



**DEEP REGIONAL RESISTIVITY STRUCTURE ACROSS THE
BATTLE MOUNTAIN-EUREKA AND CARLIN TRENDS,
NORTH-CENTRAL NEVADA**

by

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Open-File Report 01-346

on-line edition

2001

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**U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY**

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ABSTRACT

Magnetotelluric data collected along four, regional scale, southwest-to-northeast profiles show deep resistivity structures beneath the Battle Mountain-Eureka and Carlin gold trends in north-central Nevada, which appear consistent with tectonic breaks in the crust that possibly served as channels for hydrothermal fluids. It seems likely that gold deposits along these linear trends were, therefore, controlled by deep regional crustal fault systems.

Two-dimensional resistivity modeling of the magnetotelluric data generally show resistive (30 to 1,000 ohm-m) crustal blocks broken by narrow, sub-vertical, two-dimensional, conductive (1 to 10 ohm-m) zones that are indicative of large-scale crustal fault zones. These inferred fault zones are regional in scale, trend southeast-to-northwest, and extend to mid-crustal (20 km) depths. The conductors are about 3 to 15 km wide, extend from 1 to 8 km below the surface to about 20 km depth, and show two-dimensional electrical structure with general north to northwesterly strikes. From connecting the locations of the conductors together, a single regional crustal fault zone can be inferred that is about 10 km wide within the upper crust and about 150-km long. It coincides with the Battle Mountain-Eureka mineral trend. The images also show regional changes in the resistive crust from north to south. Most of Reese River Valley and Boulder Valley are underlain by a thick (20 km) southwest-to-northeast section of conductive (1 to 10 ohm-m) rock, suggesting that high-temperature fluids are more pervasive in this area (Battle Mountain Heat-Flow High), which implies that the crust beneath these valleys is more fractured than in the areas surveyed to the south.

INTRODUCTION

Many sediment-hosted gold deposits occur along linear trends in northern Nevada. The distribution and genesis of these deposits along the Battle Mountain-Eureka (BME) and Carlin gold trends is not fully understood. In general, most models agree that regional structures played an important role in the spatial distribution of these deposits (e.g. Arehart and others, 1993; Ilchik and Barton, 1997; Radtke, 1985; Shawe, 1991; Sillitoe and Bonham, 1990; Tosdal, 1998). To investigate crustal structures that may be related to the genesis of gold deposits along these trends, four regional southeast-to-northwest profiles of magnetotelluric (MT) soundings were acquired in 1996, 1997, 1999, and 2000 (lines MT1 to MT4, [Figure 1](#)). Resistivity modeling of the MT data can be used to infer the deep resistivity structure of the crust. Such structures may reflect possible tectonic

controls on the emplacement of mineral deposits along these linear trends, and so may be used to help improve critical gold endowment estimates in the Humboldt River Basin.

MAGNETOTELLURIC METHOD

The magnetotelluric (MT) method is a passive surface geophysical technique, which uses the earth's natural electromagnetic fields to investigate the electrical resistivity structure of the subsurface. The resistivity of geologic units is largely dependent upon their fluid content, porosity, degree of fracturing, temperature, and conductive mineral content (Keller, 1989). Saline fluids within the pore spaces and fracture openings can reduce resistivities in a resistive rock matrix. Also, resistivity can be lowered by the presence of conductive clay minerals, carbon, and metallic mineralization. It is common for altered volcanic rocks to contain authigenic minerals that have resistivities ten times lower than those of the surrounding rocks (Nelson and Anderson, 1992). Increased temperatures cause higher ionic mobility and mineral activation energy, reducing rock resistivities significantly. Unaltered, unfractured igneous rocks are normally very resistive (typically 1,000 ohm-m or greater), whereas fault zones will show low resistivity (less than 100 ohm-m) when they are comprised of rocks fractured enough to have hosted fluid transport and consequent mineralogical alteration (Eberhart-Phillips and others, 1995). Carbonate rocks are moderately to highly resistive (hundreds to thousands of ohm-m) dependent upon their fluid content, porosity, fracturing, and impurities. Marine shales, mudstones, and clay-rich alluvium are normally very conductive (a few ohm-m to tens of ohm-m). Unaltered, metamorphic rocks (non-graphitic) are moderately to highly resistive (hundreds to thousands of ohm-m). Tables of electrical resistivity for a variety of rocks, minerals and geological environments may be found in Keller (1987) and Palacky (1987).

The MT method can be used to probe the crust from depths of tens of meters to depths of tens of kilometers (Vozoff, 1991). Natural variations of the Earth's magnetic and electric field are measured and recorded at each MT station. The main frequency bands used by the MT method are 10,000 Hz to 1 Hz from worldwide lightning activity and 1 Hz to 0.0001 Hz from geomagnetic micro-pulsations. The natural electric and magnetic fields propagate vertically in the earth because the very large resistivity contrast between the air and the earth causes a vertical refraction of both fields transmitted into the earth (Vozoff, 1972).

The natural electric and magnetic fields are recorded in two orthogonal, horizontal directions. The vertical magnetic field ("tipper") is also recorded. The resulting time-series signals are used to derive earth tensor apparent resistivities and phases by first converting them to complex cross-spectra using FFT (fast-Fourier-transform) techniques. Least-squares, cross-spectral analysis (Bendat and Piersol, 1971) is used to solve for a tensor-transfer function that relates the observed electric fields to the magnetic fields under the assumption that the Earth consists of a two-input, two-output, linear system with the magnetic fields as input and the electric fields as output (Rodriguez and others, 1996). Prior to conversion to apparent resistivity and phase, the tensor is normally rotated into principal directions that correspond to the direction of maximum and minimum apparent resistivity. For a two-dimensional (2-D) Earth, the MT fields can be de-coupled into transverse electric (TE) and transverse magnetic (TM) modes; 2-D modeling is generally done to fit both modes. When the geology satisfies the 2-D assumption, the MT data for the TE mode is assumed to represent the situation when the electric field is along the geologic strike, and the data for the TM mode is assumed to represent the situation when the electric field is across strike. The MT method is well suited for studying complicated geological environments because the electric and magnetic relations are sensitive to vertical and horizontal variations in resistivity. The method is capable of establishing whether the electromagnetic fields are responding to subsurface terranes of effectively 1-, 2-, or 3-dimensions. An introduction to the MT method and references for a more advanced understanding are contained in Dobrin and Savit (1988) and Vozoff (1991).

MAGNETOTELLURIC SURVEYS

Sixty-nine MT soundings were located along four regional southwest-to-northeast profiles (MT1 to MT4, [Figure 1](#)) of varying lengths (40 to 110 km) with spacing that varied from 1.3 to 19.5 km. The profile orientations are roughly perpendicular to the BME and Carlin gold trends. The MT soundings span as far northwest as Reese River Valley and Boulder Valley near Battle Mountain and as far southeast as Long Valley, east of the Alligator Ridge mine.

The following table lists the MT station locations in the four regional southwest-to-northeast profiles ([Figure 1](#)). These locations were found using either on-site GPS measurements or digitized from 100,000 scale field maps (Williams and Rodriguez, 2000; Williams and Rodriguez, 2001; Williams and others, 2001a; Williams and others, 2001b; Williams and others, 2001c). Coordinates are referenced to the 1866 Clarke spheroid and North

American 1927 Western United States datum. Longitude and latitude format below is decimal degrees. Elevation is in meters.

<u>Station</u>	<u>Longitude</u>	<u>Latitude</u>	<u>Elev (m)</u>
MT4			
98	-117.23117	40.44410	1440
12A	-117.12441	40.44999	1430
13A	-117.05447	40.46508	1420
14A	-116.98314	40.49695	1390
16A	-116.94524	40.51559	1360
19A	-116.89245	40.51839	1390
20A	-116.86685	40.52878	1350
22A	-116.84852	40.55662	1340
23A	-116.82223	40.56811	1350
24A	-116.79907	40.58977	1340
25A	-116.78090	40.61226	1400
71	-116.76773	40.69609	1350
26A	-116.70164	40.66617	1450
27A	-116.54826	40.73778	1410
28A	-116.44901	40.78003	1420
9	-116.36060	40.76114	1490
1	-116.33037	40.79034	1550
2	-116.31374	40.80459	1650
24	-116.29118	40.79805	1650
25	-116.25092	40.79475	1770
26	-116.22477	40.82100	1600
27	-116.18810	40.80681	1600
28	-116.15437	40.80115	1600
MT3			
16	-117.03204	40.03355	1740
15	-116.92586	40.06778	1595
1A	-116.84890	40.15161	1590
2A	-116.75097	40.20433	1500
5A	-116.66432	40.23551	1475
3A	-116.58452	40.27633	1445
4A	-116.57803	40.29375	1445
14	-116.55498	40.35025	1445
13	-116.56650	40.43708	1460
12	-116.46765	40.55145	1495
19	-116.41989	40.59568	1445
11	-116.40231	40.67147	1525
10	-116.36736	40.73788	1490
9	-116.36060	40.76114	1490
1	-116.33037	40.79034	1550
2	-116.31374	40.80459	1650
3	-116.30656	40.82193	1700
4	-116.30516	40.84248	1800
5	-116.29302	40.85368	1730

6	-116.27523	40.86021	1660
7	-116.26662	40.87744	1640
8	-116.25457	40.89239	1645
20	-116.22196	40.93338	1675
21	-116.18823	40.95701	1675
22	-116.16402	41.00800	1710
29	-116.09901	41.03600	1840
23	-116.03185	41.10000	1900
54	-116.38179	41.44002	2130

MT2

17	-116.83356	39.96701	1950
11A	-116.73088	39.94657	1770
10A	-116.65782	40.03011	1790
6A	-116.58502	40.03230	1720
9A	-116.48118	40.06390	1790
8A	-116.42011	40.08985	1725
7A	-116.32249	40.09119	1725
18	-116.16121	40.09325	1840

MT1

88	-116.47773	39.52744	1890
87	-116.27814	39.55249	1850
86	-116.15948	39.60576	1870
85	-116.04913	39.62802	1820
89	-115.97073	39.75141	1780
109	-115.87795	39.70953	1870
83	-115.80588	39.73506	2050
82	-115.71711	39.79929	1780
81	-115.63851	39.79379	1810
108	-115.53142	39.76552	2120
79	-115.47101	39.80462	2020
77	-115.39775	39.81638	1870
78	-115.32175	39.83858	1910

MAGNETOTELLURIC DATA

Frequencies sampled ranged from 0.002 to 300 Hz using single station recordings of both orthogonal horizontal components of the electric and magnetic fields, along with the vertical magnetic field at stations 12A to 28A, 1, 11, 14, 71, 77, 79 to 89, 98, 108, and 109 (Williams and Rodriguez, 2000; Williams and Rodriguez, 2001; Williams and others, 2001a; Williams and others, 2001b; Williams and others, 2001c). Sampling this frequency range in previous areas of widely varying geology has allowed us to probe the crust from depths of hundreds of meters to depths of tens of kilometers (Rodriguez and others, 1996). The recorded time-series data were transformed to the frequency domain and Fourier analyzed to determine a two-dimensional apparent

resistivity and phase tensor at each site. The data were rotated to maximum and minimum apparent resistivity directions so that propagation modes for the signals were decoupled into TE and TM modes.

A measure of the dimensionality for MT data is provided by the impedance skew of the impedance tensor (Vozoff, 1972) and the impedance polar plots (Reddy and others, 1977). By examining the tensor impedances, the dimensionality (2- or 3-D) of electrical structures and the general strikes of 2-D structures were determined for different frequencies. MT stations whose impedances were 3-D in the lower frequencies (Williams and Rodriguez, 2000; Williams and Rodriguez, 2001; Williams and others, 2001a; Williams and others, 2001b; Williams and others, 2001c) are indicated with triangle symbols in [Figure 1](#). Predicted values of the electric field can be computed from the measured values of the magnetic field (Vozoff, 1991). The coherence of the predicted electric field with the measured electric field is a measure of the signal-to-noise ratio provided in the multiple coherency plot. Values are normalized between 0 and 1, where values at 0.5 signify signal levels equal to noise levels. For this data set, coherencies were generally at an acceptable level, except at times in the "dead band" (0.1 to 1 Hz) and at times in the lower frequencies (0.002 to 0.1). Overall data quality was fair to good for profiles MT1, MT2, and MT4, and fair to poor for MT3 (Williams and Rodriguez, 2000; Williams and Rodriguez, 2001; Williams and others, 2001a; Williams and others, 2001b; Williams and others, 2001c). The worst data points were ignored and the data used in the modeling generally had predicted coherencies above 90% and 60% for the higher and lower quality data, respectively.

In the Appendix, observed data of each MT sounding for each profile (MT1 to MT4) are represented by discrete values (circle and x symbols) of the TE and TM modes from the raw data curves (Williams and Rodriguez, 2000; Williams and Rodriguez, 2001; Williams and others, 2001a; Williams and others, 2001b; Williams and others, 2001c). Calculated data for each profile are represented by solid (TE mode) and dashed (TM mode) lines interpolated from the discrete values output from the 2-D finite element model ([Figure 2](#)).

RESISTIVITY MODELS

Wannamaker (1983) found that MT responses in the northern Basin and Range are fundamentally 3-D in nature. However, because 3-D modeling is very time-consuming, 2-D modeling was used to construct the preliminary resistivity cross-sections shown in [Figure 2](#). Wannamaker and others (1984) have demonstrated in 3-D resistivity (MT) modeling that approximating 3-D structure beneath a centrally located profile with 2-D modeling is best achieved when fitting the TM curve even at the expense of fitting the TE curve. However, because TM data are quite insensitive to the depth extent of a subsurface body (Eberhart-Phillips and others, 1995), the depths to the base of the bodies in the model are not well constrained. Clarifying the limits of the model structures with 3-D resistivity modeling is needed.

Resistivity models ([Figure 2](#)) assuming a 2-D earth were constructed for each profile using the forward modeling finite element algorithm of Wannamaker and others [1987]. The resistivity models generally fit the TM data better than the TE data (see Appendix A, B, C, and D), although fits to the TE data were generally satisfactory for stations where 2-D structure was indicated ([Figure 2](#)). However, because of the widespread 3-D character of the results, we focus only on the gross structure determined by the models.

The variable-dimension finite-element grid cells used for our models had 77x38, 127x38, 136x36, and 125x38 horizontal and vertical nodes for profiles MT1, MT2, MT3, and MT4, respectively. The edges of the model were extended to 900-, 980-, 550-, and 890-km horizontally and 450-, 450-, 200-, and 450-km vertically for profiles MT1, MT2, MT3, and MT4, respectively, so as to minimize edge effects. The resolution of the resistivity boundaries used for each model is somewhat subjective. If different resistivities are used, then boundary positions and layer depths would have to be adjusted to achieve similar fits to the observed data. The extreme case would be to use a model with a "continuous" resistivity gradient from low to high resistivities. The resolution of the resistivity boundaries is also, in part, a function of our model grid mesh design. We have attempted to keep each model simple. The MT profile models ([Figure 2](#)) are stacked as though viewed from the southeast end of the BME trend ([Figure 1](#)). The model depths are relative to the surface.

DISCUSSION

The resistivity model for profile MT4 (Figure 2) shows high crustal resistivity (300 to 1,000 ohm-m) beneath the Carlin trend, characteristic of carbonates or intruded rock, although significant portions of the model below 5 to 10 km depth beneath the Carlin trend is poorly defined because of poor data quality. The narrow, sub-vertical, 2-D, low resistivity (1 to 10 ohm-m) zone beneath stations 20A to 24A that penetrates to mid-crustal depths (from 5 to 20 km depth) is hard to explain other than by a major crustal-dimension fault or fracture zone (Eberhart-Phillips et al., 1995). The low resistivities are likely caused by material associated with faulting or fracture filling, such as mylonitic breccia, brine-filled fractures, argillaceous alteration from hydrothermal fluids, substantial graphitic carbon associated with shearing, or a combination of these (Eberhart-Phillips et al., 1995). Additional support for a fault zone interpretation is the 2-D electrical structure. In the upper 8 km, the resistive (30 to 1,000 ohm-m) crustal blocks near Battle Mountain (beneath station 16A, Figure 1) appear to be broken by a southwest-to-northeast fault zone. Other conductive zones in this model are 3-D in character and so are not interpreted as crustal fault zones, however, the large 3-D conductive (1 ohm-m) zone from 1 to 12 km depth between stations 27A and 28A is characteristic of a geothermal resource area (GRA).

The resistivity model for profile MT3 (Figure 2) also shows a high crustal resistivity (300 to 1,000 ohm-m) beneath the Carlin trend, characteristic of carbonates or intruded rock. Exposures of Cretaceous quartz monzonite near MT station 4, Tertiary granodiorite about one mile southeast of station 2, widespread re-crystallized carbonates in these areas (Evans, 1980), and a broad magnetic high (Grauch, 1996) support the presence of a large, concealed, pluton. Most of the MT sites inside the Carlin trend indicate 3-D resistivity structure at depth (Williams and Rodriguez, 2000). The narrow, sub-vertical, 2-D, low resistivity (1 to 10 ohm-m) zone, extending to about 20 km depth beneath station 8 is interpreted as a crustal fault zone. The moderately resistive (30 to 300 ohm-m) rocks in the upper 5 km northeast and southwest of the Carlin trend probably correspond to carbonates in the near surface where local outcrops exist (stations 11, 10, 9, 1, 5, 29, and 23) or other unknown volcanic and/or clastic sedimentary rocks at depth (Grauch and others, 1998). The low resistivity (3 ohm-m) zone beneath stations 12 and 19 correlates with a known geothermal resource area (Beowawe KGRA, Figure 1). The narrow, sub-vertical, 2-D, low resistivity (3 to 10 ohm-m) zone, extending to about 20 km depth beneath station 5A is interpreted as a crustal fault zone. Significant portions of the model below 5 to 10 km depth at the southwest and northeast sections are poorly defined because of

poor data quality. Other conductive zones in this model are 3-D in character and so are not interpreted as crustal fault zones.

Crustal resistivity for profile MT2 (Figure 2) across the eastern part of the BME trend (1,000 ohm-m, between stations 7A and 9A) is also characteristic of carbonates or intruded rocks. Southwest of this high resistivity body, a narrow, sub-vertical, 2-D, low resistivity (1 to 10 ohm-m) zone, extending to about 20 km depth is interpreted as a crustal fault zone. The inferred crustal fault zone is more resistive (from 1 ohm-m to 10 ohm-m) near 15-km depth, where it intersects the top of the brittle-ductile transition (Holbrook and others, 1991). Grauch and others (1998) show that sub-horizontal seismic reflectors from COCORP seismic-reflection data (Potter and others, 1987) in this depth range occur near a horizontal resistivity boundary near 15-km depth (brittle-ductile transition) that shows a change to lower resistivity (from 1,000 ohm-m to 100 ohm-m). Potter and others (1987) suggested the west-dipping reflection might be an inclined magma feeder for the Northern Nevada rift, whose magnetic-high expression is between stations 9A and 8A (Grauch and others, 1998). Another horizontal resistivity boundary that shows a general change to lower resistivity (from 100 ohm-m to 30 ohm-m) occurs below 20 km depth, where Holbrook and others (1991) suggested that rising basaltic magmas intrude the ductile lower crust with mafic sills.

The resistivity model for profile MT1 (Figure 2) shows high crustal resistivity (300 ohm-m), characteristic of carbonates or intruded rock, beneath Alligator Ridge (station 108, Figure 1) that is in-line with a southeast extension of the Carlin trend. The narrow, sub-vertical, 2-D, low resistivity (3 to 10 ohm-m) zone, extending to about 20 km depth beneath station 79 is interpreted as a crustal fault zone. The resistive crustal blocks near Alligator Ridge (station 79) appear to be broken by a south-to-north fault zone in the upper 5 to 10 km. The narrow, sub-vertical, 2-D, low resistivity (3 ohm-m) zone, extending to about 20 km depth beneath station 87 is interpreted as a crustal fault zone. Other conductive zones in this model are 3-D in character and so are not interpreted as crustal fault zones.

The crustal conductors, in general, are not well constrained laterally due to wide station spacing, giving 3 to 15 km as the overall range of widths. The images also show regional changes in the resistive crust from north to south. Most of Reese River Valley and Boulder Valley are underlain by a thick (20 km) southwest-to-northeast section of conductive (1 to 10 ohm-m) rock, suggesting that high-temperature fluids are more pervasive in this area (Battle Mountain Heat-Flow High, MT4, Figure 2). In turn, this implies that the crust is more highly fractured in the vicinity of profile MT4 than in the areas surveyed to the south.

SUMMARY

Strengthening the suggestion of Shawe (1991), MT data collected along four, regional scale, southwest-to-northeast profiles show deep resistivity structures beneath the Battle Mountain-Eureka (BME) and Carlin gold trends in north-central Nevada, which appear consistent with tectonic breaks in the crust that possibly served as channels for hydrothermal fluids. It seems likely that gold deposits along these linear trends were, therefore, controlled by deep regional crustal fault systems.

Two-dimensional resistivity modeling of the MT data was used to image the deep resistivity structure in the study area. The models generally show resistive (30 to 1,000 ohm-m) crustal blocks broken by narrow, sub-vertical, two-dimensional, conductive (1 to 10 ohm-m) zones that are indicative of large-scale crustal fault zones. These inferred fault zones are regional in scale, trend southeast-to-northwest, and extend to mid-crustal (20 km) depths. The conductors are about 3 to 15 km wide, extend from 1 to 8 km below the surface to about 20 km depth, and show two-dimensional electrical structure with general north to northwesterly strikes. From connecting the locations of the conductors together, a single regional crustal fault zone can be inferred that is about 10 km wide within the upper crust and about 150-km long. It coincides with the BME mineral trend.

The interpreted structure from these profiles should provide constraints for future geologic interpretations of the genesis of gold deposits along the Carlin and BME trends. The deep regional resistivity structure across the Carlin and BME trends has huge implications for large gold resources in northeastern Nevada, because it reveals major crustal structures that were probably responsible for the deformation and shattering of upper crustal rocks providing local permeable zones favorable for fluid flow and precipitation of gold ores. This implies that the potential for many additional undiscovered deeper-level deposits in the Carlin trend is large.

Acknowledgments. We thank Douglas P. Klein for his contributions to this study before his retirement from the U.S. Geological Survey. We also thank V.J.S. Grauch with the U.S. Geological Survey and Louise Pellerin with the University of Utah, Energy and Geoscience Institute for their helpful comments and suggestions to this report.

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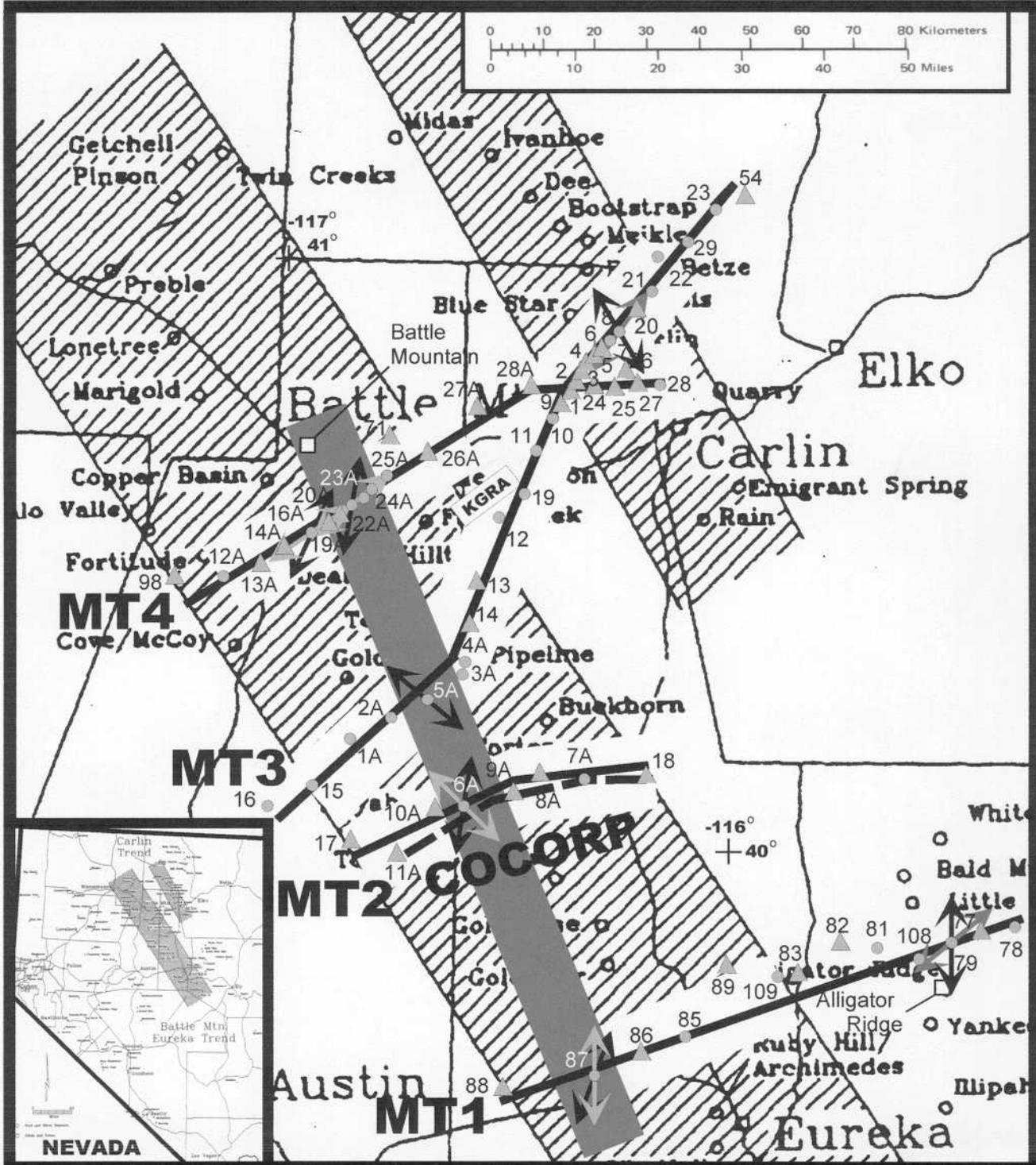


Figure 1. Index map. Magnetotelluric (MT) transects (MT1 to MT4) acquired in 1996, 1997, 1999, and 2000. Hatched zones are two northwest-trending mineralized belts in north-central Nevada, the well-known Carlin trend and the less well-defined Battle Mountain-Eureka trend. MT stations are grey circles and triangles (three-dimensional character in the lower frequency MT data), strikes are two-dimensional (2-D) conductors about 1-km (grey arrows) and 10-km (black arrows) below the ground surface, resistivity model profile locations (MT1 to MT4) are black lines, and interpreted crustal fault zone is 10 km-wide gray swath based on locations and extents of the sub-vertical 2-D conductors. MT strike resolution is about ± 20 degrees. Base map adapted from Struhsacker and others (1996).

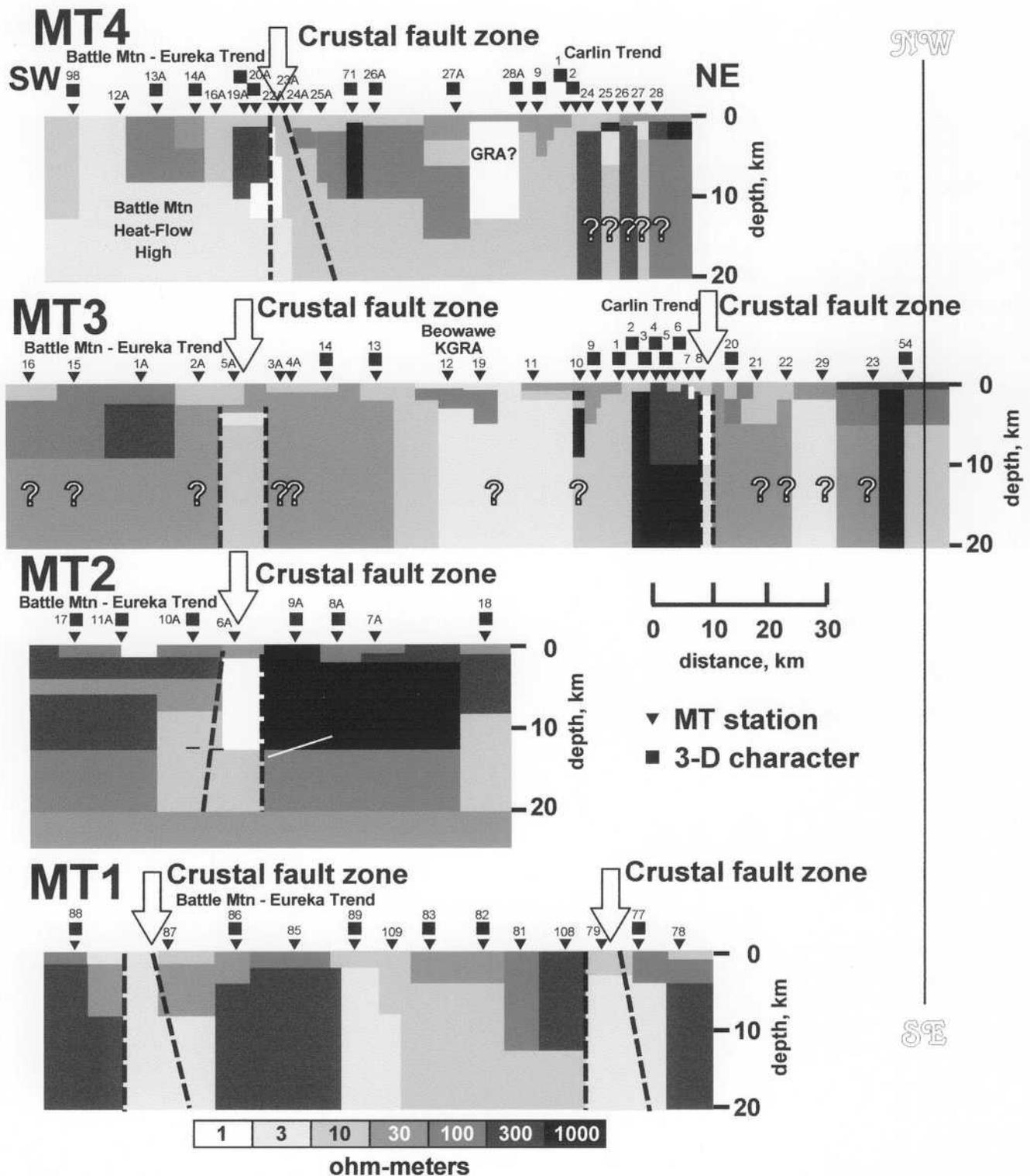


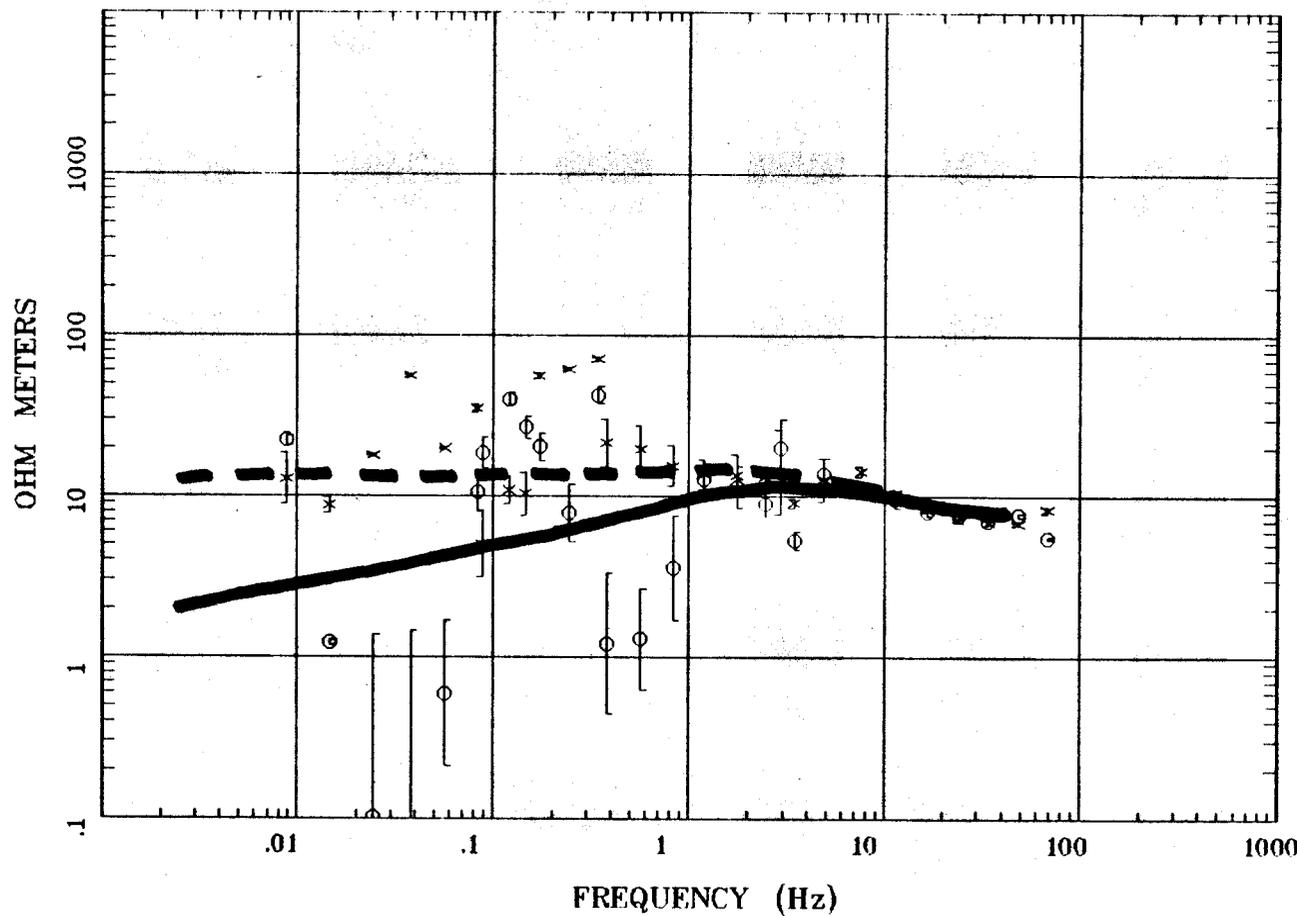
Figure 2. Magnetotelluric (MT) profile, two-dimensional, resistivity models (MT1 to MT4) stacked in relative positions along a northwest-to-southeast line (Figure 1). Depths are from ground surface. White arrows mark interpreted crustal fault zones. Black squares show stations whose MT data indicated three-dimensional character in the lower frequencies. Black and white solid lines on MT2 are COCORP seismic reflectors (Potter and others, 1987). Question marks indicate poor model definition from poor data quality. Vertical exaggeration is 1.4.

OBSERVED AND CALCULATED DATA - PROFILE MT4

Magnetotelluric (MT) observed (circle and x symbols) and calculated (solid and dashed lines are TE and TM modes, respectively) resistivity and phase data for profile MT4. See the "Magnetotelluric Data" section of this report for a description of the observed data and the "Resistivity Models" section for a description of the calculated data.

APPARENT RESISTIVITY

Fish Creek Mtns, NV 100k



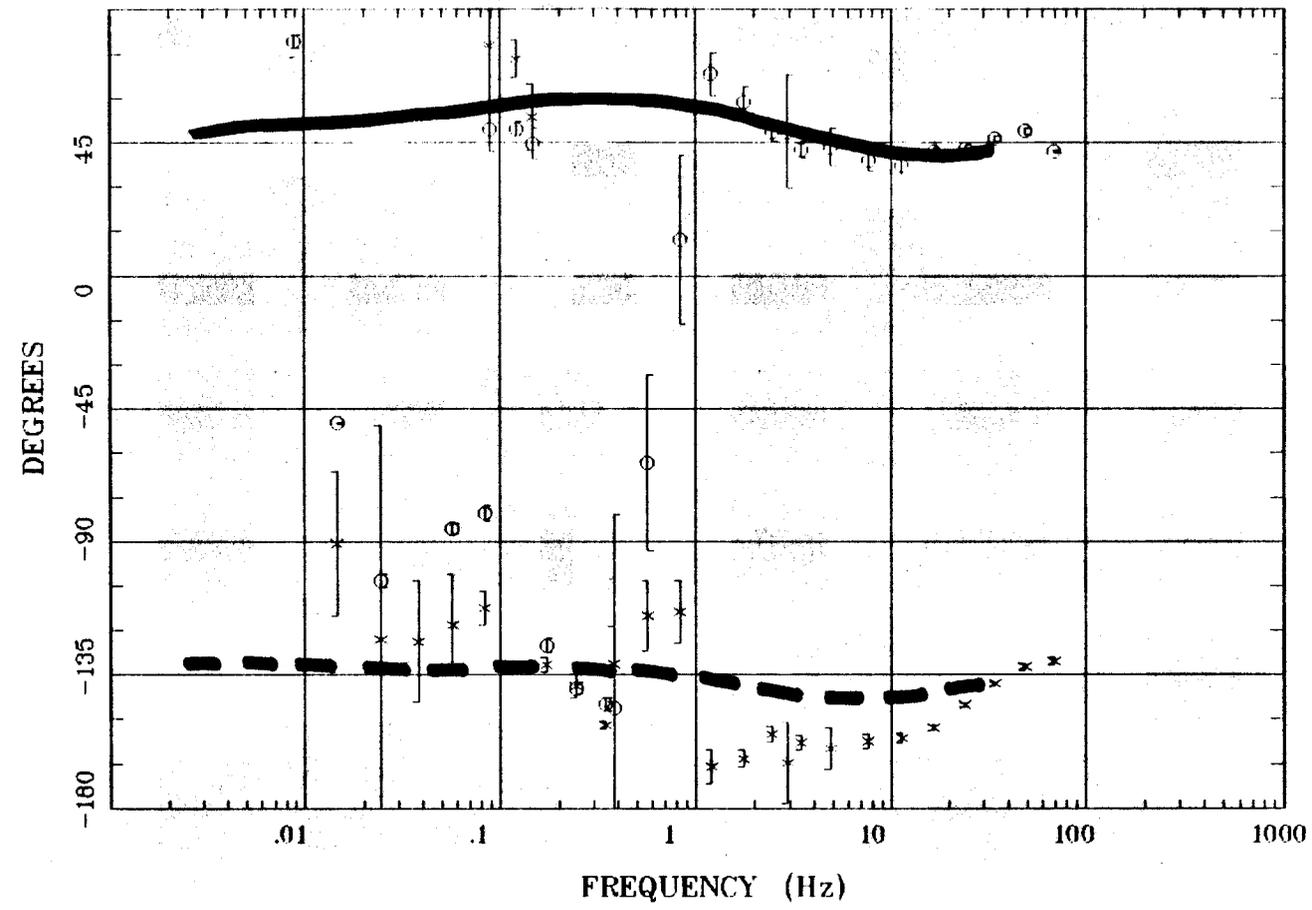
Client:
 Remote: none
 Acquired: 13:1 Jul 30, 2000
 Survey Co:USGS

Rotation:
 Filename: hr98c.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 08:24 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 98

IMPEDANCE PHASE

Fish Creek Mtns, NV 100k



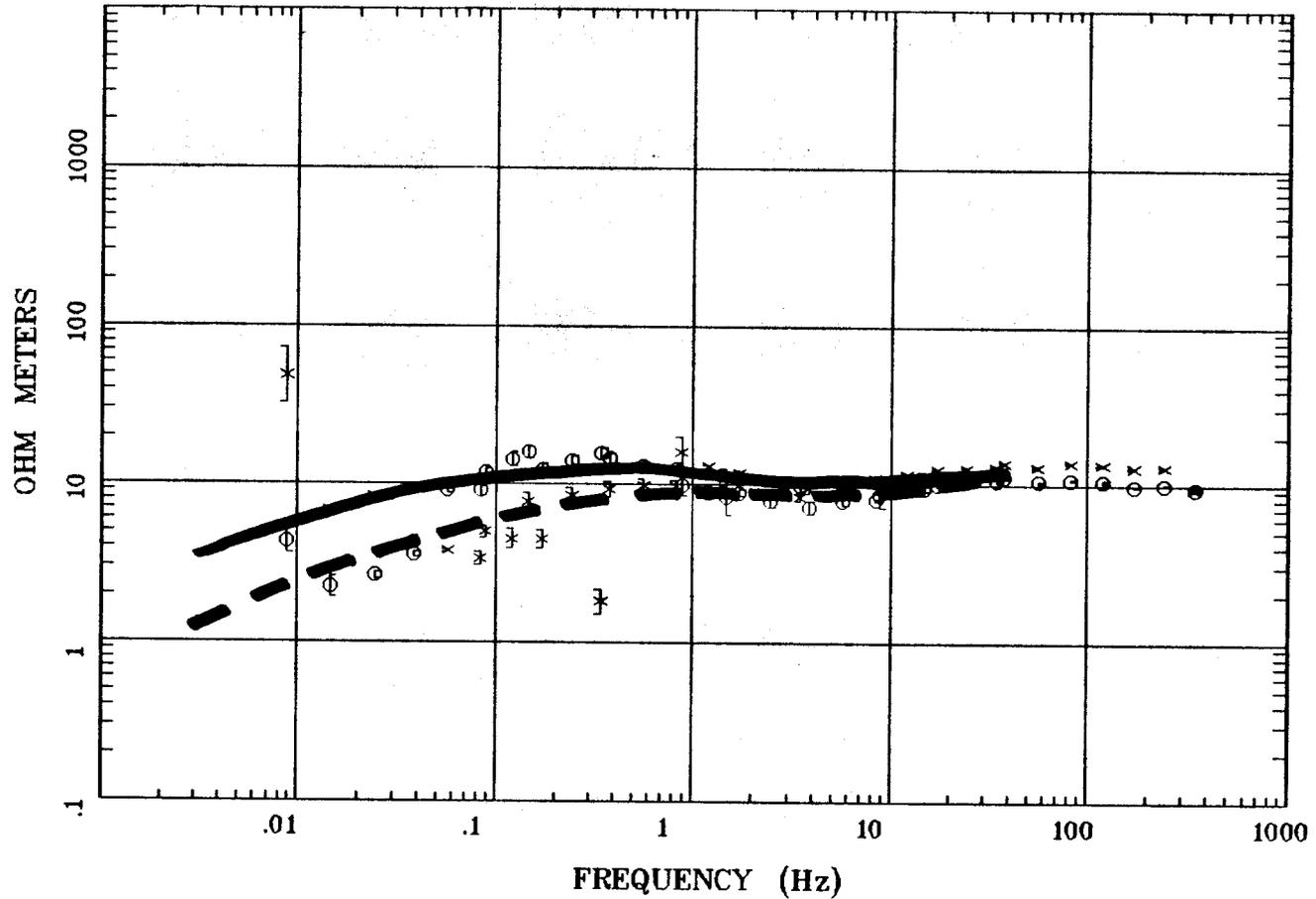
Client:
Remote: none
Acquired: 13:1 Jul 30, 2000
Survey Co:USGS

Rotation:
Filename: hr98c.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 08:24 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

Station 12A

APPARENT RESISTIVITY

battle mtn No. NV



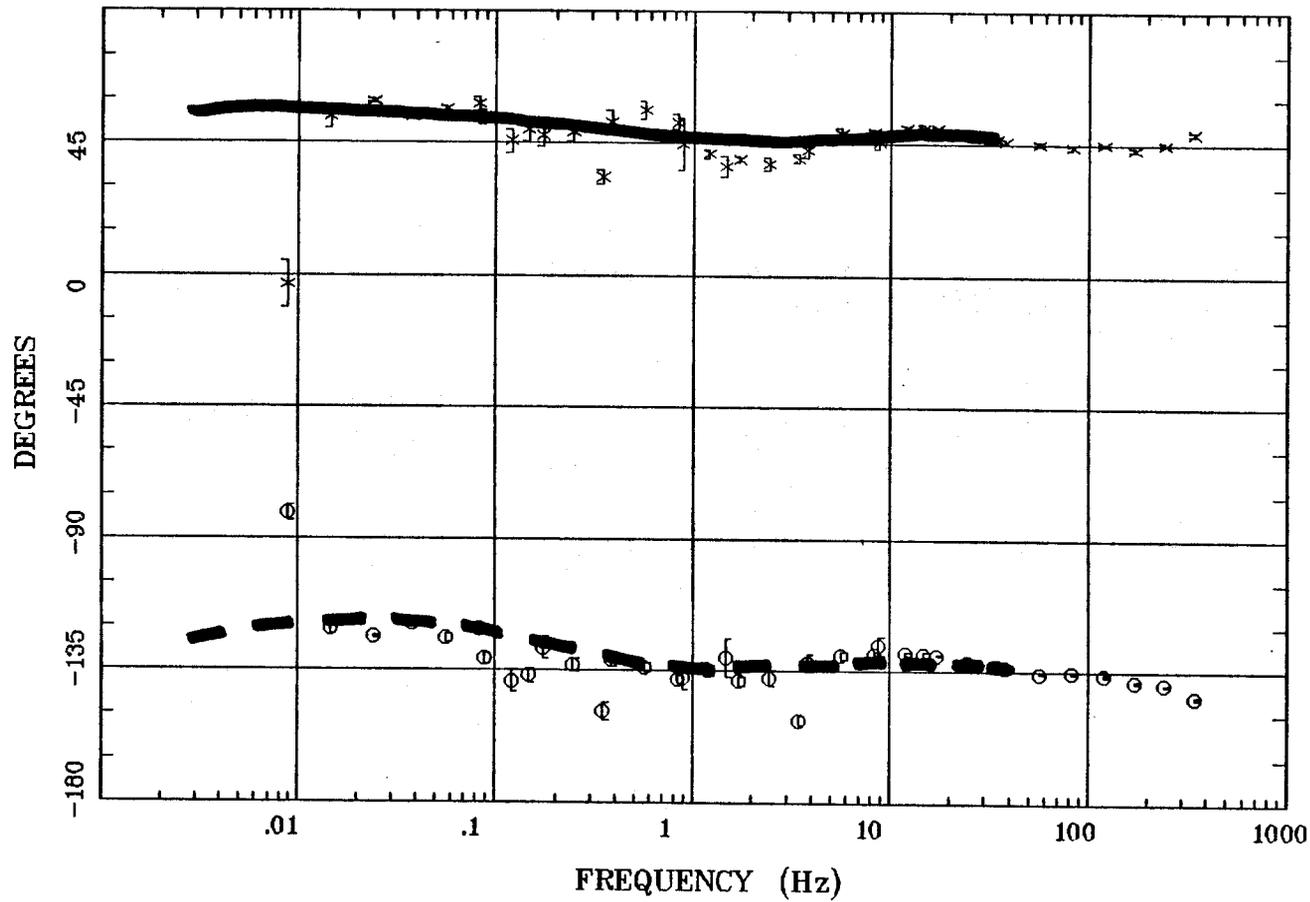
Client:
 Remote: e-field local ref
 Acquired: 17:0 Jul 09, 1997
 Survey Co:

Rotation:
 Filename: nna12.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:51 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 12A

IMPEDANCE PHASE

battle mtn No. NV

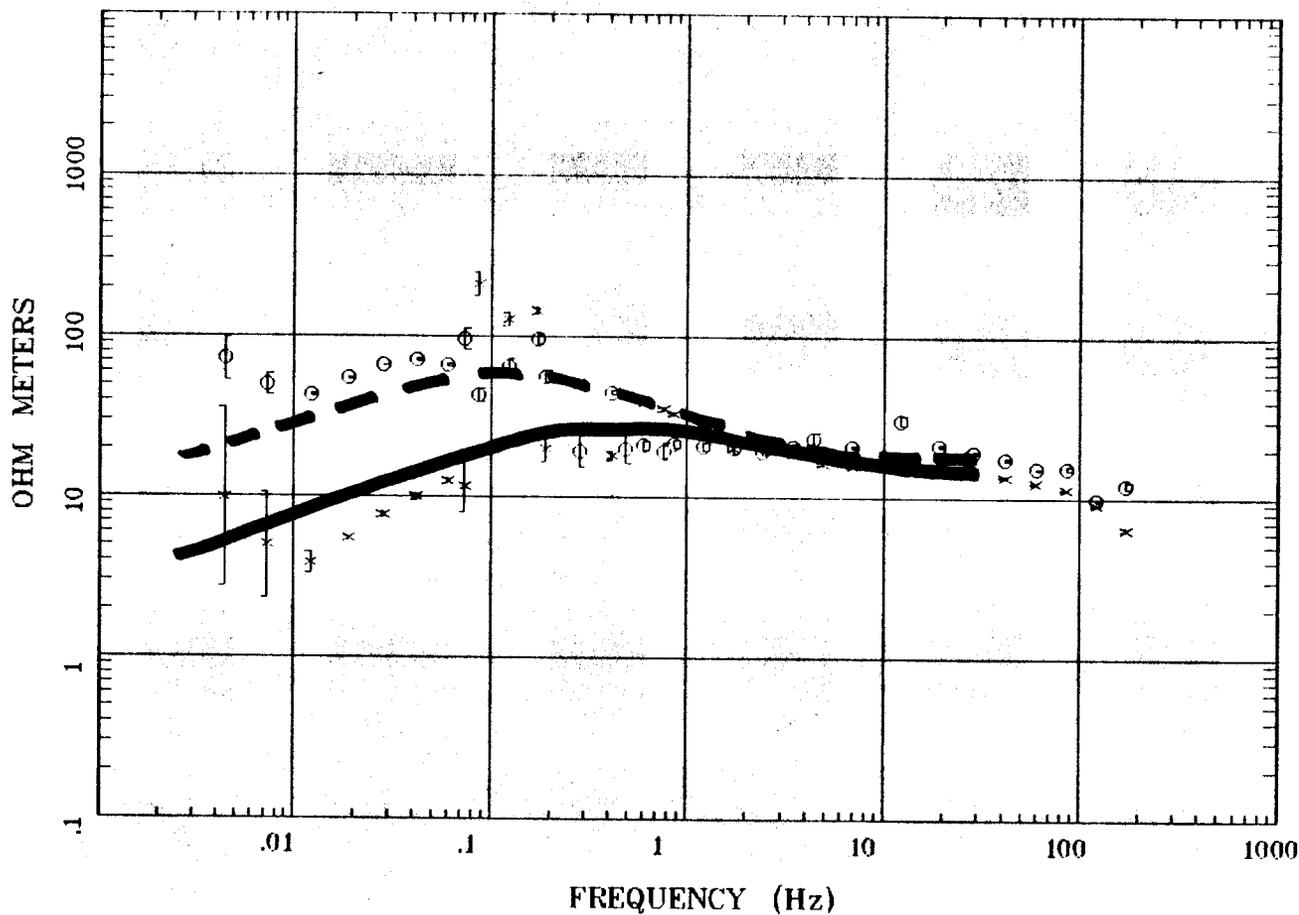


Client:
Remote: e-field local ref
Acquired: 17:0 Jul 09, 1997
Survey Co:

Rotation:
Filename: nna12.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:51 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Battle Mtn.

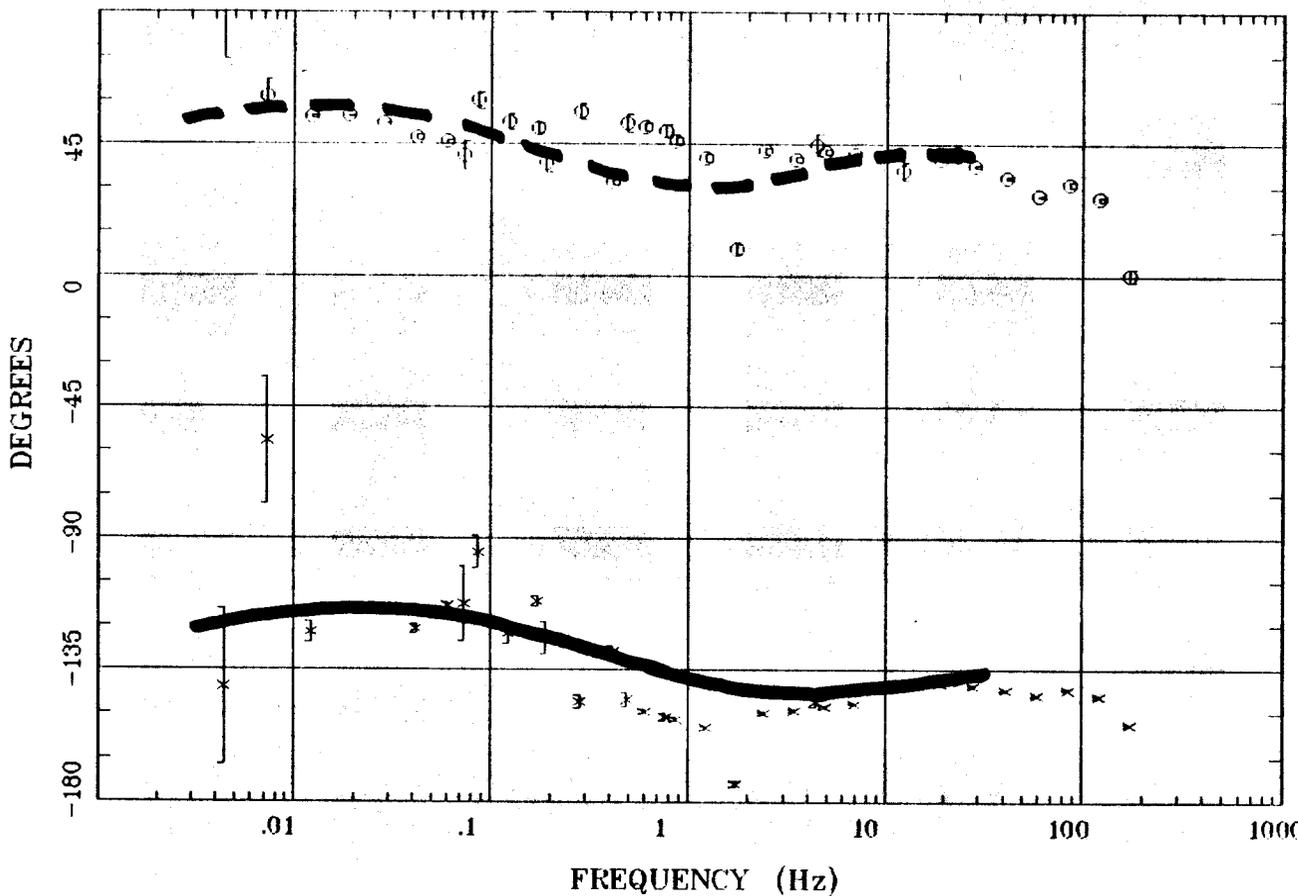


Client:
 Remote: E local ref.
 Acquired: 09:4 Jul 16, 1997
 Survey Co:

Rotation:
 Filename: nn13a.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:26 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Battle Mtn.



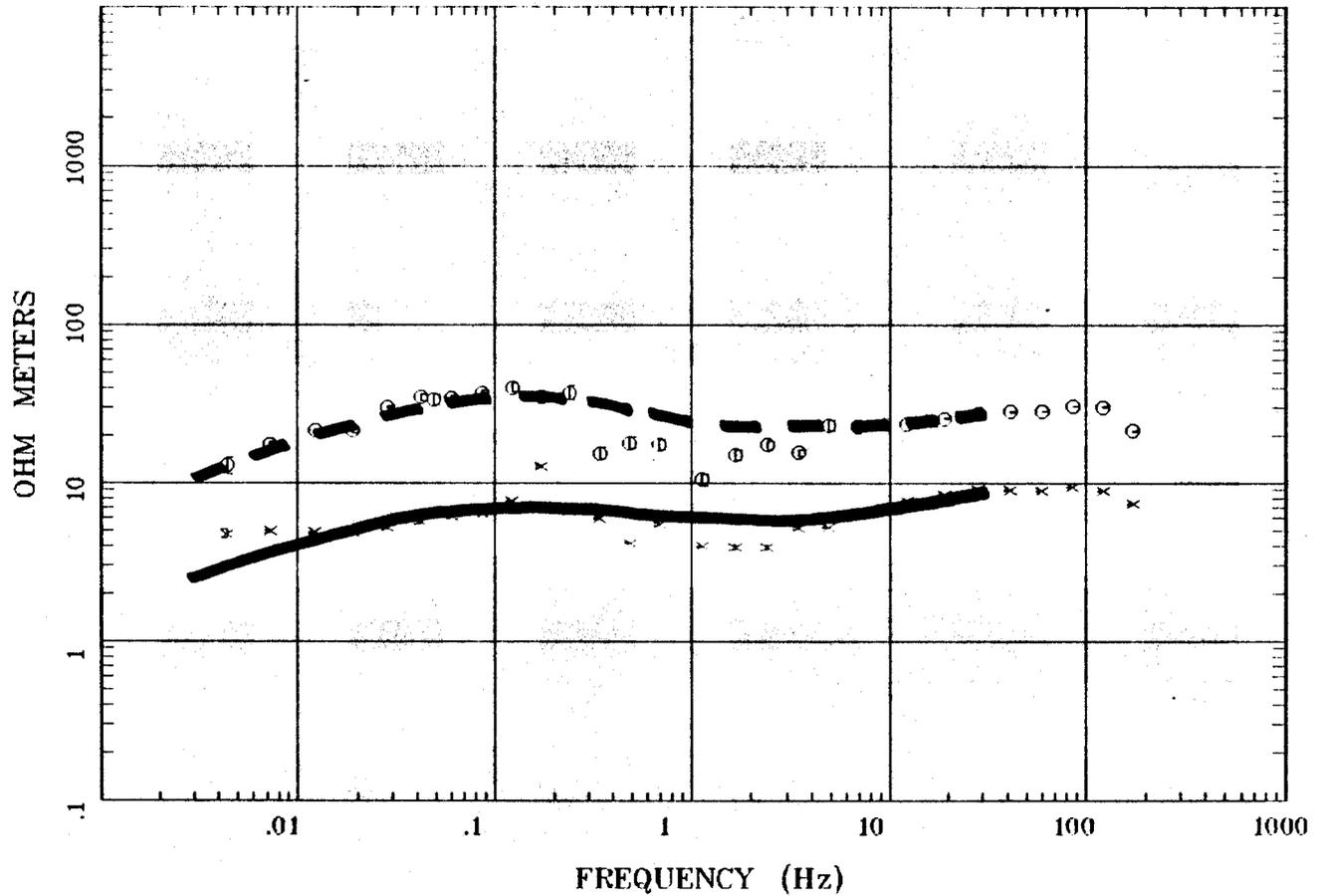
Client:
 Remote: E local ref.
 Acquired: 09:4 Jul 16, 1997
 Survey Co:

Rotation:
 Filename: nn13a.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:26 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 14A

APPARENT RESISTIVITY

Battle Mtn.

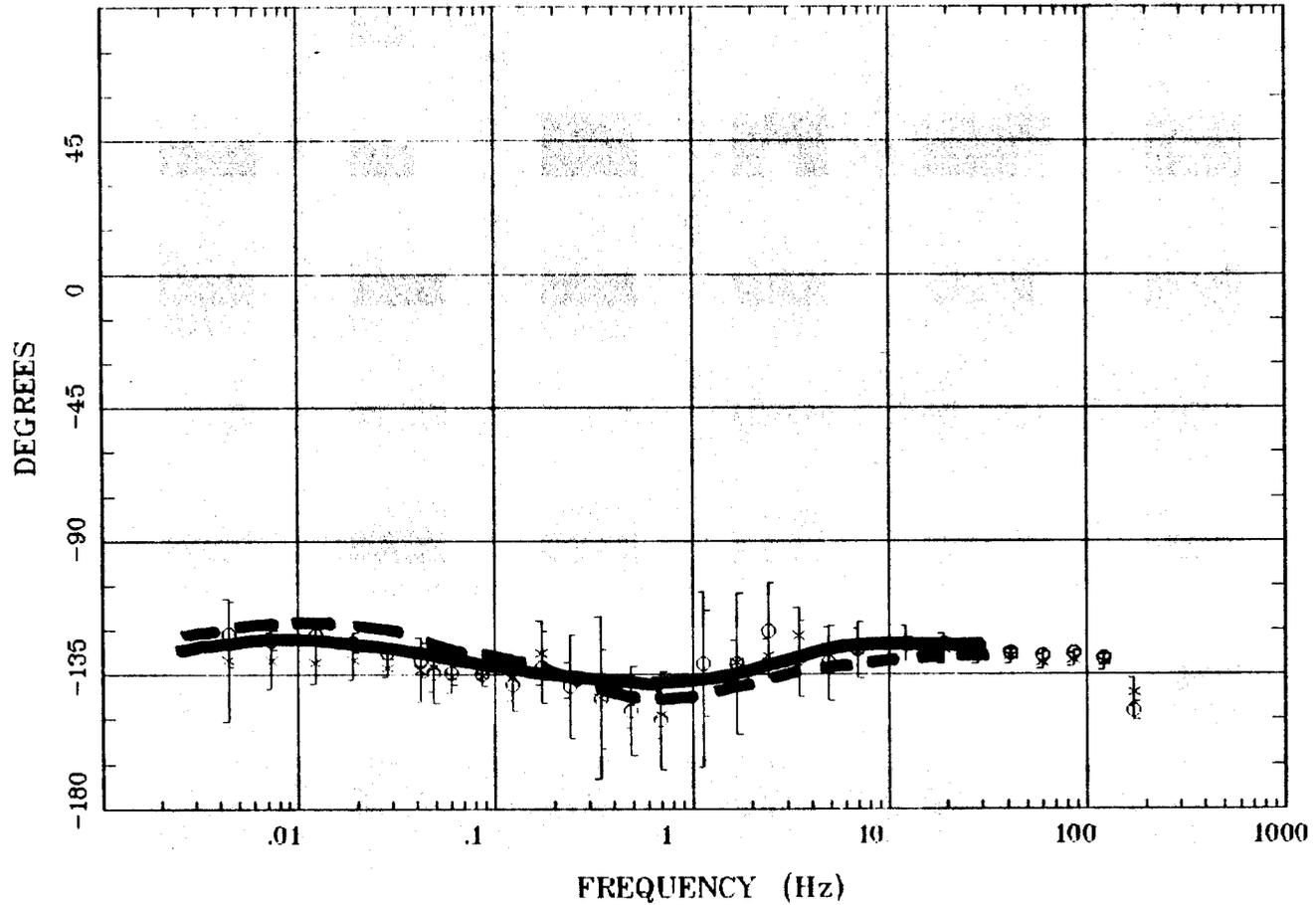


Client:
Remote: E local ref.
Acquired: 10:0 Jul 17, 1997
Survey Co:

Rotation:
Filename: nn14.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:27 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Battle Mtn.

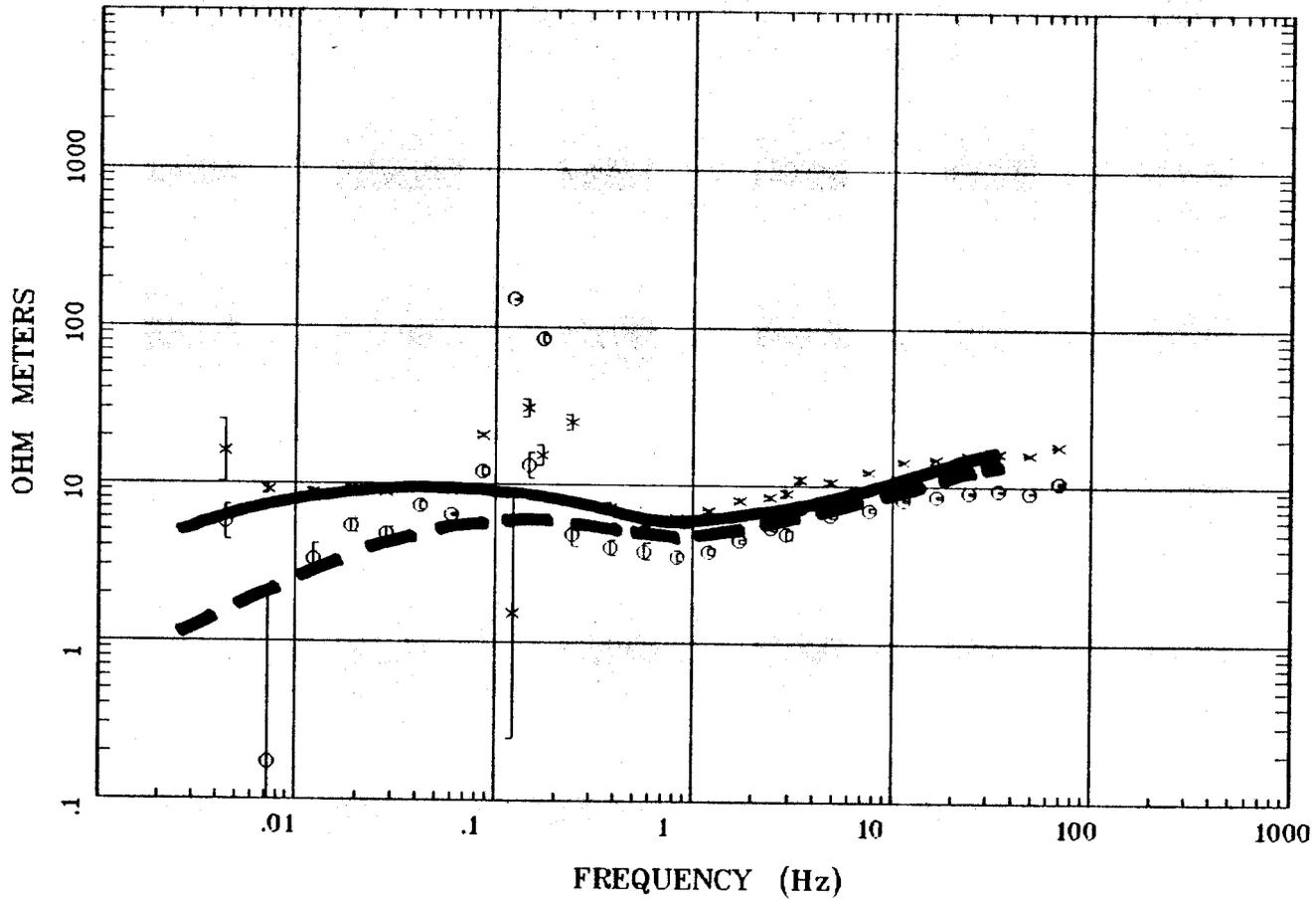


Client:
 Remote: E local ref.
 Acquired: 10:0 Jul 17, 1997
 Survey Co:

Rotation:
 Filename: nn14.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:27 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Battle Mtn.



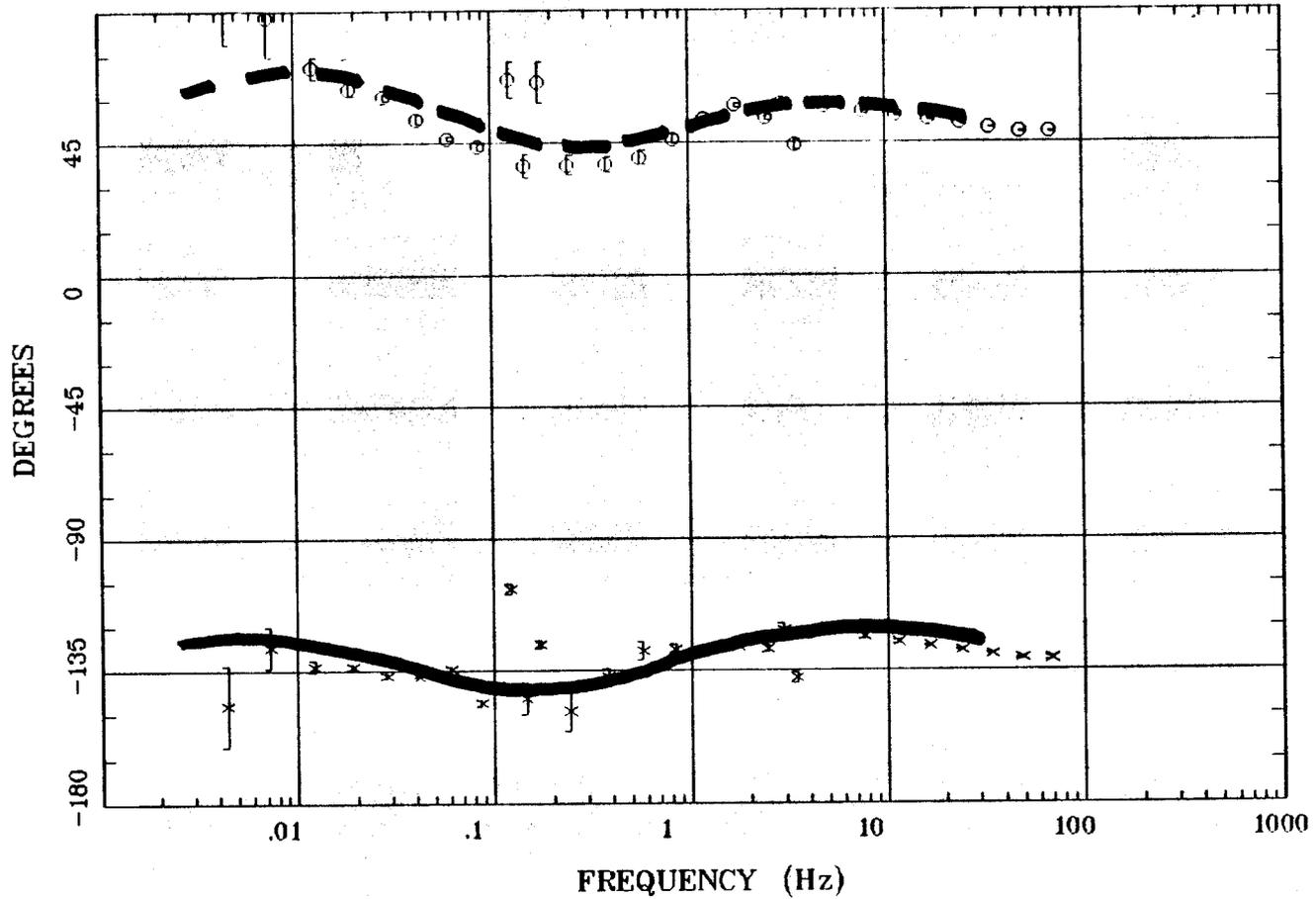
Client:
 Remote: e-field local ref
 Acquired: 15:2 Jul 11, 1997
 Survey Co:

Rotation:
 Filename: nn16.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:30 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 16A

IMPEDANCE PHASE

Battle Mtn.



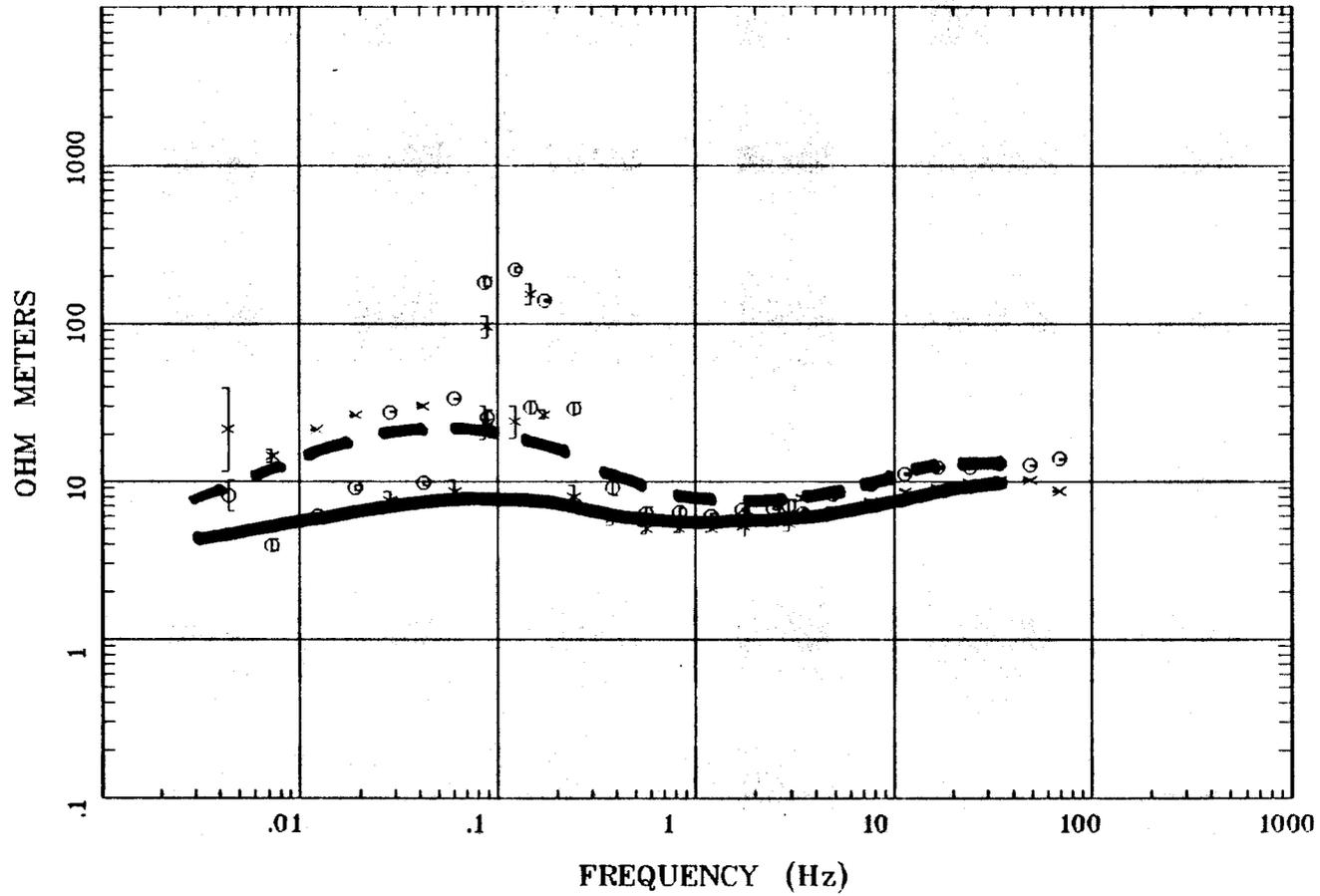
Client:
Remote: e-field local ref
Acquired: 15:2 Jul 11, 1997
Survey Co:

Rotation:
Filename: nn16.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:30 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

Station 19A

APPARENT RESISTIVITY

Battle Mtn.



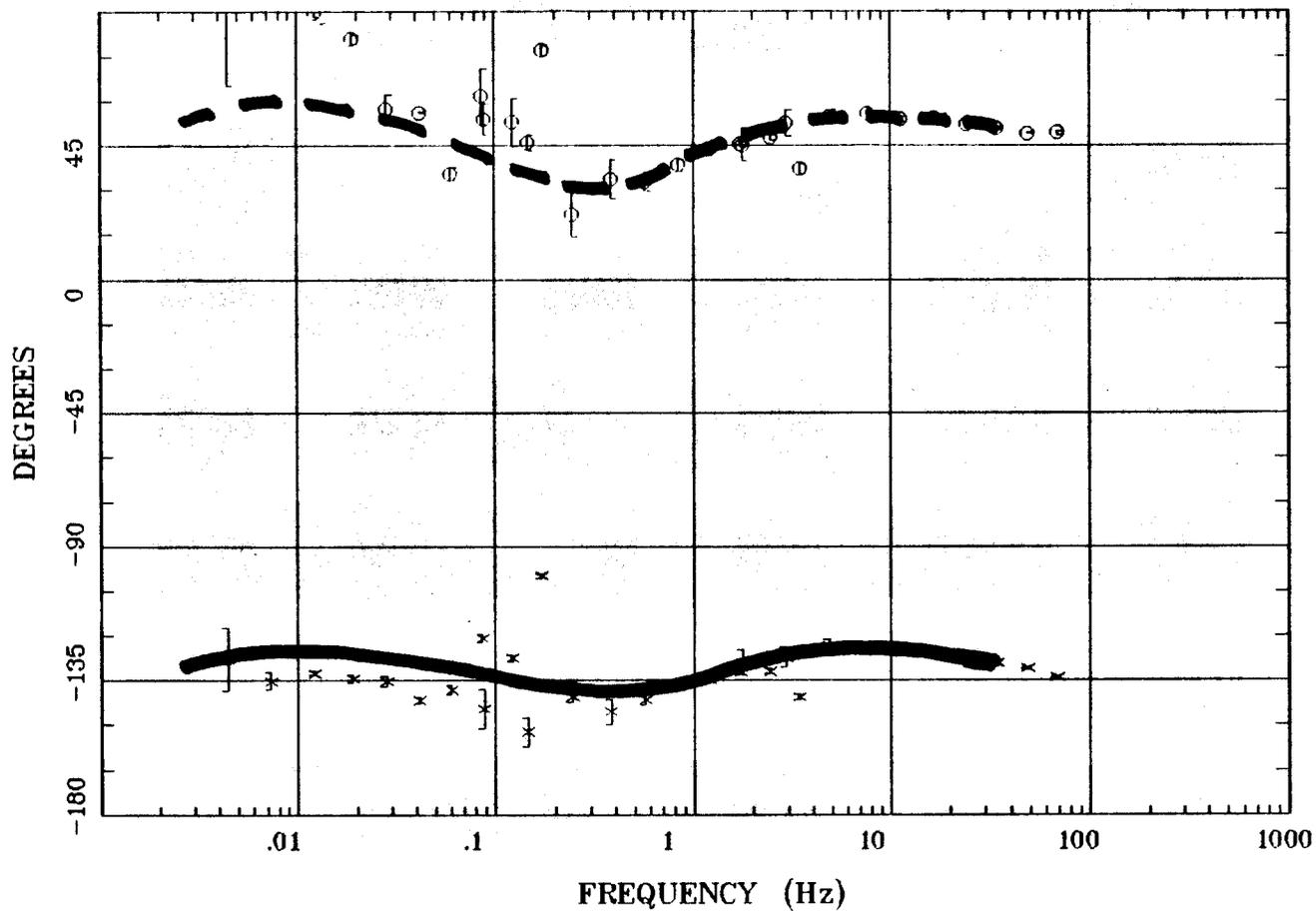
Client:
Remote: e-field local ref
Acquired: 12:1 Jul 11, 1997
Survey Co:

Rotation:
Filename: nn19.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:31 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

Station 19A

IMPEDANCE PHASE

Battle Mtn.

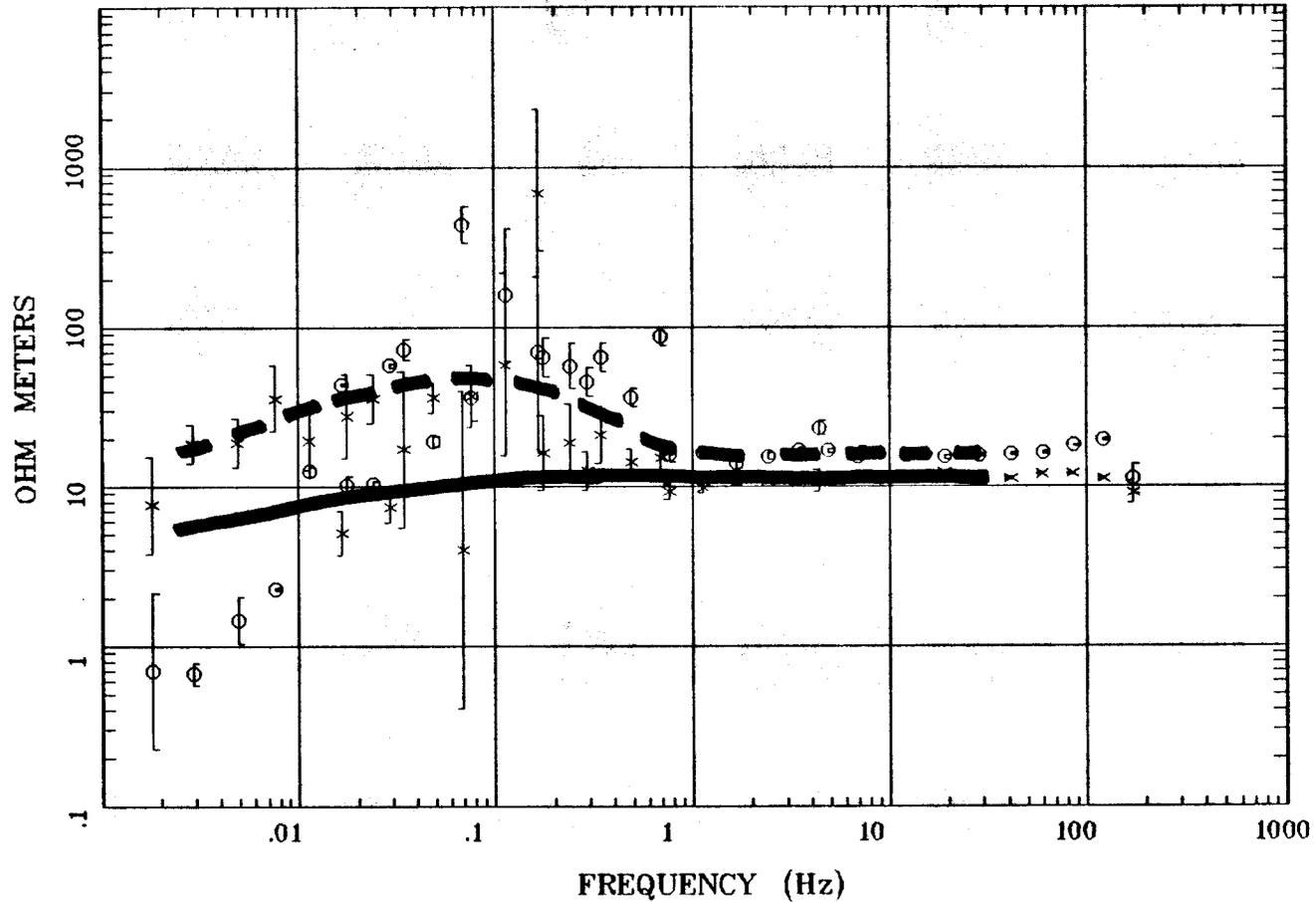


Client:
Remote: e-field local ref
Acquired: 12:1 Jul 11, 1997
Survey Co:

Rotation:
Filename: nn19.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:31 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Battle Mtn.



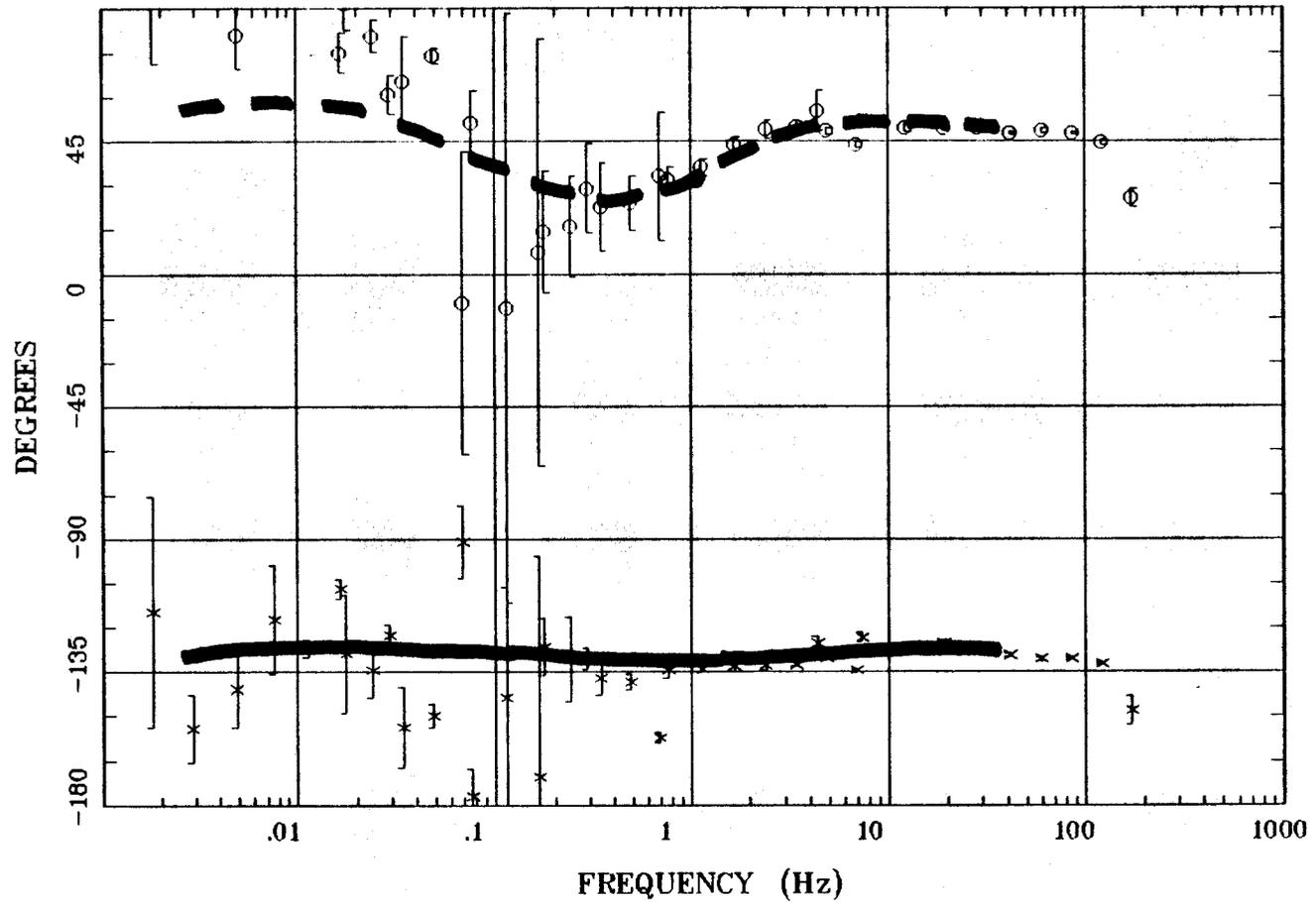
Client:
 Remote: E local ref.
 Acquired: 15:1 Jul 18, 1997
 Survey Co:

Rotation:
 Filename: nn20.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:32 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 20A

IMPEDANCE PHASE

Battle Mtn.

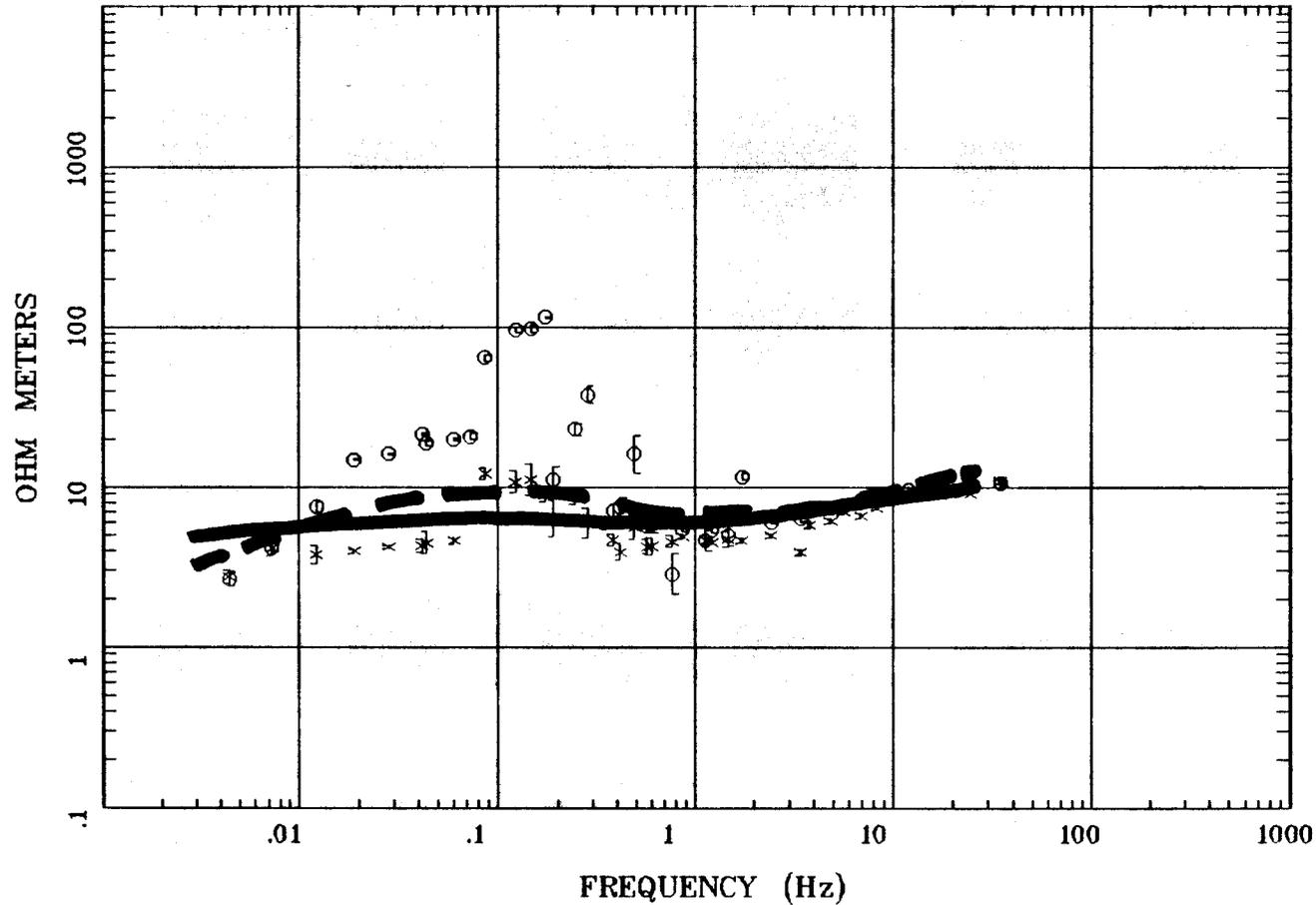


Client:
Remote: E local ref.
Acquired: 15:1 Jul 18, 1997
Survey Co:

Rotation:
Filename: nn20.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:32 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Battle Mtn.



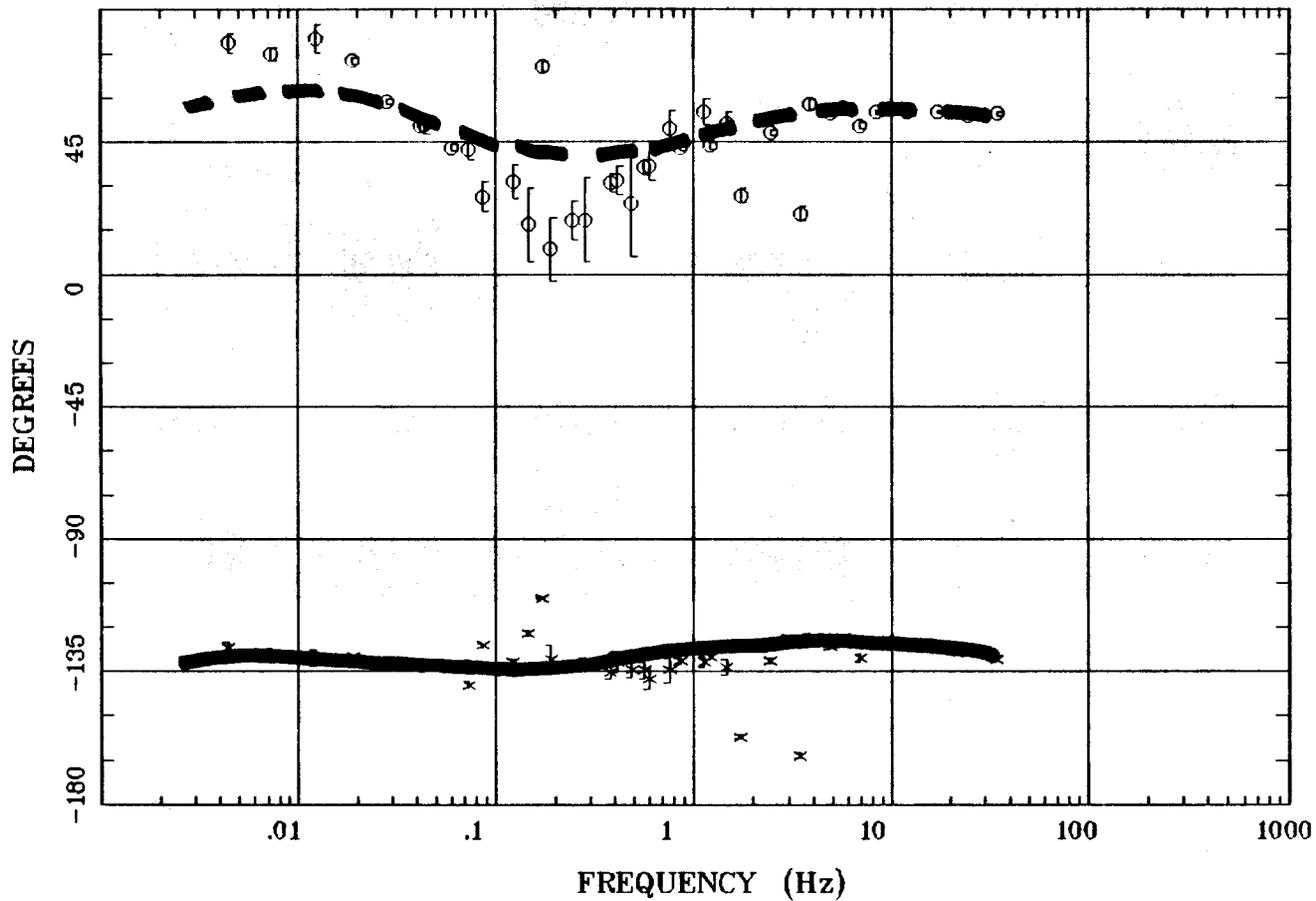
Client:
 Remote: e-field local ref
 Acquired: 19:5 Jul 10, 1997
 Survey Co:

Rotation:
 Filename: nn22e.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:34 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Battle Mtn.

Station 22A



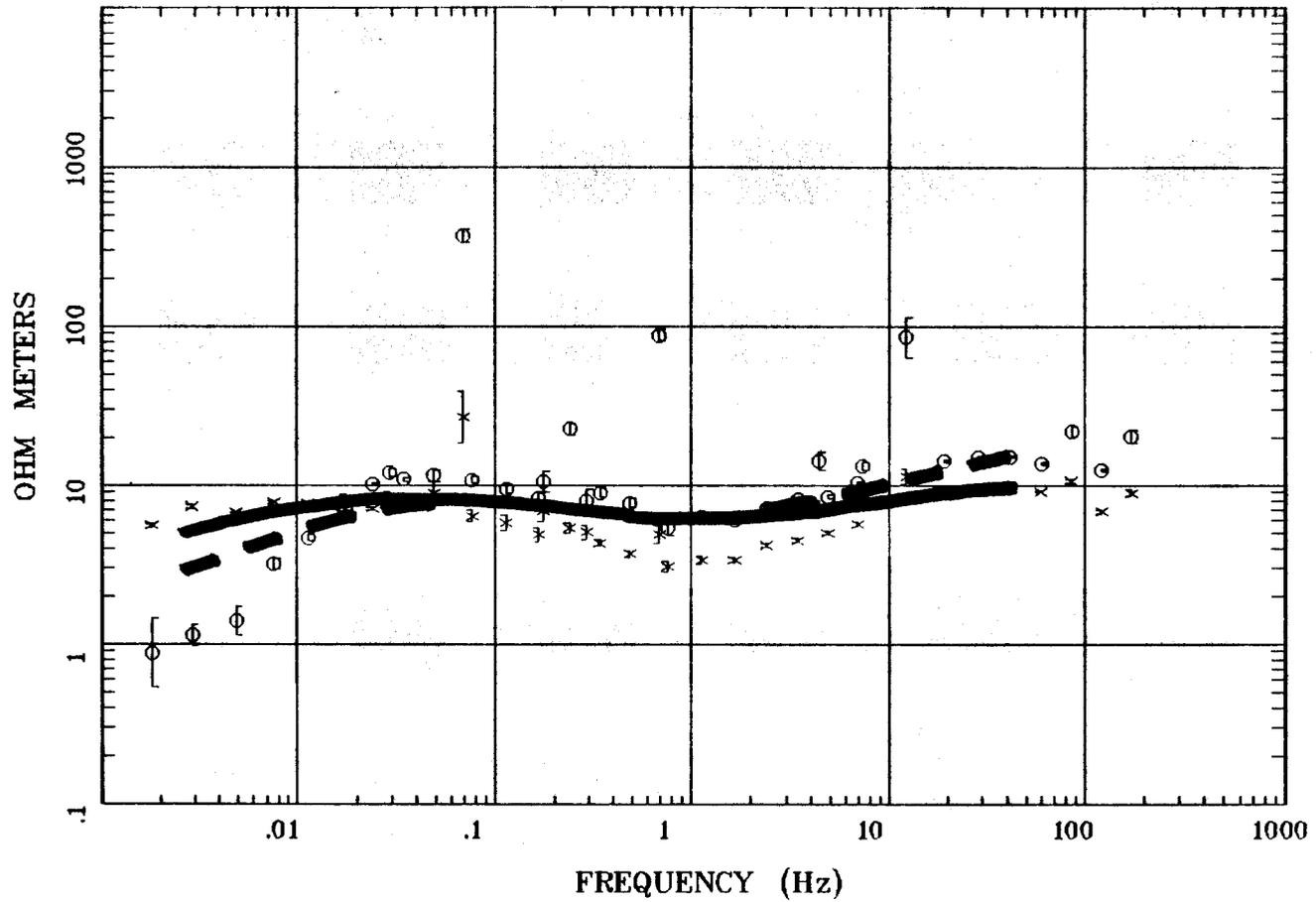
Client:
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 Acquired: 19:5 Jul 10, 1997
 Survey Co:

Rotation:
 Filename: nn22e.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:34 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 23A

APPARENT RESISTIVITY

Battle Mtn.

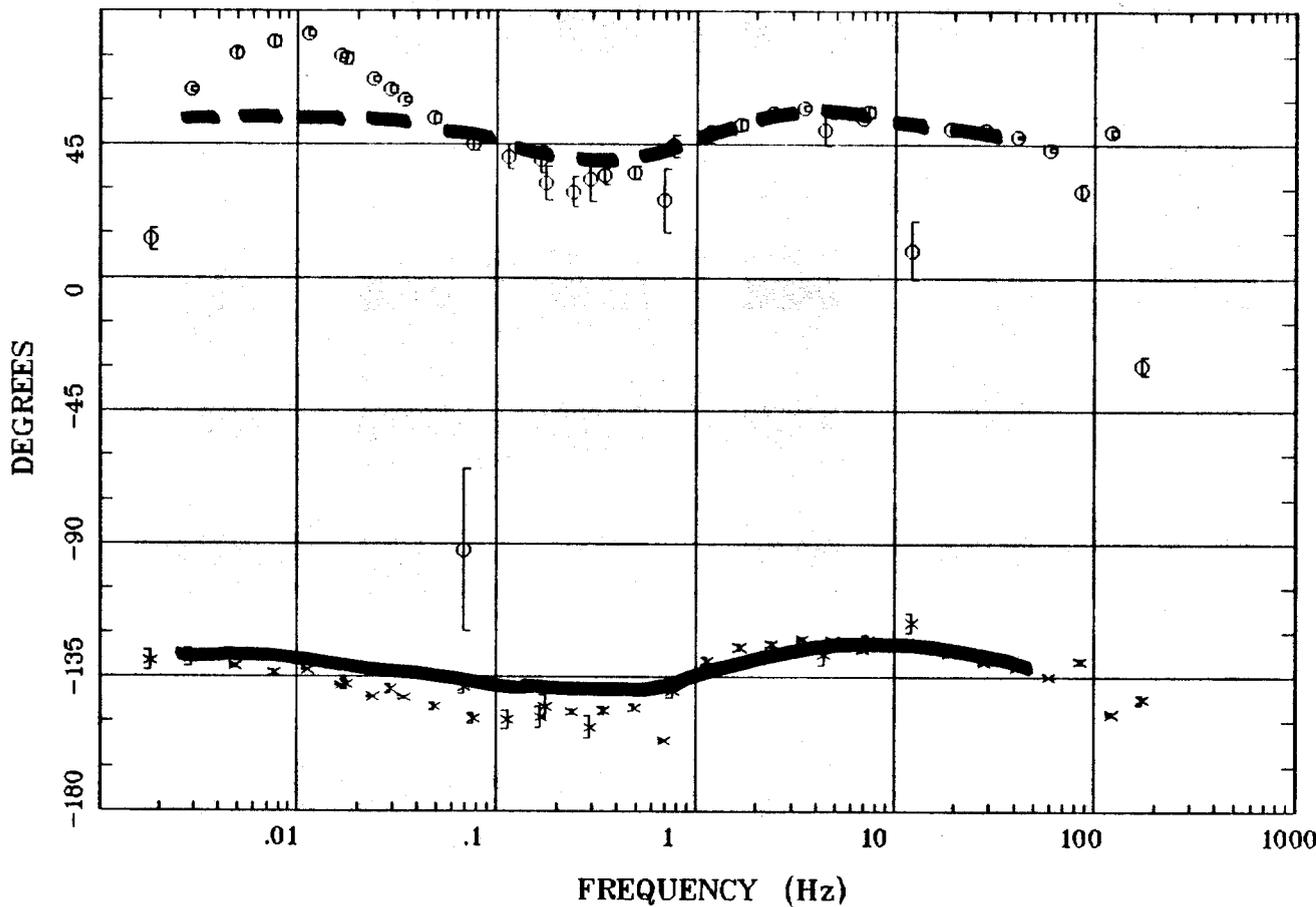


Client:
Remote: E local ref.
Acquired: 09:2 Jul 15, 1997
Survey Co:

Rotation:
Filename: nn23a.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:36 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

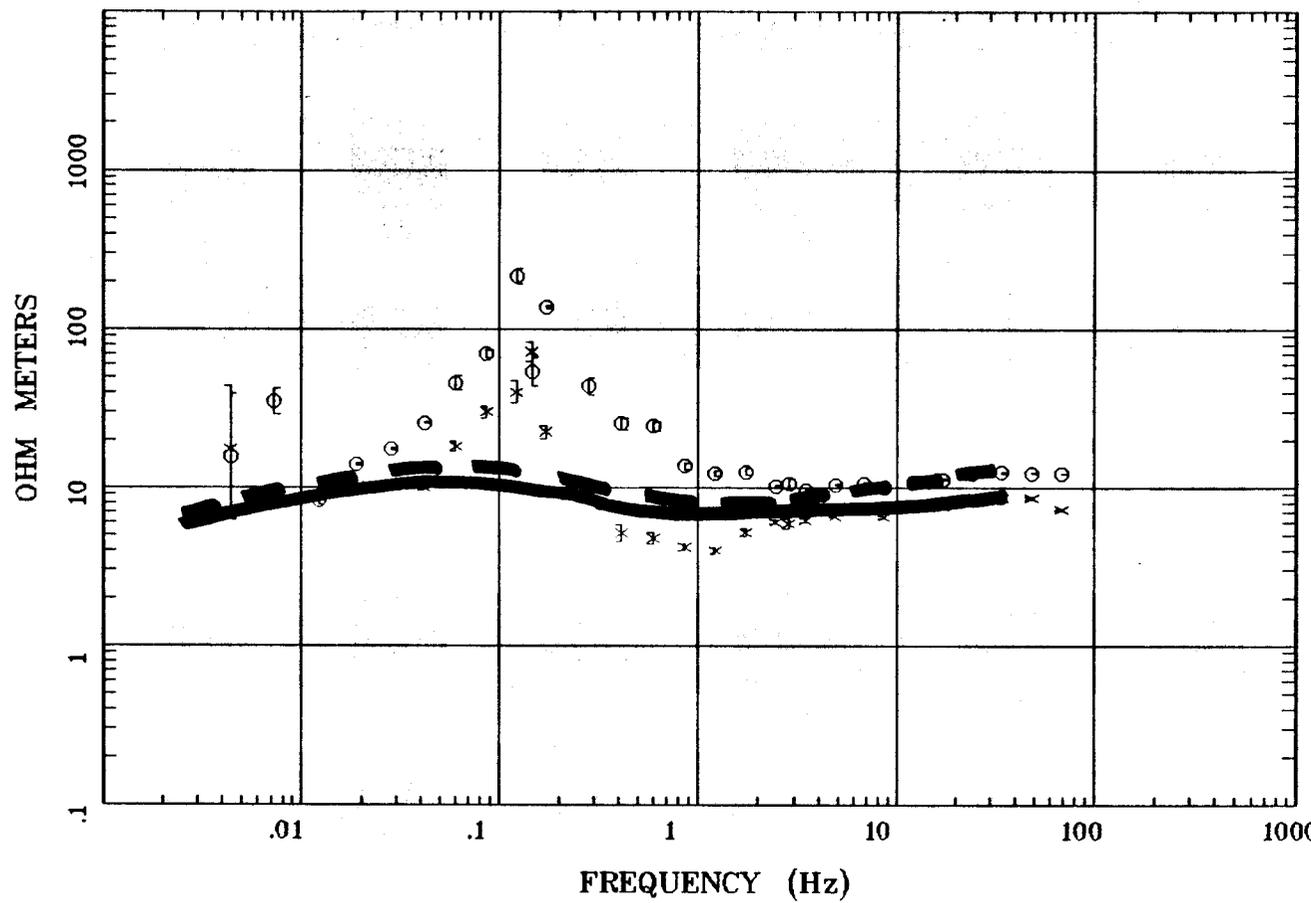
IMPEDANCE PHASE

Battle Mtn.



Client:
 Remote: E local ref.
 Acquired: 09:2 Jul 15, 1997
 Survey Co:

Rotation:
 Filename: nn23a.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:36 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

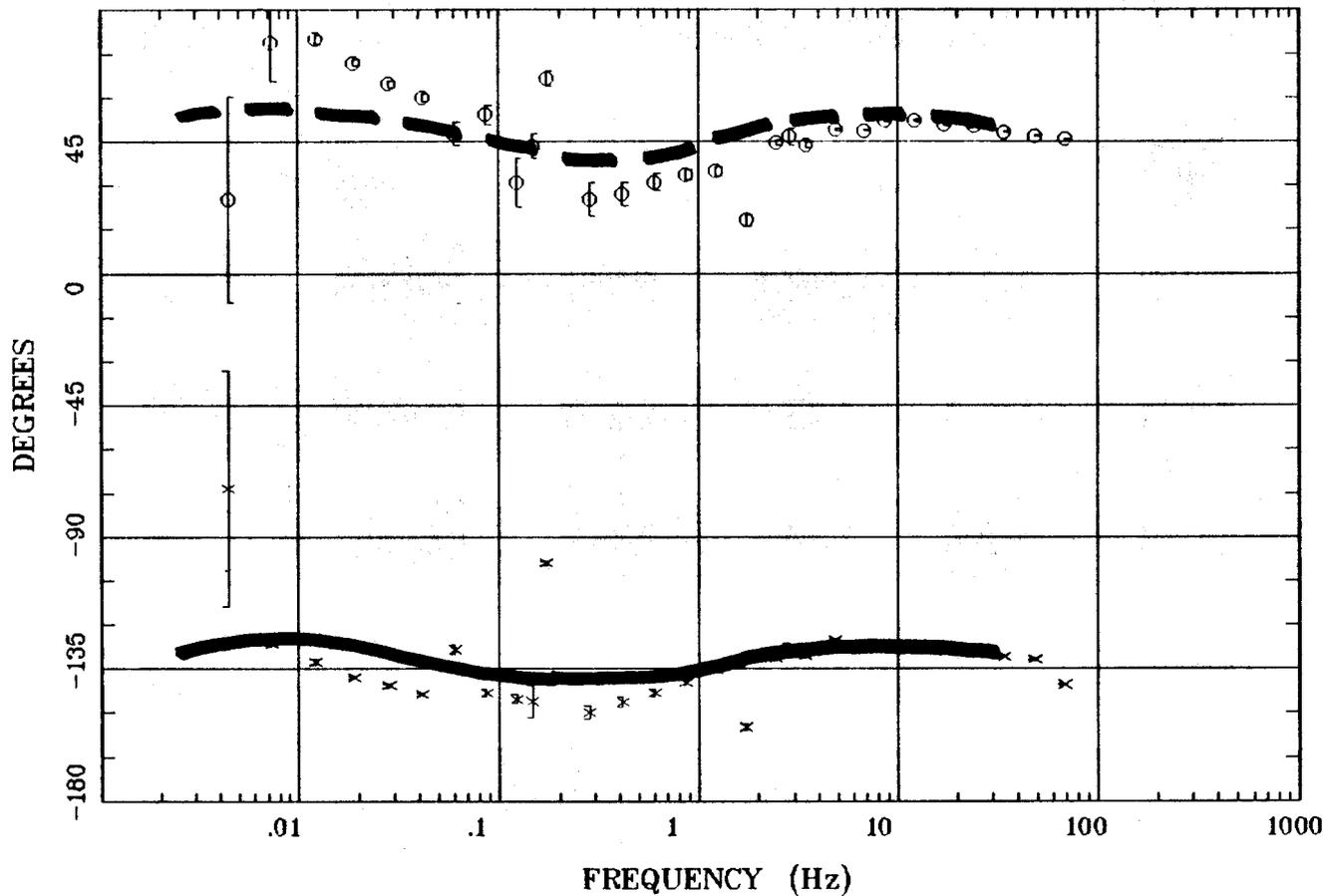


Client:
Remote: e-field local ref
Acquired: 10:2 Jul 12, 1997
Survey Co:

Rotation:
Filename: nn24c.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:37 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Battle Mtn.

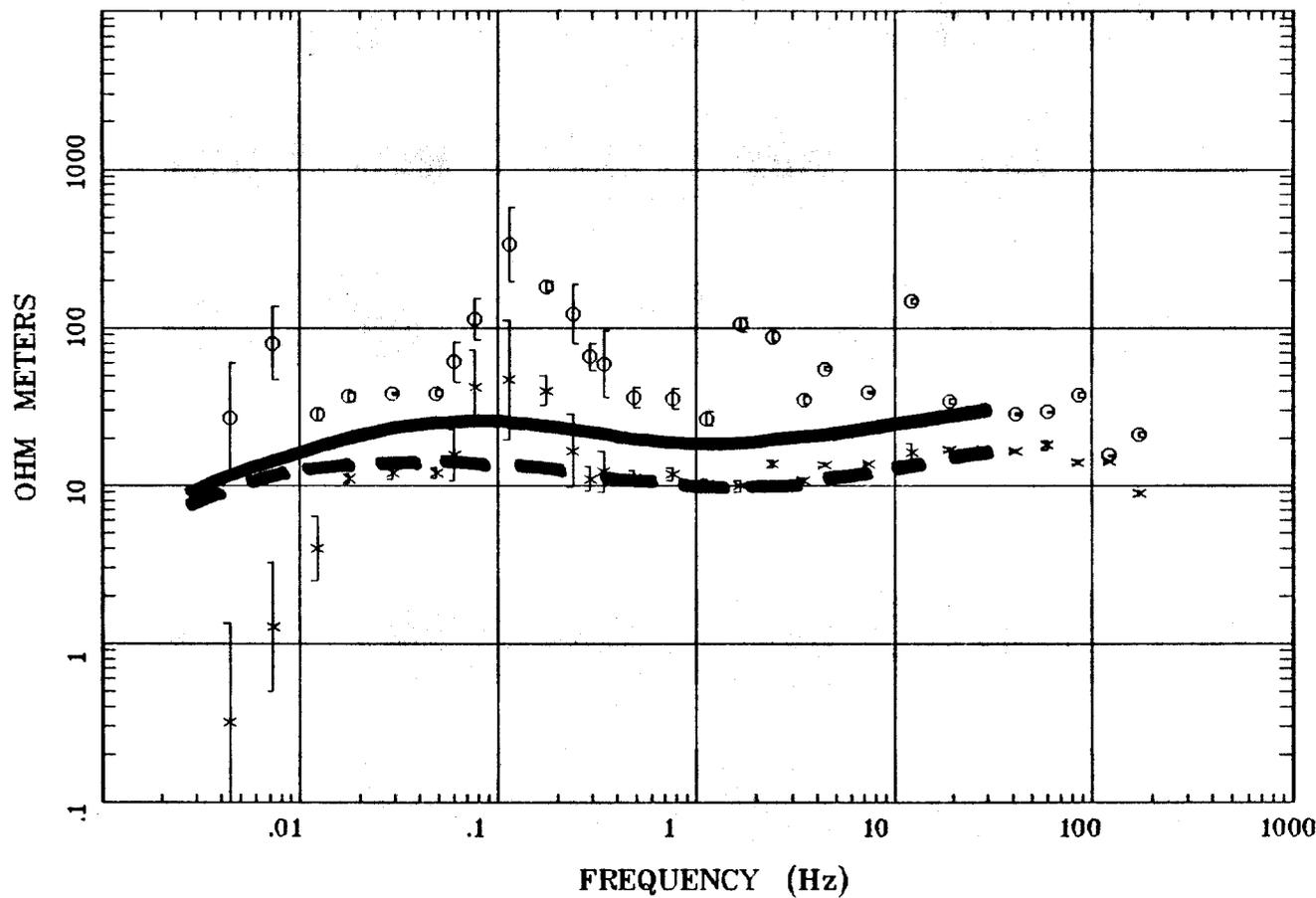


Client:
 Remote: e-field local ref
 Acquired: 10:2 Jul 12, 1997
 Survey Co:

Rotation:
 Filename: nn24c.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:37 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Battle Mtn.



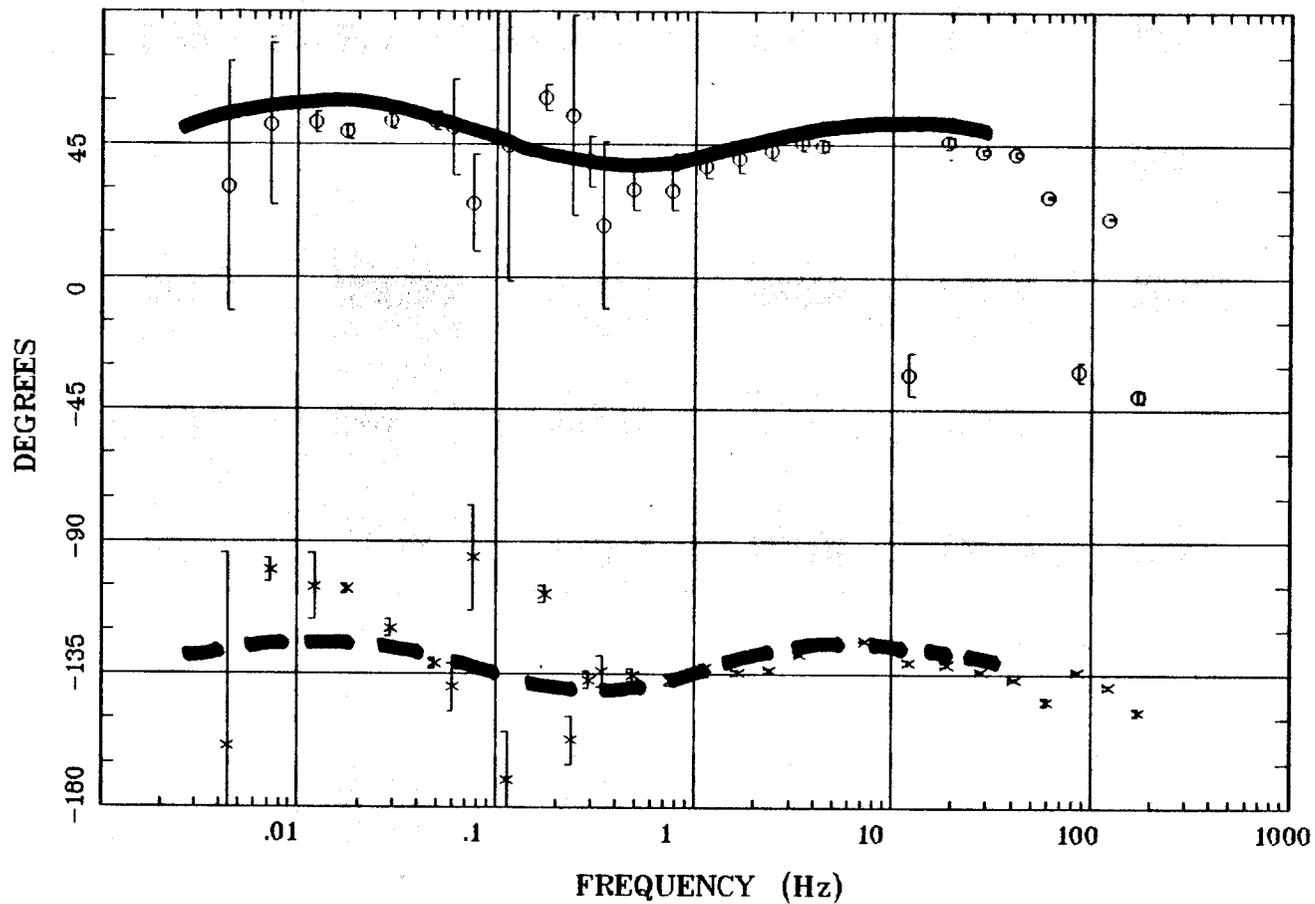
Client:
 Remote: E local ref.
 Acquired: 11:3 Jul 14, 1997
 Survey Co:

Rotation:
 Filename: nn25a.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:39 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 25A

IMPEDANCE PHASE

Battle Mtn.

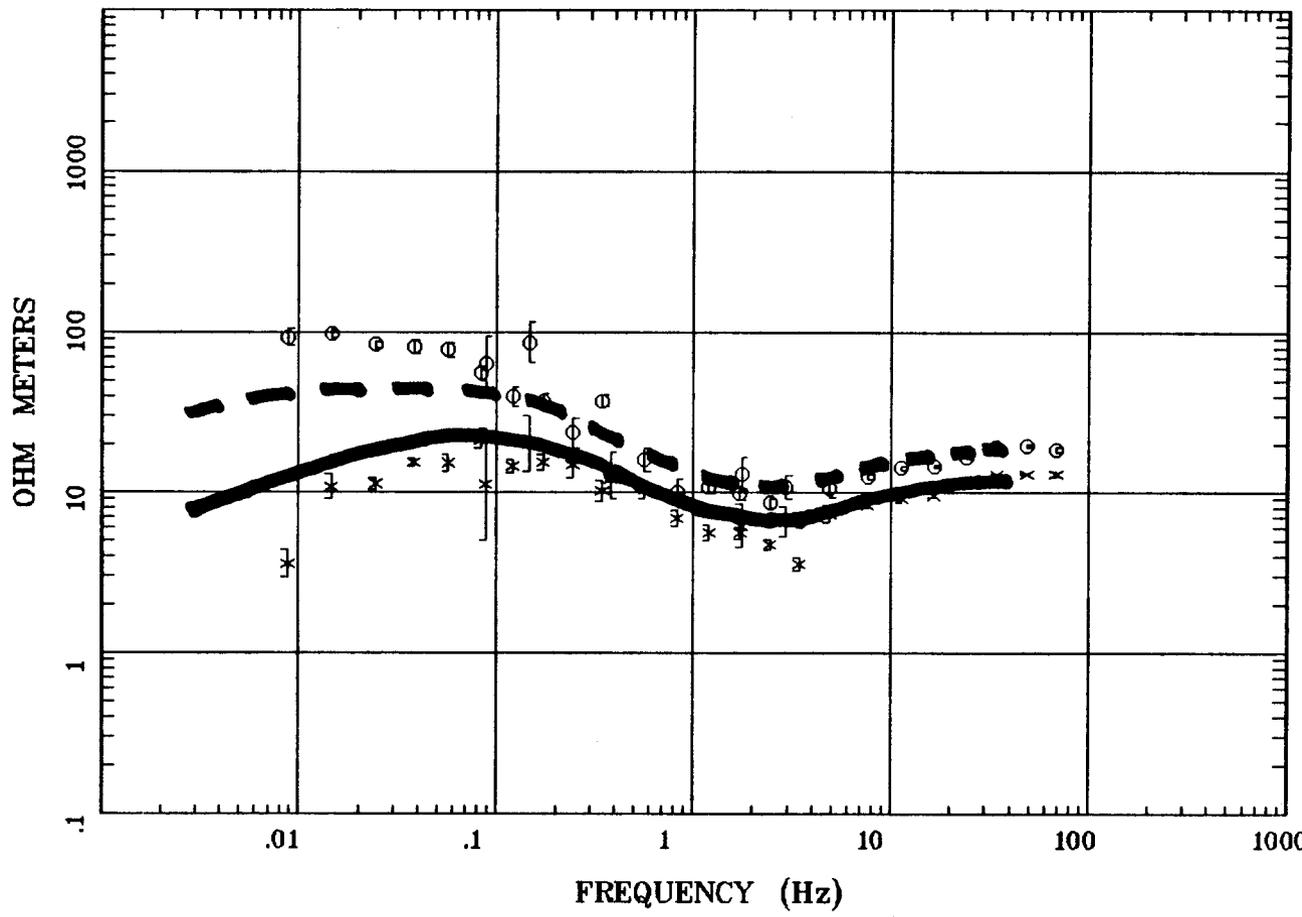


Client:
Remote: E local ref.
Acquired: 11:3 Jul 14, 1997
Survey Co:

Rotation:
Filename: nn25a.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:39 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Battle Mountain, NV



41

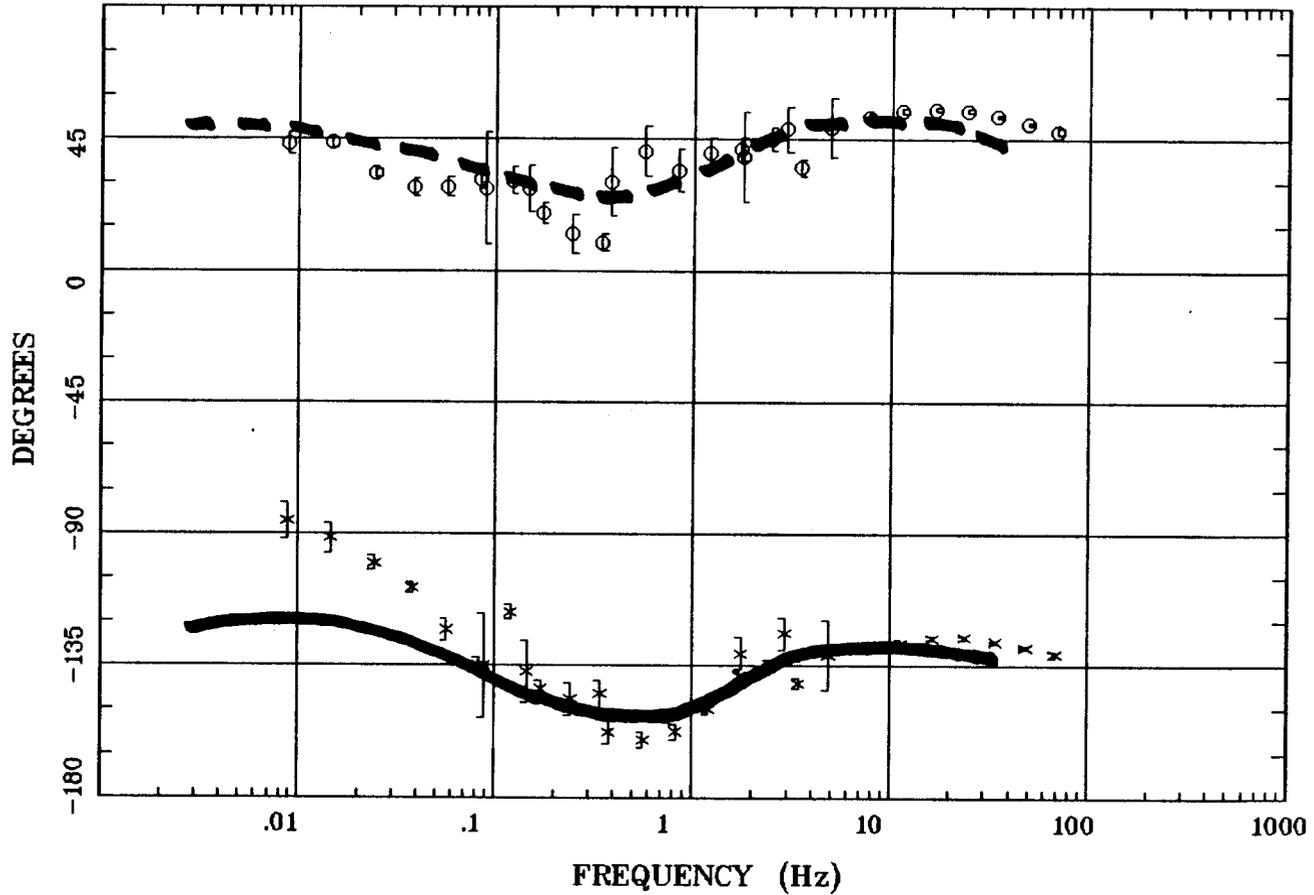
Client:
 Remote: local
 Acquired: 10:3 Jul 31, 1999
 Survey Co:USGS

Rotation:
 Filename: hr71.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 15:24 Jan 23, 2001
 < EMI - ElectroMagnetic Instruments >

Station 71

IMPEDANCE PHASE

Battle Mountain, NV



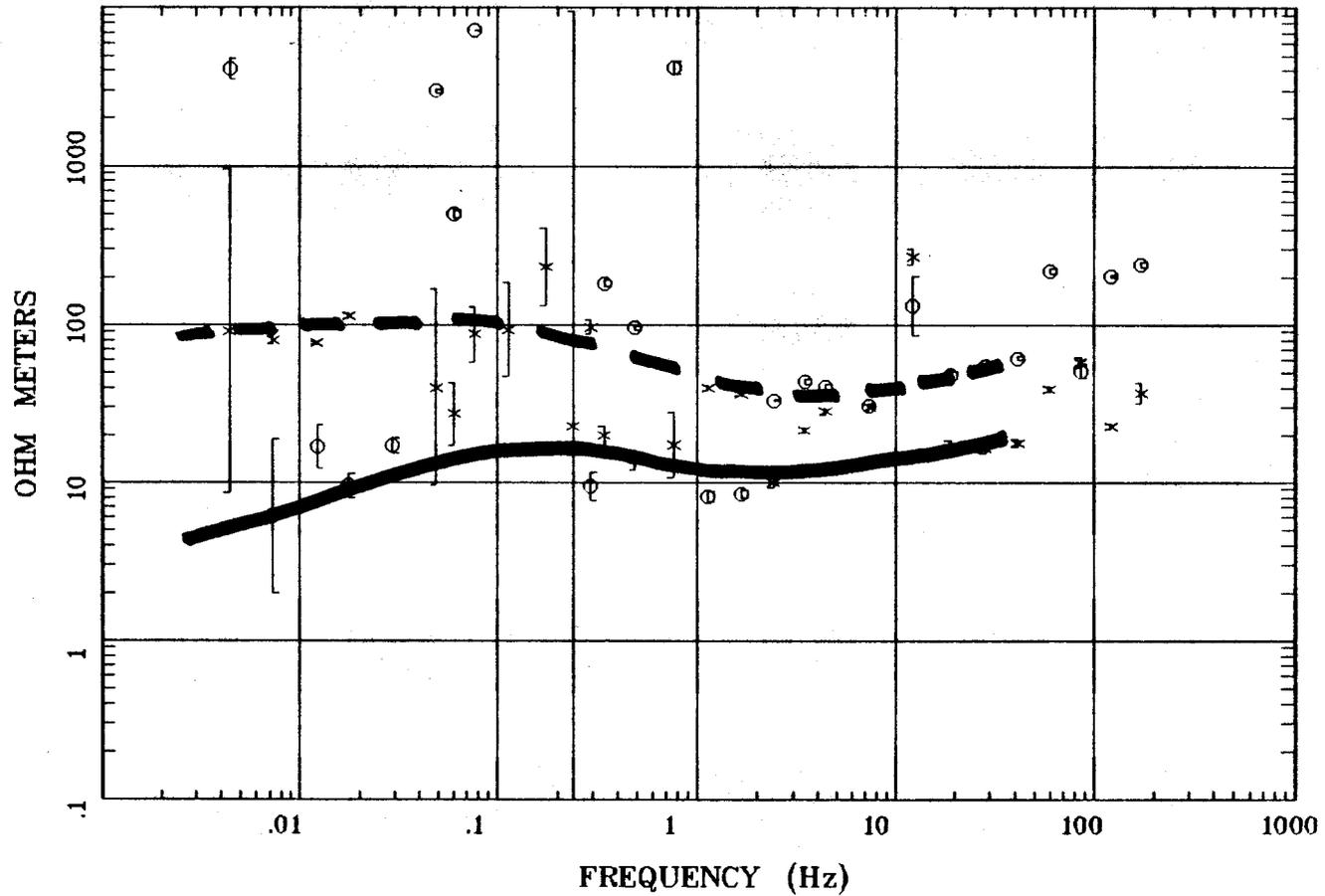
Client:
Remote: local
Acquired: 10:3 Jul 31, 1999
Survey Co:USGS

Rotation:
Filename: hr71.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 15:24 Jan 23, 2001
< EMI - ElectroMagnetic Instruments >

Station 26A

APPARENT RESISTIVITY

Battle Mtn.

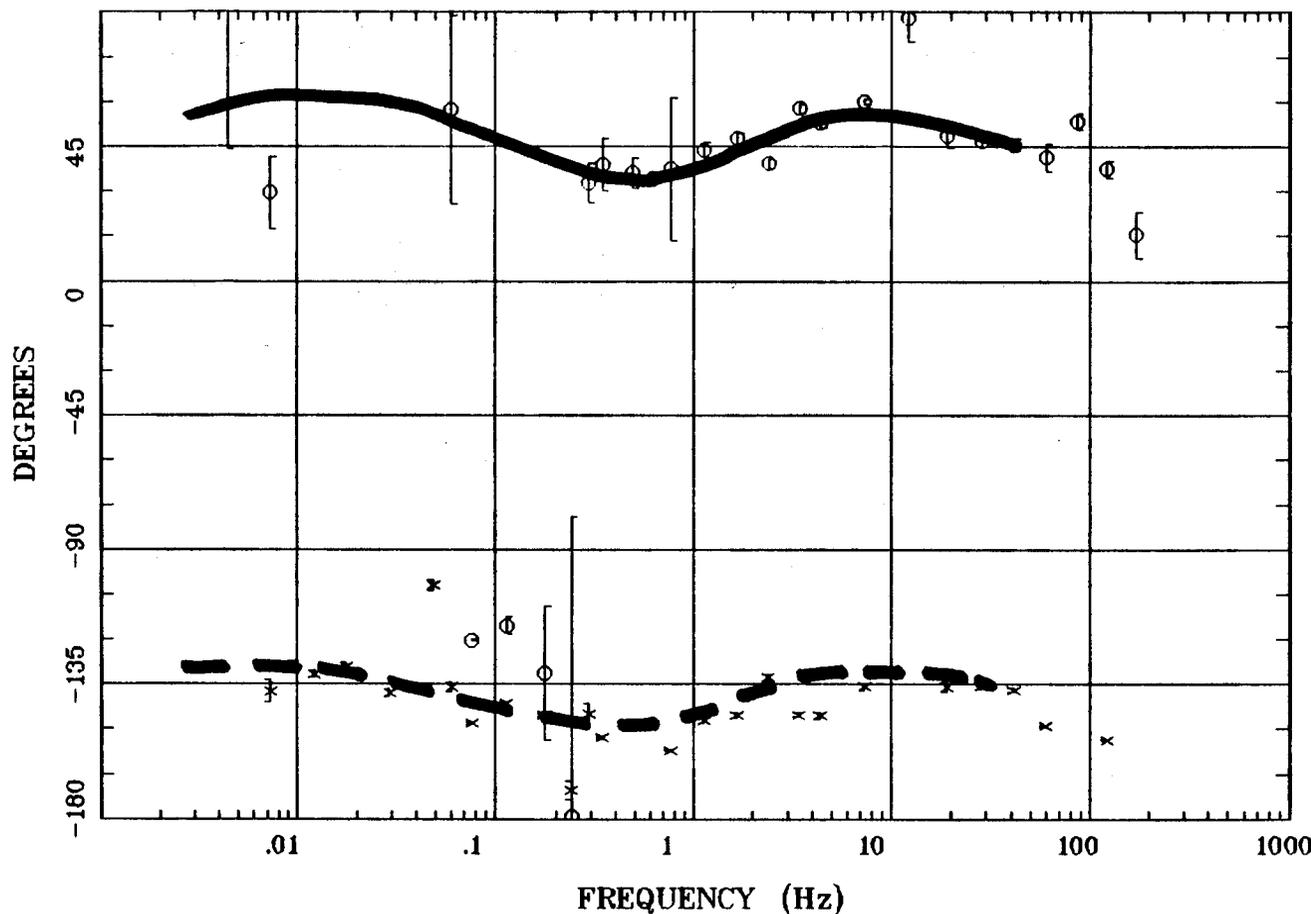


Client:
Remote: E local ref.
Acquired: 17:5 Jul 14, 1997
Survey Co:

Rotation:
Filename: nn26a.all
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:40 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Battle Mtn.



44

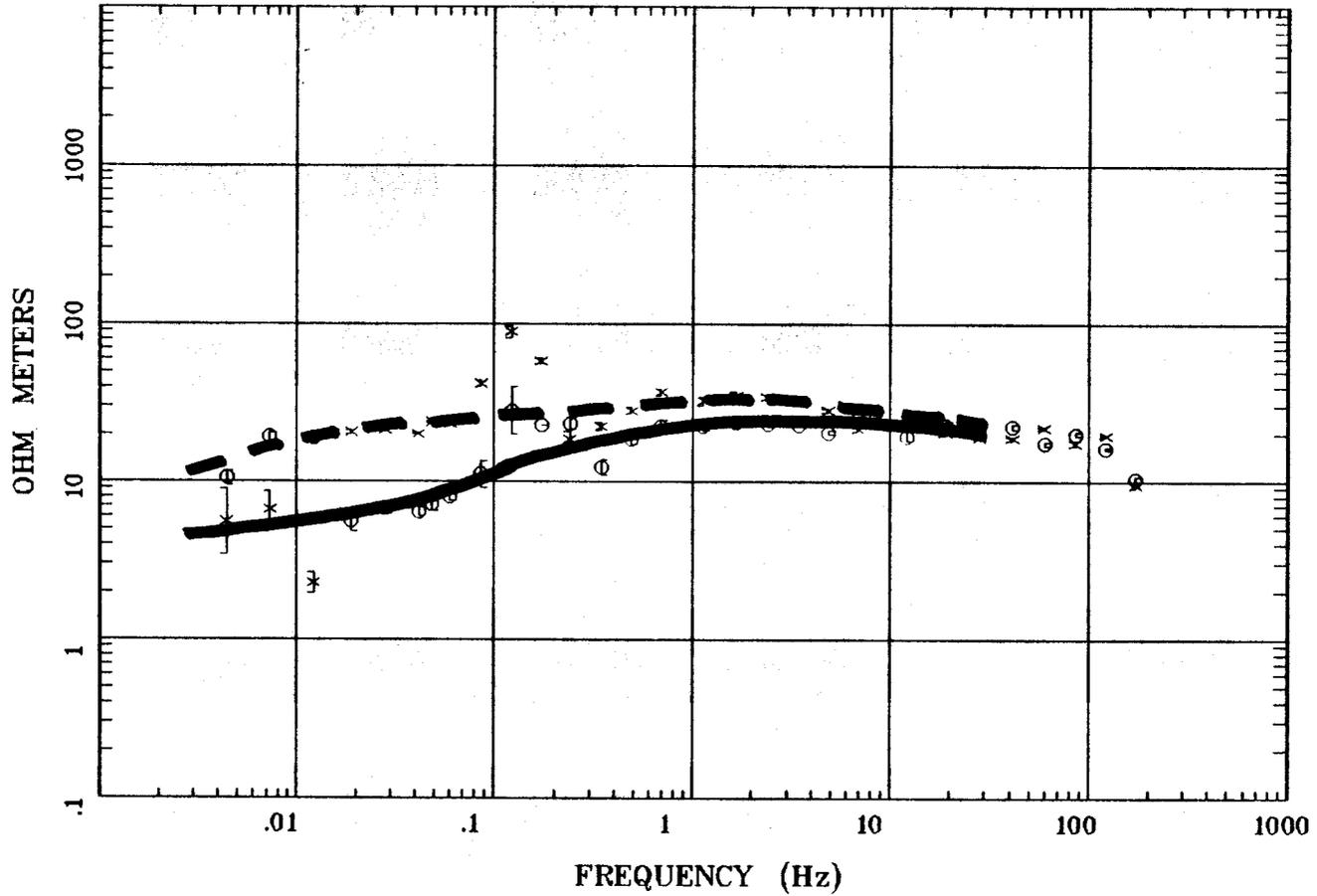
Client:
 Remote: E local ref.
 Acquired: 17:5 Jul 14, 1997
 Survey Co:

Rotation:
 Filename: nn26a.all
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:40 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 27A

APPARENT RESISTIVITY

...Battle Mtn...

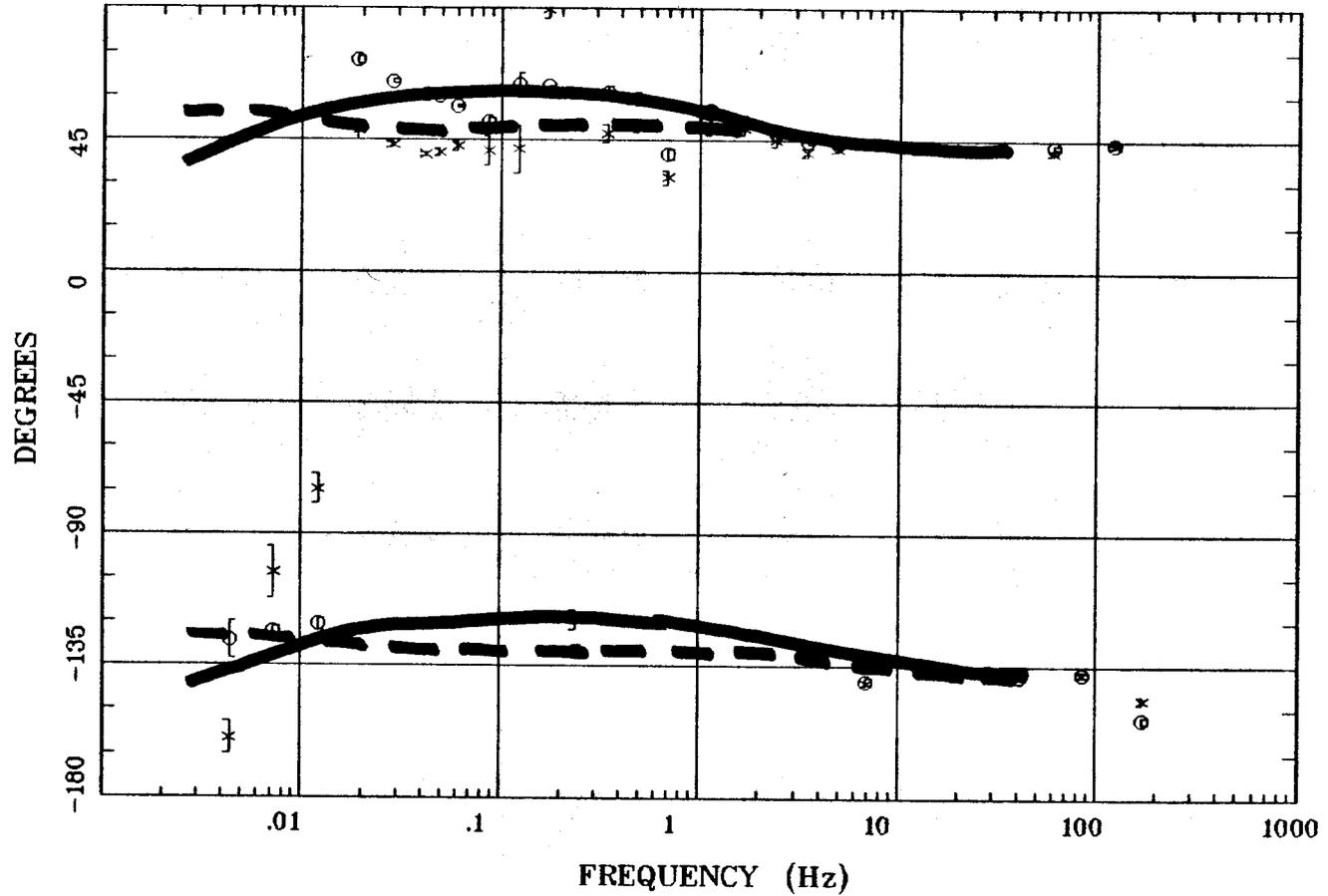


Client:
Remote: E local ref.
Acquired: 12:0 Jul 21, 1997
Survey Co:

Rotation:
Filename: nn27a.all
Channels: Ch6 Ch7 Ch8 Ch9 Ch10Ch1 Ch2
Plotted: 08:43 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

...Battle Mtn...

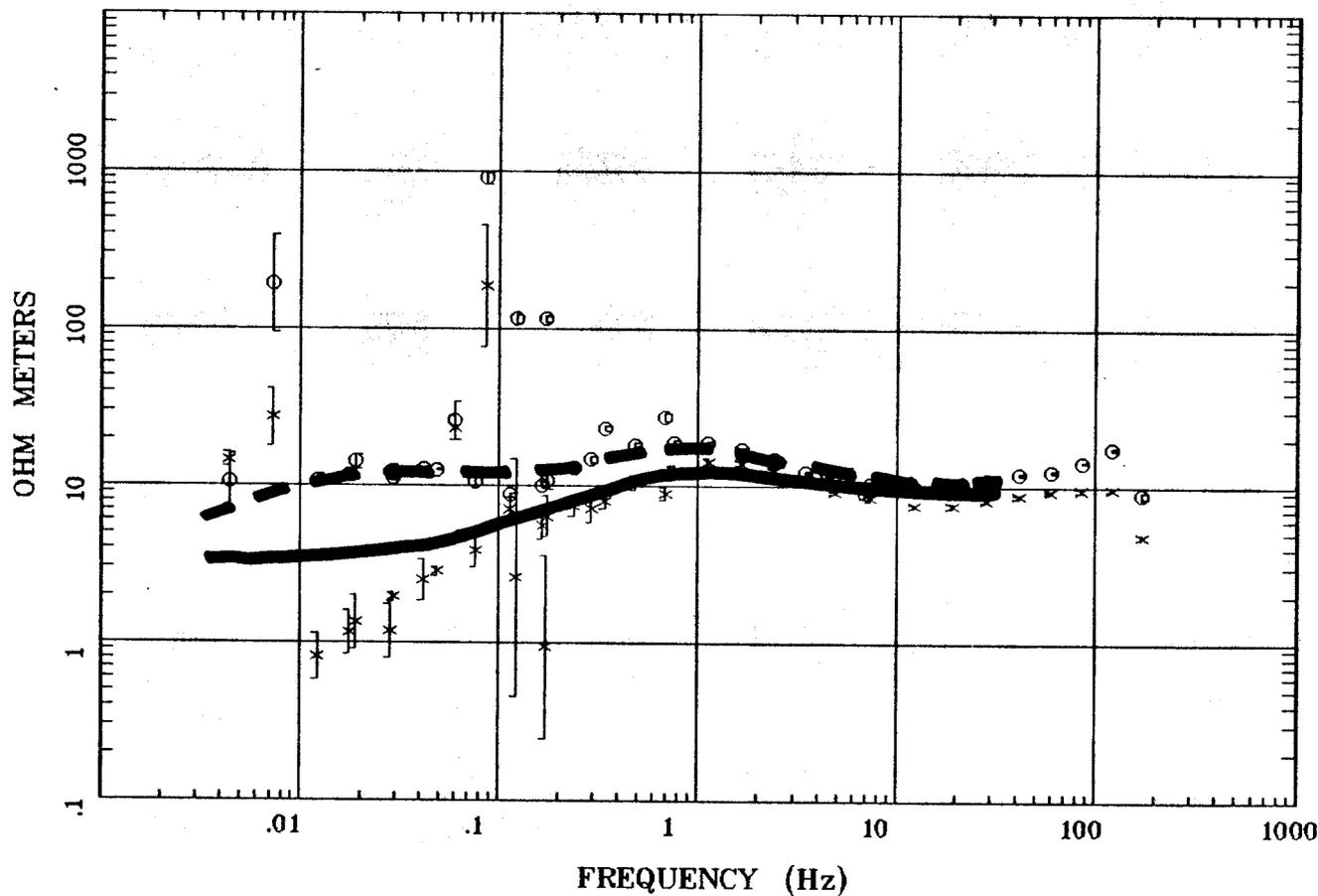


Client:
 Remote: E local ref.
 Acquired: 12:0 Jul 21, 1997
 Survey Co:

Rotation:
 Filename: nn27a.all
 Channels: Ch6 Ch7 Ch8 Ch9 Ch10Ch1 Ch2
 Plotted: 08:43 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

...Battle Mtn...

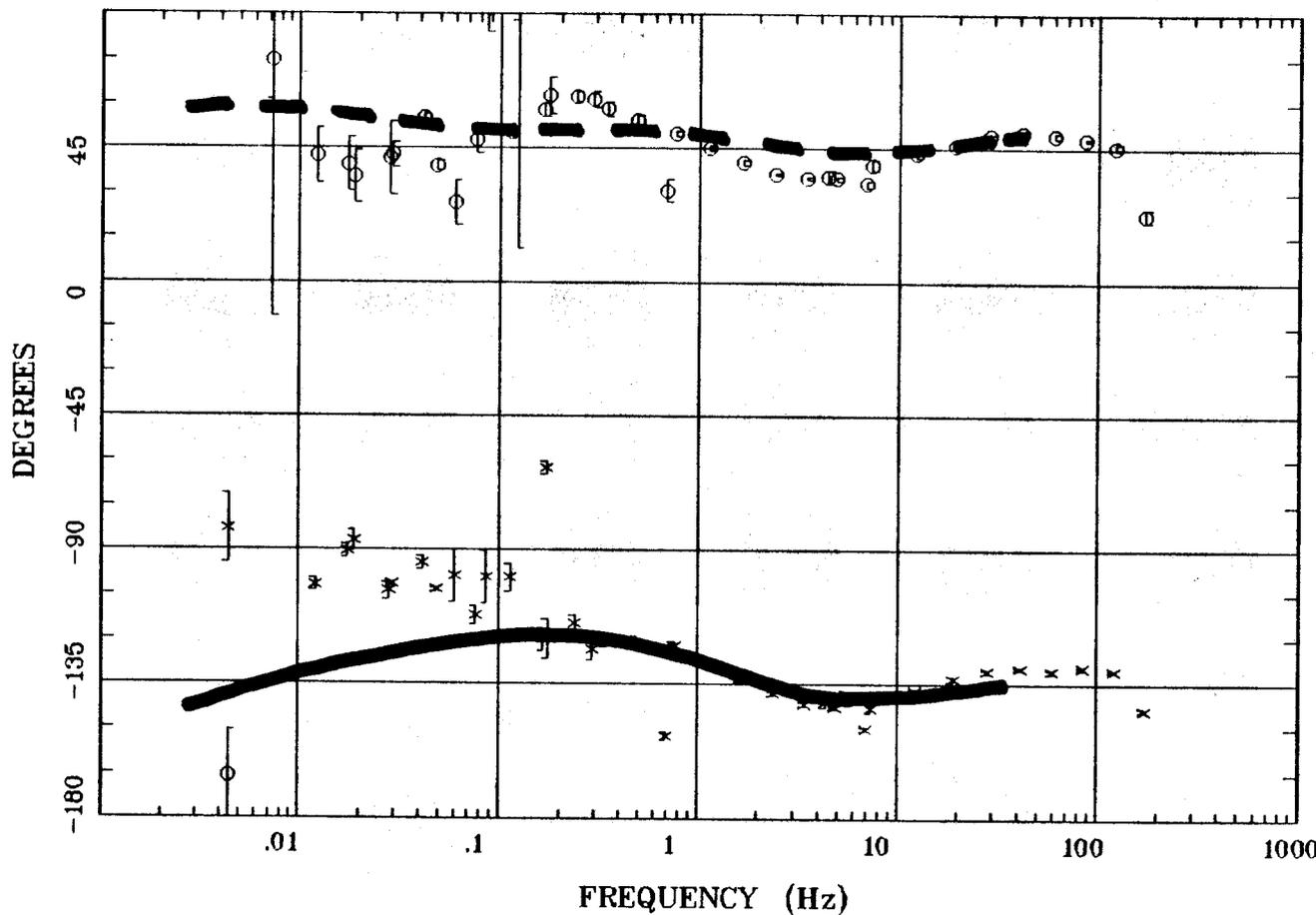


Client:
 Remote: E local ref.
 Acquired: 18:4 Jul 21, 1997
 Survey Co:

Rotation:
 Filename: nn28.all
 Channels: Ch6 Ch7 Ch8 Ch9 Ch10Ch1 Ch2
 Plotted: 08:44 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

...Battle Mtn...

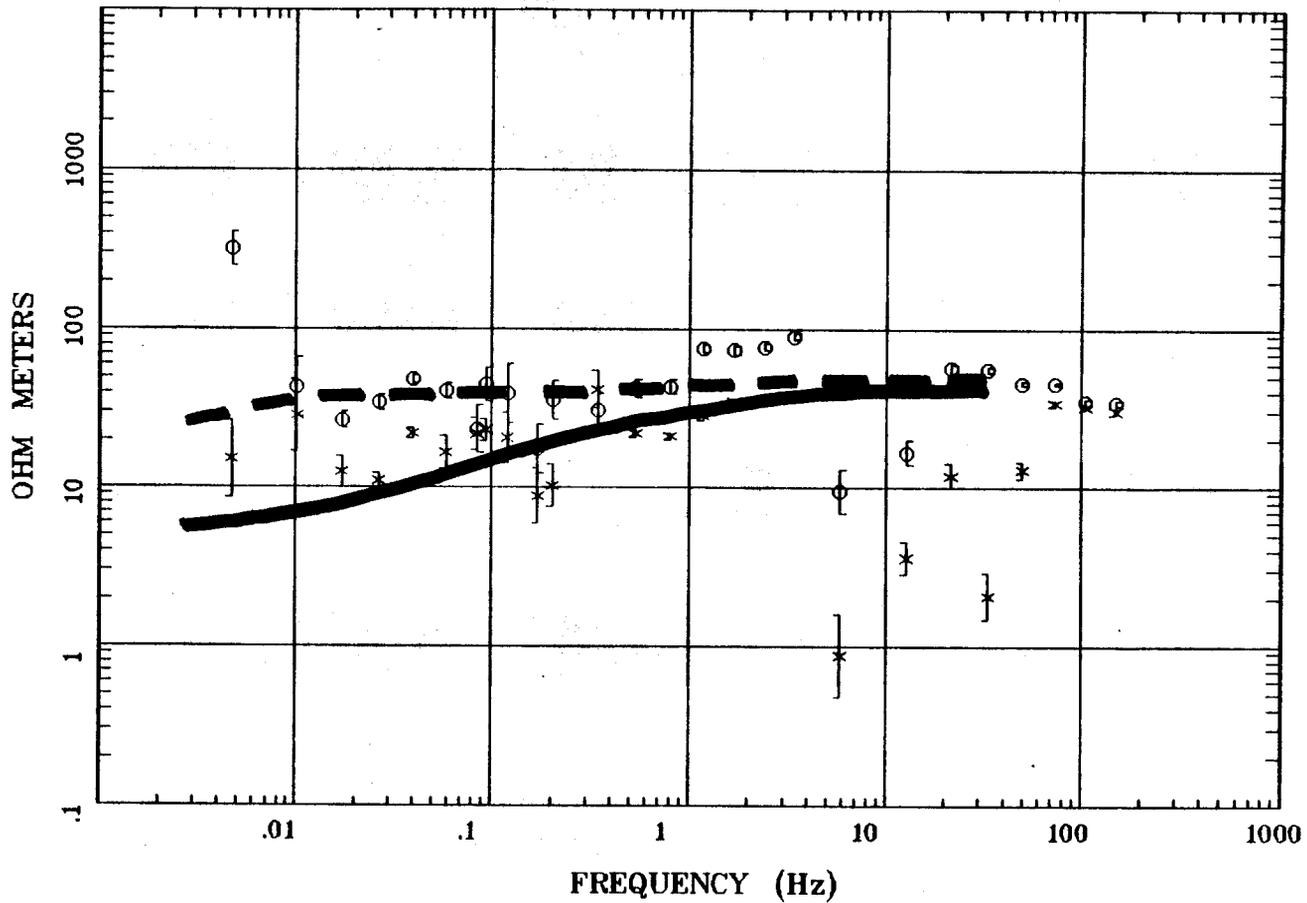


Client:
 Remote: E local ref.
 Acquired: 18:4 Jul 21, 1997
 Survey Co:

Rotation:
 Filename: nn28.all
 Channels: Ch6 Ch7 Ch8 Ch9 Ch10Ch1 Ch2
 Plotted: 08:44 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Station 9

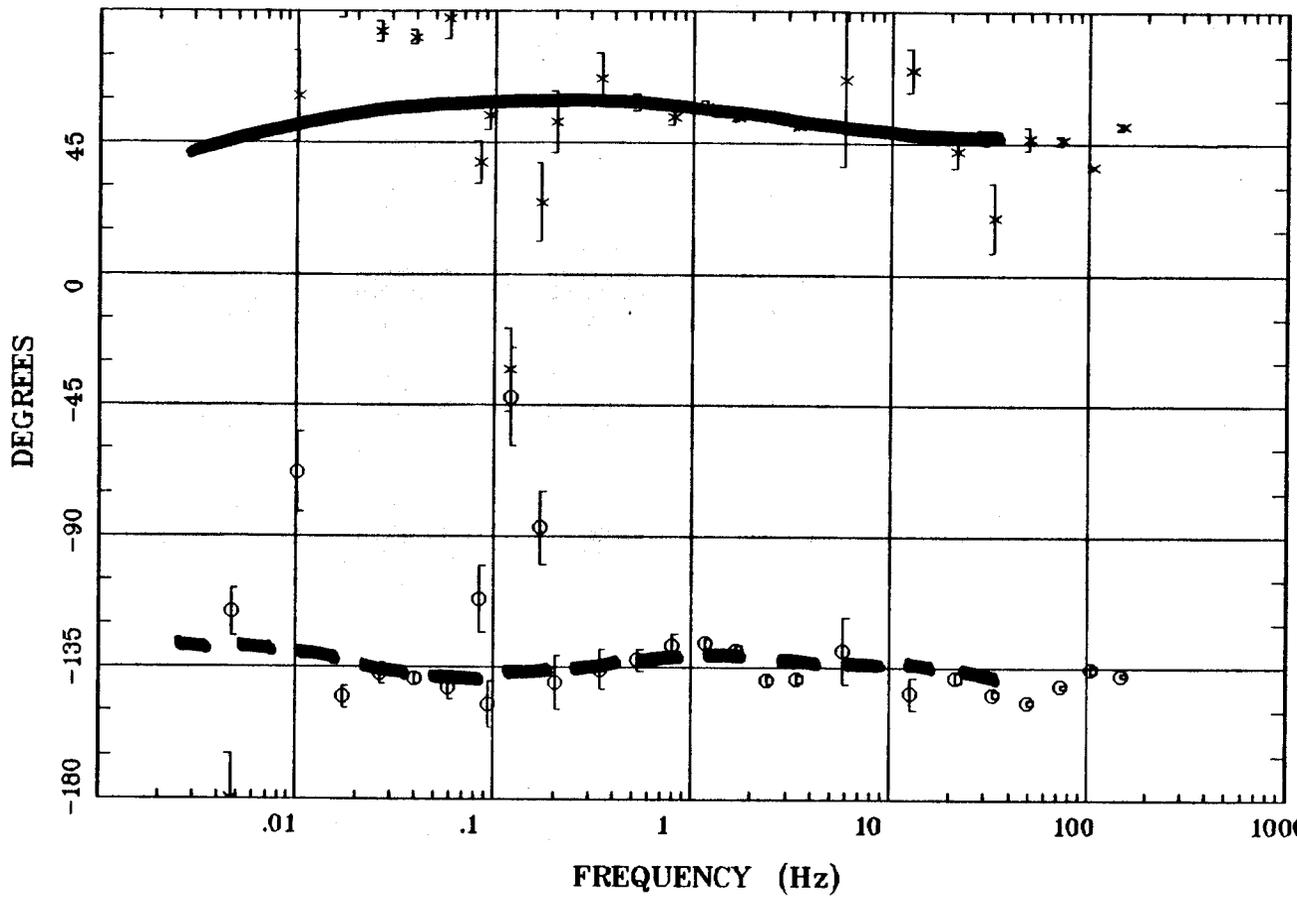


Client:
Remote:
Acquired:
Survey Co:

Rotation:
Filename: CT09A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:25 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Station 9



50

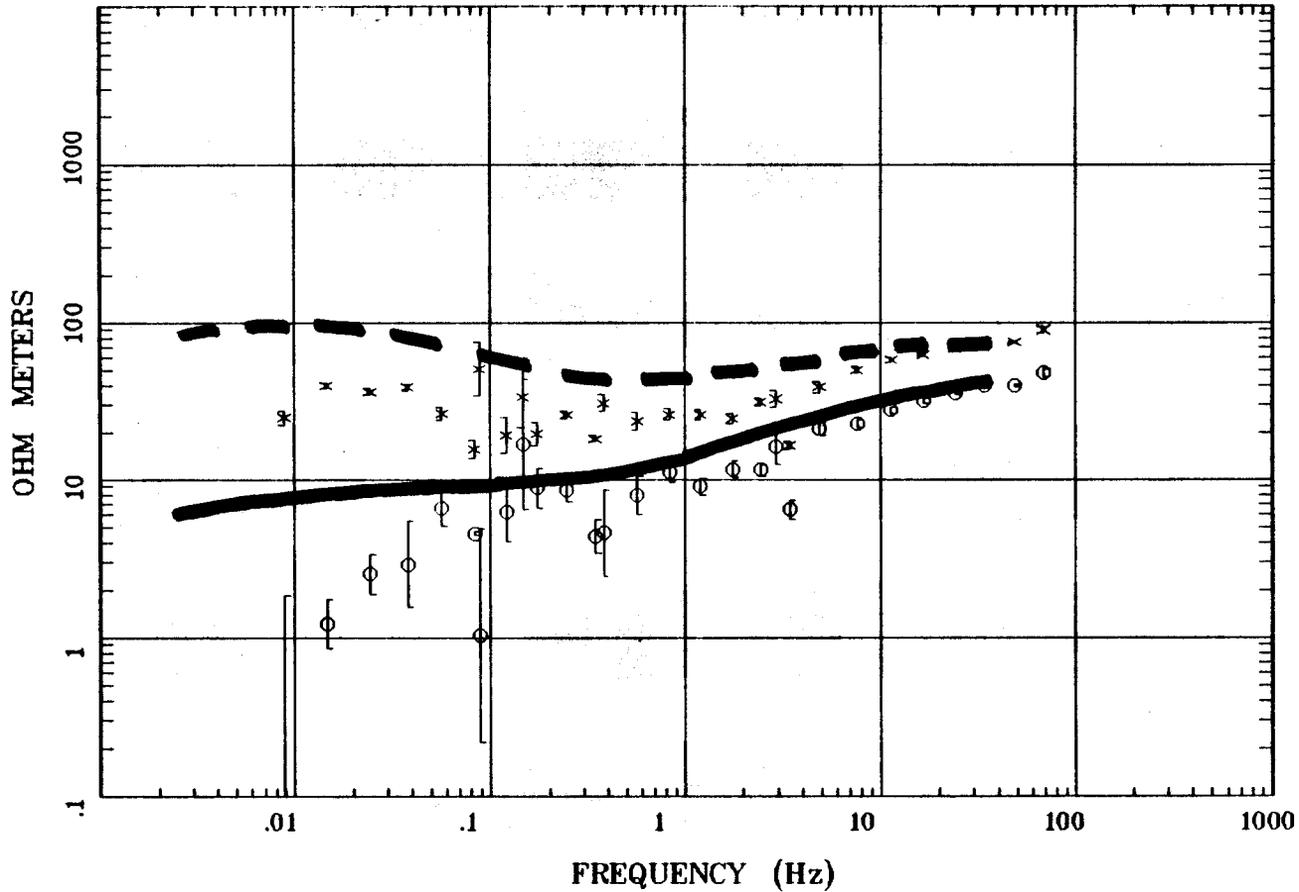
Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT09A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:25 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

Station 1

APPARENT RESISTIVITY

Carlin, Nevada

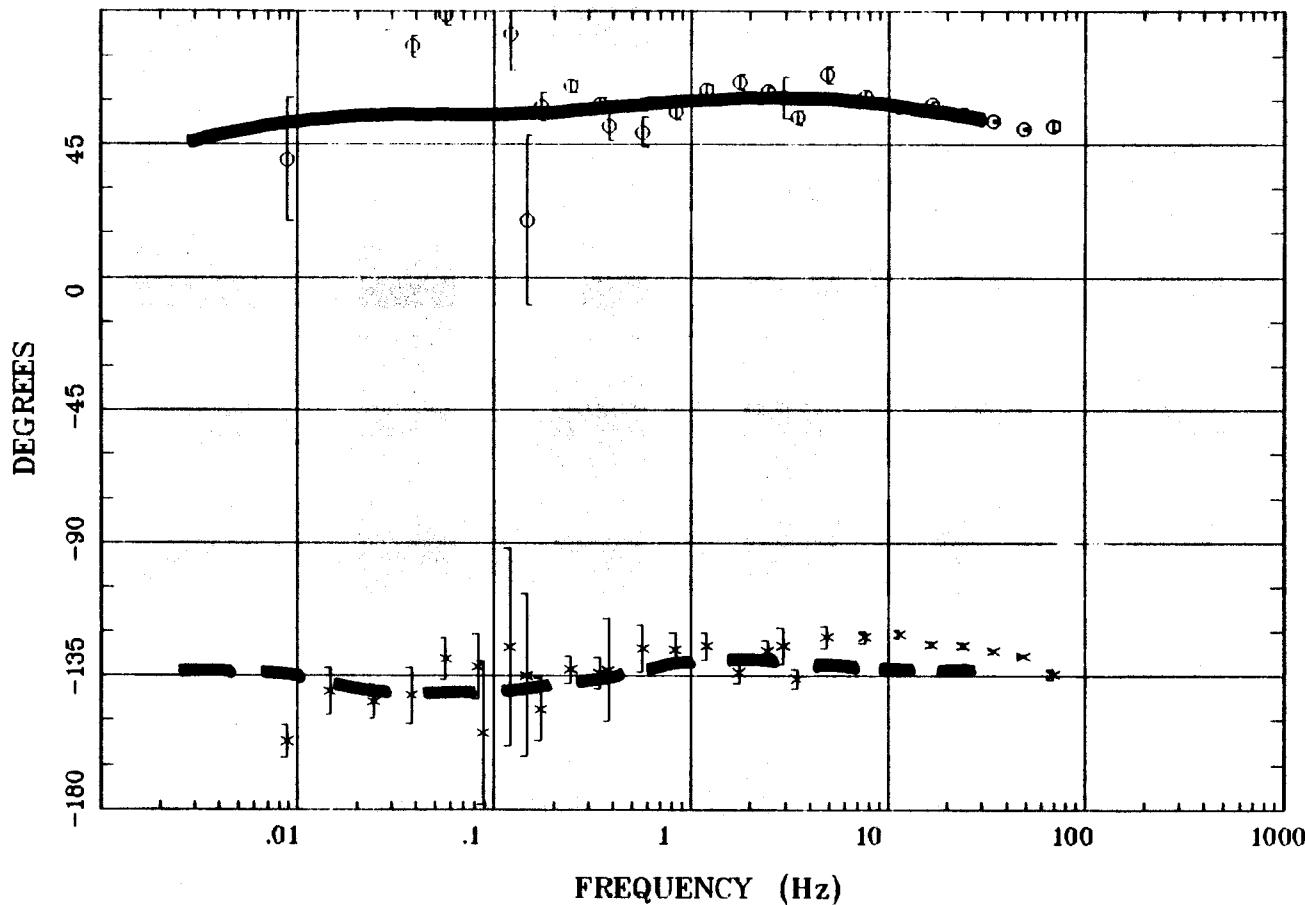


Client:
Remote: local
Acquired: 13:4 Jul 26, 1999
Survey Co:USGS

Rotation:
Filename: ct01.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
Plotted: 15:42 Jan 24, 2001
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Carlin, Nevada

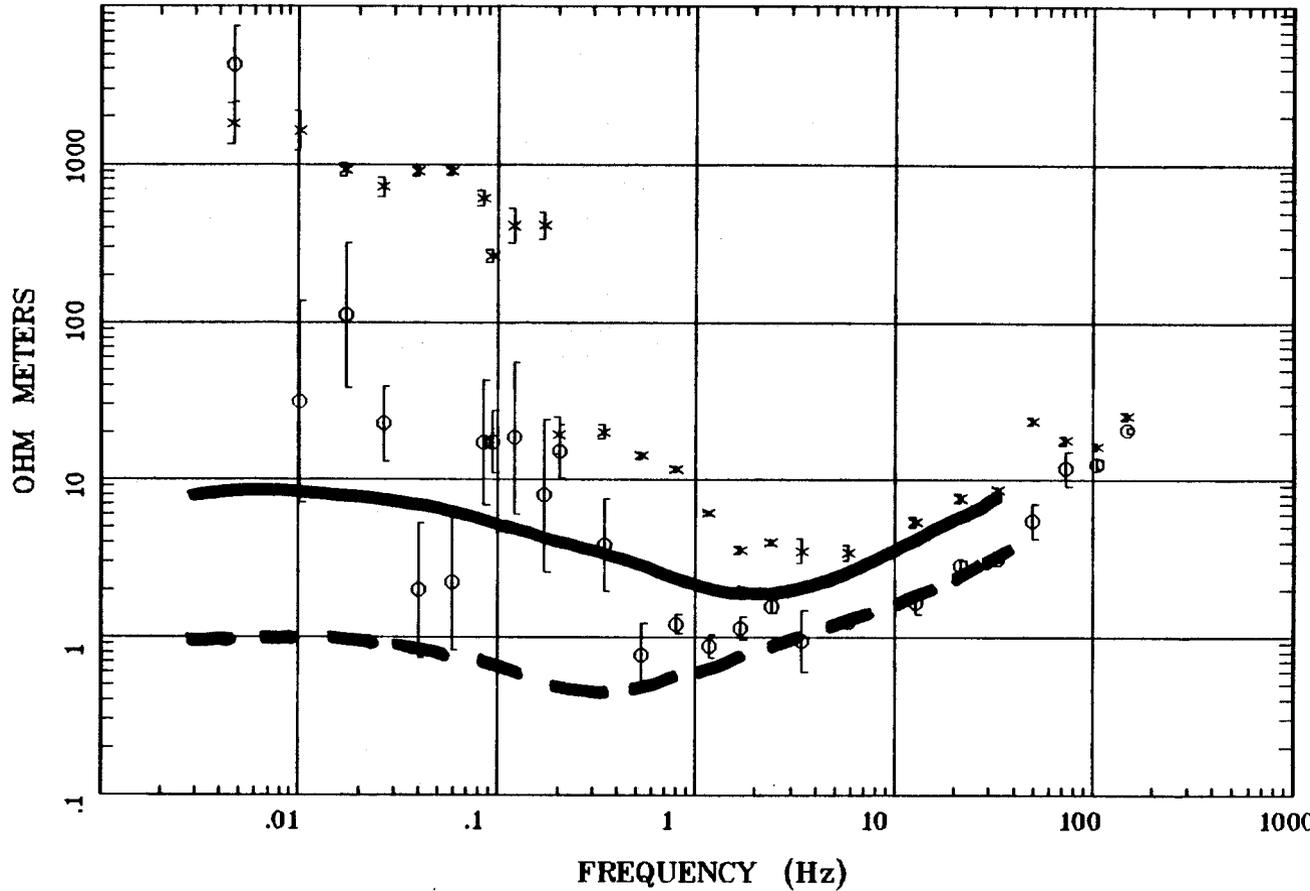


Client:
 Remote: local
 Acquired: 13:4 Jul 26, 1999
 Survey Co:USGS

Rotation:
 Filename: ct01.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
 Plotted: 15:42 Jan 24, 2001
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Station 2

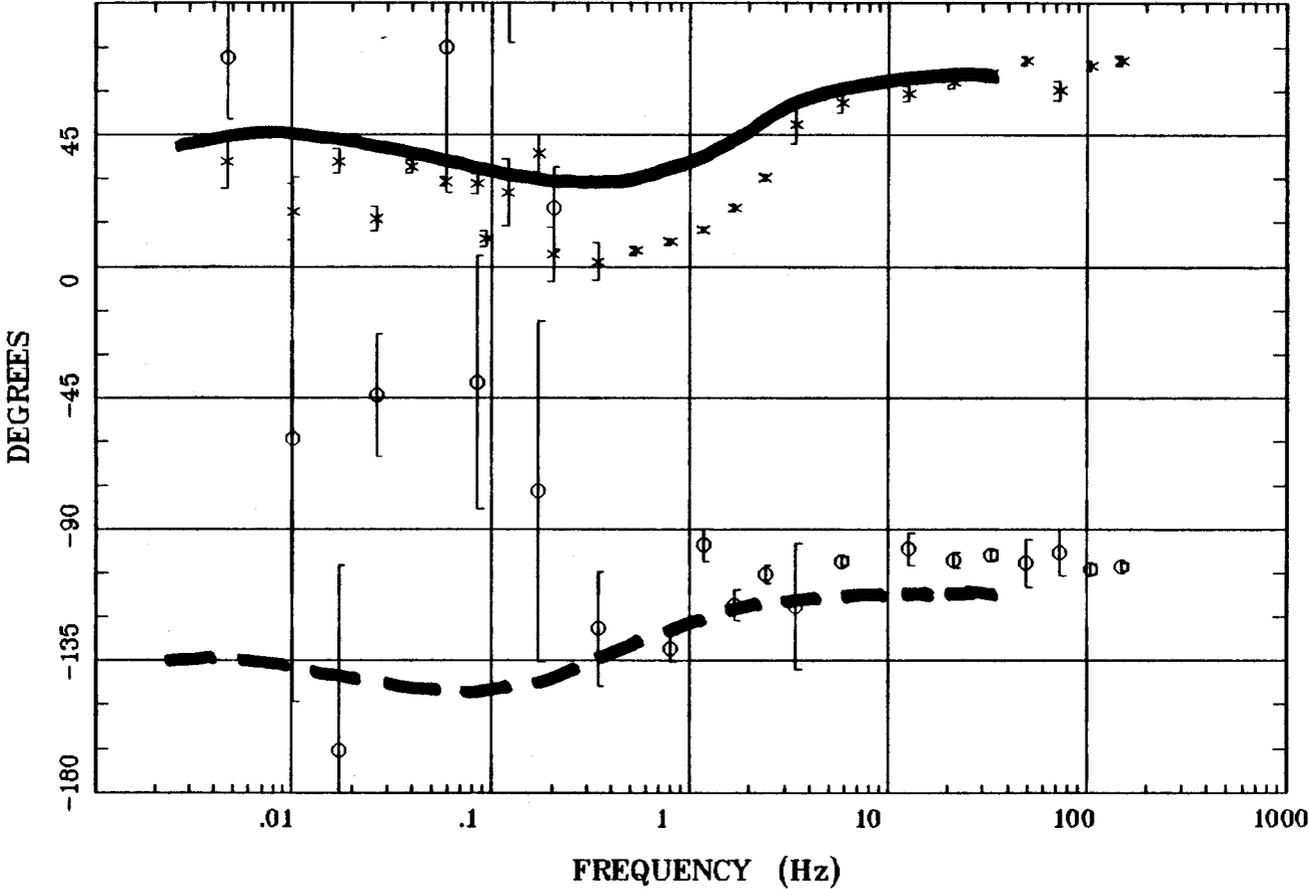


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT02A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:43 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

53

IMPEDANCE PHASE



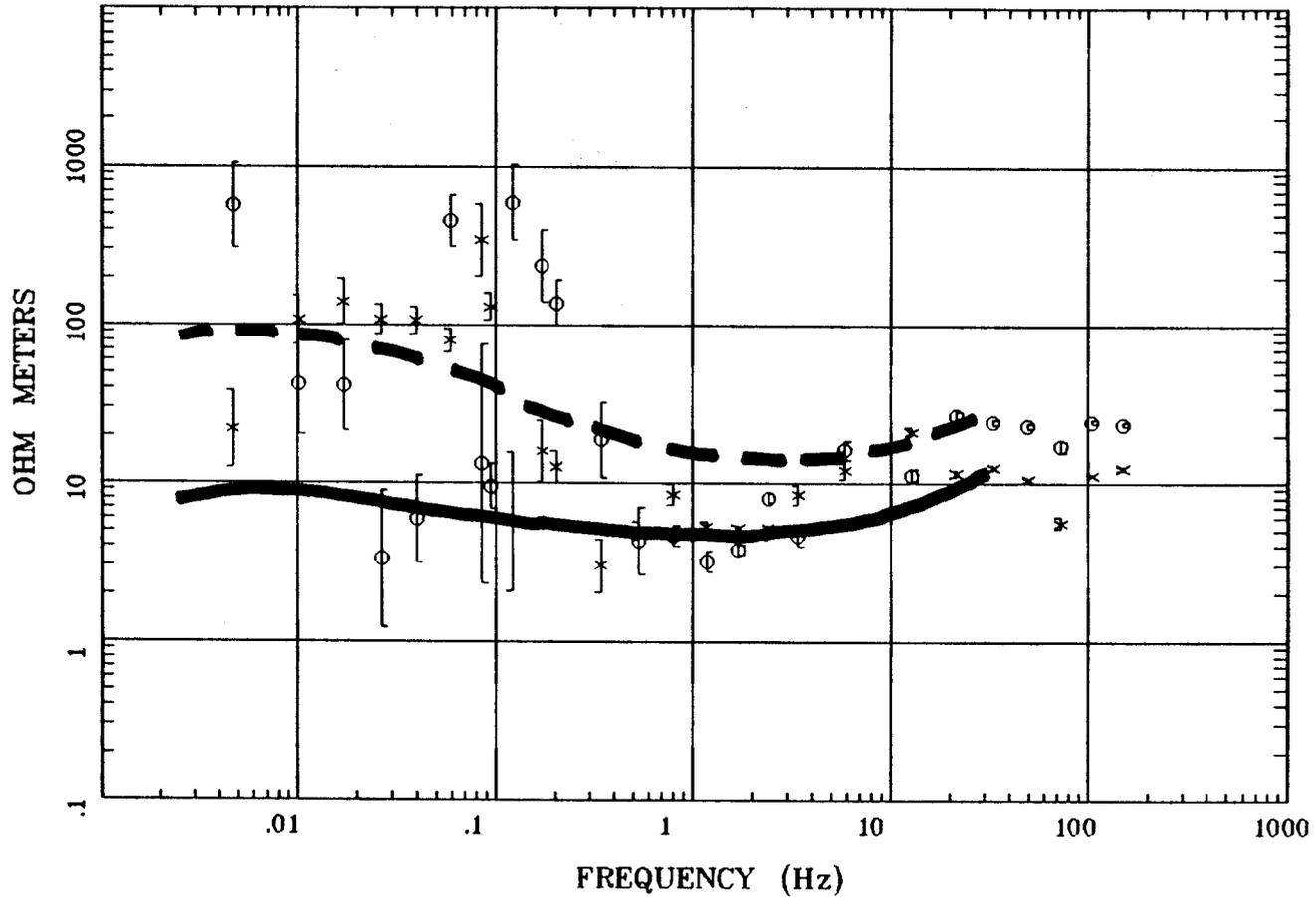
Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT02A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:43 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

54

Station 24

APPARENT RESISTIVITY

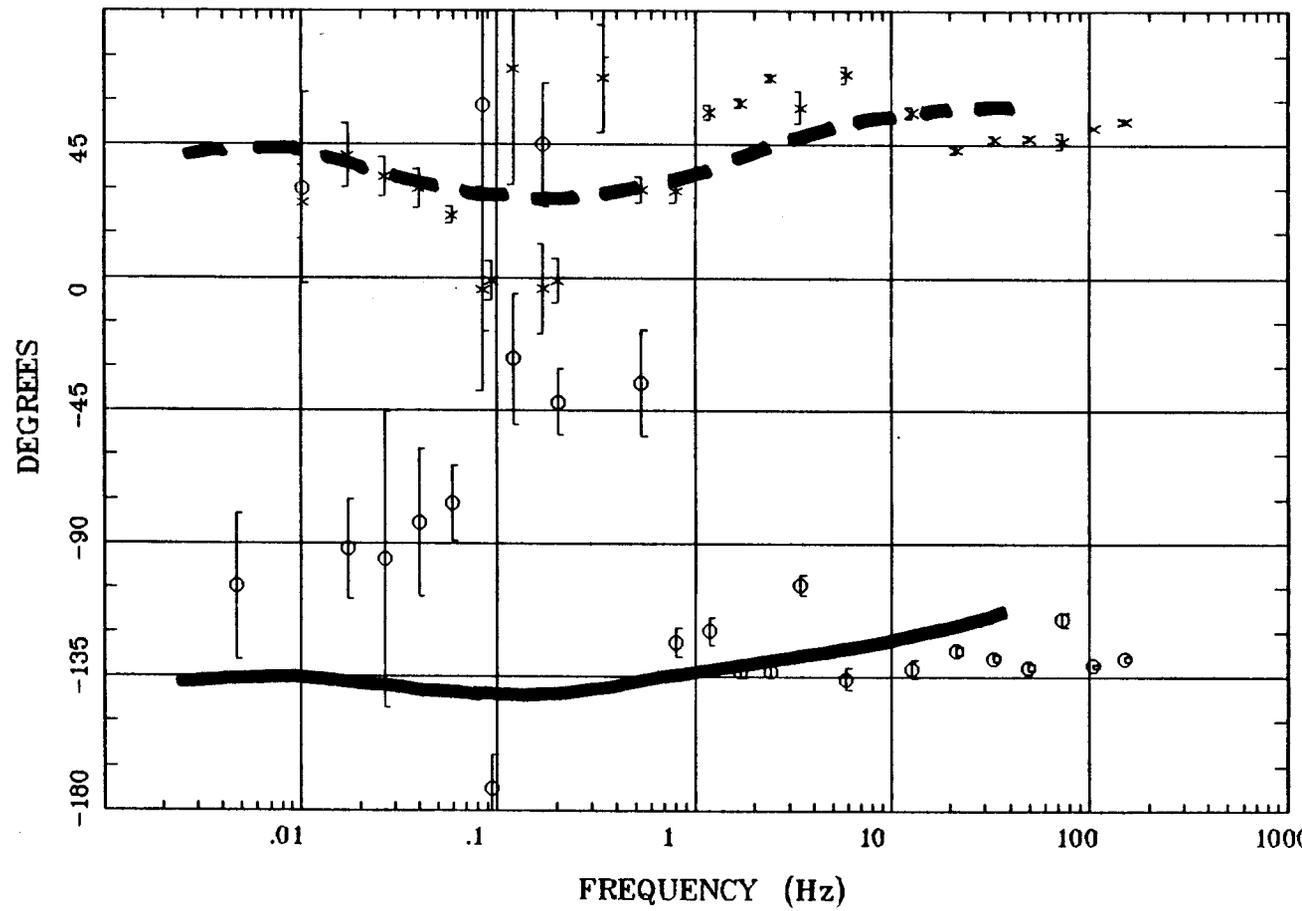


Client:
Remote:
Acquired: : :
Survey Co:

Rotation:
Filename: CT24C
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:57 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

55

IMPEDANCE PHASE

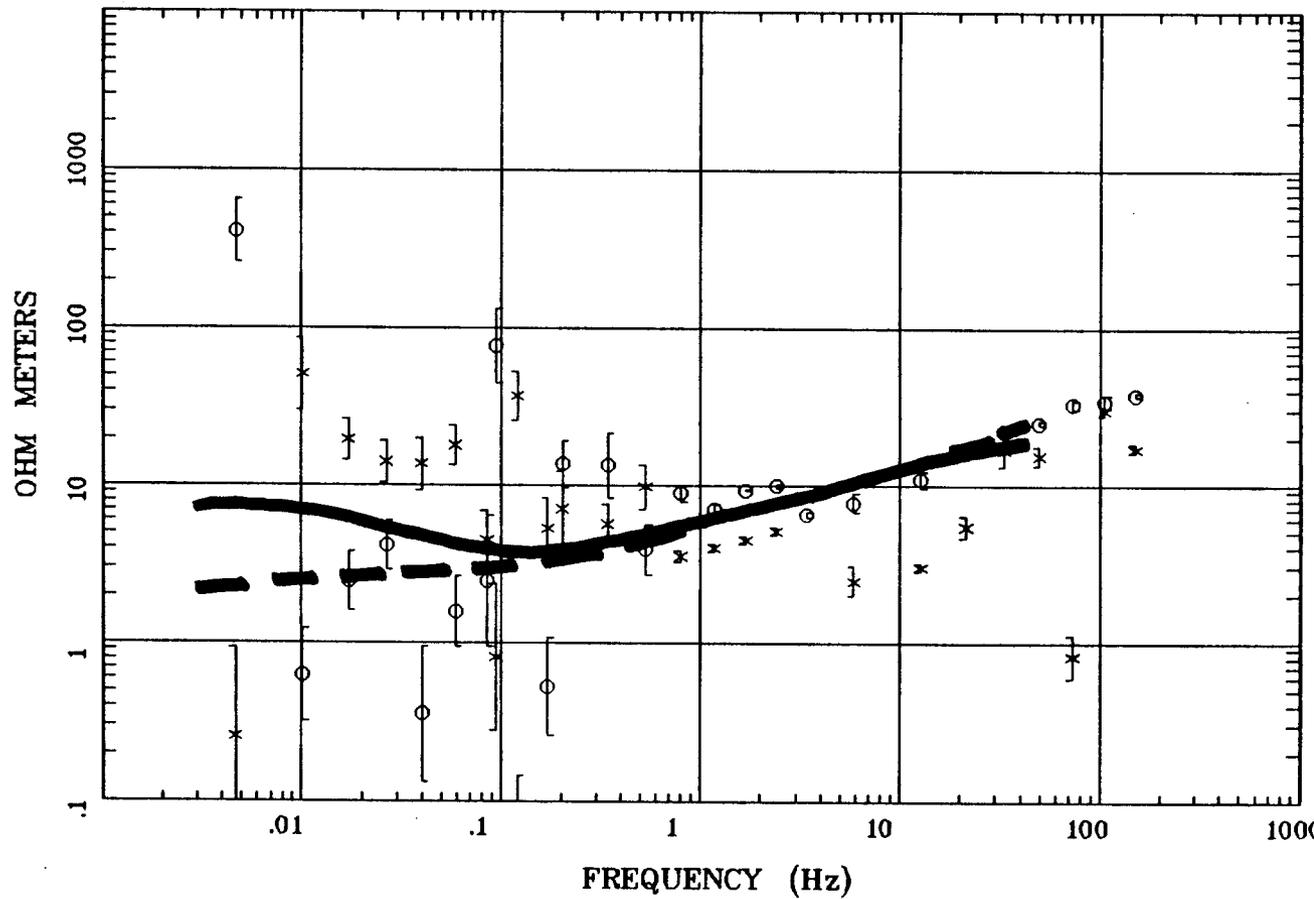


95

Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT24C
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:57 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

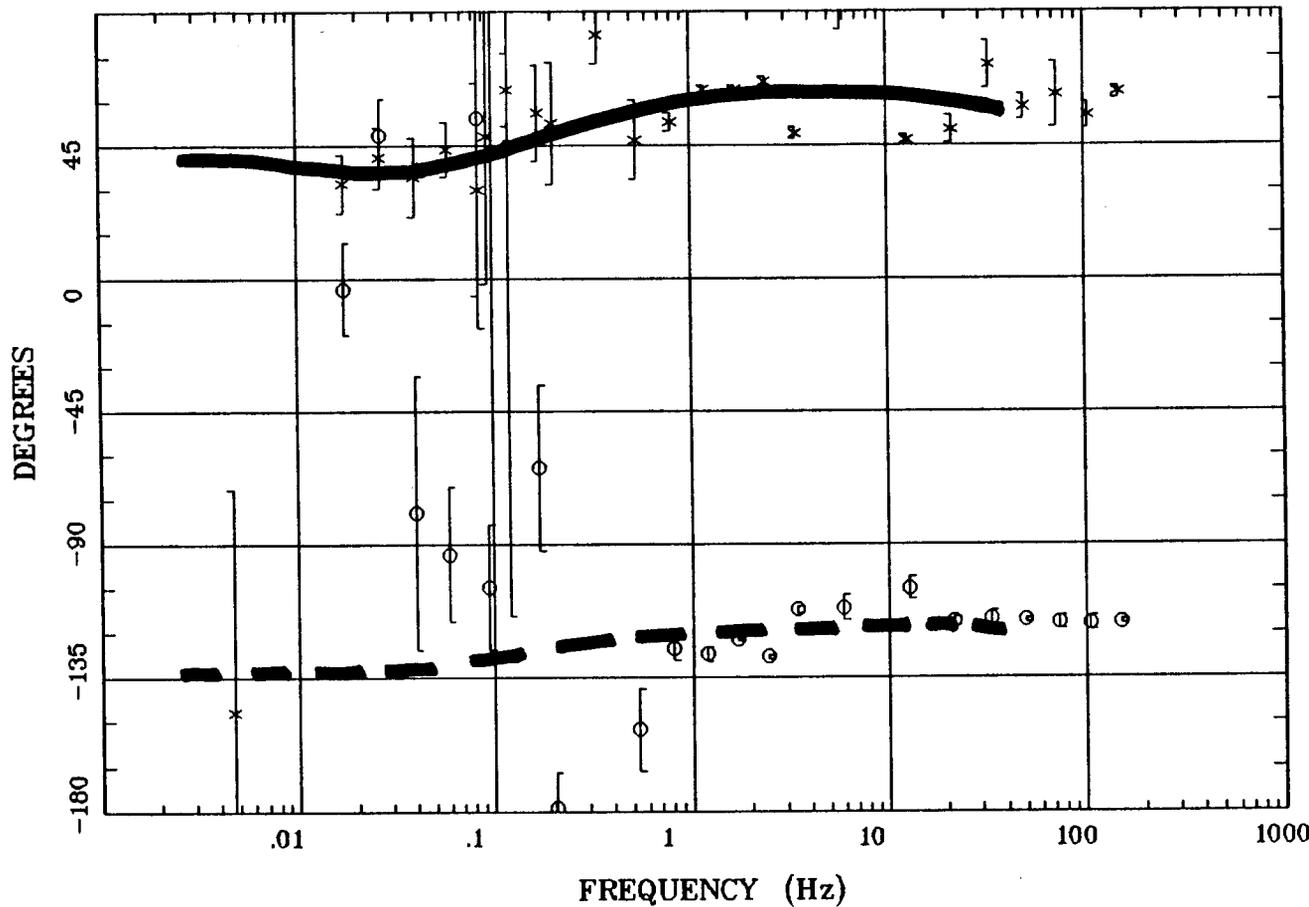


57

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT25D
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:58 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

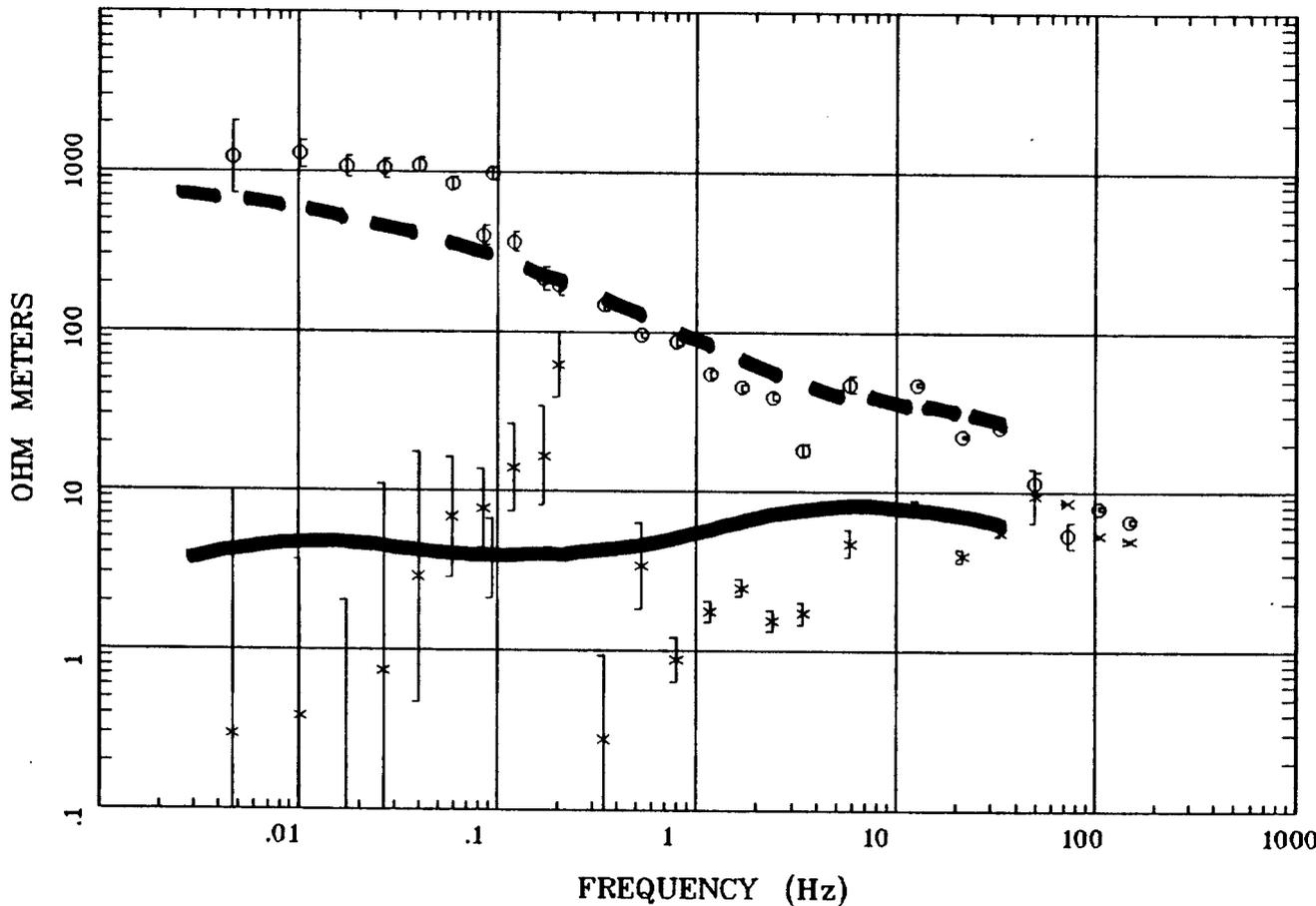
IMPEDANCE PHASE



85

Client:
 Remote:
 Acquired: :
 Survey Co:

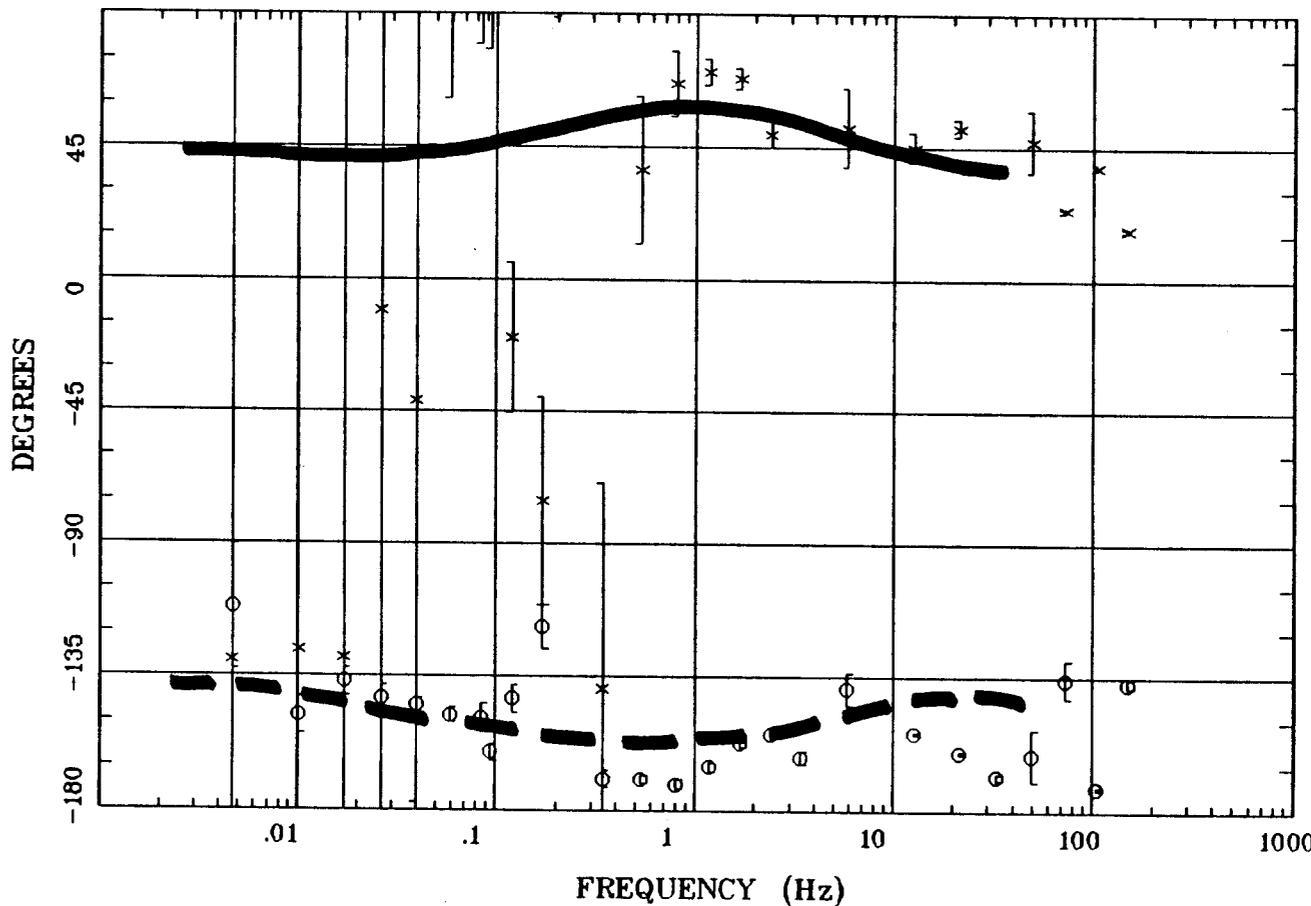
Rotation:
 Filename: CT25D
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:58 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >



59

Client:
 Remote:
 Acquired: :
 Survey Co:

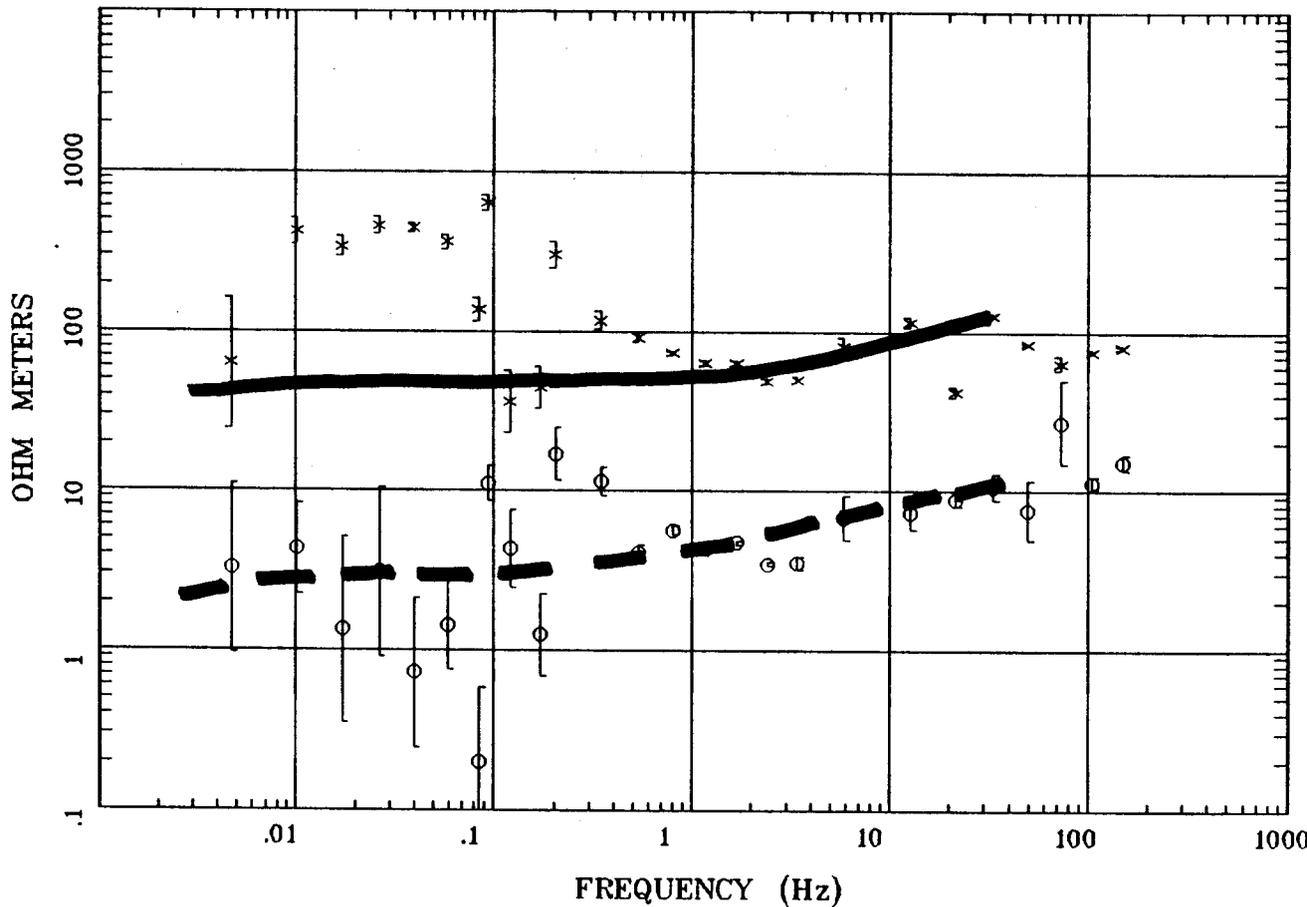
Rotation:
 Filename: CT26C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:59 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >



09

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT26C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:59 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >



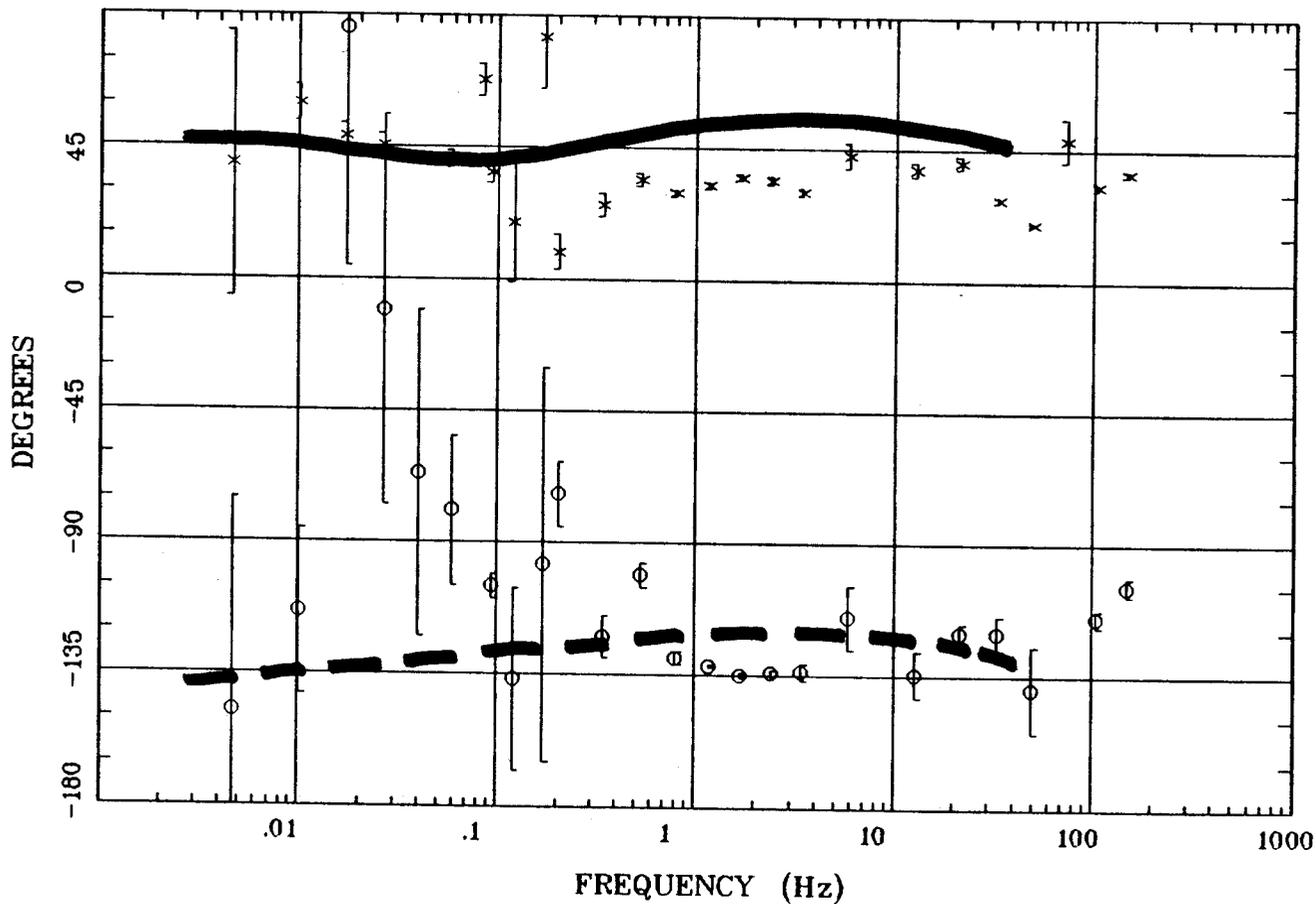
19

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT27A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 16:00 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

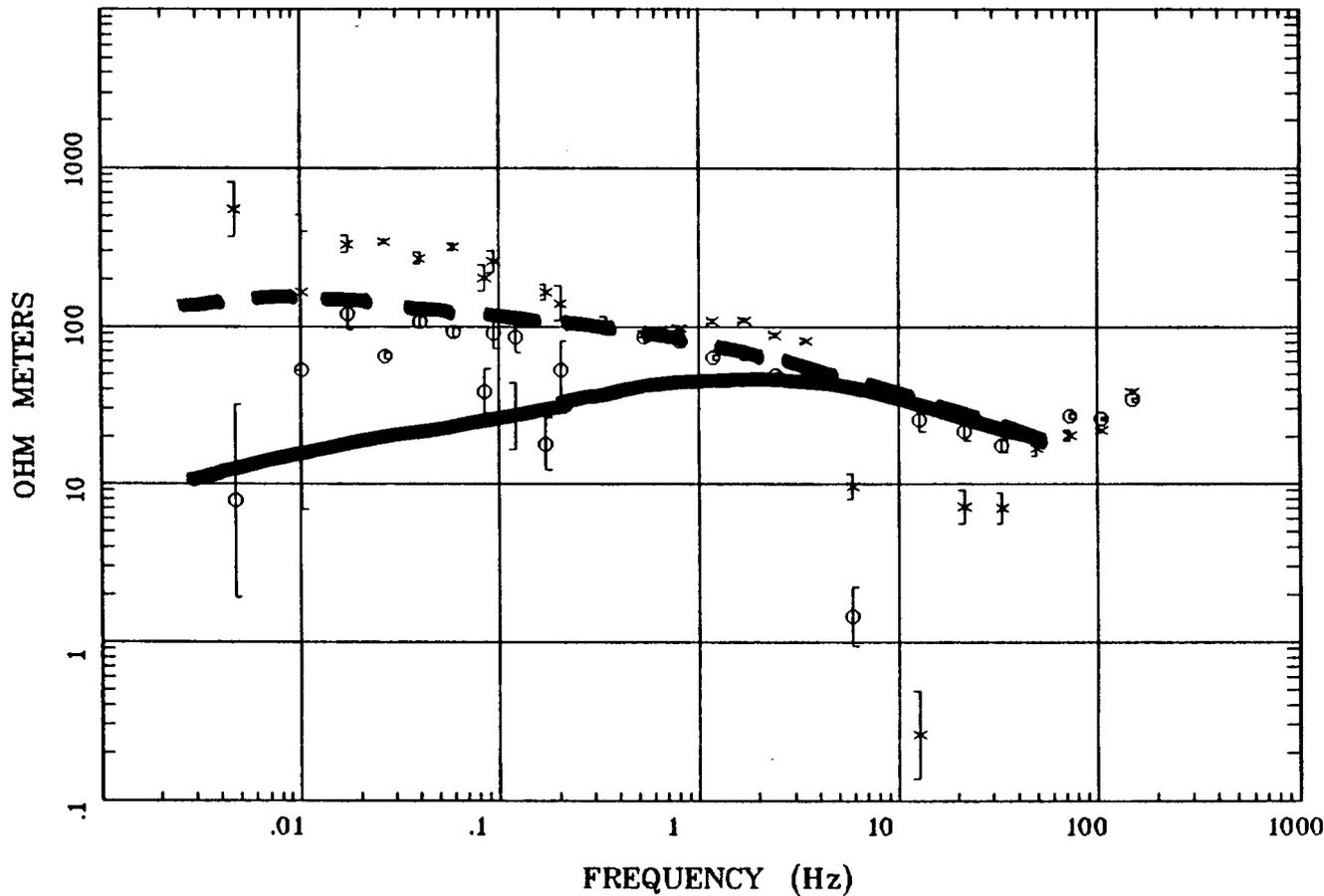
Station 27



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT27A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 16:00 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

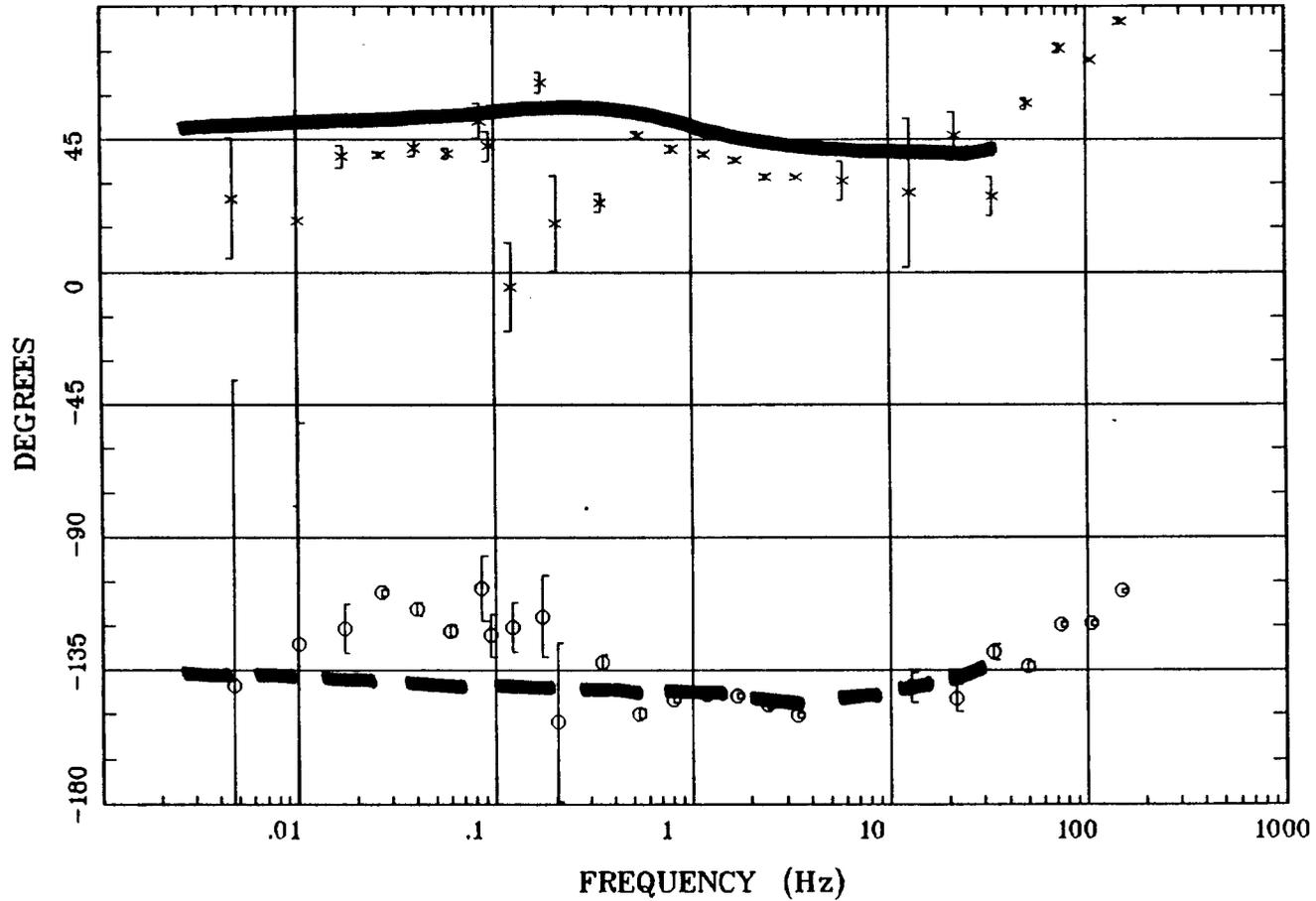


63

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT28C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 16:02 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE



Client:
 Remote:
 Acquired: :
 Survey Co:

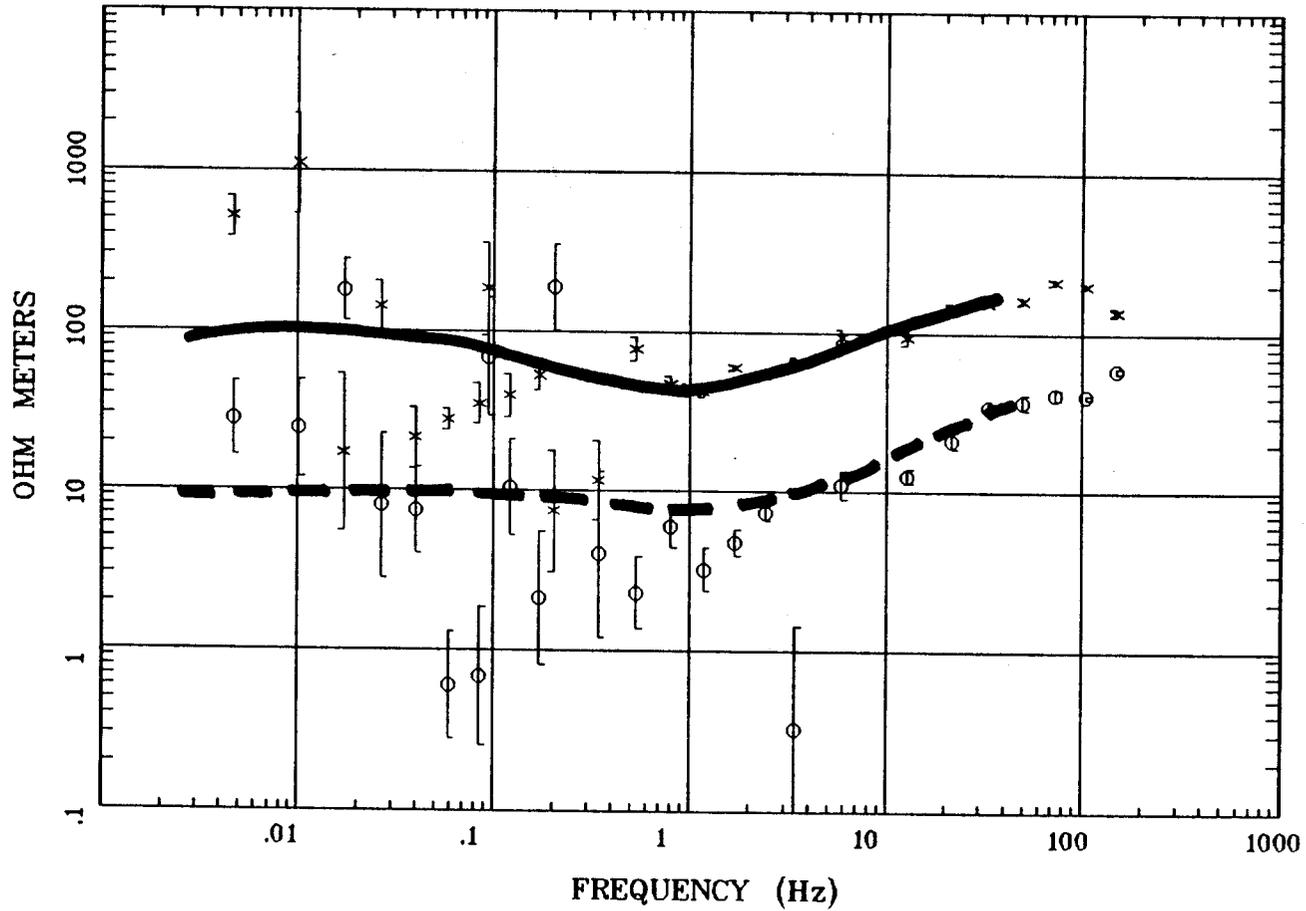
Rotation:
 Filename: CT28C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 16:02 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

OBSERVED AND CALCULATED DATA - PROFILE MT3

Magnetotelluric (MT) observed (circle and x symbols) and calculated (solid and dashed lines are TE and TM modes, respectively) resistivity and phase data for profile MT3. See the "Magnetotelluric Data" section of this report for a description of the observed data and the "Resistivity Models" section for a description of the calculated data.

Station 16

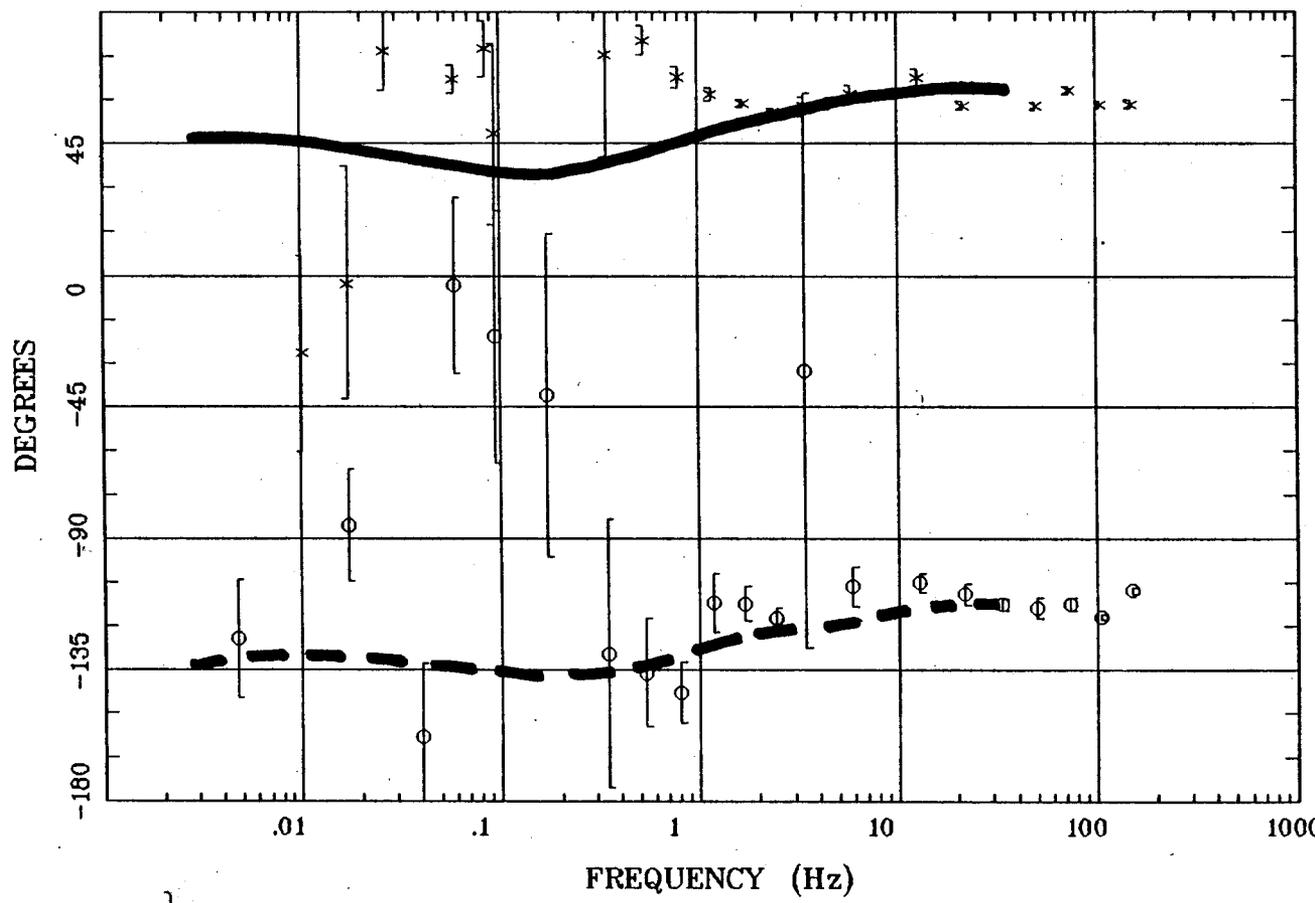
APPARENT RESISTIVITY



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT16C
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:52 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

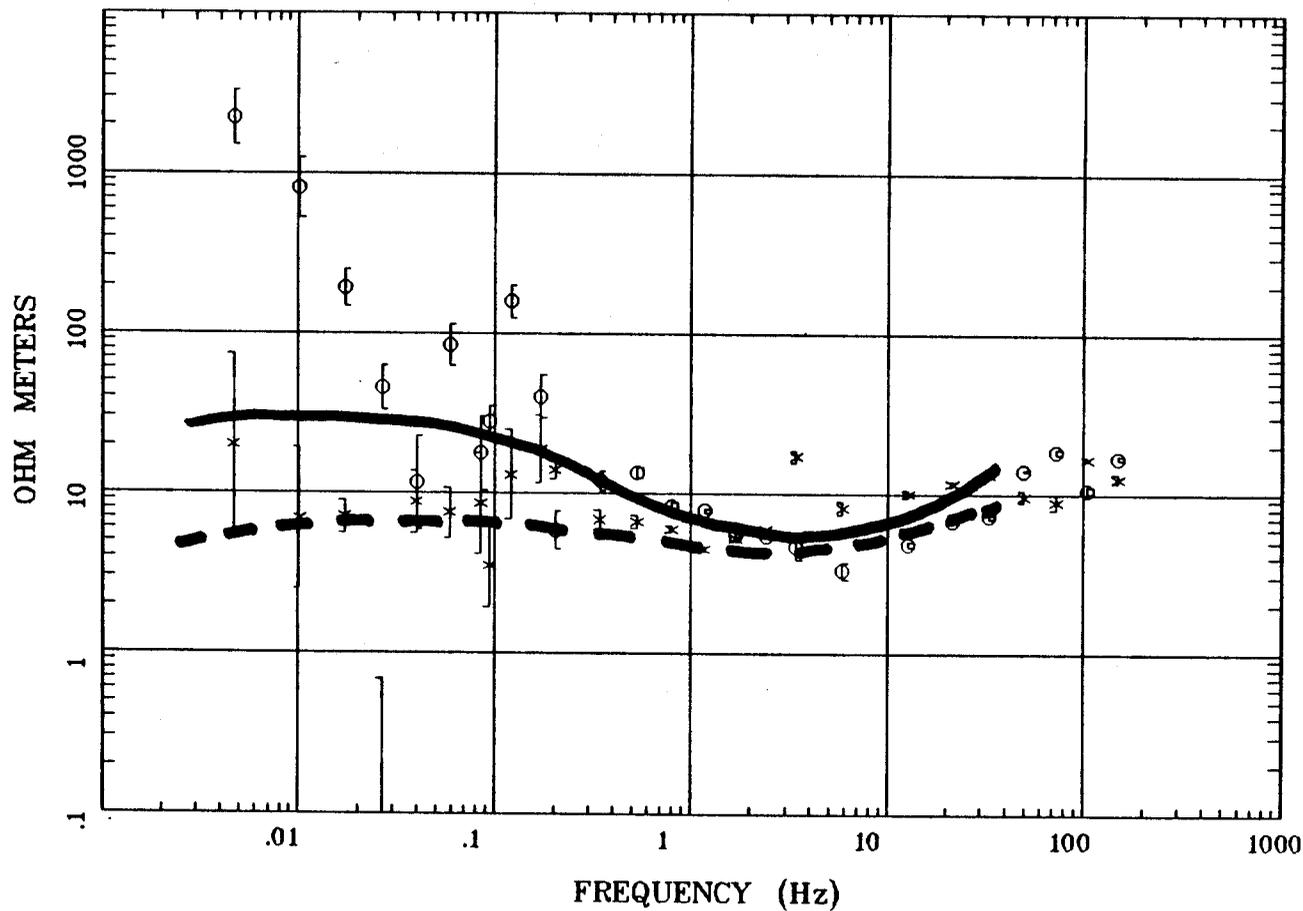


69

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT16C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:52 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

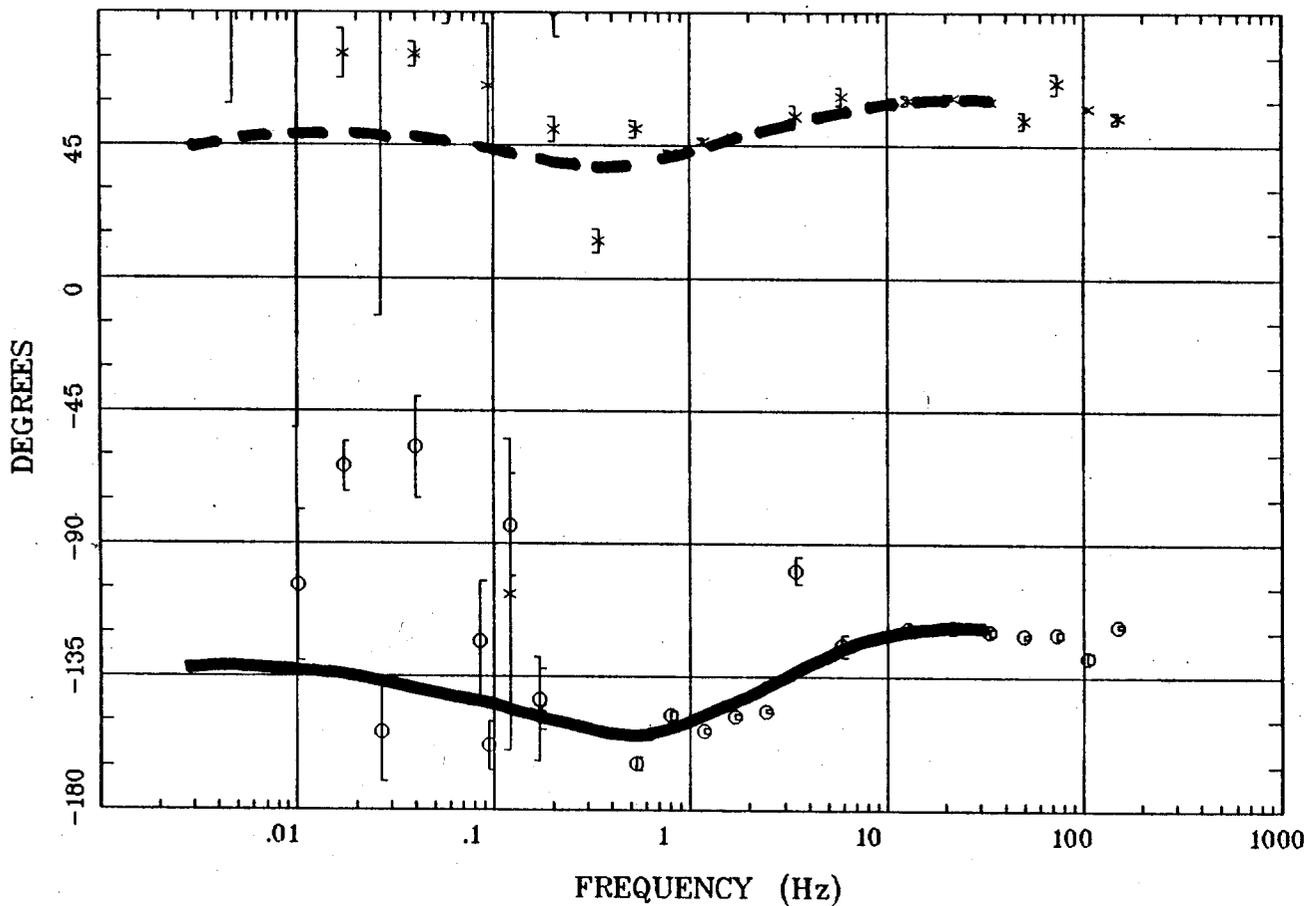
APPARENT RESISTIVITY



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT15F
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:49 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

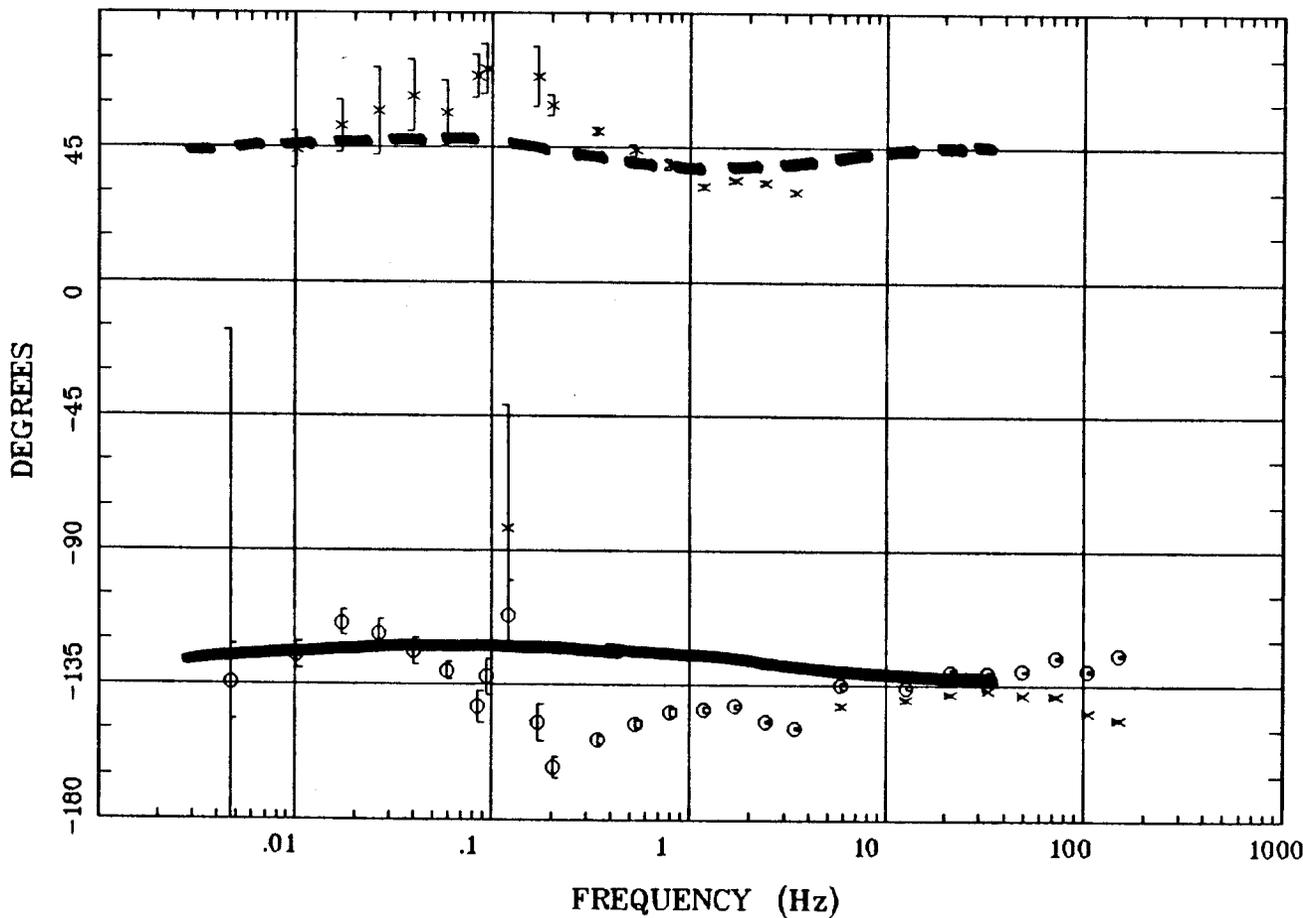
IMPEDANCE PHASE



Client:
Remote:
Acquired:
Survey Co:

Rotation:
Filename: CT15F
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:49 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

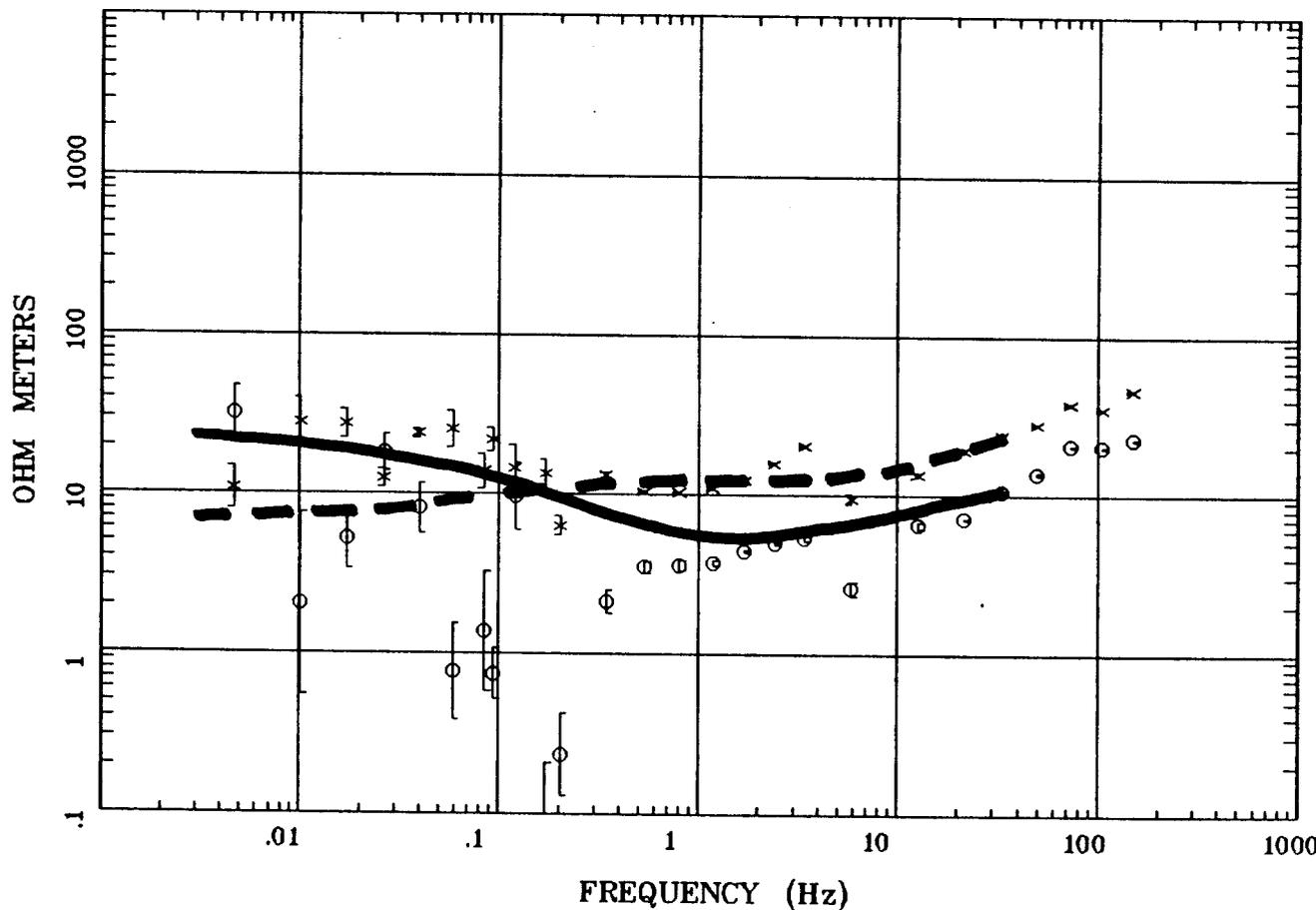


17

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR01
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:29 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

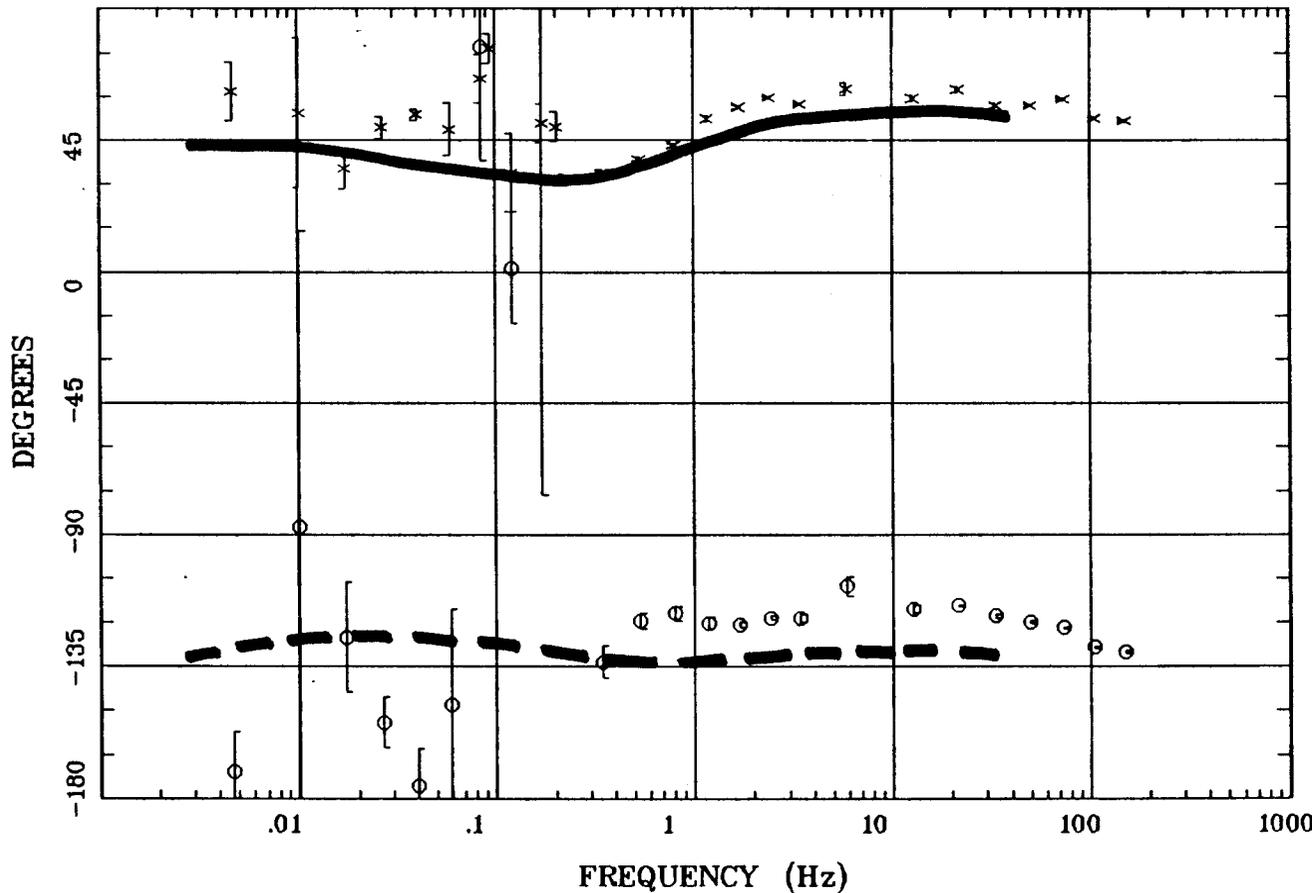
APPARENT RESISTIVITY



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR02
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:34 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

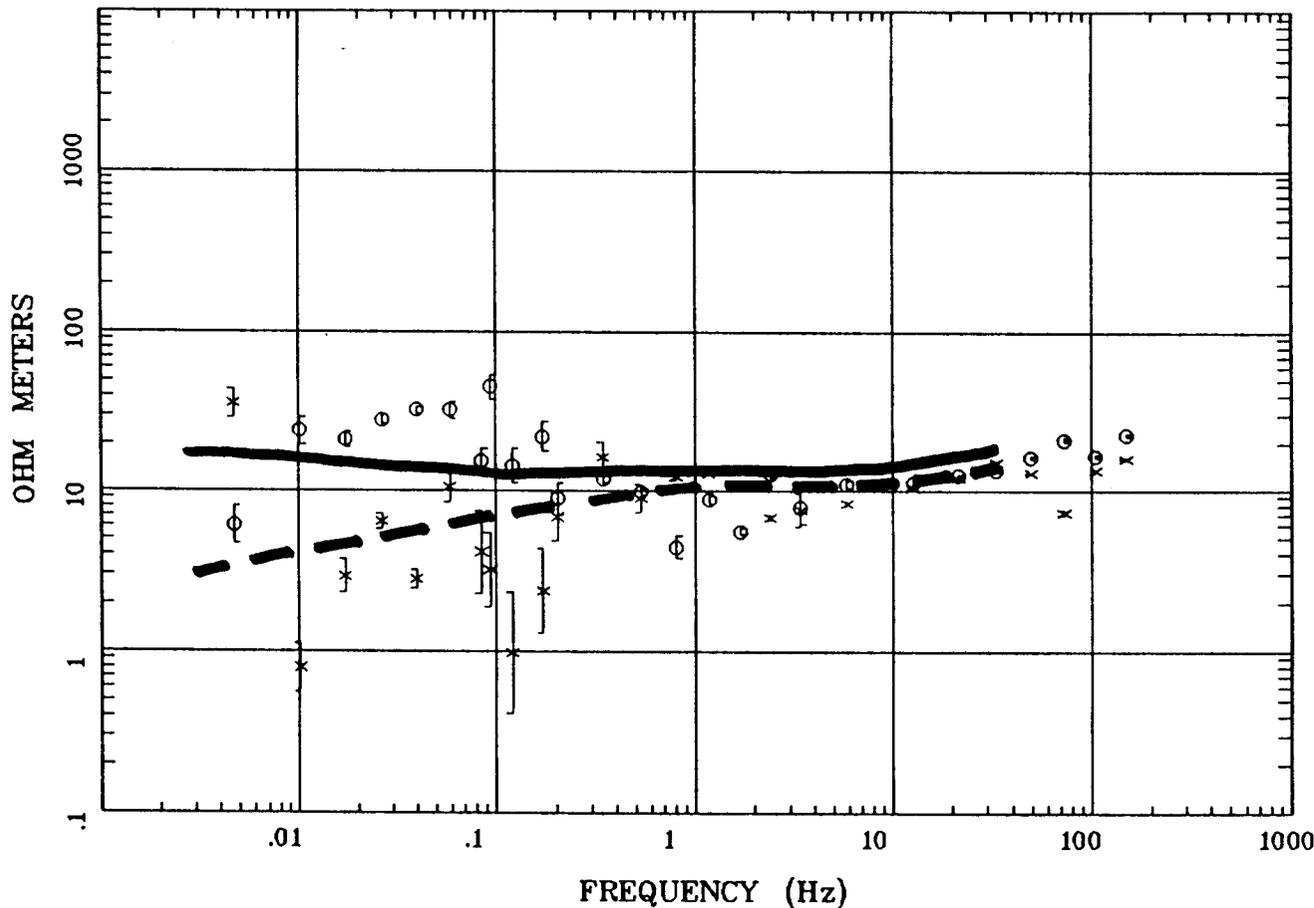
IMPEDANCE PHASE



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR02
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:34 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY



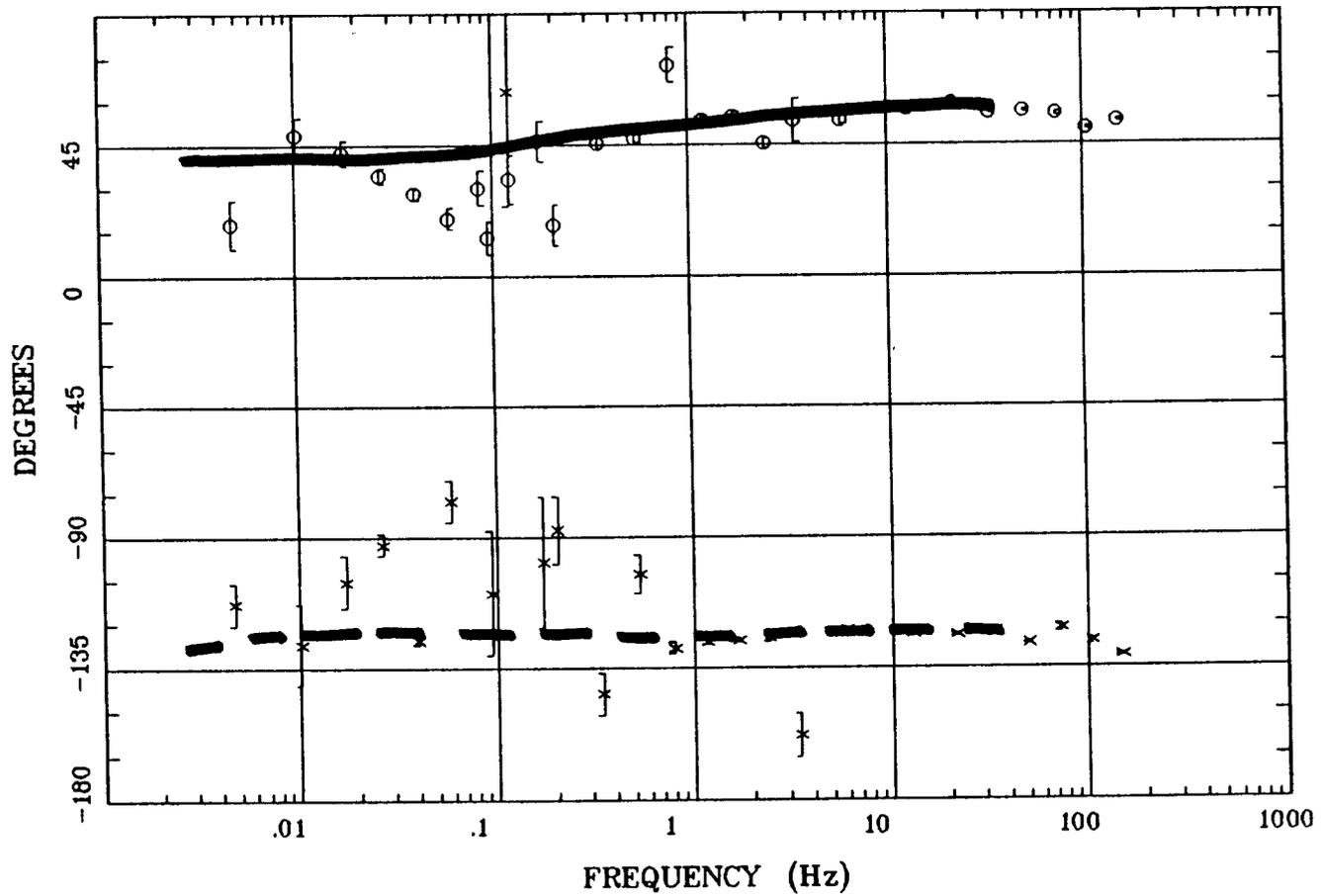
74

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR05
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:38 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

Station 5A

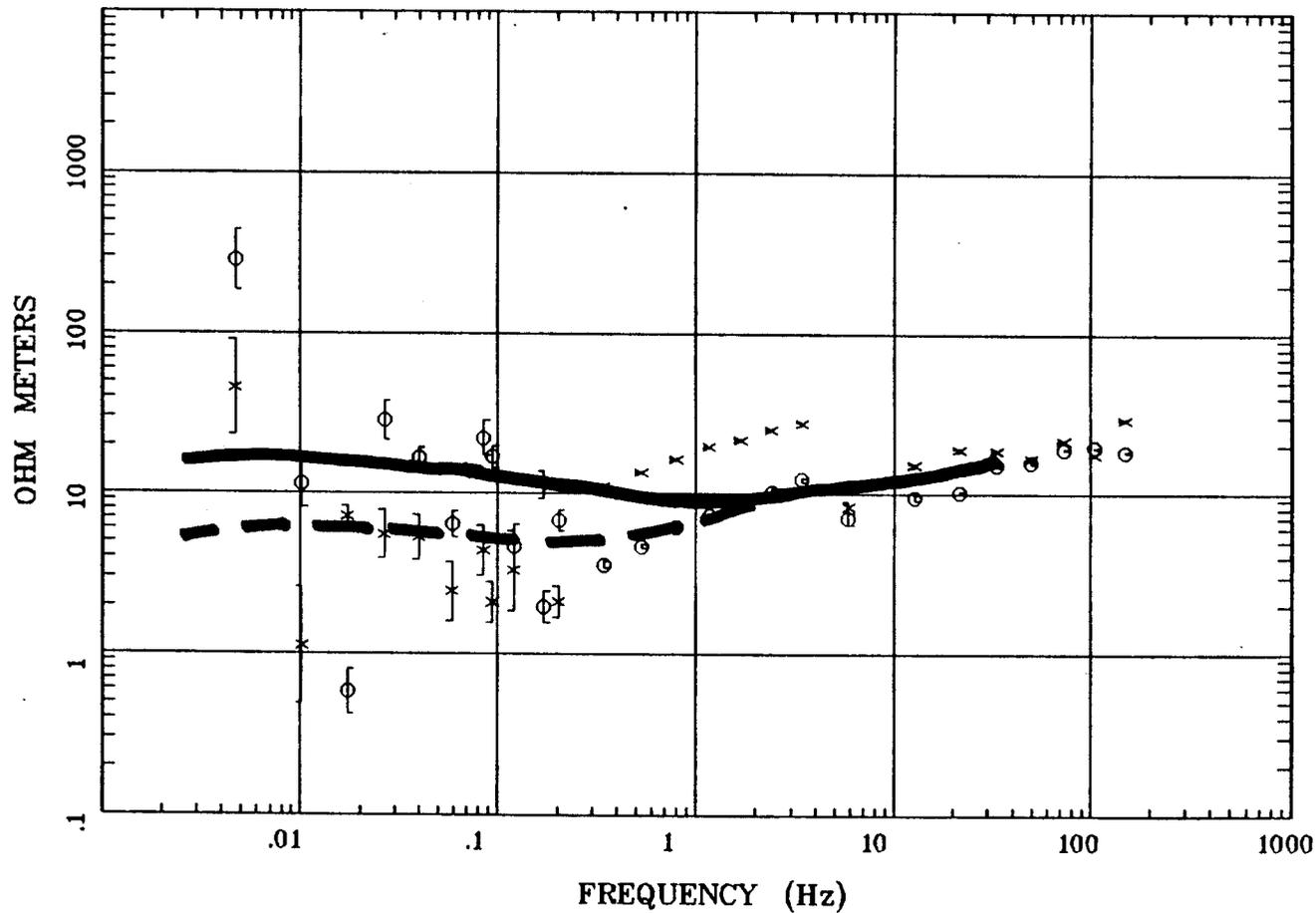
IMPEDANCE PHASE



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR05
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:38 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

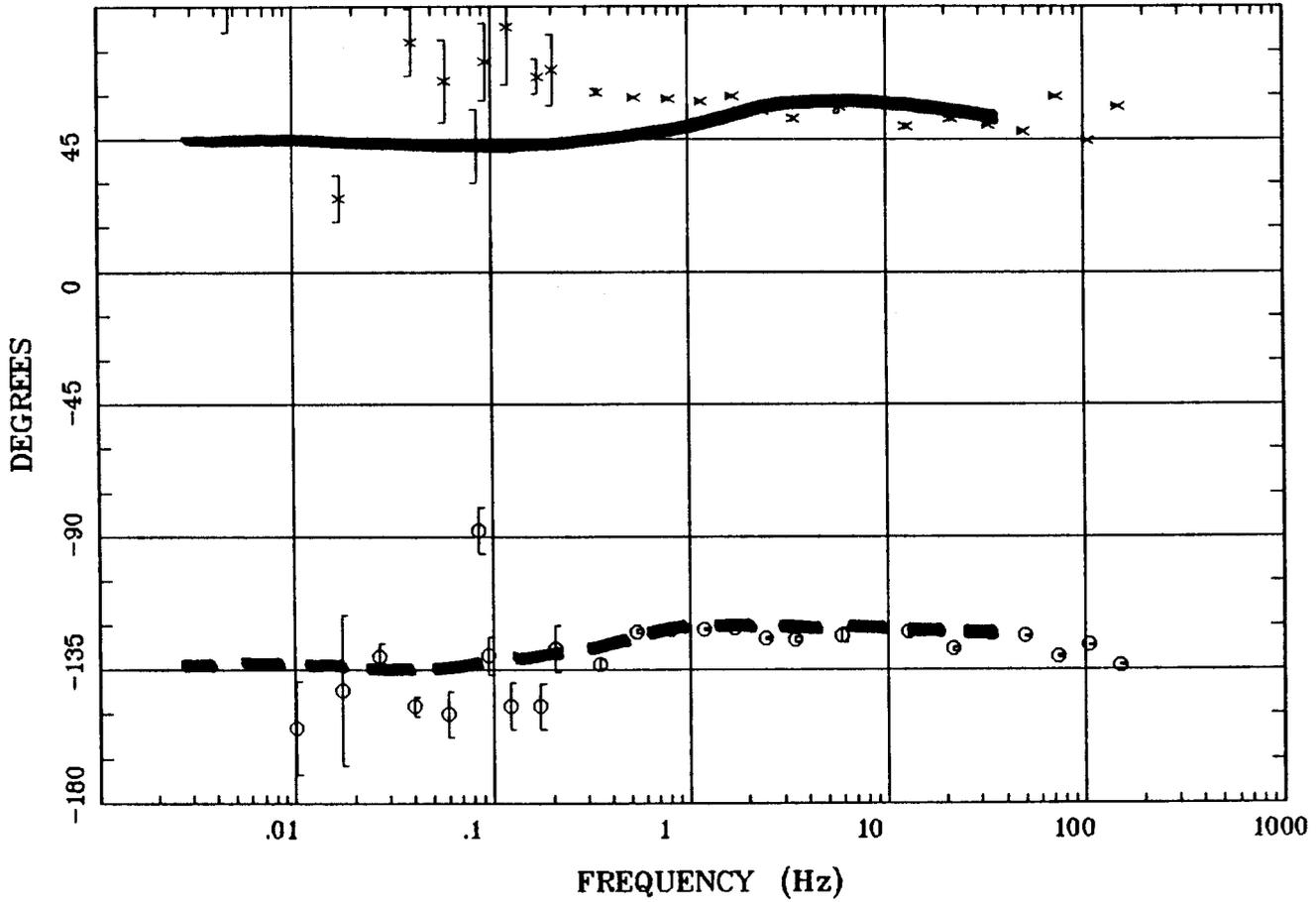


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR03
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:35 Dec 11, 2000
 < EMI - ElectroMagnetic Instruments >

Station 3A

IMPEDANCE PHASE

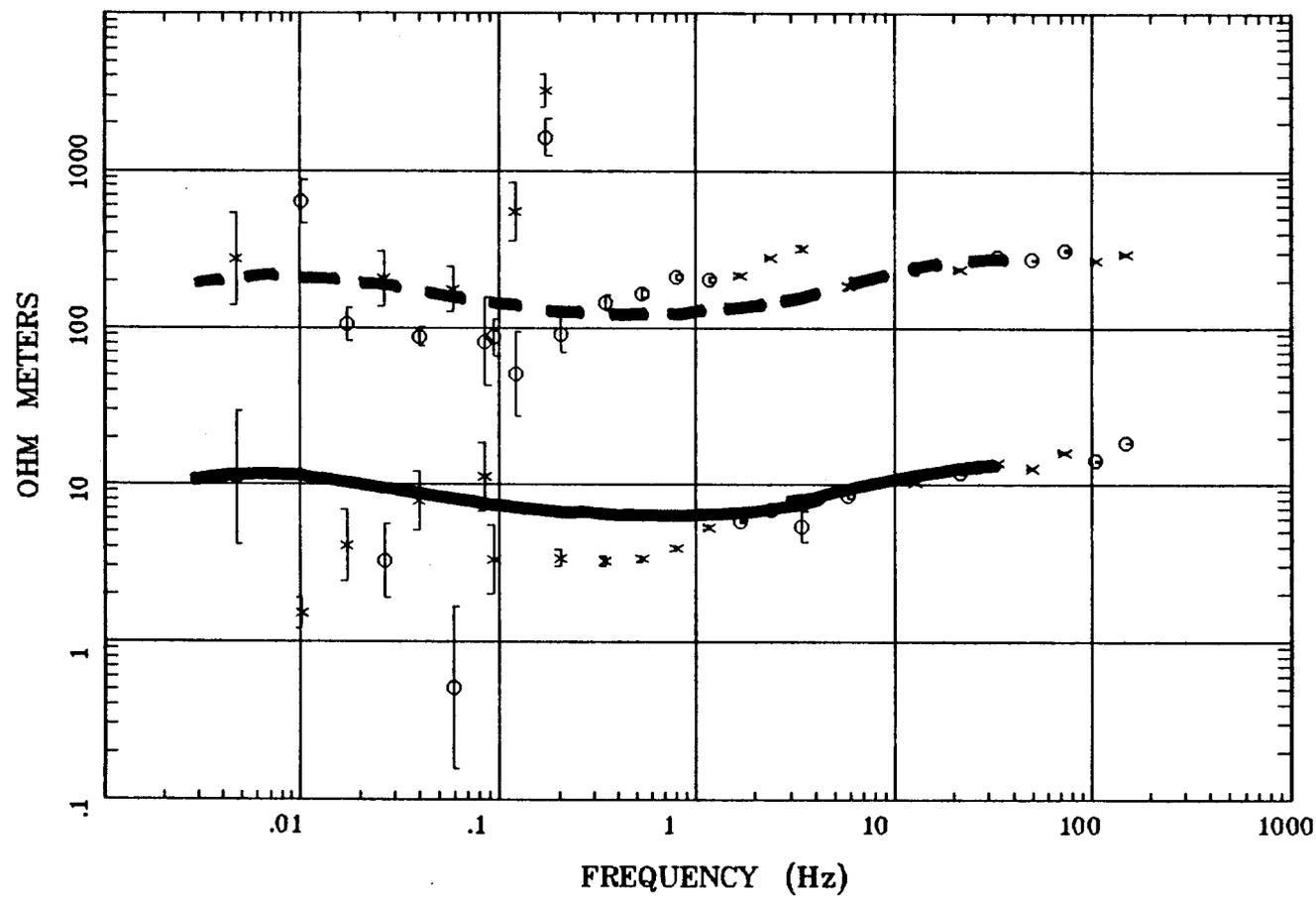


Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR03
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:35 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

77

APPARENT RESISTIVITY



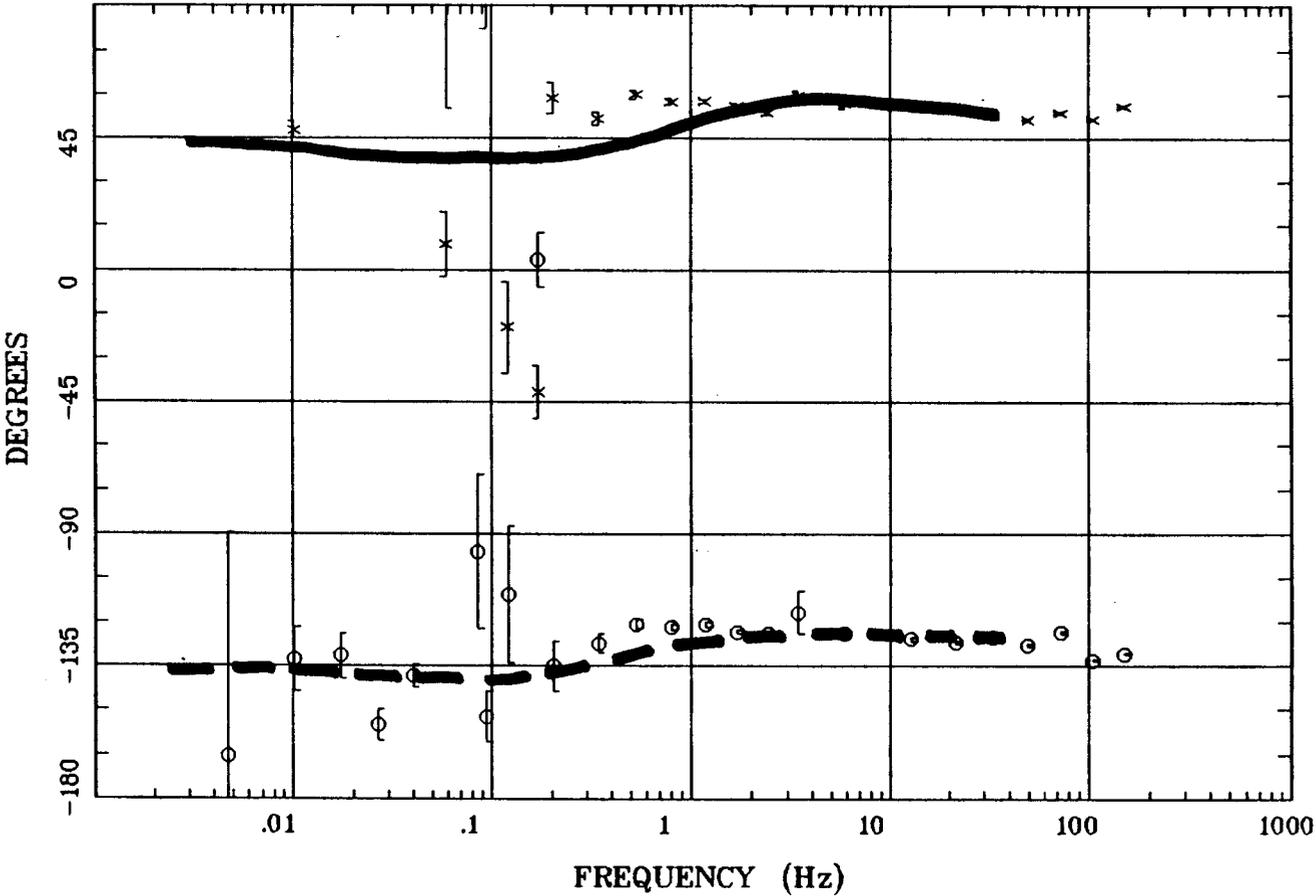
78

Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR04
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:37 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >

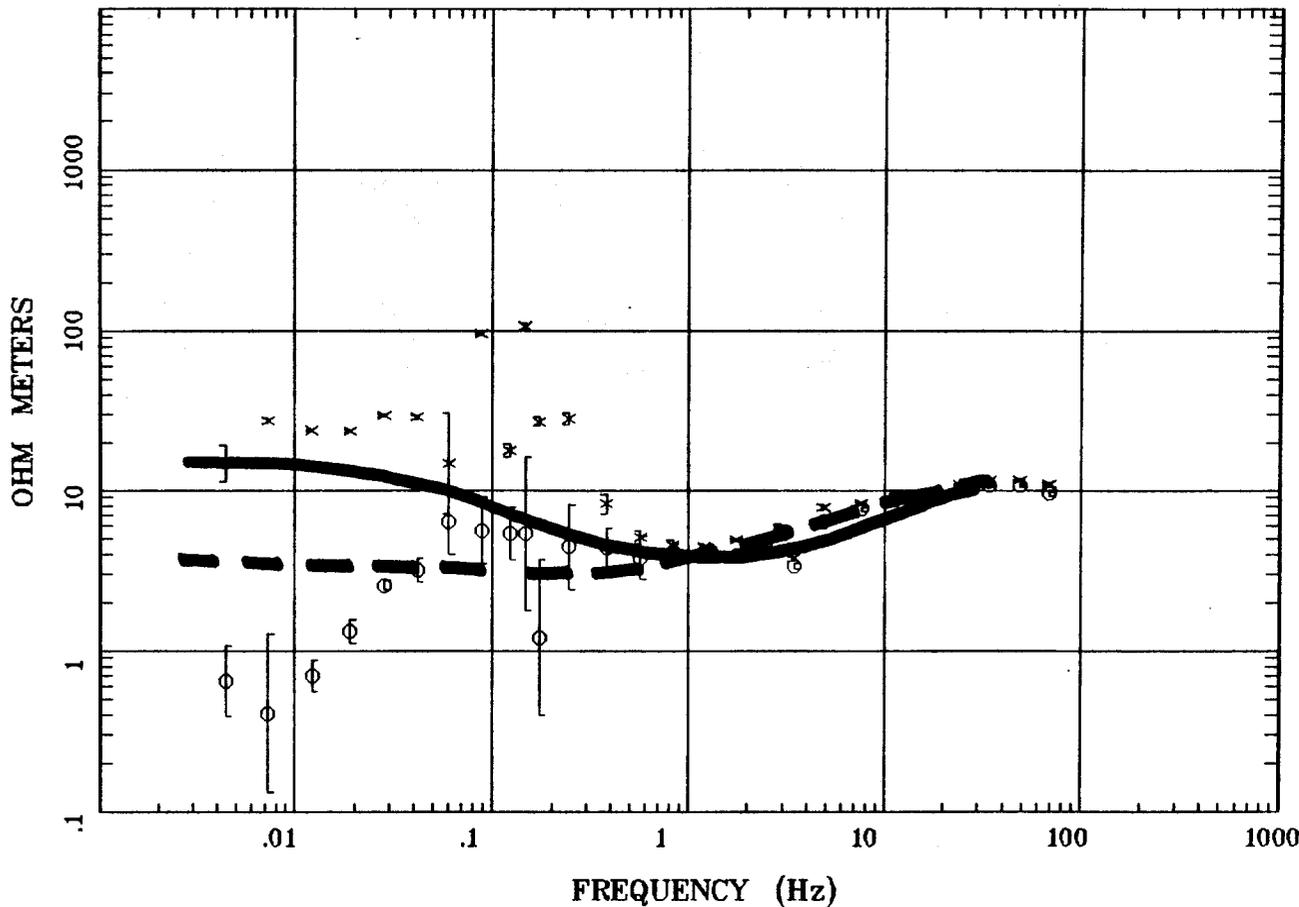
Station 4A

IMPEDANCE PHASE



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR04
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 15:37 Dec 11, 2000
< EMI - ElectroMagnetic Instruments >



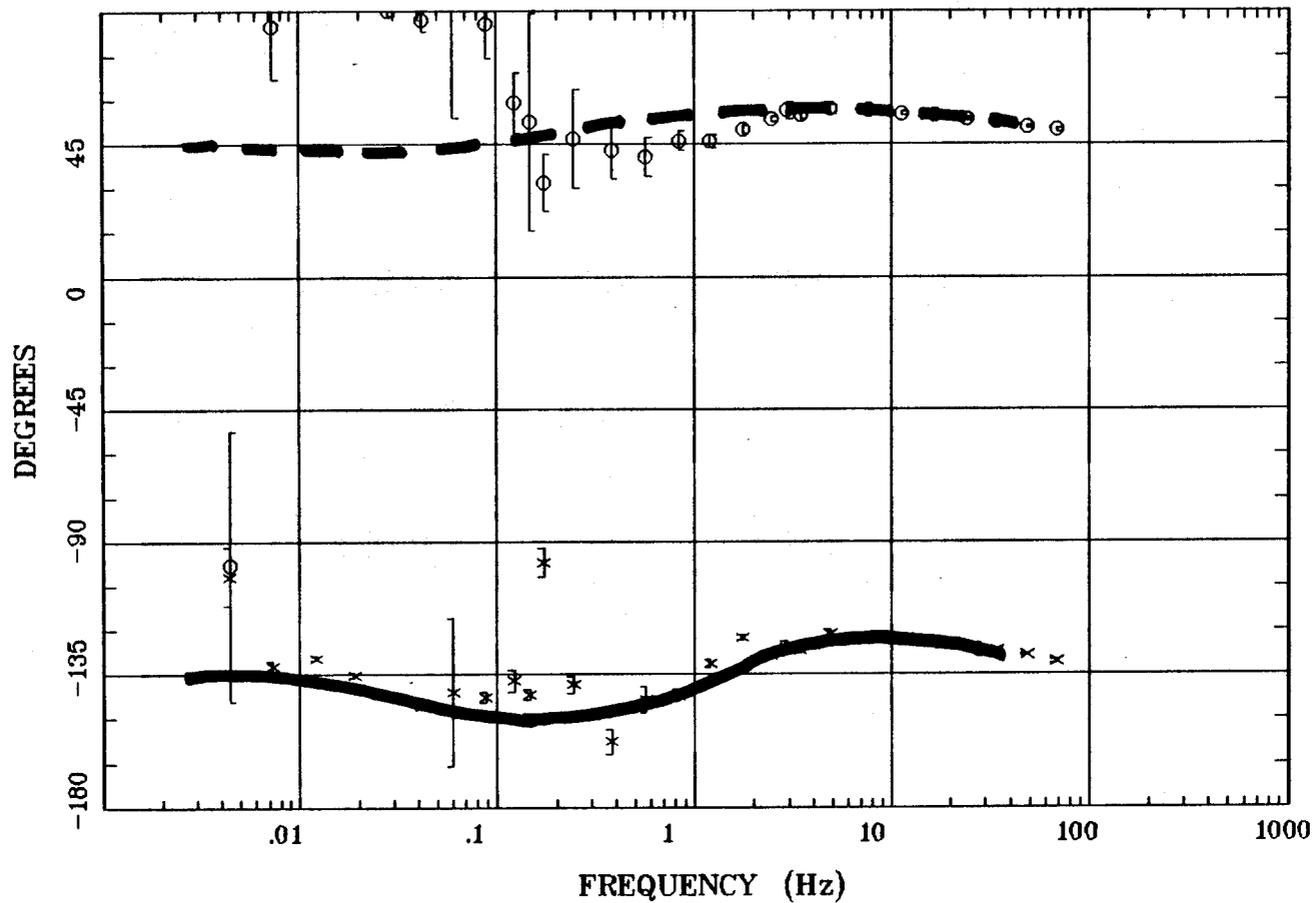
Client:
 Remote: Local B
 Acquired: 10:4 Jul 26, 1998
 Survey Co:USGS GD-MRP Denver

Rotation:
 Filename: hr14.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
 Plotted: 14:42 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

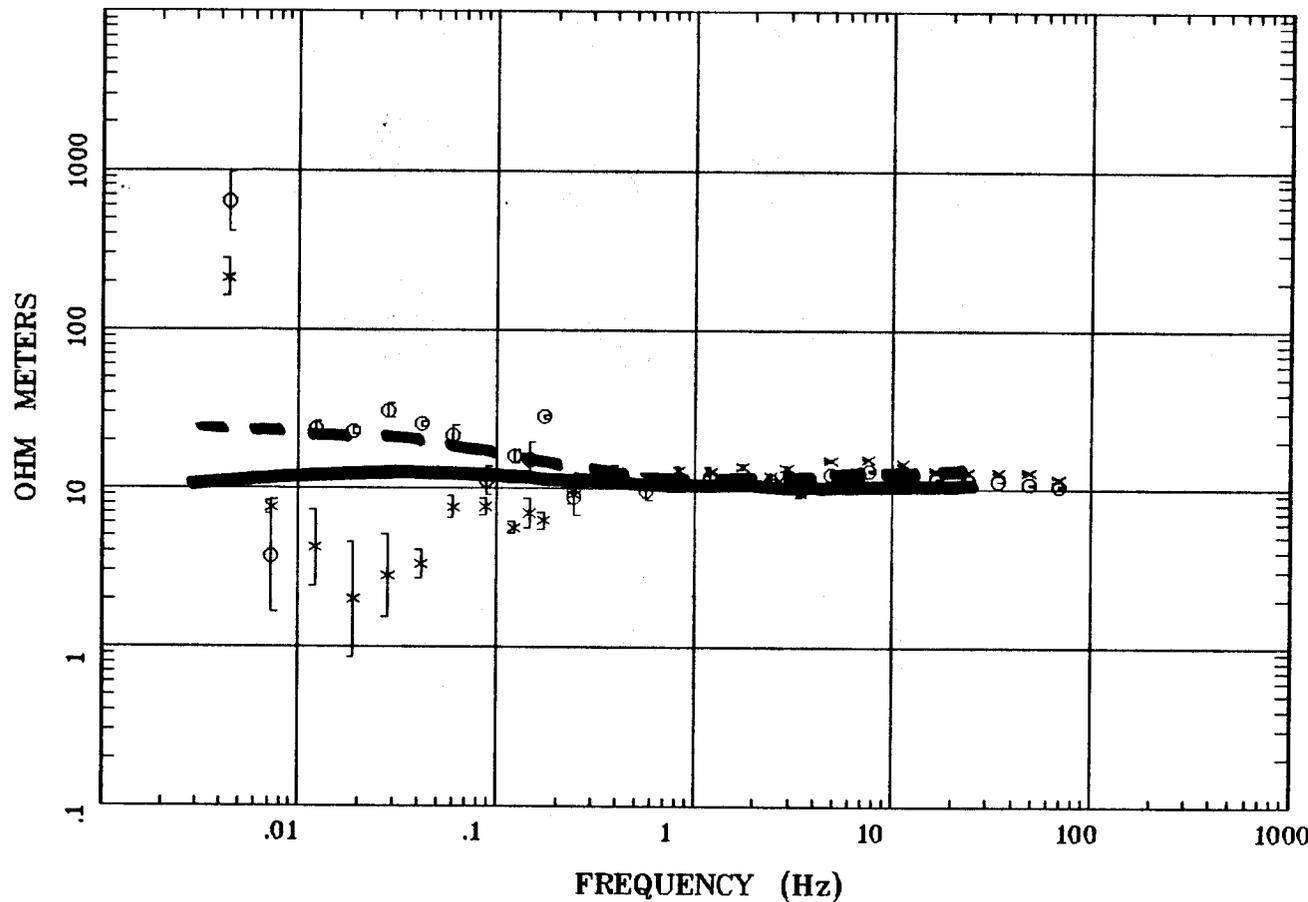
Carlin Trend

Station 14



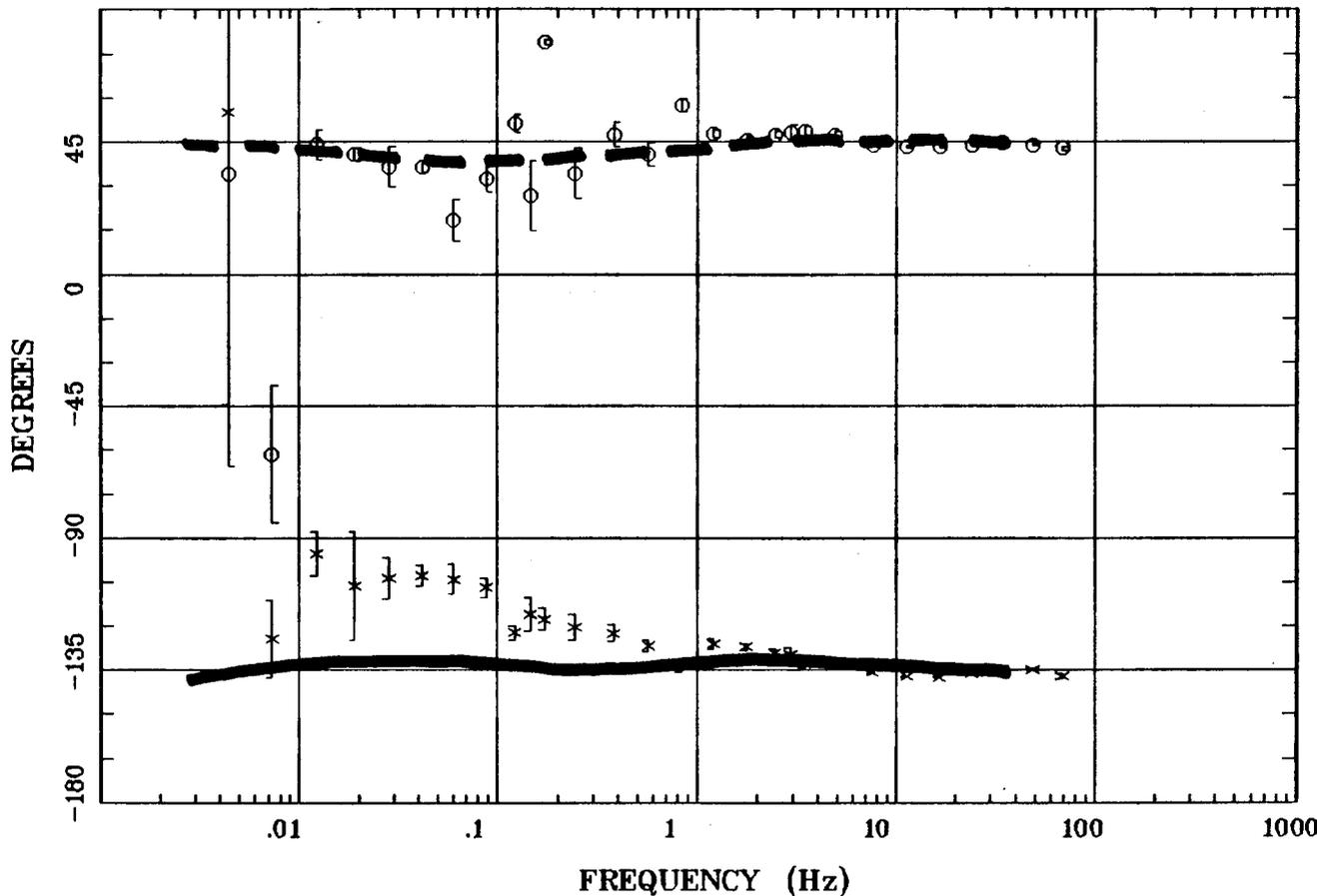
Client:
 Remote: Local B
 Acquired: 10:4 Jul 26, 1998
 Survey Co:USGS GD-MRP Denver

Rotation:
 Filename: hr14.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch9
 Plotted: 14:42 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >



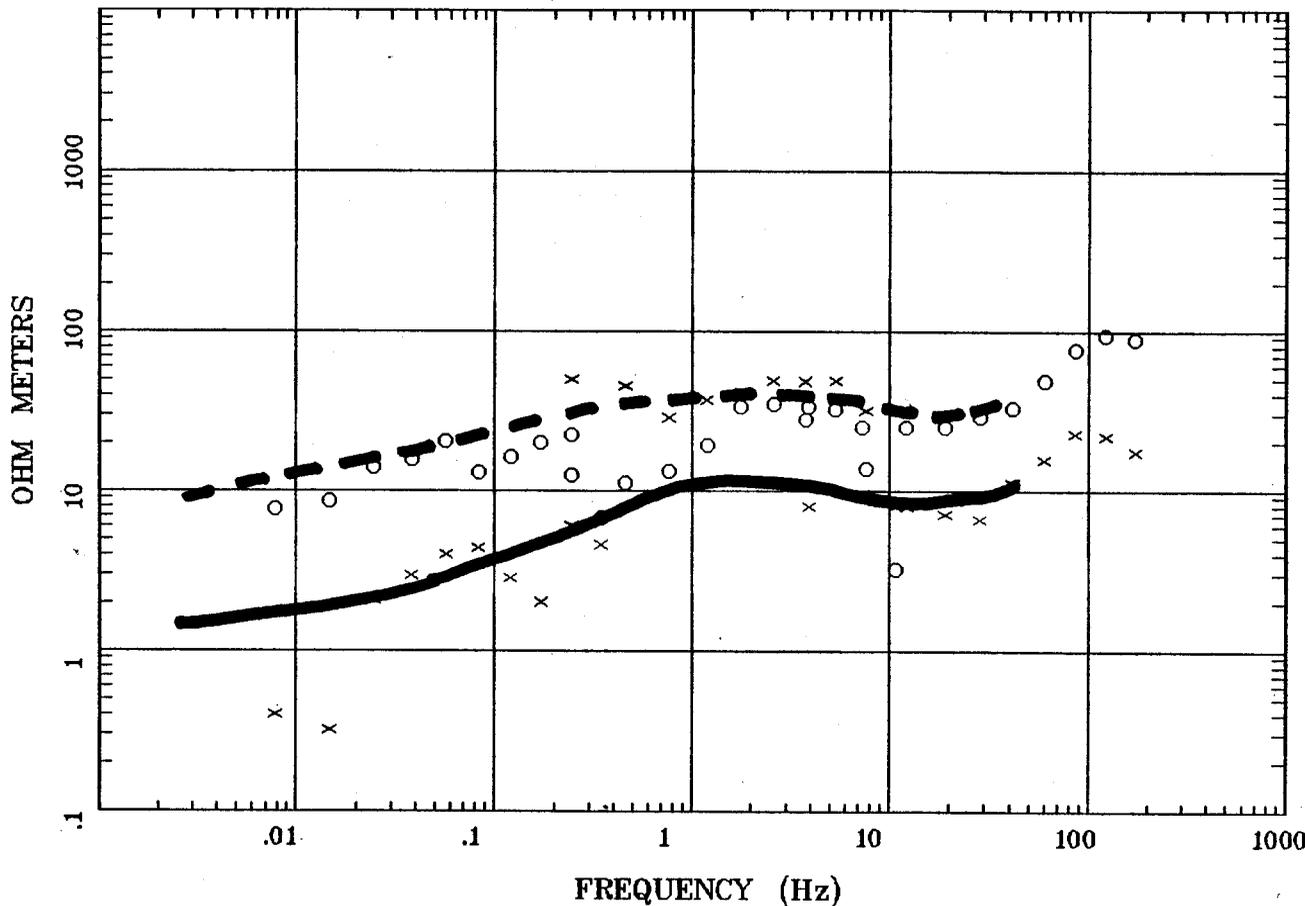
Client:
 Remote: Local B
 Acquired: 16:2 Jul 26, 1998
 Survey Co:USGS GD-MRP Denver

Rotation:
 Filename: hr13.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
 Plotted: 14:54 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >



Client:
 Remote: Local B
 Acquired: 16:2 Jul 26, 1998
 Survey Co:USGS GD-MRP Denver

Rotation:
 Filename: hr13.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
 Plotted: 14:54 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >



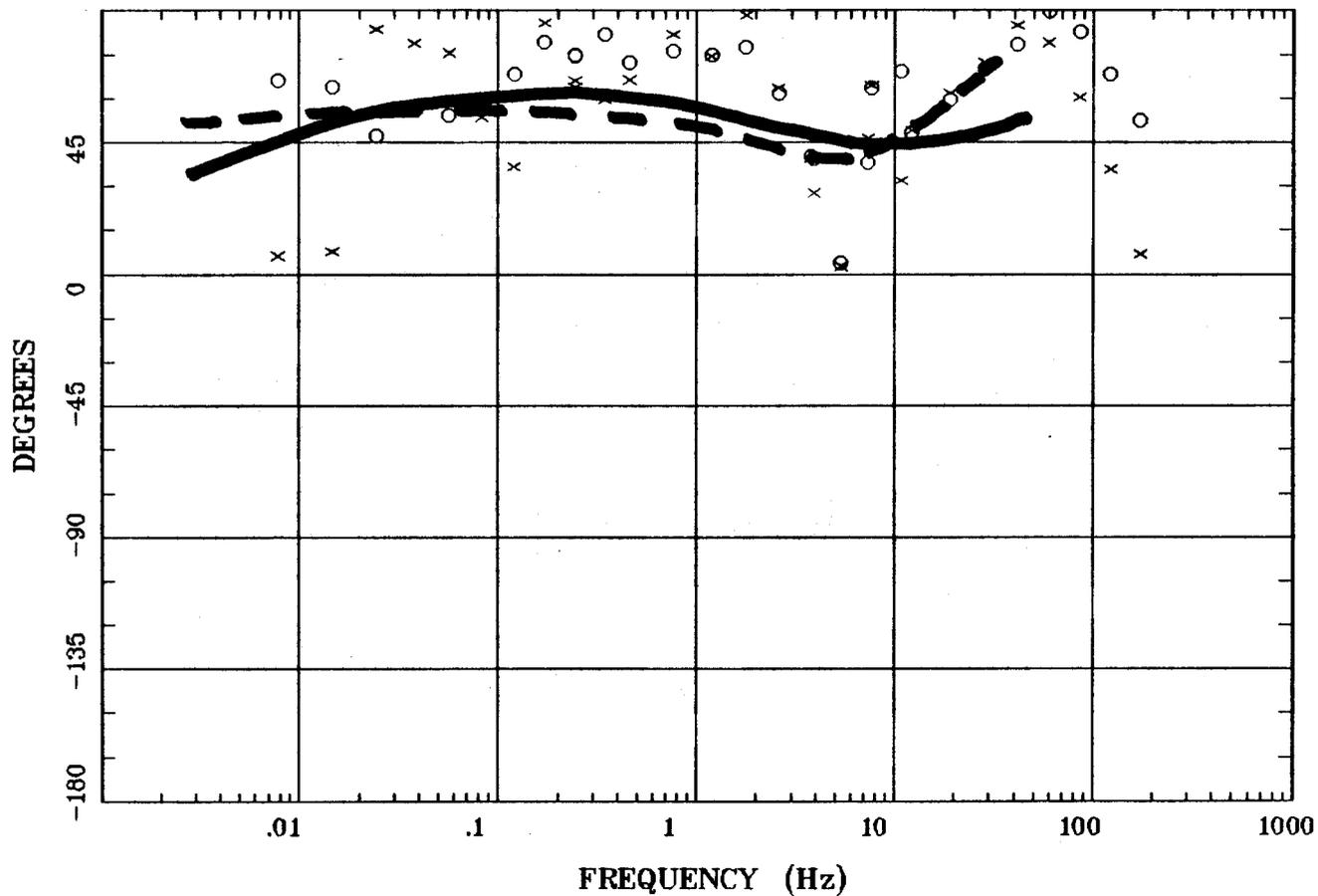
84

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: ct12a
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 14:12 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >

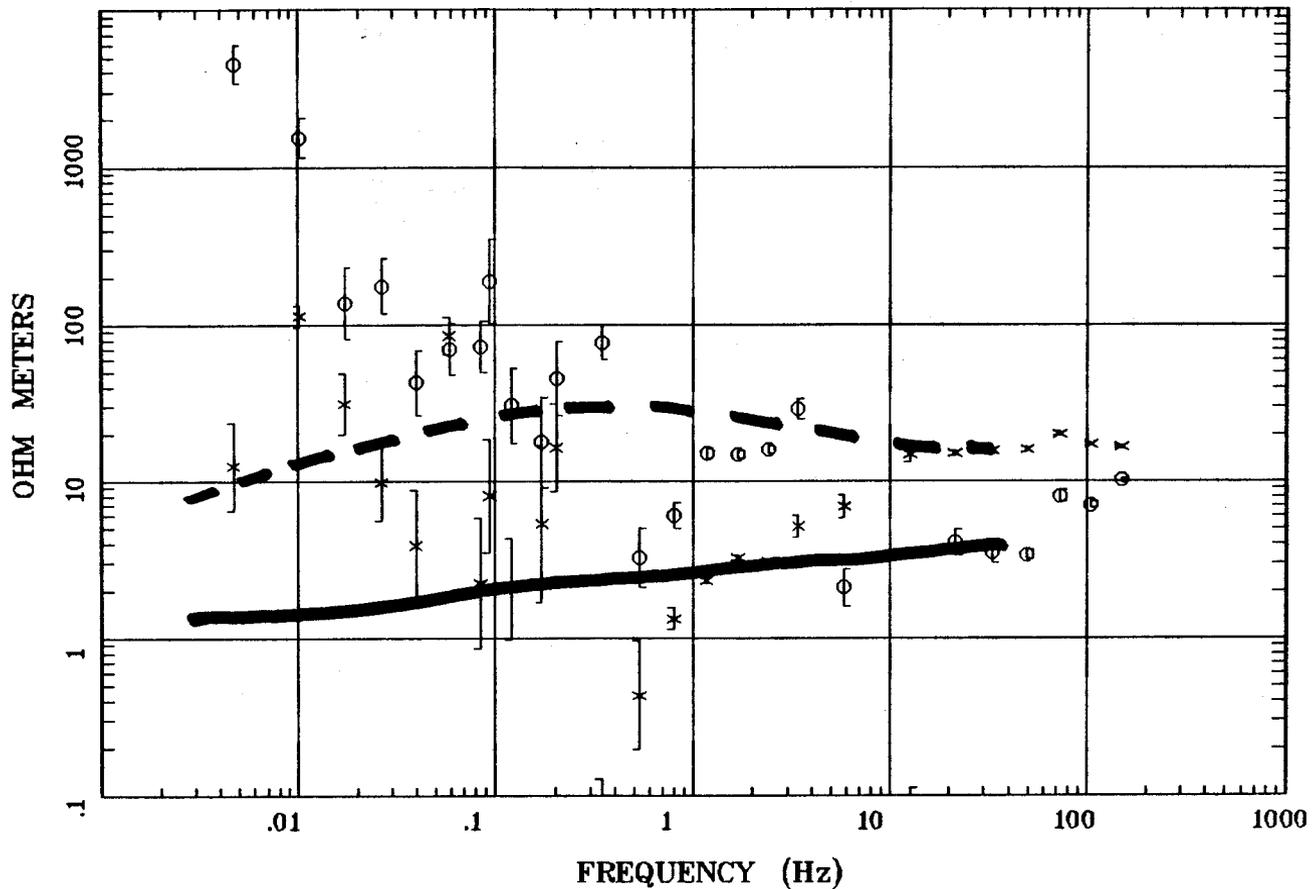
IMPEDANCE PHASE

Station 12



Client:
Remote:
Acquired: :
Survey Co:

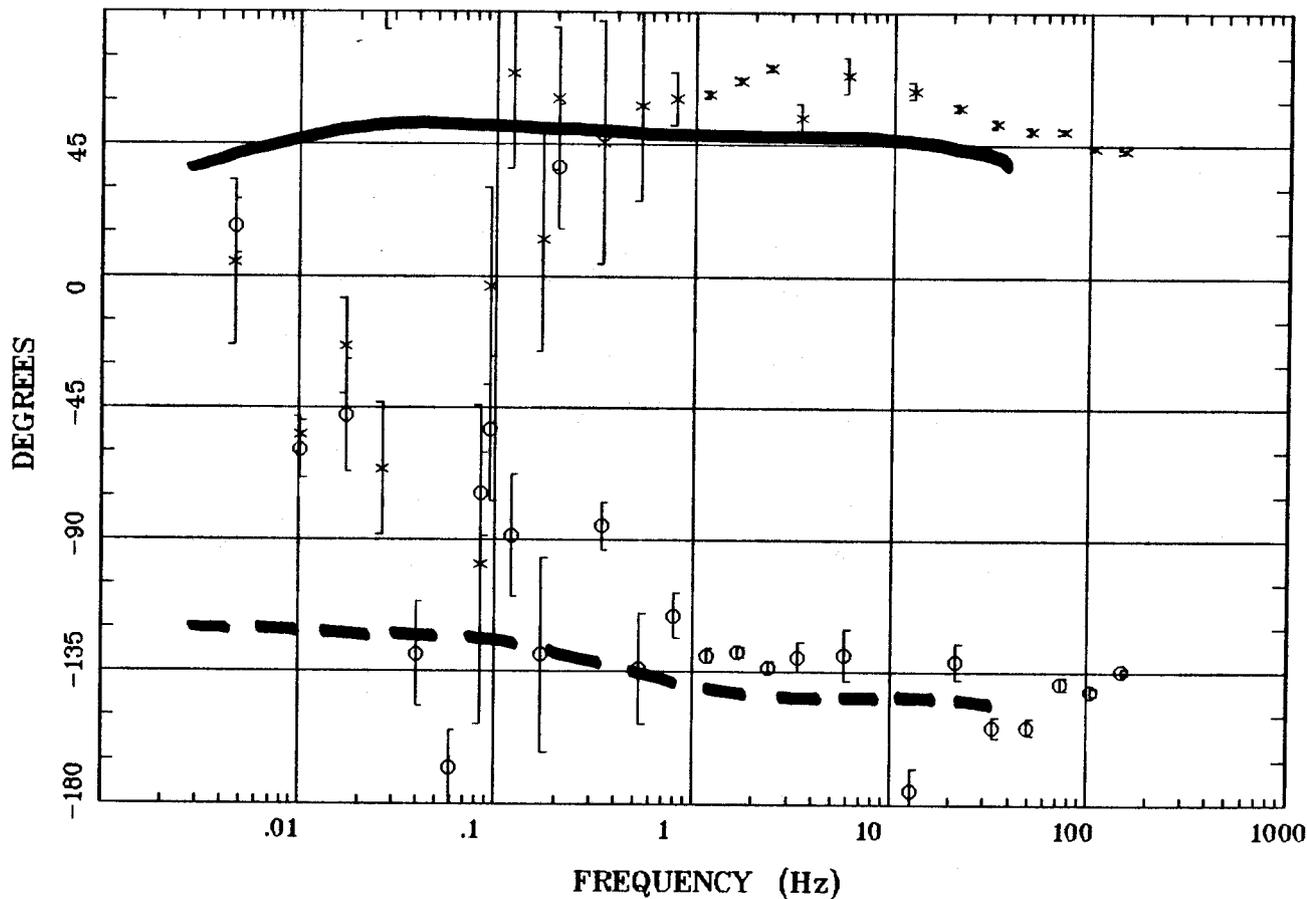
Rotation:
Filename: ct12a
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 14:12 Sep 16, 1998
< EMI - ElectroMagnetic Instruments >



98

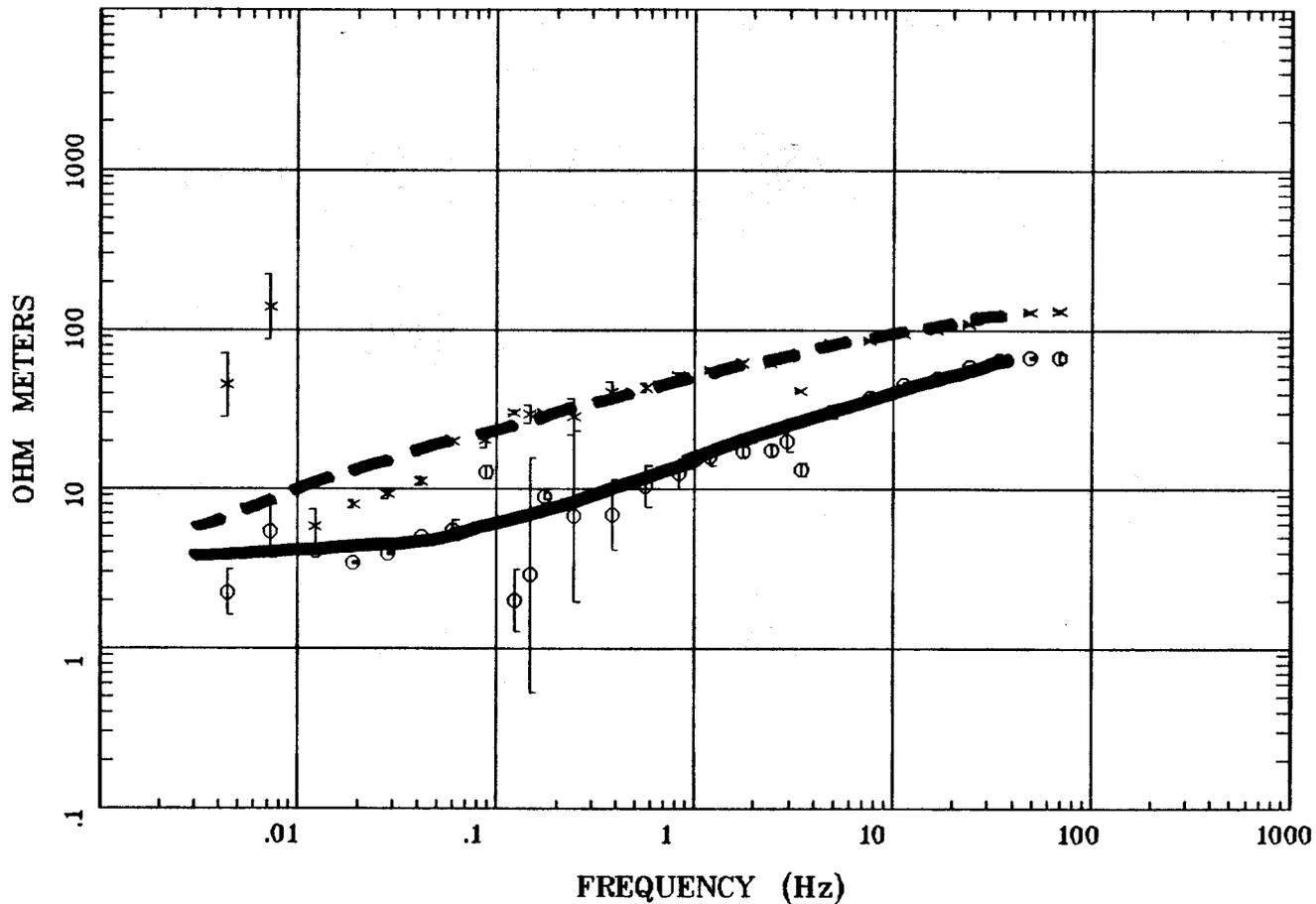
Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT19B
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:10 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT19B
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:10 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



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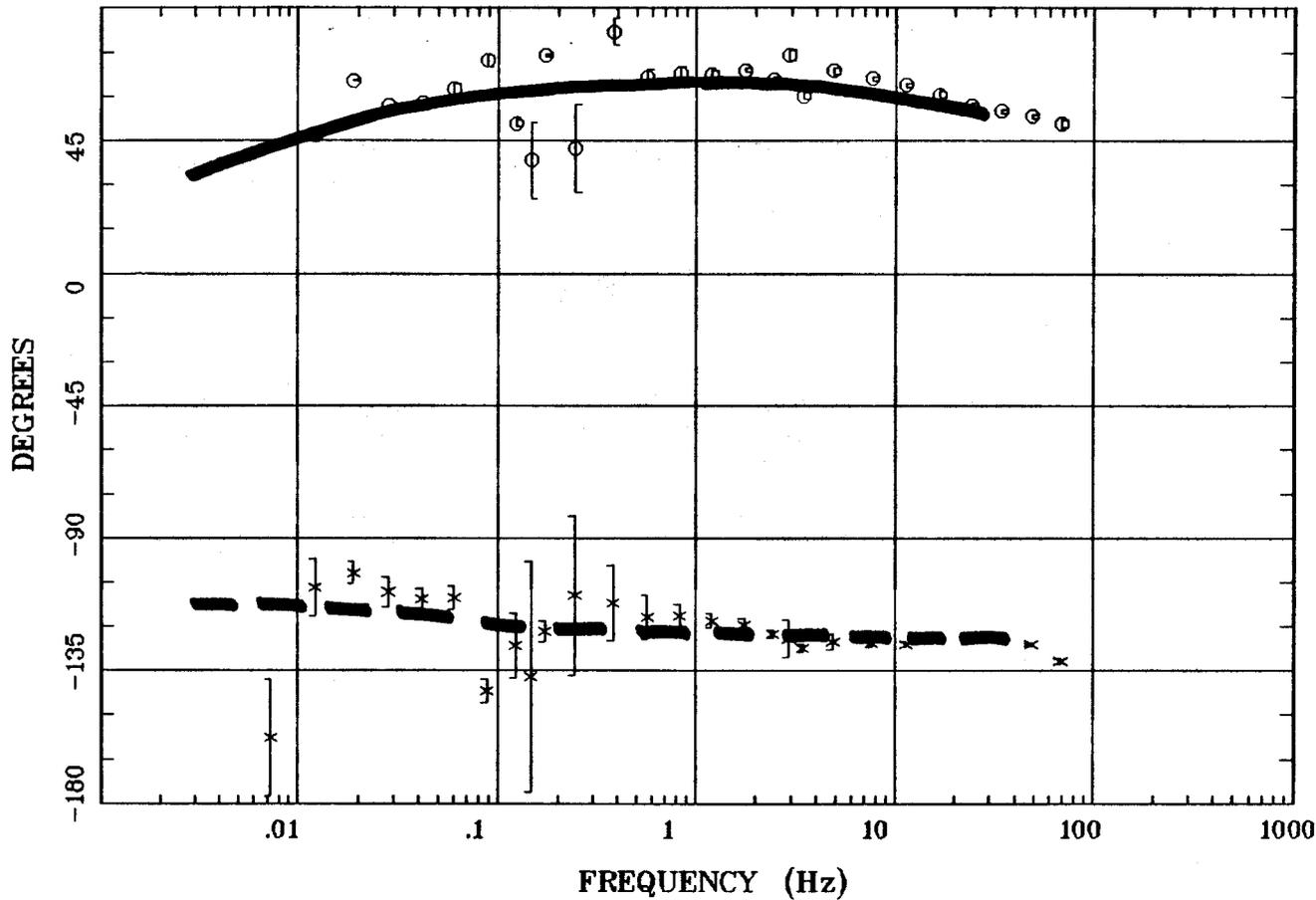
Client:
 Remote: Local B
 Acquired: 14:5 Jul 25, 1998
 Survey Co:USGS GD-MRP Denver

Rotation:
 Filename: hr111.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
 Plotted: 15:09 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Carlin Trend

Station 11

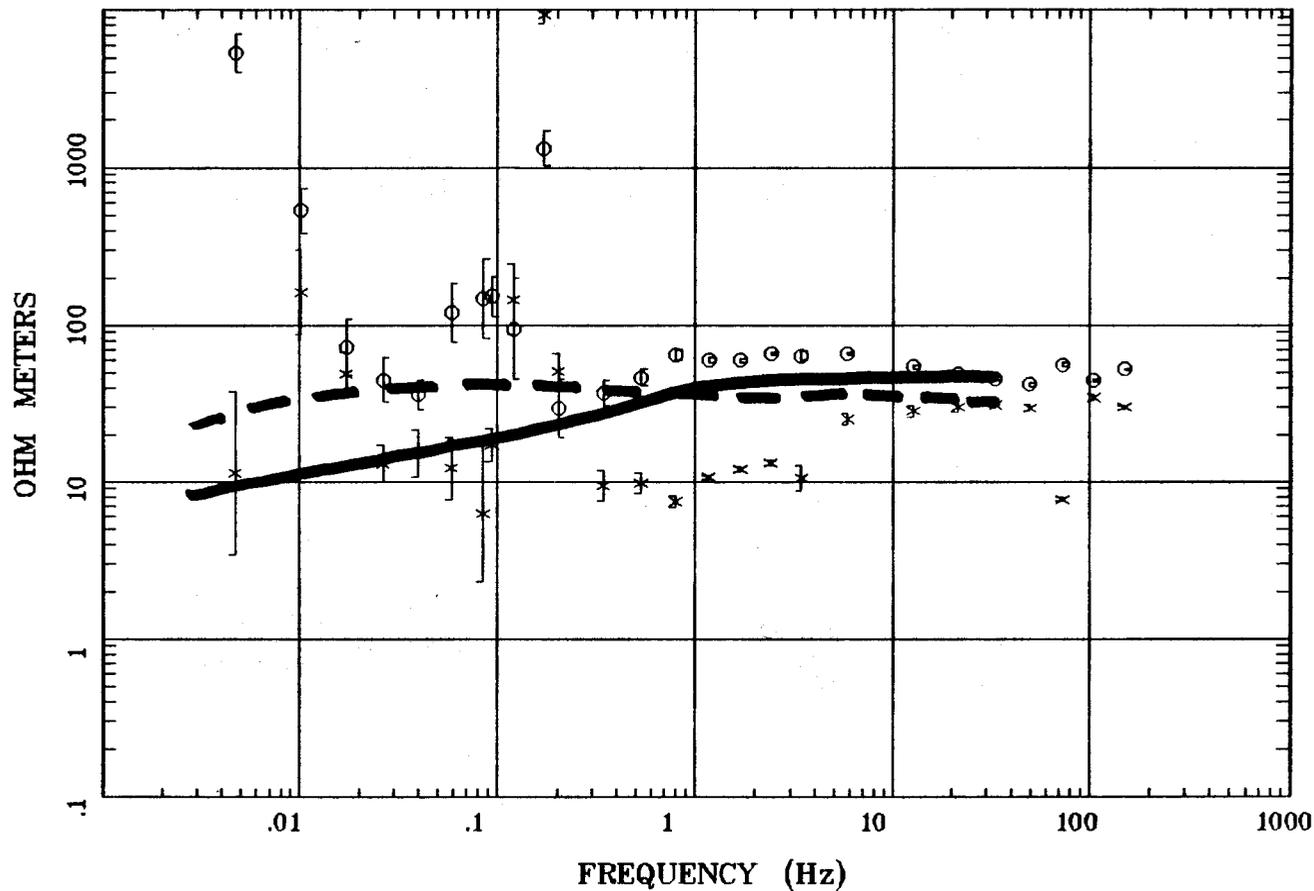


Client:
Remote: Local B
Acquired: 14:5 Jul 25, 1998
Survey Co:USGS GD-MRP Denver

Rotation:
Filename: hr11l.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
Plotted: 15:09 Sep 16, 1998
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

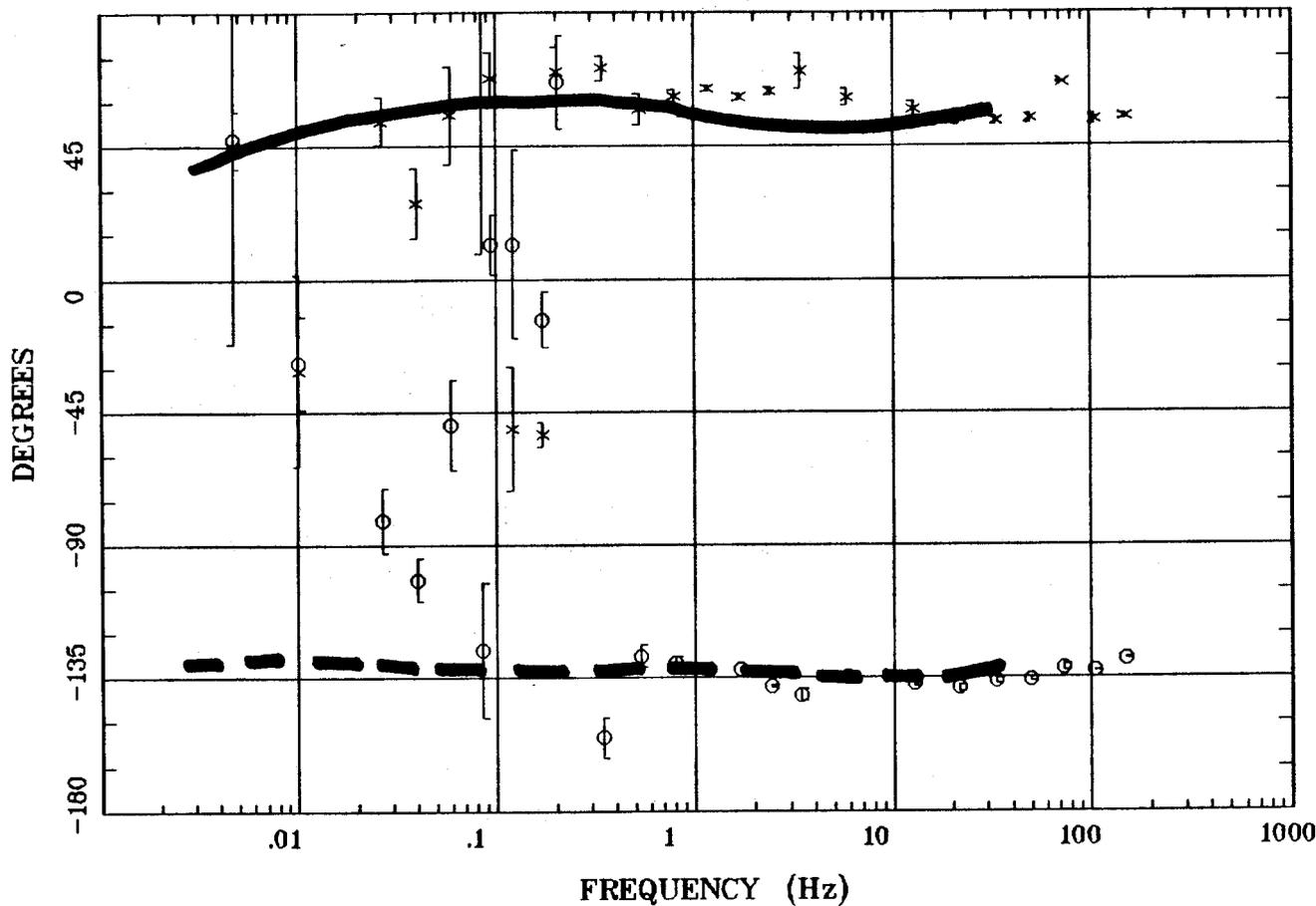
Station 10



Client:
Remote:
Acquired: : ,
Survey Co:

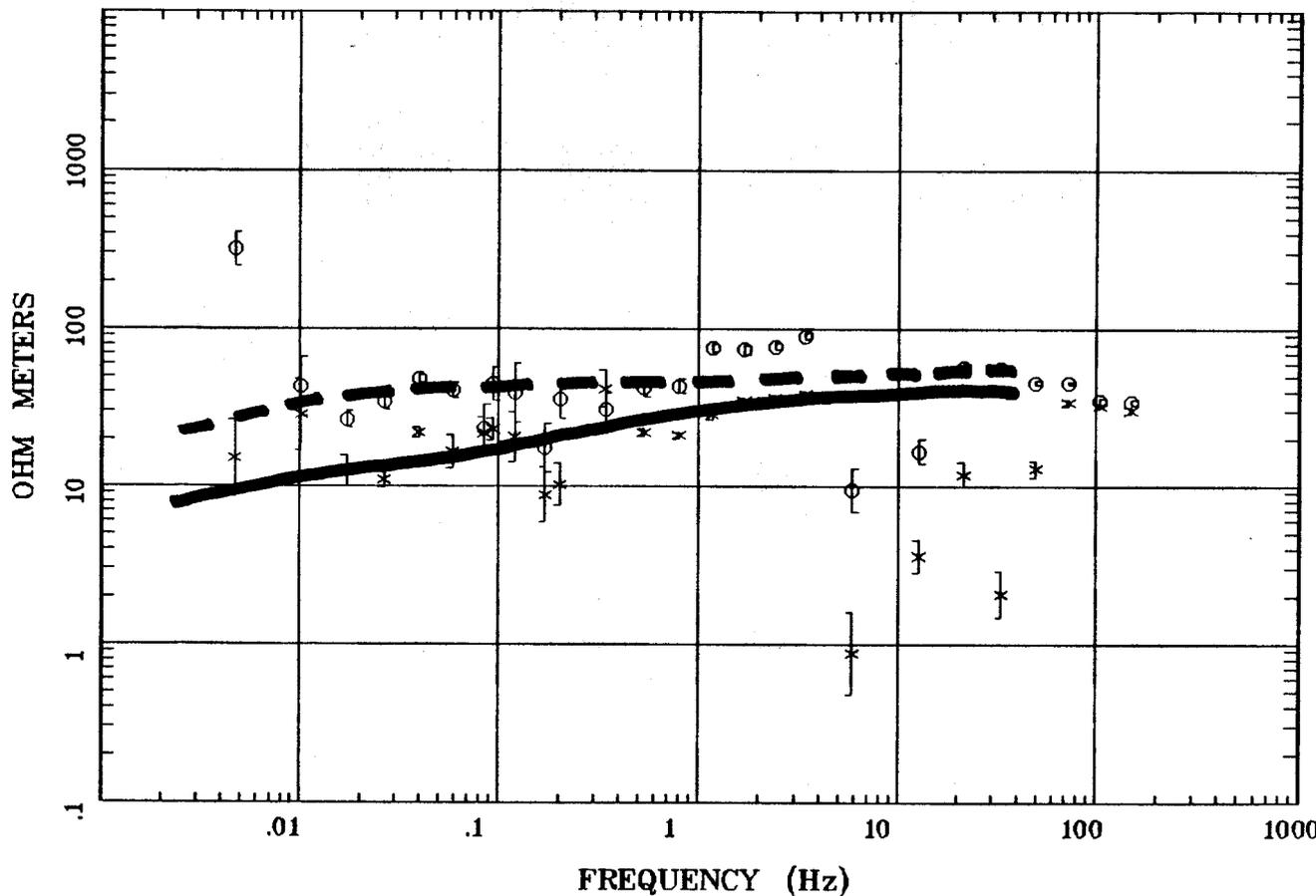
Rotation:
Filename: CT10
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:12 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT10
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:12 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

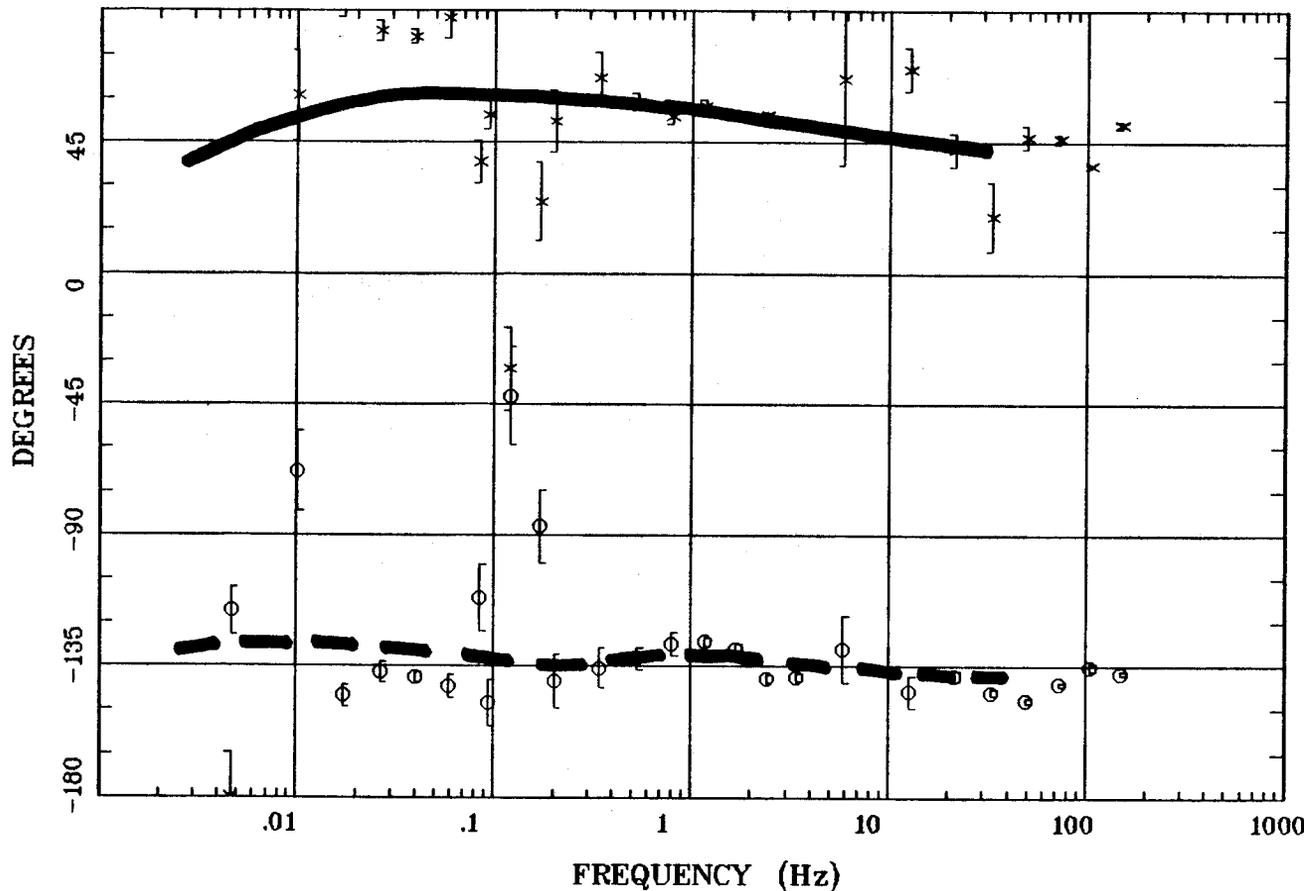


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT09A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:25 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Station 9

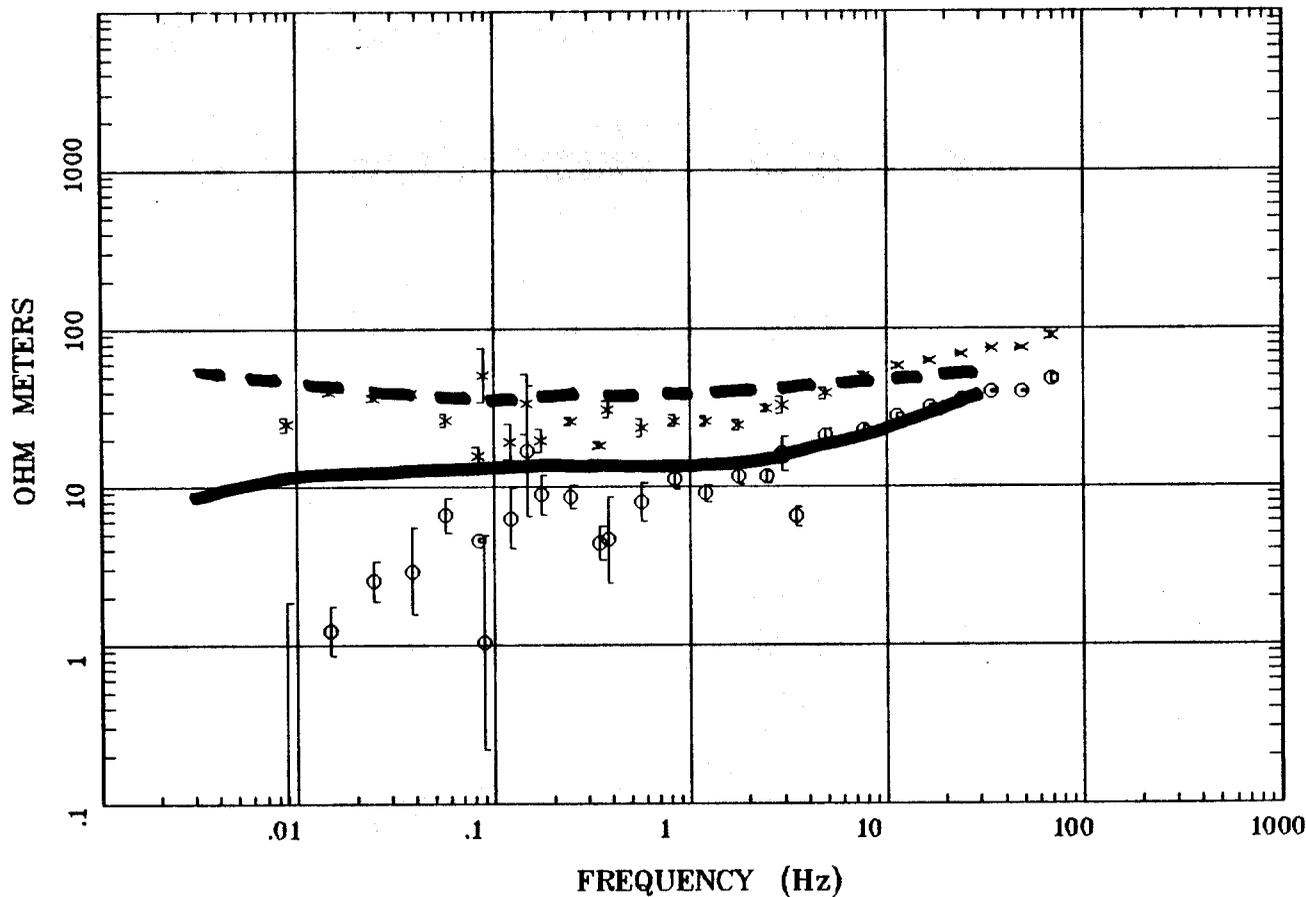


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT09A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:25 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Carlin, Nevada

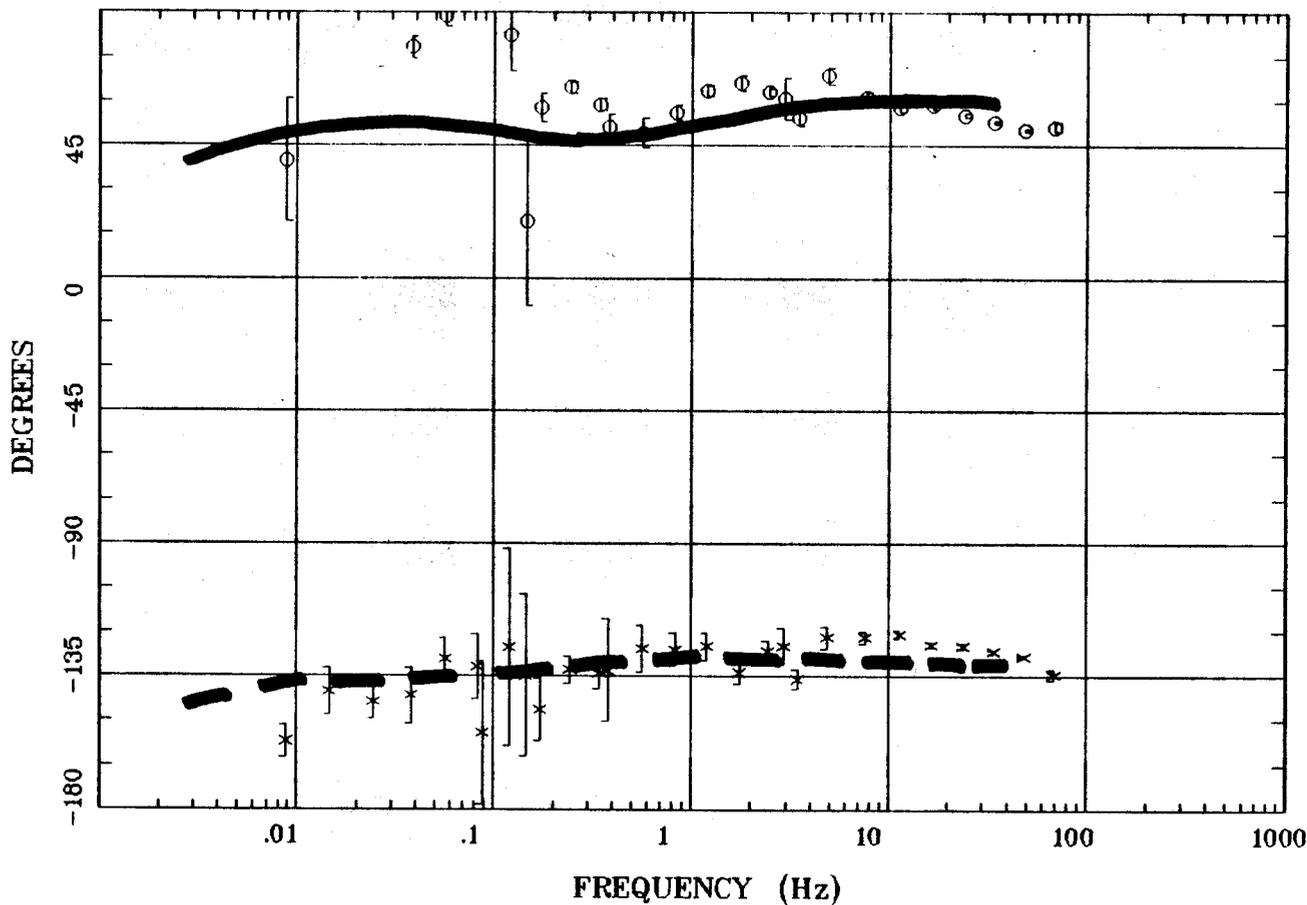


Client:
 Remote: local
 Acquired: 13:4 Jul 26, 1999
 Survey Co:USGS

Rotation:
 Filename: ct01.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
 Plotted: 15:42 Jan 24, 2001
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

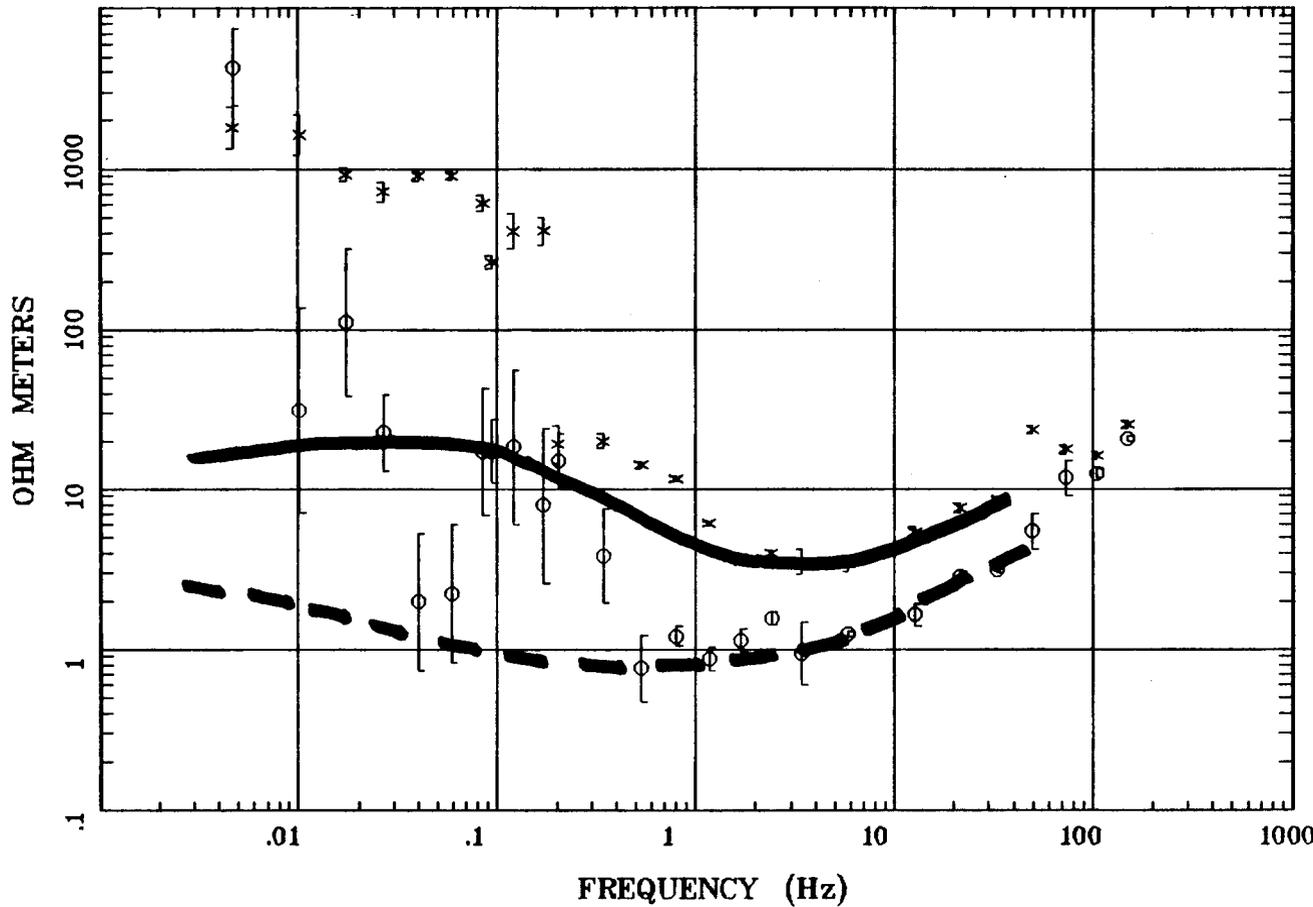
Carlin, Nevada



Client:
 Remote: local
 Acquired: 13:4 Jul 26, 1999
 Survey Co:USGS

Rotation:
 Filename: ct01.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch8 Ch9
 Plotted: 15:42 Jan 24, 2001
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

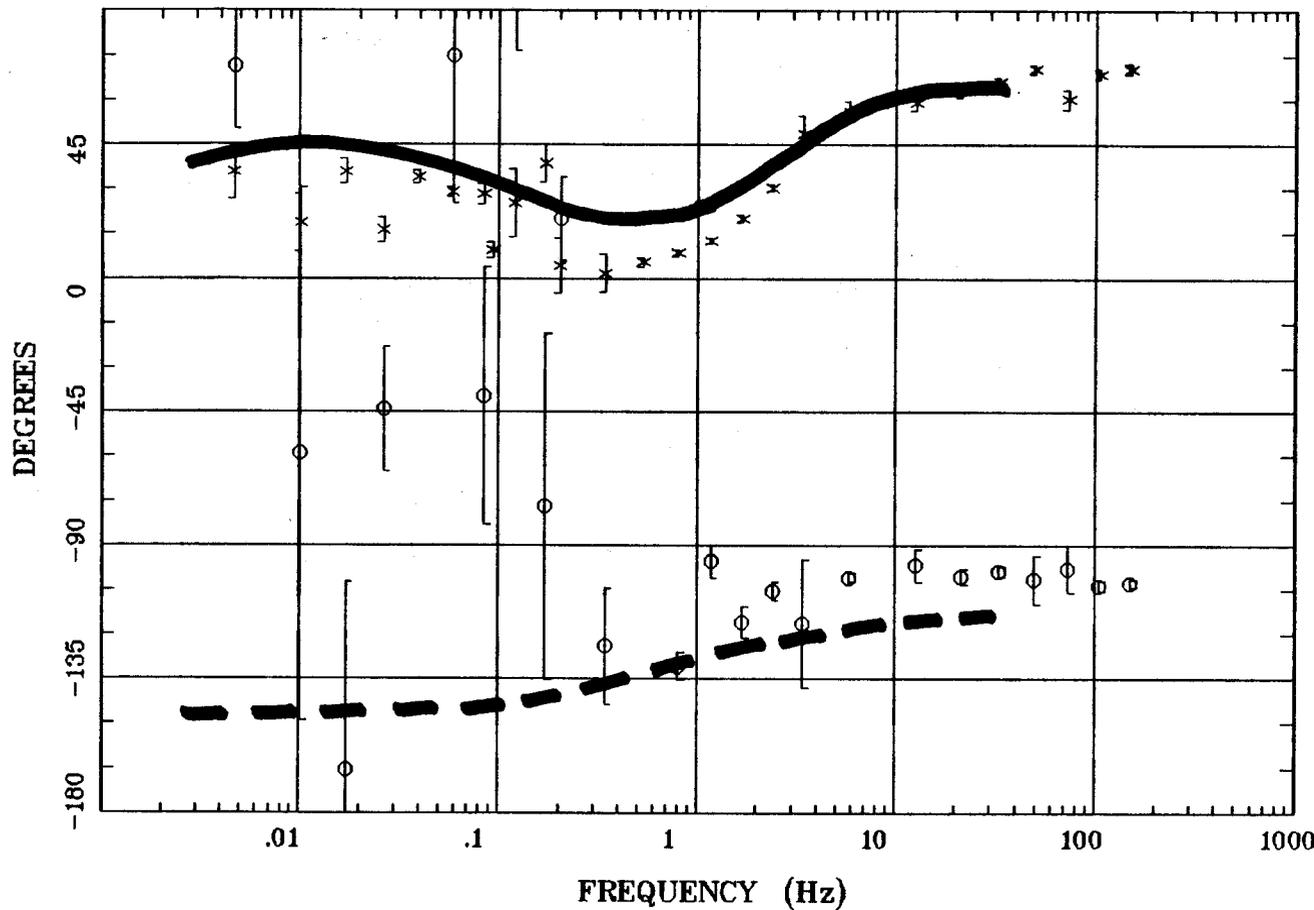


96

Client:
Remote:
Acquired: :
Survey Co:

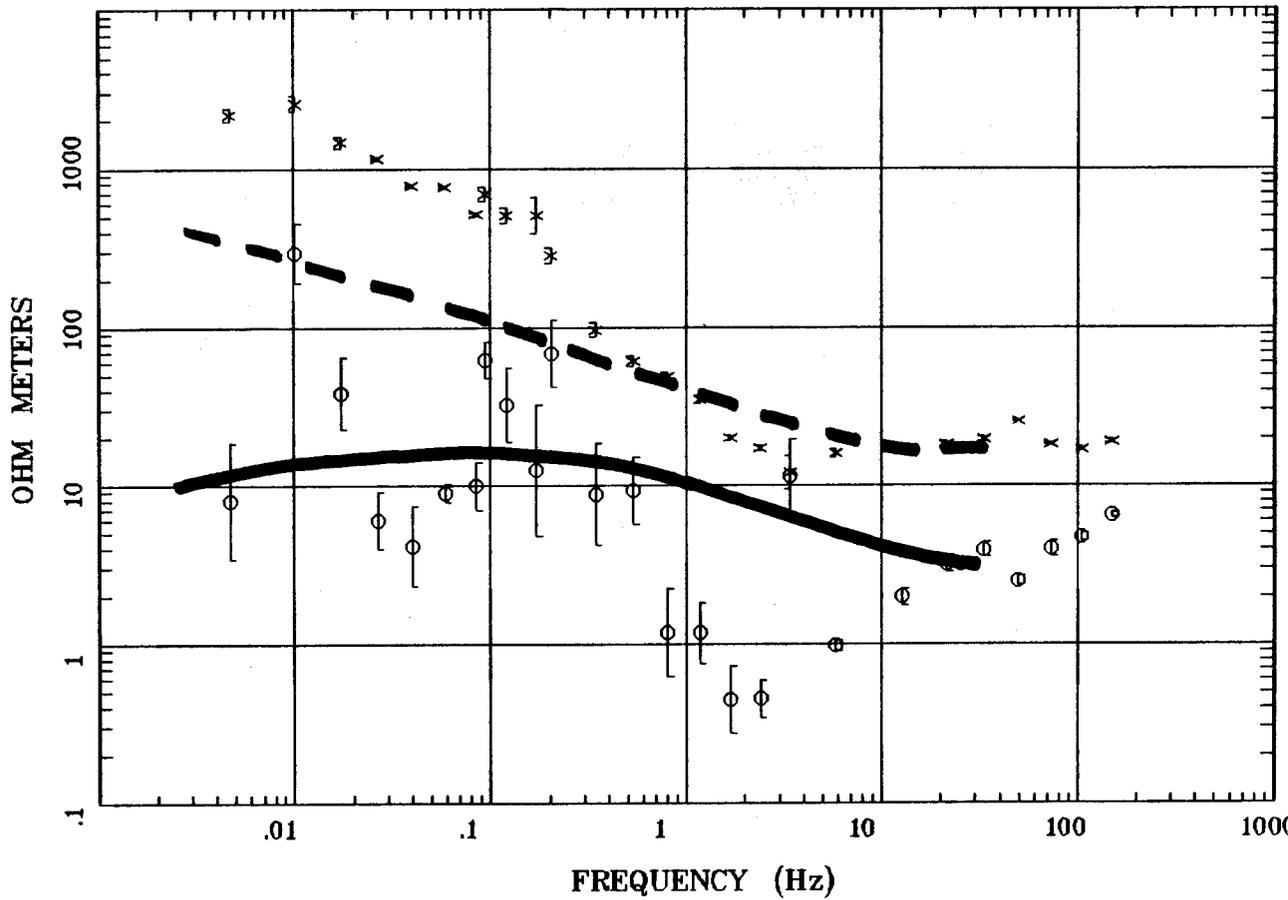
Rotation:
Filename: CT02A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:43 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT02A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:43 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



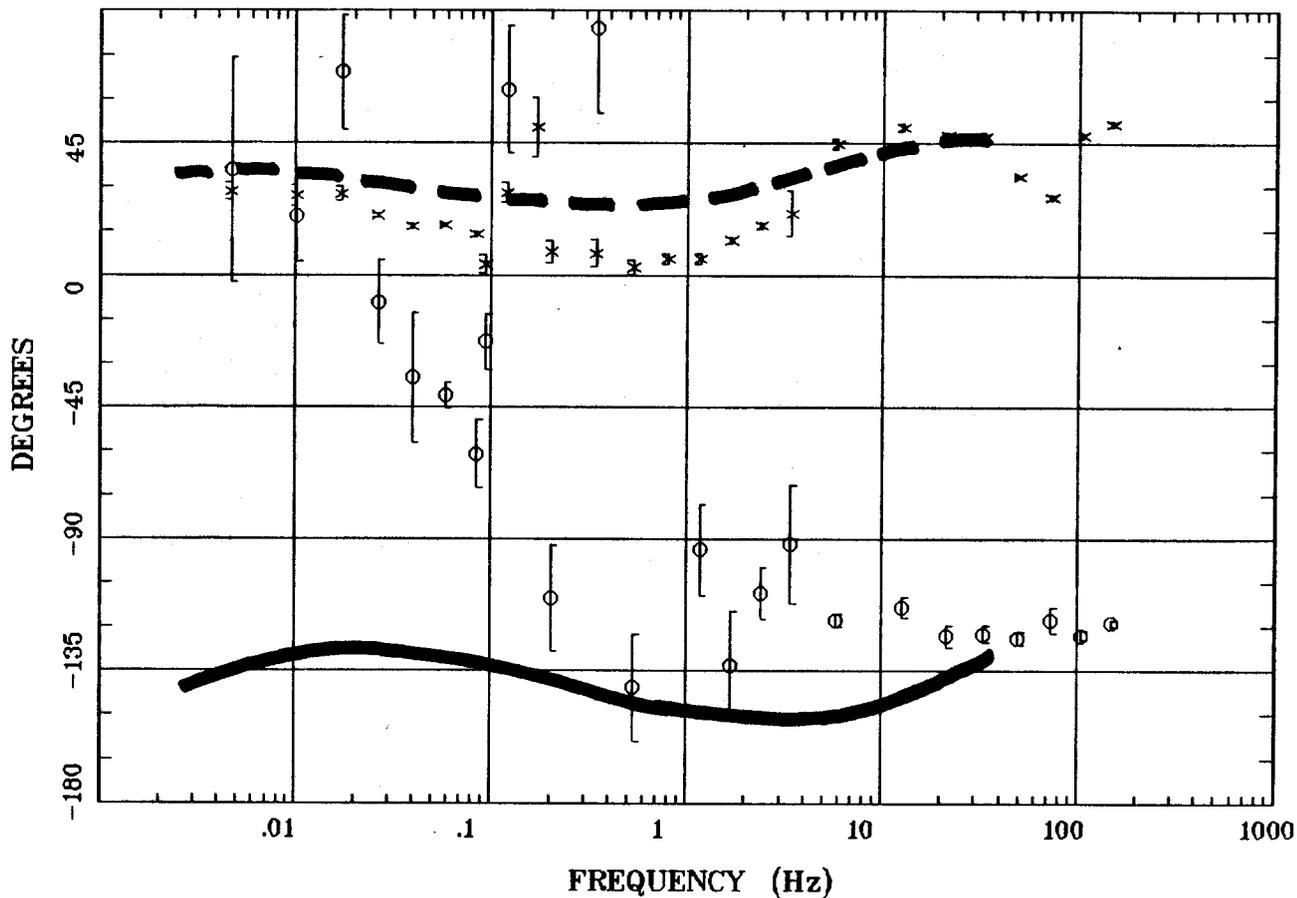
86

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT03C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:45 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Station 3

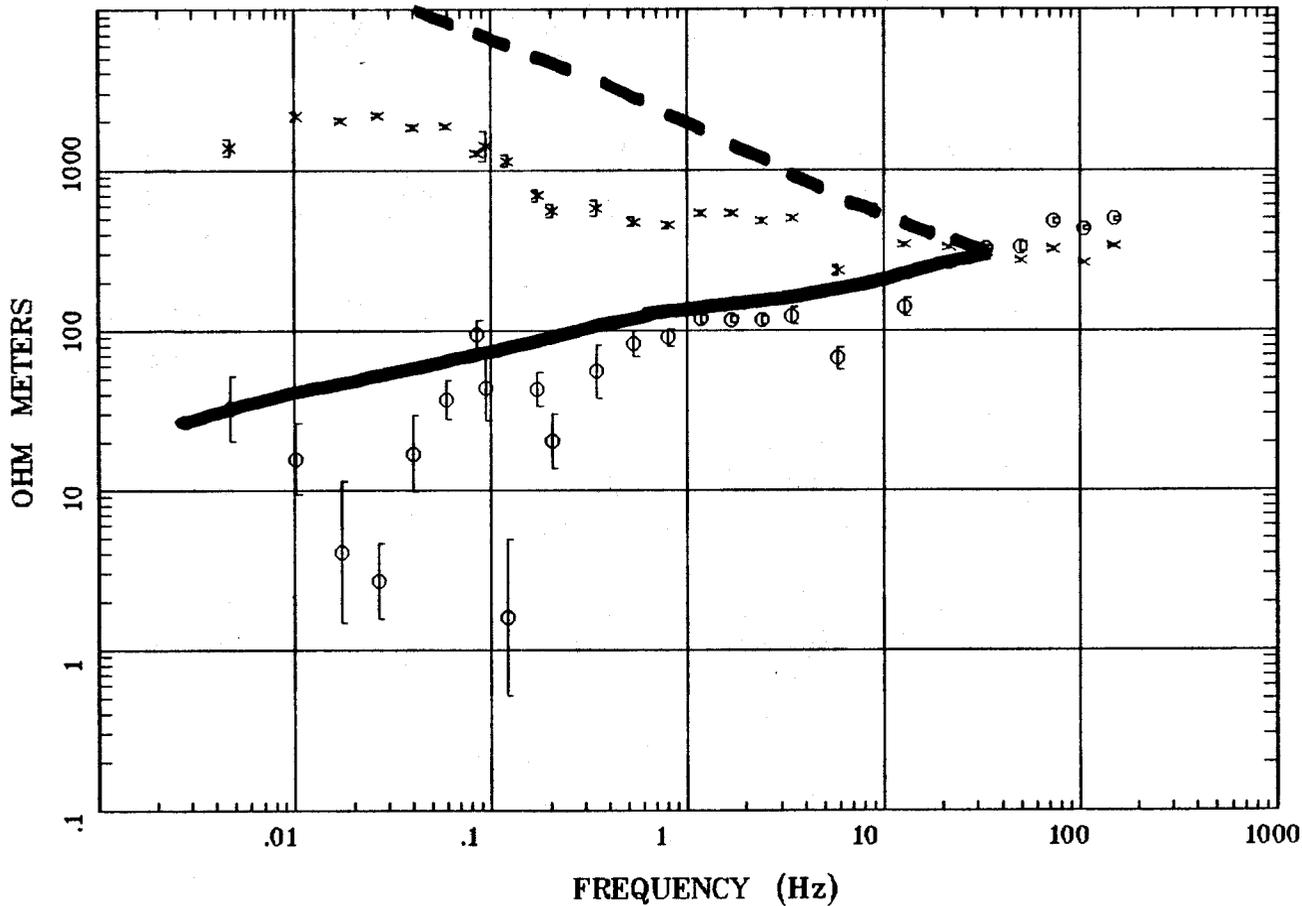


Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT03C
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:45 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

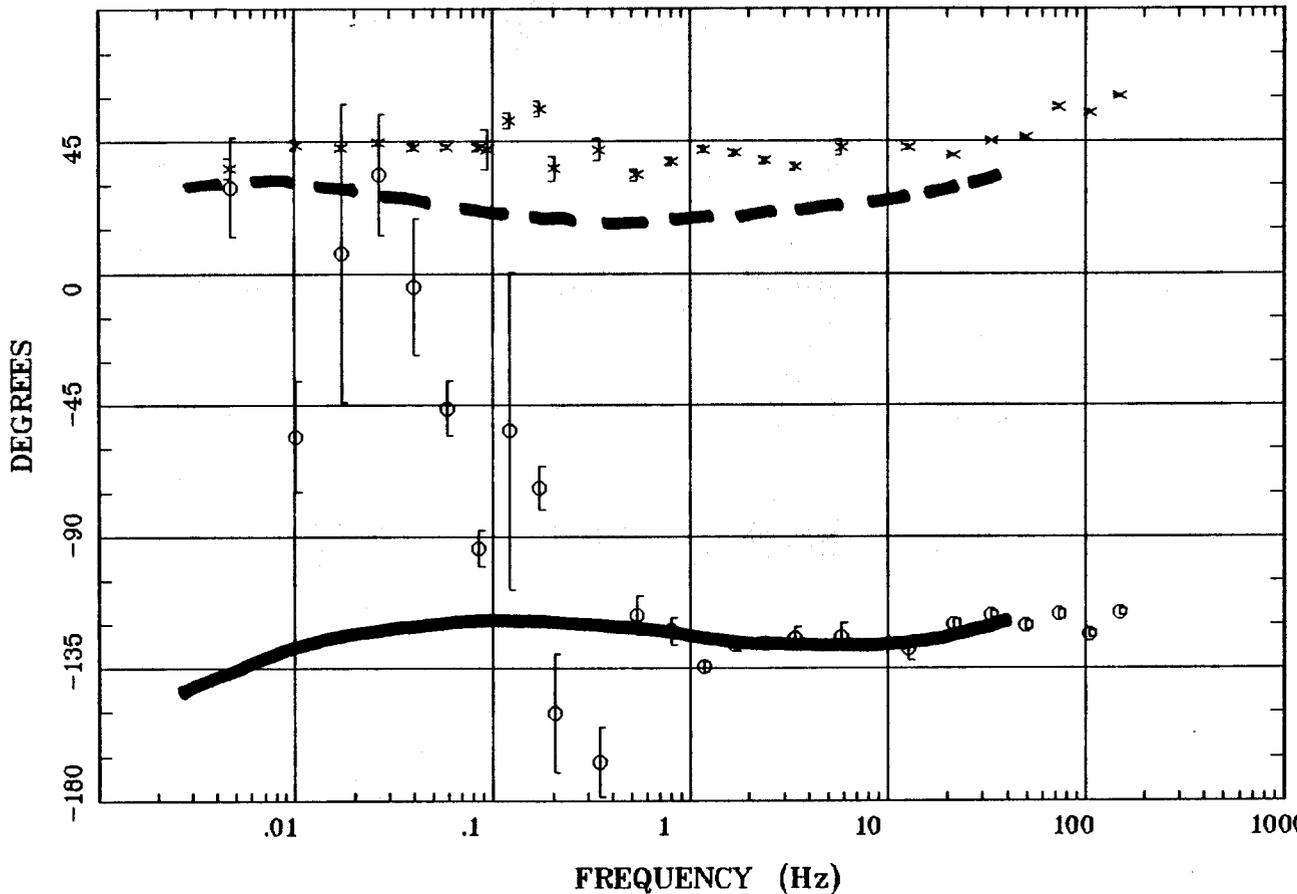
APPARENT RESISTIVITY

Station 4



Client:
Remote:
Acquired: : ,
Survey Co:

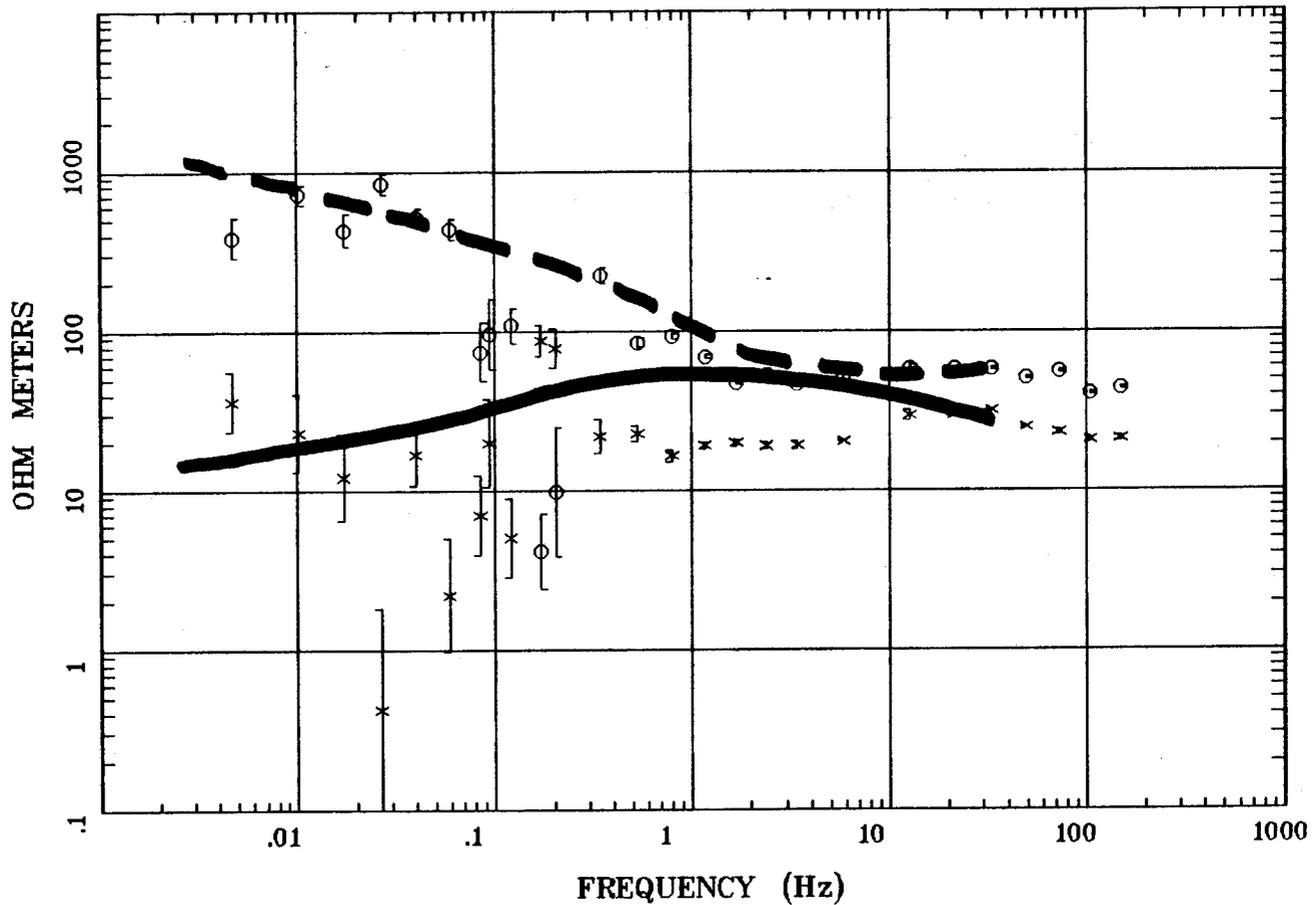
Rotation:
Filename: CT04A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:46 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >



101

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT04A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:46 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

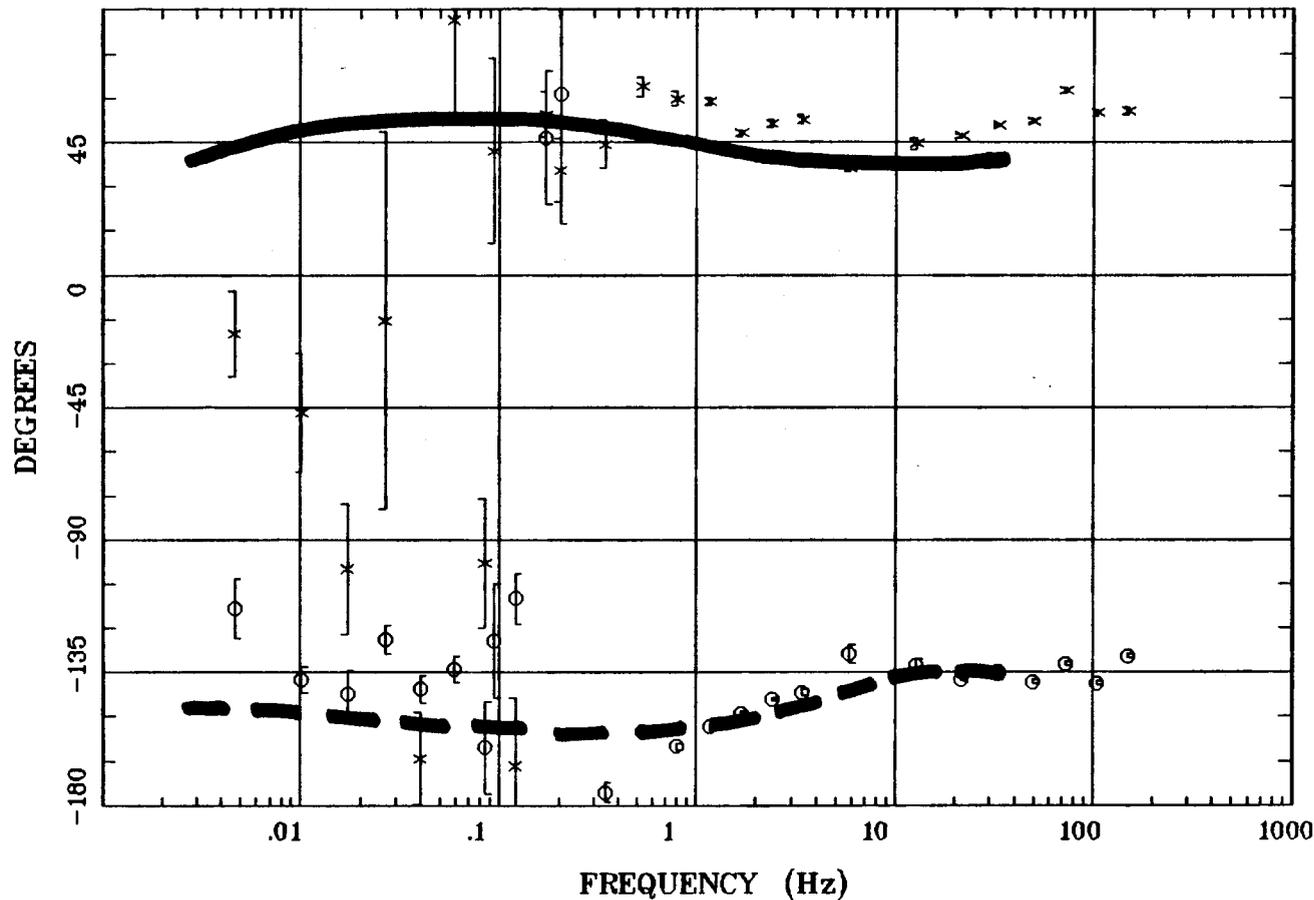


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT05
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:48 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Station 5

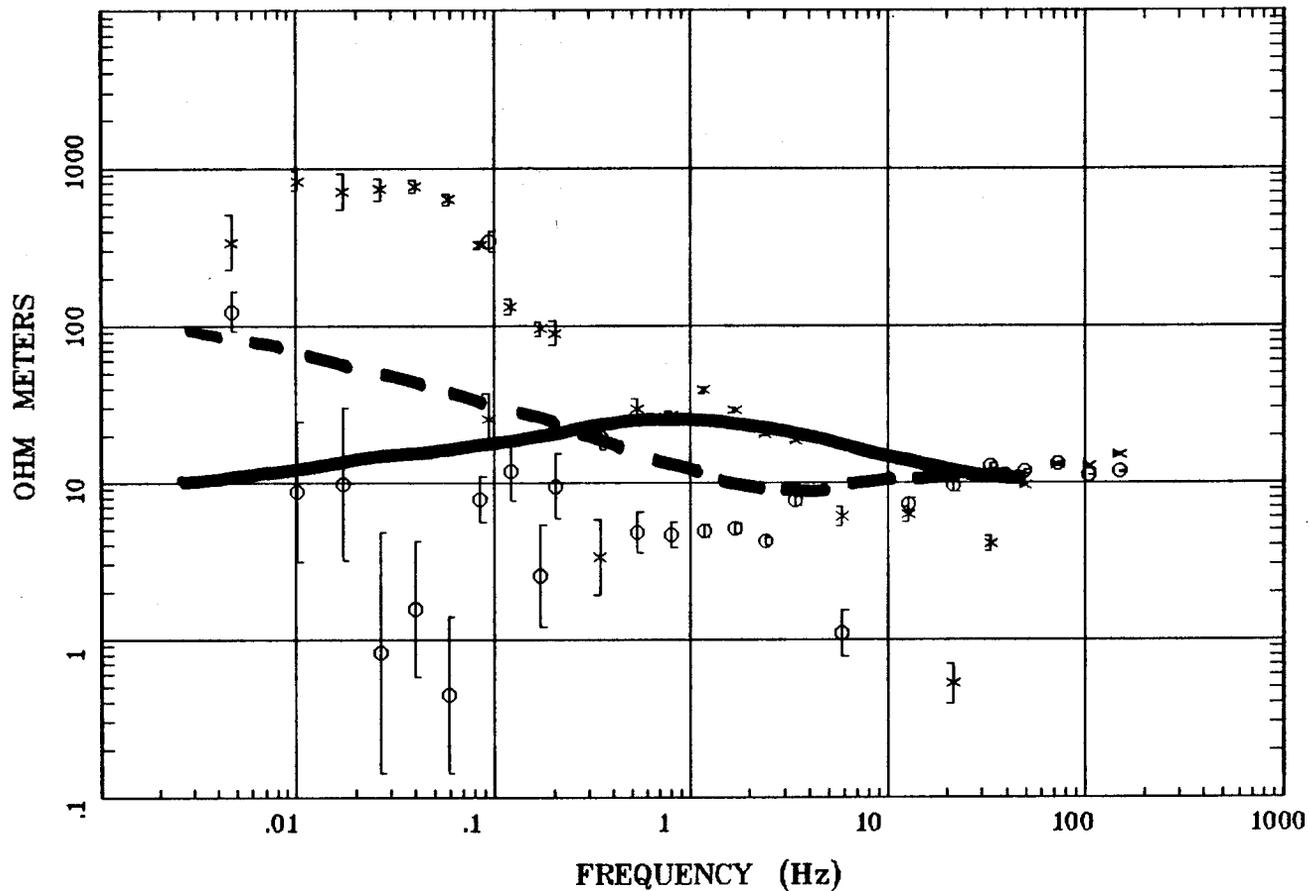


Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT05
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:48 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Station 6

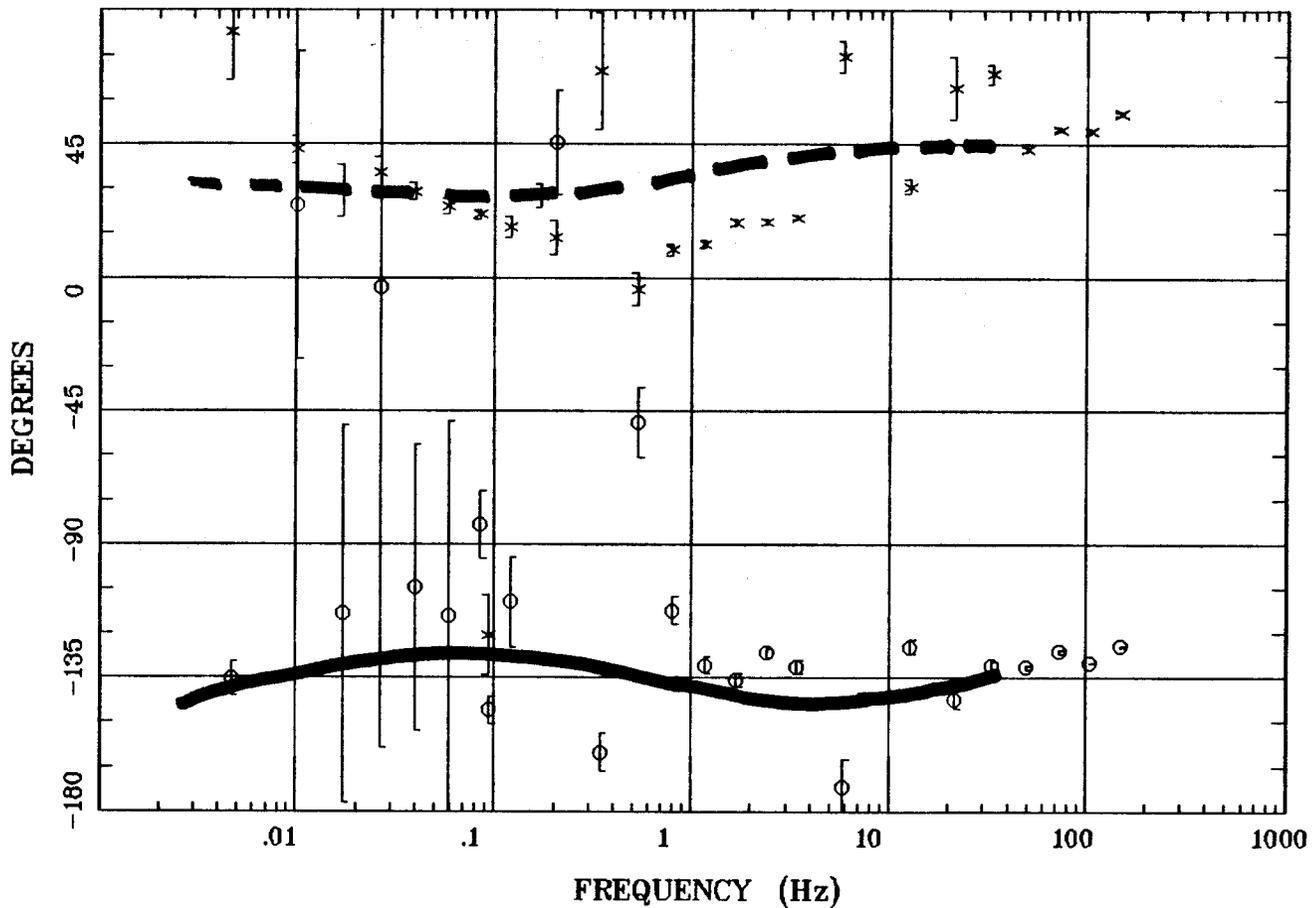


Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT06B
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:49 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

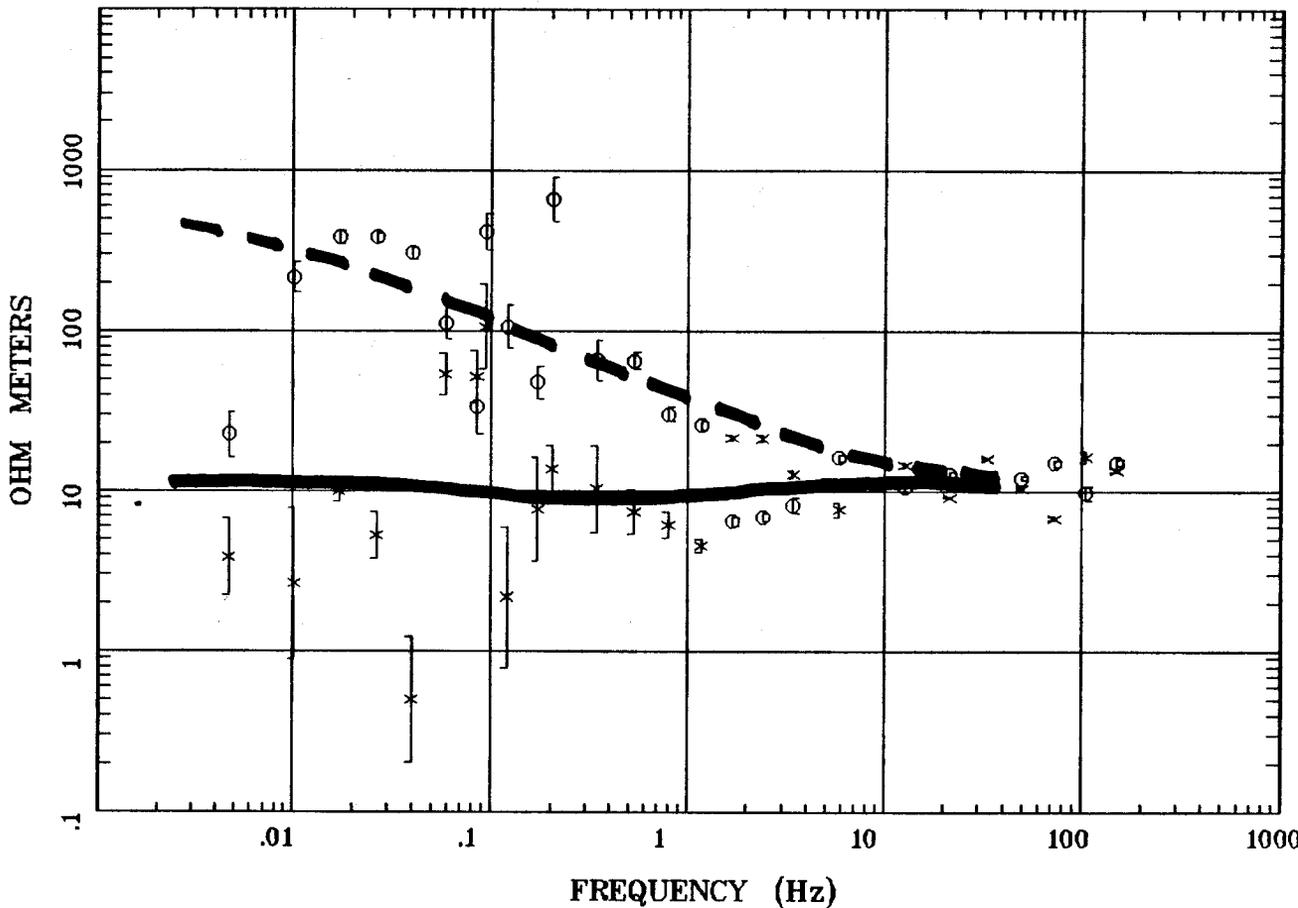
IMPEDANCE PHASE

Station 6



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT06B
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:49 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

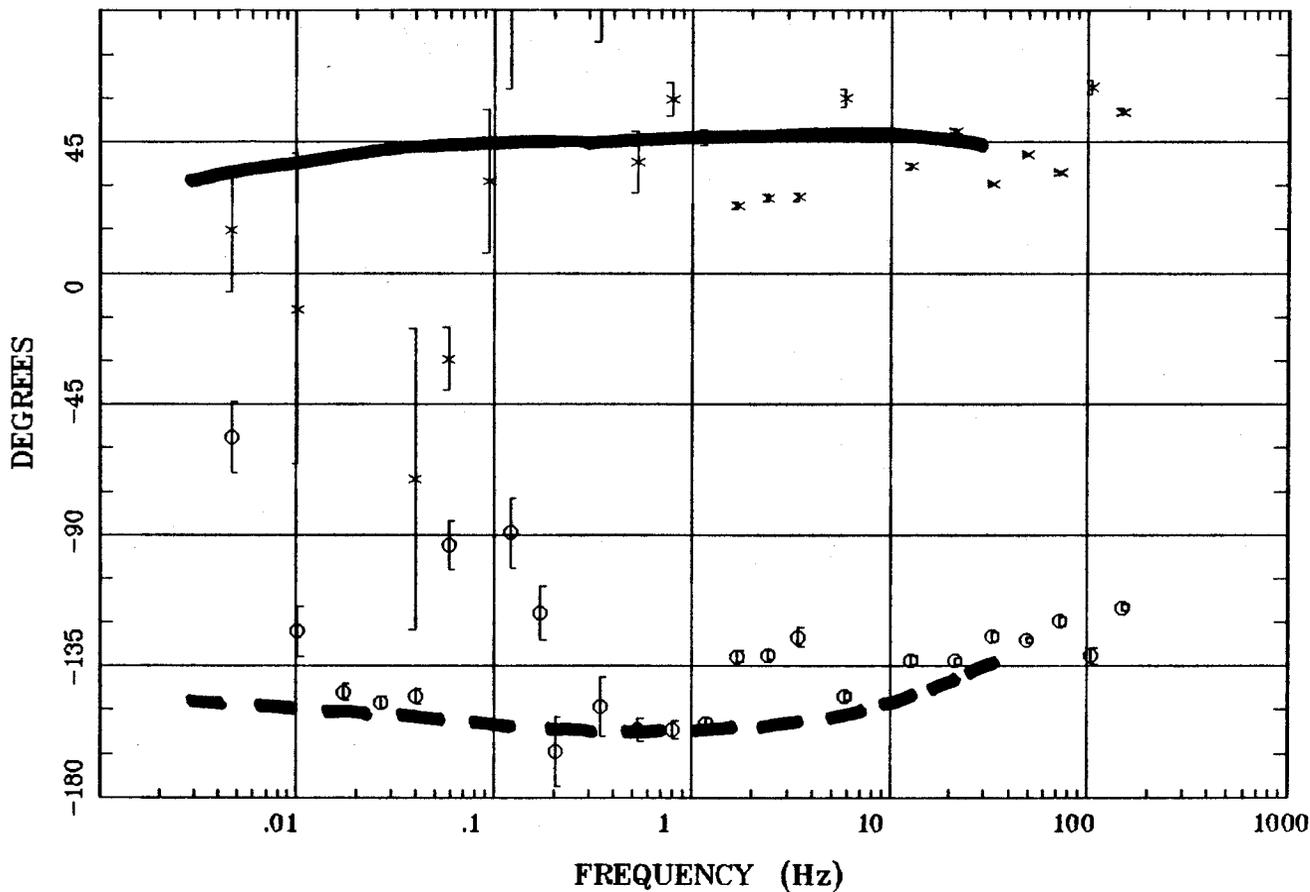


106

Client:	Rotation:
Remote:	Filename: CT07C
Acquired: :	Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Survey Co:	Plotted: 08:50 Sep 17, 1998
	< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

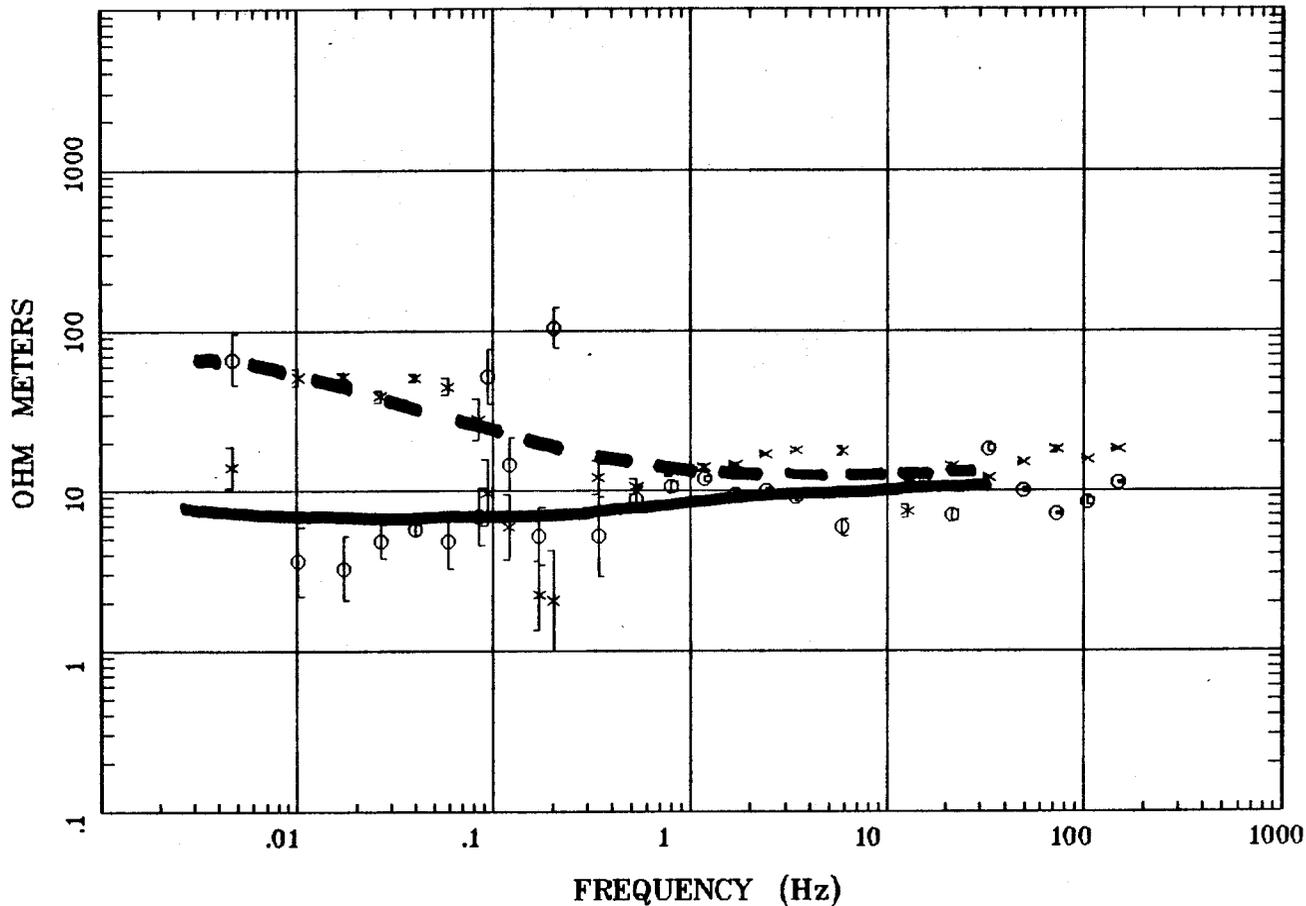
Station 7



Client:
Remote:
Acquired: :
Survey Co:

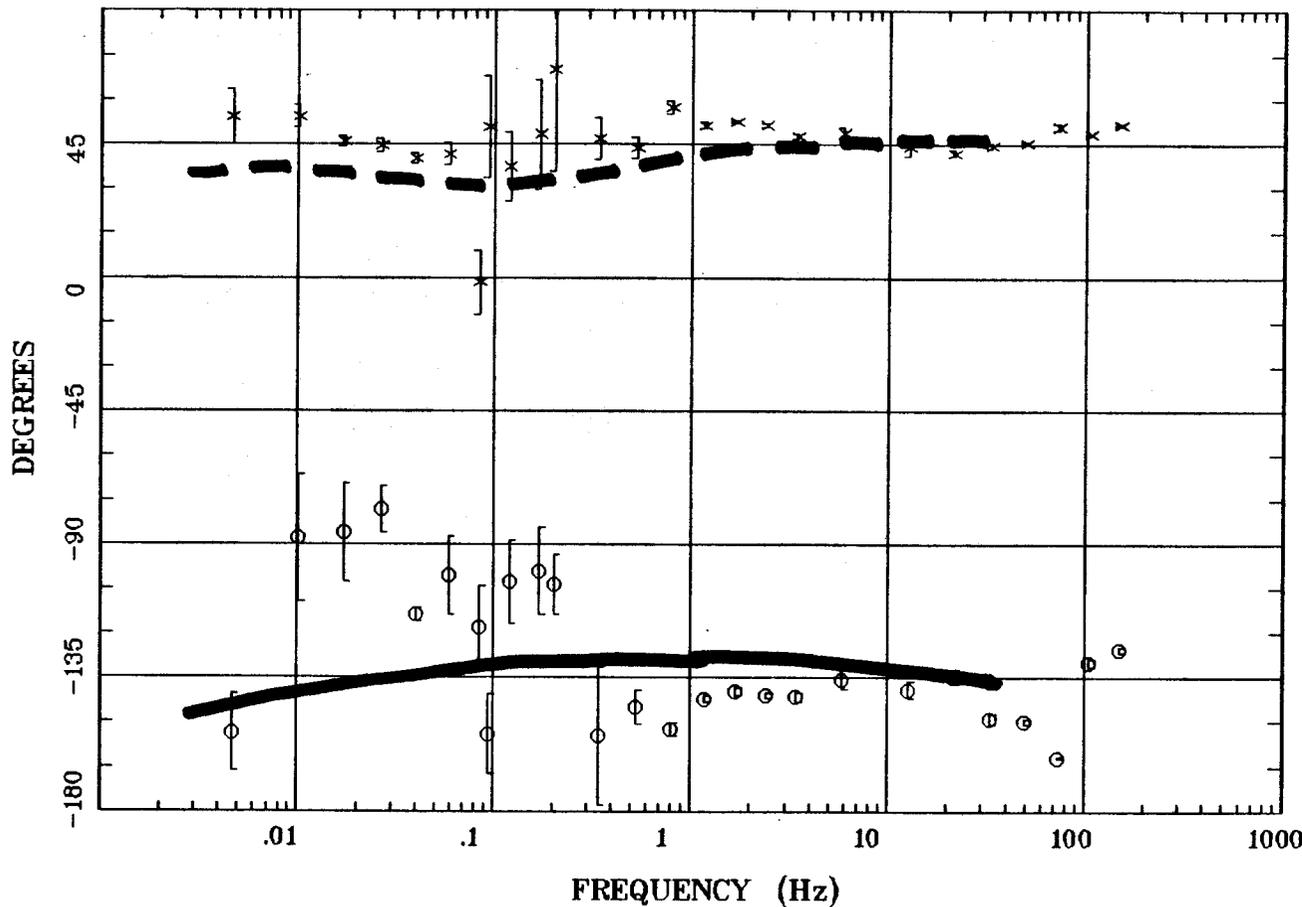
Rotation:
Filename: CT07C
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:50 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

107



Client:
 Remote:
 Acquired: :
 Survey Co:

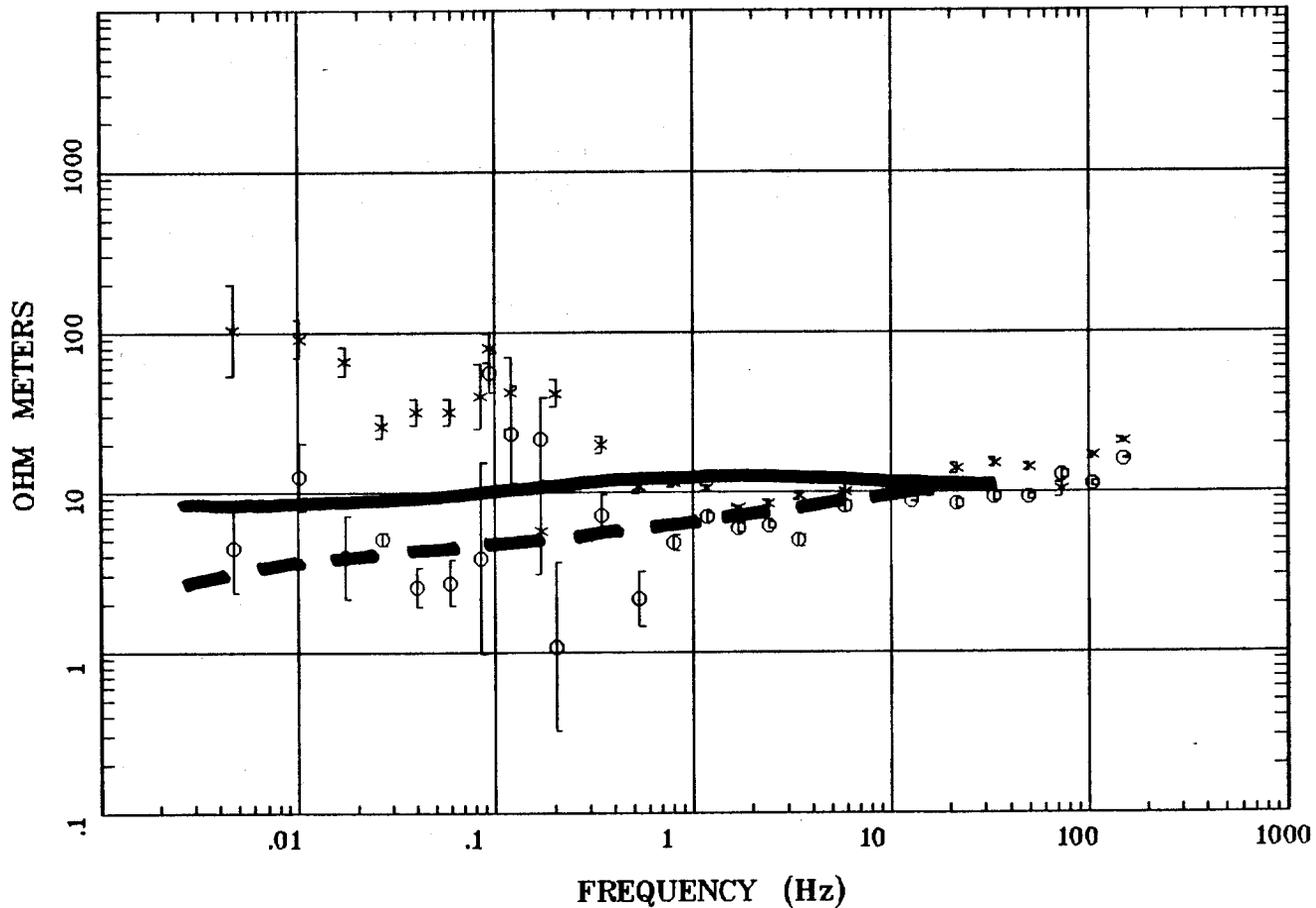
Rotation:
 Filename: CT08D
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:52 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



601

Client:
 Remote:
 Acquired: :
 Survey Co:

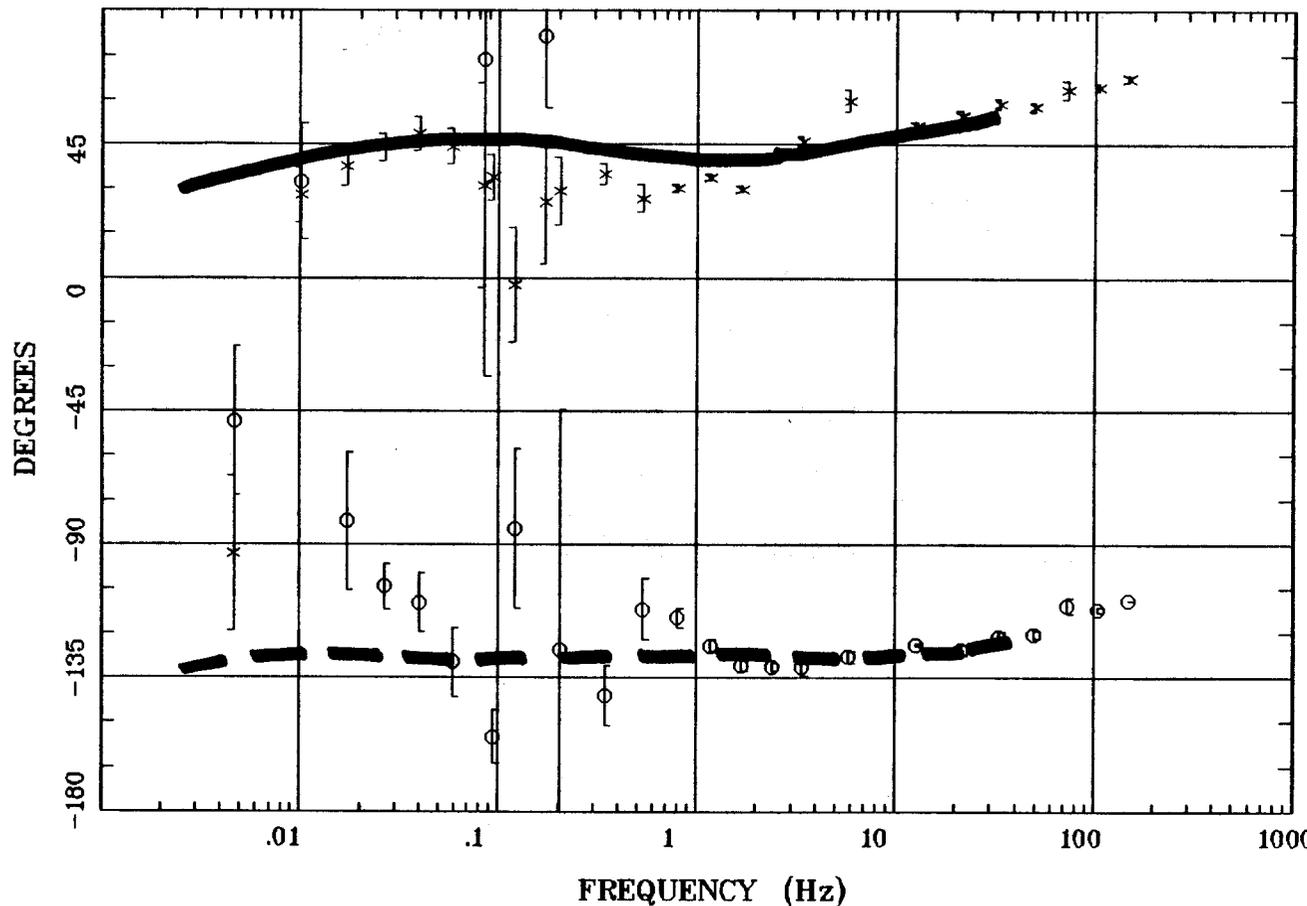
Rotation:
 Filename: CT08D
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 06:52 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



110

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT20C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:53 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



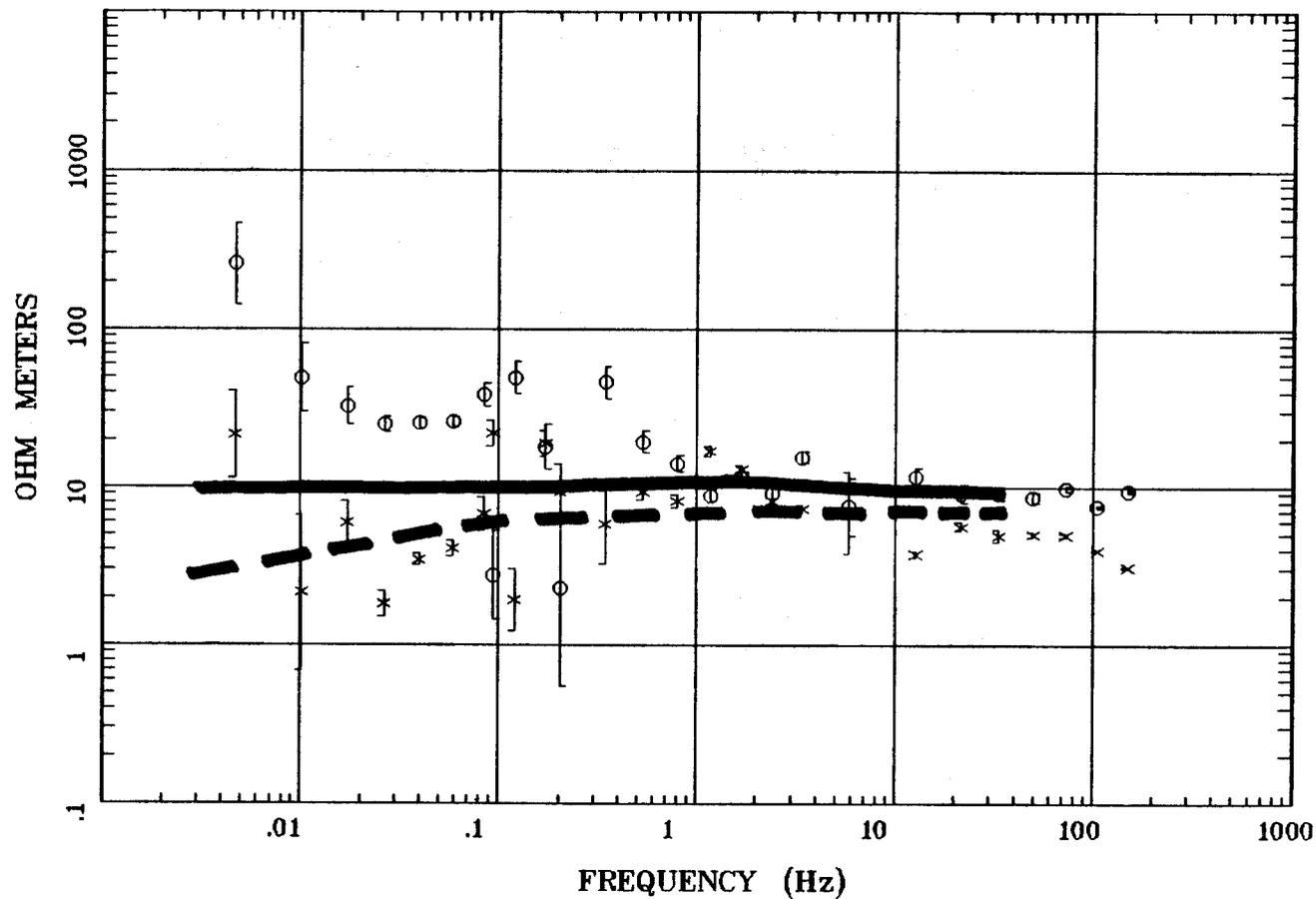
III

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT20C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:53 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Station 21

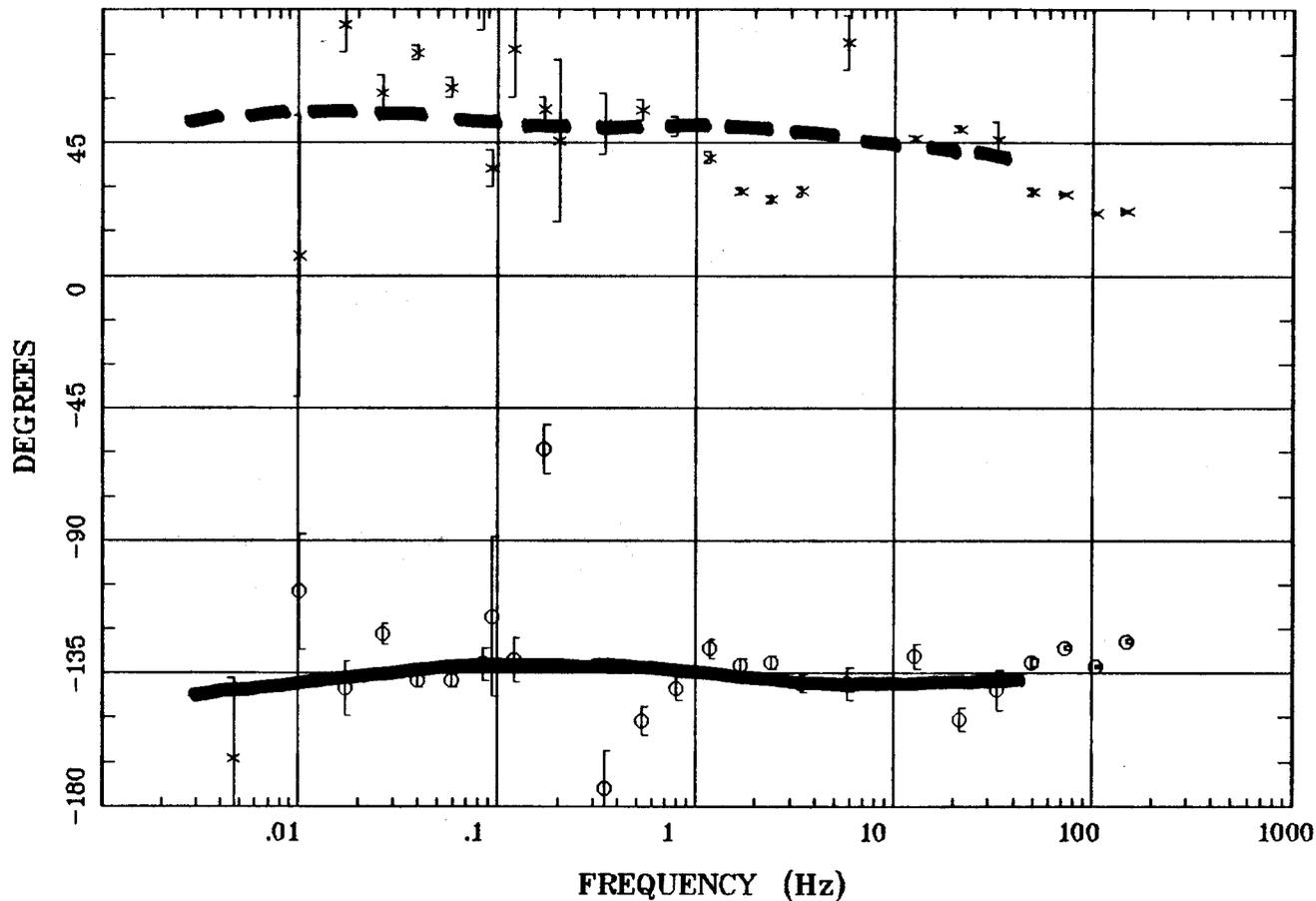


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT21
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:54 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Station 21

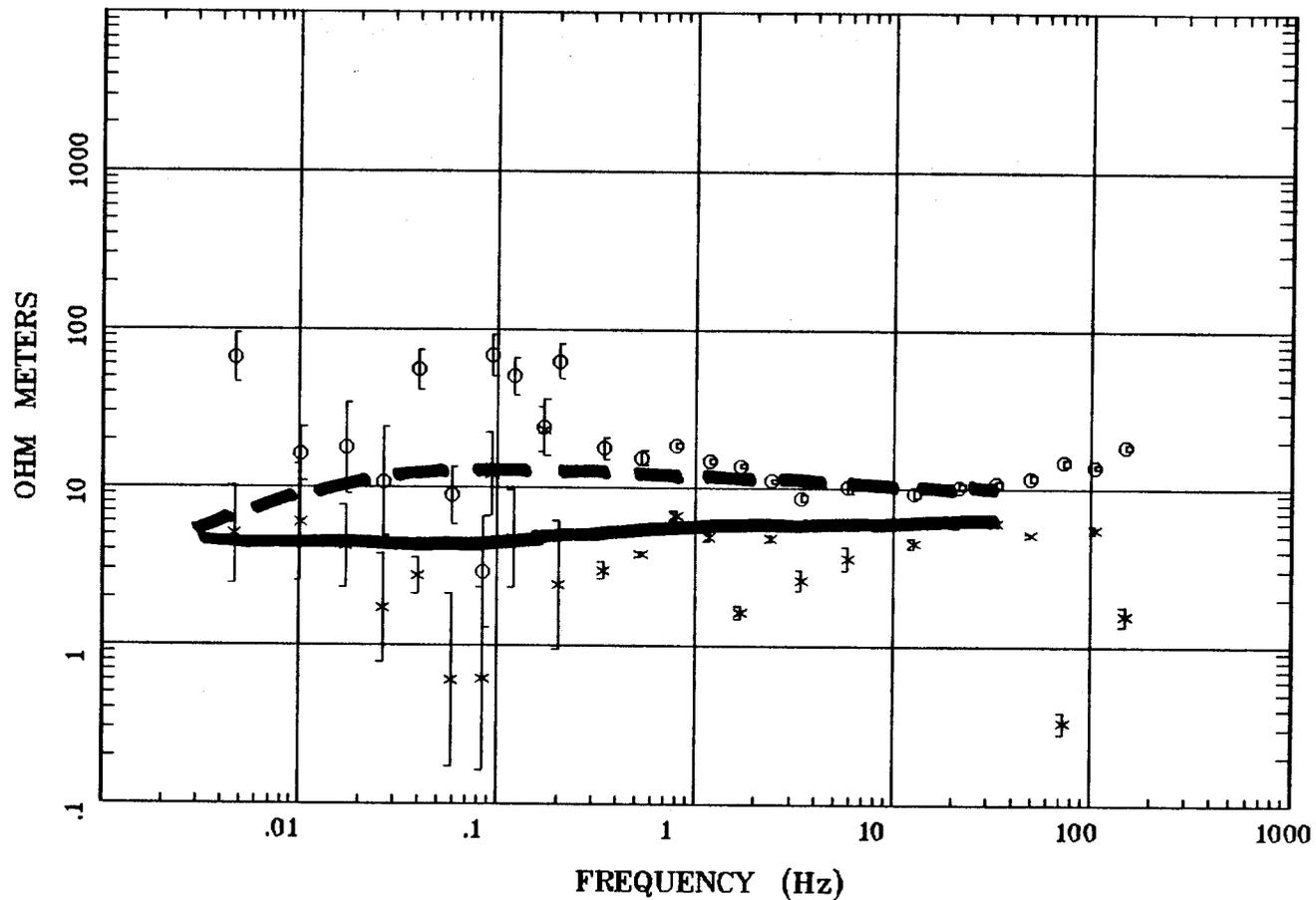


Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: CT21
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:54 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >

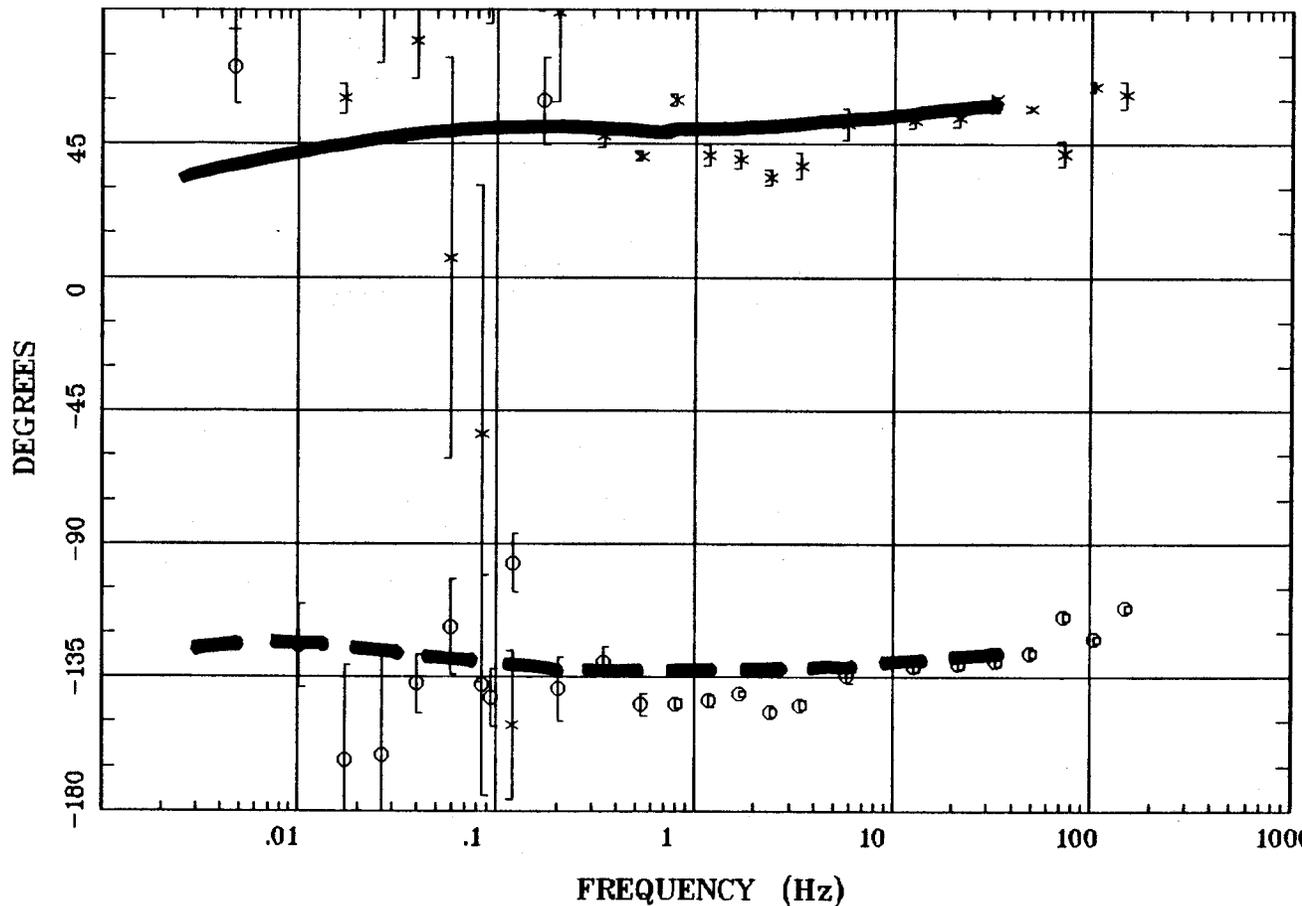
APPARENT RESISTIVITY

Station 22



Client:
 Remote:
 Acquired: :
 Survey Co:

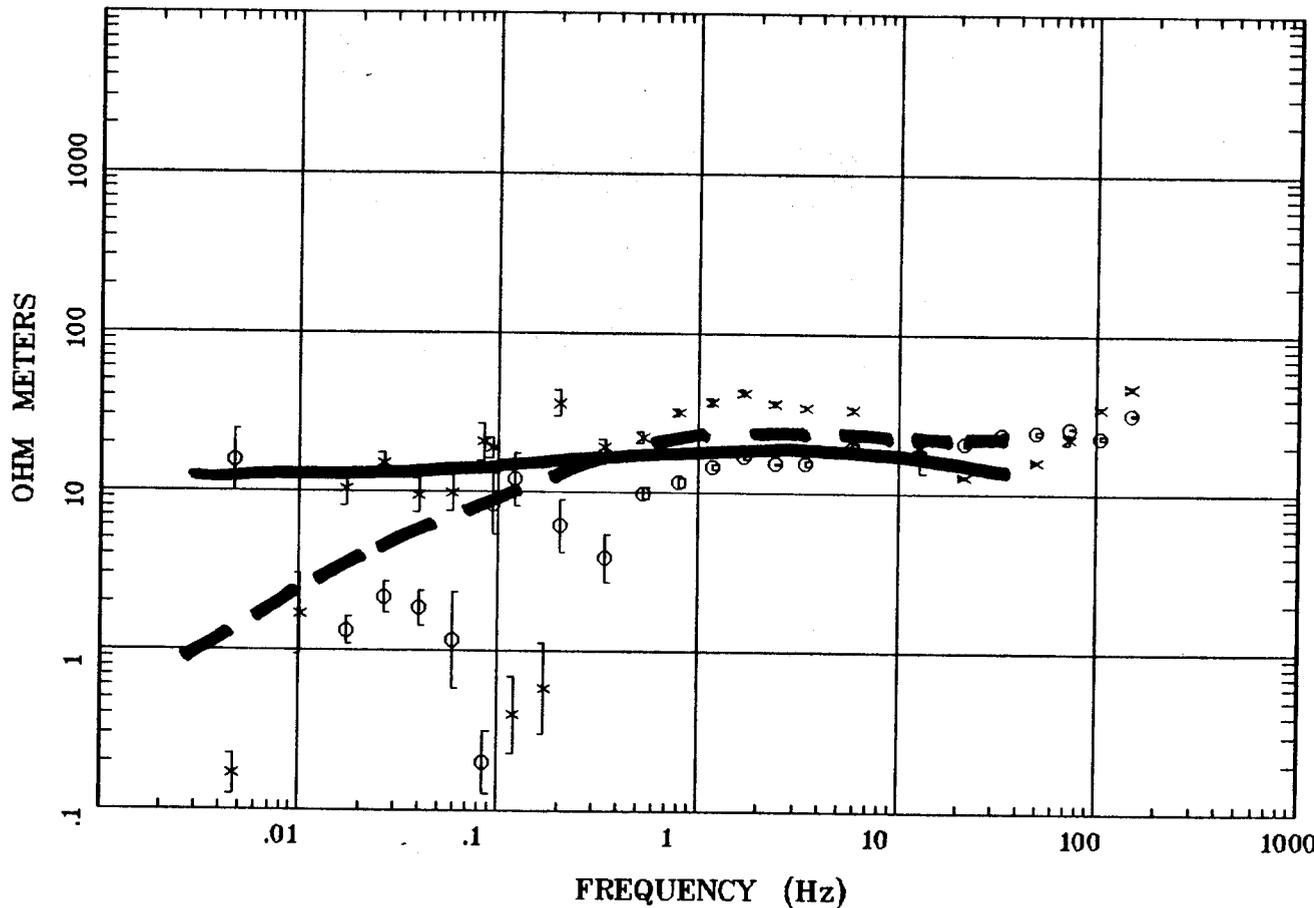
Rotation:
 Filename: CT22A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:55 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



111

Client:
Remote:
Acquired: :
Survey Co:

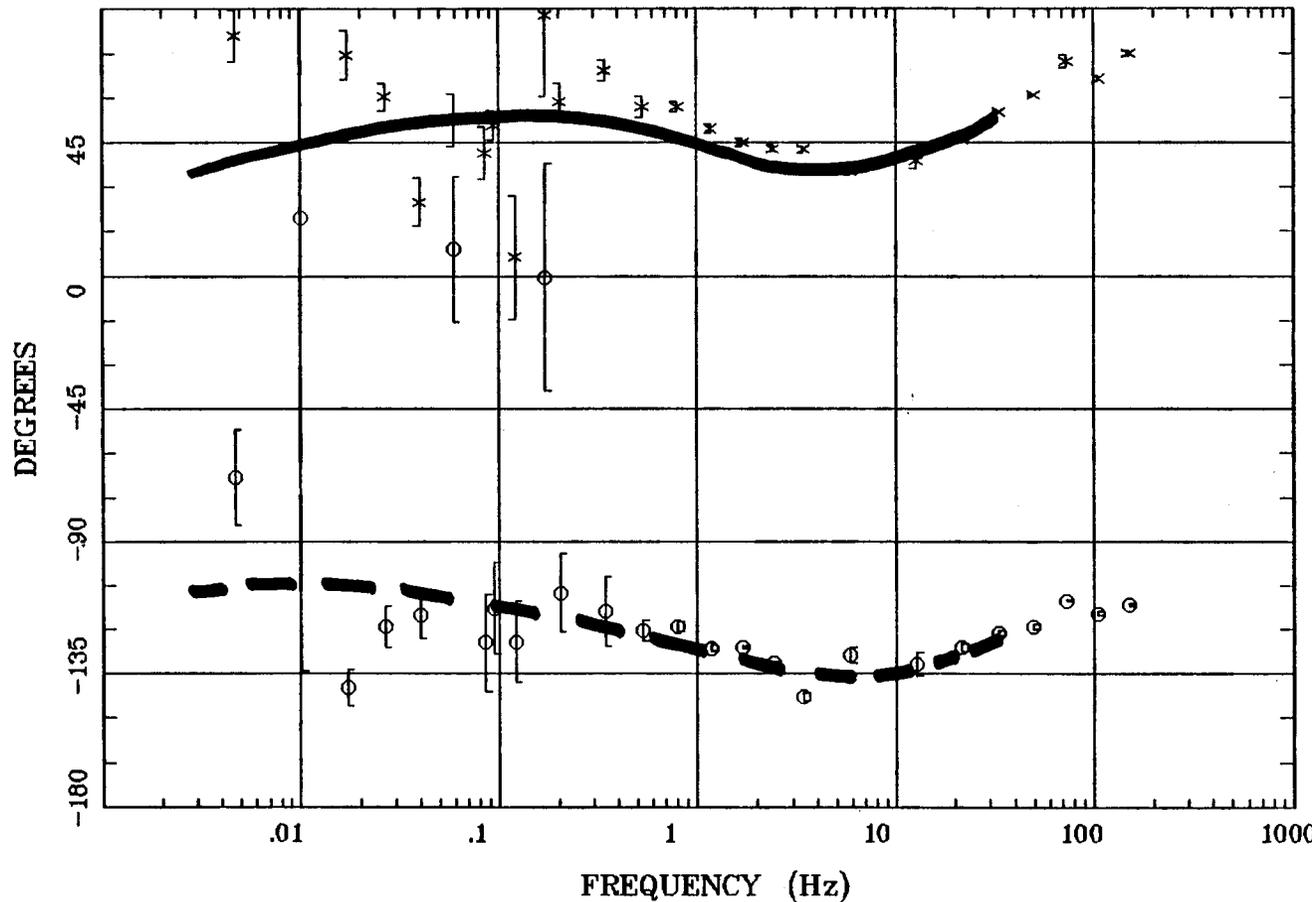
Rotation:
Filename: CT22A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:55 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >



116

Client:
 Remote:
 Acquired: :
 Survey Co:

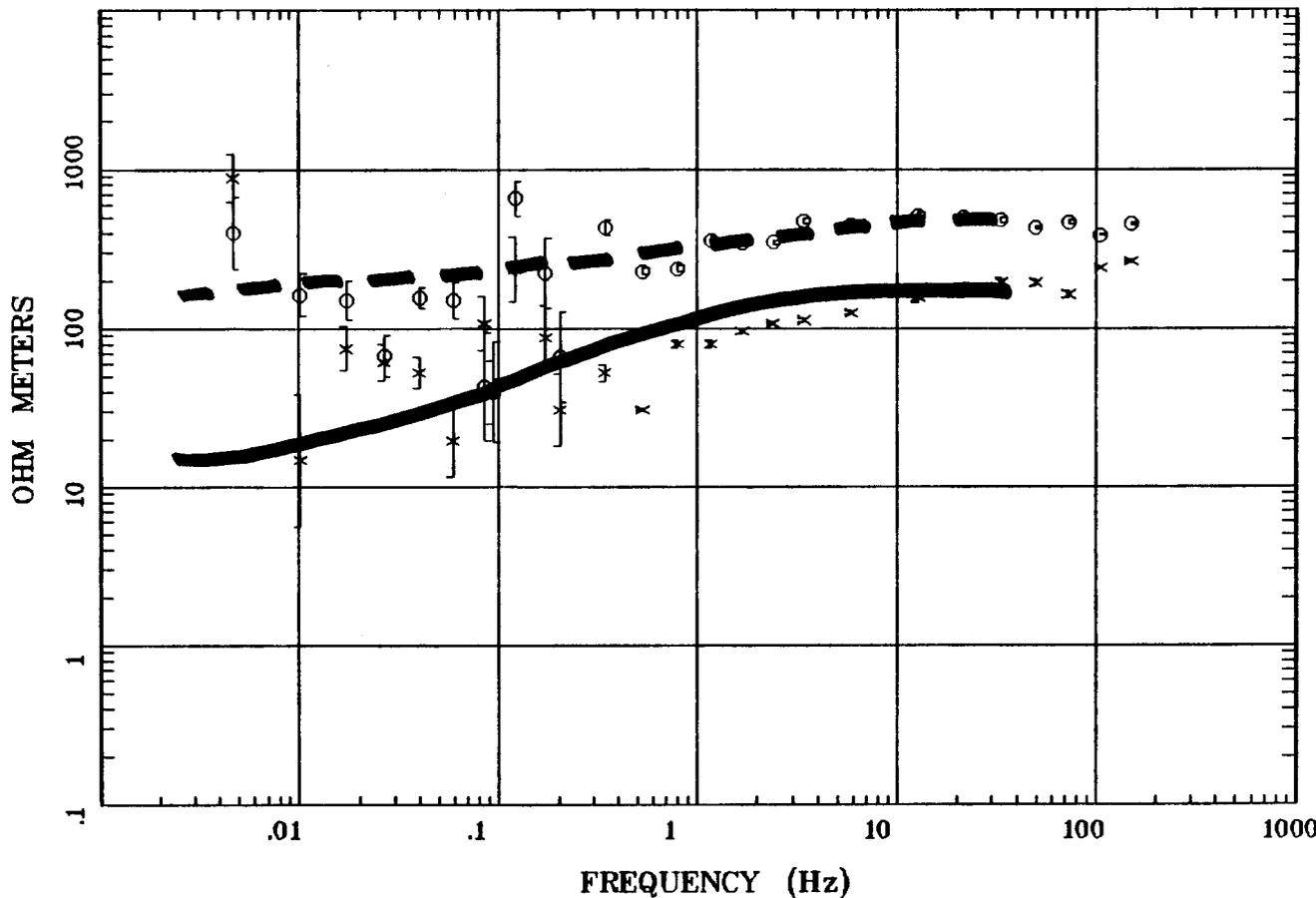
Rotation:
 Filename: CT29A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:57 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >



117

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT29A
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:57 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

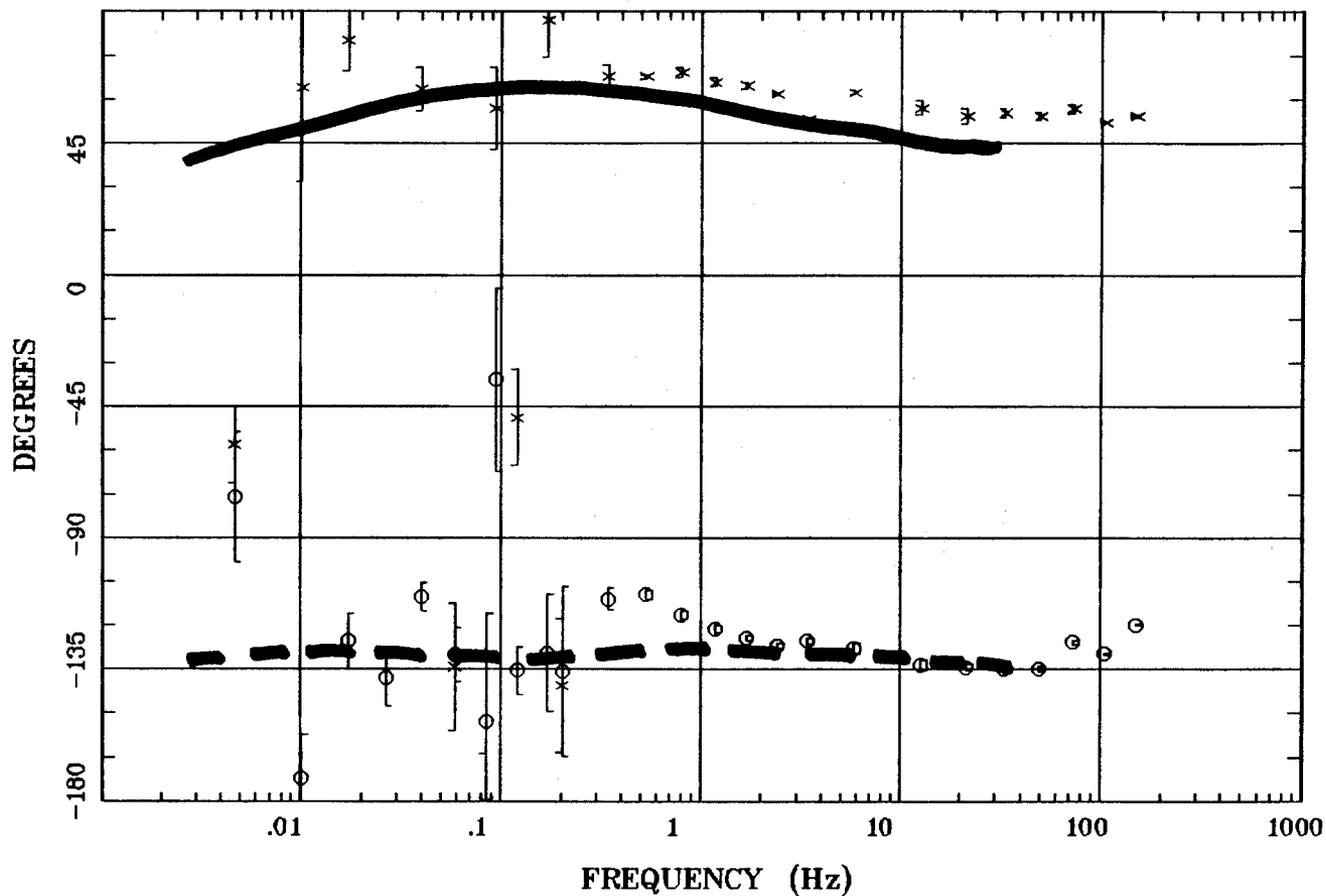


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT23C
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 08:58 Sep 17, 1998
 < EMI - ElectroMagnetic Instruments >

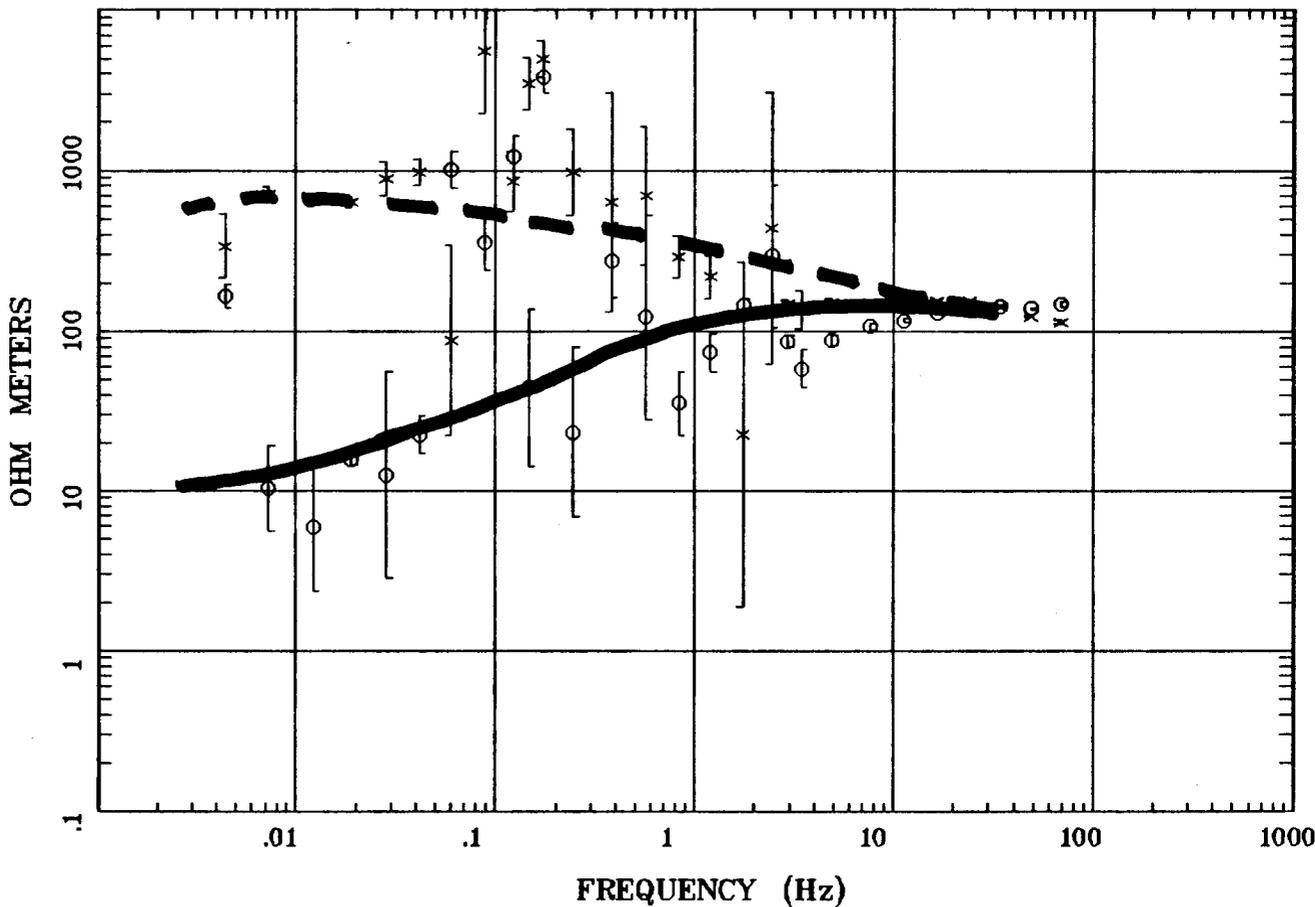
IMPEDANCE PHASE

Station 23



Client:
Remote:
Acquired: : ,
Survey Co:

Rotation:
Filename: CT23C
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 08:58 Sep 17, 1998
< EMI - ElectroMagnetic Instruments >



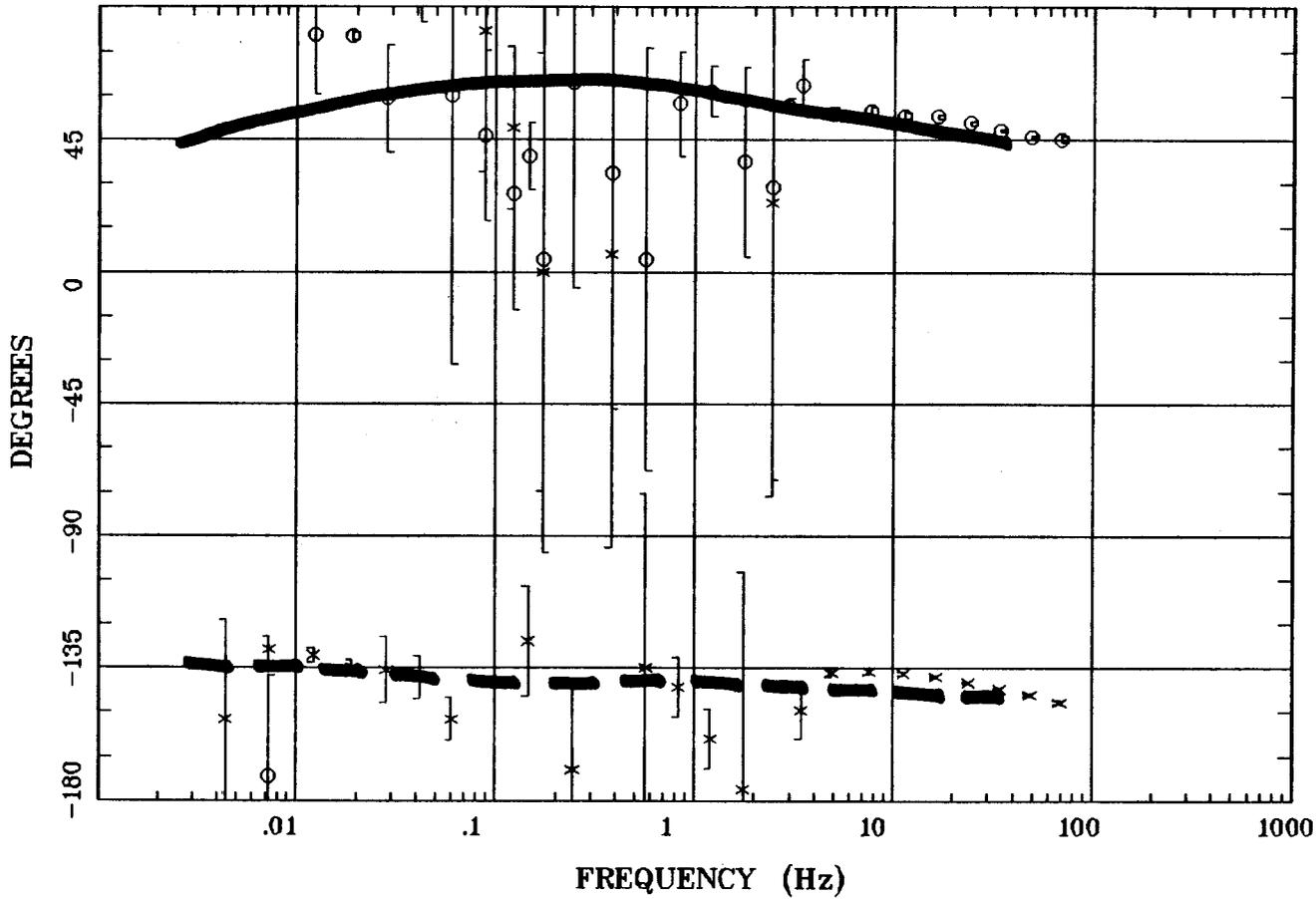
120

Client:
 Remote: Local E
 Acquired: 16:0 Jul 27, 1998
 Survey Co:USGS GD-MRP Denver

Rotation:
 Filename: hr54.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:13 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Humboldt River Line 1



Client:
 Remote: Local E
 Acquired: 16:0 Jul 27, 1998
 Survey Co:USGS GD-MRP Denver

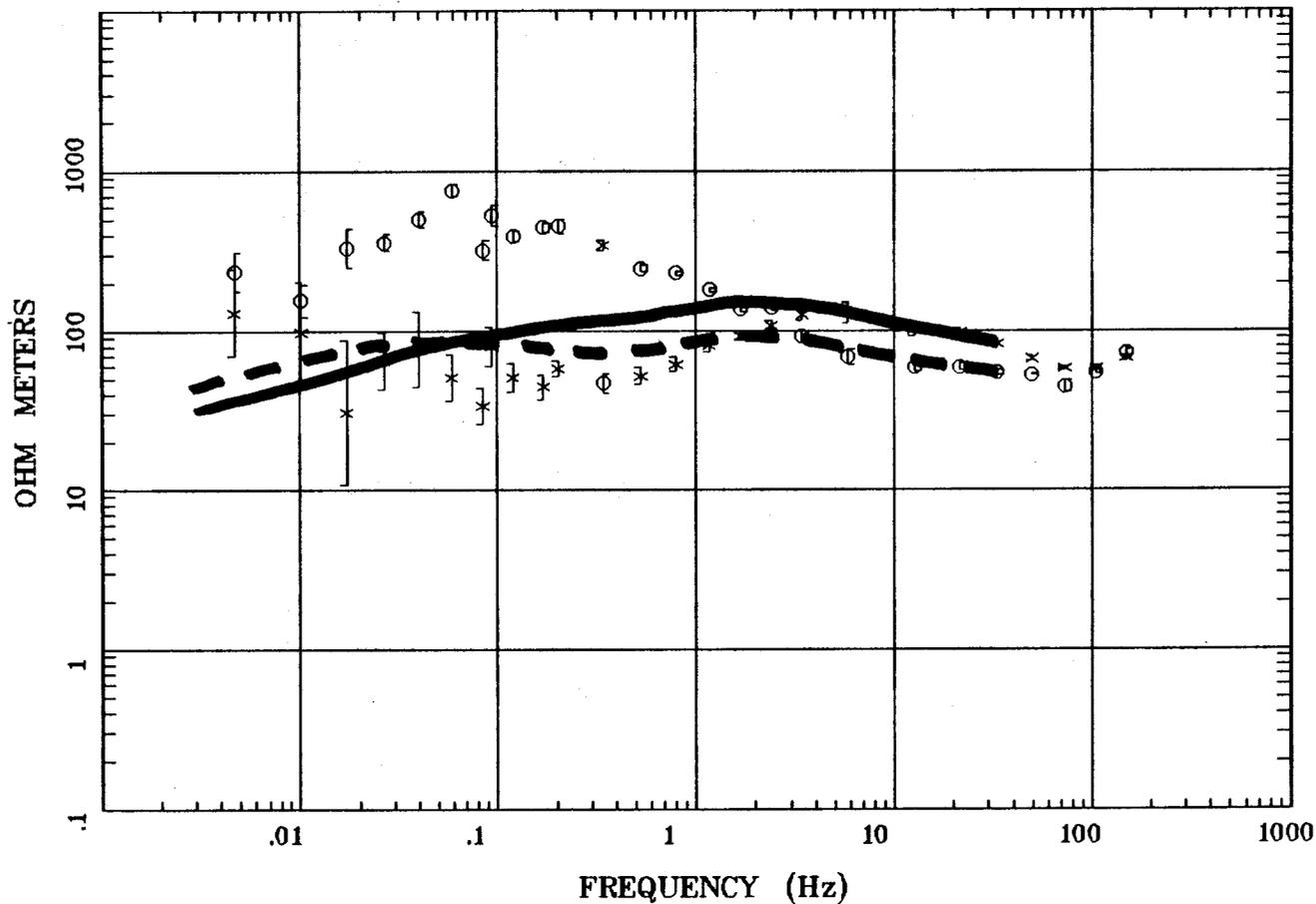
Rotation:
 Filename: hr54.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 15:13 Sep 16, 1998
 < EMI - ElectroMagnetic Instruments >

APPENDIX C

OBSERVED AND CALCULATED DATA - PROFILE MT2

Magnetotelluric (MT) observed (circle and x symbols) and calculated (solid and dashed lines are TE and TM modes, respectively) resistivity and phase data for profile MT2. See the "Magnetotelluric Data" section of this report for a description of the observed data and the "Resistivity Models" section for a description of the calculated data.

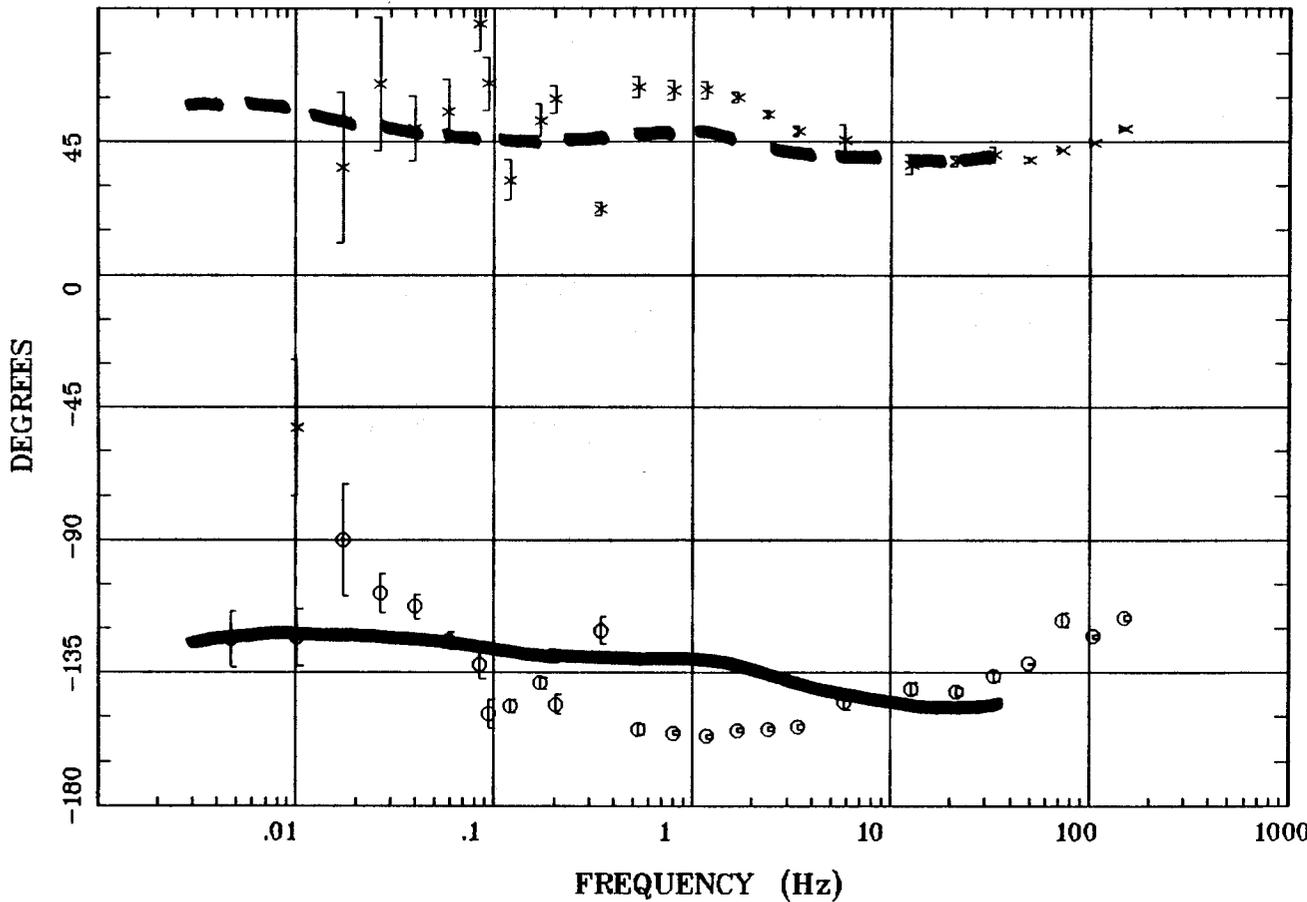
APPARENT RESISTIVITY



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT17
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 10:15 Jun 25, 1999
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE



124

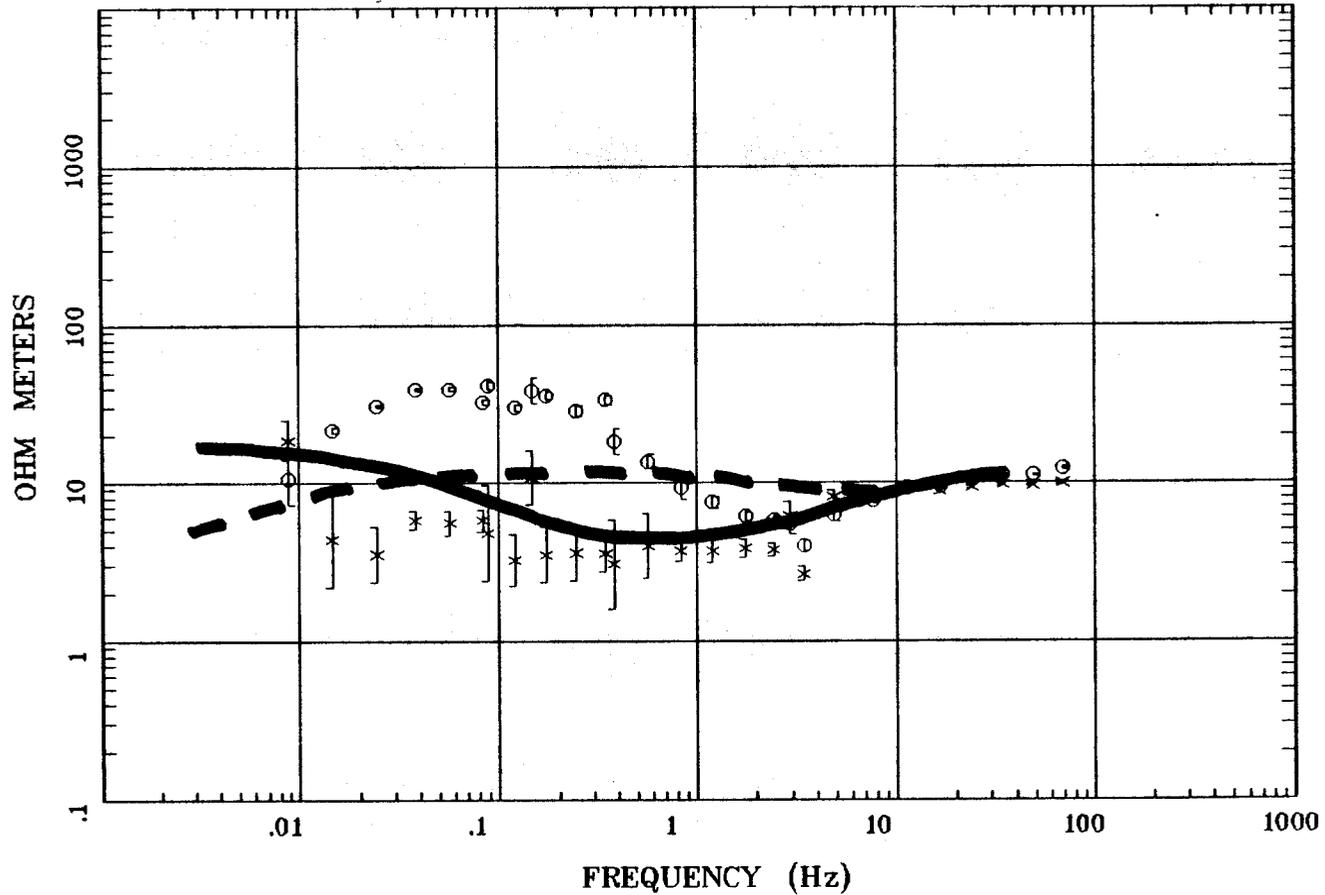
Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT17
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 10:15 Jun 25, 1999
 < EMI - ElectroMagnetic Instruments >

Station 11A

APPARENT RESISTIVITY

Simpson park Mts,NV 100k

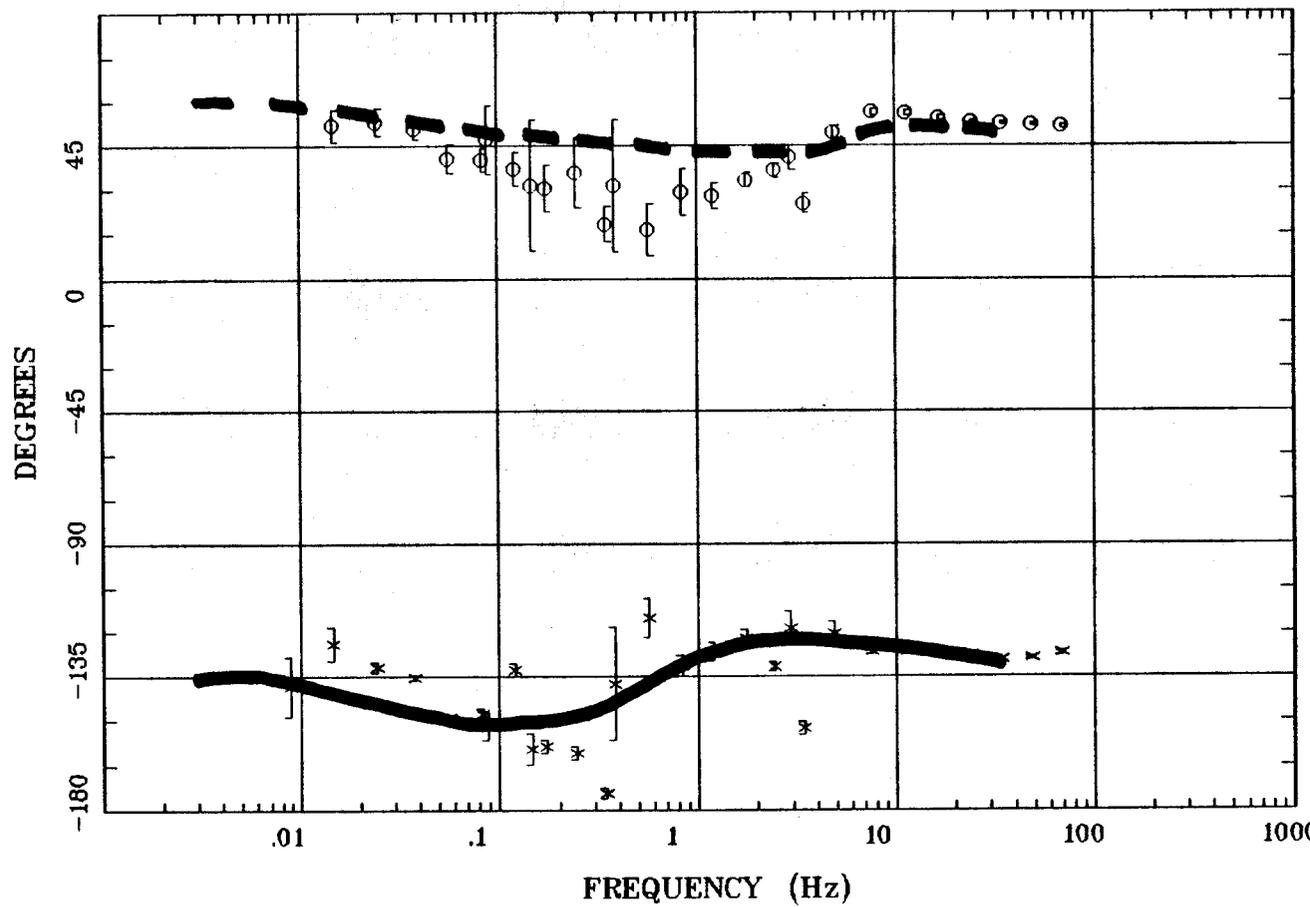


Client:
Remote: none
Acquired: 10:3 Aug 05, 2000
Survey Co:USGS

Rotation:
Filename: nnr11b.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 09:41 Jan 24, 2001
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Simpson park Mts,NV 100k



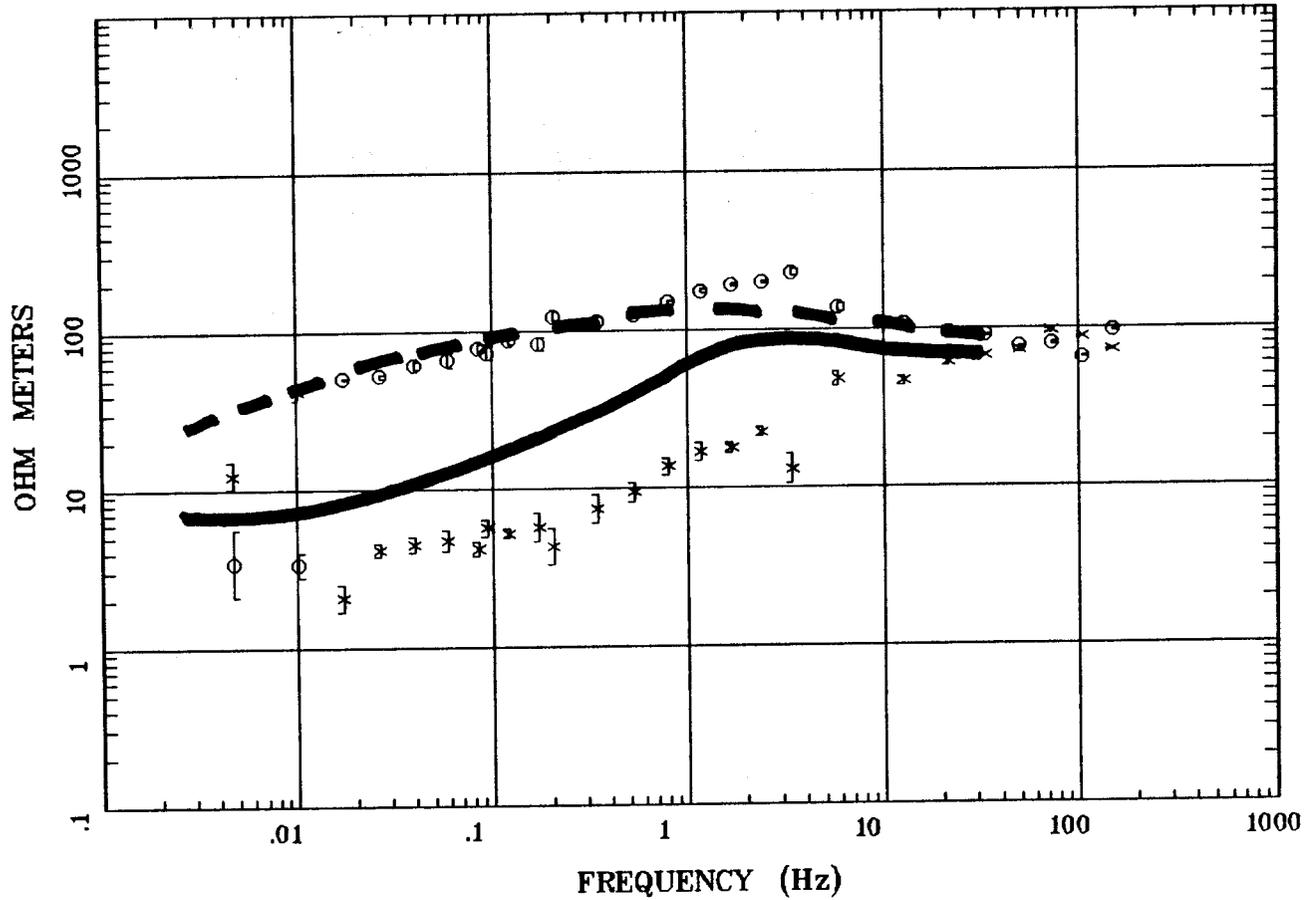
126

Client:
Remote: none
Acquired: 10:3 Aug 05, 2000
Survey Co:USGS

Rotation:
Filename: nnr11b.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 09:41 Jan 24, 2001
< EMI - ElectroMagnetic Instruments >

Station 10A

APPARENT RESISTIVITY

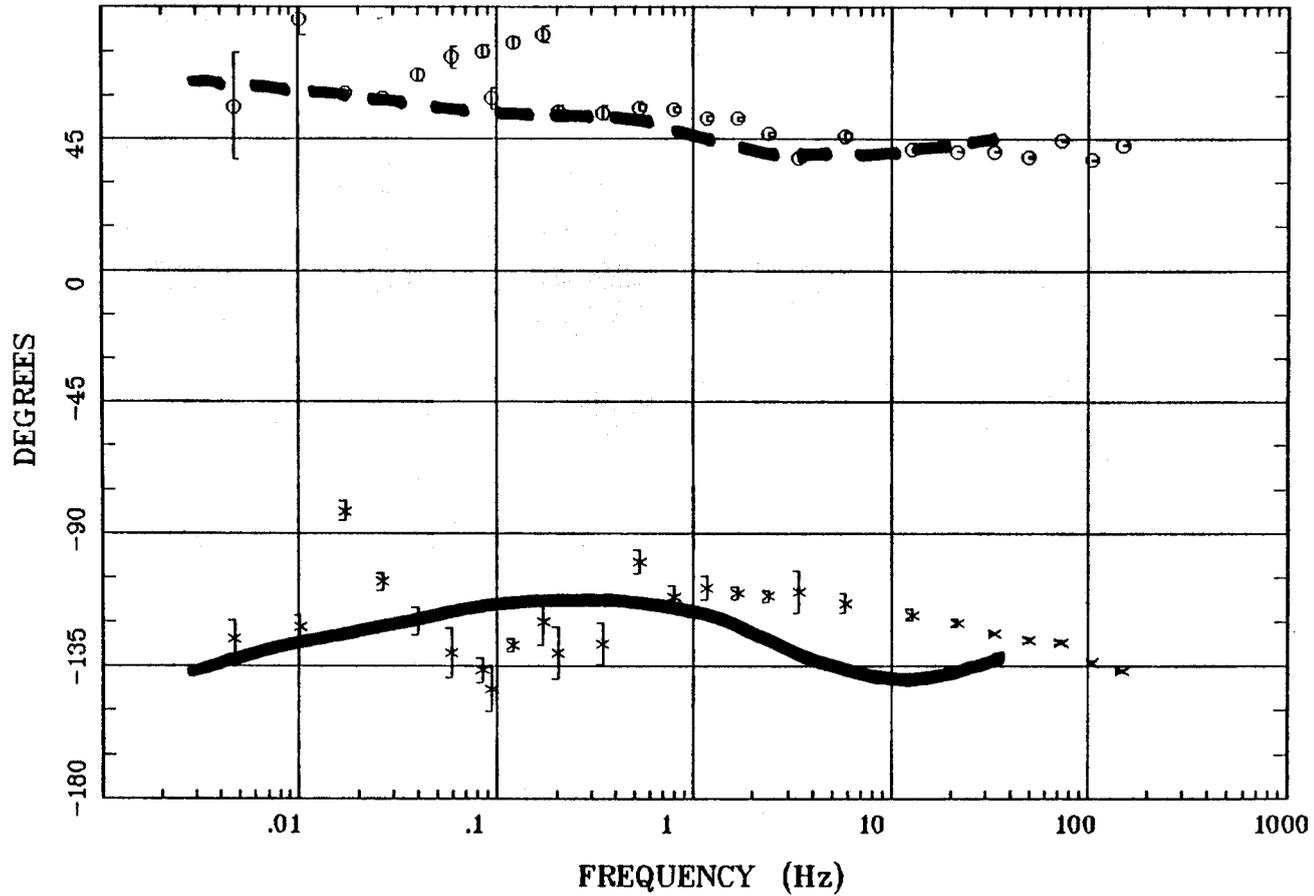


Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR10A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 17:49 Jun 24, 1999
< EMI - ElectroMagnetic Instruments >

Station 10A

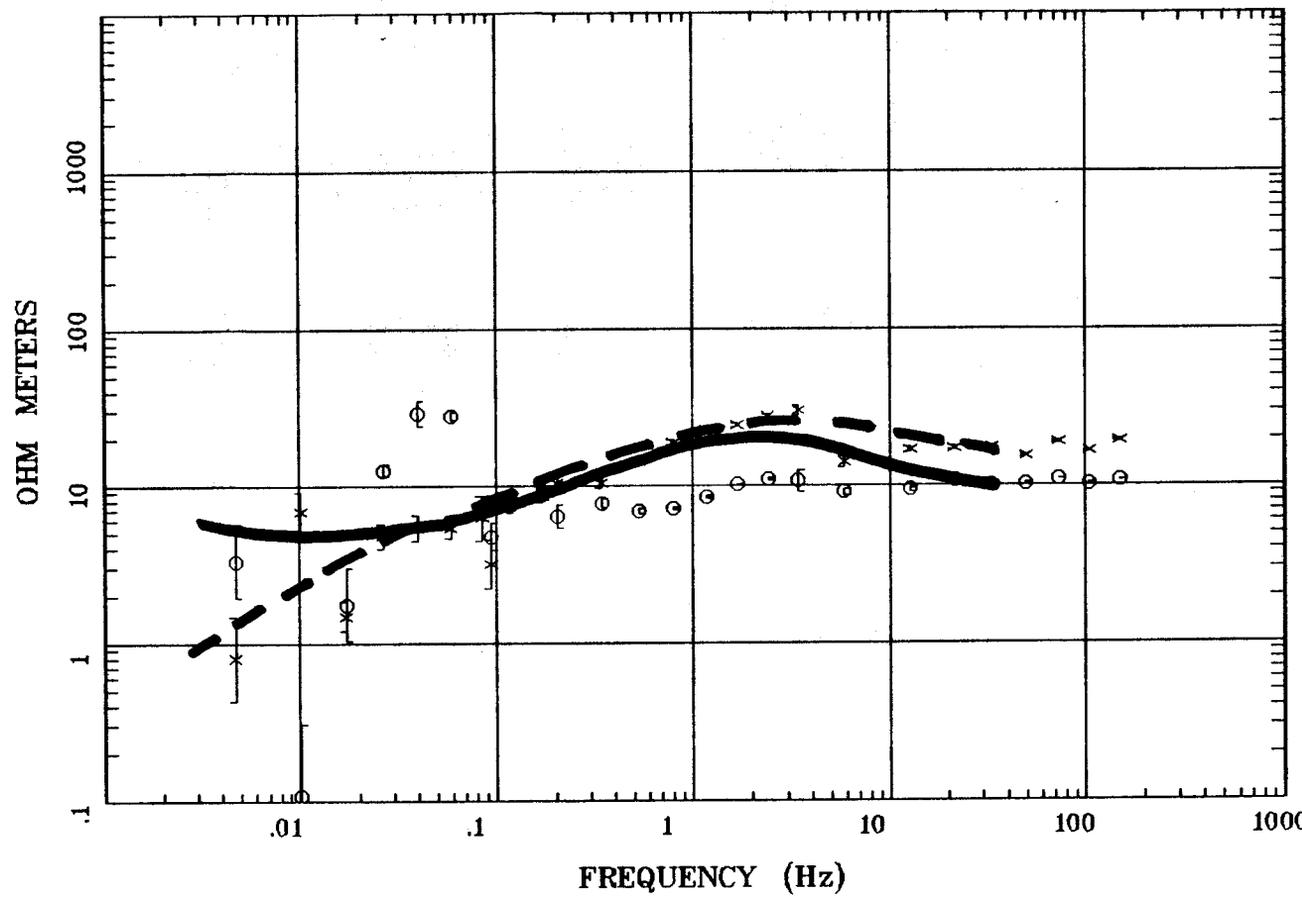
IMPEDANCE PHASE



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR10A
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 17:49 Jun 24, 1999
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

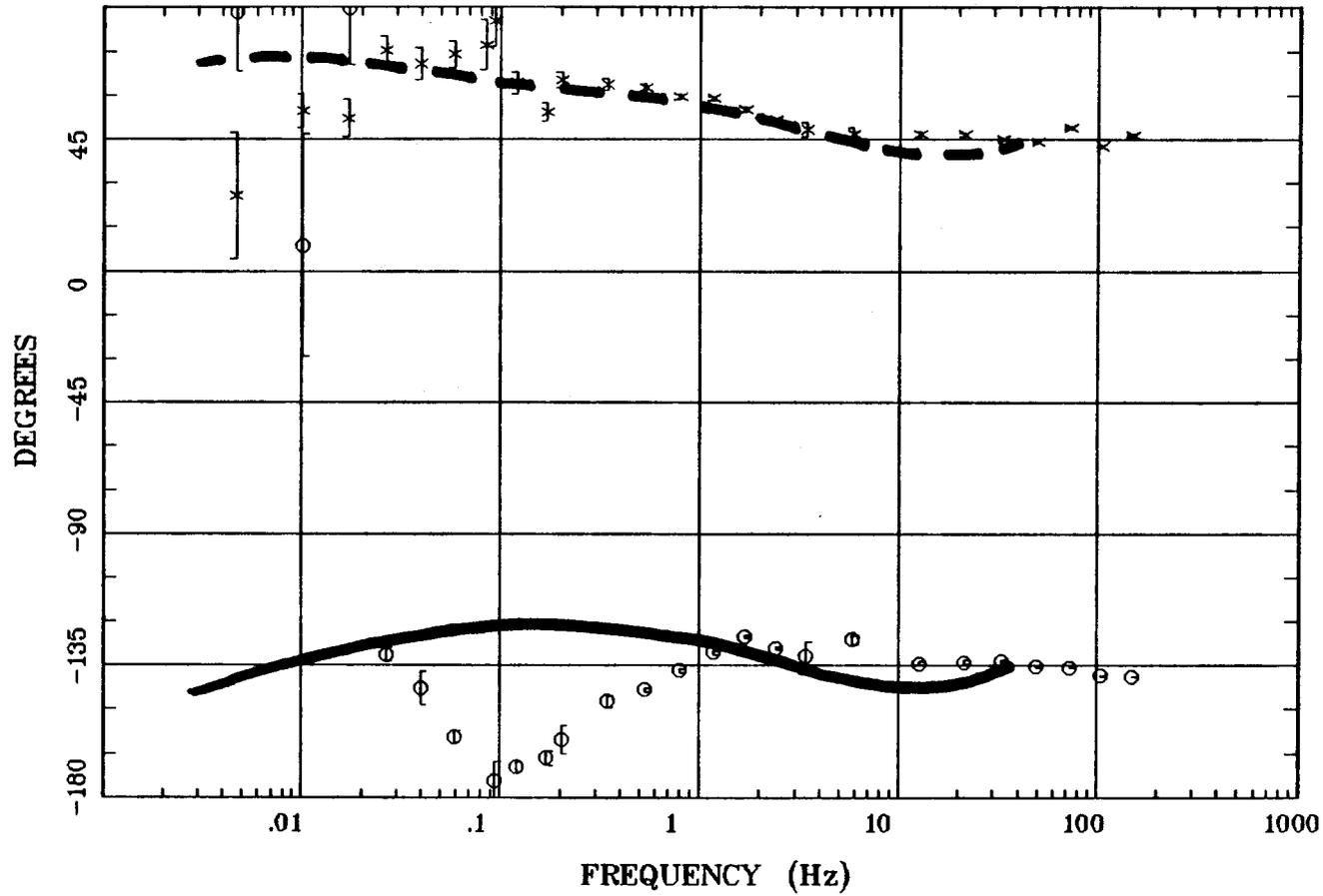


129

Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR06
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 18:15 Jun 24, 1999
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

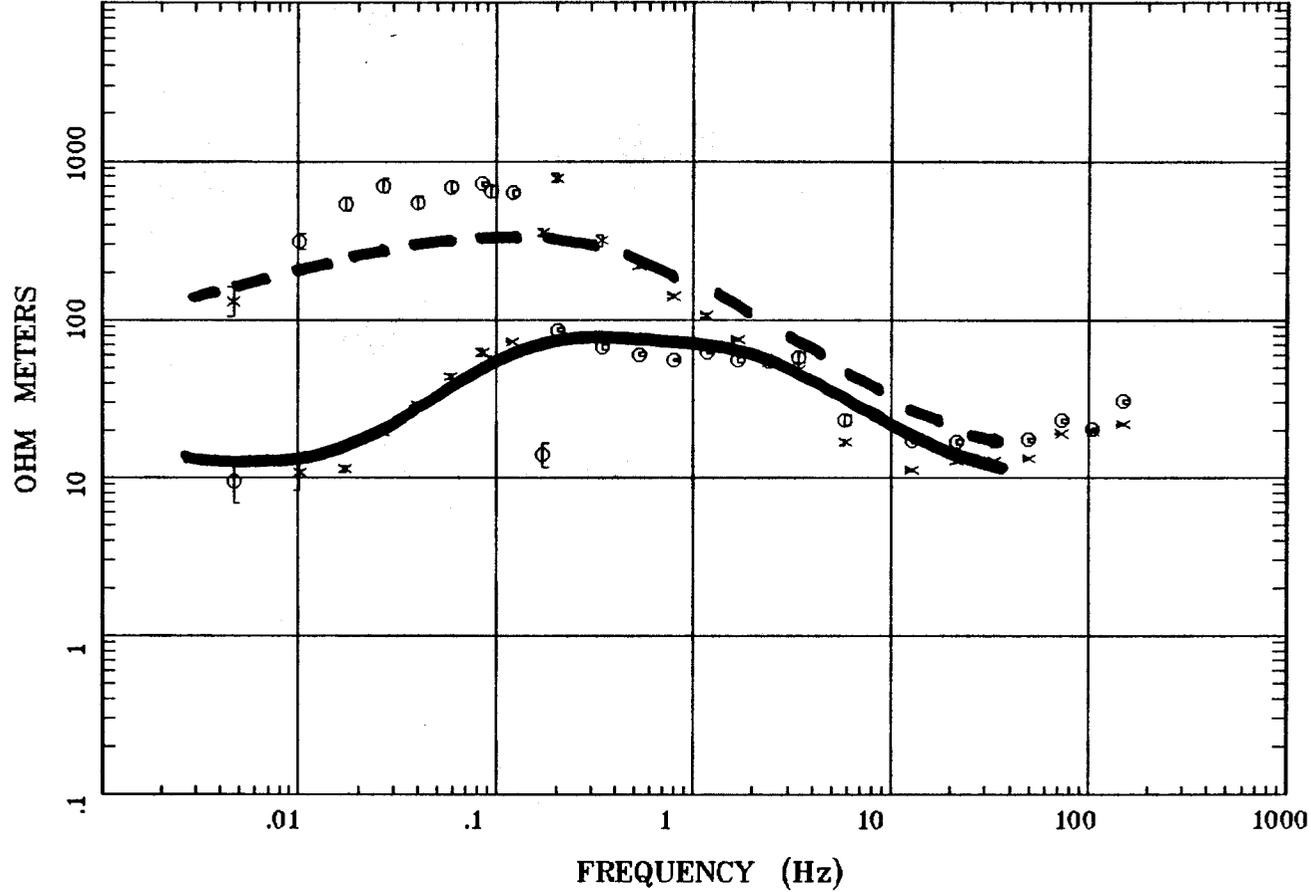


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR06
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 18:15 Jun 24, 1999
 < EMI - ElectroMagnetic Instruments >

Station 9A

APPARENT RESISTIVITY

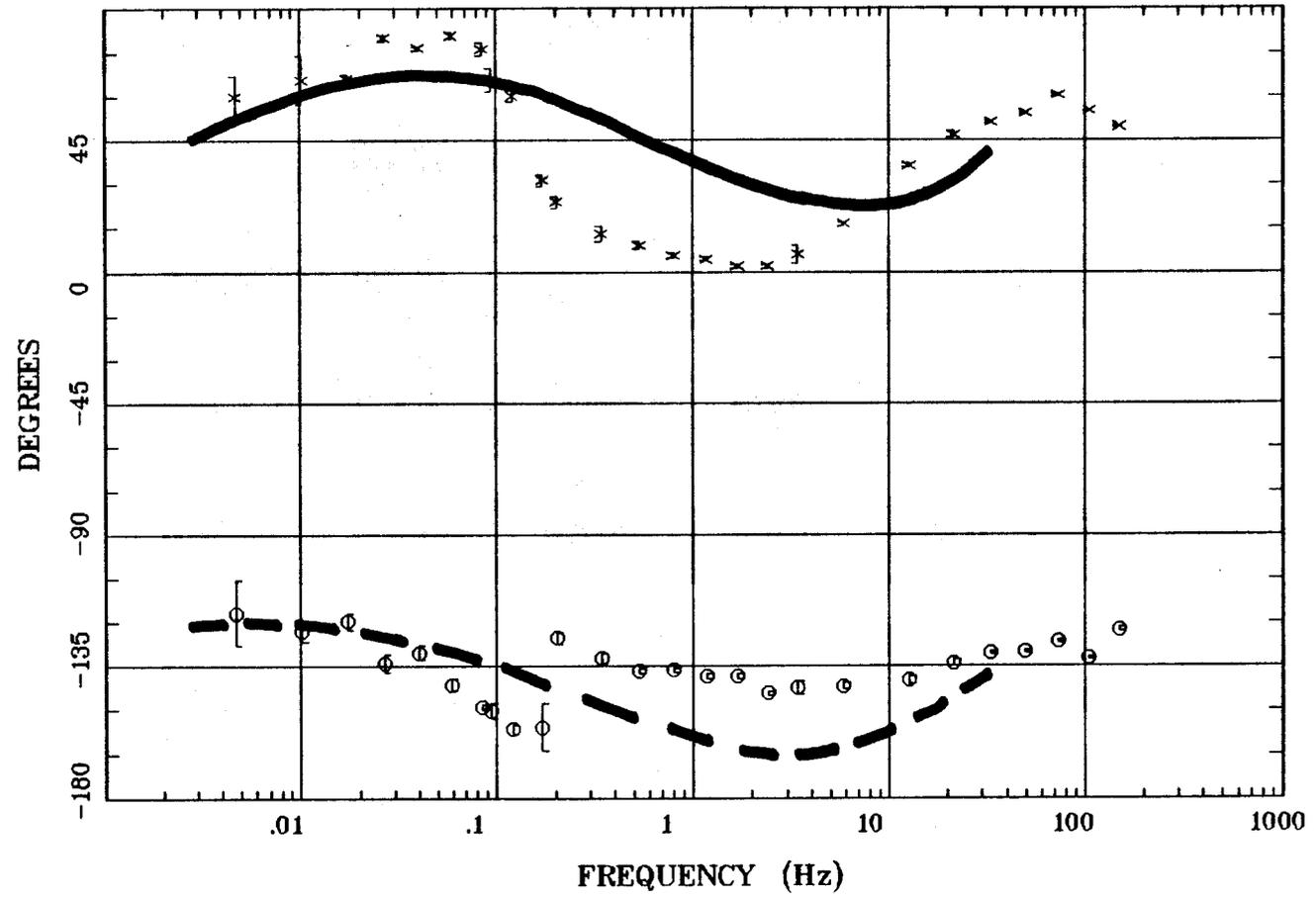


131

Client:	Rotation:
Remote:	Filename: NNR09
Acquired: :	Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Survey Co:	Plotted: 17:59 Jun 24, 1999
	< EMI - ElectroMagnetic Instruments >

Station 9A

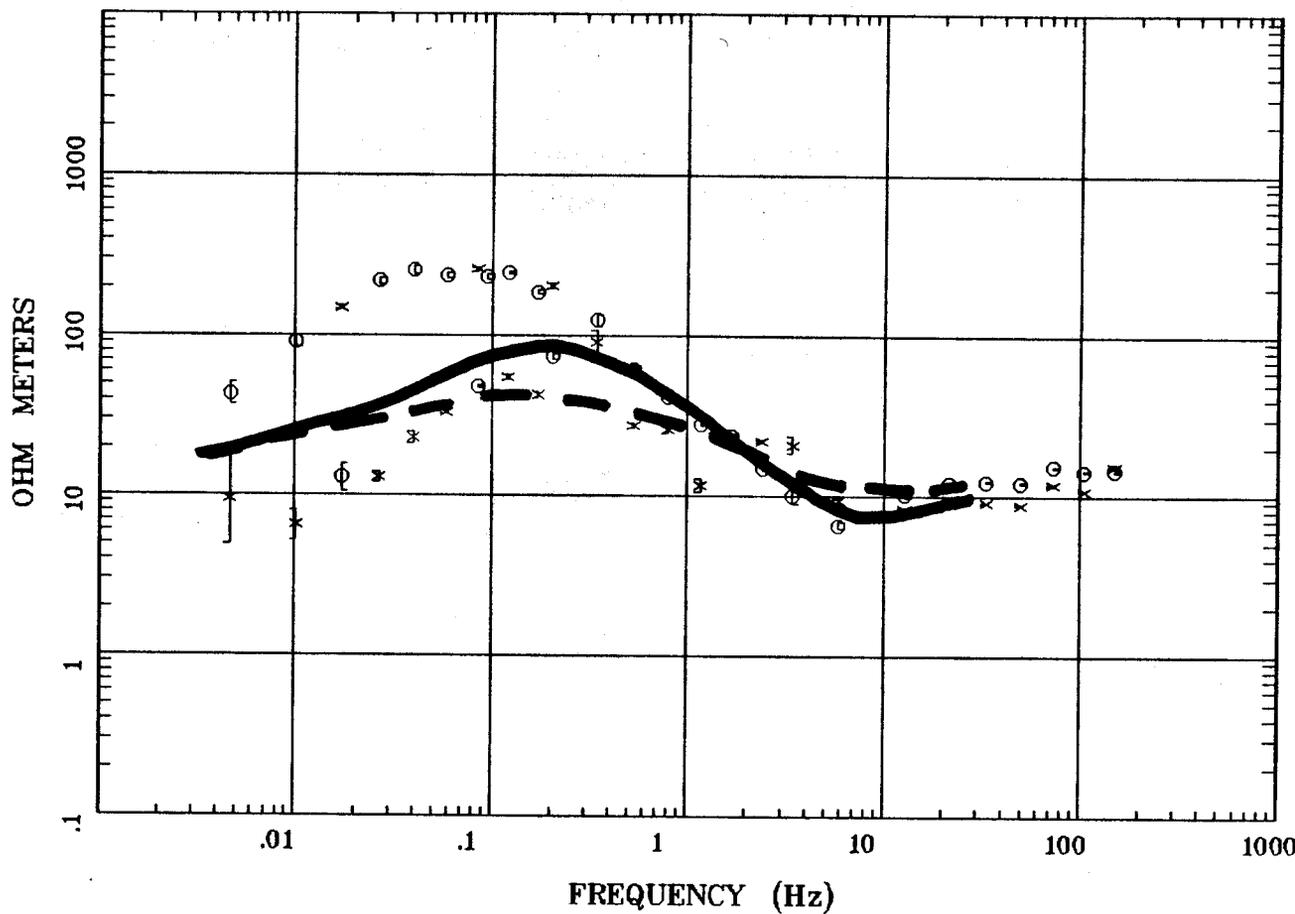
IMPEDANCE PHASE



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR09
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 17:59 Jun 24, 1999
< EMI - ElectroMagnetic Instruments >

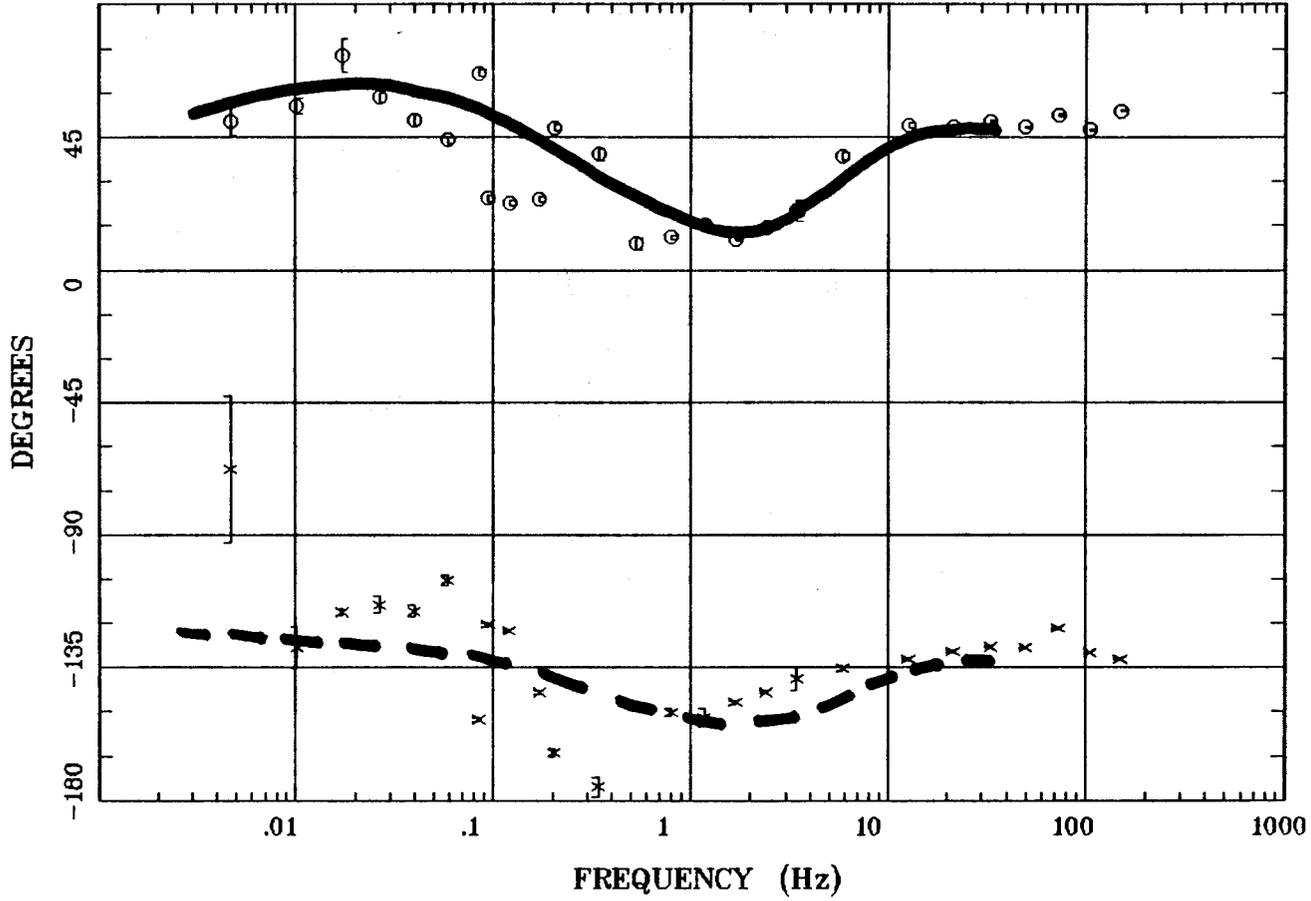
APPARENT RESISTIVITY



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR08
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 18:07 Jun 24, 1999
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

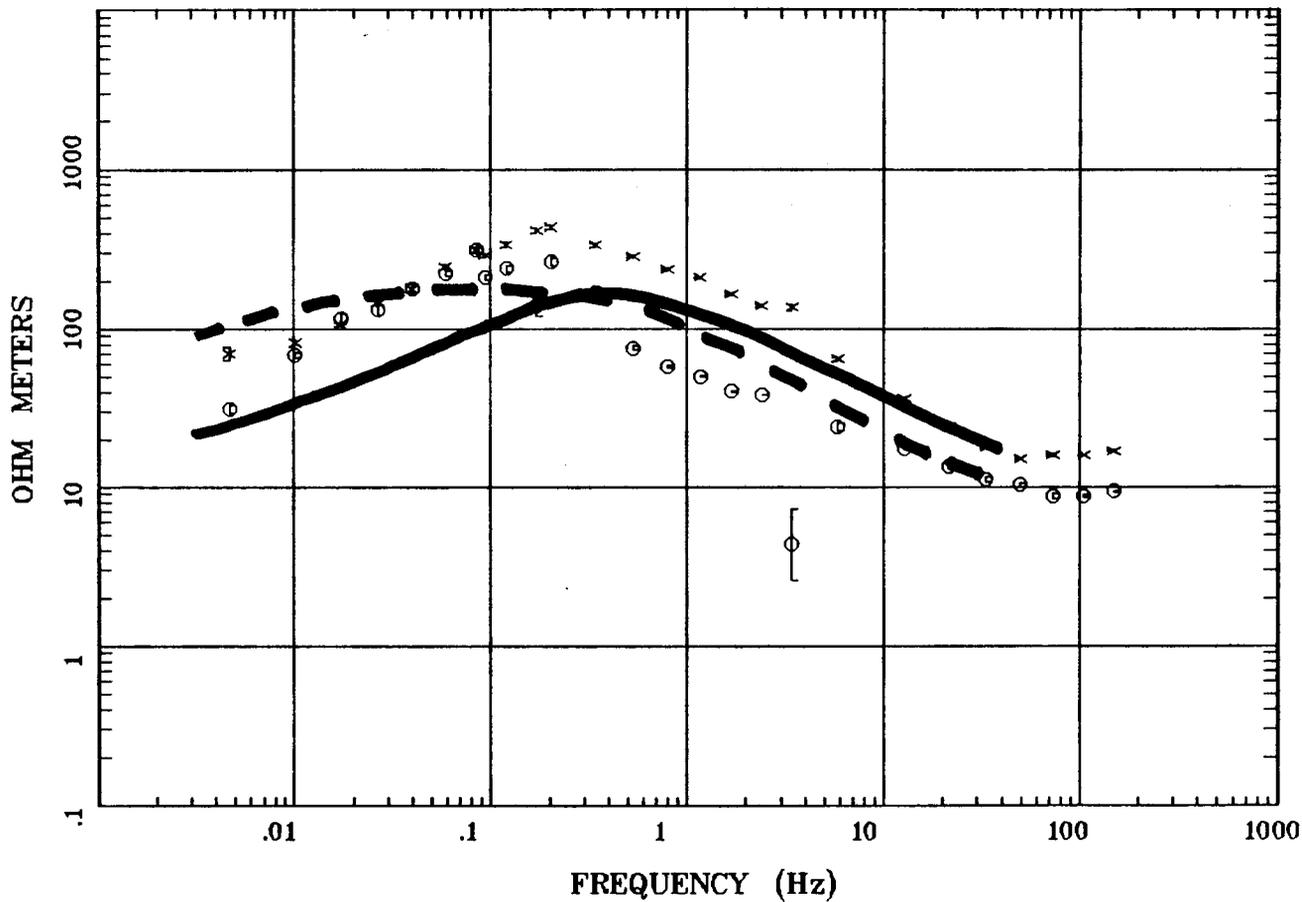


134

Client:
Remote:
Acquired: : ,
Survey Co:

Rotation:
Filename: NNR08
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 18:07 Jun 24, 1999
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

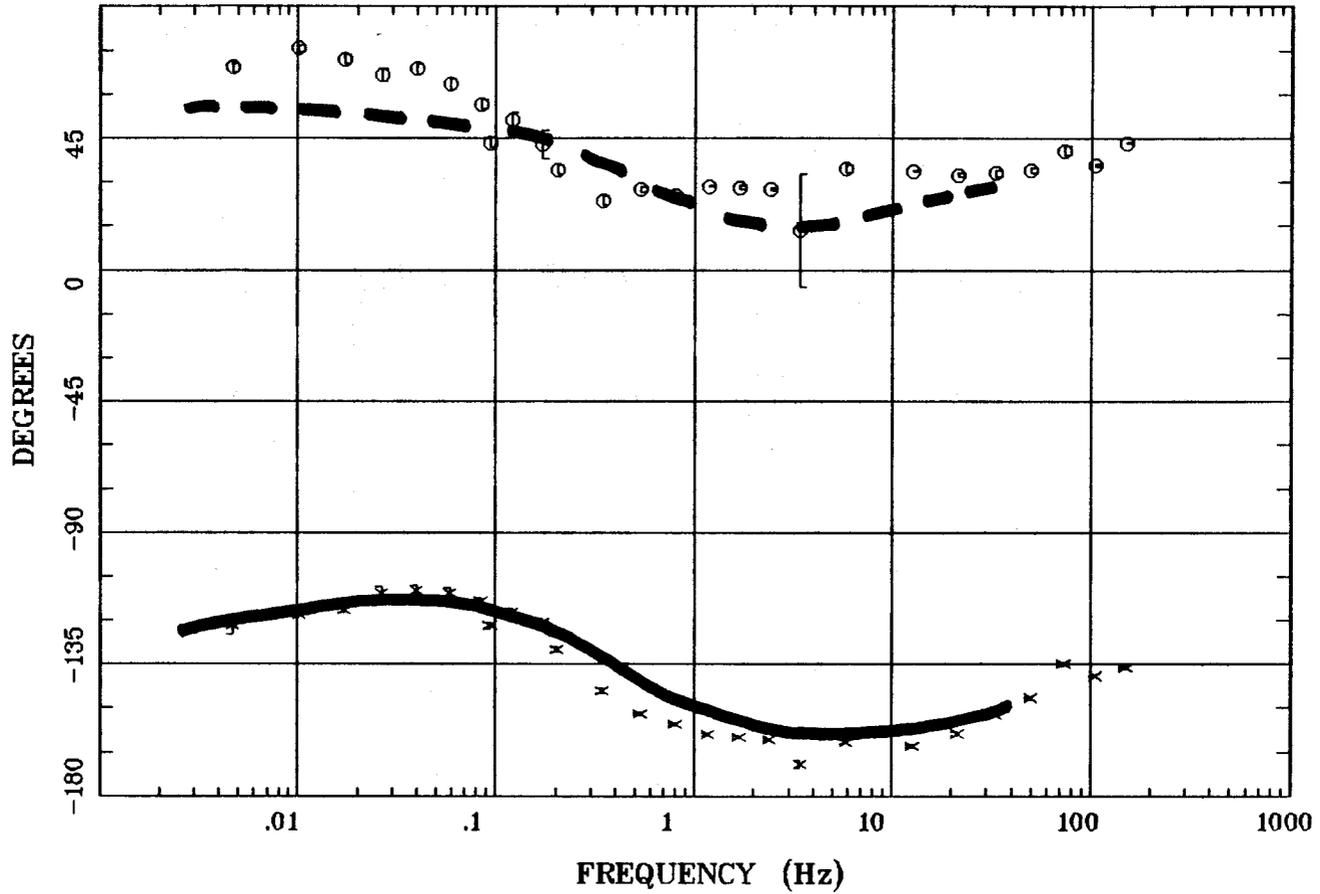


Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: NNR07
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 18:13 Jun 24, 1999
 < EMI - ElectroMagnetic Instruments >

Station 7A

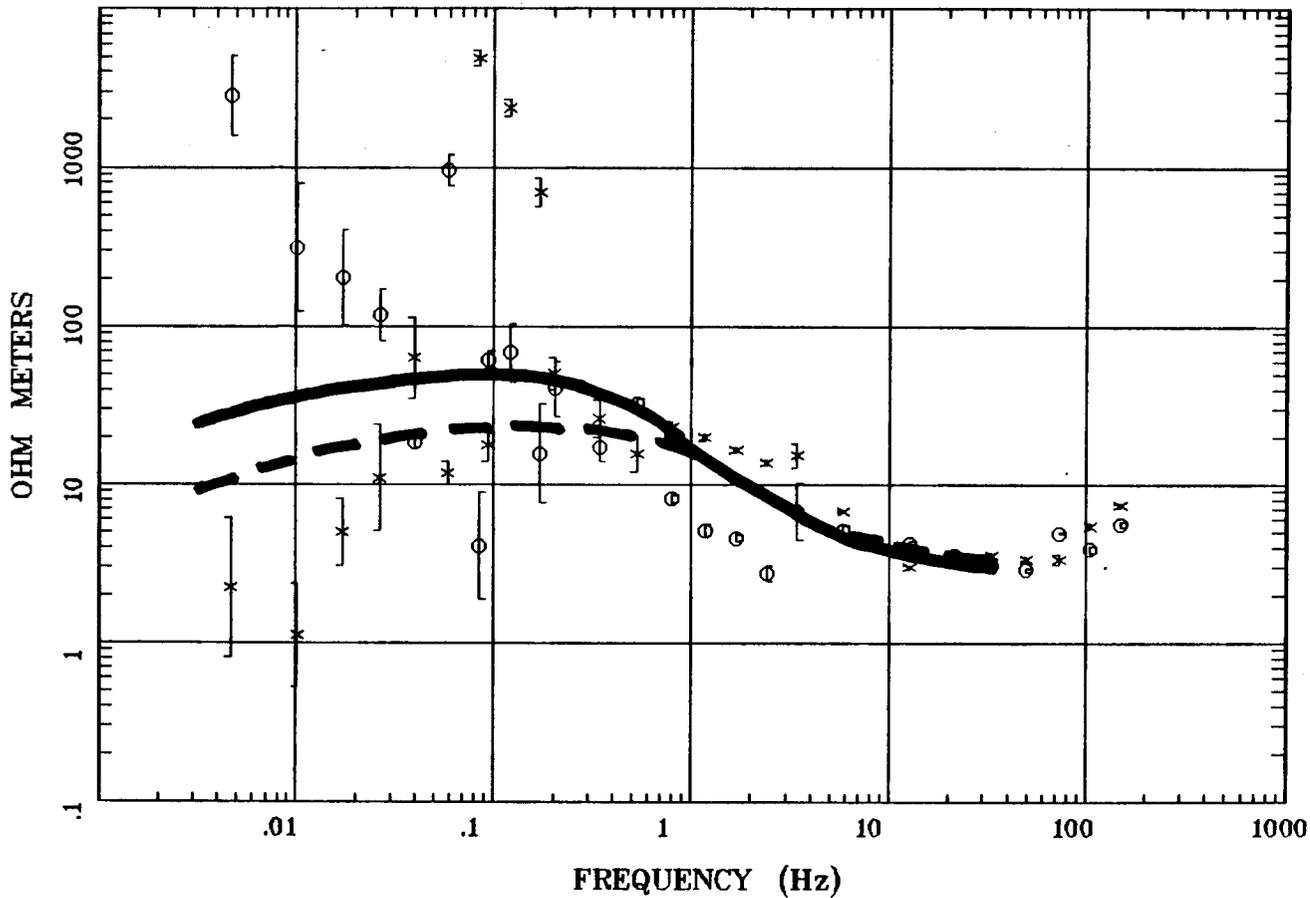
IMPEDANCE PHASE



Client:
Remote:
Acquired: :
Survey Co:

Rotation:
Filename: NNR07
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
Plotted: 18:13 Jun 24, 1999
< EMI - ElectroMagnetic Instruments >

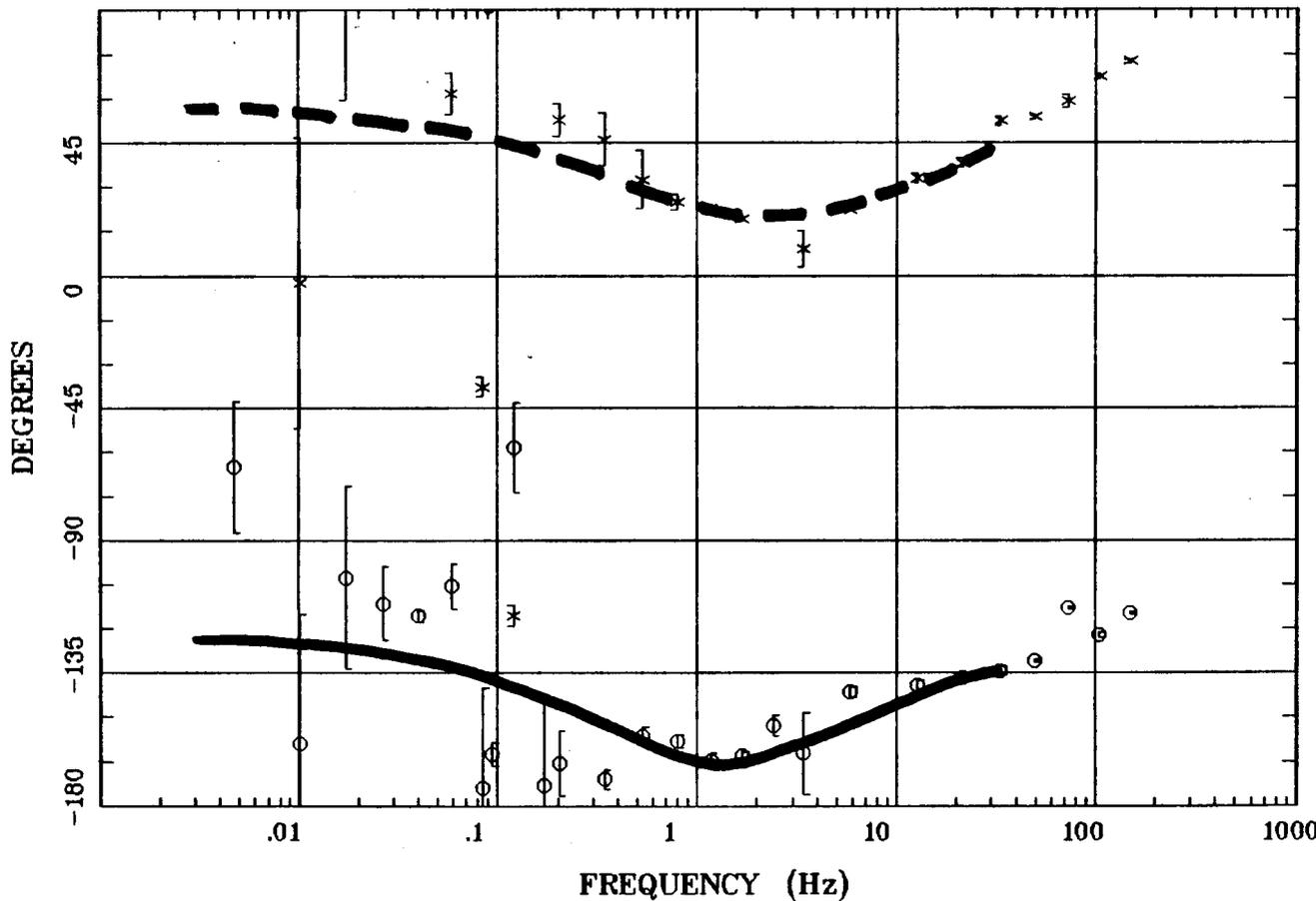
APPARENT RESISTIVITY



Client:
 Remote:
 Acquired: :
 Survey Co:

Rotation:
 Filename: CT18
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 10:14 Jun 25, 1999
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE



Client:
 Remote:
 Acquired: :
 Survey Co:

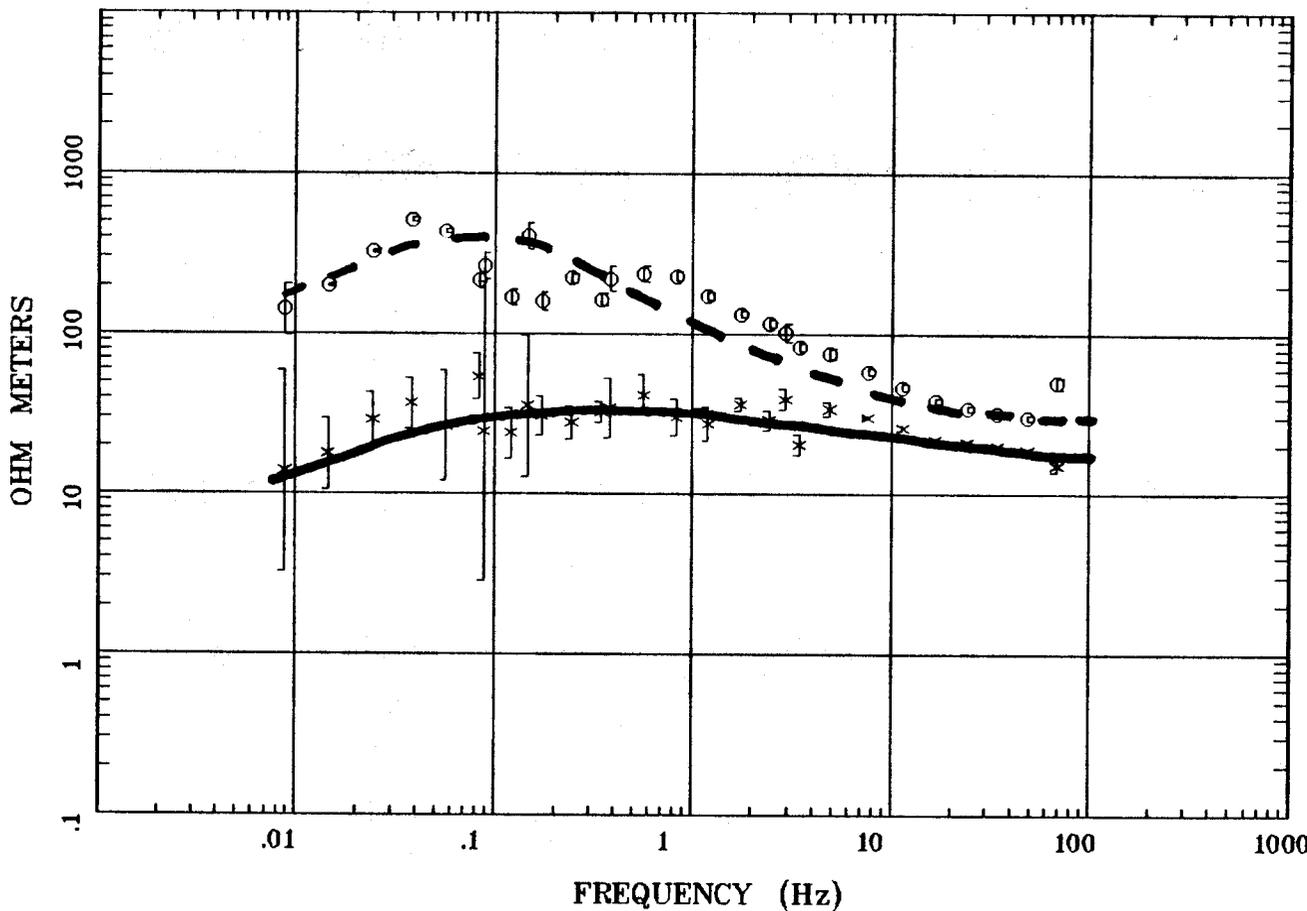
Rotation:
 Filename: CT18
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch6 Ch7
 Plotted: 10:14 Jun 25, 1999
 < EMI - ElectroMagnetic Instruments >

OBSERVED AND CALCULATED DATA - PROFILE MT1

Magnetotelluric (MT) observed (circle and x symbols) and calculated (solid and dashed lines are TE and TM modes, respectively) resistivity and phase data for profile MT1. See the "Magnetotelluric Data" section of this report for a description of the observed data and the "Resistivity Models" section for a description of the calculated data.

APPARENT RESISTIVITY

Kobeh Valley, NV



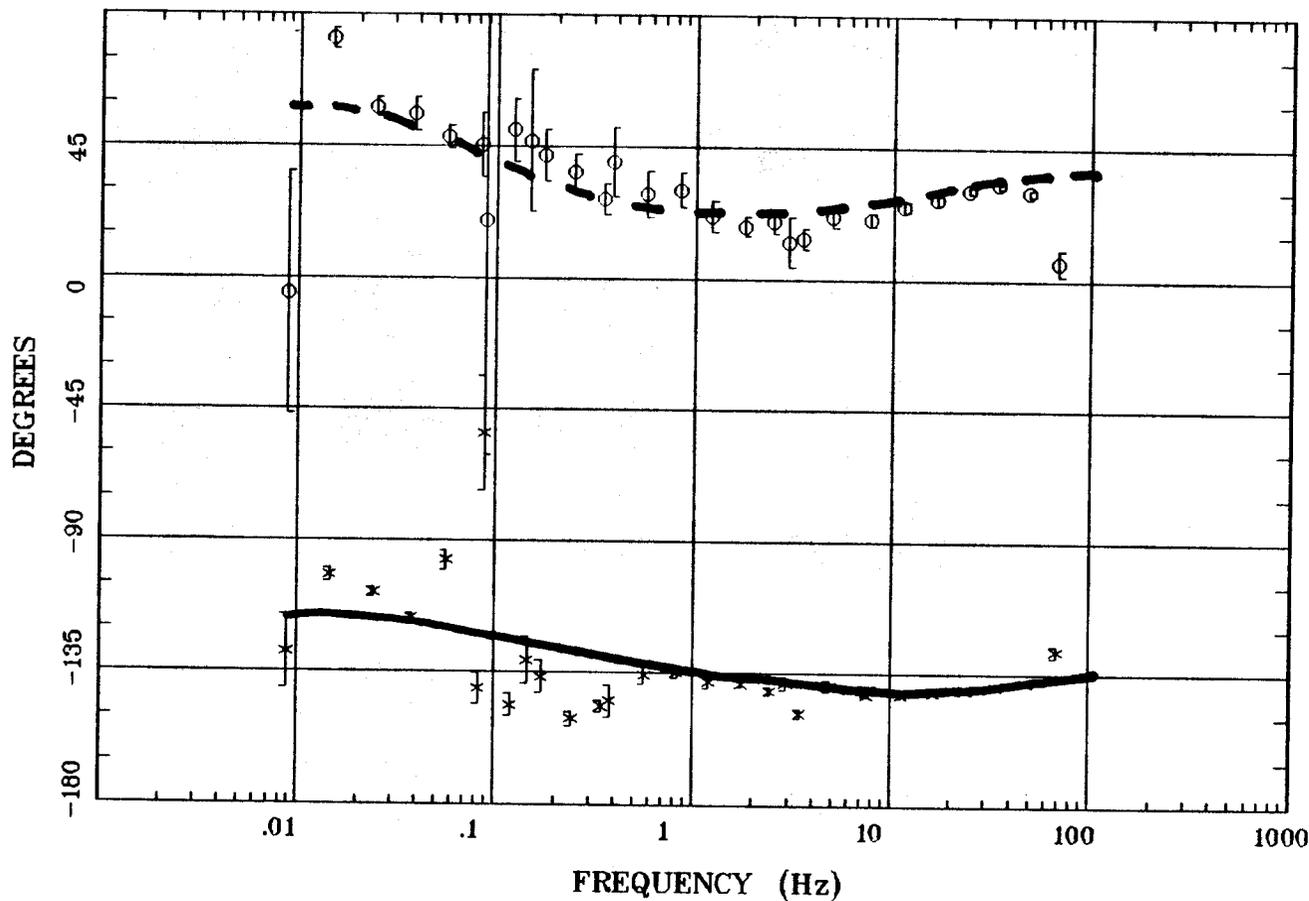
140

Client:
 Remote: none
 Acquired: 12:4 Aug 09, 1999
 Survey Co:USGS

Rotation:
 Filename: ar88b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:07 Dec 08, 2000,
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Kobeh Valley, NV



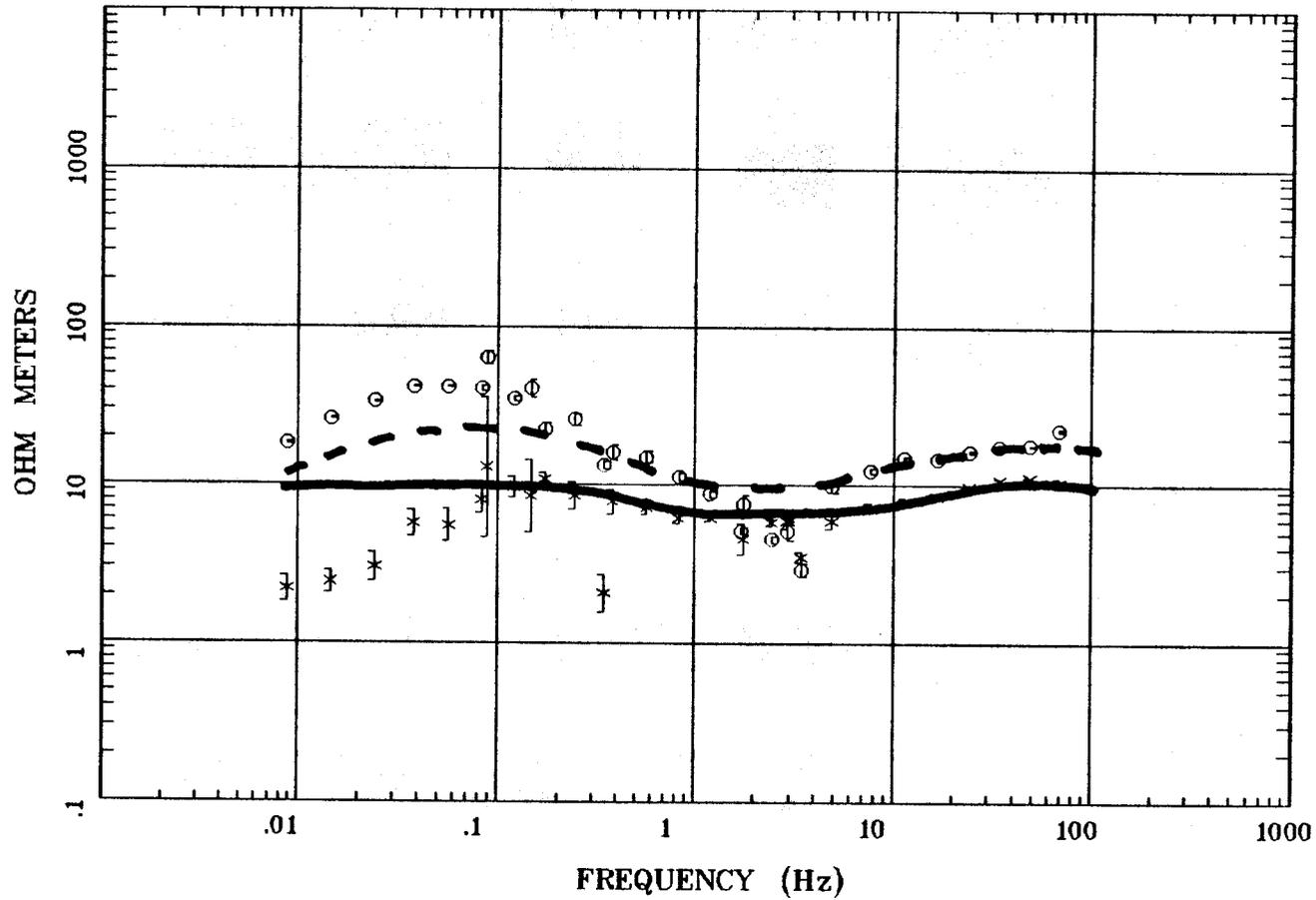
Client:
 Remote: none
 Acquired: 12:4 Aug 09, 1999
 Survey Co:USGS

Rotation:
 Filename: ar88b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:07 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 87

APPARENT RESISTIVITY

Kobeh Valley, NV



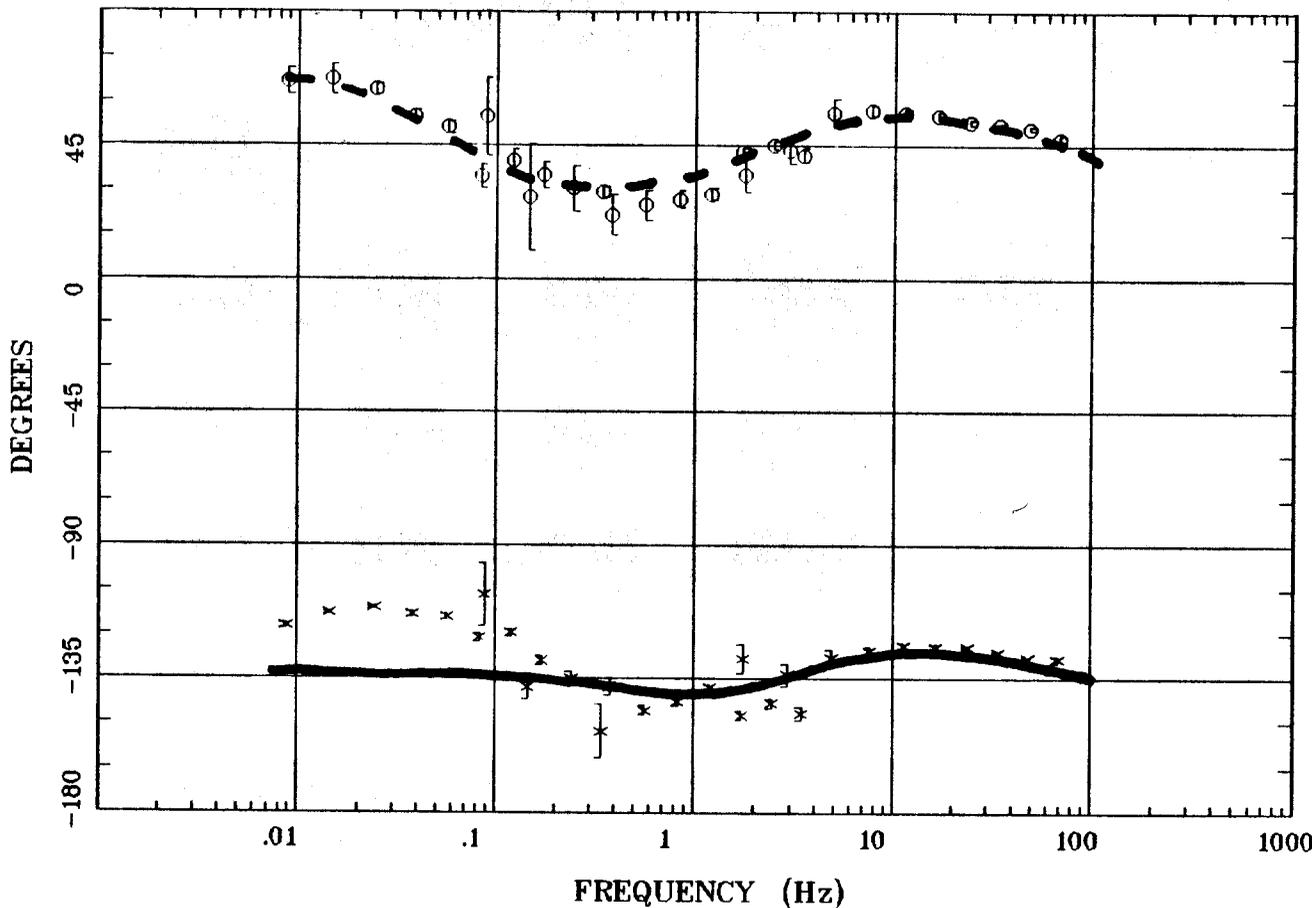
Client:
Remote: none
Acquired: 09:1 Aug 09, 1999
Survey Co:USGS

Rotation:
Filename: ar87all.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 11:05 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

142

IMPEDANCE PHASE

Kobeh Valley, NV

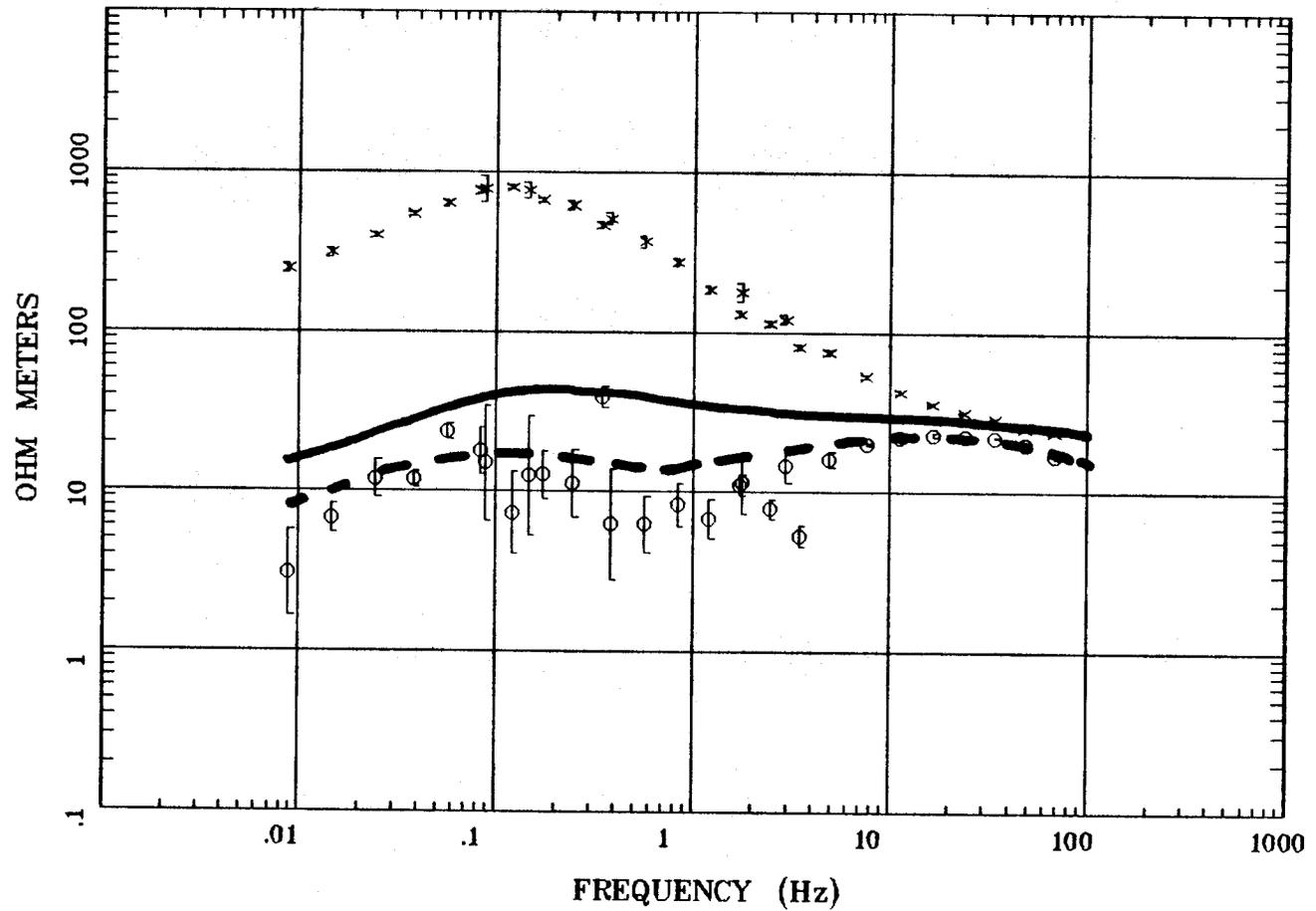


Client:
 Remote: none
 Acquired: 09:1 Aug 09, 1999
 Survey Co:USGS

Rotation:
 Filename: ar87all.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:05 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Kobeh Valley, NV



144

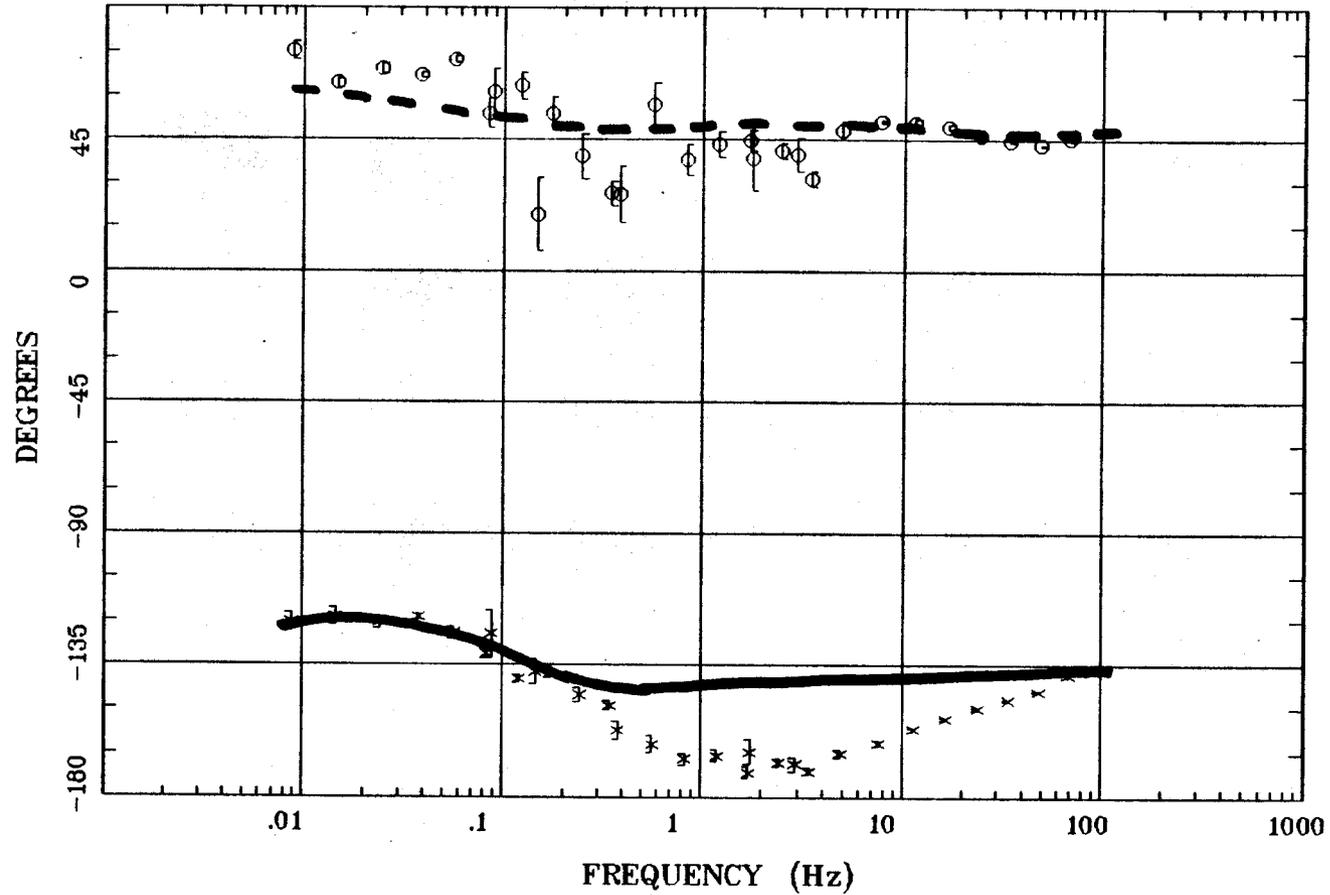
Client:
Remote: none
Acquired: 12:5 Aug 08, 1999
Survey Co:USGS

Rotation:
Filename: ar86all.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 11:04 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

Station 86

IMPEDANCE PHASE

Kobeh Valley, NV



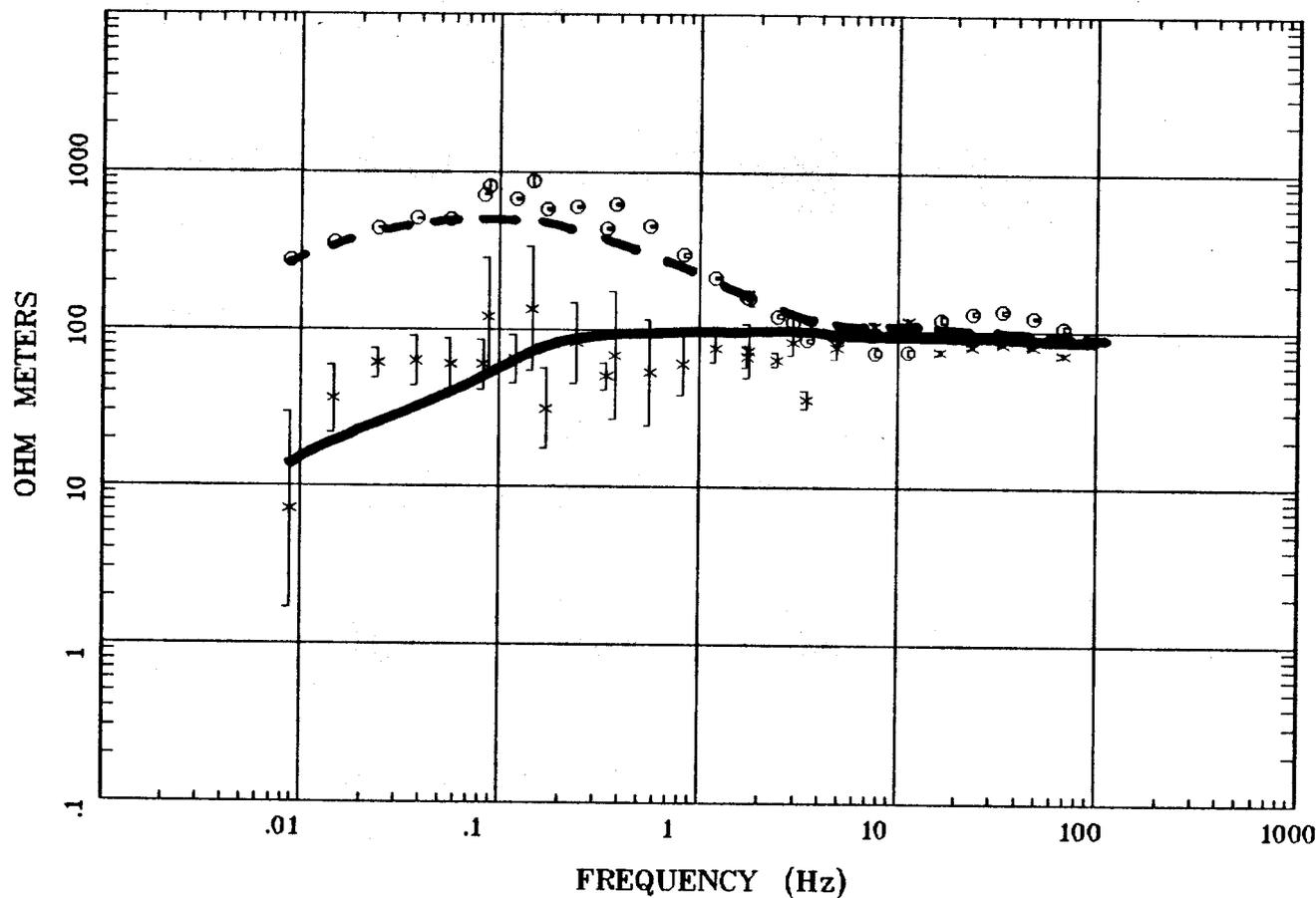
Client:
Remote: none
Acquired: 12:5 Aug 08, 1999
Survey Co:USGS

Rotation:
Filename: ar86all.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 11:04 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

145

APPARENT RESISTIVITY

whistler mtn.,nv

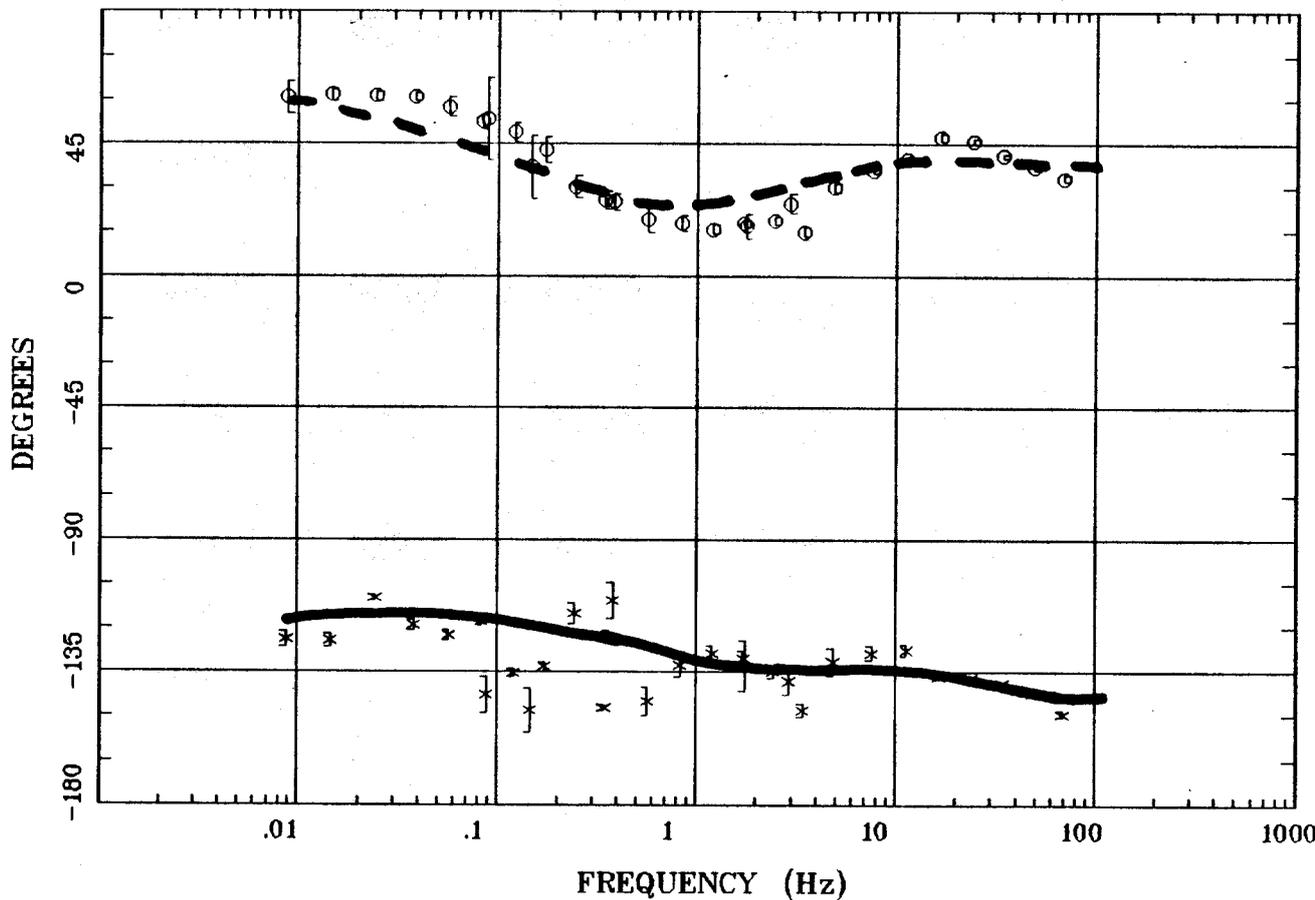


Client:
 Remote: none
 Acquired: 09:3 Aug 08, 1999
 Survey Co:USGS

Rotation:
 Filename: ar85all.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:03 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

whistler mtn.,nv



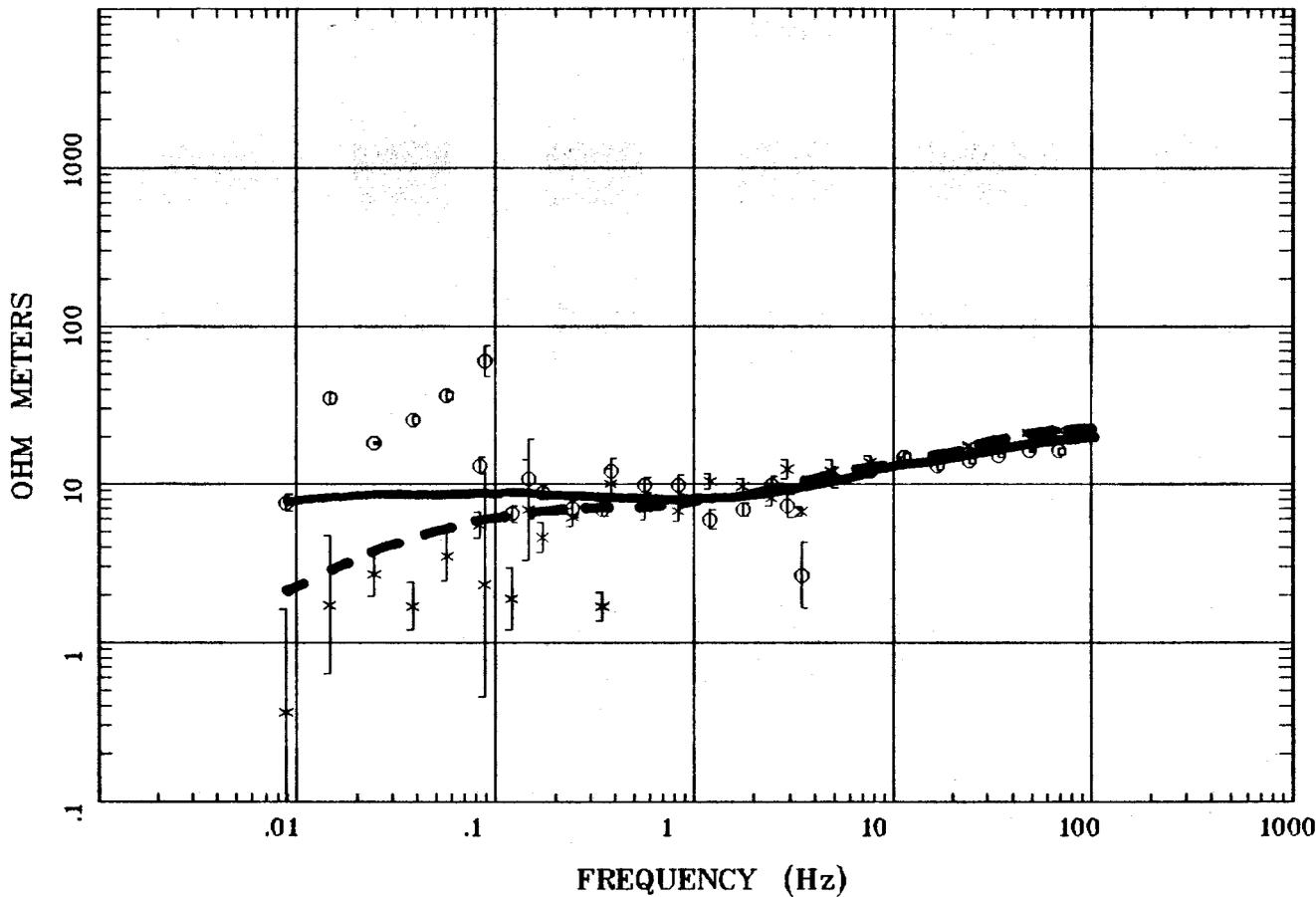
Client:
 Remote: none
 Acquired: 09:3 Aug 08, 1999
 Survey Co:USGS

Rotation:
 Filename: ar85all.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:03 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

147

APPARENT RESISTIVITY

Diamond Valley, NV

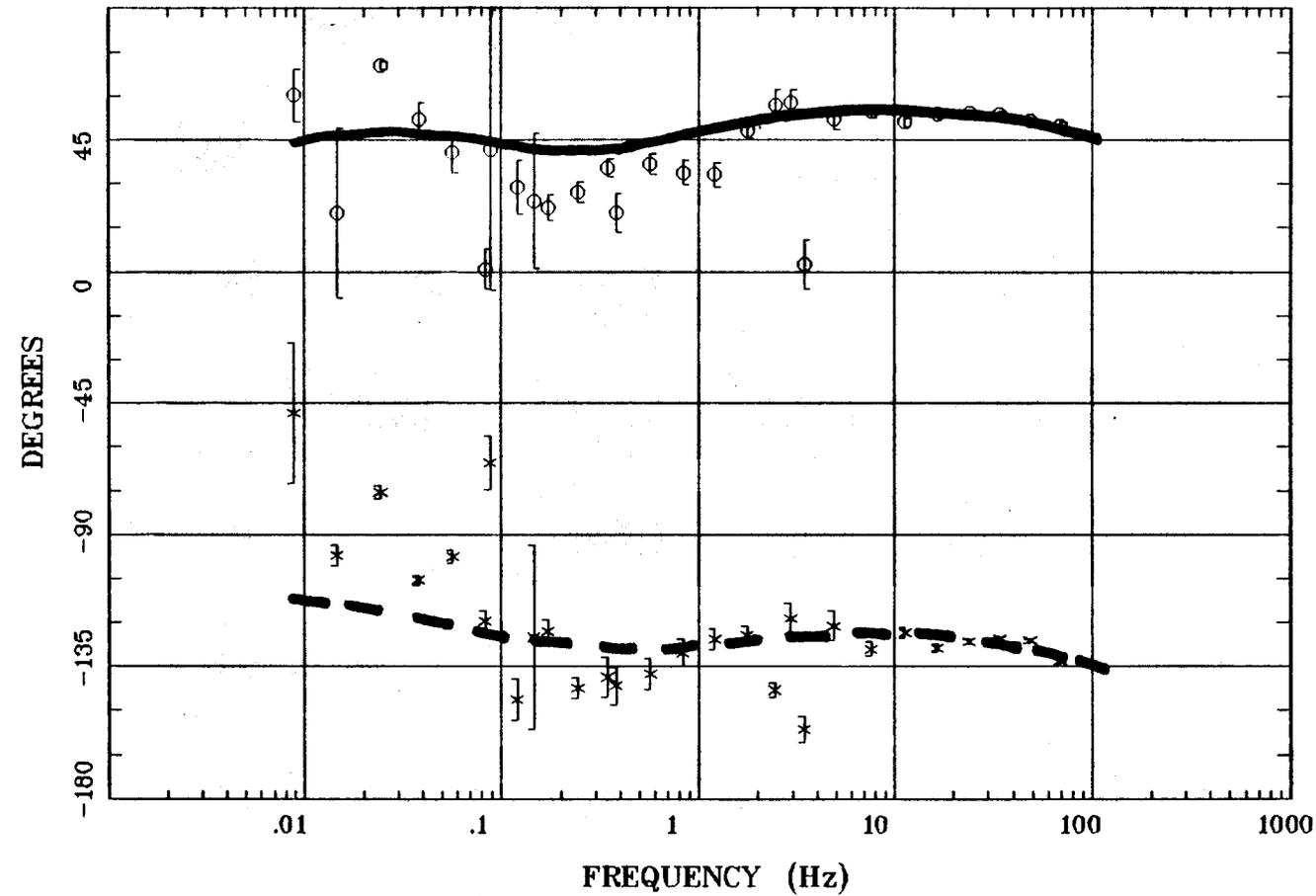


Client:
 Remote: none
 Acquired: 11:5 Aug 10, 1999
 Survey Co:USGS

Rotation:
 Filename: ar89.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:08 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Diamond Valley, NV



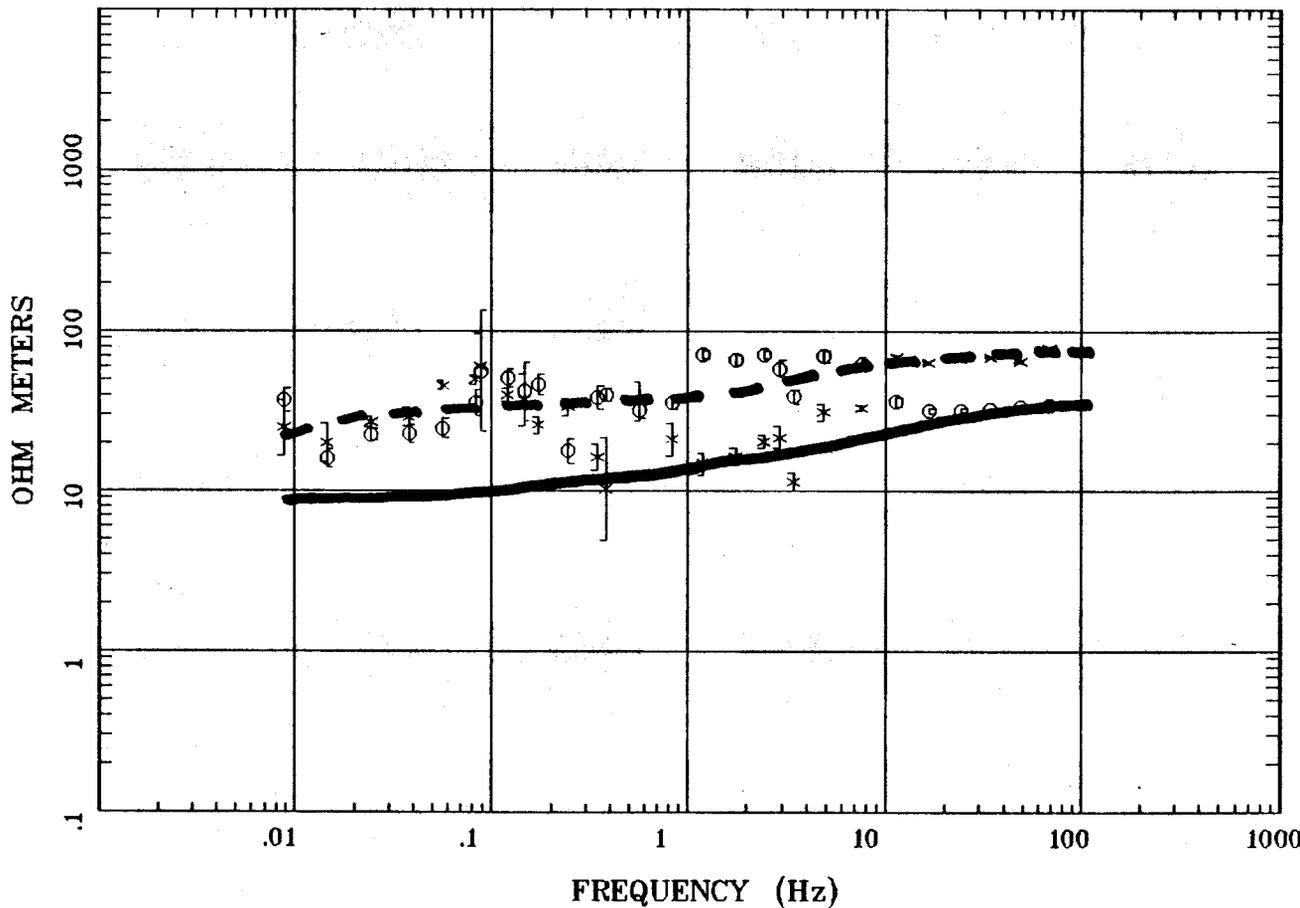
149

Client:
Remote: none
Acquired: 11:5 Aug 10, 1999
Survey Co:USGS

Rotation:
Filename: ar89.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 11:08 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Newark Lake, NV 100K

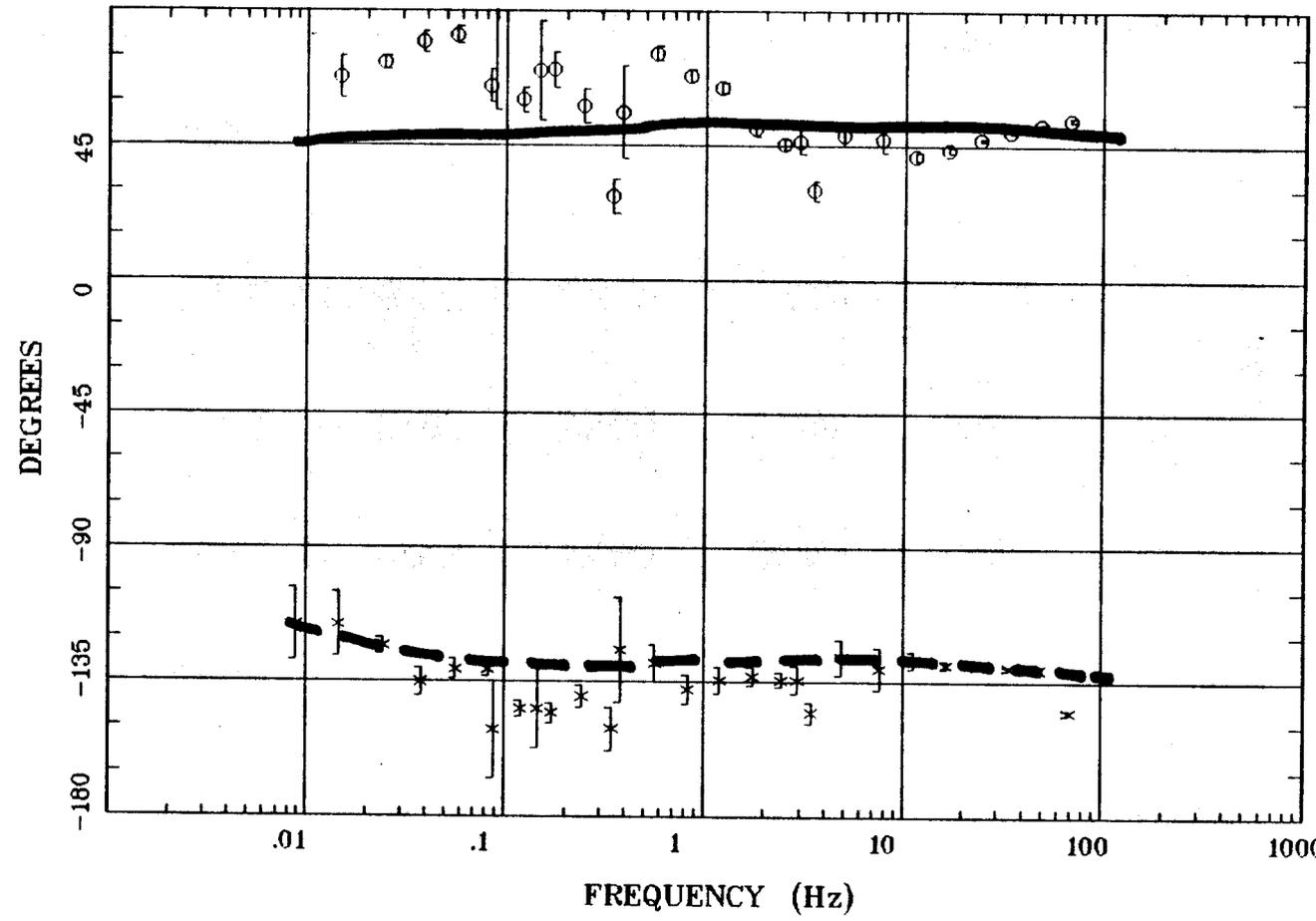


Client:
 Remote: none
 Acquired: 09:2 Aug 08, 2000
 Survey Co:USGS

Rotation:
 Filename: ar109b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:53 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Newark Lake, NV 100K



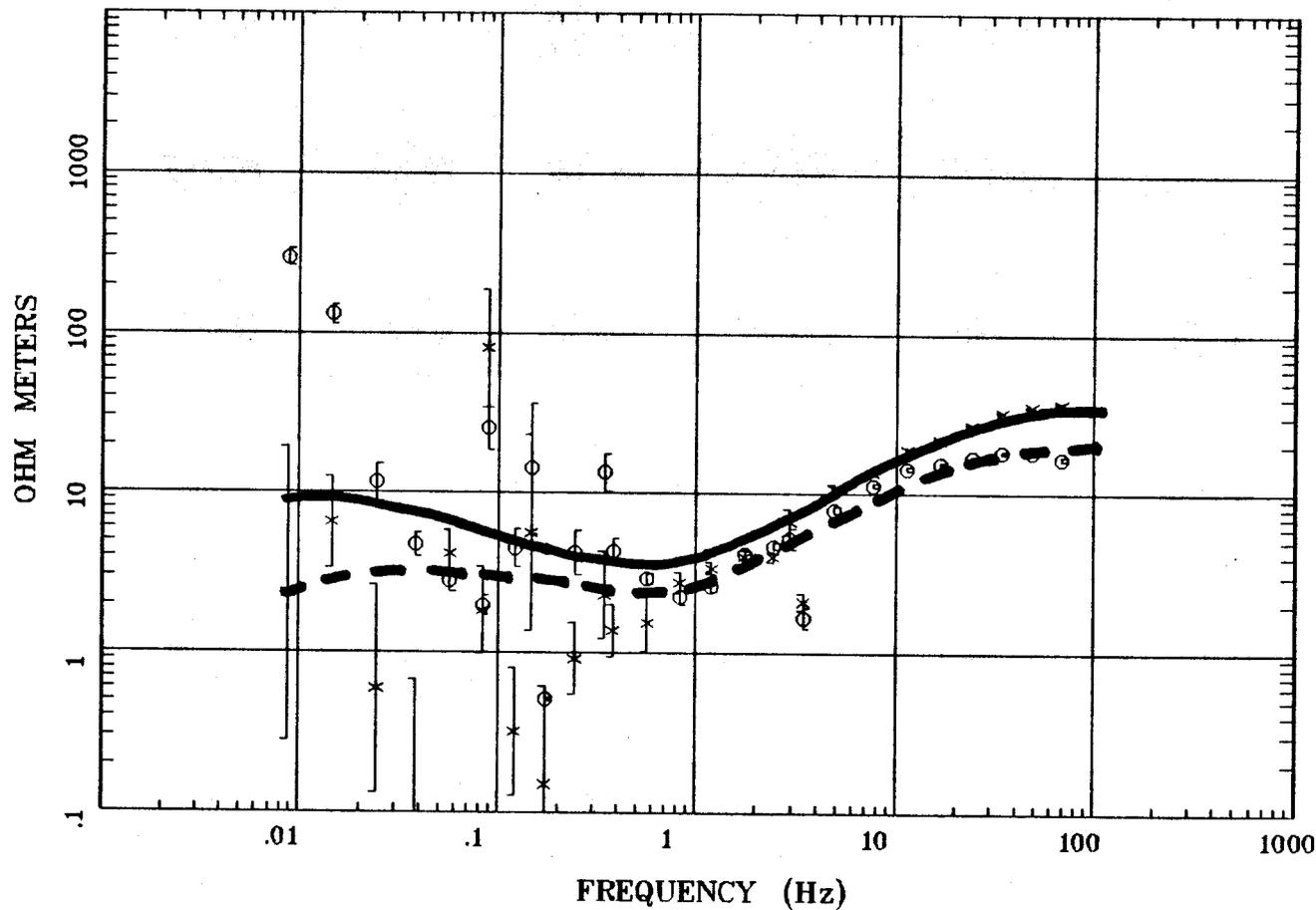
151

Client:
Remote: none
Acquired: 09:2 Aug 08, 2000
Survey Co:USGS

Rotation:
Filename: ar109b.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 10:53 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Diamond Mtns., NV

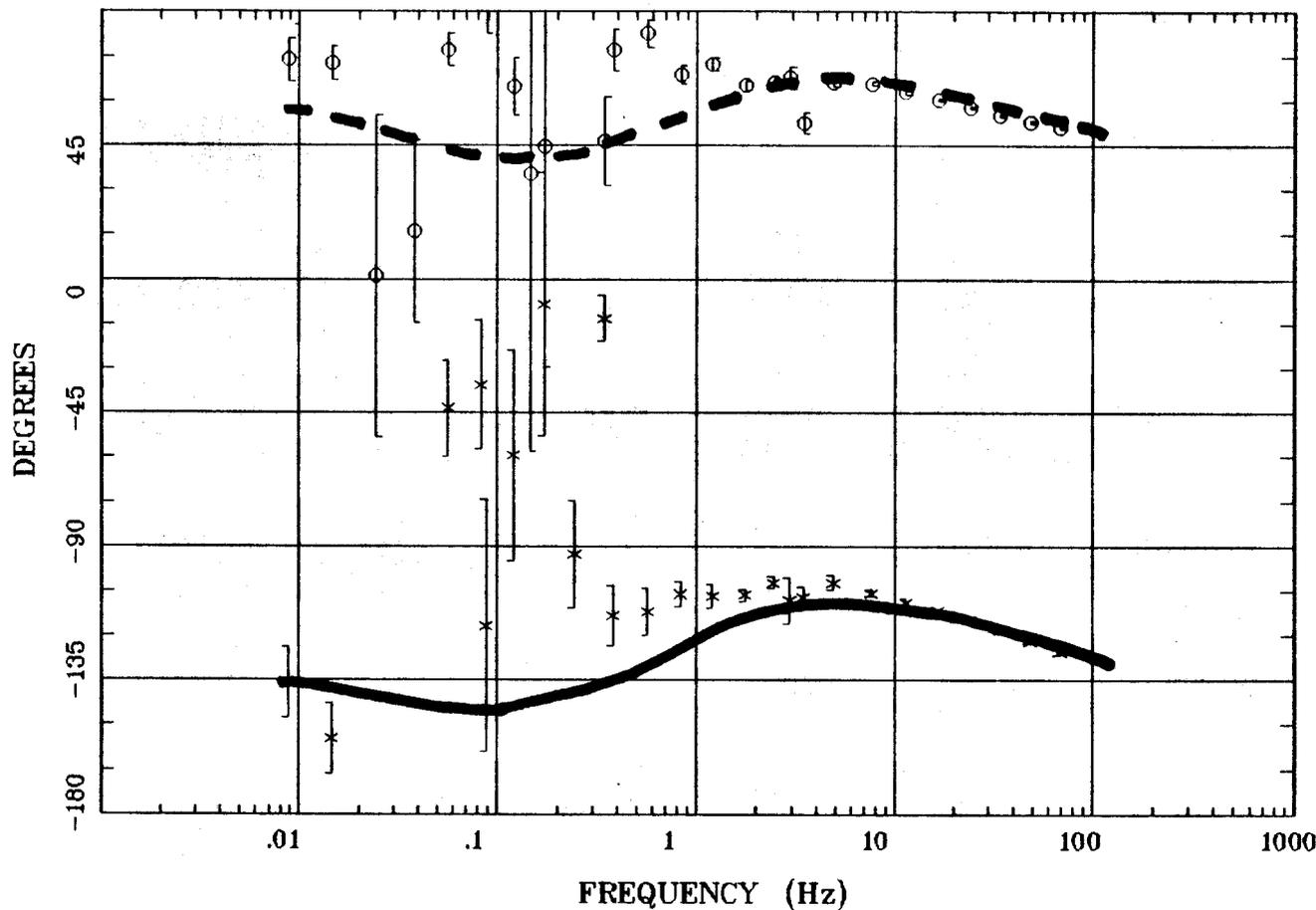


Client:
 Remote: none
 Acquired: 09:4 Aug 07, 1999
 Survey Co:USGS

Rotation:
 Filename: ar83b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:01 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Diamond Mtns., NV

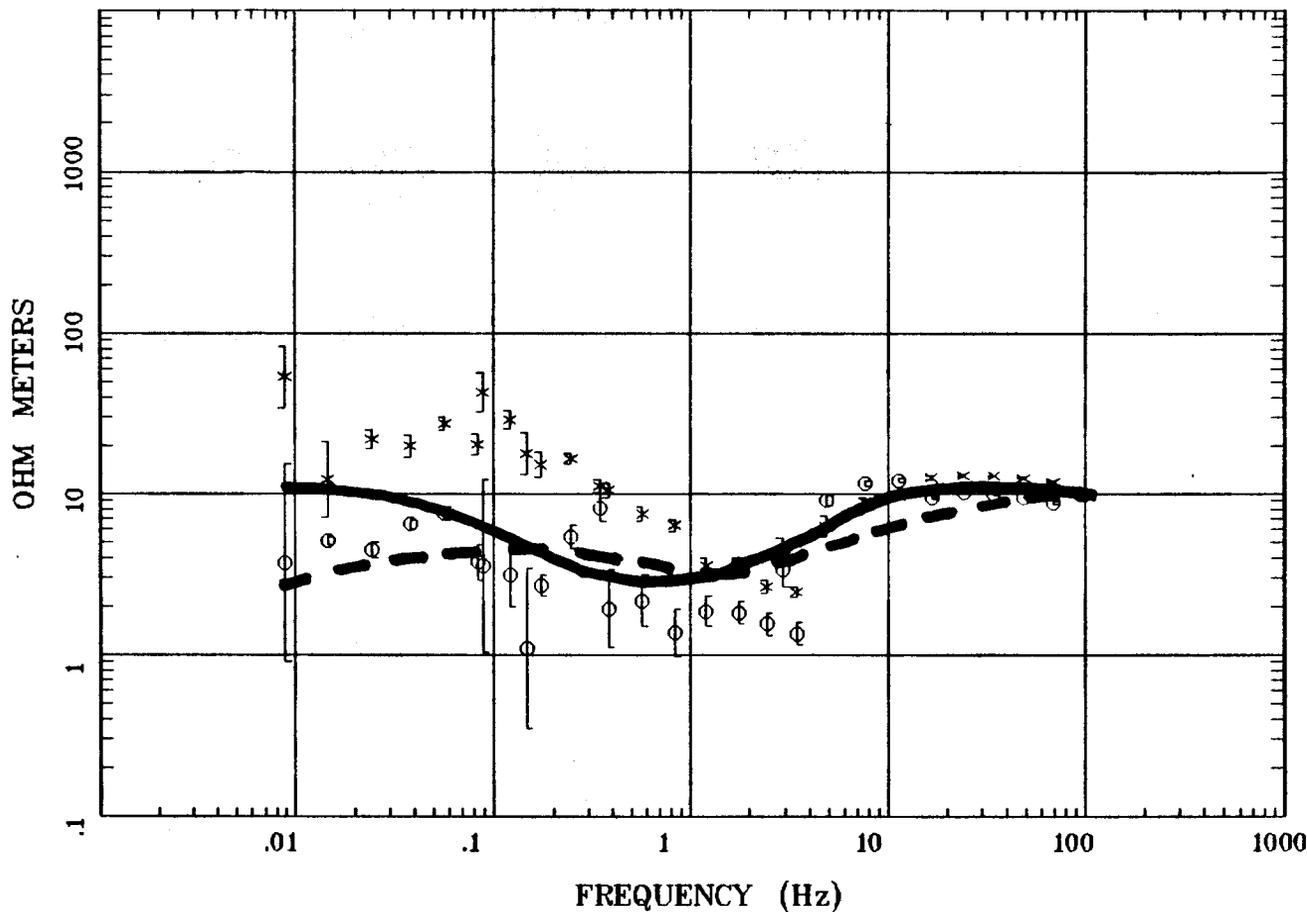


Client:
 Remote: none
 Acquired: 09:4 Aug 07, 1999
 Survey Co:USGS

Rotation:
 Filename: ar83b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:01 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Newark Valley, NV

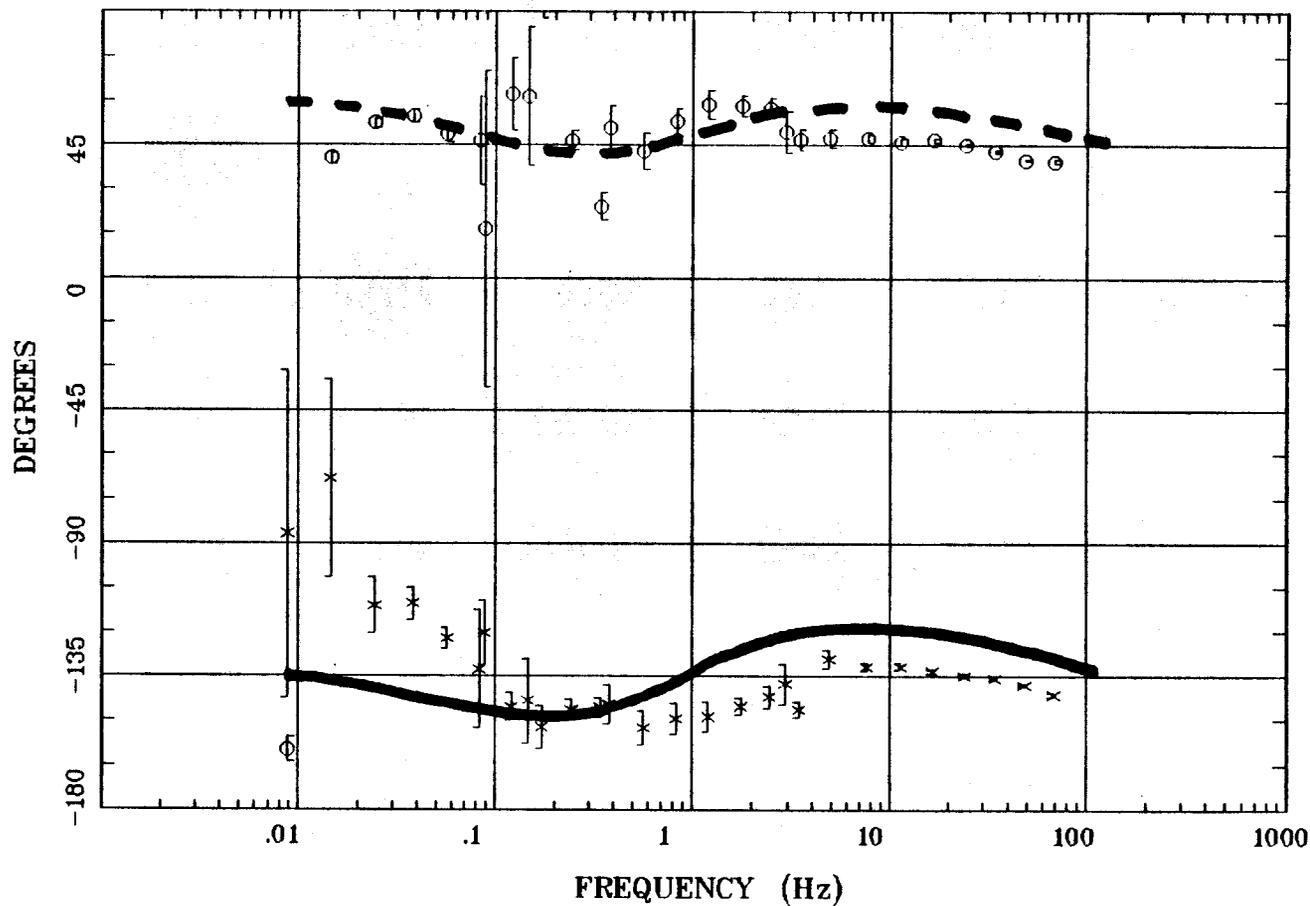


Client:
 Remote: none
 Acquired: 14:1 Aug 06, 1999
 Survey Co:USGS

Rotation:
 Filename: ar82b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:00 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Newark Valley, NV



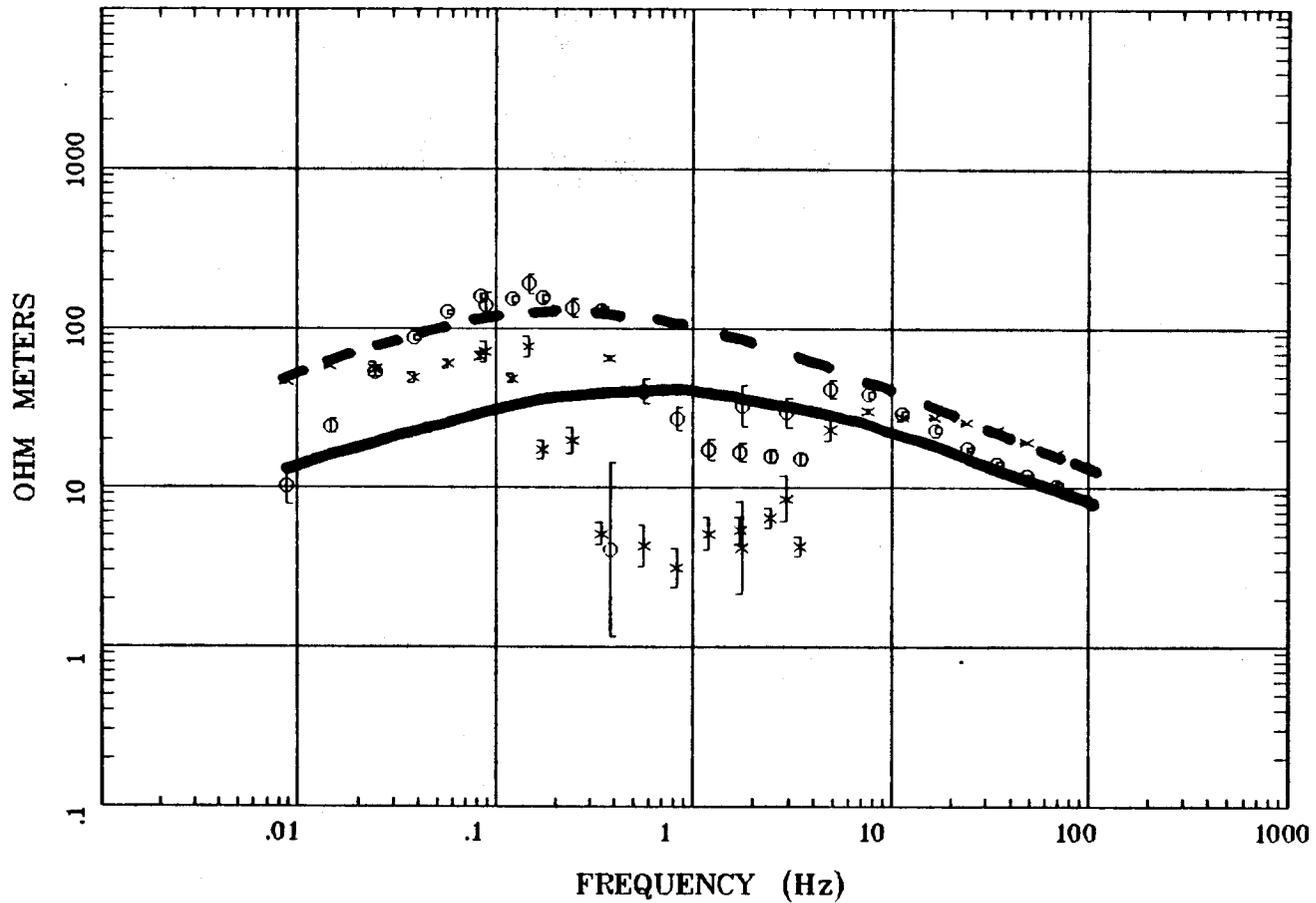
Client:
 Remote: none
 Acquired: 14:1 Aug 06, 1999
 Survey Co:USGS

Rotation:
 Filename: ar82b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 11:00 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

Station 81

APPARENT RESISTIVITY

newark valley,nv

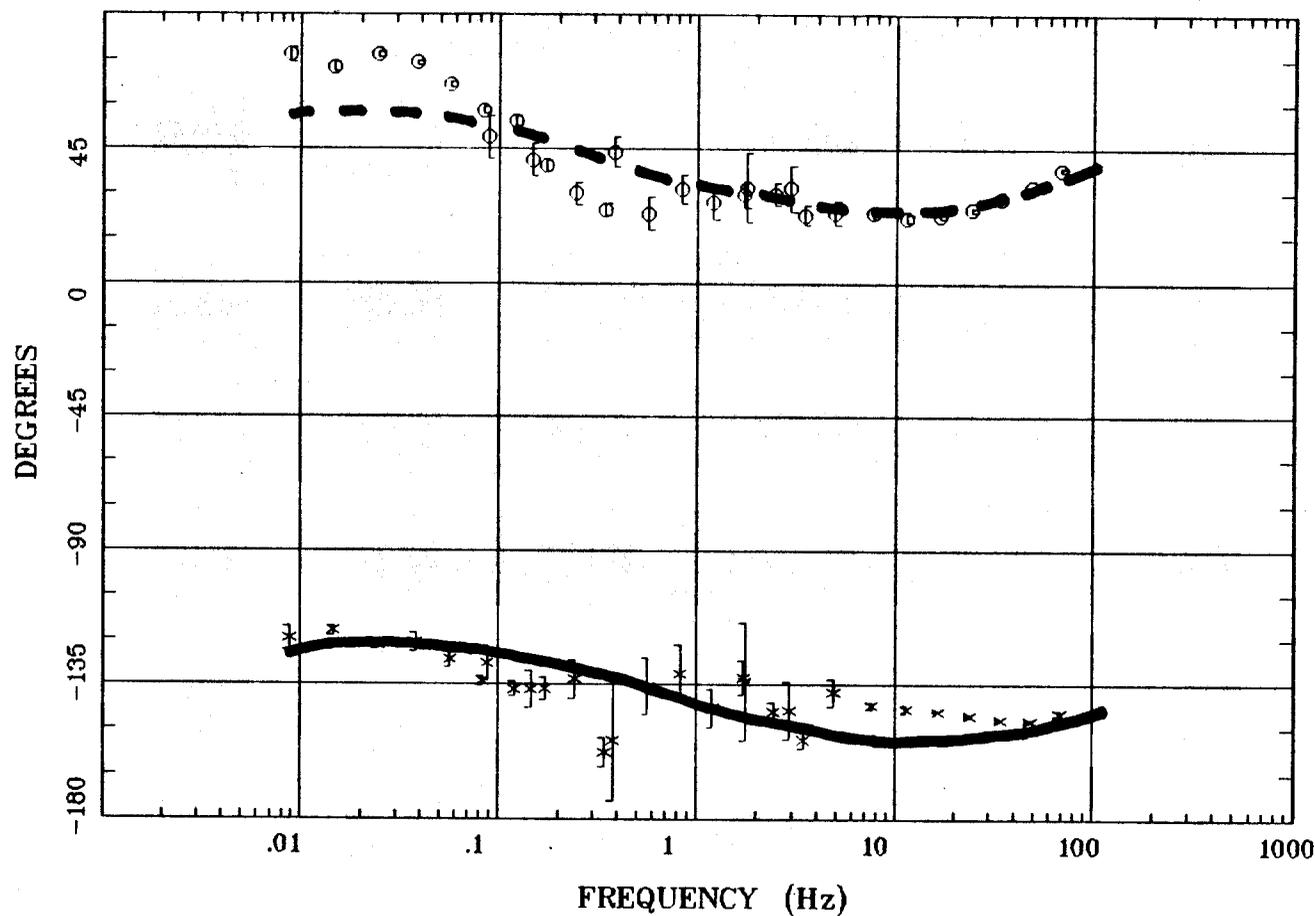


Client:
Remote: none
Acquired: 11:2 Aug 06, 1999
Survey Co:USGS

Rotation:
Filename: ar81.avg
Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
Plotted: 10:58 Dec 08, 2000
< EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

newark valley,nv

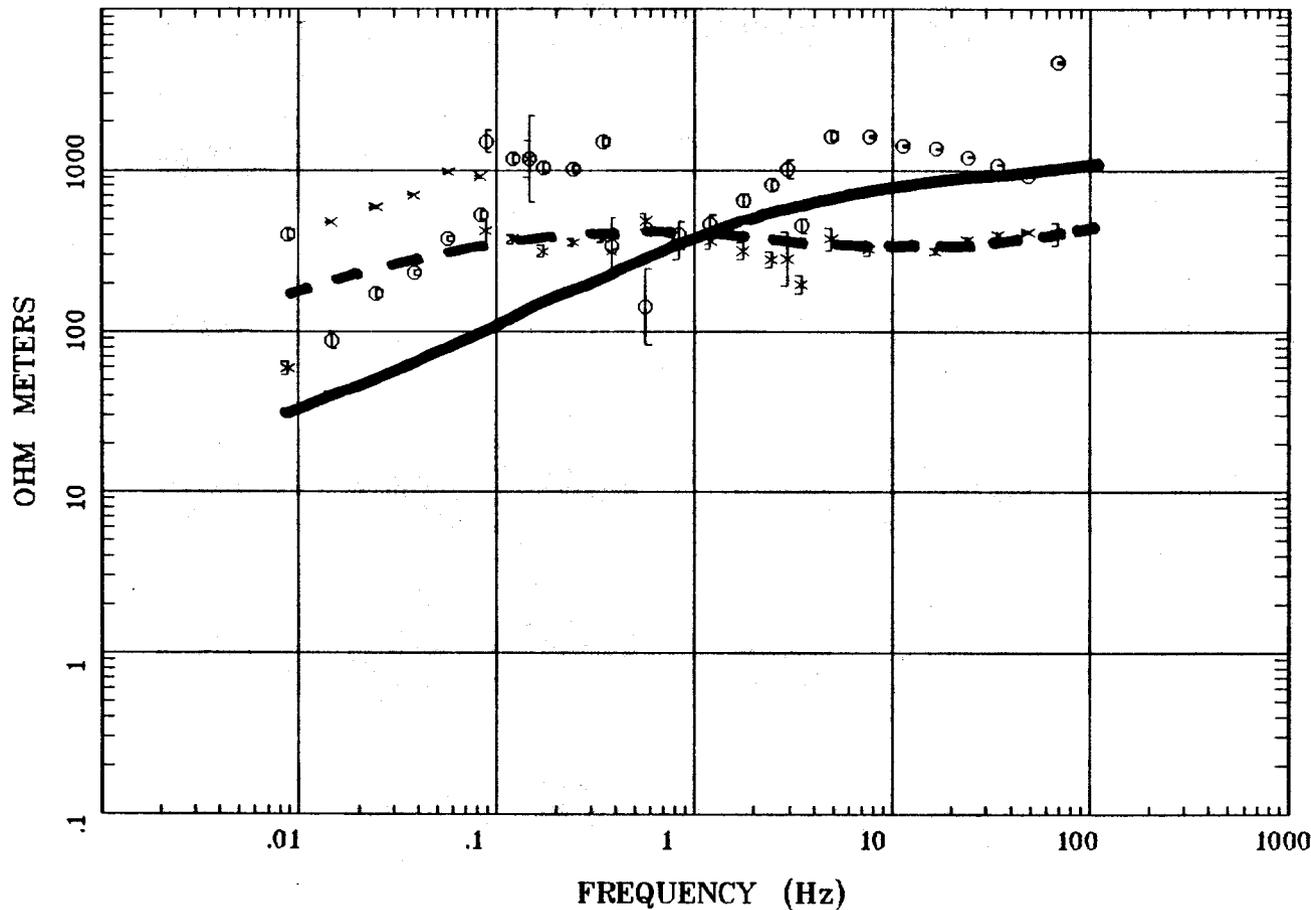


Client:
 Remote: none
 Acquired: 11:2 Aug 06, 1999
 Survey Co:USGS

Rotation:
 Filename: ar81.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:58 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Newark Lake, NV 100K

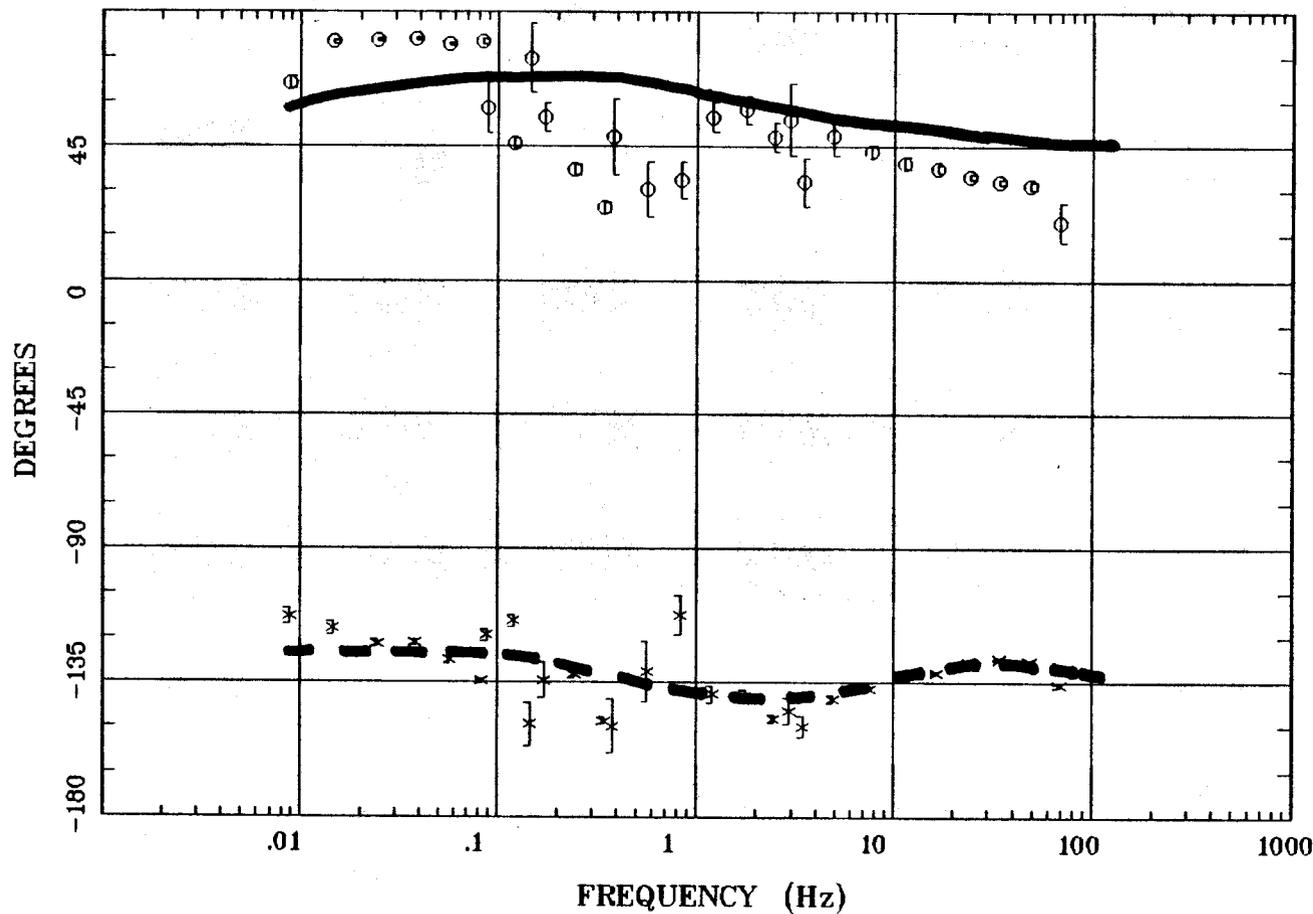


Client:
 Remote: none
 Acquired: 11:1 Aug 07, 2000
 Survey Co:USGS

Rotation:
 Filename: ar108b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:51 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Newark Lake, NV 100K

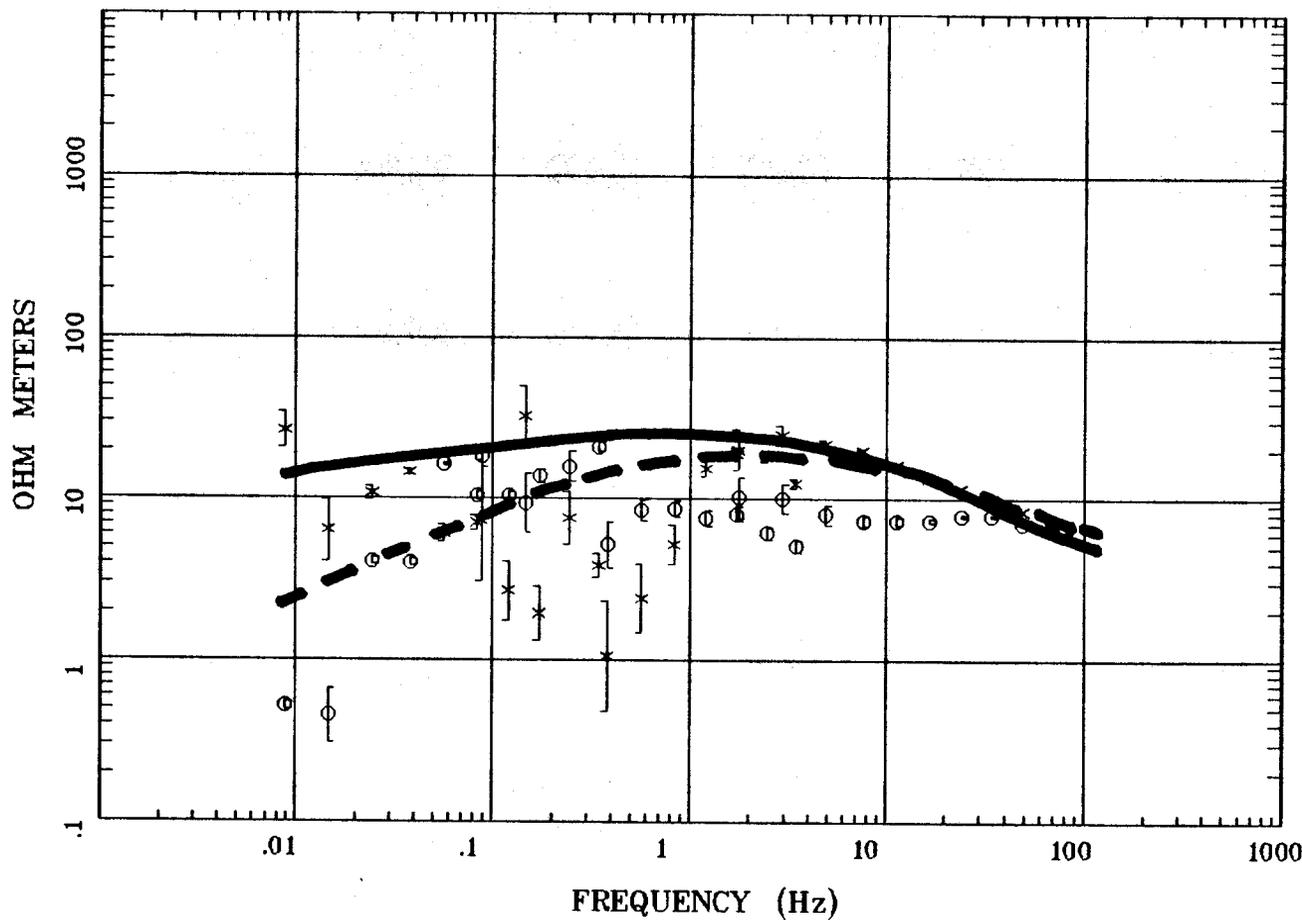


Client:
 Remote: none
 Acquired: 11:1 Aug 07, 2000
 Survey Co:USGS

Rotation:
 Filename: ar108b.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:51 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Alligator Ridge

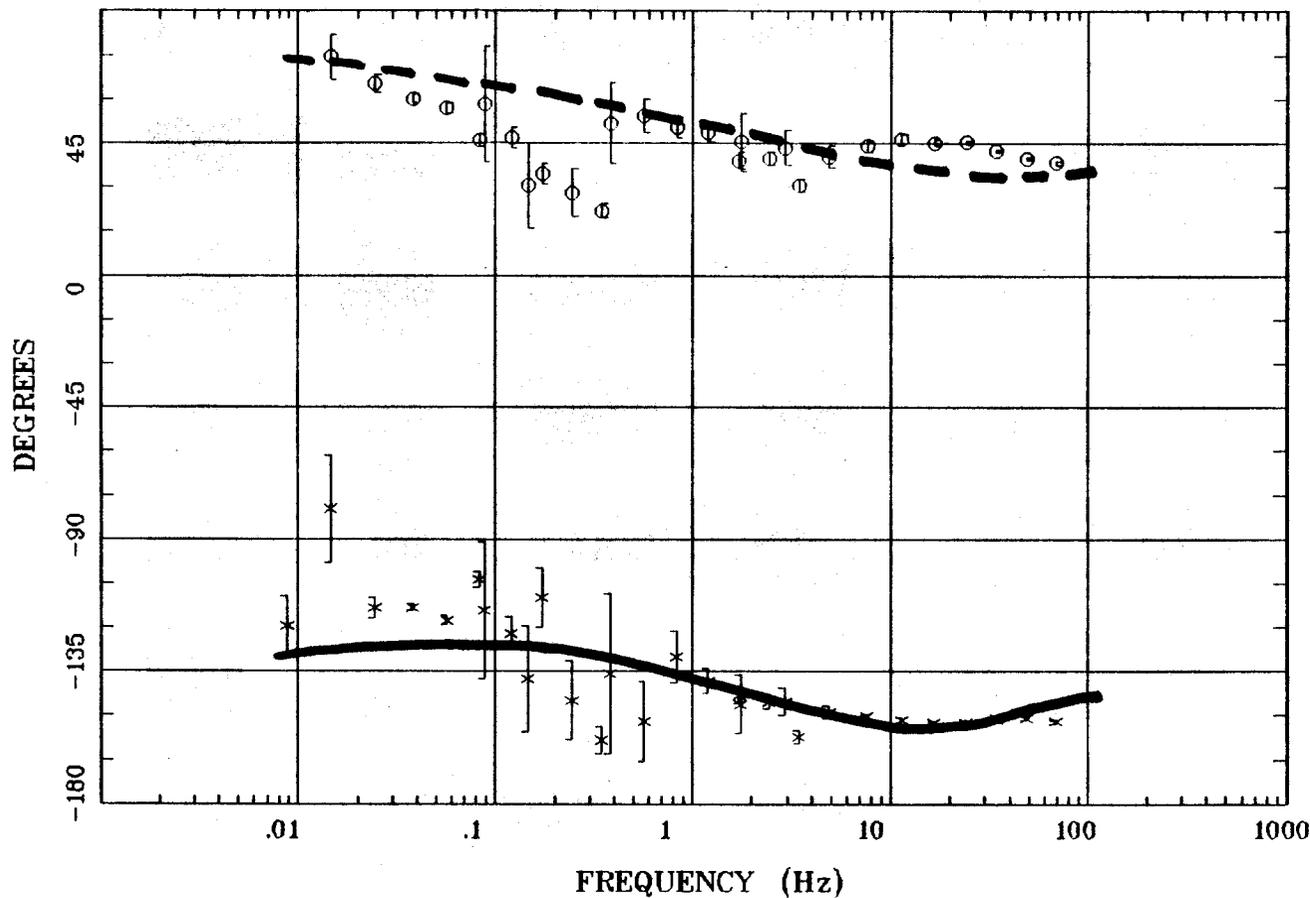


Client:
 Remote: none
 Acquired: 10:4 Aug 05, 1999
 Survey Co:USGS

Rotation:
 Filename: ar79.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:56 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

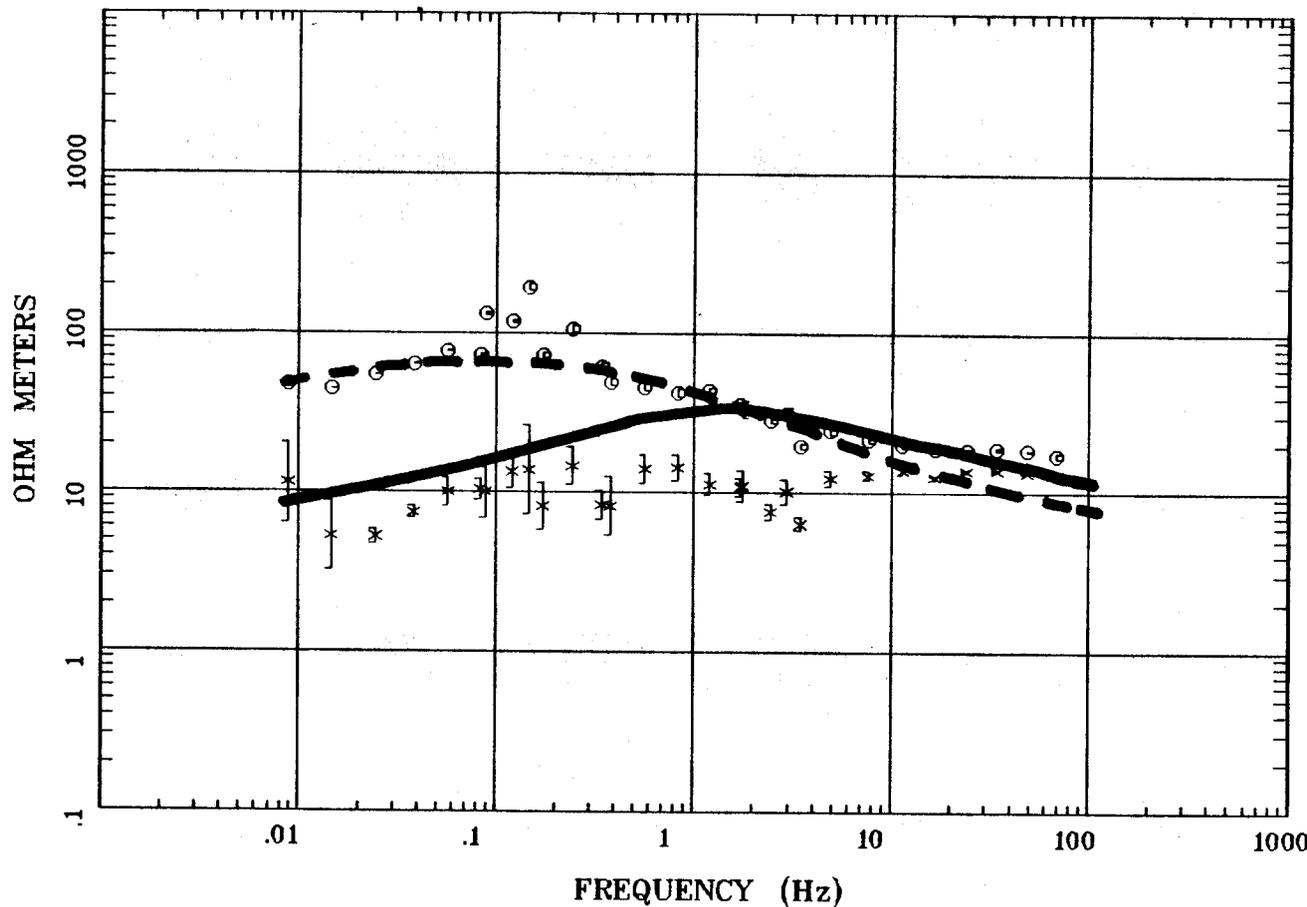
IMPEDANCE PHASE

Alligator Ridge



Client:
 Remote: none
 Acquired: 10:4 Aug 05, 1999
 Survey Co:USGS

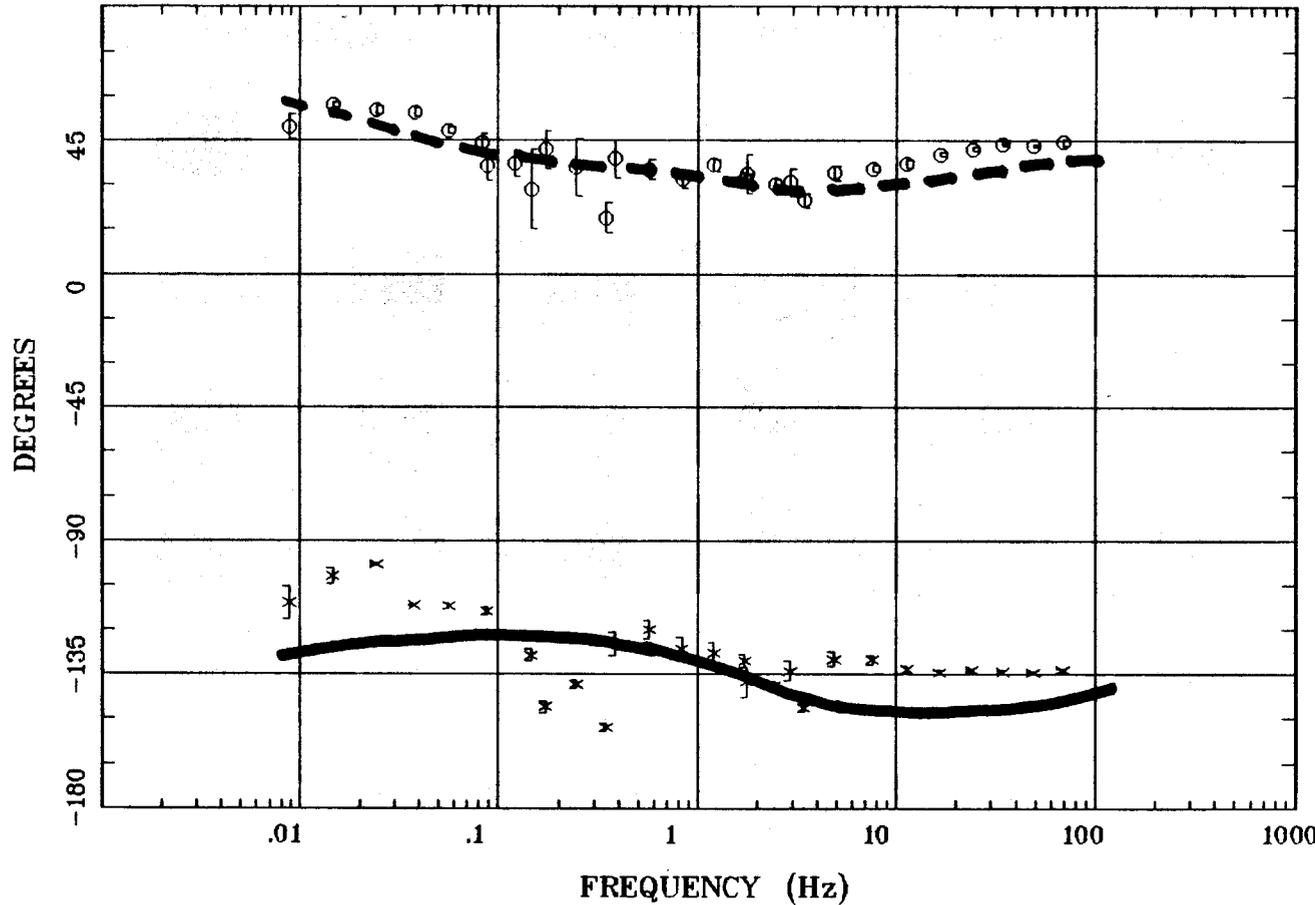
Rotation:
 Filename: ar79.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:56 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >



162

Client:
 Remote: none
 Acquired: 10:5 Aug 04, 1999
 Survey Co:USGS

Rotation:
 Filename: ar77.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:54 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

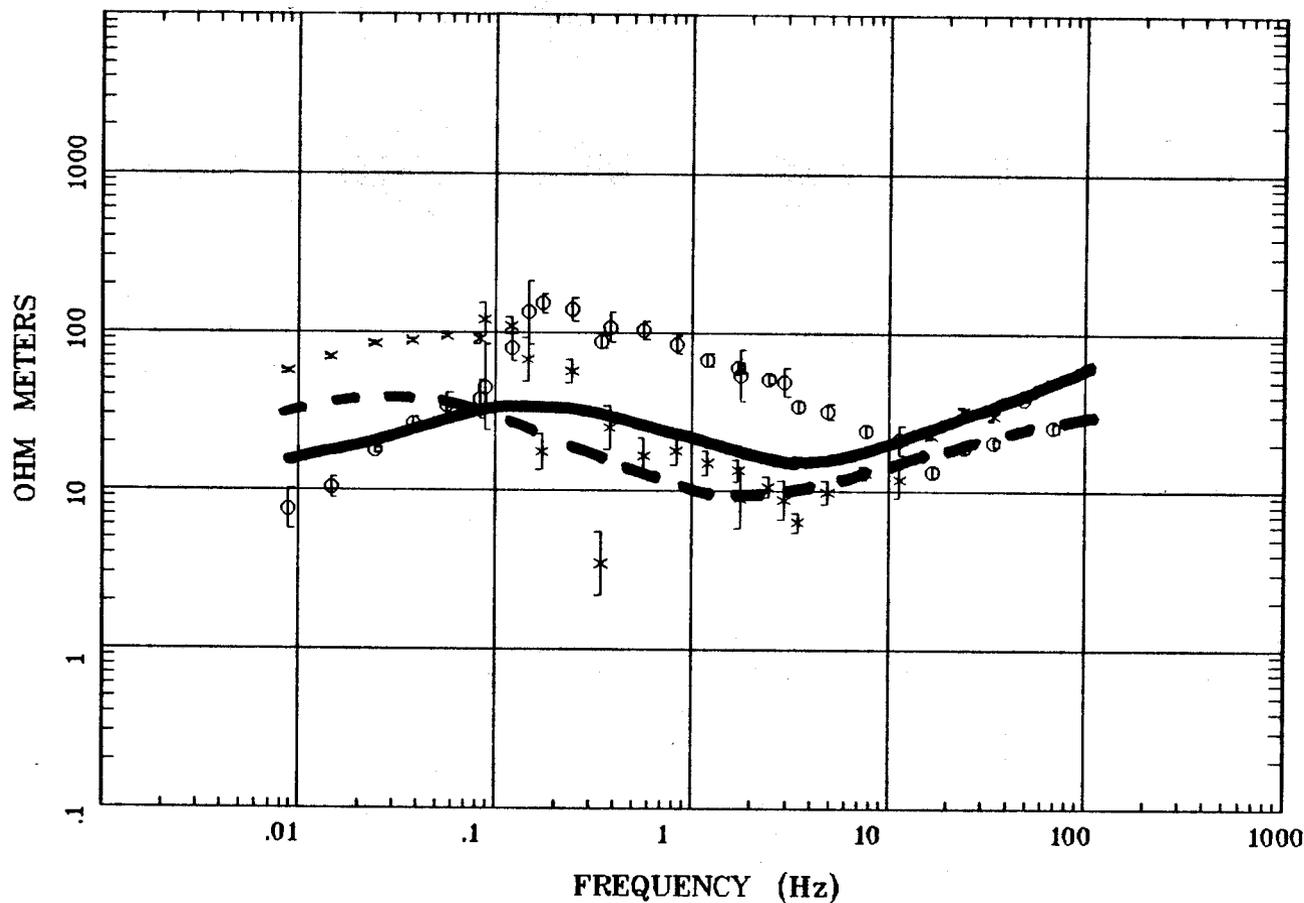


Client:
 Remote: none
 Acquired: 10:5 Aug 04, 1999
 Survey Co:USGS

Rotation:
 Filename: ar77.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:54 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

APPARENT RESISTIVITY

Long Valley



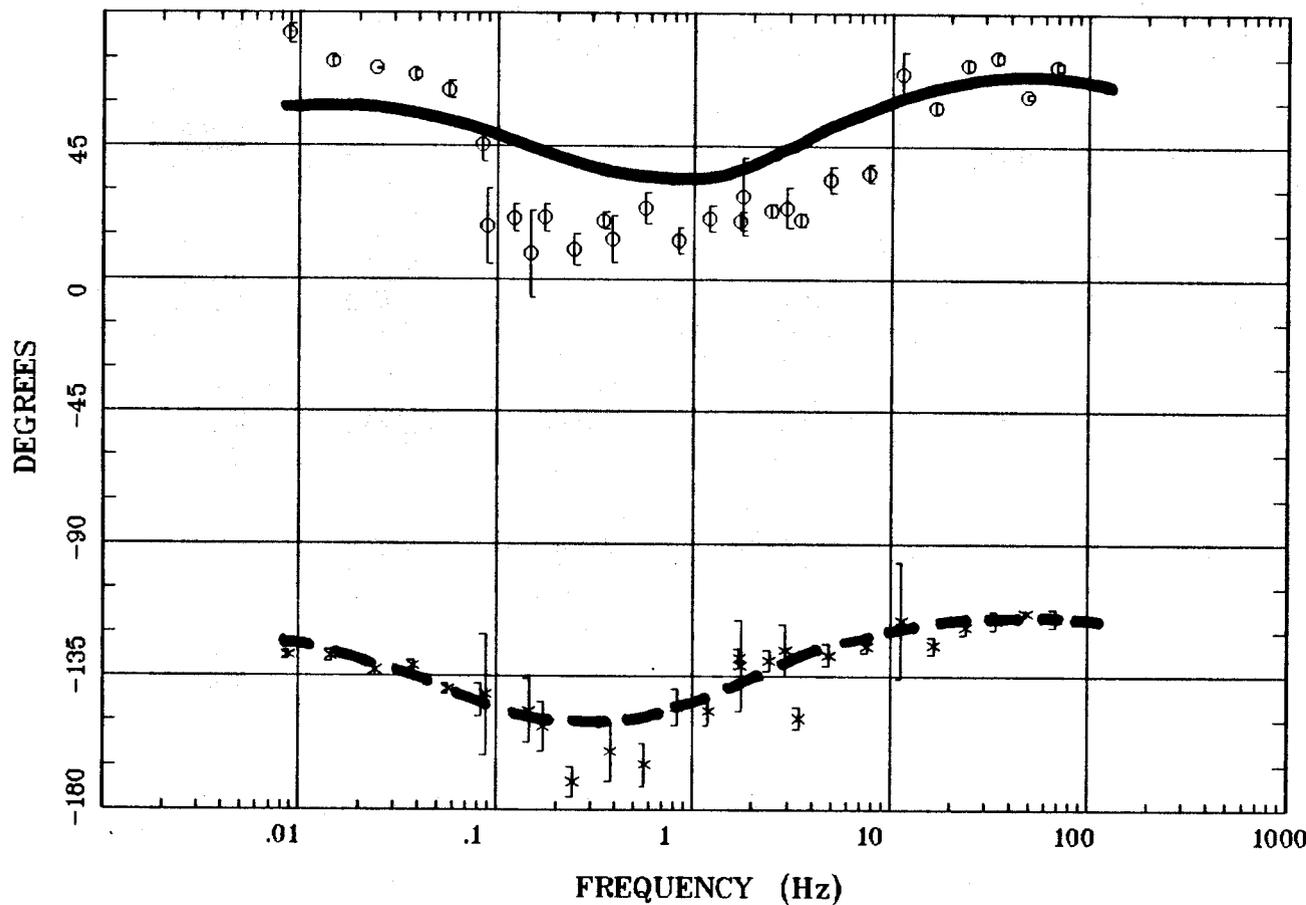
164

Client:
 Remote: none
 Acquired: 13:4 Aug 04, 1999
 Survey Co:USGS

Rotation:
 Filename: ar78.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:55 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >

IMPEDANCE PHASE

Long Valley



Client:
 Remote: none
 Acquired: 13:4 Aug 04, 1999
 Survey Co:USGS

Rotation:
 Filename: ar78.avg
 Channels: Ch1 Ch2 Ch3 Ch4 Ch5 Ch3 Ch4
 Plotted: 10:55 Dec 08, 2000
 < EMI - ElectroMagnetic Instruments >