give rise to very large secondary field errors depending on the accuracy of the loop and station location method used. Transmitter loop current/system sensitivity error is rarely greater than 2%. ***Primary Field Reduced*** is plotted in situations where a large Channel 1 response is observed. In this case the assumption that the Channel 1 value is a reasonable estimate of the primary field effect is not valid.

Note: When UTEM data is plotted in the ***Channel 1 Reduced*** form the secondary field data for Channel 1 itself are always presented in ***Primary Field Reduced*** form and are plotted on a separate axis. This plotting format serves to show any long time-constant responses, magnetostatic anomalies and/or geometric errors present in the data.

Mathematical Formulations

In the following expressions:

$\mathbf{Rn_j}$ is the result plotted for the n^{th} UTEM channel,

$\mathbf{R1_j}$ is the result plotted for the latest-time UTEM channel, channel 1,

$\mathbf{Chn_j}$ is the raw component sensor value for the n^{th} channel at station j,

$\mathbf{Ch1_j}$ is the raw component sensor value for channel 1 at station j,

$\mathbf{H^P_j}$ is the computed primary field component in the sensor direction

$|\mathbf{H^P}|$ is the magnitude of the computed primary field at:
- a fixed station for the entire line (point normalized data)
- the local station of observation (continuously normalized data)
- a fixed depth below the station (continuously normalized at a depth).

Channel 1 Reduced Secondary Fields : Here, the latest time channel, Channel 1 is used as an "estimate" of the primary signal and channels 2-10 are expressed as:

$$Rn_j = (Chn_j - Ch1_j) / |H^P| \quad x\,100\%$$

Channel 1 itself is reduced by subtracting a calculation of the primary field observed in the direction of the coil, H^P as follows:

$$R1_j = (Ch1_j - H^P{}_j) / |H^P| \quad x\,100\%$$

Primary Field Reduced Secondary Fields : In this form all channels are reduced according to the equation used for channel 1 above:

$$Rn_j = (Chn_j - H^P{}_j) / |H^P| \quad x\,100\%$$

This type of reduction is most often used in cases where very good geometric control is available (leading to low error in the calculated primary field, $H^P{}_j$) and where very slowly decaying responses result in significant secondary field effects remaining in channel 1 observations.

UTEM Results as a Total Field

In certain cases results are presented as a % of the **Total Field**. This display is particularly useful, in borehole surveys where the probe may actually pass through a very good conductor. In these cases the shielding effect of the conductor will cause the observed (total) field to become very small below the intersection point. This nullification due to shielding effects on the total field is much easier to see on a separate ***Total Field*** plot. In cases where the amplitude of the anomalies relative to the primary field is small, suggesting the presence of poorly conductive bodies, the ***Total Field*** plot is less useful.

The data contained in the UTEM reduced data files is in ***Total Field,*** continuously normalized form if:

$$Rn_j = Chn_j / |H^P| \quad x\,100\%$$

DATA PRESENTATION

All UTEM survey results are presented as profiles in an Appendix of this report. For BHUTEM surveys the requisite Vectorplots, presented as plan and section views showing the direction and magnitude of the calculated primary field vectors for each transmitter loop, are presented in a separate Appendix.

The symbols used to identify the channels on all plots as well as the mean delay time for each channel is shown in the table below.

UTEM System Mean Delay Times

10 Channel Mode @ 31 hz.(approx.)

(base freq: 30.974 hertz)

Channel #	Delay time (ms)	Plot Symbol
1	12.11	
2	6.053	
3	3.027	
4	1.513	
5	0.757	
6	0.378	
7	0.189	
8	0.095	
9	0.047	
10	0.024	

Notes on Standard plotting formats:

10 channel data in ***Channel 1 Reduced*** form - The data are usually displayed on three separate axes. This permits scale expansion, allowing for accurate determination of signal decay rates. The standard configuration is:

Bottom axis - Channel 1 (latest time) is plotted alone in ***Primary Field Reduced*** form using the same scale as the center axis.

Center axis - The intermediate to late time channels, ch5 to ch2 are plotted on the center axis using a suitable scale.

Top axis - The early time channels, ch10 to ch6 and a repeat of ch5 for comparison are plotted on the top axis at a reduced scale. The earliest channels, ch8 to ch10, may not be plotted to avoid clutter.

10 channel data in ***Primary Field Reduced*** form: The data are displayed using a

single axis plot format. Secondary effects are plotted using a Y axis on each data plot with peak to peak values up to 200%.

BHUTEM data plotted as total field profiles: Data are expressed directly as a percentage of the ***Total Field*** value. The Y axis on each single axis data plot shows peak values of up to 100%. These departures are always relative to the measured total field value at the observation station.

BHUTEM data plotted as secondary field profiles: Check the title block of the plot to determine if the data is in ***Channel 1 Reduced*** form or in ***Primary Field Reduced*** form.

Note that on all BHUTEM plots the ratio between the axial component of the primary field of the loop and the magnitude of the total primary field strength **(dc)** is plotted as a profile without symbols. In UTEM jargon this is referred to as the "primary field" and it is plotted for use as a polarity reference tool.

Appendix D

0812
Note on sources of anomalous Ch1

UTEM Survey

Timmins Ontario

2008

for

Xstrata Nickel Ltd.

Note on sources of anomalous Ch1

This section outlines the possible sources of anomalous channel 1 which is not correlated to the Ch2-10 data plotted on the upper axes of a *channel 1 normalized* plot.

1) **Mislocation of the transmitter loop and/or survey stations**

Mislocating the transmitter loop and/or the survey stations results in an error in the calculated primary field at the station and appears as an anomalous Ch1 value not correlated to *channel 1 normalized* Ch2-10. The effect is amplified near the loop front. This can be seen in the profiles - the error in Ch1 generally increases approaching the loop. As a rule a 1% error in measurement of the distance from the loop will result in, for outside the loop surveys, an error in Ch1 of:

- 1% near the loop front (long-wire field varies as $1/r$)
- 3% at a distance from the loop front (dipolar field varies as $1/r^3$)
- 2% at intermediate distances (intermediate field varies as $\sim 1/r^2$)

Errors in elevation result in smaller errors but as they often affect the chainage they accumulate along the line.

The in-loop survey configuration generally diminishes geometric error since the field gradients are very low. At the centre of the loop the gradient in the vertical field is essentially zero so it is difficult to introduce geometric anomalies near the loop centre. Near the loop sides and at the closest approach of the lines to the wire mislocation of the loop and the station becomes more critical. Typically loop sides are designed to be >200m from any survey stations.

2) **Magnetostatic UTEM responses**

Magnetostatic UTEM responses arise over rocks which generate magnetic anomalies. Such magnetic materials will amplify the total (primary + secondary) field of the UTEM transmitter which is sensed by the receiver coil. The secondary field is generated by subtracting a computed primary which does not include magnetic effects. This can give rise to strong and abrupt channel 1 anomalies when the source of the magnetics is at surface. This is the case in a number of places on these grids. UTEM magnetostatic anomalies differ from DC magnetic anomalies in the following three major ways:

1) In the case of DC magnetics the field is dipping N and is very uniform over the scale of the survey area while the UTEM field inside the loop is vertical and it is stronger near the loop edges.
2) Most aeromagnetics are collected as total field while with UTEM we measure a given (in this case the z) component.
3)DC magnetic instruments observe the total magnetization of the causative body which is due to its susceptibility as well as any remnant magnetization. An AC method such as UTEM will not respond to the remnant portion of the magnetization.

The larger amplitude of the UTEM Ch1 response is explained by the fact that the UTEM primary field is often more favourably coupled (magnetostatically speaking) to magnetic mineralization as compared to the earths field. Another factor could be the presence of a reverse remnant component to the magnetization.
Note that positive (*negative*) magnetic anomalies will cause:
- positive (*negative*) Ch1 anomalies in data collected outside the loop
- negative (*positive*) Ch1 anomalies in data collected inside the loop

3) **Extremely good conductors**

An extremely good conductor will be characterized by a time constant much longer than the half-period (@ 30Hz >>16ms). This will give rise to an anomalous Ch1 which is not correlated to the Ch2-10 data plotted on the upper axes of a *channel 1 normalized* plot.