

SUB-REPORTER
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VANCOUVER, B.C.

COMINCO LTD.

LOG NO.	1027	RD.
AREA	WESTERN CANADA	
DATE		

EXPLORATION

NTS: 82F/2

FILMED

GEOPHYSICAL REPORT
ON A UTEM SURVEY
ON THE DODGE PROPERTY
NELSON M.D., B.C.
- ASSESSMENT REPORT -

Latitude : 49° 1'N

Longitude : 116°38'W

Work Performed by : J.J. Lajoie & J. G. Parkinson
Between : June 21st and July 4th, 1988

Claims Covered : DODGE 1, 2, 3 and 4

Claim Owner and Operator : COMINCO LTD.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

SEPTEMBER 1989

19,225 J. G. Parkinson

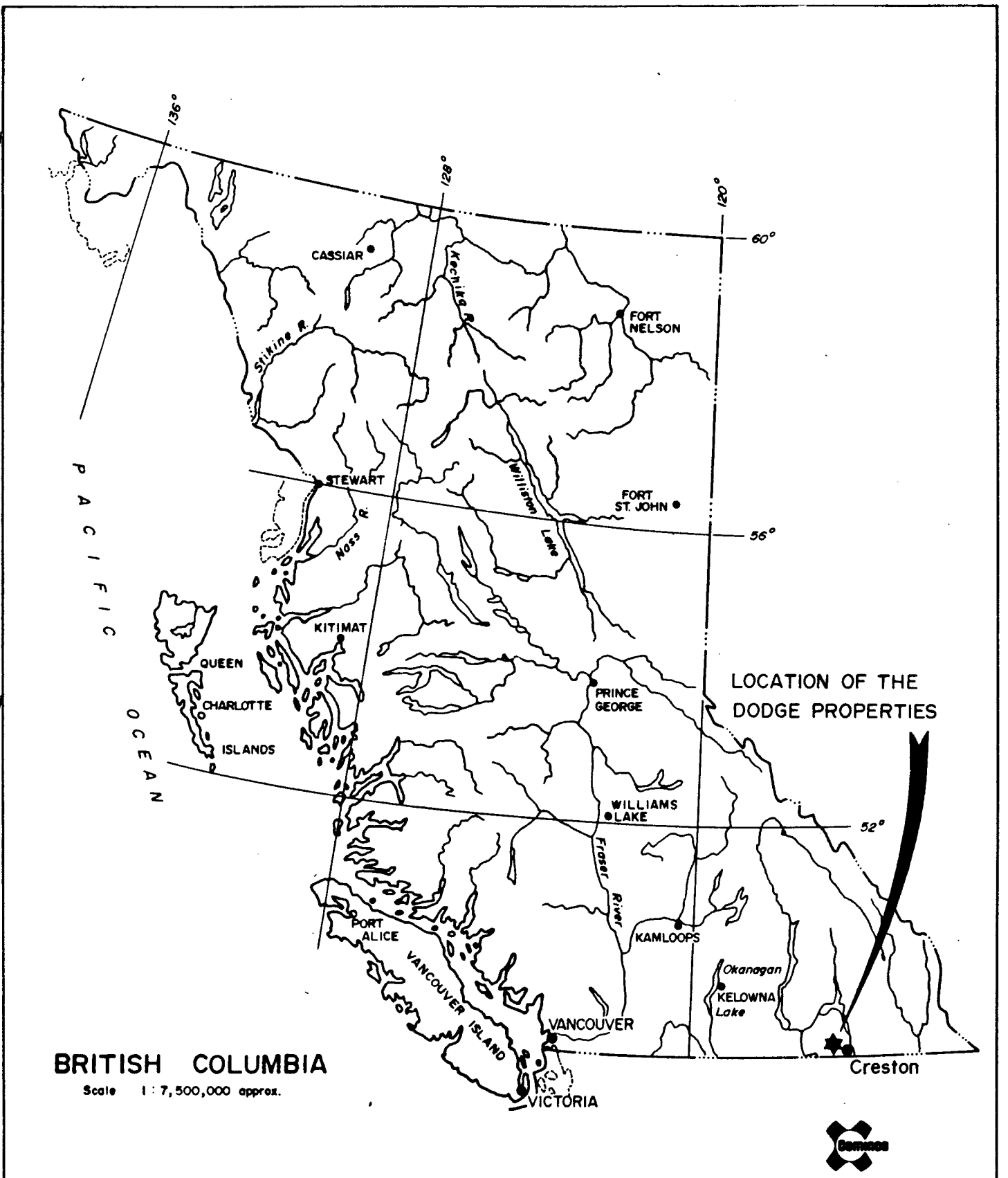
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LIST OF CLAIMS

Cominco Interest - Owner and Operator

<u>CLAIM</u>	<u>NO. OF UNITS</u>	<u>RECORD NO.</u>	<u>ASSESSMENT WORK DUE</u>
DODGE 1	20	4143	June 20, 1992
DODGE 2	15	4144	June 20, 1992
DODGE 3	15	4145	June 20, 1992
DODGE 4	15	4219	Sept. 12, 1992



BRITISH COLUMBIA

Scale 1 : 7,500,000 approx.

LOCATION OF THE
DODGE PROPERTIES



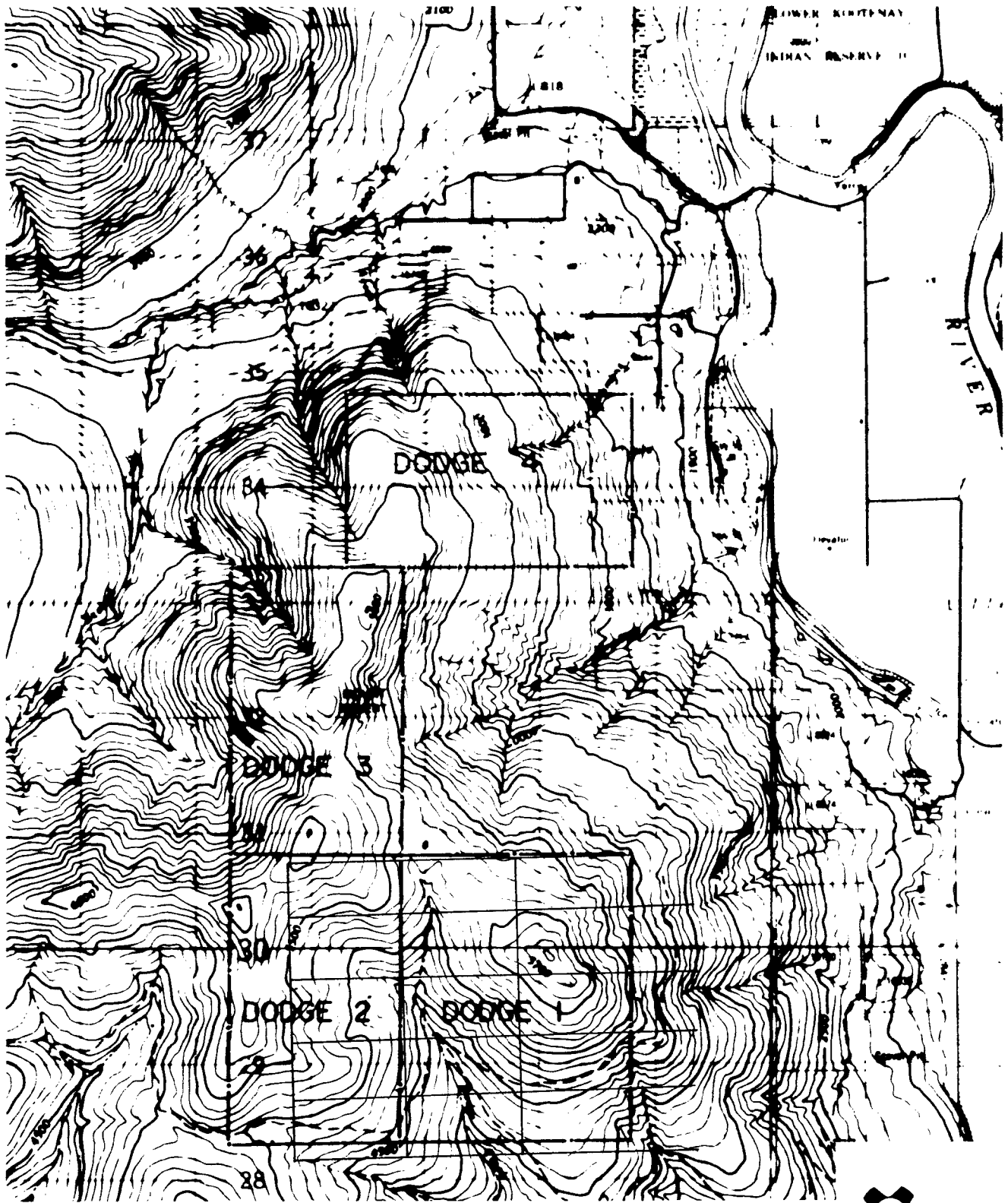
Drawn by: M.J.D.		Traced by:	
Revised by	Date	Revised by	Date

**DODGE PROPERTIES
GENERAL LOCATION MAP**

Scale: 1 : 7,500,000

Date: September /89

Plate: 364-89-1



Drawn by: M.J.D.		Traced by:	
Revised by	Date	Revised by	Date

DODGE PROPERTIES CLAIM MAP

Nelson M.D. 82F/2

Scale: 1:50,000 Date: September /89

Plate: 364-89-2

COMINCO LTD.

EXPLORATION

WESTERN CANADA

NTS: 82F/2

GEOPHYSICAL REPORT
ON AN UTEM SURVEY
ON THE DODGE PROPERTY
NELSON M.D., B.C.

- ASSESSMENT REPORT -

INTRODUCTION

During the time period of June 21st to July 4, 1989, a 15.8 km UTEM survey was carried out by a Cominco geophysical crew on the DODGE Property.

Geology of the present grid is Middle to Upper Aldridge sedimentary rocks of Proterozoic age. The Aldridge formation hosts the Sullivan orebody near Kimberley, B.C., and is thus a favourable geologic environment for exploration.

Kootenay Exploration of Cranbrook, B.C., a district office of Cominco Exploration - Western Canada, is the sole owner and operator of the DODGE property.

LOCATION AND ACCESS

The DODGE property is located 13 kms southwest of Creston, B.C. The property is closely bordered to the south by the International Boundary with the USA. The southern and central parts of the property are accessible by the Dodge Creek logging road which climbs for 8 km from the floor of the Kootenay River valley. The turnoff to this logging road is reached by travelling 6 kms west of Creston on Highway 3 and then 9 kms south along the Kootenay River.

DESCRIPTION OF UTEM SYSTEM

UTEM is an acronym for "University of Toronto ElectroMagnetometer". The system was developed by Dr. Y. Lamontagne (1975) while he was a graduate student of that University.

The field procedure consists of first laying out a large loop of single strand insulated wire and energizing it with current from a transmitter which is powered by a 1.7 kW motor generator. The loop is generally square shaped, wherever possible, with sides between 500 metres and 1,500 metres long. In this survey, the loop dimension was 1,500 m x 1,000 m. Survey lines are generally oriented perpendicular to one side of the loop and surveying can be performed both inside and outside the loop. The field procedure is similar to Turam, a better known electromagnetic surveying method.

The transmitter loop is energized with a precise triangular current waveform at a carefully controlled frequency (30.9 Hz for this survey). The receiver system includes a sensor coil and backpack portable receiver module which has a digital recording facility on cassette magnetic tape. The time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units which must be accurate to about one second in 50 years.

The receiver sensor coil measures the vertical magnetic component of the electromagnetic field and responds to its time derivative. Since the transmitter current waveform is triangular, the receiver coil will sense a perfect square wave in the absence of geologic conductors. Deviations from a perfect square wave are caused by electrical conductors which may be geologic or cultural in origin. The receiver stacks any pre-set number of cycles in order to increase the signal to noise ratio.

The UTEM receiver gathers and records 9 channels of data at each station. The higher number channels (7-8-9) correspond to short time or high frequency while the lower number channels (1-2-3) correspond to long time or low frequency. Therefore, poor or weak conductors will respond on channels 9, 8, 7 and 6. Progressively better conductors will give responses on progressively lower number channels as well. For example, massive, highly conducting sulphides or graphite will produce a response on all nine channels.

The UTEM receiver records data digitally on a cassette. This tape is played back into a computer at the base camp. The mini computer processes the data and controls the plotting on a small (11" x 15") graphics plotter. Data are portrayed as profiles of each of the nine channels, shown for each survey line of each transmitter loop. These profiles and an interpretive plan are appended to this report.

The magnetic field amplitudes from both the transmitter loop (primary field) and from the electric currents induced in the ground (secondary field) vary considerably from the beginning of a line (near the transmitter loop) to the end of the survey line (far away from the transmitter loop). In order to present such data, a normalizing scheme must be used. In this survey, the primary field from the loop is used for normalizing and presenting the data in two ways.

1. Continuously normalized plots.

This is the standard normalization scheme.

a) For Channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - P}{P} \times 100$$

where P is the primary field from the loop at the station and Ch.1 is the observed amplitude for Channel 1.

b) For the remaining channels (n=2 to 9)

$$\% \text{ Ch.n anomaly} = \frac{\text{Ch.n} - \text{Ch.1}}{\text{Ch.1}} \times 100$$

where Ch.n is the observed amplitude of Channel n (2 to 9).

2. Point normalized plots.

These plots display an arrow at the top of the section indicating the station to which all data on the line are normalized. The purpose of point normalized plots is to display only the relative amplitude variation of the secondary field along the line, that is, only that magnetic field from the currents induced in the ground.

a) For Channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - P_{pn}}{P_{pn}} \times 100$$

where P_{pn} is the primary field from the loop at the point norm station and Ch.1 is the observed amplitude for Channel 1.

b) The remaining channels (n=2 to 9) are Channel 1 reduced and Channel 1 normalized:

$$\% \text{ Ch.n anomaly} = \frac{\text{Ch.n} - \text{Ch.1}_{pn}}{\text{Ch.1}_{pn}} \times 100$$

where Ch.n is the observed amplitude of Channel n and Ch.1_{pn} is the observed Channel 1 amplitude at the point norm station

Point normalized plots are usually produced on data sections containing anomalies in order to help interpretation by providing a different perspective to the data. In this survey, all the Data Section numbers containing a "p" are point normalized plots.

The above normalizing procedures result in chaining errors displayed in Channel 1 only, since all other channels are normalized to Channel 1.

INTERPRETATION

Four loops of UTEM data were collected on the DODGE Property in June and July of 1989.

A Channel 8 crossover type conductor was detected on Loop 3, located at: Line 500N at Station 550E.

CONCLUSIONS

15.8 kms of UTEM electromagnetic surveying were completed on the DODGE claims in June/July 1989. The survey results show only a crossover anomaly, representing a weakly conductive zone at shallow depth.

Report by: J. G. Parkinson
 J. G. Parkinson, B.Sc.
 Geophysicist
 Cominco Ltd.

Approved for
 Release: W. J. Wolfe
 W. J. Wolfe
 Manager, Exploration
 Western Canada
 Cominco Ltd.

Distribution:

Mining Recorder (2)
 Kootenay Exploration (1)
 Western District (1)
 Geophysics Files (1)

A P P E N D I X I

IN THE MATTER OF THE B.C. MINERAL ACT
AND THE MATTER OF A GEOPHYSICAL PROGRAMME
CARRIED OUT ON THE DODGE 1-4 CLAIMS
LOCATED 13 KMS SOUTHWEST OF CRESTON, B.C.

IN THE NELSON MINING DIVISION OF THE
PROVINCE OF BRITISH COLUMBIA,

MORE PARTICULARLY

N.T.S. 82F/2

S T A T E M E N T

I, Graham Parkinson, of 1643 Collingwood Street, in the City of Vancouver, in the Province of British Columbia, make oath and say:

1. THAT I am employed as a geophysicist by Cominco Ltd. and, as such have a personal knowledge of the facts to which I hereinafter depose;
2. THAT annexed hereto and marked as "Exhibit A" to this statement is a true copy of expenditures incurred on a geophysical survey on the DODGE Claims;
3. THAT the said expenditures were incurred between June 21st and July 4th, 1989 for the purpose of mineral exploration on the above-noted claims.

J. G. Parkinson

J. G. Parkinson, B.Sc.
Geophysicist, Cominco Ltd.

Dated this 16th day of October, 1989
at Vancouver, B.C.

A P P E N D I X II

E X H I B I T "A"

STATEMENT OF EXPENDITURES (1989)

DODGE PROPERTY - June 21st to July 4th, 1989

1. STAFF COSTS

a)	D. Pighin, supervision 2 days @ \$250/day	500.00	
b)	J.J. Lajoie, geophysicist 17.5 days @ \$415/day	7,262.50	
c)	J.G. Parkinson, geophysicist 19 days @ \$215/day	4,085.00	
d)	J.V. Bjelica, assistant 14 days @ \$ 85/day	1,190.00	
e)	N.E. Murphy, assistant 14 days @ \$100/day	1,778.00	
		14,815.50	

2. OPERATING DAY CHARGES

Note: This charge is applied for those days on which useful data are acquired, to cover the cost of data compilation, drafting, interpretation and report.

6.5 days @ \$375/day	2,437.50
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3. EQUIPMENT RENTAL

UTEM Standby	3 days @ \$ 75/day	225.00	
UTEM	18 days @ \$150/day	2,700.00	
Ford UTEM 4x4 Truck	14 days @ \$40/day	560.00	
Rental 4x4 Truck	14 days @ \$40/day	560.00	
Use of Radios	14 days @ \$25/day	350.00	
		4,395.00	

4. EXPENSE ACCOUNTS

J.J. Lajoie	1,600.08	
J.G. Parkinson	859.57	
J.V. Bjelica	354.00	
N.E. Murphy	354.00	
	3,167.65	

5. MISCELLANEOUS

Domicile, Creston, B.C.	14 days @ \$25/day	350.00	
Freight Charges		1,054.35	
		1,404.35	

TOTAL	\$ 26,220.00
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A P P E N D I X III

CERTIFICATE OF QUALIFICATIONS

I, J. GRAHAM PARKINSON, of 1643 Collingwood Street, in the City of Vancouver Province of British Columbia, do hereby certify:

- i. THAT I graduated with a B.Sc. in Physics from the University of British Columbia in 1980.
- ii. THAT I am graduated with a Certificate in Geophysics from the University of Alberta in 1984.
- iii. THAT I am a member of the B.C. Geophysical Society and of the Northwest Mining Association.
- iv. THAT I have been practising Geophysics from 1981 to 1989, and have been an employee of Cominco Ltd. since June 1989.

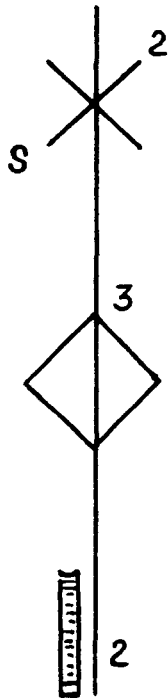
J. G. Parkinson

J. Graham Parkinson, B.Sc.
Geophysicist, Cominco Ltd.

SEPTEMBER 1989

LEGEND

UTEM COMPILATION MAPS



Axis of a crossover anomaly. The number indicates the latest anomalous channel.

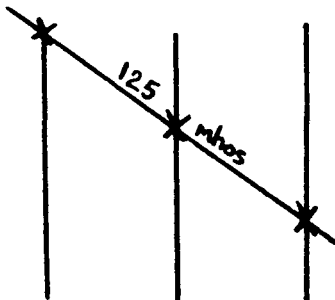
Depth indicated by: S - Shallow (< 50 m)
M - Moderate (50-150 m)
D - Deep (> 150 m)

Axis of reversed crossover anomaly produced when a small conductor dips at less than 70° towards the transmitter. In normal crossover the positive response is towards the transmitter; reversed one, it is away from the transmitter.

Indicates a negative anomaly of width shown by the dash. The latest anomalous channel is shown. Can sometimes be confused with the negative part of a crossover anomaly.



Outline of a transmitter loop.



Conductor axis located by crossover anomalies with a conductance determination. The conductance is the interpreted conductivity x thickness of the conductor in mhos (same as Siemens).

Only the principal crossovers are indicated.

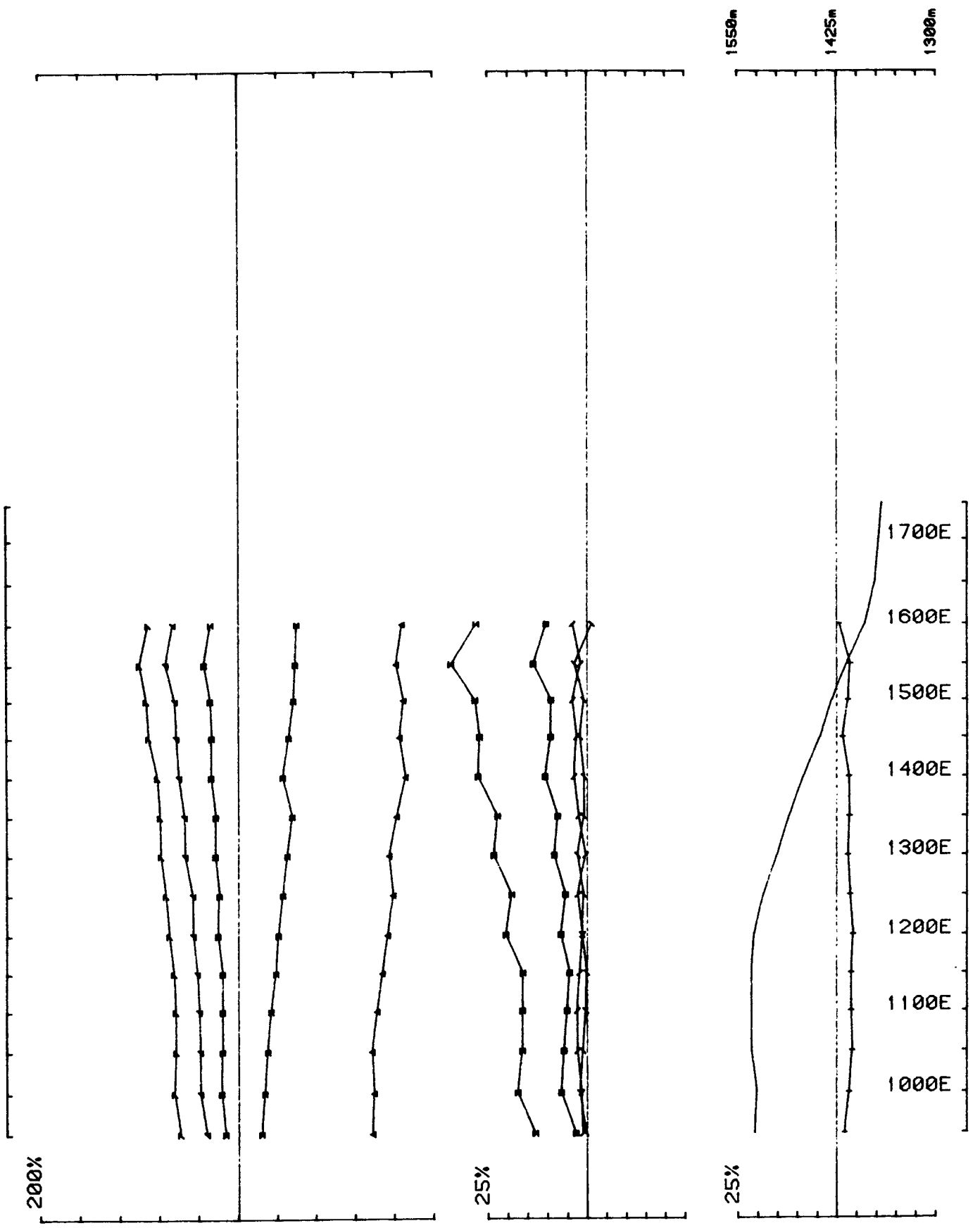
LEGEND

UTEM DATA SECTIONS

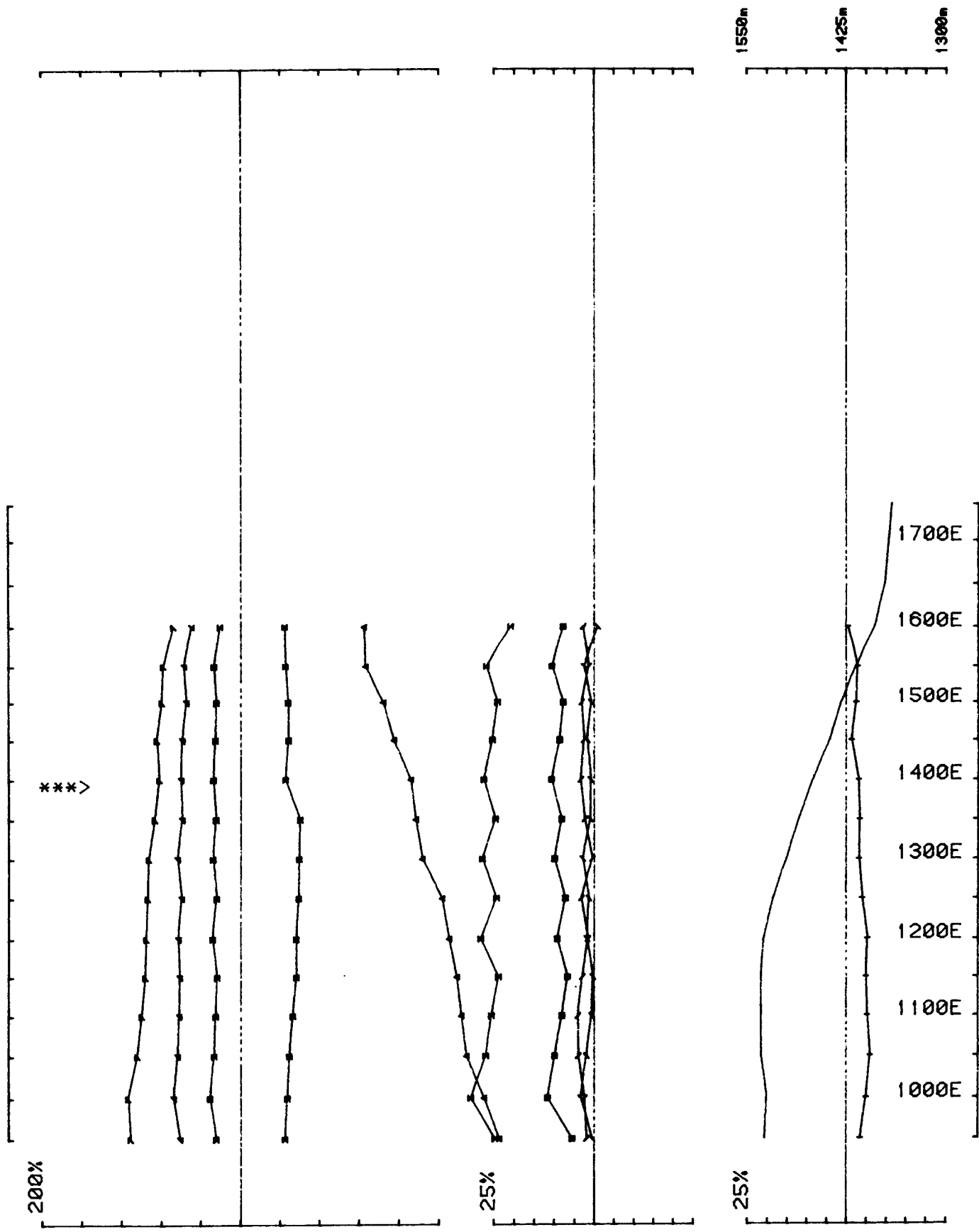
ORDINATE: Amplitude scale is given in %

ABSCISSA: Station or Picket Numbers in Hundreds of Meters

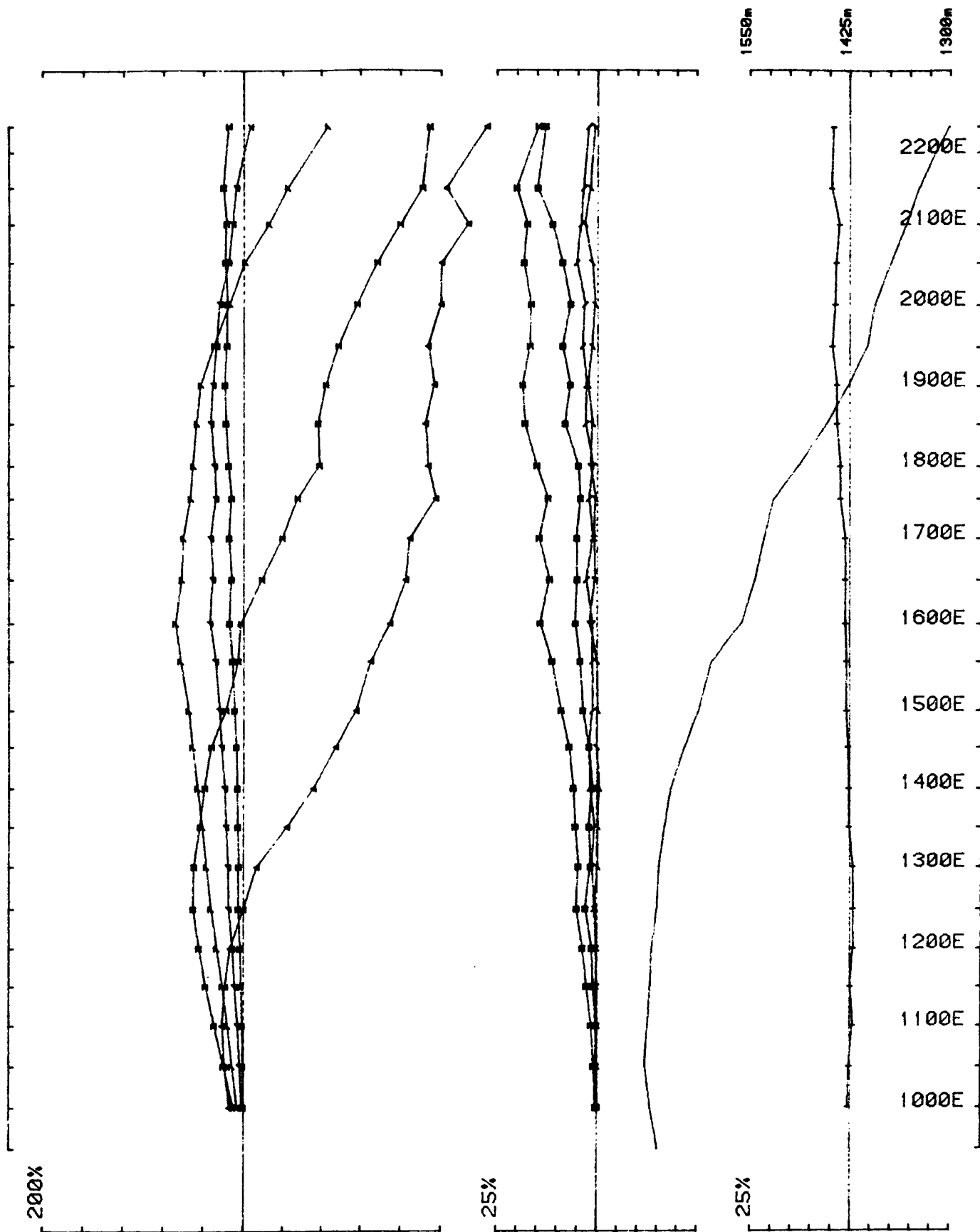
SYMBOL	CHANNEL	MEAN DELAY TIME	
		15 Hz	30 Hz
	1	25.6 ms	12.8 ms
/	2	12.8	6.4
\	3	6.4	3.2
□	4	3.2	1.6
Σ	5	1.6	0.8
△	6	0.8	0.4
7	7	0.4	0.2
⊗	8	0.2	0.1
△	9	0.1	0.05
◇	10	0.05	0.025



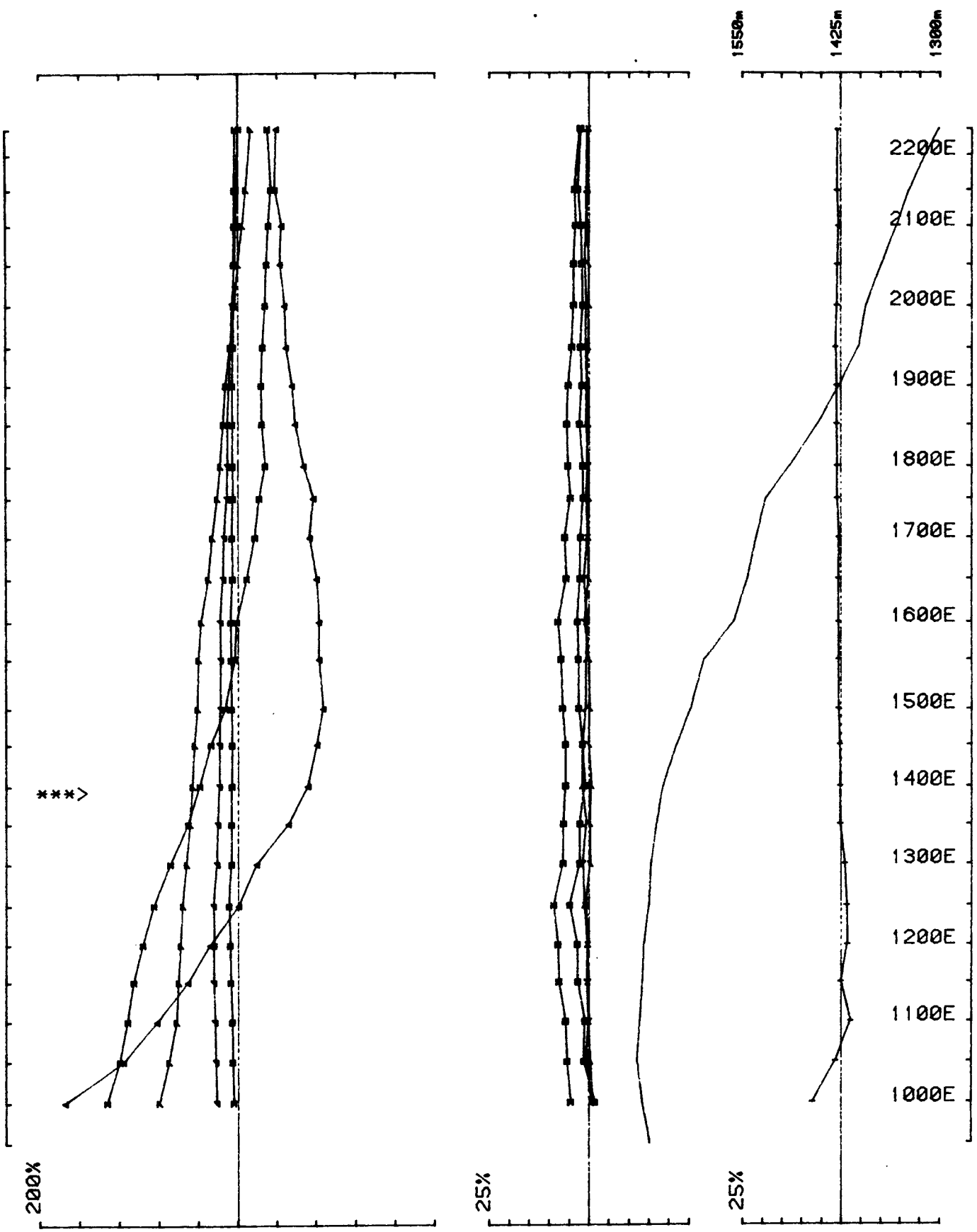
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 Loopno 1 Line 600N component Hz secondary Ch 1 normalized Ch 1 reduced



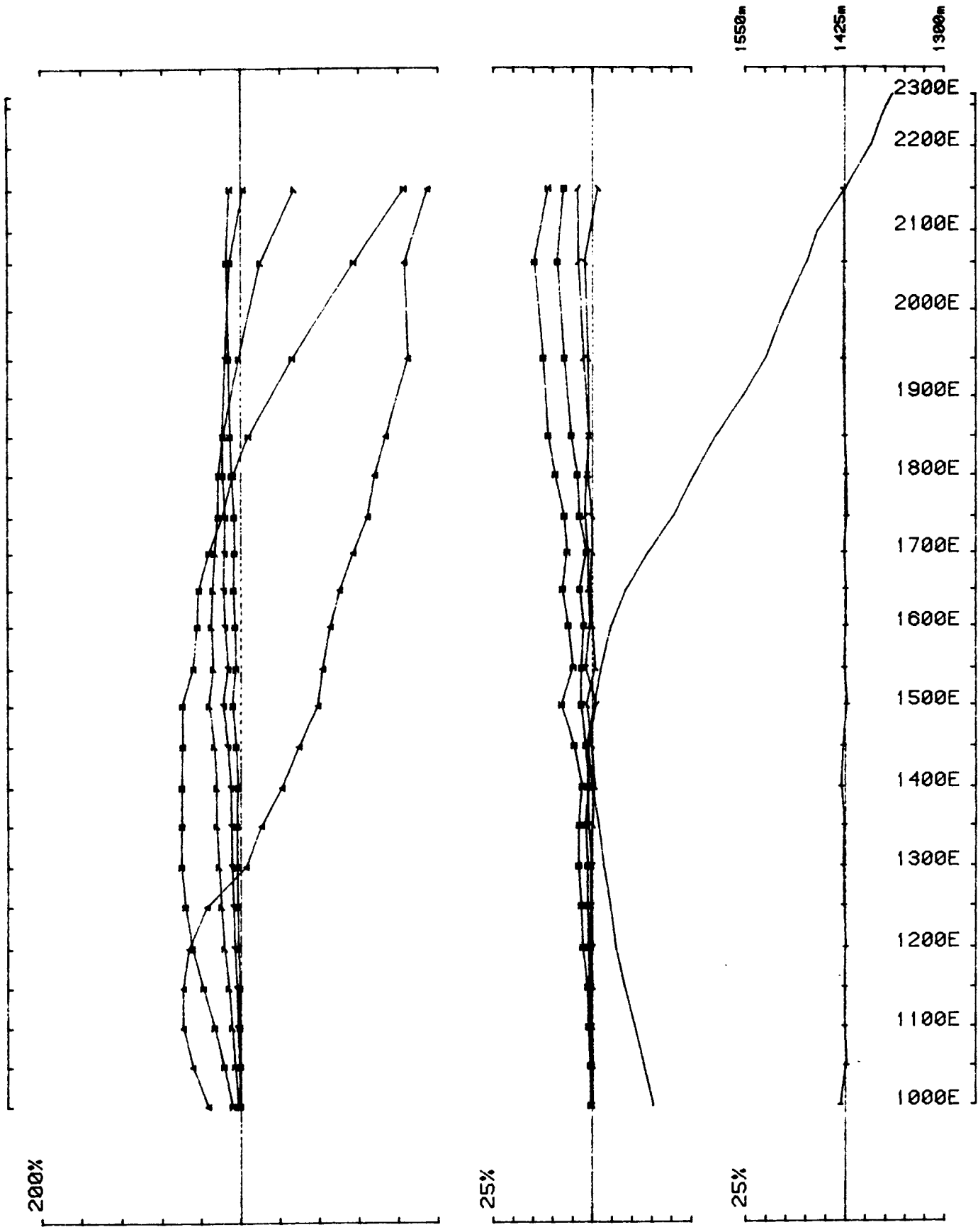
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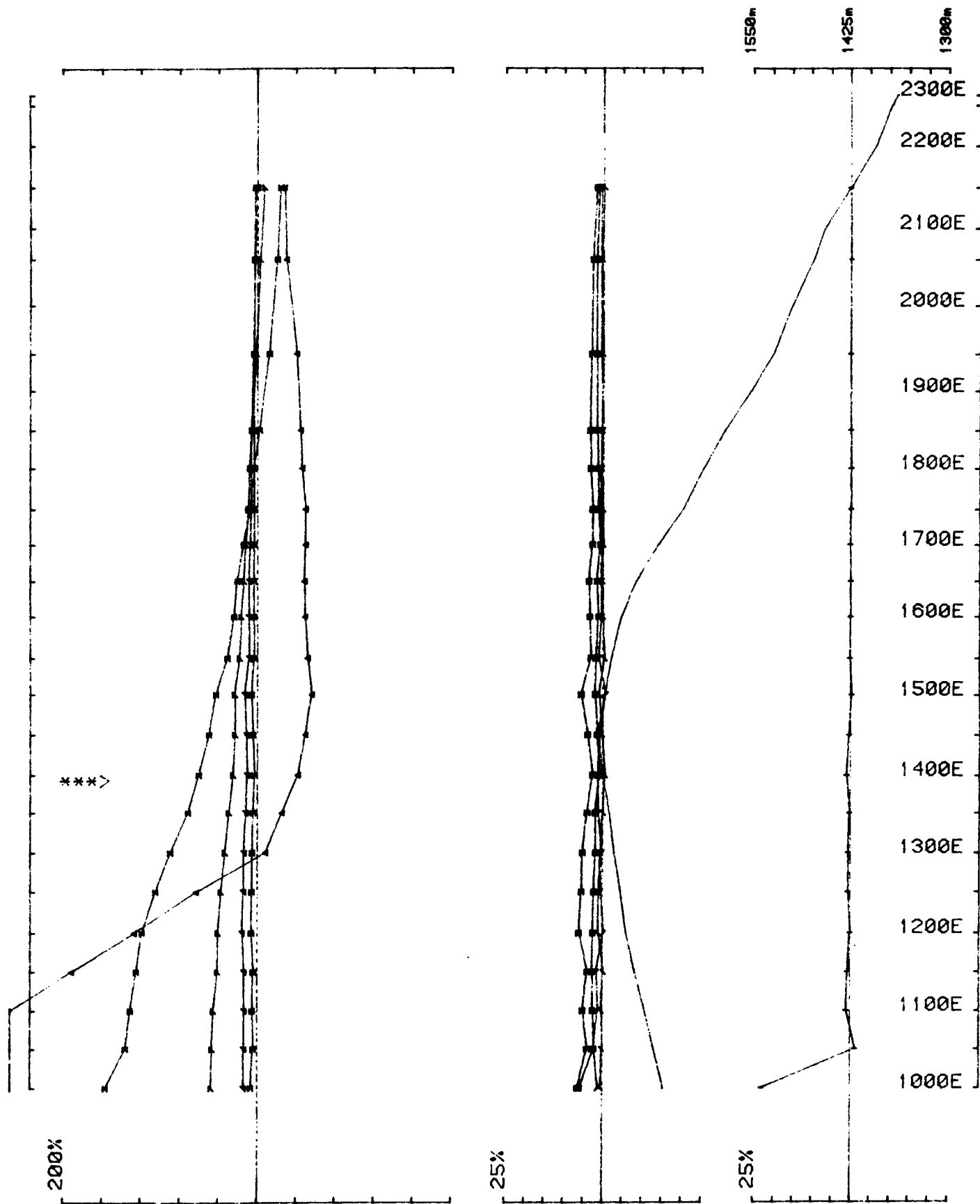
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 Loopno 1 Line 0S component Hz secondary Ch 1 normalized Ch 1 reduced



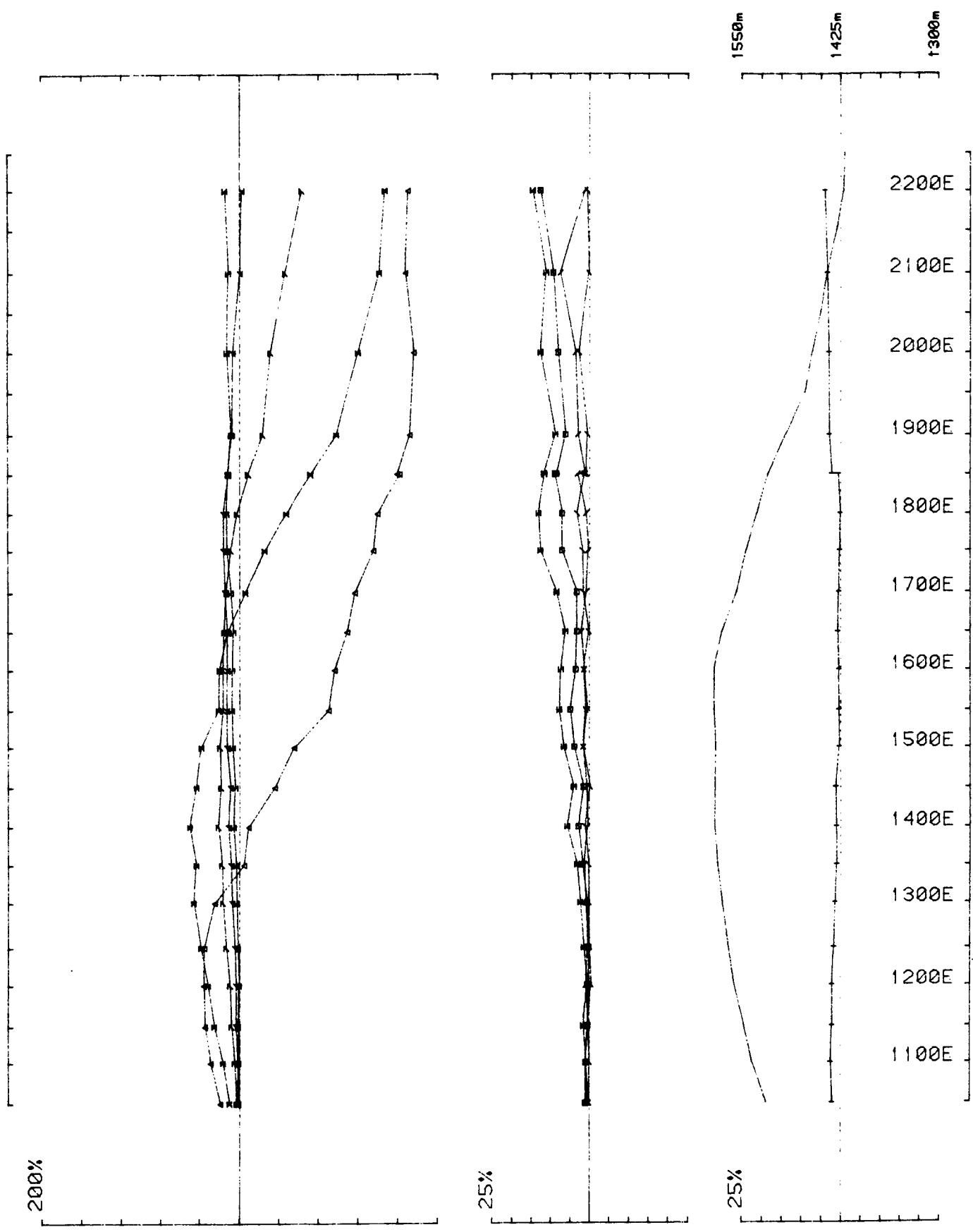
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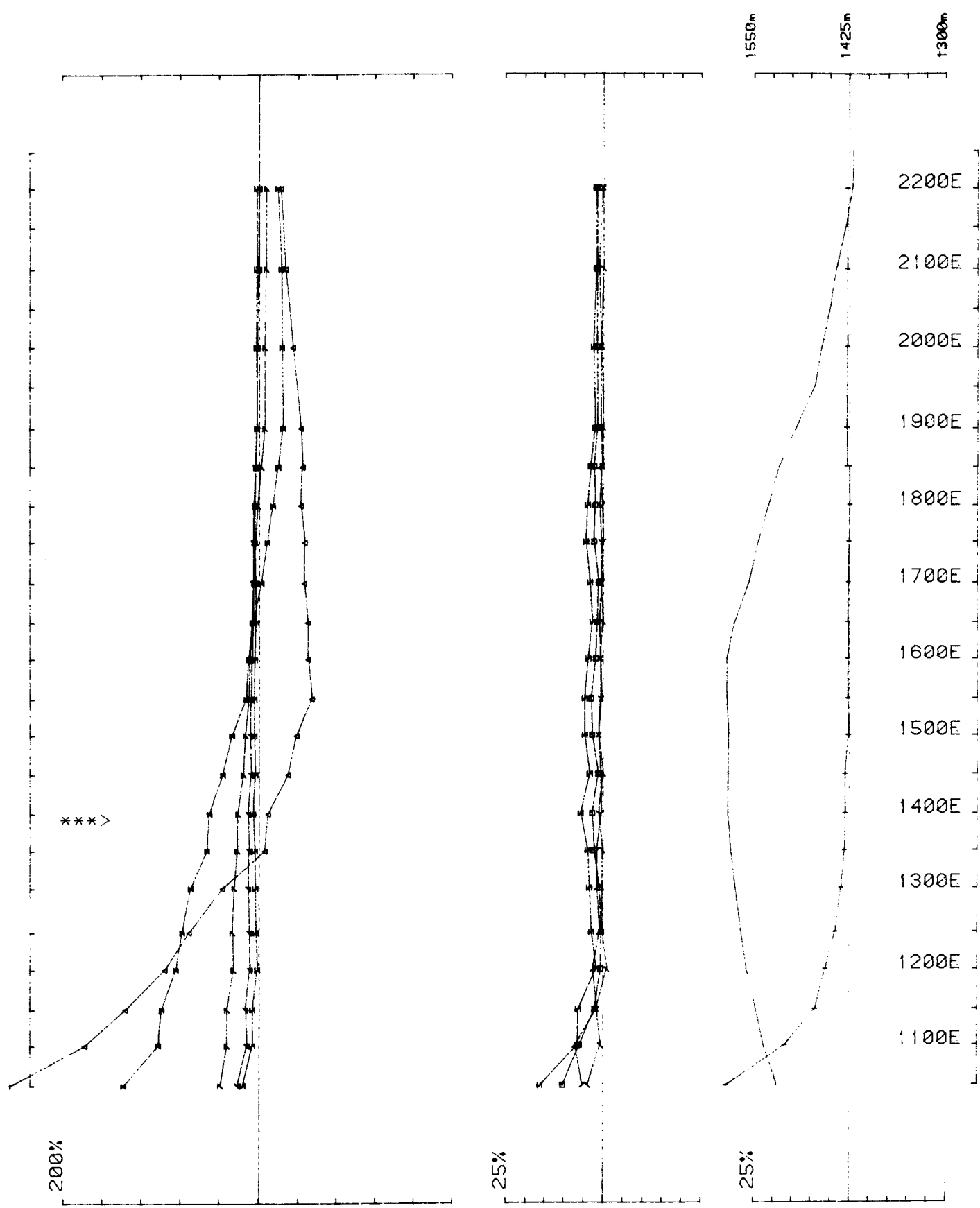
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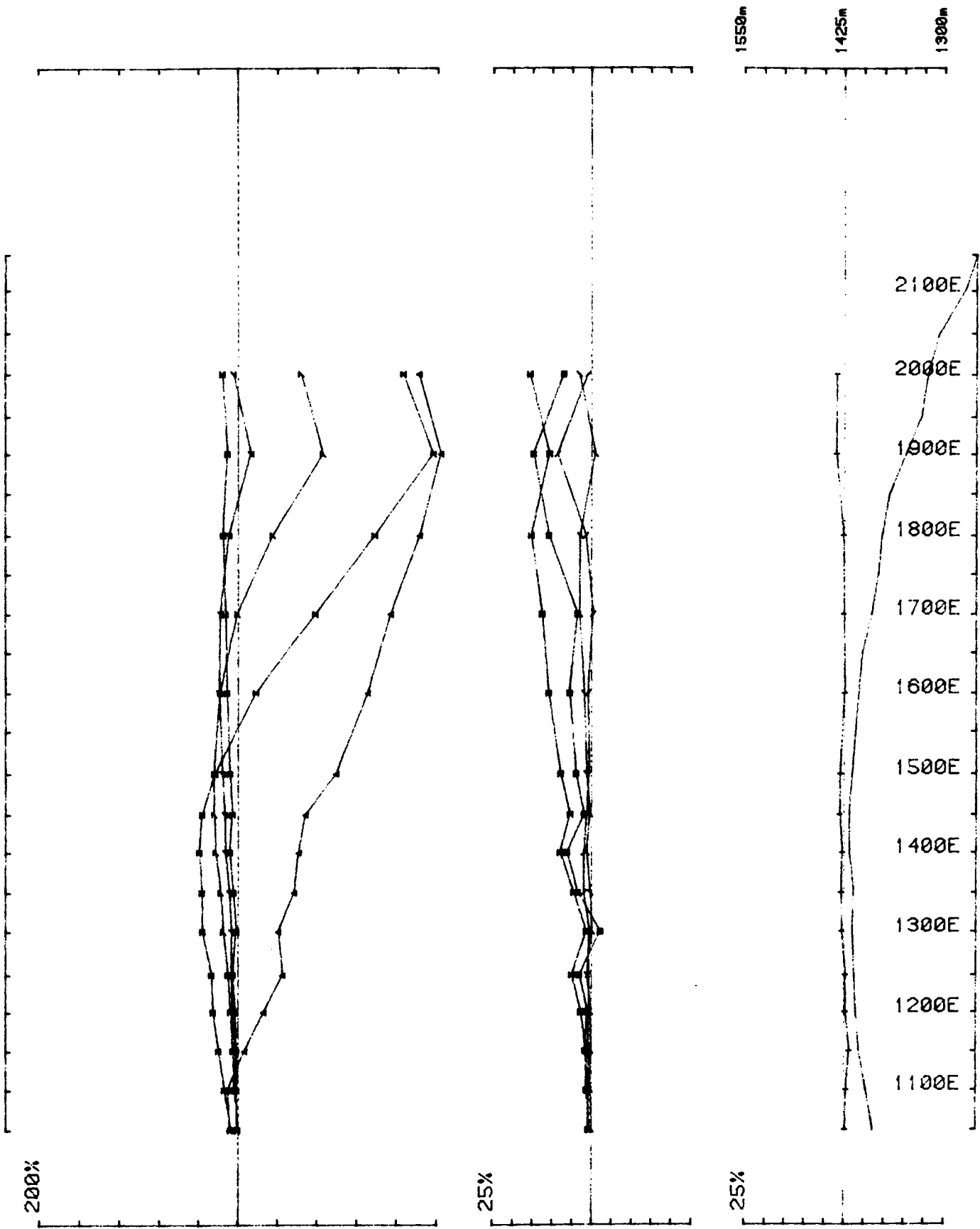
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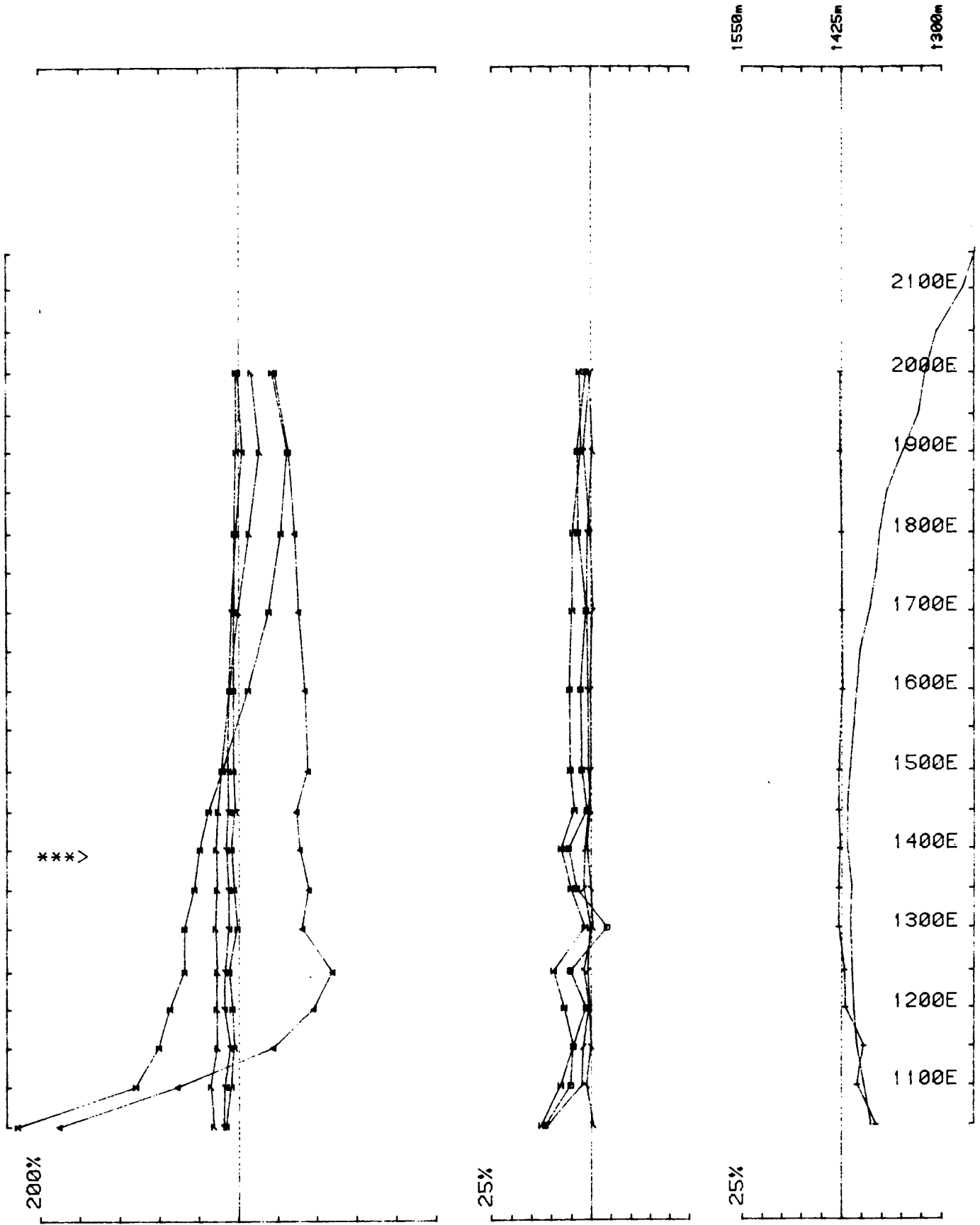
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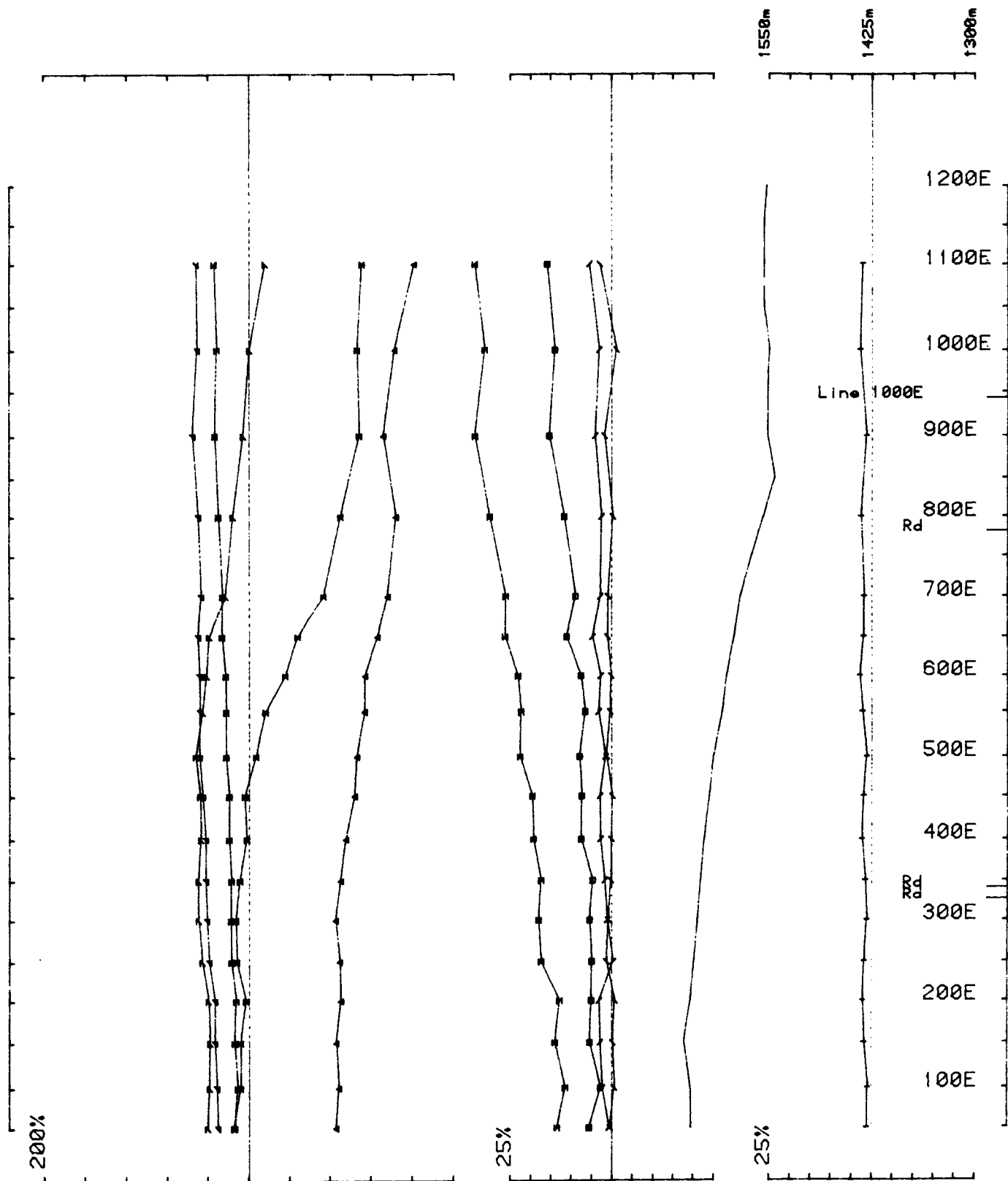
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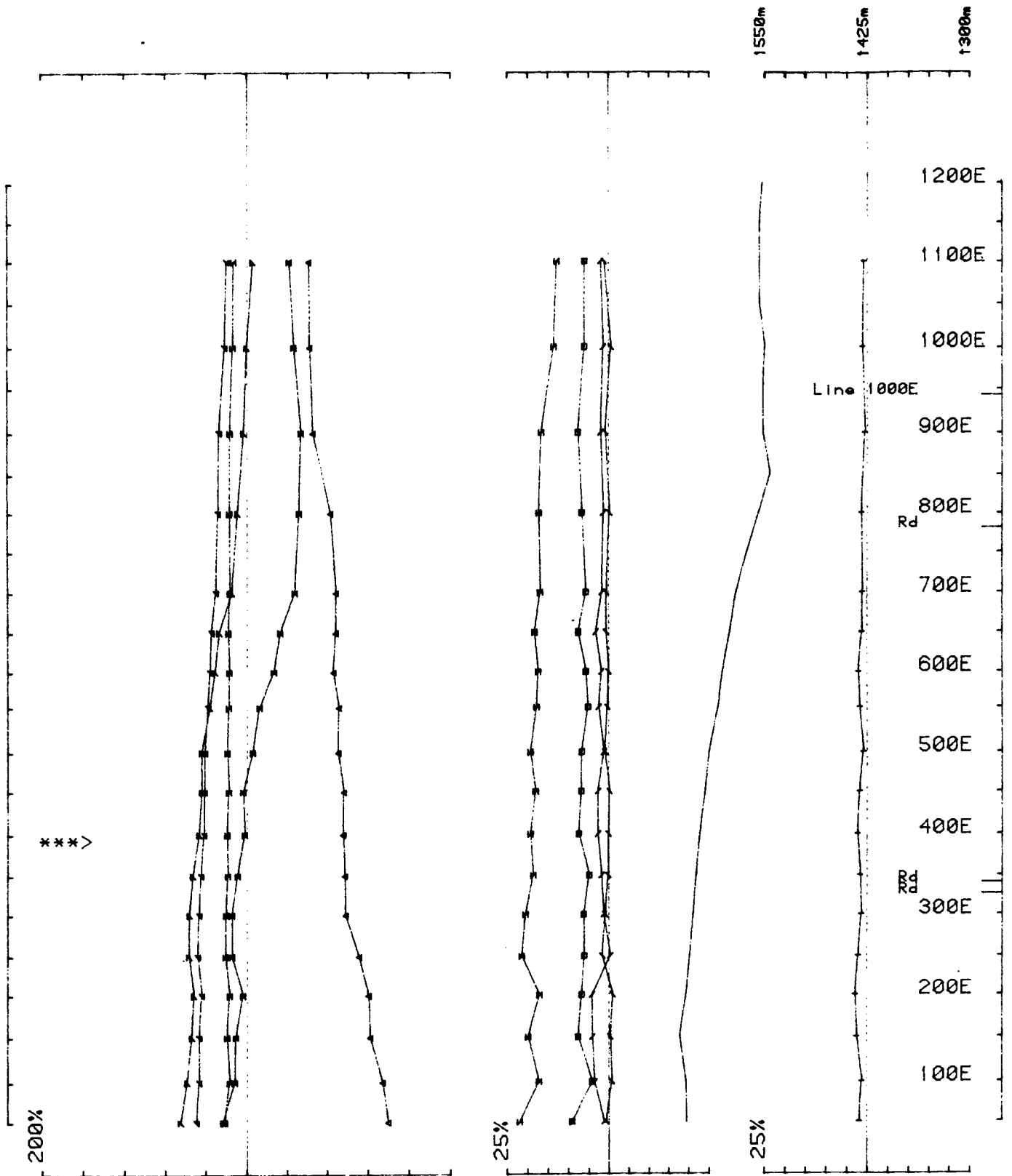
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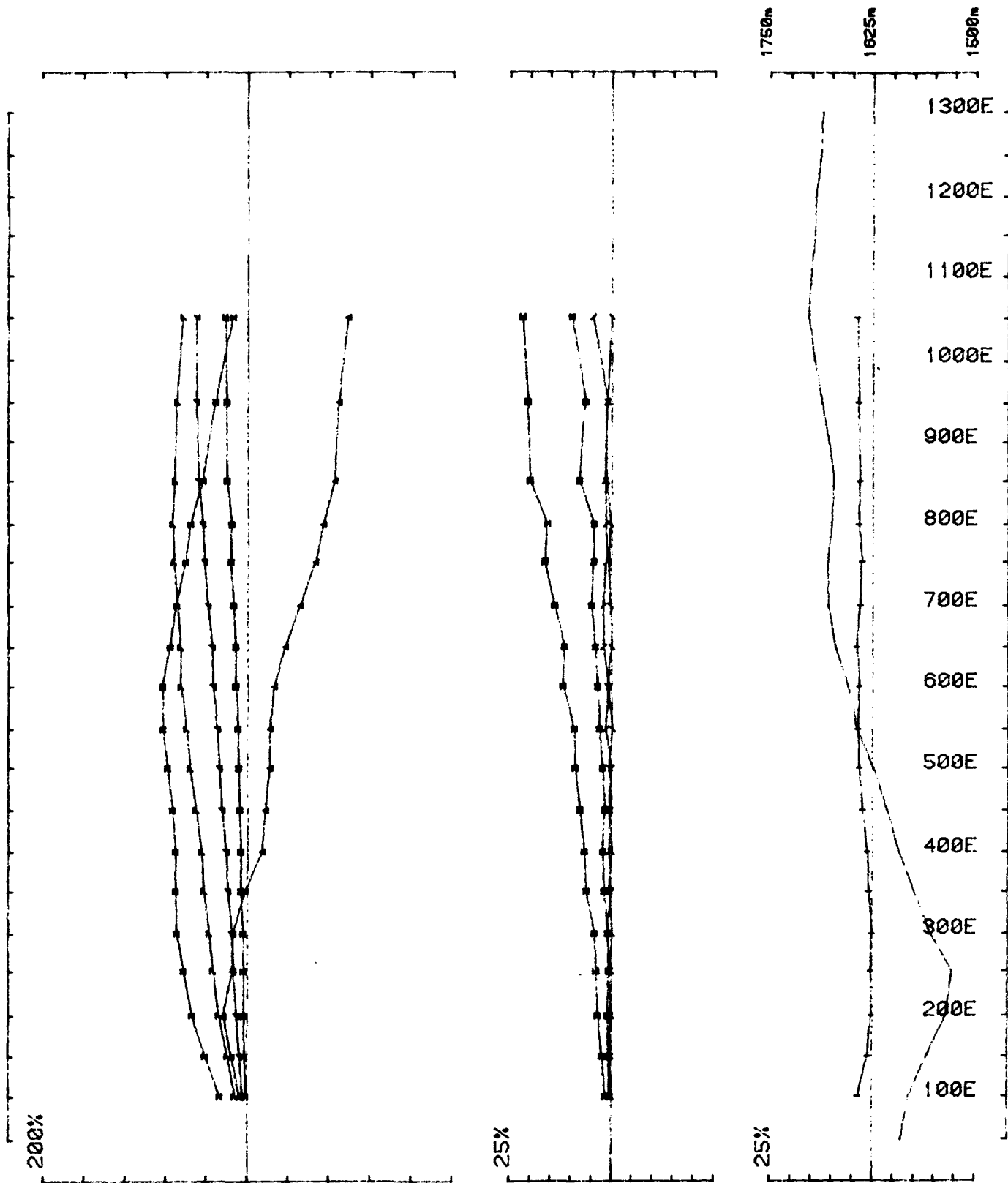
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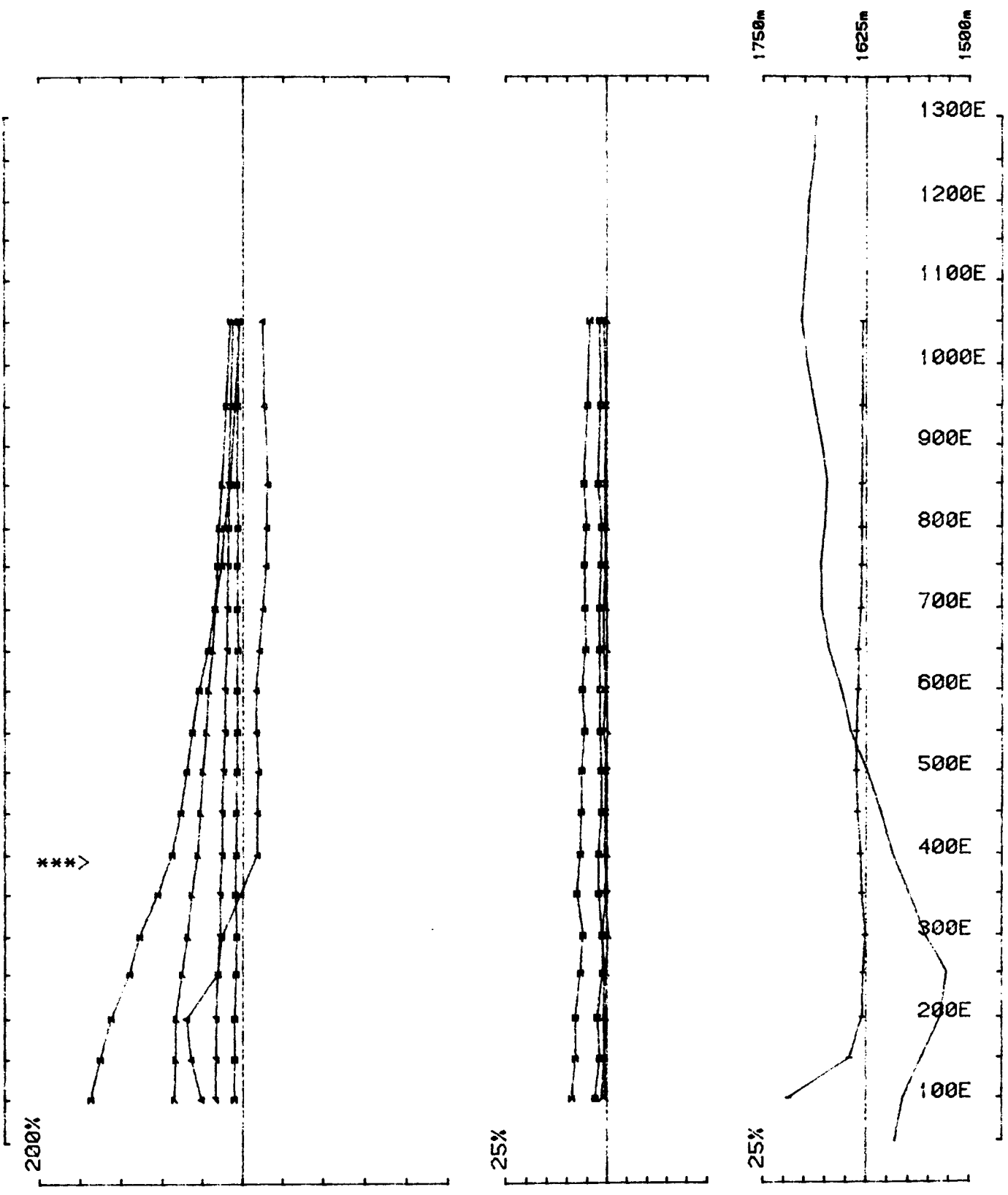
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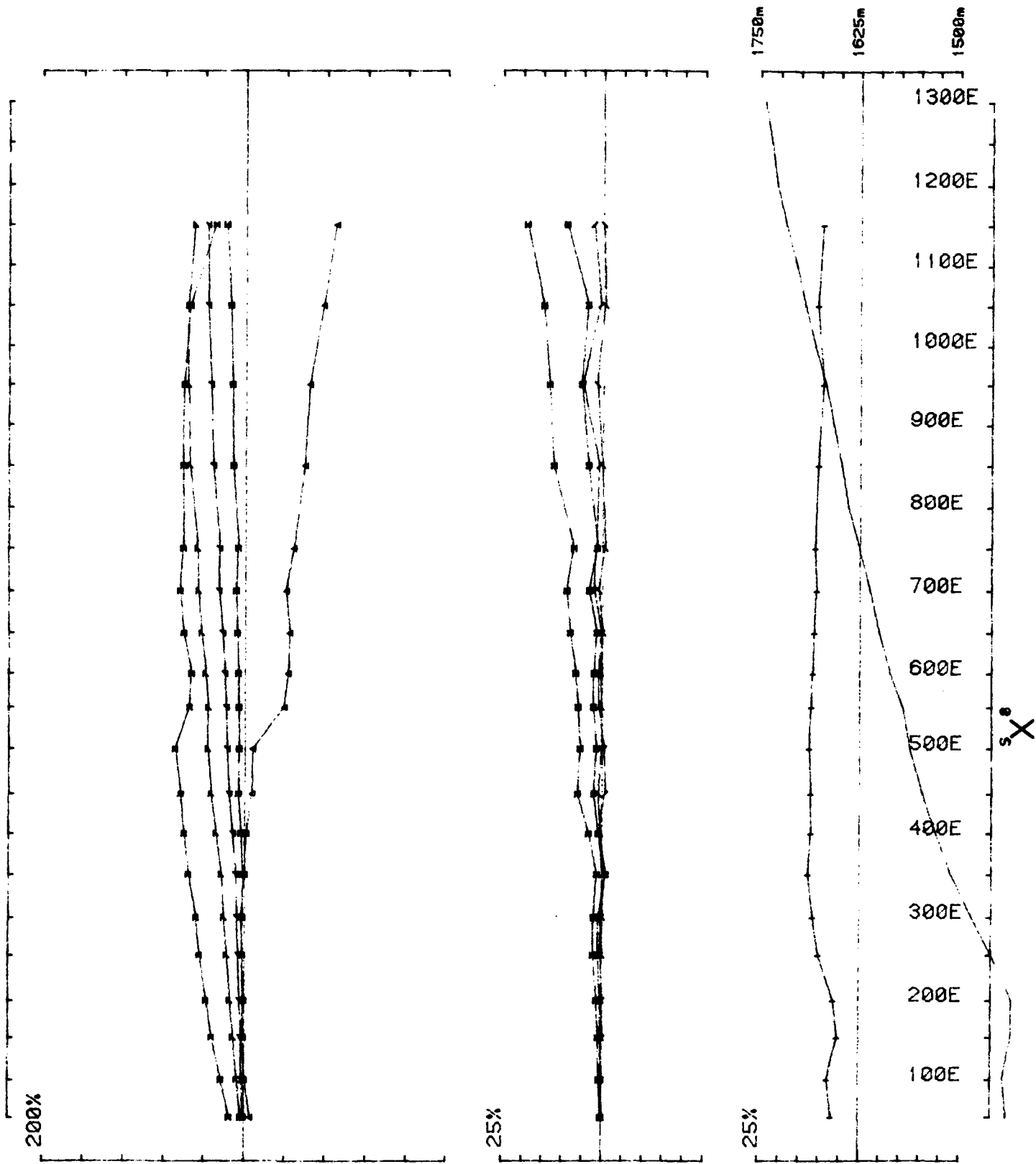
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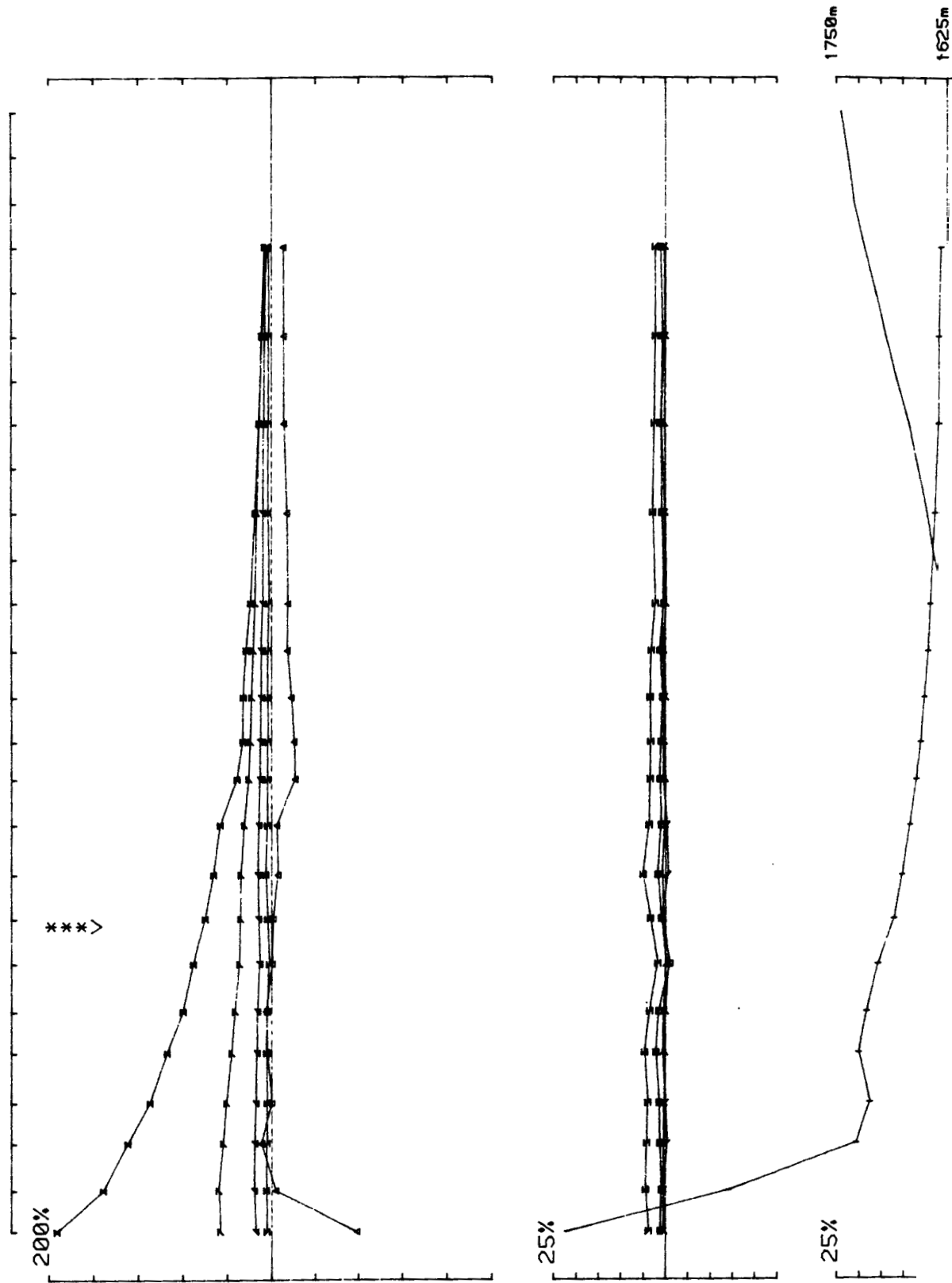
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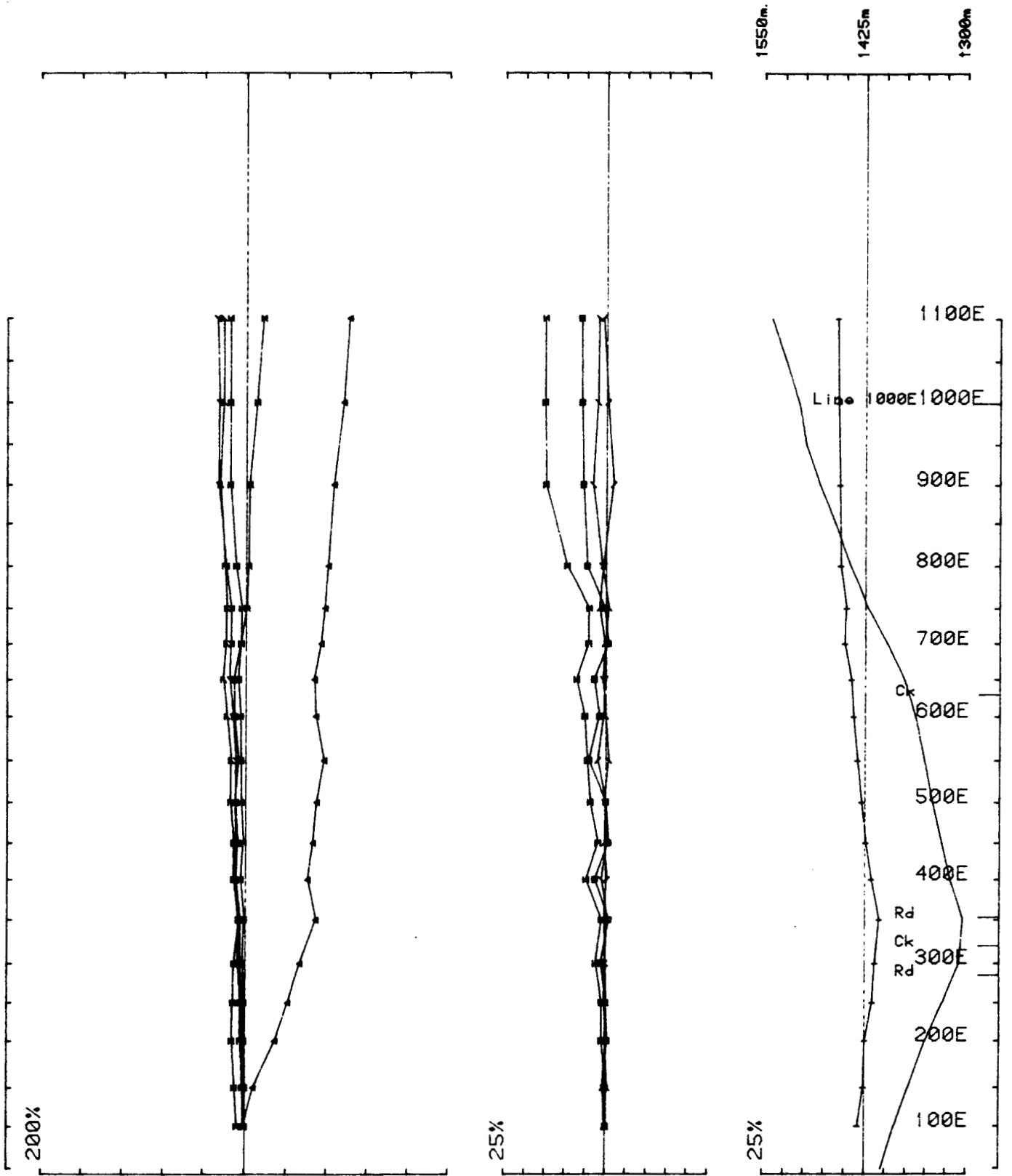
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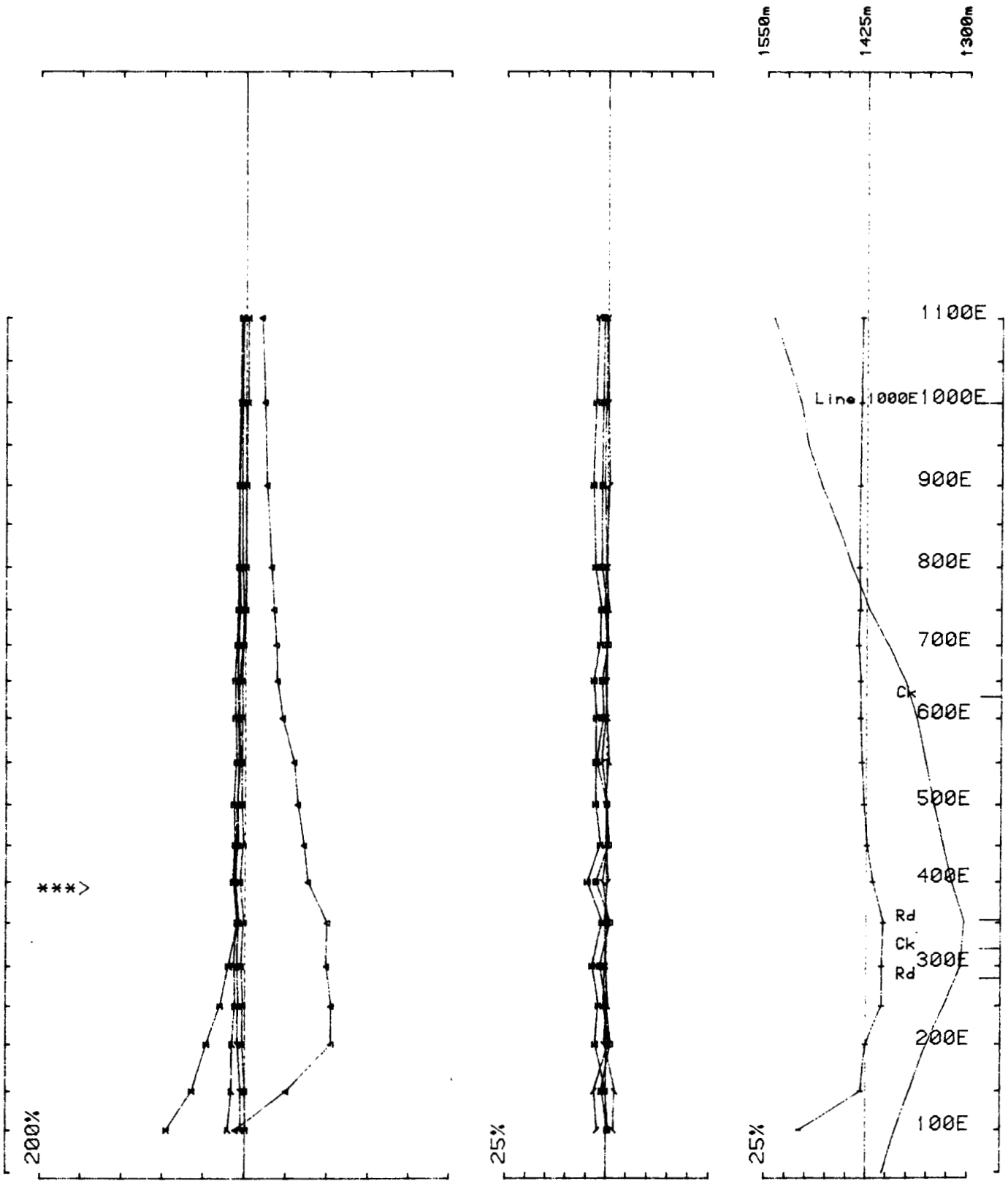
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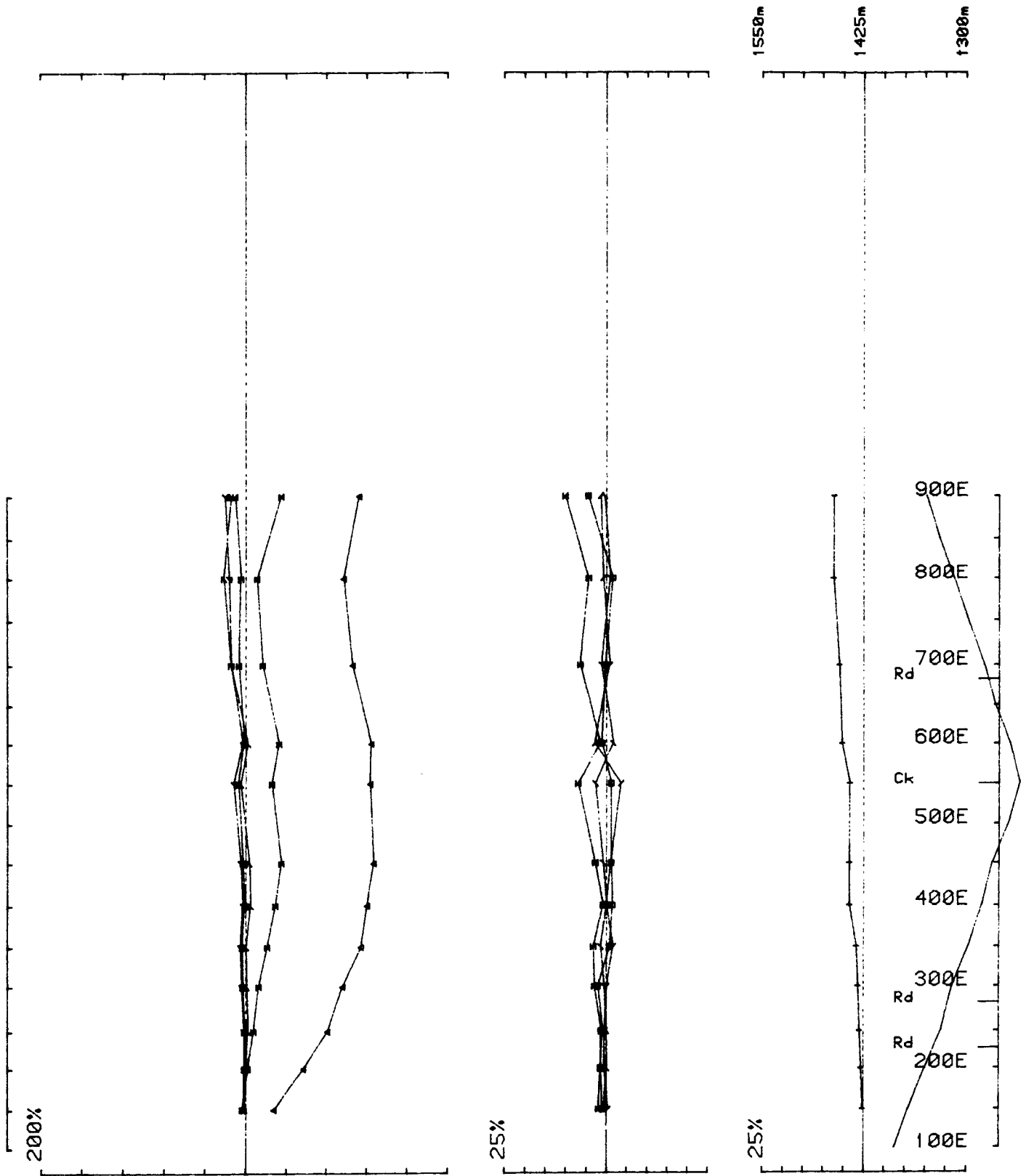
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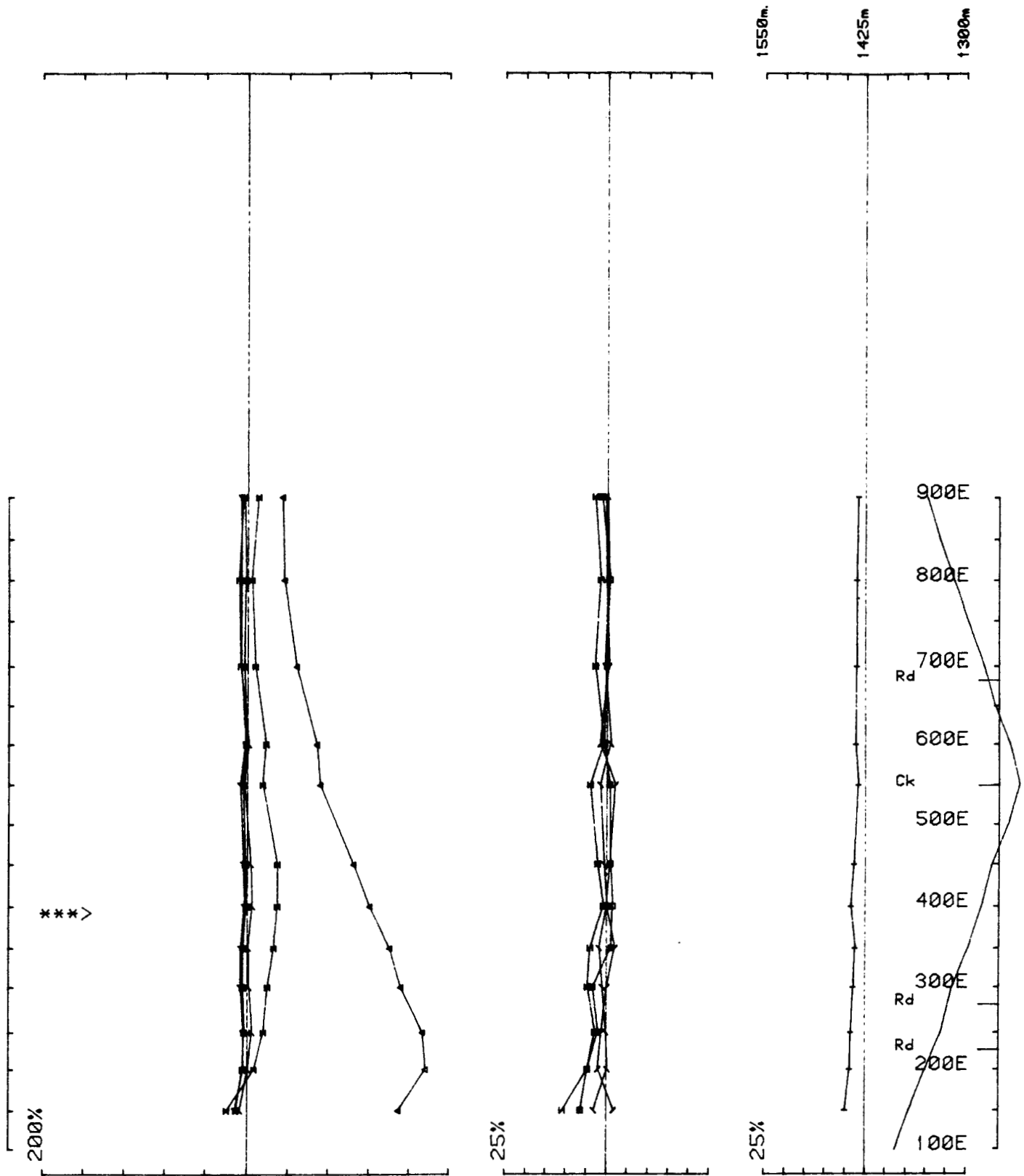
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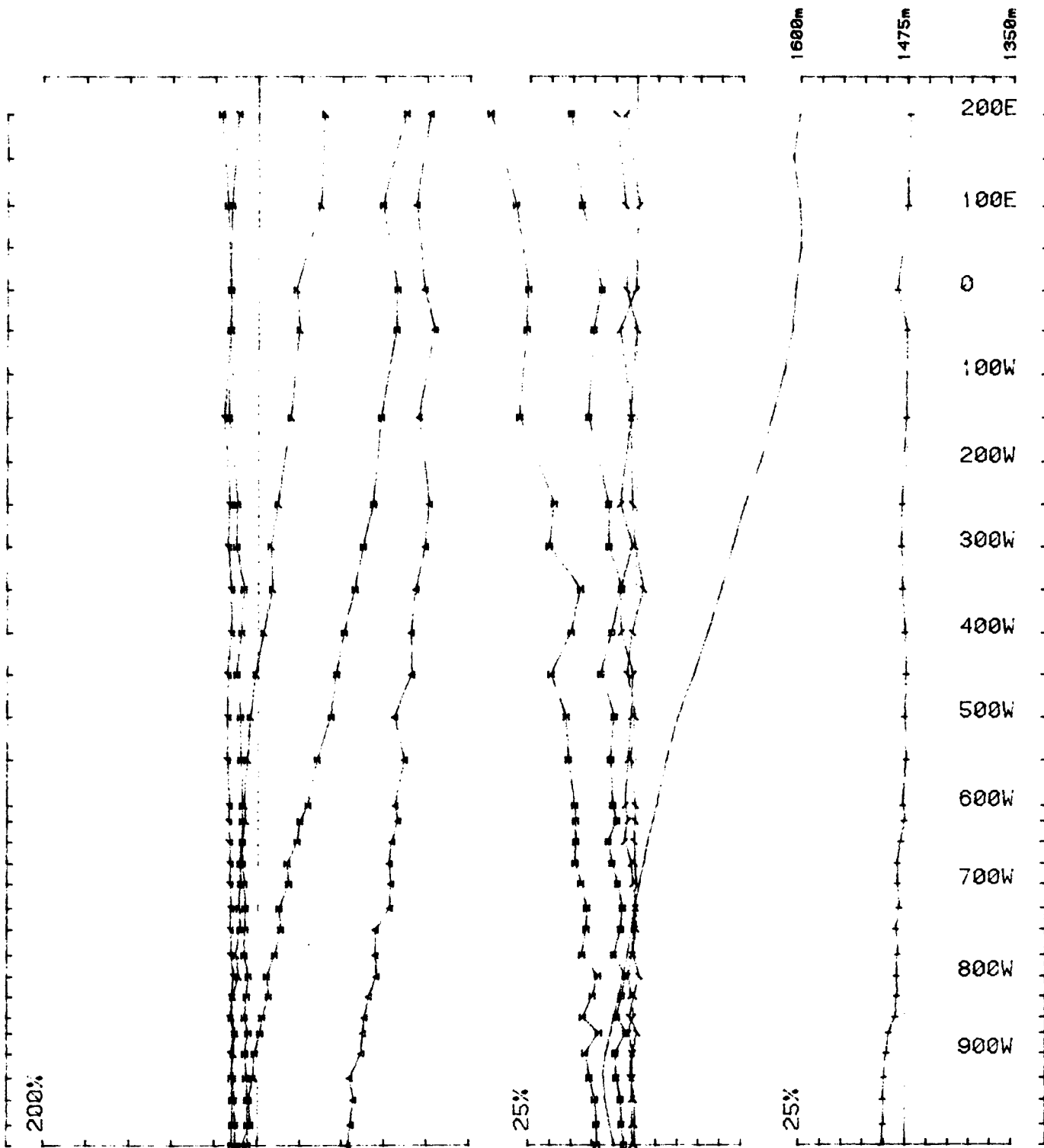
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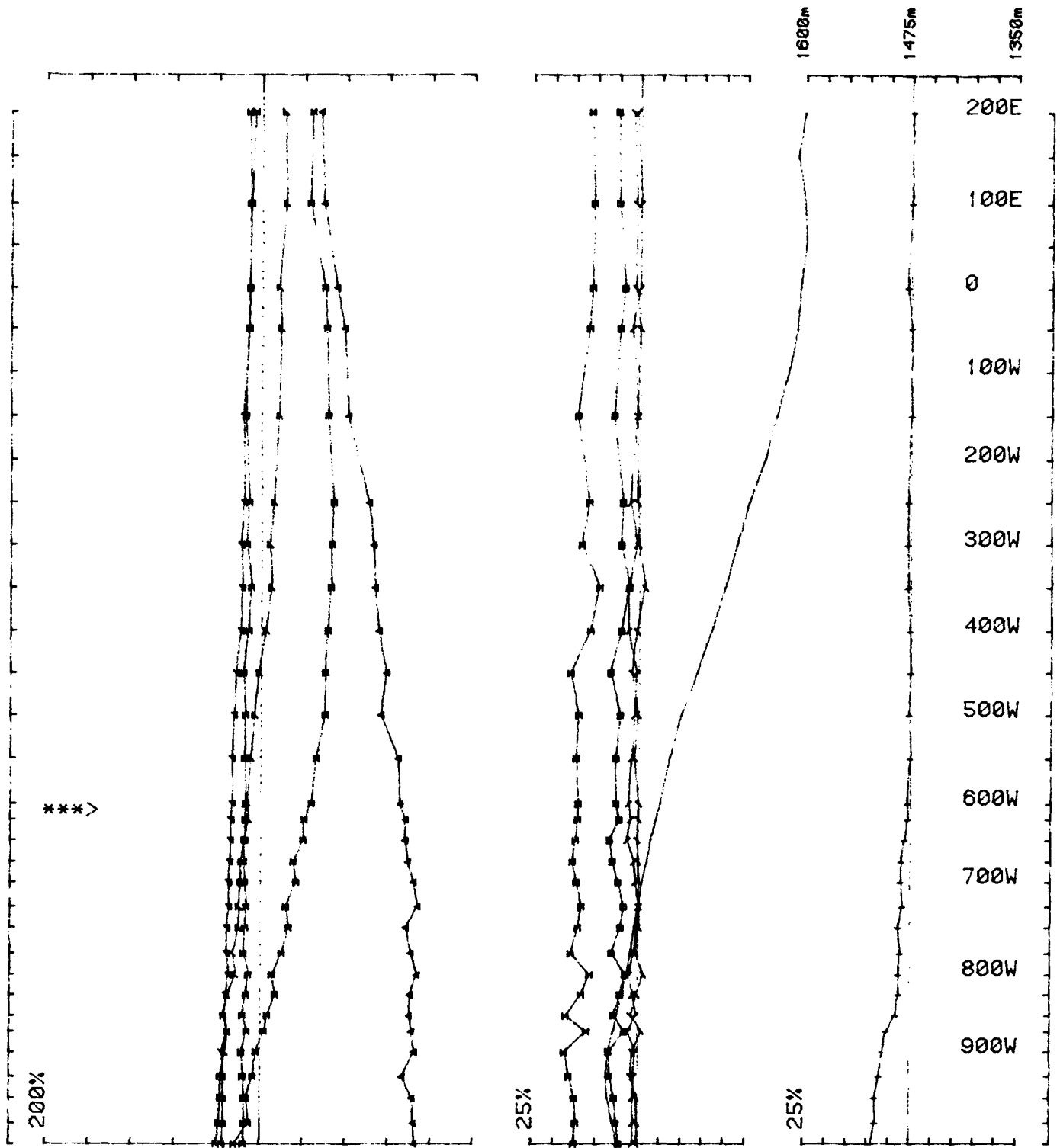
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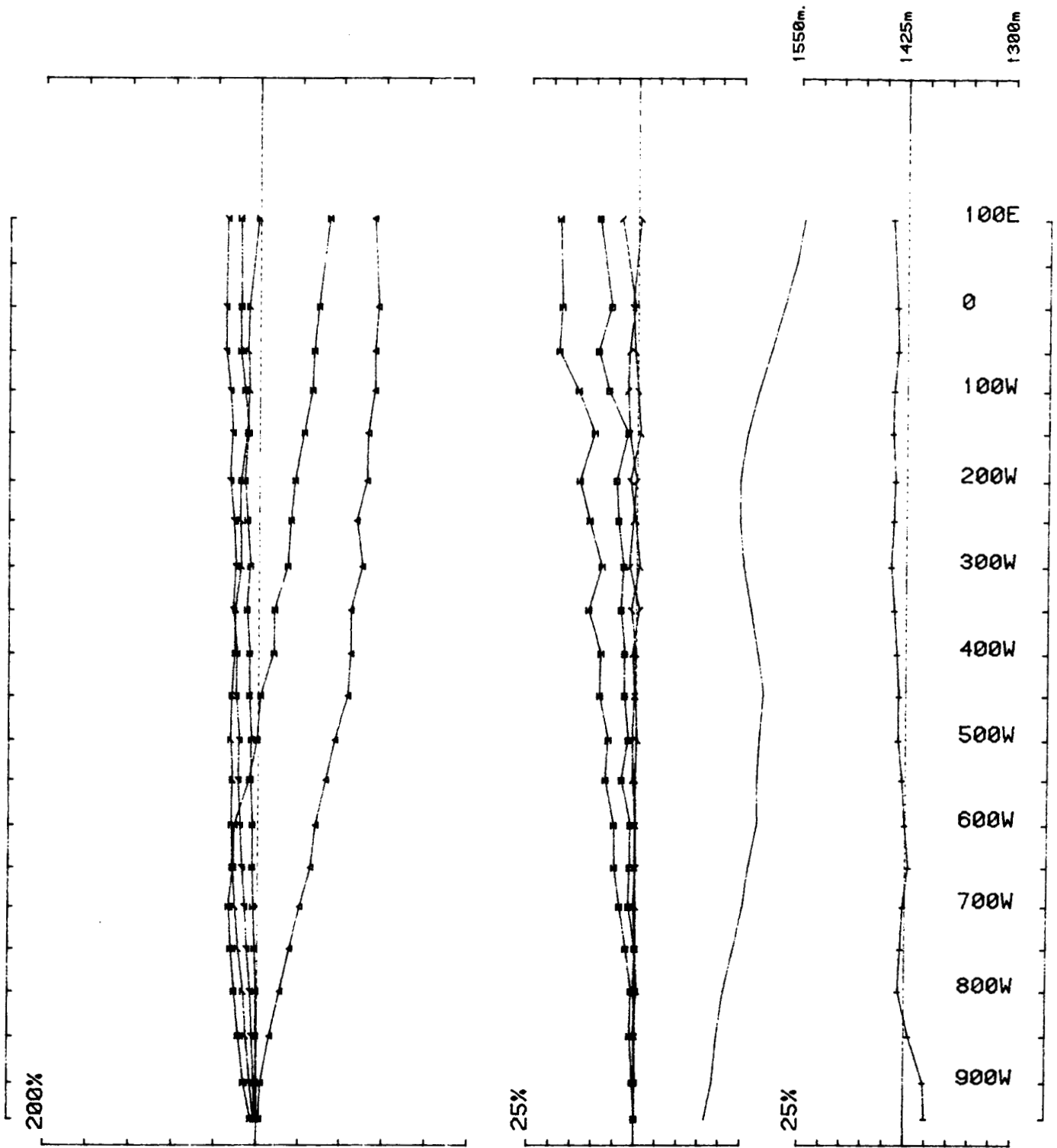
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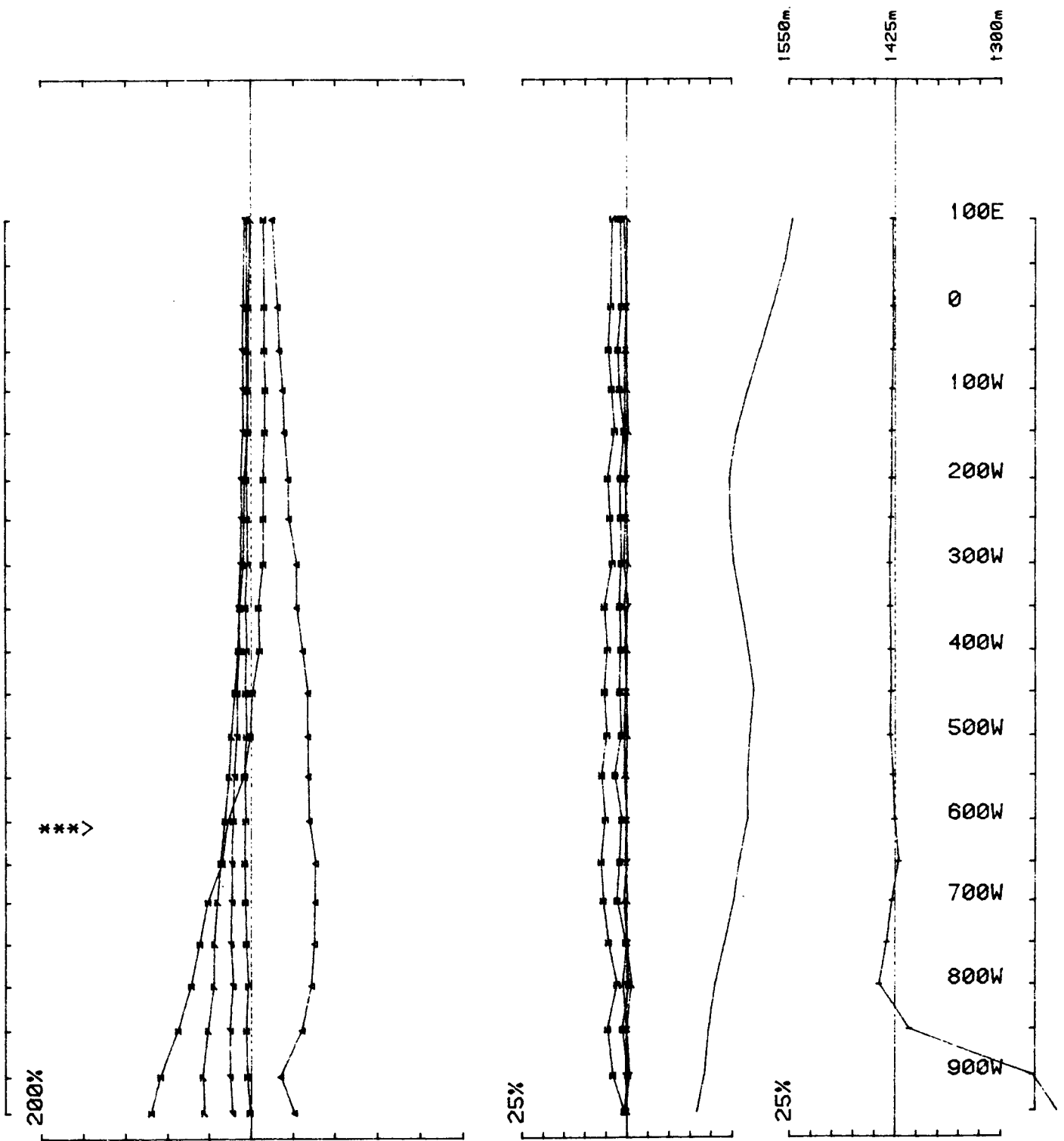
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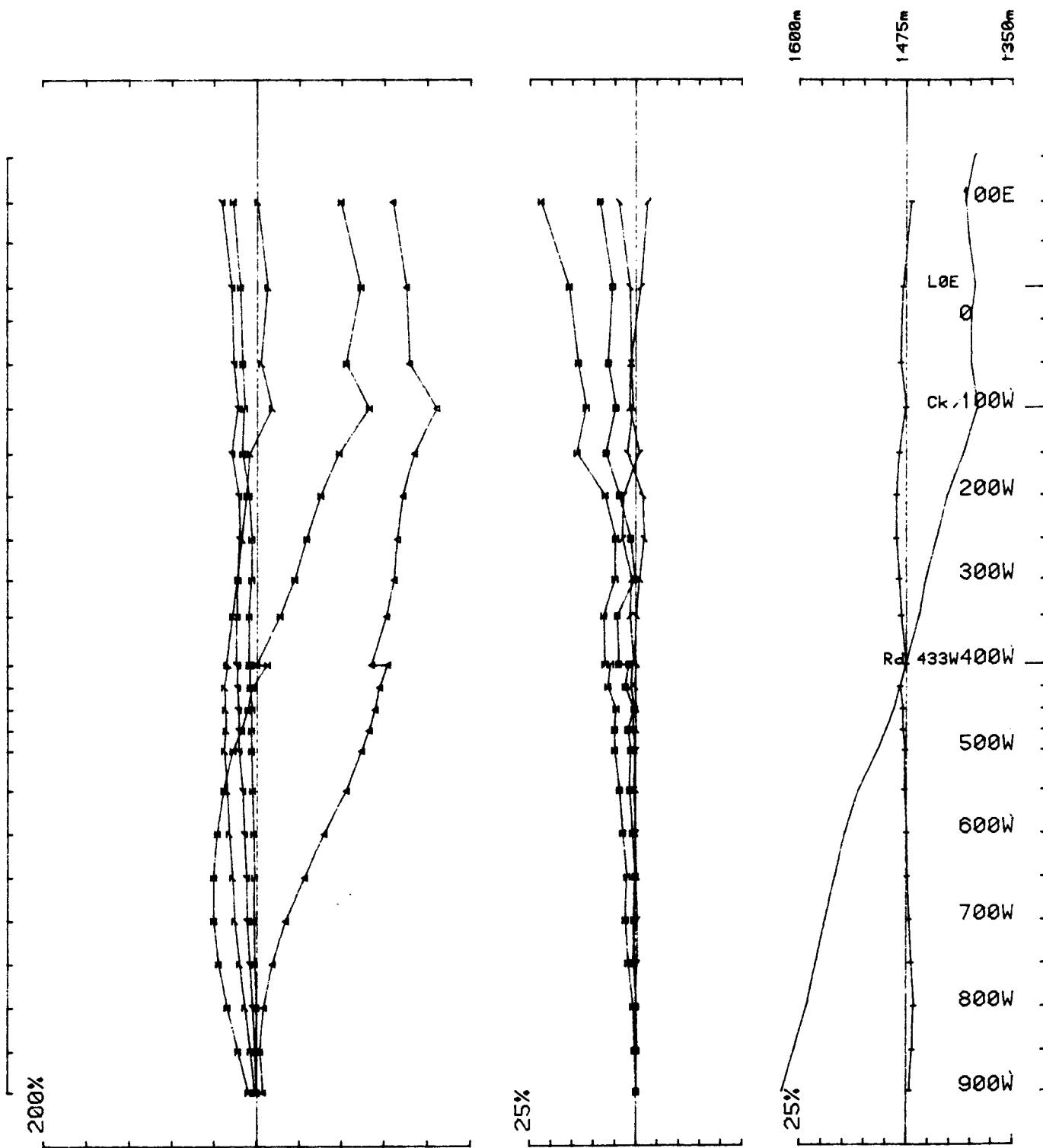
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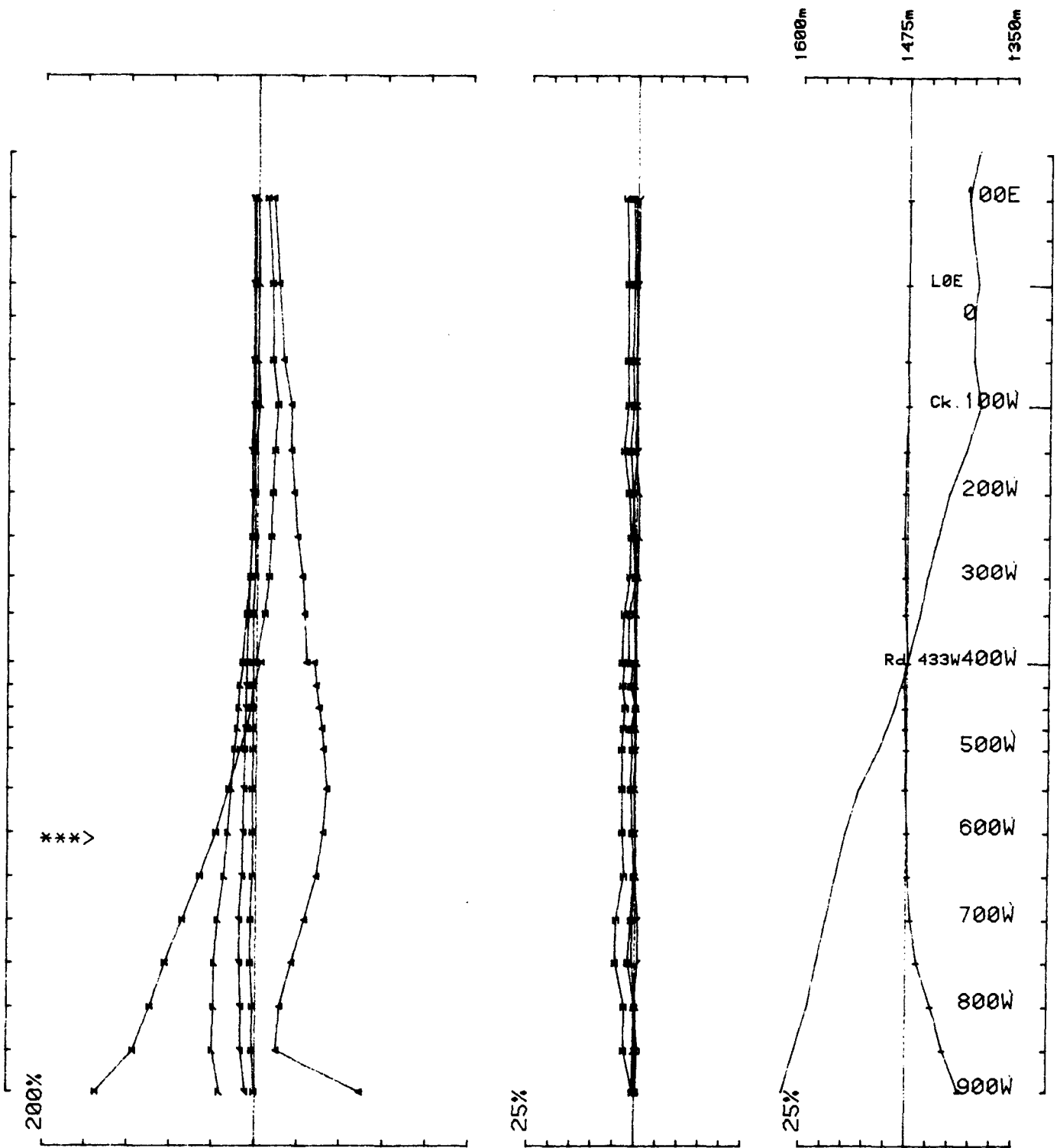
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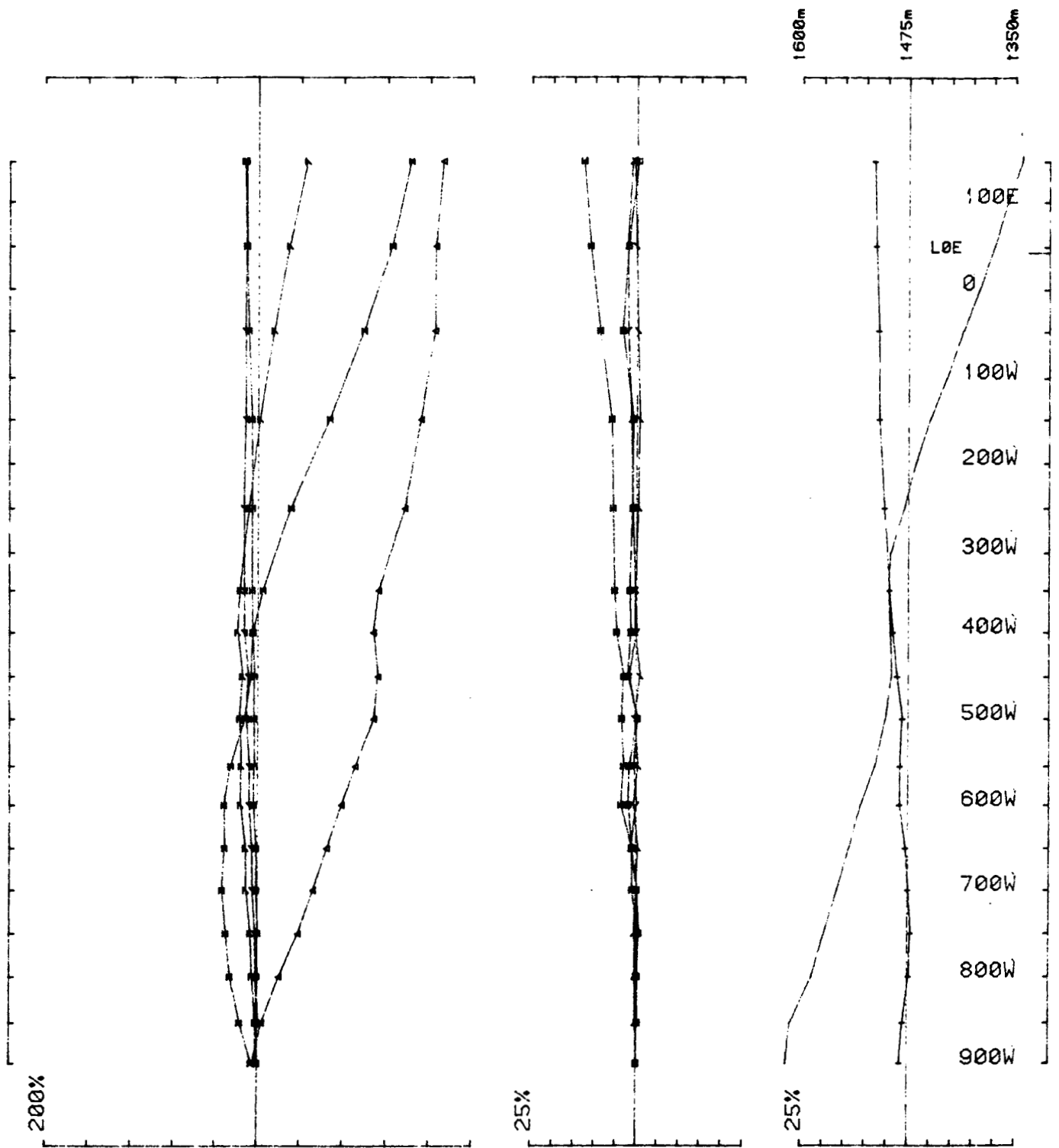
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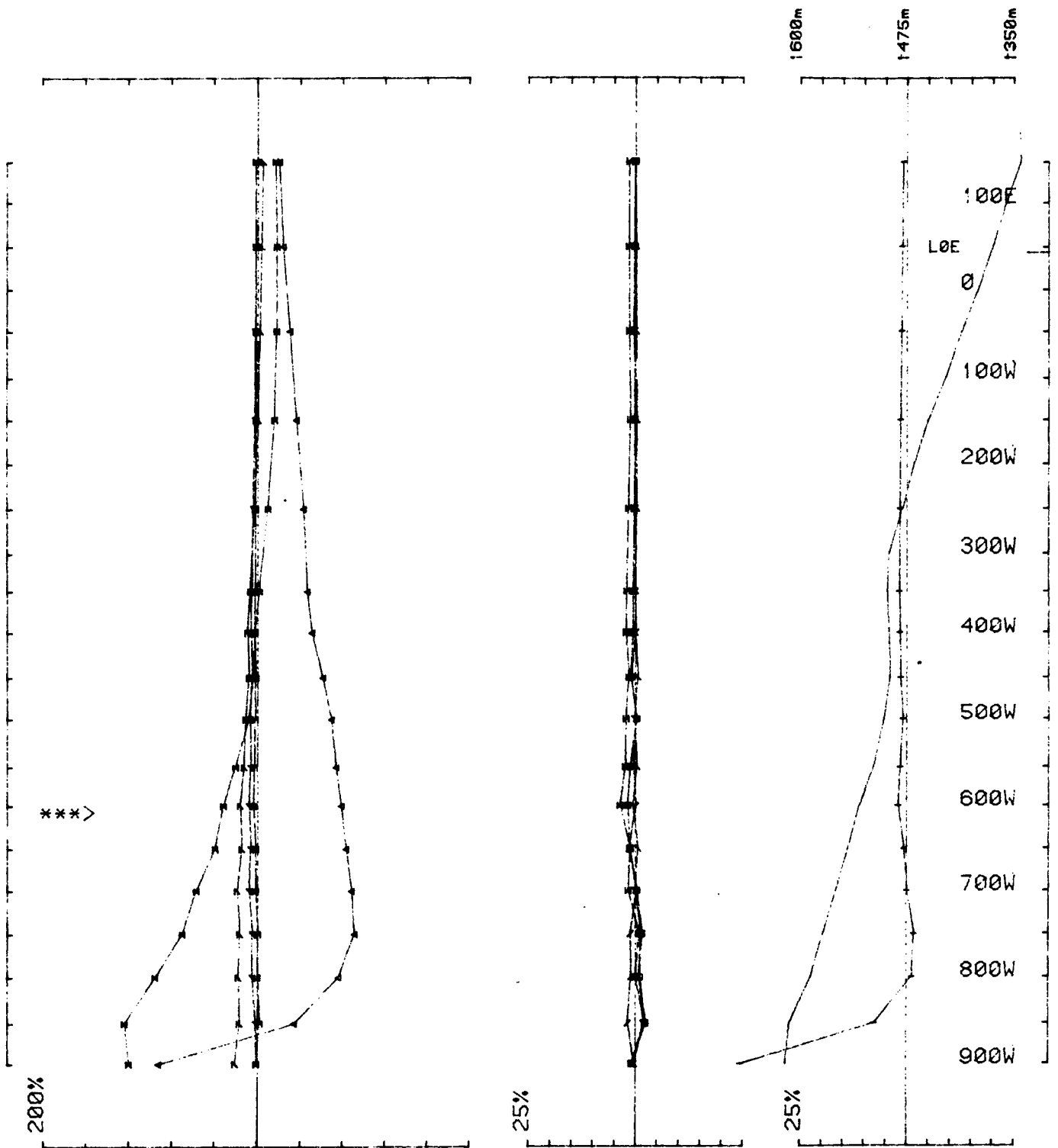
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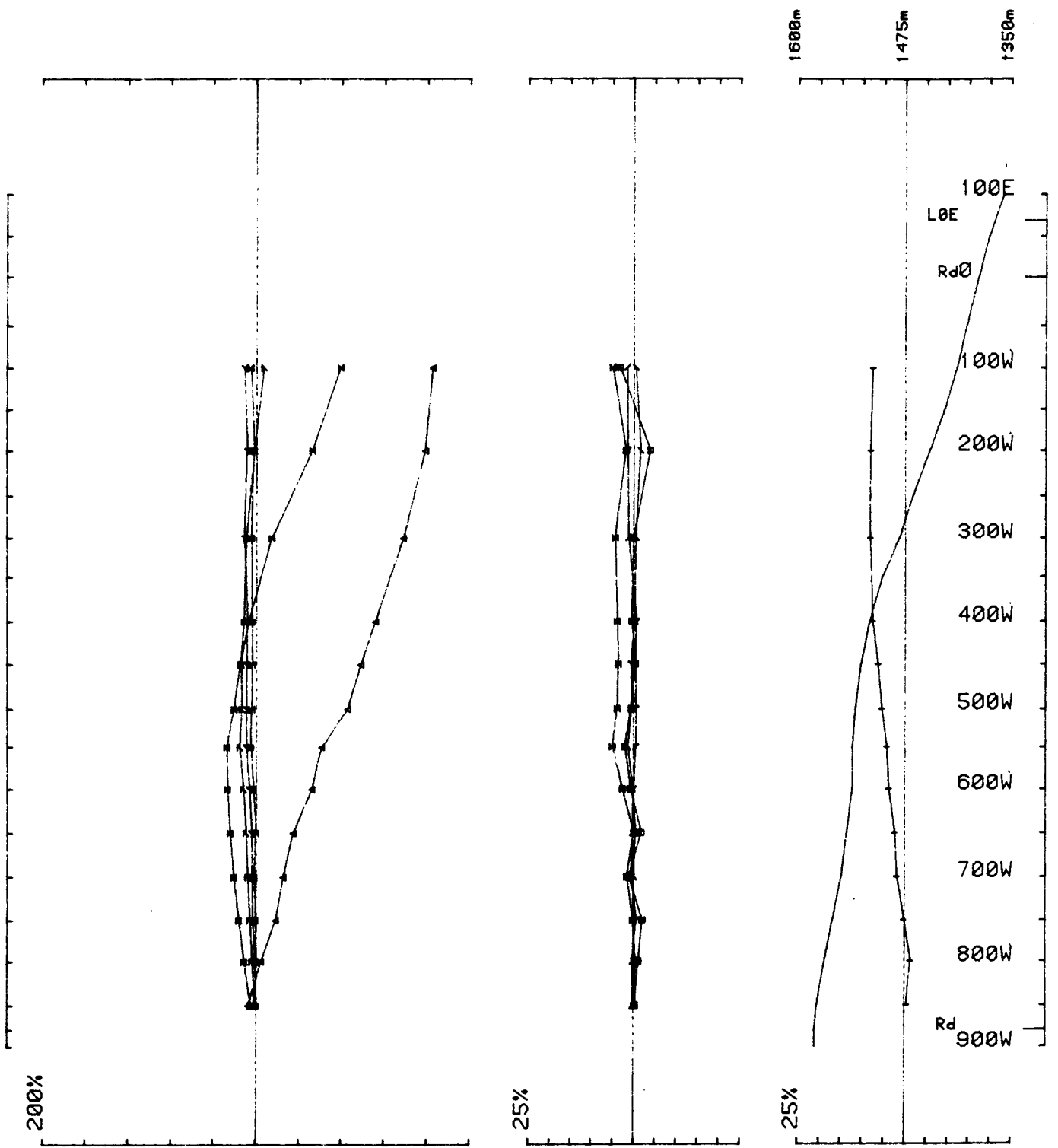
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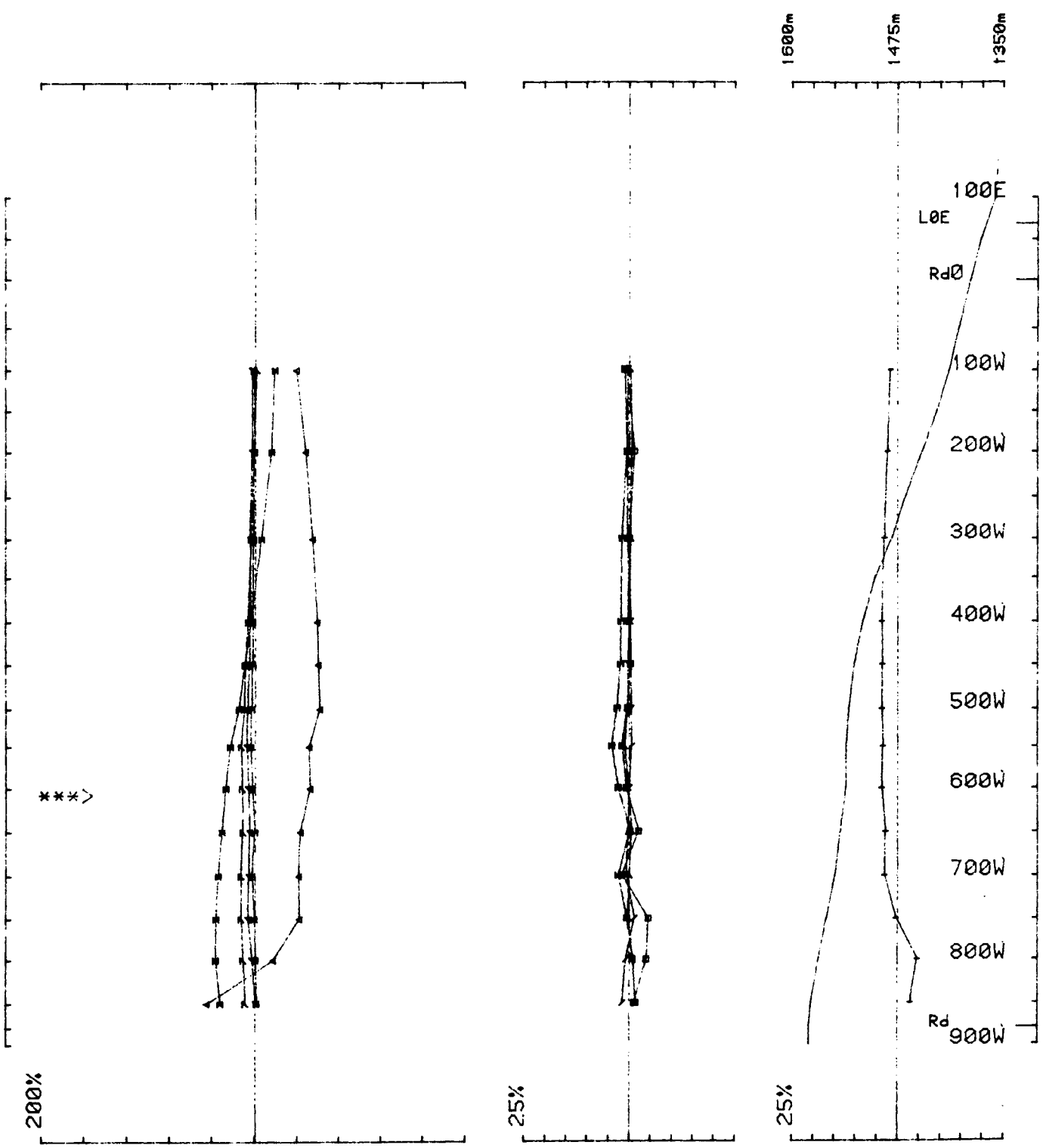
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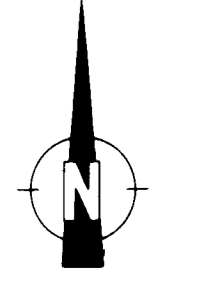
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 Loopno 4 Line 1000S component HZ secondary Ch 1 normalized Ch 1 reduced



Area DODGE '89 Cominco operator JUL & JGP freq(hz) 30.974
 Loopno 4 Line 1500S component Hz secondary Ch 1 normalized Ch 1 reduced



Area DODGE '89 Cominco operator JUL & JGP freq(hz) 30.974
 Loopno 4 Line 1500S component Hz secondary Ch 1 normalized Ch 1 reduced



GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,225

DODGE PROPERTY — CRESTON, B.C.

Drawn by: M.J.D. Traced by:

Revised by: Date Revised by: Date

1989 UTEM COMPILATION

Scale: 1:20,000 Date: September/89 Plate: 364-B-93



MAPPING CONTROL: B.C. GOV'T
DATUM OF ELEVATIONS: GEODETIC
AIR PHOTOGRAPHY: B.C. GOV'T
DATE OF PHOTOGRAPHY: 1987
N.T.M. GRID: ZONE 11 (1975)
SHORELINE: HIGH WATER MARK

BASE COMPLETED: NOVEMBER 1983
BASE SOURCE: PHOTOGRAMMETRIC
REVISION DATE:
LAND DISTRICTS: KOOTENAY
LAND TITLE DIST.: NELSON

DIST. LOT AND TP. SEC. SUBDIVISION LOT

AIR PHOTO CENTRE

BUILDING
CONTOURS AND ELEVATION
APPROX. CONTOUR
SWAMP

DEPRESSION
THREE SWAMP

ROADS PAVED
RAILWAY
POWER LINE
FENCE
FLUME

ROUGH
TRAIL
ABAND.

SCALE: 1:20000
200 0 200 400 600 800
METRES
CONTOUR INTERVAL 20 METRES