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Ancient Monuments Laboratory
Report 88/93

WOODBURY FARM, AXMINSTER, DEVON. INTERIM REPORT ON GEOPHYSICAL SURVEY, 1993

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WOODBURY FARM, Axminster, Devon.

Interim Report on geophysical survey, 1993

Introduction

The aim of this survey was to investigate the extent of archaeological activity to the W of the currently scheduled Roman Fort (DV 1031, Silvester 1984) at Woodbury Farm to aid the accurate protection of the monument. This work was prompted by an application for planning permission to develop the land for housing and from watching brief evidence recovered by Exeter Archaeological Unit during the laying of the 1990 South West Water pipeline (Simpson 1991).

The site (OS 297 973) lies over white Lias limestones, shales and marls of the Rhaetic beds.

Method

Due to the large area under investigation and the unfavourably wet field conditions it was decided to carry out a pilot fluxgate gradiometer survey to assess the response of the site to magnetic survey techniques. A topsoil susceptibility survey was also conducted in conjunction with the magnetometer survey.

A survey grid divided into 30m squares was established over the site (see location plan) with partial squares extending to the field boundaries. The area was then surveyed with a Geoscan FM36 magnetometer along successive N-S traverses separated by 1.0m intervals. Readings were logged every 0.25m and the data was downloaded to a microcomputer in the field. Final presentation of the data has been enhanced by the application of a local median filter to remove the intense response of buried/surface iron and a low pass Gaussian filter to suppress image noise (Scollar et al 1990); Plot 1 shows a grey-tone of this data and Plot 2 a truncated trace-plot.

Topsoil magnetic susceptibility measurements were taken at a 15m sample interval using a Bartington MS2 meter and field search loop. The data is displayed as a greyscale image superimposed over the OS map in Plot 3.

Soil samples were recovered from two augured anomalies and values for low field magnetic susceptibility (χ_{LF}) and frequency dependent of magnetic susceptibility (χ_{FD}) were measured using a Bartington MS2 meter and dual frequency laboratory coil. Samples were then heated in a Carbolite furnace to a temperature of 650 C in covered crucibles for 40mins and then for a further 40mins with the covers removed. The increased magnetic enhancement that occurred after this treatment was used to calculate the fractional conversion (Thompson & Oldfield 1986) of the samples (Figures 1 and 2).

Results

Magnetometer survey

The results in the N of the survey area (squares 1 - 17) have been severely marred by the presence of both the SSW pipeline, a Gas main and a third unidentified ferrous pipeline running across the survey area from Woodbury Cottage. Further modern interference from electric fence posts is evident in the S of the survey although the latter has not affected the identification of archaeological anomalies. The 1992 slurry pipeline is not immediately obvious although square 23 contains a group of intense anomalies of unknown origin. However, soil samples recovered from the latter (Figure 1) suggest that they may not be of archaeological origin.

The survey has identified a plethora of positive linear ditch-type anomalies extending throughout squares 20 - 45 and into the wake of the pipe-line disturbance in squares 15 - 18. There is also tentative evidence for two further ditch-type anomalies cut by the water main in square 8, an interpretation supported by observations made during the pipeline watching brief (Simpson 1991). A number of pit-type anomalies are also evident throughout the survey area and one of the most striking of these (square 27/28) was augured for soil samples (figure 2). These samples demonstrated an enhanced low field magnetic susceptibility (χ_{LF}) increasing with depth and the inclusion of bright orange burnt material and charcoal from 40-120cm. The frequency dependence (χ_{FD}) of the individual samples appears to be unrelated to the presence of burnt material. After controlled laboratory heating the fractional conversion of the samples from an archaeological origin were found to be much greater than the two natural topsoil samples, suggesting a degree of anthropogenic magnetic enhancement had already occurred in those samples containing burnt material. The variation of frequency dependence between the samples was found to be greatly reduced after the heating experiments.

The survey within the scheduled area revealed a number of positive linear anomalies (eg square 33) in addition to the outer defensive ditch running parallel to the field boundary. A number of amorphous anomalies are also evident, possibly related to occupation features within the fort.

Topsoil magnetic susceptibility survey

Figure 3 shows a concentration of enhanced topsoil susceptibility immediately W of the fort and to the E within the fort (beyond the area covered by the magnetometer survey). Whilst these results broadly reflect the magnetometer data caution must be exercised in extending the interpretation of this data. However, the low values recorded within squares 3, 4 and 5 supports the quiet magnetometer data and suggests the absence of occupation activity within this area.

Conclusion

The survey has successfully demonstrated the response of magnetic survey techniques to archaeological targets on this site. A pattern of anomalies related to occupation within the

fort is evident and the extension of archaeological activity along a planned system of linear boundaries has been demonstrated to the W of the currently scheduled area. Unfortunately the response in the N of the site has been hampered by the presence of modern disturbance in the form of buried ferrous pipelines. A fuller definition of this area and of the location of the Roman road alignments to the N and S of the survey could be best established by use of a resistivity survey at a more favourable time of year.

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Date of survey: 11-14/10/93

Reported by: N Linford

Date of report: 19/10/93

Archaeometry Branch,
Ancient Monuments Laboratory,
English Heritage.

References

Scollar, I, *et al*	1990	Archaeological Prospecting and Remote Sensing, 507-508, Cambridge.
Silvester, R & Bidwell, P	1984	A Roman Site at Woodbury Axminster, Proceedings of of the Devon Archaeological Society, v42 (1984).
Simpson, S	1991	Musbury to Axminster water main, EMAFU Report 91.18 (1991).
Thompson & Oldfield	1986	Environmental Magnetism. Allen & Unwin.

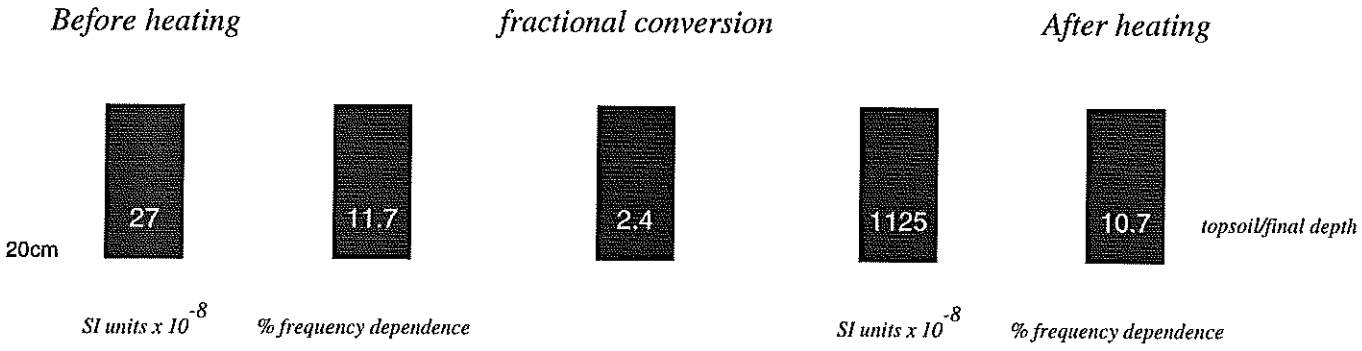


Figure 1; Magnetic susceptibility results from augured anomaly.

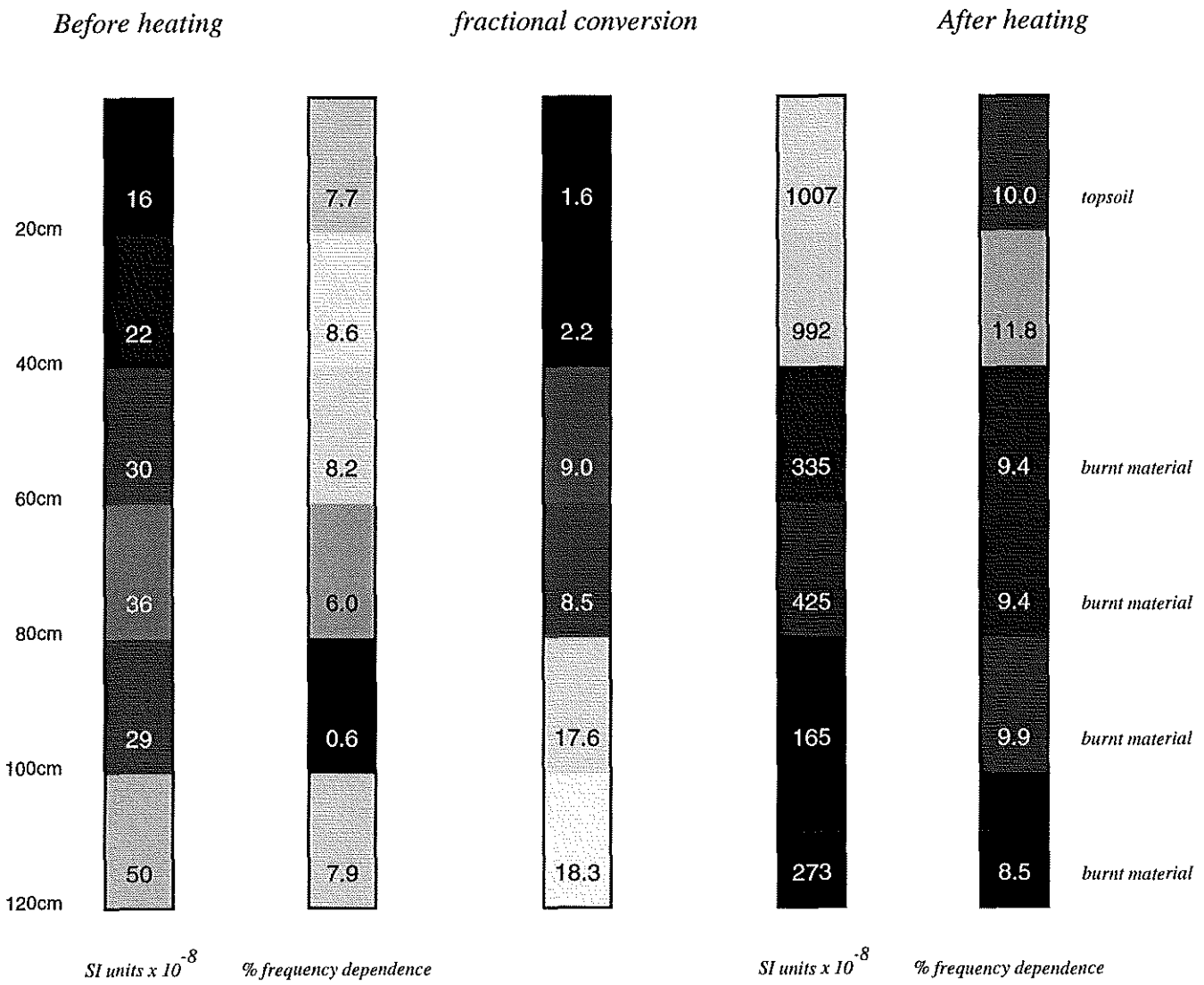
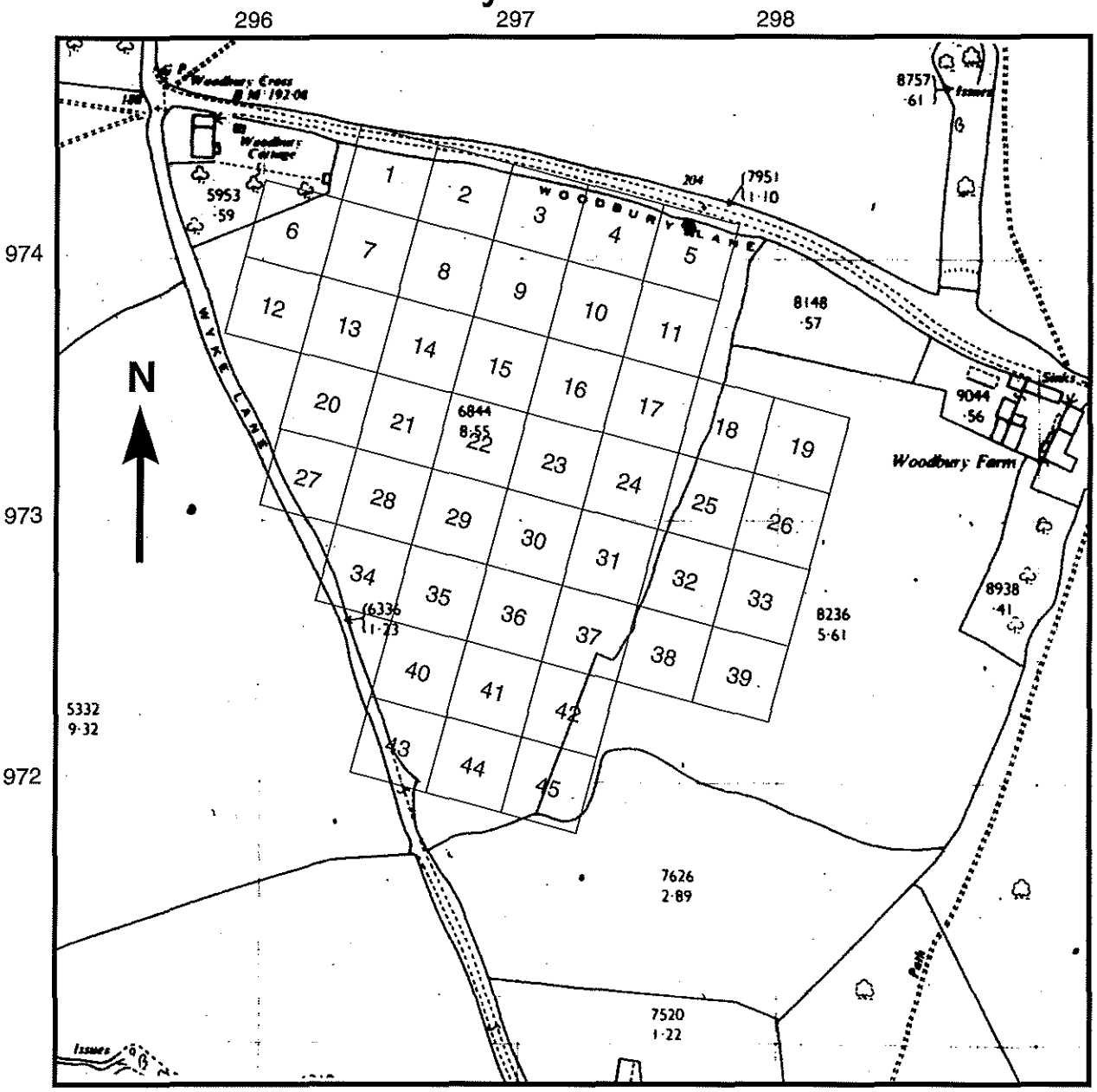


Figure 2; Magnetic susceptibility results from augured pit anomaly.

Location of survey

SY 2997



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Magnetometer survey October 1993

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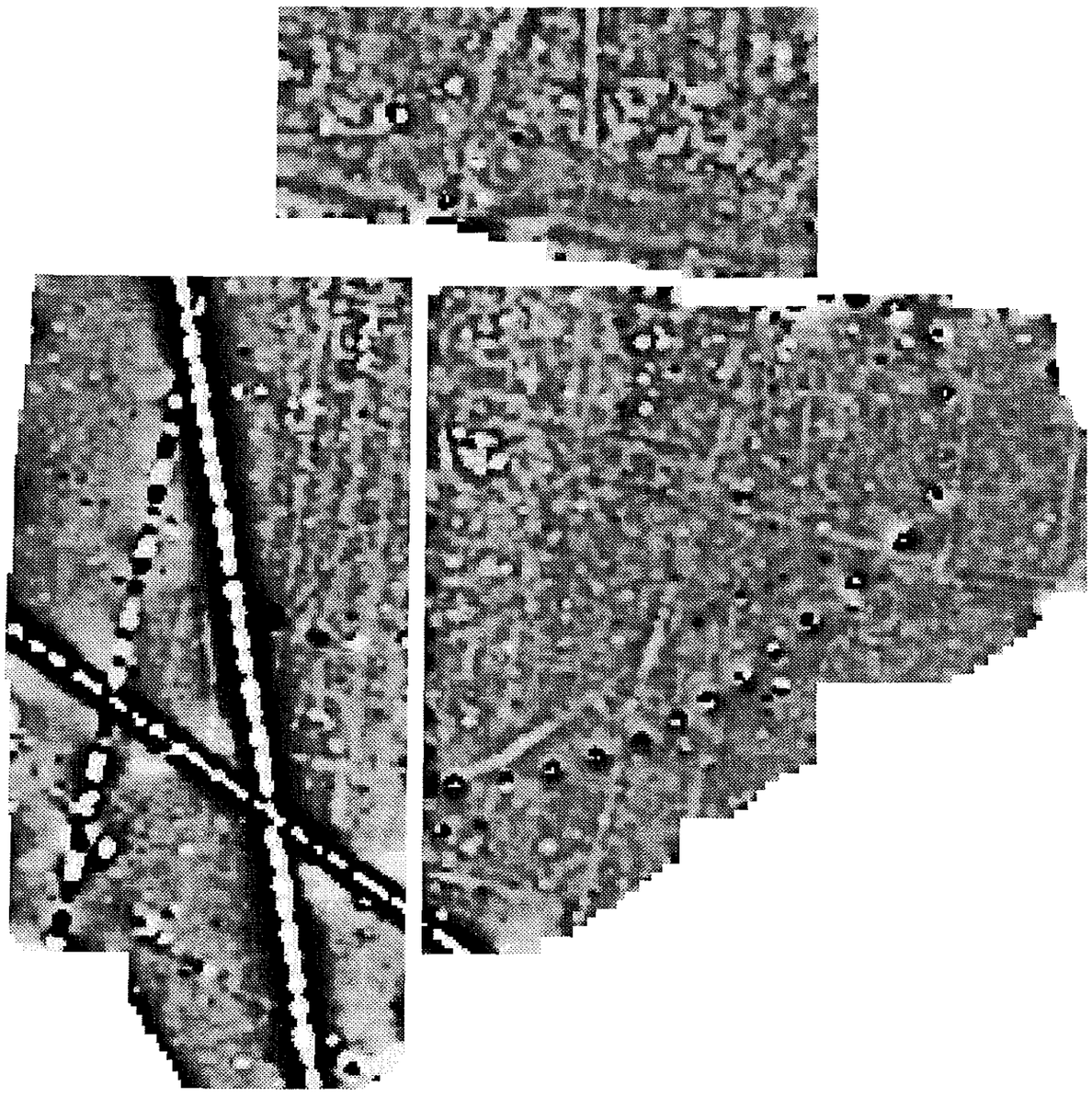
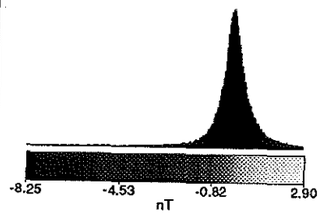
1. Greytone smoothed data





0 ——— 90m

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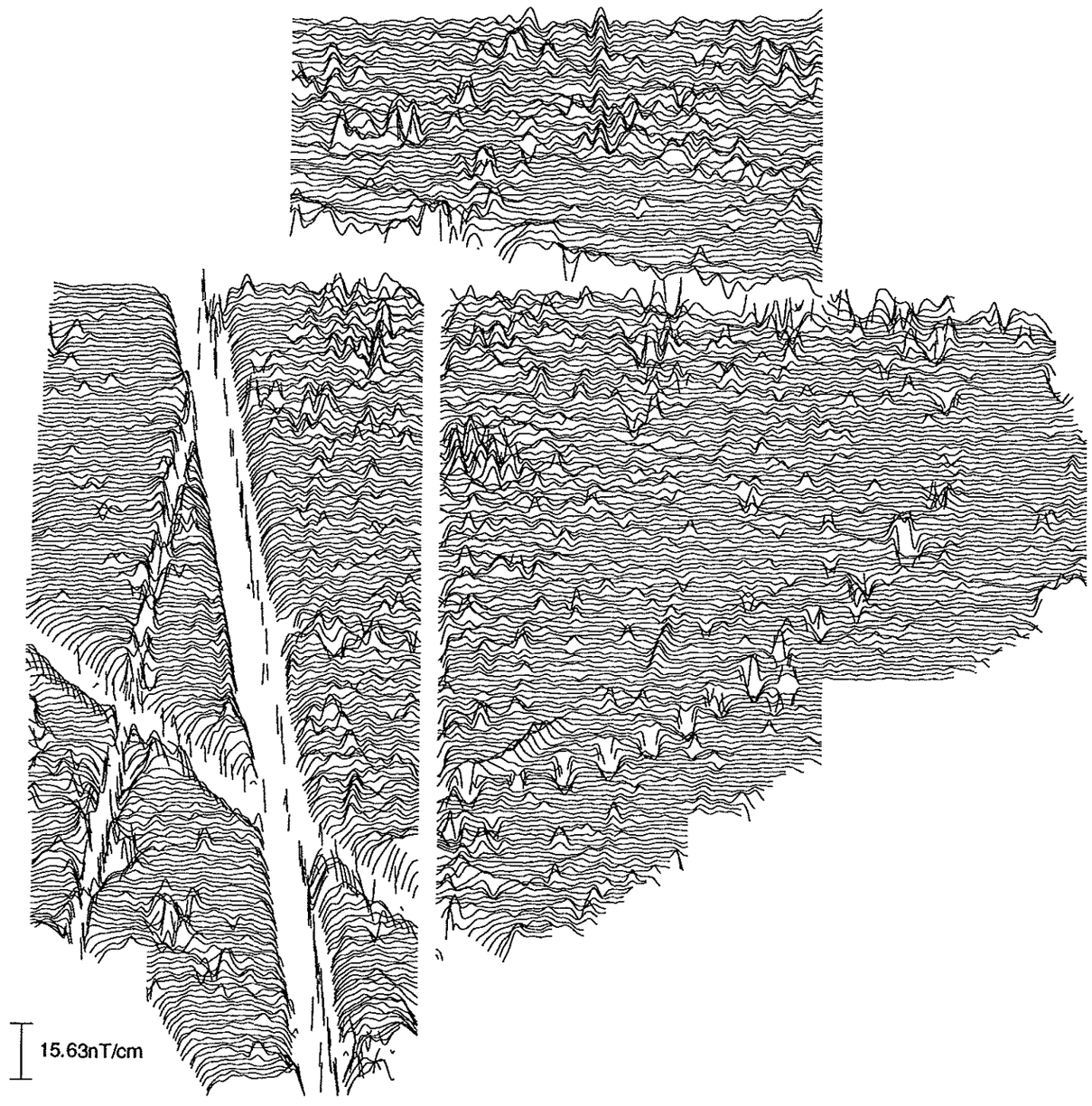
2. Trace plot smoothed data



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Magnetic susceptibility

PLOT 3