

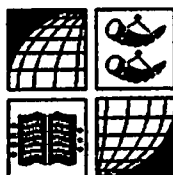
**UNIVERSITY OF BRADFORD
DEPARTMENT OF ARCHAEOLOGICAL SCIENCES**

**ARCHAEOMAGNETIC DATING OF THE
IRON WORKING SITE AT MYERS WOOD,
HUDDERSFIELD**

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ABSTRACT

This report describes the archaeomagnetic investigation of the iron working site at Myers Wood (SE186125), Kirkburton near Huddersfield. A total of 122 samples were taken from eleven excavated areas, using the standard disc method. Samples showed stable magnetisation and variously a wide range of magnetic intensities and a considerable amount of scatter in magnetic direction. With five exceptions which could not be dated, the excavated areas are shown to be all medieval; one area is dated to the early 12th Century, two areas are dated to the second half of the 12th Century, two to the second half of the 13th Century, one to late 13th/early 14th Century and one to the early 14th Century. Although not substantiated archaeologically, there is the possibility of Romano-British dates for two of these areas.

An introduction to archaeomagnetic dating and an explanation of the technical terms used in this report can be found in Appendix 1. The detailed measurements and statistical analyses can be found in Appendix 2.

INTRODUCTION

Oriented archaeomagnetic samples were taken from the heat affected material located in ten excavated areas on the Myers Wood site.

The objectives were to:

- investigate the suitability of fired material from these areas for archaeomagnetic dating,
- to provide a date for the last use of each of these areas.

The sampling and measurement programme was undertaken by Alan Powell, at the request of Dr. Gerry McDonnell on behalf of the Myers Wood Project.

ARCHAEOLOGICAL CONTEXT

The Myers Wood site is in woodland near Storthes Hall, Kirkburton, about 5 km south of Huddersfield. Excavations in September 2002, April and August 2003 found evidence of iron smelting furnaces, slag dumps, roasted iron ore and charcoal. The iron smelting and other associated processes may have been carried out under the auspices of the Cistercian monks from Roche Abbey, although it is known that there was Romano-British, Danish and Norman activity in the vicinity (B. Spence *pers. comm.*).

The site comprises several furnaces, slag dumps, a charcoal production/ore roasting area and a possible smithy; these and the location of the excavation trenches are shown in Figure 1. Table 1 lists the excavated areas and the particular contexts associated with the remains of the smelting furnaces and heat affected zones. Figures 2 to 10 are sketches and photographs showing the location of the samples taken for archaeomagnetic dating.

SAMPLING

A total of 122 samples were taken from cleaned horizontal surfaces within the excavated areas listed in Table 1 using the standard disc method (see Appendix 1). Samples were north-oriented using a magnetic compass; none of the samples were observed to have a localised magnetic anomaly within the sample material which would have deflected the magnetic compass needle away from the geomagnetic field.

MEASUREMENT

The direction of remanent magnetisation of all samples was measured using a Molspin fluxgate spinner magnetometer and listed in Appendix 2 as the natural remanent magnetism (NRM) measurements. The stability of the magnetisation of each set of samples was investigated by the stepped alternating field (a.f.) demagnetisation of pilot samples in fields of 2.5, 5, 7.5, 10, 15, 20, 30, 40, 60, 80, and 100 mT (peak applied field), with the remanence being measured after each step (Appendix 2). These pilot samples, 36 in total, were chosen for three reasons: their declination and inclination values represented the spread of magnetic directions exhibited by all the samples in each set, their initial magnetic intensities were sufficiently high enough to obtain meaningful results and they were spread physically over each of the areas under investigation. From a study of the pilot sample behaviour, specific alternating fields were chosen to provide a series of data for each sample set which when analysed would give the optimum removal of the less stable components, leaving the magnetisation of archaeological interest. The sample remanences were remeasured in turn after partial demagnetisation (Appendix 2).

RESULTS

The results of the magnetic properties analysis are summarised in Table 1.

The intensity of NRM varied considerably across all the excavated areas, possibly reflecting the variation in sample size, inhomogeneous firing or varying concentrations of remanence-carrying minerals. All samples had a strong enough magnetisation to be measurable, with the exception of ten whose magnetic intensities were not high enough not to have been compromised by the noise levels of the spinner magnetometer.

The stepped a.f. demagnetisation of the pilot samples demonstrated that all the heat affected material sampled had some viscous remanence in addition to a single component probably associated with the geomagnetic field at the time of the materials' last cooling. The samples from Trench B context 207 indicated more viscosity than the majority, whilst those from Trench B contexts 267/271 indicated less. The intensity spectra (Appendix 2) are all very similar in shape but have varying median destructive fields (mdf) whose averages range from 8 to 32 mT, suggesting materials which could be regarded generally as being magnetically "soft".

The stability index (SI), as defined by Tarling and Symons (1967), was calculated for the all the pilot samples; the results suggest that the heat affected material across the site was on the whole was magnetically stable, with only eight samples showing poor or very poor stability.

The initial sample scatter plots (Appendix 2) indicate a wide variation of individual sample magnetic directions. Each of the pilot samples was subjected to the full range of a.f. demagnetisation fields, and both intensity spectra and Zijderveld plots constructed (Appendix 2). The reasons for the magnetic behaviour of each pilot sample are speculative and may be difficult to explain, but could include variations in the mineral content of the basic clay material and the way it has reacted to the heating/cooling cycles to which it was subjected.

Scatter plots were constructed to show the clustering of samples after demagnetisation (the applied fields varied according to the sample set). In all cases except four, the scatter of the magnetic directions reduced. For the four exceptions - Trench B context 262, Trench C group B, Trench C group C and Trench M – the very wide initial scatters did not improve with demagnetisation. Mean values of declination and inclination, and the errors at both the 68% and 95% confidence levels, (α_{68}) and (α_{95}), were calculated for all sets of demagnetisation data.

Comparison of corrected mean values of declination and inclination and α_{95} for all sets of demagnetisation data indicated the most appropriate demagnetisation results to be used in providing the optimum α_{95} for each of the excavated areas.

DATING OF MAGNETIC DIRECTION

The mean declination and inclination for each of the excavated areas were corrected to Meriden, the reference locality for the British calibration curve, using the standard method (Noel and Batt, 1990). The corrected mean site directions were then dated by comparison with the Clark calibration curve in the conventional manner (see Appendix 1) and shown in Figures 11 to 18. A summary of the results are given in Table 2 and the dates corresponding to the mean corrected directions are shown overlaid on the site location plan (Figure 1).

In archaeomagnetic dating it is often necessary to give multiple possible date ranges as the earth's magnetic field has had the same direction at different times in the past. The corrected mean directions can be applied to both upper and lower calibration curves. Although the α_{95} data show that there is a possibility that Trench A and Trench G excavated areas are Romano-British in date, it is unlikely given the archaeological evidence from the site.

As the α_{95} for the Trench B context 262, Trench C group B, Trench C group C and Trench M demagnetisation results had not improved significantly compared to the original NRM α_{95} , remaining high and well outside the acceptable gradings defined by Tarling and Dobson (1995), it is not possible to apply the corrected mean directions of these four areas to the Clark calibration curve and produce a reliable date range.

Table 2 shows the results at both α_{95} and α_{68} confidence levels. It is normal practice to quote dates based on α_{95} but occasionally α_{68} data has to be used as an alternative. For Trench B context 270 the latter information was necessary as the α_{95} result did not produce a reliable enough date range; the quoted mid-point dates are speculative. However, as Trench B context 270 was subsequently shown to be associated stratigraphically with Trench B context 207, the data from both contexts were combined. The ensuing analysis resulted in an α_{95} of $\pm 2.96^\circ$ and a more precise date.

SUMMARY AND CONCLUSIONS

- All of the samples were measurable and exhibited a wide range of magnetic intensities.
- In general, stable magnetism was recorded, consistent with previous heating above the Curie temperature.
- The results showed the heat affected material was suitable for archaeomagnetic dating and did provide a record of the geomagnetic field at the time of last cooling, with five exceptions.
- Four of these exceptions are Trench B context 262, Trench C groups B and C and Trench M; material from these areas are most likely to be the remains of furnace lining and/or heat affected clay, having been deposited away from their original positions and as a result are undatable. The fifth exception, Trench B context 270, did not have data which was sufficiently reliable enough to produce a date.
- The data for the remaining excavated areas indicate multiple date ranges. Given the archaeological evidence from furnace construction and slag morphology, it is considered that these areas are all medieval in date, spanning the period AD1040 to 1360. There is the possibility that Trench A and Trench G are Romano-British, although this is unlikely due to the lack of archaeological evidence.
- Trench L is dated to the first half of the 12th Century.
- Trench B contexts 267/271 and Trench C group A are dated to the second half of the 12th Century.
- Trench B context 207 and combined contexts 207/270 are dated to the second half of the 13th Century.
- Trench A is dated to the late 13th/early 14th Century.
- Trench G is dated to the early 14th Century.

SITE CONTACTS

B. Spence,
Huddersfield and District Archaeological Society.

Dr. Gerry McDonnell,
Ancient Metallurgy Research Group,
University of Bradford.

EXCAVATED AREA	MAGNETIC PROPERTIES SUMMARY
Trench A	15 samples. Magnetic intensities: range 1.4 to 147.8 mA m ⁻¹ , all except one over 20 mA m ⁻¹ , mean 49.2 mA m ⁻¹ . 6 pilot samples. Some evidence of viscosity. Intensity spectra similar: average mdf = 12 mT. Material magnetically relatively “soft”. Stability Index: material stable to very stable. Initial plot shows some scatter with one outlier. A.f. demagnetisation in 10 & 15 mT fields; 10 mT data chosen for final calculations.
Trench B, context 207	11 samples. Magnetic intensities: range 1.1 to 377.9 mA m ⁻¹ , majority of values between 10 & 20 mA m ⁻¹ , mean 57.1 mA m ⁻¹ . 4 pilot samples. Evidence of viscosity. Wide differences in intensity spectra: 9 to 49 mT, average mdf = 32 mT. Material magnetically mixed relatively “soft” to “hard”. Stability Index: material poorly stable to stable. Initial plot shows a wide variation, particularly in inclination. A.f. demagnetisation in 15, 20 & 30 mT fields; a combination of demagnetisation data chosen for final calculations. α_{95} optimised to $\pm 3.35^\circ$, with samples 8 to 11 excluded.
Trench B, context 270	6 samples. Magnetic intensities: range 4.7 to 351.9 mA m ⁻¹ , mean 124.0 mA m ⁻¹ . 2 pilot samples. Some evidence of viscosity. Intensity spectra similar: average mdf = 10 mT. Material magnetically relatively “soft”. Stability Index: material poorly stable to stable. Initial plot shows some scatter, with 5 outliers. A.f. demagnetisation in 2.5 & 5 mT fields; a combination of demagnetisation data chosen for final calculations. α_{95} optimised to $\pm 8.52^\circ$, with the 5 outliers excluded.
Trench B, contexts 207 & 270	Combined data. 4 samples (207: 10, 270: 3, 5 & 6) excluded to optimise and improve α_{95} to $\pm 2.96^\circ$.
Trench B, context 262	12 samples. Magnetic intensities: range 4.9 to 6044 mA m ⁻¹ , majority of values above 500 mA m ⁻¹ , mean 1390 mA m ⁻¹ . 4 pilot samples. Evidence of viscosity. Intensity spectra similar: average mdf = 10 mT. Material magnetically relatively “soft”, although physically very hard. Stability Index: material unstable to stable. Initial plot shows a very wide scatter. NRM $\alpha_{95} = \pm 16.83^\circ$. A.f. demagnetisation not undertaken. Material most likely to be the remains of furnace lining, having been deposited away from its original position and as a result undatable.
Trench B, contexts 267 & 271	10 samples. Magnetic intensities: range 3.6 to 205.4 mA m ⁻¹ , majority of values above 10 mA m ⁻¹ , mean 57.4 mA m ⁻¹ . 3 pilot samples. Very little viscosity. Intensity spectra similar: average mdf = 17 mT. Material magnetically relatively “medium hard”. Stability Index: material stable to extremely stable. Initial plot shows wide scatter, with 4 outliers. A.f. demagnetisation in 2.5 & 5 mT fields; a combination of demagnetisation data (mainly 5 mT) chosen for final calculations. α_{95} optimised to $\pm 4.08^\circ$, with the 4 outliers excluded.

Table 1. Summary of magnetic properties analysis.

EXCAVATED AREA	MAGNETIC PROPERTIES SUMMARY
Trench C, group A	12 samples. Magnetic intensities: range 0.7 to 96.4 mA m ⁻¹ , all except one over 20 mA m ⁻¹ , mean 38.8 mA m ⁻¹ . 3 pilot samples. Some evidence of viscosity. Intensity spectra similar: average mdf = 8 mT. Material magnetically relatively "soft". Stability Index: material poorly stable to stable. Initial plot shows some scatter. A.f. demagnetisation in 2.5, 5, 7.5 & 10 mT fields; 5 mT data chosen for final calculations. α_{95} optimised to $\pm 2.52^\circ$, with one sample excluded.
Trench C, group B	8 samples. Magnetic intensities: range 20.6 to 431.0 mA m ⁻¹ , all except one lying between 20 & 70 mA m ⁻¹ , mean 87.3 mA m ⁻¹ . 3 pilot samples. Some evidence of viscosity. Intensity spectra similar: average mdf = 16 mT. Material magnetically relatively "harder". Stability Index: material stable to very stable. Initial plot shows a very wide scatter. NRM $\alpha_{95} = \pm 50.87^\circ$ or $\pm 16.01^\circ$ with 4 exclusions. A.f. demagnetisation in 7.5, 10 & 15 mT fields. α_{95} did not improve significantly with different demagnetisation data. Material most likely to be the remains of furnace lining and/or heat affected clay, having been deposited away from its original position and as a result undatable.
Trench C, group C	10 samples. Magnetic intensities: range 5.9 to 78.3 mA m ⁻¹ , majority of values above 10 mA m ⁻¹ , mean 38.3 mA m ⁻¹ . 3 pilot samples. Some evidence of viscosity. Intensity spectra similar: average mdf = 15 mT. Material magnetically relatively "harder". Stability Index: material poorly stable to stable. Initial plot shows a very wide scatter. NRM $\alpha_{95} = \pm 58.22^\circ$ or $\pm 18.26^\circ$ with 5 exclusions. A.f. demagnetisation in 10 & 15 mT fields. α_{95} did not improve significantly with different demagnetisation data. Material most likely to be the remains of furnace lining and/or heat affected clay, having been deposited away from its original position and as a result undatable.
Trench G	12 samples. Magnetic intensities: range 1.7 to 495.9 mA m ⁻¹ , 5 values under 10 mA m ⁻¹ , 3 over 250 mA m ⁻¹ , mean 115.6 mA m ⁻¹ . 3 pilot samples. Some evidence of viscosity. Intensity spectra similar: average mdf = 13 mT. Material magnetically relatively "soft". Stability Index: material stable to very stable. Initial plot shows wide scatter with 3 outliers. A.f. demagnetisation in 5 & 7.5 mT fields; 5 mT data chosen for final calculations. α_{95} optimised to $\pm 5.15^\circ$, with 6 exclusions.

Table 1. Summary of magnetic properties analysis (cont'd.).

EXCAVATED AREA	MAGNETIC PROPERTIES SUMMARY
Trench L	13 samples. Magnetic intensities: range 1.5 to 130.7 mA m ⁻¹ , 6 values under 5 mA m ⁻¹ , 2 over 90 mA m ⁻¹ , mean 33.3 mA m ⁻¹ . 3 pilot samples. Small amount of viscosity. Intensity spectra similar: average mdf = 12 mT. Material magnetically relatively "soft". Stability Index: material stable to very stable. Initial plot shows wide scatter with 5 outliers. A.f. demagnetisation in 2.5, 5 & 7.5 mT fields; 2.5 mT data chosen for final calculations. α_{95} optimised to $\pm 2.81^\circ$, with 8 exclusions.
Trench M	13 samples. Magnetic intensities: range 9.9 to 450.7 mA m ⁻¹ , 3 values under 10 mA m ⁻¹ , 6 over 100 mA m ⁻¹ , mean 118.7 mA m ⁻¹ . 2 pilot samples. Large amount of viscosity. Intensity spectra different: mdfs of 10 & 30 mT. Indication of both relatively "soft" & "hard" magnetic material in the same location. Stability Index: material stable. Initial plot shows very wide scatter within the 3 groups of samples. NRM $\alpha_{95} = \pm 58.58^\circ$. A.f. demagnetisation in 5, 7.5 & 10 mT fields. With all samples included, best α_{95} of $\pm 16.77^\circ$ obtained with 7.5 mT data. Best α_{95} : samples 1 to 3 = $\pm 22.46^\circ$ (NRM data), or = $\pm 64.68^\circ$ (15 mT data); samples 4 to 8 = $\pm 13.89^\circ$ (10 mT data); samples 9 to 13 = $\pm 7.10^\circ$ (10 mT data). Samples 1 to 3: insufficient data for dating purposes. Samples 4 to 8: material is probably the heat affected remains of a hearth clay lining, deposited away from its original position and as a result undatable. Samples 9 to 13: furnace structure or lining material subjected to possible tree-root disturbance resulting in unreliable data.

Table 1. Summary of magnetic properties analysis (cont'd.).

EXCAVATED AREA	CONFIDENCE LEVEL		MEAN CORRECTED		DATE	
			DECLINATION	INCLINATION	MID-POINT	RANGE
Trench A	α_{95}	$\pm 3.33^\circ$	1.15°	62.35°	AD1300 AD190 AD290	AD1260 - 1330 AD1410 - 1490 AD130 - 230 AD260 - 460
	α_{68}	$\pm 1.96^\circ$				AD1280 - 1310 AD1420 - 1440 AD150 - 210 AD275 - 430
Trench B: context 207	α_{95}	$\pm 3.35^\circ$	8.82°	60.31°	AD1265	AD1150 - 1300 AD1400 - 1460
	α_{68}	$\pm 1.9^\circ$				AD1180 - 1280
Trench B: context 270	α_{95}	$\pm 8.52^\circ$	4.17°	62.27°	-	-
	α_{68}	$\pm 4.63^\circ$			AD1290 AD1440 - AD280	AD1160 - 1340 AD1390 - 1520 AD100 - 230 AD260 - 510
Trench B: combined contexts 207 & 270	α_{95}	$\pm 2.96^\circ$	7.04°	57.37°	AD1260	AD1230 - 1280 AD1400 - 1425
	α_{68}	$\pm 1.75^\circ$				AD1250 - 1260
Trench B: context 262	α_{95}	$\pm 16.83^\circ$	10.42°	58.41°	-	-
	α_{68}	$\pm 9.91^\circ$			-	-
Trench B: contexts 267 & 271	α_{95}	$\pm 4.08^\circ$	12.64°	63.66°	AD1170	AD1090 - 1220 AD1270 - 1290 AD1410 - 1520
	α_{68}	$\pm 2.28^\circ$				AD1120 - 1200 AD1460 - 1500

Table 2. Summary of dating results, with the most probable date range at a 95% confidence level shown in bold for each excavated area, where appropriate.

EXCAVATED AREA	CONFIDENCE LEVEL		MEAN CORRECTED		DATE	
			DECLINATION	INCLINATION	MID-POINT	RANGE
Trench B: contexts 267 & 271	α_{95}	$\pm 4.08^\circ$	12.64°	63.66°	AD1170	AD1090 - 1220 AD1270 - 1290 AD1410 - 1520
	α_{68}	$\pm 2.28^\circ$				AD1120 - 1200 AD1460 - 1500
Trench C: group A	α_{95}	$\pm 2.52^\circ$	10.50°	62.29°	AD1190	AD1140 - 1220 AD1440 - 1470
	α_{68}	$\pm 1.48^\circ$				AD1160 - 1200
Trench C: group B	α_{95}	$\pm 16.01^\circ$	28.52°	51.23°	-	-
	α_{68}	$\pm 8.29^\circ$			-	-
Trench C: group C	α_{95}	$\pm 18.26^\circ$	16.26°	42.07°	-	-
	α_{68}	$\pm 9.90^\circ$			-	-
Trench G	α_{95}	$\pm 5.15^\circ$	-0.91°	60.29°	AD1310 AD210	AD1250 - 1360 AD1375 - 1490 AD140 - 480
	α_{68}	$\pm 2.87^\circ$				AD1280 - 1340 AD1400 - 1440 AD170 - 240 AD260 - 300
Trench L	α_{95}	$\pm 2.81^\circ$	19.76°	64.50°	AD1105	AD1040 - 1170
	α_{68}	$\pm 1.53^\circ$				AD1070 - 1140
Trench M: samples 1 to 3	α_{95}	$\pm 64.68^\circ$	-51.85°	74.23°	-	-
	α_{68}	$\pm 29.14^\circ$			-	-
Trench M: samples 4 to 8	α_{95}	$\pm 13.89^\circ$	32.76°	64.15°	-	-
	α_{68}	$\pm 6.52^\circ$			-	-
Trench M: samples 9 to 13	α_{95}	$\pm 7.10^\circ$	1.64°	62.39°	-	-
	α_{68}	$\pm 3.34^\circ$			-	-

Table 2. Summary of dating results, with the most probable date range at a 95% confidence level shown in bold for each excavated area, where appropriate (cont'd.).

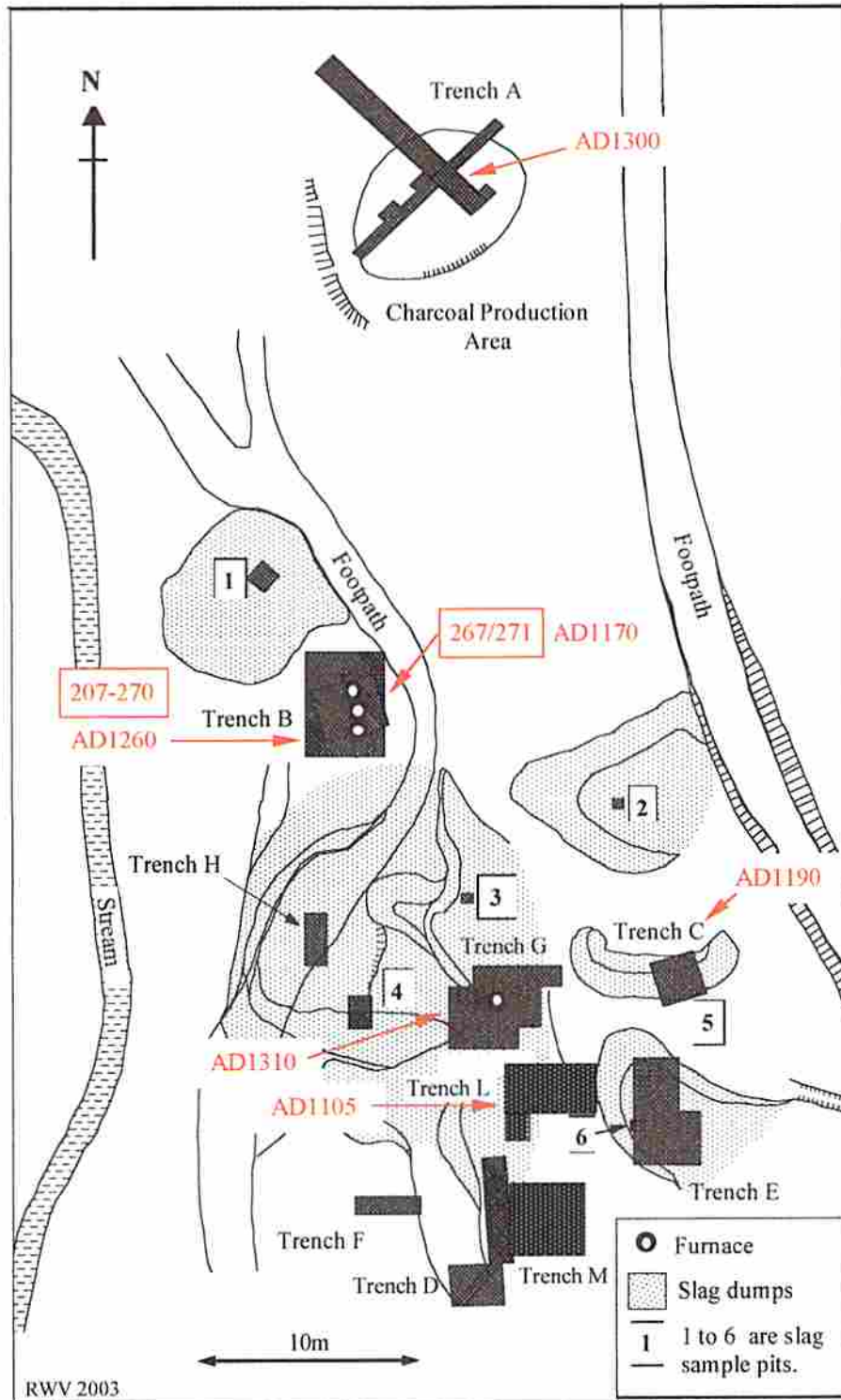


Figure 1. Myers Wood location plan (after R. Vernon), showing the archaeomagnetic dates of the excavated areas. All dates are at the mid-points of their respective ranges and at 95% confidence limits.

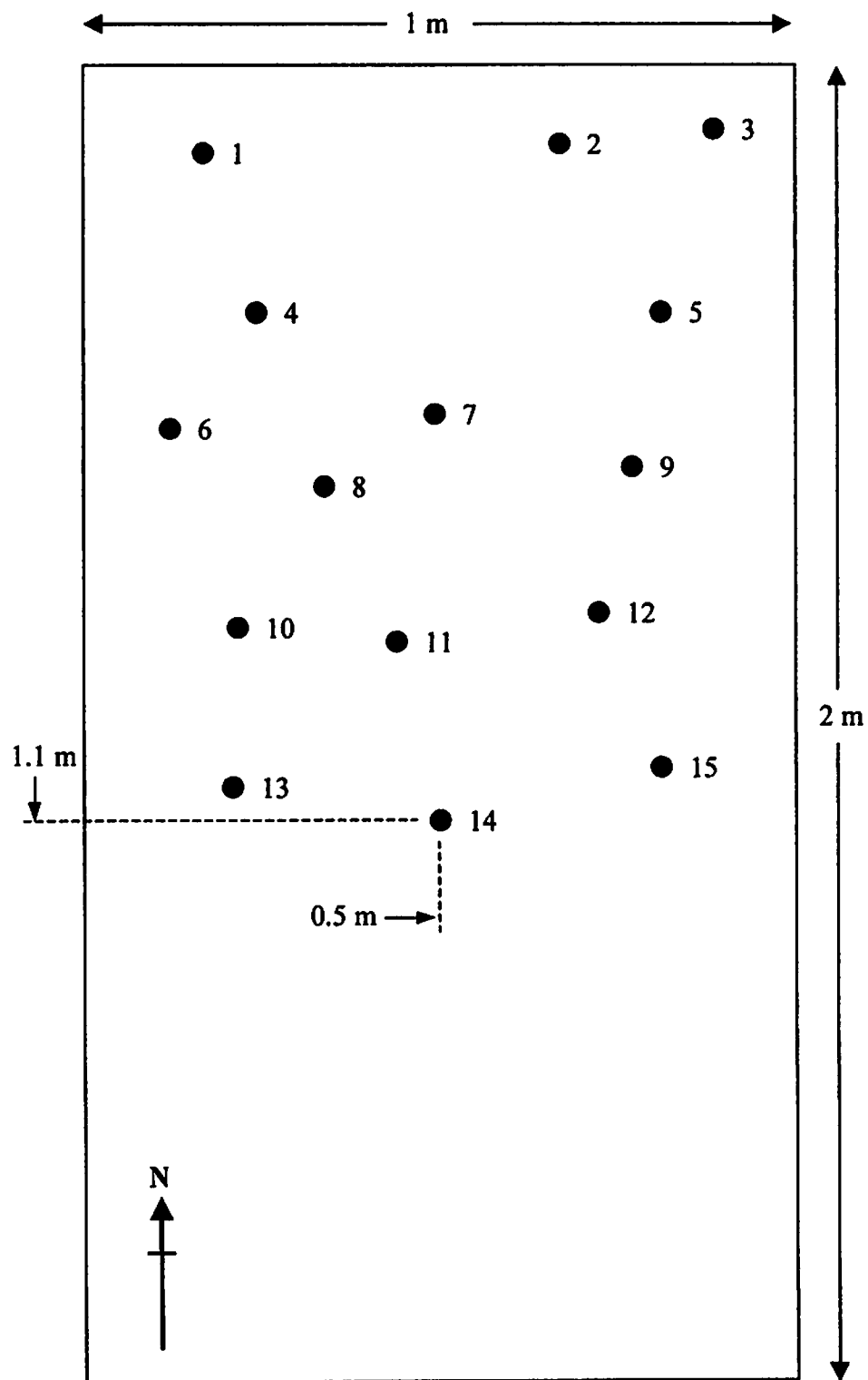


Figure 2. Myers Wood site: Trench A archaeomagnetic dating sampling points.

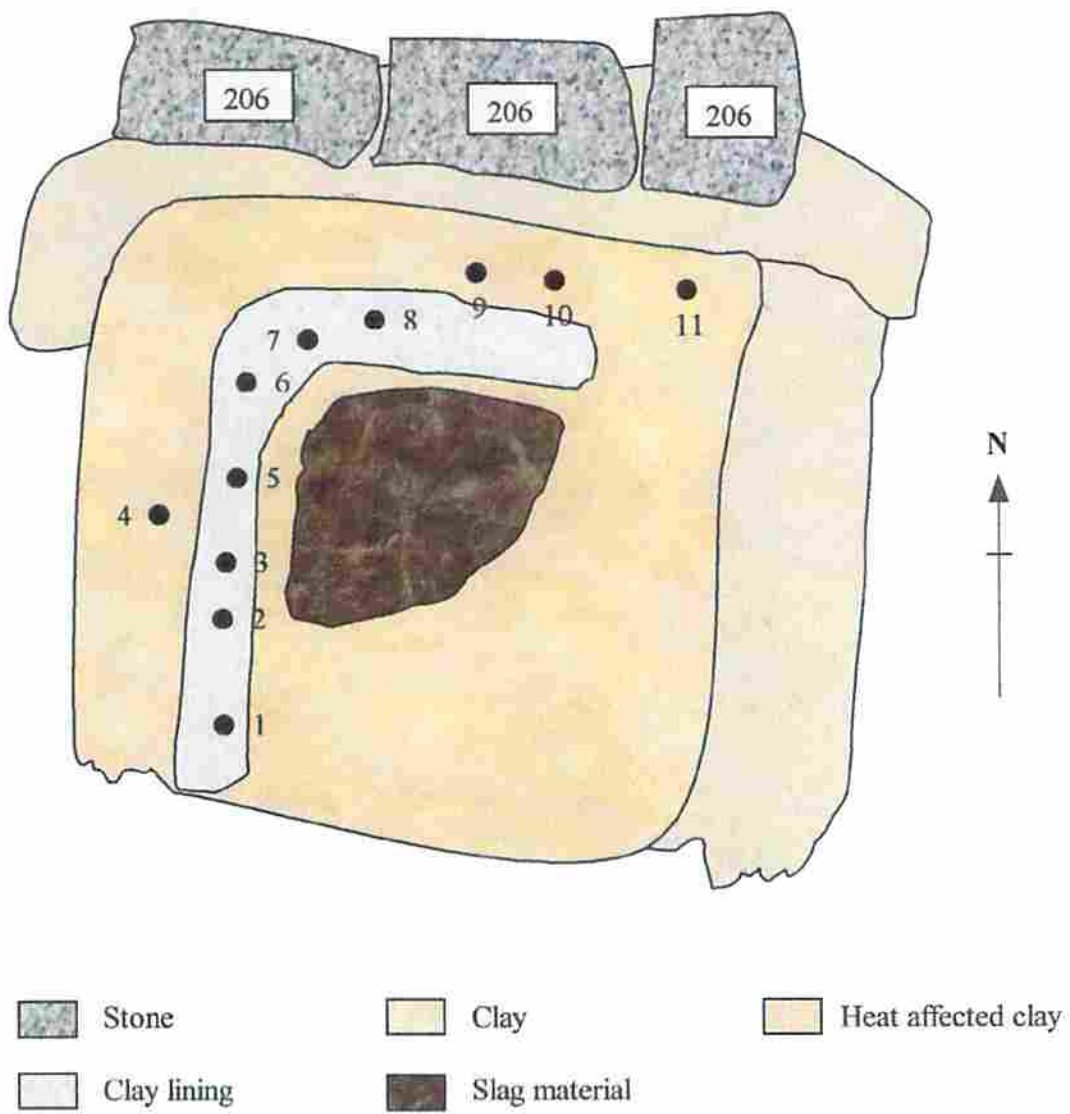


Figure 3. Myers Wood site: Trench B, context 207 archaeomagnetic dating sampling points.

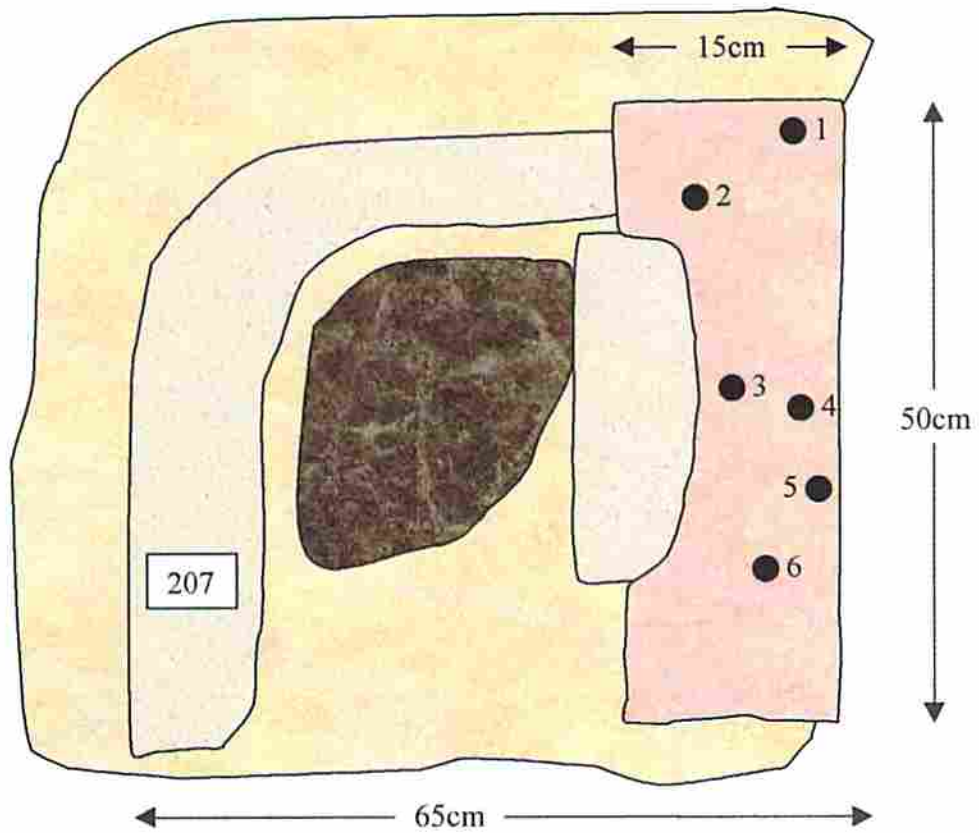


Figure 4. Myers Wood: Trench B, context 270 archaeomagnetic dating sampling points.

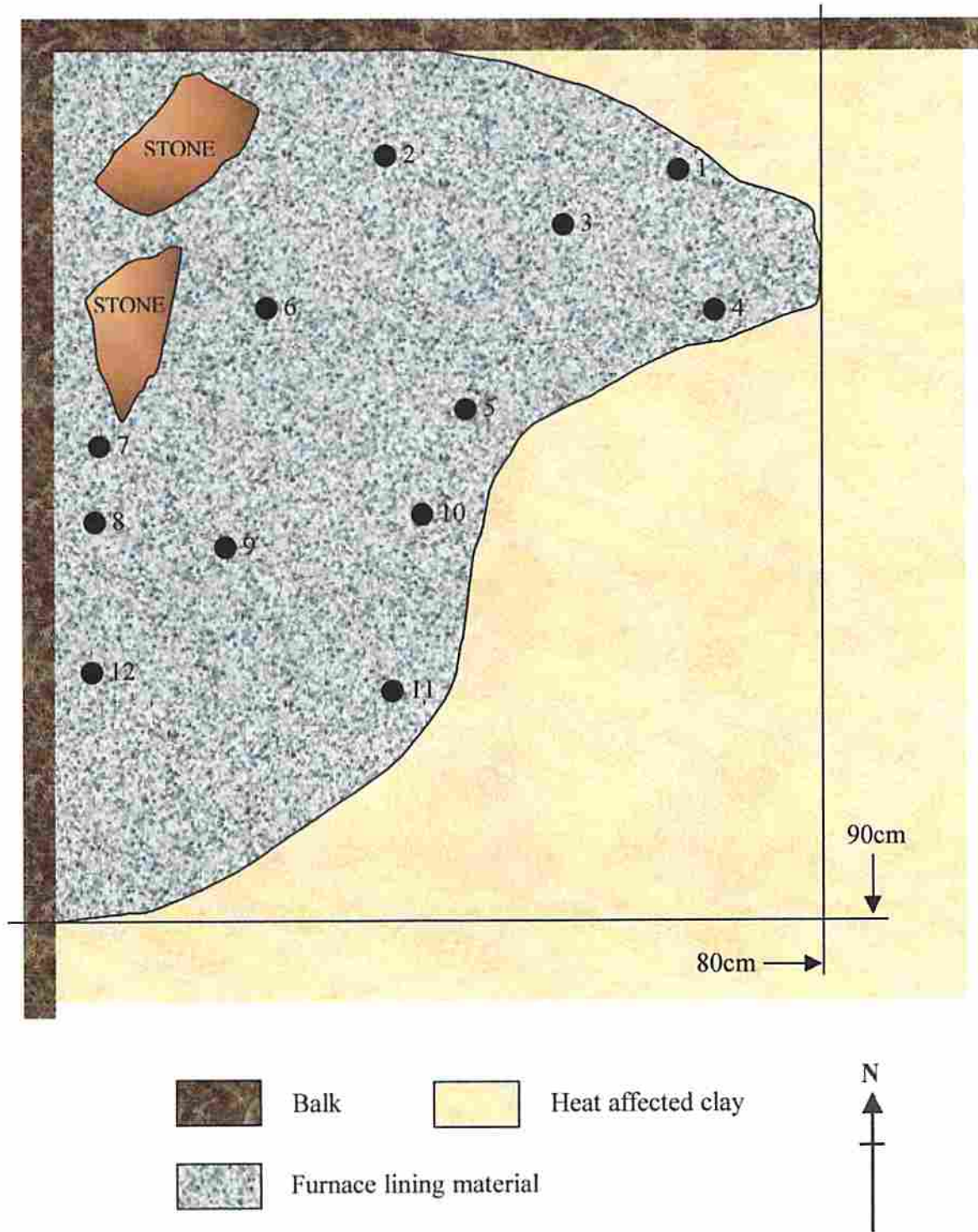


Figure 5. Myers Wood: Trench B, context 262 archaeomagnetic dating sampling points.

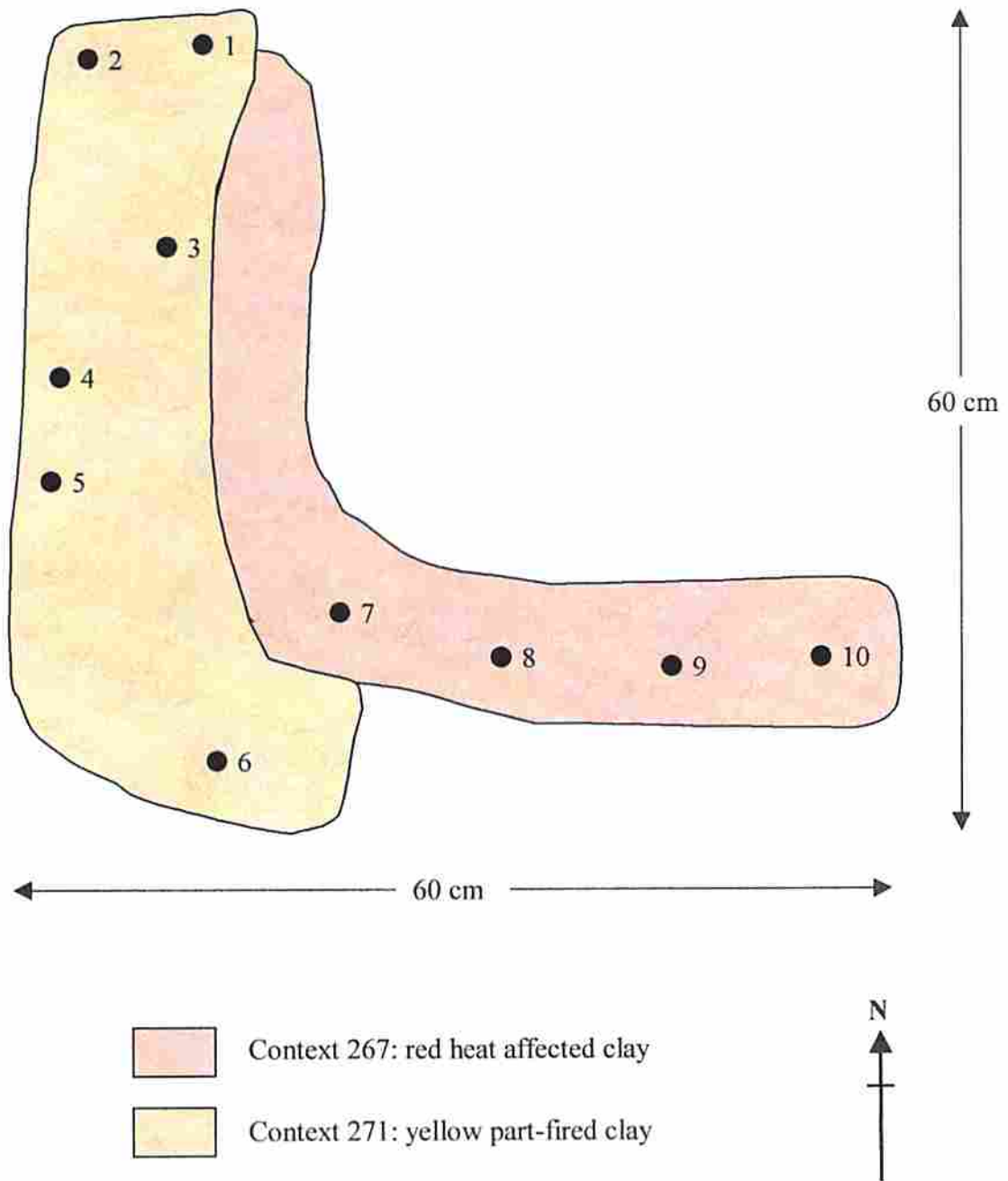


Figure 6. Myers Wood: Trench B, contexts 267 & 271 archaeomagnetic dating sampling points.

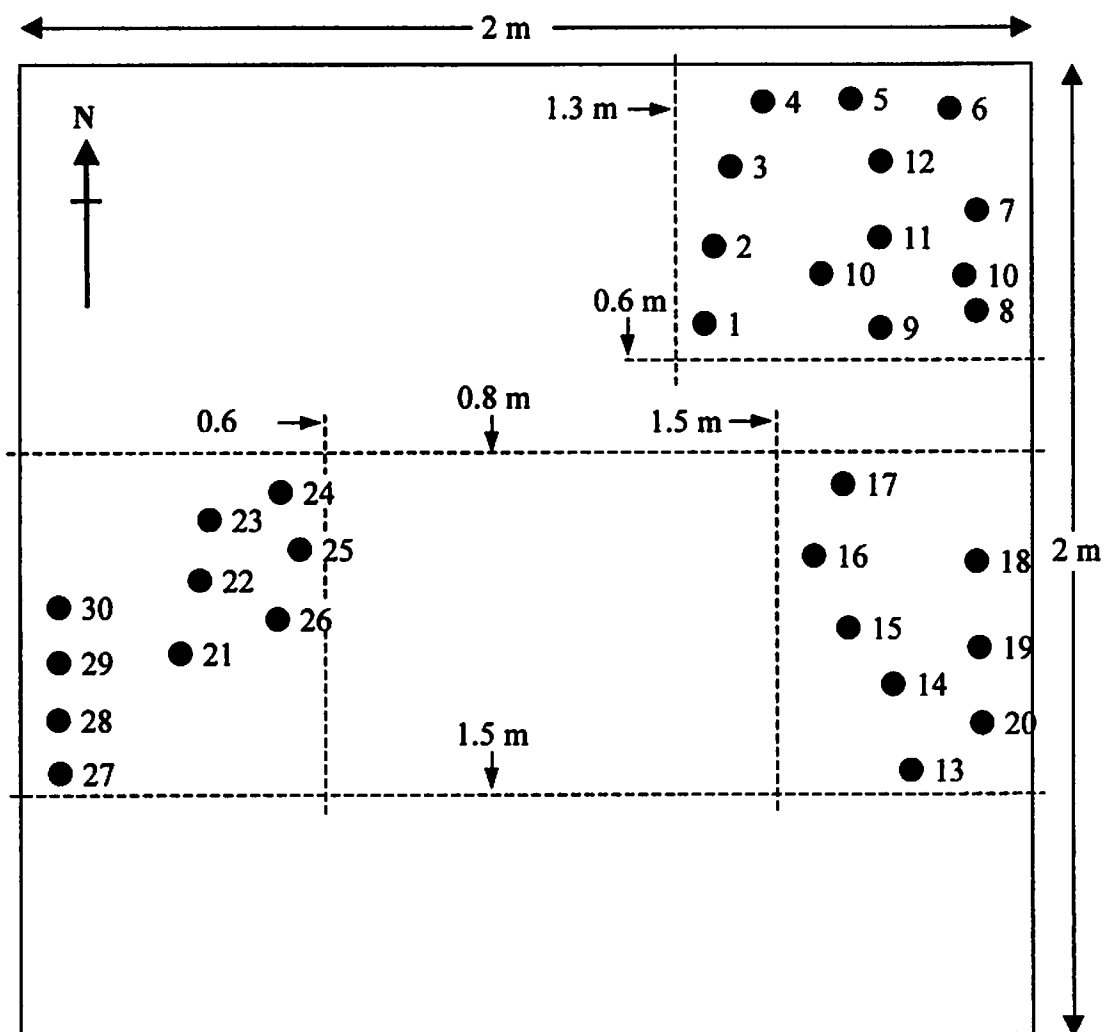


Figure 7. Myers Wood site: Trench C archaeomagnetic dating sampling points.

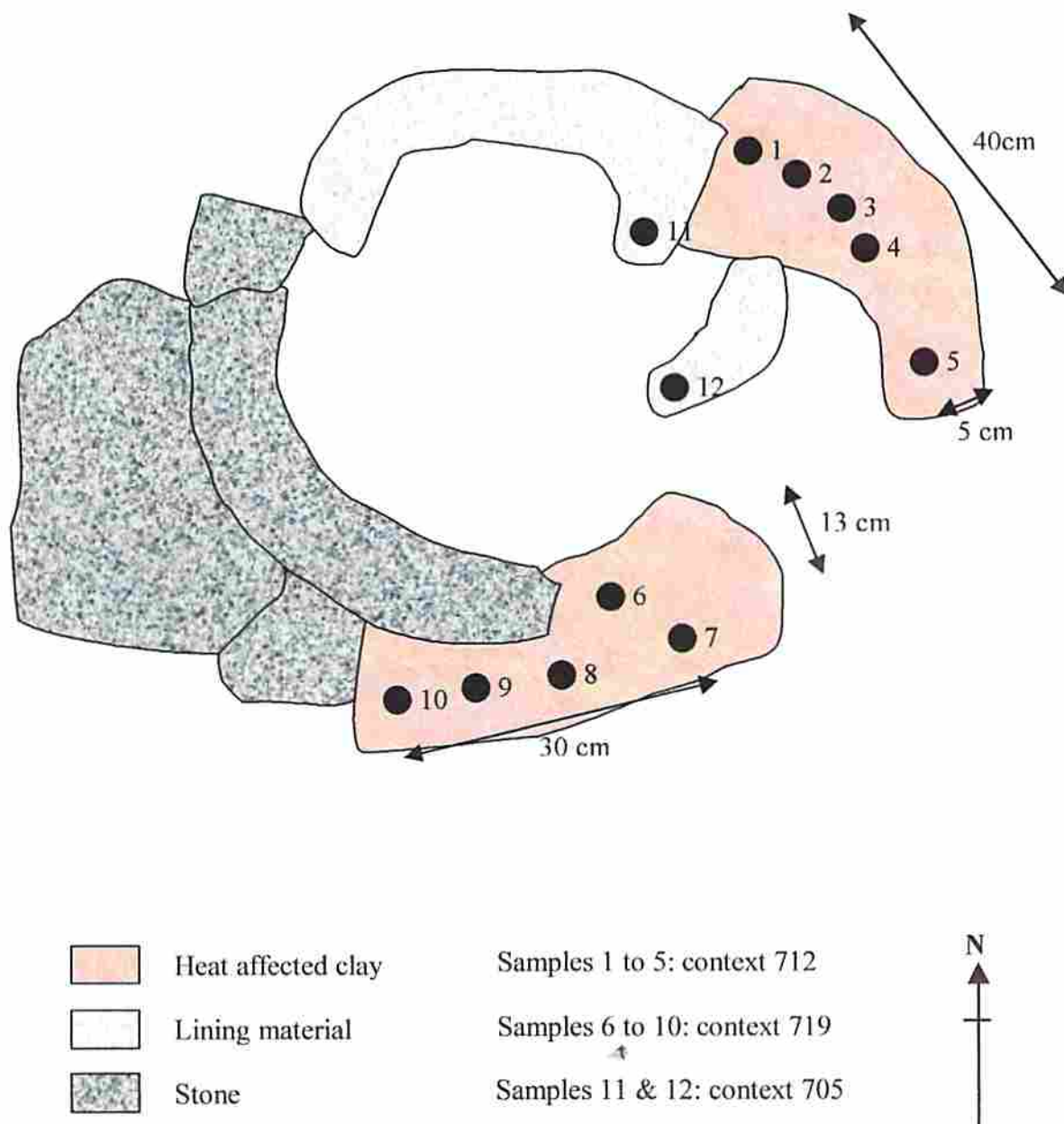


Figure 8. Myers Wood: Trench G furnace structure archaeomagnetic dating sampling points.

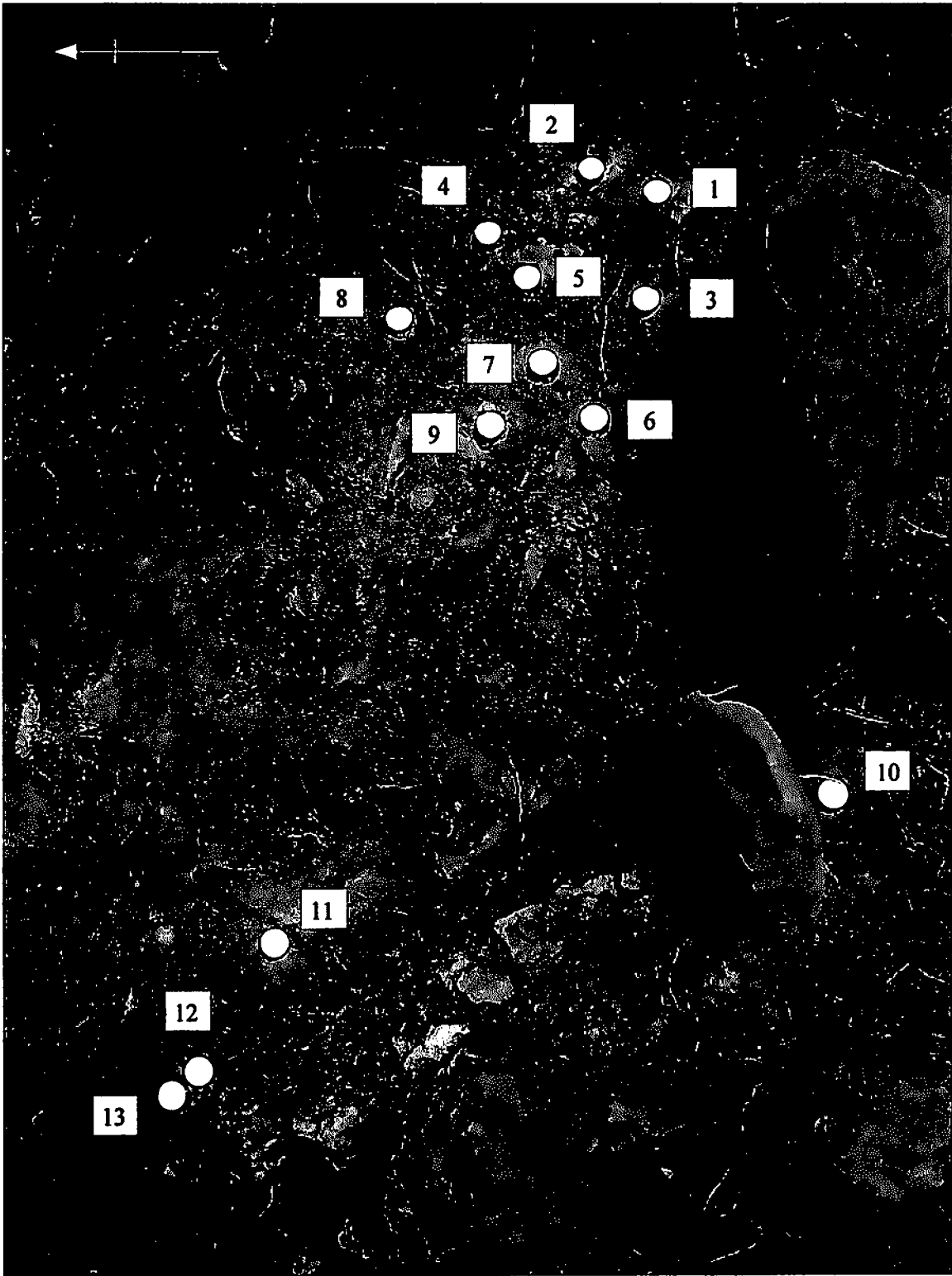


Figure 9. Myers Wood: Trench L furnace structure archaeomagnetic dating sampling points.

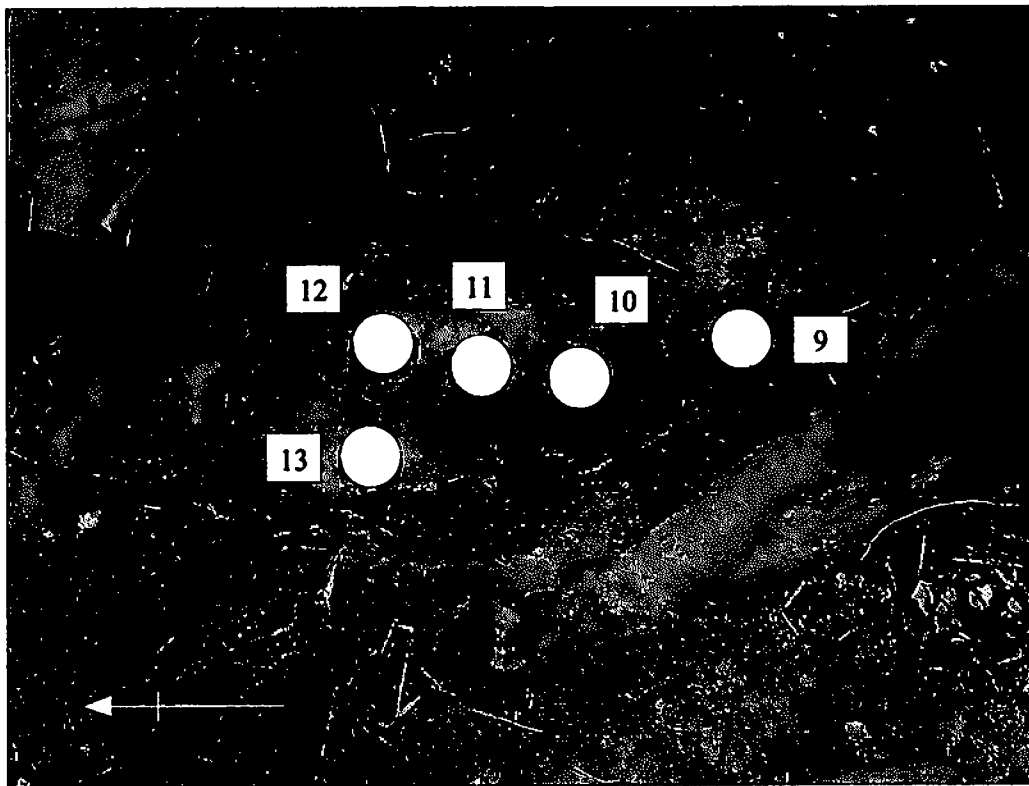
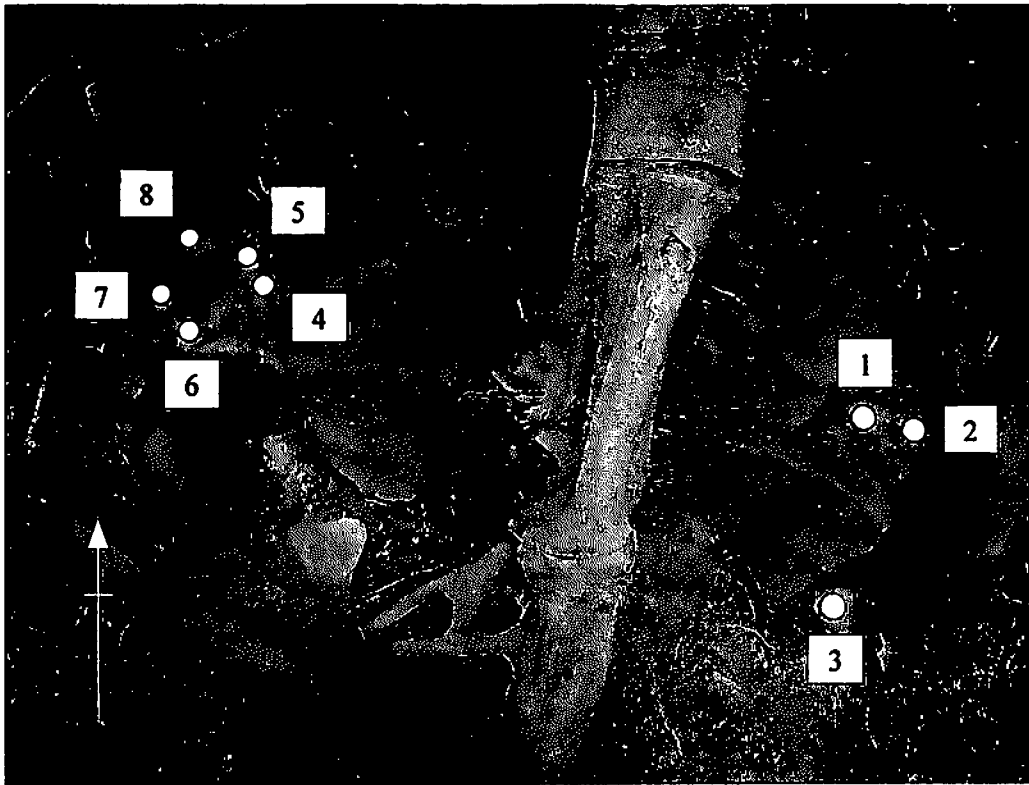


Figure 10. Myers Wood: Trench M smithy hearth archaeomagnetic dating sampling points.

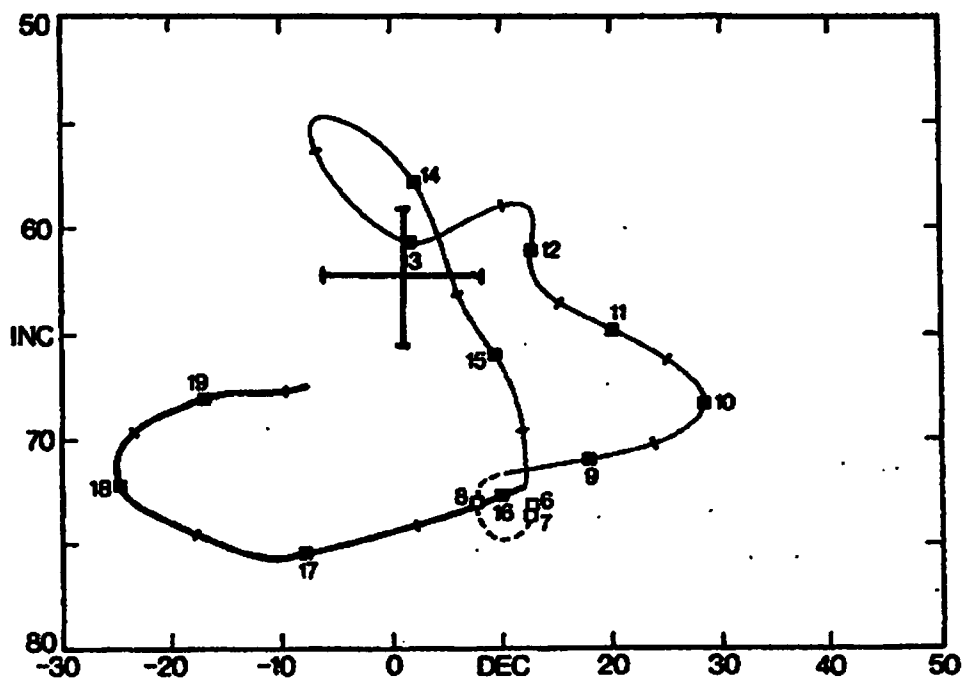
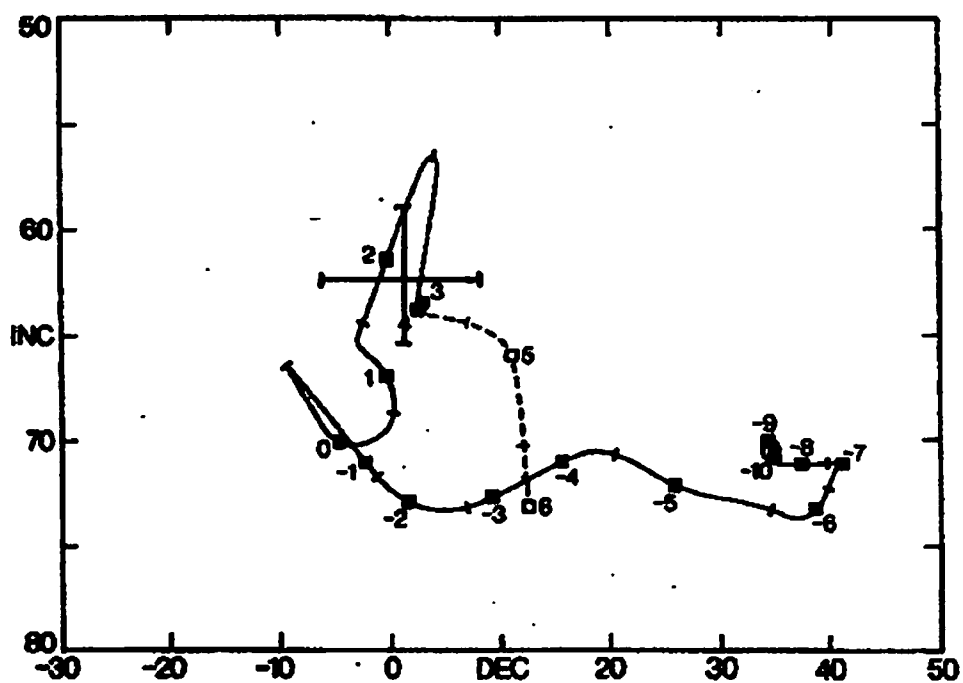


Figure 11. Corrected mean remanence vectors for Myers Wood Trench A together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.

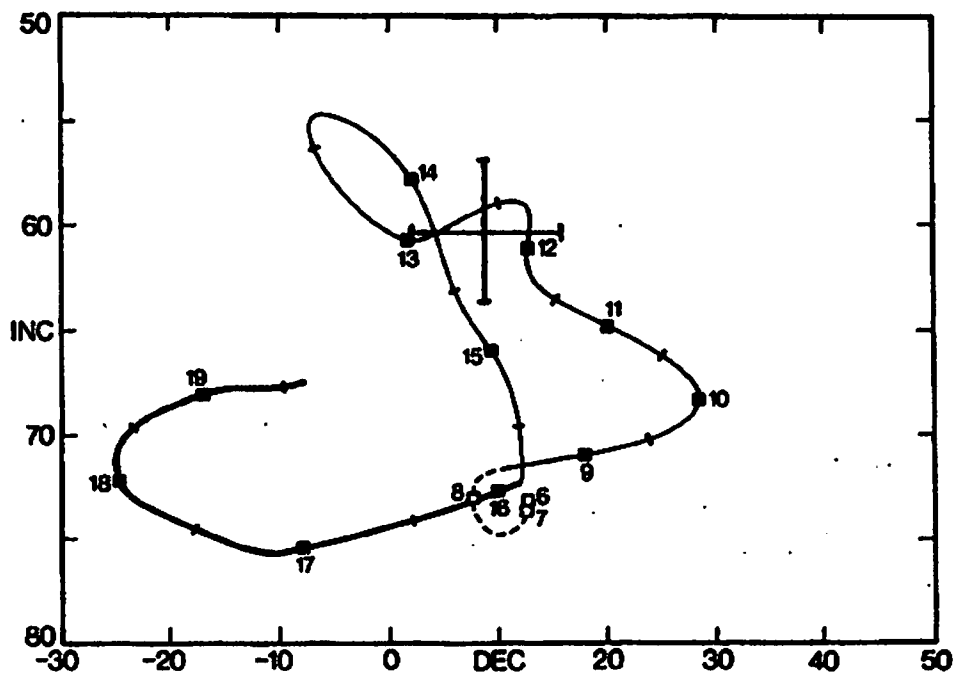
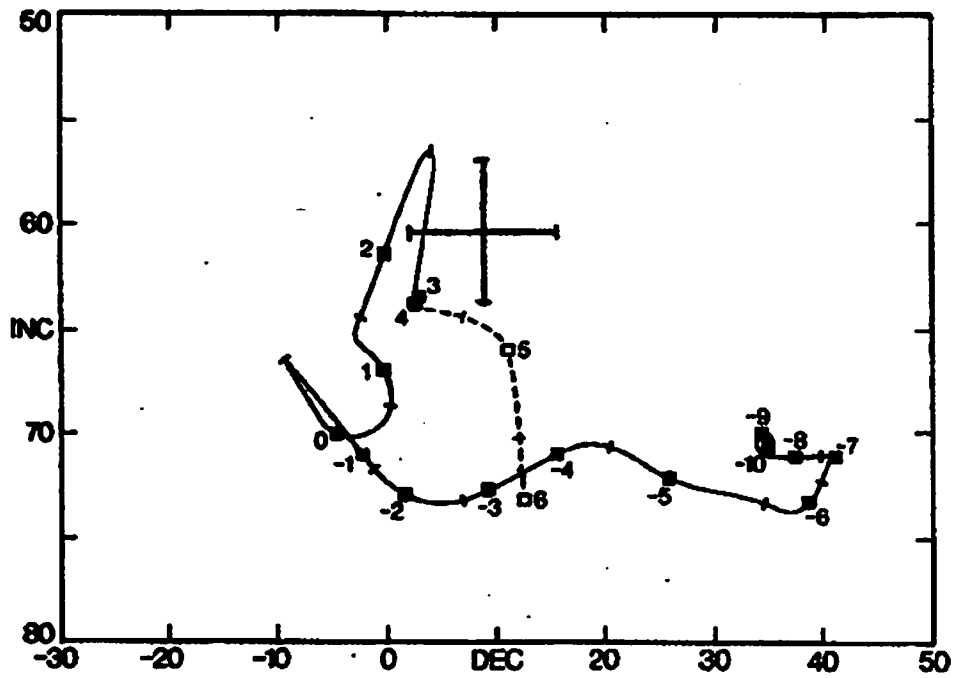


Figure 12. Corrected mean remanence vectors for the Myers Wood Trench B context 207 together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.

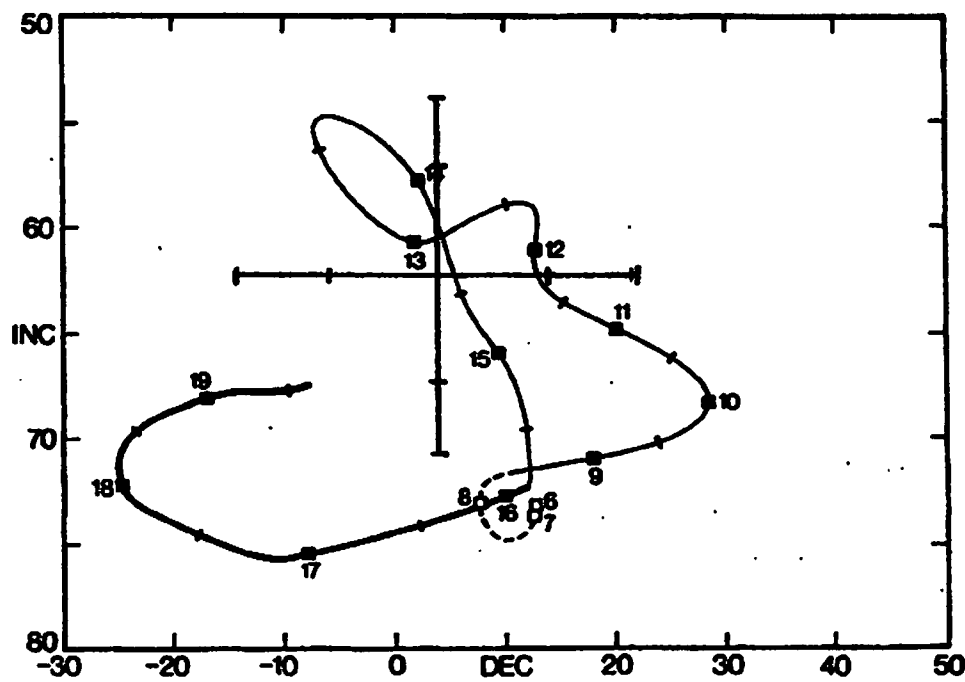
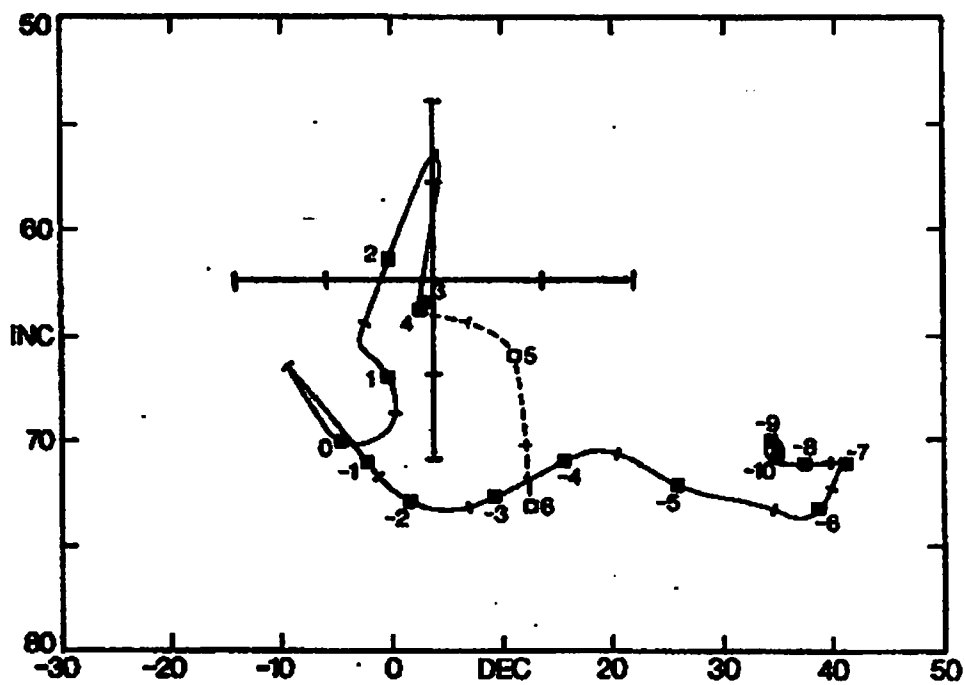


Figure 13. Corrected mean remanence vectors for the Myers Wood Trench B context 270 together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.

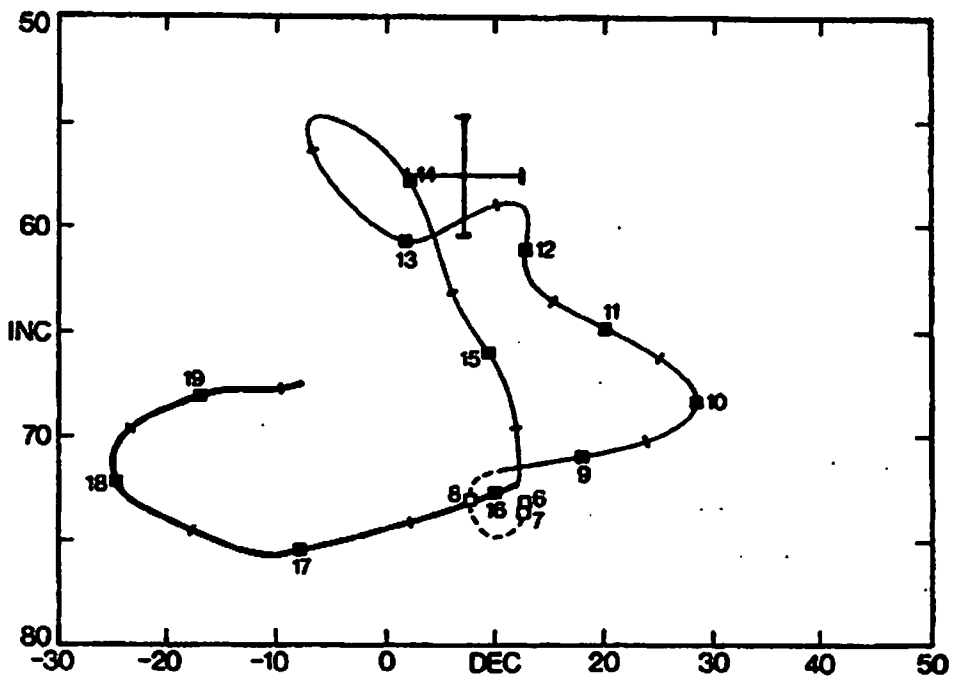
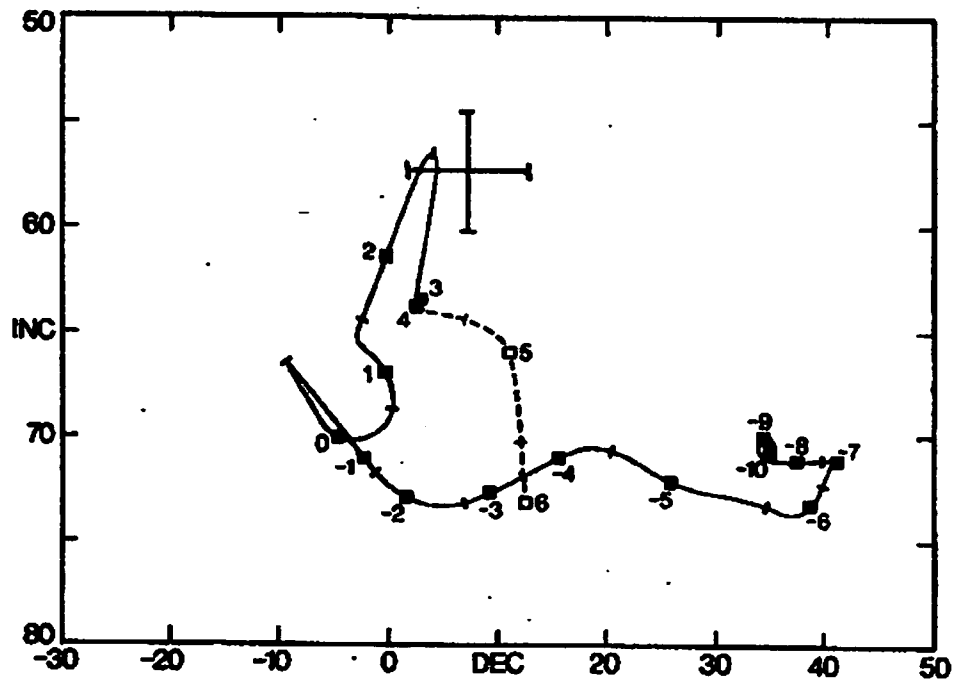
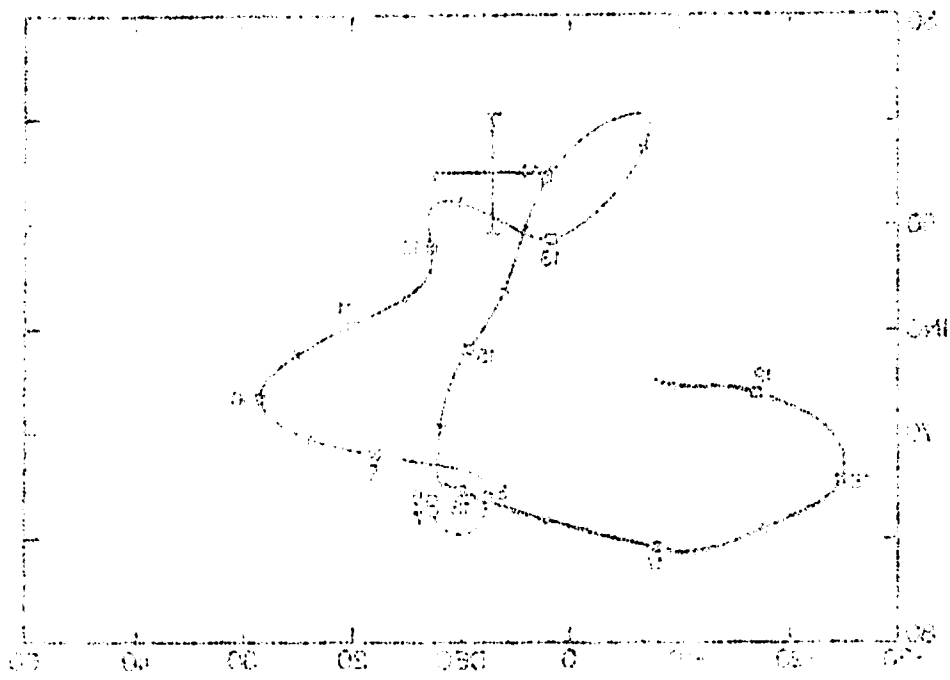
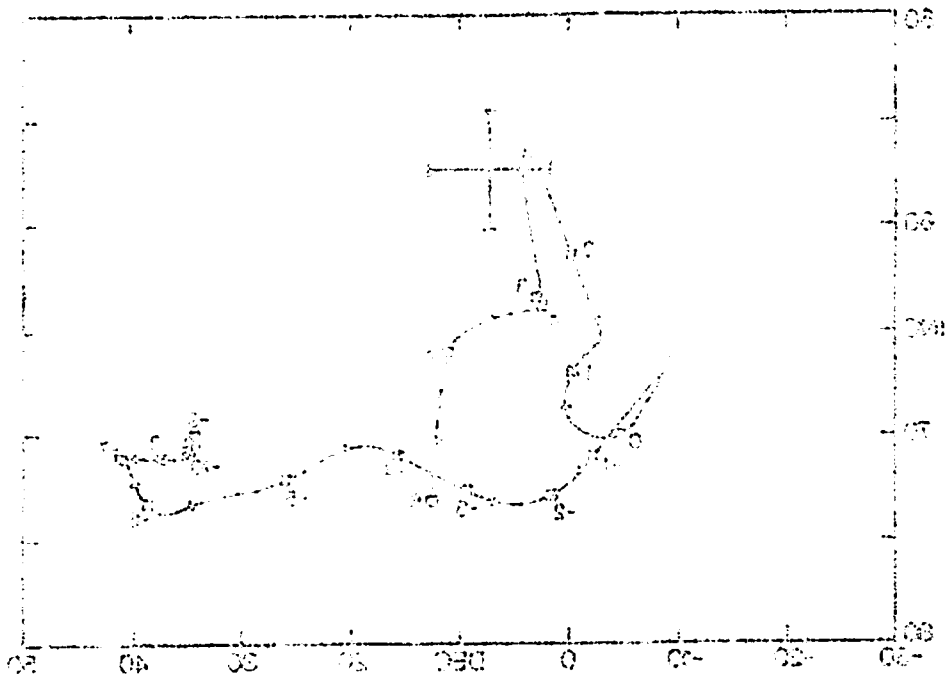


Figure 14. Corrected mean remanence vectors for the Myers Wood Trench B combined contexts 207 & 270 together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.



1. The path shown in the above figure is a closed curve. It is a simple closed curve. It is a closed curve because it starts and ends at the same point. It is a simple closed curve because it does not intersect itself. The path is a closed curve because it starts and ends at the same point. It is a simple closed curve because it does not intersect itself. The path is a closed curve because it starts and ends at the same point. It is a simple closed curve because it does not intersect itself.

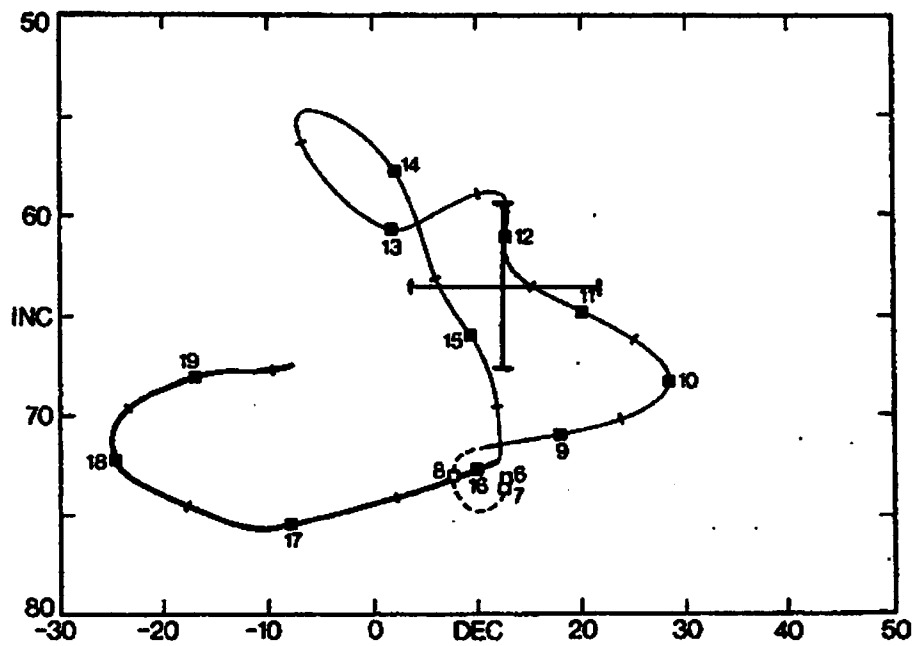
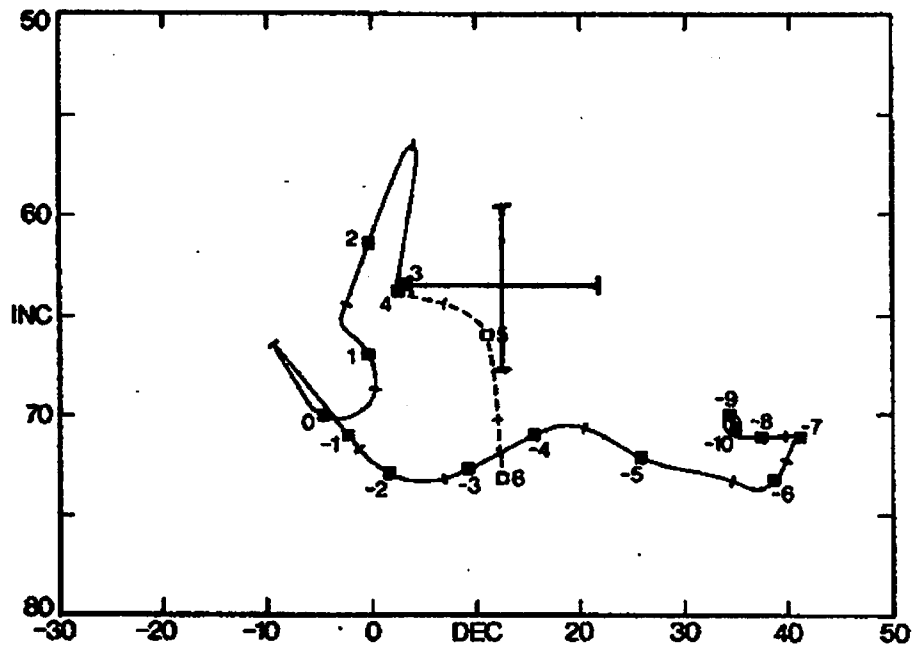


Figure 15. Corrected mean remanence vectors for the Myers Wood Trench B contexts 267 & 271 together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.

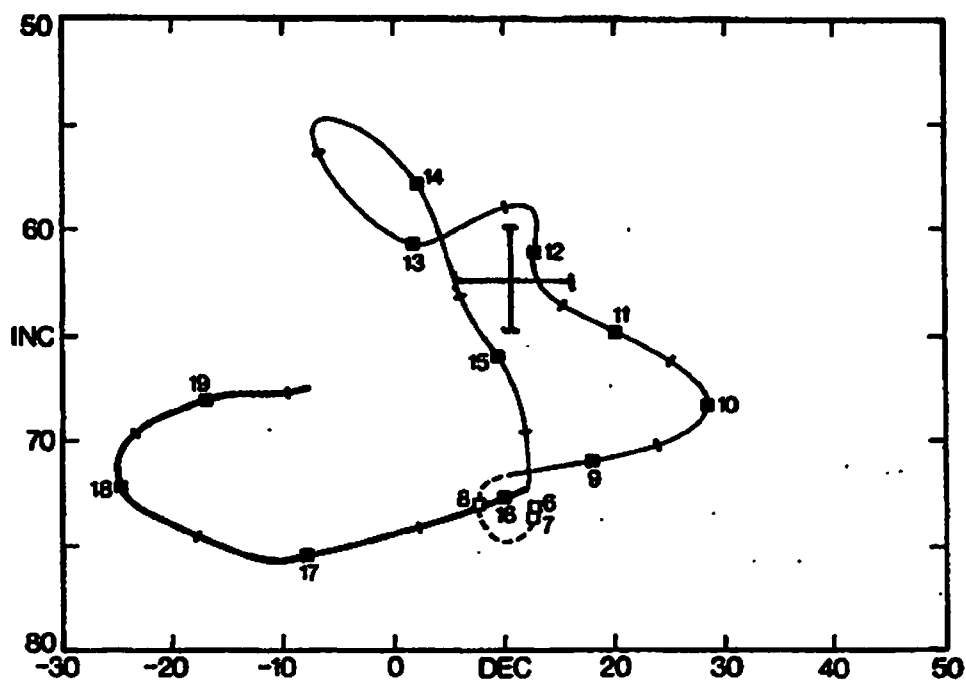
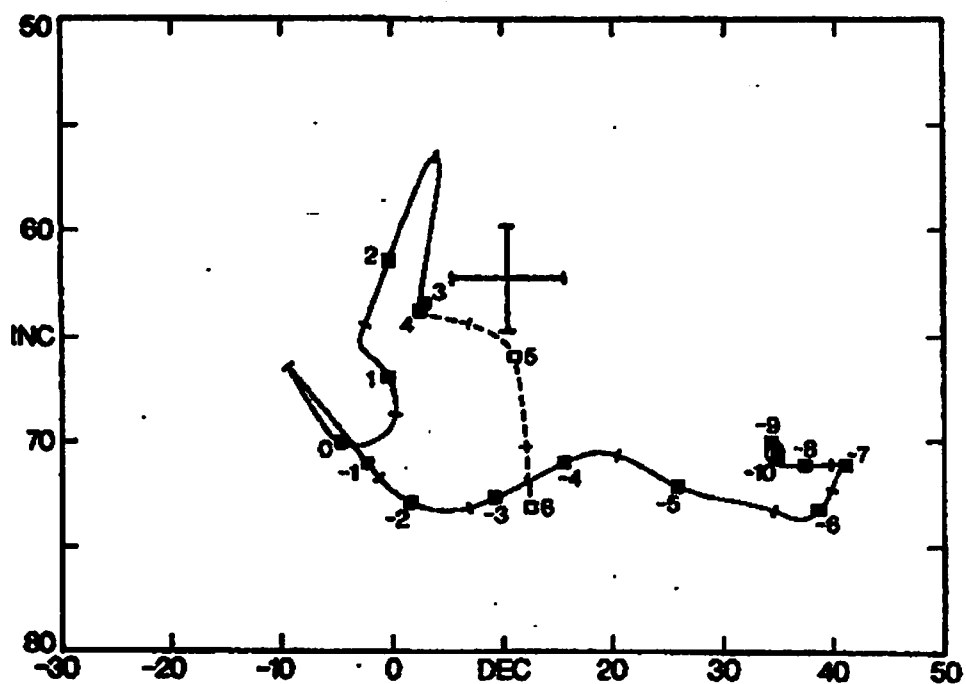


Figure 16. Corrected mean remanence vectors for the Myers Wood Trench C group A together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.

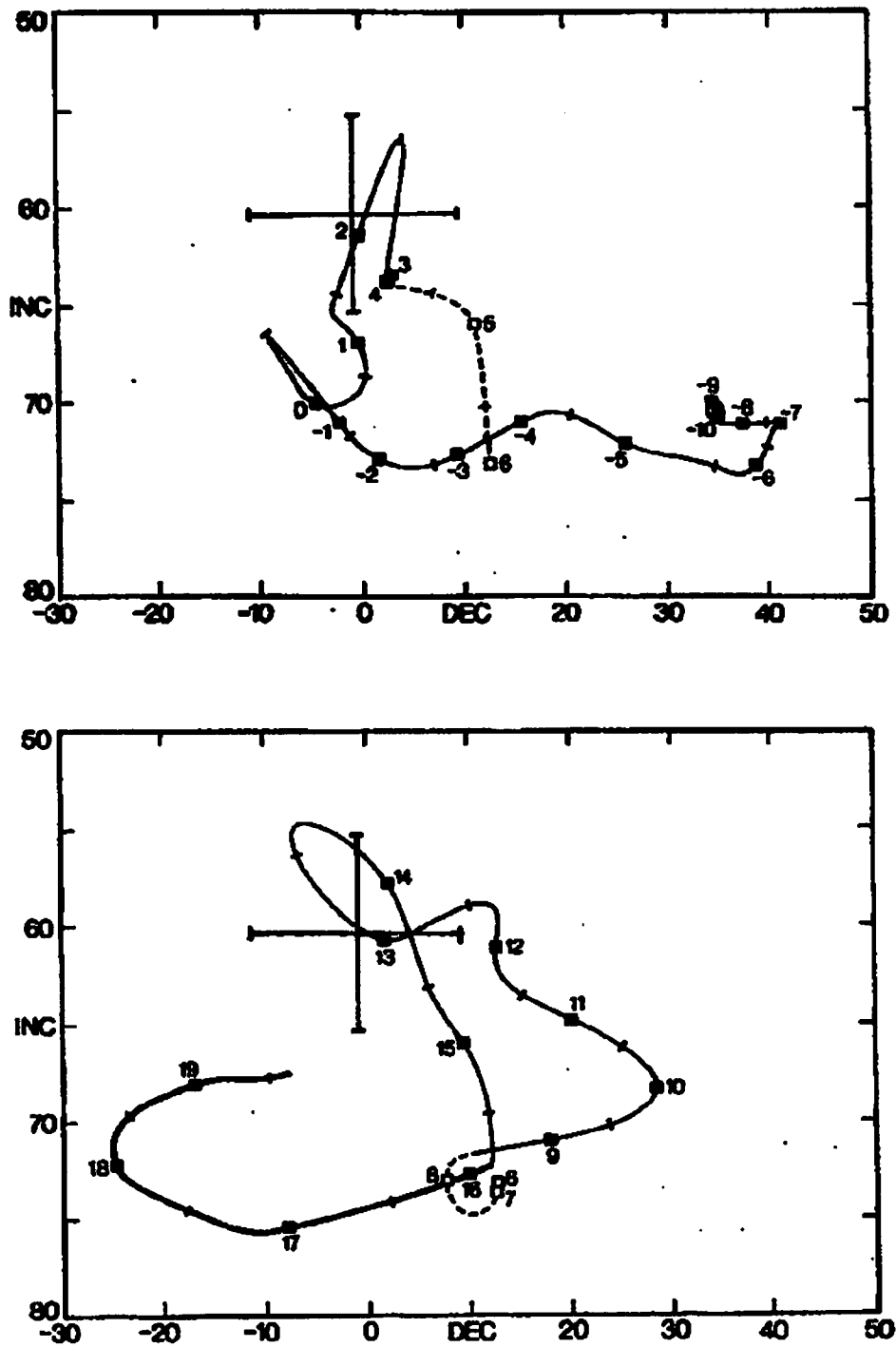
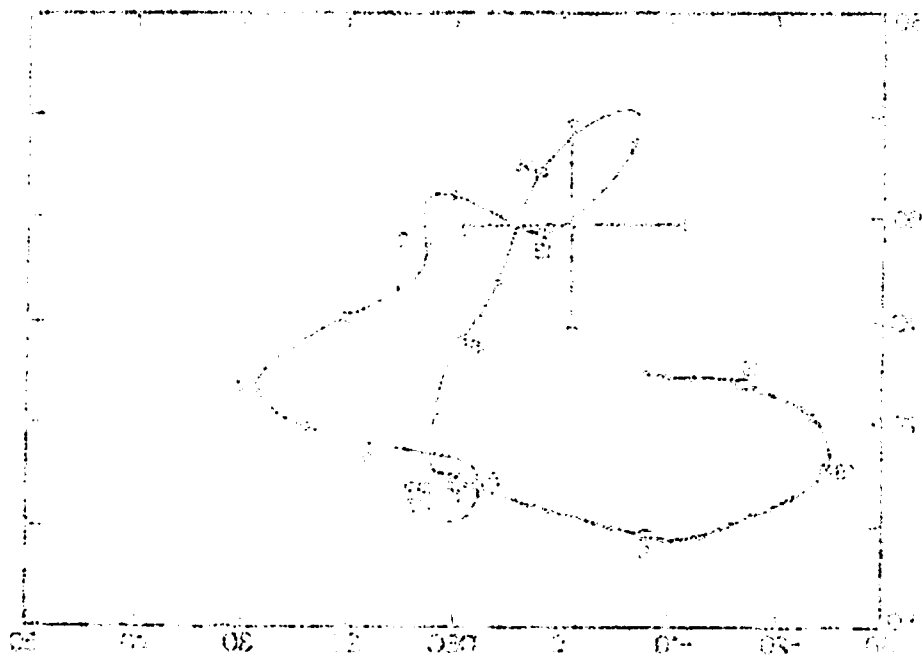
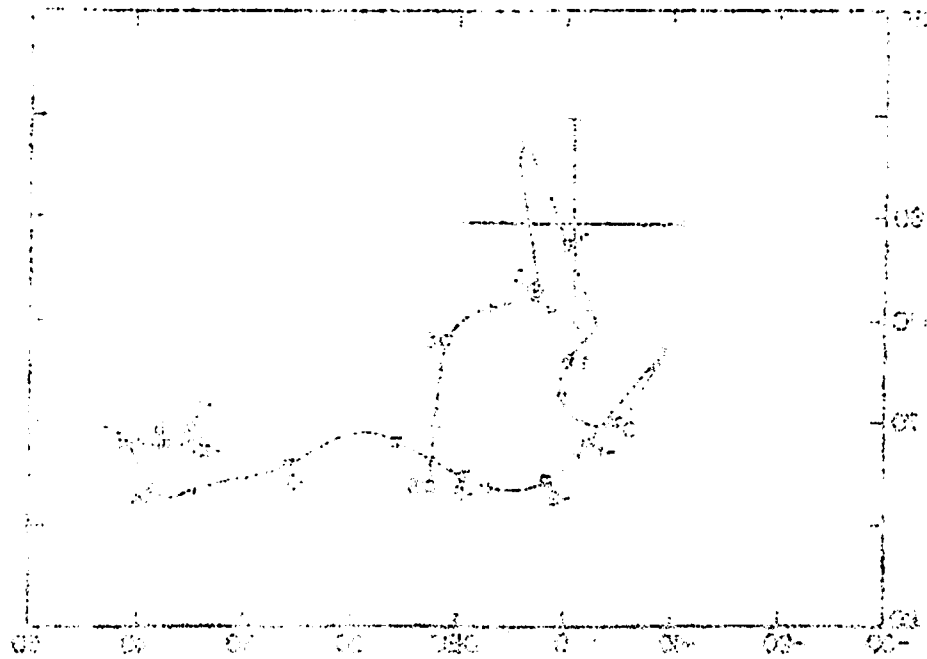


Figure 17. Corrected mean remanence vectors for the Myers Wood Trench G together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.



The above curves are plotted on a coordinate system where the horizontal axis represents the independent variable and the vertical axis represents the dependent variable. The curves exhibit complex, non-linear behavior, characterized by multiple peaks and troughs, suggesting a highly non-linear relationship between the variables. The curves are plotted on a grid with major ticks every 2 units on both axes, ranging from 0 to 8.

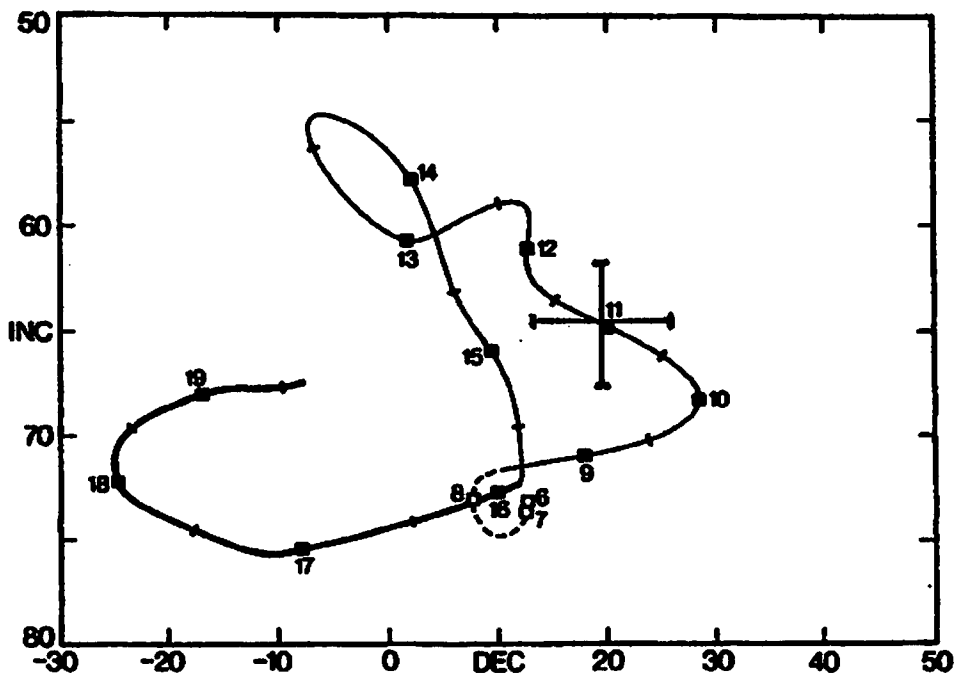
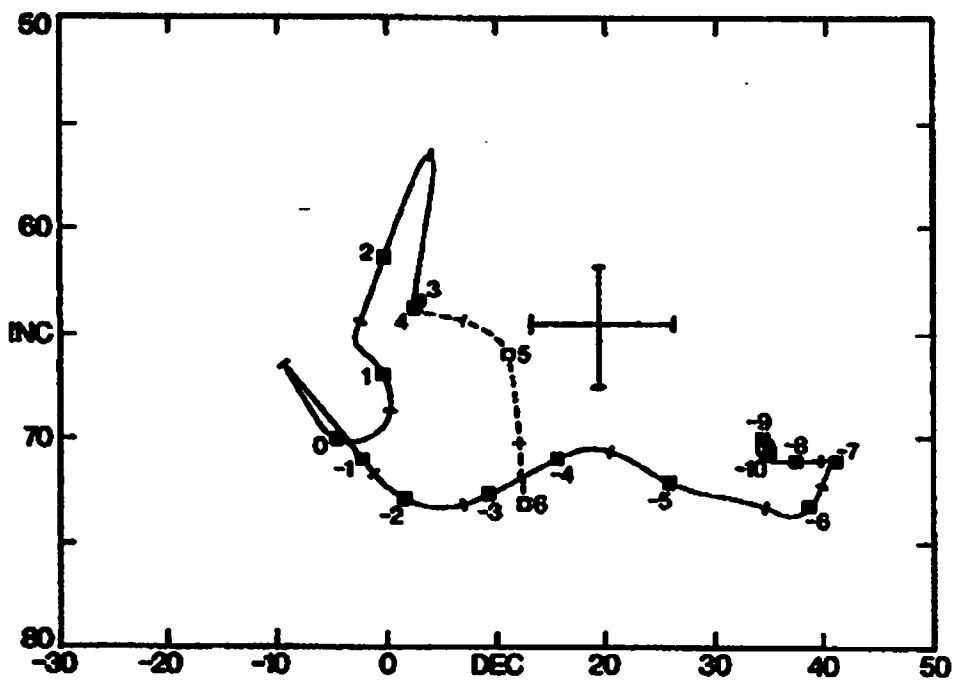


Figure 18. Corrected mean remanence vectors for the Myers Wood Trench L together with 95% confidence level errors, superimposed on the British archaeomagnetic calibration curve (Clark *et al.*, 1988), normalised to Meriden, showing (upper) 1000BC-AD600 and (lower) AD600-AD1975.

APPENDIX 1: AN INTRODUCTION TO ARCHAEOMAGNETIC DATING

PRINCIPLES

Archaeomagnetic dating is based on a comparison of the ancient geomagnetic field, as recorded by archaeological materials, with a dated record of changes in the Earth's field over time in a particular geographical area. The geomagnetic field changes both in direction (declination and inclination) and in strength (intensity) and archaeomagnetic dating can be based on either changes in direction or intensity or a combination of the two. Dating by direction requires the exact position of the archaeological material in relation to the present geomagnetic field to be recorded, and so material must be undisturbed and sampled *in situ*. Dating by intensity does not require *in situ* samples but is less precise and experimentally more difficult. The laboratory at Bradford uses archaeomagnetic dating by direction.

SUITABLE MATERIALS FOR DATING

For an archaeological material to be suitable for dating using magnetic direction, it must contain sufficient magnetised particles and an event must have caused these particles to record the Earth's magnetic field. Many geologically derived materials e.g. soils, sediments, clays, contain sufficient magnetic minerals. There are primarily two types of archaeological event which may result in the Earth's magnetic field at a particular moment being recorded by archaeological materials: heating and deposition in air or water.

If materials have been heated to a sufficiently high temperature (>600°C) they may retain a thermoremanent magnetisation (TRM) which reflects the earth's magnetic field at the time of last cooling. Suitable archaeological features would include hearths, kilns and other fired structures.

Sediments may acquire a datable detrital remanent magnetisation (DRM) from the alignment of their magnetic grains by the ambient field during deposition. Such an effect allows deposits in wells, ditches and streams to be dated. However, this aspect of archaeomagnetic dating is still under development, as factors such as bioturbation and diagenesis, can cause post-depositional disturbance of the magnetisation.

Archaeomagnetic dating can be applied to features expected to date from 1000BC to the present day, as this is the period covered by the calibration curve. However, as discussed below the precision of the date obtained will vary according to the period being dated.

SAMPLING

Samples of robust fired materials are taken by attaching a 25mm diameter flanged plastic reference disc to a cleaned, stable area of the feature using a fast setting epoxy resin (Clark *et al*, 1988). The disc is levelled, using a bubble spirit level, and held in place with a small bead of plasticine while the resin sets. The direction of north is then marked on using a magnetic compass, sun compass or gyrotheodolite and the disc removed with a small part of the feature attached to it. In the laboratory, samples are trimmed and if necessary consolidated with a solution of 10% polyvinylacetate in acetone. Sediments and friable fired materials are sampled by insertion of a 2 cm diameter plastic cylinder, onto which the

direction of north is marked. Magnetometers used are sufficiently sensitive for only small samples (c. 1cm³) to be required; approximately 12 to 15 samples are needed from each feature and it may be possible to select sampling location to minimise the visual impact, if the feature is to be preserved.

LABORATORY MEASUREMENTS

In the laboratory a spinner magnetometer is used to measure the remanent magnetisation of each sample (Molyneux, 1971). This measurement indicates the relative strength and direction of the magnetic field of the sample. The stability of this magnetisation is then examined by placing the sample in alternating magnetic fields of increasing strength and removing the magnetisation step-by-step. The demagnetisation measurements allow removal of any less stable magnetisations acquired after the firing or deposition event, leaving the magnetisation of archaeological interest. The magnetic stability of a sample can be demonstrated by a demagnetisation curve (intensity spectrum) or a Zijderveld plot. The results of measurements of the direction of magnetisation of a group of samples are represented on a stereographic plot, which shows declination as an angle measured clockwise from north and inclination as a distance from the perimeter; alternatively the results can be shown on a scatter plot of the angles of declination and inclination for each sample.

STATISTICAL ANALYSIS

The magnetic directions from a number of samples expected to have the same date are combined to give a mean direction, the precision of which is defined using Fisherian statistics (Fisher, 1953). α_{95} represents a 95% probability that the true direction lies within that cone of confidence around the observed mean direction, and would be expected to be less than 5° for dating purposes. A value larger than this indicates that the magnetic directions of the samples are scattered and therefore do not all record the same magnetic field. The stability of magnetisation of an individual sample on demagnetisation is quantified using the Stability Index (Tarling and Symons, 1967). For a stable magnetisation this value would be expected to be greater than 2.5, a value less than this would indicate that the recorded magnetisation was not reliable for dating purposes.

CALIBRATION OF DATES

Once a stable, mean magnetic direction has been obtained this is dated by comparing it with a calibration curve showing changes in the Earth's field over time. The calibration curve is compiled from direct measurements of the field, which extend back to AD1576 in Britain, and from archaeomagnetic measurements from features dated by other methods. Because the geomagnetic field changes spatially, data for the calibration curve can only be drawn from within an area approximately 1000km across and all magnetic directions must be corrected mathematically to a central location (Noel and Batt, 1990). There is a single calibration curve for England, Scotland and Wales and directions are corrected to Meriden (52.43°N, 1.62°W). Conventionally British archaeomagnetic dates are calibrated by visual comparison to the calibration curve produced by Clark *et al.* (1988). However, this method takes no account of the errors in the calibration curve itself and an alternative method is also used (Batt, 1997). The latter method gives a larger error margin on the date but is a better reflection of the actual error.

PRECISION OF DATES

There are a number of factors that will influence the error margins of the dates obtained:

- differential recording of the field by different parts of the feature
- disturbance of the material after firing / deposition
- uncertainties in sampling and laboratory measurements
- error margins in the calibration curve itself
- uncertainties in the comparison of the magnetic direction with the calibration curve
- spatial variation of the geomagnetic field

The precision of the calibration curve varies according to the archaeological period and so the precision of the date obtained will depend on the archaeological date. As the geomagnetic field has occasionally had the same direction at two different times, it is also possible to have two or more alternative dates for a single feature. In most cases the archaeological evidence can be used to select the most likely.

Given the number of different factors it is not possible to give a general figure for the precision of archaeomagnetic dates but there will be an error margin of at least ± 25 years. It is important to note that, since the method relies on the reliability of previously dated sites, the calibration curve can be improved as more measurements become available.

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- Noel, M. and Batt, C.M. (1990). A method for correcting geographically separated remanence directions for the purpose of archaeomagnetic dating. *Geophys. J. Int.* 102, 753-756.
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- Tarling, D.H. and Symons, D.T.A. (1967). A stability index of remanence in palaeomagnetism. *Geophys. J. R. astr. Soc.* 12, 443-448.

FURTHER READING

For general information on scientific dating methods:

Aitken, M.J. (1990). *Science-Based Dating in Archaeology*. London: Longman.

For details of wider applications of magnetic studies:

Oldfield, F. (1991). Environmental magnetism - a personal perspective. *Quaternary Science Reviews* 10, 73-85.

For an international perspective on archaeomagnetic dating:

Eighmy, J.L. and Sternberg, R.S. (1990). *Archaeomagnetic Dating*. Tucson: The University of Arizona Press.

For details of the principles and geological applications:

Tarling, D.H. (1983). *Palaeomagnetism*. London: Chapman and Hall.

APPENDIX 2: DETAILED MEASUREMENTS AND STATISTICAL ANALYSES

INCORPORATES:

- Site information
- Magnetic measurements
- Statistics for NRM
- Statistics for partial demagnetisation
- Statistics for corrections, final result and errors
- Scatter plots for NRM and demagnetised samples
- Pilot demagnetisation measurements and plots

FOR EACH OF THE FOLLOWING EXCAVATED AREAS:

- Trench A
- Trench B, context 207
- Trench B, context 270
- Trench B, combined contexts 207 & 270
- Trench B, context 262
- Trench B, contexts 267 & 271
- Trench C, sample group A
- Trench C, sample group B
- Trench C, sample group C
- Trench G
- Trench L
- Trench M

SITE INFORMATION

Site Name Myers Wood
Area Trench A
Context No
Description Ore roasting area
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 18/9/02

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments
	D	I	Int		D	I	Int		
	<i>degs.</i>	<i>degs.</i>	<i>arb</i>	<i>mT</i>	<i>degs.</i>	<i>degs.</i>	<i>arb</i>	Y/N	
1	8.5	69.4	147.75	10	4.8	66.9	67.78	Y	
2	352.7	68.8	58.64	10	1.5	63.3	14.77		
3	9.6	79.8	33.87	10	5.1	63.2	2.66	Y	
4	10.4	61.1	35.64	10	6.9	59.1	18.80		
5	1.7	74.9	85.03	10	14.8	69.1	17.35		
6	347.4	67.1	75.78	10	337.4	60.8	15.36		
7	350.3	66.8	60.61	10	10.1	58.3	21.93	Y	
8	352.0	68.9	21.44	10	16.9	64.6	3.80		
9	104.5	56.8	22.46	10	124.0	12.2	14.19	Y	Outlier
10	27.7	65.1	29.24	10	34.2	54.4	9.74		
11	280.3	74.1	1.37	10	350.7	58.8	0.14	Y	
12	355.0	72.2	38.05	10	7.8	62.9	8.21		
13	354.7	73.0	61.01	10	16.4	67.1	15.24		
14	349.7	64.2	48.33	10	345.8	59.4	5.92	Y	
15	326.0	70.6	18.92	10	341.8	71.3	3.79		

STATISTICS FOR NRM

Sample no.	NRM				
	D degs.	I degs.	x	y	z
1	8.5	69.4	0.34798	0.05201	0.93606
2	352.7	68.8	0.35869	-0.04595	0.93232
3	9.6	79.8	0.17460	0.02953	0.98420
4	10.4	61.1	0.47534	0.08724	0.87546
5	1.7	74.9	0.26039	0.00773	0.96547
6	347.4	67.1	0.37975	-0.08488	0.92119
7	350.3	66.8	0.38831	-0.06638	0.91914
8	352.0	66.9	0.38852	-0.05460	0.91982
9	104.5	56.8	-0.13710	0.53012	0.83676
10	27.7	65.1	0.37278	0.19572	0.90704
11	280.3	74.1	0.04898	-0.26954	0.96174
12	355.0	72.2	0.30453	-0.02664	0.95213
13	354.7	73.0	0.29112	-0.02701	0.95630
14	349.7	64.2	0.42822	-0.07782	0.90032
15	326.0	70.6	0.27537	-0.18574	0.94322

Number = 15
 Sum x = 4.35750
 Sum y = 0.06378
 Sum z = 13.91118
 R = 14.57782
 x bar = 0.29891
 y bar = 0.00437
 z bar = 0.95427

 Mean Dec = 0.84
 Mean Inc = 72.61
 Alpha95 = 6.74

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demag				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	4.8	66.9	0.39096	0.03283	0.91982
2	1.5	63.3	0.44917	0.01176	0.89337
3	5.1	63.2	0.44909	0.04008	0.89259
4	6.9	59.1	0.50982	0.06170	0.85806
5	14.8	69.1	0.34490	0.09113	0.93420
6					
7	10.1	58.3	0.51733	0.09215	0.85081
8	16.9	64.6	0.41041	0.12469	0.90334
9					
10					
11	350.7	58.8	0.51122	-0.08372	0.85536
12	7.8	62.9	0.45133	0.06182	0.89021
13	16.4	67.1	0.37329	0.10987	0.92119
14	345.8	59.4	0.49349	-0.12487	0.86074
15					

Number = 11
 Sum x = 4.90101
 Sum y = 0.41744
 Sum z = 9.77970
 R = 10.94699
 x bar = 0.44770
 y bar = 0.03813
 z bar = 0.89337

Mean Dec = 4.87
 Mean Inc = 63.30
 Alpha95 = 3.33

Alpha68 = 1.96

CORRECTIONS

Mean Dec = 4.87
Mean Inc = 63.30

Correction for magnetic variation

Mean Dec = 1.15
Mean Inc = 63.30

Correction to Meriden (CVP)

Uncorrected Dec = 1.15
Uncorrected Inc = 63.30
Latitude = 53.60
Longitude = -1.73

Kai = 45.17
Latitude of pole = 81.20
Beta1 = 5.33
Longitude of pole = 172.94
Geomag colat = 46.34
Corrected Inc = 62.35
Beta 2 = 5.44
Corrected Dec = 1.15

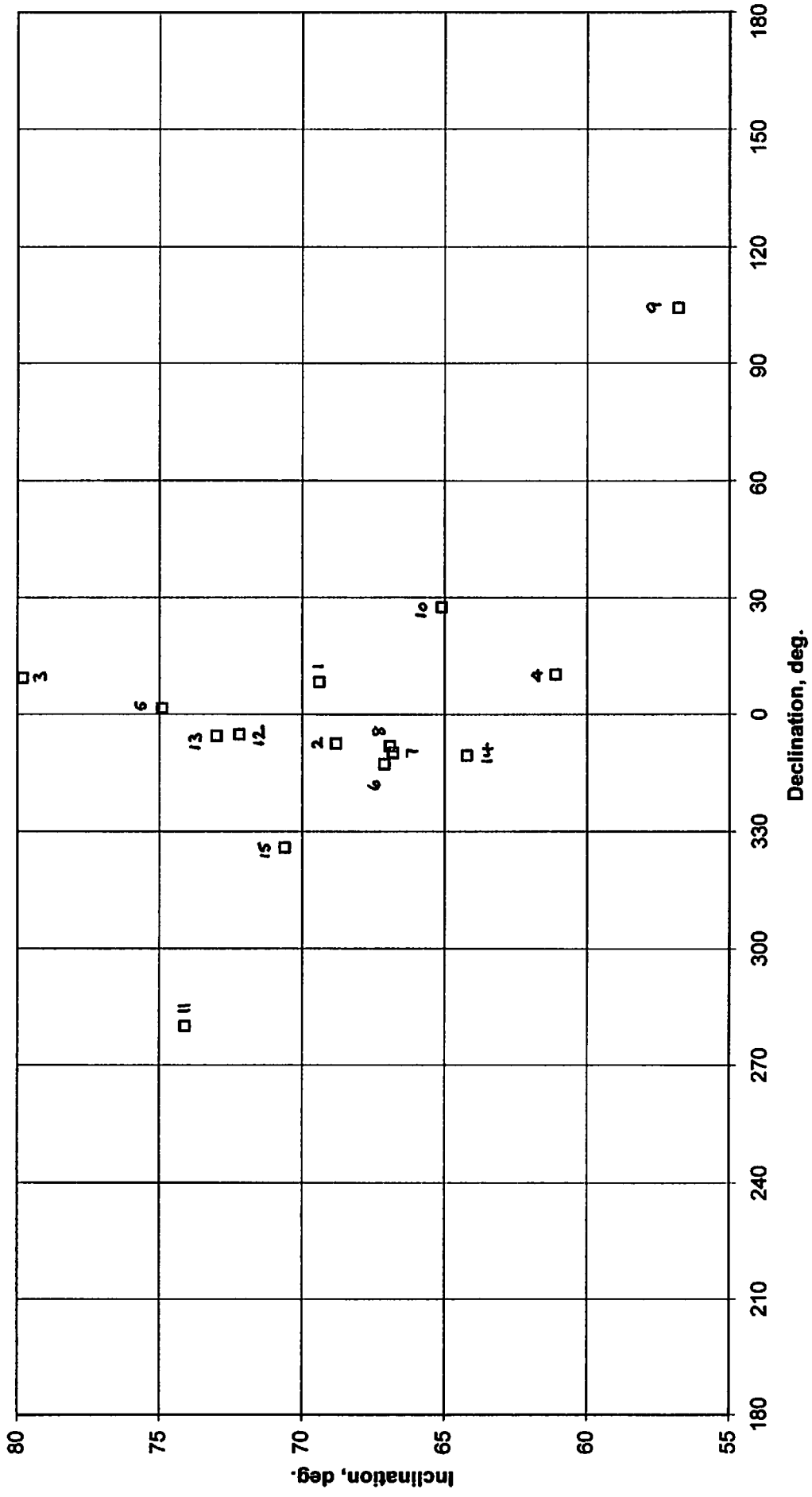
FINAL RESULT

Corrected Dec = 1.15
Corrected Inc = 62.35
Alpha95 = 3.33

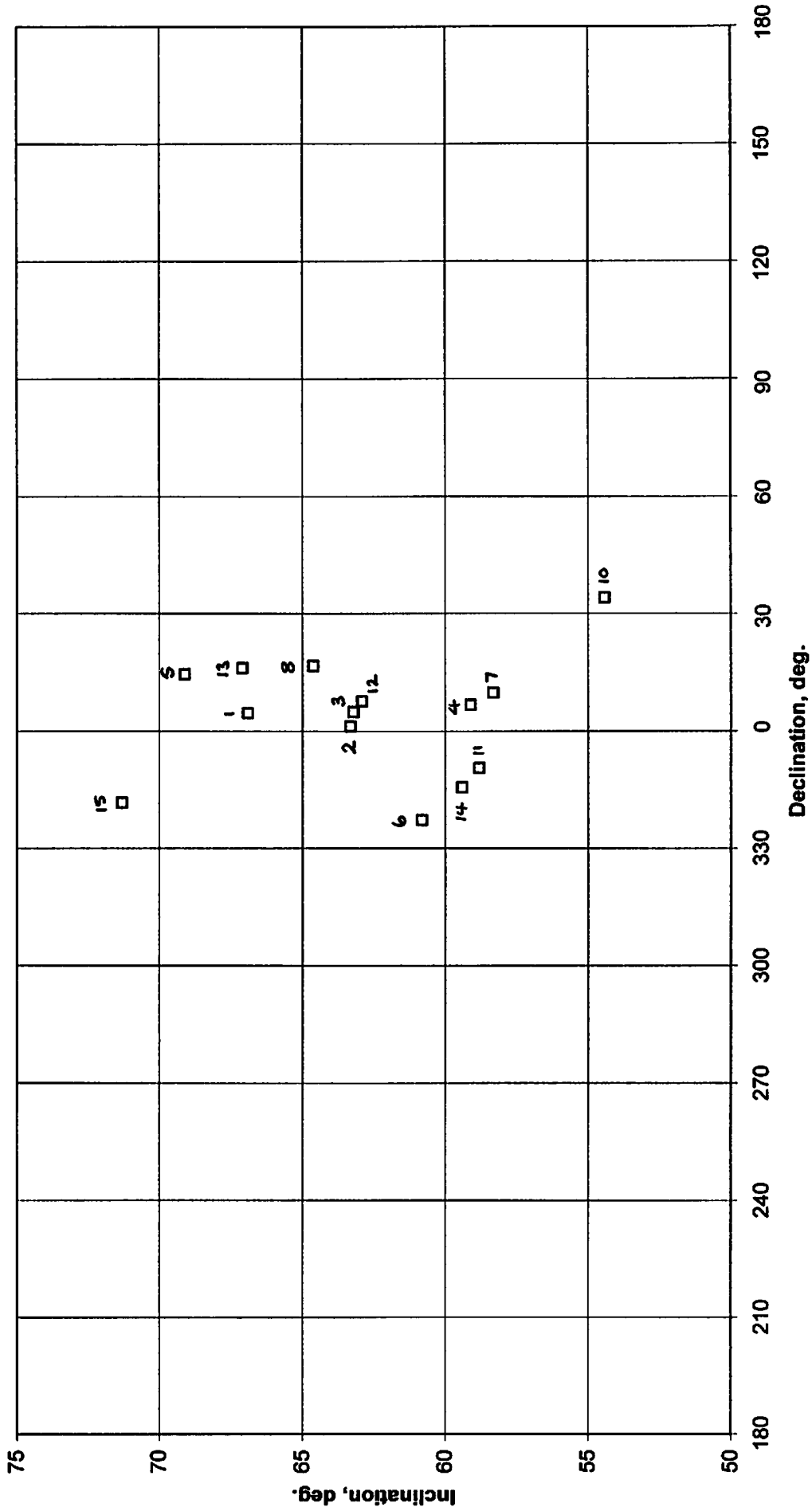
ERROR BARS

Alpha95		Alpha68	
$\delta Dec = \pm$	7.18	$\delta Dec = \pm$	4.22
$\delta Inc = \pm$	3.33	$\delta Inc = \pm$	1.96

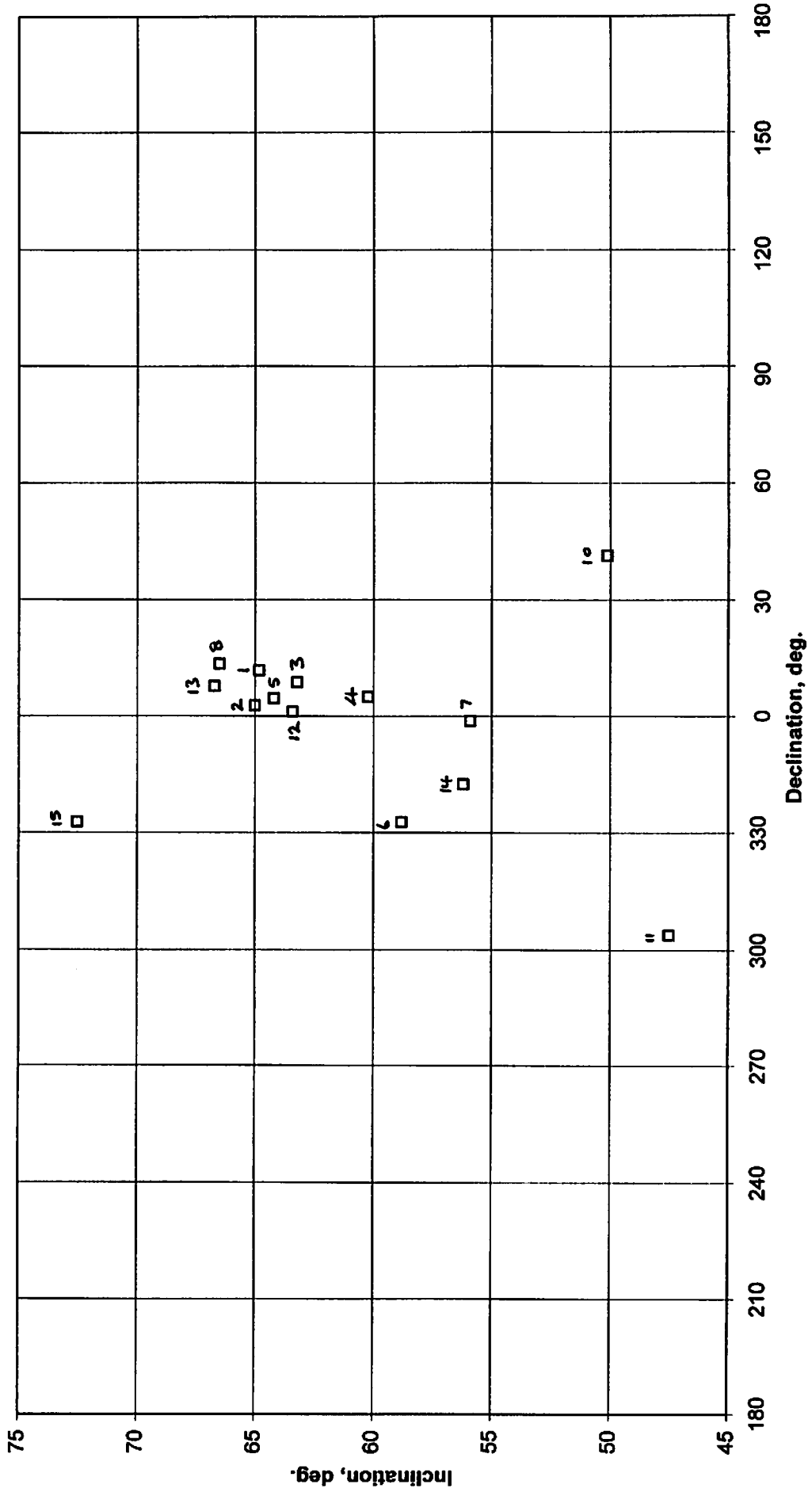
INITIAL SAMPLE SCATTER



10mT DEMAGNETISED SAMPLE SCATTER



15mT DEMAGNETISED SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

Sample No. 1

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	132.76	1.00	39.96	4.38	126.53	6.3	72.4
2.5	131.50	0.99	40.74	2.12	125.01	3.0	71.9
5.0	120.51	0.91	42.71	9.78	112.26	12.9	68.7
7.5	107.24	0.81	40.85	1.95	99.14	2.7	67.6
10.0	93.23	0.70	34.48	3.04	85.74	4.8	66.9
15.0	67.78	0.51	28.28	5.94	61.31	11.9	64.8
20.0	38.06	0.29	16.16	1.89	34.41	6.7	64.7
30.0	11.50	0.09	4.61	-0.31	10.53	356.2	66.3
40.0	7.34	0.06	2.32	0.38	6.95	9.4	71.3
60.0	6.19	0.05	2.44	-0.76	5.64	342.7	65.7
80.0	5.70	0.04	2.43	-0.09	5.16	357.9	64.7
100.0	5.45	0.04	2.30	-0.56	4.92	346.4	64.3

Sample No. 7

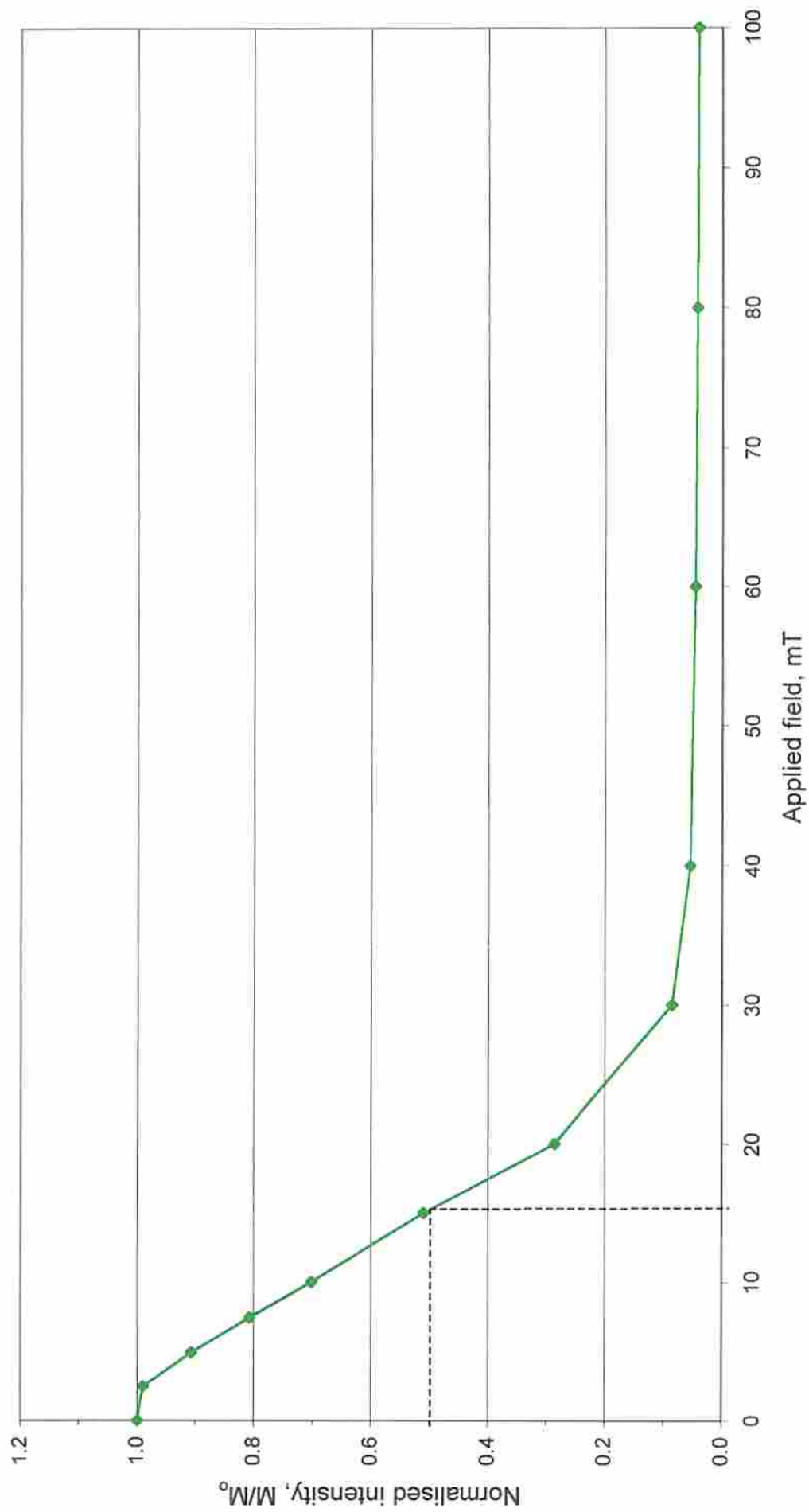
Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	56.00	1.00	25.44	-3.55	49.76	352.1	62.7
2.5	55.24	0.99	24.66	-4.17	49.26	350.4	63.1
5.0	50.51	0.90	20.98	-1.21	45.93	356.7	65.4
7.5	43.71	0.78	21.43	-2.21	38.03	354.1	60.5
10.0	37.24	0.67	19.25	3.45	31.69	10.1	58.3
15.0	21.93	0.39	12.30	-0.22	18.16	359.0	55.9
20.0	9.50	0.17	5.24	0.13	7.93	1.5	56.5
30.0	2.90	0.05	1.56	-0.40	2.41	345.5	56.2
40.0	2.09	0.04	1.12	-0.28	1.74	346.1	56.5
60.0	1.78	0.03	1.03	-0.29	1.42	344.6	52.9
80.0	1.72	0.03	0.92	-0.20	1.44	347.6	56.8
100.0	2.01	0.04	1.03	-0.07	1.72	356.0	59.0

Sample No.

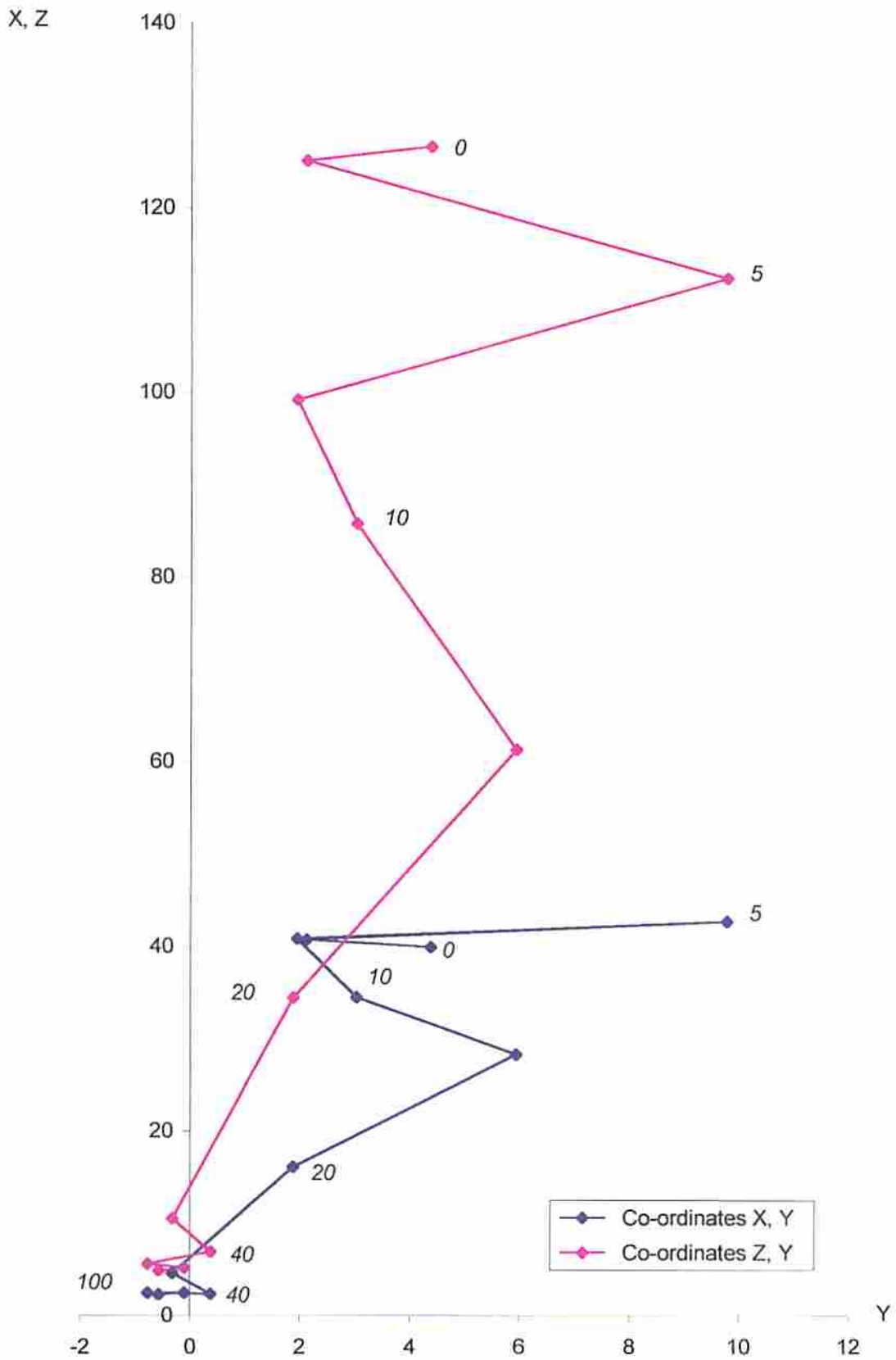
14

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	43.21	1.00	14.69	-5.00	40.32	341.2	69.0
2.5	44.99	1.04	22.78	-3.13	38.67	352.2	59.3
5.0	35.60	0.82	16.09	-3.39	31.58	348.1	62.5
7.5	24.48	0.57	12.34	-2.44	21.00	348.8	59.1
10.0	15.77	0.37	7.78	-1.96	13.58	345.8	59.4
15.0	5.92	0.14	3.14	-0.97	4.92	342.8	56.2
20.0	2.48	0.06	1.47	-0.58	1.91	338.4	50.5
30.0	1.19	0.03	0.74	-0.51	0.77	325.2	40.7
40.0	1.31	0.03	0.95	-0.62	0.64	326.8	29.4
60.0	1.16	0.03	0.70	-0.68	0.62	315.7	32.6
80.0	1.05	0.02	0.73	-0.45	0.61	328.2	35.6
100.0	0.99	0.02	0.75	-0.36	0.54	334.2	32.8

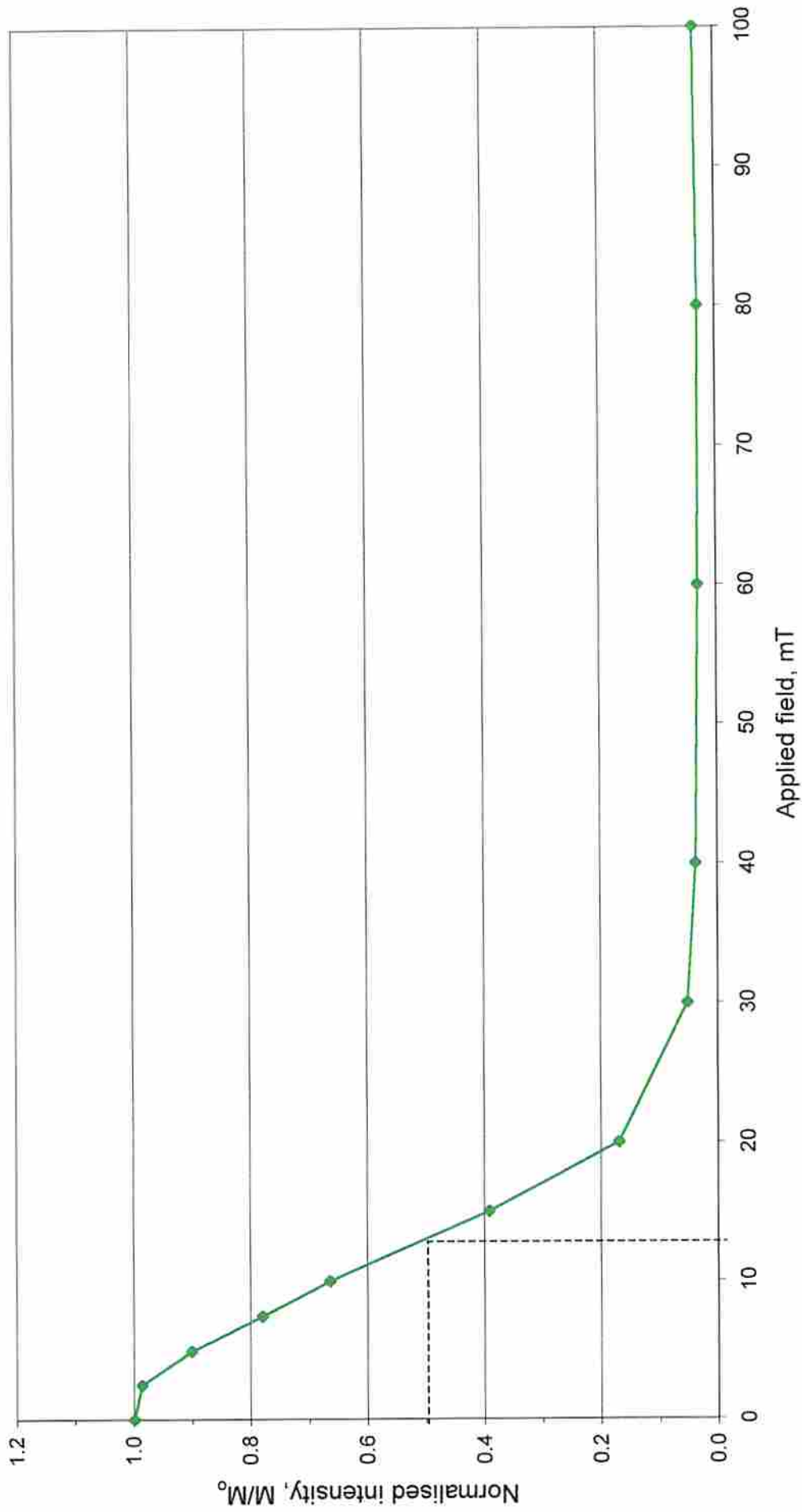
MYERS WOOD - SAMPLE POINT A1 DEMAGNETISATION: INTENSITY SPECTRUM



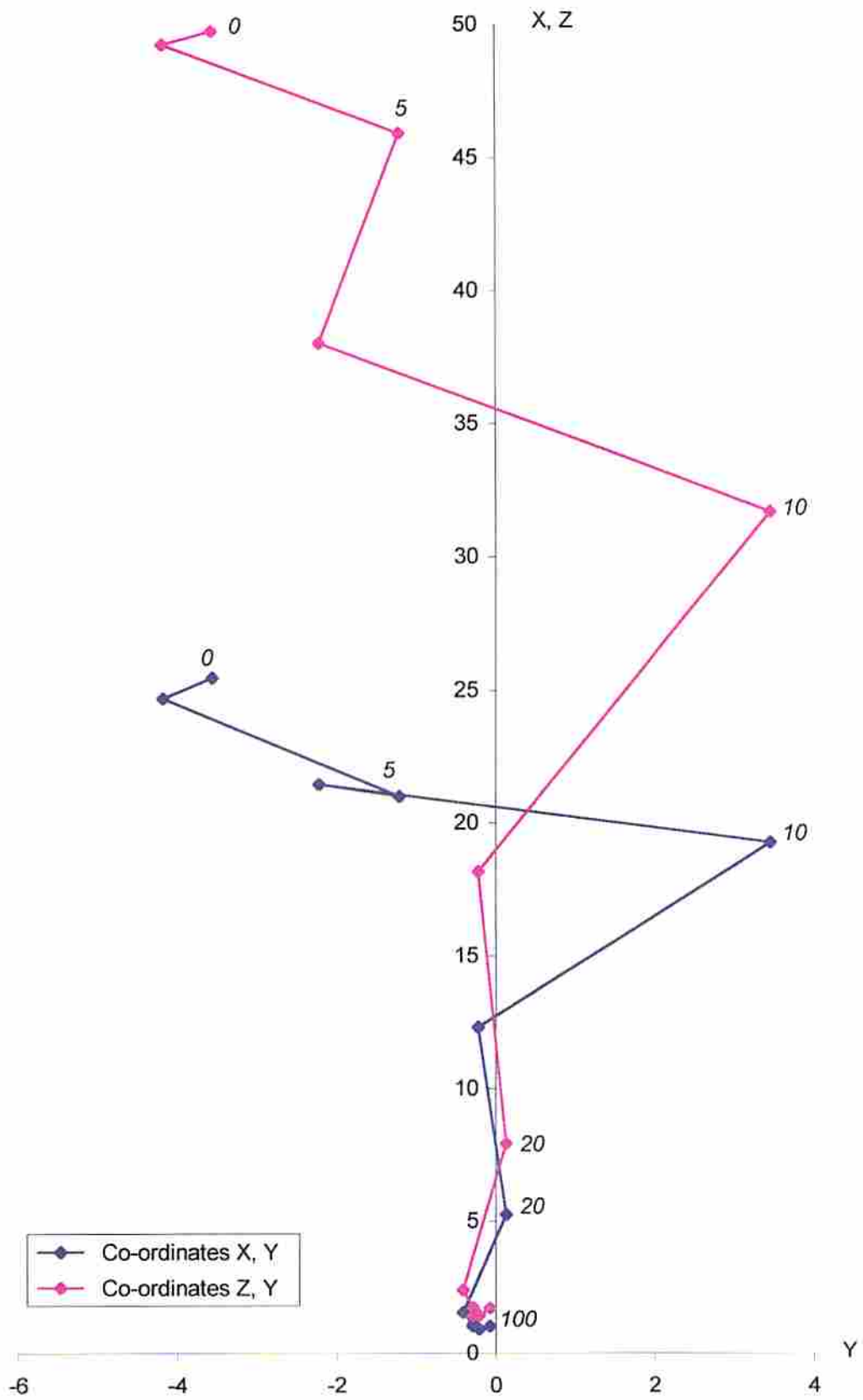
MYERS WOOD - SAMPLE POINT A1 - ZIJDERVELD PLOT



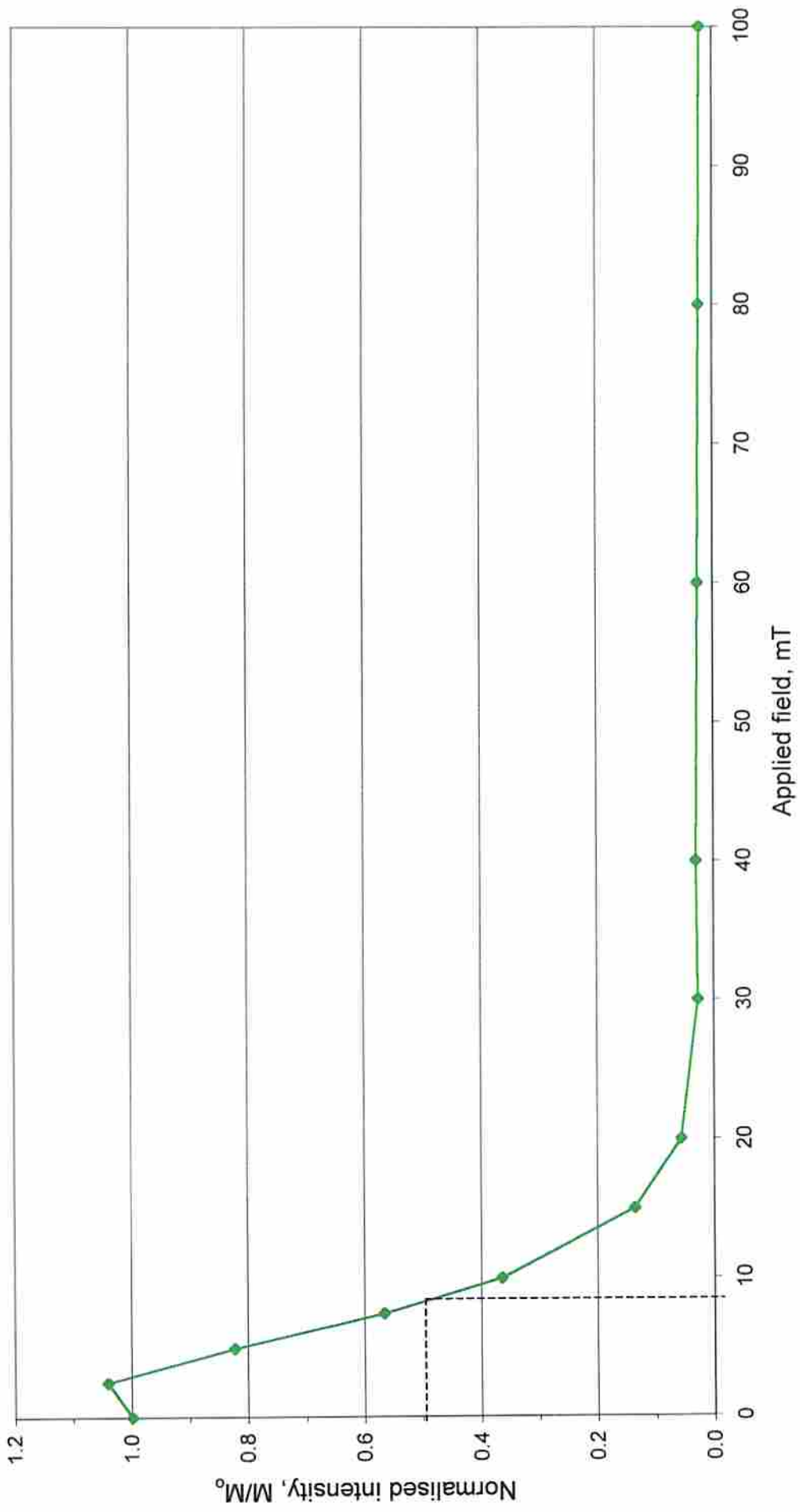
MYERS WOOD - SAMPLE POINT A7 DEMAGNETISATION: INTENSITY SPECTRUM



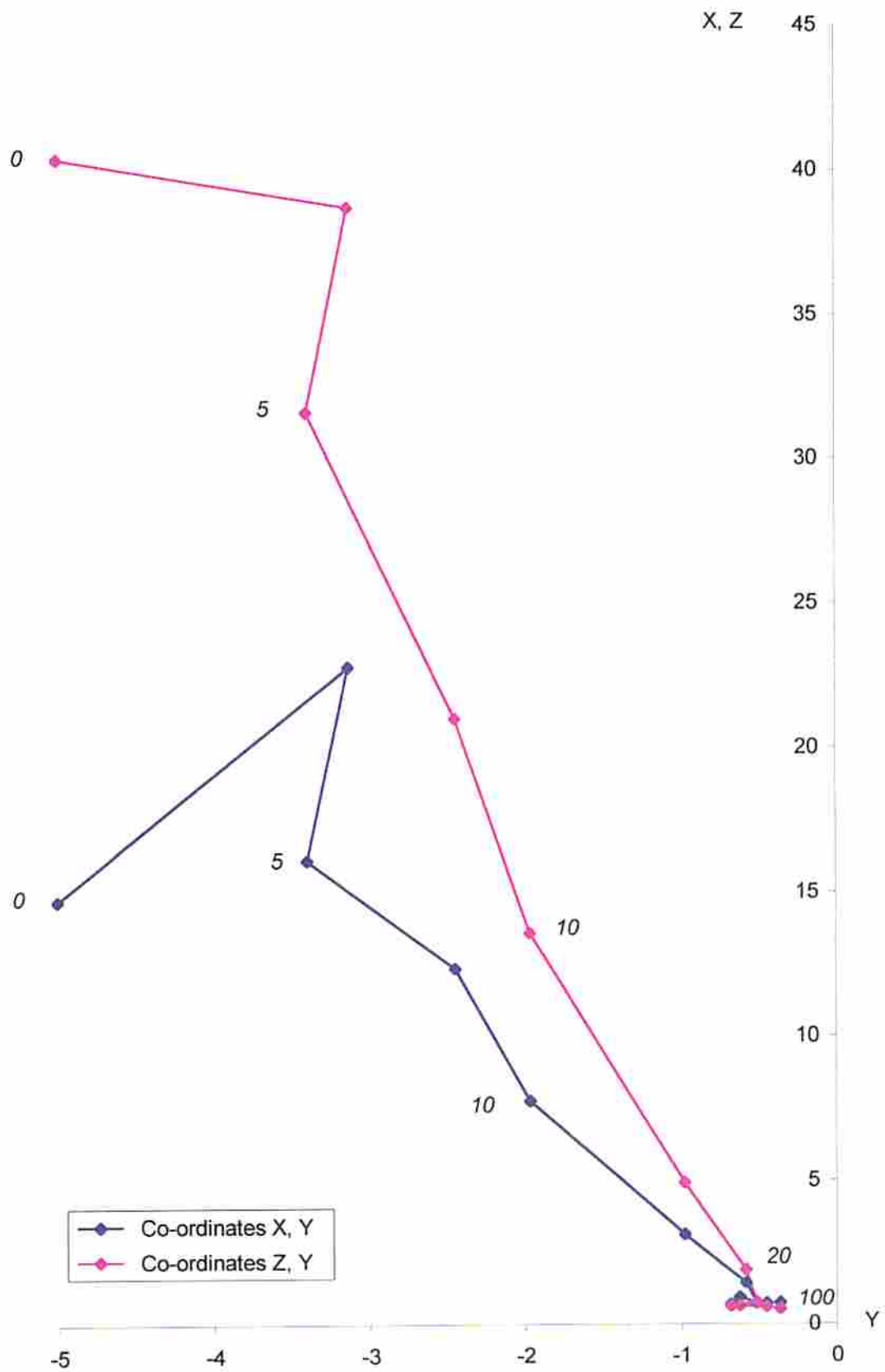
MYERS WOOD - SAMPLE POINT A7 - ZIJDERVELD PLOT



MYERS WOOD - SAMPLE POINT A14 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT A14 - ZIJDERVELD PLOT



STEPPED A.F. DEMAGNETISATION MEASUREMENTS FOR OUTLIERS

Sample No. 3

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	29.08	1.00	7.71	1.69	27.99	12.4	74.3
2.5	28.14	0.97	8.06	1.66	26.91	11.6	73.0
5.0	23.47	0.81	8.80	1.03	21.73	6.7	67.8
7.5	14.22	0.49	5.86	0.78	12.94	7.6	65.4
10.0	7.55	0.26	3.30	0.29	6.57	5.1	63.2
15.0	2.66	0.09	1.18	0.19	2.38	8.9	63.2
20.0	1.29	0.04	0.62	-0.34	1.07	331.1	56.6
30.0	0.94	0.03	0.57	-0.07	0.74	352.5	52.3
40.0	0.83	0.03	0.42	-0.15	0.70	340.4	57.2
60.0	0.72	0.02	0.33	-0.07	0.64	347.5	62.3
80.0	0.71	0.02	0.32	-0.20	0.60	328.0	57.8
100.0	0.83	0.03	0.41	-0.31	0.66	323.0	52.1

Sample No. 9

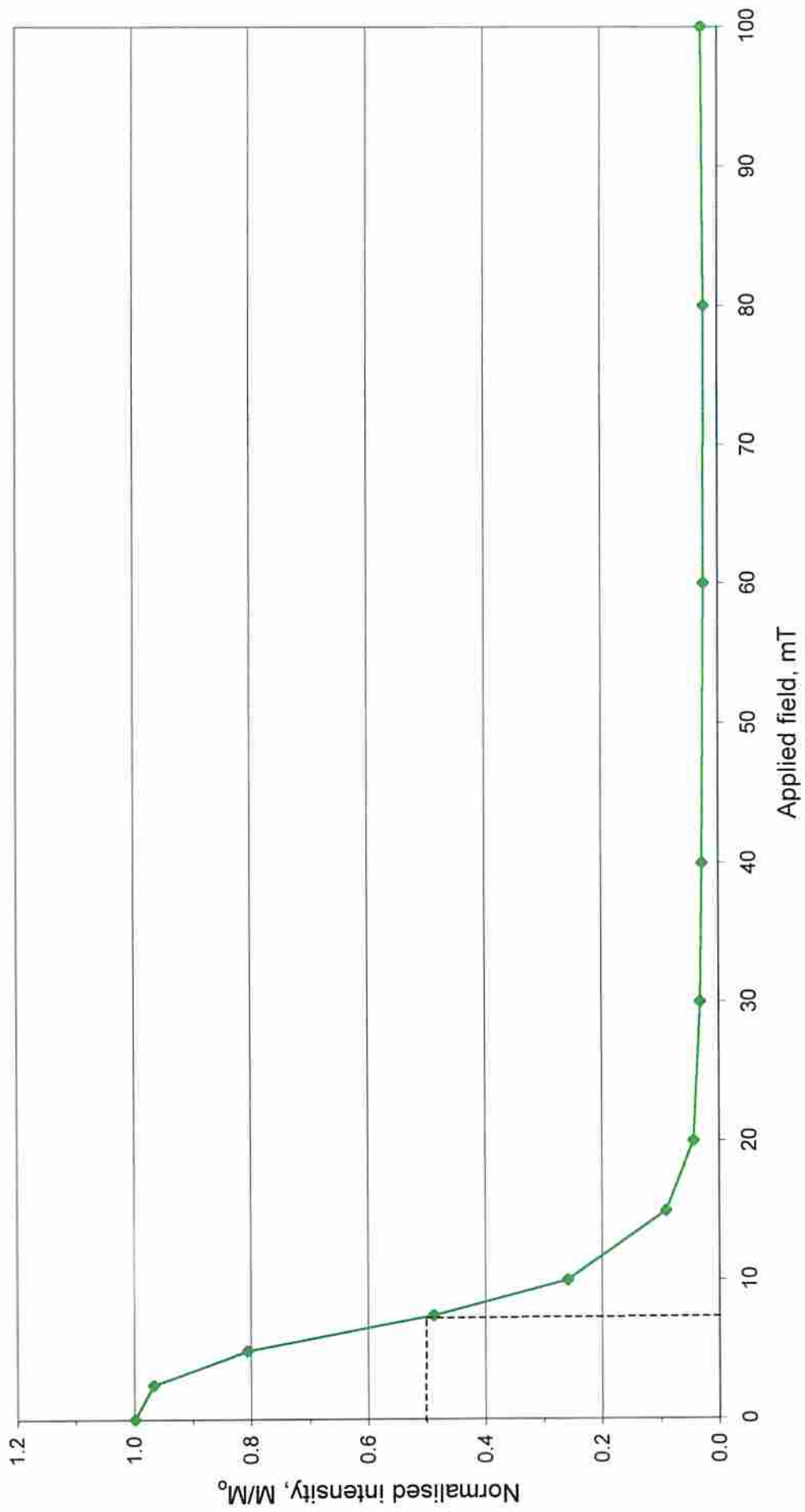
Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	21.27	1.00	-1.53	11.51	17.81	97.6	56.9
2.5	21.29	1.00	-1.93	11.93	17.53	99.2	55.4
5.0	18.04	0.85	-3.54	10.41	14.30	108.8	52.4
7.5	14.74	0.69	-5.17	10.98	8.36	115.2	34.6
10.0	13.68	0.64	-7.48	11.08	2.90	124.0	12.2
15.0	14.19	0.67	-9.24	10.39	-2.82	131.6	-11.5
20.0	10.39	0.49	-6.94	6.91	-3.46	135.1	-19.5
30.0	2.79	0.13	-1.96	1.94	-0.41	135.3	-8.4
40.0	0.79	0.04	-0.18	0.22	0.74	130.2	69.0
60.0	0.86	0.04	0.27	-0.07	0.81	346.0	71.1
80.0	0.91	0.04	0.39	-0.23	0.78	329.1	59.7
100.0	0.84	0.04	0.25	-0.20	0.78	321.2	67.6

Sample No.

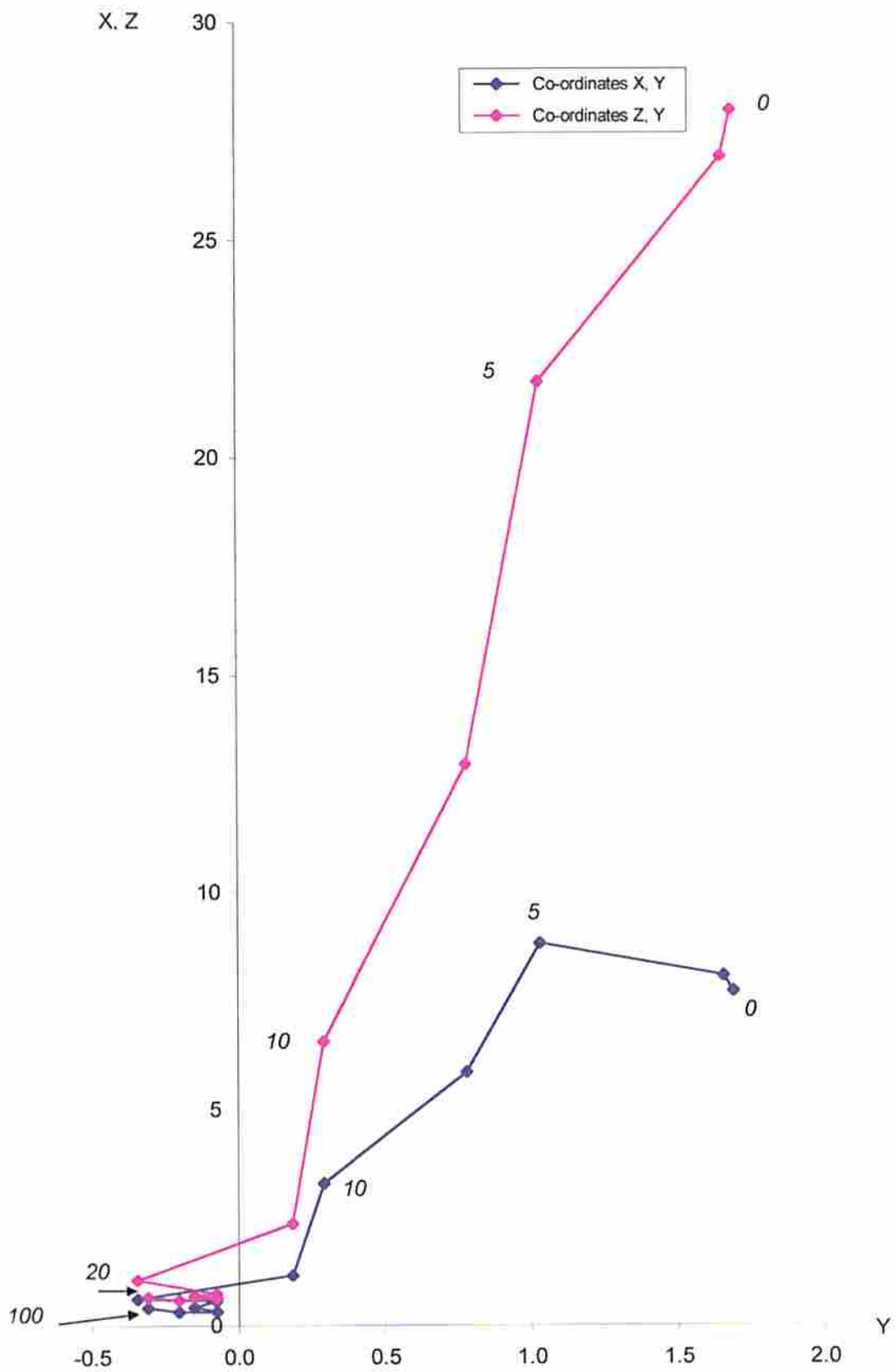
11

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	0.91	1.00	0.17	-0.21	0.87	308.2	72.6
2.5	0.85	0.93	0.30	-0.15	0.78	333.4	66.9
5.0	0.74	0.81	0.12	-0.05	0.72	336.9	79.7
7.5	0.55	0.61	0.14	-0.01	0.53	355.7	75.4
10.0	0.41	0.45	0.21	-0.03	0.35	350.7	58.8
15.0	0.14	0.15	0.05	-0.08	0.10	304.0	47.5
20.0	0.03	0.04	-0.01	0.03	0.00	109.9	3.7
30.0	0.26	0.28	0.00	0.14	0.22	89.9	57.1
40.0	0.19	0.20	0.05	0.01	0.18	15.3	72.7
60.0	0.23	0.25	0.10	0.06	0.19	30.6	59.4
80.0	0.20	0.22	0.07	-0.01	0.19	348.3	68.9
100.0	0.20	0.22	-0.03	0.00	0.20	181.7	81.6

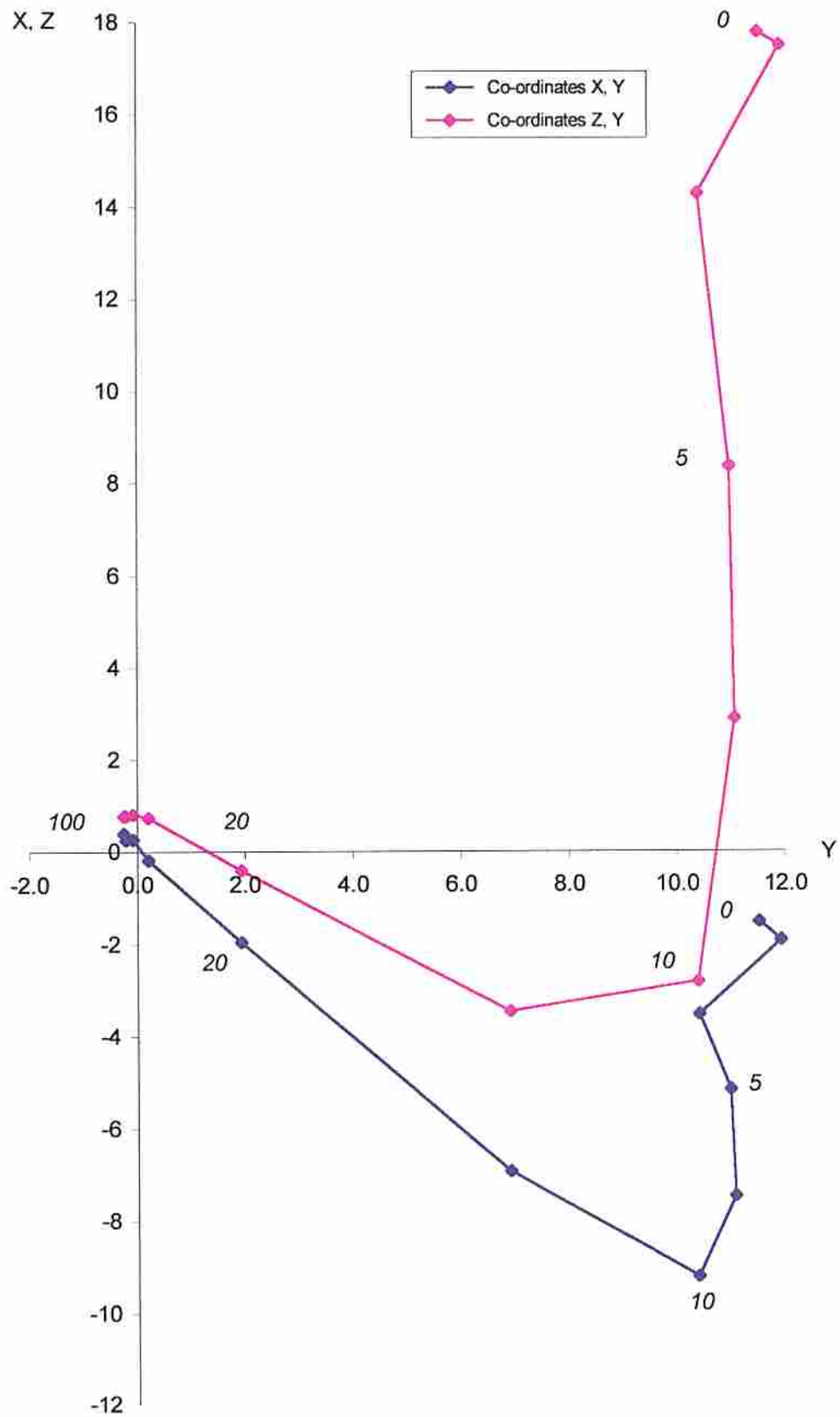
MYERS WOOD - SAMPLE POINT A3 DEMAGNETISATION: INTENSITY SPECTRUM



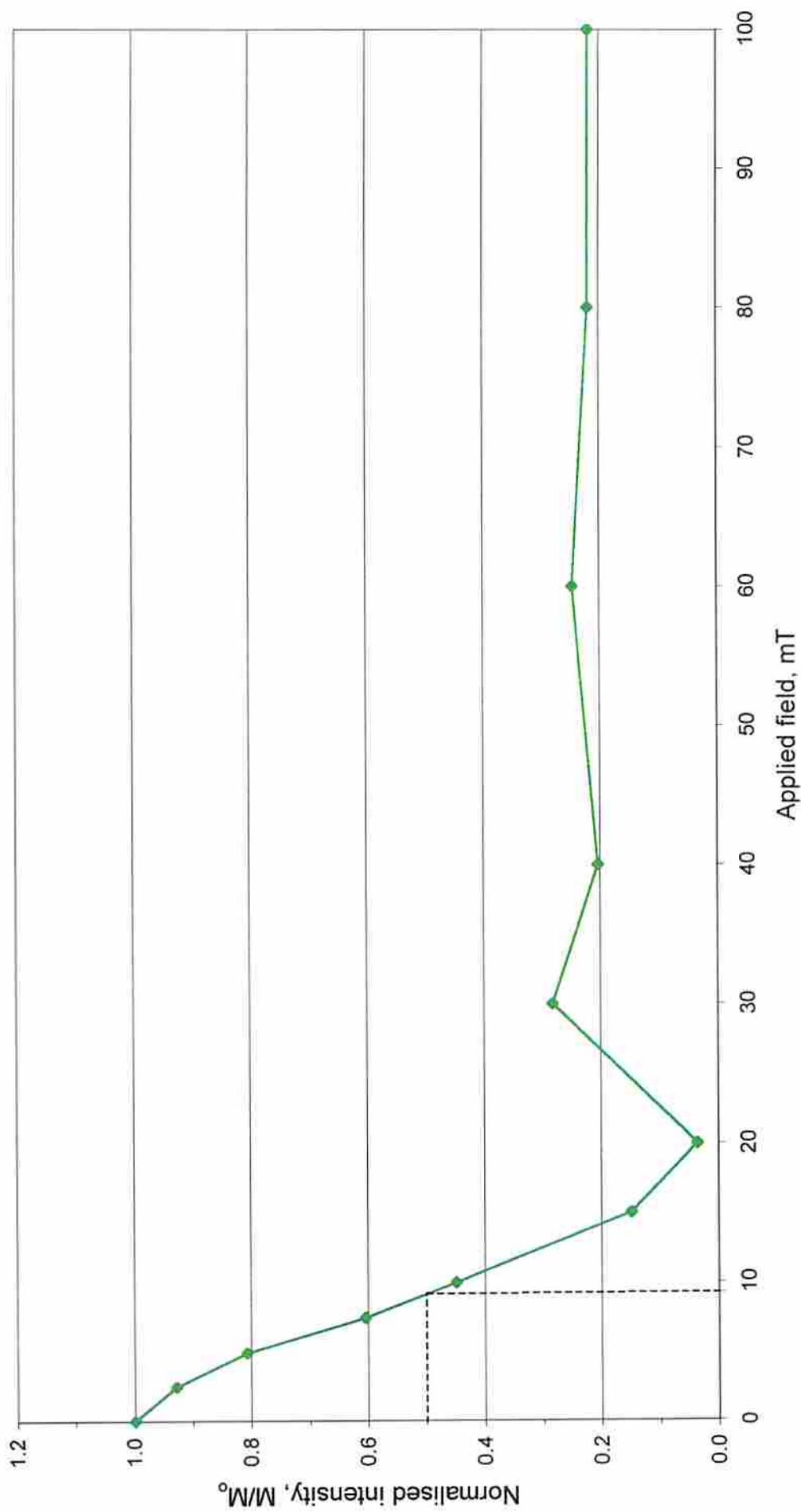
MYERS WOOD - SAMPLE POINT A3 - ZIJDERVELD PLOT



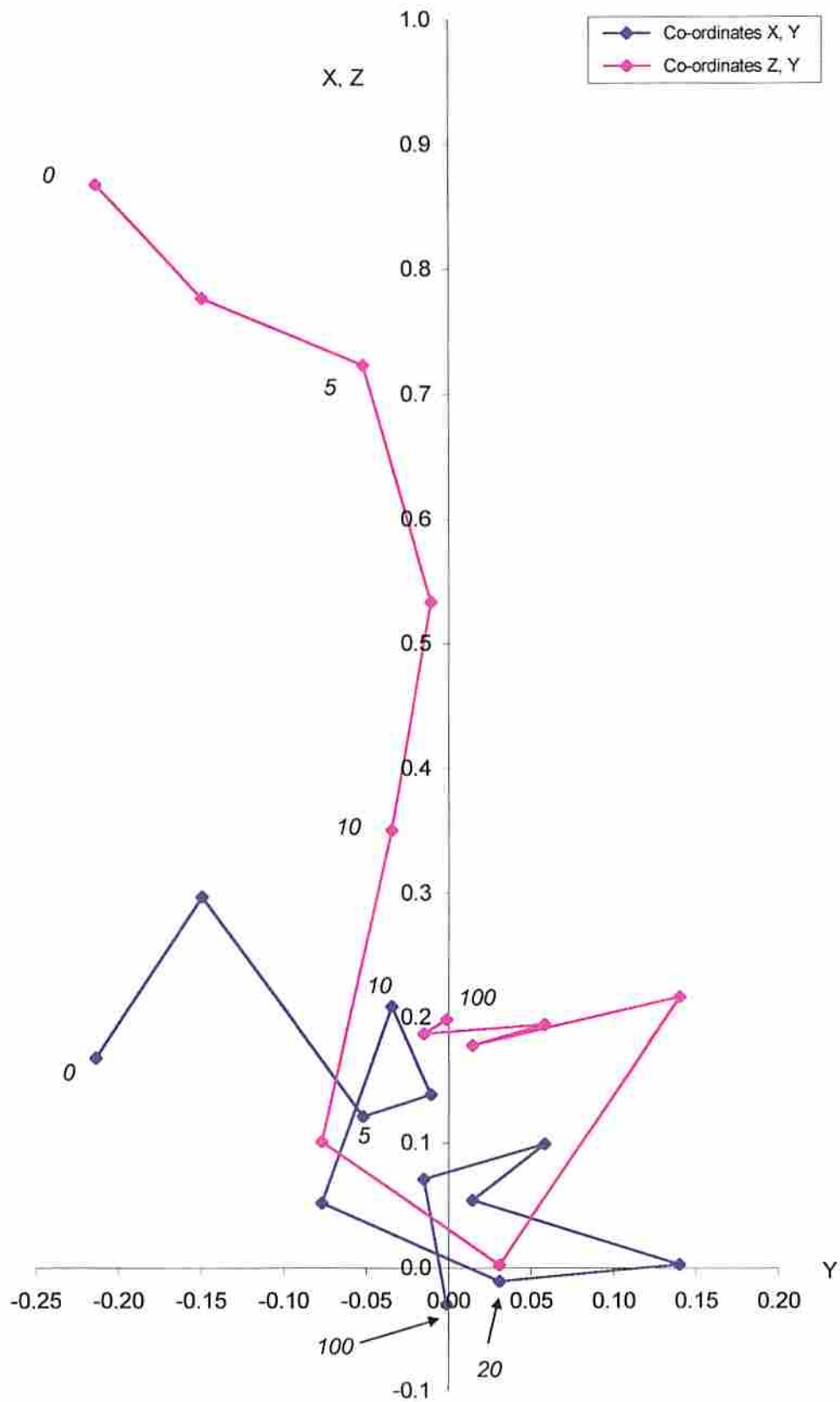
MYERS WOOD - SAMPLE POINT A9 - ZIJDERVELD PLOT

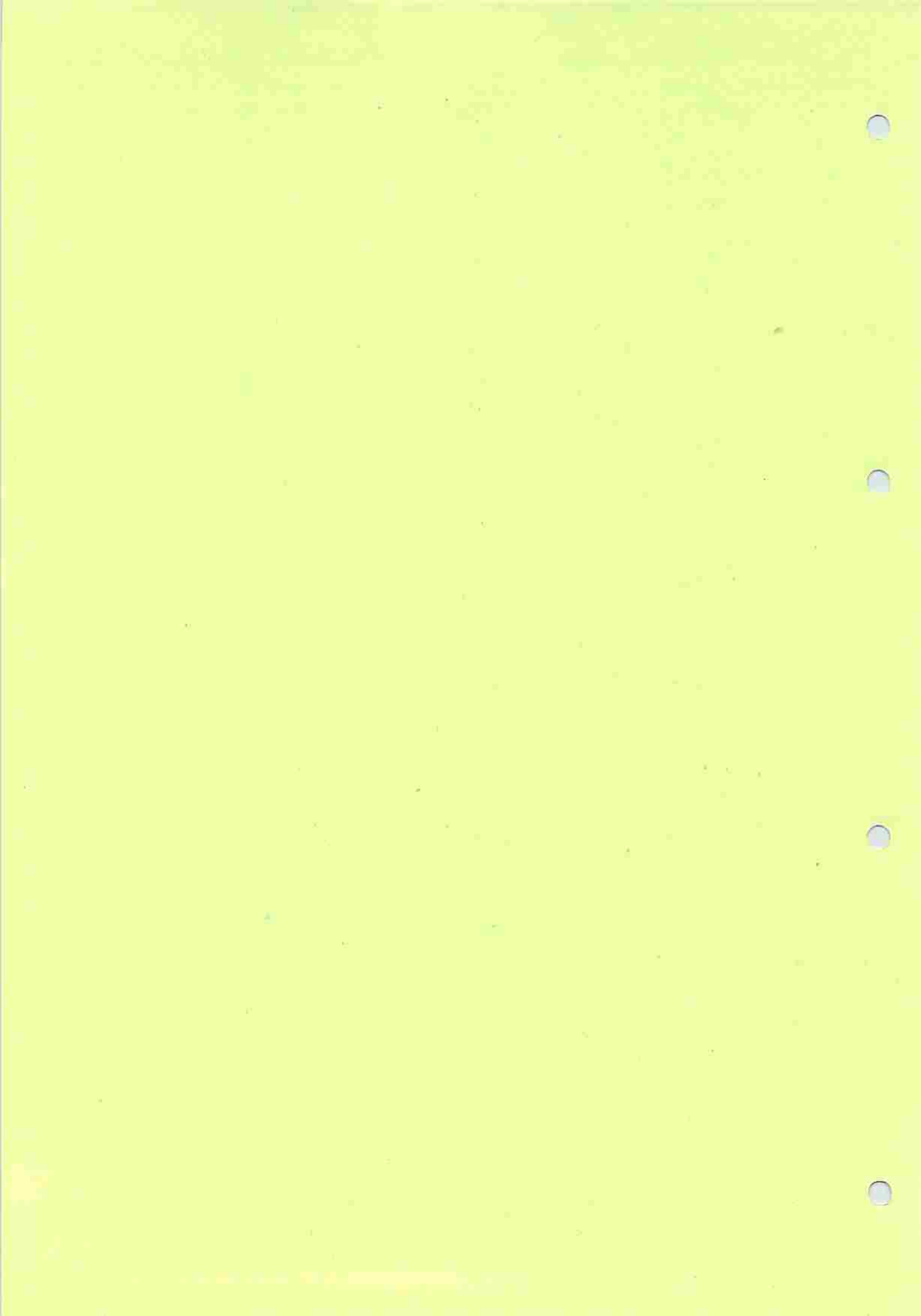


MYERS WOOD - SAMPLE POINT A11 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT A11 - ZIJDERVELD PLOT





SITE INFORMATION

Site Name Myers Wood
Area Trench B
Context No 207
Description Tapping channel
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 20/9/02

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments
	D	I	Int		D	I	Int		
	degs.	degs.	mA m ⁻¹	mT	degs.	degs.	mA m ⁻¹	Y/N	
1	49.3	72.8	16.46	15	28.5	62.4	11.16	Y	
2	13.7	70.5	18.16	20	14.5	62.5	11.68		
3	13.1	67.0	17.37	20	14.7	58.9	12.99		
4	191.9	-80.0	19.13	30	6.7	62.9	4.81		
5	276.9	-70.5	114.63	20	5.5	58.0	4.29		
6	334.7	-40.2	35.18	30	5.5	59.5	30.18	Y	
7	12.0	-5.4	5.71	20	14.9	63.4	13.56		
8	359.0	12.8	11.63	20	7.0	51.5	10.09	Y	
9	327.1	-69.0	10.53	30	15.1	52.7	4.17	Y	
10	32.0	-66.9	1.05	15	34.5	45.4	0.69		
11	9.2	52.5	377.87	15	6.5	52.7	390.78		
12									

STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	49.3	72.8	0.19500	0.22671	0.95424
2	13.7	70.5	0.32431	0.07906	0.94264
3	13.1	67.0	0.38056	0.08856	0.92050
4	191.9	-80.0	-0.16992	-0.03581	-0.98481
5	276.9	-70.5	0.04010	-0.33139	-0.94264
6	334.7	-40.2	0.69053	-0.32641	-0.64546
7	12.0	-5.4	0.97381	0.20699	-0.09411
8	359.0	12.8	0.97500	-0.01702	0.22155
9	327.1	-69.0	0.30089	-0.19466	-0.93358
10	32.0	-66.9	0.33272	0.20791	-0.91982
11	9.2	52.5	0.60093	0.09733	0.79335
12					

Number = 11
 Sum x = 4.64395
 Sum y = 0.00127
 Sum z = -0.68813
 R = 4.69465
 x bar = 0.98920
 y bar = 0.00027
 z bar = -0.14658

Mean Dec = 0.02
 Mean Inc = -8.43
 Alpha95 = 57.93

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	28.5	62.4	0.40715	0.22107	0.88620
2	14.5	62.5	0.44704	0.11561	0.88701
3	14.7	58.9	0.49963	0.13107	0.85627
4	6.7	62.9	0.45243	0.05315	0.89021
5	5.5	58.0	0.52748	0.05079	0.84805
6	5.5	59.5	0.50520	0.04865	0.86163
7	14.9	63.4	0.43270	0.11513	0.89415
8					
9					
10					
11					
12					

Number = 7
 Sum x = 3.27164
 Sum y = 0.73547
 Sum z = 6.12353
 R = 6.98155
 x bar = 0.46861
 y bar = 0.10534
 z bar = 0.87710

Mean Dec = 12.67
 Mean Inc = 61.29
 Alpha95 = 3.35

Alpha68 = 1.90

CORRECTIONS

Mean Dec = 12.67
Mean Inc = 61.29

Correction for magnetic variation

Mean Dec = 8.95
Mean Inc = 61.29

Correction to Meriden (CVP)

Uncorrected Dec = 8.95
Uncorrected Inc = 61.29
Latitude = 53.60
Longitude = -1.73

Kai = 47.60
Latitude of pole = 77.32
Beta1 = 31.56
Longitude of pole = 146.71
Geomag colat = 48.75
Corrected Inc = 60.31
Beta 2 = 31.67
Corrected Dec = 8.82

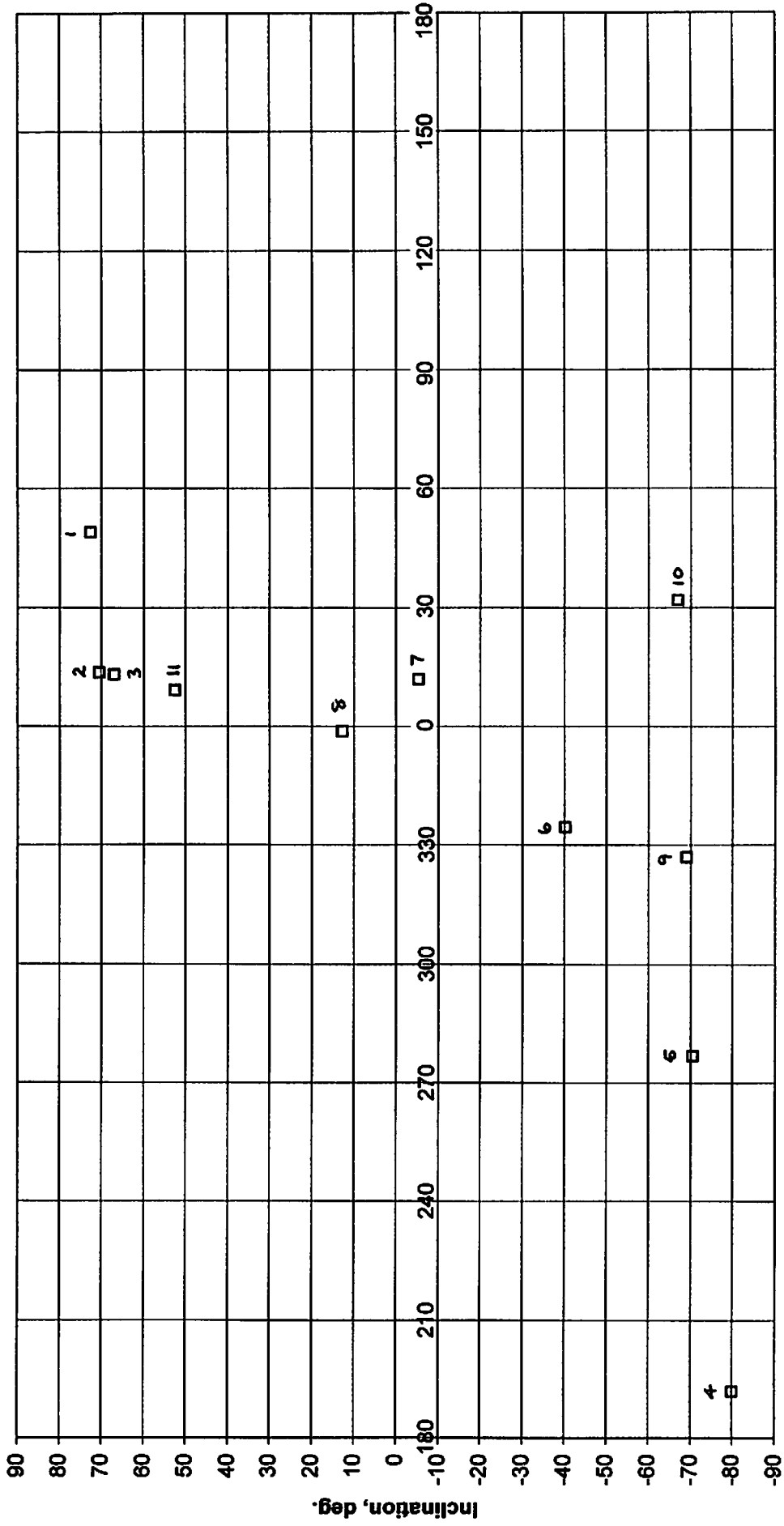
FINAL RESULT

Corrected Dec = 8.82
Corrected Inc = 60.31
Alpha95 = 3.35

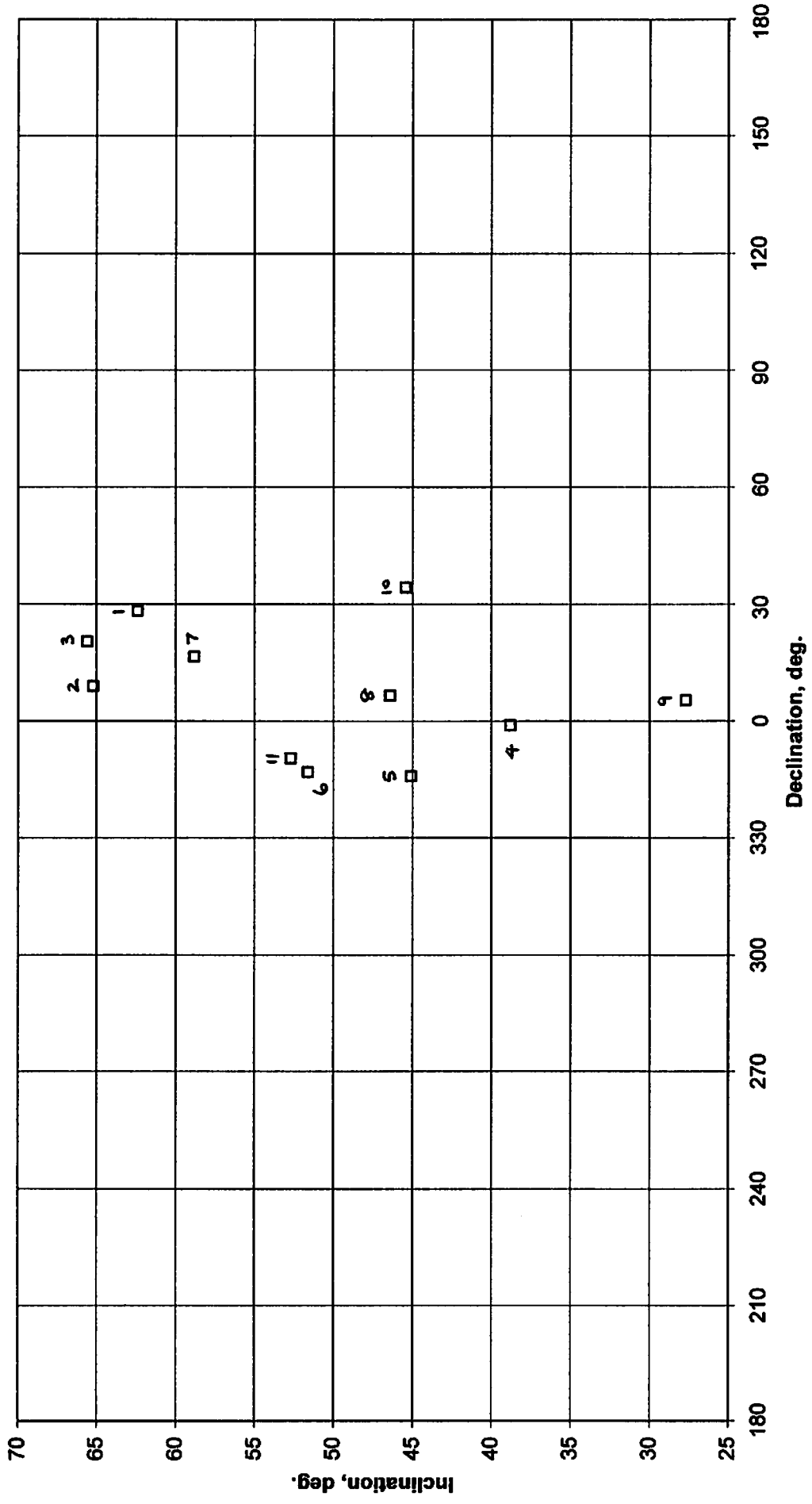
ERROR BARS

Alpha95		Alpha68	
$\delta Dec = \pm$	6.77	$\delta Dec = \pm$	3.85
$\delta Inc = \pm$	3.35	$\delta Inc = \pm$	1.90

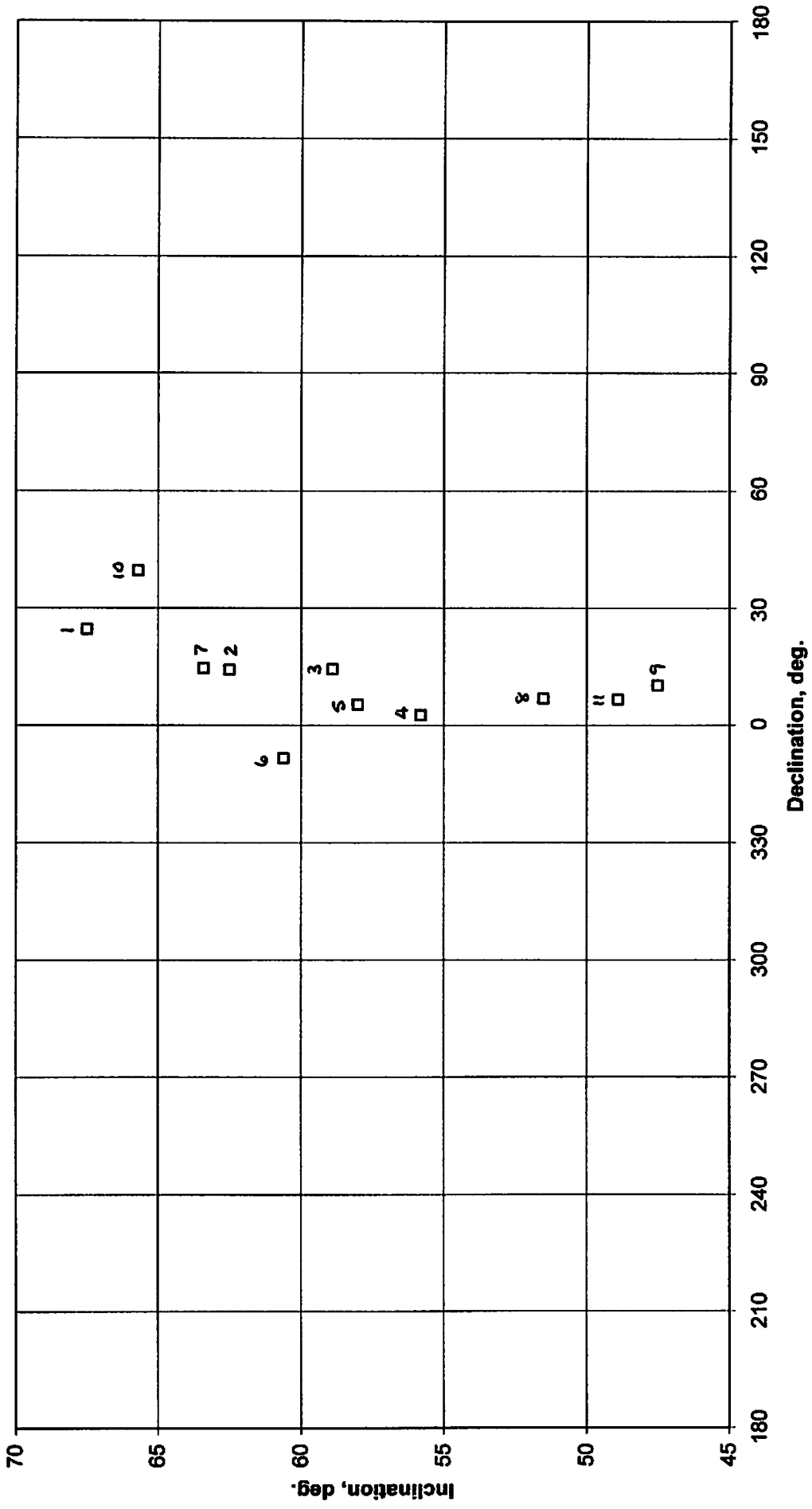
INITIAL SAMPLE SCATTER



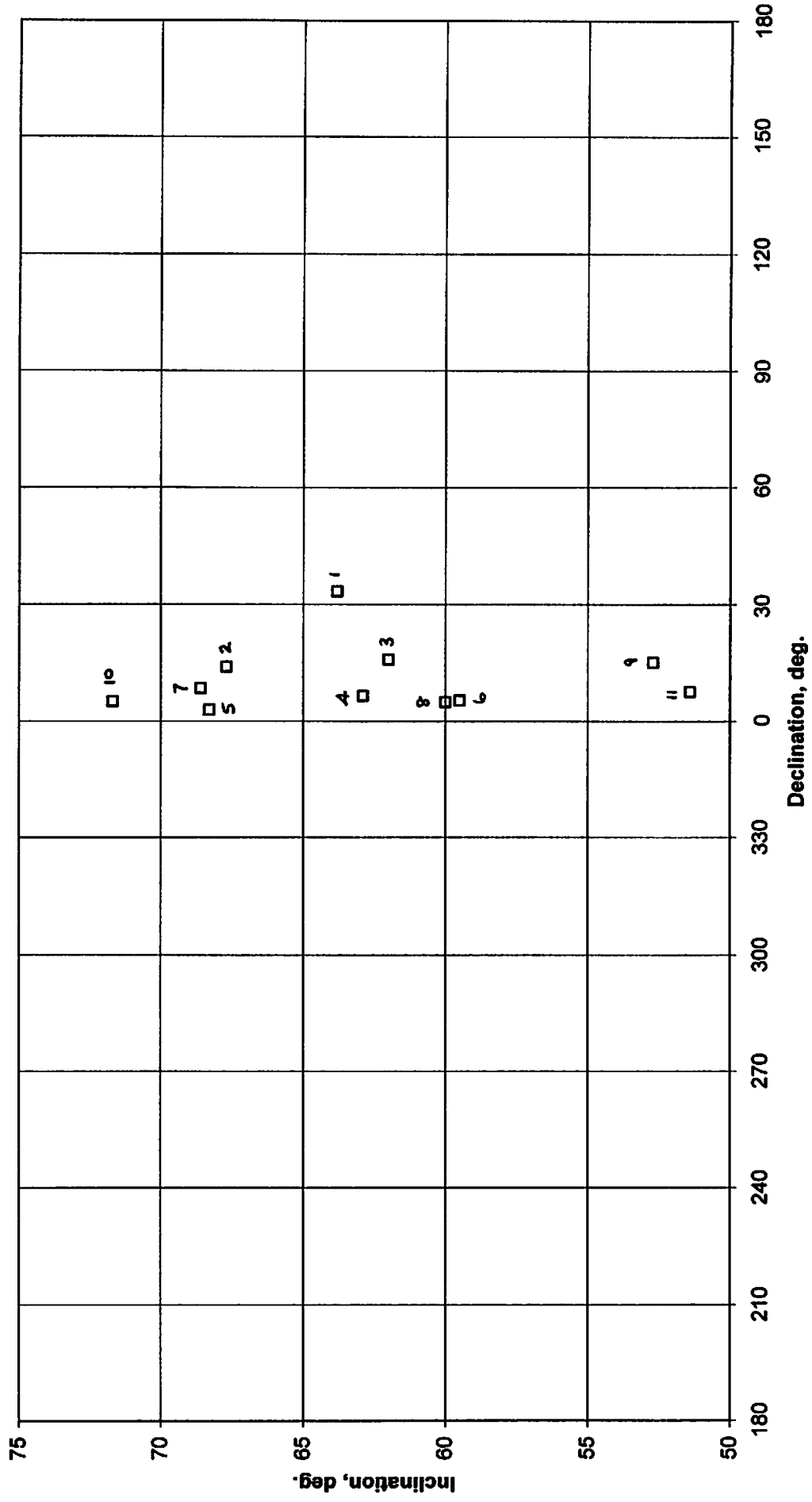
15mT DEMAGNETISED SAMPLE SCATTER



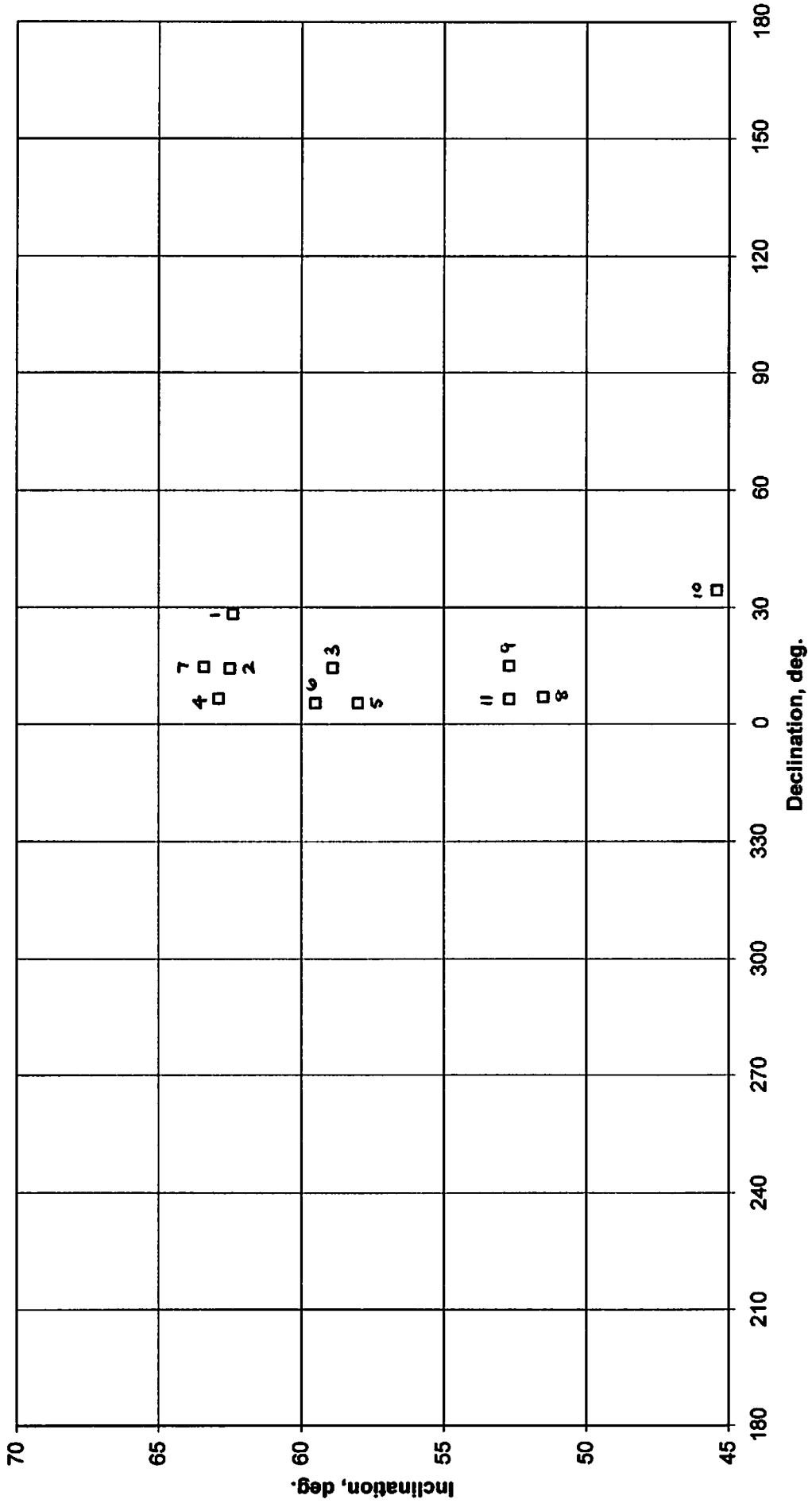
20mT DEMAGNETISED SAMPLE SCATTER



30mT DEMAGNETISED SAMPLE SCATTER



FINAL DEMAGNETISED SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

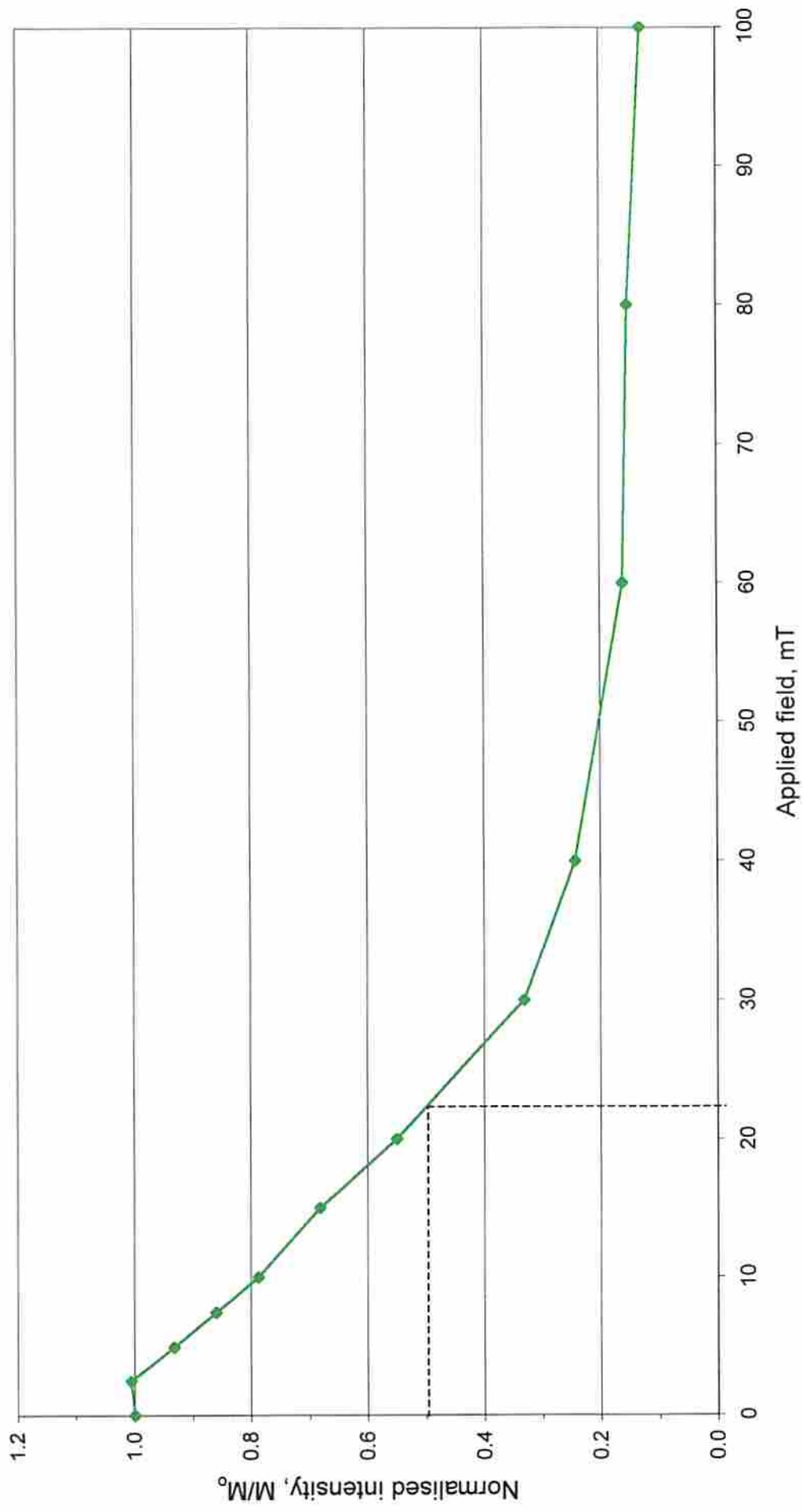
Sample No. 1

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	16.34	1.00	3.23	3.64	15.60	48.4	72.7
2.5	16.45	1.01	3.94	3.46	15.59	41.3	71.4
5.0	15.25	0.93	4.61	3.99	13.98	40.9	66.4
7.5	14.07	0.86	4.05	2.65	13.21	33.3	69.9
10.0	12.87	0.79	4.57	2.87	11.69	32.2	65.2
15.0	11.16	0.68	4.55	2.47	9.88	28.5	62.4
20.0	9.00	0.55	3.13	1.45	8.31	24.8	67.5
30.0	5.43	0.33	2.00	1.33	4.87	33.6	63.8
40.0	4.00	0.24	1.34	0.60	3.72	24.1	68.5
60.0	2.65	0.16	0.99	0.45	2.41	24.3	65.7
80.0	2.50	0.15	0.82	0.47	2.32	30.1	67.8
100.0	2.14	0.13	1.07	0.45	1.80	27.7	57.1

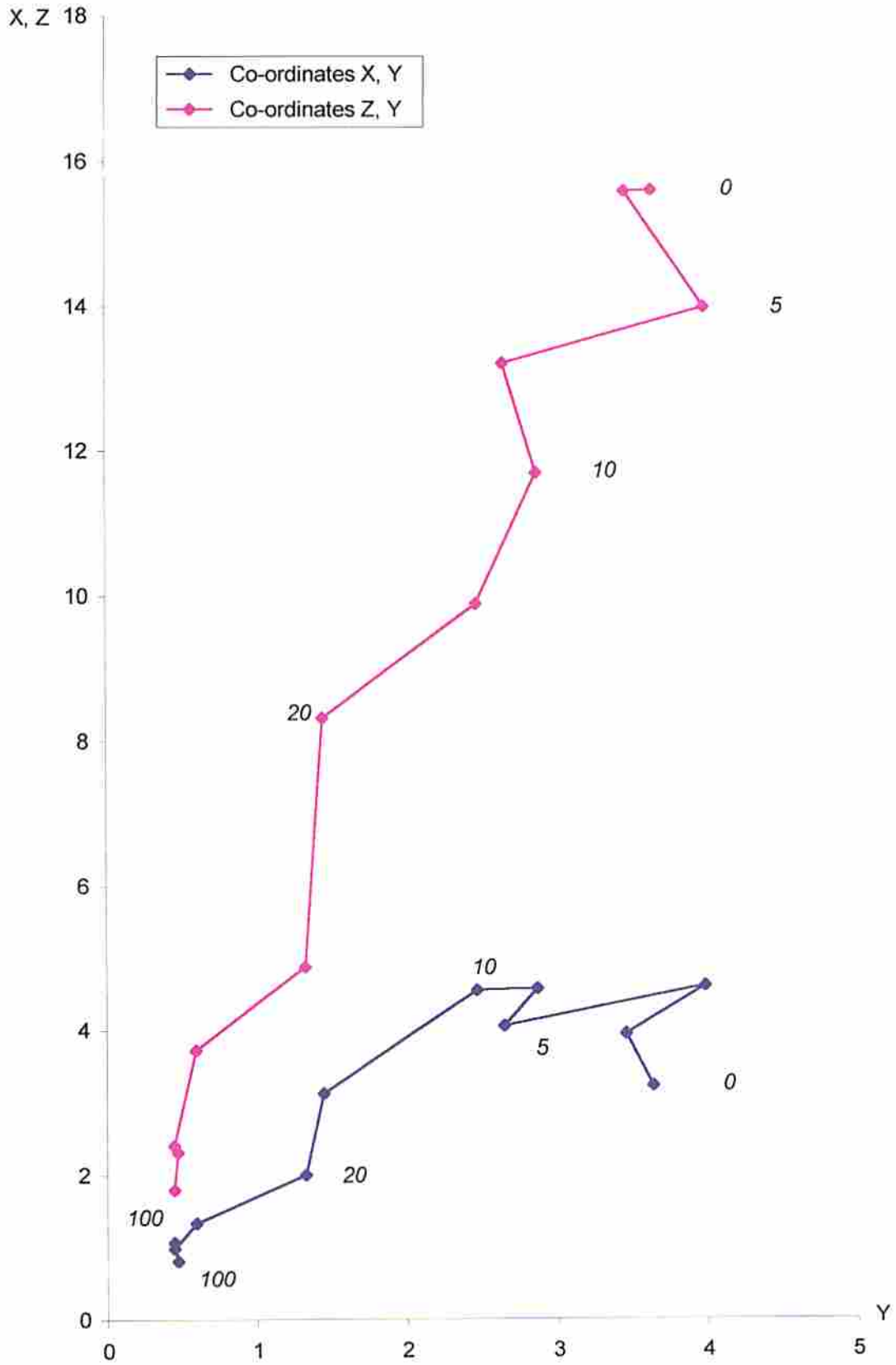
Sample No. 8

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	11.62	1.00	11.52	-0.25	1.50	358.7	7.4
2.5	11.65	1.00	11.42	-0.25	2.30	358.8	11.4
5.0	11.25	0.97	10.67	-0.38	3.55	358.0	18.4
7.5	10.53	0.91	9.50	-0.01	4.53	359.9	25.5
10.0	10.25	0.88	8.39	0.07	5.88	0.5	35.0
15.0	9.92	0.85	6.80	0.80	7.18	6.7	46.4
20.0	10.09	0.87	6.23	0.77	7.90	7.0	51.5
30.0	8.79	0.76	4.37	0.39	7.61	5.1	60.0
40.0	6.89	0.59	3.39	0.94	5.93	15.5	59.3
60.0	4.36	0.38	2.03	0.52	3.82	14.4	61.3
80.0	3.24	0.28	1.68	0.14	2.76	4.8	58.6
100.0	2.54	0.22	1.18	0.15	2.24	7.0	62.0

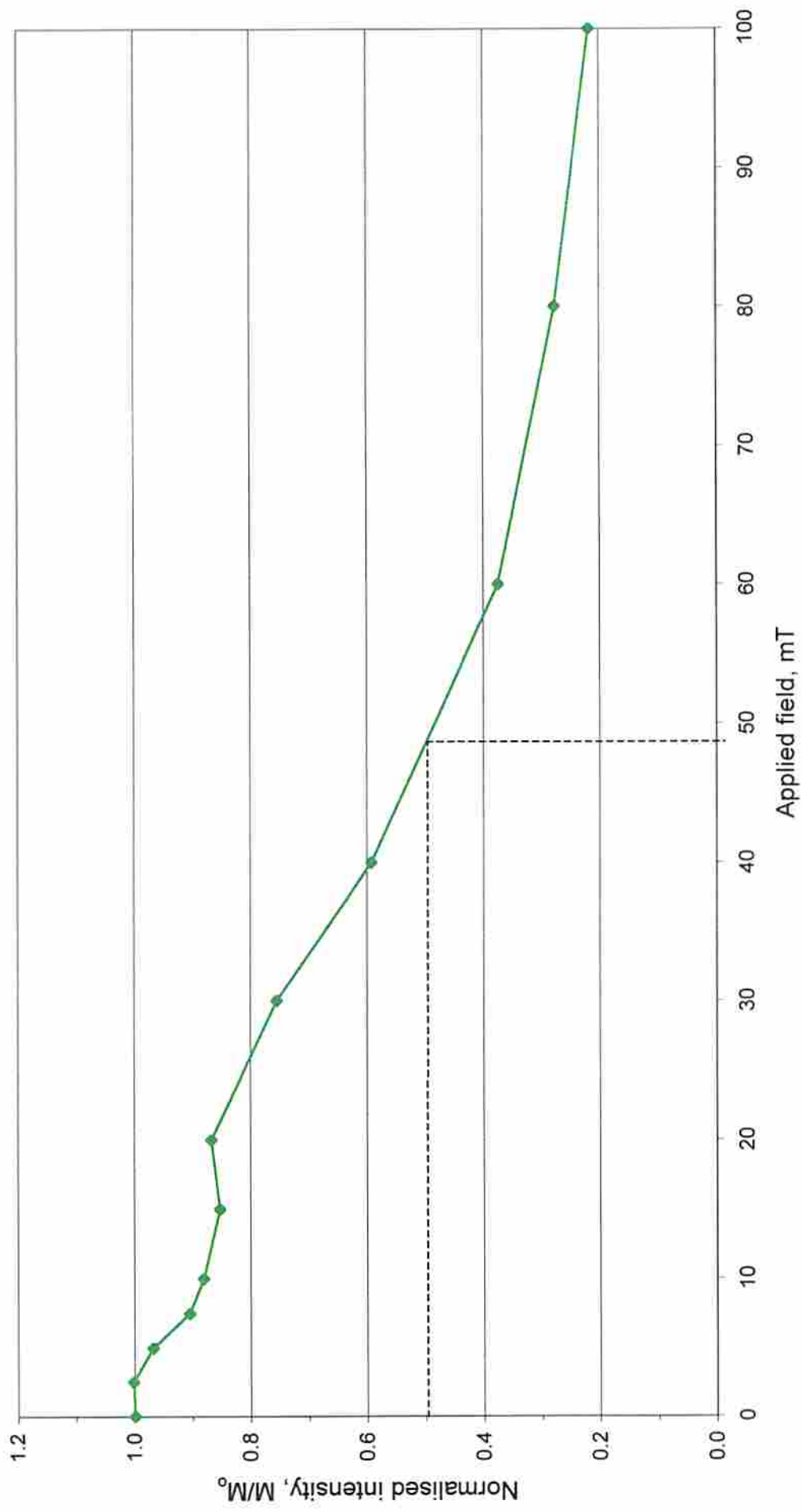
MYERS WOOD - SAMPLE POINT 207/1 DEMAGNETISATION: INTENSITY SPECTRUM



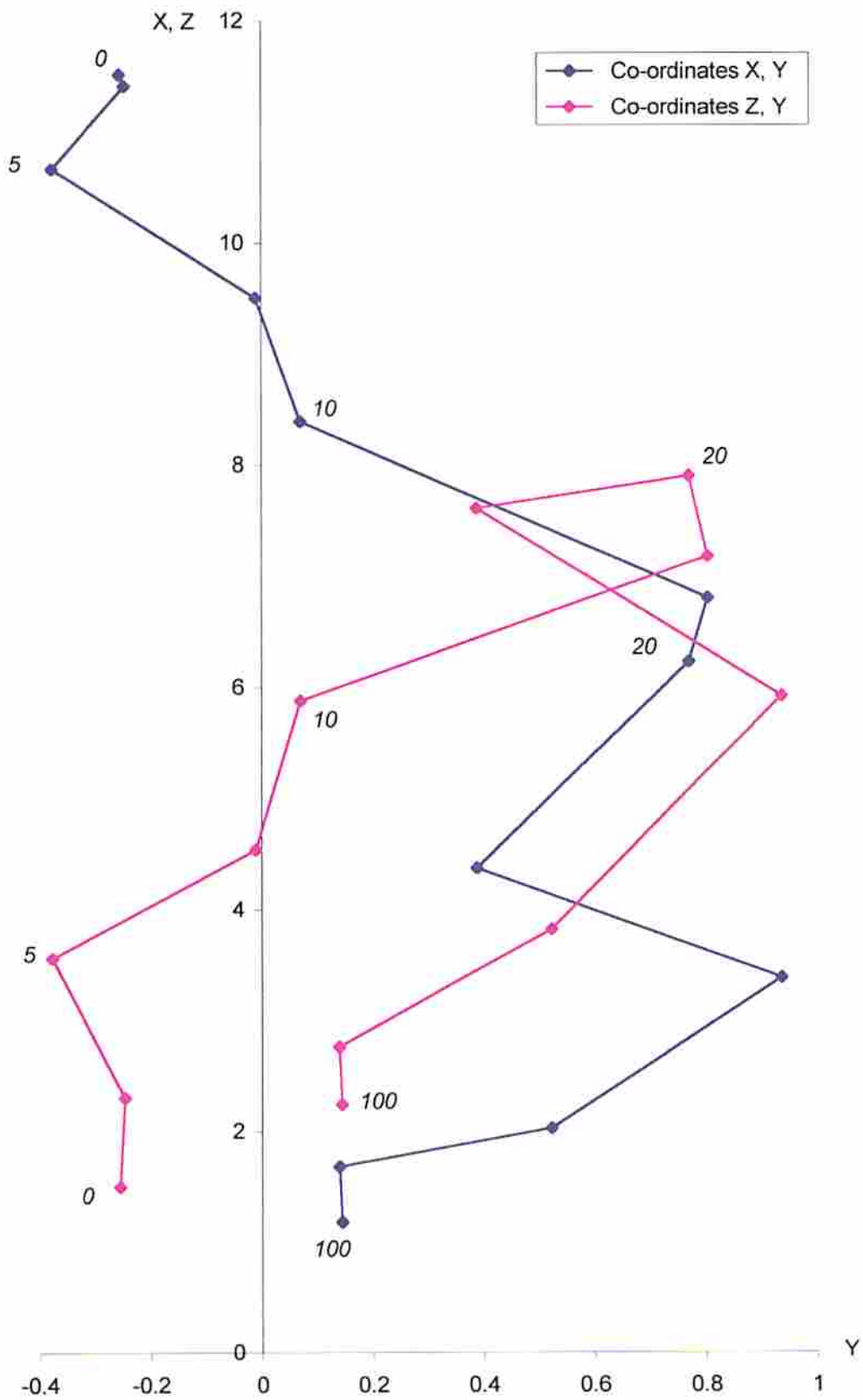
MYERS WOOD - SAMPLE POINT 207/1 - ZIJDERVELD PLOT



MYERS WOOD - SAMPLE POINT 207/8 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT 207/8 - ZIJDERVELD PLOT



STEPPED A.F. DEMAGNETISATION MEASUREMENTS FOR OUTLIERS

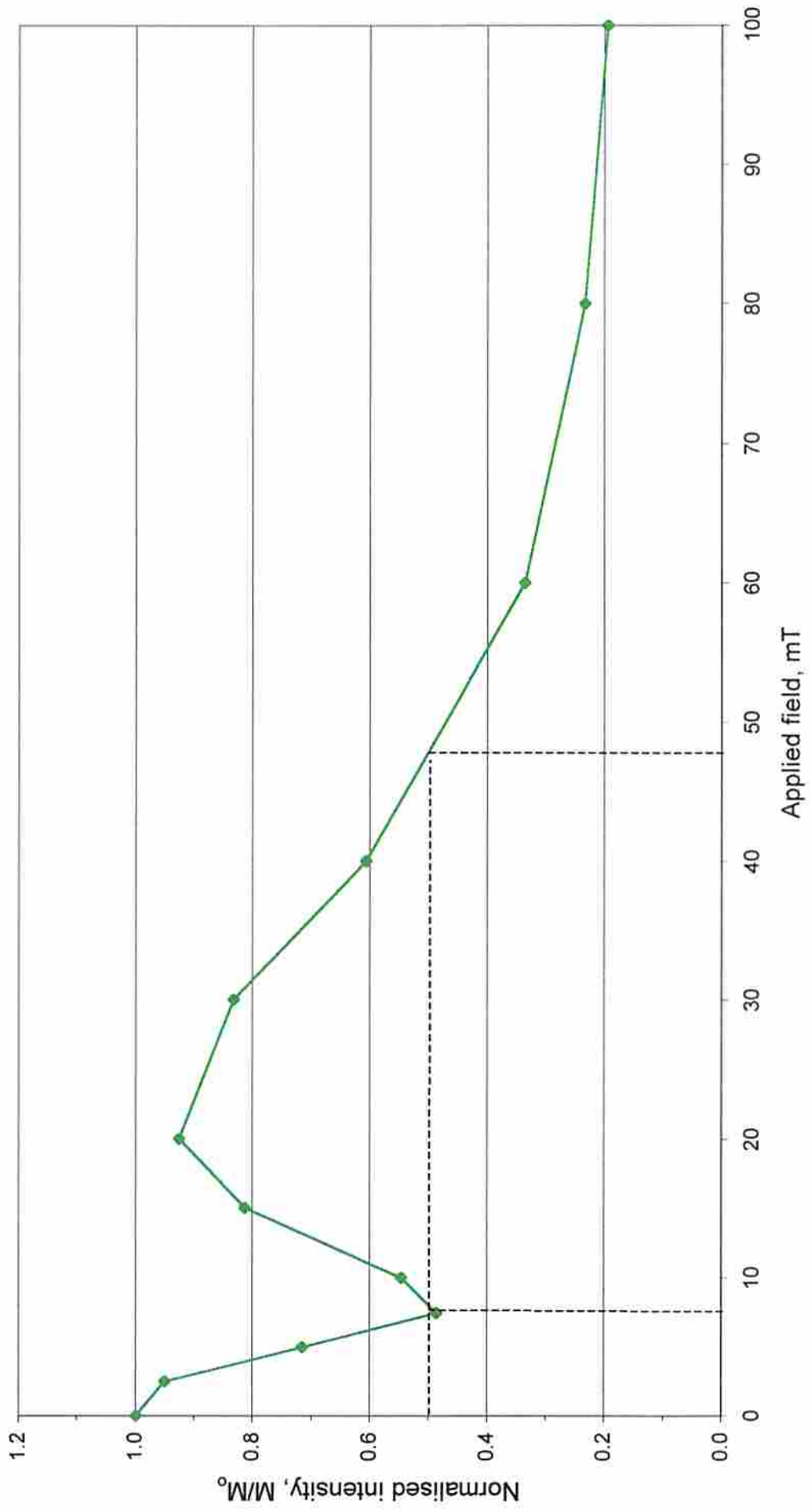
Sample No. 6

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	36.21	1.00	25.29	-12.67	-22.61	333.4	-38.6
2.5	34.42	0.95	23.81	-11.04	-22.26	335.1	-40.3
5.0	25.92	0.72	17.91	-9.43	-16.20	332.2	-38.7
7.5	17.63	0.49	15.18	-8.25	-3.51	331.5	-11.5
10.0	19.81	0.55	15.43	-8.16	9.36	332.1	28.2
15.0	29.47	0.81	17.86	-4.06	23.09	347.2	51.6
20.0	33.54	0.93	16.28	-2.35	29.23	351.8	60.6
30.0	30.18	0.83	15.24	1.46	26.01	5.5	59.5
40.0	21.96	0.61	9.59	0.68	19.74	4.1	64.0
60.0	12.17	0.34	5.20	0.41	10.99	4.5	64.6
80.0	8.47	0.23	3.75	0.15	7.60	2.3	63.7
100.0	7.05	0.19	3.01	0.13	6.37	2.5	64.7

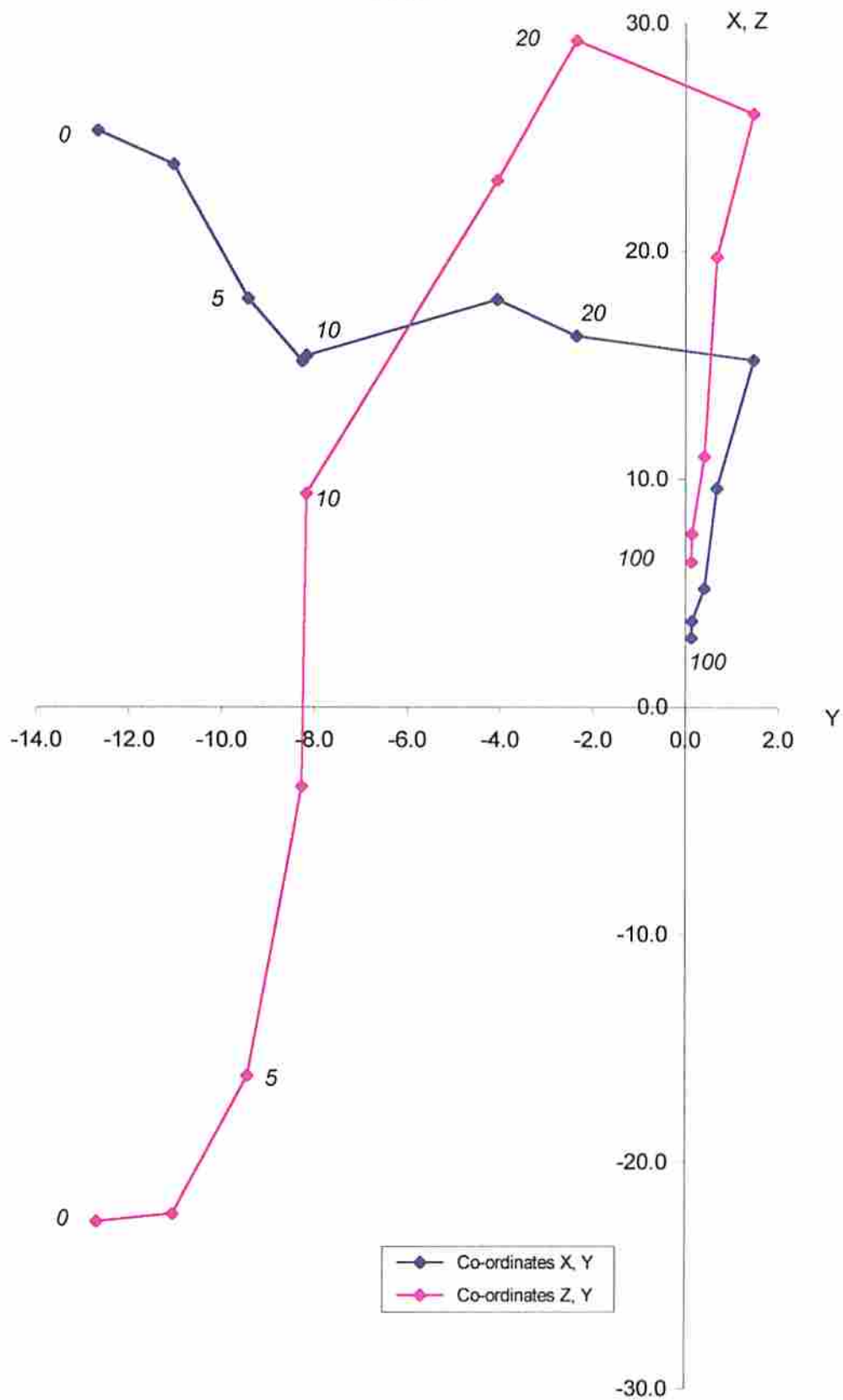
Sample No. 9

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	10.29	1.00	2.32	-1.85	-9.85	321.5	-73.2
2.5	10.53	1.02	3.04	-2.49	-9.77	320.7	-68.1
5.0	8.70	0.85	2.96	-1.59	-8.02	331.8	-67.3
7.5	5.95	0.58	2.40	-0.94	-5.36	338.7	-64.3
10.0	3.71	0.36	2.71	-0.63	-2.46	346.9	-41.5
15.0	2.95	0.29	2.60	0.25	1.37	5.5	27.7
20.0	4.07	0.40	2.70	0.49	3.00	10.4	47.5
30.0	4.17	0.41	2.44	0.66	3.32	15.1	52.7
40.0	3.49	0.34	1.75	0.43	2.99	13.7	58.9
60.0	2.38	0.23	1.15	0.17	2.08	8.3	60.8
80.0	1.78	0.17	0.79	0.09	1.60	6.8	63.6
100.0	1.41	0.14	0.58	0.12	1.27	12.0	64.9

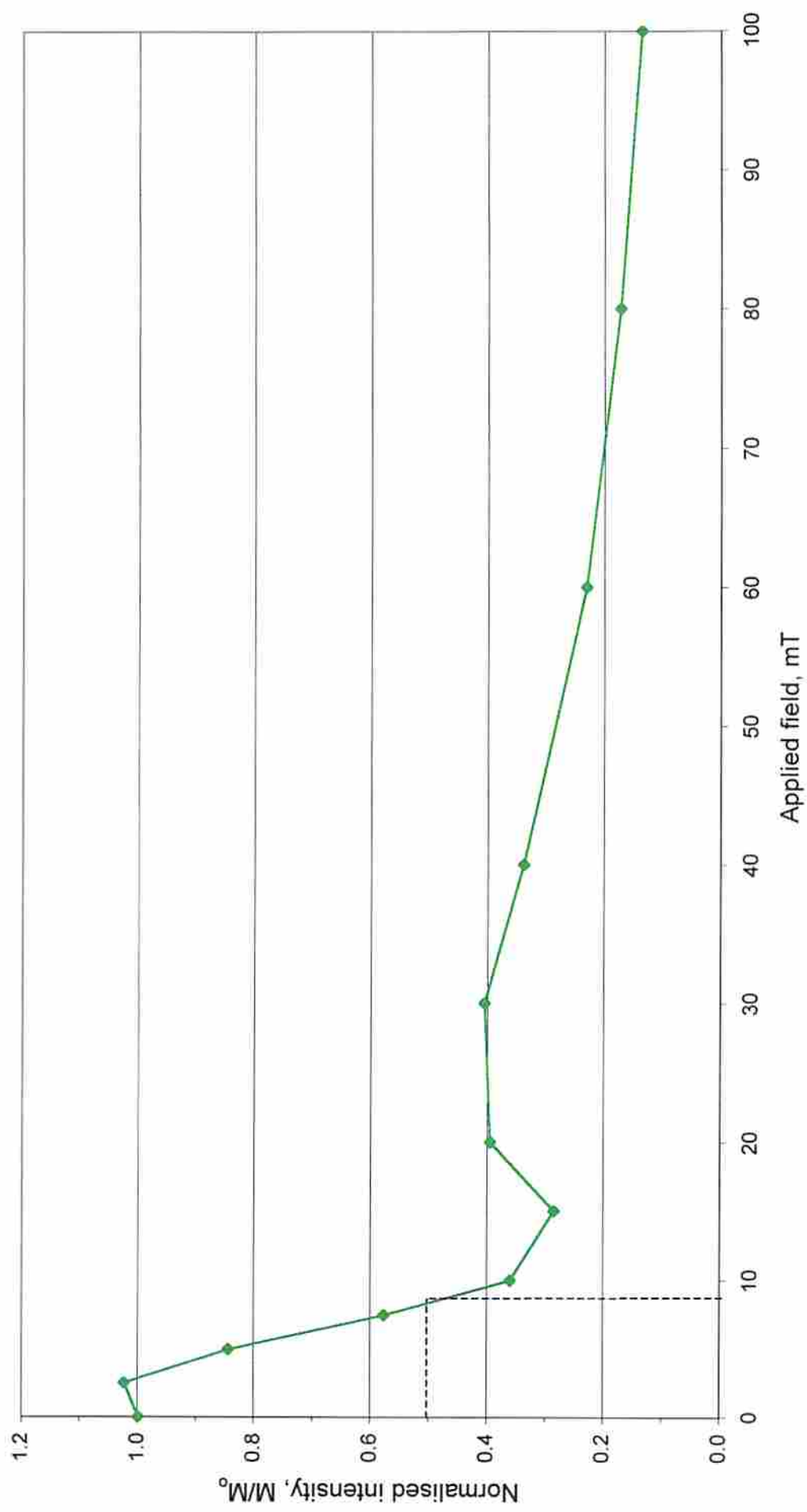
MYERS WOOD - SAMPLE POINT 207/6 DEMAGNETISATION: INTENSITY SPECTRUM



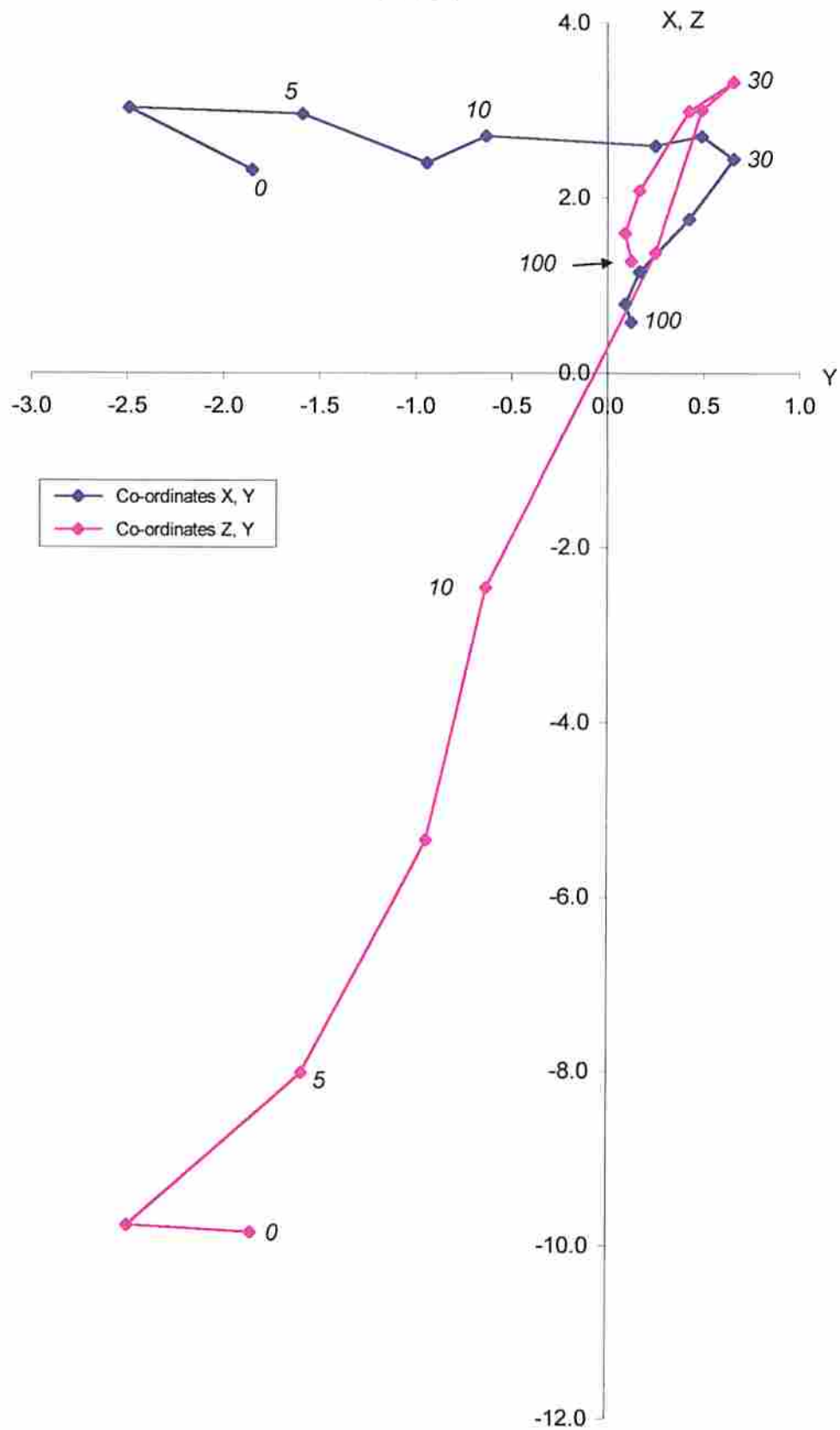
MYERS WOOD - SAMPLE POINT 207/6 - ZIJDERVELD PLOT



MYERS WOOD - SAMPLE POINT 20719 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT 207/9 - ZIJDERVELD PLOT



SITE INFORMATION

Site Name Myers Wood
Area Trench B
Context No 270
Description Furnace baked clay material
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 24/4/03

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field mT	After partial demag			Pilot? Y/N	Comments
	D	I	Int		D	I	Int		
	degs.	degs.	mA m ⁻¹		degs.	degs.	mA m ⁻¹		
1	357.8	63.1	40.80	5	355.80	60.90	33.28	Y	
2	17.2	59.7	4.69	2.5	13.80	56.70	4.75		
3	18.8	74.9	351.90	5	15.40	73.30	349.15		
4	14.5	54.5	104.37	2.5	14.10	54.90	110.27		
5	284.3	63.4	168.93	5	278.50	62.30	159.38	Y	Outlier
6	16.3	74.8	73.35	5	359.50	69.10	71.20		

STATISTICS FOR NRM

Sample no.	NRM				
	D	l	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	357.80	63.10	0.45210	-0.01737	0.89180
2	17.20	59.70	0.48196	0.14919	0.86340
3	18.80	74.90	0.24661	0.08395	0.96547
4	14.50	54.50	0.56221	0.14540	0.81412
5	284.30	63.40	0.11060	-0.43389	0.89415
6	16.30	74.80	0.25165	0.07359	0.96502

Number = 6
 Sum x = 2.10512
 Sum y = 0.00088
 Sum z = 5.39395
 R = 5.79019
 x bar = 0.36357
 y bar = 0.00015
 z bar = 0.93157

Mean Dec = 0.02
 Mean Inc = 68.68
 Alpha95 = 14.01

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	355.80	60.90	0.48503	-0.03562	0.87377
2	13.80	56.70	0.53317	0.13098	0.83581
3	15.40	73.30	0.27704	0.07631	0.95782
4	14.10	54.90	0.55768	0.14008	0.81815
5					
6	359.50	69.10	0.35672	-0.00311	0.93420

Number = 5
 Sum x = 2.20965
 Sum y = 0.30862
 Sum z = 4.41976
 R = 4.95087
 x bar = 0.44631
 y bar = 0.06234
 z bar = 0.89271

Mean Dec = 7.95
 Mean Inc = 63.22
 Alpha95 = 8.52

Alpha68 = 4.63

CORRECTIONS

Mean Dec = 7.95
Mean Inc = 63.22

Correction for magnetic variation

Mean Dec = 4.23
Mean Inc = 63.22

Correction to Meriden (CVP)

Uncorrected Dec = 4.23
Uncorrected Inc = 63.22
Latitude = 53.60
Longitude = -1.73

Kai = 45.27
Latitude of pole = 80.71
Beta1 = 18.95
Longitude of pole = 159.32
Geomag colat = 48.44
Corrected Inc = 62.27
Beta 2 = 19.06
Corrected Dec = 4.17

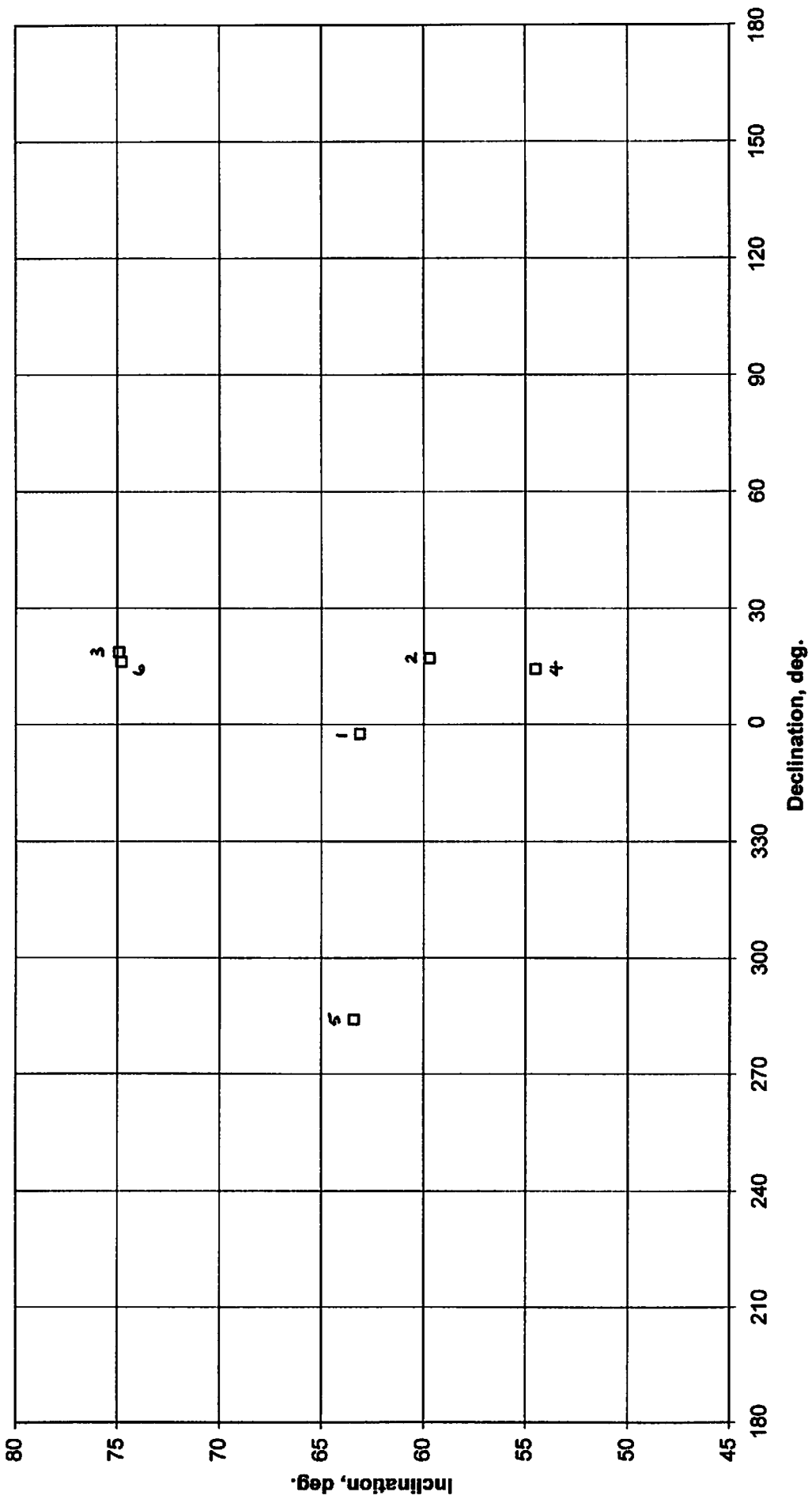
FINAL RESULT

Corrected Dec = 4.17
Corrected Inc = 62.27
Alpha95 = 8.52

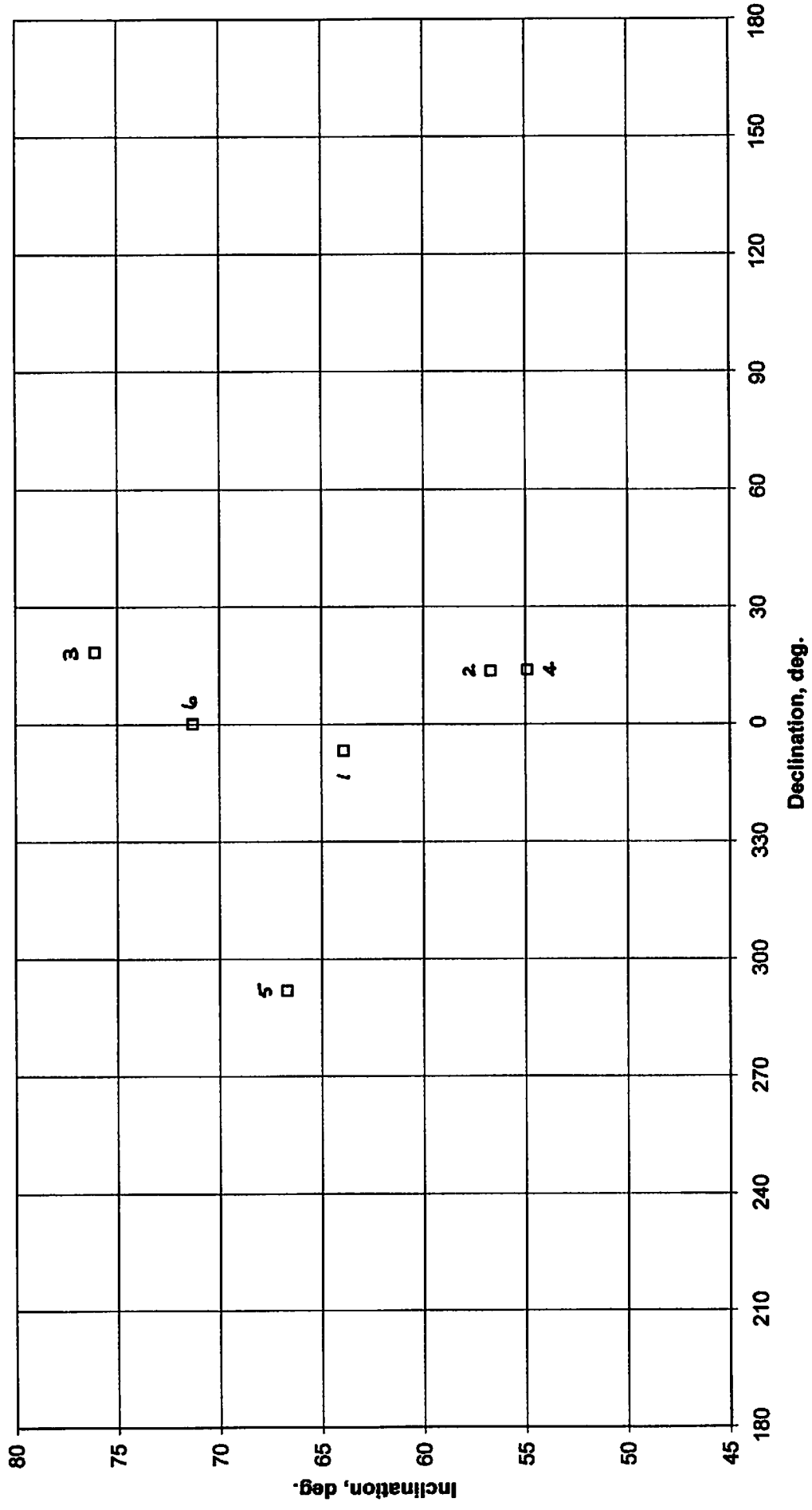
ERROR BARS

Alpha95		Alpha68	
δDec = ±	18.31	δDec = ±	9.95
δInc = ±	8.52	δInc = ±	4.63

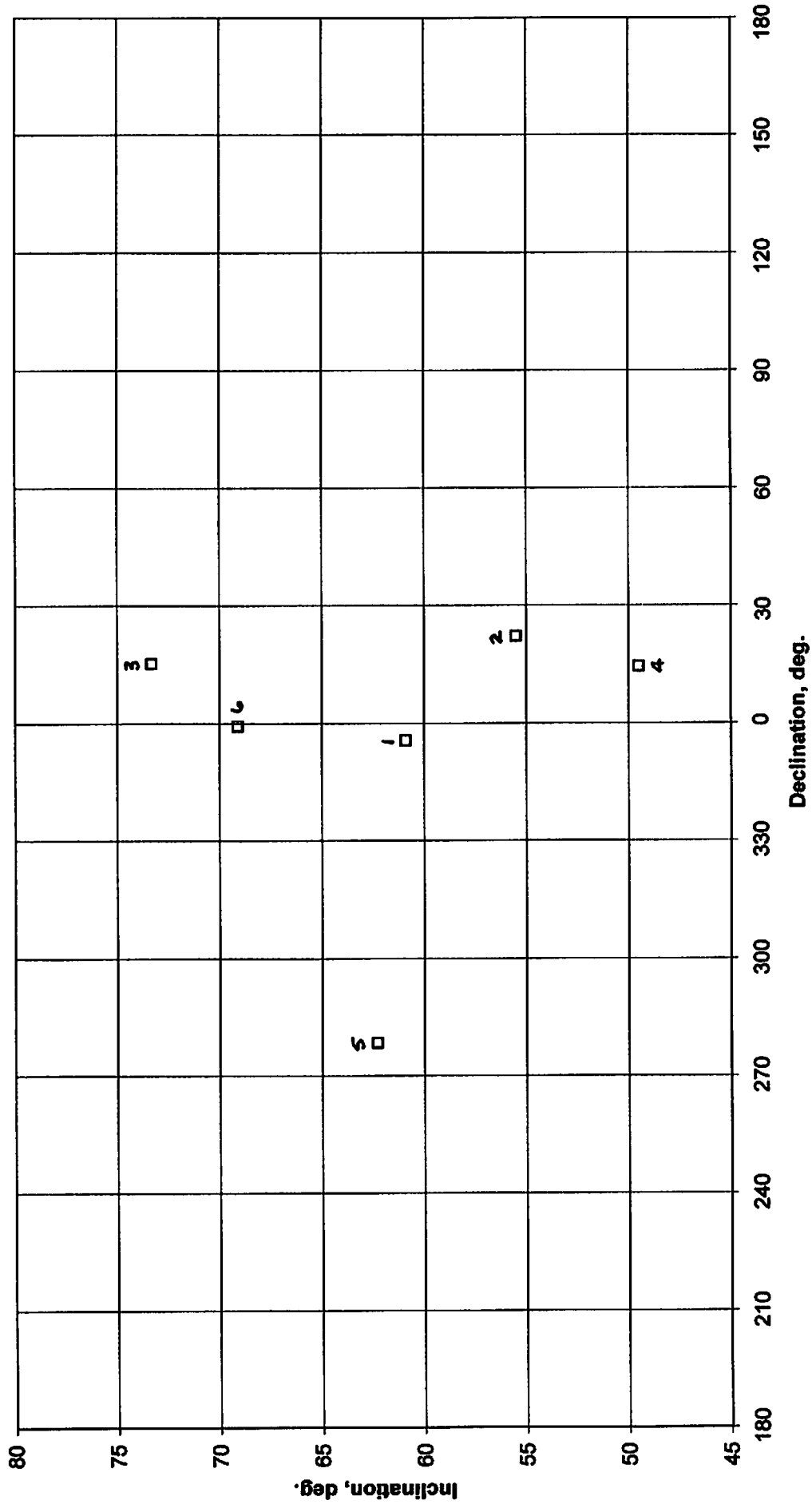
INITIAL SAMPLE SCATTER



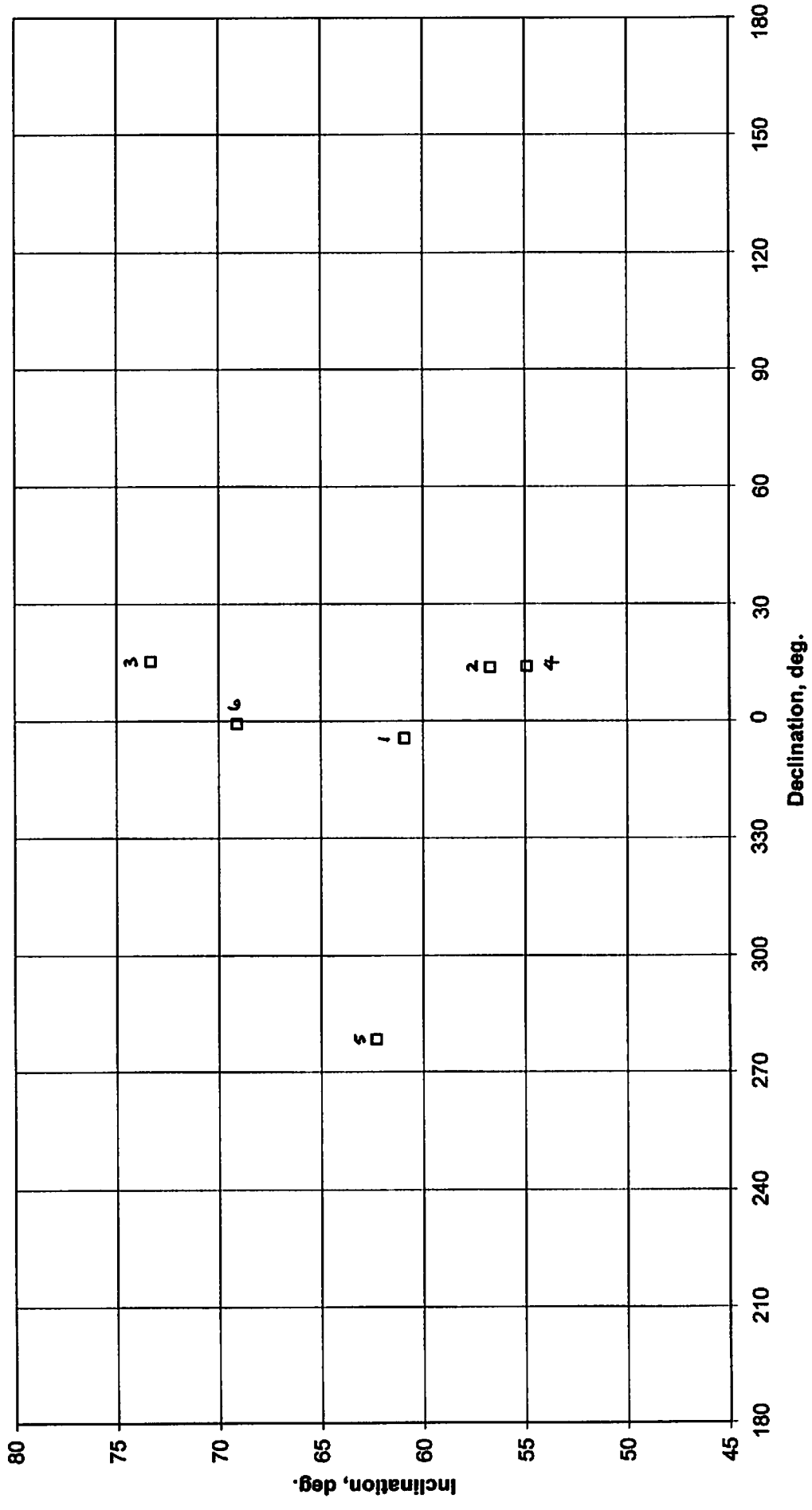
2.5mT DEMAGNETISED SAMPLE SCATTER



5mT DEMAGNETISED SAMPLE SCATTER



FINAL GROUP SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

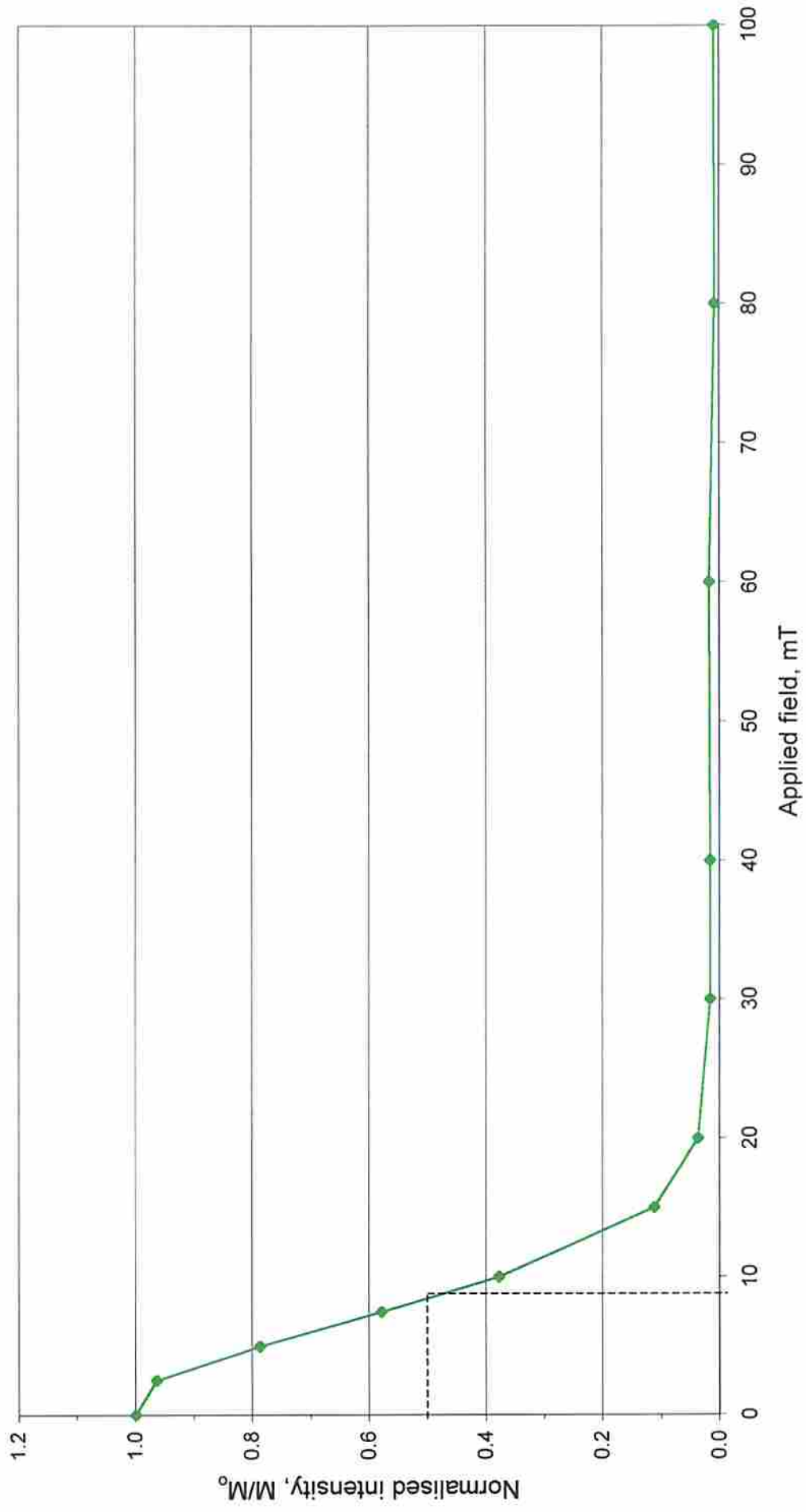
Sample No. 1

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	42.27	1.00	17.76	-1.04	38.34	356.70	65.10
2.5	40.77	0.96	17.79	-2.09	36.63	353.30	63.90
5.0	33.28	0.79	16.14	-1.20	29.08	355.80	60.90
7.5	24.48	0.58	11.94	-0.43	21.36	357.90	60.80
10.0	15.97	0.38	7.96	-0.70	13.82	355.00	59.90
15.0	4.76	0.11	2.55	-0.38	4.00	351.60	57.20
20.0	1.56	0.04	0.94	-0.16	1.24	350.60	52.40
30.0	0.71	0.02	0.59	-0.19	0.35	342.20	29.10
40.0	0.68	0.02	0.50	-0.34	0.31	325.80	26.80
60.0	0.78	0.02	0.20	-0.56	0.50	289.60	40.10
80.0	0.36	0.01	0.20	-0.25	0.17	308.10	27.10
100.0	0.42	0.01	0.15	-0.18	0.35	310.70	56.60

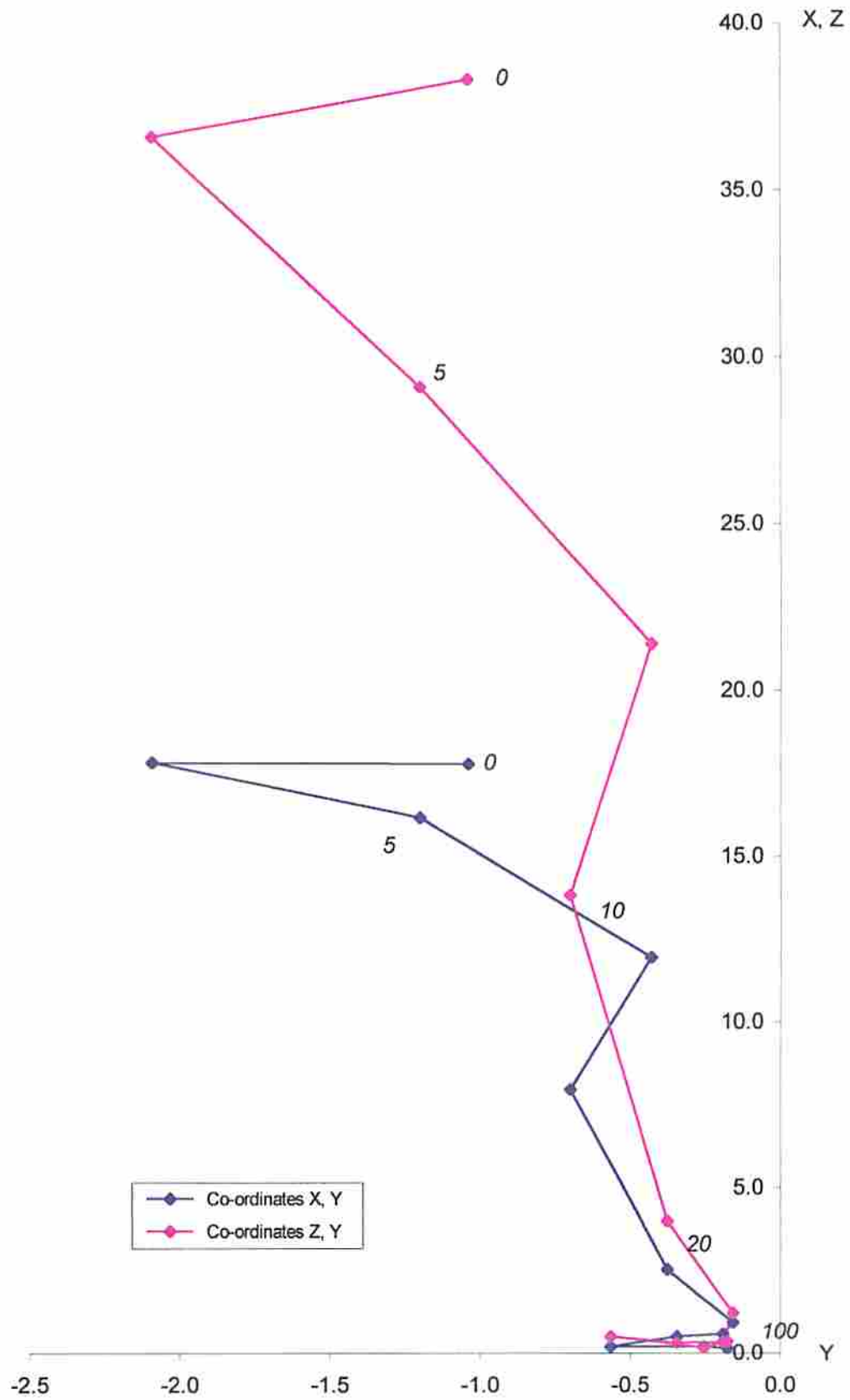
Sample No. 5

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	179.33	1.00	16.77	-73.23	162.83	282.90	65.20
2.5	175.22	0.98	26.12	-64.21	160.92	292.10	66.70
5.0	159.38	0.89	10.96	-73.19	141.16	278.50	62.30
7.5	137.00	0.76	5.03	-68.01	118.82	274.20	60.10
10.0	108.28	0.60	-0.13	-58.17	91.33	269.90	57.50
15.0	54.40	0.30	-4.30	-31.99	43.78	262.30	53.60
20.0	25.75	0.14	-3.40	-16.00	19.89	258.00	50.60
30.0	6.24	0.03	-0.27	-4.05	4.73	266.20	49.30
40.0	2.27	0.01	0.65	-1.51	1.55	293.40	43.30
60.0	2.20	0.01	0.78	-1.58	1.32	296.40	36.90
80.0	1.61	0.01	0.95	-1.09	0.73	311.00	26.80
100.0	1.74	0.01	0.99	-1.23	0.73	308.90	24.60

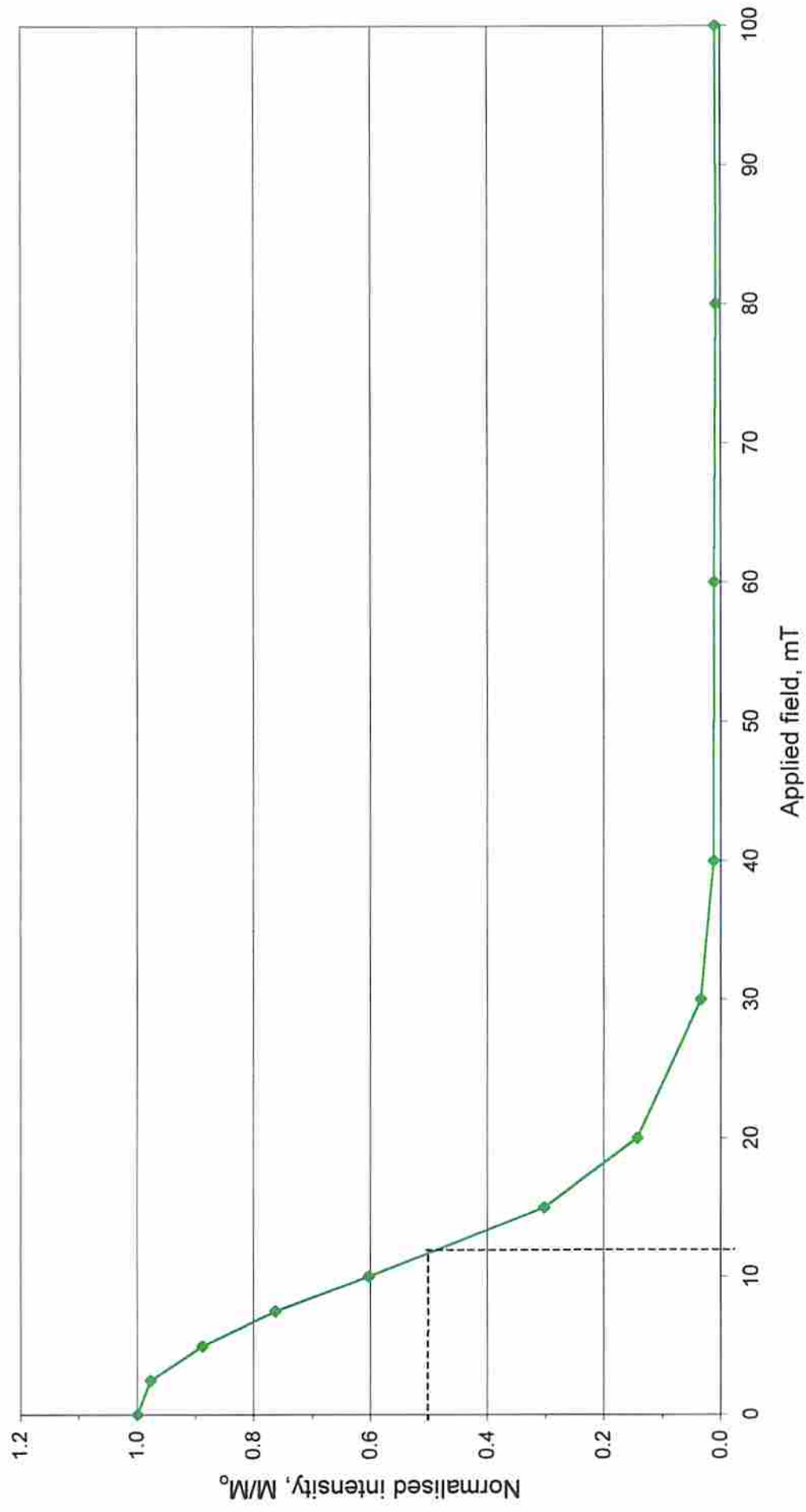
MYERS WOOD - SAMPLE POINT 270/1 DEMAGNETISATION: INTENSITY SPECTRUM



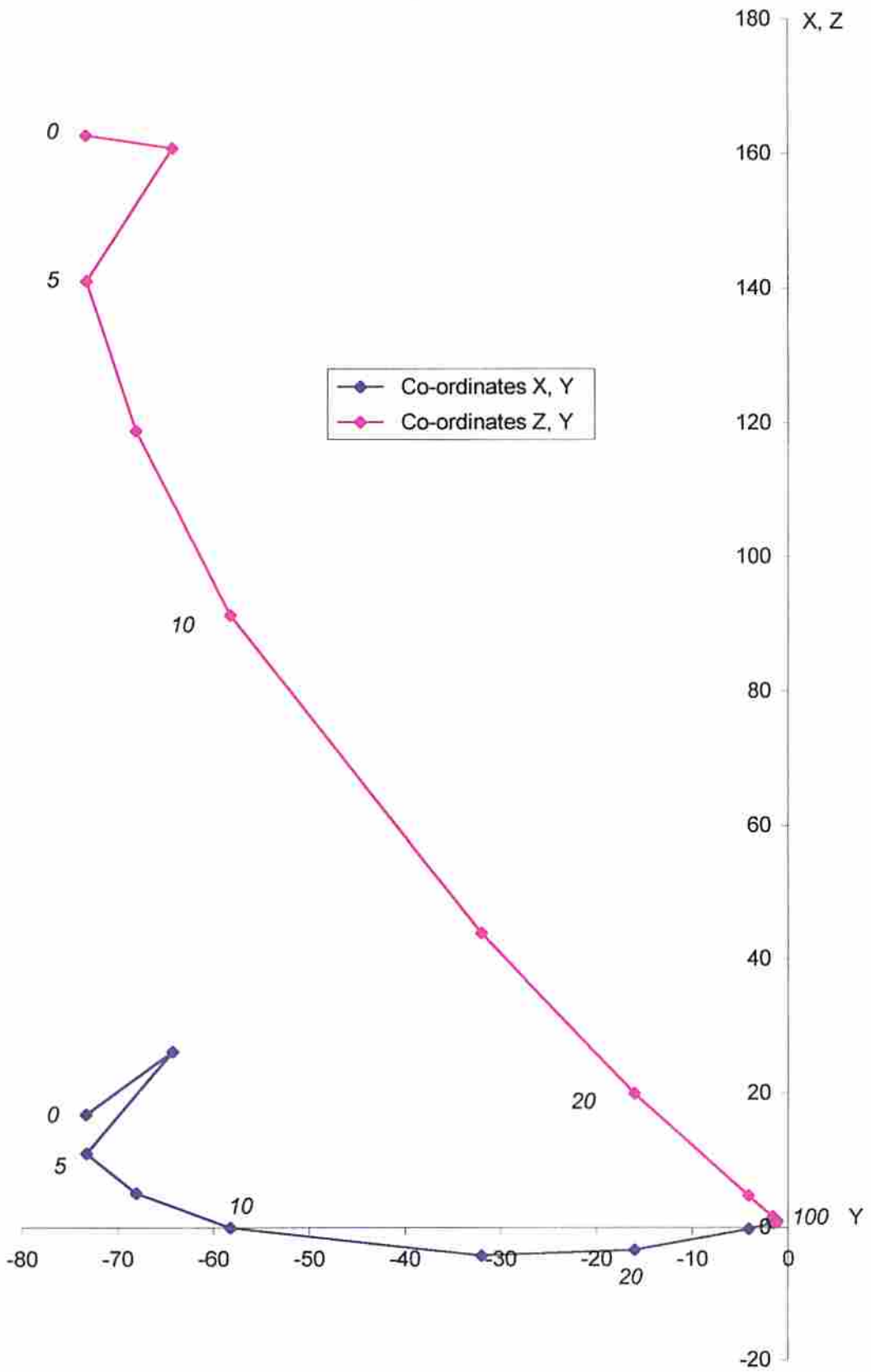
MYERS WOOD - SAMPLE POINT 270/1 - ZIJDERVELD PLOT

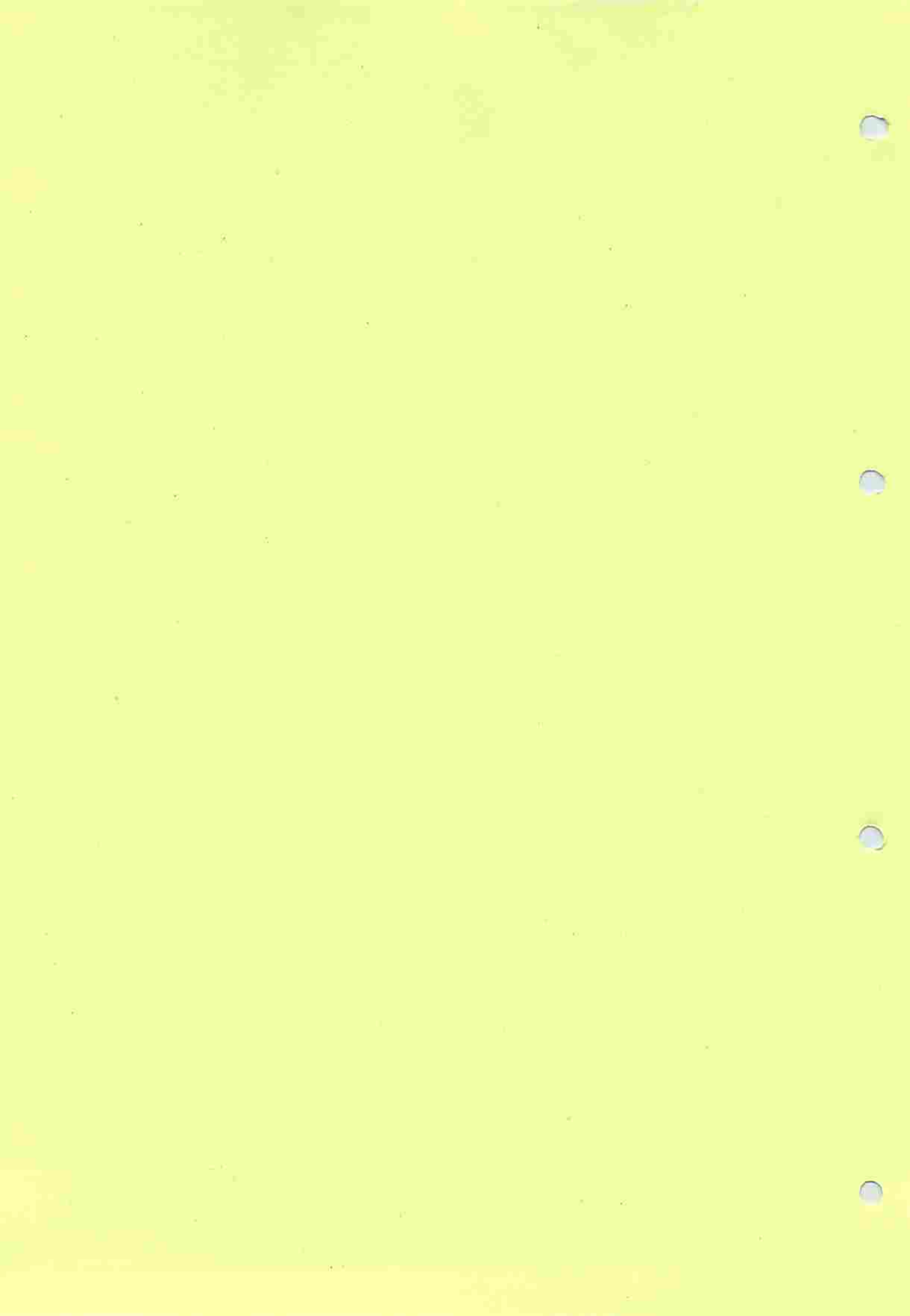


MYERS WOOD - SAMPLE POINT 270/5 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT 270/5 - ZIJDERVELD PLOT





SITE INFORMATION

Site Name Myers Wood
Area Trench B
Context No 207 & 270
Description Furnace baked clay material: combined data
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 20/9/02 & 24/4/03

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments	
	D	I	Int		D	I	Int			
	degs.	degs.	mA m^{-1}	mT	degs.	degs.	mA m^{-1}	Y/N		
207	1	49.3	72.6	16.46	15	28.5	62.4	11.16	Y	
	2	13.7	70.5	18.16	20	14.5	62.5	11.68		
	3	13.1	67.0	17.37	20	14.7	58.9	12.99		
	4	191.9	-80.0	19.13	30	6.7	62.9	4.81		
	5	276.9	-70.5	114.63	20	5.5	58.0	4.29		
	6	334.7	-40.2	35.18	30	5.5	59.5	30.18	Y	
	7	12.0	-5.4	5.71	20	14.9	63.4	13.56		
	8	359.0	12.8	11.63	20	7.0	51.5	10.09	Y	
	9	327.1	-69.0	10.53	30	15.1	52.7	4.17	Y	
	10	32.0	-86.9	1.05	15	34.5	45.4	0.69		
	11	9.2	52.5	377.87	15	6.5	52.7	390.78		
270	1	357.8	63.1	40.80	5	355.8	60.9	33.28	Y	
	2	17.2	59.7	4.69	2.5	13.8	56.7	4.75		
	3	18.8	74.9	351.90	5	15.4	73.3	349.15		
	4	14.5	54.5	104.37	2.5	14.1	54.9	110.27		
	5	284.3	63.4	168.93	5	278.5	62.3	159.38	Y	
	6	16.3	74.8	73.35	5	359.5	69.1	71.20		

STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	degs.	degs.			
207-1	49.3	72.6	0.19500	0.22671	0.95424
2	13.7	70.5	0.32431	0.07906	0.94264
3	13.1	67.0	0.38056	0.08856	0.92050
4	191.9	-80.0	-0.16992	-0.03581	-0.98481
5	276.9	-70.5	0.04010	-0.33139	-0.94264
6	334.7	-40.2	0.69053	-0.32641	-0.64546
7	12.0	-5.4	0.97381	0.20699	-0.09411
8	359.0	12.8	0.97500	-0.01702	0.22155
9	327.1	-69.0	0.30089	-0.19466	-0.93358
10	32.0	-66.9	0.33272	0.20791	-0.91982
11	9.2	52.5	0.60093	0.09733	0.79335
270-1	357.8	63.1	0.45210	-0.01737	0.89180
2	17.2	59.7	0.48196	0.14919	0.86340
3	18.8	74.9	0.24661	0.08395	0.96547
4	14.5	54.5	0.56221	0.14540	0.81412
5	284.3	63.4	0.11060	-0.43389	0.89415
6	16.3	74.8	0.25165	0.07359	0.96502

Number = 17
 Sum x = 6.74907
 Sum y = 0.00215
 Sum z = 4.70582
 R = 8.22768
 x bar = 0.82029
 y bar = 0.00026
 z bar = 0.57195

Mean Dec = 0.02
 Mean Inc = 34.89
 Alpha95 = 38.70

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	degs.	degs.			
207-1	28.5	62.4	0.40715	0.22107	0.88620
2	14.5	62.5	0.44704	0.11561	0.88701
3	14.7	58.9	0.49963	0.13107	0.85627
4	6.7	62.9	0.45243	0.05315	0.89021
5	5.5	58.0	0.52748	0.05079	0.84805
6	5.5	59.5	0.50520	0.04865	0.86163
7	14.9	63.4	0.43270	0.11513	0.89415
8	7.0	51.5	0.61787	0.07587	0.78261
9	15.1	52.7	0.58507	0.15786	0.79547
10					
11	6.5	52.7	0.60209	0.06860	0.79547
270-1	355.8	60.9	0.48503	-0.03562	0.87377
2	13.8	56.7	0.53317	0.13096	0.83581
3					
4	14.1	54.9	0.55768	0.14008	0.81815
5					
6					

Number = 13
 Sum x = 6.65256
 Sum y = 1.27322
 Sum z = 11.02481
 R = 12.93924
 x bar = 0.51414
 y bar = 0.09840
 z bar = 0.85204

Mean Dec = 10.83
 Mean Inc = 58.43
 Alpha95 = 2.96

Alpha68 = 1.75

CORRECTIONS

Mean Dec = 10.83
Mean Inc = 58.43

Correction for magnetic variation

Mean Dec = 7.11
Mean Inc = 58.43

Correction to Meriden (CVP)

Uncorrected Dec = 7.11
Uncorrected Inc = 58.43
Latitude = 53.60
Longitude = -1.73

Kai = 50.86
Latitude of pole = 74.75
Beta1 = 21.42
Longitude of pole = 156.85
Geomag colat = 52.01
Corrected Inc = 57.37
Beta 2 = 21.53
Corrected Dec = 7.04

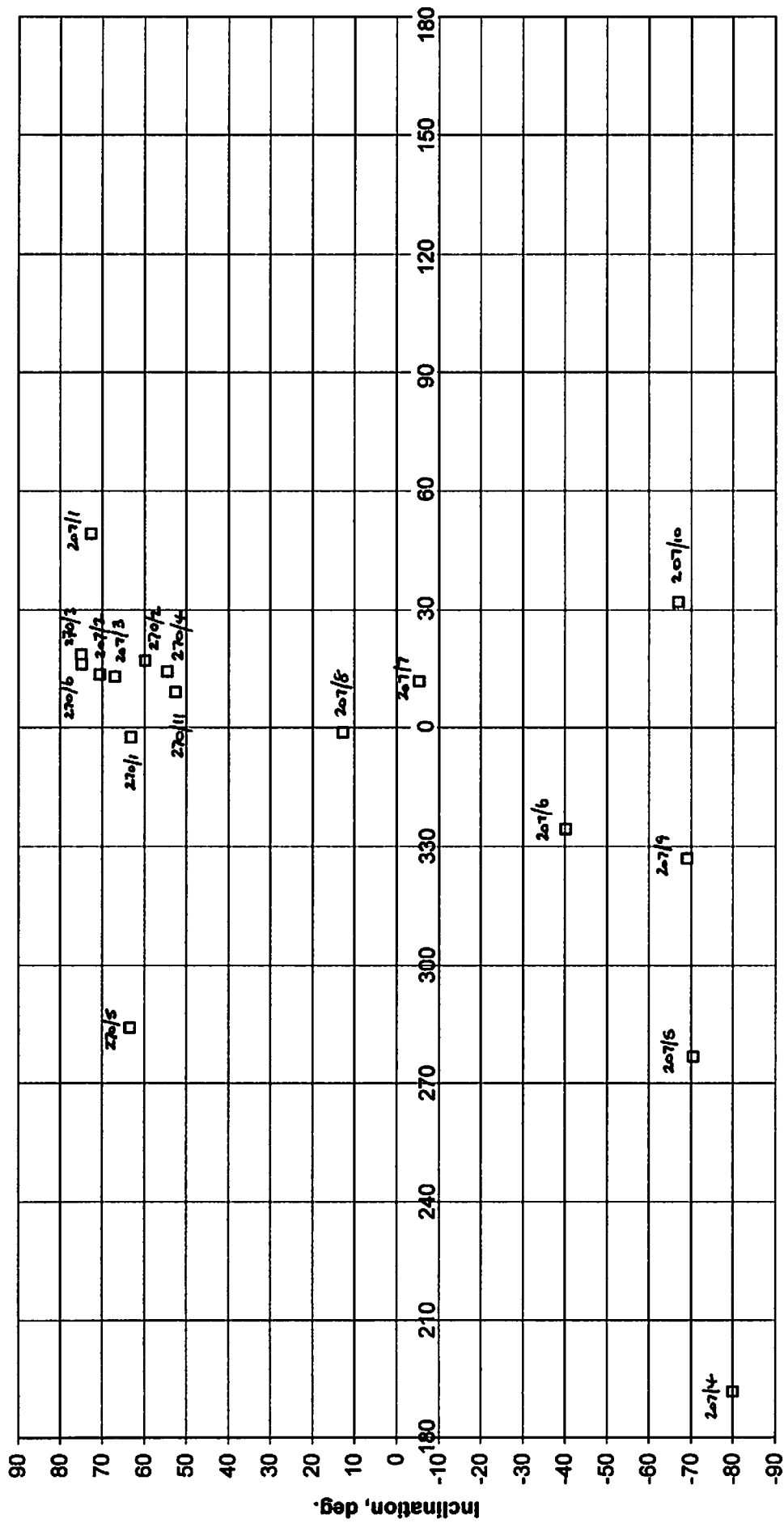
FINAL RESULT

Corrected Dec = 7.04
Corrected Inc = 57.37
Alpha95 = 2.96

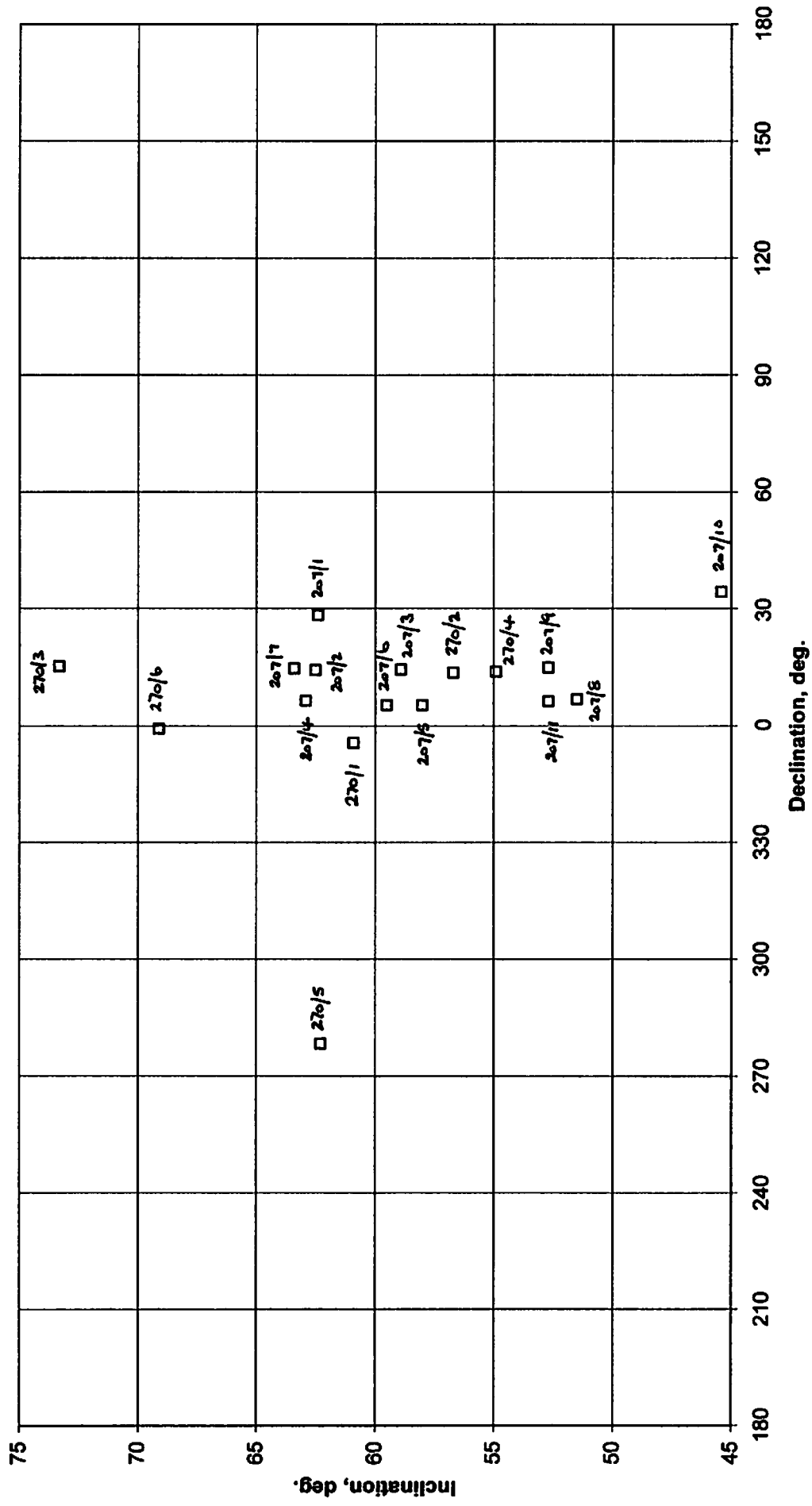
ERROR BARS

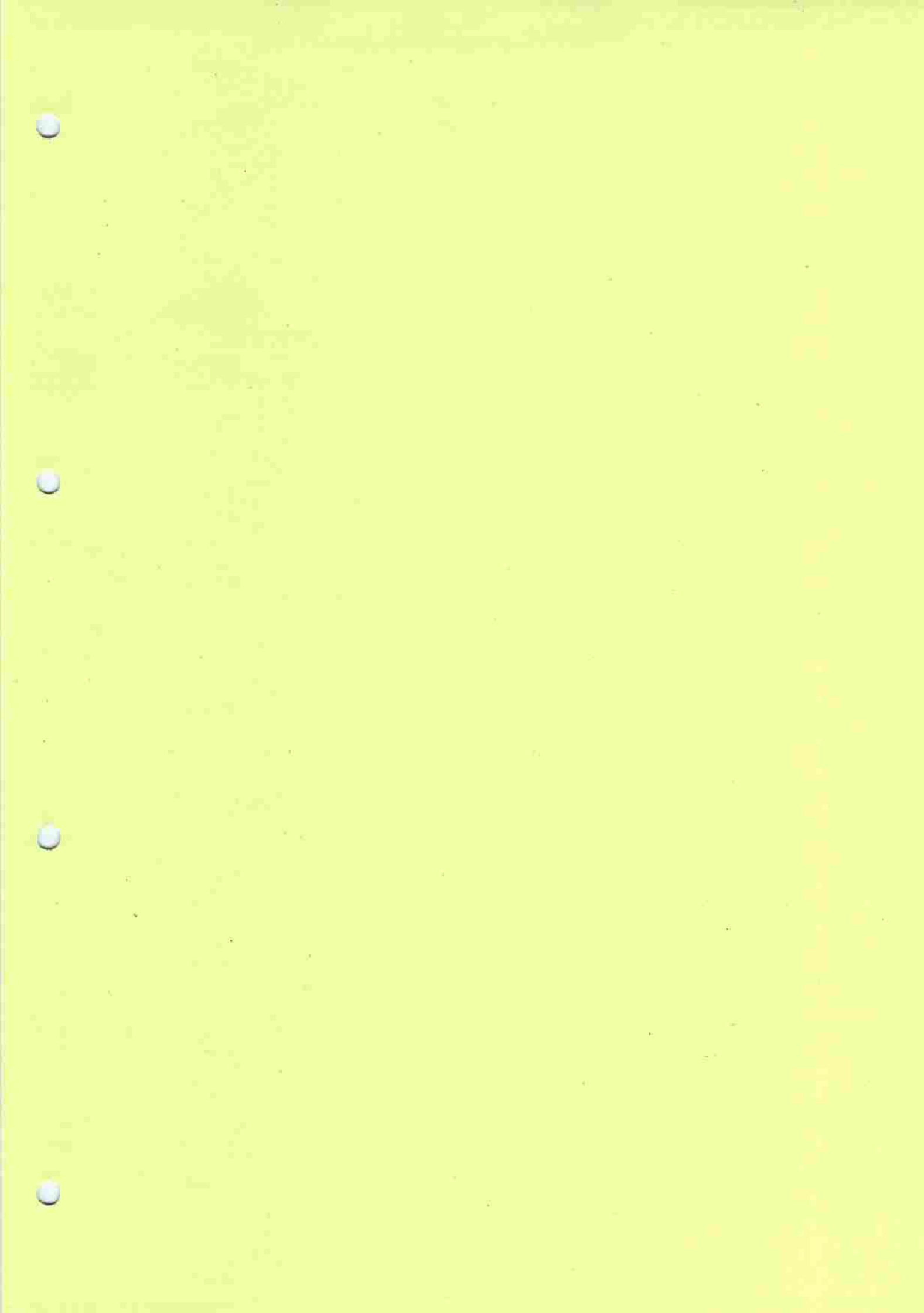
Alpha95		Alpha68	
$\delta Dec = \pm$	5.48	$\delta Dec = \pm$	3.25
$\delta Inc = \pm$	2.96	$\delta Inc = \pm$	1.75

INITIAL SAMPLE SCATTER



FINAL GROUP SAMPLE SCATTER





SITE INFORMATION

Site Name Myers Wood
Area Trench B
Context No 262
Description Furnace lining material
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 24/4/03

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments
	D	I	Int		D	I	Int		
	<i>degs.</i>	<i>degs.</i>	<i>mA m⁻¹</i>		<i>degs.</i>	<i>degs.</i>	<i>mA m⁻¹</i>		
1	87.9	31.2	91.81					Y	x10 atten.
2	9.6	54.1	92.70						x10 atten.
3	325.7	7.9	4.89					Y	
4	357.3	44.9	90.00						x10 atten.
5	6.7	42.1	48.79					Y	
6	338.6	61.9	16.06					Y	
7	259.5	81.9	86.81						x10 atten.
8	24.8	65.9	343.37						x10 atten.
9	40.5	52.1	234.76						
10	36.8	62.8	270.45						x10 atten.
11	39.8	78.0	57.85						x10 atten.
12	20.8	53.7	60.44						x100 atten.

STATISTICS FOR NRM

Sample no.	NRM				
	D	l	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	87.90	31.20	0.03134	0.85479	0.51803
2	9.60	54.10	0.57816	0.09779	0.81004
3	325.70	7.90	0.81826	-0.55818	0.13744
4	357.30	44.90	0.70755	-0.03337	0.70587
5	6.70	42.10	0.73691	0.08657	0.67043
6	338.60	61.90	0.43854	-0.17186	0.88213
7	259.50	81.90	-0.02568	-0.13854	0.99002
8	24.80	65.90	0.37067	0.17128	0.91283
9	40.50	52.10	0.46711	0.39895	0.78908
10	36.80	62.80	0.36601	0.27381	0.88942
11	39.80	78.00	0.15974	0.13309	0.97815
12	20.80	53.70	0.55343	0.21023	0.80593

Number = 12
 Sum x = 5.20204
 Sum y = 1.32454
 Sum z = 9.08937
 R = 10.55615
 x bar = 0.49280
 y bar = 0.12548
 z bar = 0.86105

Mean Dec = 14.29
 Mean Inc = 59.43
 Alpha95 = 16.83

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	87.90	31.20	0.03134	0.85479	0.51803
2	9.60	54.10	0.57816	0.09779	0.81004
3	325.70	7.90	0.81826	-0.55818	0.13744
4	357.30	44.90	0.70755	-0.03337	0.70587
5	6.70	42.10	0.73691	0.08657	0.87043
6	338.60	61.90	0.43854	-0.17188	0.88213
7	259.50	81.90	-0.02568	-0.13854	0.99002
8	24.80	65.90	0.37067	0.17128	0.91283
9	40.50	52.10	0.48711	0.39895	0.78908
10	36.80	62.80	0.36601	0.27381	0.88942
11	39.80	78.00	0.15974	0.13309	0.97815
12	20.80	53.70	0.55343	0.21023	0.80593

Number = 12
 Sum x = 5.20204
 Sum y = 1.32454
 Sum z = 9.08937
 R = 10.55615
 x bar = 0.49280
 y bar = 0.12548
 z bar = 0.86105

Mean Dec = 14.29
 Mean Inc = 59.43
 Alpha95 = 16.83

Alpha68 = 9.91

CORRECTIONS

Mean Dec = 14.29
Mean Inc = 59.43

Correction for magnetic variation

Mean Dec = 10.57
Mean Inc = 59.43

Correction to Meriden (CVP)

Uncorrected Dec = 10.57
Uncorrected Inc = 59.43
Latitude = 53.60
Longitude = -1.73

Kai = 49.75
Latitude of pole = 74.86
Beta1 = 32.41
Longitude of pole = 145.86
Geomag colat = 50.89
Corrected Inc = 58.41
Beta 2 = 32.52
Corrected Dec = 10.42

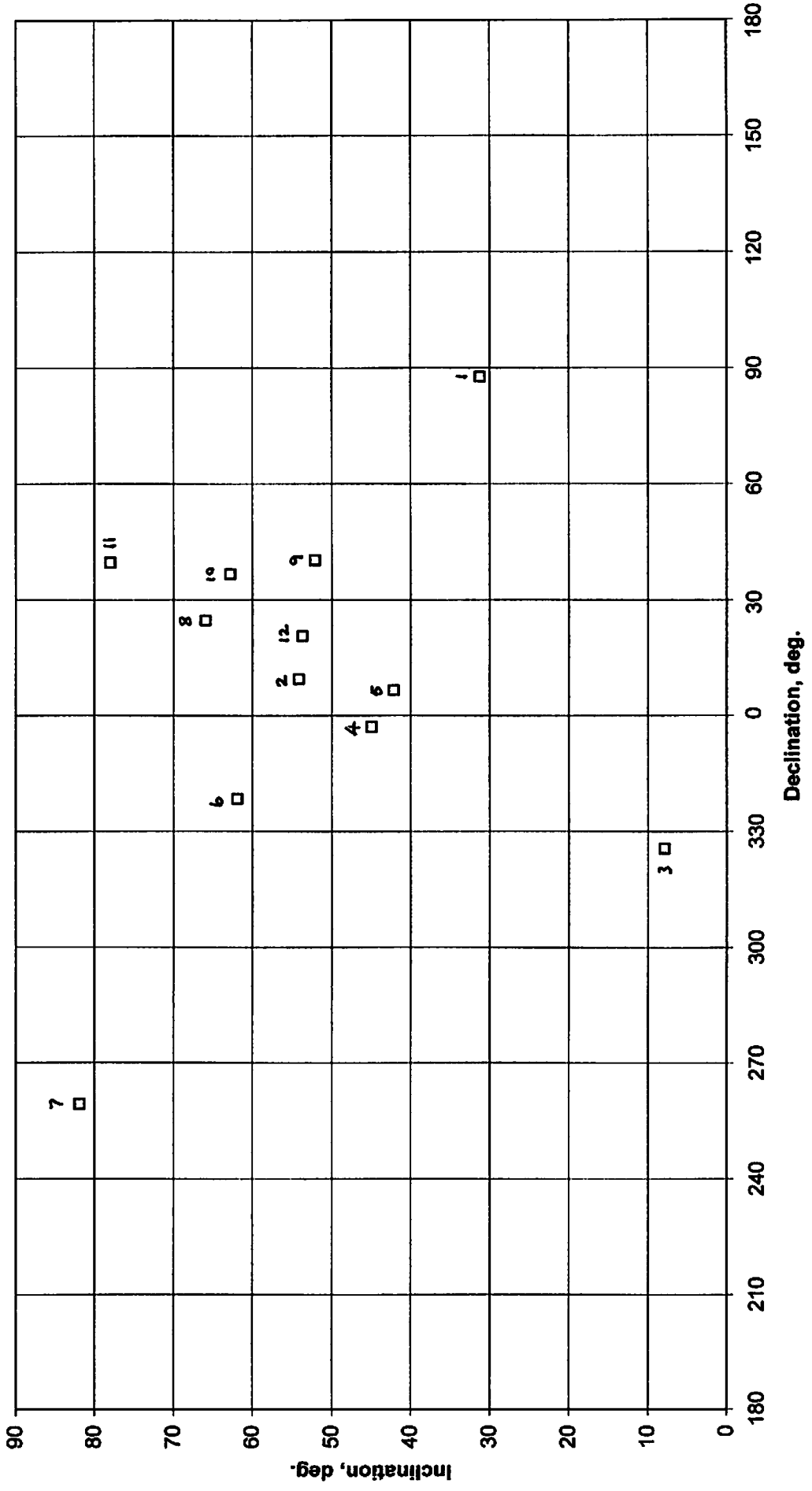
FINAL RESULT

Corrected Dec = 10.42
Corrected Inc = 58.41
Alpha95 = 16.83

ERROR BARS

Alpha95		Alpha68	
δDec = ±	32.12	δDec = ±	18.92
δInc = ±	16.83	δInc = ±	9.91

INITIAL SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

Sample No. 1

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	14.02	1.00	12.46	6.02	-2.24	25.80	-9.20
2.5	12.22	0.87	10.90	5.10	-2.11	25.10	-10.00
5.0	7.80	0.56	7.16	2.87	-1.16	21.80	-8.60
7.5	5.84	0.42	5.43	1.92	-0.98	19.40	-9.70
10.0	4.90	0.35	4.40	1.91	-1.00	23.50	-11.80
15.0	3.62	0.26	3.27	1.43	-0.62	23.70	-9.90
20.0	2.54	0.18	2.19	1.29	-0.02	30.50	-0.40
30.0	1.53	0.11	1.29	0.81	0.15	32.00	5.50
40.0	0.75	0.05	0.66	0.24	0.28	19.70	21.70
60.0	0.55	0.04	0.42	0.27	0.23	32.90	25.30
80.0	0.39	0.03	0.34	0.01	0.19	2.00	29.70
100.0	0.42	0.03	0.30	0.22	0.19	35.80	27.10

Sample No. 3

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	0.94	1.00	0.07	0.11	0.93	56.00	82.10
2.5	0.81	0.87	0.13	0.29	0.75	65.80	67.20
5.0	0.64	0.68	-0.03	0.23	0.59	96.80	68.60
7.5	0.62	0.67	-0.11	0.43	0.44	104.00	44.40
10.0	0.50	0.54	-0.04	0.36	0.35	97.10	44.40
15.0	0.37	0.40	-0.16	0.19	0.28	130.80	48.20
20.0	0.26	0.27	-0.12	0.20	0.10	120.80	22.70
30.0	0.16	0.18	-0.10	0.13	0.01	126.40	3.20
40.0	0.29	0.31	-0.29	0.05	-0.03	169.70	-5.40
60.0	0.08	0.08	0.02	0.08	0.01	77.10	5.70
80.0	0.07	0.07	0.04	-0.05	-0.03	313.20	-25.00
100.0	0.15	0.16	-0.03	0.10	-0.11	109.40	-46.70

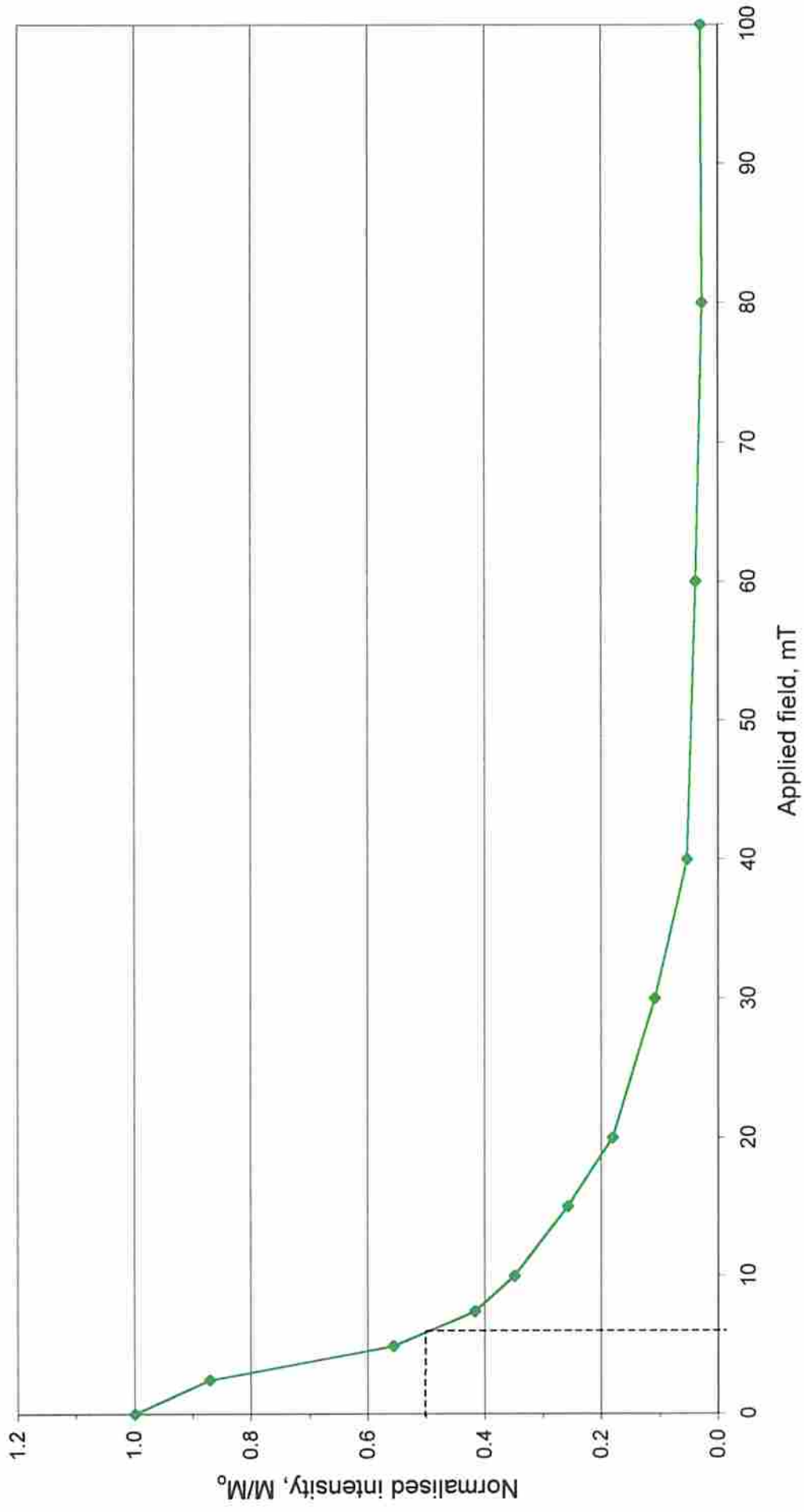
Sample No. 5

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised Intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	12.59	1.00	9.40	-6.03	5.81	327.30	27.50
2.5	9.97	0.79	8.68	-1.44	4.68	350.60	28.00
5.0	7.72	0.61	7.36	-2.20	0.79	343.40	5.90
7.5	7.31	0.58	6.77	-2.32	-1.53	341.10	-12.10
10.0	6.81	0.54	6.16	-1.90	-2.21	342.80	-18.90
15.0	5.19	0.41	4.91	1.60	0.54	18.10	5.90
20.0	6.05	0.48	4.06	3.40	2.94	40.00	29.00
30.0	4.39	0.35	2.35	2.30	2.91	44.40	41.50
40.0	3.28	0.26	1.79	1.66	2.20	43.00	42.00
60.0	2.33	0.18	1.41	0.94	1.60	33.70	43.50
80.0	2.17	0.17	1.33	0.63	1.59	25.30	47.30
100.0	1.85	0.15	1.05	0.49	1.44	24.90	51.00

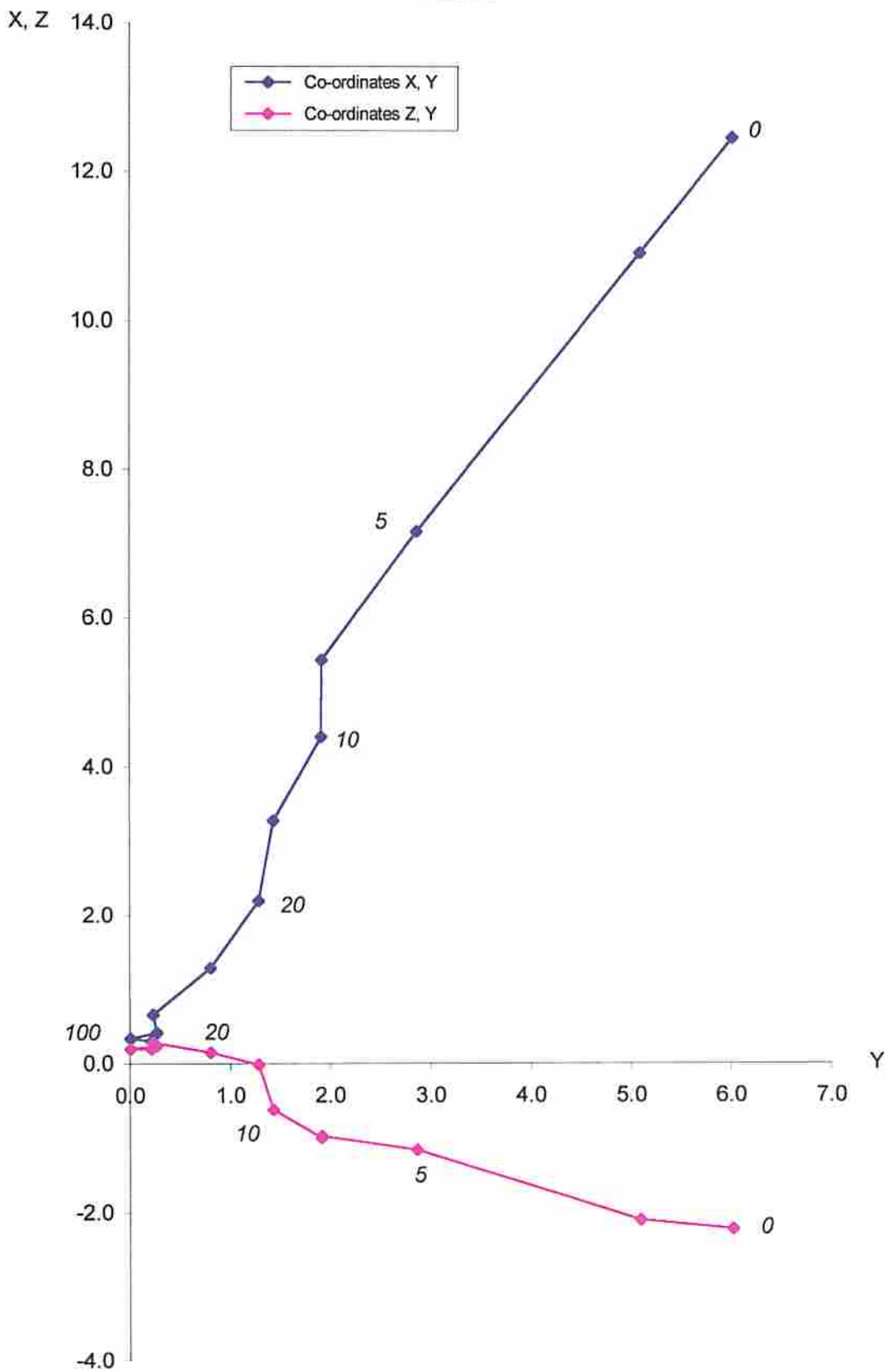
Sample No. 6

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised Intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	8.43	1.00	4.90	-1.14	6.77	346.90	53.40
2.5	7.39	0.88	4.22	-1.27	5.94	343.30	53.40
5.0	6.36	0.75	3.90	-1.49	4.79	339.10	48.90
7.5	5.49	0.65	3.43	-1.59	3.98	335.00	46.50
10.0	4.57	0.54	3.02	-1.36	3.15	335.90	43.60
15.0	2.96	0.35	2.05	-0.72	2.00	340.80	42.60
20.0	1.84	0.22	1.31	-0.27	1.26	348.50	43.50
30.0	0.77	0.09	0.58	-0.13	0.49	346.90	39.70
40.0	0.47	0.06	0.27	-0.15	0.35	331.00	48.50
60.0	0.34	0.04	0.26	-0.09	0.20	341.10	35.30
80.0	0.23	0.03	0.08	0.00	0.22	1.30	69.00
100.0	0.11	0.01	0.07	-0.05	0.07	323.10	41.30

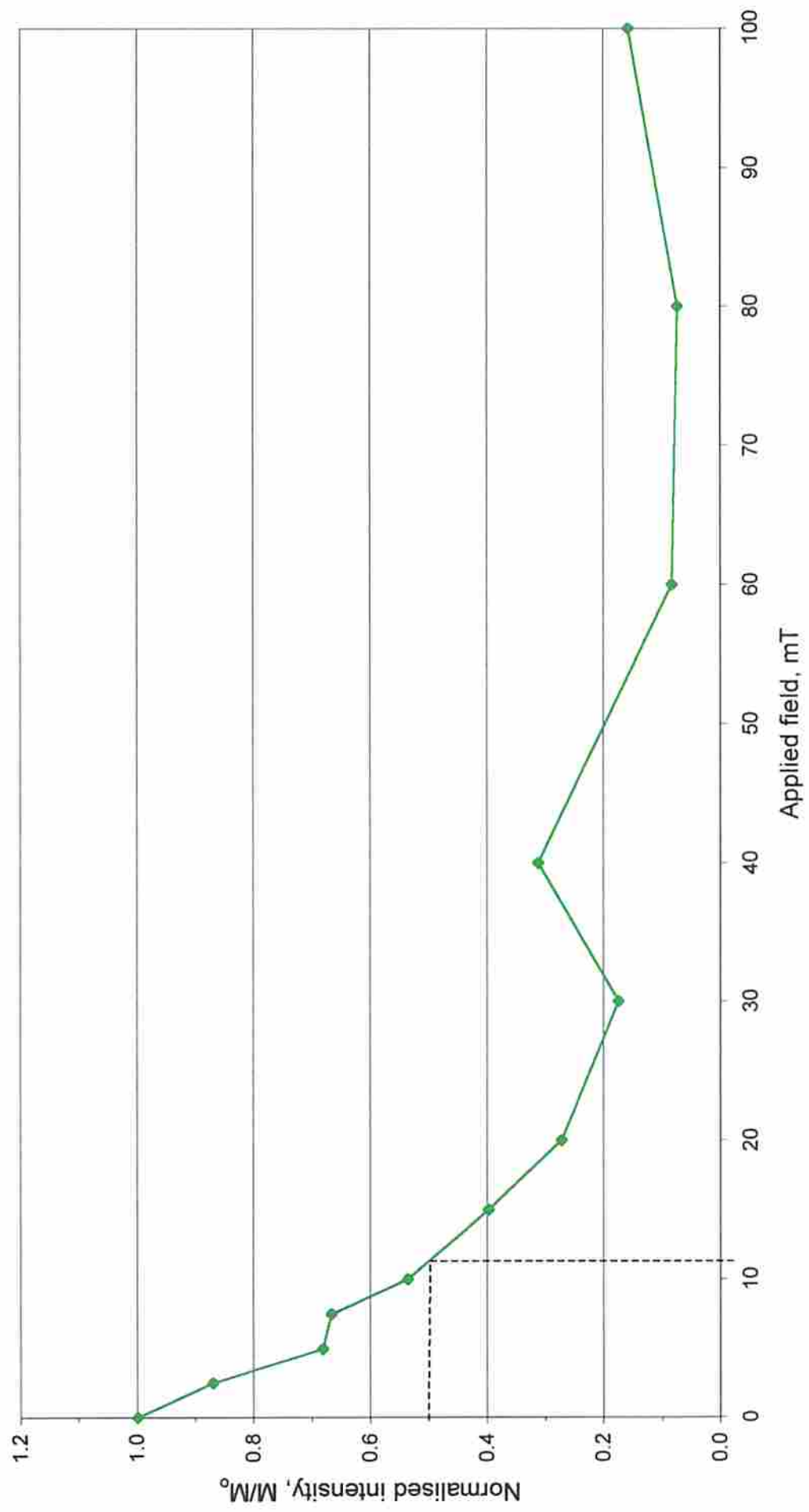
MYERS WOOD - SAMPLE POINT 262/1 DEMAGNETISATION: INTENSITY SPECTRUM



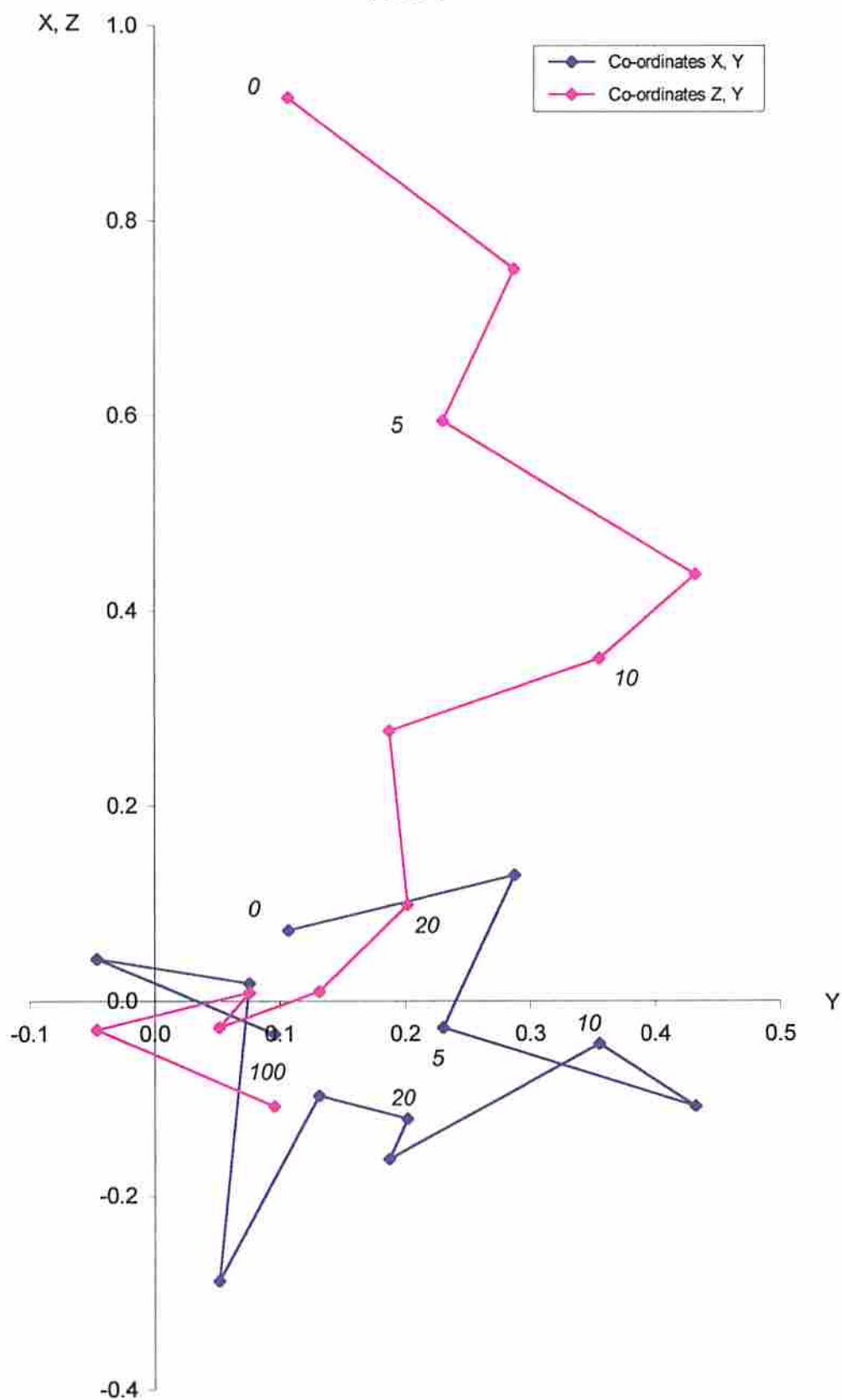
MYERS WOOD - SAMPLE POINT 262/1 - ZIJDERVELD PLOT



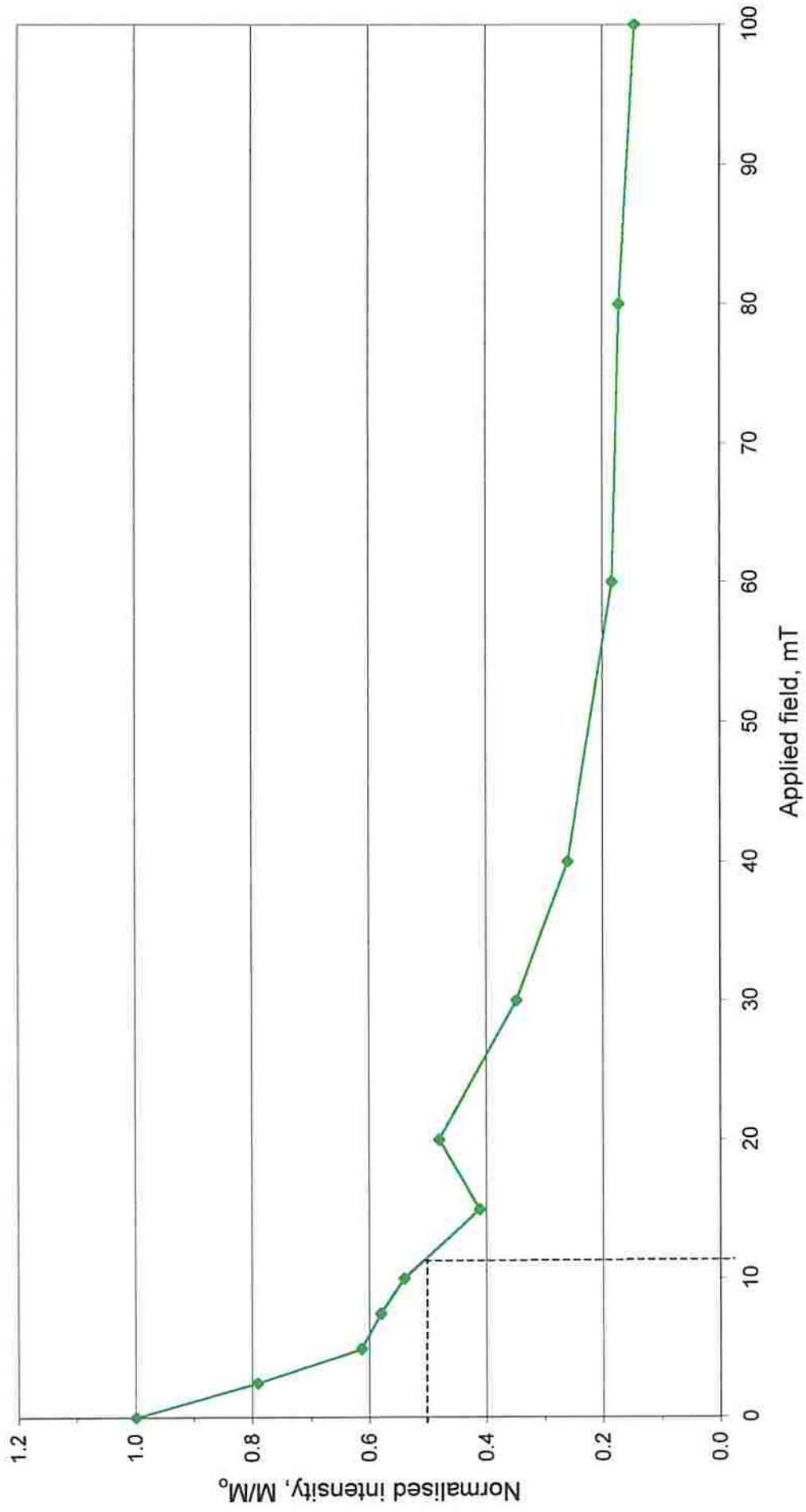
MYERS WOOD - SAMPLE POINT 262/3 DEMAGNETISATION: INTENSITY SPECTRUM



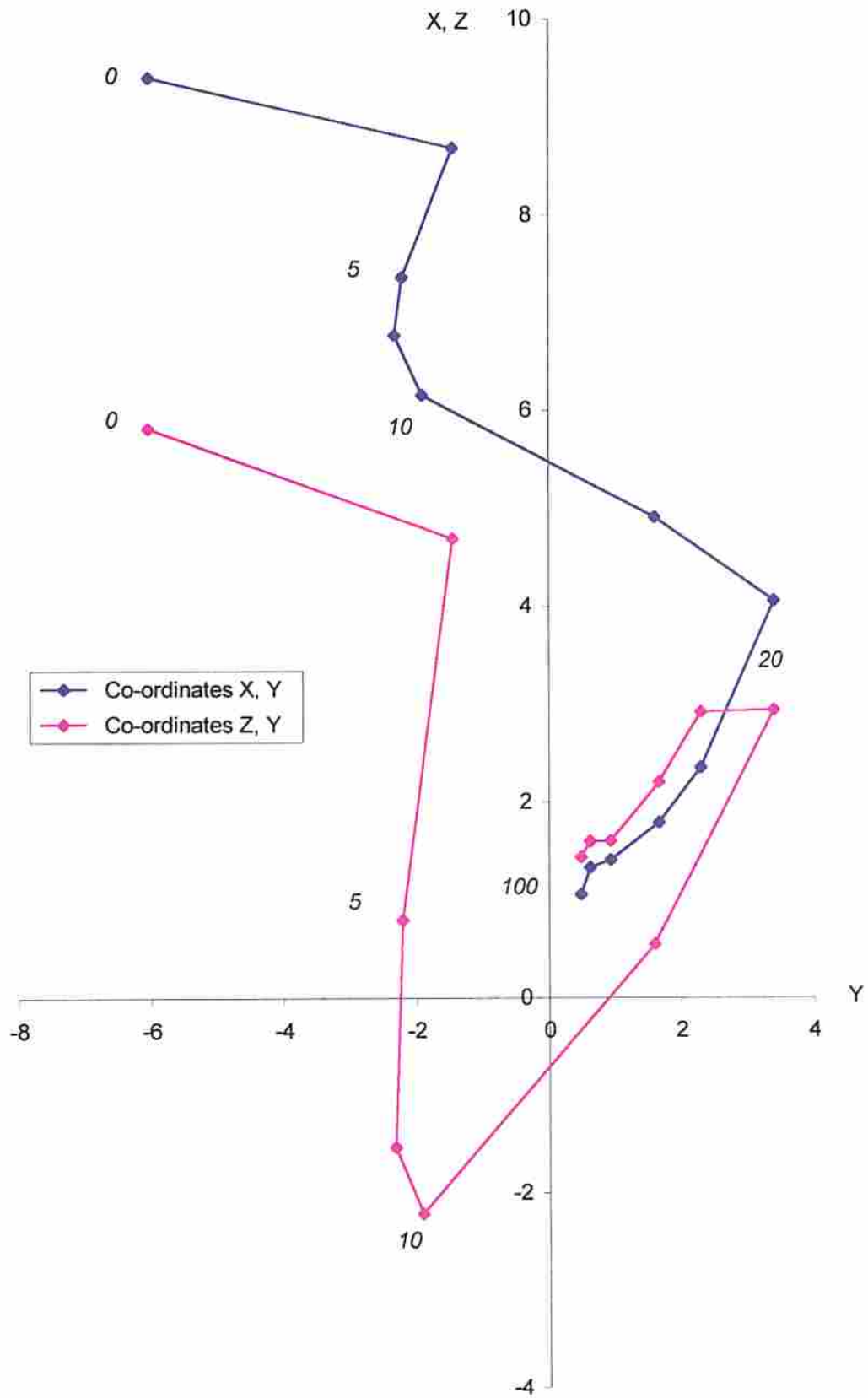
MYERS WOOD - SAMPLE POINT 262/3 - ZIJDERVELD PLOT



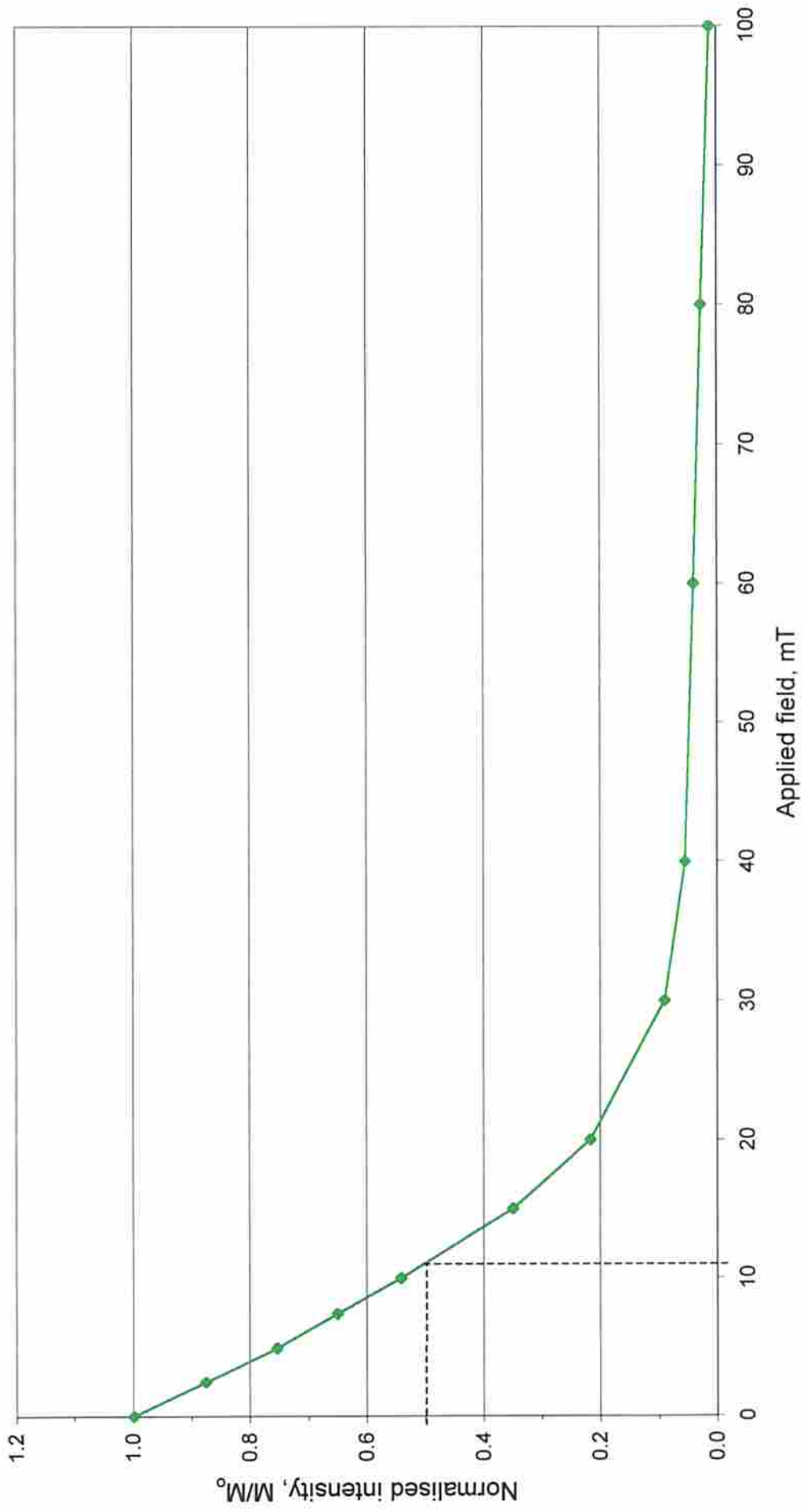
MYERS WOOD - SAMPLE POINT 262/5 DEMAGNETISATION: INTENSITY SPECTRUM



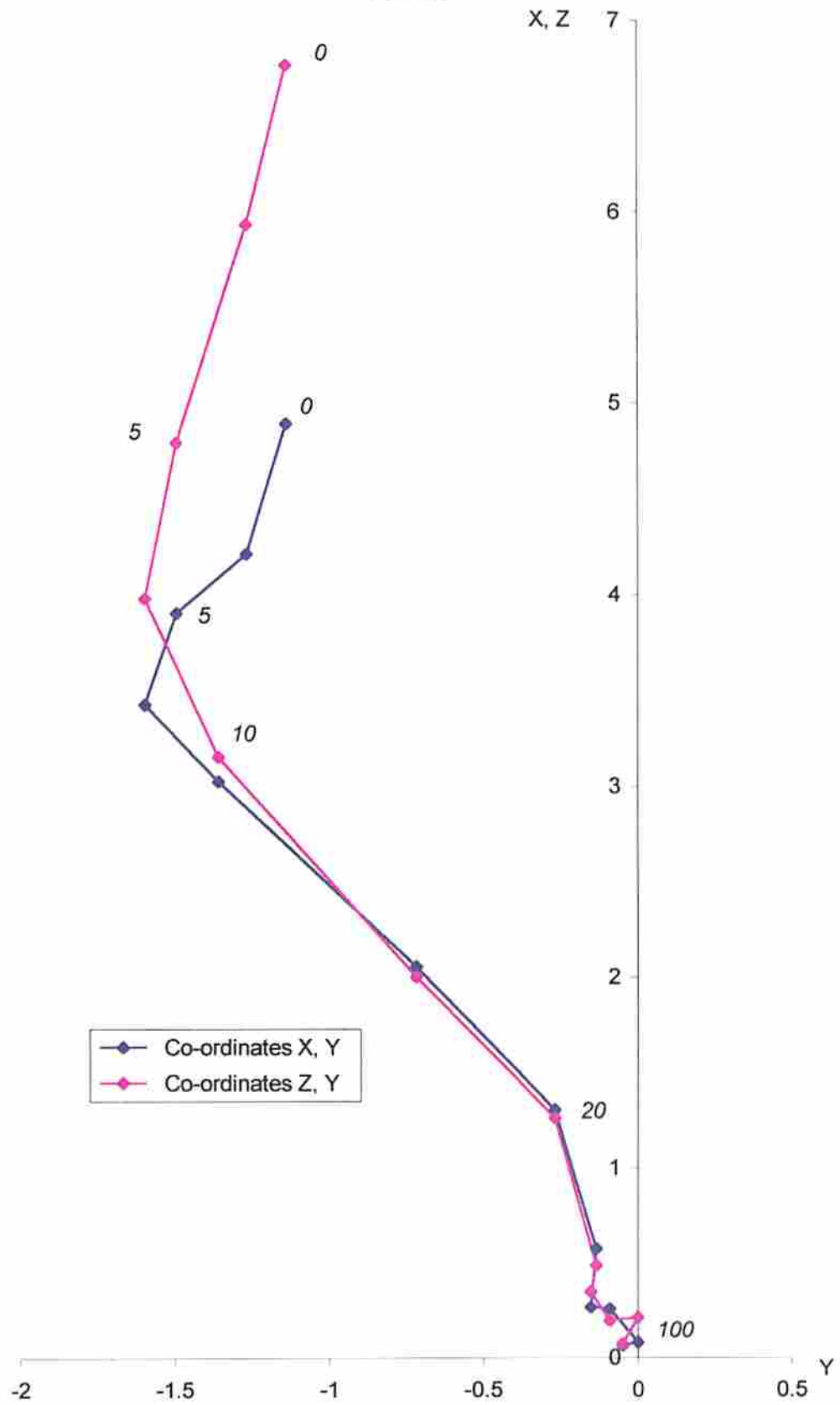
MYERS WOOD - SAMPLE POINT 262/5 - ZIJDERVELD PLOT



MYERS WOOD - SAMPLE POINT 262/6 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT 262/6 - ZIJDERVELD PLOT



STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	13.90	69.40	0.34154	0.08452	0.93606
2	315.50	40.80	0.53993	-0.53058	0.65342
3	304.90	44.10	0.41087	-0.58897	0.69591
4	5.30	47.80	0.66885	0.06205	0.74080
5	16.10	56.10	0.53587	0.15467	0.83001
6	29.30	57.80	0.46471	0.26078	0.84619
7	51.80	79.10	0.11694	0.14860	0.98198
8	3.10	70.40	0.33496	0.01814	0.94206
9	28.20	68.40	0.32443	0.17396	0.92978
10	18.20	68.70	0.34508	0.11346	0.93169

Number = 10
 Sum x = 4.08317
 Sum y = -0.10338
 Sum z = 8.48769
 R = 9.41951
 x bar = 0.43348
 y bar = -0.01098
 z bar = 0.90110

Mean Dec = -1.45
 Mean Inc = 64.30
 Alpha95 = 12.67

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	19.20	66.20	0.38110	0.13271	0.91496
2					
3					
4					
5	13.00	60.20	0.48424	0.11179	0.86777
6	19.30	59.80	0.47475	0.16626	0.86427
7					
8	1.80	67.00	0.39054	0.01227	0.92050
9	27.60	66.00	0.36045	0.18844	0.91355
10	18.30	66.90	0.37249	0.12319	0.91982

Number = 6
 Sum x = 2.46357
 Sum y = 0.73467
 Sum z = 5.40087
 R = 5.98150
 x bar = 0.41187
 y bar = 0.12282
 z bar = 0.90293

Mean Dec = 16.61
 Mean Inc = 64.55
 Alpha95 = 4.08

Alpha68 = 2.28

CORRECTIONS

Mean Dec = 16.61
Mean Inc = 64.55

Correction for magnetic variation

Mean Dec = 12.89
Mean Inc = 64.55

Correction to Meridian (CVP)

Uncorrected Dec = 12.89
Uncorrected Inc = 64.55
Latitude = 53.60
Longitude = -1.73

Kai = 43.59
Latitude of pole = 79.06
Beta1 = 54.12
Longitude of pole = 124.15
Geomag colat = 44.72
Corrected Inc = 63.66
Beta 2 = 54.23
Corrected Dec = 12.64

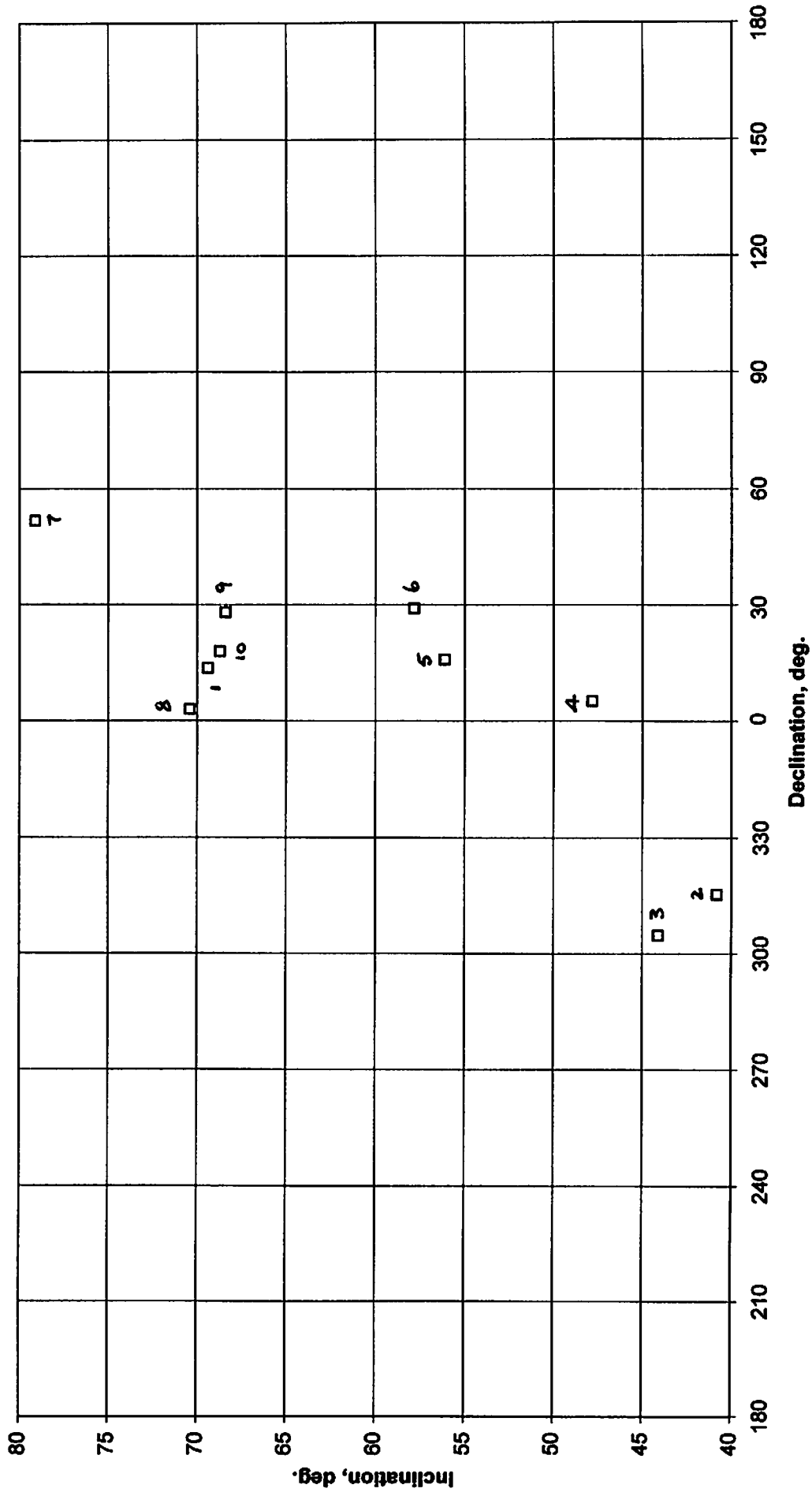
FINAL RESULT

Corrected Dec = 12.64
Corrected Inc = 63.66
Alpha95 = 4.08

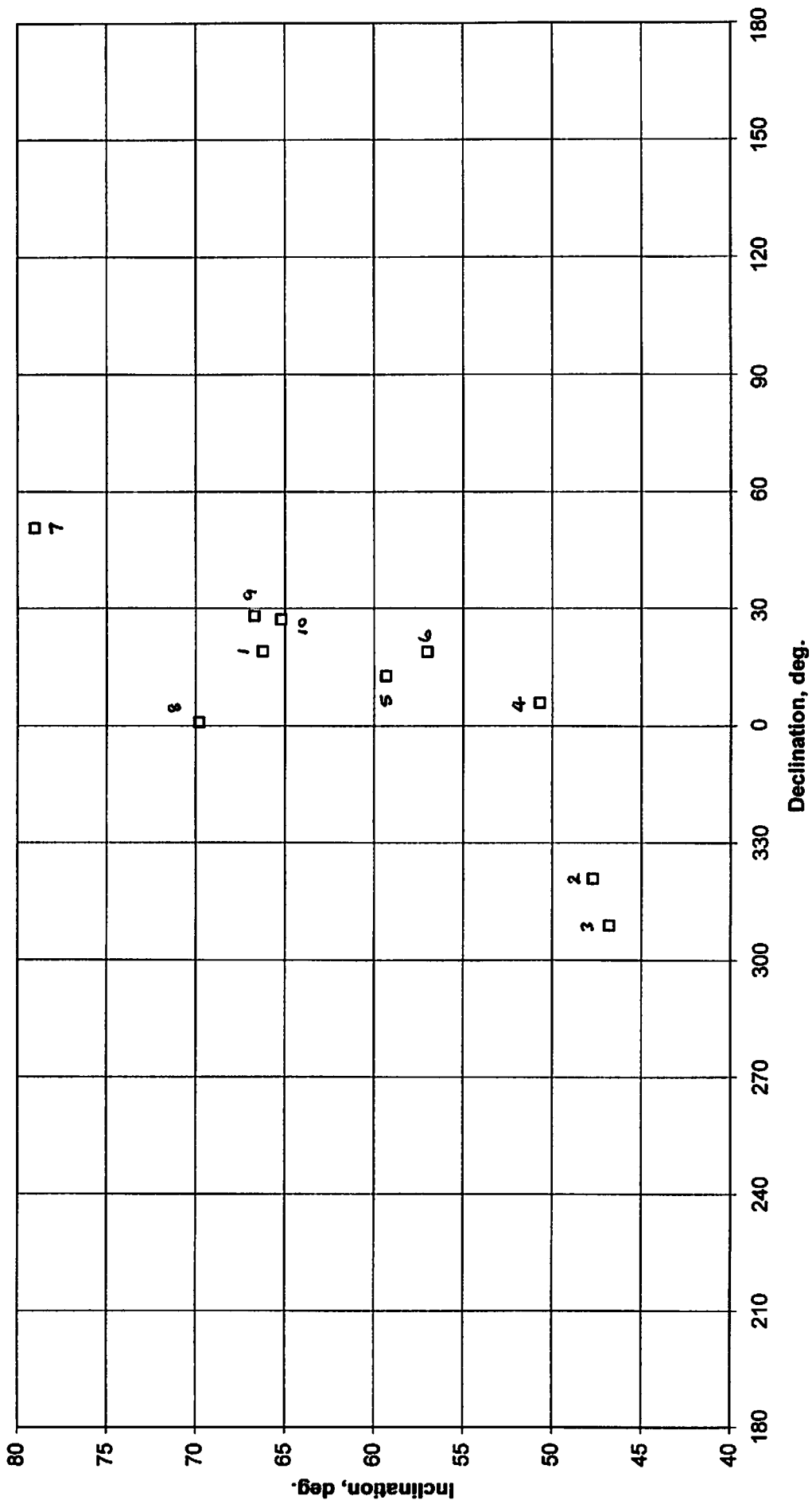
ERROR BARS

Alpha95		Alpha68	
$\delta Dec = \pm$	9.20	$\delta Dec = \pm$	5.14
$\delta Inc = \pm$	4.08	$\delta Inc = \pm$	2.28

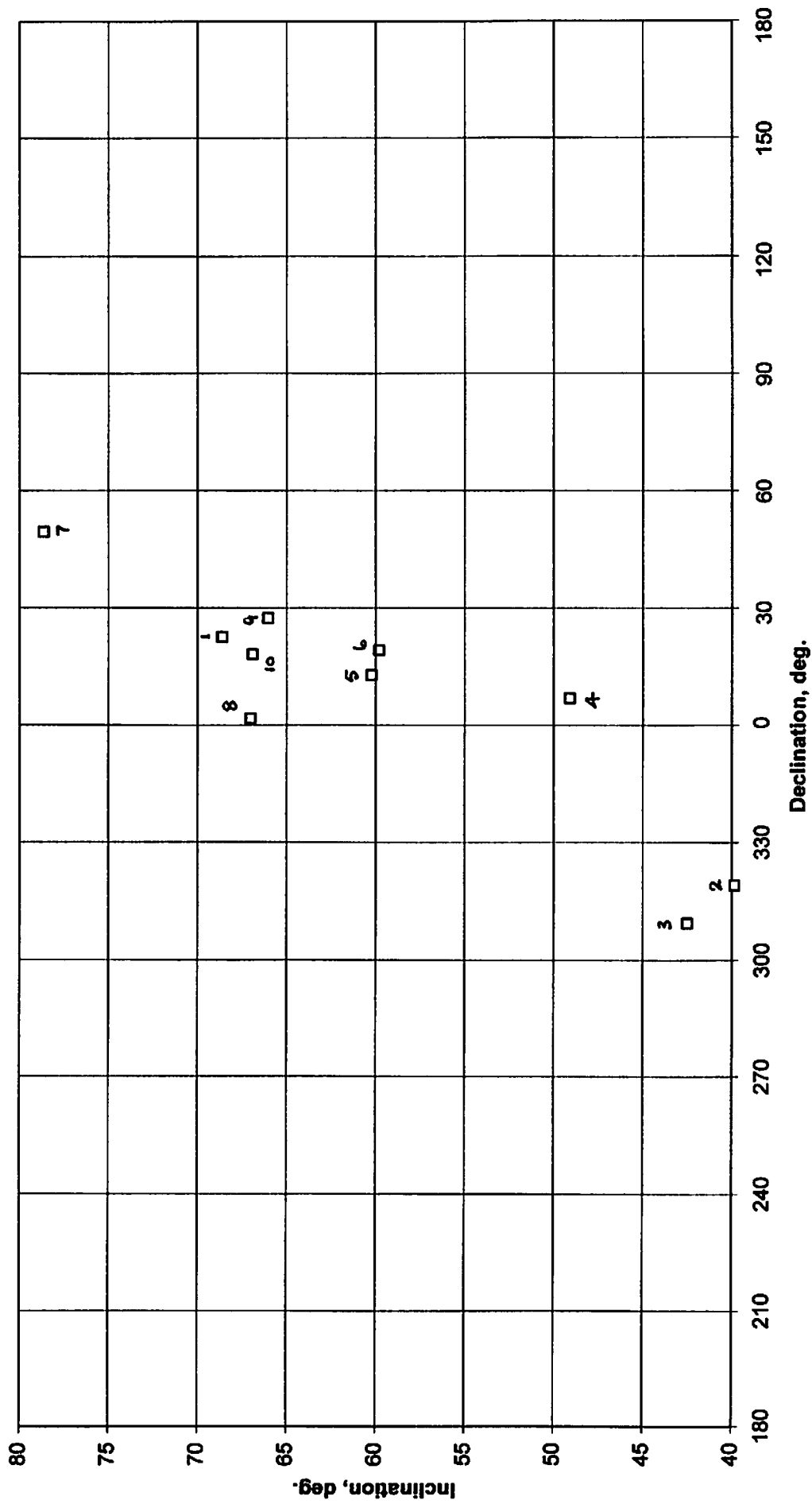
INITIAL SAMPLE SCATTER



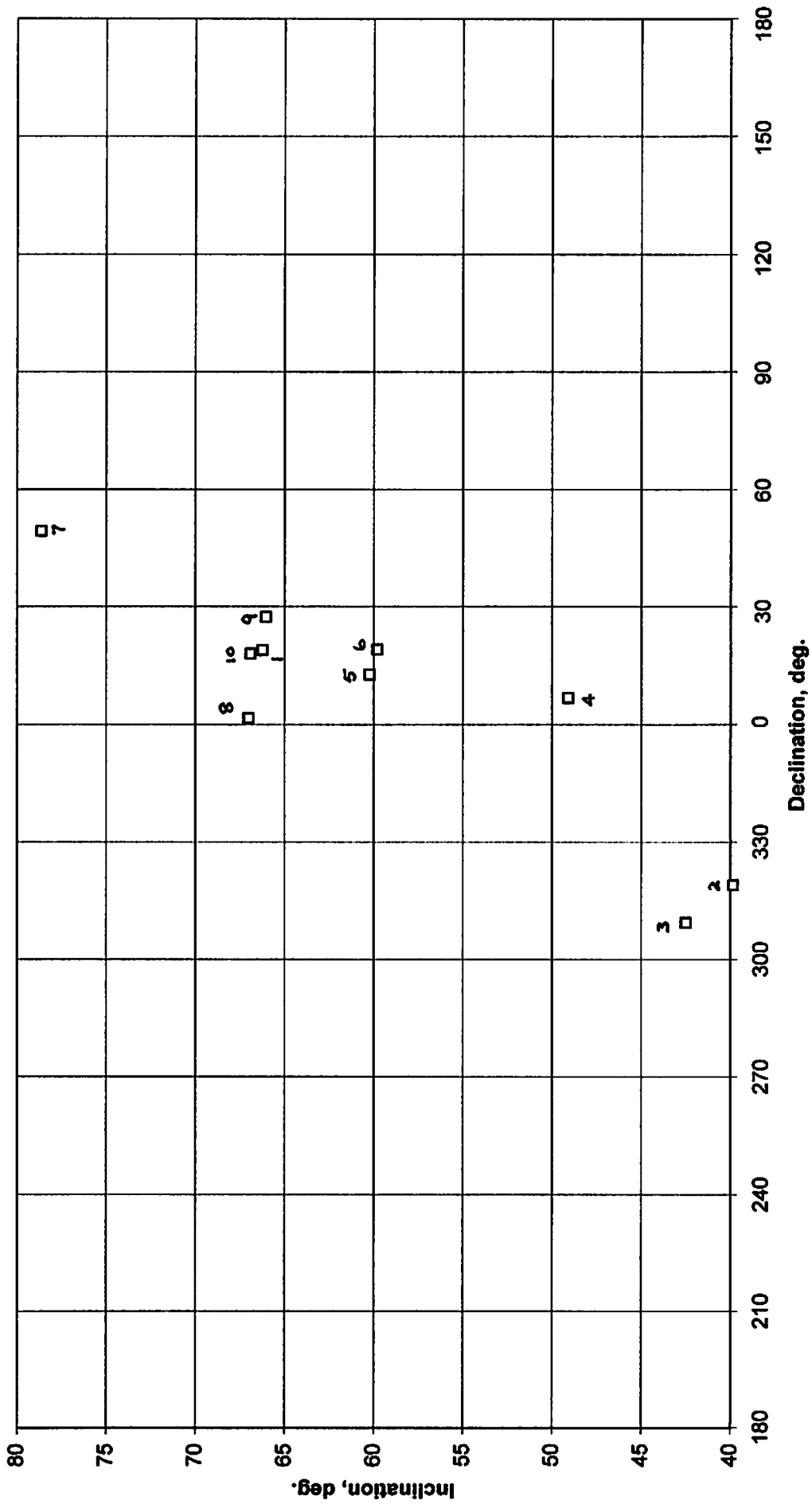
2.5mT DEMAGNETISED SAMPLE SCATTER



5mT DEMAGNETISED SAMPLE SCATTER



FINAL GROUP SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

Sample No. 5

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	94.70	1.00	45.62	11.36	82.21	14.00	60.20
2.5	94.64	1.00	47.14	10.81	81.35	12.90	59.30
5.0	90.56	0.96	43.81	10.11	78.61	13.00	60.20
7.5	84.23	0.89	41.14	9.25	72.91	12.70	60.00
10.0	76.27	0.81	37.71	8.40	65.76	12.60	59.60
15.0	54.24	0.57	27.40	5.92	46.43	12.20	58.90
20.0	32.92	0.35	18.44	3.46	27.05	10.60	55.30
30.0	11.54	0.12	6.46	1.09	9.50	9.60	55.40
40.0	6.09	0.06	3.61	0.17	4.91	2.70	53.70
60.0	3.36	0.04	1.88	0.14	2.78	4.40	55.90
80.0	2.60	0.03	1.52	0.06	2.11	2.10	54.20
100.0	2.15	0.02	1.17	-0.05	1.81	357.50	57.00

Sample No. 7

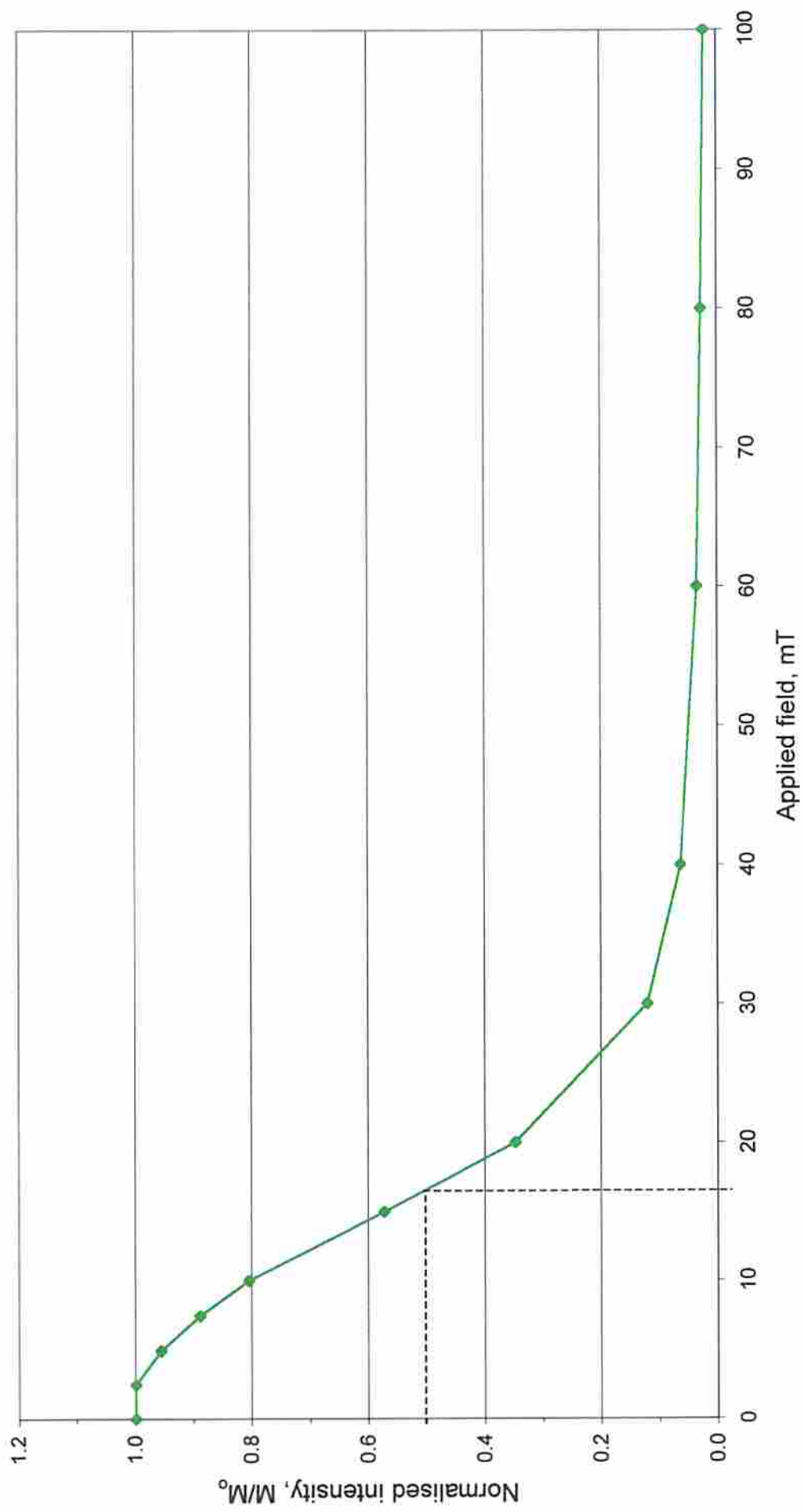
Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	48.24	1.00	4.91	35.98	31.75	82.20	41.20
2.5	40.64	0.84	4.87	5.99	39.90	50.90	79.00
5.0	37.60	0.78	4.80	5.64	36.86	49.60	78.60
7.5	32.81	0.68	4.38	5.05	32.12	49.10	78.30
10.0	29.10	0.60	3.90	4.55	28.48	49.40	78.10
15.0	22.12	0.46	3.45	3.43	21.58	44.80	77.30
20.0	17.60	0.36	2.90	2.51	17.17	40.90	77.40
30.0	11.68	0.24	2.09	1.67	11.36	38.70	76.70
40.0	8.25	0.17	1.53	1.24	8.01	38.90	76.20
60.0	4.92	0.10	0.72	0.77	4.80	47.20	77.60
80.0	3.60	0.07	0.68	0.72	3.46	46.40	74.00
100.0	3.21	0.07	0.84	0.62	3.04	36.50	71.10

Sample No.

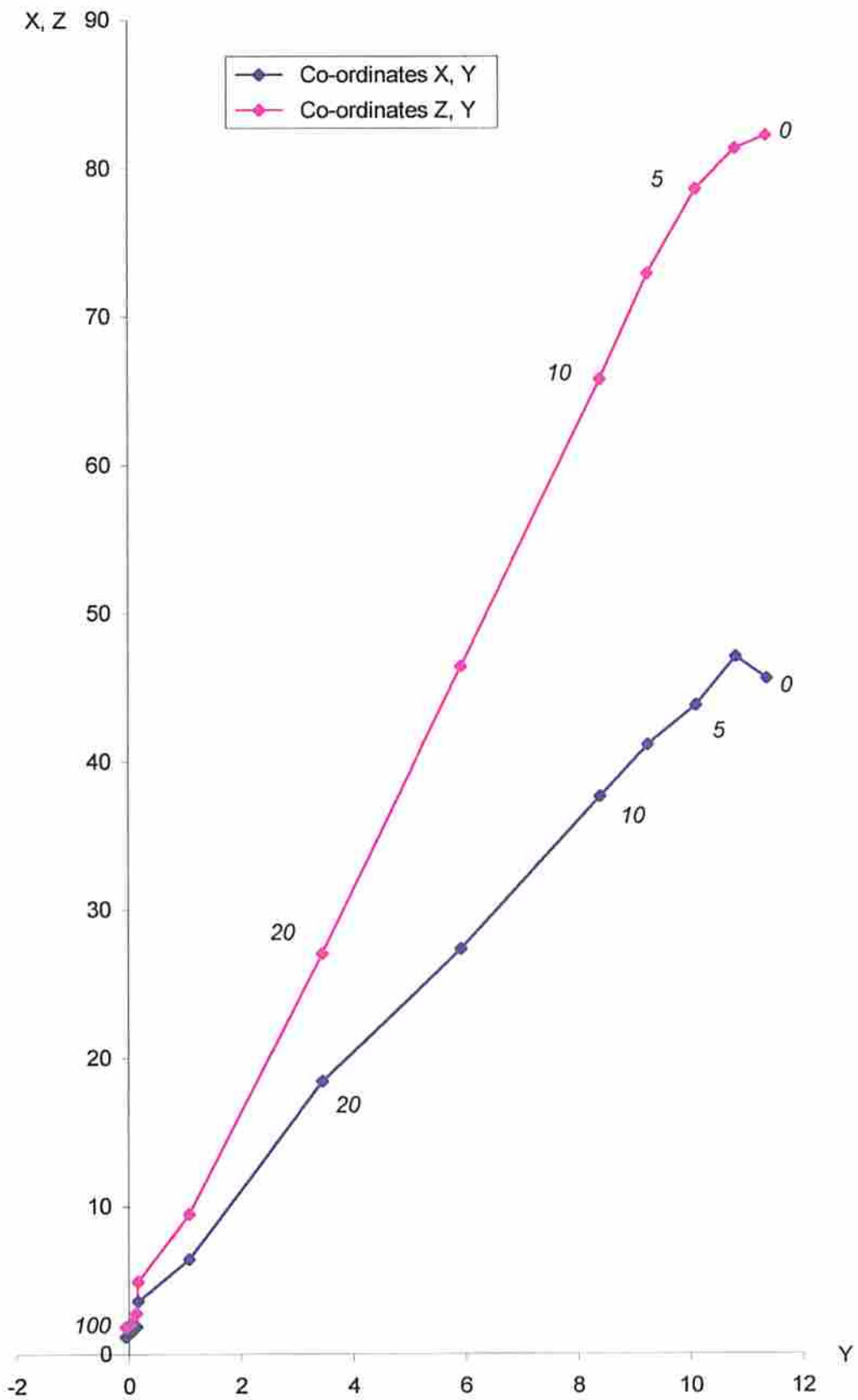
9

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	45.82	1.04	14.85	8.28	42.55	29.20	68.20
2.5	44.07	1.00	15.36	8.28	40.47	28.30	66.70
5.0	40.60	0.92	14.64	7.65	37.09	27.60	66.00
7.5	38.35	0.87	13.98	7.44	34.93	28.00	65.60
10.0	35.92	0.82	13.37	7.01	32.59	27.70	65.10
15.0	29.10	0.66	10.54	6.06	26.44	29.90	65.30
20.0	22.84	0.52	7.85	4.50	20.97	29.80	66.70
30.0	14.40	0.33	4.96	2.88	13.21	30.20	66.50
40.0	9.83	0.22	3.39	1.89	9.03	29.20	66.80
60.0	6.17	0.14	2.05	1.11	5.71	28.50	67.80
80.0	4.91	0.11	1.64	0.78	4.57	25.50	68.40
100.0	4.29	0.10	1.63	0.58	3.92	19.70	66.20

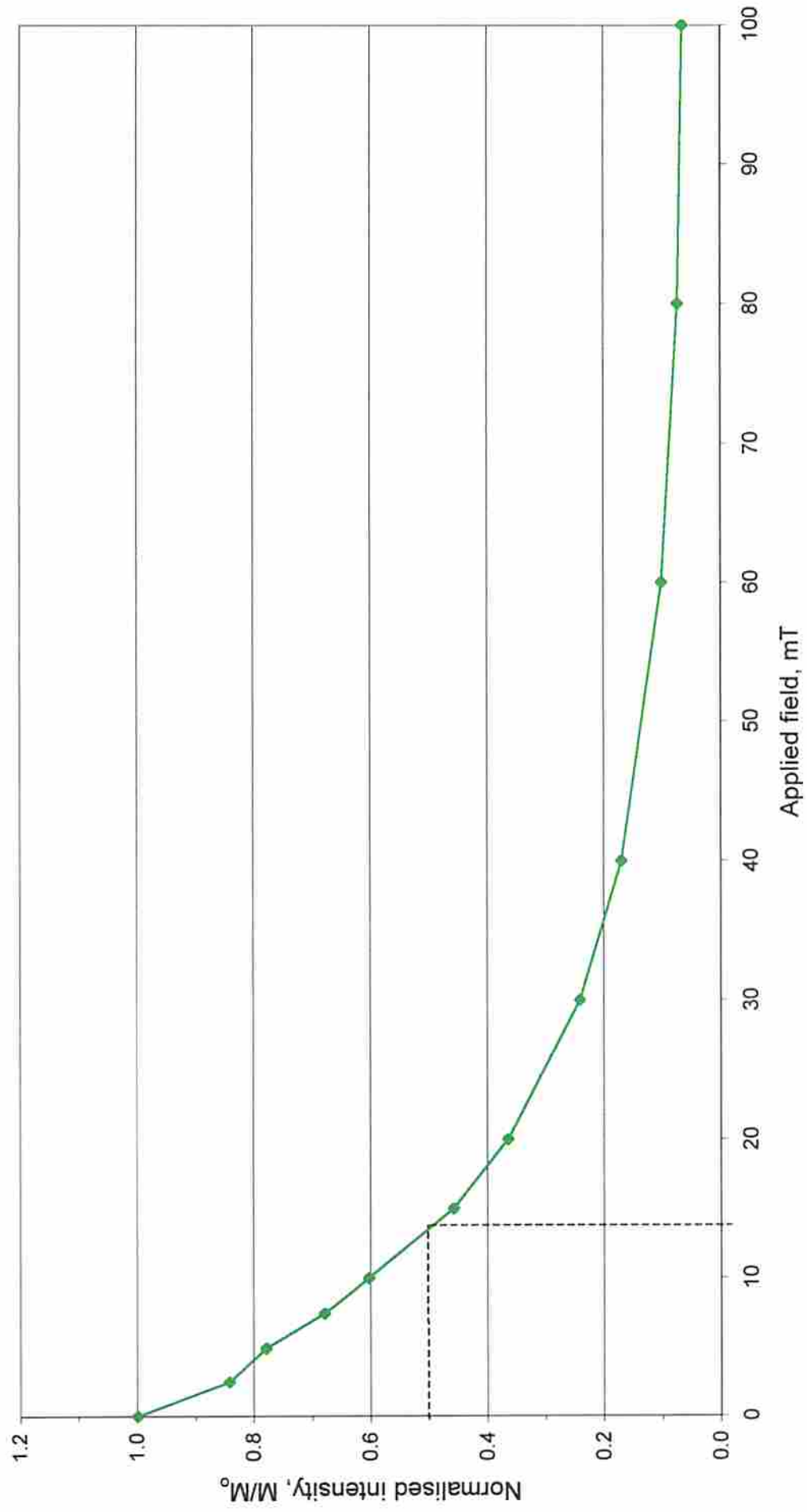
MYERS WOOD - SAMPLE POINT 271/5 DEMAGNETISATION: INTENSITY SPECTRUM



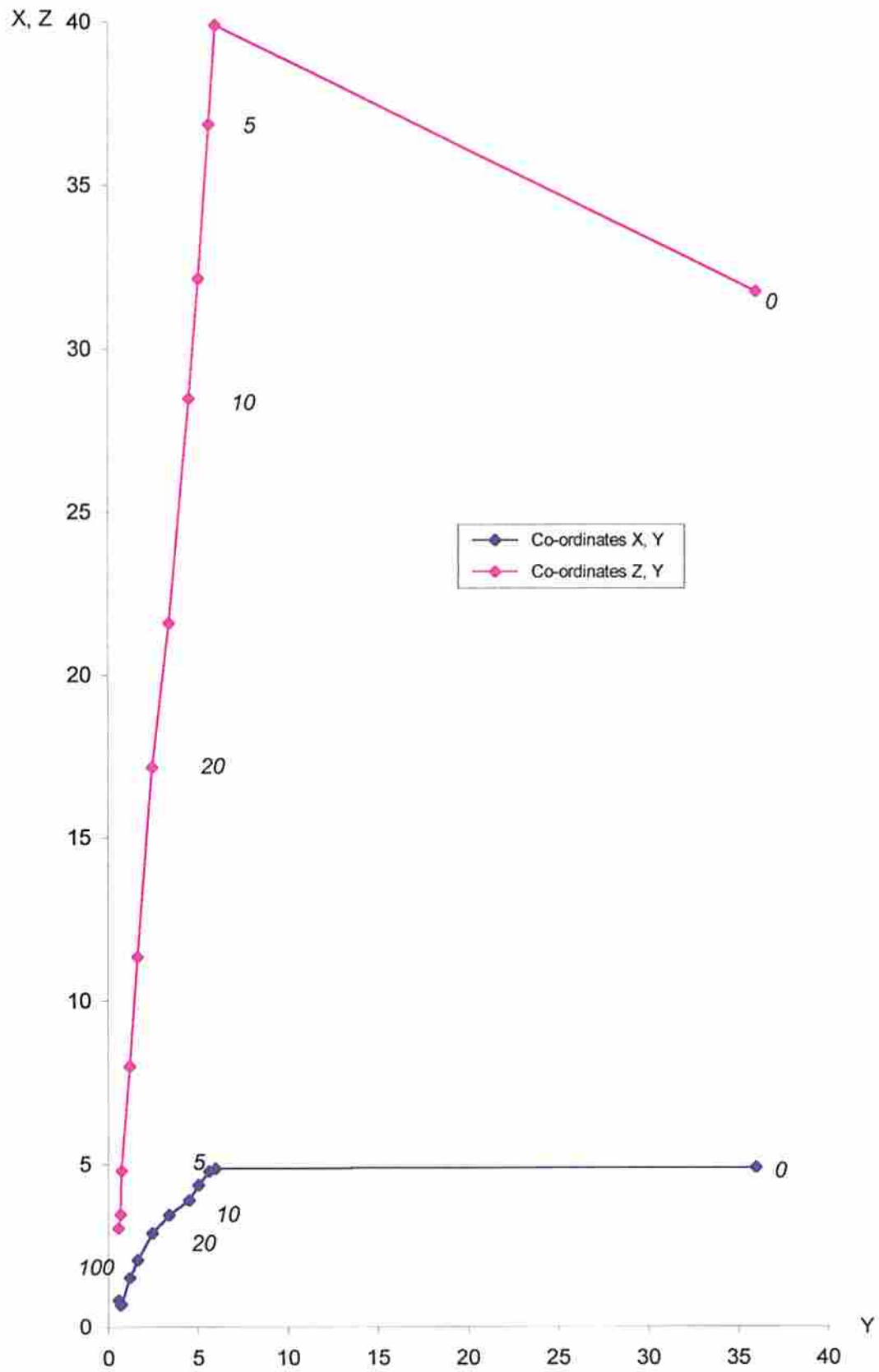
MYERS WOOD - SAMPLE POINT 271/5 - ZIJDERVELD PLOT



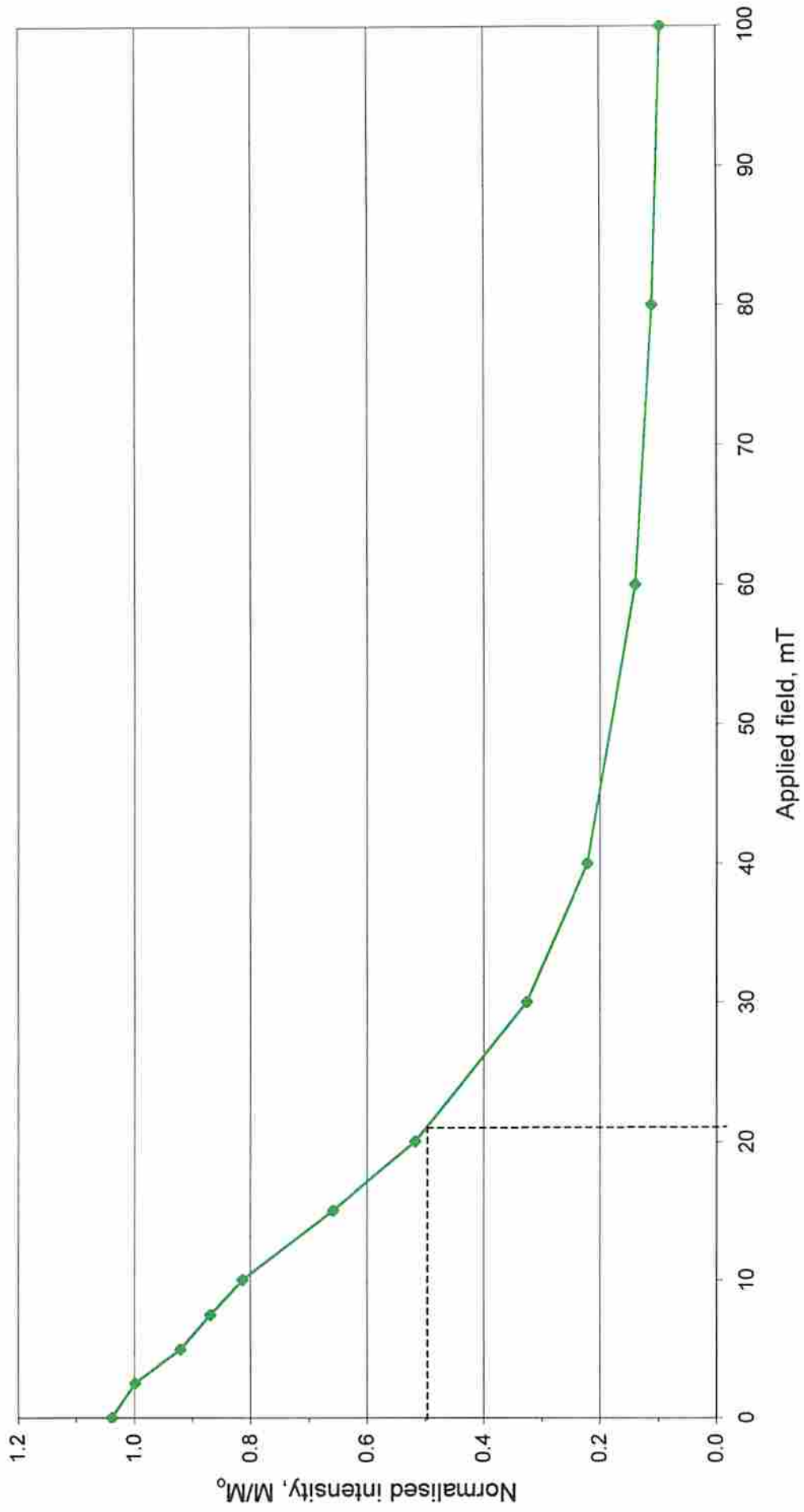
MYERS WOOD - SAMPLE POINT 267/7 DEMAGNETISATION: INTENSITY SPECTRUM



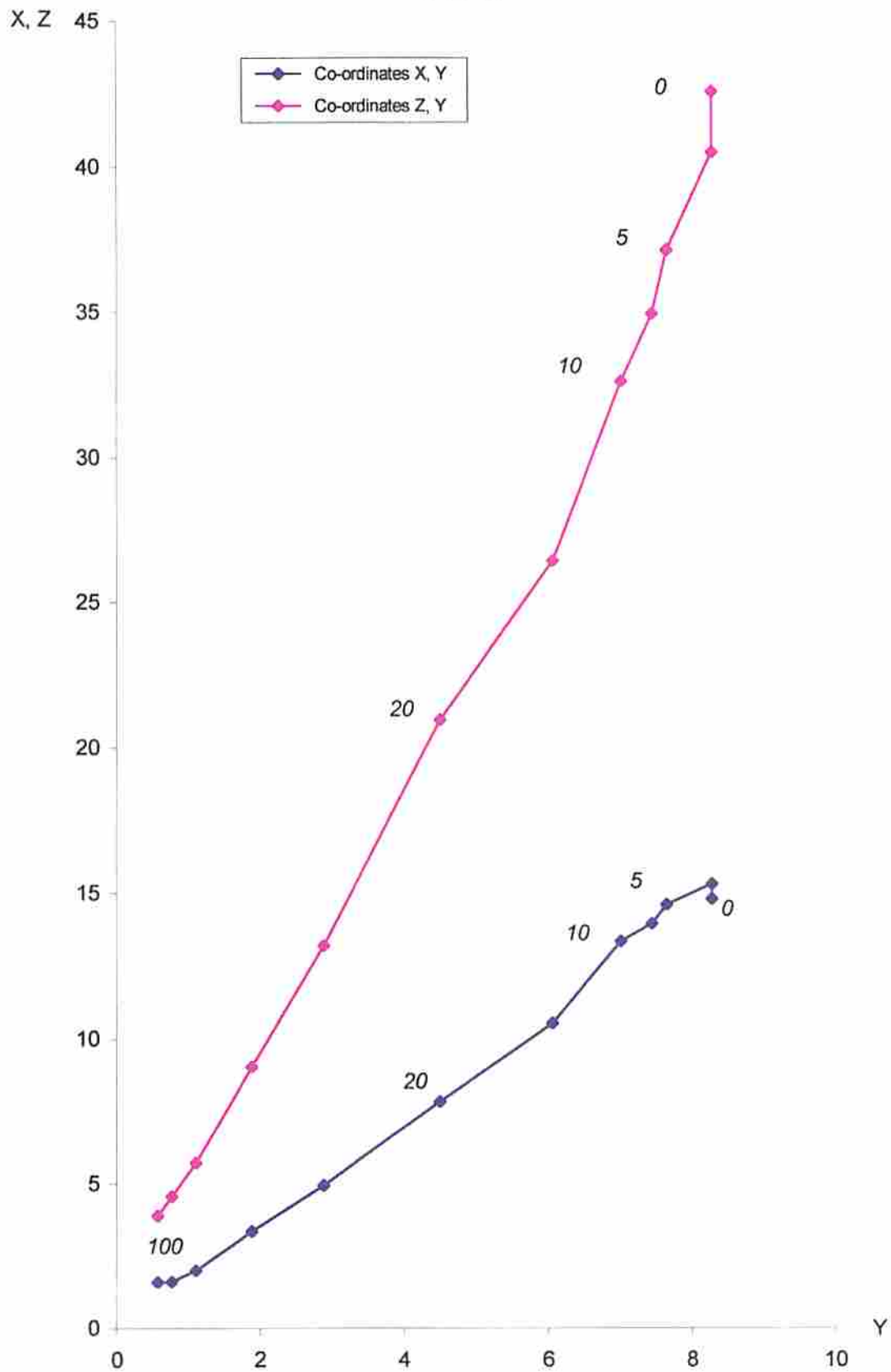
MYERS WOOD - SAMPLE POINT 267/7 - ZIJDERVELD PLOT

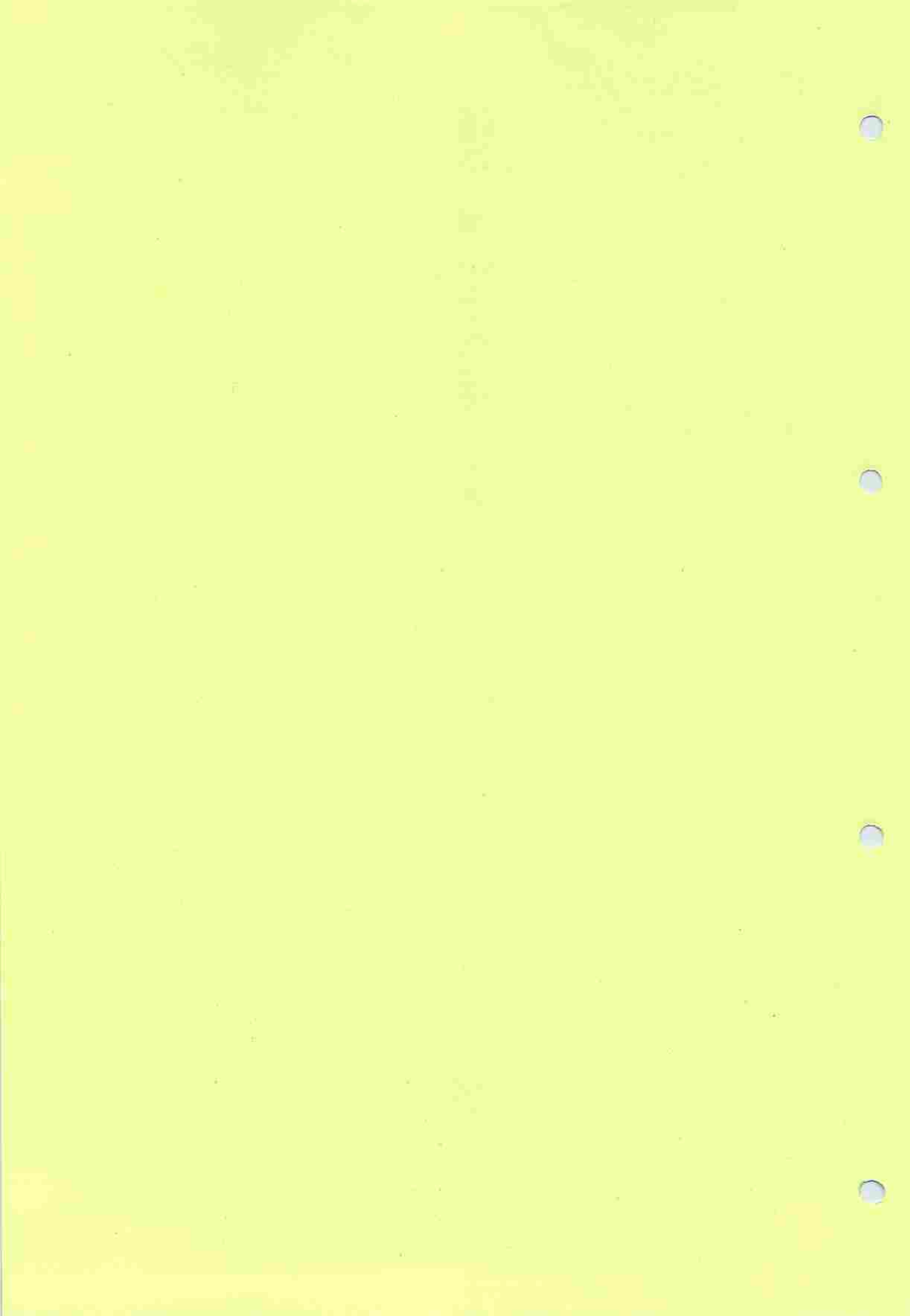


MYERS WOOD - SAMPLE POINT 267/9 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT 267/9 - ZIJDERVELD PLOT





SITE INFORMATION

Site Name Myers Wood
Area Trench C
Context No
Description Slag dump: sample Group A
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 24/9/02

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments
	D	I	Int		D	I	Int		
	degs.	degs.	mA m ⁻¹		degs.	degs.	mA m ⁻¹		
1	18.0	68.6	35.15	5	24.7	60.3	32.08		
2	13.2	68.8	48.06	5	11.7	59.8	33.69	Y	
3	37.6	68.0	40.03	5	25.4	62.1	33.61		
4	345.4	66.3	75.06	5	7.7	61.3	63.84		
5	17.2	63.9	96.39	5	12.6	62.8	84.74		
6	17.9	67.9	28.57	5	13.5	70.0	21.91	Y	
7	33.6	72.8	20.90	5	14.8	66.3	16.43	Y	
8	6.0	59.4	23.91	5	13.4	58.3	21.21		
9	11.6	69.2	22.60	5	14.6	66.7	21.71		
10	4.8	66.8	53.49	5	6.5	61.4	52.27		
11	4.5	69.1	0.73	5	357.4	82.9	0.77		Outlier
12	27.1	69.4	21.01	5	13.40	65.10	17.64		

STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	18.0	68.6	0.34702	0.11275	0.93106
2	13.2	68.8	0.35207	0.08258	0.93232
3	37.6	68.0	0.29680	0.22856	0.92718
4	345.4	66.3	0.38897	-0.10132	0.91566
5	17.2	63.9	0.42026	0.13009	0.89803
6	17.9	67.9	0.35801	0.11564	0.92653
7	33.6	72.8	0.24630	0.16364	0.95528
8	6.0	59.4	0.50625	0.05321	0.86074
9	11.6	69.2	0.34785	0.07140	0.93483
10	4.8	66.8	0.39256	0.03296	0.91914
11	4.5	69.1	0.35564	0.02799	0.93420
12	27.1	69.4	0.31321	0.16028	0.93606

Number = 12
 Sum x = 4.32495
 Sum y = 1.07779
 Sum z = 11.07103
 R = 11.93459
 x bar = 0.36239
 y bar = 0.09031
 z bar = 0.92764

Mean Dec = 13.99
 Mean Inc = 68.07
 Alpha95 = 3.36

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	24.7	60.3	0.45013	0.20704	0.86863
2	11.7	59.8	0.49257	0.10201	0.86427
3	25.4	62.1	0.42270	0.20071	0.88377
4	7.7	61.3	0.47589	0.06434	0.87715
5	12.6	62.8	0.44609	0.09971	0.88942
6	13.5	70.0	0.33257	0.07984	0.93969
7	14.8	66.3	0.38861	0.10268	0.91566
8	13.4	58.3	0.51117	0.12178	0.85081
9	14.6	66.7	0.38277	0.09970	0.91845
10	6.5	61.4	0.47561	0.05419	0.87798
11					
12	13.4	65.1	0.40957	0.09757	0.90704

Number = 11
 Sum x = 4.78769
 Sum y = 1.22957
 Sum z = 9.79287
 R = 10.96969
 x bar = 0.43645
 y bar = 0.11209
 z bar = 0.89272

Mean Dec = 14.40
 Mean Inc = 63.22
 Alpha95 = 2.52

Alpha68 = 1.48

CORRECTIONS

Mean Dec = 14.40
Mean Inc = 63.22

Correction for magnetic variation

Mean Dec = 10.68
Mean Inc = 63.22

Correction to Meriden (CVP)

Uncorrected Dec = 10.68
Uncorrected Inc = 63.22
Latitude = 53.60
Longitude = -1.73

Kai = 45.27
Latitude of pole = 78.73
Beta1 = 42.39
Longitude of pole = 135.88
Geomag colat = 46.41
Corrected Inc = 62.29
Beta 2 = 42.50
Corrected Dec = 10.50

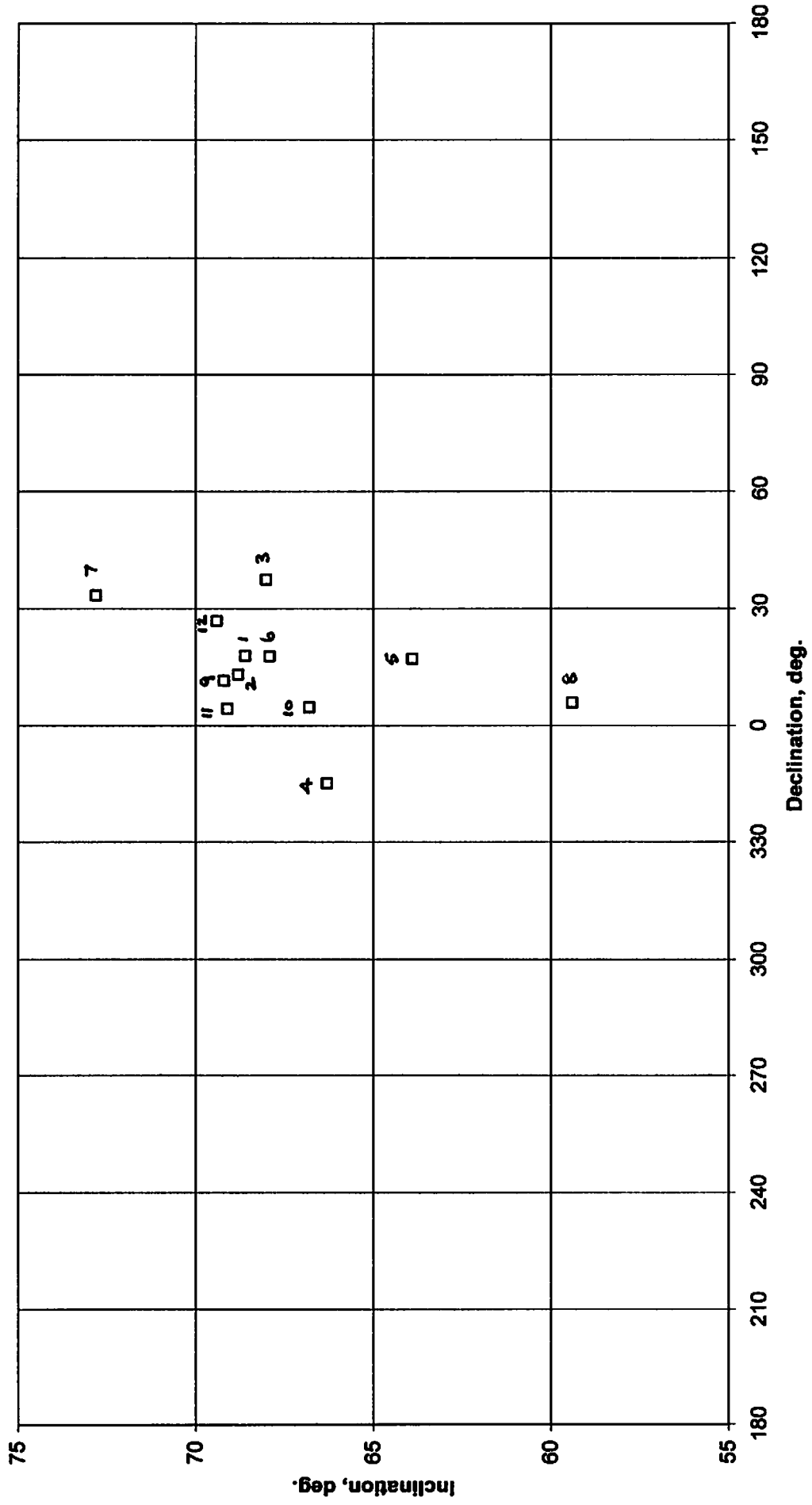
FINAL RESULT

Corrected Dec = 10.50
Corrected Inc = 62.29
Alpha95 = 2.52

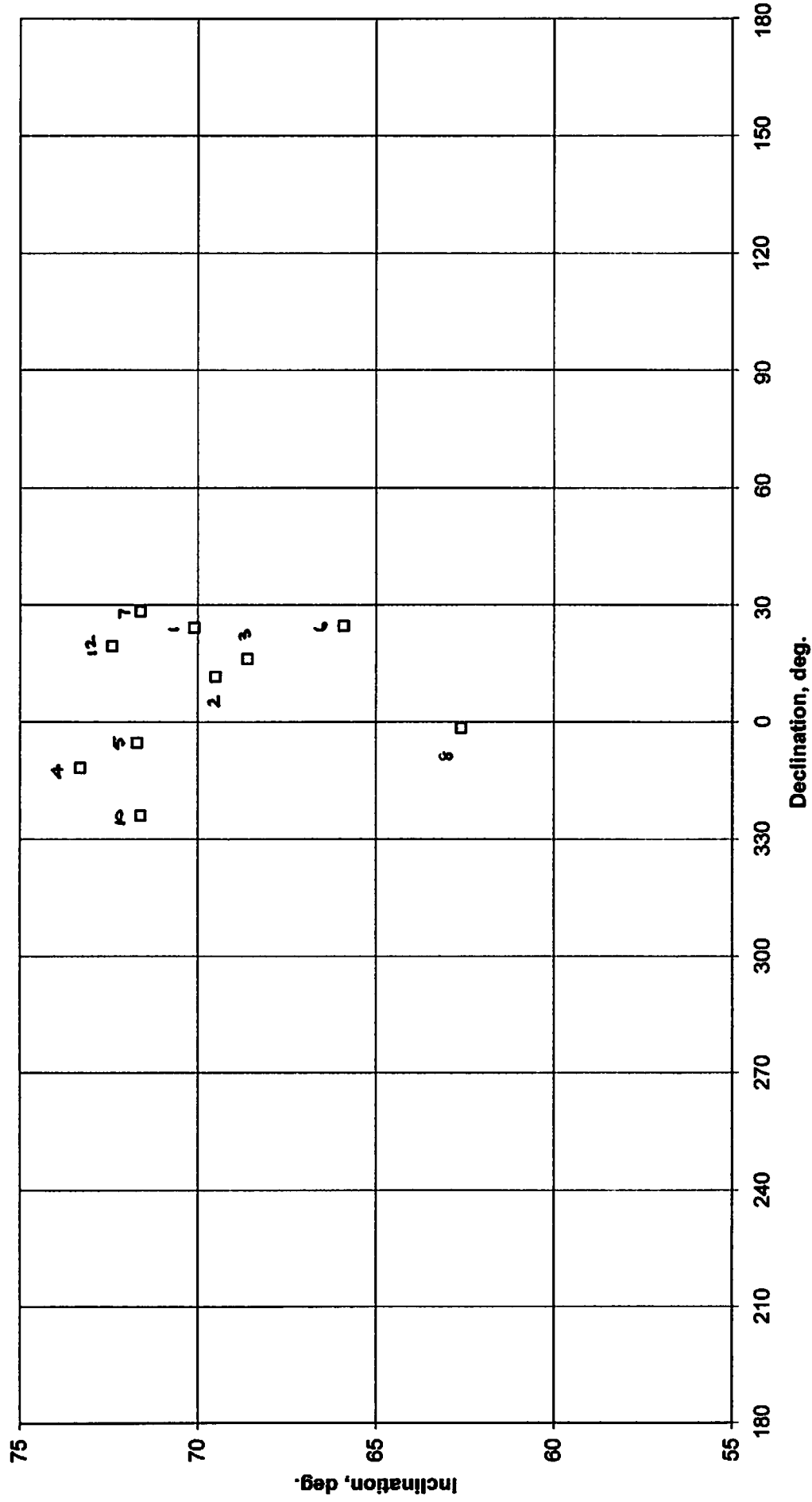
ERROR BARS

Alpha95		Alpha68	
$\delta Dec = \pm$	5.41	$\delta Dec = \pm$	3.18
$\delta Inc = \pm$	2.52	$\delta Inc = \pm$	1.48

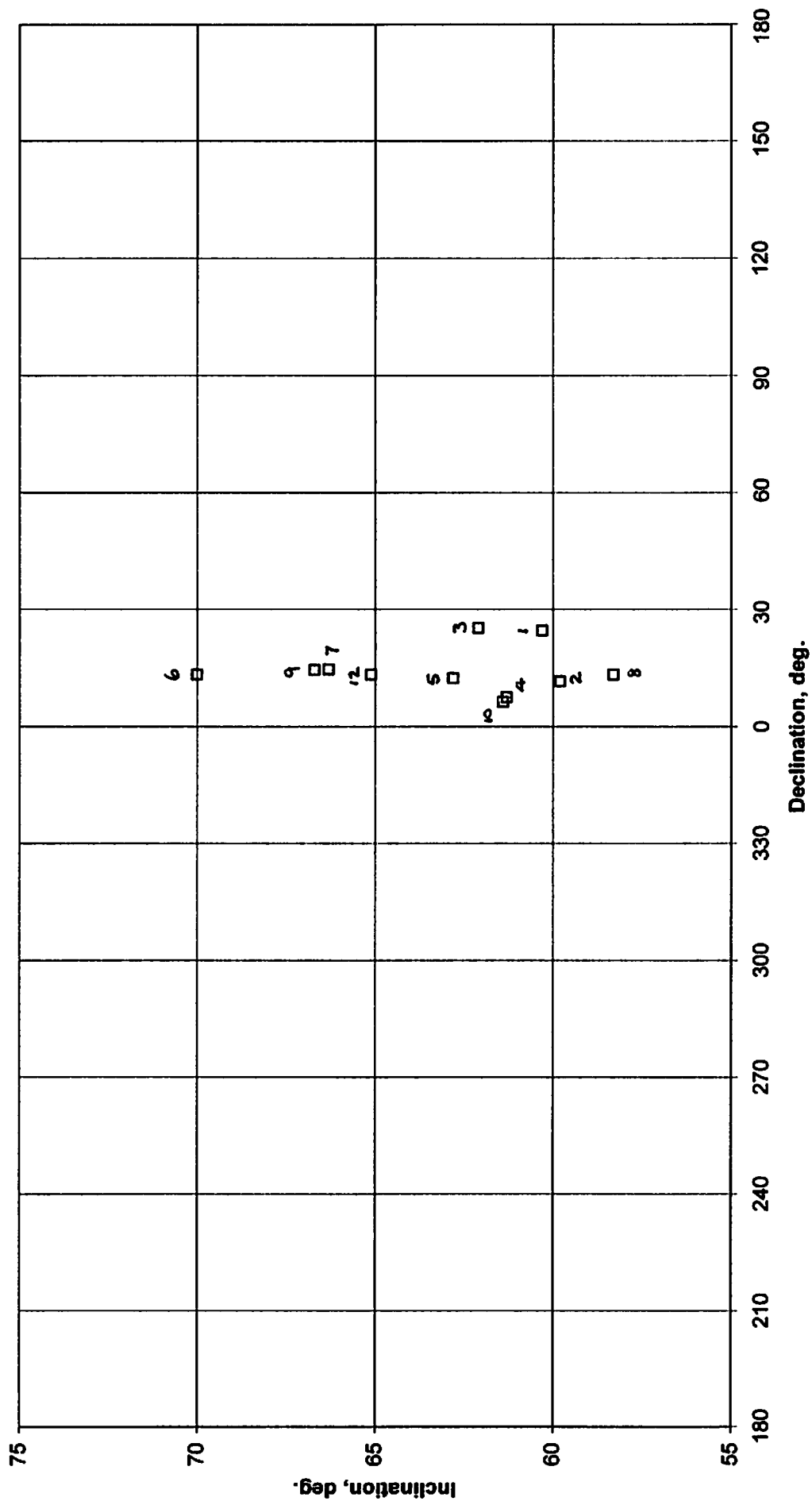
INITIAL SAMPLE SCATTER



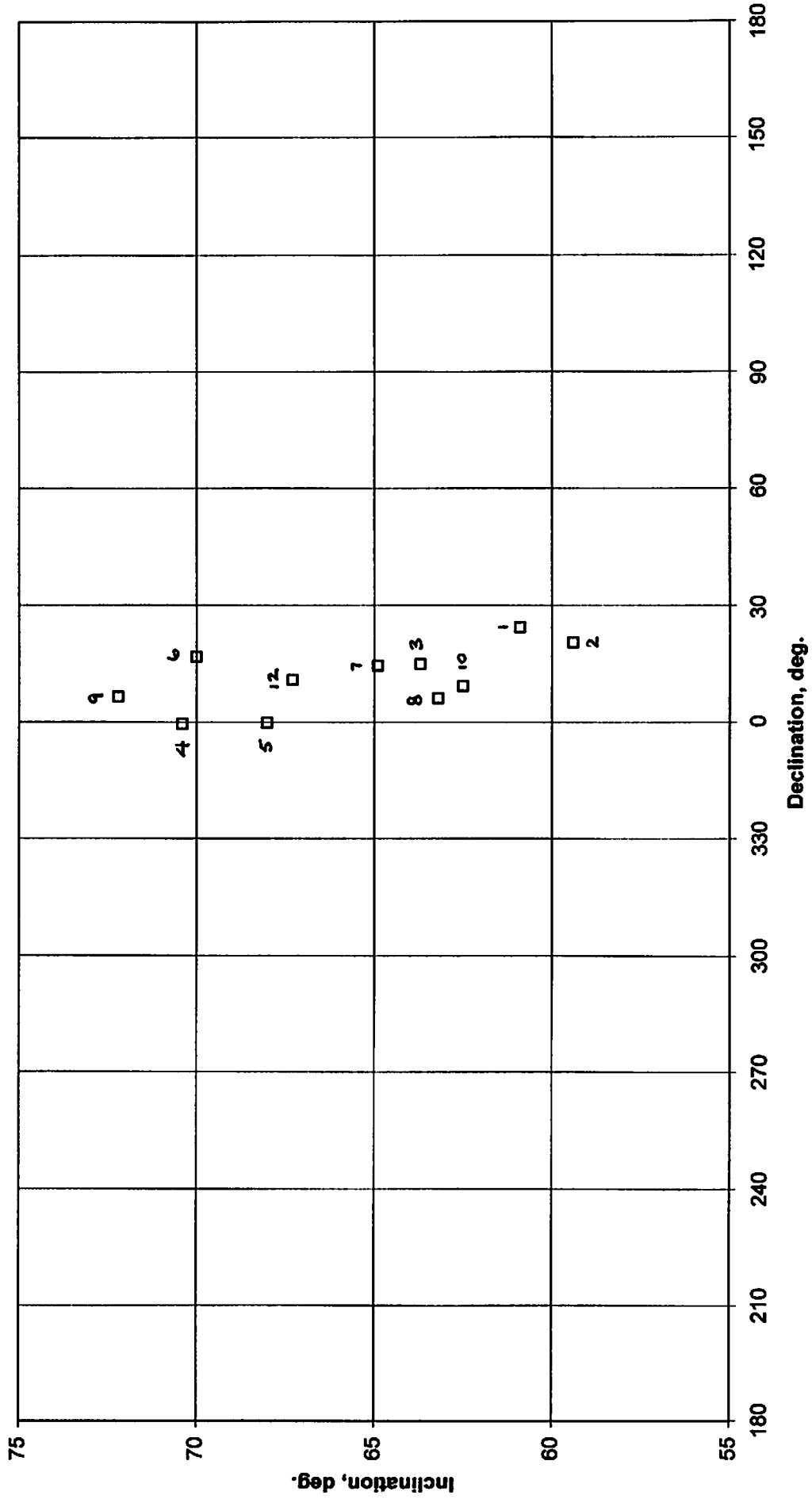
2.5mT DEMAGNETISED SAMPLE SCATTER



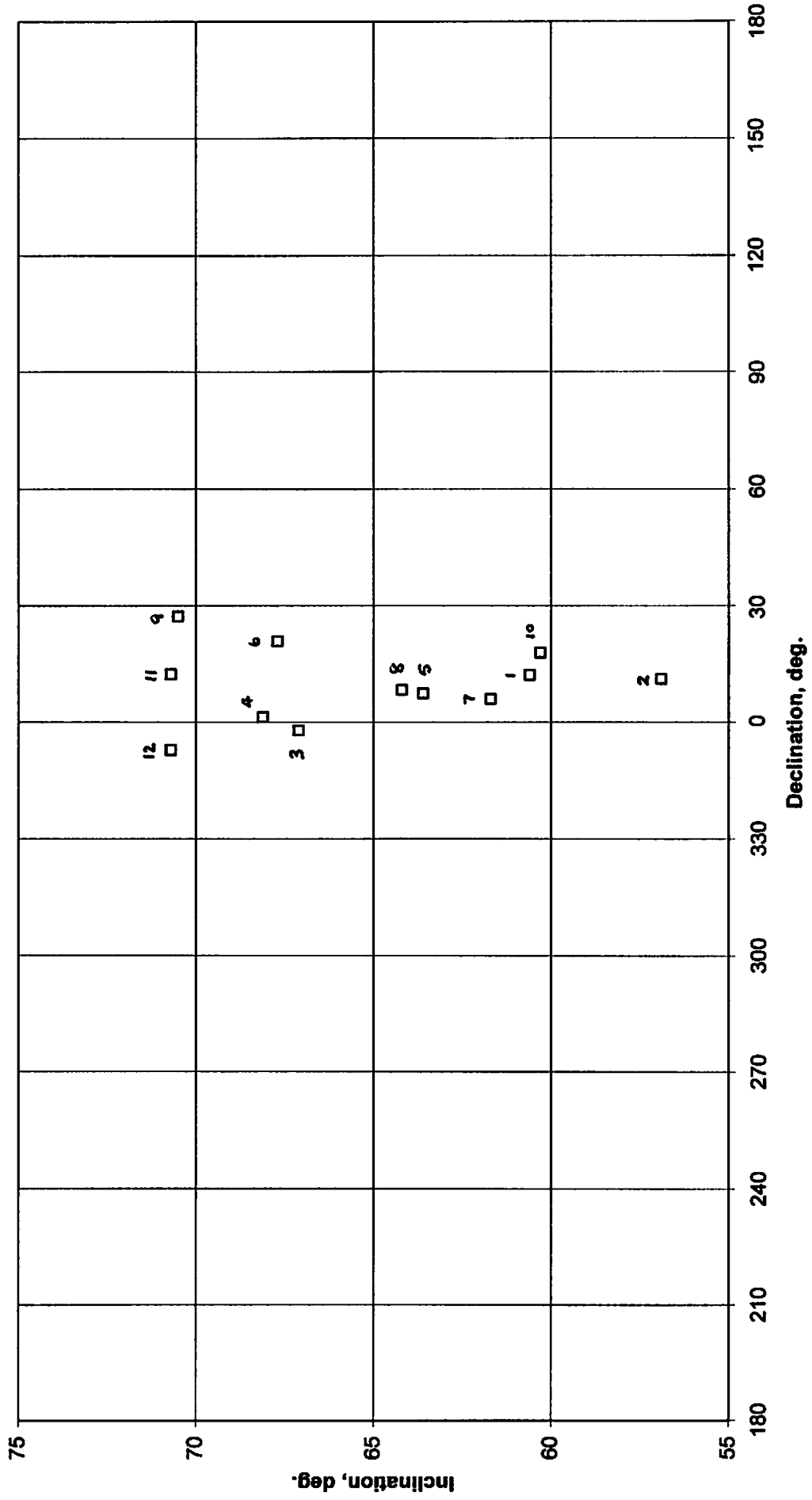
5mT DEMAGNETISED SAMPLE SCATTER



7.5mT DEMAGNETISED SAMPLE SCATTER



10mT DEMAGNETISED SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

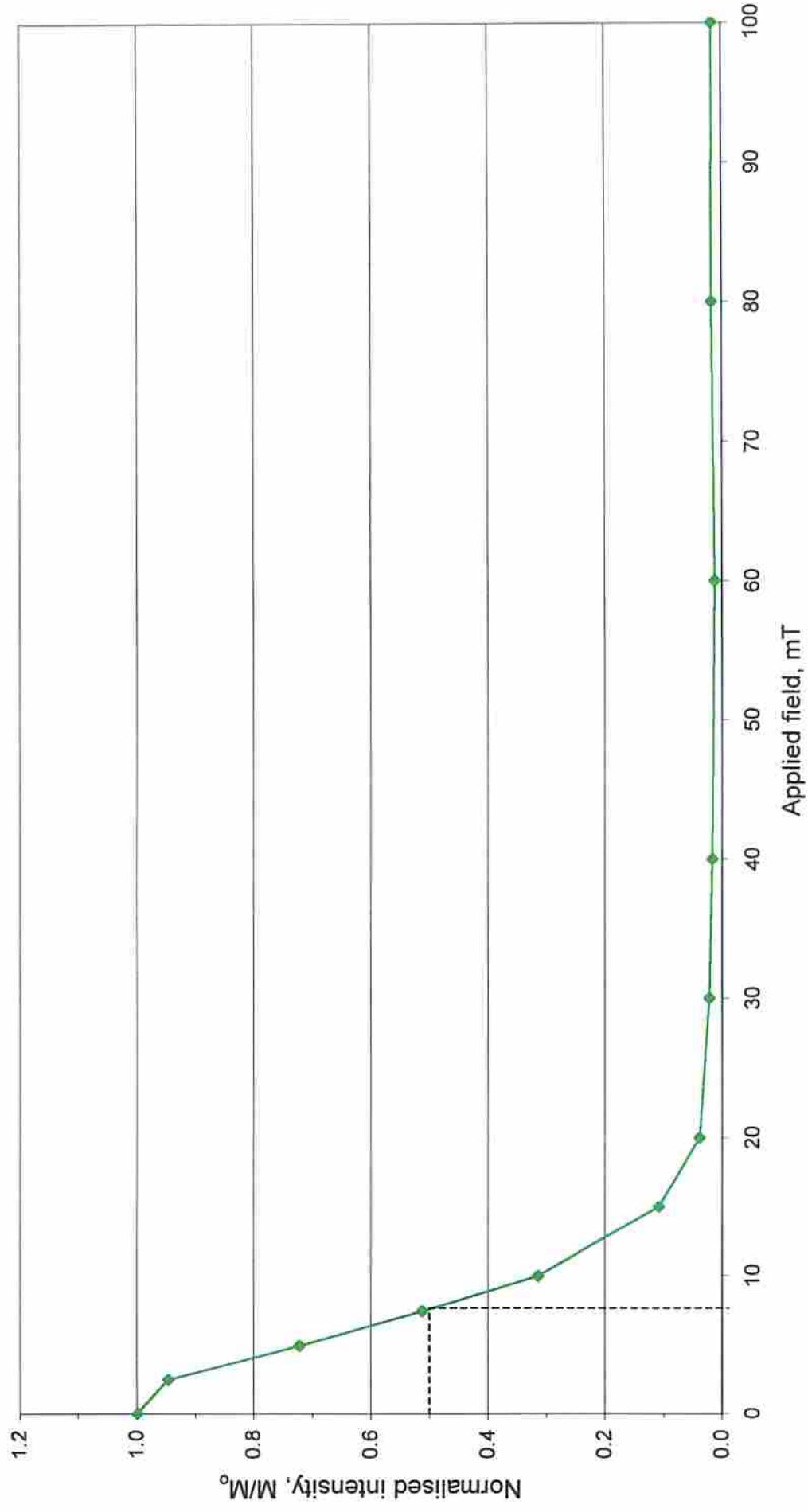
Sample No. 2

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	46.58	1.00	14.60	1.73	44.19	6.8	71.6
2.5	44.10	0.95	15.12	3.12	41.31	11.7	69.5
5.0	33.69	0.72	16.59	3.43	29.12	11.7	59.8
7.5	23.89	0.51	11.38	4.31	20.56	20.7	59.4
10.0	14.68	0.32	7.85	1.58	12.30	11.4	56.9
15.0	5.07	0.11	2.45	-0.22	4.43	354.9	60.9
20.0	1.80	0.04	1.20	-0.43	1.27	340.2	44.7
30.0	1.03	0.02	0.53	-0.65	0.60	309.6	35.6
40.0	0.79	0.02	0.54	-0.36	0.46	326.3	35.0
60.0	0.61	0.01	0.36	-0.06	0.48	350.5	53.1
80.0	0.86	0.02	0.53	-0.38	0.56	324.2	40.5
100.0	0.79	0.02	0.38	-0.40	0.56	313.3	45.3

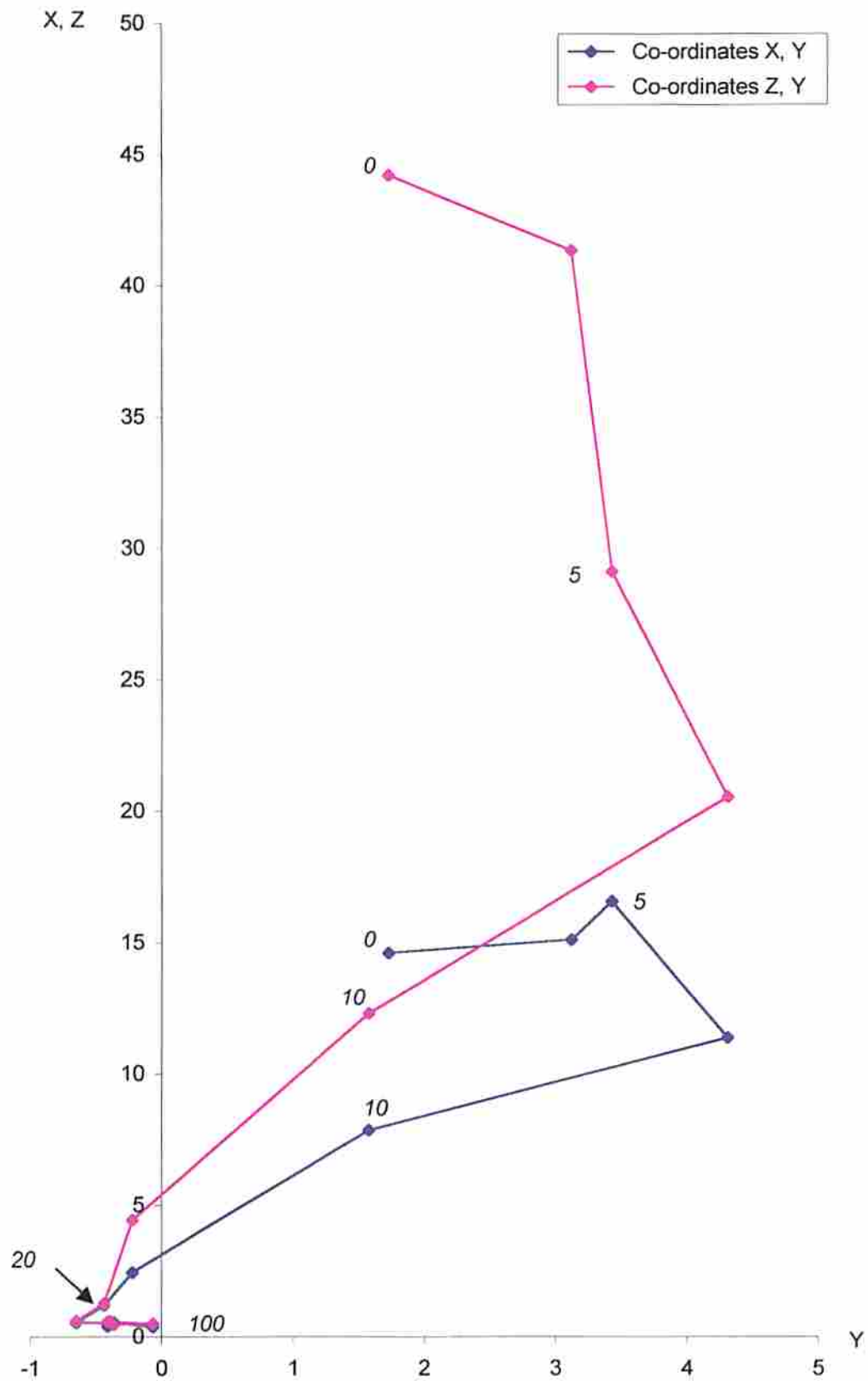
Sample No. 6

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	28.63	1.00	9.91	3.23	26.66	18.0	68.6
2.5	27.65	0.97	10.24	4.74	25.24	24.8	65.9
5.0	21.91	0.77	7.30	1.75	20.58	13.5	70.0
7.5	15.48	0.54	5.07	1.55	14.54	16.9	70.0
10.0	10.04	0.35	3.56	1.37	9.28	21.1	67.7
15.0	3.53	0.12	1.43	-0.03	3.23	359.0	66.1
20.0	1.34	0.05	0.59	-0.25	1.18	337.3	61.3
30.0	0.61	0.02	0.33	-0.30	0.41	317.1	42.6
40.0	0.48	0.02	0.14	-0.17	0.42	309.4	62.3
60.0	0.53	0.02	0.22	-0.21	0.43	315.9	54.6
80.0	0.42	0.01	0.15	-0.11	0.37	323.3	62.4
100.0	0.49	0.02	0.20	-0.20	0.40	314.9	54.4

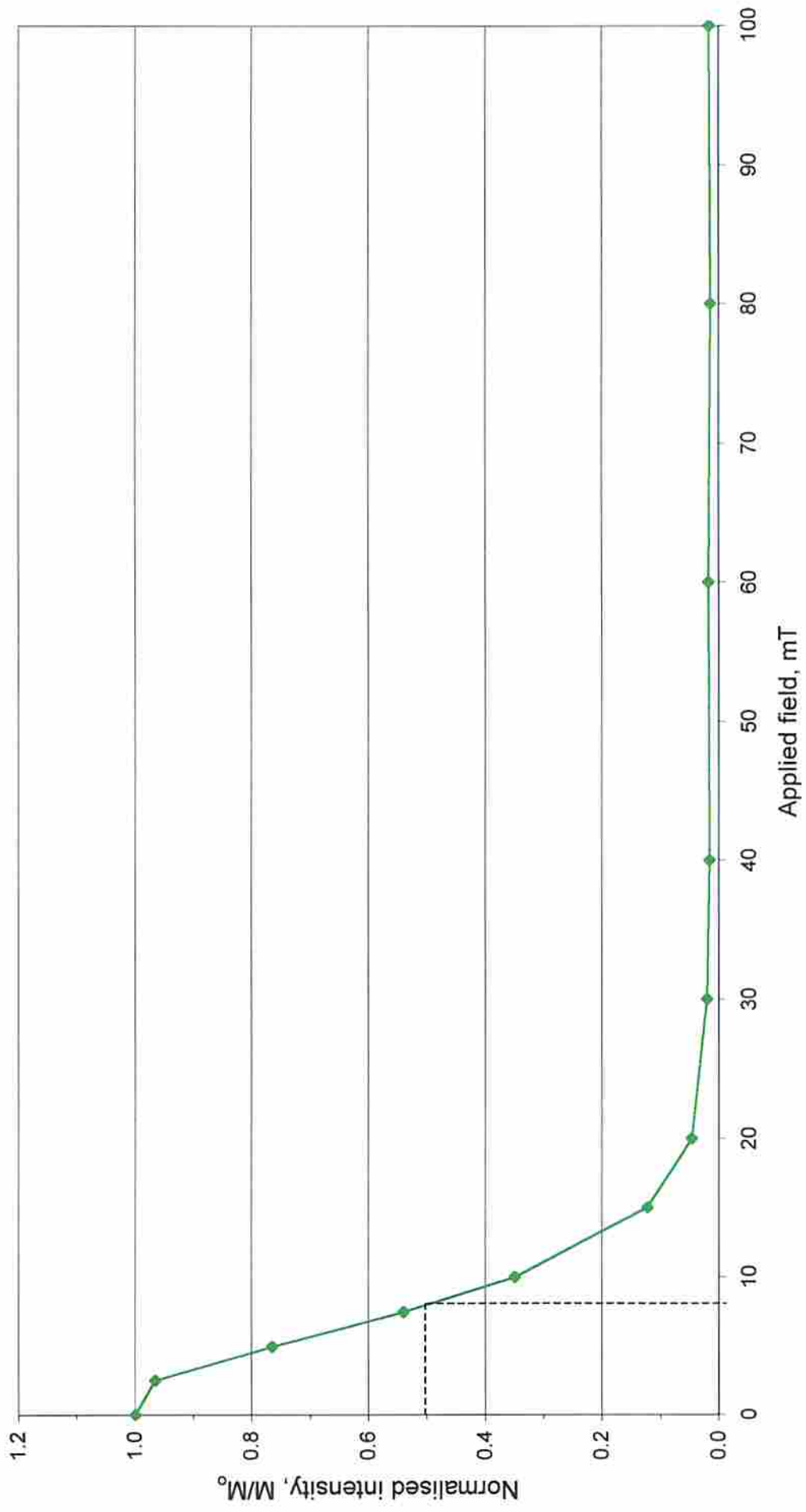
MYERS WOOD - SAMPLE POINT C2 DEMAGNETISATION: INTENSITY SPECTRUM



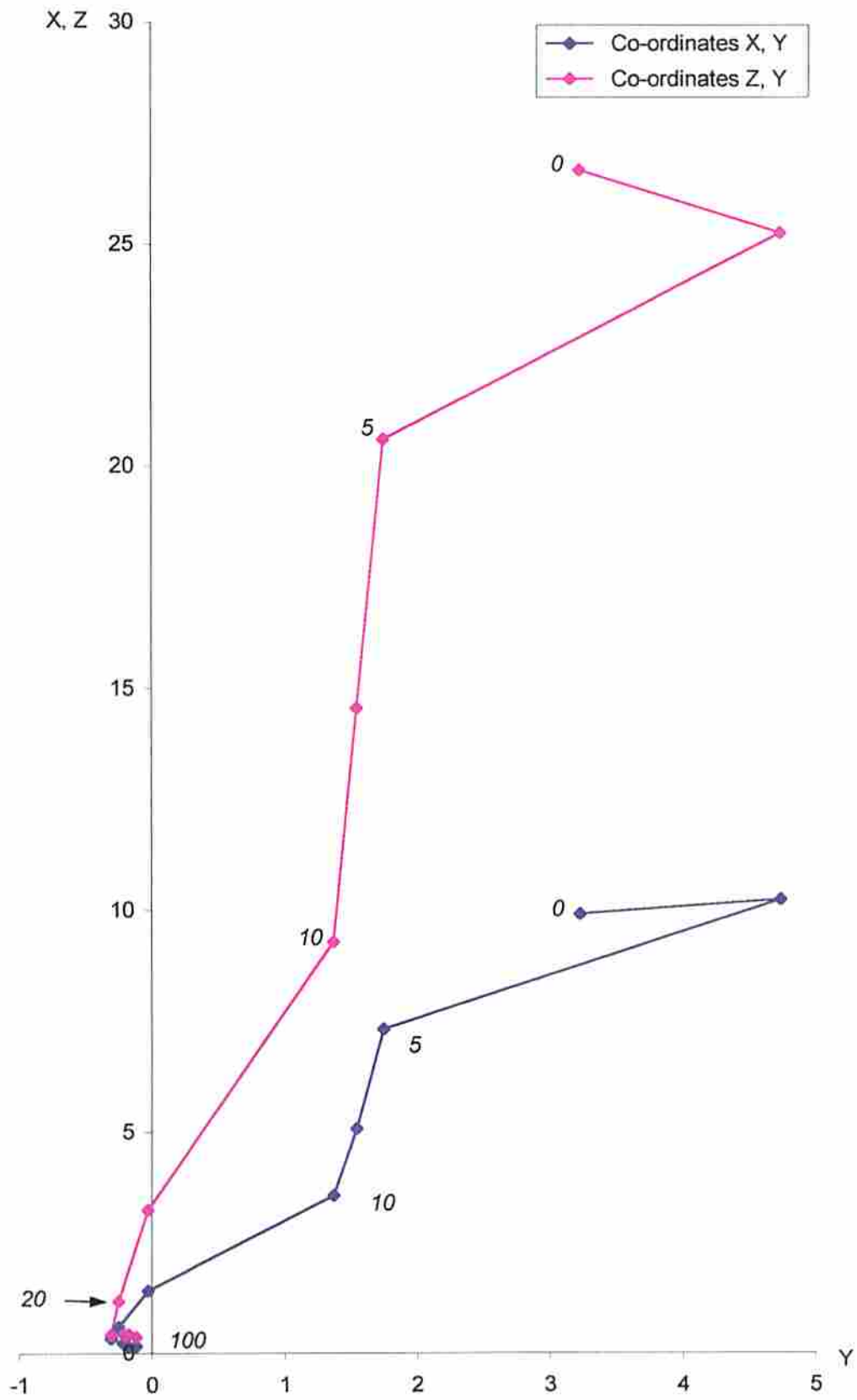
MYERS WOOD - SAMPLE POINT C2 - ZIJDERVELD PLOT



MYERS WOOD - SAMPLE POINT C6 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT C6 - ZIJDERVELD PLOT

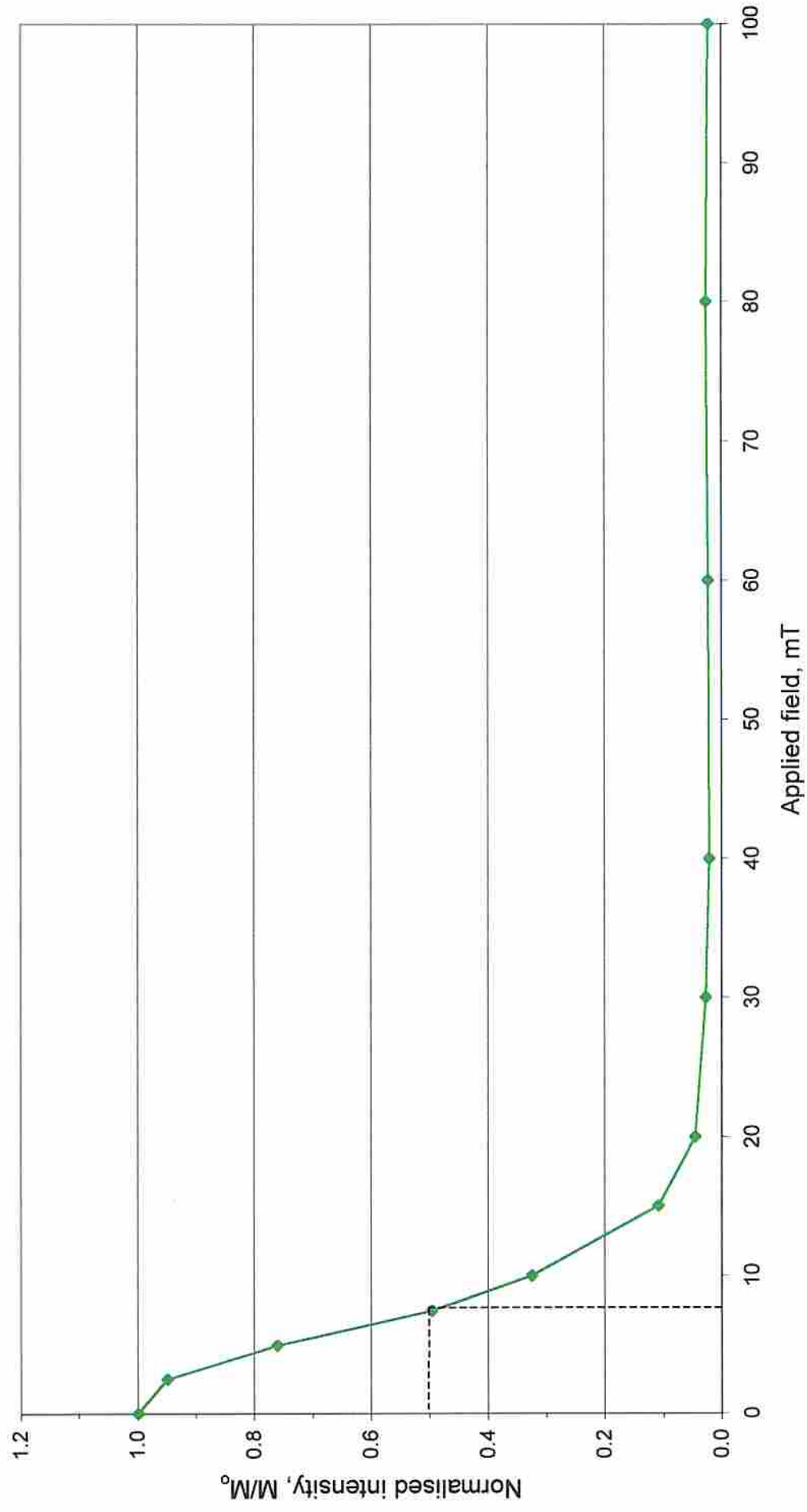


STEPPED A.F. DEMAGNETISATION MEASUREMENTS FOR OUTLIERS

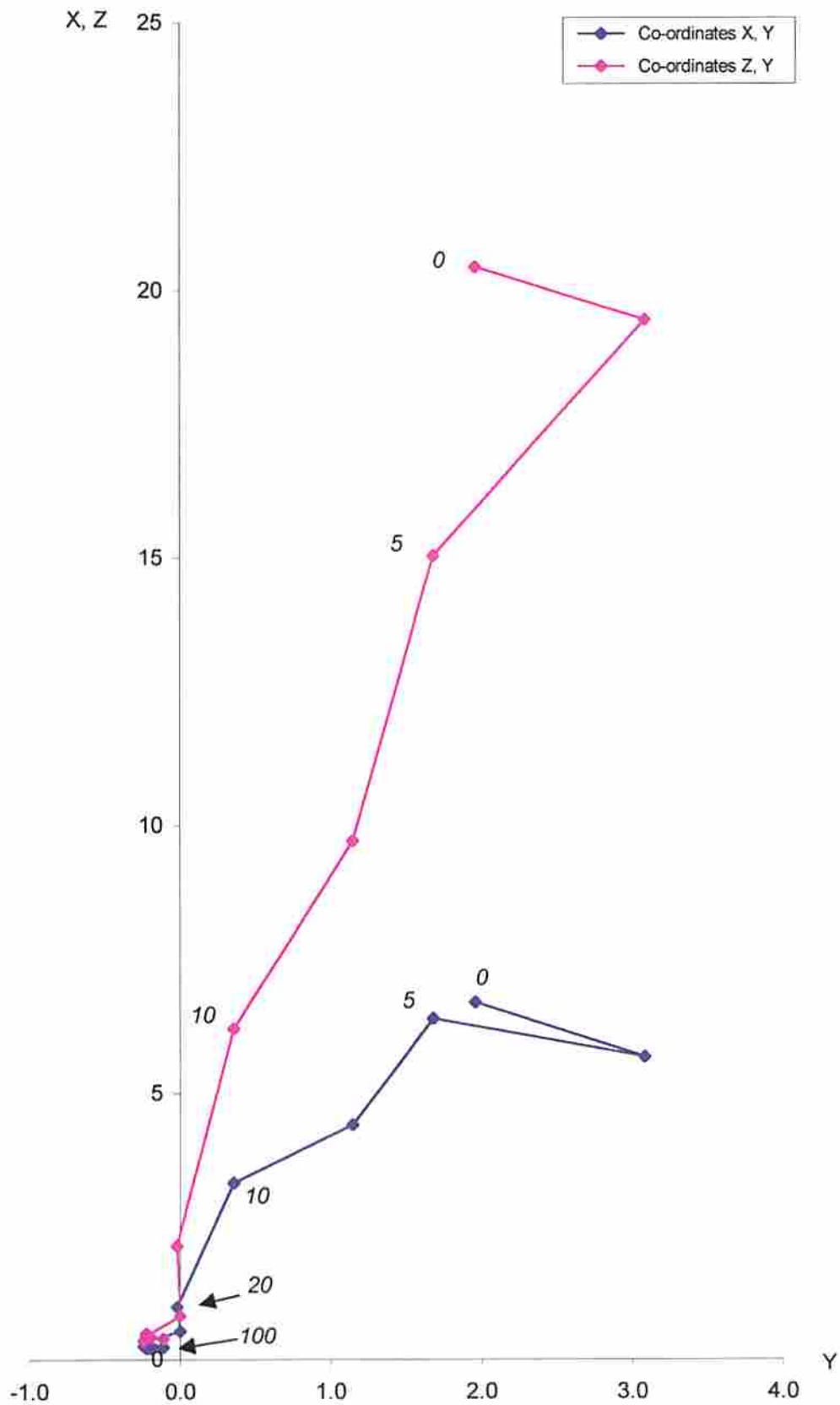
Sample No. 7

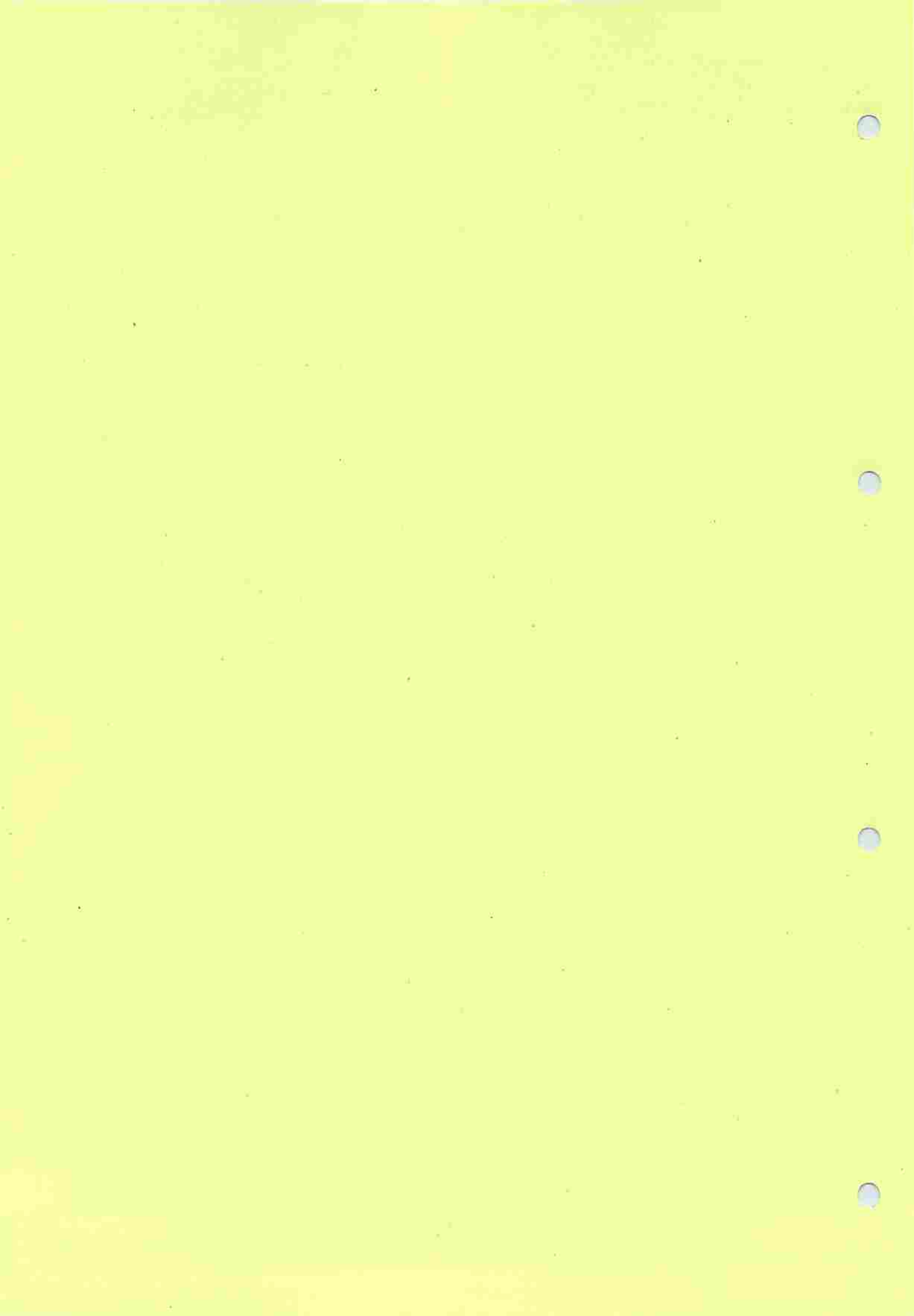
Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	21.59	1.00	6.70	1.96	20.43	16.3	71.1
2.5	20.50	0.95	5.68	3.09	19.46	28.5	71.6
5.0	16.43	0.76	6.39	1.68	15.04	14.8	66.3
7.5	10.73	0.50	4.41	1.15	9.71	14.6	64.9
10.0	7.04	0.33	3.31	0.36	6.20	6.2	61.7
15.0	2.36	0.11	1.00	-0.02	2.14	359.0	64.9
20.0	0.99	0.05	0.53	0.00	0.84	0.4	57.5
30.0	0.60	0.03	0.34	-0.22	0.45	326.7	47.6
40.0	0.47	0.02	0.23	-0.11	0.39	334.6	56.9
60.0	0.51	0.02	0.20	-0.19	0.43	317.0	57.0
80.0	0.59	0.03	0.21	-0.22	0.50	314.1	58.5
100.0	0.50	0.02	0.25	-0.24	0.36	316.5	46.4

MYERS WOOD - SAMPLE POINT C7 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT C7 - ZIJDERVELD PLOT





SITE INFORMATION

Site Name Myers Wood
Area Trench C
Context No
Description Slag dump: sample Group B
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 24/9/02

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field mT	After partial demag			Pilot? Y/N	Comments
	D degs.	I degs.	Int mA m ⁻¹		D degs.	I degs.	Int mA m ⁻¹		
13	15.5	48.5	66.22						
14	4.4	-6.7	25.77				Y		
15	340.9	19.9	25.16						
16	27.6	46.1	431.01				Y		
17	188.4	-5.1	20.55				Y		
18	49.6	-27.0	36.97						
19	61.6	49.7	41.95						
20	25.7	59.6	50.68						

STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
13	15.5	48.5	0.63852	0.17708	0.74896
14	4.4	-6.7	0.99024	0.07620	-0.11667
15	340.9	19.9	0.88852	-0.30768	0.34038
16	27.6	46.1	0.61450	0.32125	0.72055
17	188.4	-5.1	-0.98536	-0.14550	-0.08889
18	49.6	-27.0	0.57748	0.67854	-0.45399
19	61.6	49.7	0.30763	0.56895	0.76267
20	25.7	59.6	0.45598	0.21945	0.86251

Number = 8
 Sum x = 3.48751
 Sum y = 1.58827
 Sum z = 2.77551
 R = 4.73188
 x bar = 0.73706
 y bar = 0.33567
 z bar = 0.58658

Mean Dec = 24.49
 Mean Inc = 35.91
 Alpha95 = 50.87

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
13	15.5	48.5	0.63852	0.17708	0.74896
14					
15					
16	27.6	46.1	0.61450	0.32125	0.72055
17					
18					
19	61.8	49.7	0.30763	0.56895	0.76267
20	25.7	59.6	0.45598	0.21945	0.86251

Number = 4
 Sum x = 2.01662
 Sum y = 1.28672
 Sum z = 3.09469
 R = 3.91146
 x bar = 0.51557
 y bar = 0.32896
 z bar = 0.79119

Mean Dec = 32.54
 Mean Inc = 52.30
 Alpha95 = 16.01

Alpha68 = 8.29

CORRECTIONS

Mean Dec = 32.54
Mean Inc = 52.30

Correction for magnetic variation

Mean Dec = 28.82
Mean Inc = 52.30

Correction to Meriden (CVP)

Uncorrected Dec = 28.82
Uncorrected Inc = 52.30
Latitude = 53.80
Longitude = -1.73

Kai = 57.10
Latitude of pole = 60.89
Beta1 = 56.31
Longitude of pole = 121.96
Geomag colat = 58.10
Corrected Inc = 51.23
Beta 2 = 56.42
Corrected Dec = 28.52

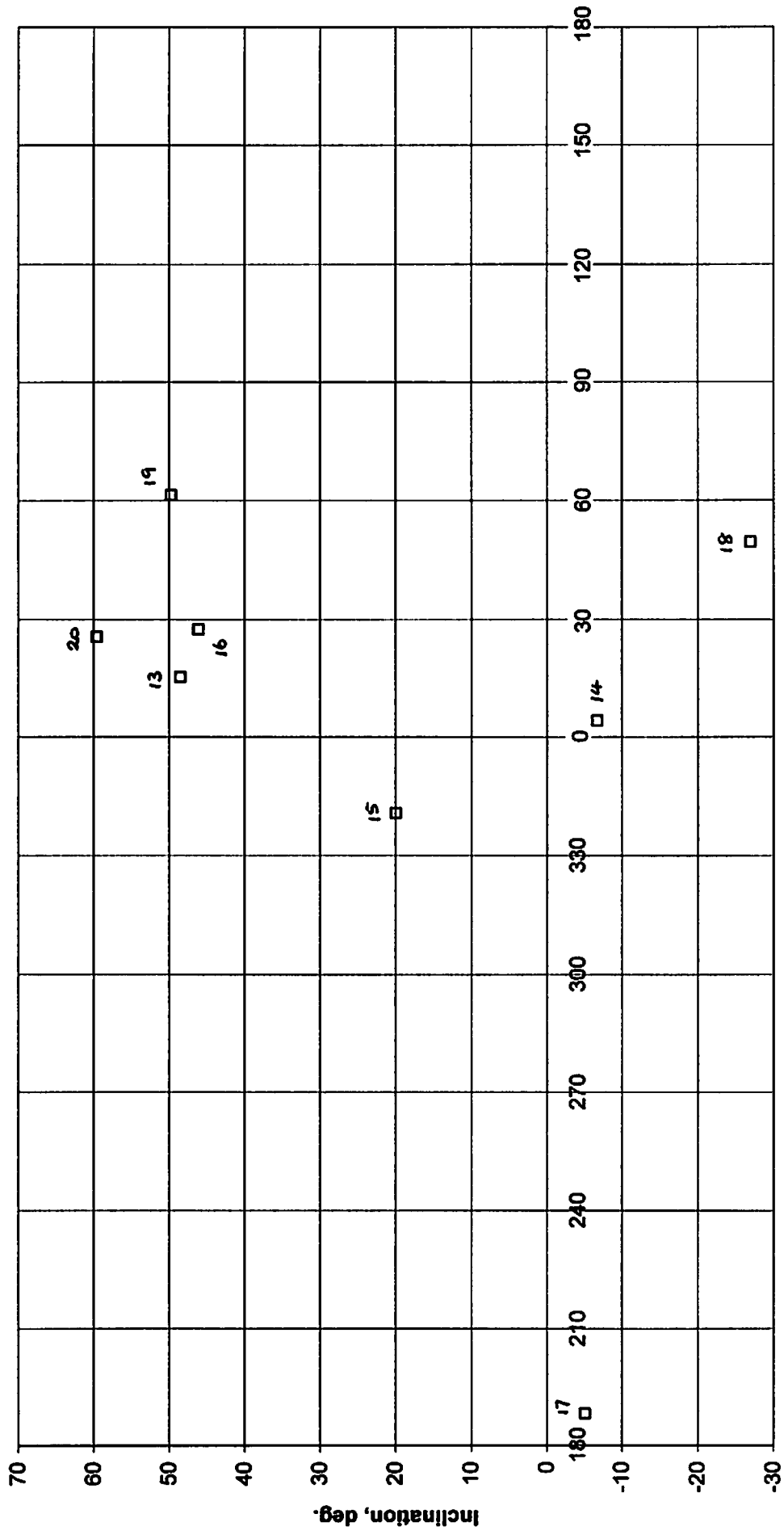
FINAL RESULT

Corrected Dec = 28.52
Corrected Inc = 51.23
Alpha95 = 16.01

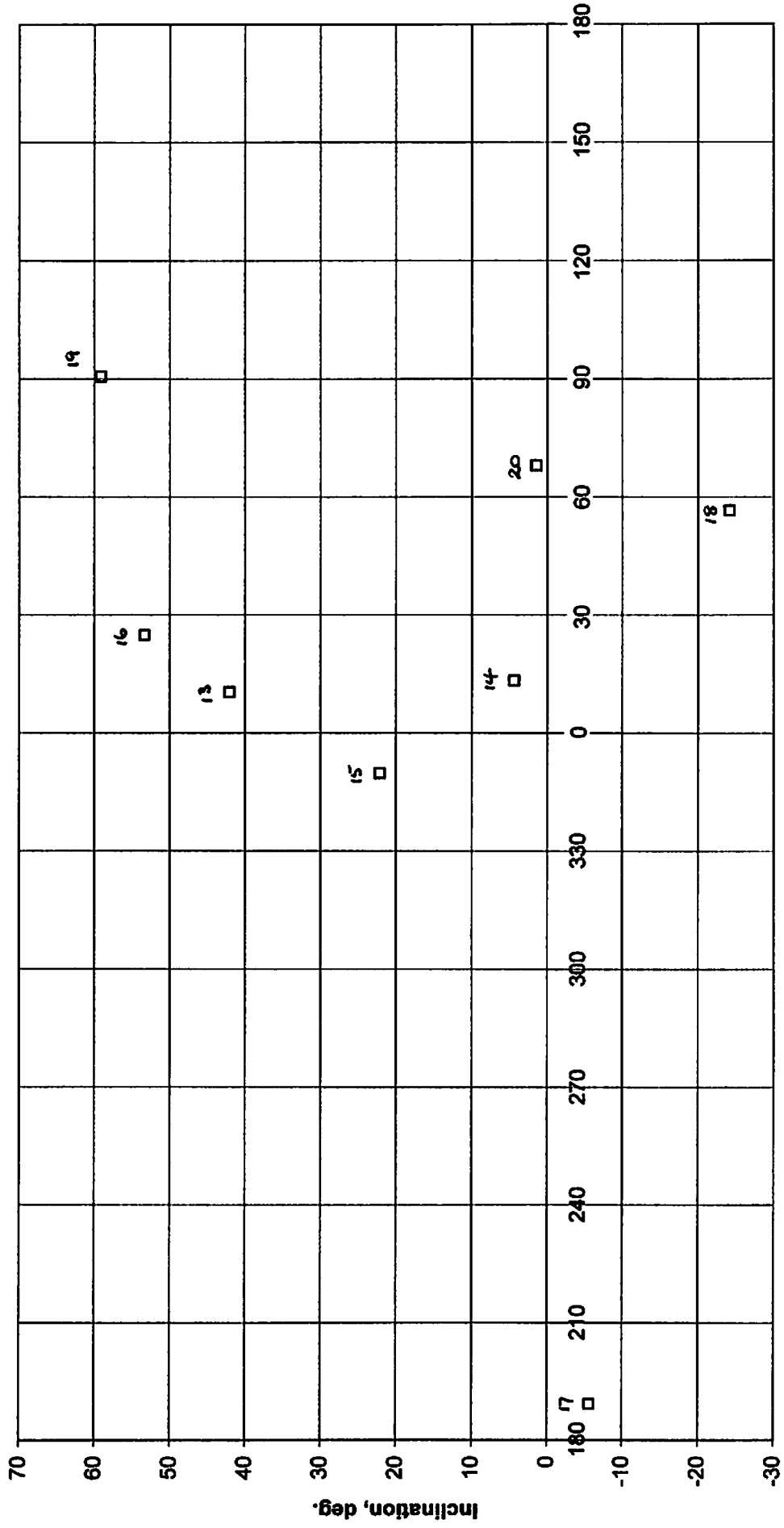
ERROR BARS

Alpha95		Alpha68	
$\delta Dec = \pm$	25.57	$\delta Dec = \pm$	13.24
$\delta Inc = \pm$	16.01	$\delta Inc = \pm$	8.29

INITIAL SAMPLE SCATTER

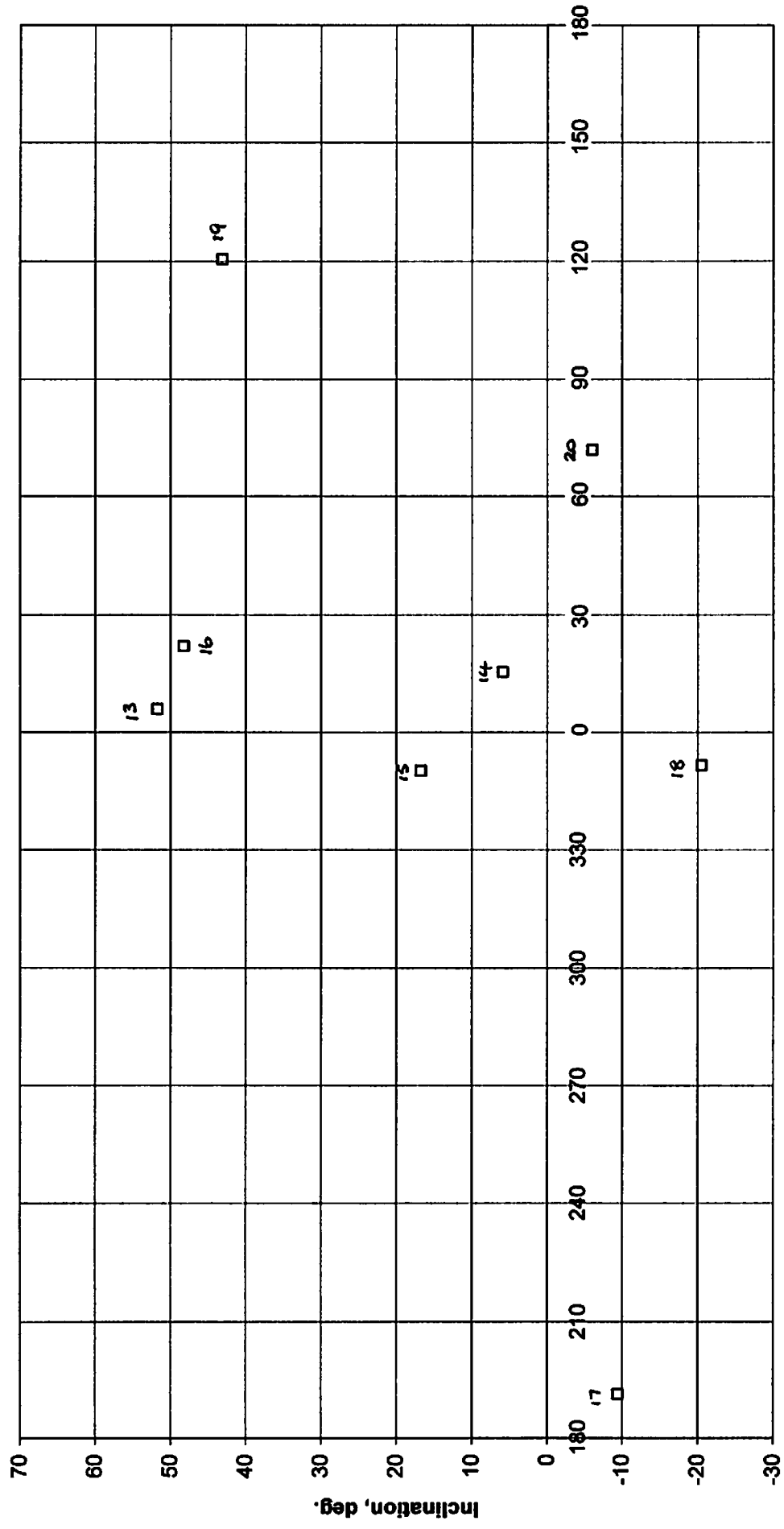


7.5mT DEMAGNETISED SAMPLE SCATTER

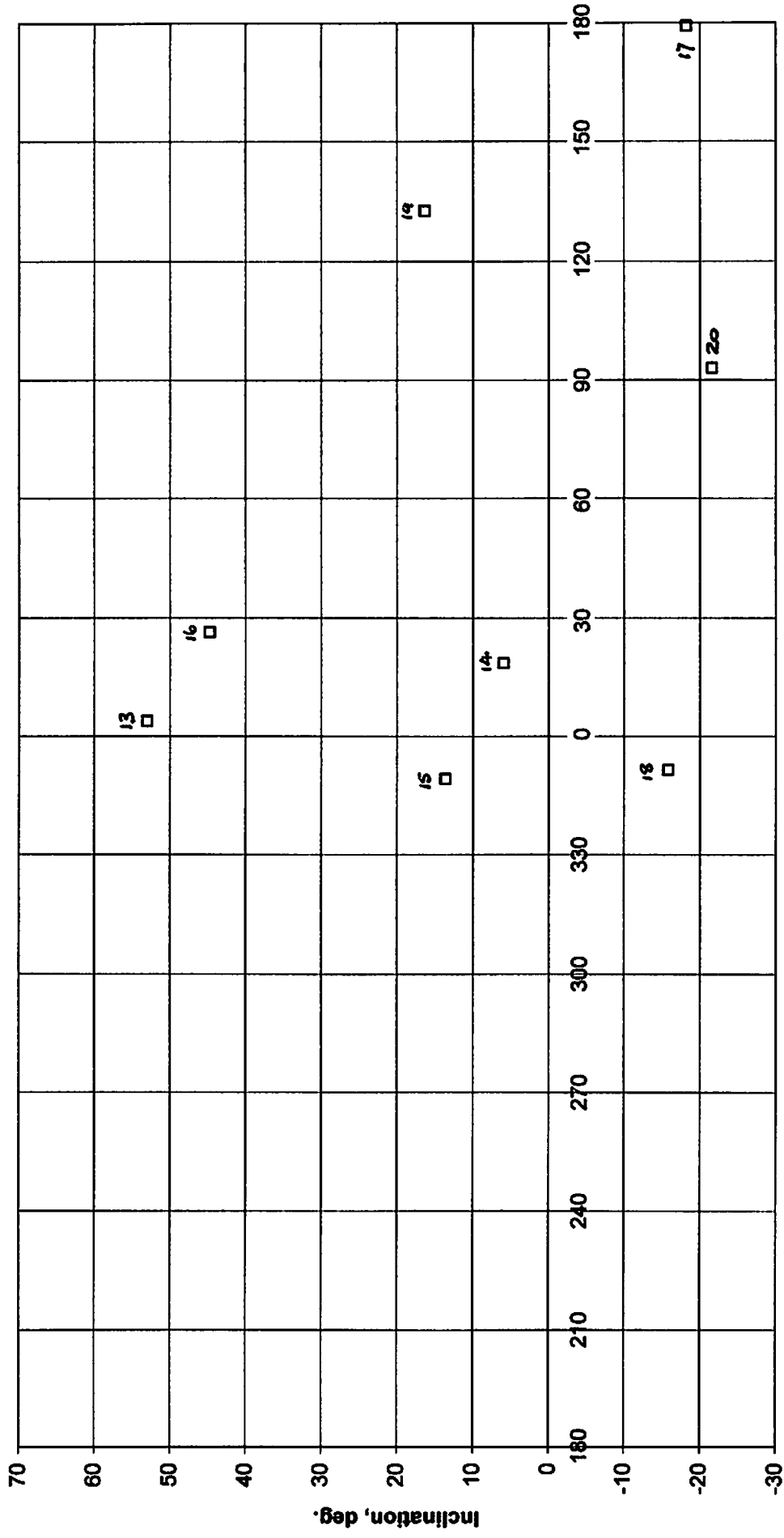


Declination, deg.

10mT DEMAGNETISED SAMPLE SCATTER



15mT DEMAGNETISED SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

Sample No. 14

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	33.13	1.00	32.55	5.02	-3.59	8.8	-6.2
2.5	39.56	1.19	38.87	6.80	2.87	9.9	4.2
5.0	39.90	1.20	38.57	8.90	5.01	13.0	7.2
7.5	35.67	1.08	34.58	8.29	2.68	13.5	4.3
10.0	30.86	0.93	29.59	8.19	3.14	15.5	5.8
15.0	20.91	0.63	19.71	6.63	2.13	18.6	5.9
20.0	11.85	0.36	10.91	4.59	0.56	22.8	2.7
30.0	3.25	0.10	2.39	2.18	-0.28	42.3	-4.9
40.0	1.40	0.04	0.43	1.29	-0.33	71.6	-13.6
60.0	0.78	0.02	-0.19	0.02	-0.75	174.5	-75.9
80.0	0.68	0.02	-0.18	-0.31	-0.58	239.1	-58.2
100.0	0.77	0.02	-0.41	-0.37	-0.54	222.5	-44.2

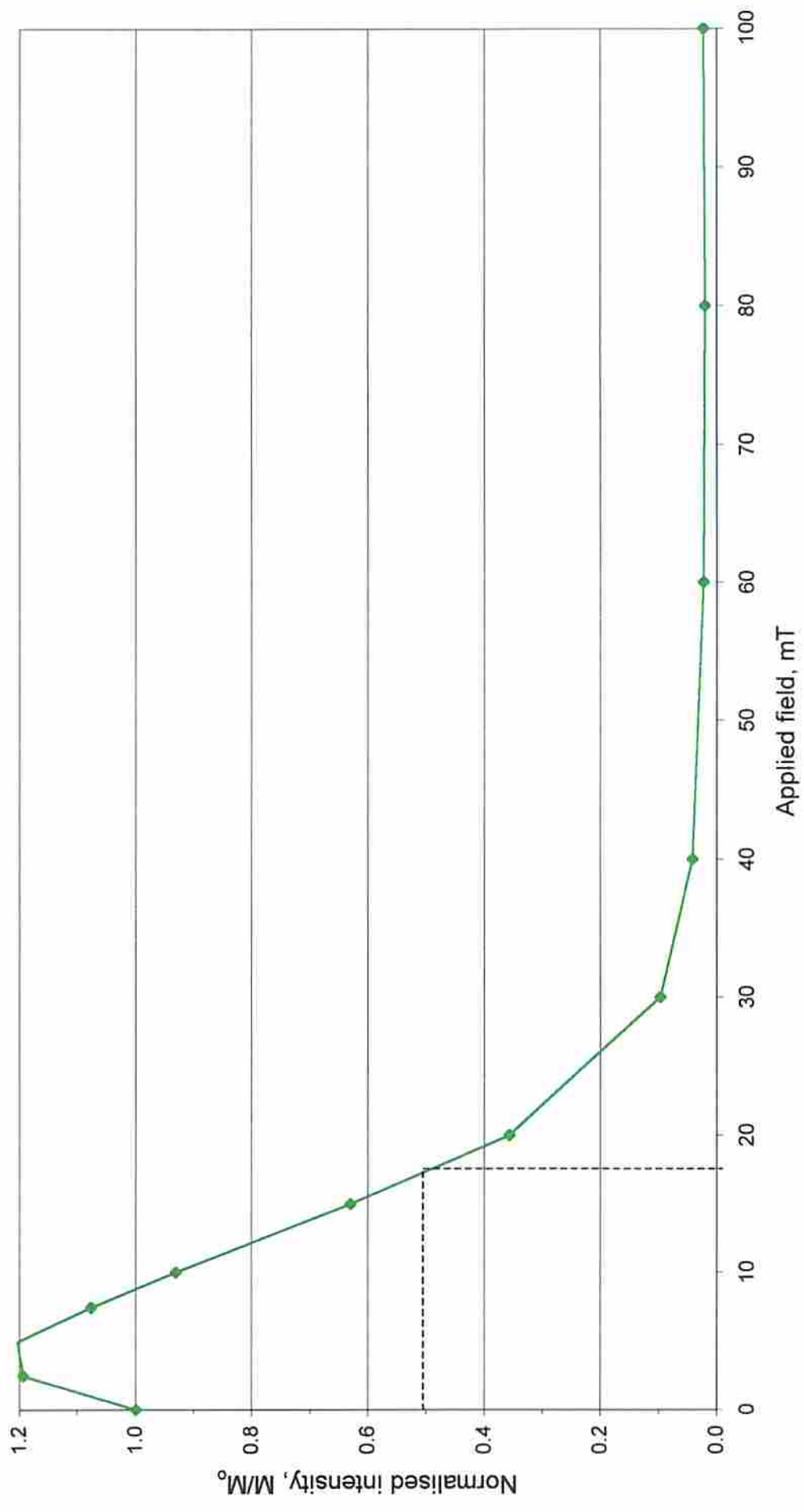
Sample No. 16

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	408.07	1.00	228.05	79.40	328.96	19.2	53.7
2.5	420.35	1.03	255.60	109.02	315.40	23.1	48.6
5.0	425.12	1.04	271.50	112.94	307.02	22.6	46.2
7.5	375.66	0.92	203.51	94.53	301.28	24.9	53.3
10.0	330.91	0.81	204.31	82.98	246.73	22.1	48.2
15.0	179.08	0.44	114.02	56.74	125.90	26.5	44.7
20.0	72.92	0.18	51.85	24.53	45.02	25.3	38.1
30.0	13.08	0.03	10.13	3.12	7.67	17.1	35.9
40.0	5.12	0.01	3.85	0.47	3.35	7.0	40.8
60.0	2.77	0.01	2.03	-0.47	1.83	347.0	41.3
80.0	1.89	0.00	1.63	-0.10	0.95	356.5	30.3
100.0	1.45	0.00	0.99	-0.39	0.98	338.4	42.9

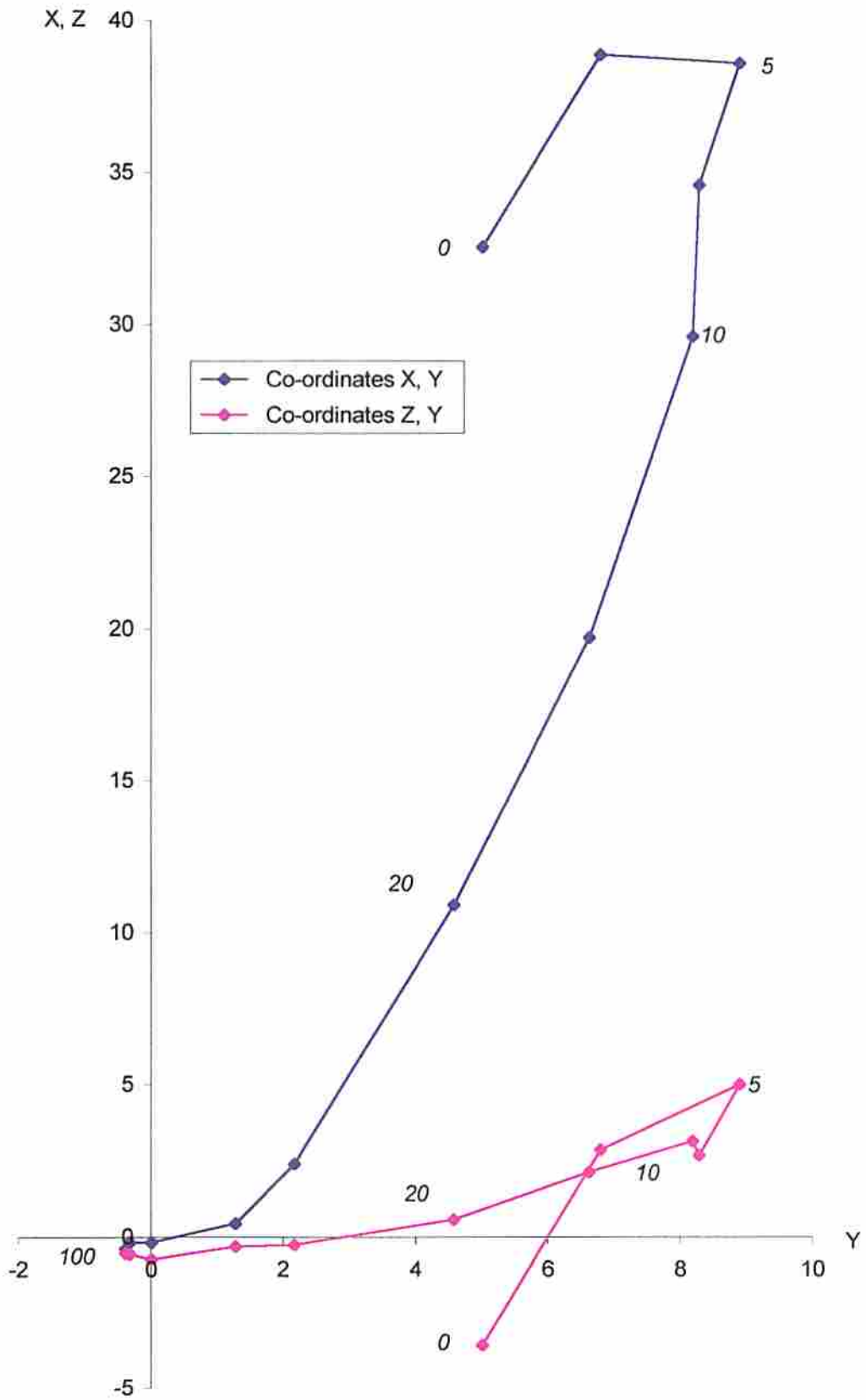
Sample No. 17

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised Intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	19.97	1.00	-19.80	-2.48	-0.88	187.1	-2.5
2.5	19.68	0.99	-19.55	-2.08	-0.77	186.1	-2.2
5.0	19.90	1.00	-19.71	-2.67	-0.64	187.7	-1.8
7.5	19.49	0.98	-19.13	-3.21	-1.89	189.5	-5.6
10.0	18.77	0.94	-18.15	-3.66	-3.07	191.4	-9.4
15.0	8.93	0.45	-8.48	0.09	-2.79	179.4	-18.2
20.0	5.04	0.25	-4.72	-0.07	-1.75	180.9	-20.3
30.0	1.47	0.07	-1.01	0.90	-0.58	138.5	-23.2
40.0	0.64	0.03	-0.64	0.00	0.04	180.1	3.4
60.0	0.83	0.04	-0.52	-0.64	0.09	230.9	6.2
80.0	0.37	0.02	-0.22	-0.29	0.08	233.0	12.2
100.0	0.26	0.01	0.09	-0.24	-0.05	290.4	-11.3

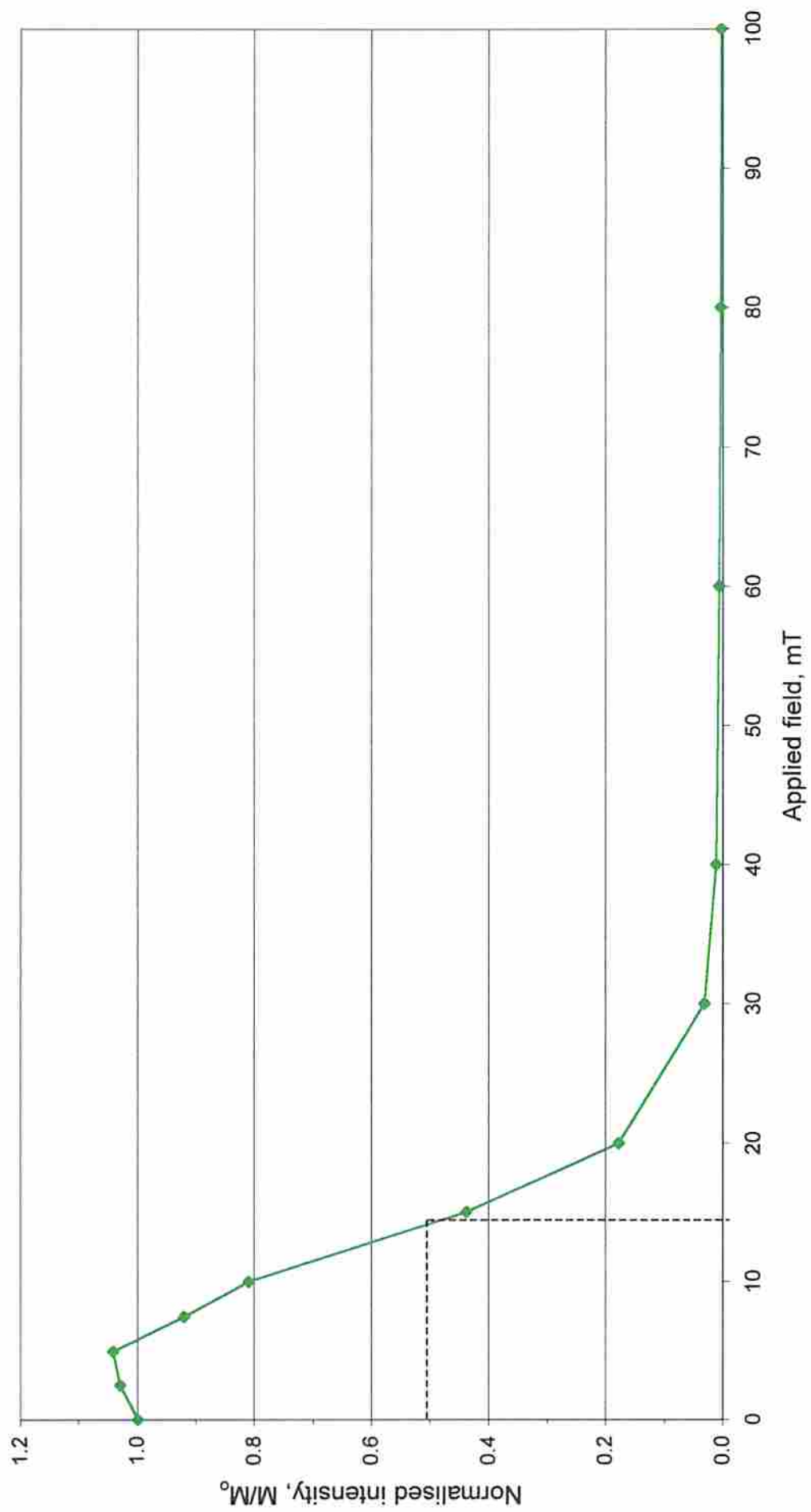
MYERS WOOD - SAMPLE POINT C14 DEMAGNETISATION: INTENSITY SPECTRUM



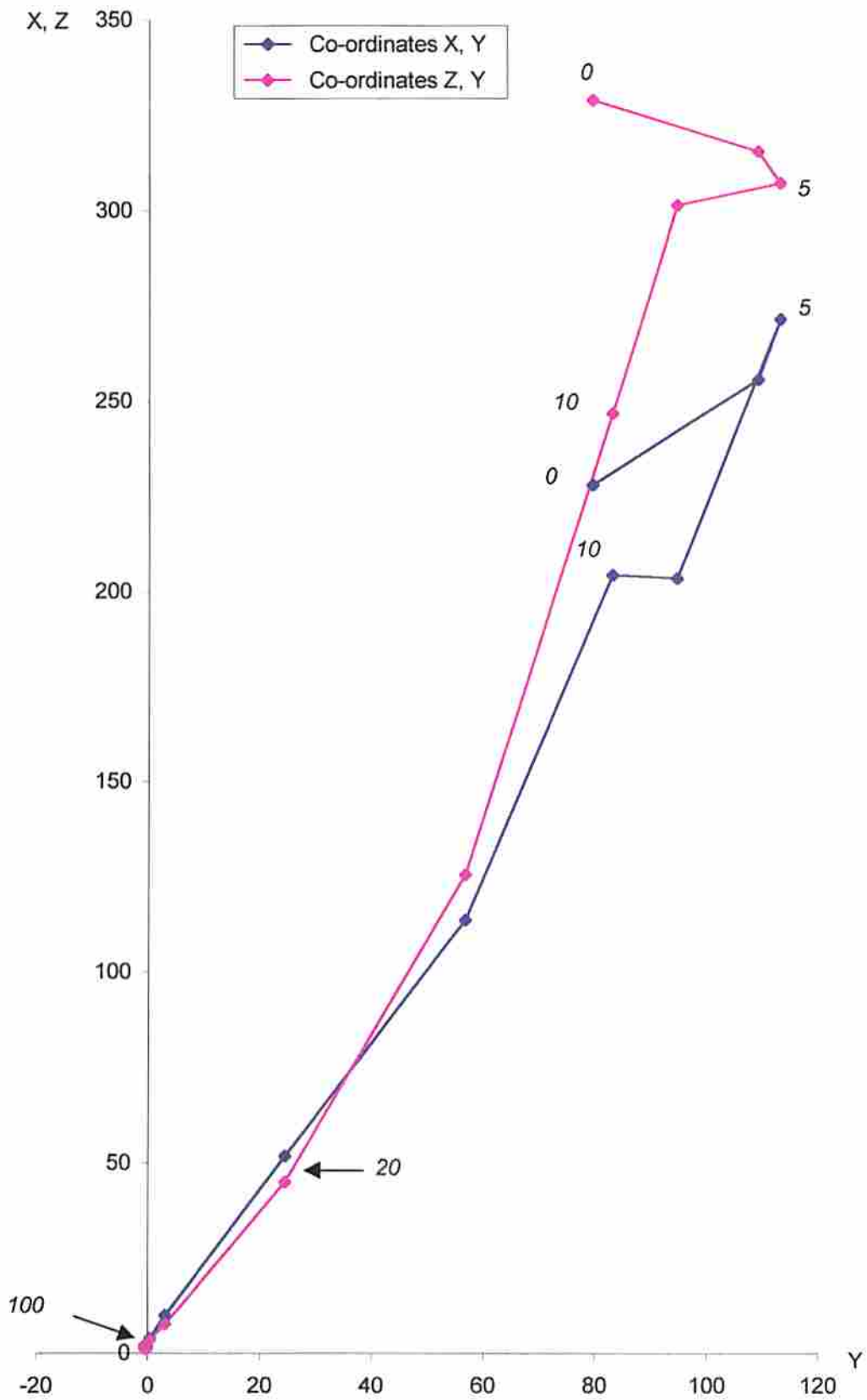
MYERS WOOD - SAMPLE POINT C14 - ZIJDERVELD PLOT



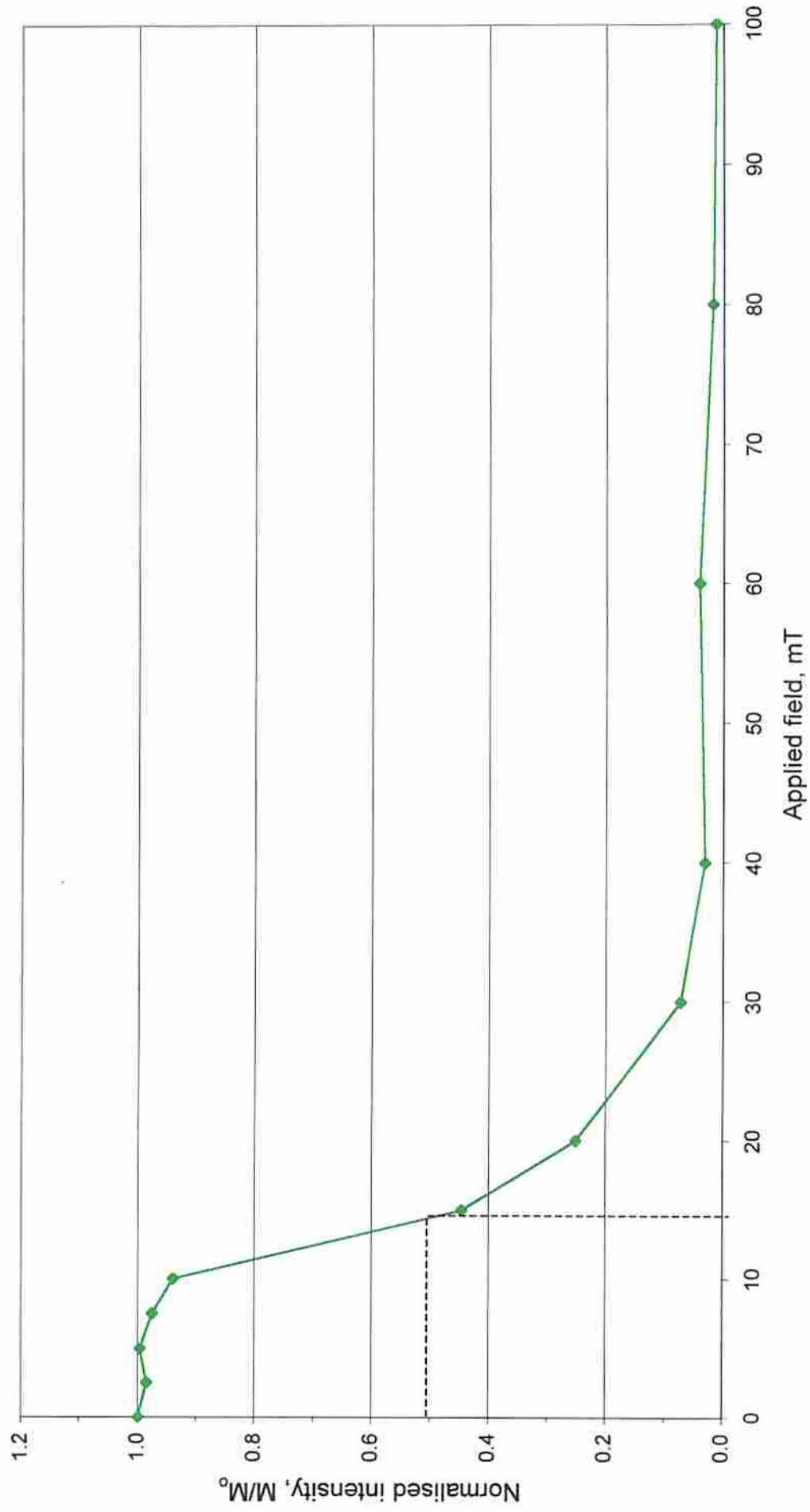
MYERS WOOD - SAMPLE POINT C16 DEMAGNETISATION: INTENSITY SPECTRUM



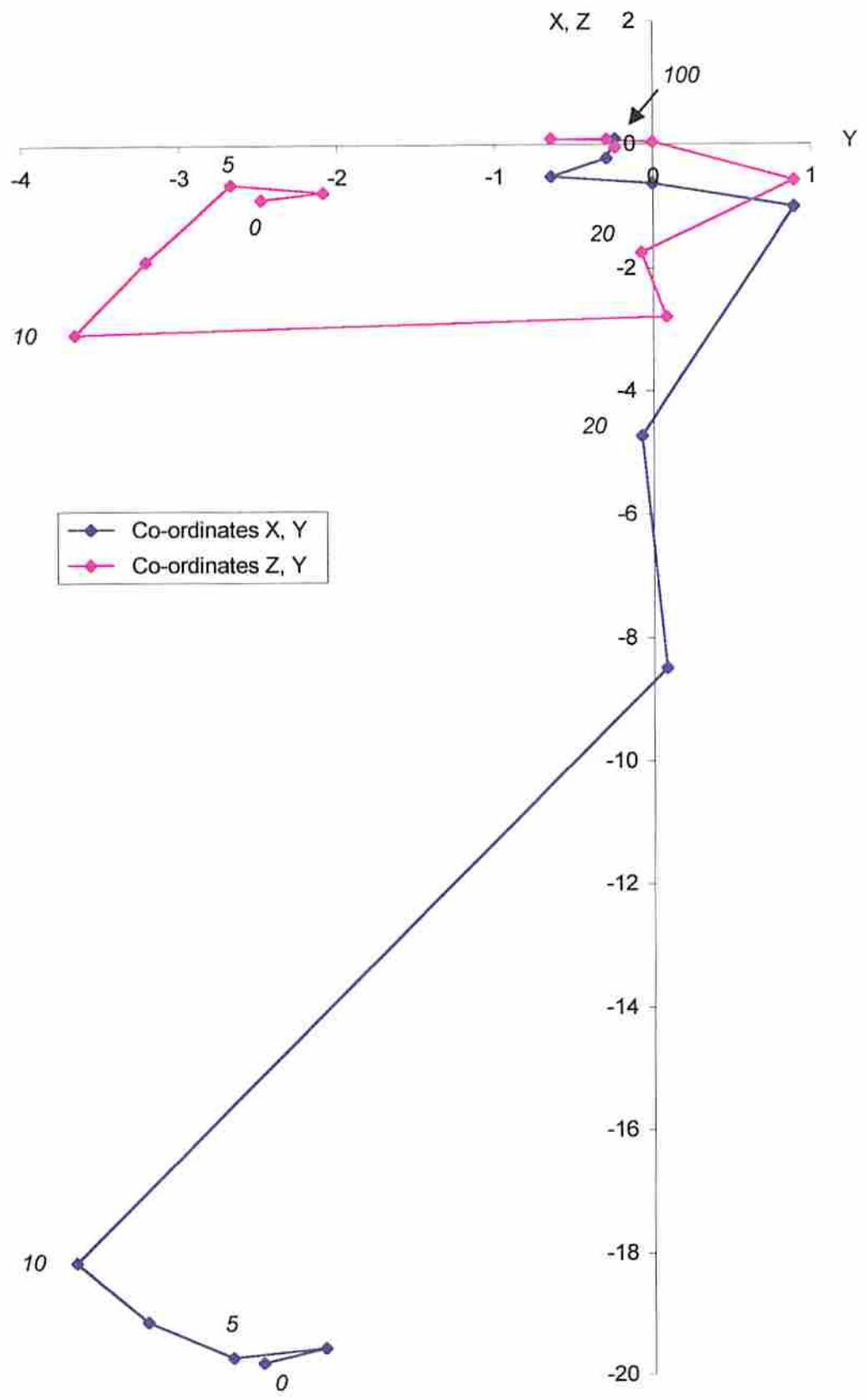
MYERS WOOD - SAMPLE POINT C16 - ZIJDERVELD PLOT

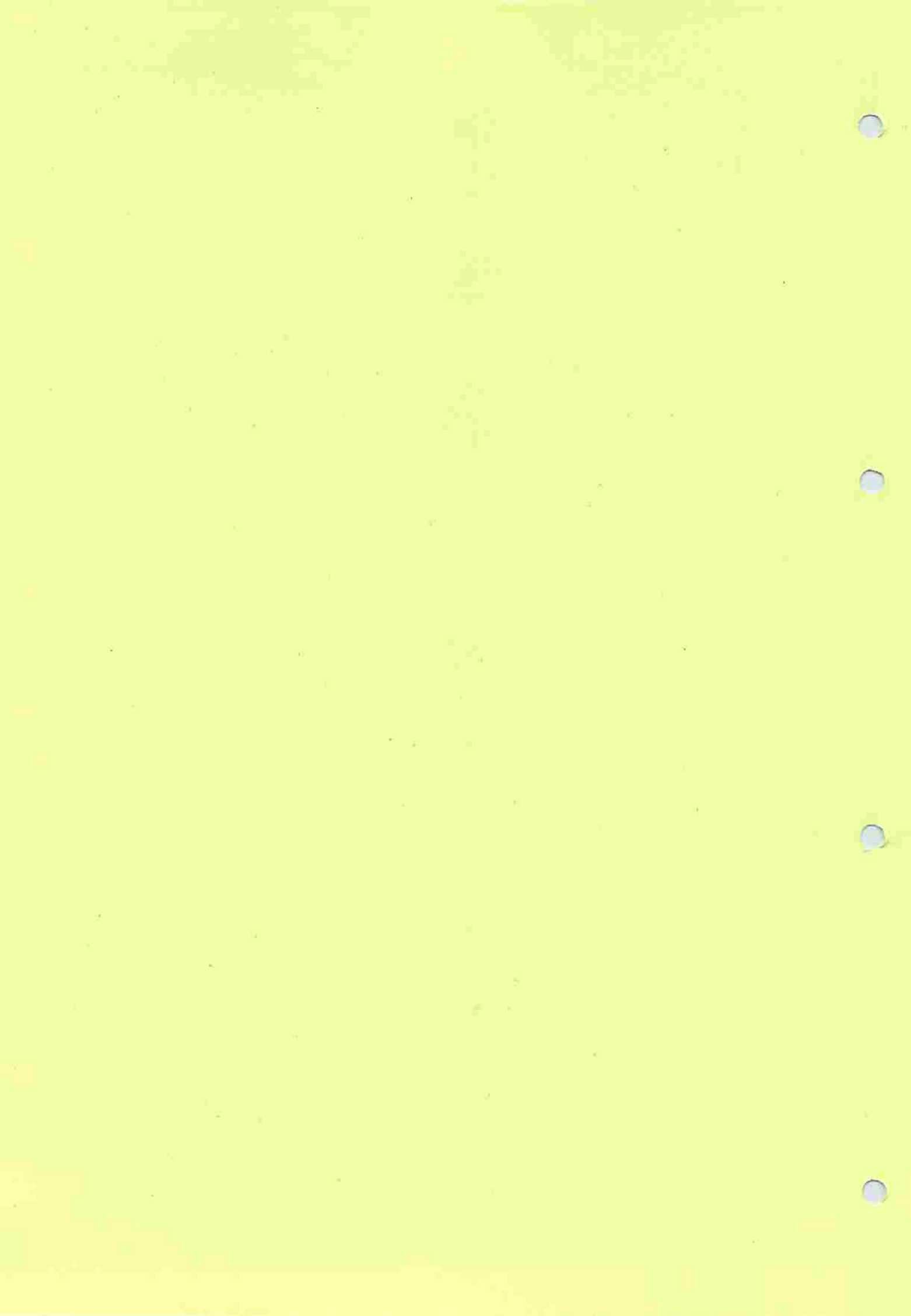


MYERS WOOD - SAMPLE POINT C17 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT C17 - ZIJDERVELD PLOT





SITE INFORMATION

Site Name Myers Wood
Area Trench C
Context No
Description Slag dump: sample Group C
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 24/9/02

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field mT	After partial demag			Pilot? Y/N	Comments
	D degs.	I degs.	Int mA m ⁻¹		D degs.	I degs.	Int mA m ⁻¹		
21	5.0	34.2	12.21						
22	76.7	-27.8	37.68						
23	24.4	28.8	50.82					Y	
24	82.4	9.9	17.96						
25	226.4	12.8	7.77					Y	
26	55.9	50.5	5.95						
27	358.2	55.6	71.80						
28	19.1	40.8	58.77						
29	37.4	-79.8	78.35					Y	
30	254.4	50.4	41.93						

STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
21	5.0	34.2	0.82393	0.07208	0.56208
22	76.7	-27.8	0.20350	0.86086	-0.46639
23	24.4	28.8	0.79804	0.36201	0.48175
24	82.4	9.9	0.13029	0.97646	0.17193
25	226.4	12.8	-0.67248	-0.70618	0.22155
26	55.9	50.5	0.35661	0.52671	0.77162
27	358.2	55.6	0.56469	-0.01775	0.82511
28	19.1	40.8	0.71532	0.24770	0.65342
29	37.4	-79.8	0.14068	0.10756	-0.98420
30	254.4	50.4	-0.17142	-0.61394	0.77051

Number = 10
 Sum x = 2.88916
 Sum y = 1.81551
 Sum z = 3.00740
 R = 4.54838
 x bar = 0.63521
 y bar = 0.39915
 z bar = 0.66120

 Mean Dec = 32.14
 Mean Inc = 41.39
 Alpha95 = 58.22

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
21	5.0	34.2	0.82393	0.07208	0.56208
22	76.7	-27.8	0.20350	0.86086	-0.46639
23	24.4	28.8	0.79804	0.36201	0.48175
24	82.4	9.9	0.13029	0.97646	0.17193
25	226.4	12.8	-0.67248	-0.70618	0.22155
26	55.9	50.5	0.35661	0.52671	0.77162
27	358.2	55.6	0.56469	-0.01775	0.82511
28	19.1	40.8	0.71532	0.24770	0.65342
29	37.4	-79.8	0.14068	0.10756	-0.98420
30	254.4	50.4	-0.17142	-0.61394	0.77051

Number = 10
 Sum x = 2.88916
 Sum y = 1.81551
 Sum z = 3.00740
 R = 4.54838
 x bar = 0.63521
 y bar = 0.39915
 z bar = 0.66120

Mean Dec = 32.14
 Mean Inc = 41.39
 Alpha95 = 58.22

Alpha68 = 33.05

CORRECTIONS

Mean Dec = 32.14
Mean Inc = 41.39

Correction for magnetic variation

Mean Dec = 28.42
Mean Inc = 41.39

Correction to Meriden (CVP)

Uncorrected Dec = 28.42
Uncorrected Inc = 41.39
Latitude = 53.60
Longitude = -1.73

Kai = 66.22
Latitude of pole = 53.34
Beta1 = 46.84
Longitude of pole = 131.43
Geomag colat = 67.22
Corrected Inc = 40.03
Beta 2 = 46.95
Corrected Dec = 28.25

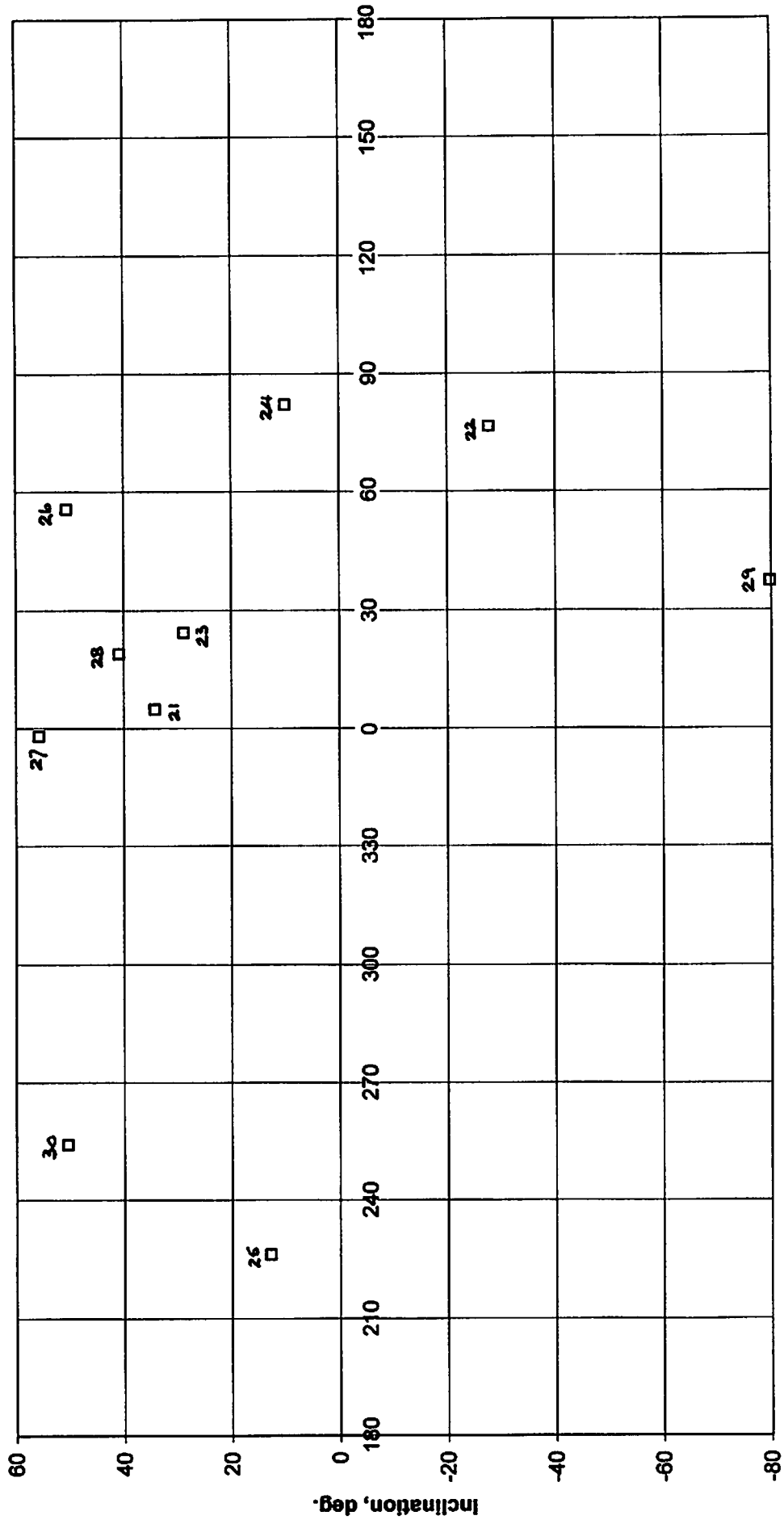
FINAL RESULT

Corrected Dec = 28.25
Corrected Inc = 40.03
Alpha95 = 58.22

ERROR BARS

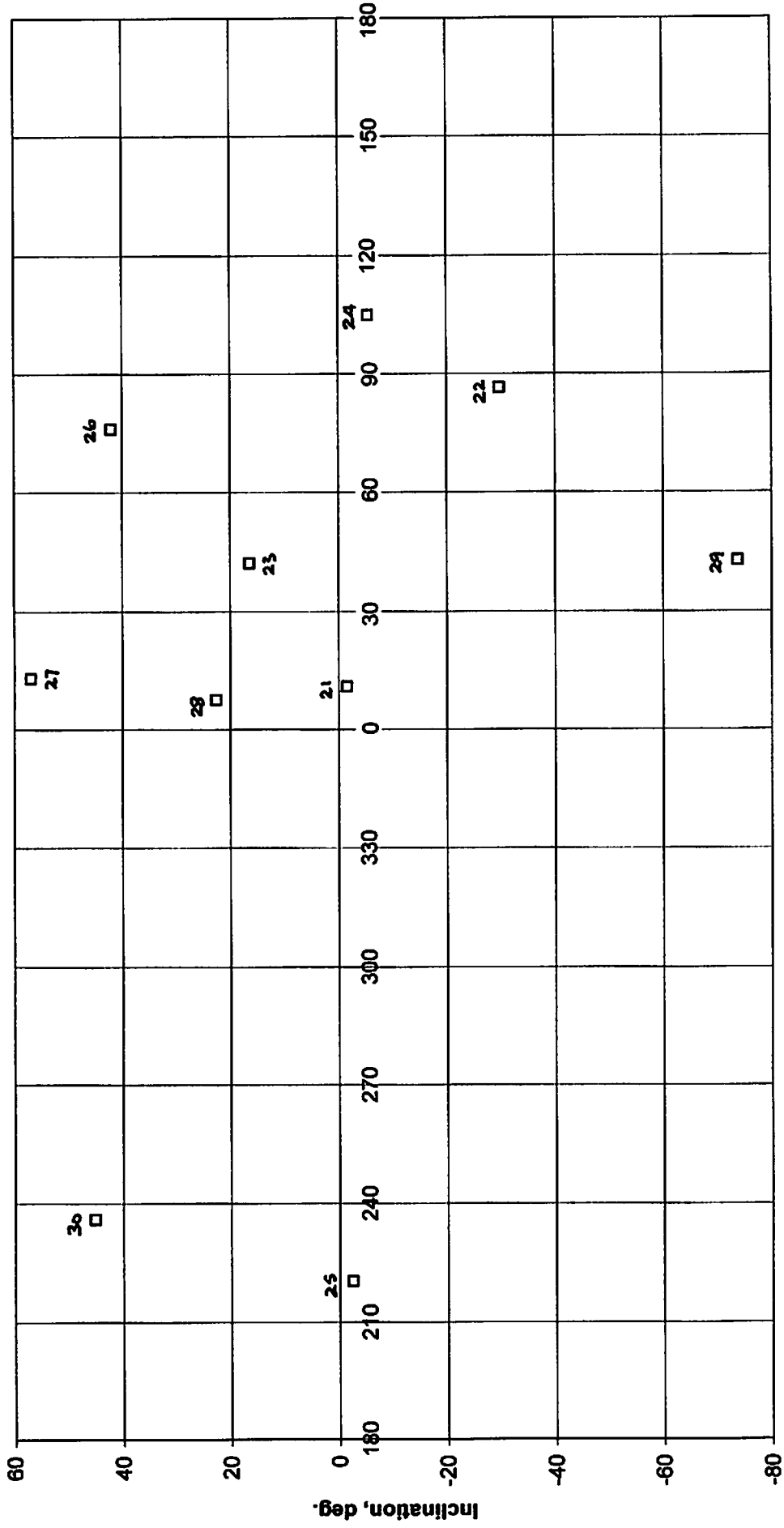
Alpha95		Alpha68	
$\delta Dec = \pm$	76.04	$\delta Dec = \pm$	43.16
$\delta Inc = \pm$	58.22	$\delta Inc = \pm$	33.05

INITIAL SAMPLE SCATTER



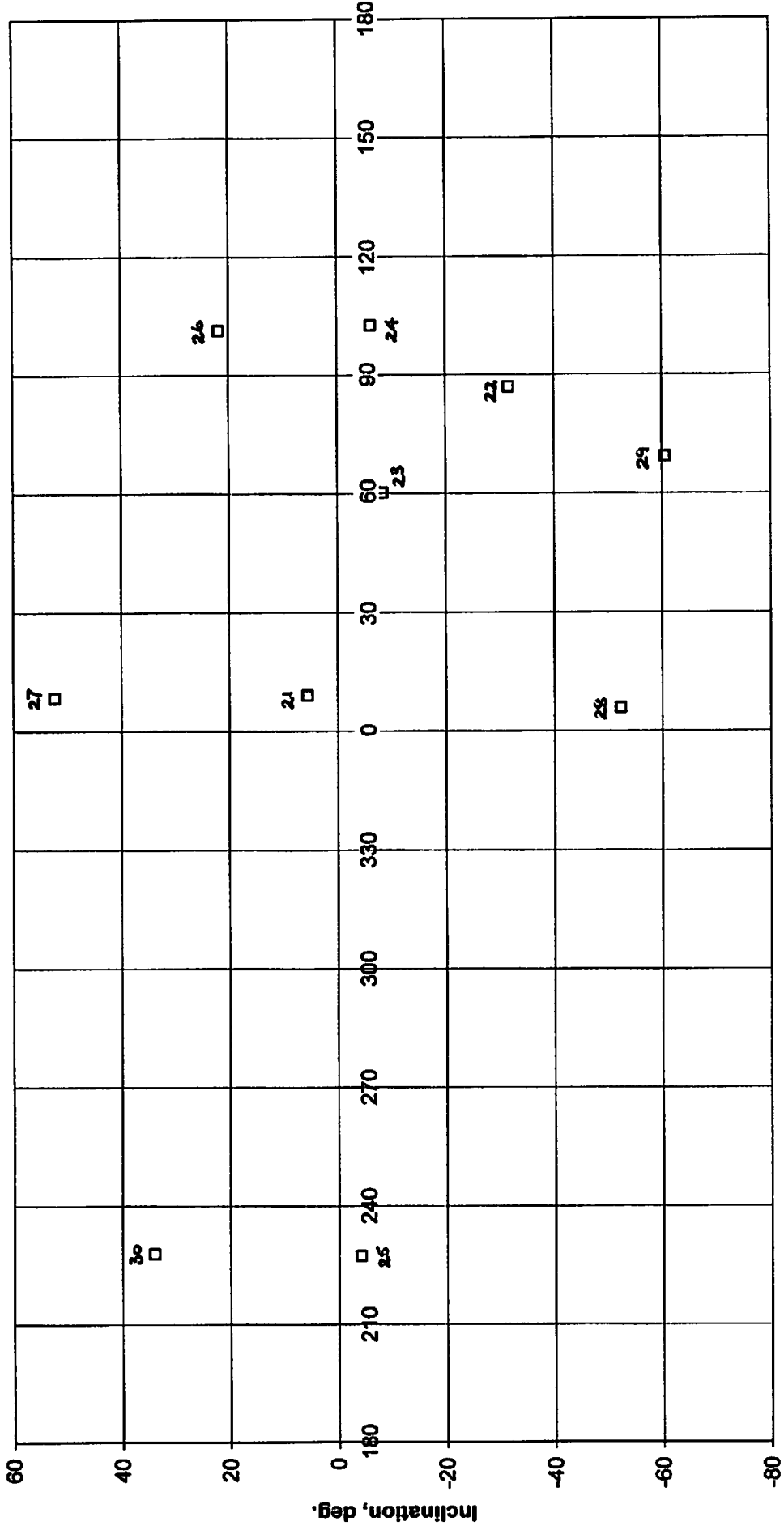
Declination, deg.

10mT DEMAGNETISED SAMPLE SCATTER



Declination, deg.

15mT DEMAGNETISED SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

Sample No. 23

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	49.08	1.00	38.77	19.38	23.02	26.6	28.0
2.5	49.81	1.01	39.19	14.32	27.21	20.1	33.1
5.0	46.09	0.94	34.59	15.67	26.11	24.4	34.5
7.5	37.00	0.75	26.51	19.36	17.07	36.1	27.5
10.0	29.37	0.60	20.82	18.98	8.29	42.3	16.4
15.0	19.29	0.39	9.40	16.61	-2.82	60.5	-8.4
20.0	12.77	0.26	5.34	10.24	-5.45	62.5	-25.3
30.0	8.08	0.16	5.48	2.99	-5.13	28.6	-39.4
40.0	7.26	0.15	5.62	1.01	-4.48	10.2	-38.1
60.0	7.76	0.16	6.66	0.33	-3.96	2.8	-30.7
80.0	7.95	0.16	7.13	1.00	-3.37	8.0	-25.1
100.0	7.68	0.16	6.76	0.38	-3.64	3.2	-28.2

Sample No. 25

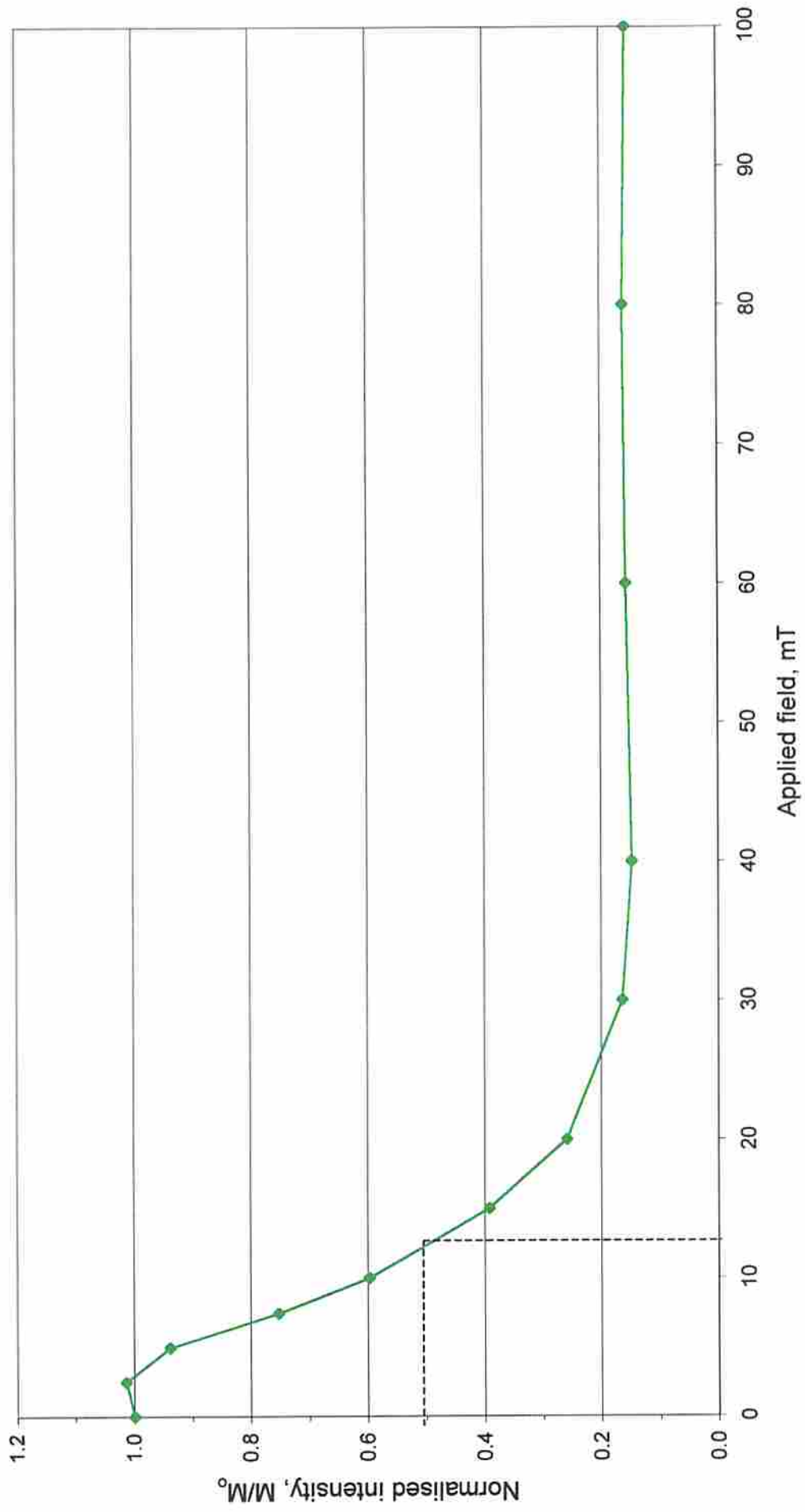
Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	7.29	1.00	-5.44	-4.75	0.98	221.1	7.7
2.5	7.24	0.99	-5.48	-4.63	0.96	220.2	7.6
5.0	7.44	1.02	-5.75	-4.67	0.68	219.1	5.2
7.5	7.79	1.07	-5.90	-5.08	0.34	220.7	2.5
10.0	7.37	1.01	-5.59	-4.78	-0.33	220.5	-2.5
15.0	5.74	0.79	-3.86	-4.22	-0.42	227.6	-4.2
20.0	3.03	0.42	-1.93	-2.26	-0.58	229.6	-11.1
30.0	1.15	0.16	-0.64	-0.78	-0.56	230.8	-29.2
40.0	0.95	0.13	-0.43	-0.64	-0.57	236.3	-36.4
60.0	0.95	0.13	-0.39	-0.69	-0.52	240.7	-33.3
80.0	0.90	0.12	-0.57	-0.51	-0.48	221.3	-31.9
100.0	0.78	0.11	-0.47	-0.45	-0.42	223.6	-32.7

Sample No.

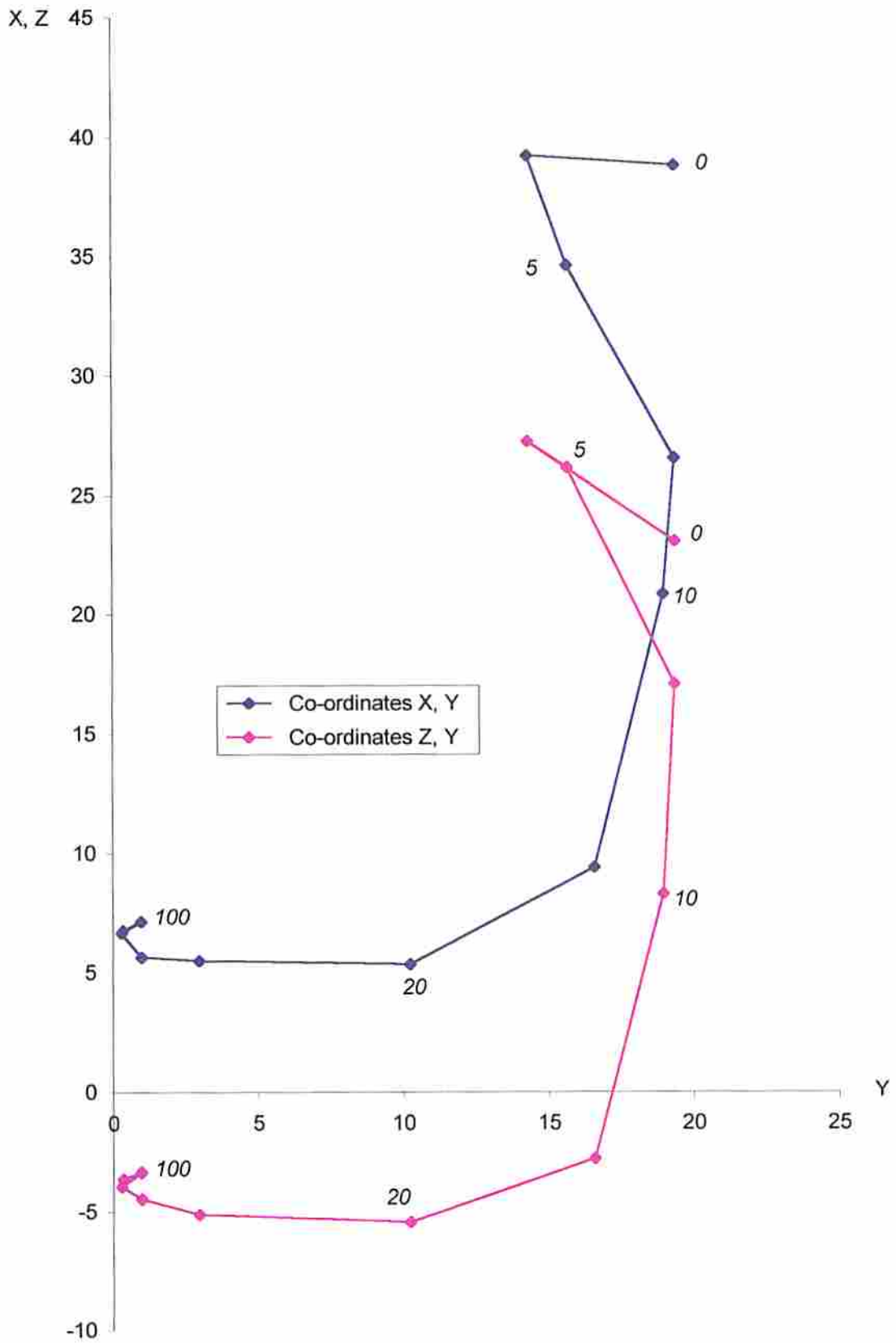
29

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	78.18	1.00	12.69	13.51	-75.95	46.8	-76.3
2.5	75.74	0.97	11.70	17.39	-72.78	56.1	-73.9
5.0	70.81	0.91	11.09	11.76	-68.95	46.7	-76.8
7.5	64.51	0.83	9.42	8.88	-63.20	43.3	-78.4
10.0	54.97	0.70	11.20	10.44	-52.80	43.0	-73.8
15.0	26.91	0.34	4.64	12.43	-23.41	69.5	-60.5
20.0	13.32	0.17	4.87	10.45	-6.68	65.0	-30.1
30.0	6.29	0.08	2.79	5.54	1.01	63.3	9.2
40.0	4.31	0.06	1.75	3.60	1.58	64.1	21.6
60.0	2.05	0.03	0.91	1.71	0.67	62.0	19.2
80.0	1.85	0.02	0.64	1.63	0.61	68.6	19.1
100.0	1.19	0.02	0.64	0.91	0.42	55.1	20.6

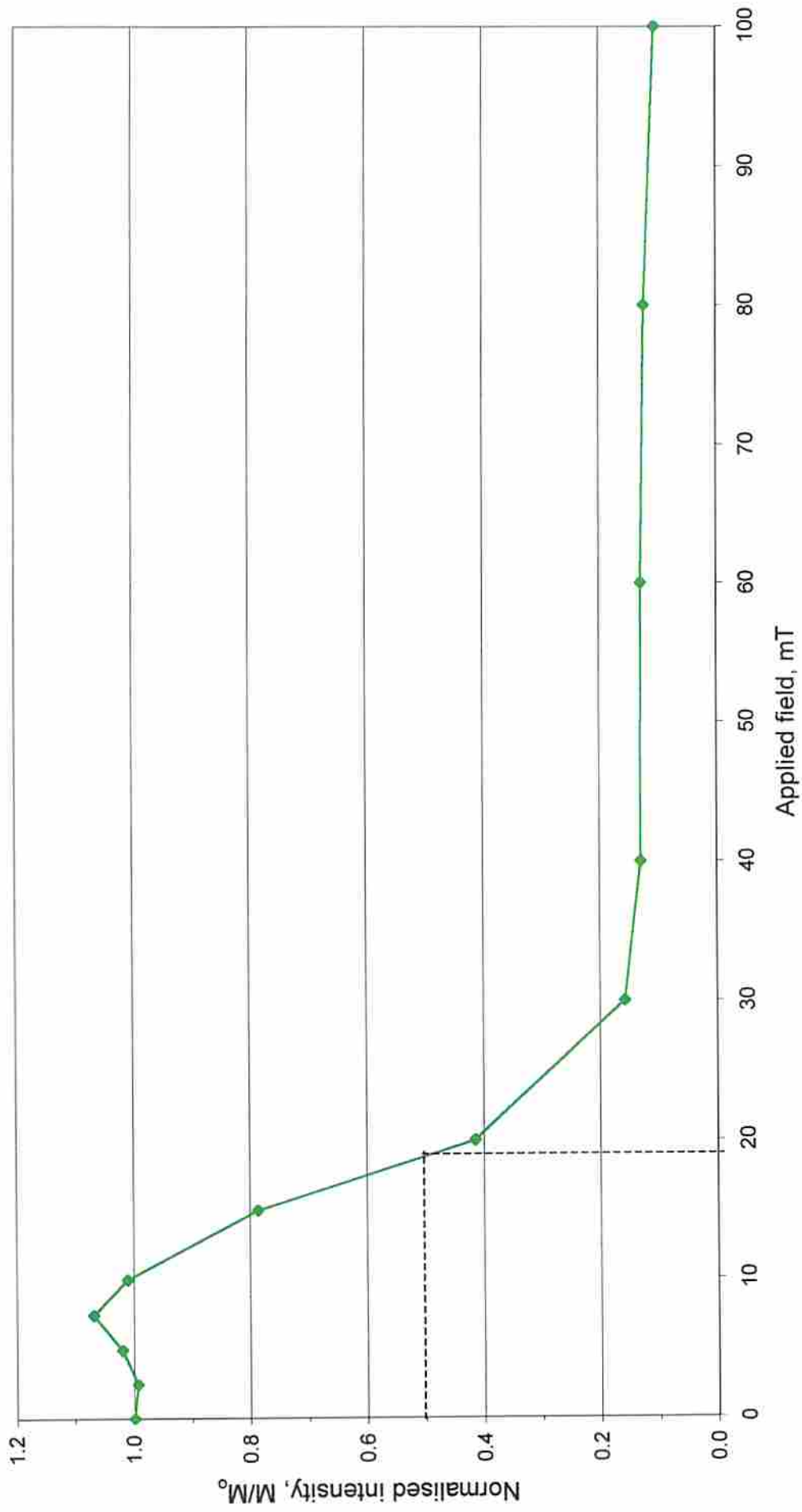
MYERS WOOD - SAMPLE POINT C23 DEMAGNETISATION: INTENSITY SPECTRUM



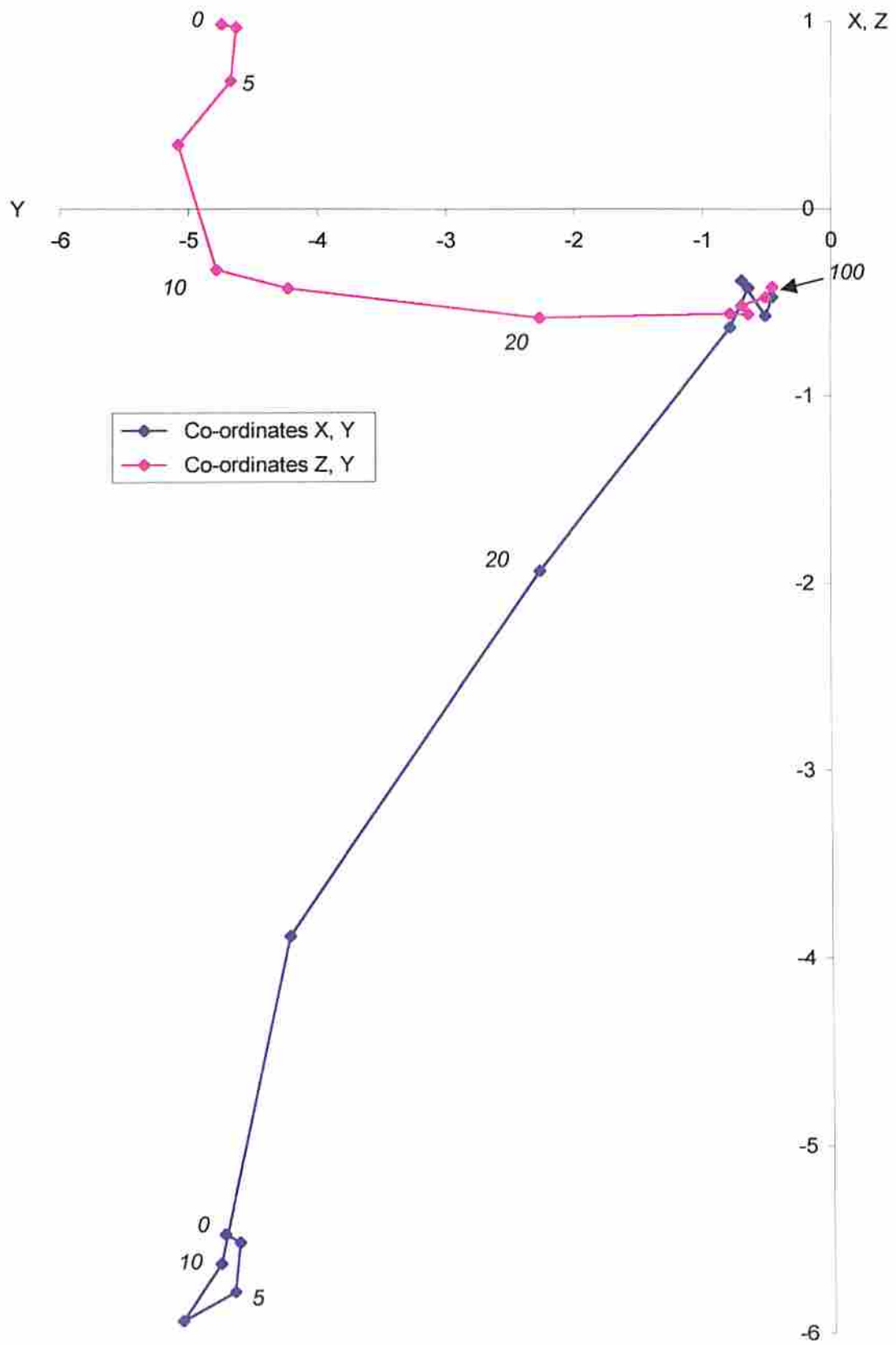
MYERS WOOD - SAMPLE POINT C23 - ZIJDERVELD PLOT



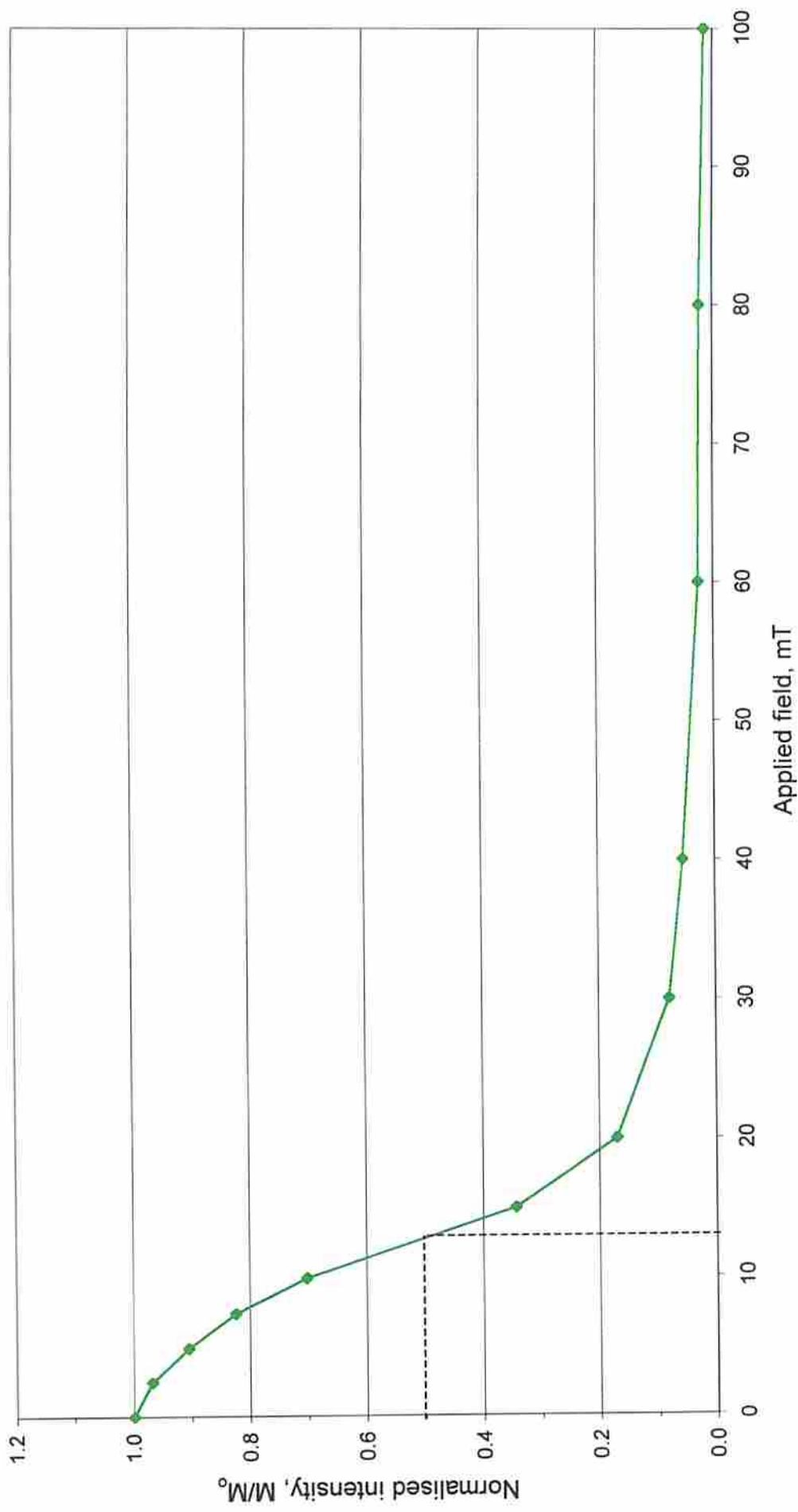
MYERS WOOD - SAMPLE POINT C25 DEMAGNETISATION: INTENSITY SPECTRUM



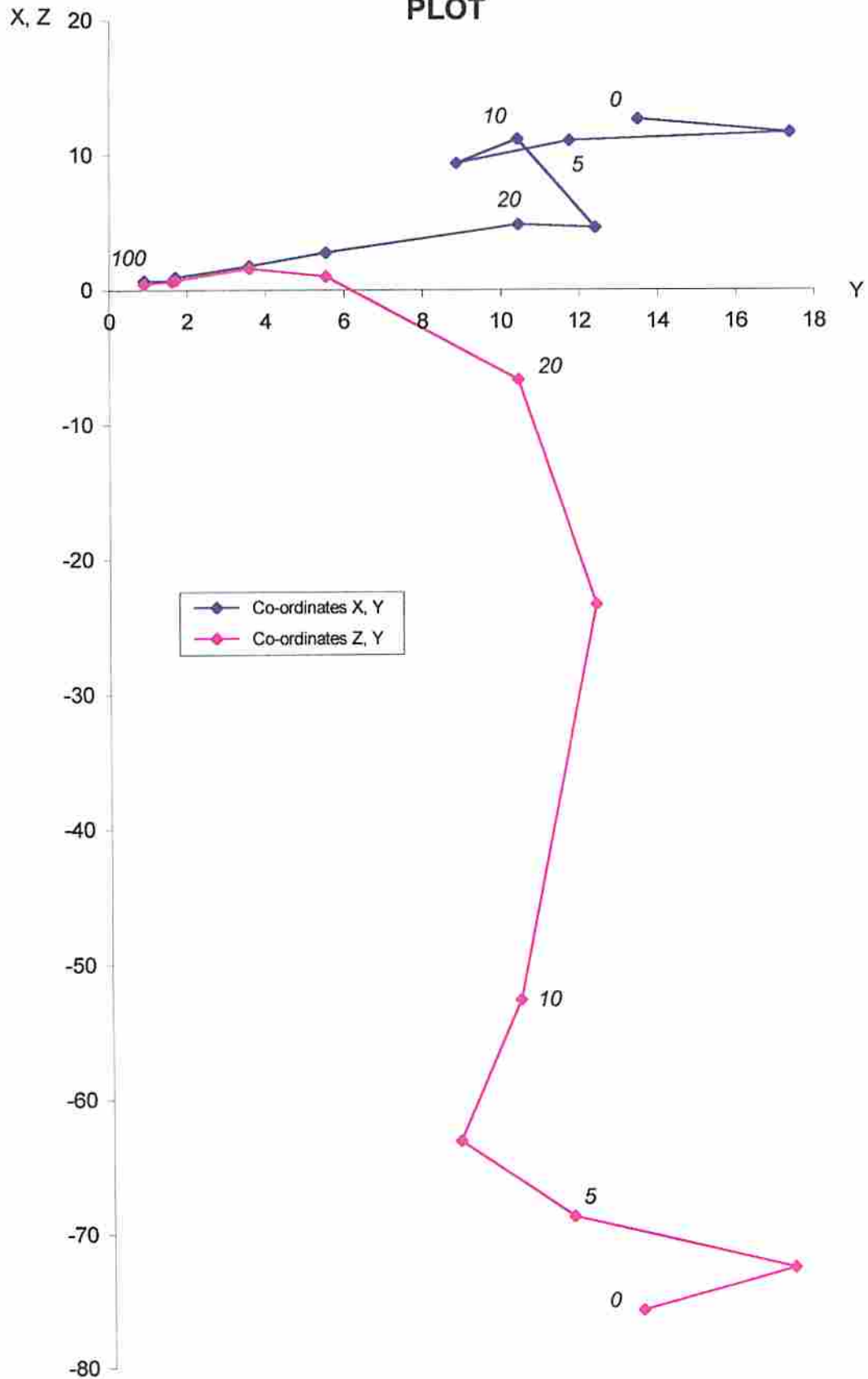
MYERS WOOD - SAMPLE POINT C25 - ZIJDERVELD PLOT

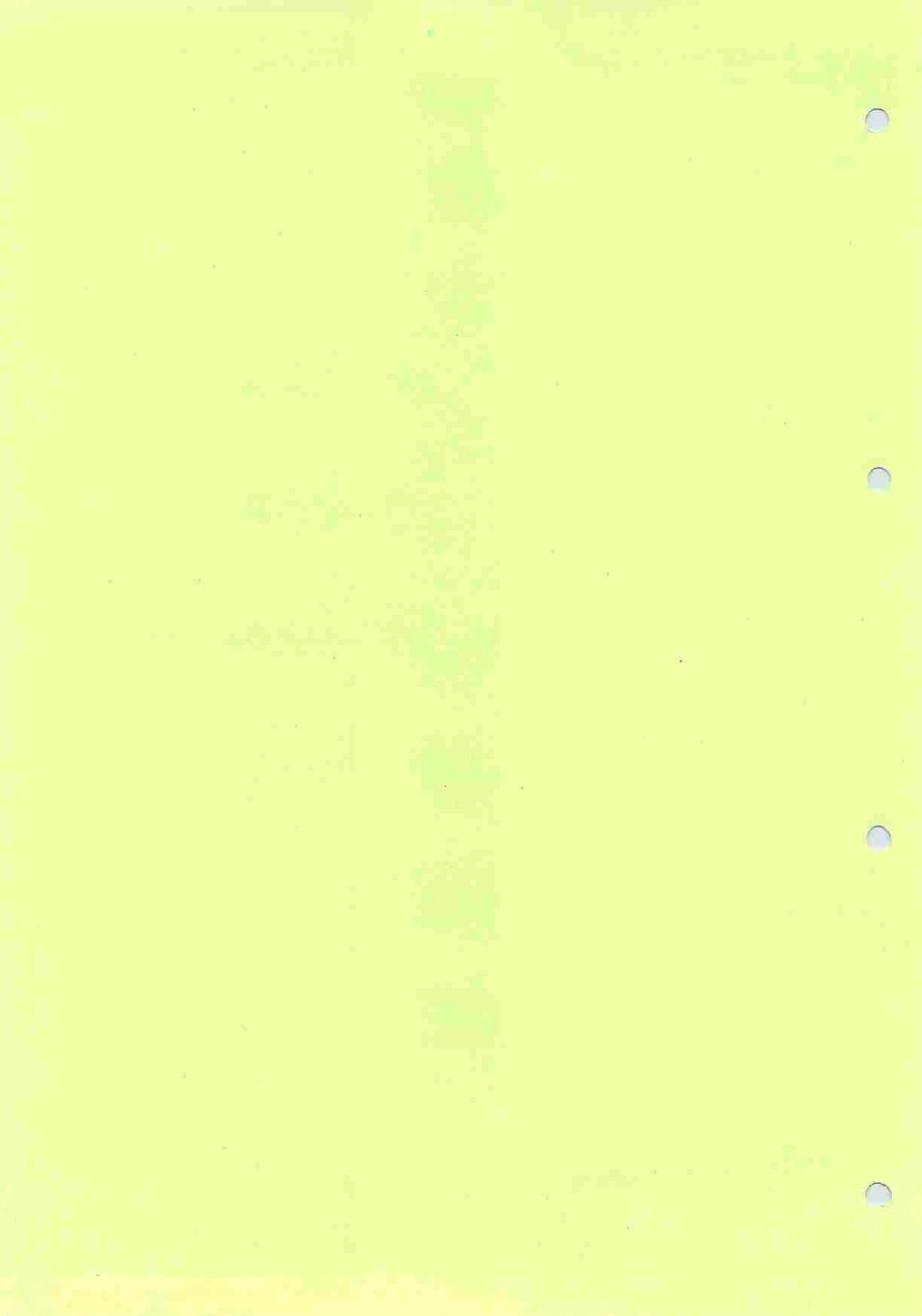


MYERS WOOD - SAMPLE POINT C29 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT C29 - ZIJDERVELD PLOT





SITE INFORMATION

Site Name Myers Wood
Area Trench G
Context No 705/712/719
Description Furnace
Latitude (+ve N) 53.60
Longitude (+ve E) -1.73
Magnetic Var -3.72
Date Sampled 24/4/03

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments
	D	I	Int		D	I	Int		
	degs.	degs.	mA m ⁻¹		degs.	degs.	mA m ⁻¹		
1	39.4	70.8	473.35	5	39.30	68.30	478.30		
2	60.10	31.30	1.67	5	56.10	48.20	2.61		Outlier
3	278.80	26.00	9.88	5	288.10	34.60	9.10	Y	Outlier
4	13.70	48.90	3.64	5	20.50	52.30	4.49		
5	356.10	62.70	262.99	5	0.60	63.70	276.92	Y	
6	12.20	59.90	52.18	5	15.60	62.00	54.99		
7	356.80	56.60	16.84	5	357.40	61.00	18.65		
8	8.60	51.60	30.70	5	5.10	51.90	32.41	Y	
9	352.10	58.10	7.36	5	352.40	61.60	8.29		
10	257.20	-10.70	1.79	5	249.00	-11.70	1.90		Outlier
11	4.50	65.90	30.88	5	5.40	66.40	28.33		
12	36.70	58.00	495.90	5	27.40	58.70	483.34		

STATISTICS FOR NRM

Sample no.	NRM				
	D	l	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	39.40	70.80	0.25413	0.20874	0.94438
2	60.10	31.30	0.42594	0.74073	0.51952
3	278.80	26.00	0.13750	-0.88821	0.43837
4	13.70	48.90	0.63867	0.15569	0.75356
5	356.10	62.70	0.45759	-0.03120	0.88862
6	12.20	59.90	0.49018	0.10598	0.86515
7	356.80	56.60	0.54962	-0.03073	0.83485
8	8.60	51.60	0.61416	0.09288	0.78369
9	352.10	58.10	0.52342	-0.07263	0.84897
10	257.20	-10.70	-0.21770	-0.95819	-0.18567
11	4.50	65.90	0.40707	0.03204	0.91283
12	36.70	58.00	0.42488	0.31669	0.84805

Number = 12
 Sum x = 4.70547
 Sum y = -0.32821
 Sum z = 8.45233
 R = 9.67941
 x bar = 0.48613
 y bar = -0.03391
 z bar = 0.87323

Mean Dec = -3.99
 Mean Inc = 60.84
 Alpha95 = 22.34

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	degs.	degs.			
1					
2					
3					
4					
5	0.60	63.70	0.44305	0.00464	0.89649
6	15.60	62.00	0.45218	0.12625	0.88295
7	357.40	61.00	0.48431	-0.02199	0.87462
8	5.10	51.90	0.61459	0.05485	0.78694
9	352.40	61.60	0.47145	-0.06290	0.87965
10					
11	5.40	66.40	0.39857	0.03768	0.91636
12					

Number = 6
 Sum x = 2.86415
 Sum y = 0.13852
 Sum z = 5.23700
 R = 5.97065
 x bar = 0.47970
 y bar = 0.02320
 z bar = 0.87712

Mean Dec = 2.77
 Mean Inc = 61.30
 Alpha95 = 5.15

Alpha68 = 2.87

CORRECTIONS

Mean Dec = 2.77
Mean Inc = 61.30

Correction for magnetic variation

Mean Dec = -0.95
Mean Inc = 61.30

Correction to Meriden (CVP)

Uncorrected Dec = -0.95
Uncorrected Inc = 61.30
Latitude = 53.60
Longitude = -1.73

Kai = 47.60
Latitude of pole = 78.78
Beta1 = -3.61
Longitude of pole = 181.88
Geomag colat = 48.77
Corrected Inc = 60.29
Beta 2 = -3.50
Corrected Dec = -0.91

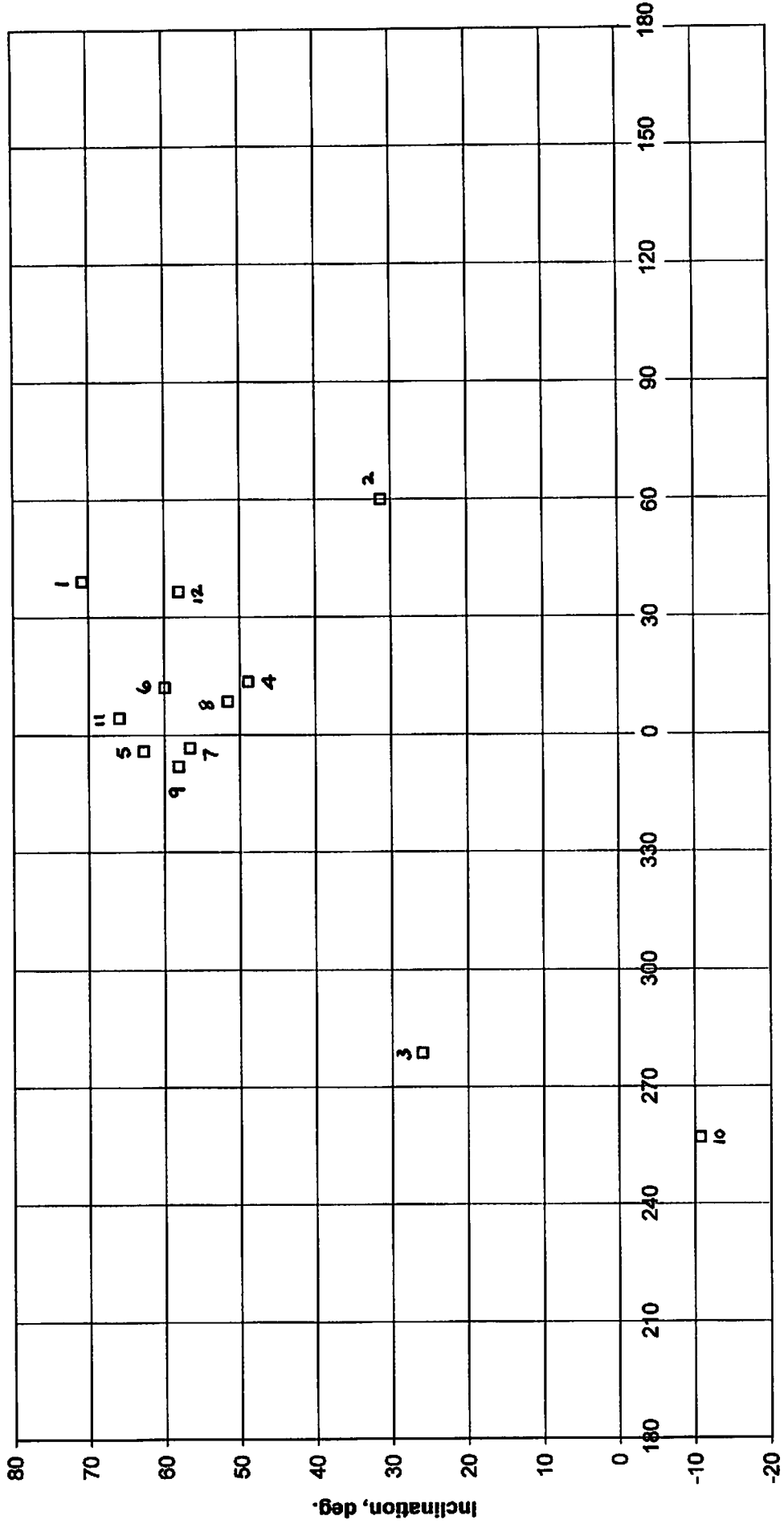
FINAL RESULT

Corrected Dec = -0.91
Corrected Inc = 60.29
Alpha95 = 5.15

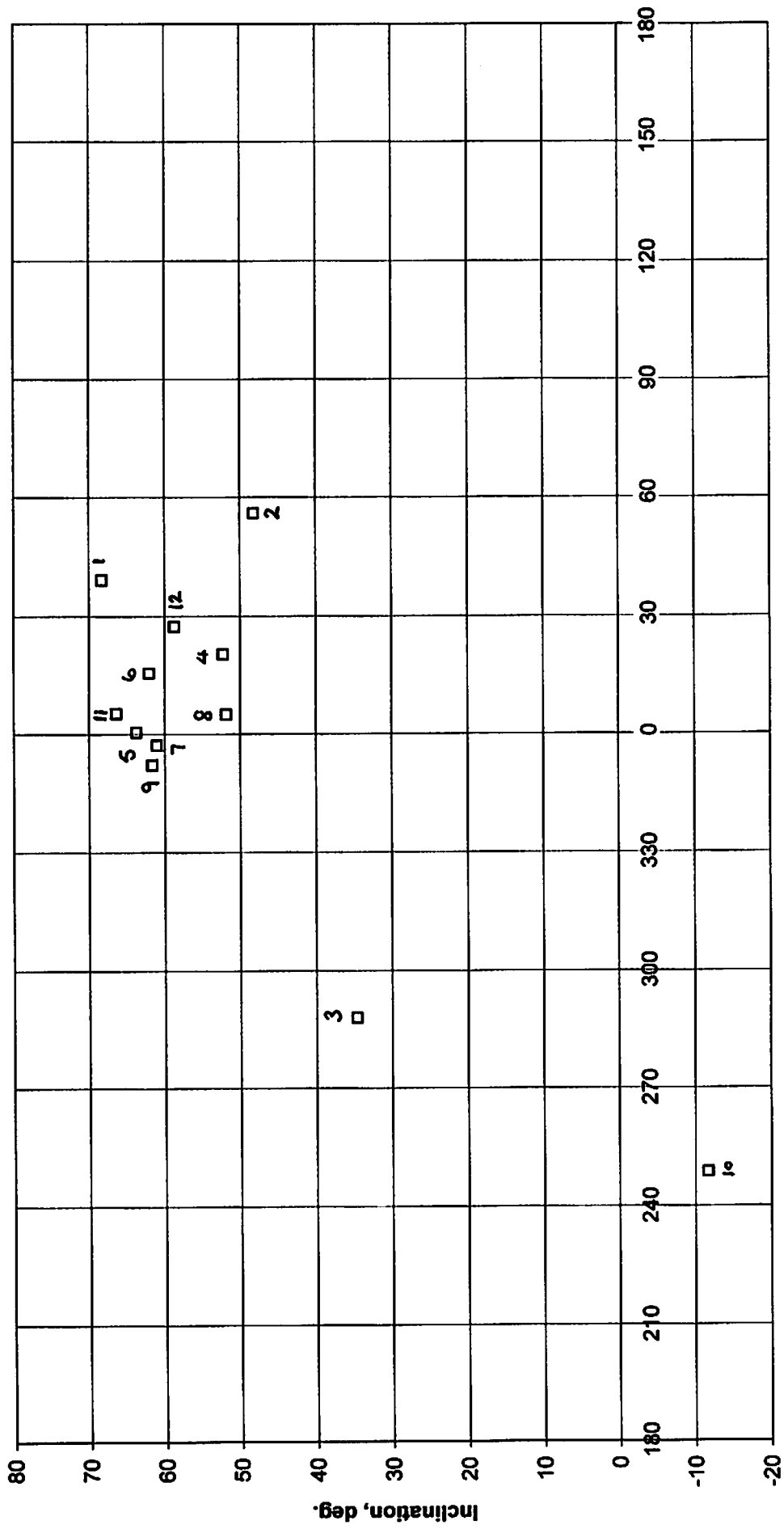
ERROR BARS

Alpha95		Alpha68	
$\delta Dec = \pm$	10.39	$\delta Dec = \pm$	5.80
$\delta Inc = \pm$	5.15	$\delta Inc = \pm$	2.87

INITIAL SAMPLE SCATTER

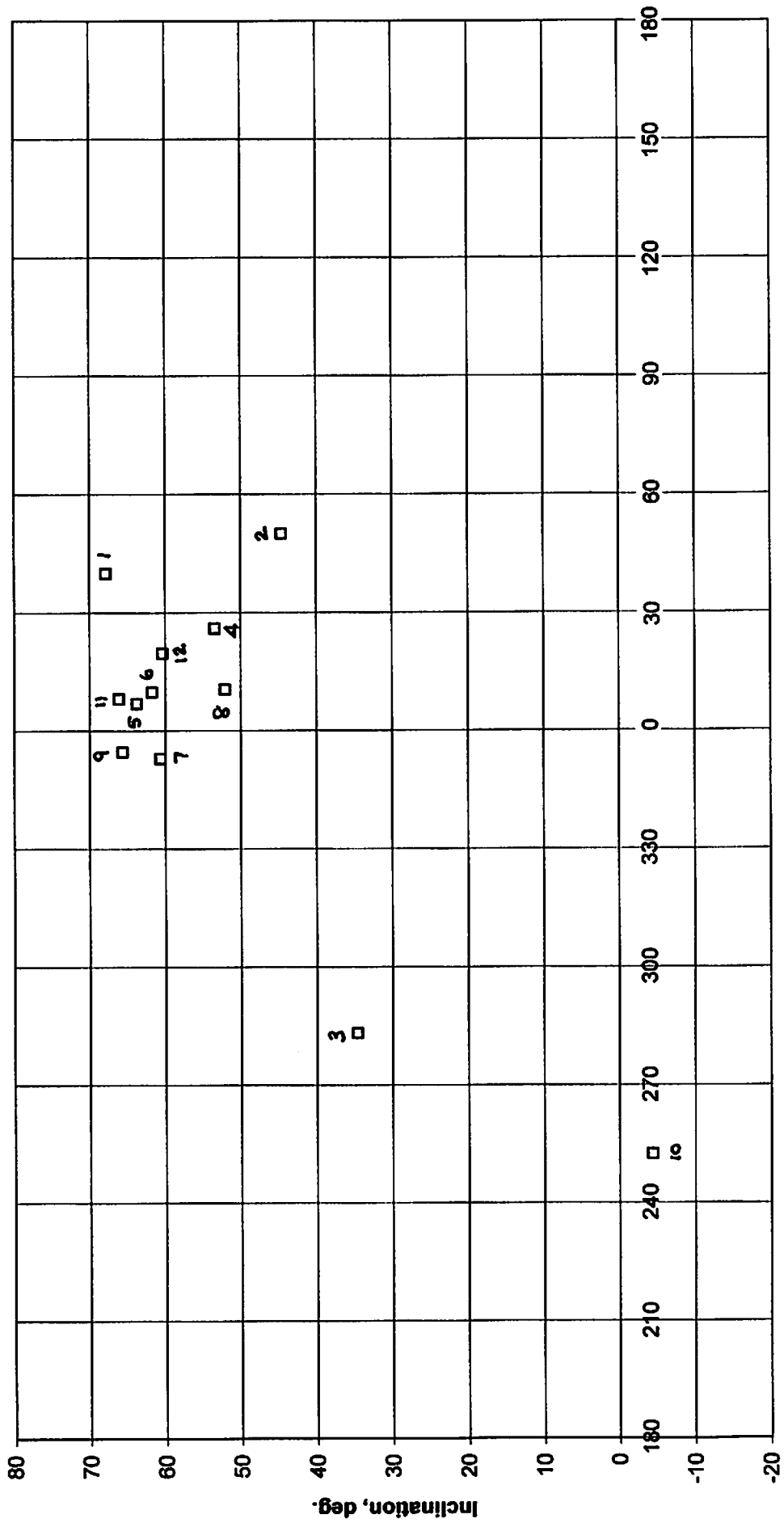


5mT DEMAGNETISED SAMPLE SCATTER



Declination, deg.

7.5mT DEMAGNETISED SAMPLE SCATTER



Declination, deg.

PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

Sample No. 3

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	9.88	1.00	1.35	-8.77	4.33	278.80	26.00
2.5	10.04	1.02	2.30	-7.66	6.07	286.70	37.20
5.0	9.10	0.92	2.32	-7.12	5.17	288.10	34.60
7.5	7.24	0.73	1.38	-5.80	4.12	283.40	34.60
10.0	5.46	0.55	0.80	-4.18	3.42	280.90	38.80
15.0	2.71	0.27	0.38	-1.78	2.00	282.20	47.80
20.0	1.39	0.14	0.27	-0.71	1.17	291.10	56.90
30.0	0.71	0.07	0.12	-0.37	0.60	287.60	57.10
40.0	0.61	0.06	0.08	-0.33	0.51	283.40	56.80
60.0	0.49	0.05	0.12	-0.29	0.37	291.80	49.50
80.0	0.41	0.04	0.04	-0.30	0.27	278.00	41.60
100.0	0.29	0.03	0.15	-0.15	0.19	315.80	42.80

Sample No. 5

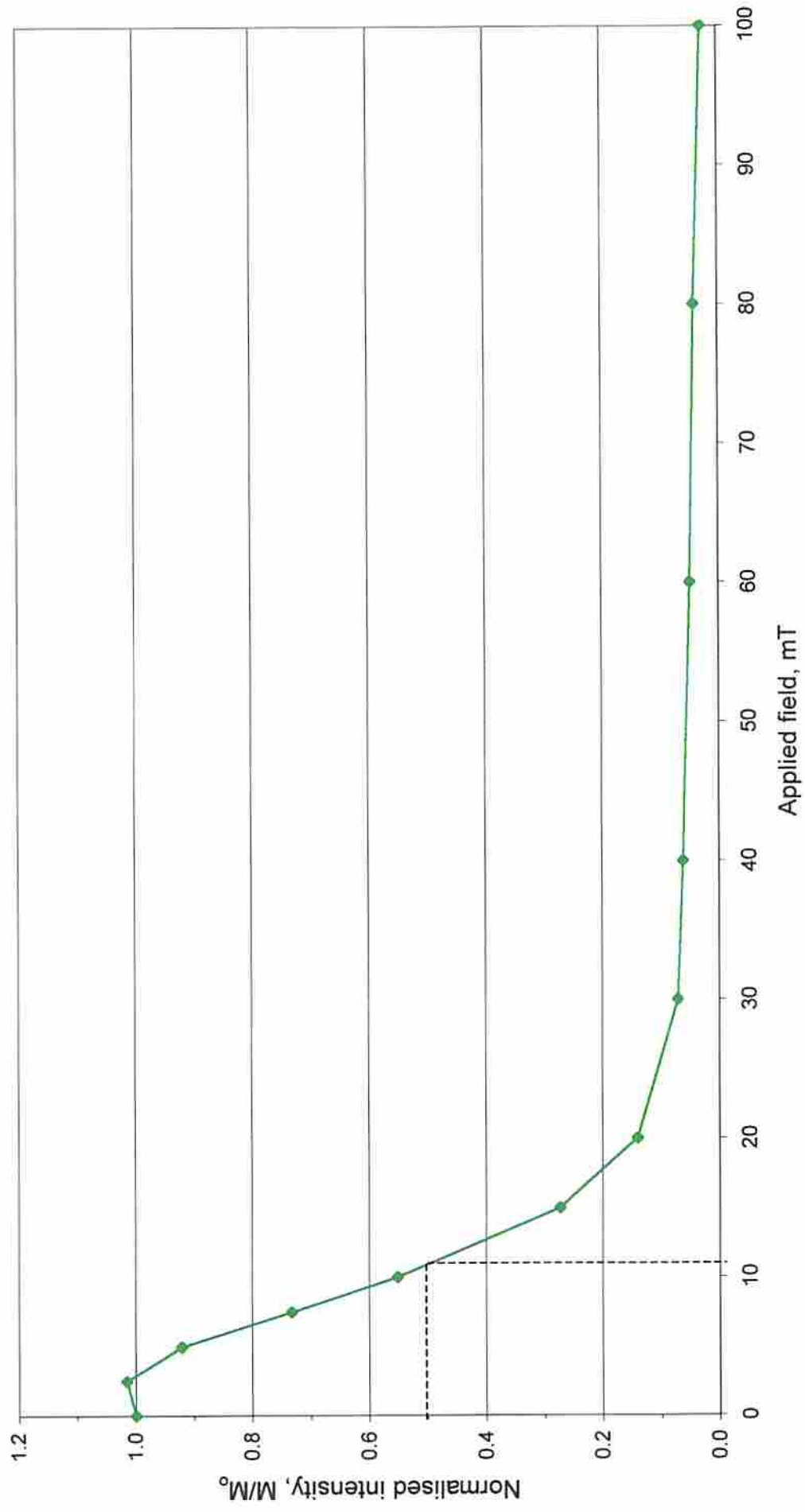
Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	262.99	1.00	120.31	-8.23	233.71	356.10	62.70
2.5	283.12	1.08	123.97	1.04	254.54	0.50	64.00
5.0	276.92	1.05	122.85	1.28	248.18	0.60	63.70
7.5	261.60	0.99	115.18	14.29	234.45	7.10	63.70
10.0	231.82	0.88	101.11	5.61	208.53	3.20	64.10
15.0	135.24	0.51	62.04	2.45	120.14	2.30	62.70
20.0	67.15	0.26	30.67	0.39	59.74	0.70	62.80
30.0	32.24	0.12	14.73	-0.19	28.68	359.30	62.80
40.0	26.48	0.10	12.19	0.14	23.51	0.60	62.60
60.0	23.54	0.09	12.10	-0.23	20.18	358.90	59.00
80.0	21.60	0.08	11.12	0.25	18.52	1.30	59.00
100.0	19.73	0.08	10.05	0.94	16.95	5.30	59.20

Sample No.

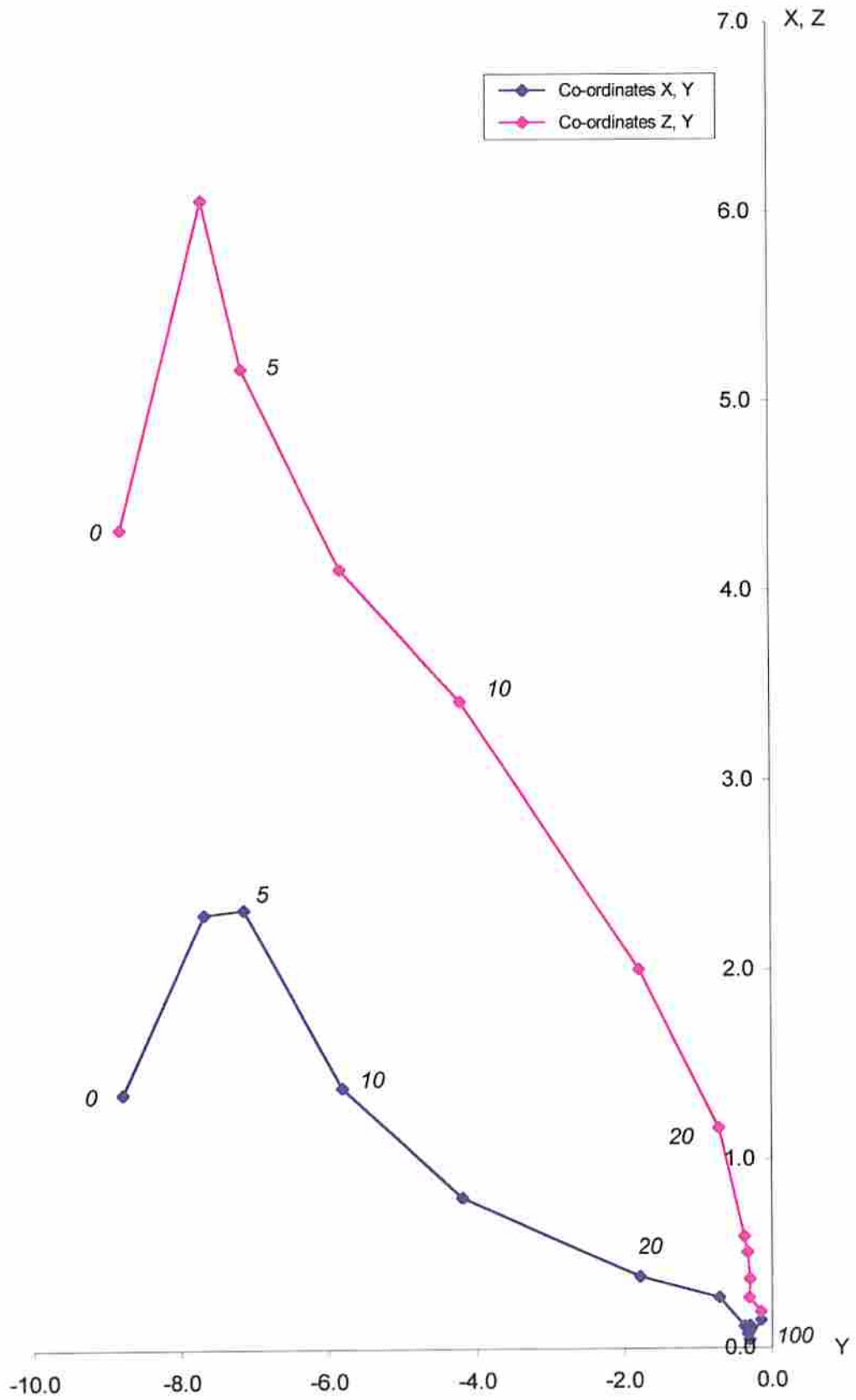
8

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	30.70	1.00	18.87	2.84	24.05	8.60	51.60
2.5	36.69	1.20	22.13	3.27	29.08	8.40	52.40
5.0	32.41	1.06	19.92	1.78	25.50	5.10	51.90
7.5	25.02	0.82	15.11	2.82	19.75	10.60	52.10
10.0	17.81	0.58	10.68	0.66	14.24	3.60	53.10
15.0	8.44	0.27	5.00	0.22	6.79	2.50	53.60
20.0	3.97	0.13	2.47	-0.20	3.10	355.40	51.40
30.0	1.16	0.04	0.79	-0.04	0.85	357.00	47.00
40.0	0.72	0.02	0.34	-0.23	0.60	325.80	55.90
60.0	0.69	0.02	0.52	-0.02	0.45	358.00	40.90
80.0	0.56	0.02	0.27	-0.07	0.48	345.00	59.80
100.0	0.54	0.02	0.40	-0.10	0.35	346.50	40.30

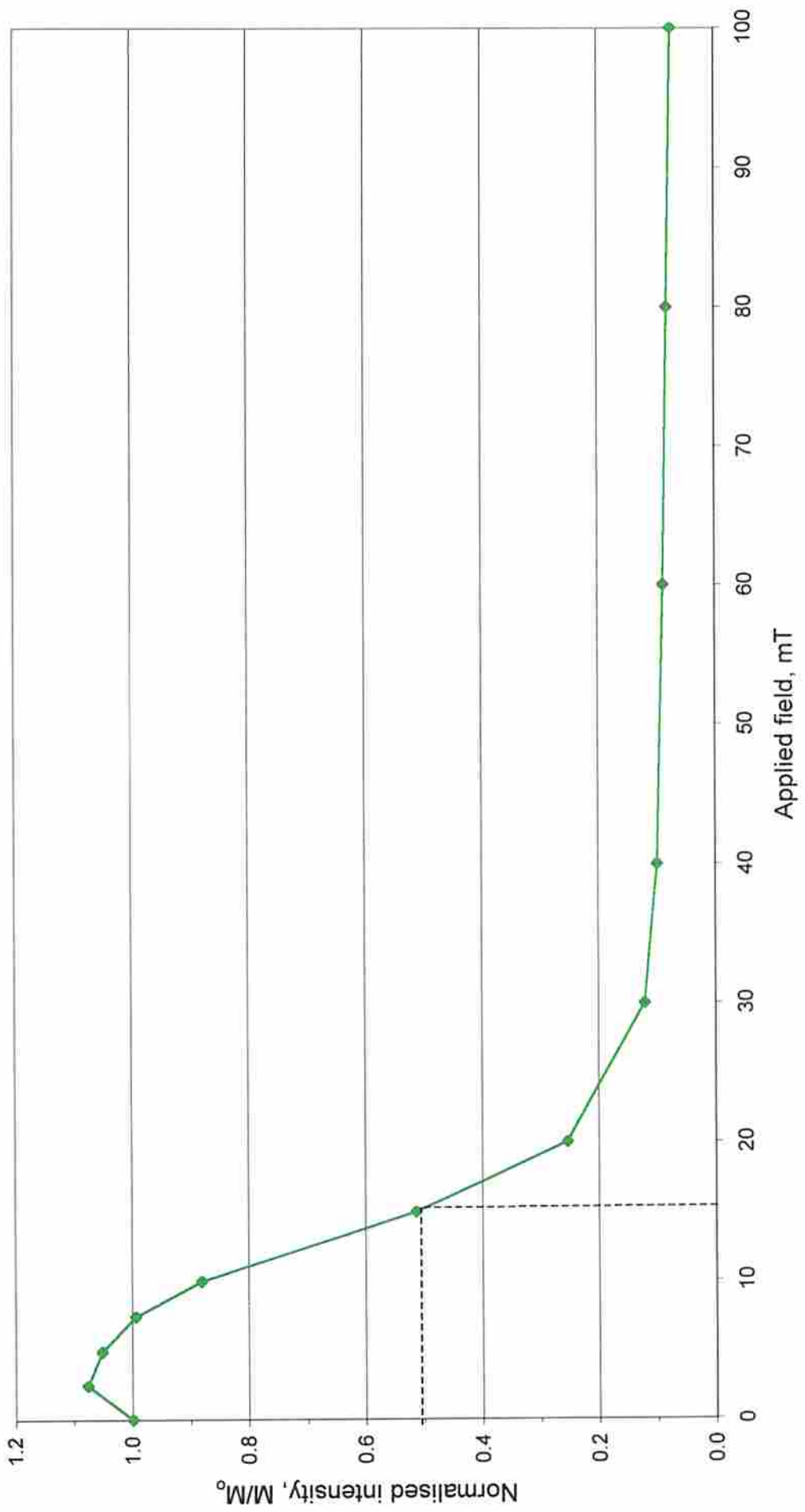
MYERS WOOD - SAMPLE POINT G3 DEMAGNETISATION: INTENSITY SPECTRUM



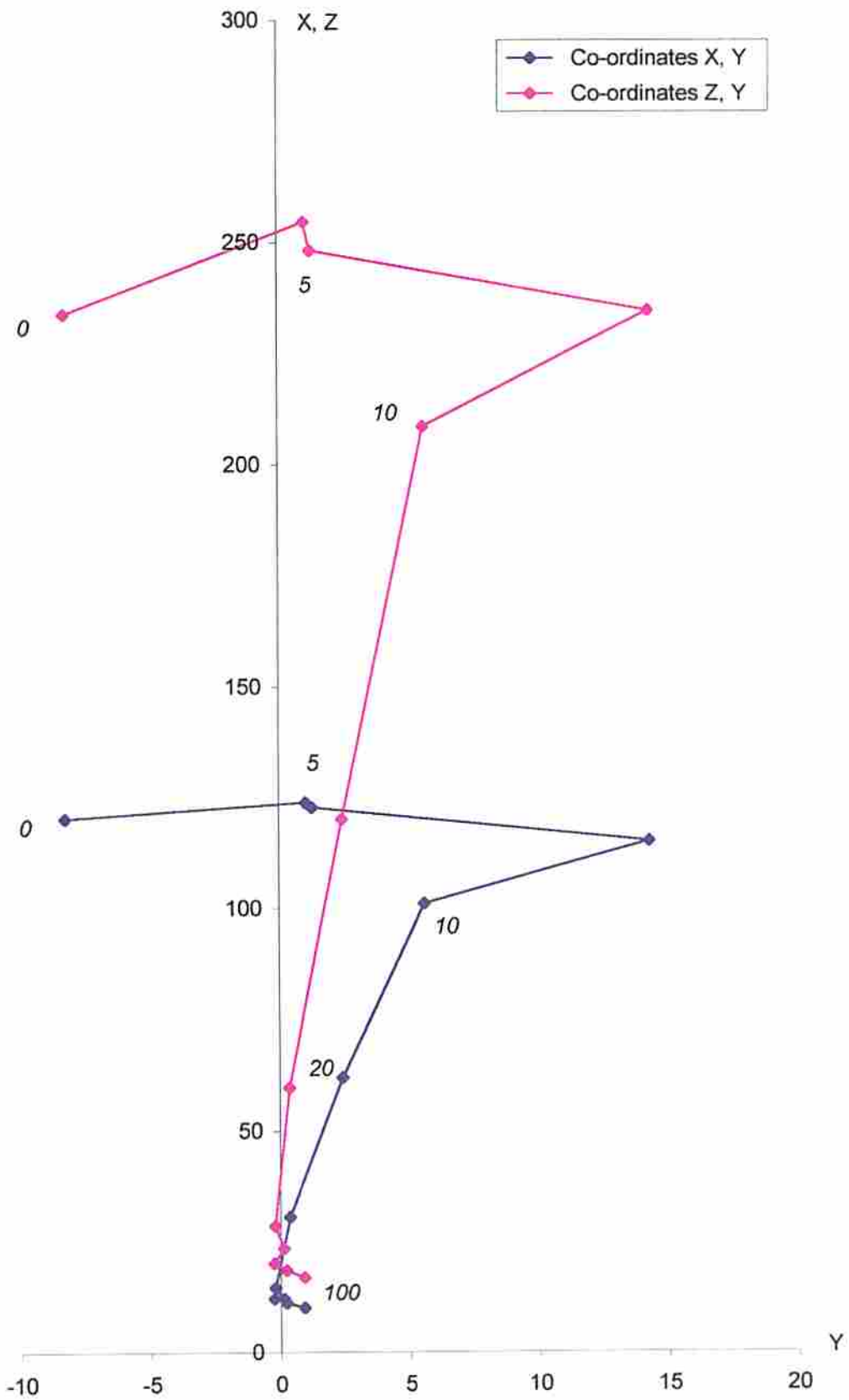
MYERS WOOD - SAMPLE POINT G3 - ZIJDERVELD PLOT



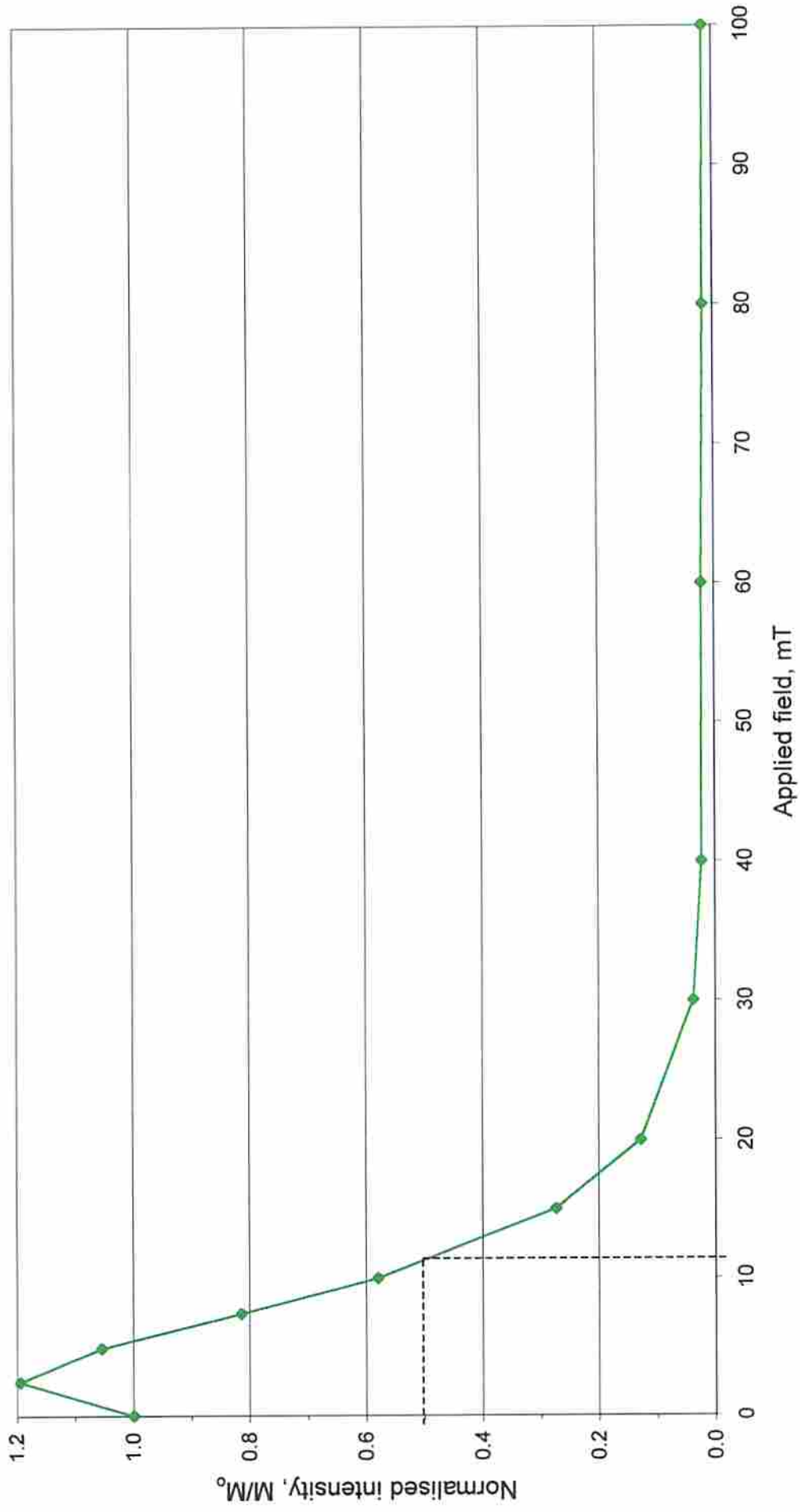
MYERS WOOD - SAMPLE POINT G5 DEMAGNETISATION: INTENSITY SPECTRUM



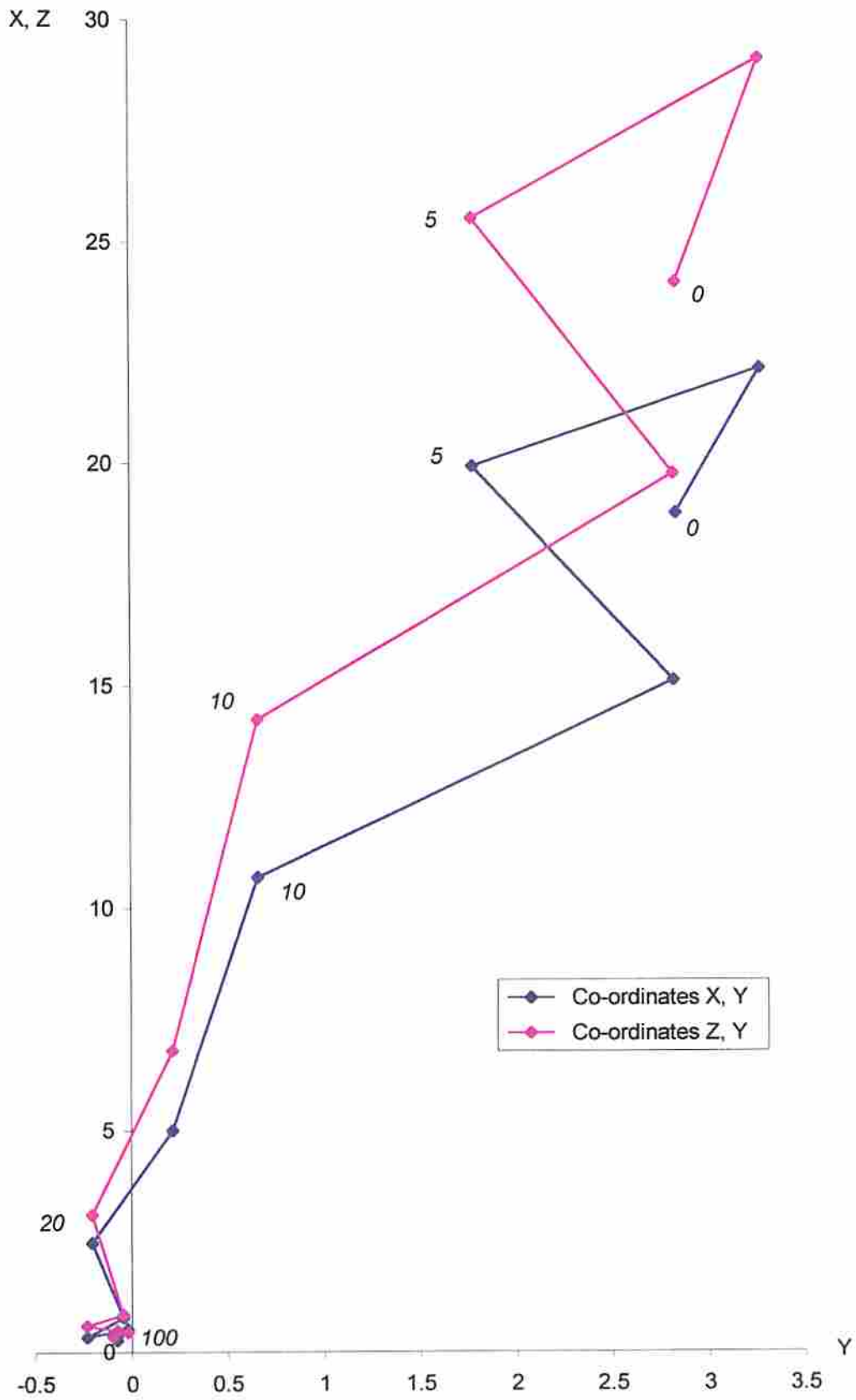
MYERS WOOD - SAMPLE POINT G5 - ZIJDERVELD PLOT

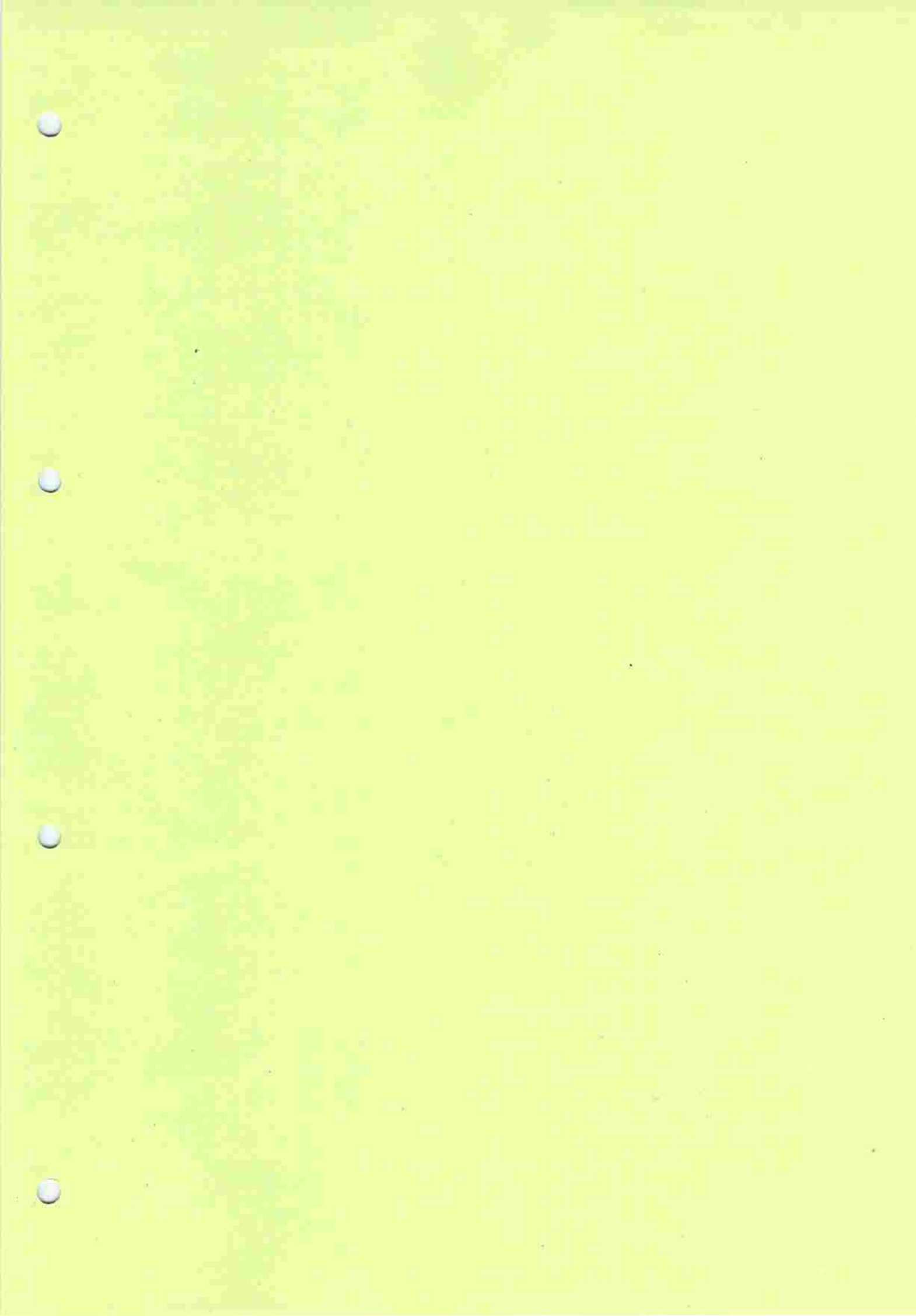


MYERS WOOD - SAMPLE POINT G8 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT G8 - ZIJDERVELD PLOT





SITE INFORMATION

Site Name Myers Wood
 Area Trench L
 Context No L112 to L115
 Description Hearth/furnace
 Latitude (+ve N) 53.60
 Longitude (+ve E) -1.73
 Magnetic Var -3.72
 Date Sampled 27/8/03

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments
	D	I	Int		D	I	Int		
	degs.	degs.	$mA\ m^{-1}$	mT	degs.	degs.	$mA\ m^{-1}$	Y/N	
1	283.5	81.20	7.87	2.5	323.00	78.20	7.86	Y	Outlier
2	266.90	60.40	3.21	2.5	263.00	66.30	3.39		Outlier
3	54.20	67.80	2.54	2.5	94.90	74.90	2.95		Outlier
4	29.90	60.80	41.68	2.5	25.20	65.50	44.80	Y	
5	39.40	60.20	36.01	2.5	29.20	71.40	38.83		
6	173.90	79.40	6.54	2.5	181.00	74.60	7.16		Outlier
7	30.00	58.30	91.43	2.5	32.10	60.50	94.62		
8	102.00	55.40	1.54	2.5	122.80	63.30	1.48		Outlier
9	29.30	60.20	43.90	2.5	26.40	65.00	43.72		
10	30.30	64.70	14.92	2.5	14.40	63.30	18.95		
11	322.30	76.70	6.18	2.5	277.00	76.80	7.28		Outlier
12	33.60	61.10	130.71	2.5	28.30	64.30	130.00	Y	
13	26.40	62.90	46.68	2.5	25.80	68.10	48.76		

STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	degs.	degs.			
1	283.50	81.20	0.03571	-0.14876	0.98823
2	286.90	60.40	-0.02671	-0.49322	0.86949
3	54.20	67.80	0.22102	0.30645	0.92587
4	29.90	60.80	0.42292	0.24319	0.87292
5	39.40	60.20	0.38403	0.31544	0.86777
6	173.90	79.40	-0.18291	0.01955	0.98294
7	30.00	58.30	0.45507	0.26274	0.85081
8	102.00	55.40	-0.11806	0.55543	0.82314
9	29.30	60.20	0.43340	0.24321	0.86777
10	30.30	64.70	0.36898	0.21561	0.90408
11	322.30	76.70	0.18202	-0.14068	0.97318
12	33.60	61.10	0.40254	0.26744	0.87546
13	26.40	62.90	0.40804	0.20255	0.89021

Number = 13
 Sum x = 2.98604
 Sum y = 1.84897
 Sum z = 11.69187
 R = 12.20799
 x bar = 0.24460
 y bar = 0.15146
 z bar = 0.95772

Mean Dec = 31.77
 Mean Inc = 73.28
 Alpha95 = 11.01

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	degs.	degs.			
1					
2					
3					
4	25.20	65.50	0.37523	0.17657	0.90996
5					
6					
7					
8					
9	26.40	65.00	0.37854	0.18791	0.90631
10	14.40	63.30	0.43520	0.11174	0.89337
11					
12	28.30	64.30	0.38183	0.20559	0.90108
13	25.80	68.10	0.33581	0.16234	0.92784

Number = 5
 Sum x = 1.90661
 Sum y = 0.84415
 Sum z = 4.53855
 R = 4.99462
 x bar = 0.38173
 y bar = 0.16901
 z bar = 0.90869

Mean Dec = 23.88
 Mean Inc = 65.32
 Alpha95 = 2.81

Alpha68 = 1.53

CORRECTIONS

Mean Dec = 23.88
Mean Inc = 65.32

Correction for magnetic variation

Mean Dec = 20.16
Mean Inc = 65.32

Correction to Meriden (CVP)

Uncorrected Dec = 20.16
Uncorrected Inc = 65.32
Latitude = 53.60
Longitude = -1.73

Kai = 42.58
Latitude of pole = 75.83
Beta1 = 72.34
Longitude of pole = 105.93
Geomag colat = 43.66
Corrected Inc = 64.50
Beta 2 = 72.45
Corrected Dec = 19.76

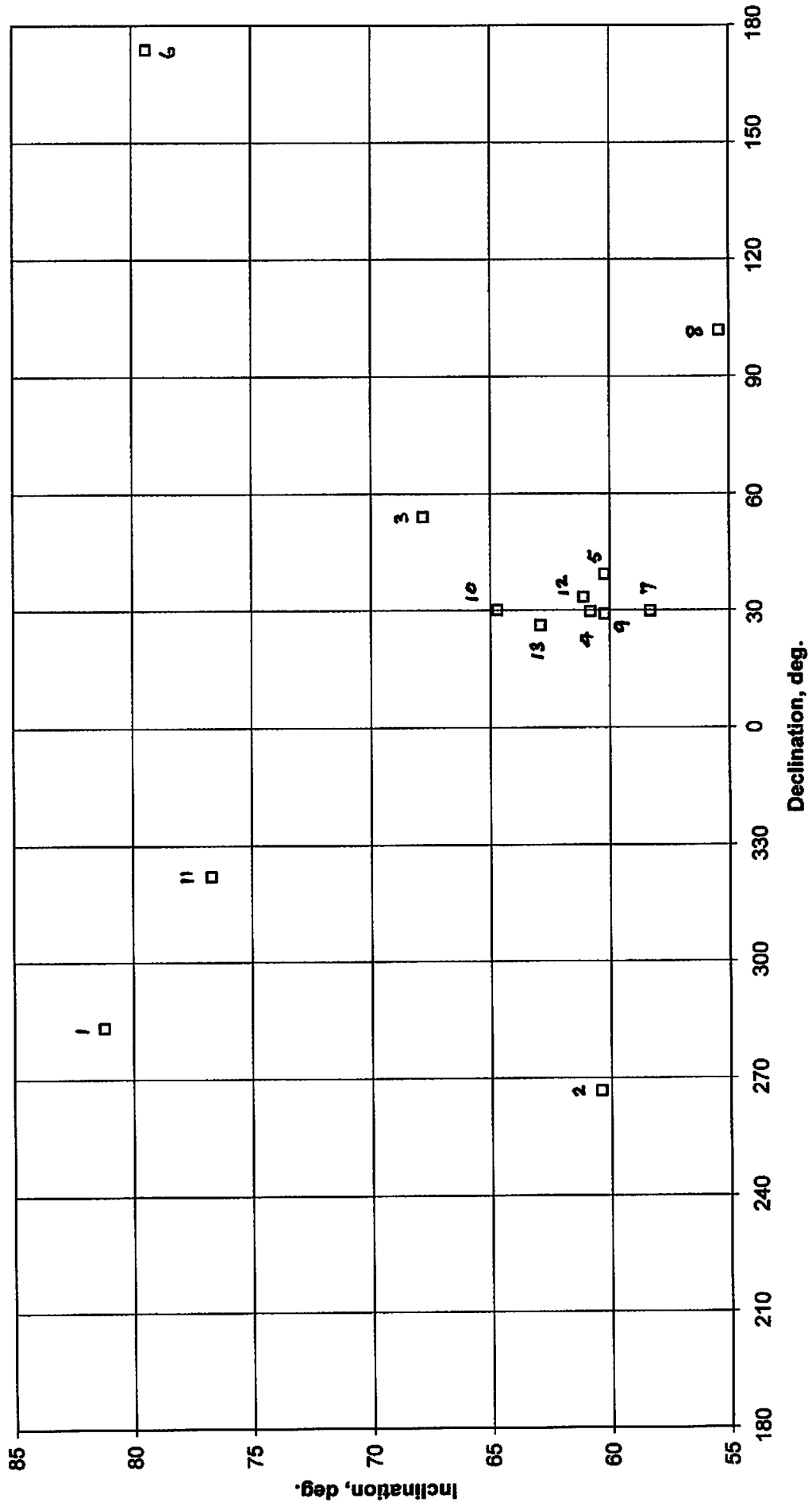
FINAL RESULT

Corrected Dec = 19.76
Corrected Inc = 64.50
Alpha95 = 2.81

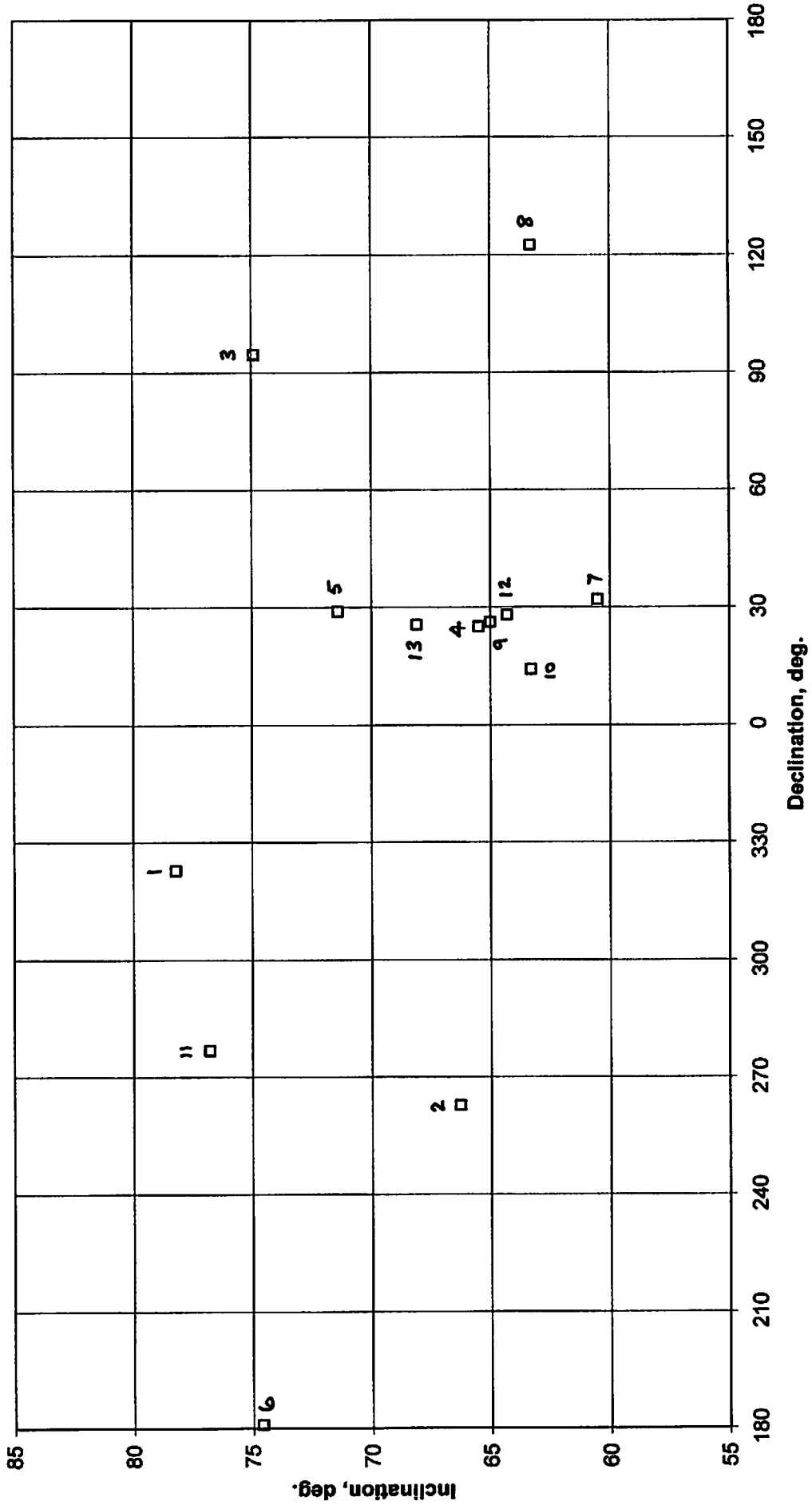
ERROR BARS

Alpha95		Alpha68	
δDec = ±	6.52	δDec = ±	3.55
δInc = ±	2.81	δInc = ±	1.53

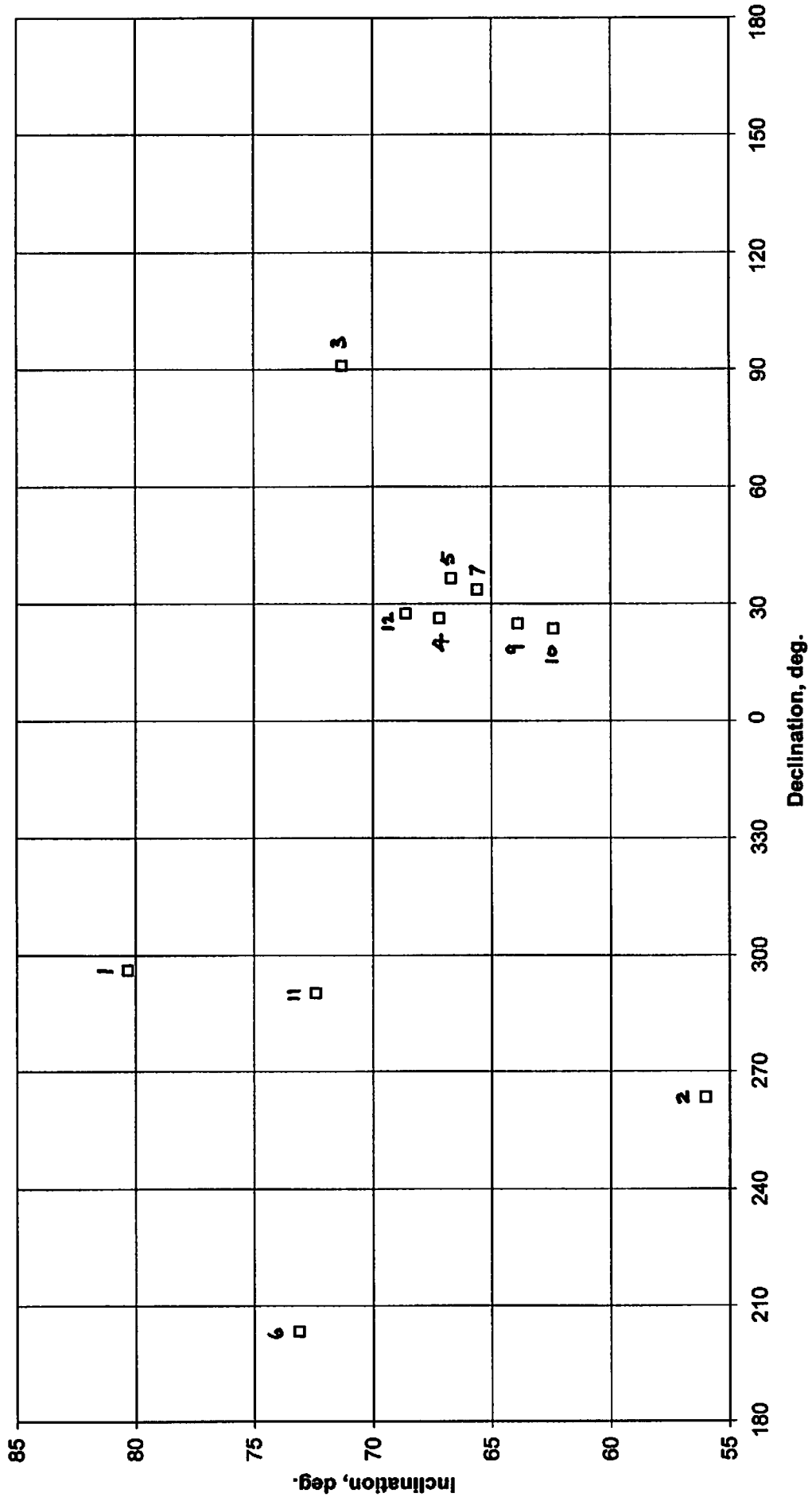
INITIAL SAMPLE SCATTER



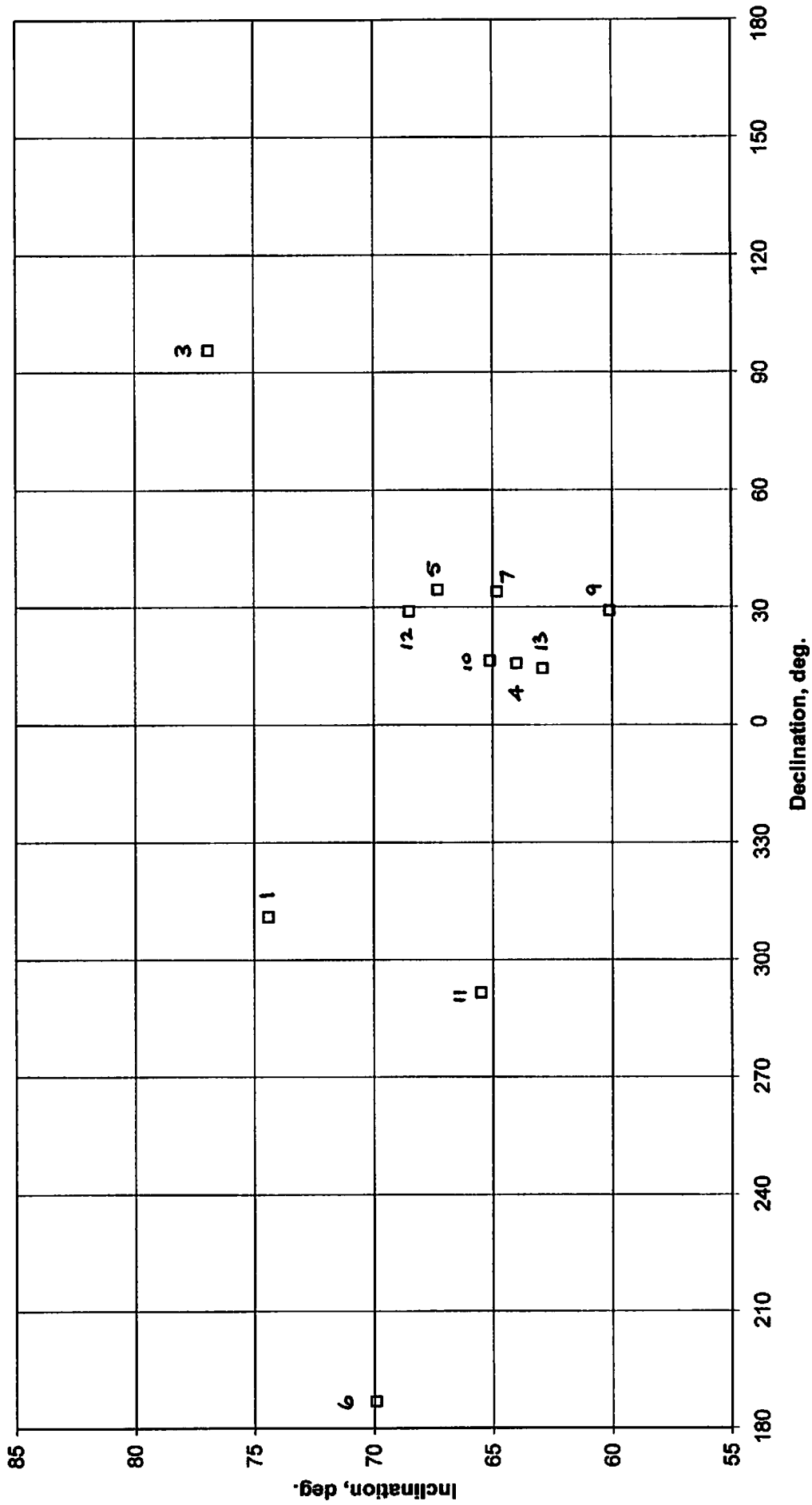
2.5mT DEMAGNETISED SAMPLE SCATTER



5mT DEMAGNETISED SAMPLE SCATTER



7.5mT DEMAGNETISED SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

Sample No. 1

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	8.32	1.00	0.48	-1.13	8.23	292.80	81.50
2.5	7.86	0.95	1.28	-0.97	7.70	323.00	78.20
5.0	6.86	0.82	0.51	-1.03	6.76	296.40	80.30
7.5	6.00	0.72	1.06	-1.22	5.78	311.10	74.40
10.0	5.24	0.63	0.49	-1.34	5.04	290.10	74.10
15.0	3.88	0.47	0.31	-1.32	3.64	283.20	69.60
20.0	2.76	0.33	0.28	-1.17	2.48	283.70	64.20
30.0	1.60	0.19	0.19	-0.74	1.41	284.50	61.60
40.0	1.32	0.16	0.01	-0.69	1.12	271.00	58.30
60.0	1.14	0.14	0.03	-0.58	0.98	272.60	59.20
80.0	1.09	0.13	0.04	-0.59	0.91	273.90	56.90
100.0	0.97	0.12	0.00	-0.49	0.84	269.80	59.80

Sample No. 4

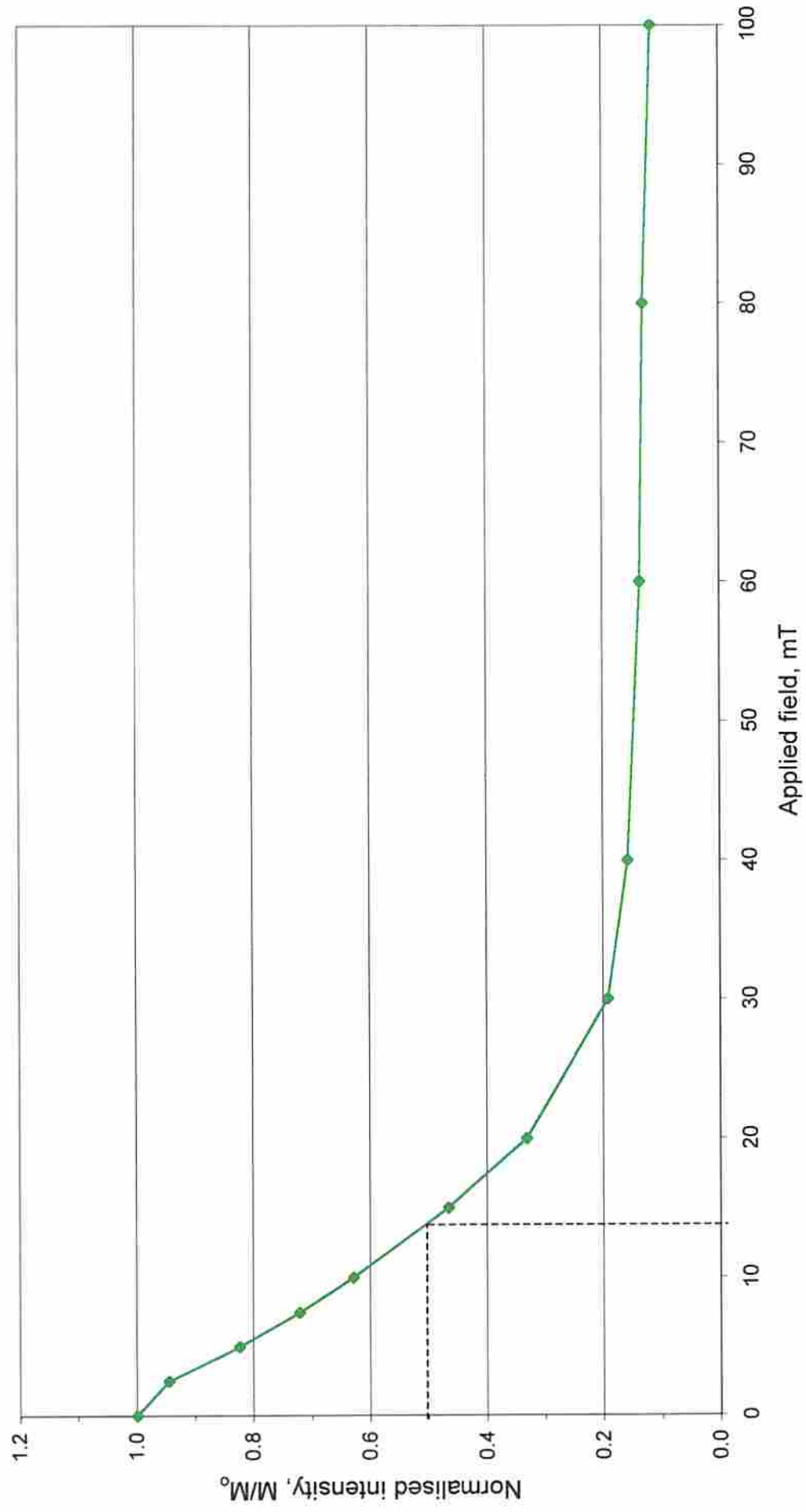
Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	46.30	1.00	15.85	7.60	42.83	25.60	67.70
2.5	44.80	0.97	16.80	7.92	40.76	25.20	65.50
5.0	37.78	0.82	13.12	6.53	34.82	26.50	67.20
7.5	29.94	0.65	12.60	3.61	26.92	16.00	64.00
10.0	22.05	0.48	8.50	1.78	20.27	11.80	66.80
15.0	10.12	0.22	4.42	1.08	9.04	13.80	63.30
20.0	3.87	0.08	1.58	0.06	3.53	2.20	65.90
30.0	1.17	0.03	0.60	-0.09	1.00	351.20	58.80
40.0	0.88	0.02	0.47	-0.13	0.73	344.90	56.20
60.0	0.74	0.02	0.36	-0.23	0.61	327.60	55.00
80.0	0.69	0.01	0.39	-0.03	0.56	354.90	55.20
100.0	0.62	0.01	0.28	-0.25	0.49	318.00	52.60

Sample No.

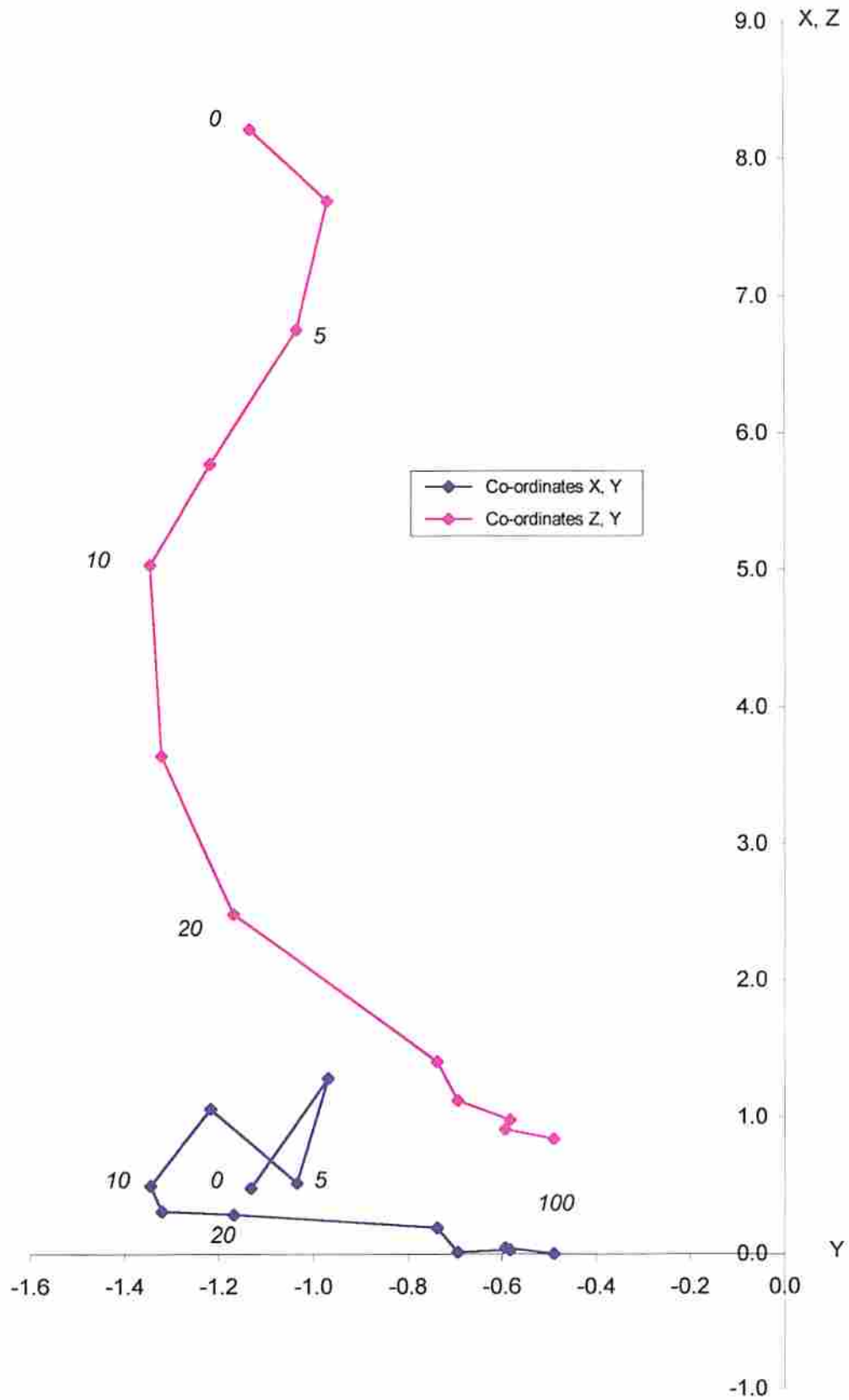
12

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec.	Inc.
			X	Y	Z	<i>degs.</i>	<i>degs.</i>
0.0	132.42	1.00	49.26	28.01	119.69	29.60	64.70
2.5	130.00	0.98	49.66	26.78	117.11	28.30	64.30
5.0	115.39	0.87	37.24	19.51	107.46	27.70	68.60
7.5	94.81	0.72	30.40	16.92	88.20	29.10	68.50
10.0	72.18	0.55	28.87	13.39	64.78	24.90	63.80
15.0	30.89	0.23	12.36	2.81	28.16	12.80	65.80
20.0	12.70	0.10	4.78	1.81	11.62	20.80	66.20
30.0	5.71	0.04	2.27	0.67	5.20	16.40	65.50
40.0	4.37	0.03	1.80	0.10	3.98	3.20	65.60
60.0	3.36	0.03	1.46	-0.06	3.02	357.50	64.10
80.0	3.01	0.02	1.27	0.18	2.73	8.10	64.90
100.0	2.78	0.02	1.15	-0.13	2.53	353.40	65.40

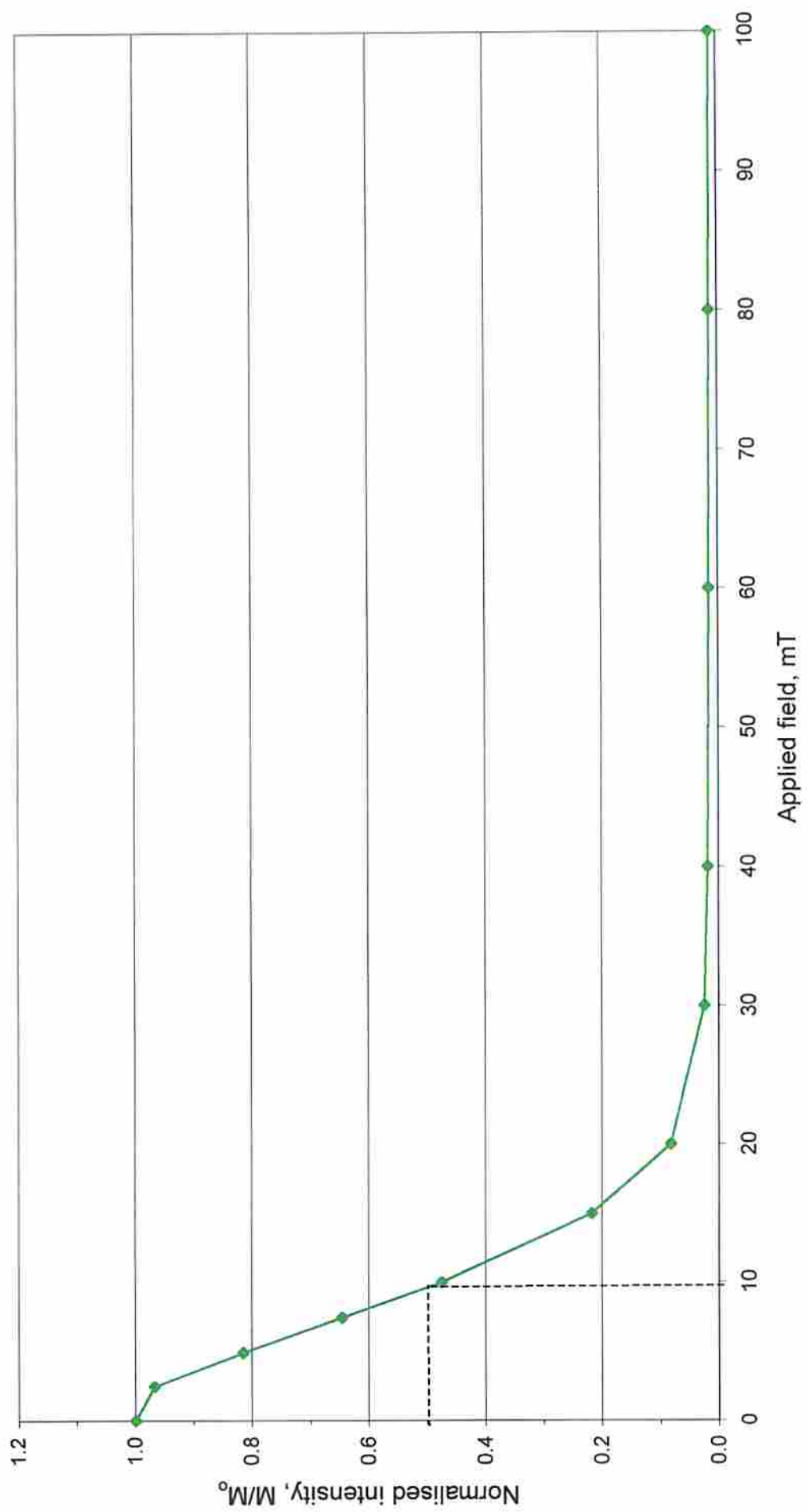
MYERS WOOD - SAMPLE POINT L1 DEMAGNETISATION: INTENSITY SPECTRUM



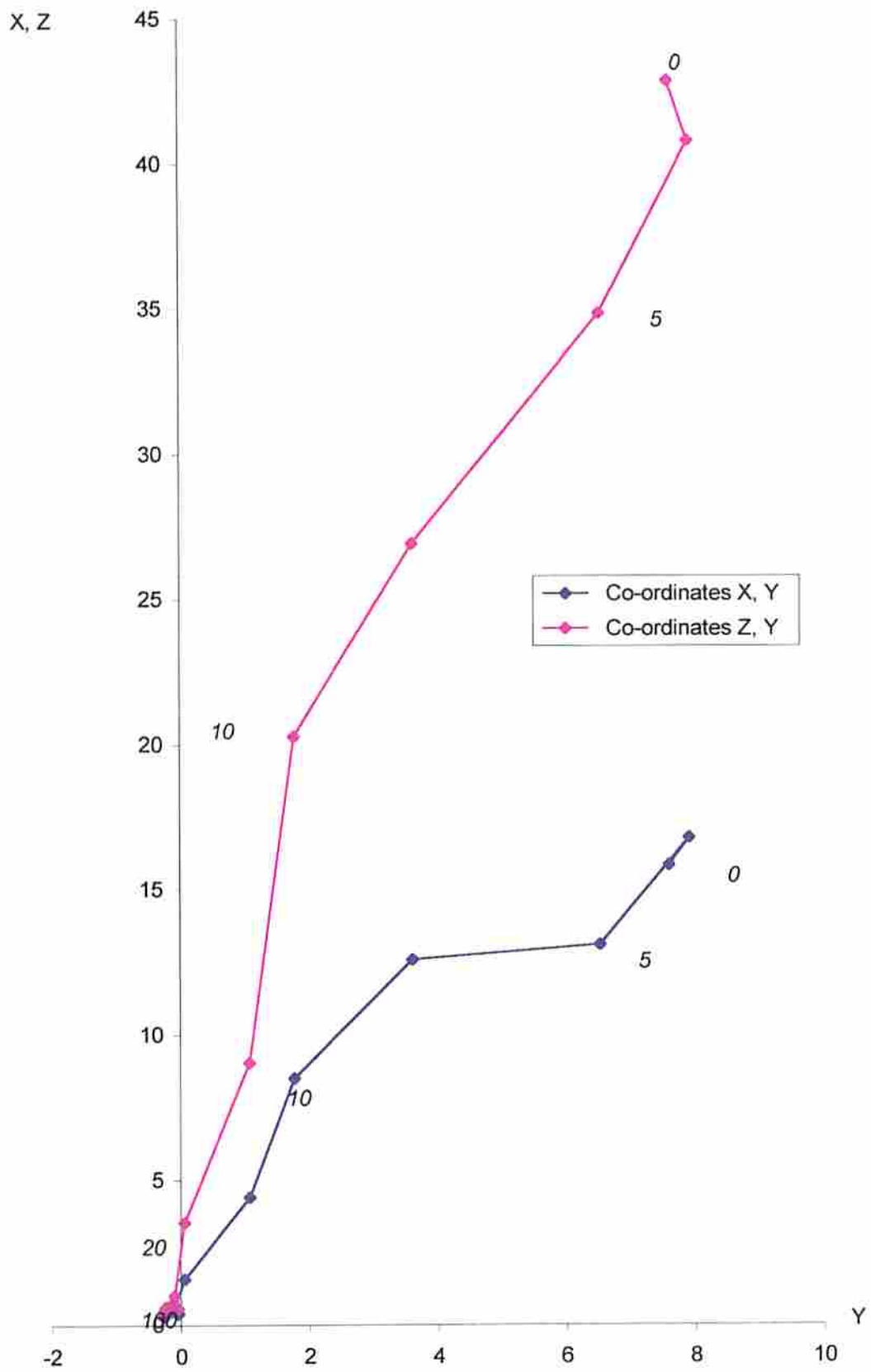
MYERS WOOD - SAMPLE POINT L1 - ZIJDERVELD PLOT



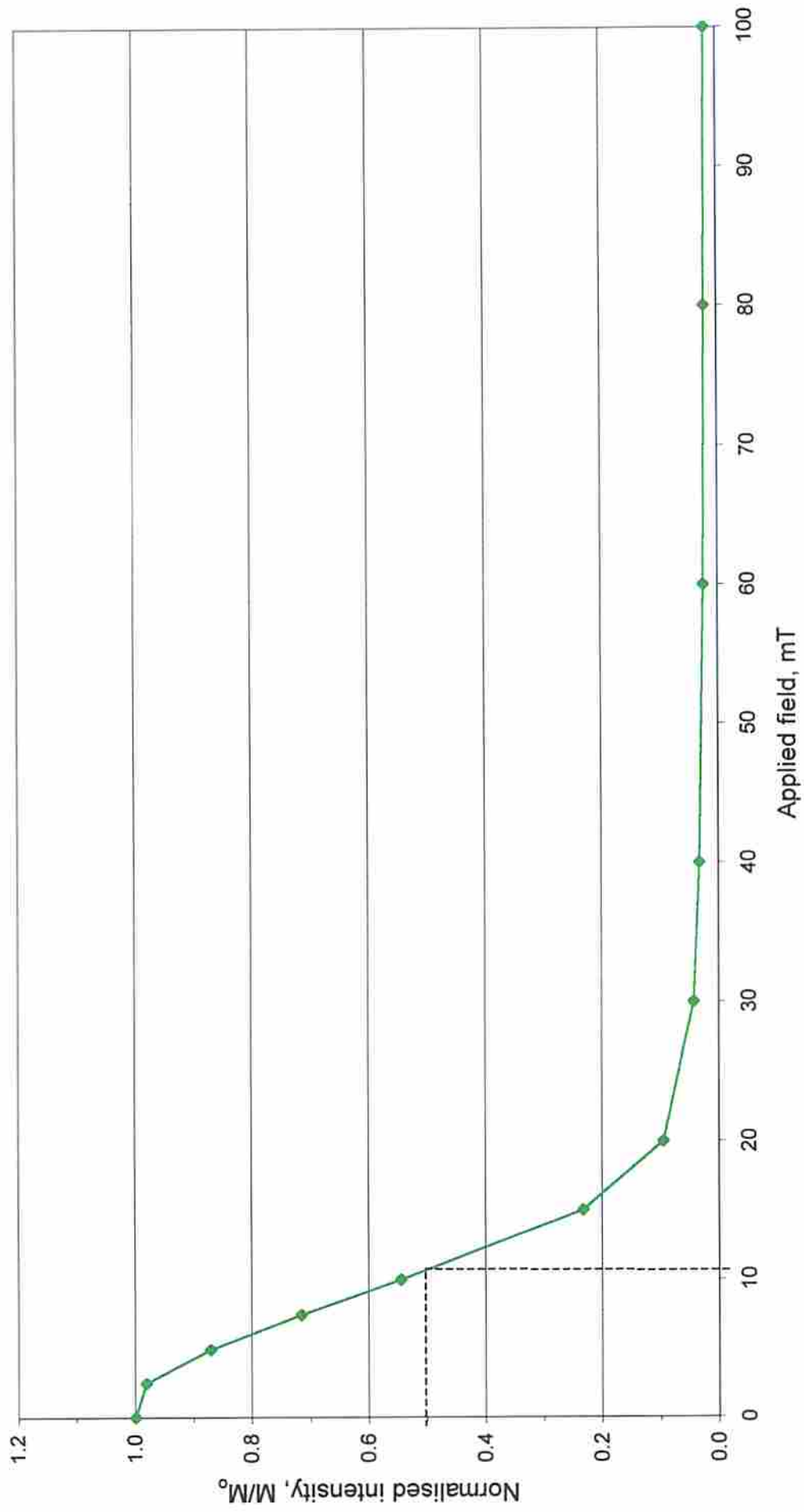
MYERS WOOD - SAMPLE POINT L4 DEMAGNETISATION: INTENSITY SPECTRUM



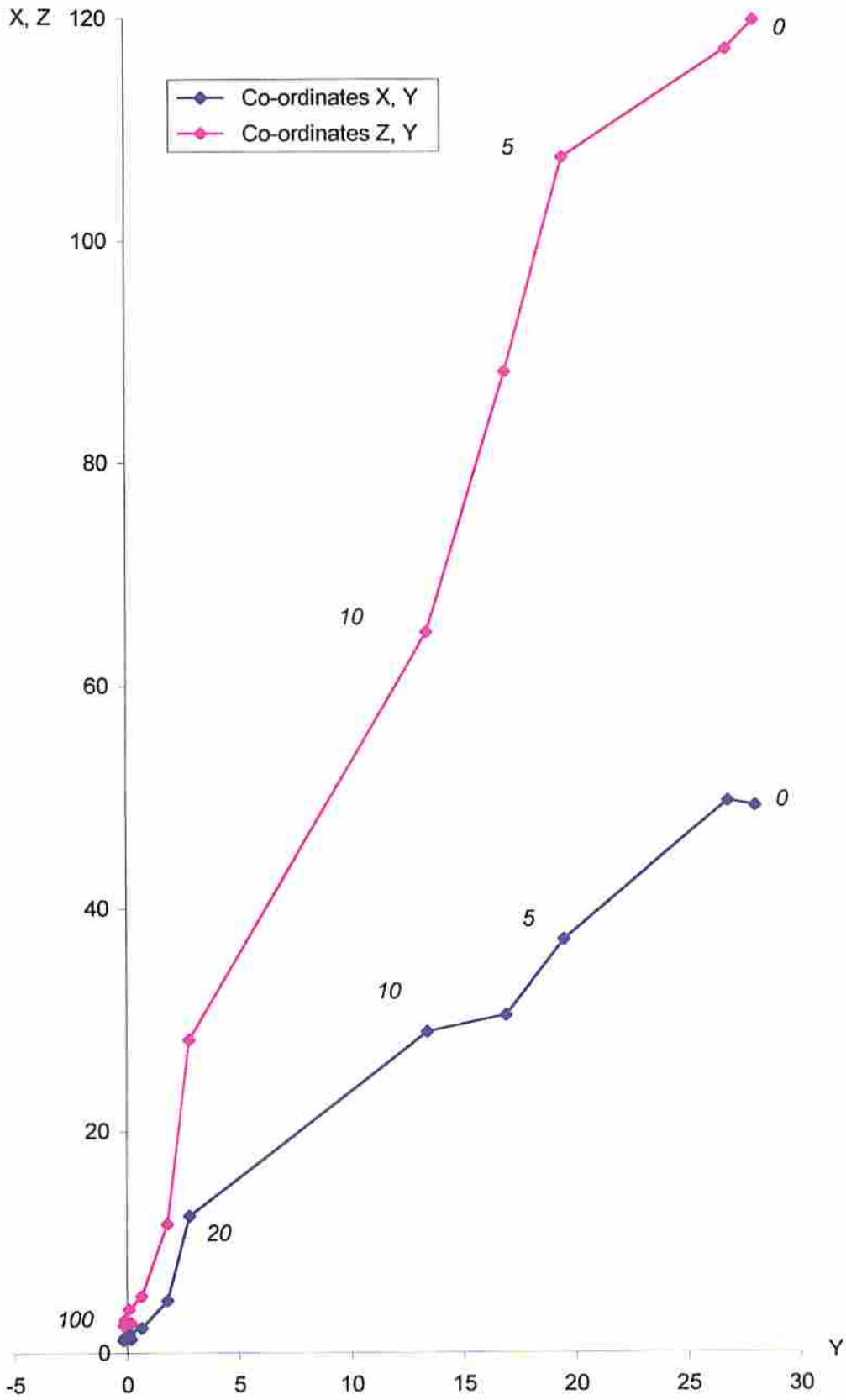
MYERS WOOD - SAMPLE POINT L4 - ZIJDERVELD PLOT



MYERS WOOD - SAMPLE POINT L12 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT L12 - ZIJDERVELD PLOT



STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	degs.	degs.			
1	8.60	52.80	0.59780	0.09041	0.79653
2	340.70	58.10	0.49874	-0.17466	0.84897
3	31.60	53.30	0.50901	0.31315	0.80178
4	191.80	-53.10	-0.58773	-0.12278	-0.79968
5	123.00	-65.00	-0.23017	0.35444	-0.90631
6	101.20	-71.90	-0.06034	0.30476	-0.95052
7	26.00	5.30	0.89495	0.43650	0.09237
8	314.60	-60.80	0.34255	-0.34737	-0.87292
9	353.10	59.70	0.50087	-0.06081	0.88340
10	187.20	75.50	-0.24416	0.05547	0.96815
11	91.80	67.70	-0.01192	0.37927	0.92521
12	47.40	56.00	0.37850	0.41162	0.82904
13	21.70	78.80	0.18047	0.07182	0.98096

Number = 13
 Sum x = 2.76858
 Sum y = 1.71201
 Sum z = 3.57696
 R = 4.83639
 x bar = 0.57245
 y bar = 0.35398
 z bar = 0.73959

Mean Dec = 31.73
 Mean Inc = 47.70
 Alpha95 = 58.58

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	352.50	52.50	0.60355	-0.07946	0.79335
2	255.20	43.30	-0.18591	-0.70363	0.68582
3	91.90	70.30	-0.01118	0.33691	0.94147
4	125.40	81.20	-0.08862	0.12470	0.98823
5	35.30	69.90	0.28047	0.19859	0.93909
6	191.80	68.40	-0.36035	-0.07528	0.92978
7	27.80	62.60	0.40708	0.21463	0.88782
8	148.80	27.00	-0.76214	0.46157	0.45399
9	353.30	60.00	0.49659	-0.05834	0.86603
10	25.50	65.80	0.36999	0.17648	0.91212
11	265.90	74.90	-0.01863	-0.25984	0.96547
12	353.80	74.30	0.26902	-0.02922	0.96269
13	17.20	60.90	0.46459	0.14381	0.87377

Number = 13
 Sum x = 1.46448
 Sum y = 0.45092
 Sum z = 11.19963
 R = 11.30397
 x bar = 0.12955
 y bar = 0.03989
 z bar = 0.99077

Mean Dec = 17.11
 Mean Inc = 82.21
 Alpha95 = 16.77

Alpha68 = 9.92

CORRECTIONS

Mean Dec = 17.11
Mean Inc = 82.21

Correction for magnetic variation

Mean Dec = 13.39
Mean Inc = 82.21

Correction to Meriden (CVP)

Uncorrected Dec = 13.39
Uncorrected Inc = 82.21
Latitude = 53.60
Longitude = -1.73

Kai = 15.30
Latitude of pole = 68.24
Beta1 = 9.49
Longitude of pole = 7.76
Geomag colat = 16.43
Corrected Inc = 81.61
Beta 2 = 170.62
Corrected Dec = 12.34

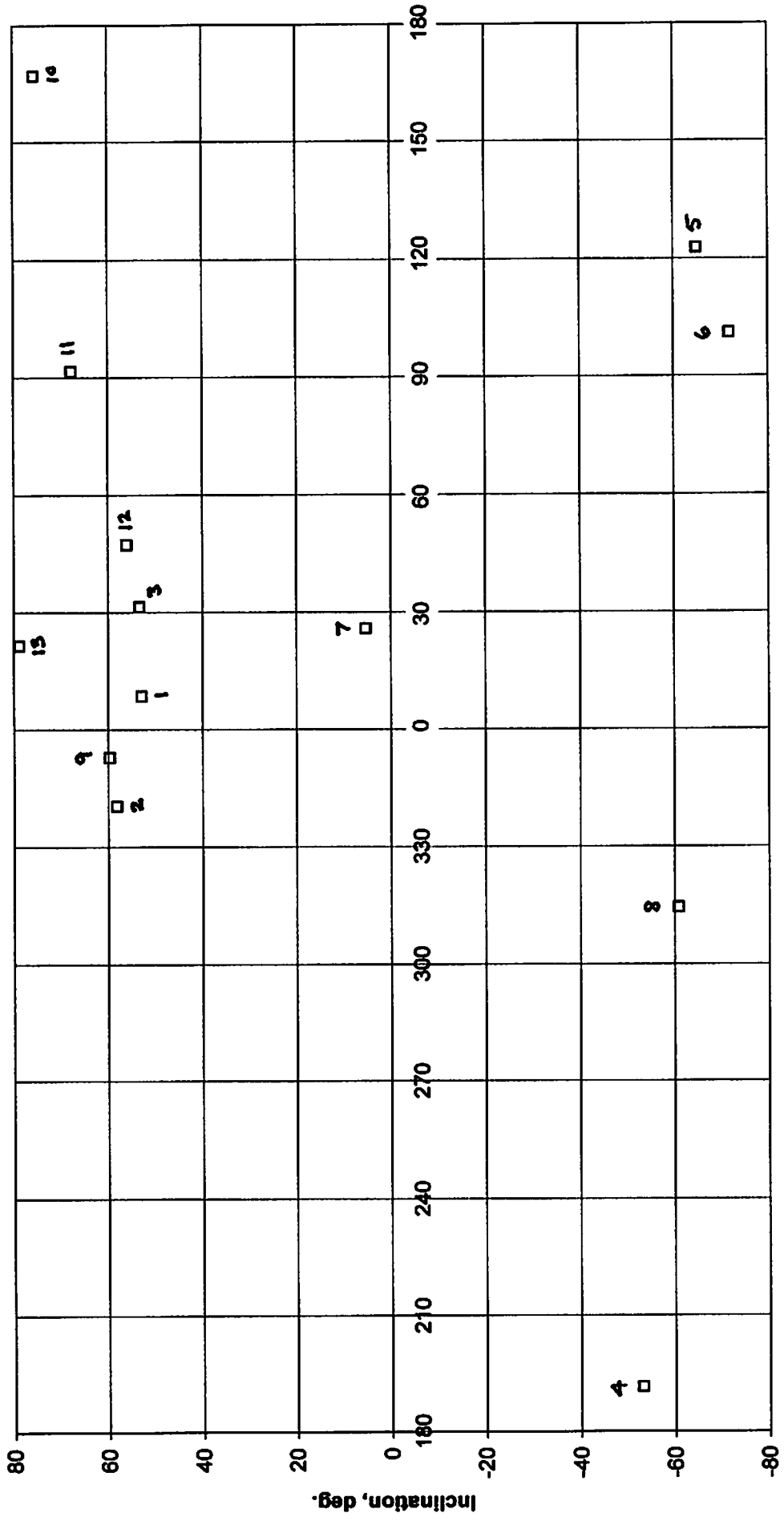
FINAL RESULT

Corrected Dec = 12.34
Corrected Inc = 81.61
Alpha95 = 16.77

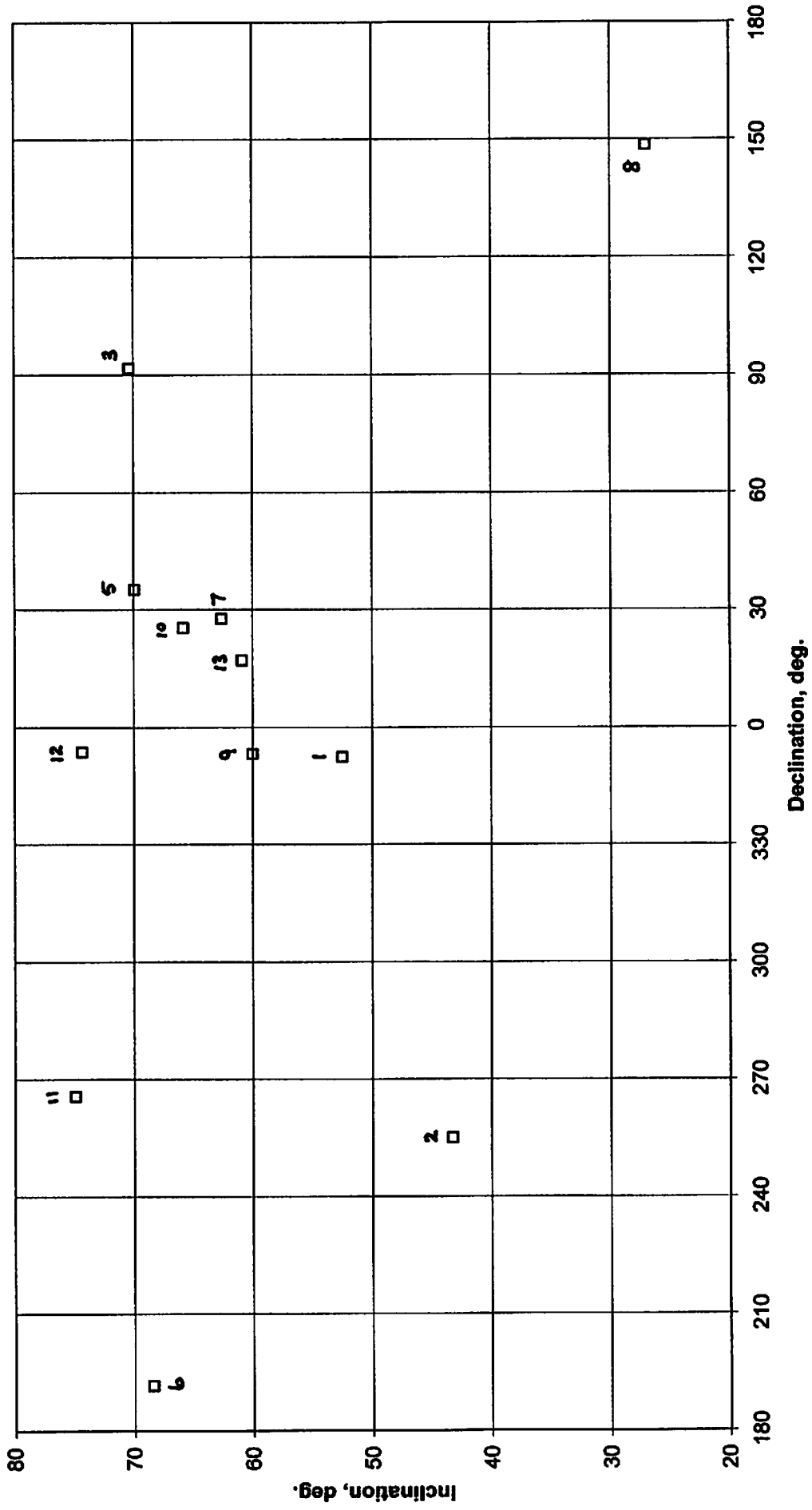
ERROR BARS

Alpha95		Alpha68	
δDec = ±	114.99	δDec = ±	68.00
δInc = ±	16.77	δInc = ±	9.92

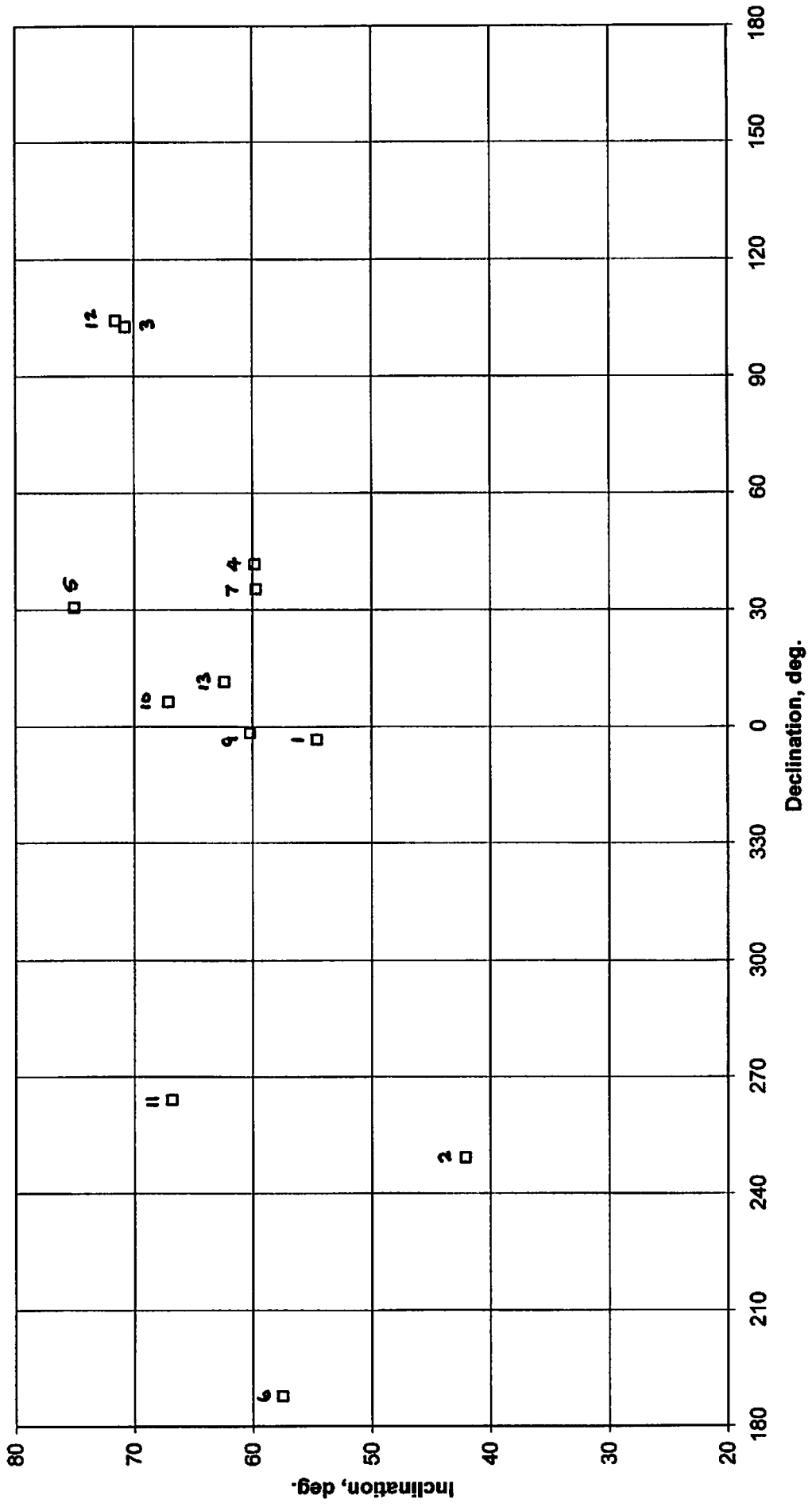
INITIAL SAMPLE SCATTER



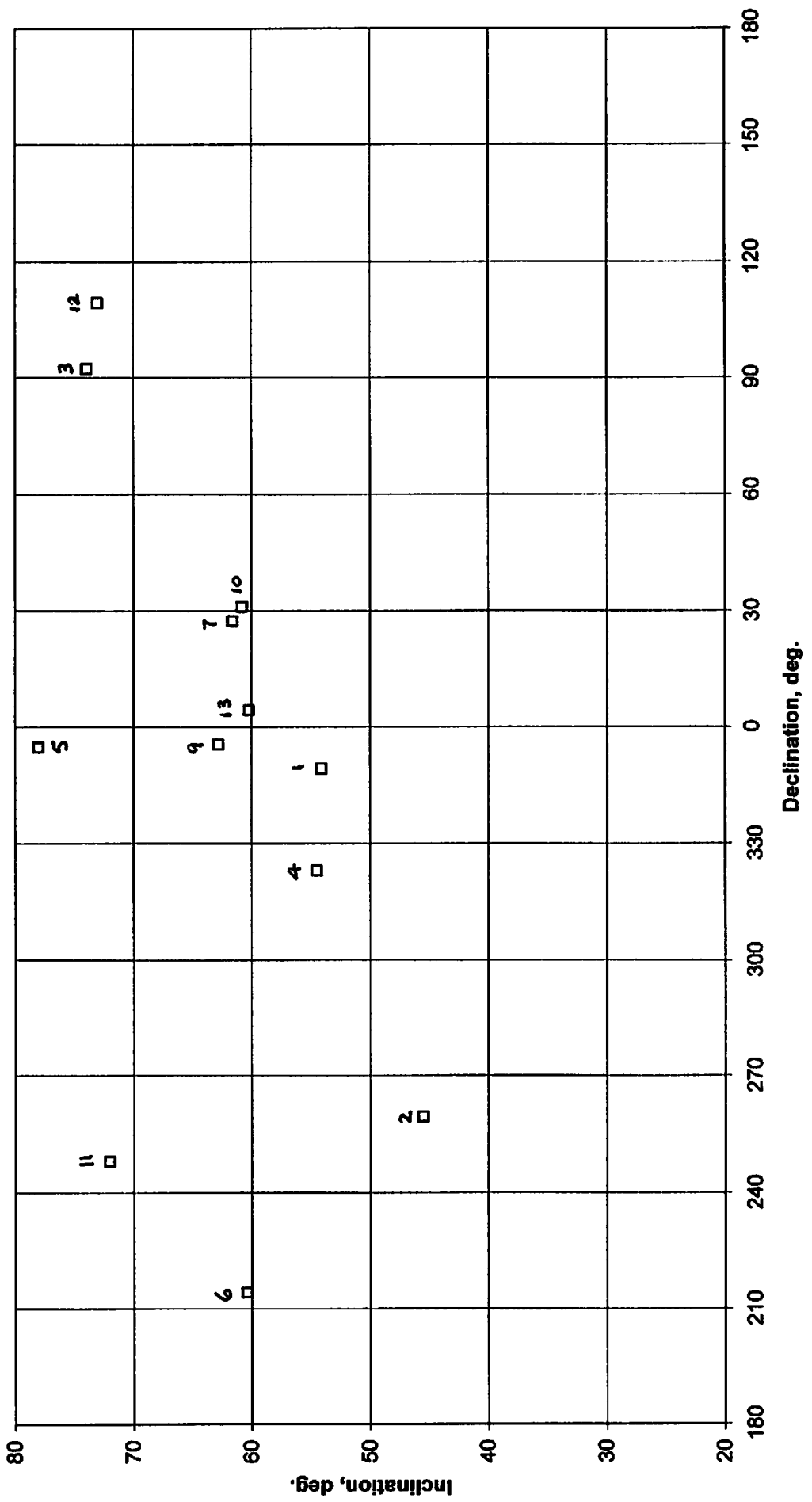
7.5mT DEMAGNETISED SAMPLE SCATTER



10mT DEMAGNETISED SAMPLE SCATTER



15mT DEMAGNETISED SAMPLE SCATTER



PILOT STEPPED A.F. DEMAGNETISATION MEASUREMENTS

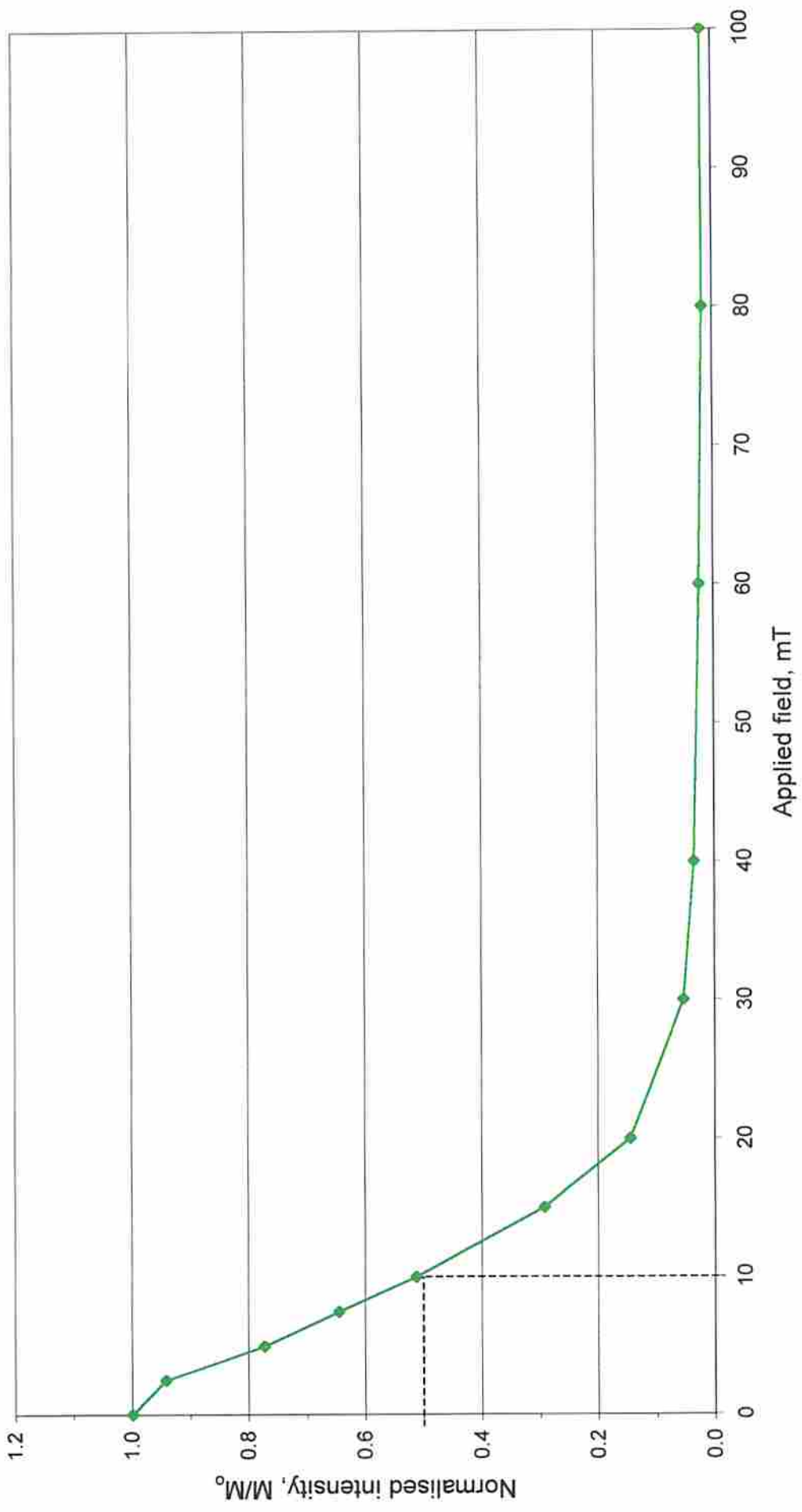
Sample No. 1

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	23.65	1.00	13.58	0.94	19.34	4.00	54.90
2.5	22.29	0.94	12.70	-0.76	18.30	356.60	55.20
5.0	18.30	0.77	10.71	0.33	14.84	1.80	54.20
7.5	15.27	0.65	9.21	-1.20	12.12	352.50	52.50
10.0	12.14	0.51	7.02	-0.38	9.89	356.90	54.60
15.0	6.93	0.29	3.99	-0.74	5.61	349.50	54.10
20.0	3.45	0.15	2.01	-0.33	2.79	350.70	53.90
30.0	1.27	0.05	0.75	-0.43	0.93	330.30	47.00
40.0	0.85	0.04	0.54	-0.22	0.62	338.30	46.70
60.0	0.59	0.02	0.28	-0.20	0.47	324.20	53.80
80.0	0.43	0.02	0.32	-0.08	0.27	346.00	38.90
100.0	0.45	0.02	0.27	-0.22	0.28	320.50	38.80

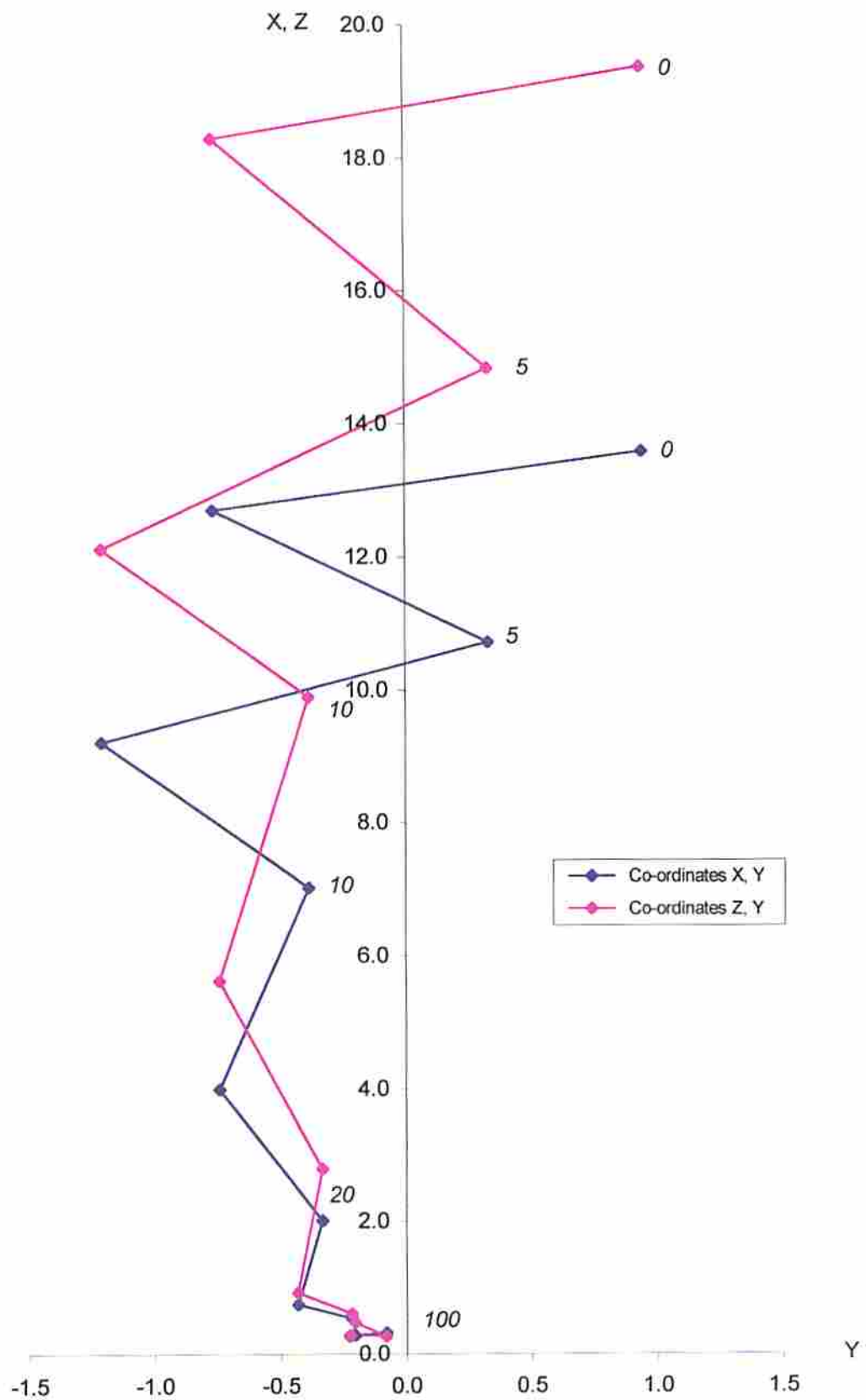
Sample No. 9

Demag Step <i>mT</i>	NRM						
	Intensity <i>mA m⁻¹</i>	Normalised intensity	Co-ordinates			Dec. <i>degs.</i>	Inc. <i>degs.</i>
			X	Y	Z		
0.0	44.00	1.00	23.71	-4.20	36.83	350.00	56.80
2.5	43.60	0.99	23.23	-2.09	36.83	354.90	57.70
5.0	43.79	1.00	19.93	-4.96	38.68	346.00	62.00
7.5	44.40	1.01	22.03	-2.57	38.47	353.30	60.00
10.0	44.17	1.00	21.97	-0.54	38.31	358.60	60.20
15.0	40.44	0.92	18.44	-1.38	35.96	355.70	62.80
20.0	36.08	0.82	17.42	-0.93	31.58	357.00	61.10
30.0	21.65	0.49	10.22	-2.22	18.96	347.70	61.10
40.0	10.66	0.24	5.81	-0.06	8.93	359.50	56.90
60.0	2.61	0.06	1.19	-0.15	2.32	352.80	62.60
80.0	1.04	0.02	0.51	-0.03	0.91	356.30	60.70
100.0	0.48	0.01	0.19	-0.03	0.44	351.60	66.80

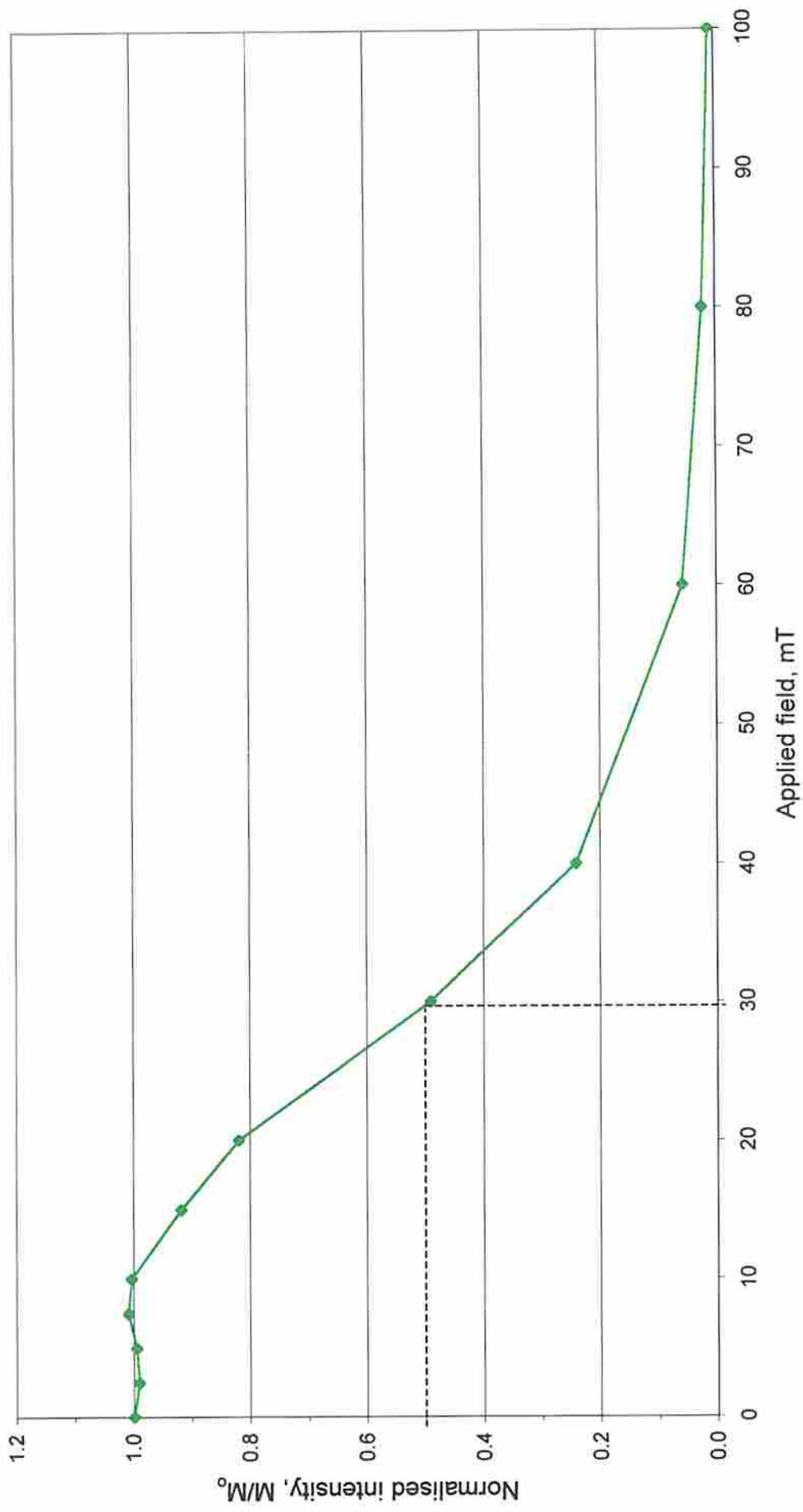
MYERS WOOD - SAMPLE POINT M1 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT M1 - ZIJDERVELD PLOT



MYERS WOOD - SAMPLE POINT M9 DEMAGNETISATION: INTENSITY SPECTRUM



MYERS WOOD - SAMPLE POINT M9 - ZIJDERVELD PLOT

