

SITE INFORMATION

Site Name Hagg End
Area Trench 1
Context No 135 to 141
Description Iron smelting furnace
Latitude (+ve N) 54.33
Longitude (+ve E) -1.13
Magnetic Var -3.35
Date Sampled 10/7/2003

MAGNETIC MEASUREMENTS

Sample no.	NRM			Field	After partial demag			Pilot?	Comments
	D	I	Int		D	I	Int		
	deg.	deg.	mA m ⁻¹		deg.	deg.	mA m ⁻¹		
1	2.4	62.2	66.49	2.5	350.10	65.00	65.07	Y	x10 atten.
2	23.90	61.80	34.38	2.5	29.40	57.50	35.12		x10 atten.
3	22.40	67.80	52.78	2.5	26.40	62.20	53.45		x10 atten.
4	349.90	63.70	144.78	2.5	358.20	60.30	145.67		x10 atten.
5	357.90	57.00	99.11	2.5	5.40	54.10	99.69		x10 atten.
6	15.50	56.10	88.27	2.5	18.30	53.00	89.36		x10 atten.
7	345.00	77.70	160.77	2.5	19.00	79.00	166.97		x10 atten.
8	358.20	62.10	15.60	2.5	13.40	58.30	16.01		x10 atten.
9	28.60	68.60	54.11	2.5	34.40	67.90	54.87		x10 atten.
10	355.40	65.80	9.16	2.5	357.20	63.20	10.23		x10 atten.
11	358.80	54.80	5.96	2.5	2.40	56.60	6.29		x10 atten.
12	213.40	71.70	1.92	2.5	206.80	81.00	19.56	Y	x10 atten.
13	10.60	68.70	5.35	7.5	17.10	66.40	3.98		x1 atten.
14	311.20	70.60	8.91	2.5	311.20	75.20	86.50	Y	x10 atten.
15	14.60	60.80	3.05	2.5	7.00	58.20	3.46		x10 atten.
16	84.40	67.80	1.43	2.5	85.40	65.70	1.52		x10 atten.
17	4.50	69.80	199.15	2.5	3.60	66.10	200.72	Y	x10 atten.
18	344.40	66.00	2.98	2.5	5.50	67.90	3.23		x10 atten.

STATISTICS FOR NRM

Sample no.	NRM				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	2.40	62.20	0.46598	0.01953	0.88458
2	23.90	61.80	0.43203	0.19145	0.88130
3	22.40	67.80	0.34933	0.14398	0.92587
4	349.90	63.70	0.43620	-0.07770	0.89649
5	357.90	57.00	0.54427	-0.01996	0.83867
6	15.50	56.10	0.53746	0.14905	0.83001
7	345.00	77.70	0.20577	-0.05514	0.97705
8	358.20	62.10	0.46770	-0.01470	0.88377
9	28.60	68.60	0.32036	0.17466	0.93106
10	355.40	65.80	0.40860	-0.03288	0.91212
11	358.80	54.80	0.57631	-0.01207	0.81714
12	213.40	71.70	-0.26214	-0.17285	0.94943
13	10.60	68.70	0.35705	0.06682	0.93169
14	311.20	70.60	0.21879	-0.24992	0.94322
15	14.60	60.80	0.47211	0.12297	0.87292
16	84.40	67.80	0.03687	0.37604	0.92587
17	4.50	69.80	0.34423	0.02709	0.93849
18	344.40	66.00	0.39175	-0.10938	0.91355

Number = 18
Sum x = 6.30269
Sum y = 0.52701
Sum z = 16.25323
R = 17.44044
x bar = 0.36138
y bar = 0.03022
z bar = 0.93193

Mean Dec = 4.78
Mean Inc = 68.74
Alpha95 = 6.37

STATISTICS FOR PARTIAL DEMAGNETISATION

Sample no.	Demagnetisation				
	D	I	x	y	z
	<i>degs.</i>	<i>degs.</i>			
1	350.10	65.00	0.41633	-0.07266	0.90631
2	29.40	57.50	0.46810	0.26376	0.84339
3	26.40	62.20	0.41775	0.20737	0.88458
4	358.20	60.30	0.49521	-0.01556	0.86863
5	5.40	54.10	0.58377	0.05518	0.81004
6	18.30	53.00	0.57138	0.18897	0.79864
7					
8	13.40	58.30	0.51117	0.12178	0.85081
9	34.40	67.90	0.31043	0.21255	0.92653
10	357.20	63.20	0.45034	-0.02203	0.89259
11	2.40	56.60	0.55000	0.02305	0.83485
12					
13	17.10	66.40	0.38265	0.11772	0.91636
14					
15	7.00	58.20	0.52303	0.06422	0.84989
16					
17	3.60	66.10	0.40434	0.02544	0.91425
18	5.50	67.90	0.37449	0.03606	0.92653

Number = 14
Sum x = 6.45898
Sum y = 1.20585
Sum z = 12.22340
R = 13.87747
x bar = 0.46543
y bar = 0.08689
z bar = 0.88081

Mean Dec = 10.58
Mean Inc = 61.74
Alpha95 = 3.88

Alpha68 = 2.30

CORRECTIONS

Mean Dec = 10.58
Mean Inc = 61.74

Correction for magnetic variation

Mean Dec = 7.23
Mean Inc = 61.74

Correction to Meriden (CVP)

Uncorrected Dec = 7.23
Uncorrected Inc = 61.74
Latitude = 54.33
Longitude = -1.13

Kai = 47.07
Latitude of pole = 77.65
Beta1 = 25.51
Longitude of pole = 153.36
Geomag colat = 48.99
Corrected Inc = 60.10
Beta 2 = 25.02
Corrected Dec = 6.88

FINAL RESULT

Corrected Dec = 6.88
Corrected Inc = 60.10
Alpha95 = 3.88

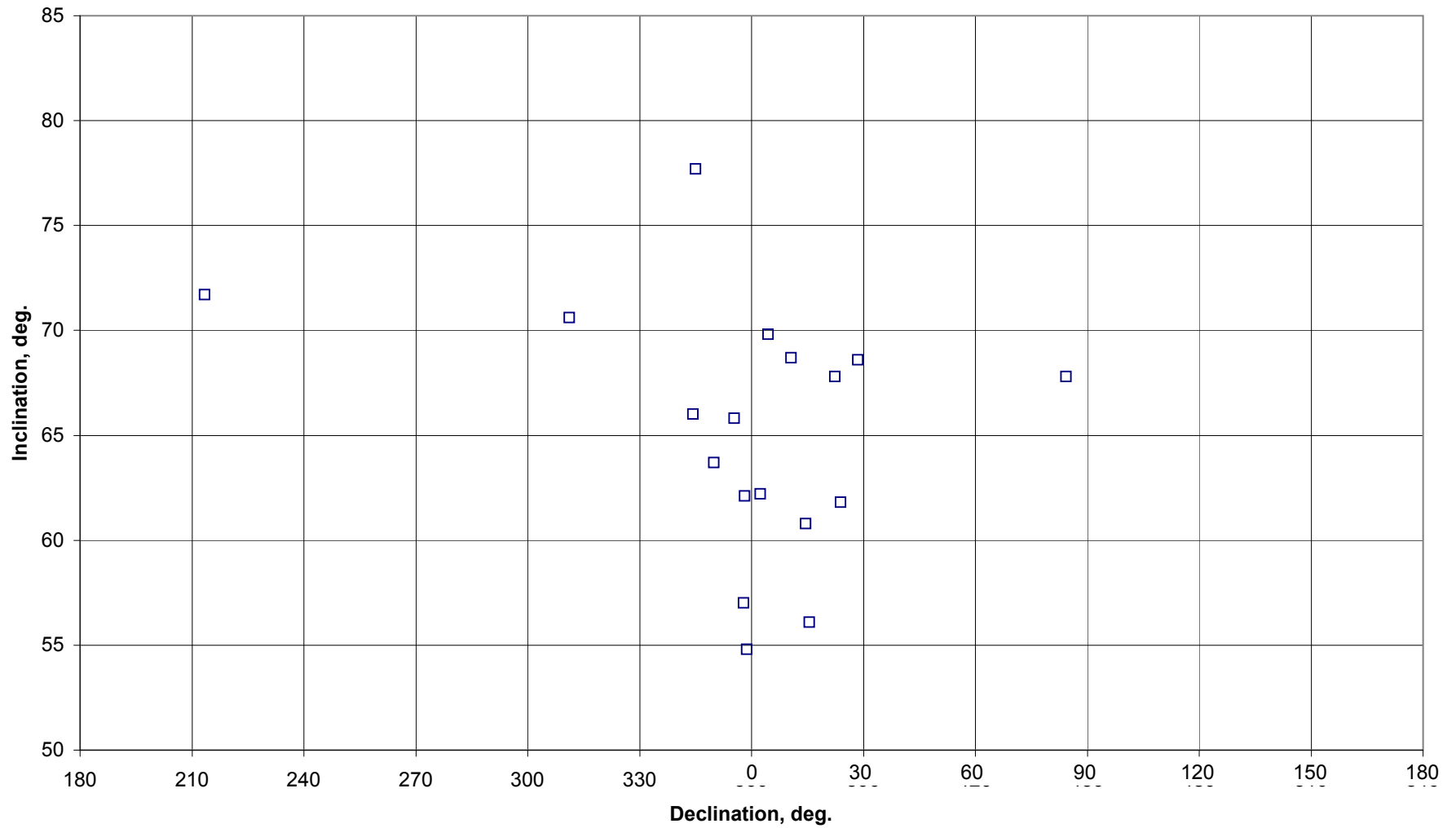
ERROR BARS

Alpha95		Alpha68	
$\delta Dec = \pm$	7.78	$\delta Dec = \pm$	4.62
$\delta Inc = \pm$	3.88	$\delta Inc = \pm$	2.30

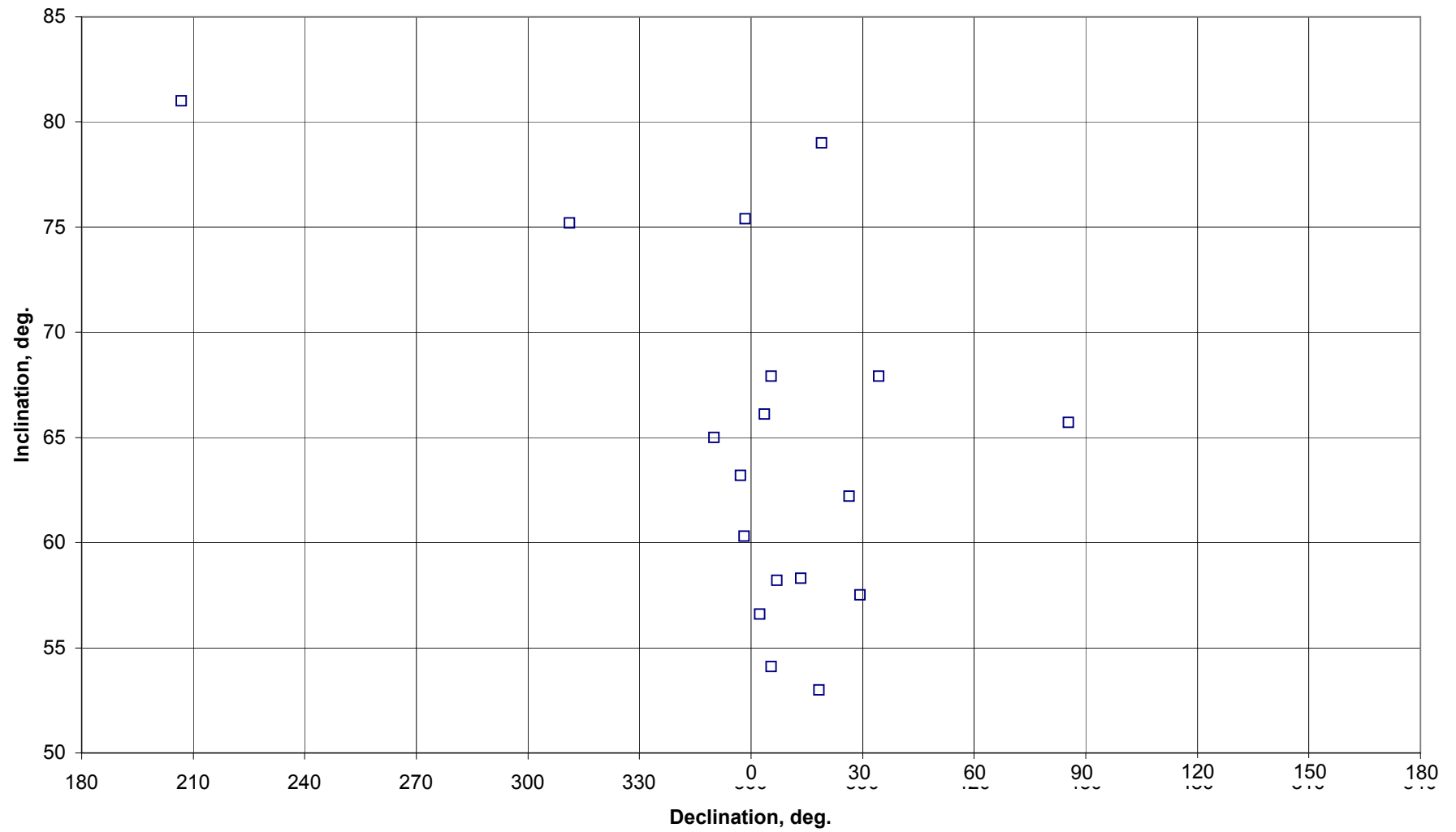
SUMMARY OF PARTIAL DEMAGNETISATION STATISTICAL RESULT:

Demag Field <i>mT</i>	No. of samples	Samples removed	Alpha95 $\pm$ <i>degs.</i>	Mean Corrected	
				Dec <i>degs.</i>	Inc <i>degs.</i>
0	18		6.37	1.34	67.38
	14	7,12,14,16	3.73	2.35	62.23
2.5	18		6.27	7.42	66.04
	14	7,12,14,16	4.26	6.03	60.78
	13	7,12,14,16 13	4.12	6.47	59.71
	12	7,12,14,16 9, 13	4.02	5.00	58.99
5	18		6.39	2.31	66.02
	14	7,12,14,16	4.70	1.79	60.80
	13	7,12,14,16 13	4.76	1.64	59.86
	13	7,12,14,16 18	4.54	3.91	60.24
	12	7,12,14,16 13, 18	4.51	3.86	59.17
7.5	18		6.87	2.70	66.05
	14	7,12,14,16	4.39	3.97	60.46
	13	7,12,14,16 18	4.26	5.53	59.68
Final group	18		6.20	8.20	65.49
	14	7,12,14,16	3.88	6.88	60.10

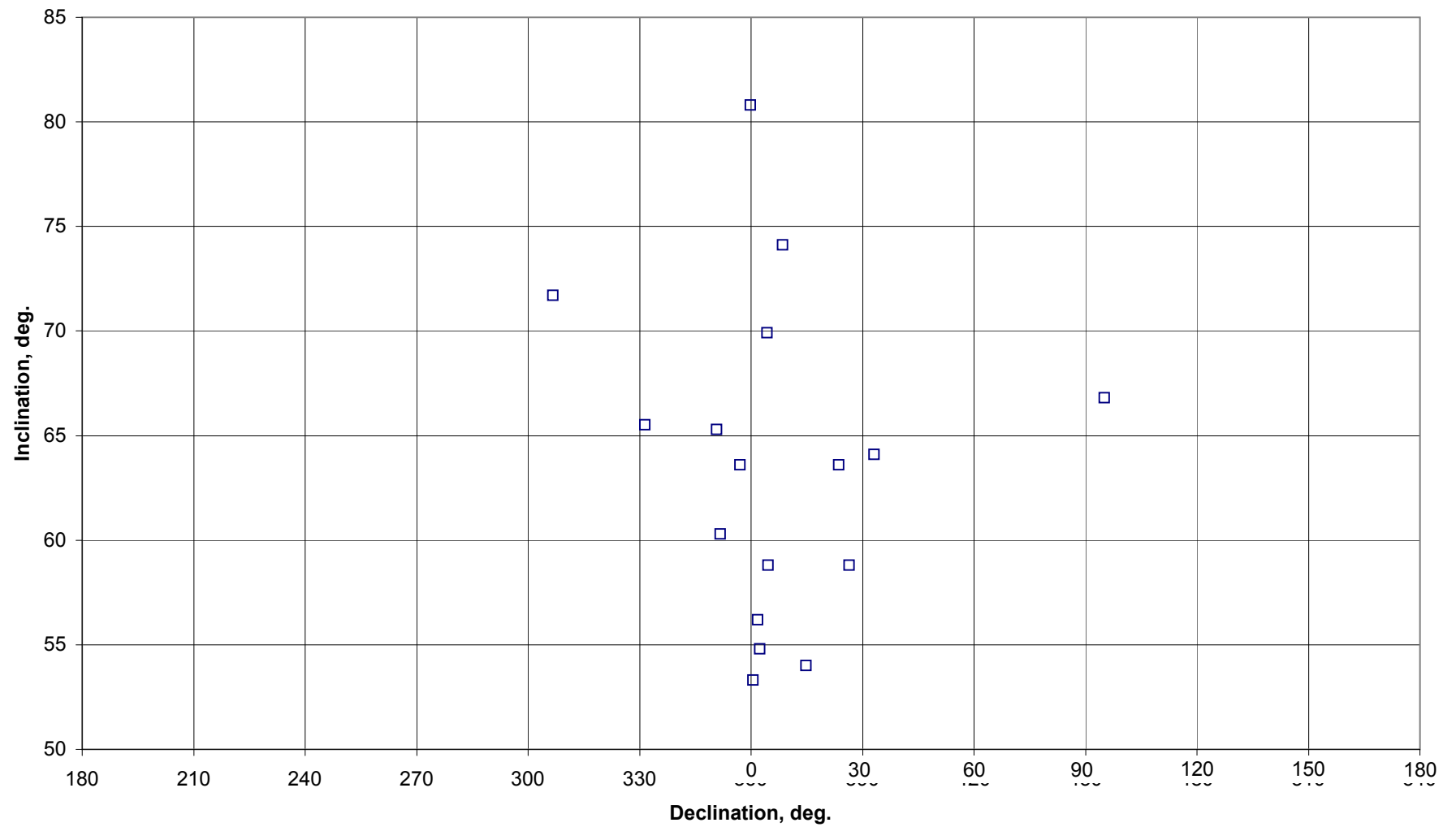
INITIAL SAMPLE SCATTER



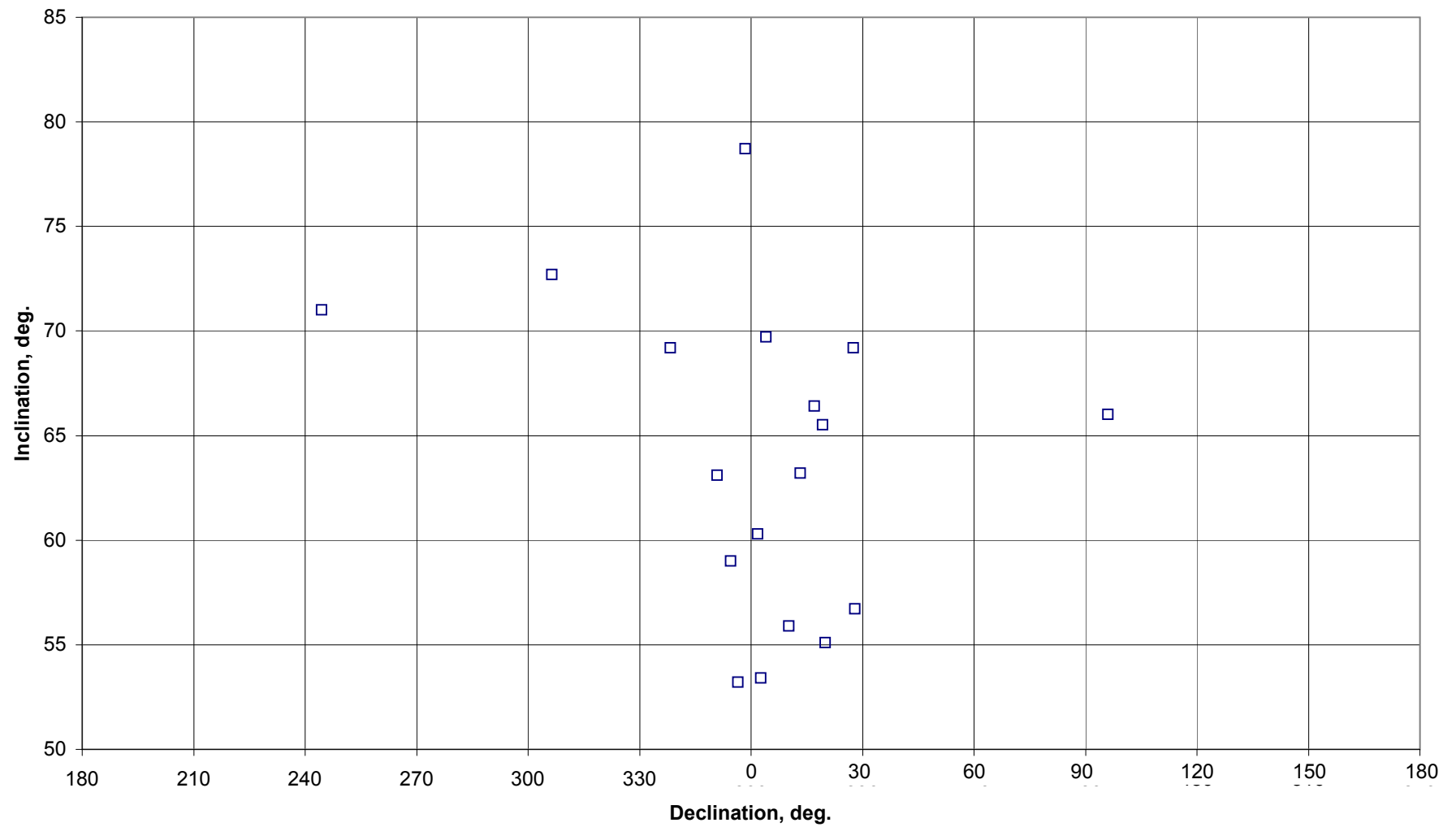
2.5mT DEMAGNETISED SAMPLE SCATTER



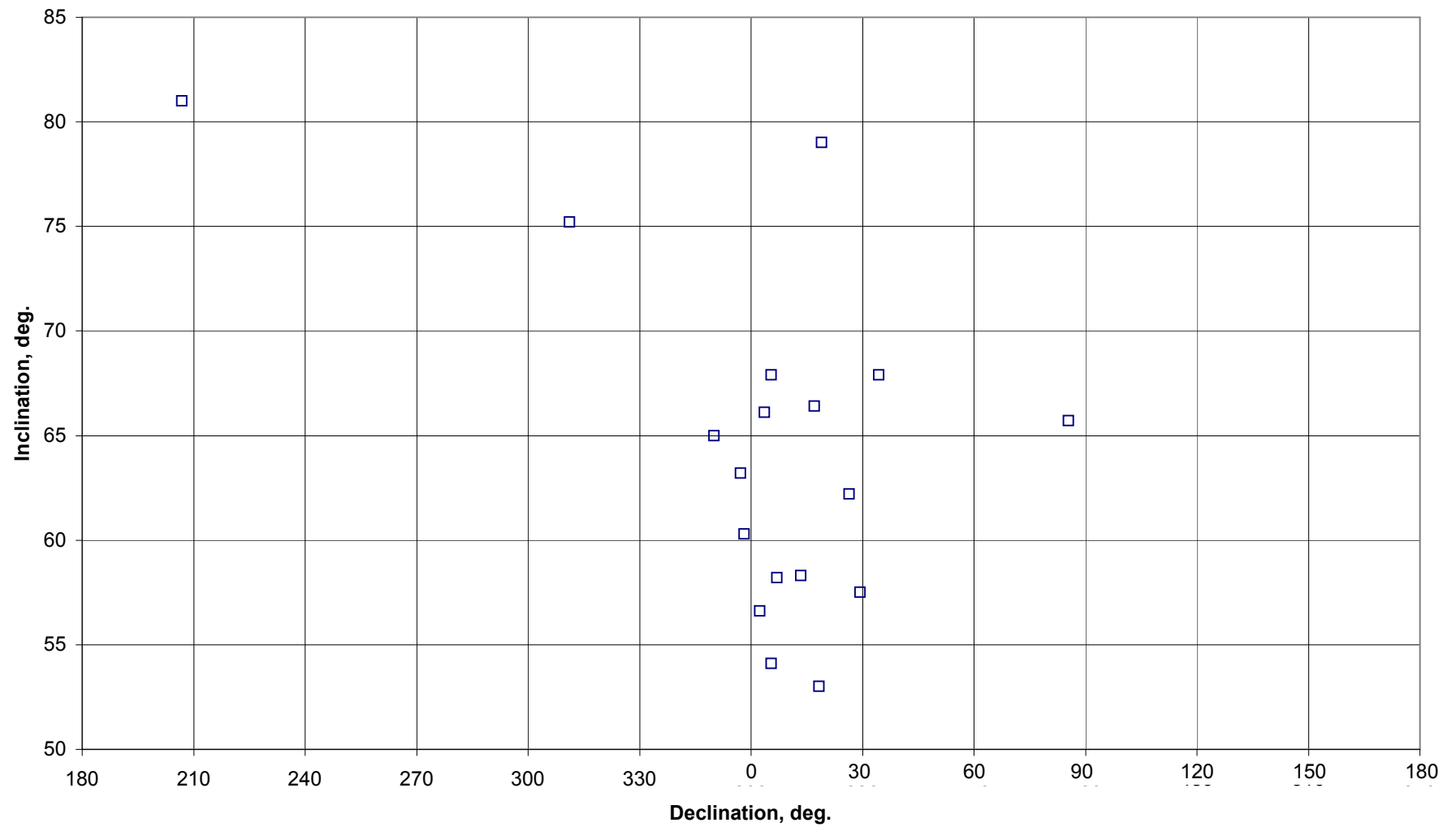
5mT DEMAGNETISED SAMPLE SCATTER



7.5mT DEMAGNETISED SAMPLE SCATTER



FINAL GROUP 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	65.63	1.00	27.51	-3.16	59.50	353.40	65.00
2.5	65.07	0.99	27.07	-4.72	58.99	350.10	65.00
5.0	64.41	0.98	26.56	-4.36	58.51	350.70	65.30
7.5	62.11	0.95	27.71	-4.43	55.41	350.90	63.10
10.0	56.43	0.86	23.44	-3.86	51.18	350.70	65.10
15.0	43.81	0.67	18.97	-0.90	39.48	357.30	64.30
20.0	34.21	0.52	15.32	-2.59	30.48	350.40	63.00
30.0	23.81	0.36	10.80	-0.11	21.21	359.40	63.00
40.0	17.96	0.27	8.19	-0.59	15.97	355.90	62.80
60.0	11.10	0.17	4.87	0.19	9.98	2.20	64.00
80.0	8.03	0.12	3.92	0.30	7.00	4.30	60.70
100.0	6.43	0.10	3.13	0.42	5.61	7.60	60.70

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	21.16	1.00	-2.04	-3.24	20.81	237.90	79.60
2.5	19.56	0.92	-2.74	-1.38	19.32	206.80	81.00
5.0	15.98	0.76	-0.44	-0.89	15.95	243.70	86.40
7.5	13.19	0.62	-1.85	-3.88	12.47	244.50	71.00
10.0	11.07	0.52	-1.00	-4.12	10.23	256.40	67.50
15.0	8.09	0.38	0.47	-3.83	7.11	277.00	61.50
20.0	5.21	0.25	1.04	-3.05	4.10	288.80	51.90
30.0	2.42	0.11	0.40	-1.90	1.44	281.80	36.60
40.0	1.74	0.08	0.40	-1.48	0.84	285.00	28.90
60.0	1.58	0.07	0.13	-1.30	0.89	275.80	34.30
80.0	1.54	0.07	-0.05	-1.18	1.00	267.50	40.20
100.0	1.52	0.07	0.04	-1.21	0.91	271.90	37.00

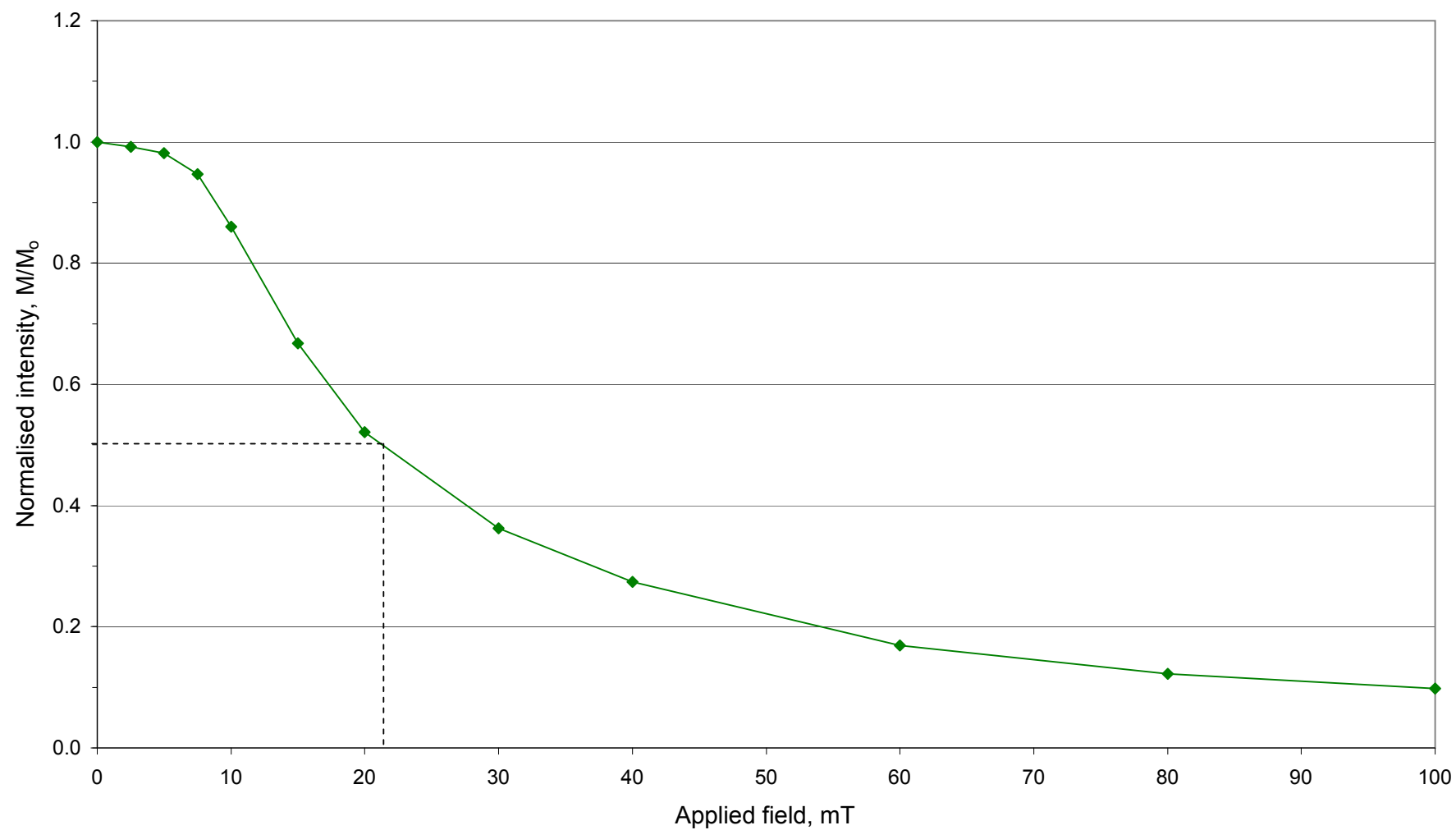
Sample No. 14

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	88.76	1.00	19.26	-22.78	83.59	310.20	70.40
2.5	86.50	0.97	14.57	-16.62	83.63	311.20	75.20
5.0	79.93	0.90	15.00	-20.16	75.88	306.70	71.70
7.5	71.09	0.80	12.59	-17.06	67.86	306.40	72.70
10.0	59.27	0.67	11.45	-15.19	56.14	307.00	71.30
15.0	35.00	0.39	7.24	-8.76	33.10	309.60	71.10
20.0	17.96	0.20	3.70	-4.57	16.97	309.00	70.90
30.0	4.34	0.05	1.06	-0.98	4.10	317.10	70.60
40.0	2.42	0.03	0.77	-0.90	2.11	310.70	60.80
60.0	2.23	0.03	0.56	-1.35	1.68	292.50	48.90
80.0	2.29	0.03	0.87	-0.64	2.02	323.50	62.00
100.0	2.03	0.02	0.58	-0.58	1.86	315.20	66.10

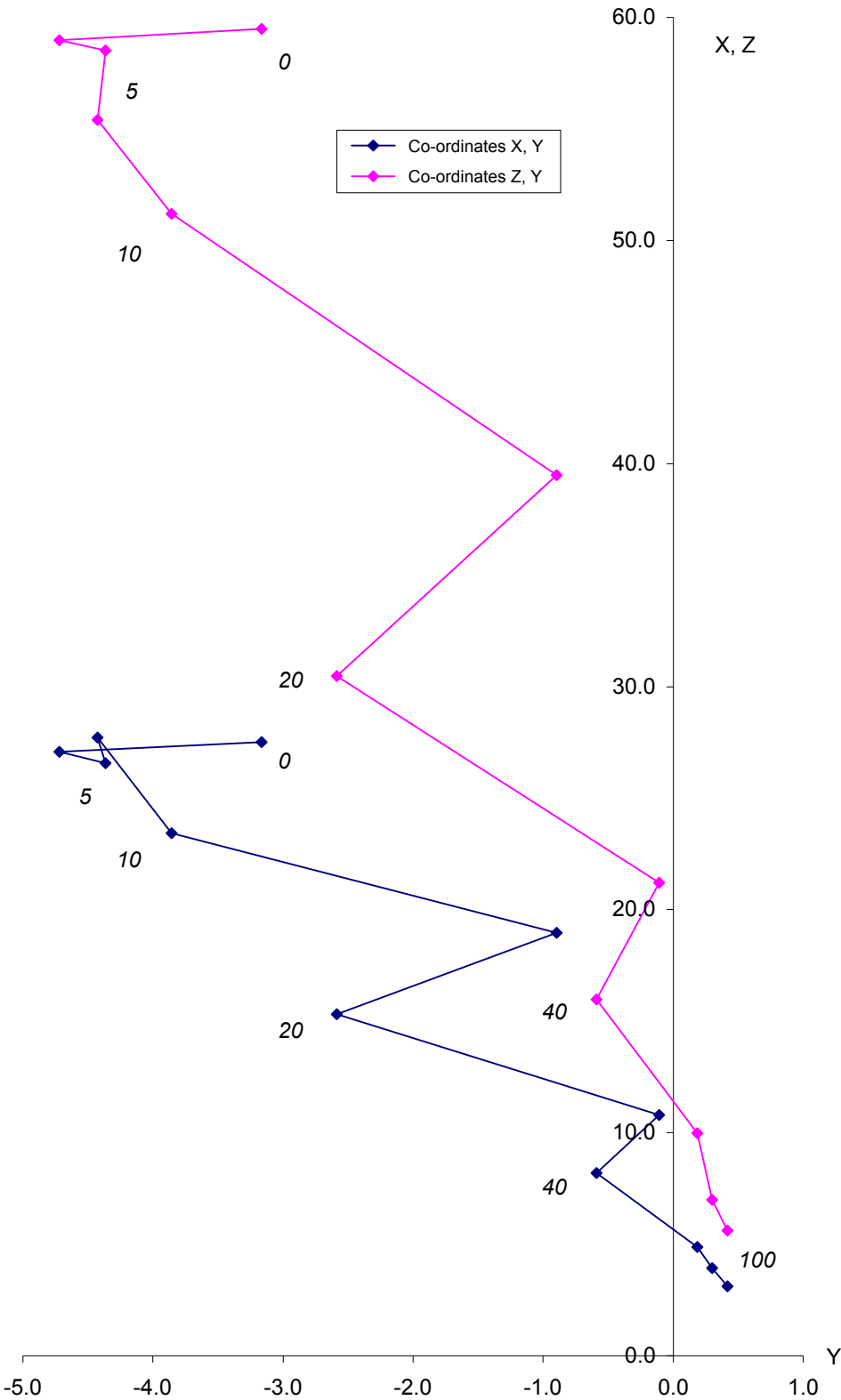
Sample No. 17

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	200.78	1.00	76.49	6.44	185.53	4.80	67.50
2.5	200.72	1.00	81.18	5.08	183.49	3.60	66.10
5.0	194.01	0.97	66.46	5.15	182.20	4.40	69.90
7.5	184.65	0.92	63.76	4.51	173.24	4.00	69.70
10.0	168.90	0.84	59.84	12.53	157.45	11.80	68.80
15.0	115.01	0.57	41.29	12.76	106.58	17.20	67.90
20.0	55.94	0.28	20.63	1.46	51.97	4.10	68.30
30.0	12.95	0.06	5.02	0.04	11.94	0.40	67.20
40.0	6.20	0.03	2.25	-0.19	5.77	355.20	68.70
60.0	4.21	0.02	1.78	-0.19	3.81	354.00	64.90
80.0	3.62	0.02	1.31	-0.16	3.37	353.00	68.60
100.0	3.20	0.02	1.39	0.01	2.88	0.20	64.30

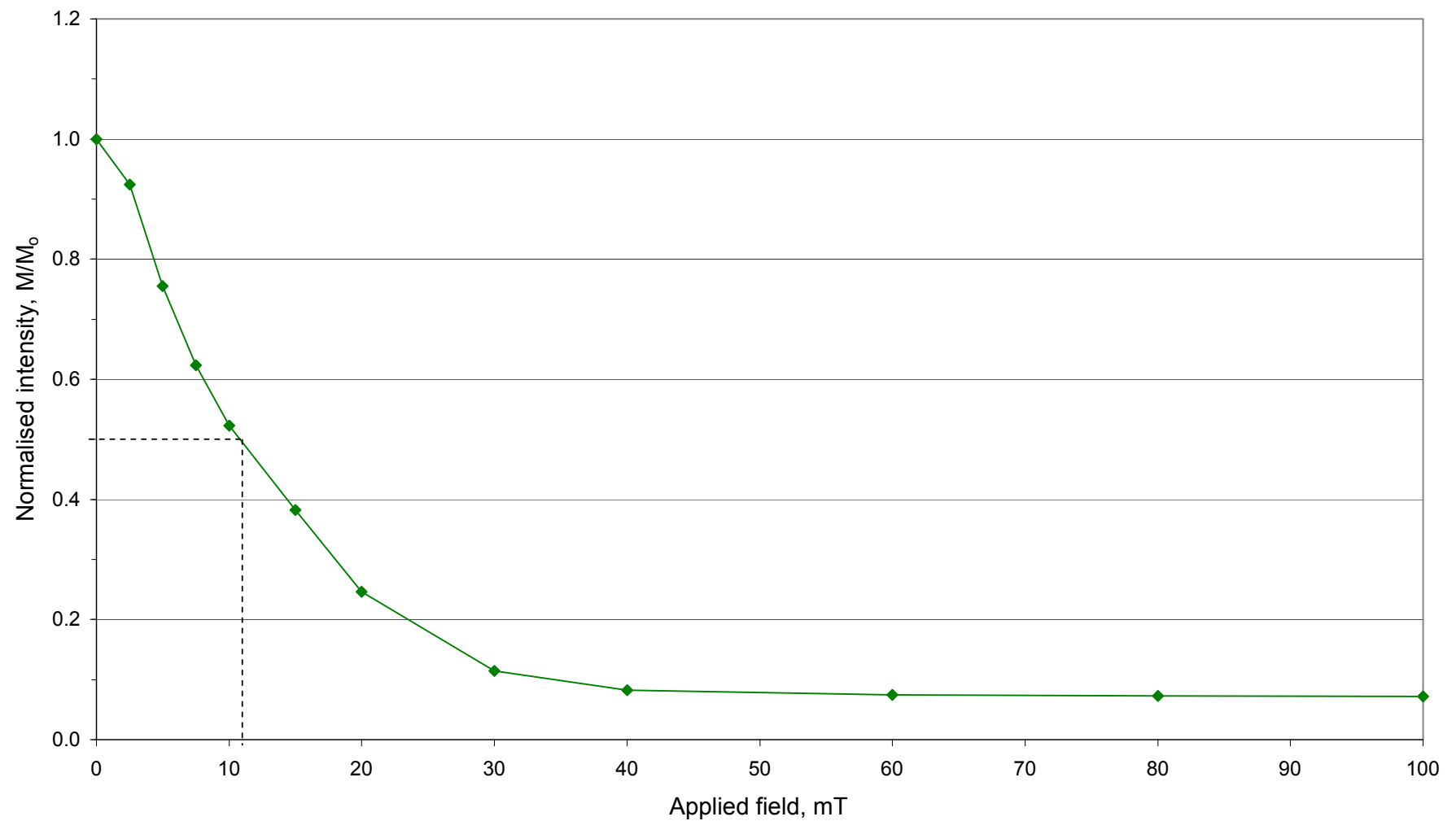
HAGG END - SAMPLE POINT 135/1 DEMAGNETISATION: INTENSITY SPECTRUM



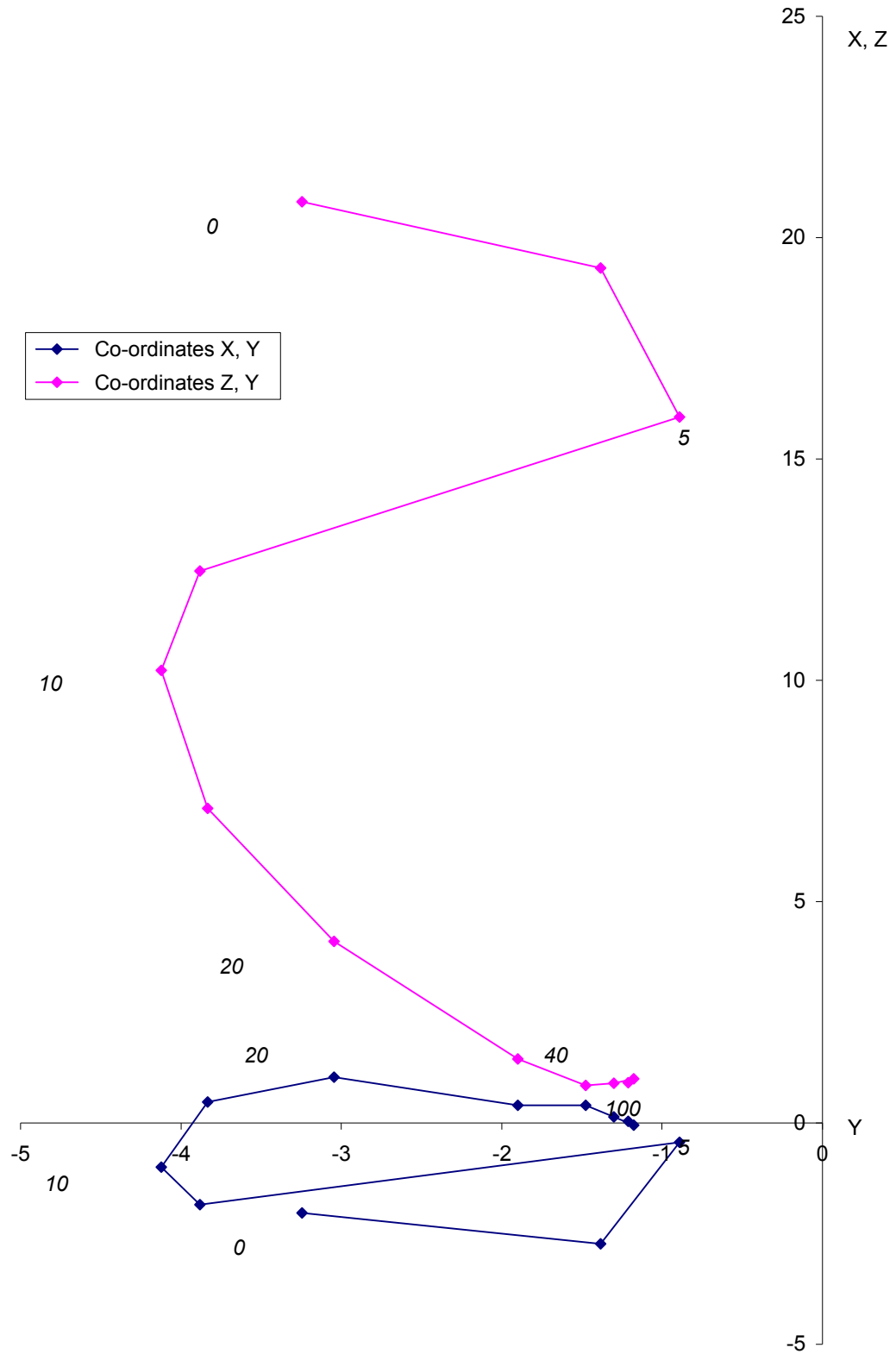
HAGG END - SAMPLE POINT 135/1 - ZIJDERVELD PLOT



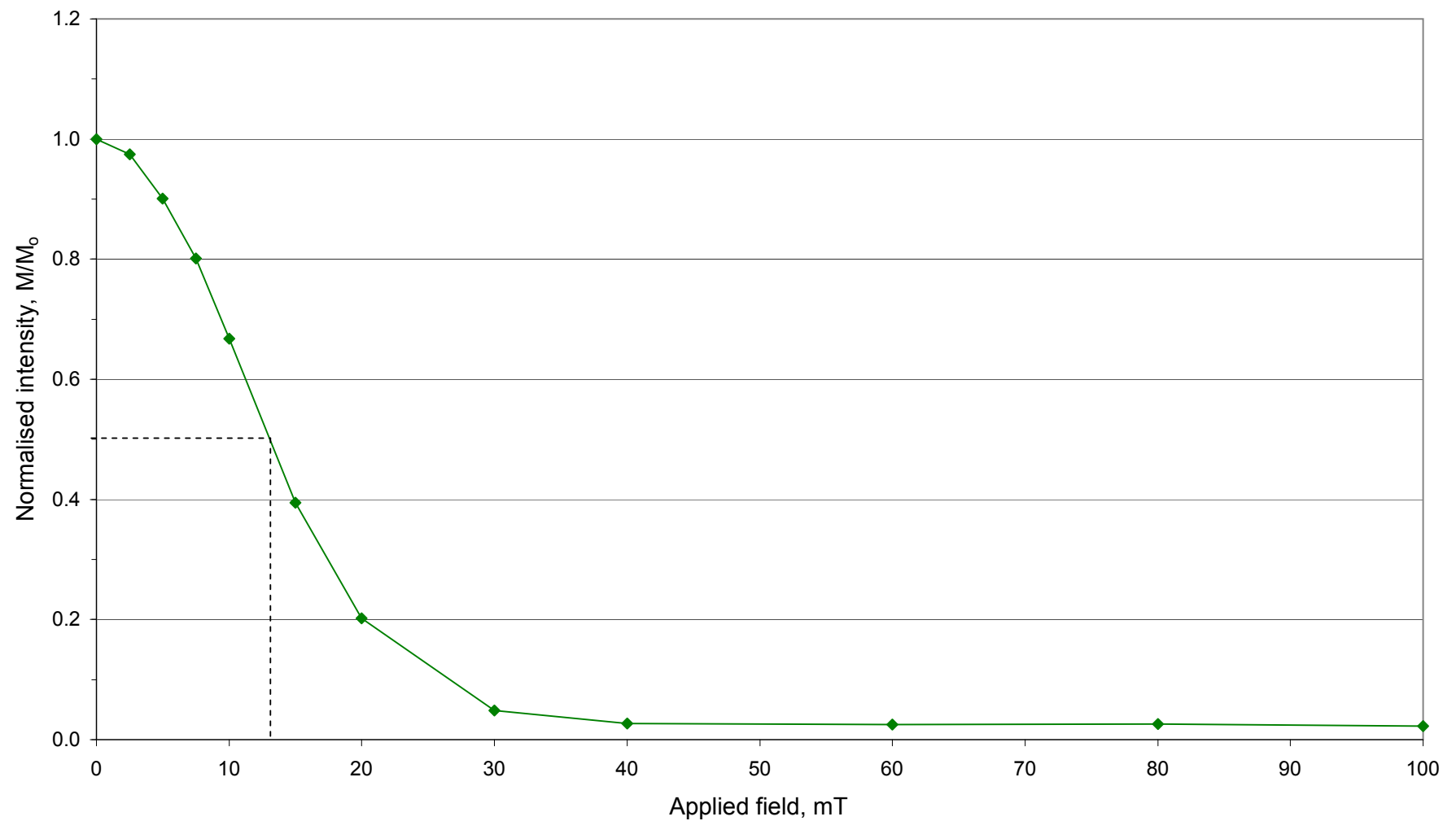
HAGG END - SAMPLE POINT 135/12 DEMAGNETISATION: INTENSITY SPECTRUM



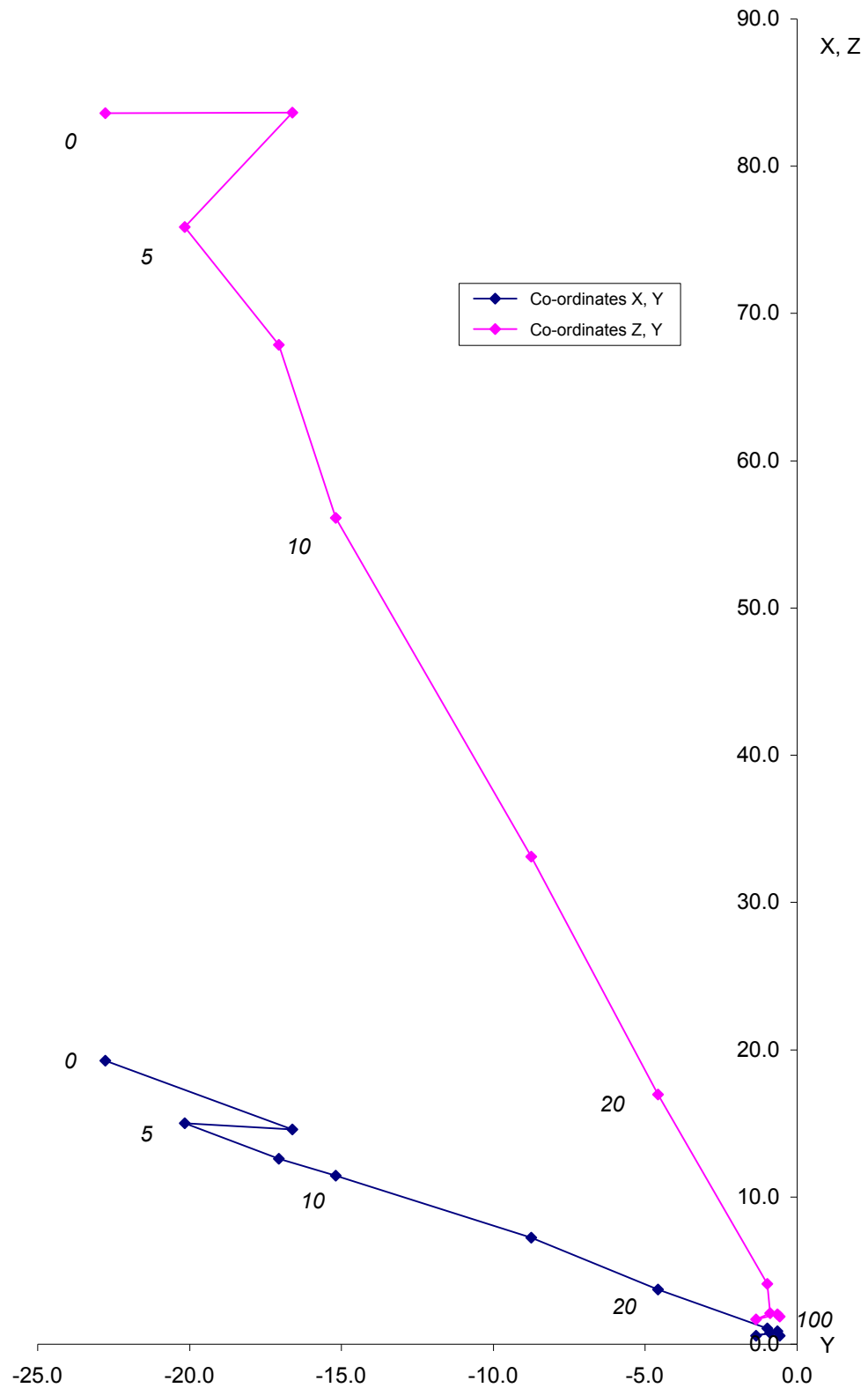
HAGG END - SAMPLE POINT 135/12 - ZIJDERVELD PLOT



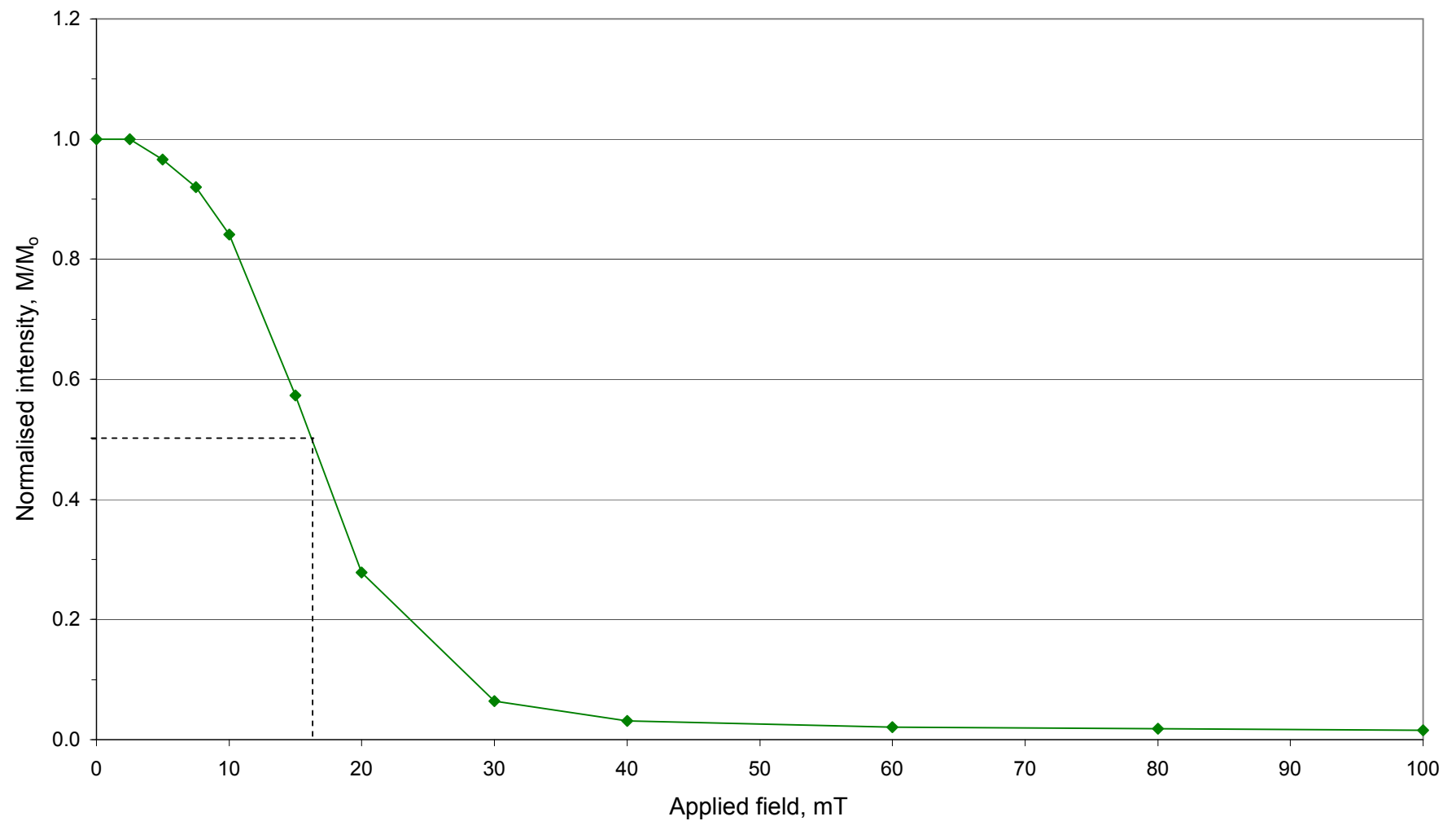
HAGG END - SAMPLE POINT 135/14 DEMAGNETISATION: INTENSITY SPECTRUM



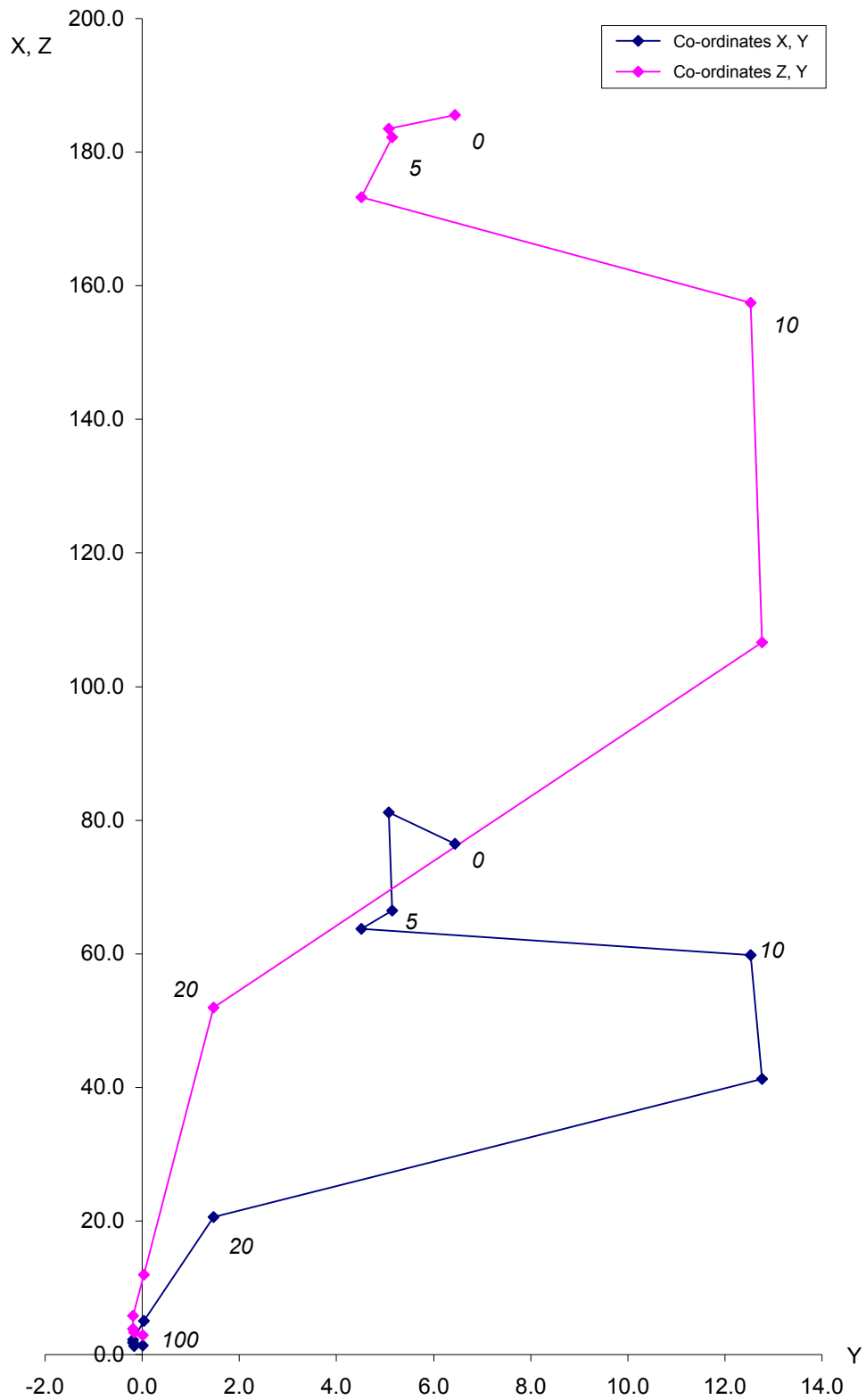
HAGG END - SAMPLE POINT 135/14 - ZIJDERVELD PLOT



HAGG END - SAMPLE POINT 135/17 DEMAGNETISATION: INTENSITY SPECTRUM



HAGG END - SAMPLE POINT 135/17 - ZIJDERVELD PLOT



STABILITY INDEX

Sample No. 1

Demag Step	NRM				
	D	I	x	y	z
<i>mT</i>	<i>degs.</i>	<i>degs.</i>			
0.0	353.40	65.00	0.41982	-0.04857	0.90631
2.5	350.10	65.00	0.41633	-0.07266	0.90631
5.0	350.70	65.30	0.41237	-0.06753	0.90851
7.5	350.90	63.10	0.44674	-0.07156	0.89180
10.0	350.70	65.10	0.41550	-0.06804	0.90704
15.0	357.30	64.30	0.43318	-0.02043	0.90108
20.0	350.40	63.00	0.44763	-0.07571	0.89101
30.0	359.40	63.00	0.45397	-0.00475	0.89101
40.0	355.90	62.80	0.45593	-0.03268	0.88942
60.0	2.20	64.00	0.43805	0.01683	0.89879
80.0	4.30	60.70	0.48800	0.03669	0.87207
100.0	7.60	60.70	0.48508	0.06472	0.87207

Sample No. 1

Number	Range	S.I.
3	5	9.3
4	7.5	7.3
5	10	9.5
6	15	8.5
7	20	9.5
8	30	9.2
9	40	10.7
10	60	11.4 *
11	80	10.5
12	100	9.9

Number = 12
Sum x = 5.31260
Sum y = -0.34369
Sum z = 10.73540
R = 11.98294
x bar = 0.44335
y bar = -0.02868
z bar = 0.89589

Mean Dec = -3.70
Mean Inc = 63.62
Alpha95 = 1.71

k = 645
Theta63 = 3.19
Range = 100
S.I. = 9.9

Sample No. 12

Demag Step	NRM				
	D	I	x	y	z
<i>mT</i>	<i>degs.</i>	<i>degs.</i>			
0.0	237.90	79.60	-0.09593	-0.15292	0.98357
2.5	206.80	81.00	-0.13963	-0.07053	0.98769
5.0	243.70	86.40	-0.02782	-0.05629	0.99803
7.5	244.50	71.00	-0.14016	-0.29385	0.94552
10.0	256.40	67.50	-0.08998	-0.37195	0.92388
15.0	277.00	61.50	0.05815	-0.47360	0.87882
20.0	288.80	51.90	0.19885	-0.58412	0.78694
30.0	281.80	36.60	0.16417	-0.78585	0.59622
40.0	285.00	28.90	0.22659	-0.84563	0.48328
60.0	275.80	34.30	0.08348	-0.82187	0.56353
80.0	267.50	40.20	-0.03332	-0.76307	0.64546
100.0	271.90	37.00	0.02648	-0.79820	0.60182

Sample No. 12

Number	Range	S.I.
3	5	1.6 *
4	7.5	1.2
5	10	1.2
6	15	1.1
7	20	1.0
8	30	0.9
9	40	0.9
10	60	1.1
11	80	1.3
12	100	1.4

Number = 12
Sum x = 0.23088
Sum y = -6.01789
Sum z = 9.39474
R = 11.15928
x bar = 0.02069
y bar = -0.53927
z bar = 0.84188

Mean Dec = -87.80
Mean Inc = 57.34
Alpha95 = 12.47

k = 13
Theta63 = 22.39
Range = 100
S.I. = 1.4

Sample No. 14

Demag Step	NRM				
	D	I	x	y	z
mT	deg.	deg.			
0.0	310.20	70.40	0.21652	-0.25622	0.94206
2.5	311.20	75.20	0.16826	-0.19220	0.96682
5.0	306.70	71.70	0.18765	-0.25175	0.94943
7.5	306.40	72.70	0.17647	-0.23936	0.95476
10.0	307.00	71.30	0.19295	-0.25605	0.94721
15.0	309.60	71.10	0.20647	-0.24958	0.94609
20.0	309.00	70.90	0.20592	-0.25430	0.94495
30.0	317.10	70.60	0.24332	-0.22611	0.94322
40.0	310.70	60.80	0.31813	-0.36986	0.87292
60.0	292.50	48.90	0.25157	-0.60734	0.75356
80.0	323.50	62.00	0.37739	-0.27925	0.88295
100.0	315.20	66.10	0.28748	-0.28548	0.91425

Number = 12
Sum x = 2.83213
Sum y = -3.46749
Sum z = 11.01822
R = 11.89309
x bar = 0.23813
y bar = -0.29156
z bar = 0.92644

Mean Dec = -50.76
Mean Inc = 67.89
Alpha95 = 4.30

k = 103
Theta63 = 7.99
Range = 100
S.I. = 4.0

Sample No. 14

Number	Range	S.I.
3	5	2.7
4	7.5	4.0
5	10	5.1
6	15	6.7
7	20	8.2
8	30	9.0
9	40	4.9
10	60	3.0
11	80	3.4
12	100	4.0

Sample No. 17

Demag Step	NRM				
	D	I	x	y	z
mT	deg.	deg.			
0.0	4.80	67.50	0.38134	0.03202	0.92388
2.5	3.60	66.10	0.40434	0.02544	0.91425
5.0	4.40	69.90	0.34265	0.02637	0.93909
7.5	4.00	69.70	0.34609	0.02420	0.93789
10.0	11.80	68.80	0.35398	0.07395	0.93232
15.0	17.20	67.90	0.35940	0.11125	0.92653
20.0	4.10	68.30	0.36880	0.02644	0.92913
30.0	0.40	67.20	0.38751	0.00271	0.92186
40.0	355.20	68.70	0.36198	-0.03040	0.93169
60.0	354.00	64.90	0.42188	-0.04434	0.90557
80.0	353.00	68.60	0.36216	-0.04447	0.93106
100.0	0.20	64.30	0.43366	0.00151	0.90108

Number = 12
Sum x = 4.52378
Sum y = 0.20468
Sum z = 11.09436
R = 11.98295
x bar = 0.37752
y bar = 0.01708
z bar = 0.92584

Mean Dec = 2.59
Mean Inc = 67.80
Alpha95 = 1.71

k = 645
Theta63 = 3.19
Range = 100
S.I. = 9.9

Sample No. 17

Number	Range	S.I.
3	5	3.7
4	7.5	4.7
5	10	4.9
6	15	4.8
7	20	6.0
8	30	7.2
9	40	7.6
10	60	8.1
11	80	9.1
12	100	9.9