

# LOGISTICS REPORT FOR A

## TITAN MT SURVEY

OVER

## KOPER LAKE PROJECT

## (NORTHERN ONTARIO)

ON BEHALF OF

## KWG RESOURCES INC.



March 6, 2023

CA01329T

Quantec Geoscience Ltd.

146 Sparks Ave., Toronto, ON, M2H 2S4, Canada  
+1-416-306-1941



**QUANTEC**  
Geoscience

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## EXECUTIVE SUMMARY

This report presents the logistics of the Titan MT survey completed from 19/01/2023 to 11/02/2023 over the Koper Lake Project by Quantec Geoscience Ltd. on behalf of KWG Resources Inc.

The report describes the instrumentation, data acquisition and processing procedures, final data formats and contents of the digital archives. The final processed data are also presented as pseudo-depth plots of apparent resistivity and chargeability, Magnetotelluric (MT) sounding curves of apparent resistivity and phase, etc.

A total of 20 profiles were surveyed. Data were processed and inspected for quality assurance on site and reviewed daily by the geophysicist in charge of the project.

The final processed survey results delivered with the report include:

- GPS Data
  - Multi-site ASCII survey files
    - Each file includes location (Latitude/Longitude, projected UTM and local GRID coordinates) and elevation details of every single electrode of the survey.
- Magnetotelluric (MT) Data
  - Single site data in the Electrical Data Interchange (EDI) format containing the MT spectra at each frequency.



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## 1. INTRODUCTION

This report presents the logistics of the Titan MT survey completed from 19/01/2023 to 11/02/2023 over the Koper Lake Project by Quantec Geoscience Ltd. on behalf of KWG Resources Inc.

### 1.1. CLIENT INFORMATION

Name:	KWG Resources Inc. Inc.
Address:	141 Adelaide Street West, Suite 240 Toronto, ON, M5H 3L5, Canada
Representative:	Maurice Lavigne Phone: +1-807-627-0132 Email: toolbuck@gmail.com

### 1.2. GENERAL PROJECT INFORMATION

Quantec Project Manager:	Mark Morrison
Quantec Project Number:	CA01329T
Report Prepared by:	Nicolae England
Project Name:	Koper Lake Project
Survey Type:	Titan MT
General Location:	Approximately 170 km NE of Fort Hope (Figure 1-1). Lat /Long: 52°44'38.4"N, 086°15'41.6"W UTM: 549850m E, 5844050m N Datum: WGS84, UTM Zone 16N
Survey Period:	19/01/2023 to 11/02/2023



Figure 1-1: General location map.

## 2. SURVEY LOGISTICS

### 2.1. ACCESS

Base of Operations:	Esker Camp
Mode of Access:	Snowmobiles

### 2.2. GRID AREA

Established by:	Client
Grid Coordinate Reference System:	Grid referenced to UTM coordinates.
Datum and Projection:	WGS 84, UTM Zone 16N
Grid Azimuth:	317°, 315°, 0° True
Magnetic Declination:	7°W
Site Location:	handheld GPS

### 2.3. PRODUCTION SUMMARY

Details of Survey Production:	See APPENDIX A
Survey Period (Total):	19/01/2023 to 11/02/2023
Survey Days (Read Time):	18
Safety Induction:	0 day
Standby:	2 days
Weather Days:	0 days

## 2.4. SURVEY COVERAGE SUMMARY

Details of Survey Coverage:

See APPENDIX B

### 2D MT Survey:

Lines Acquired:

13 lines covering a total of 17.1 km

Note: The distance reported is the cumulative distance from first to last receiver electrode of each line; overlap stations, if any, are counted once.

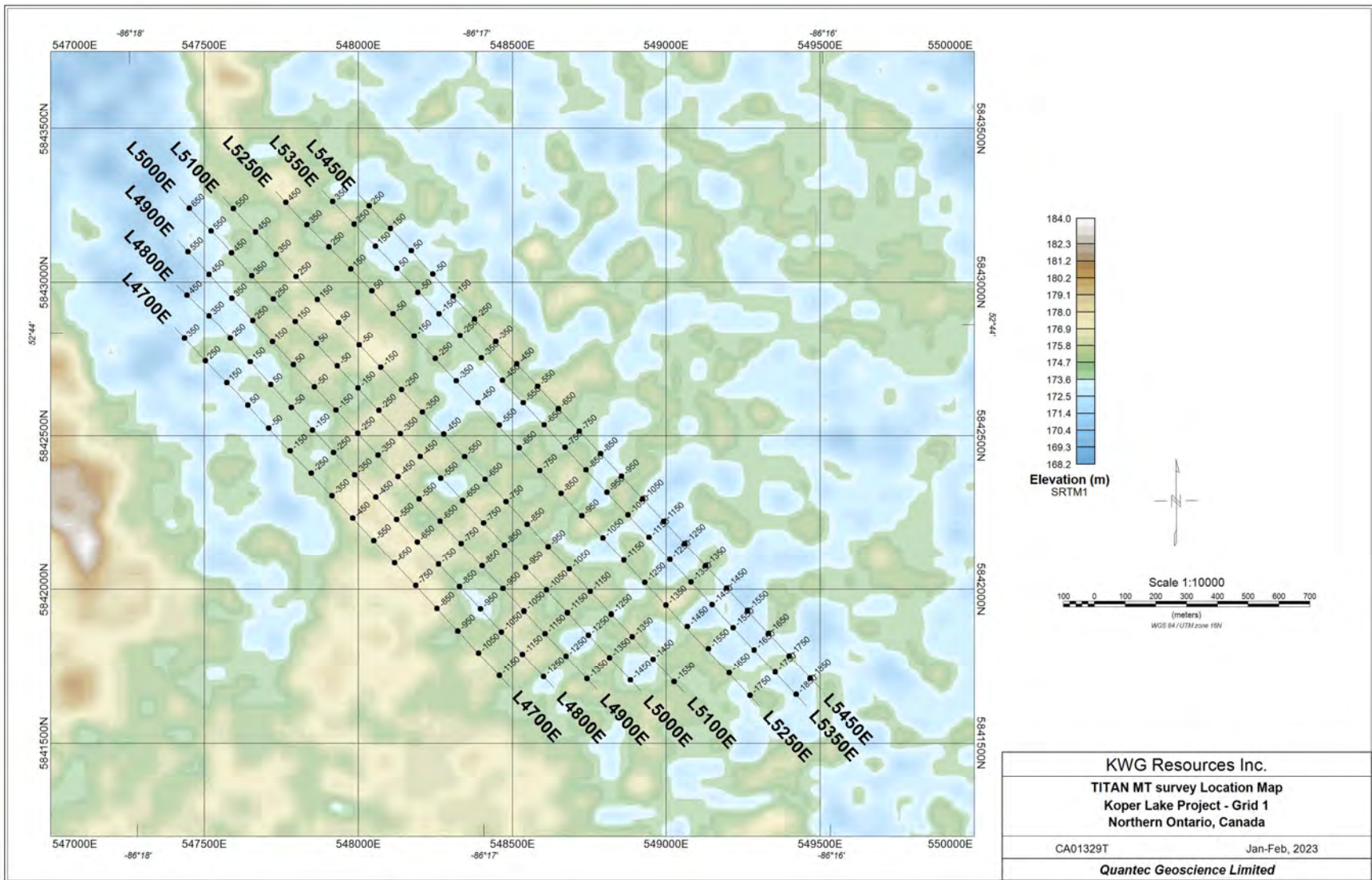


Figure 2-1: MT survey coverage map – Grid-1.

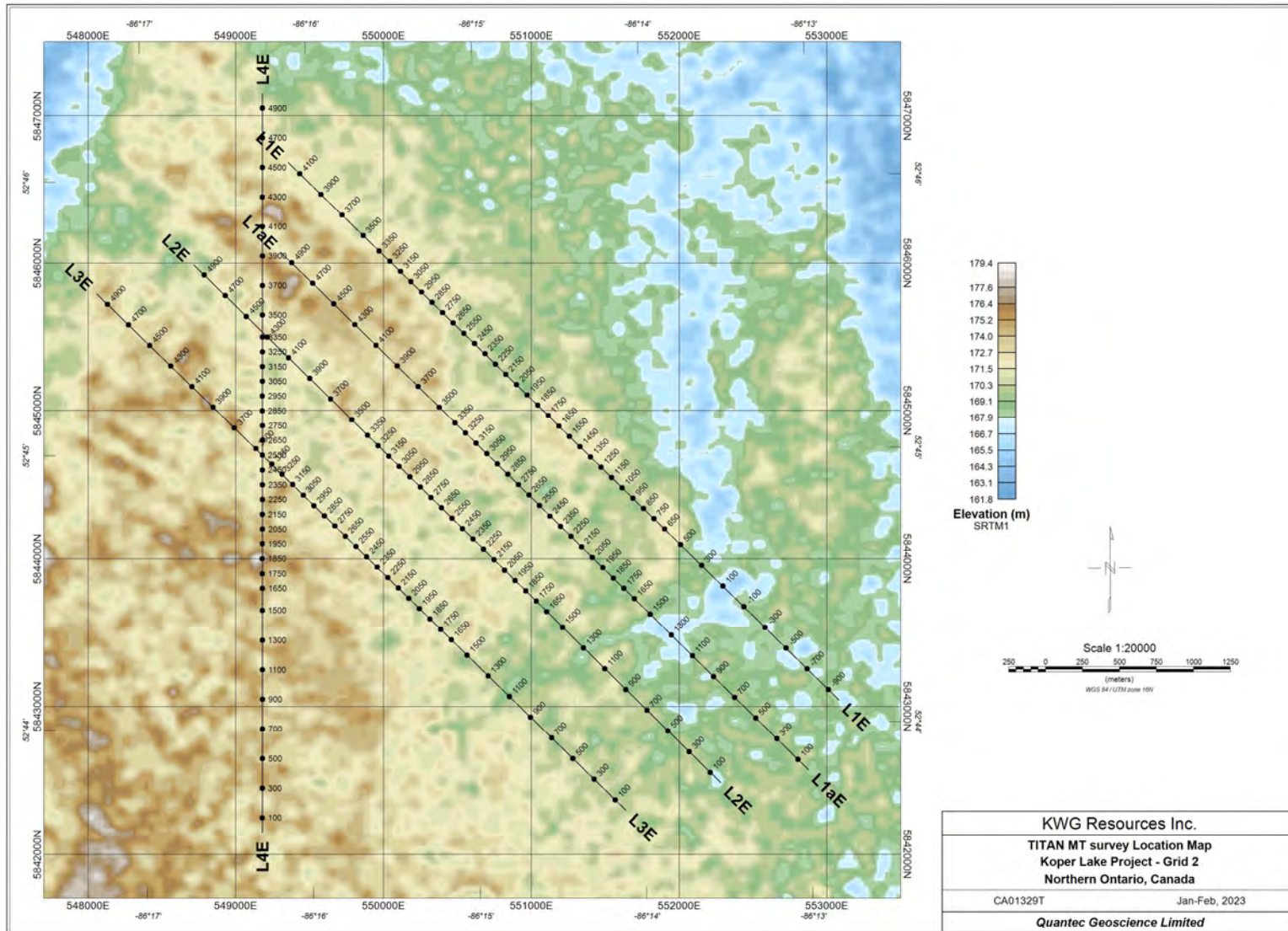


Figure 2-2: MT survey coverage map – Grid-2.

## 2.5. QUANTEC PERSONNEL

Project Manager:	Mark Morrison
Field Operations Manager:	Jesse Rondeau
Project Geophysicist:	Jimmy Stephen
Field HSE Coordinator:	Jordan Sampson
Field Data Processor:	Nicolae England
System Operators:	Jordan Reelis Jordan Sampson
Field Technicians:	Brent Commanda

## **2.6. HEALTH, SAFETY, AND ENVIRONMENT (HSE)**

Quantec Geoscience is committed to conducting its activities in a manner that will safeguard and protect the health and safety of all Quantec personnel, clients, the public, and the environment.

### **2.6.1. Hazard Assessment and Control**

Prior to mobilization, Quantec HSE compiled a hazard inventory for the project and risk assessments were completed for the tasks involved in conducting the work. On the basis of the risk assessments, corresponding Job Safety Analyses (JSA) were prepared defining safe work procedures.

### **2.6.2. Systems and Procedures**

All personnel were equipped with any personal protective equipment (PPE) required for the work.

One Quantec crew member was assigned as an HSE coordinator to assist the Field Manager with implementation of HSE procedures and reporting.

Daily safety meetings of Quantec personnel were conducted each morning prior to commencement of work to review safe work procedures and discuss any prior incidents, daily plans and potential hazards.

Vehicle circle checks were completed by drivers before departure.

### **2.6.3. Emergency Response**

With the help of the client and Quantec HSE an emergency response system was put in place in case of any unforeseen circumstances. This included the plan and routing the crew would take to get someone to help as well as the proper protocol the crew would take to relay if help was needed. Daily steps were taken to reduce the likelihood of not being prepared which could range from having fueled up truck to daily truck inspections of first aid kits.



### 3. SURVEY SPECIFICATIONS

#### 3.1. INSTRUMENTATION

Receiver Systems:	RT160Q Quantec data logger
Synchronisation:	GPS clock (10 ns precision)
Receiver Electrodes:	Ground contacts using stainless steel rods.

#### MT Specific

Magnetic Sensors [HF]:	EMI BF6 magnetic field sensors
Magnetic Sensors [LF]:	EMI BF6 magnetic field sensors

See APPENDIX F for more detailed information.

#### 3.2. SURVEY LAYOUT

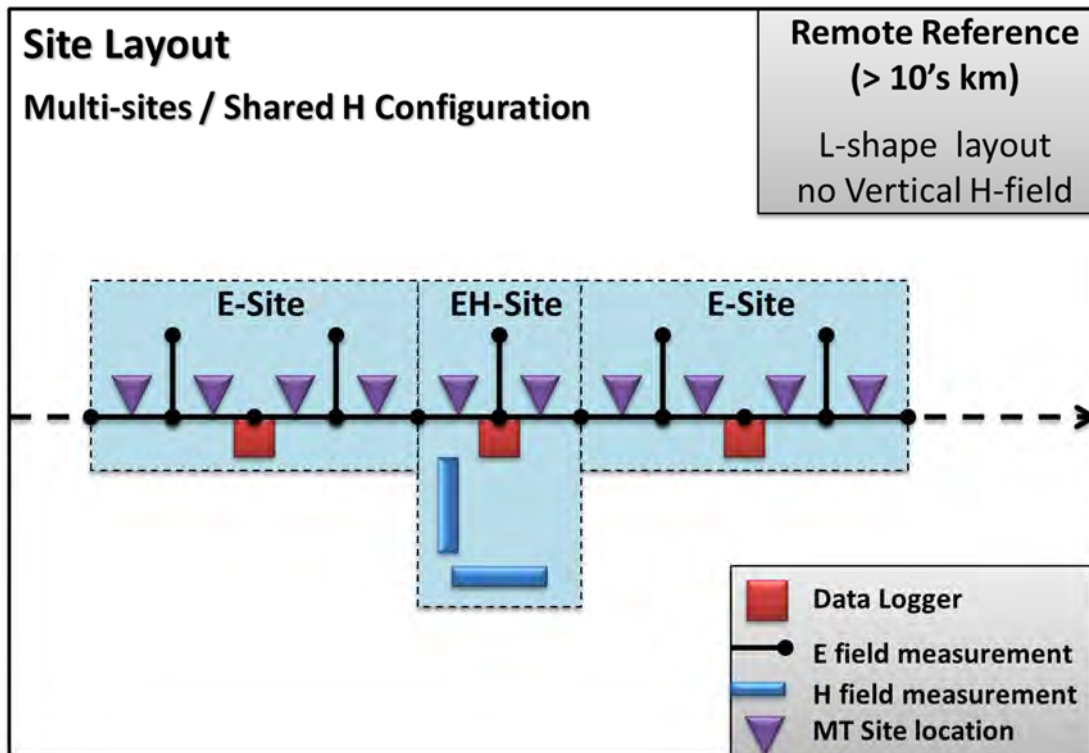


Figure 3-1: Survey acquisition layout.

### 3.3. MAGNETOTELLURIC SURVEY PARAMETERS

#### 3.3.1. Geometry

Technique:	Tensor magnetotelluric soundings processed with remote reference.
Site Configuration:	L-shaped E-field (Ex is in-line and Ey is crossline); Ey channel is shared by 2 stations; two sets of HF and LF magnetic sensors located along the line.
E-field Dipole Lengths:	Ex: 100 m, 200 m Ey: 100 m
Site Orientation:	Acquisition layout with multiple orientations - X pointing to 317° and 315° True for NW oriented lines and 0° True for one NS line.
Remote Site Configuration:	Cross-shaped E-fields with HF and LF magnetic sensors located at the site. The sensors are oriented in the same direction as the local sites.
Remote Reference Position:	551195.41E / 5839792.08N (WGS 84 / UTM Zone 16 North)
Synchronization to Remote:	GPS clock (10 ns precision)

#### 3.3.2. Acquisition and Processing Parameters

Data Acquisition:	Time series recording.
Time Series Sampling:	HF1: 48,000 samples/s HF2: 12,000 samples/s LF1: 1,000 samples/s LF2: 40 samples/s (resampled from LF1)
Time Series Recording Time:	HF1: minimum 2 events @ 30 s per event HF2: minimum 2 events @ 4 minutes per event LF1: 4 events @ 4 hours per event  HF: minimum of 1 hour to maximum of storage capacity or until pick up

LF: minimum of 8 hours to maximum of storage capacity or until pick up

HF and LF recording schedule is fixed and defined as follows:

Band	Sampling	Start	Duration
HF1	48 kHz	16, 36, 56 minutes after the hour	30 s for each run
HF2	12 kHz	0, 8, 20, 28, 40, 48 minutes after the hour	4 minutes for each run
LF	1000 Hz	At logger deployment	Continuous until pickup

Frequency Bandwidth:

10 kHz to 0.001 Hz

Calibration Version:

ver.2.325 (released: 2022/11/29)

Processing:

Quantec proprietary QuickLay software (ver.5.7.8) coupled with Egbert MT processing code (Egbert, 1997):

- 1) Coherent noise rejection using remote reference
- 2) Proprietary digital filtering (scrubbing)
- 3) Coherency sorting
- 4) Impedance estimate stacking

Processing configuration set to 12 frequencies per decade

Data processed to output X at 317° and 315° for NW oriented lines and 0° for one NS line.

Data Conventions:

Right-hand positive down coordinate system.

Time dependence:  $e^{+j\omega}$

Processed Data:

Auto- and cross-power spectral estimates for individual stations and sampling band archived as Spectral Density Matrix (SDM) files (Egbert output)

Results are band-merged, edited, and saved as SEG-EDI<sup>1</sup> (Electronic Data Interchange) files.

EDI Format:

Single site format = one site per EDI file

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<sup>1</sup> EDI is a format conforming to SEG standard for the storage of magnetotelluric (MT) data (Wight, 1987).

### 3.3.3. Field Quality Control Tests

**Parallel Sensor Test:**

A parallel sensor test was completed at the beginning of the survey to verify proper operation of the equipment. The test results are presented in APPENDIX D.

**Remote Test:**

MT data was collected at the remote site prior to the survey to evaluate suitability of the site location. The test results are presented in APPENDIX E.

### 3.3.4. Data Presentation

**Sounding Curves:**

Observed XY and YX apparent resistivity and phase  
Coherencies between local magnetic and electric fields

(see APPENDIX C for sounding curves)

**Pseudo-Section Plots:**

Observed XY and YX apparent resistivity and phase  
(see APPENDIX C for MT pseudo-sections)

### 3.3.5. Ap Index

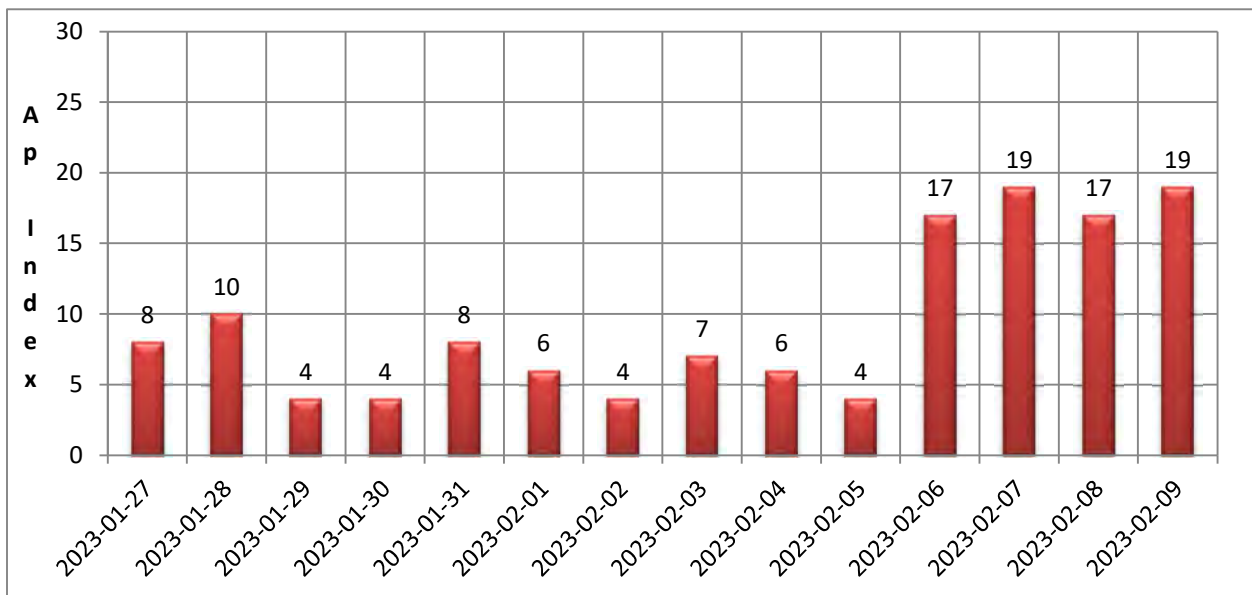


Figure 3-2: Magnetic signal strength (Ap index) during the project.

#### **4. COMMENTS ON MEASURED DATA**

The project had very snowy conditions throughout the survey. Few days were very cold and windy, affecting the measurements.

## 5. DELIVERABLES

The final deliverables include the following:

### 5.1. DIGITAL DATA ARCHIVE

Table 5-1: Contents of the digital archive.

Directory	Contents
\Report	Logistics report (.PDF)
\Data\EDI	Final processed MT data (.EDI)
\Data\GPS	Compilation of survey files.
\Geosoft	Location maps and related Geosoft database(s).
\Miscellaneous	Compilation of Various documents.

Note: This final data archive is included in the accompanying hard drive containing raw field data.

### 5.2. FIELD DATA ARCHIVE (HARD DRIVE)

The raw field data are delivered on a hard disk drive and comprise the following:

Time Series:	Raw event files (e.g., Eventxxx.dat), provided with log files having information on the location and time of the event (QuickLay digital format).
Processed MT Data:	Daily processing runs in QuickLay digital format saved as '.MT' files linked with SDM files containing auto- and cross-power spectral estimates for each sampling band and site; Spectra are in right-hand positive down coordinate system. Processed SDM formatted data are band-merged into geo-referenced EDI files containing auto- and cross-power spectral estimates for individual stations.

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Respectfully submitted March 6, 2023 by Nicolae England

Quantec Geoscience Limited

## APPENDIX A. PRODUCTION SUMMARY

QUANTEC GEOSCIENCE LTD.				
Production Summary				
Survey Specifications				
Survey:	Titan MT	Client:	KWG Resources Inc.	
Specs:	a=100m	Project Name:	Koper Lake	
TE/TM mode:		Project Number:	CA01329T	
H/W/Hy:				
Task	Crew On-Site	Date	Line	Daily Field Activity
Survey	5	1/19/2023	5450	Today we set up line 5450
Survey	5	1/20/2023	5350	Today we set up line 5350, we had some wires bit and cut from foxes, one set of coil cables also got bit and cut.
Survey	5	1/21/2023	5250	Today we set up line 5250, upon pickup on line 5350 a fox chewed right trough the cables 2 of our GPS clocks.
Survey	5	1/22/2023	5100	Today we set up a repeat on line 5350 at station 1000, due to fox chew. We also set up all of line 5150.
Survey	5	1/23/2023	5000	Today we set up line 5000, its getting very cold and windy.
Fatigue	5	1/24/2023		Fatigue day
Survey	5	1/25/2023	4900-4800	Today we set up all of line 4900 and half of 4800. The cold is back.
Survey	5	1/26/2023	4800-4700	Today we set up the last 2 lines cold again and a fox chewed two of our wires.
Survey	5	1/30/2023	L1E	Today we set up the first part of line 1E. Very cold and windy again today.
Survey	5	1/31/2023	L1AE	Today we set up the north part of line 1AE. Extreme temperatures again today and very windy.
Survey	5	2/1/2023	L2E	Very cold today again but we managed to set up line 2E
Survey/Standby	5	2/2/2023		Today we went out and picked up the data only, the weather was too cold to set anything up. The temperature was approximately -55 with windchill.
Survey	5	2/3/2023	L3E	Today we went out and set up line 3E, still pretty cold but the wind was not as strong.
Survey	5	2/4/2023	L3E-S2	Today we set up the southern part of line 3E, temperatures are getting better.
Survey	5	2/5/2023	L2E-S2	Today we set up the southern part of line 2E, temperatures are rising and much more comfortable to work.
Survey	5	2/6/2023	L1AE	Today we set up line 1AE also set up a repeat on line 4800 due to fox chew
Survey	5	2/7/2023	L1E	Today we set up L1E and a repeat on line 3E station 2000
Survey	5	2/8/2023	L4E	Today we set up the first spread of line 4E
Survey	5	2/9/2023	L4E	Today we setup the second spread of line 4E
Survey	5	2/10/2023		Today we picked up our gear and dried it out and packed it up ready for the flight out tomorrow
Standby	5	2/11/2023		Today we flew out of camp and staying in Long lac.
Demob				Demob from Long lac

## APPENDIX B. SURVEY COVERAGE

### B.1. PROFILES – EAGLES NEST GRID

Line	Grid Coordinates		UTM Coordinates (WGS84, Zone 16N)			
	Start	End	Start		End	
			Easting	Northing	Easting	Northing
L4700N	0	-1200	547673	5842562	548492	5841684
L4800N	0	-1300	547748	5842630	548635	5841680
L4900E	0	-1400	547821	5842697	548776	5841674
L5000E	0	-1500	547894	5842766	548917	5841669
L5100E	0	-1600	547968	5842834	549059	5841664
L5250E	0	-1800	548077	5842936	549305	5841619
L5350E	0	-1900	548159	5843011	549455	5841622
L5450E	0	-1900	548206	5843064	549502	5841675
L1E	-1000	5000	553080	5843047	548788	5847238
L1aE	0	5000	552875	5842575	549305	5846076
L2E	0	5000	552281	5842487	548714	5845991
L3E	0	5000	551638	5842302	548058	5845792
L4E	0	5000	549179	5842150	549179	5847151

Note: information reported is first and last **receiver** electrode of each line.



## APPENDIX C. MEASURED MT DATA

This section presents the final processed MT data on a line per line basis as:

### Pseudo-sections

- a. Observed XY and YX Apparent Resistivity ( $\Omega\cdot m$ )
- b. Observed XY and YX Phase

### Sounding curves

- a. Observed XY and YX Apparent Resistivity ( $\Omega\cdot m$ )
- b. Observed XY and YX Phase
- c. Magnetic Amplitude Spectra
- d. Coherencies Local Magnetic vs Electric fields

### **Notice:**

Mode **XY** is defined by Electrical (**Ex**) field and orthogonal magnetic (**Hy**) field (=Ex/Hy);

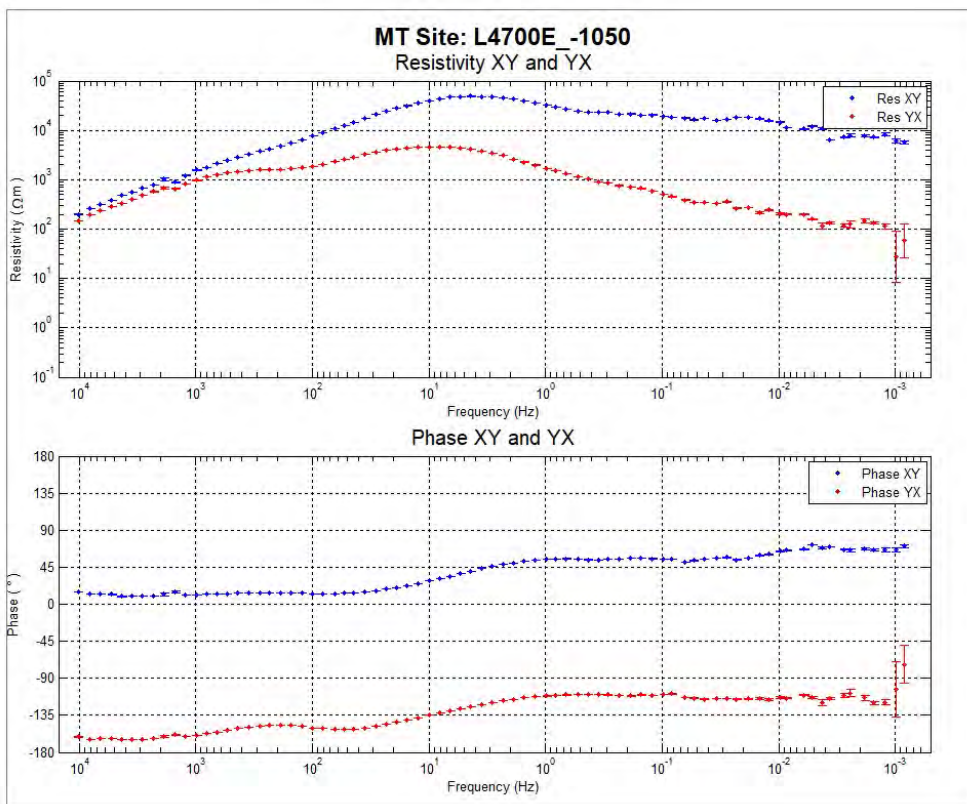
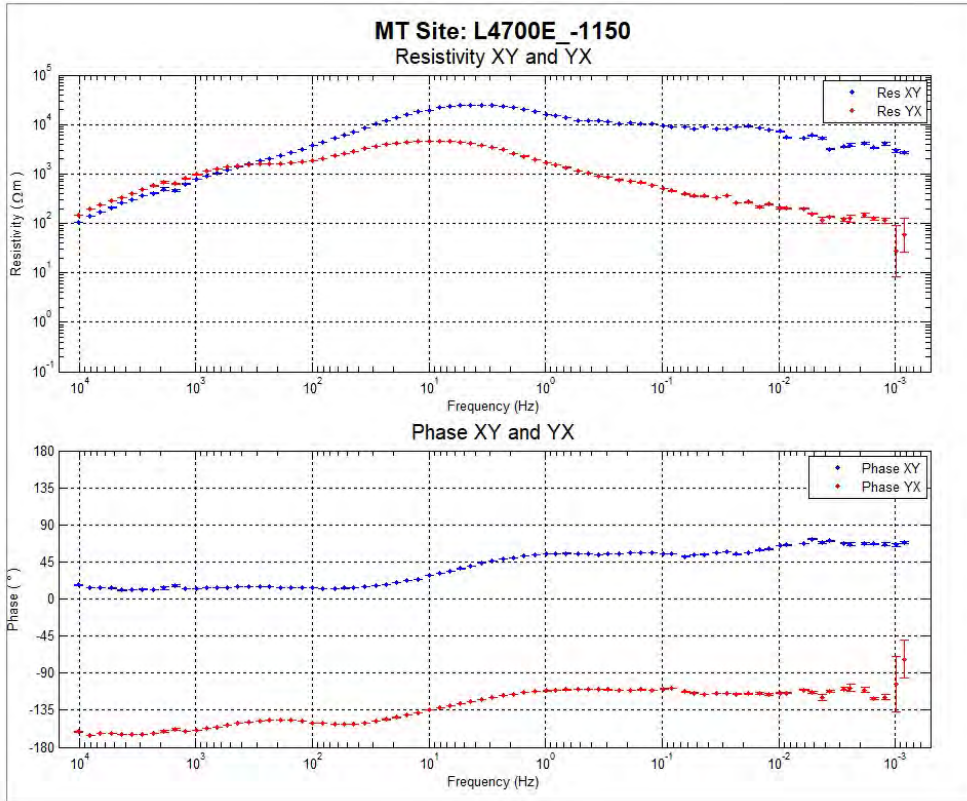
Mode **YX** is defined by Electrical (**Ey**) field and orthogonal Magnetic (**Hx**) field (=Ey/Hx);

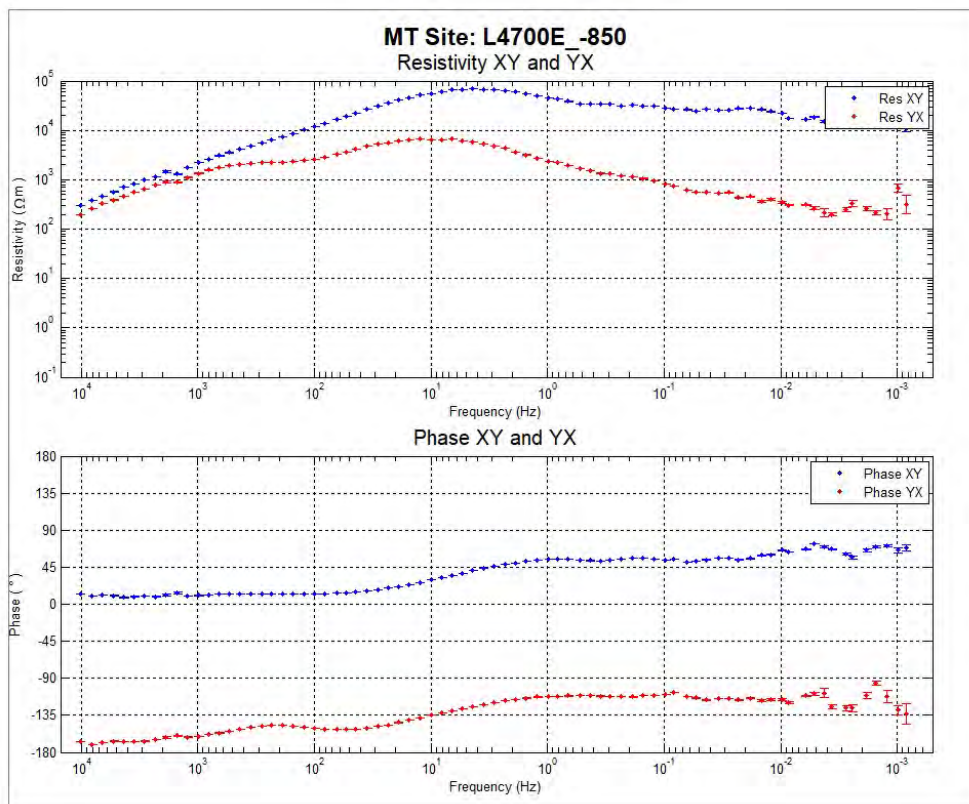
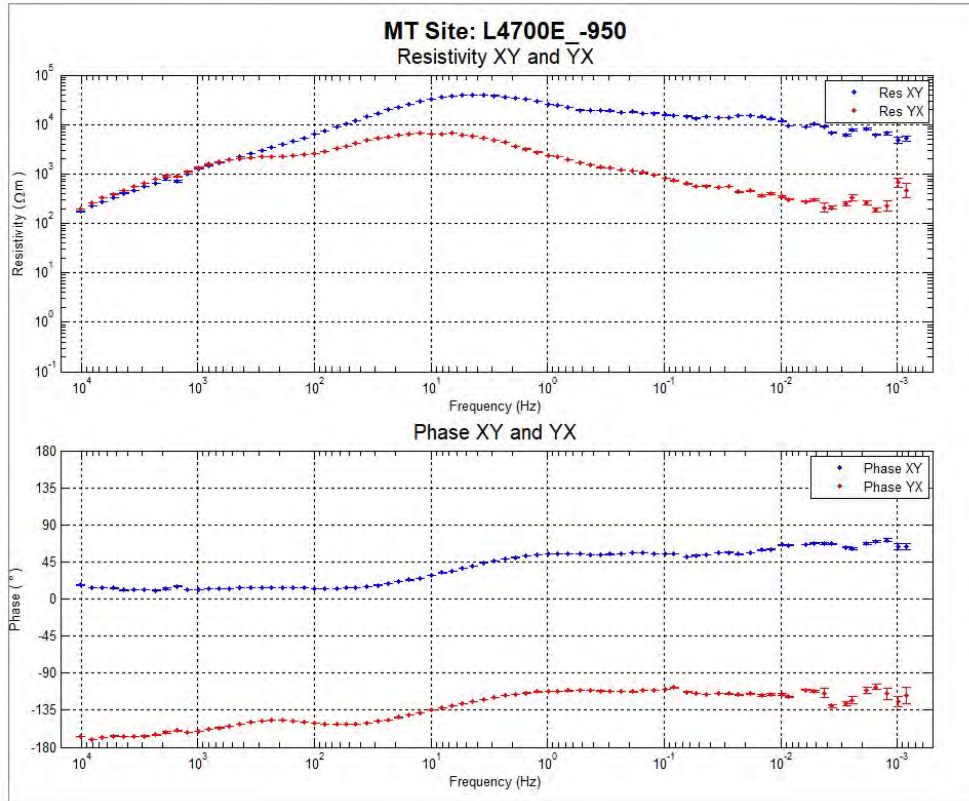
**X**-axis pointing to 317° **True** (line direction) for North-South lines and 48° **True** for East-West lines on Eagle's Nest Grid

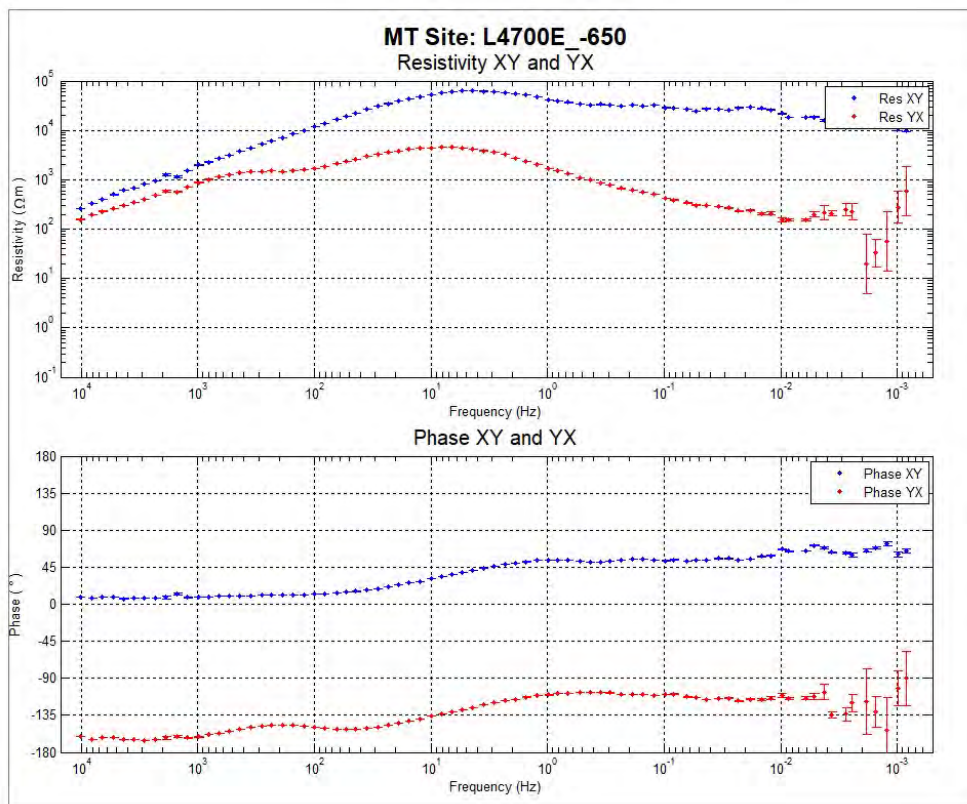
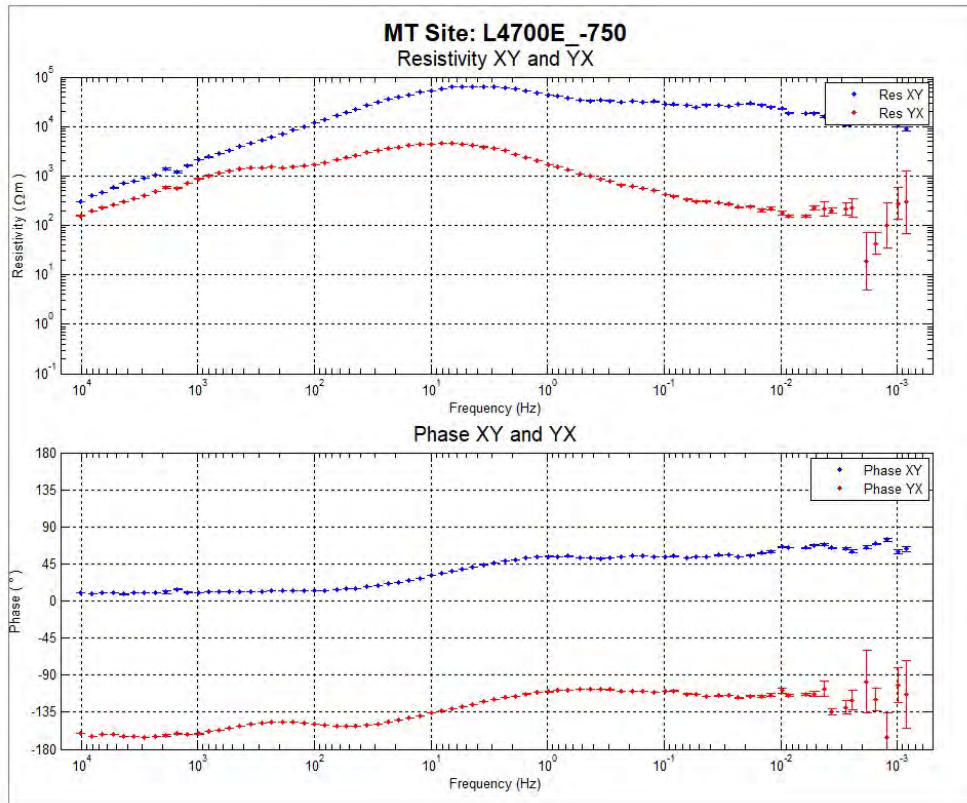
**X**-axis pointing to 106° **True** (line direction) for East-West lines on Blue Jay Grid and 16° **True** for North-South lines on Blue Jay Grid

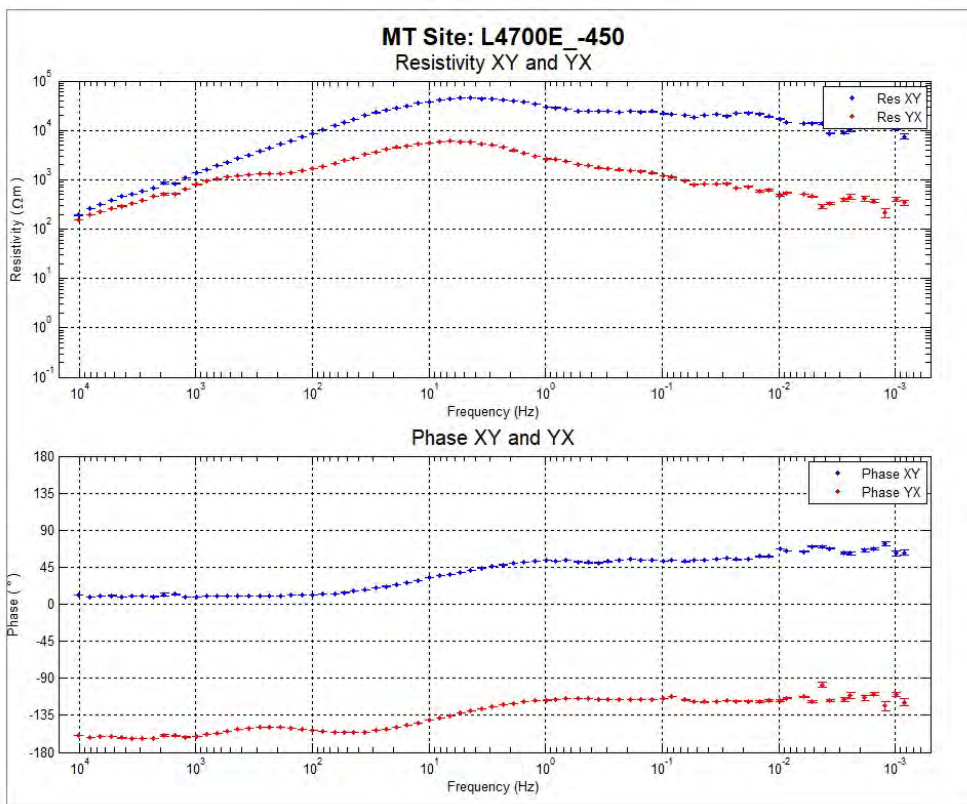
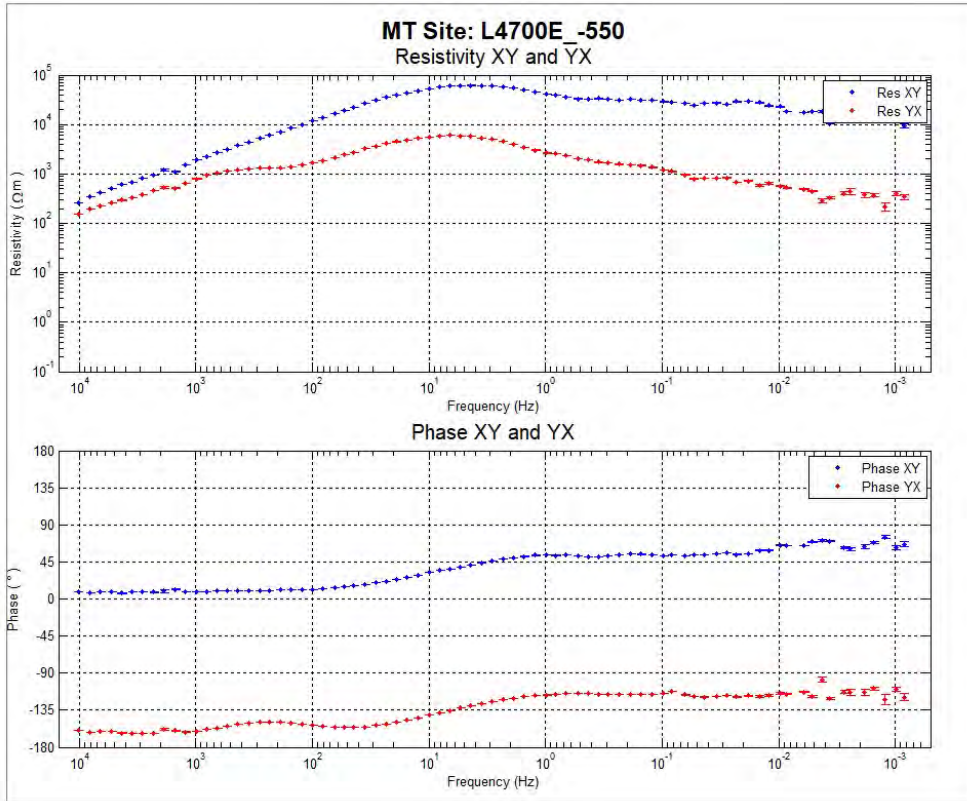
and Y is perpendicular to X

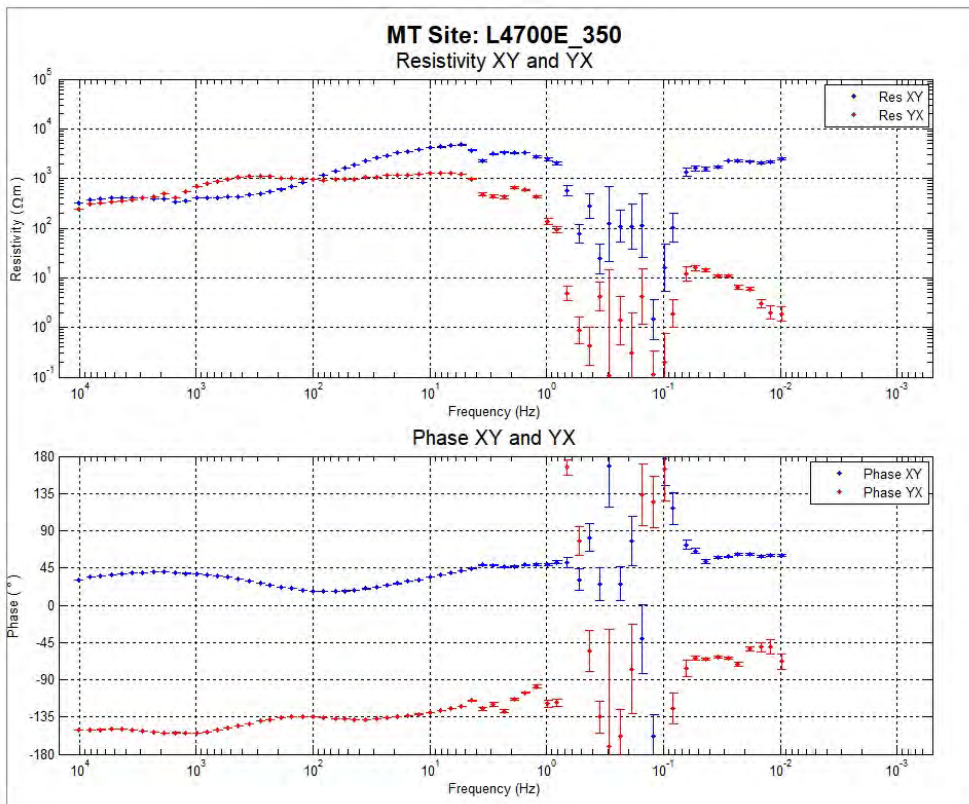
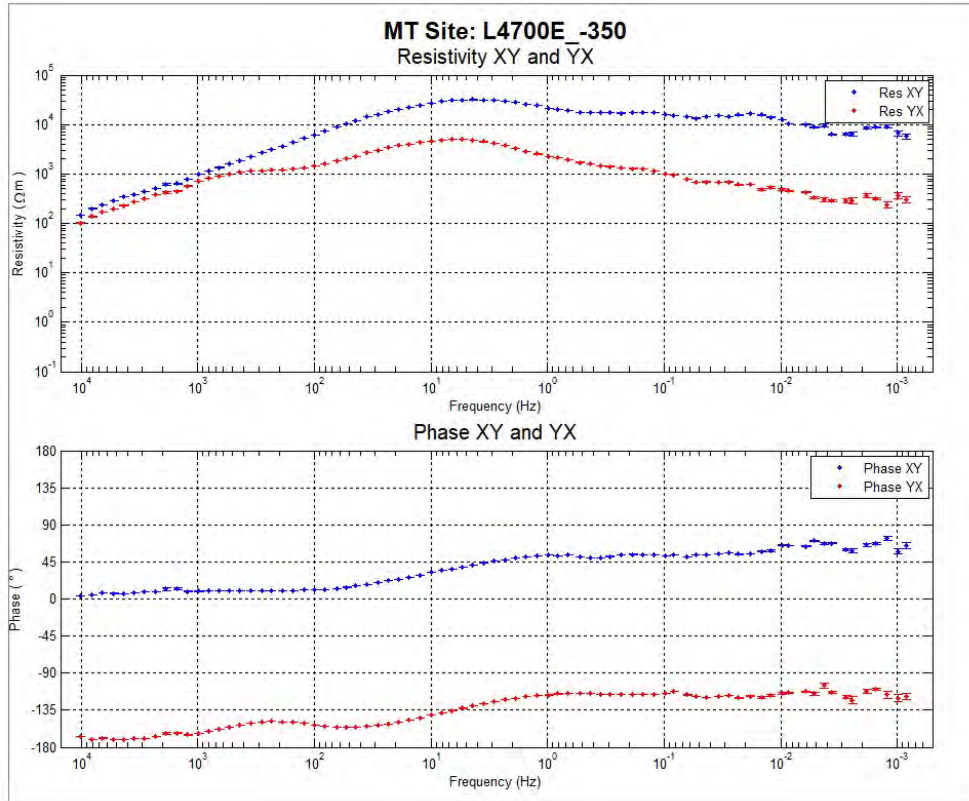
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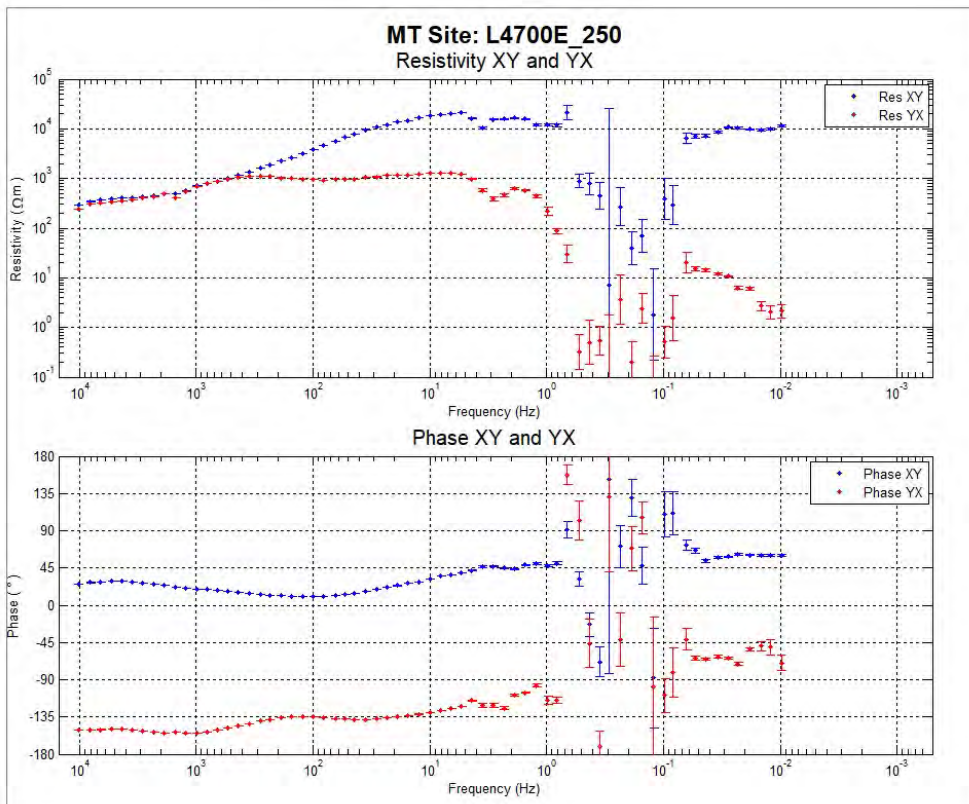
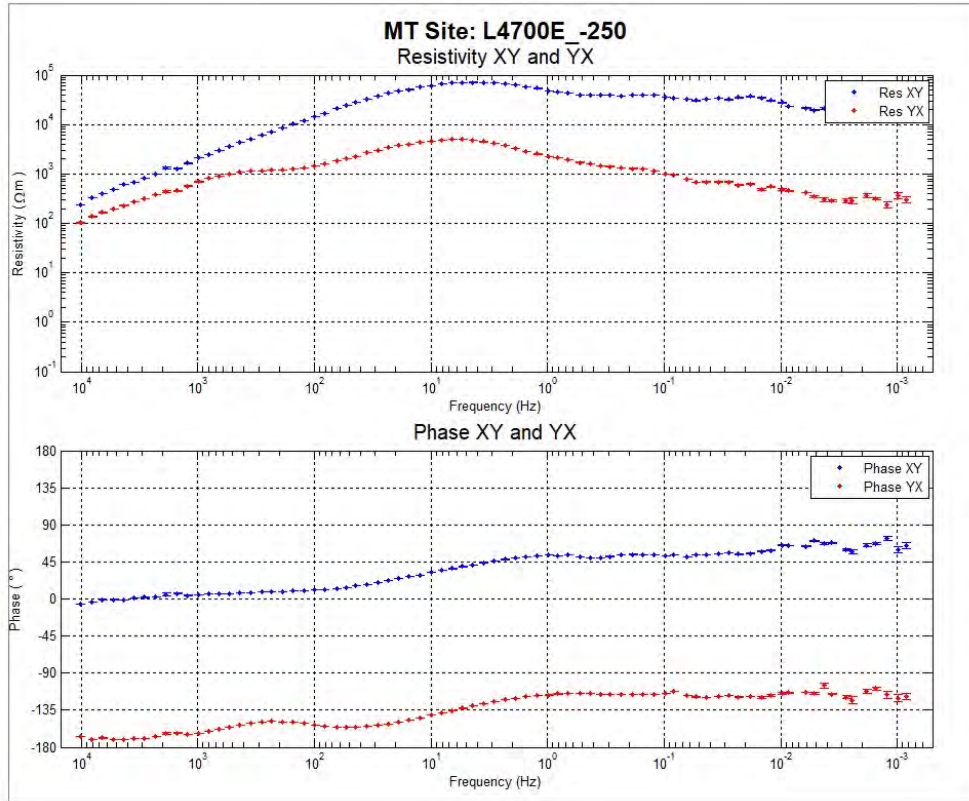


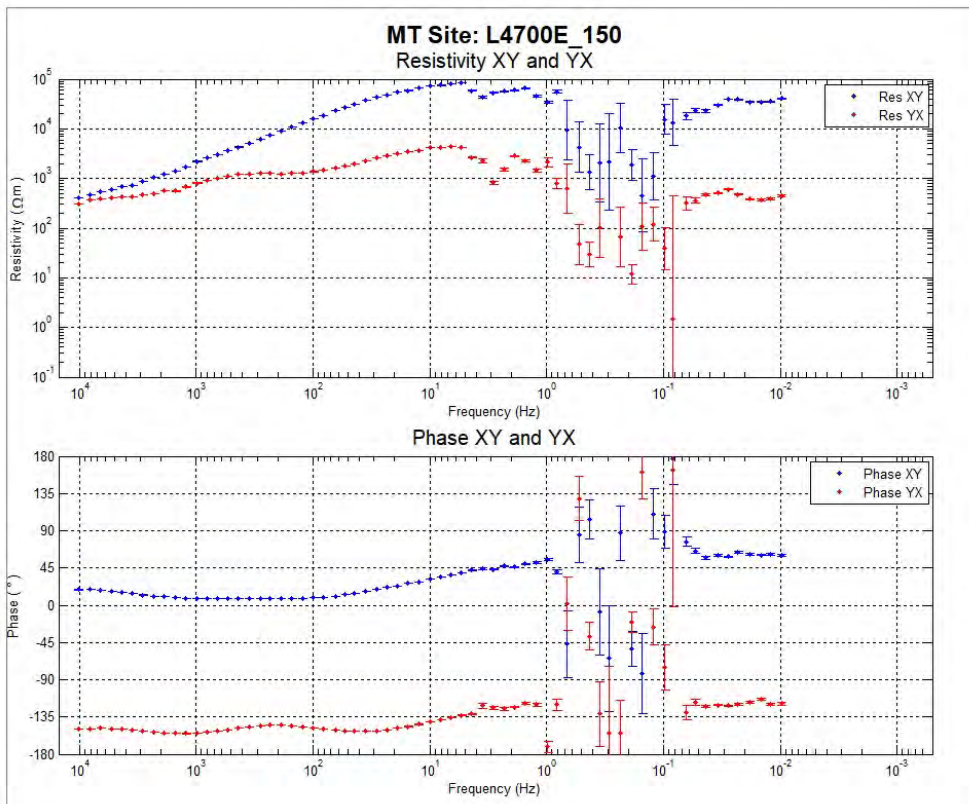
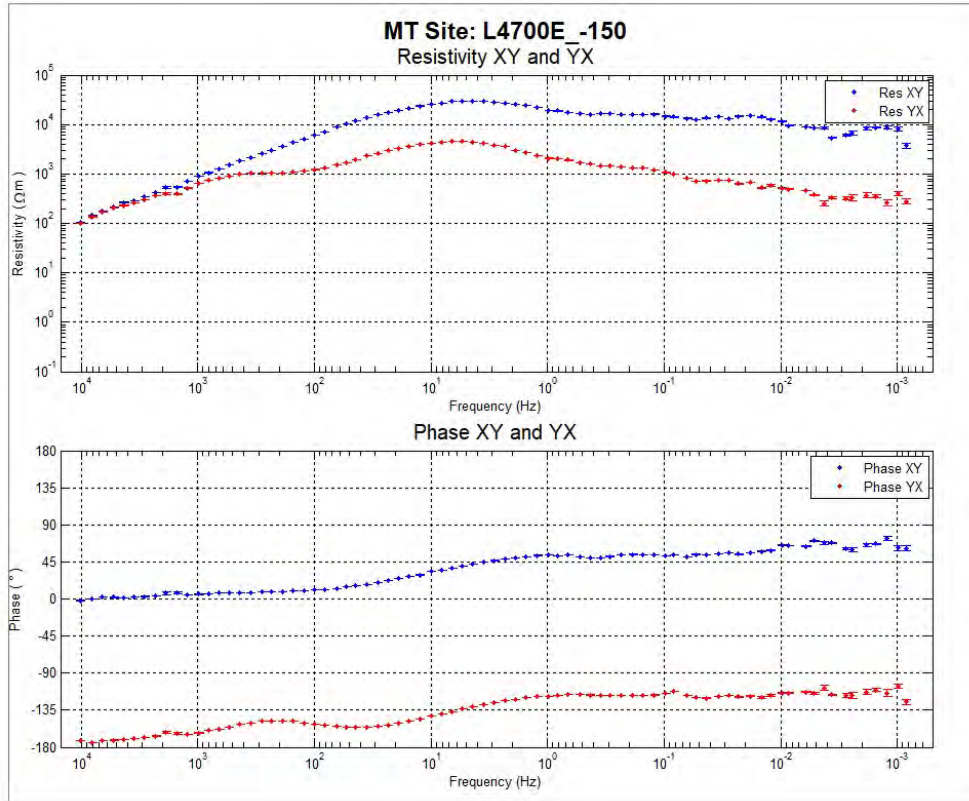




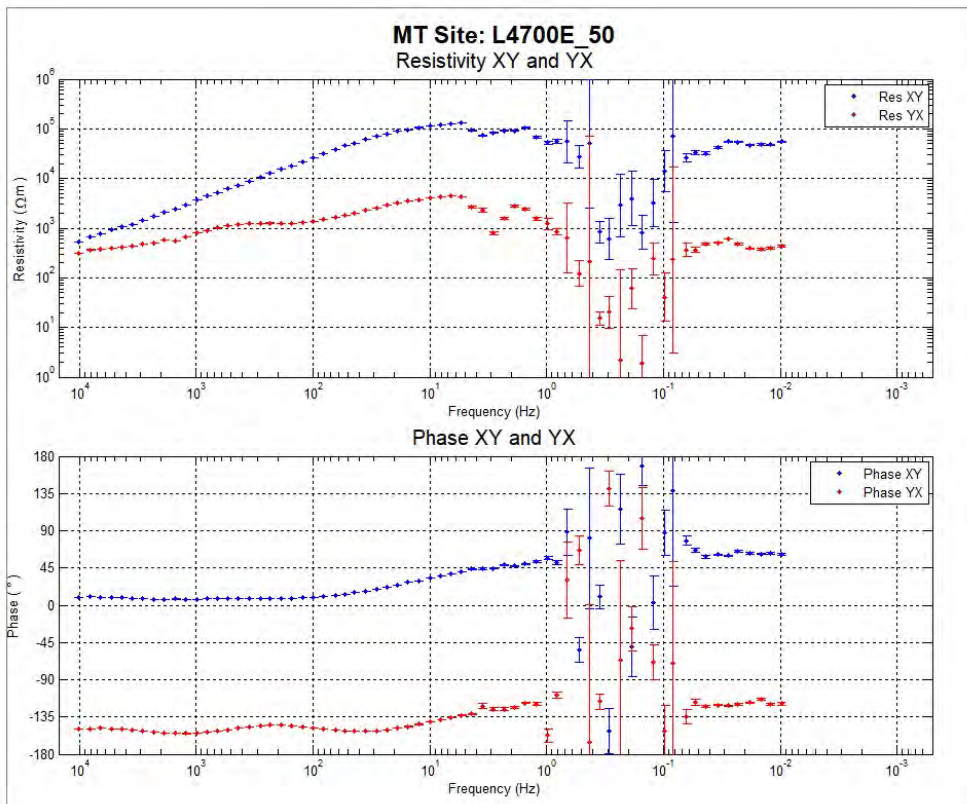
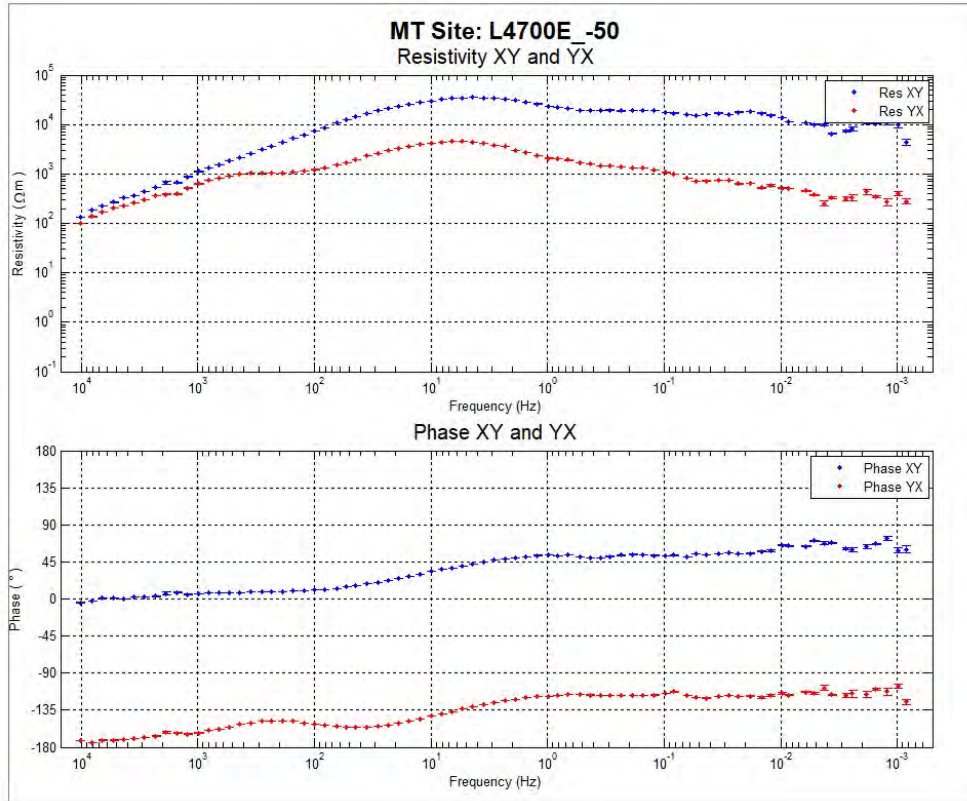


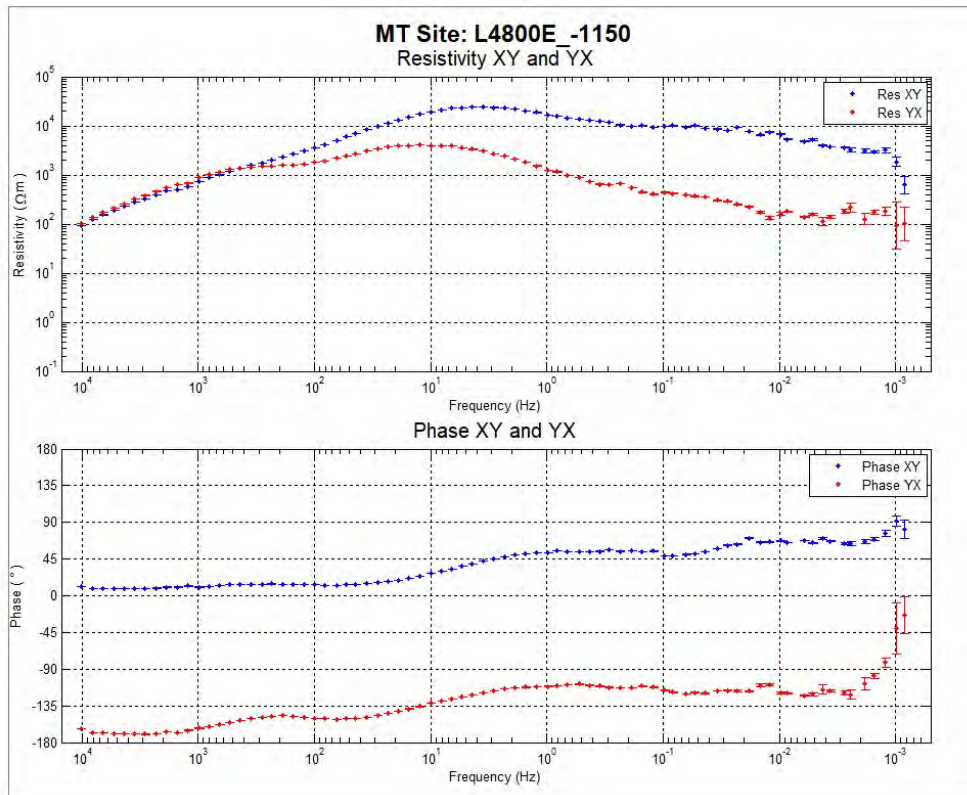
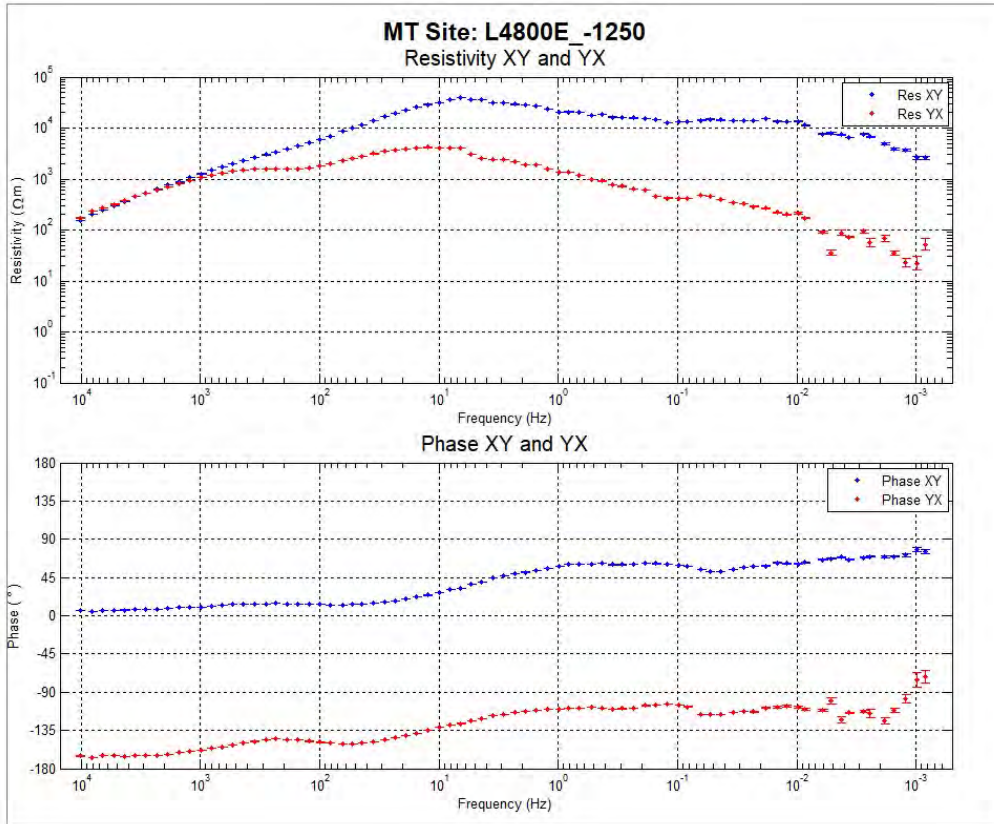


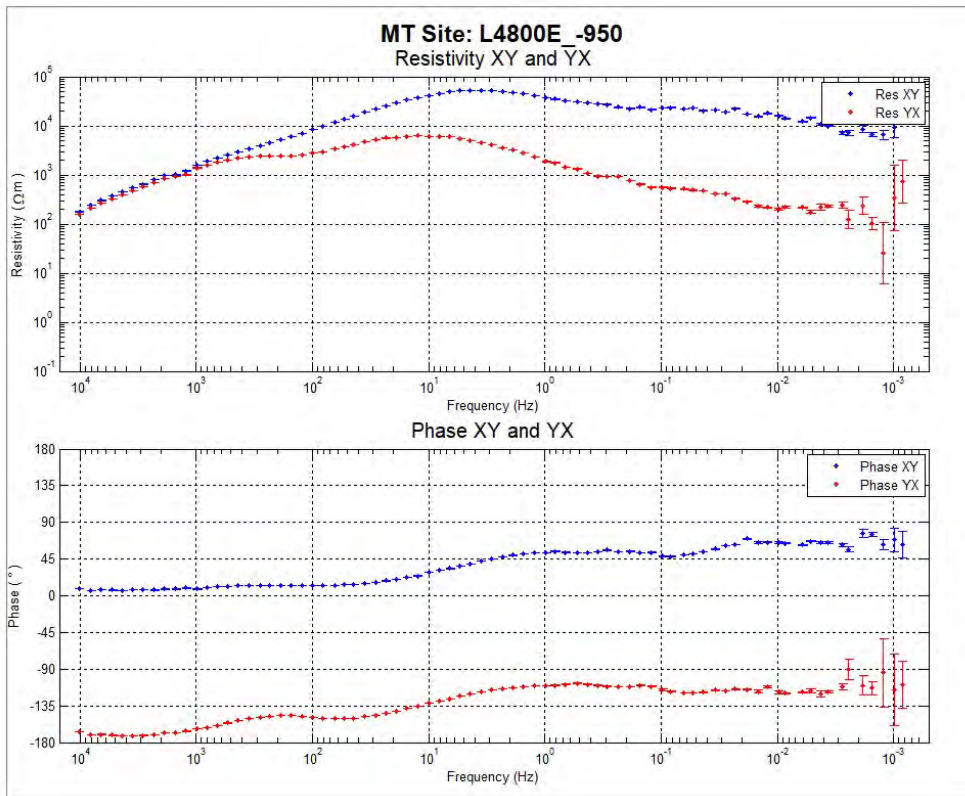
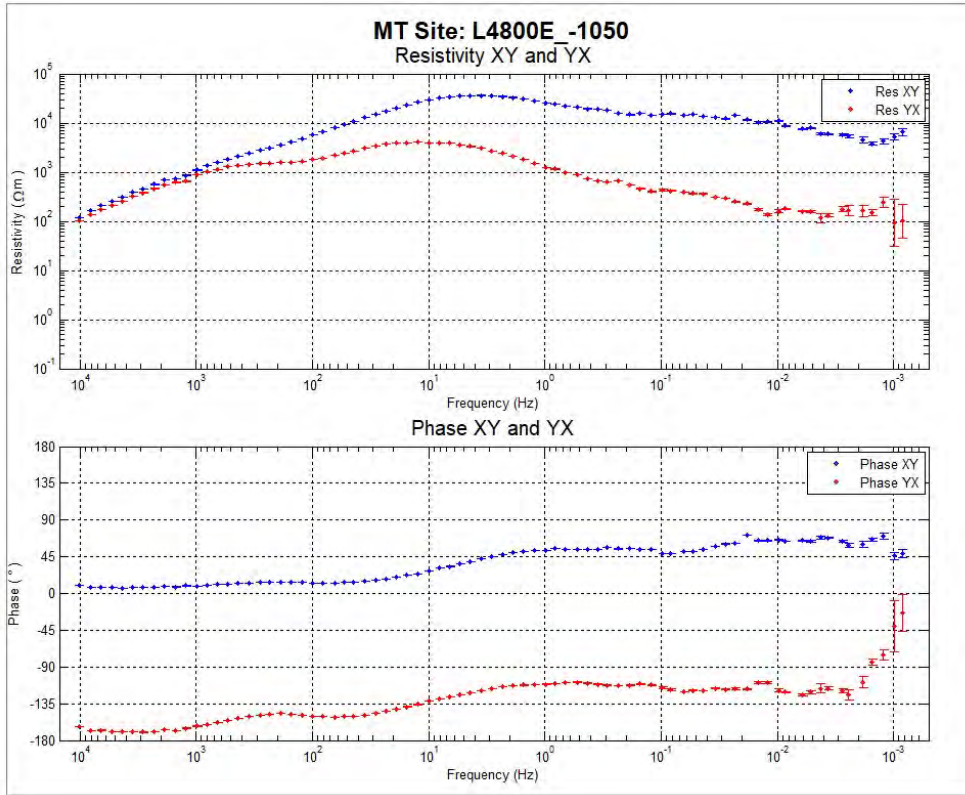


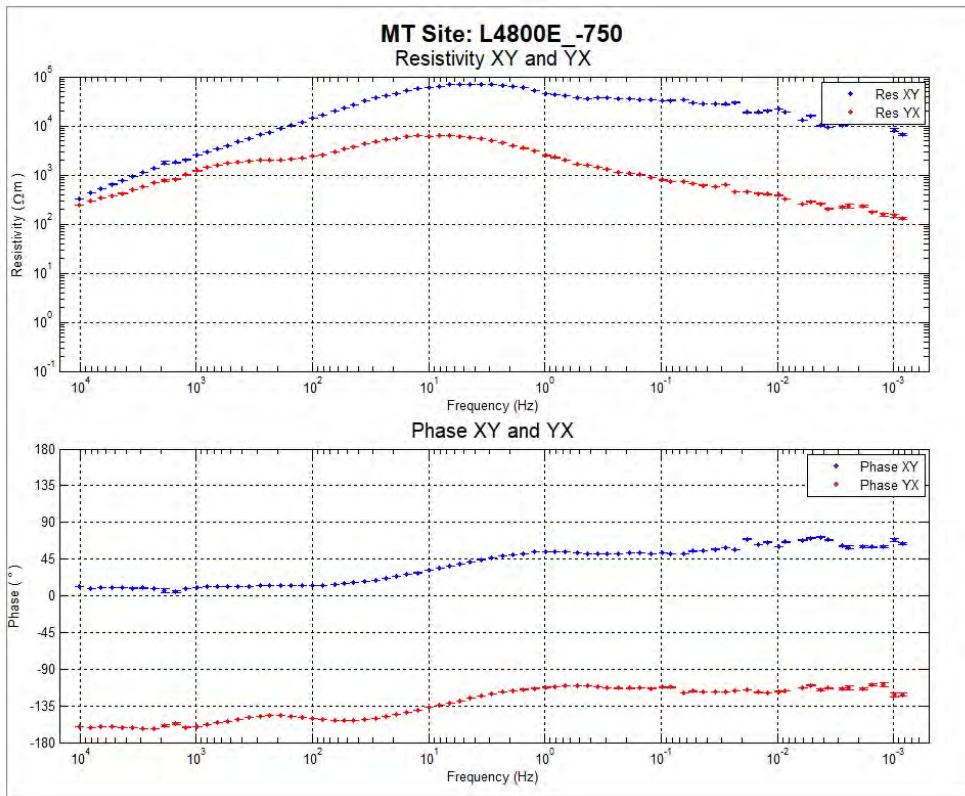
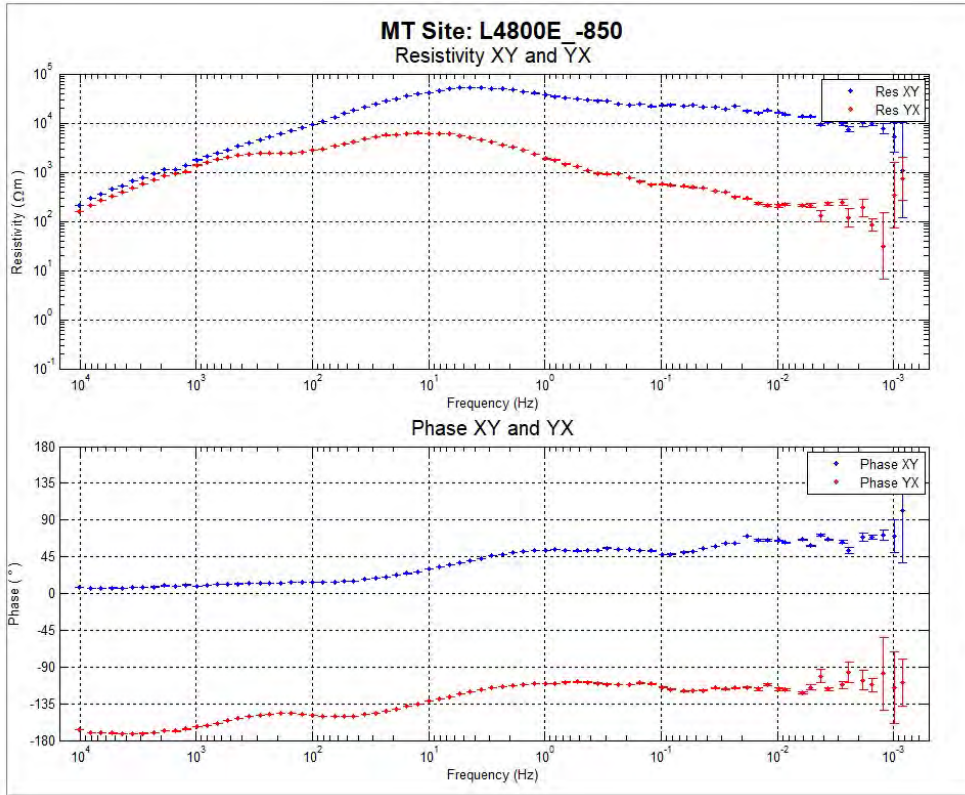


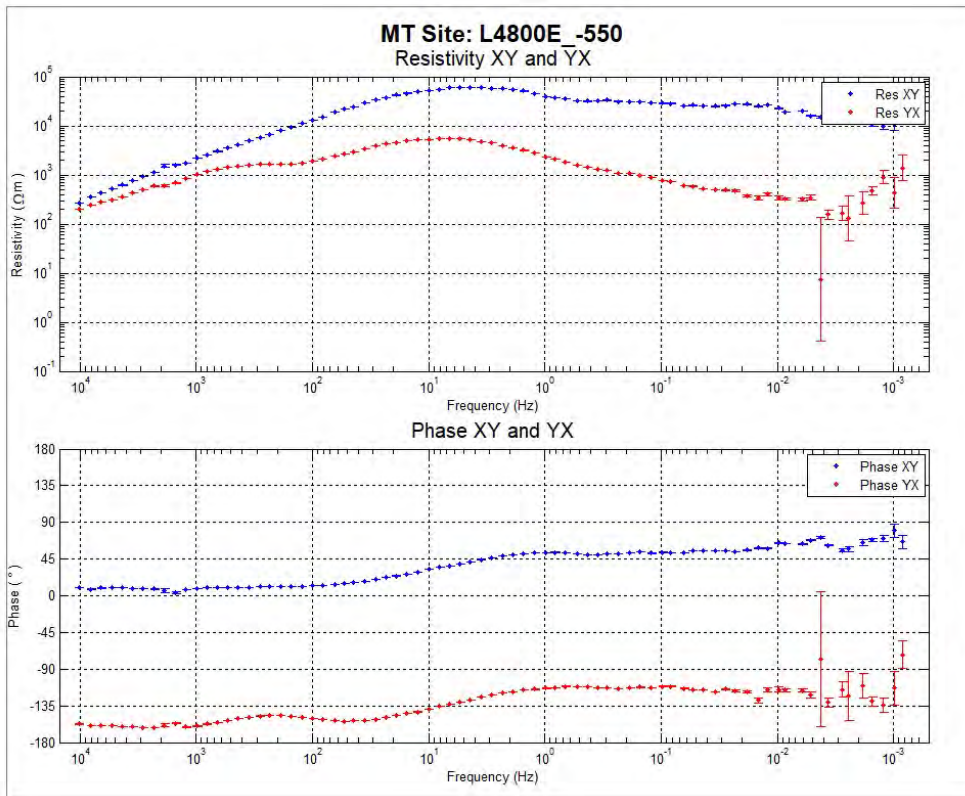
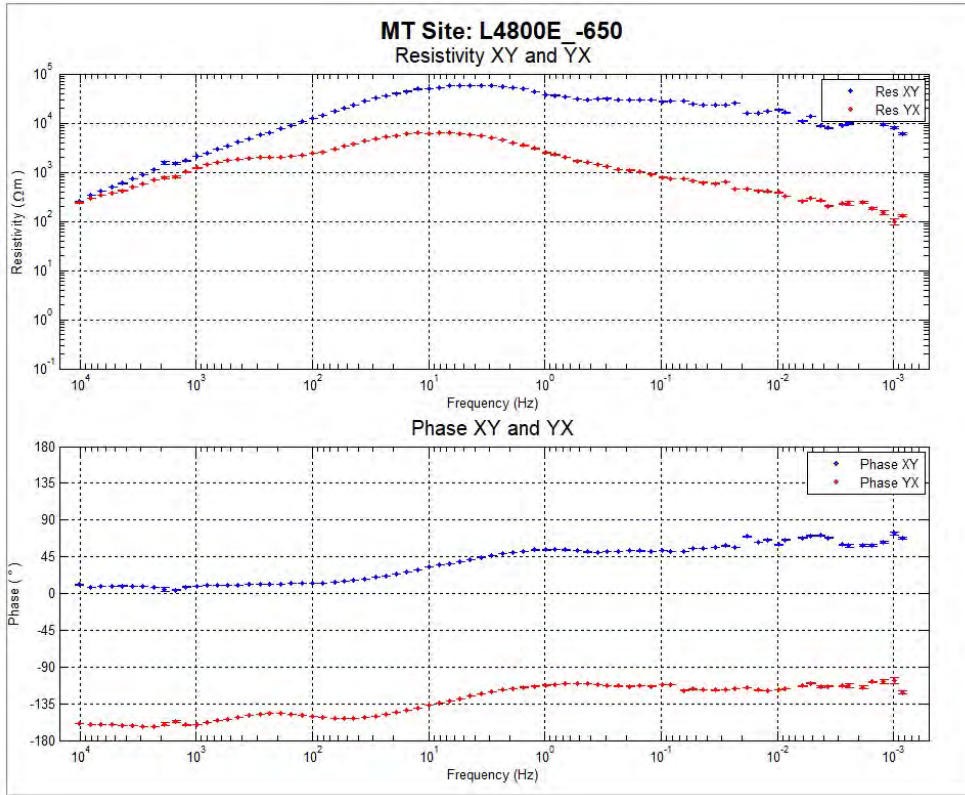


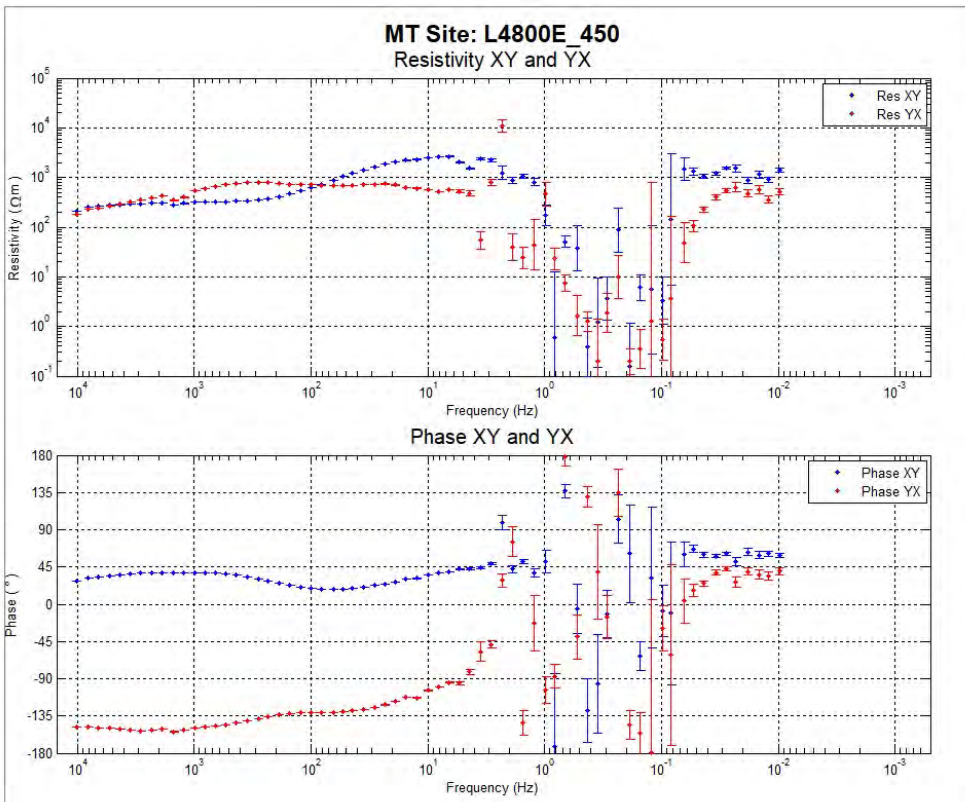
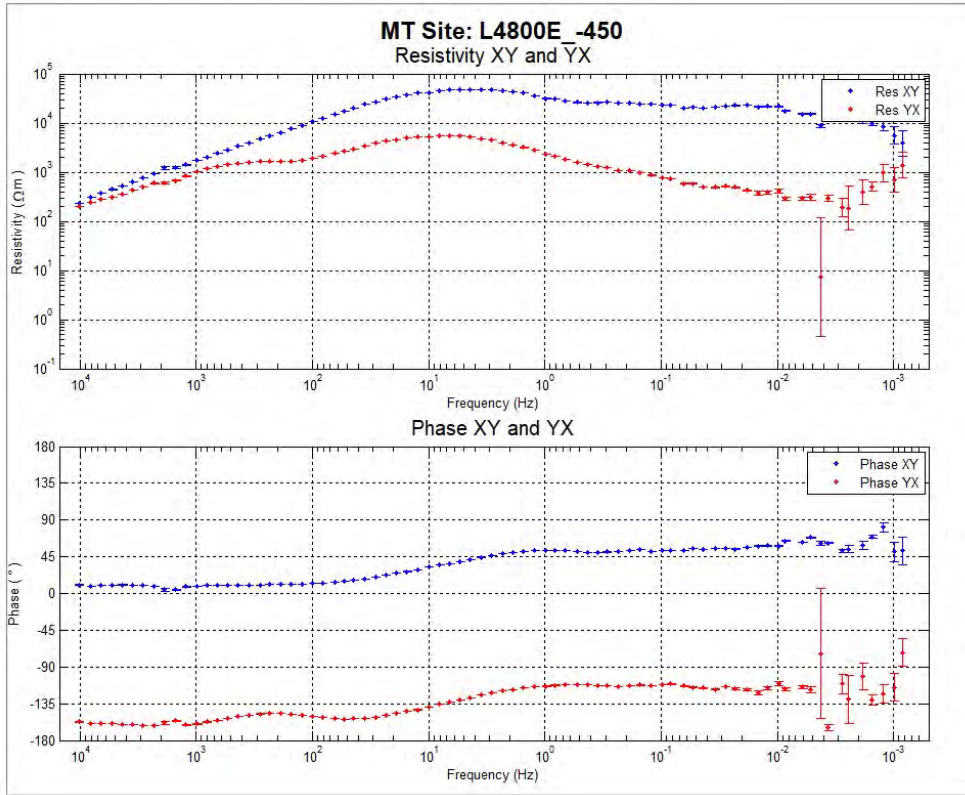


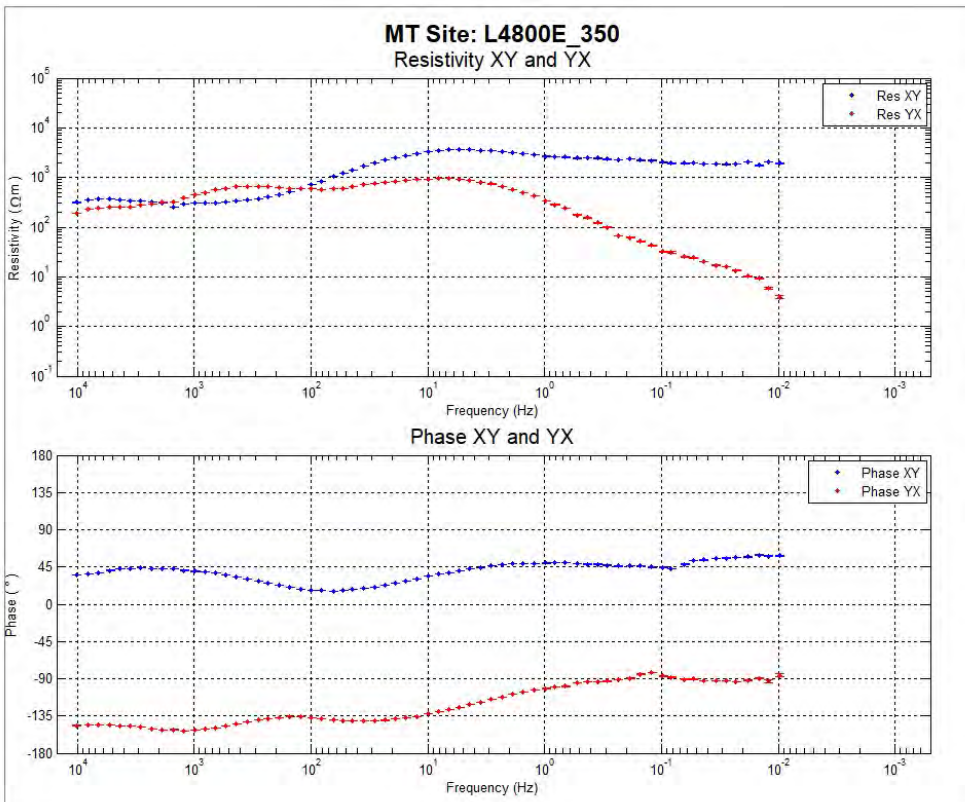
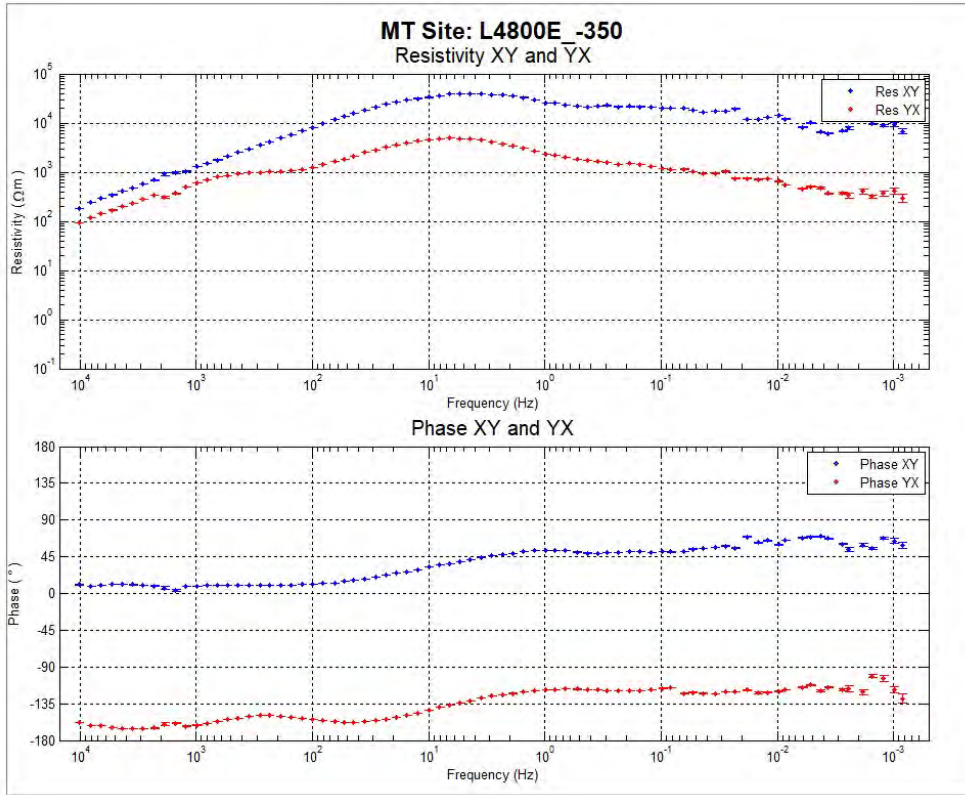


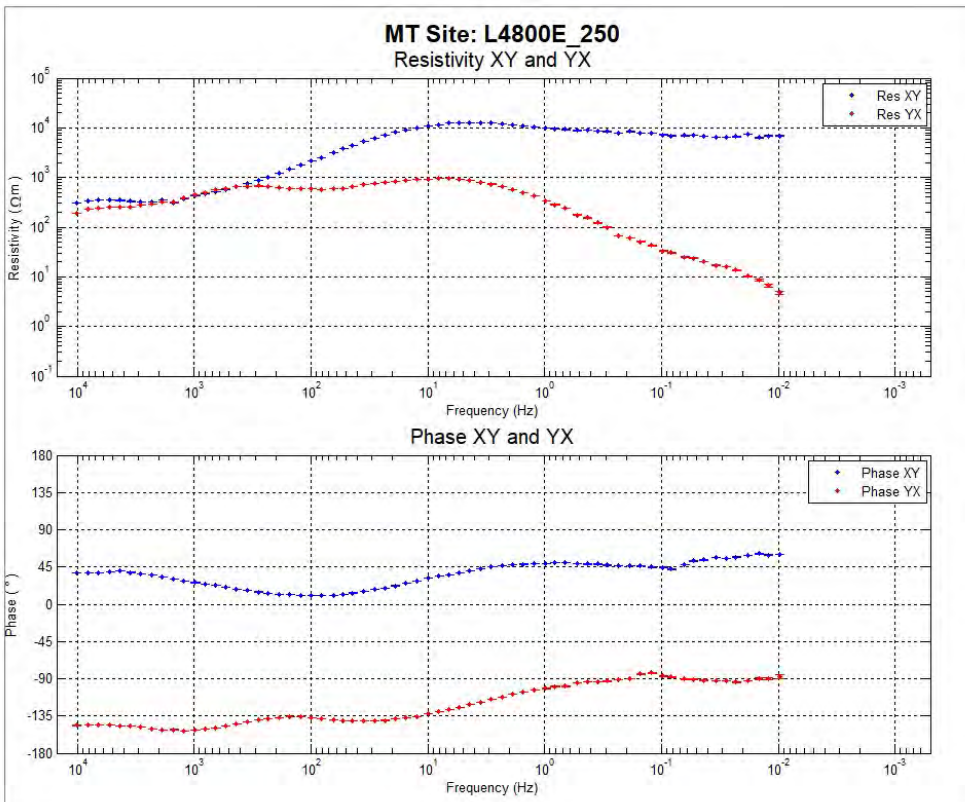
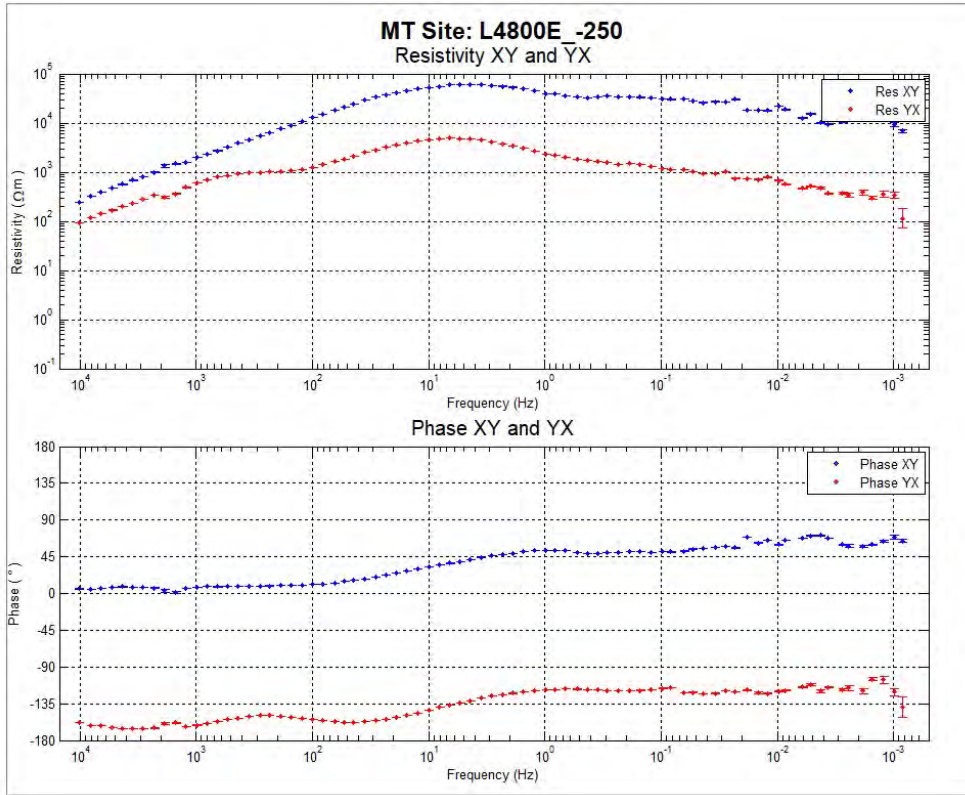




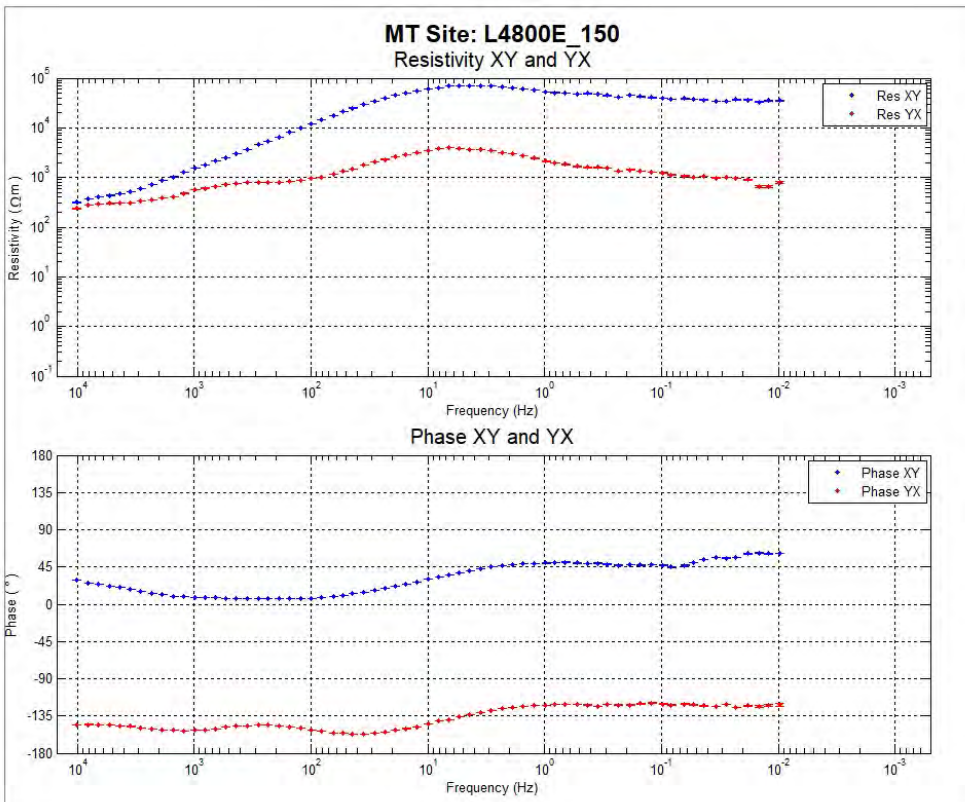
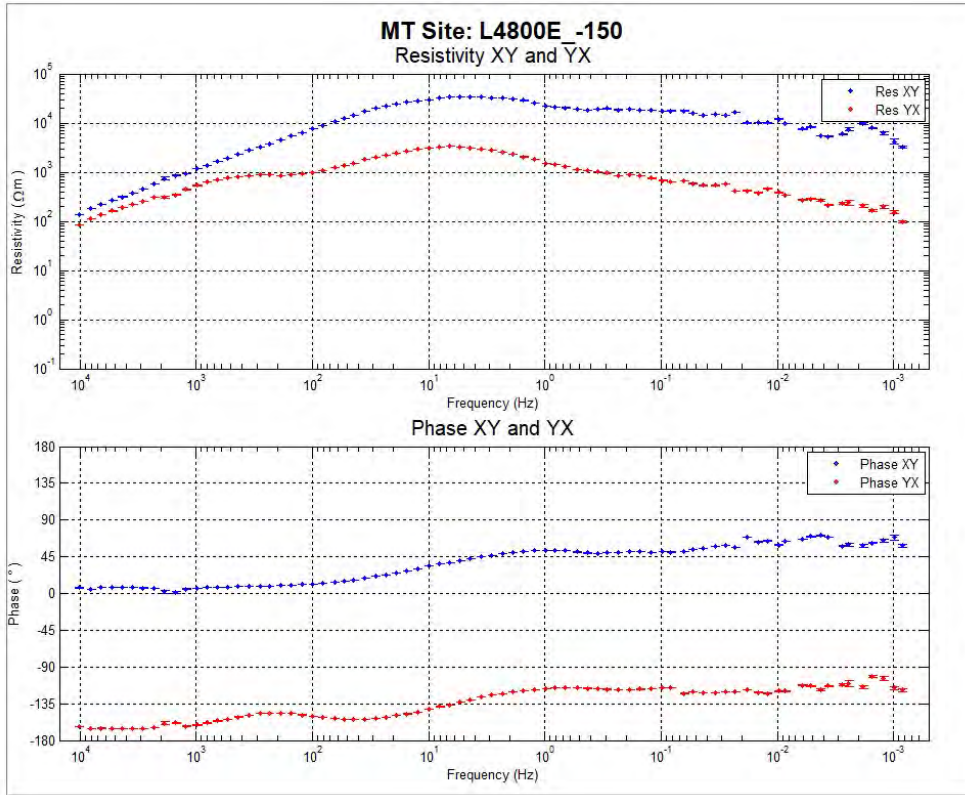


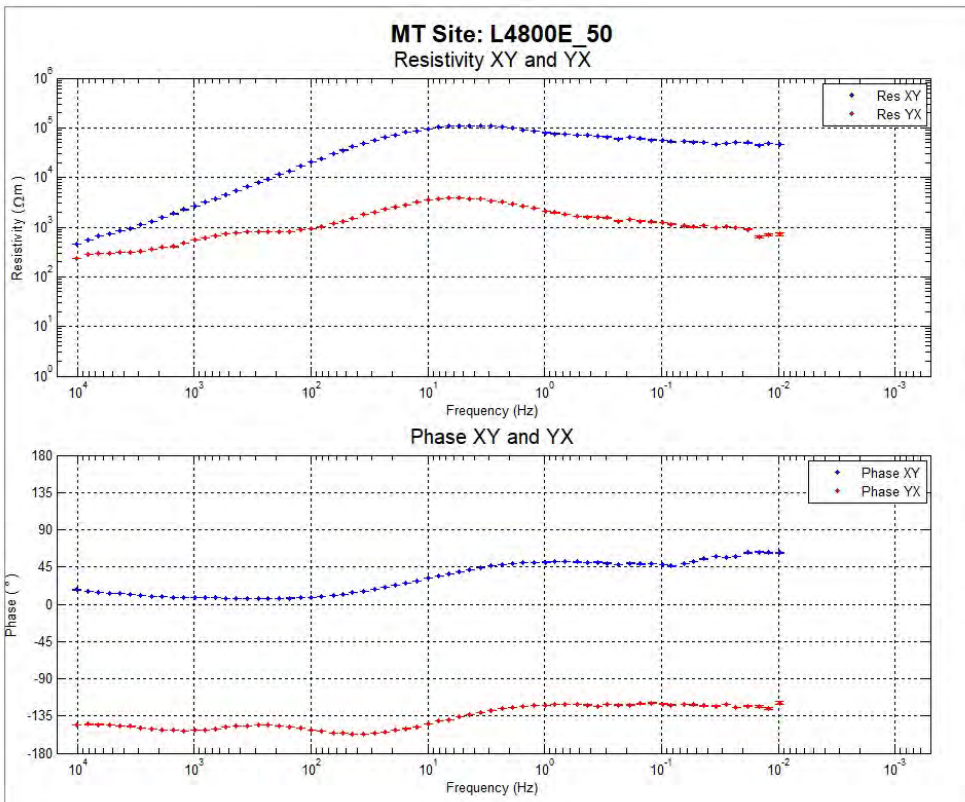
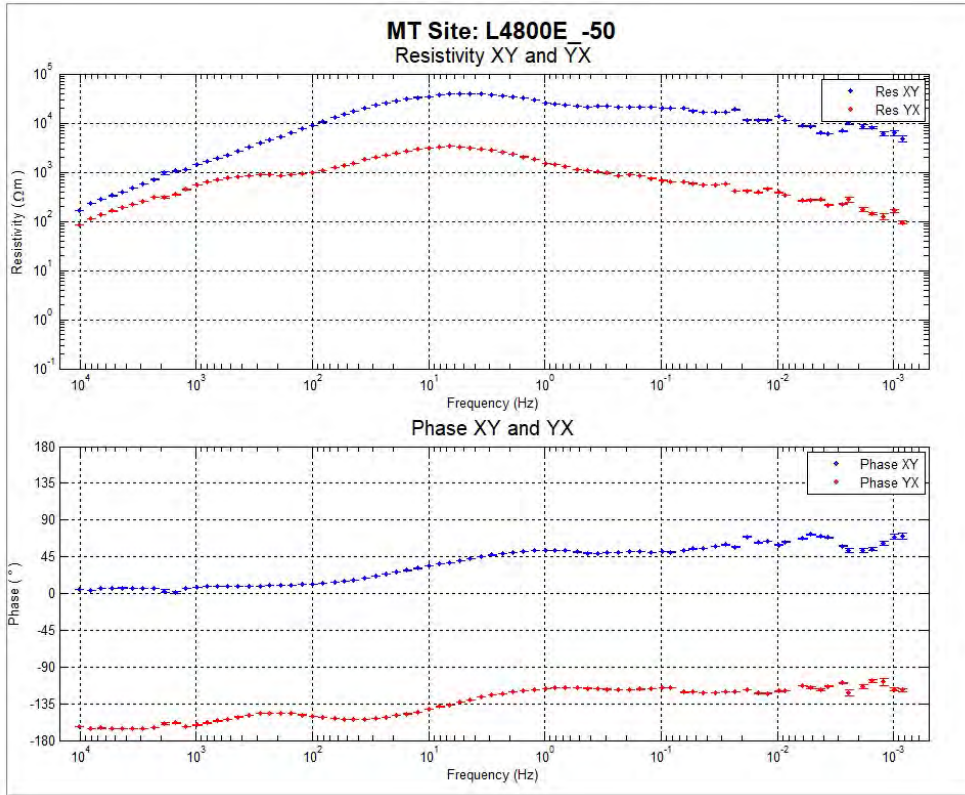




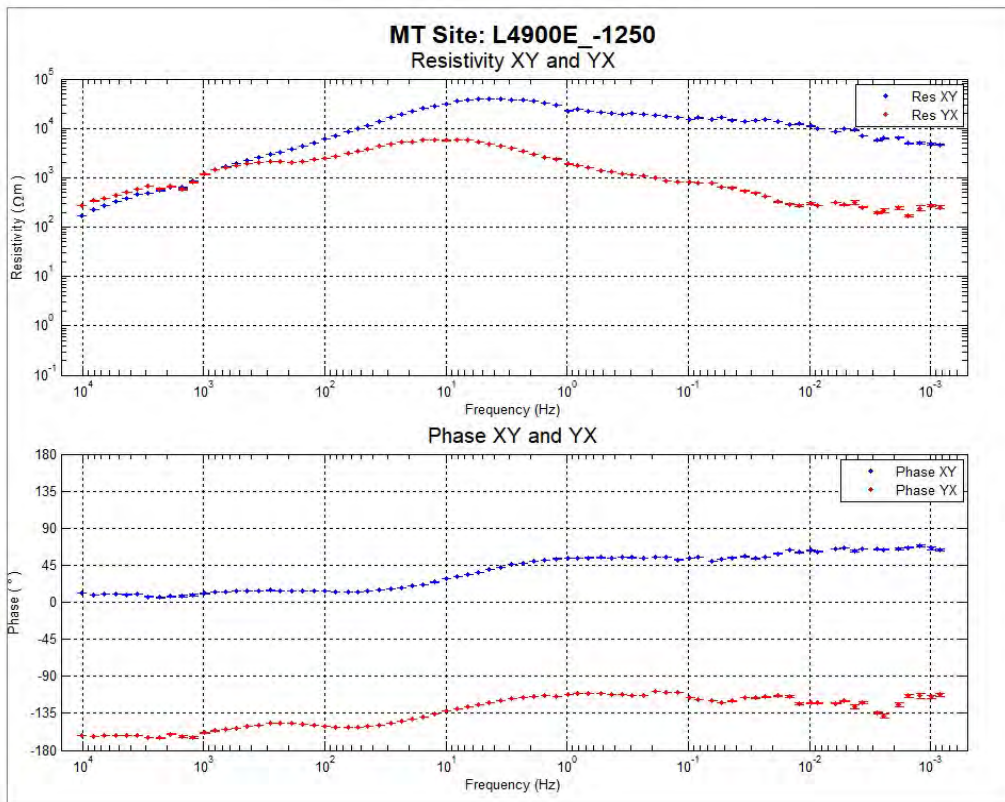
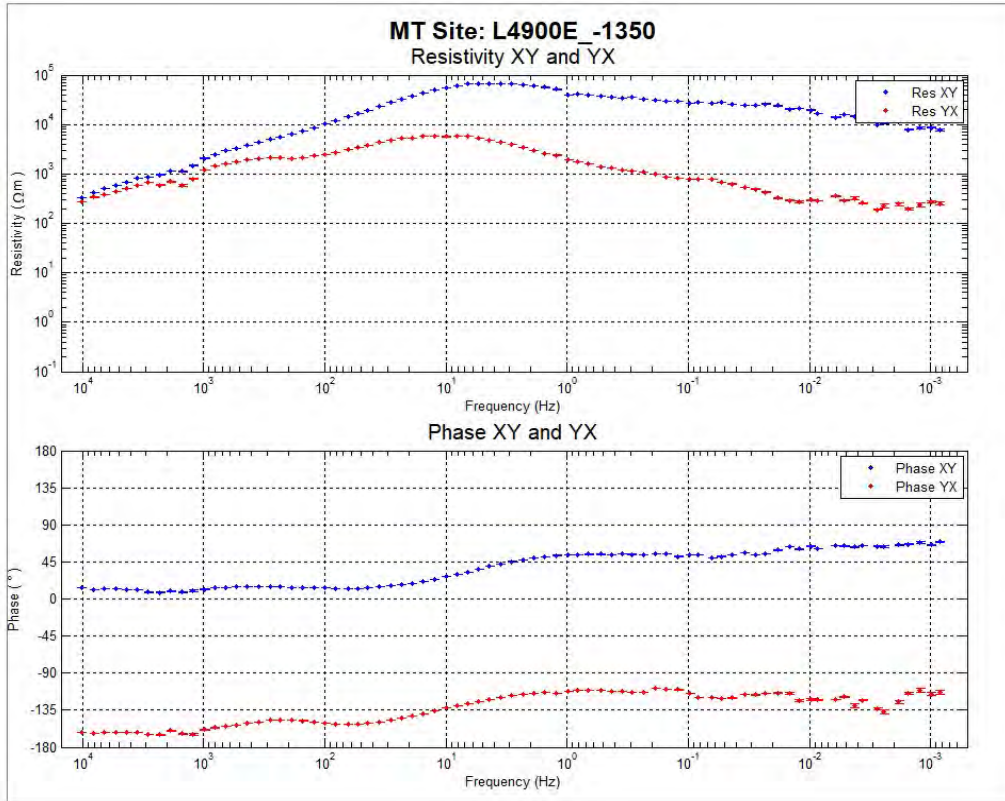


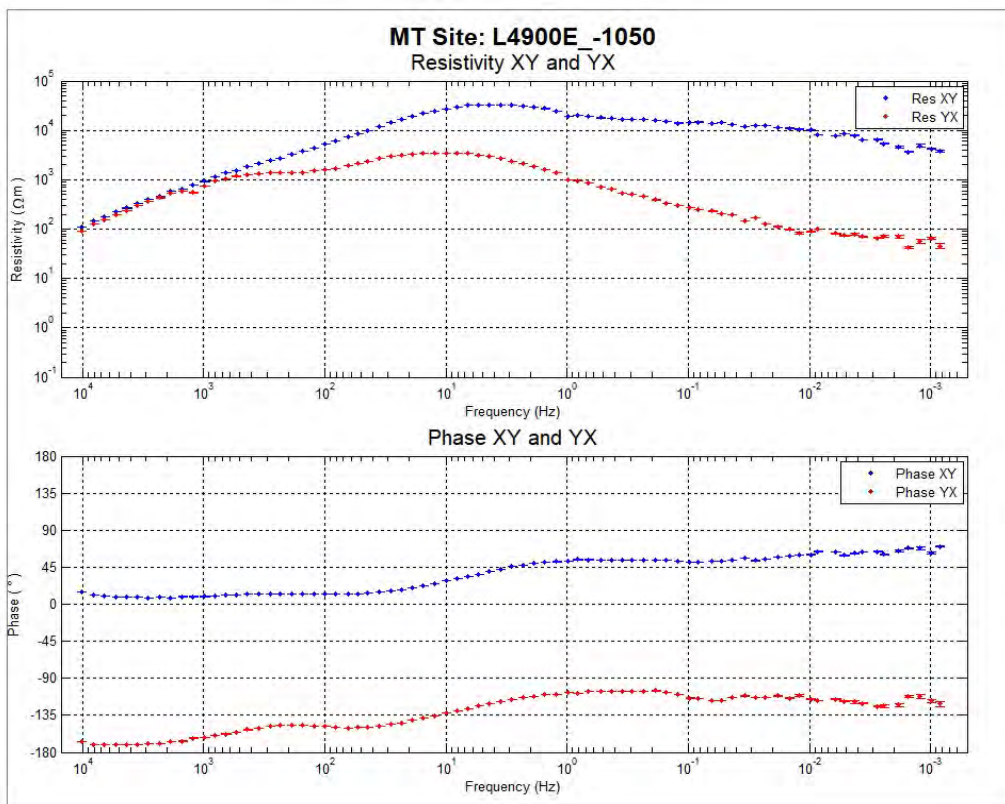
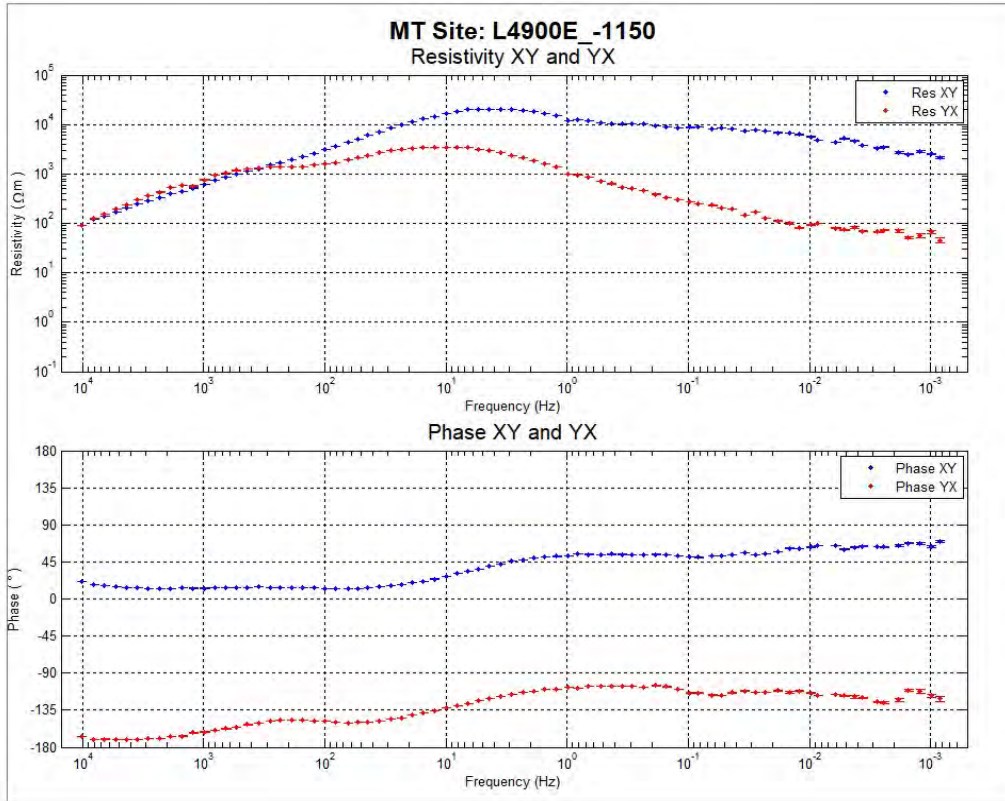


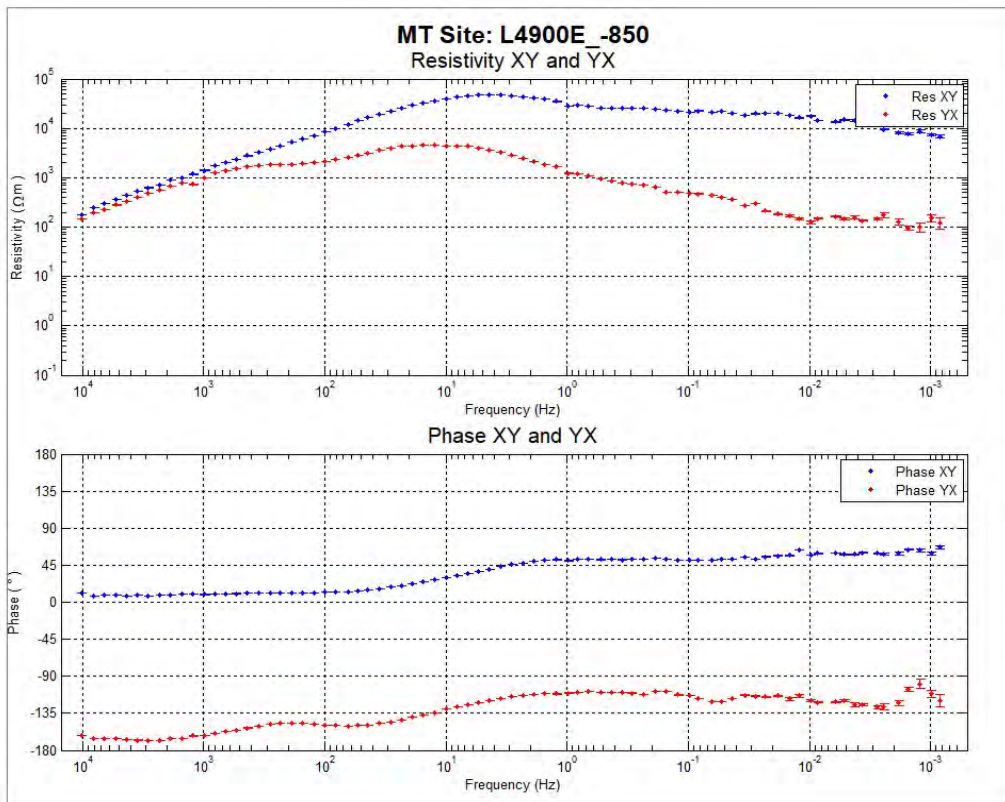
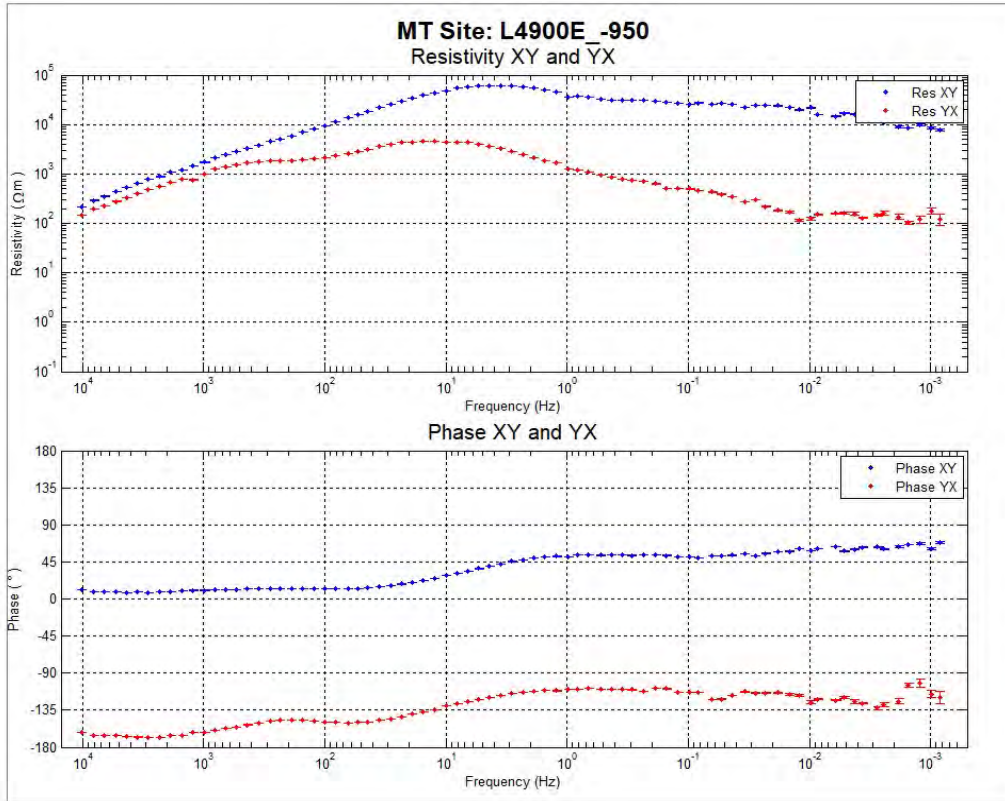


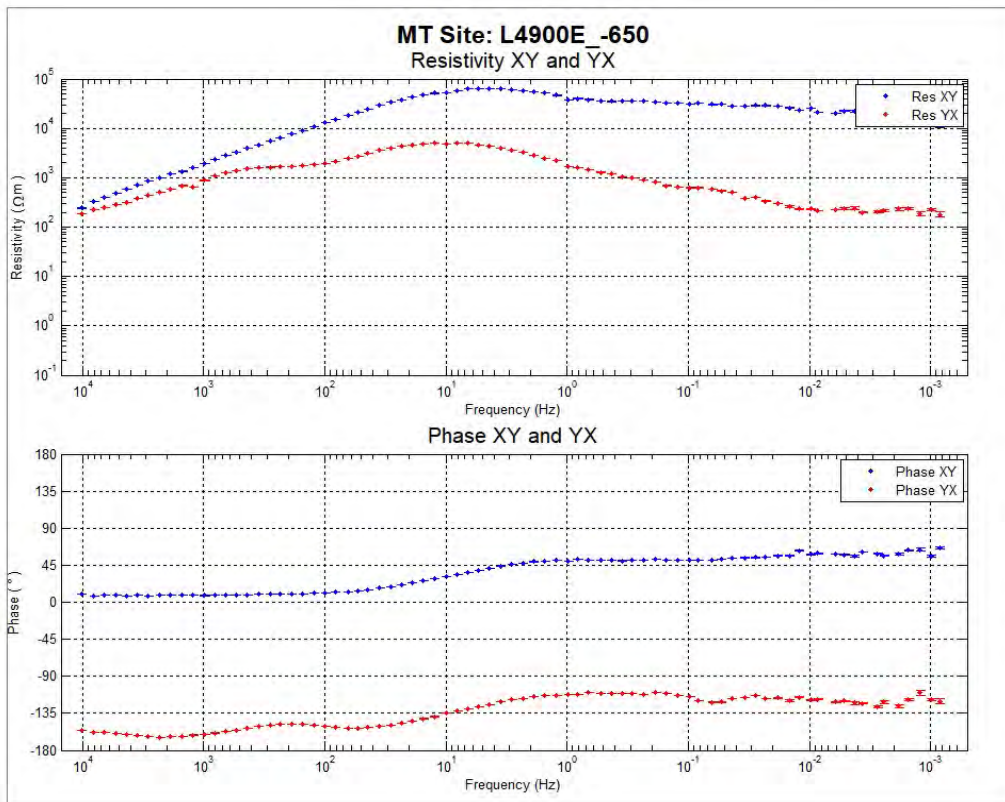
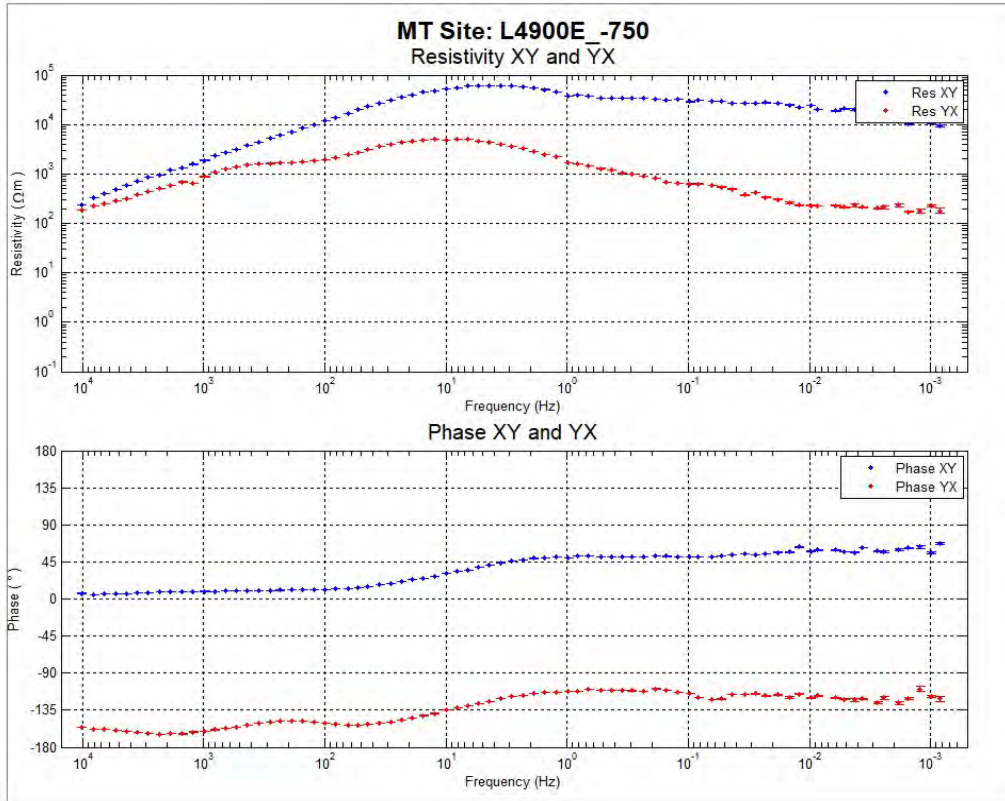


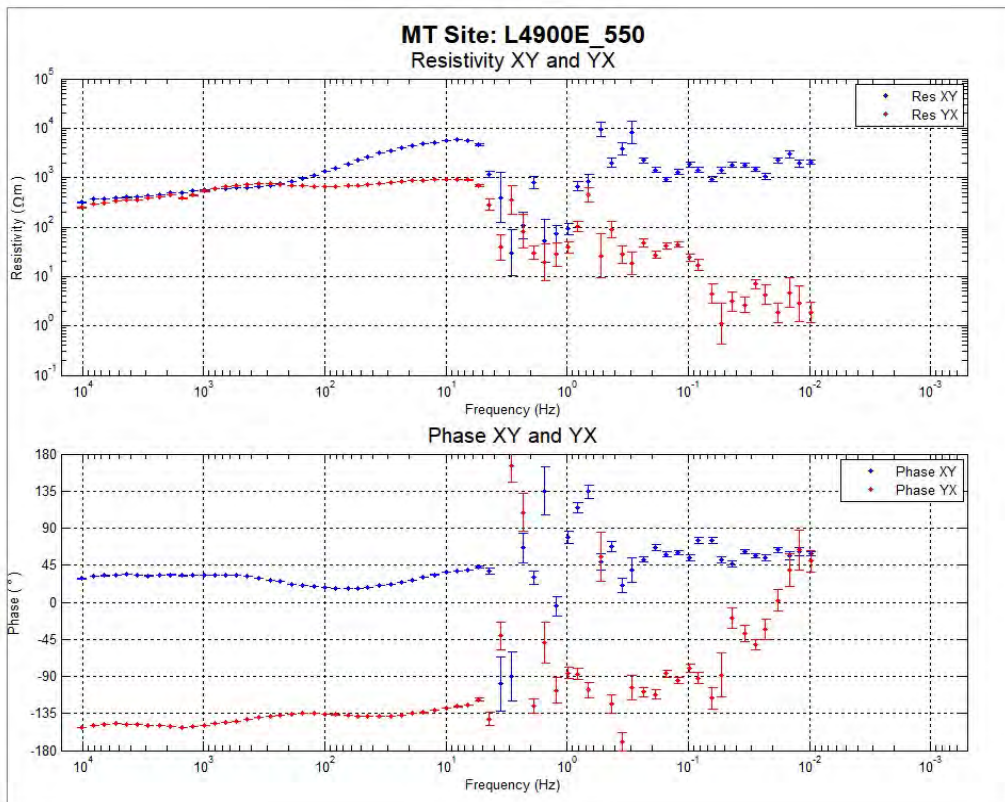
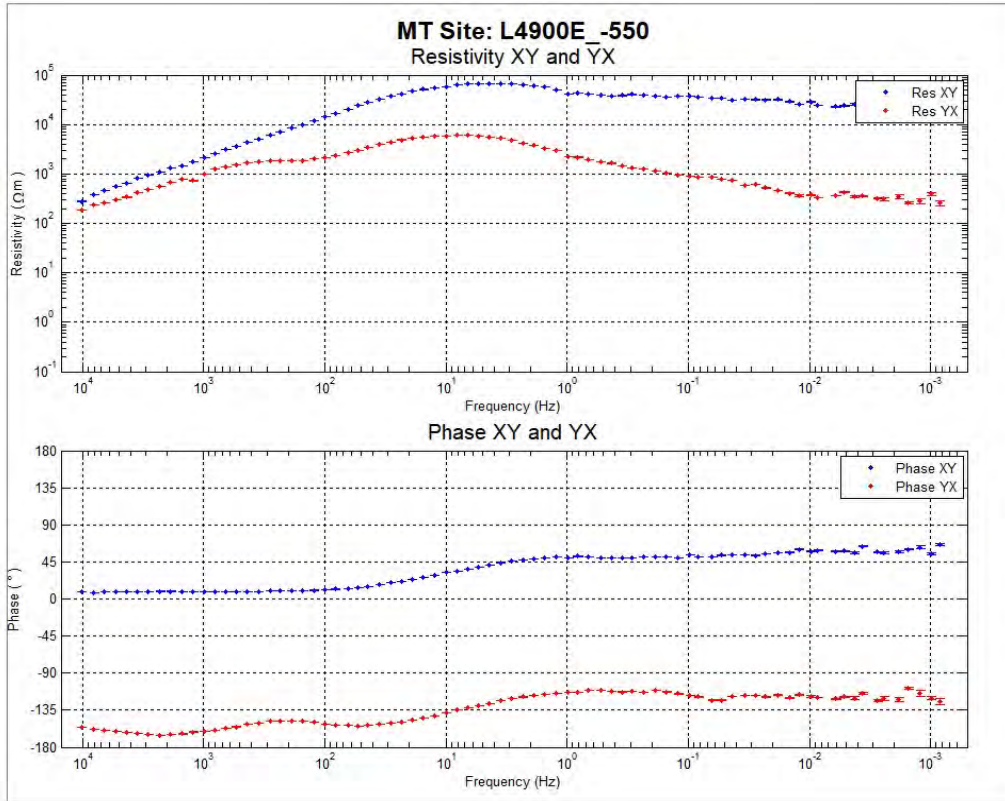




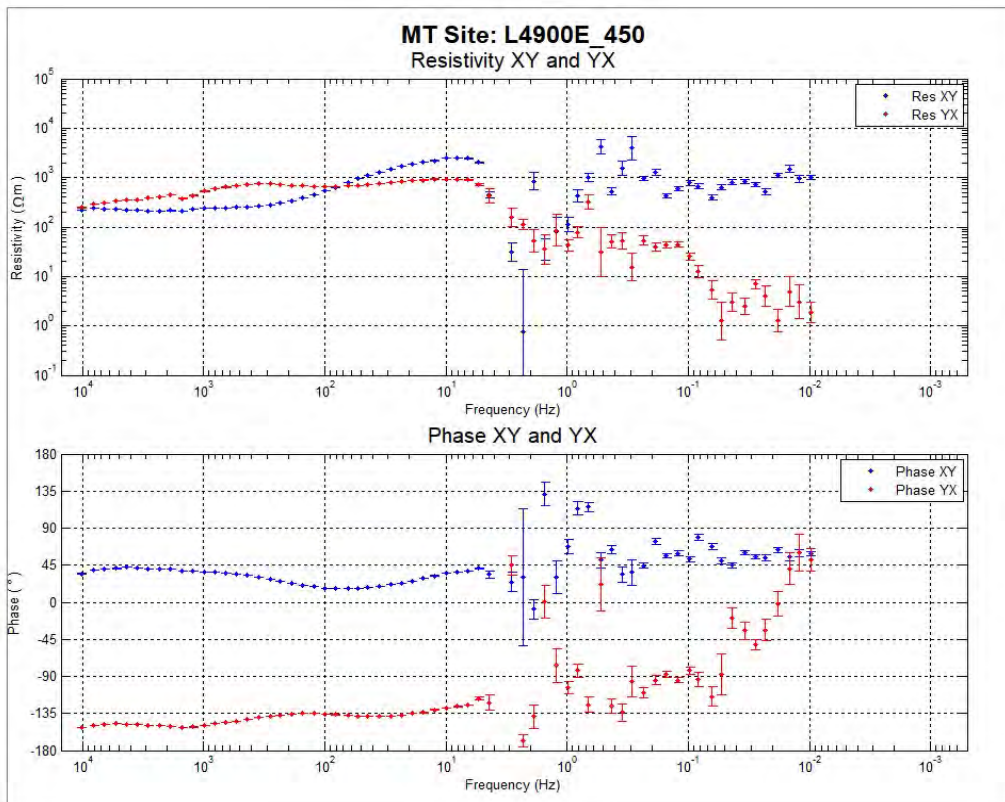
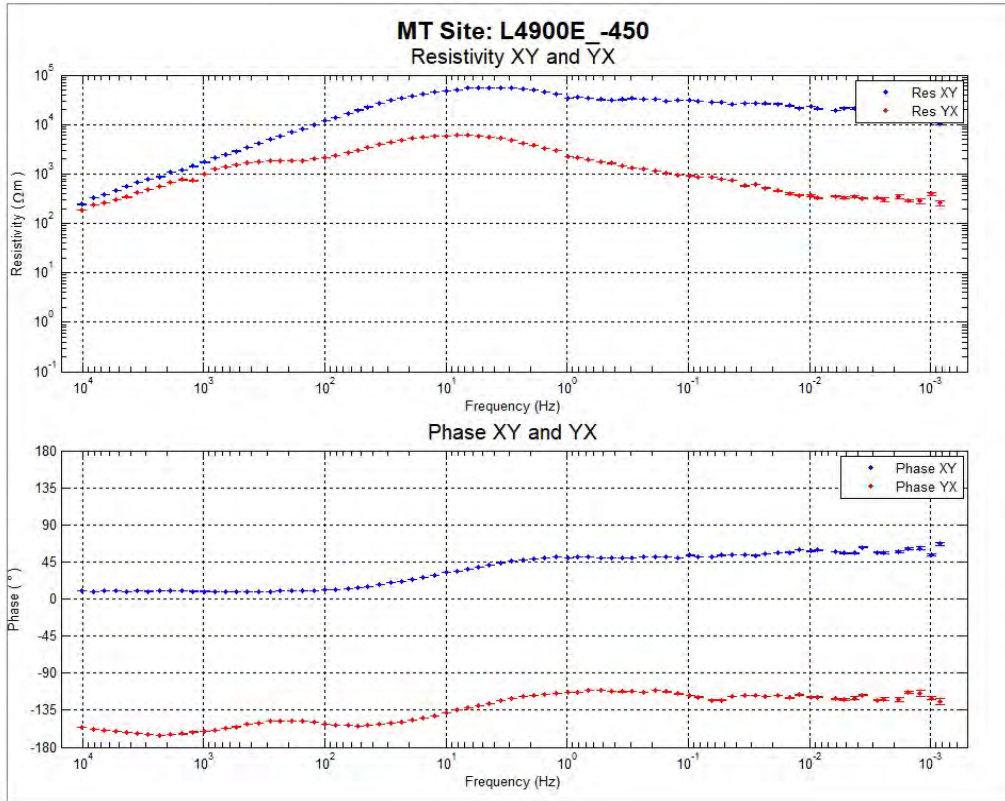


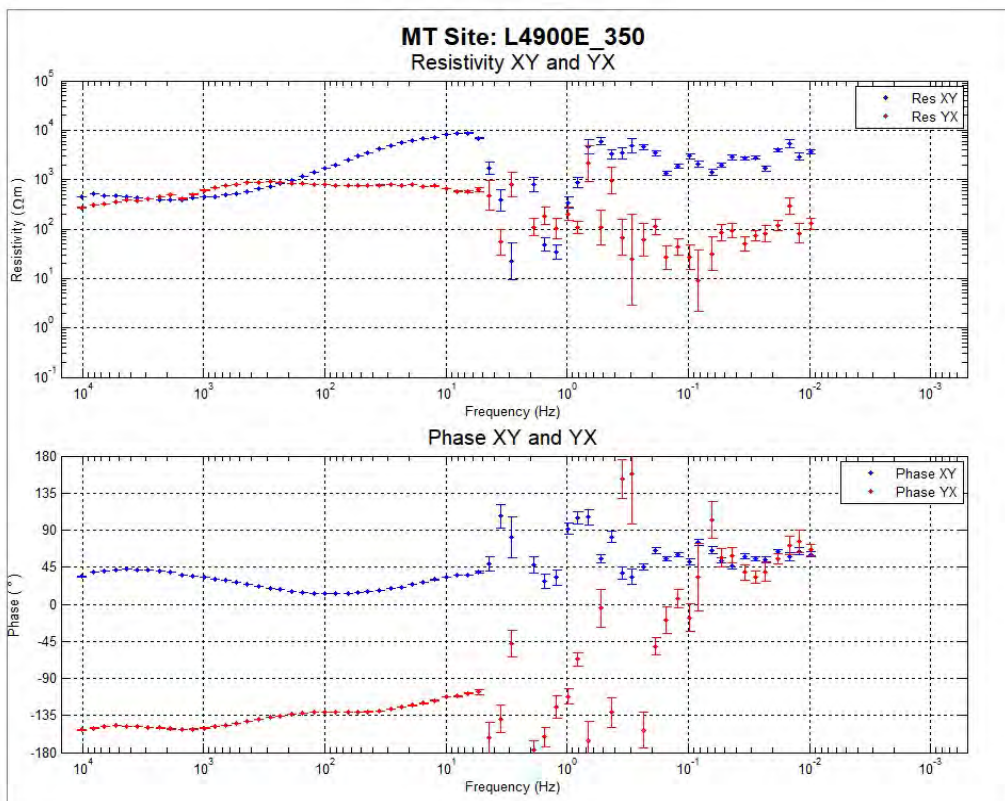
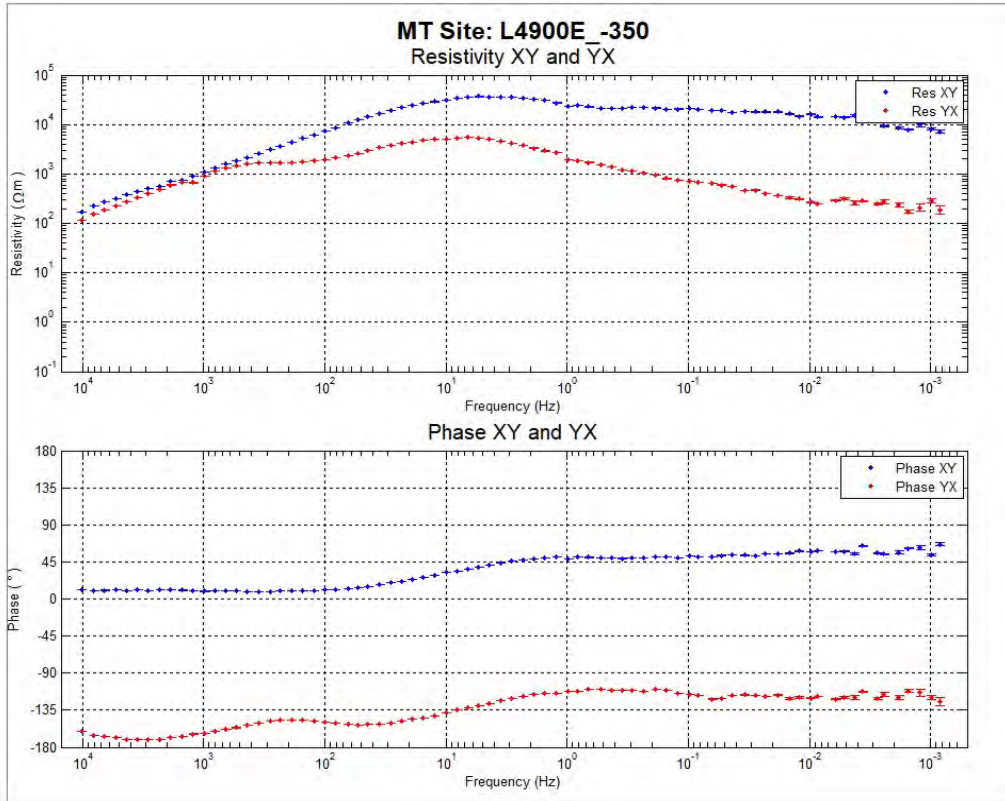


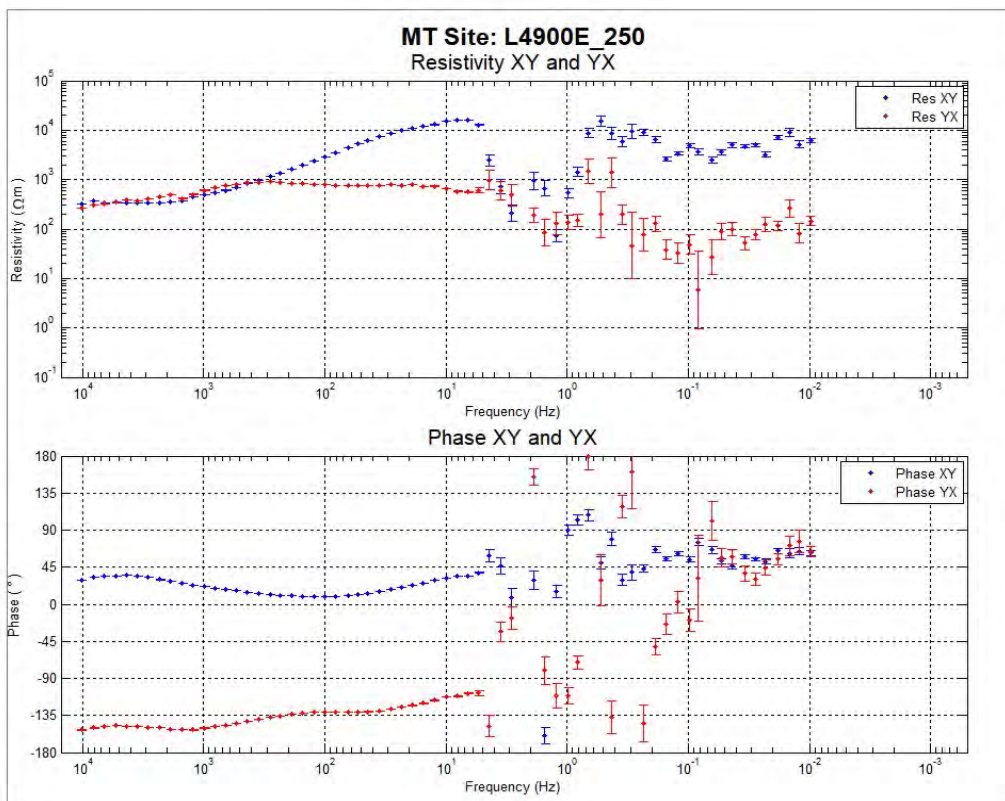
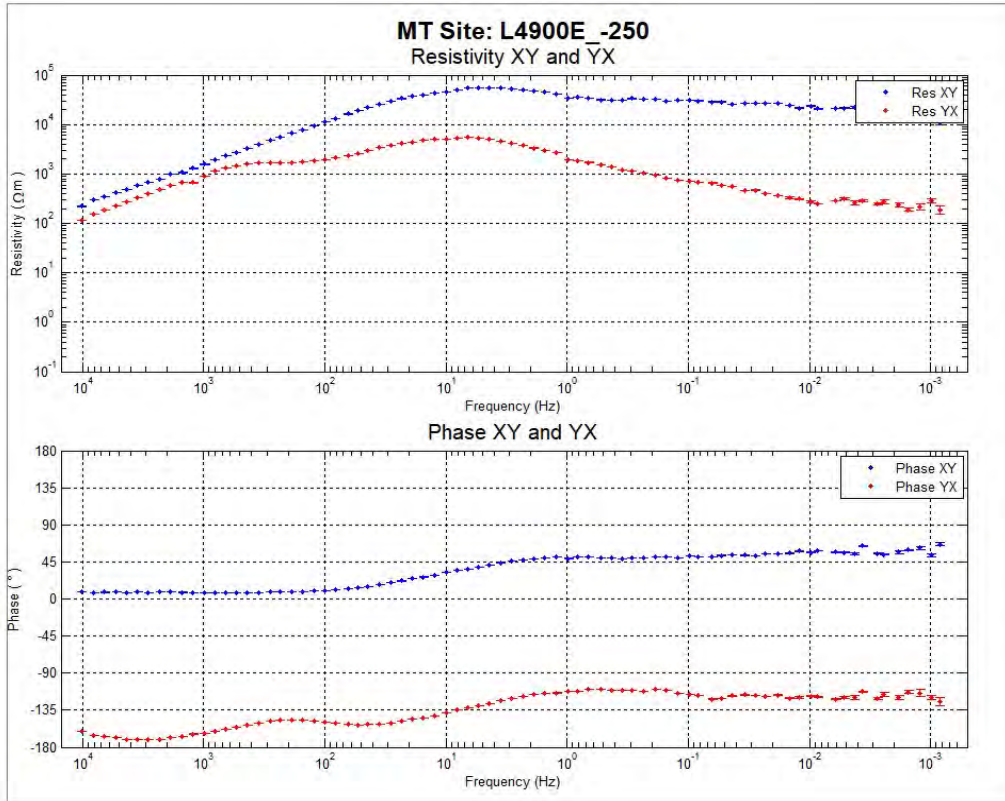


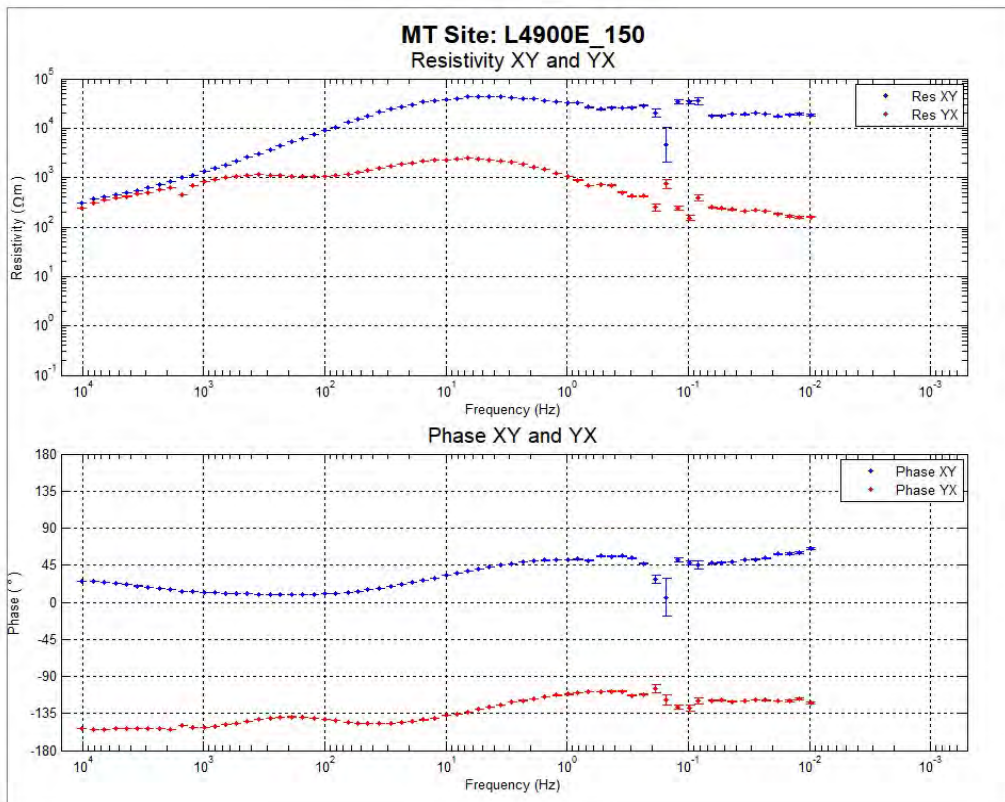
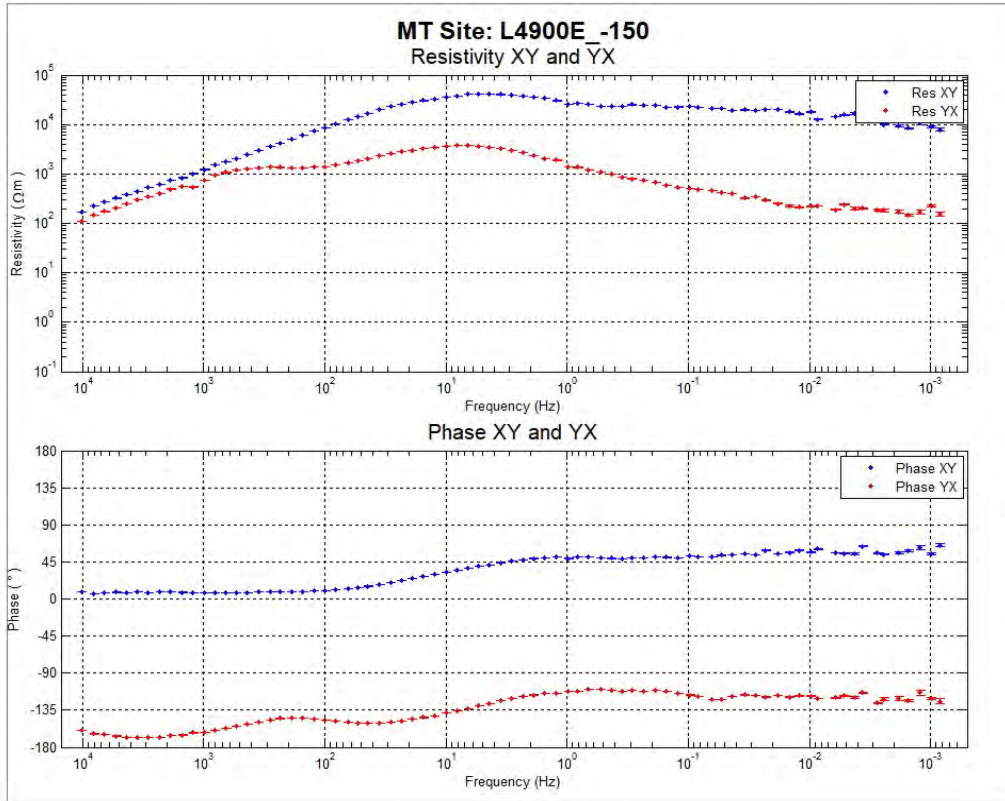


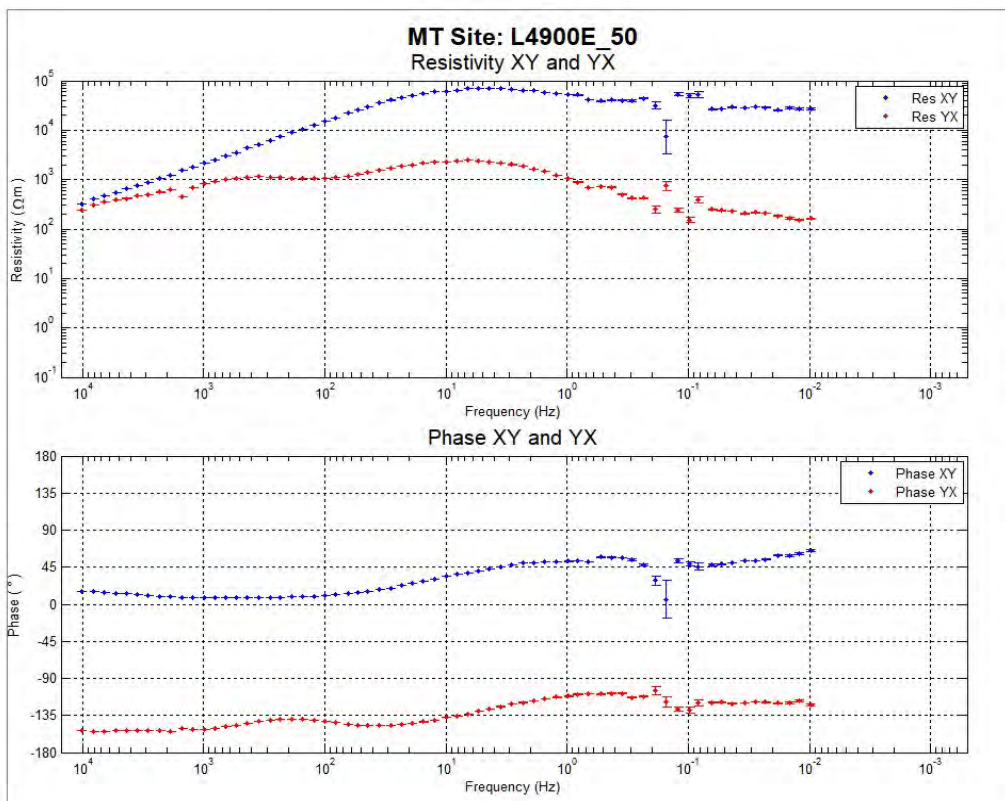
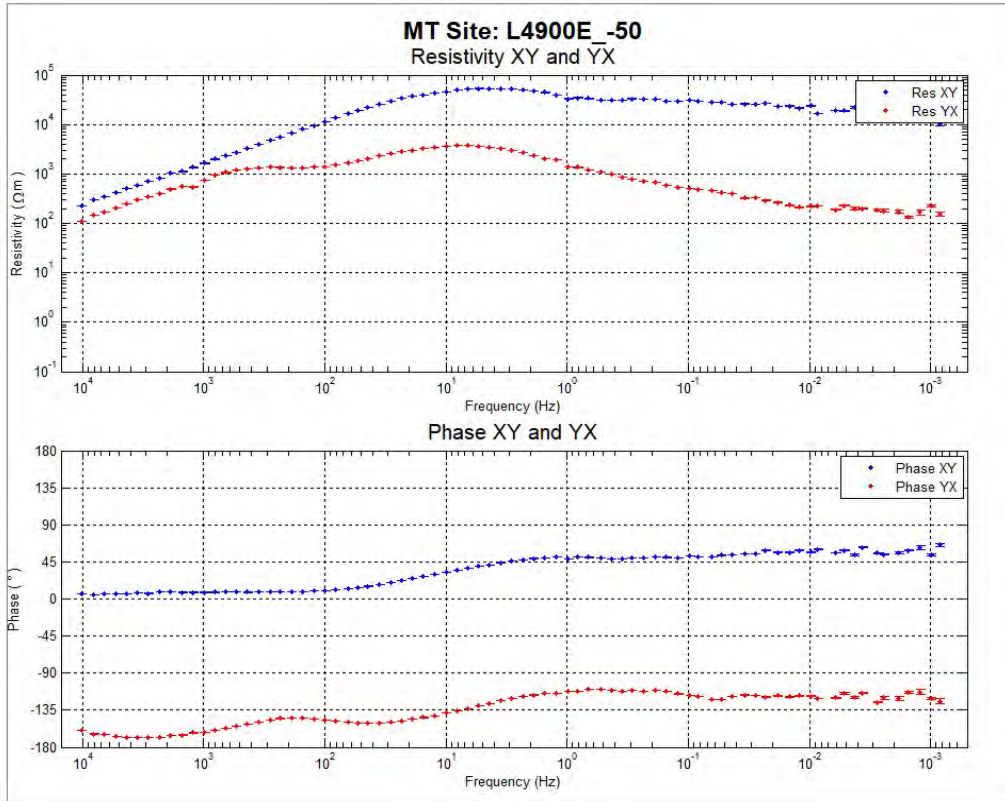


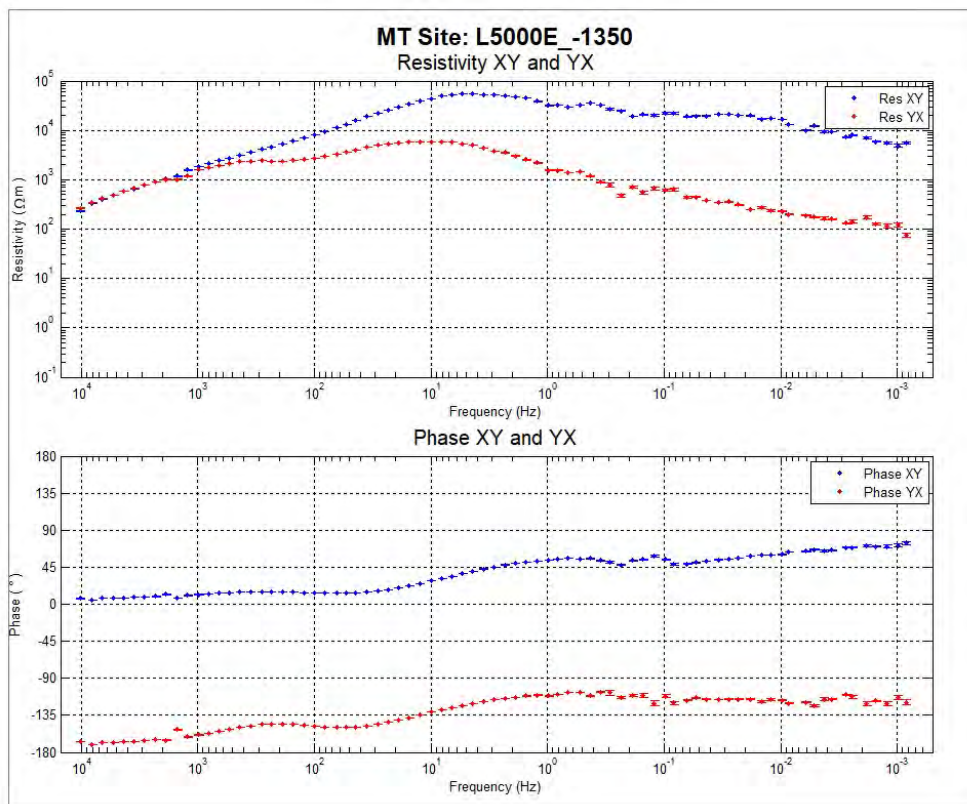
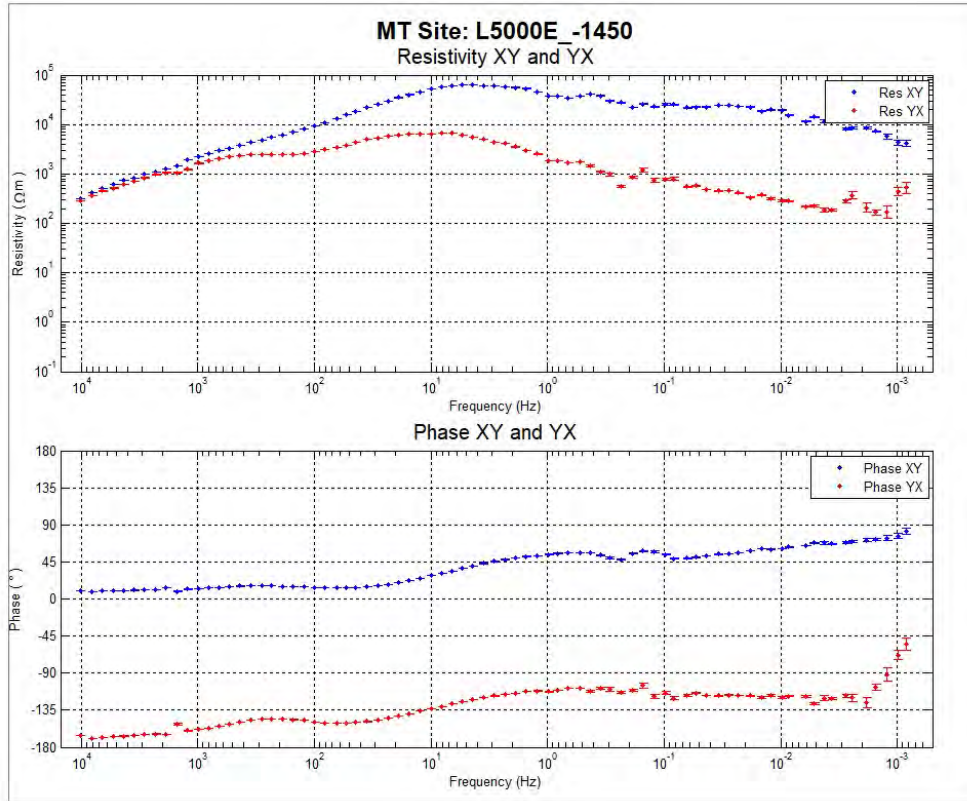


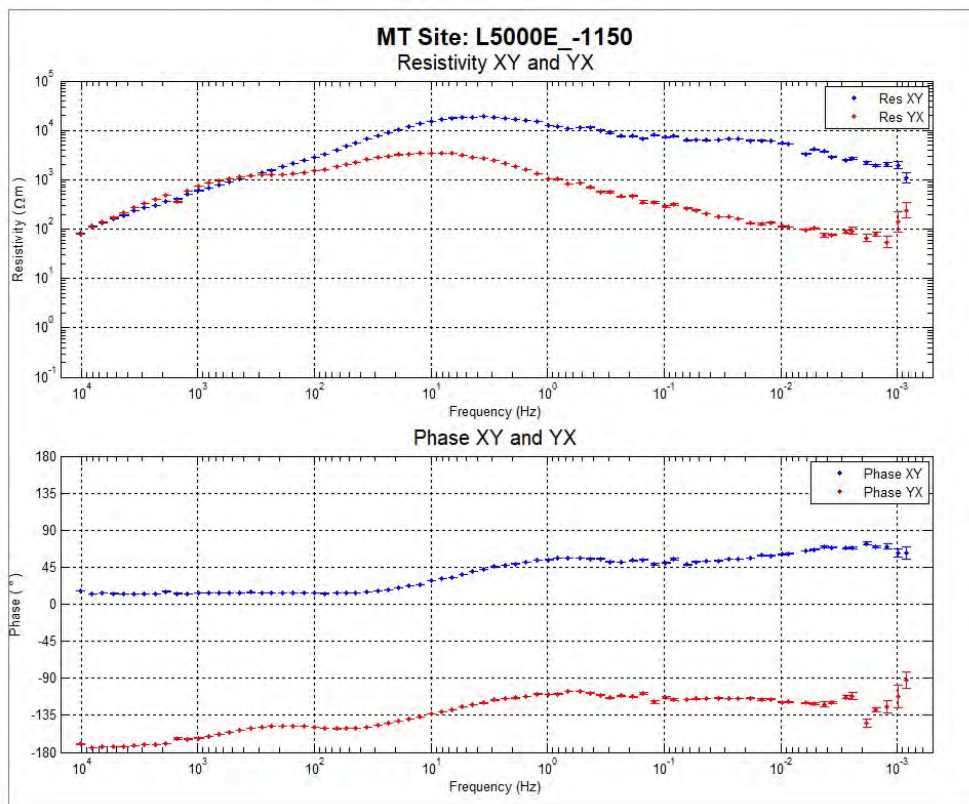
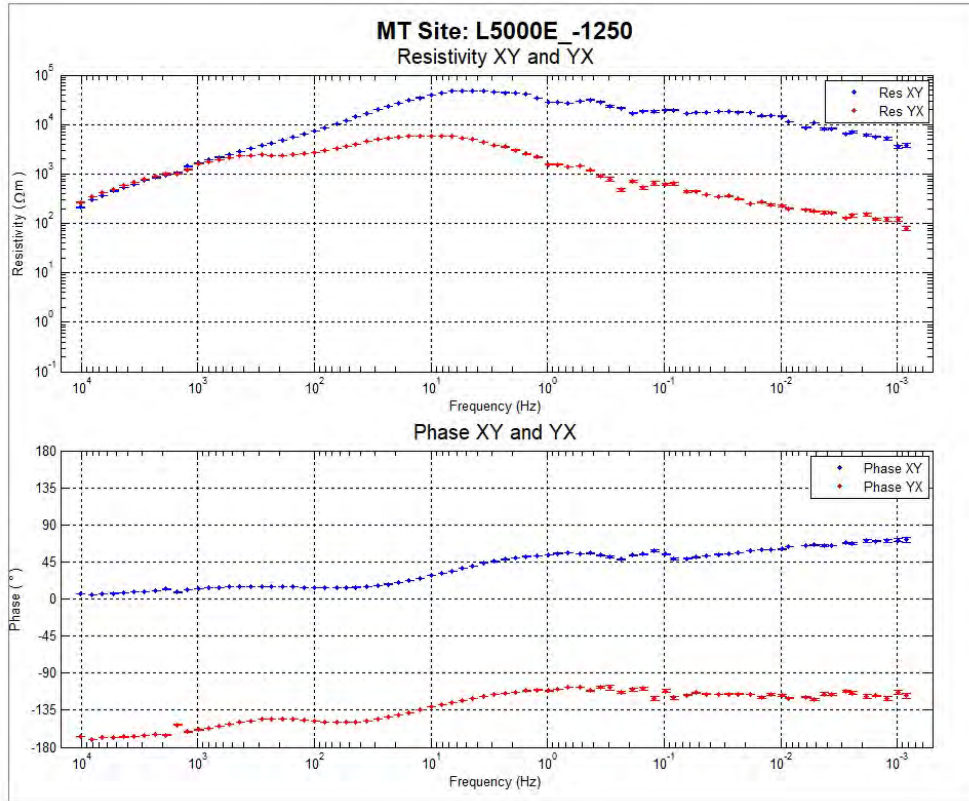


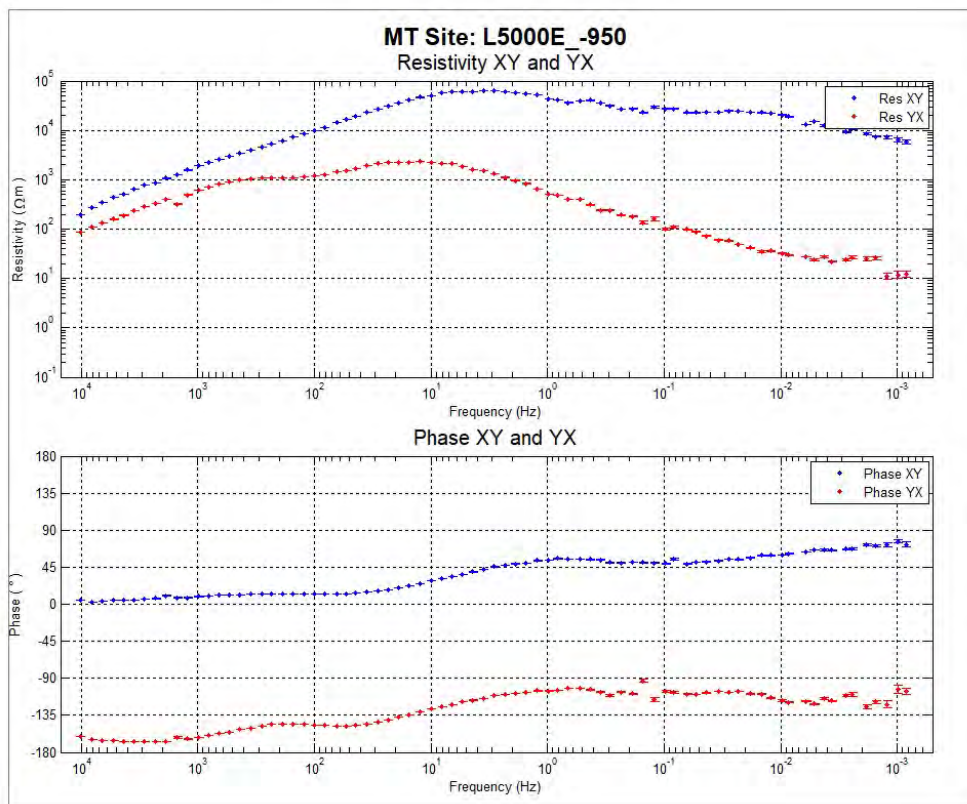
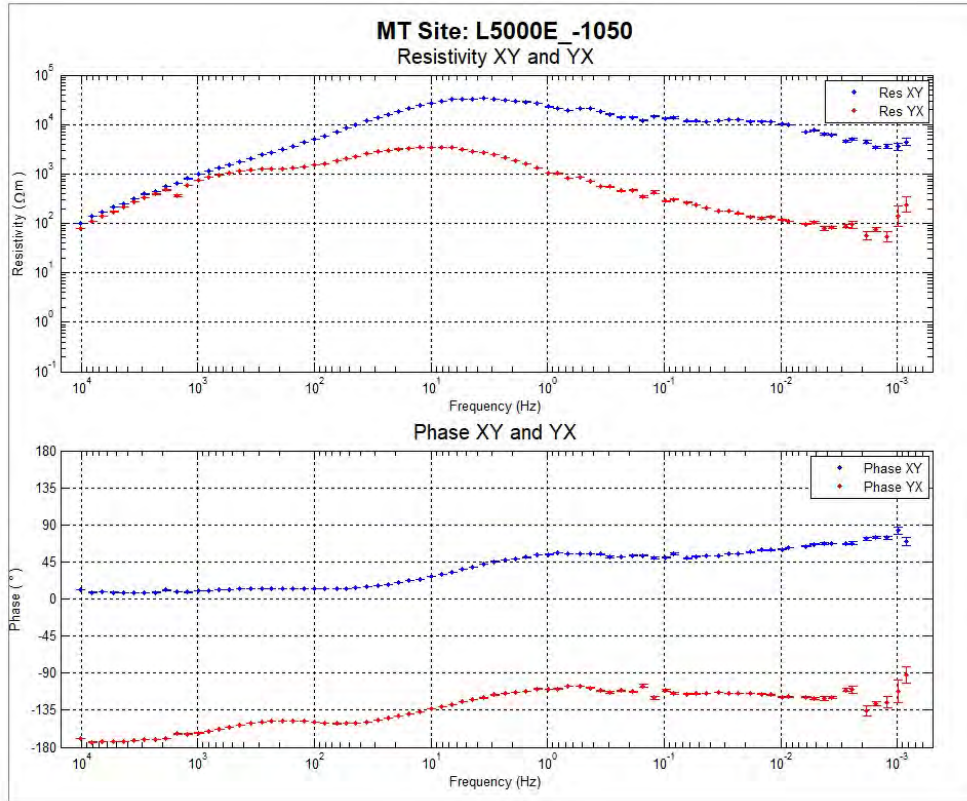




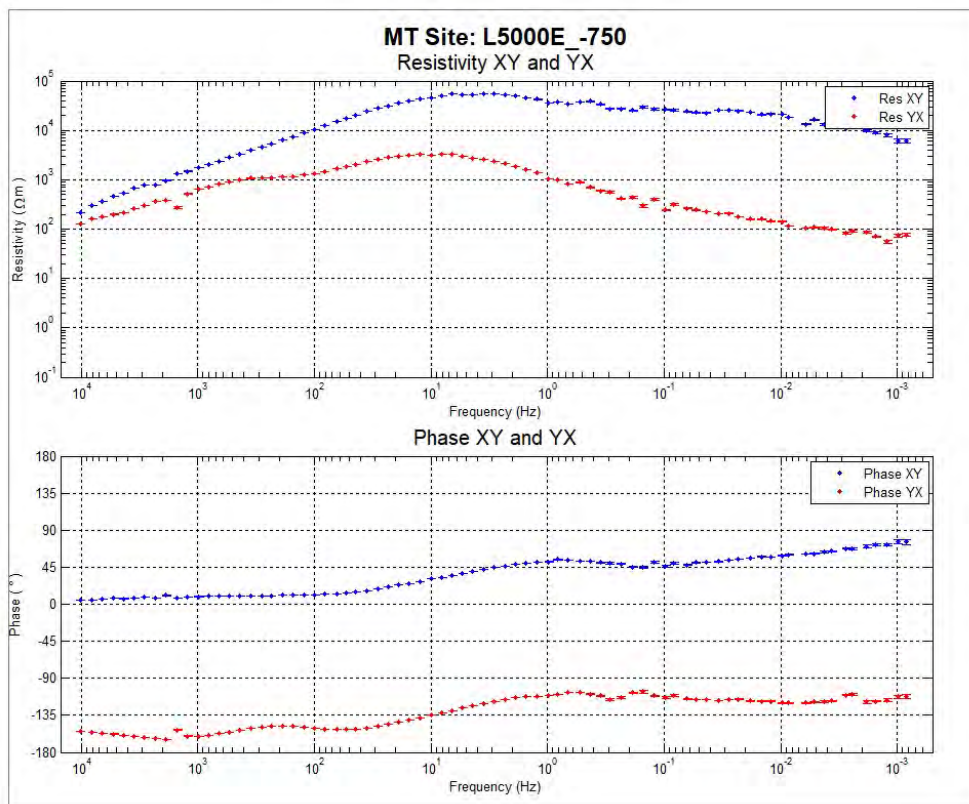
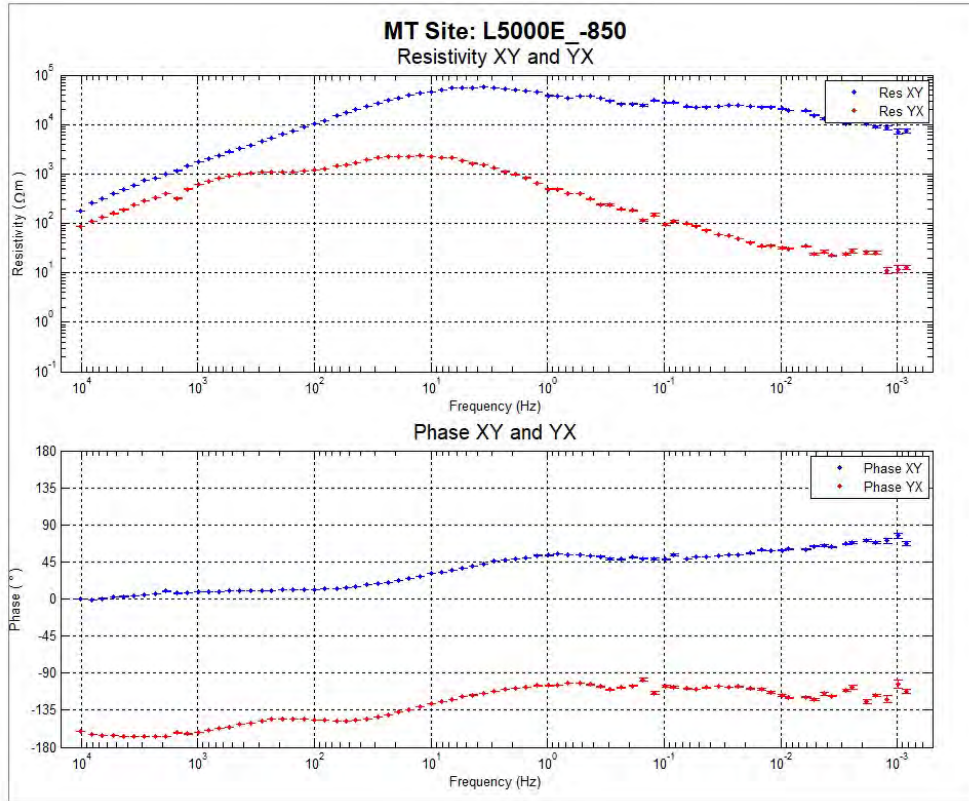


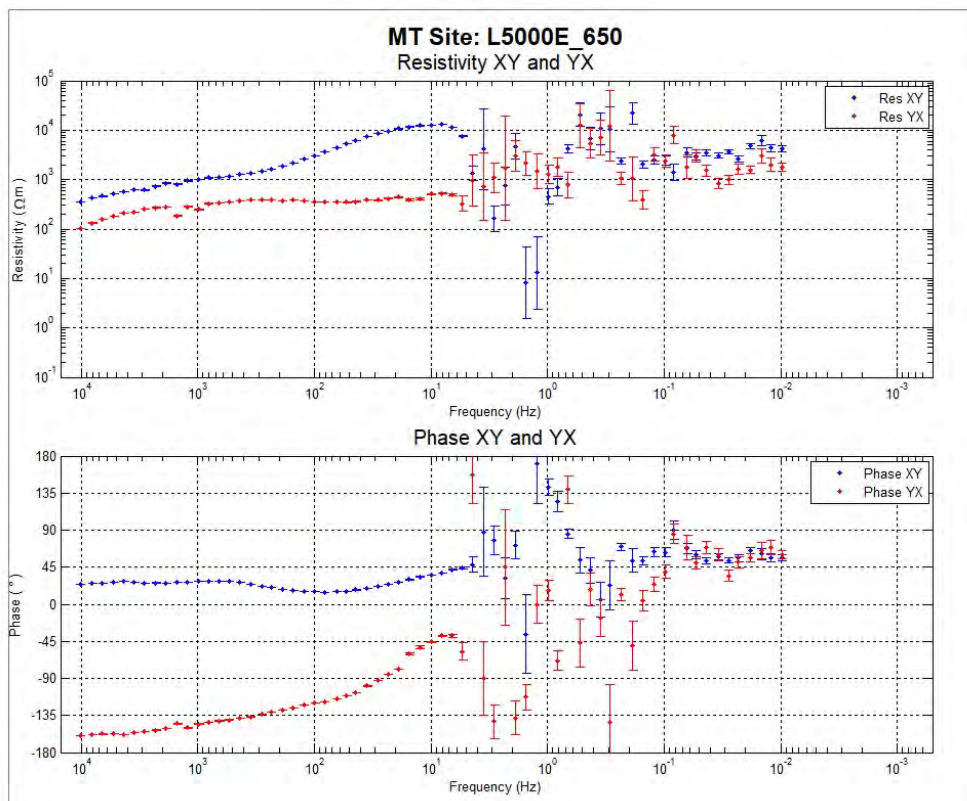
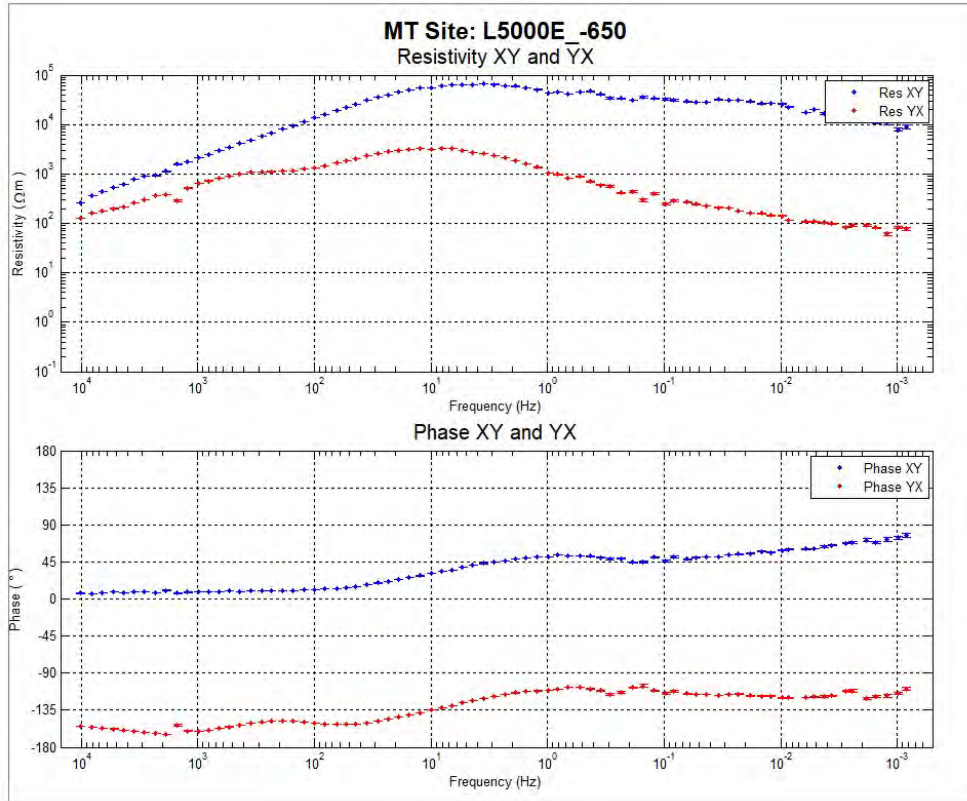


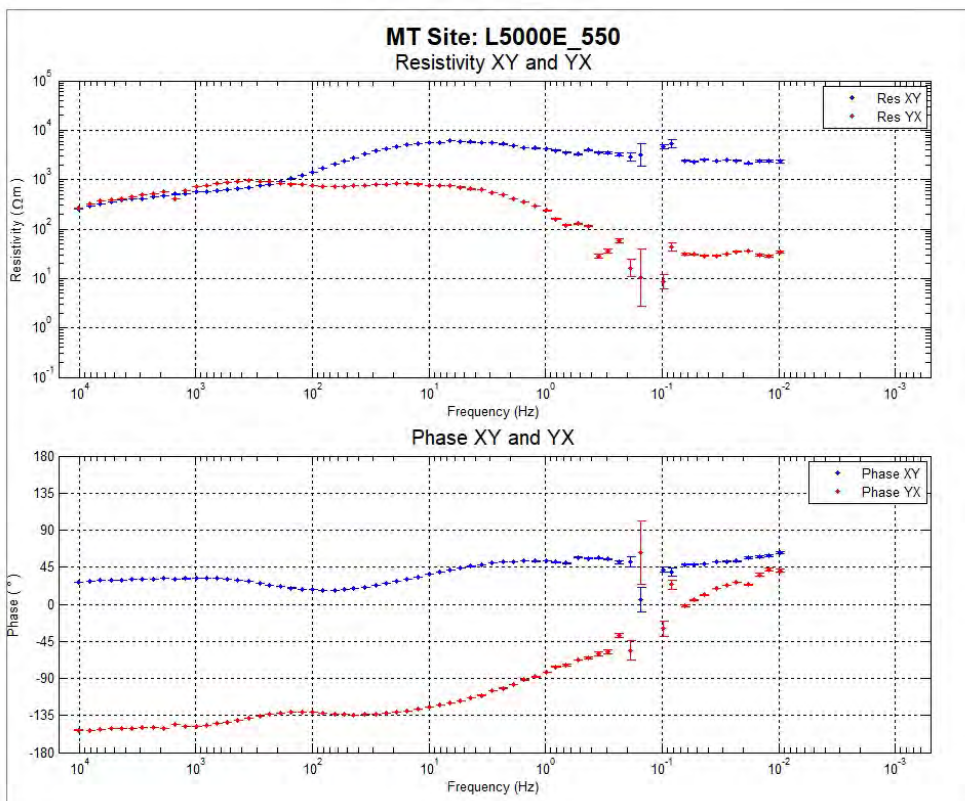
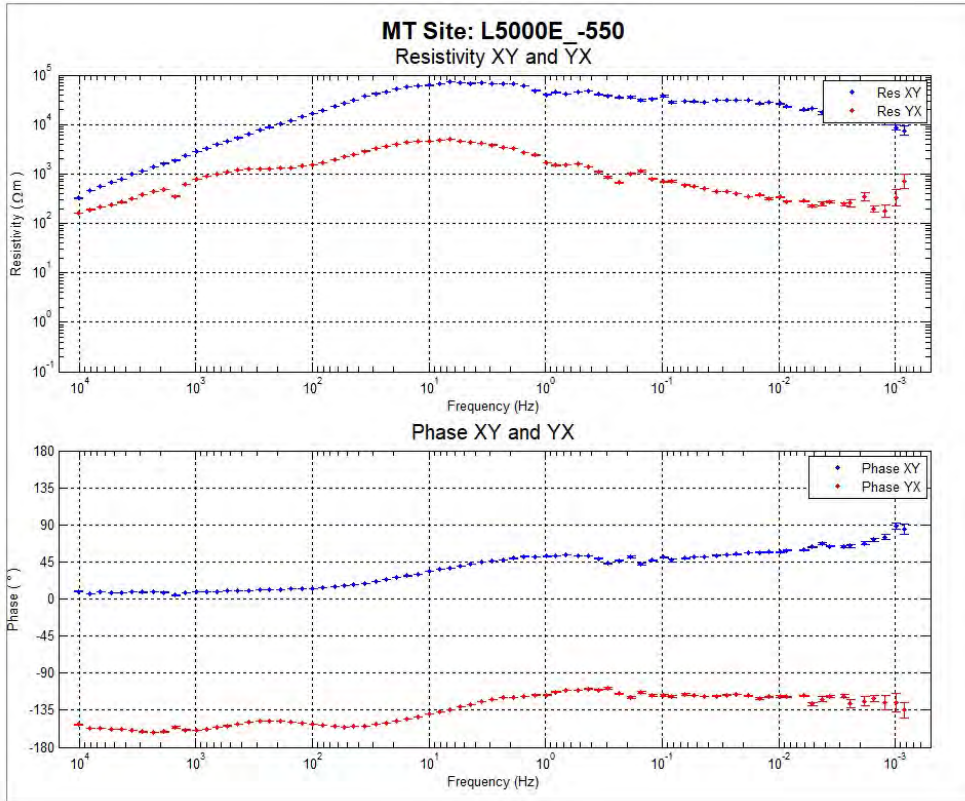


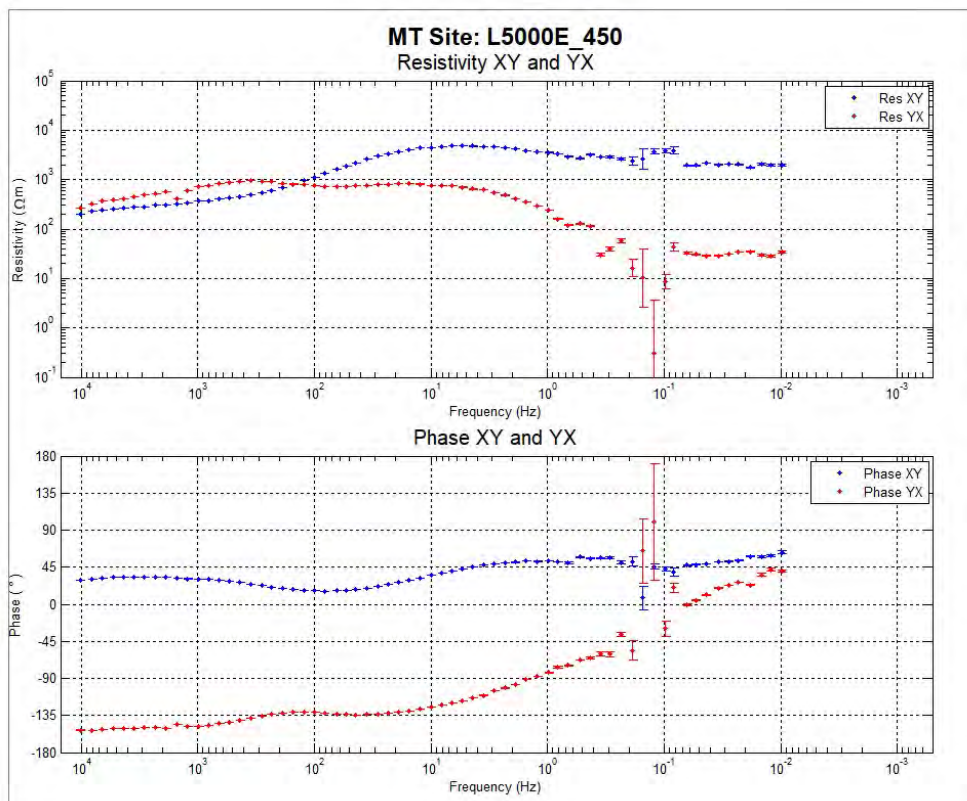
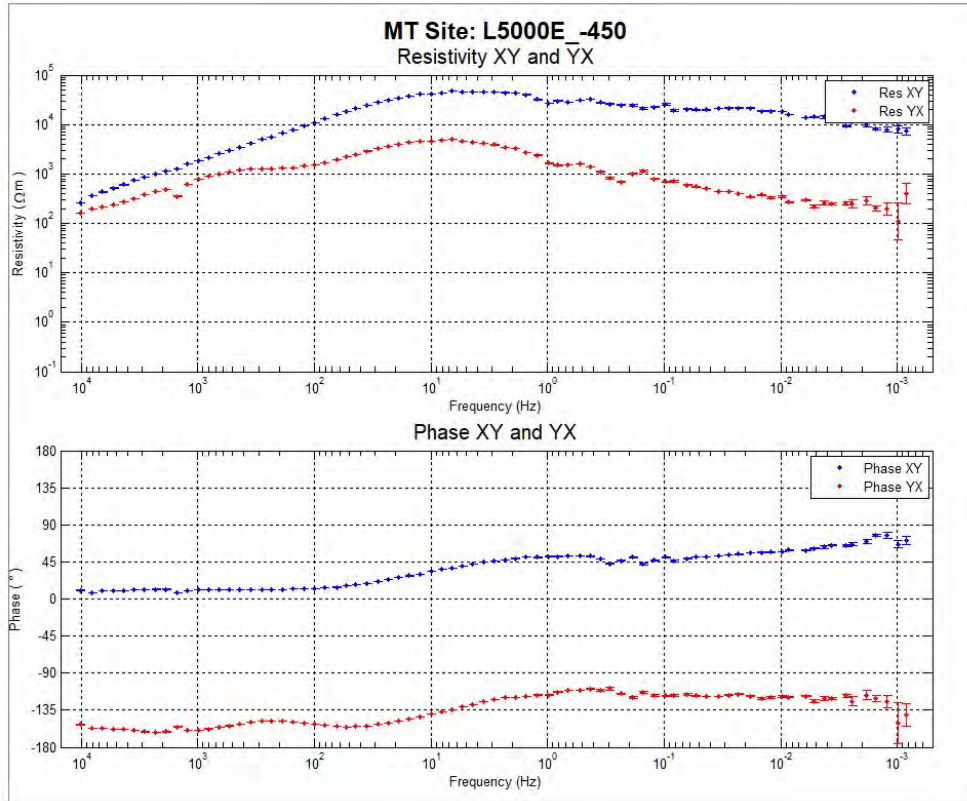


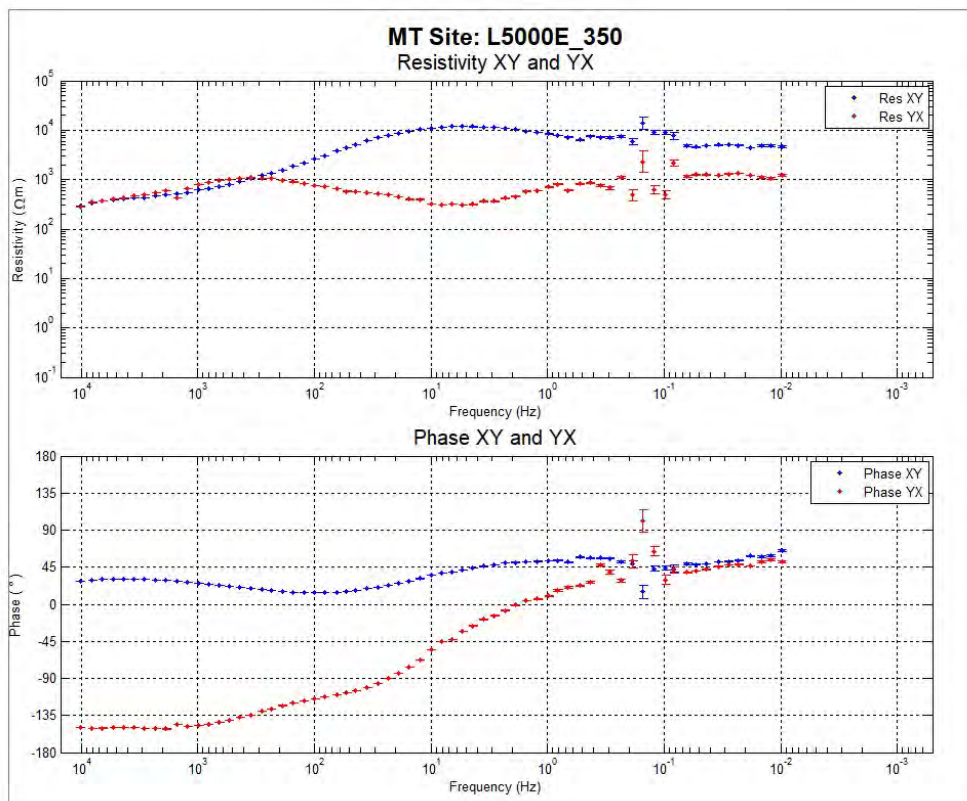
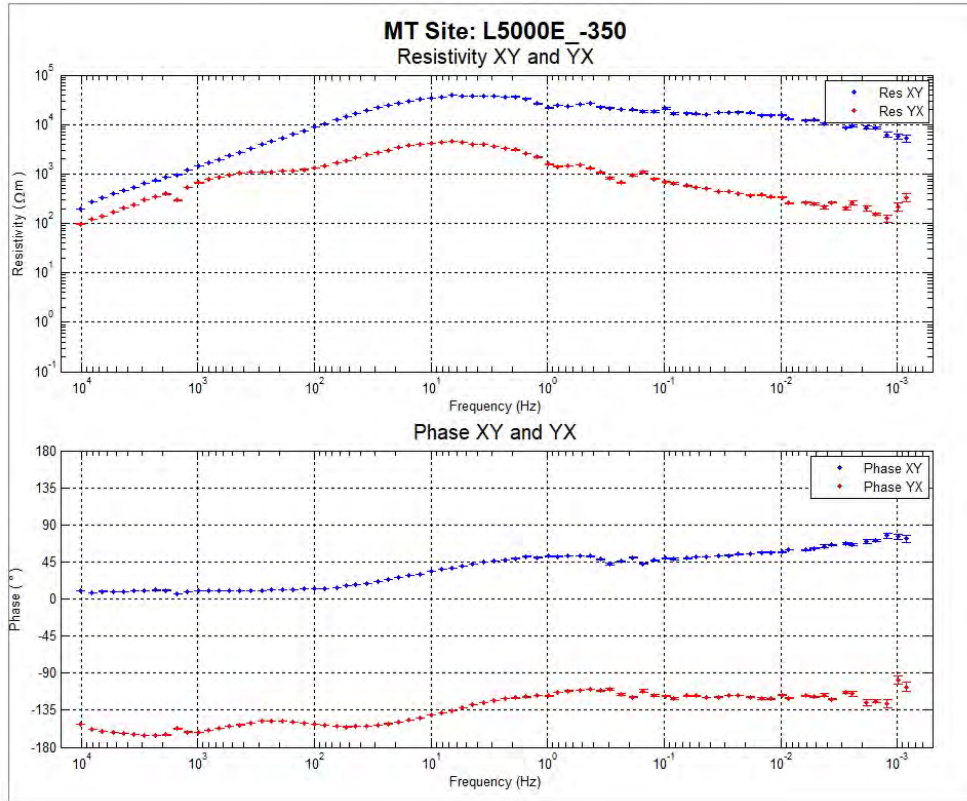


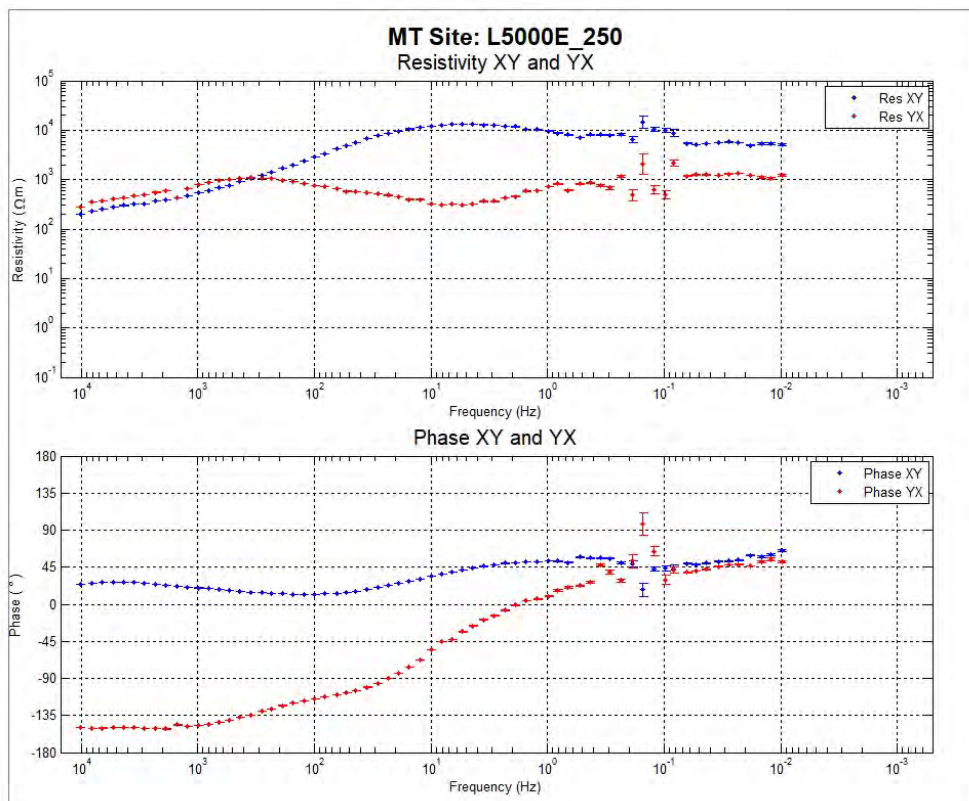
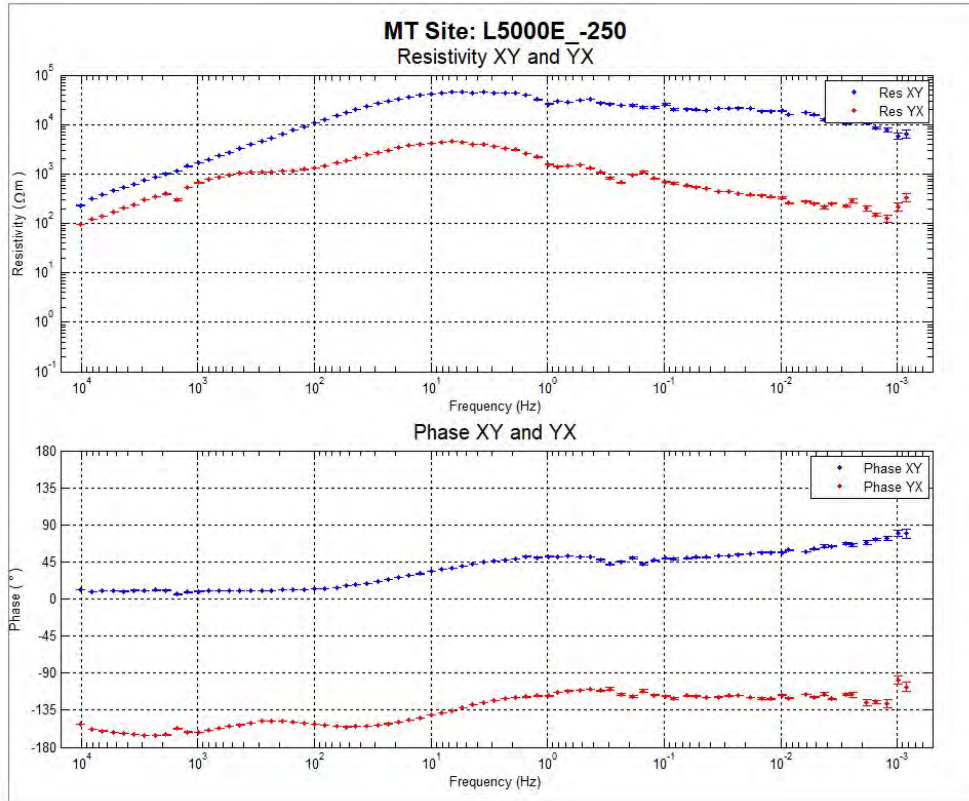


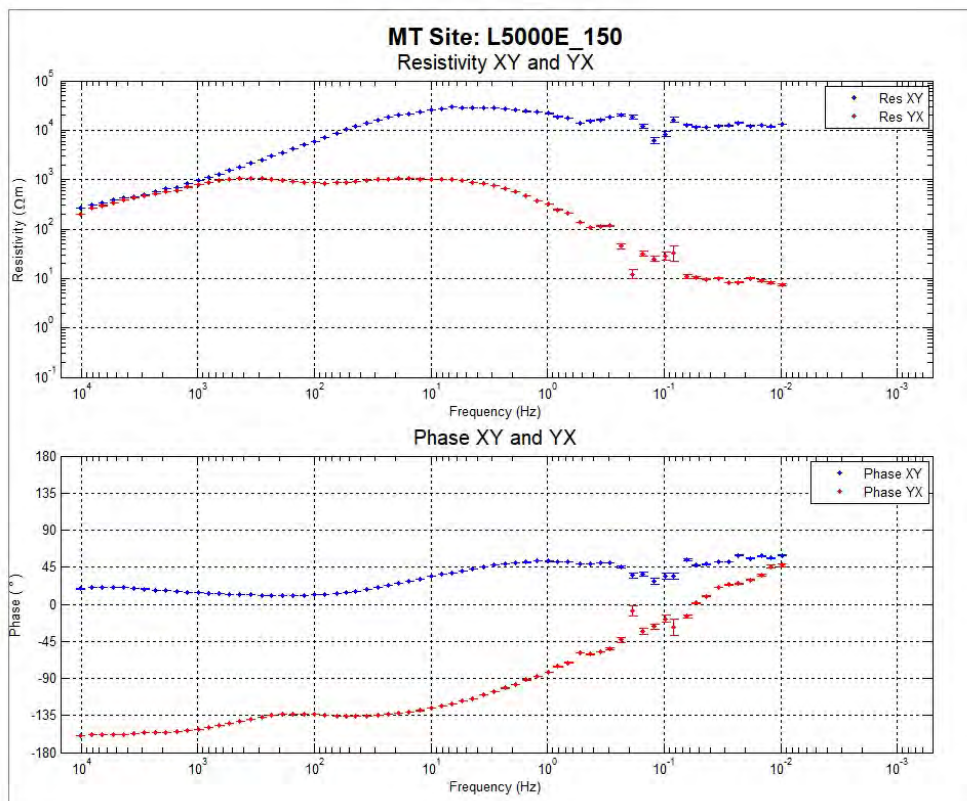
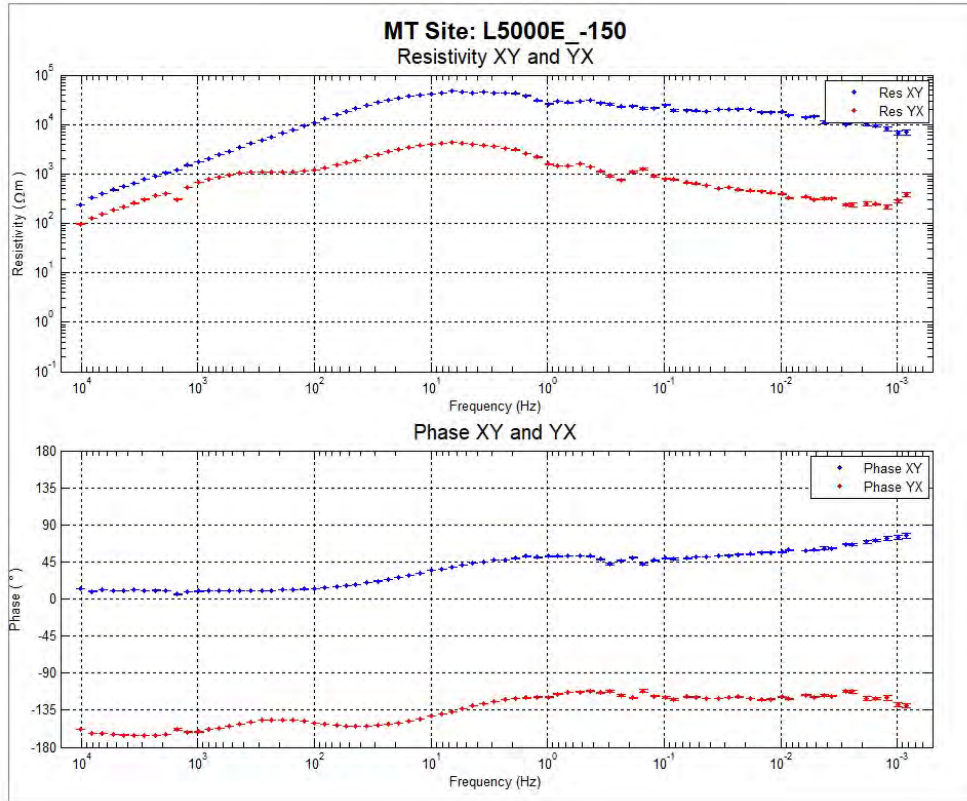


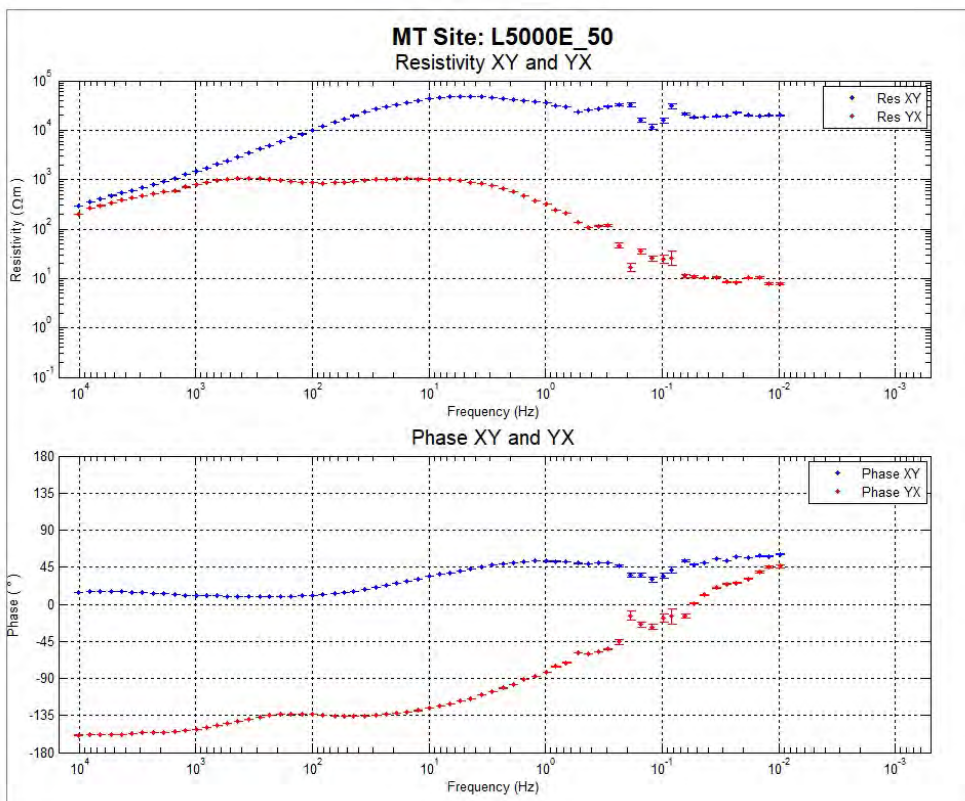
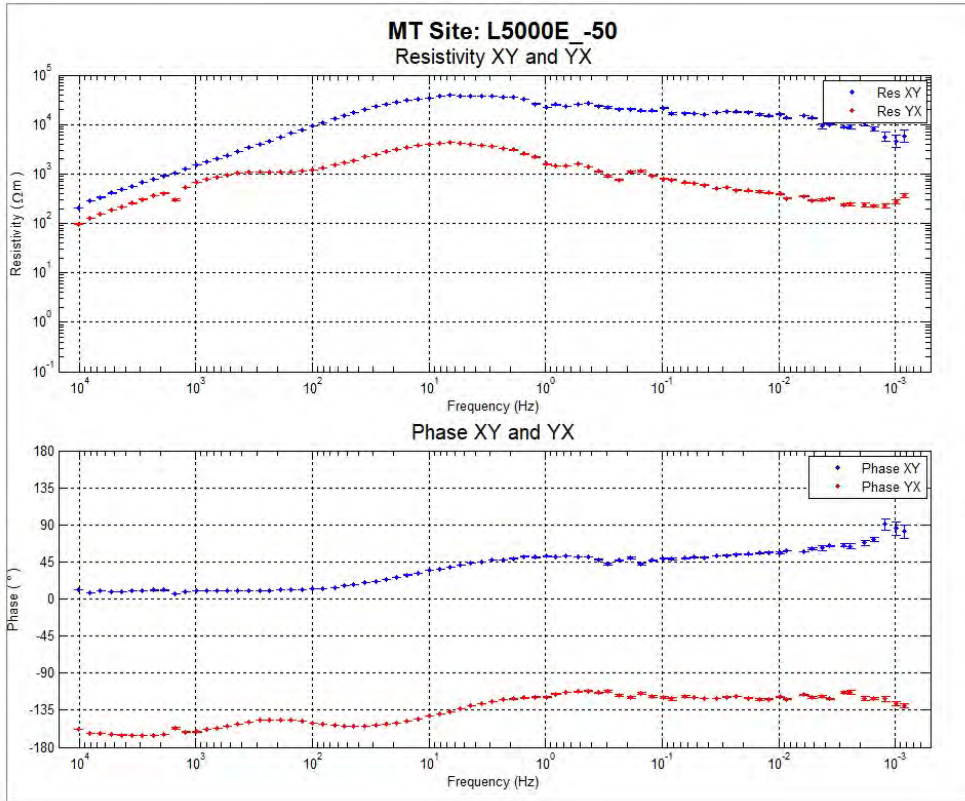




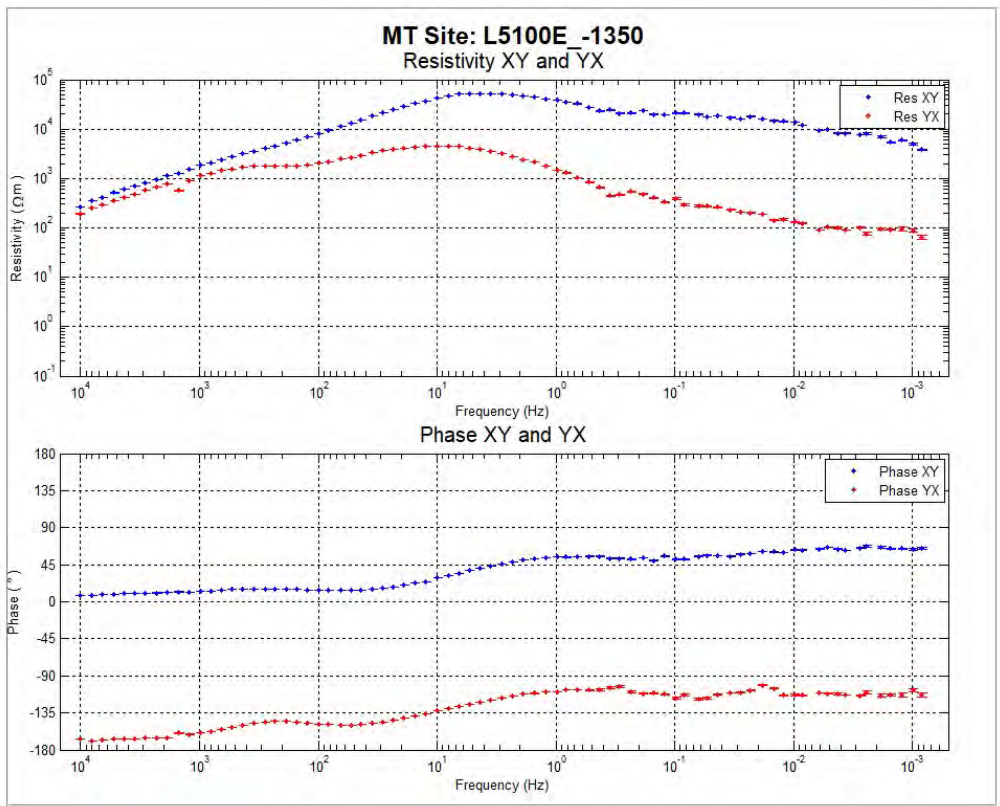
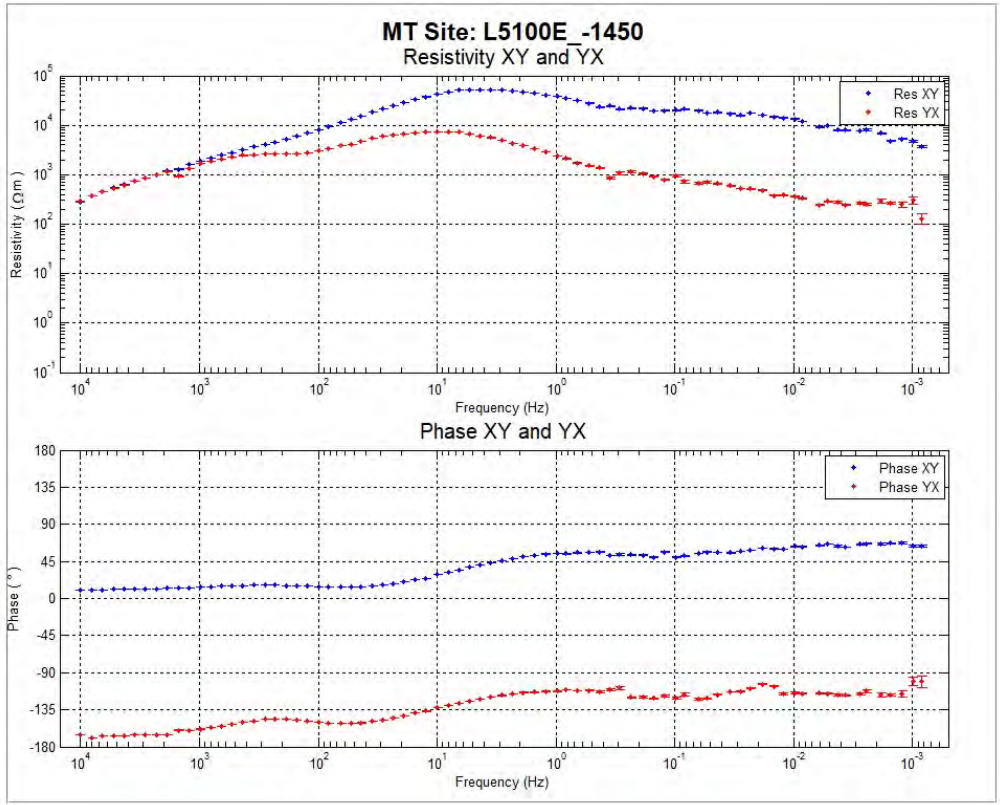


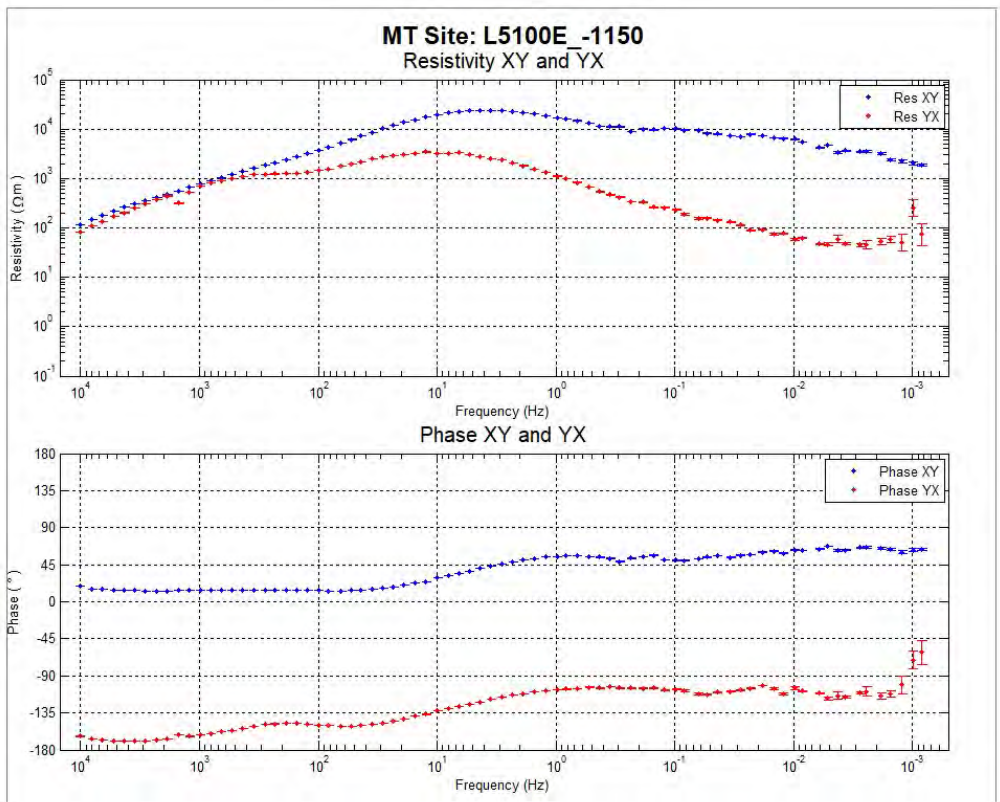
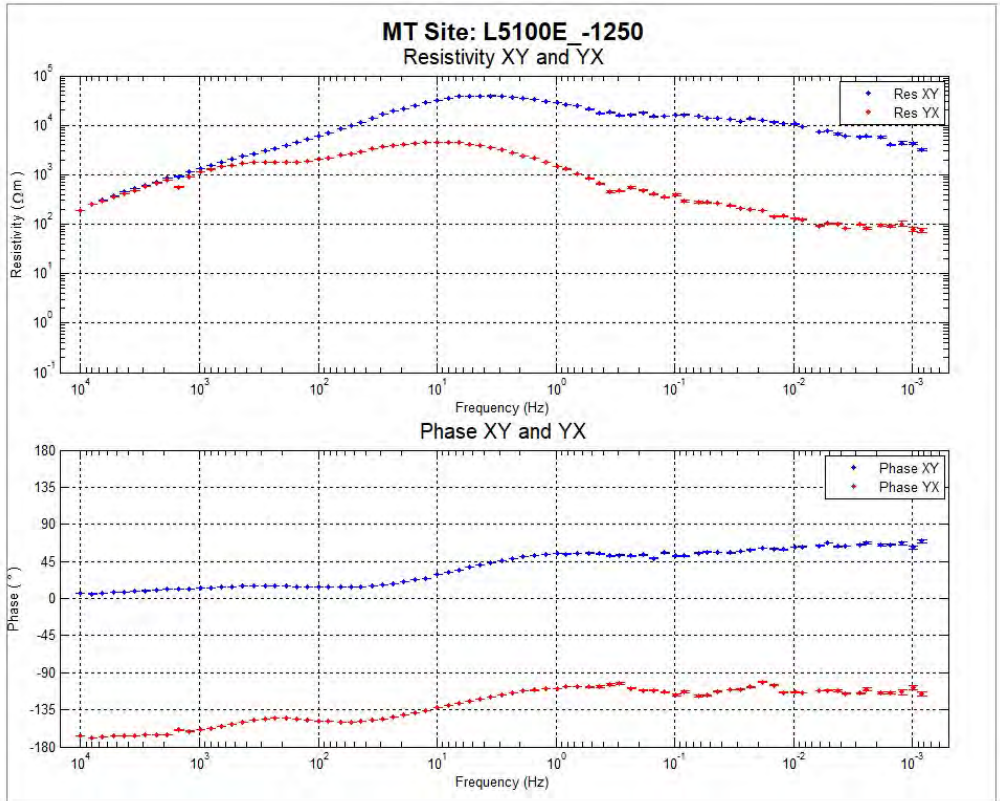


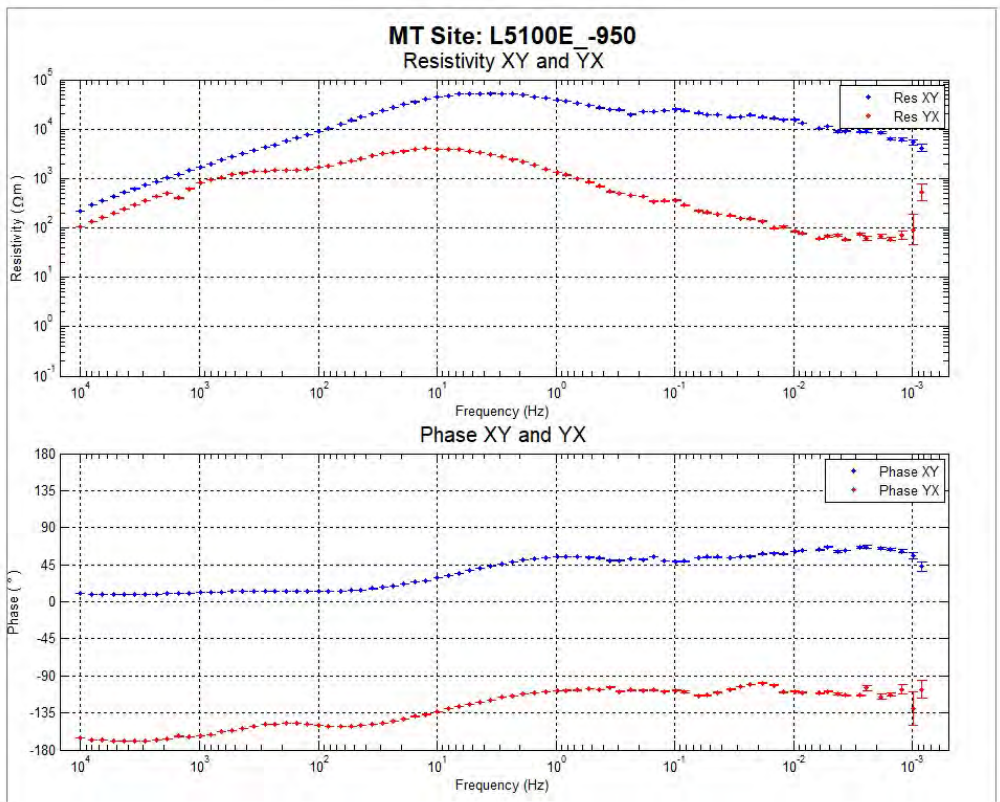
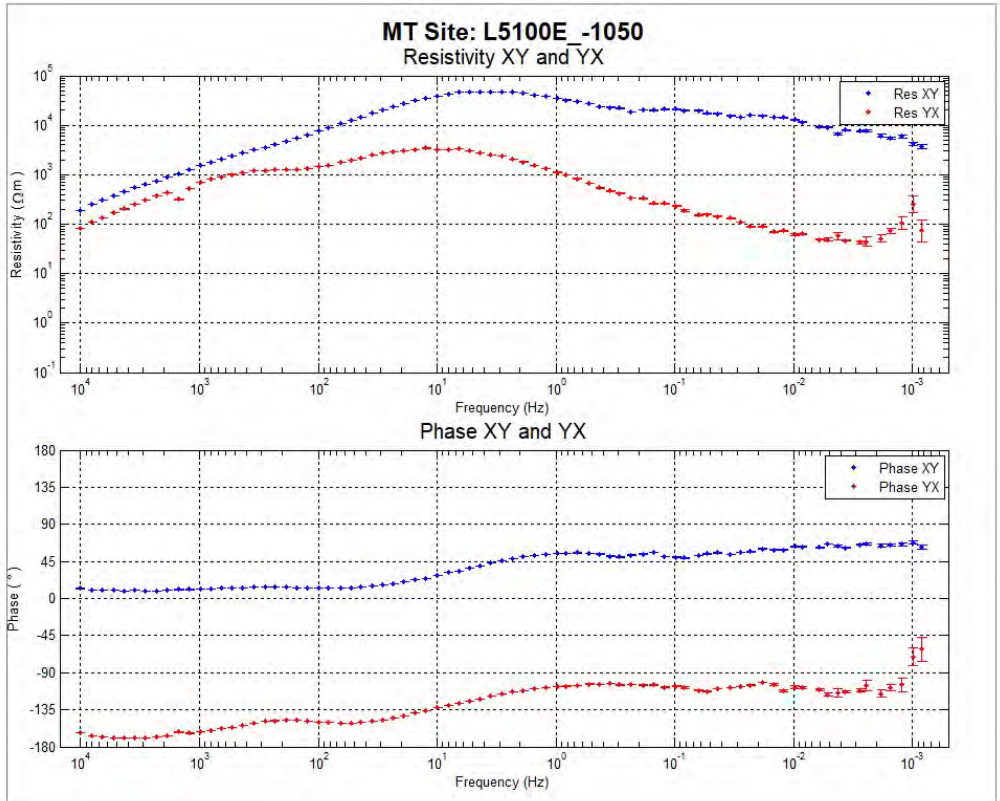


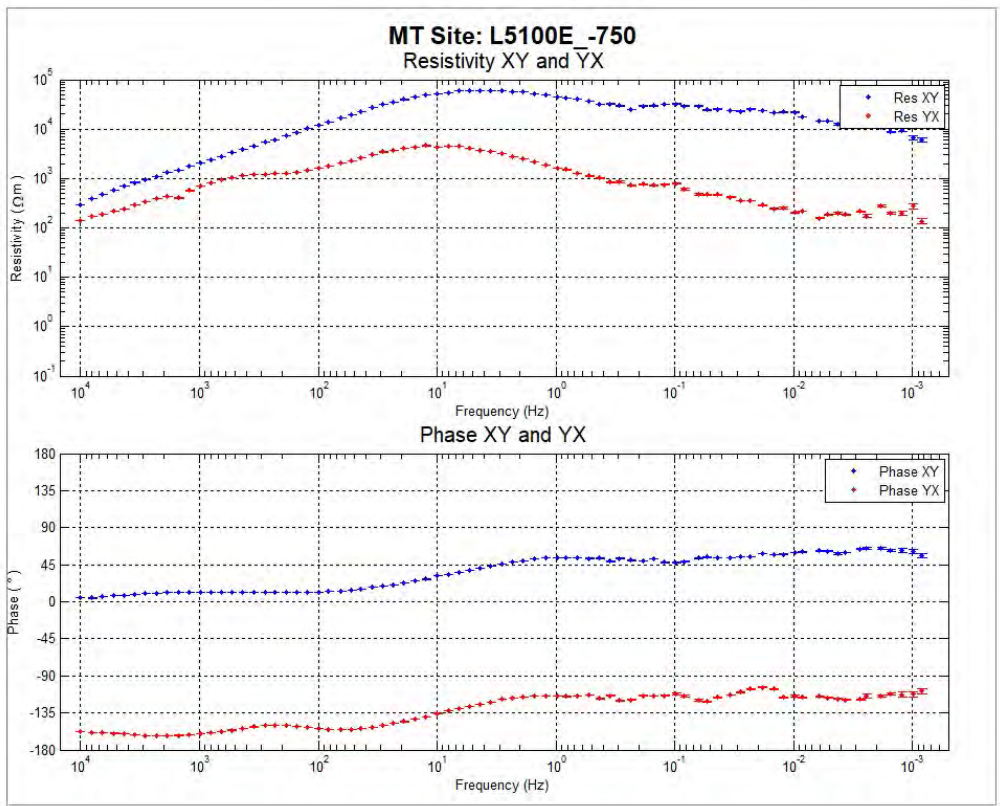
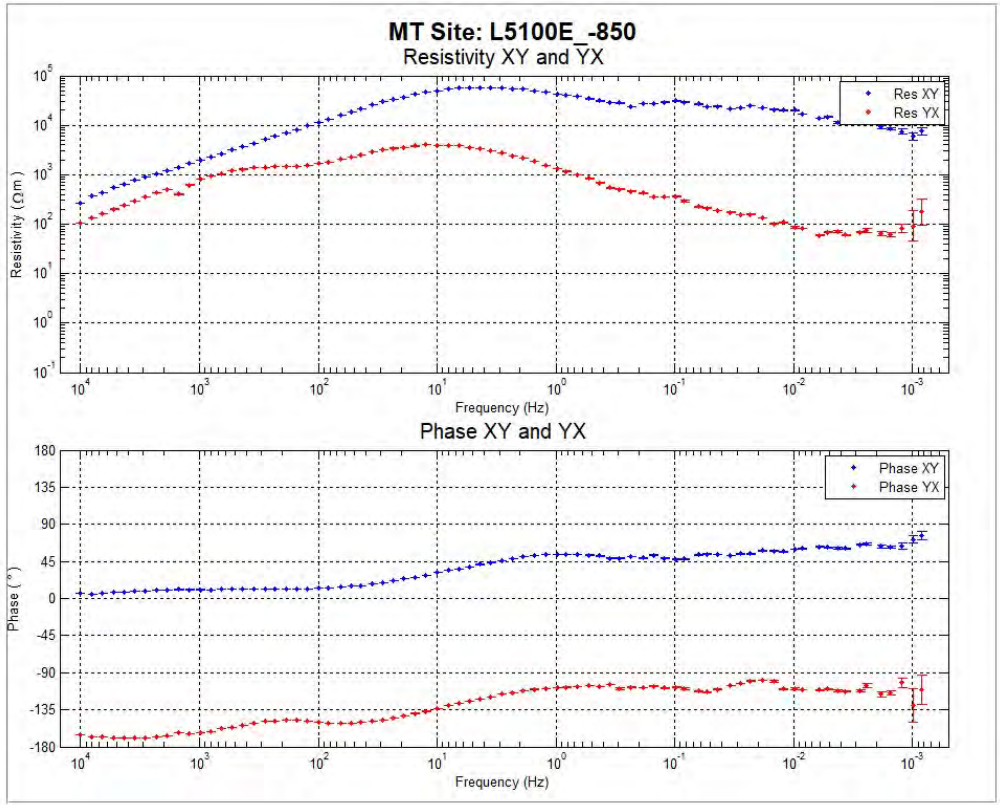


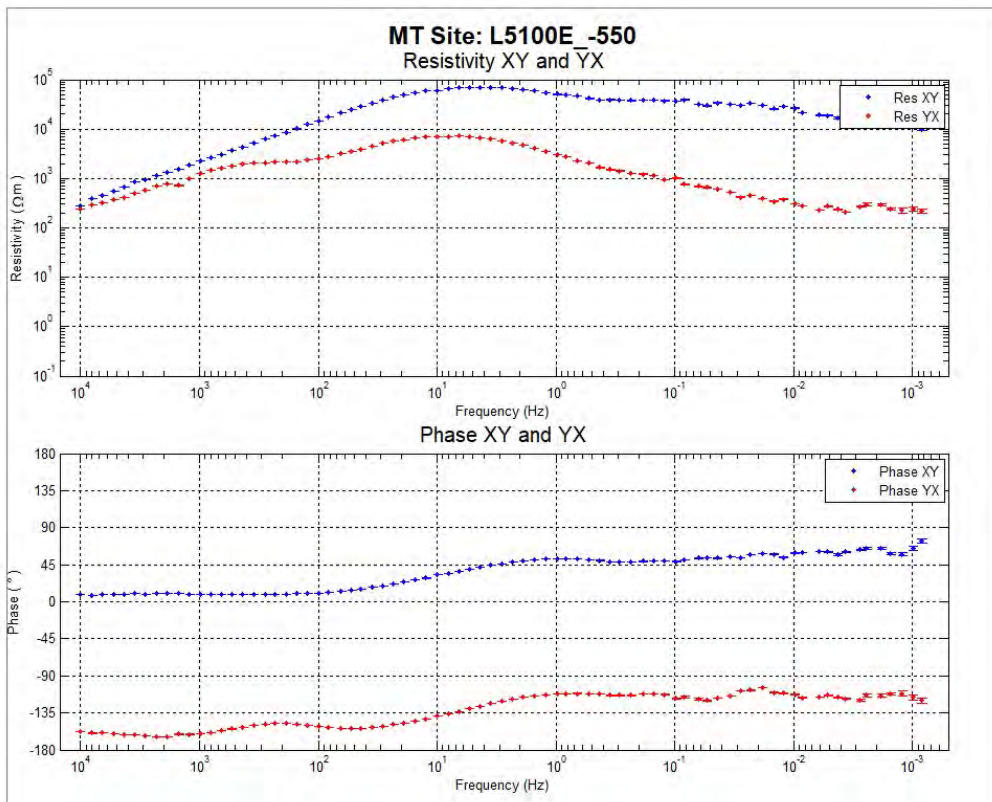
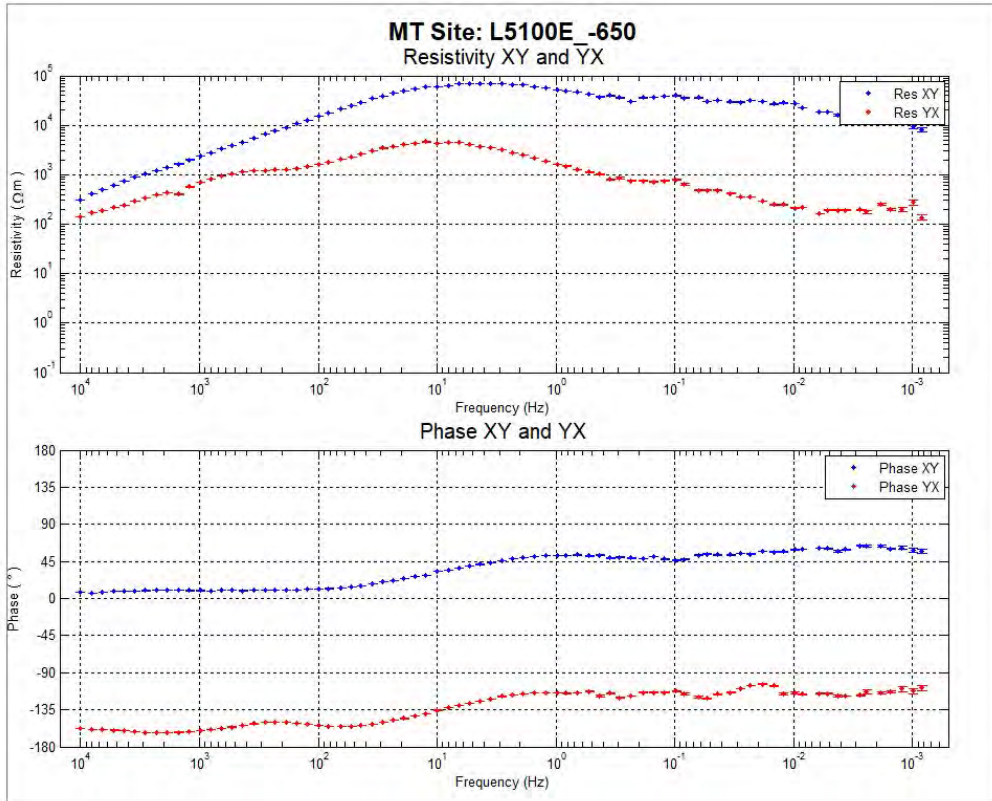


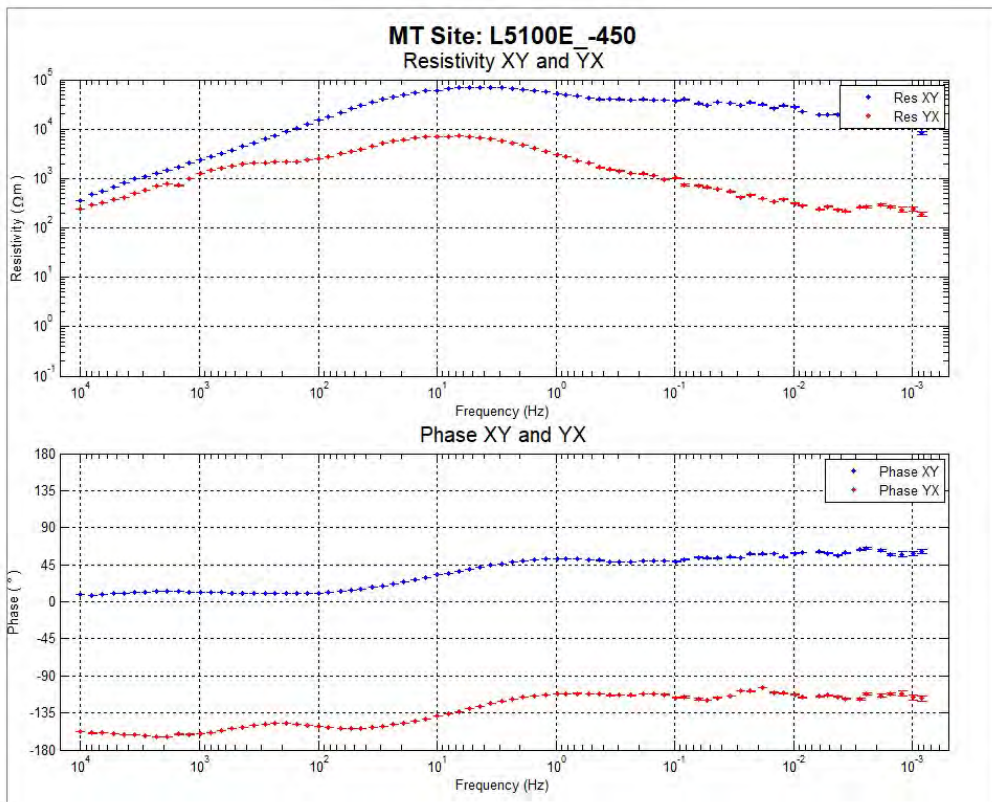
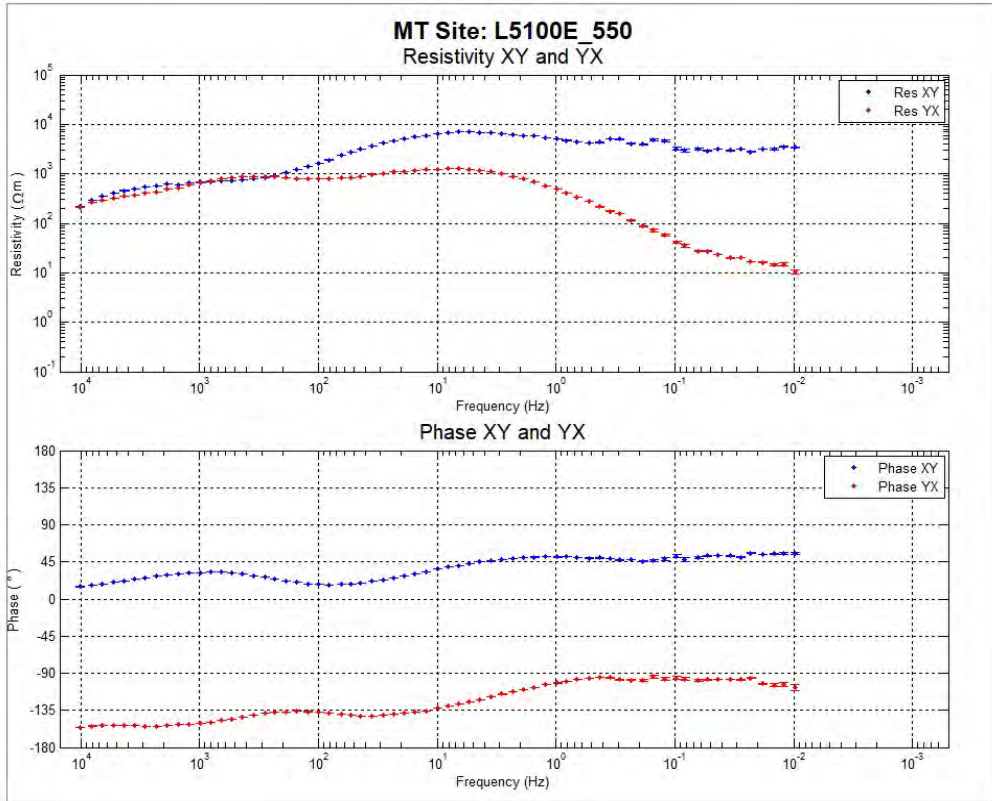


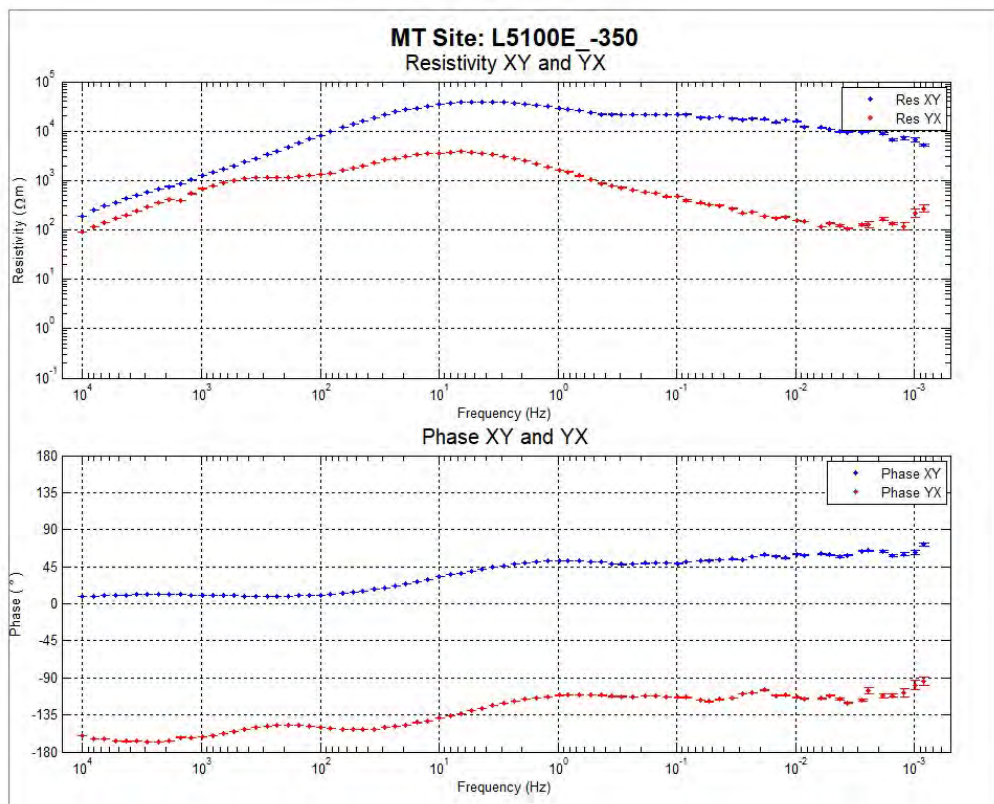
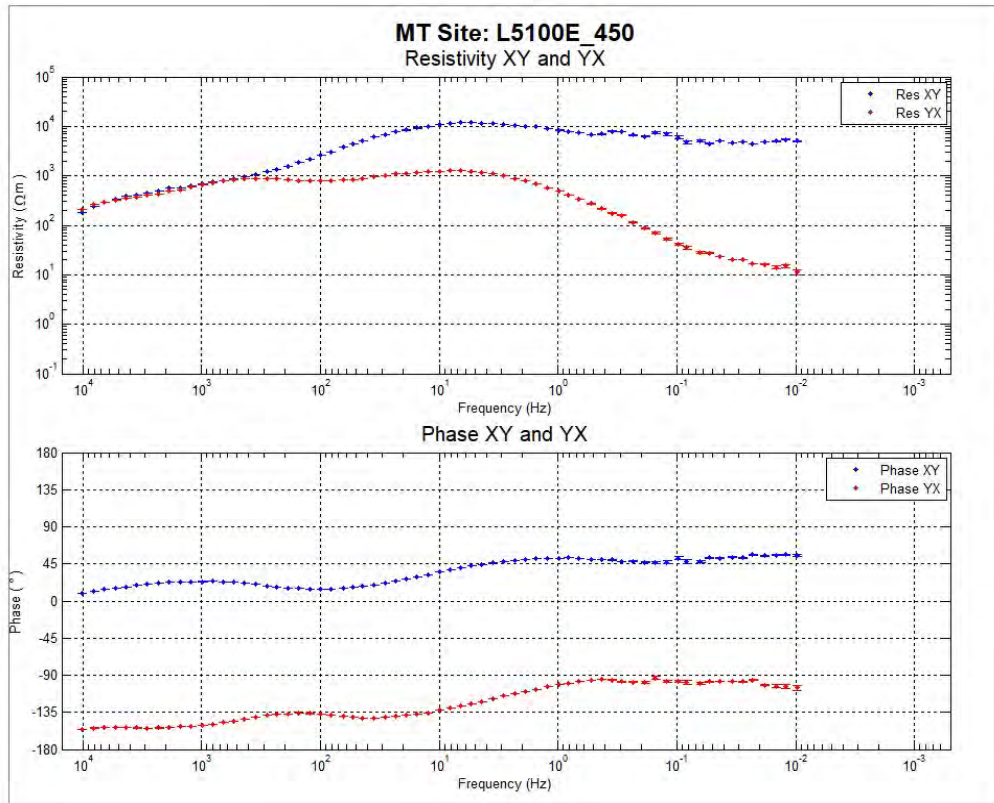


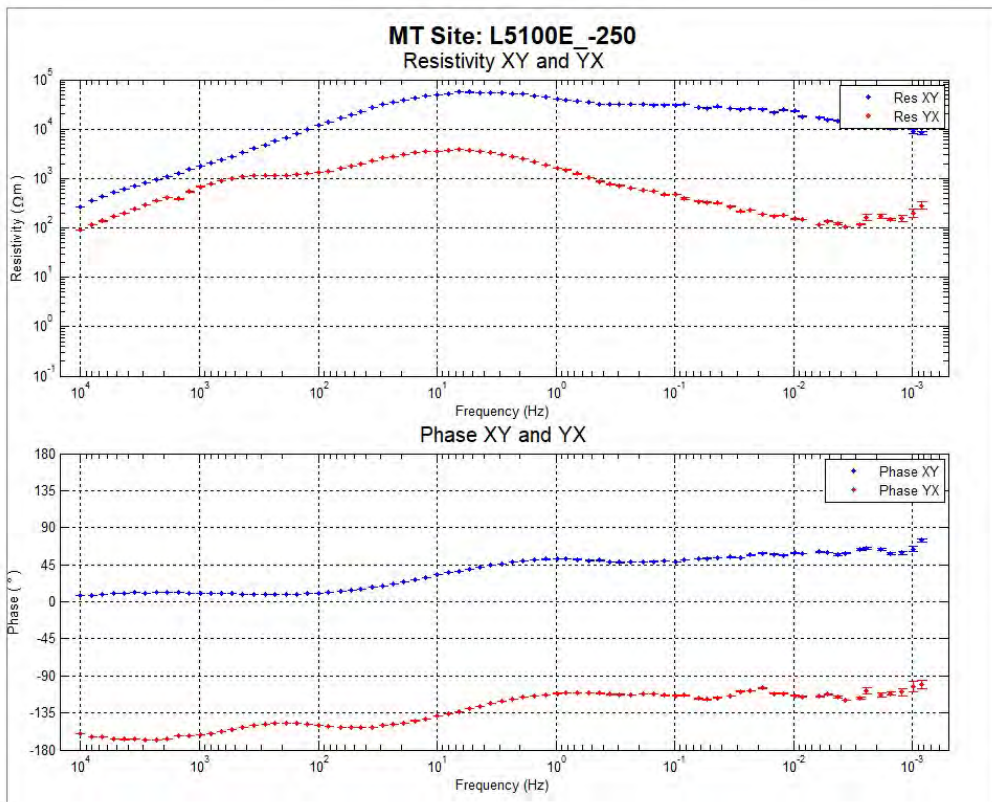
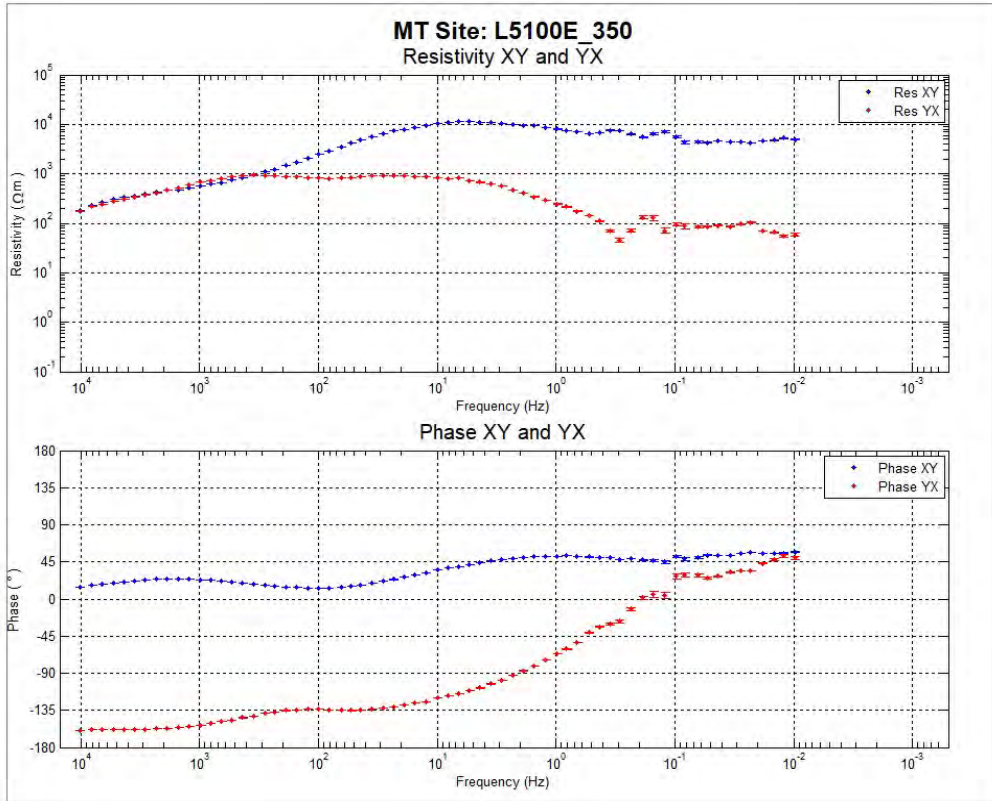




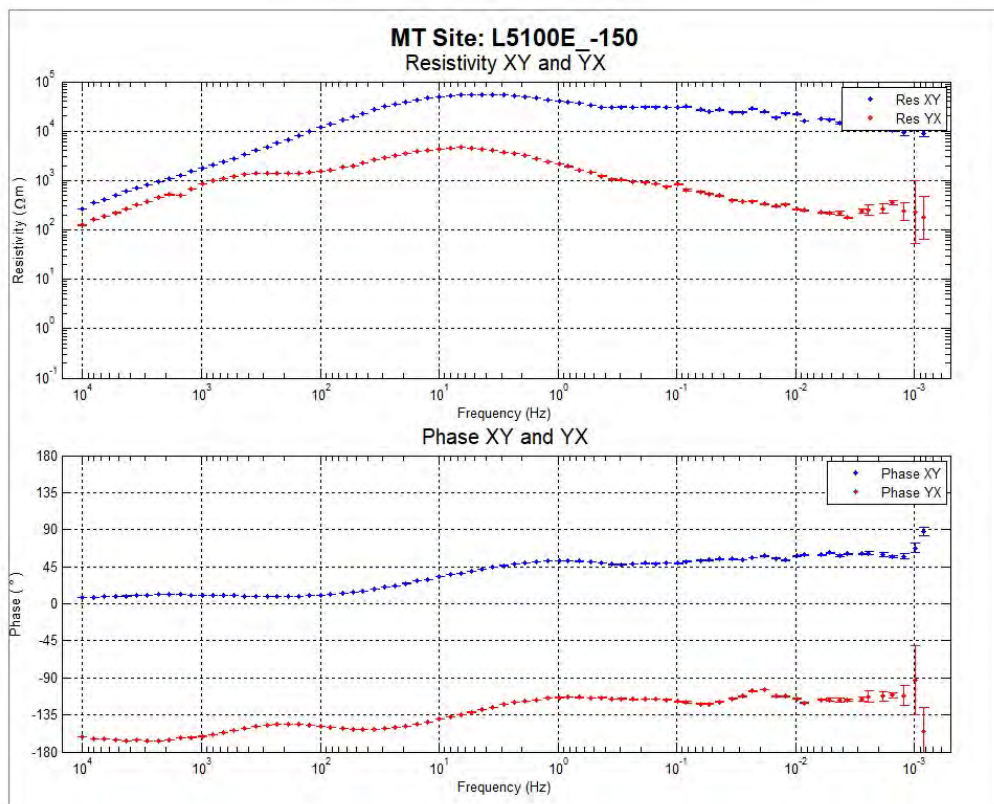
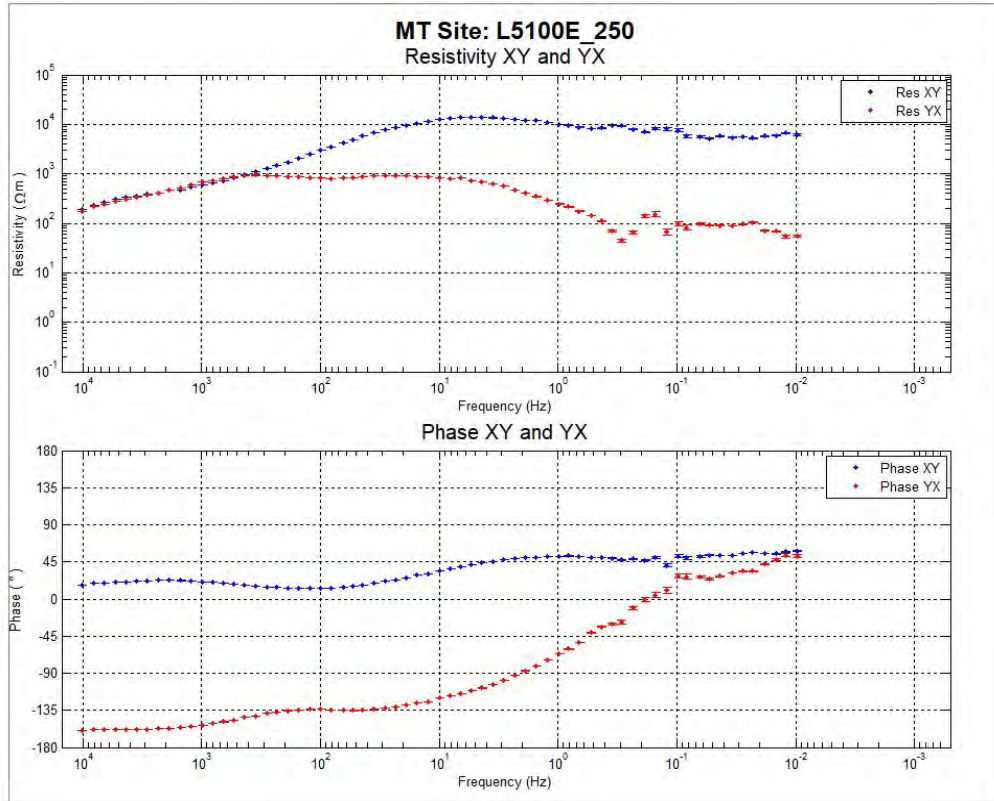


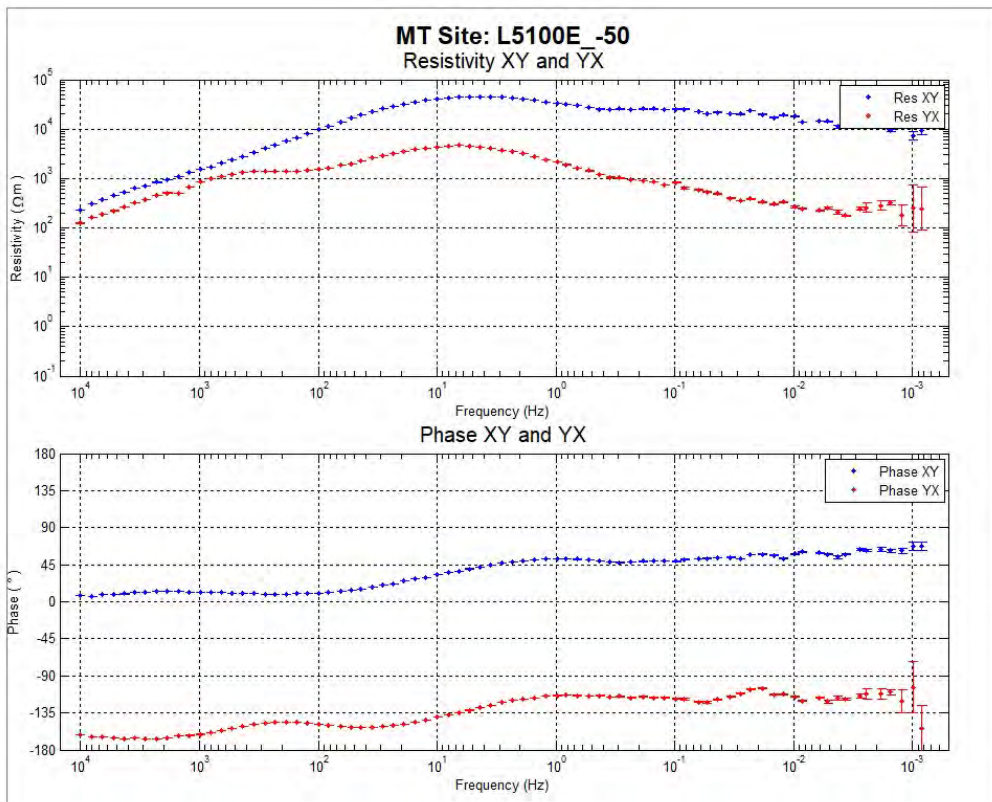
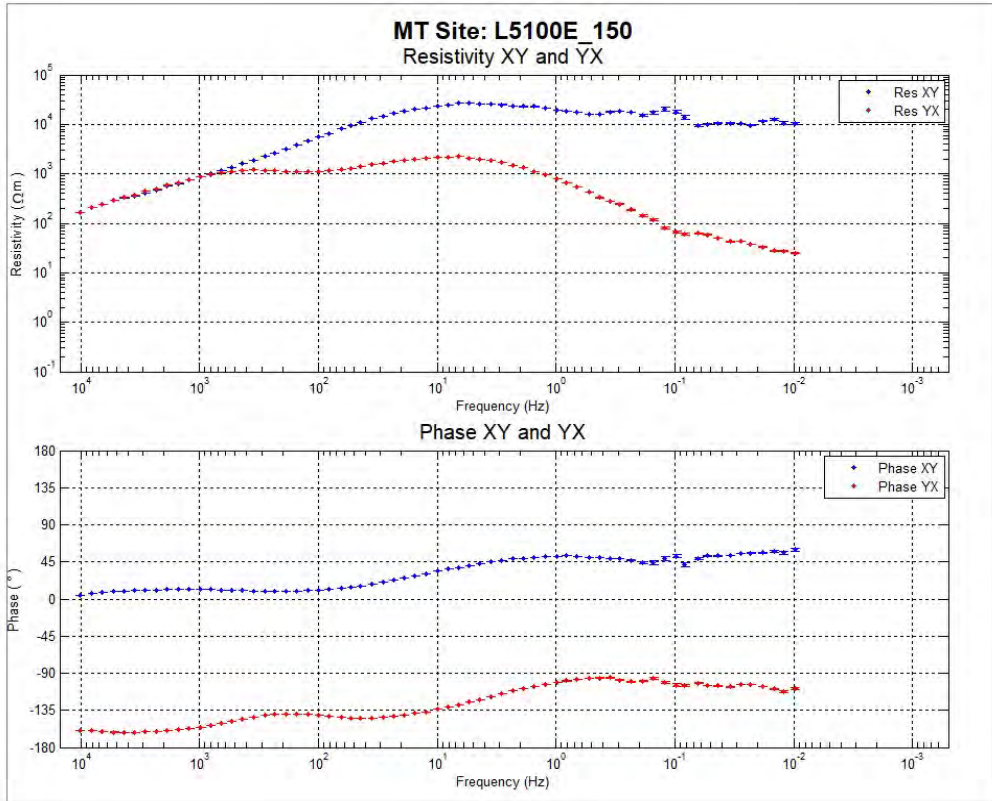


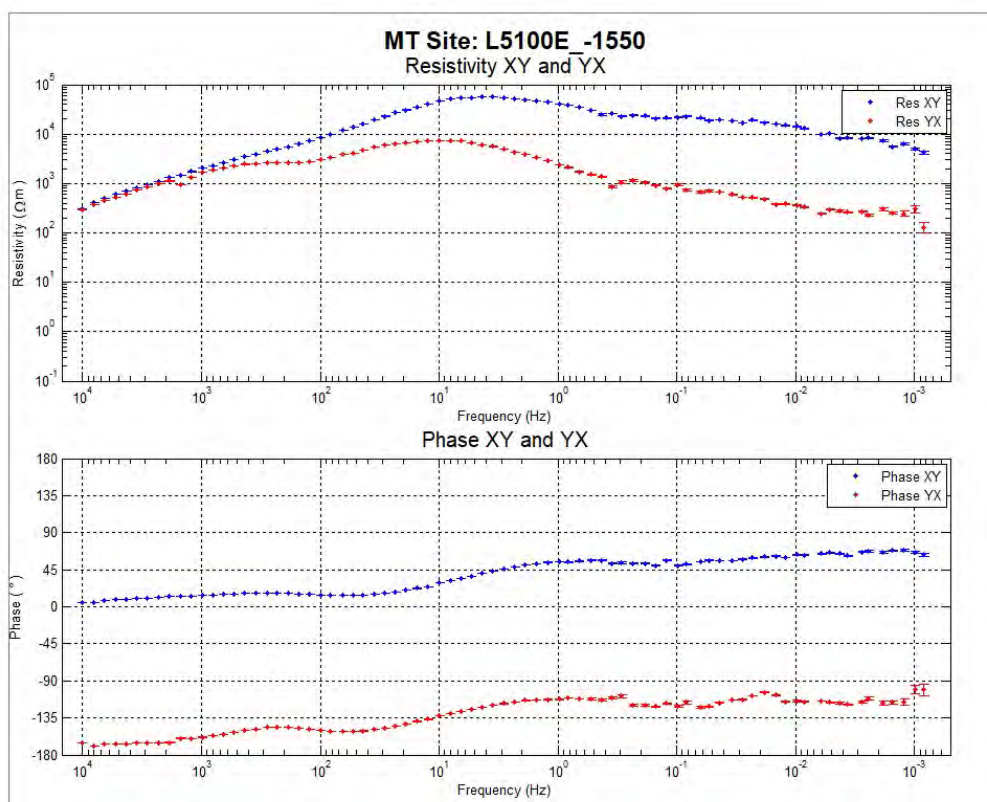
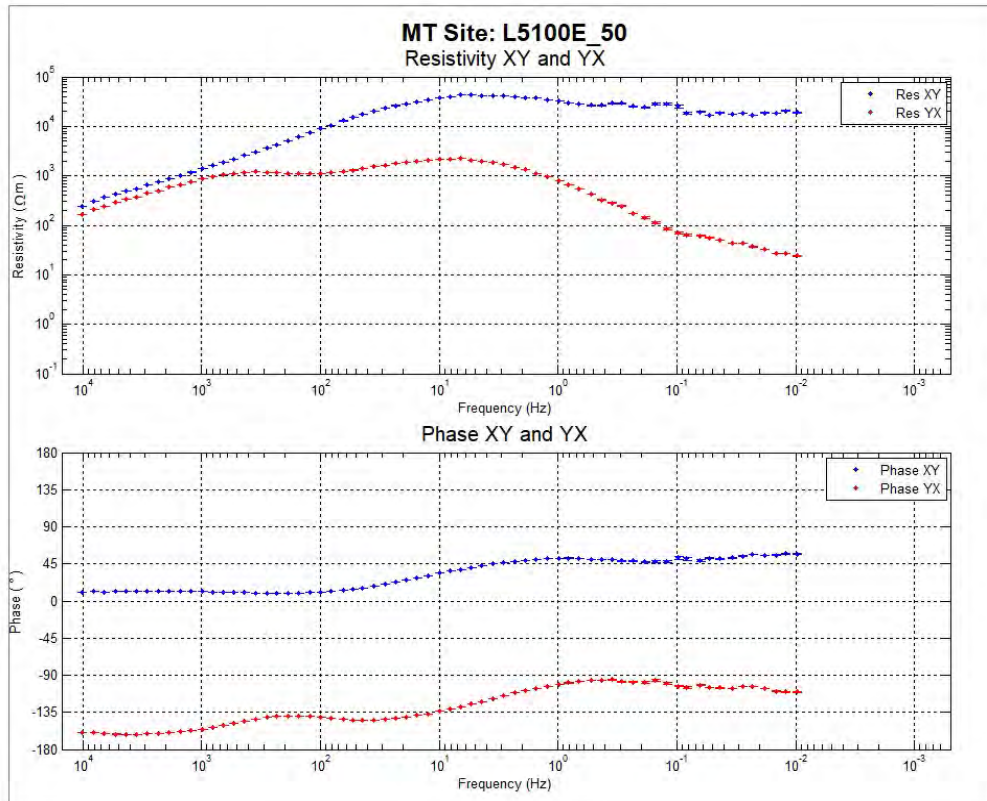


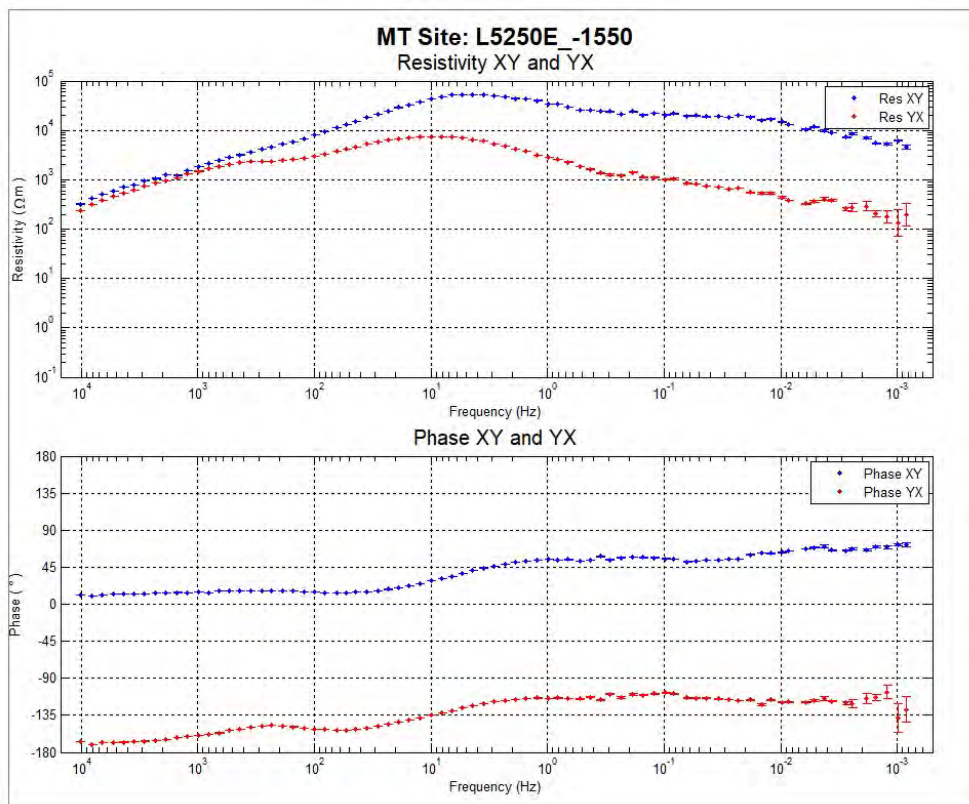
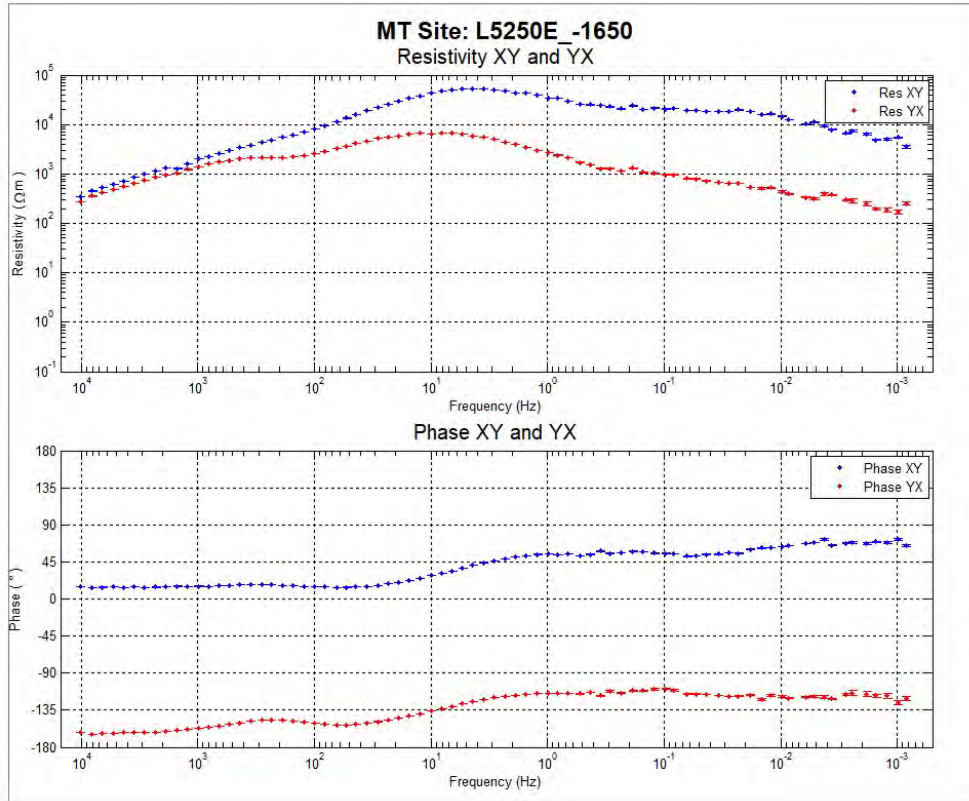


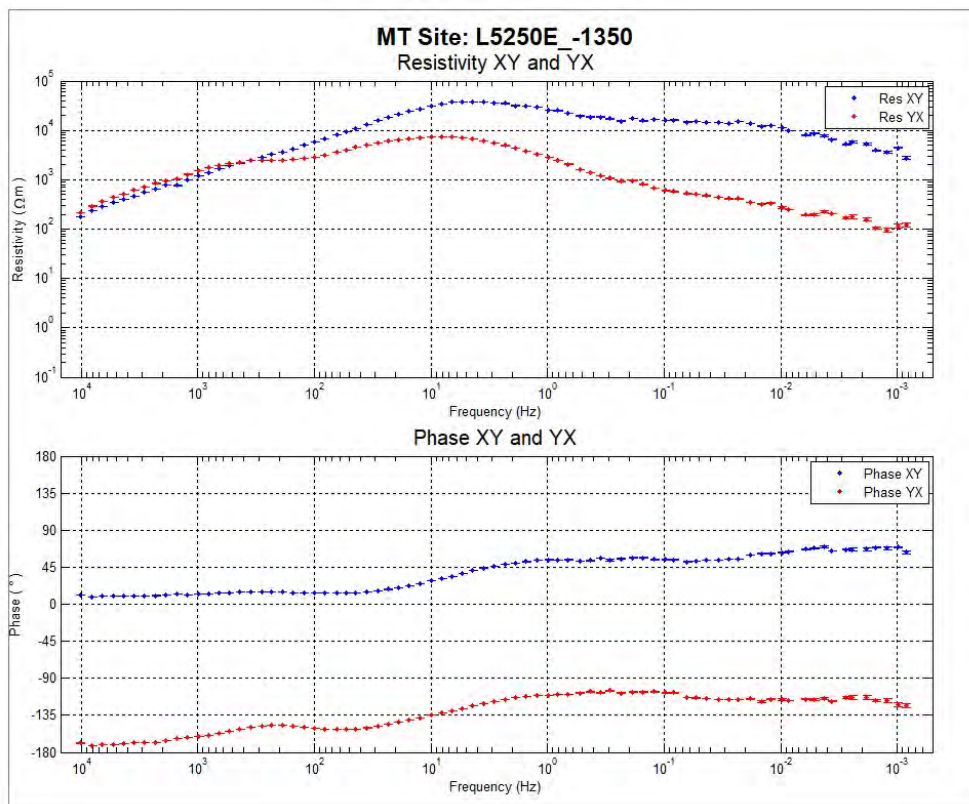
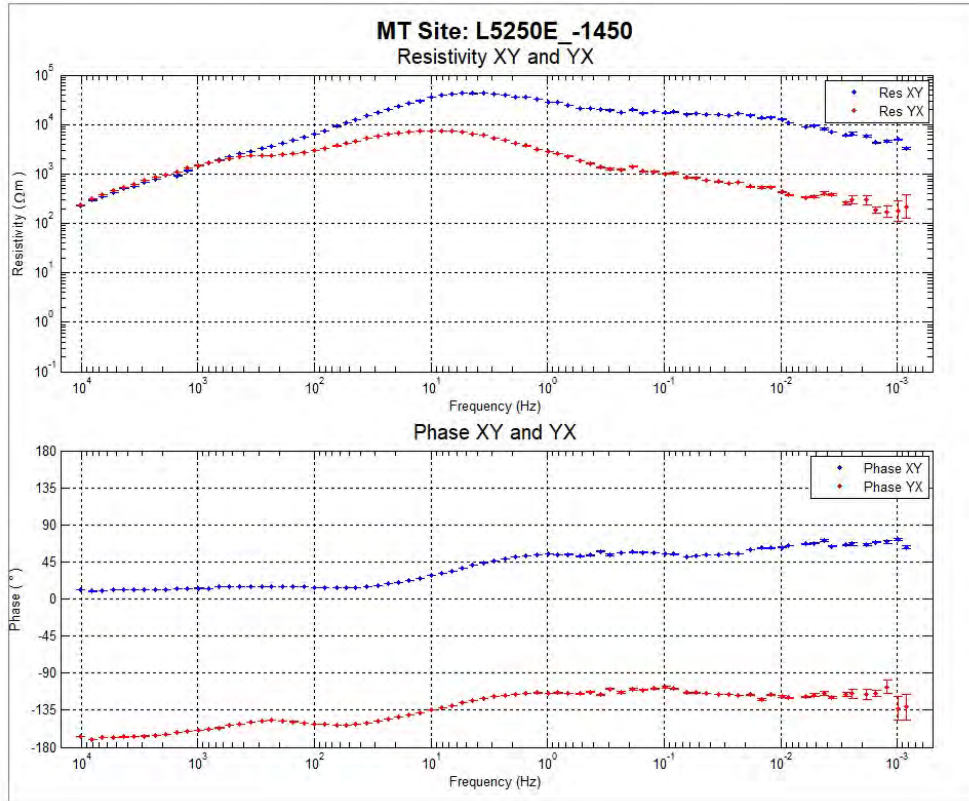


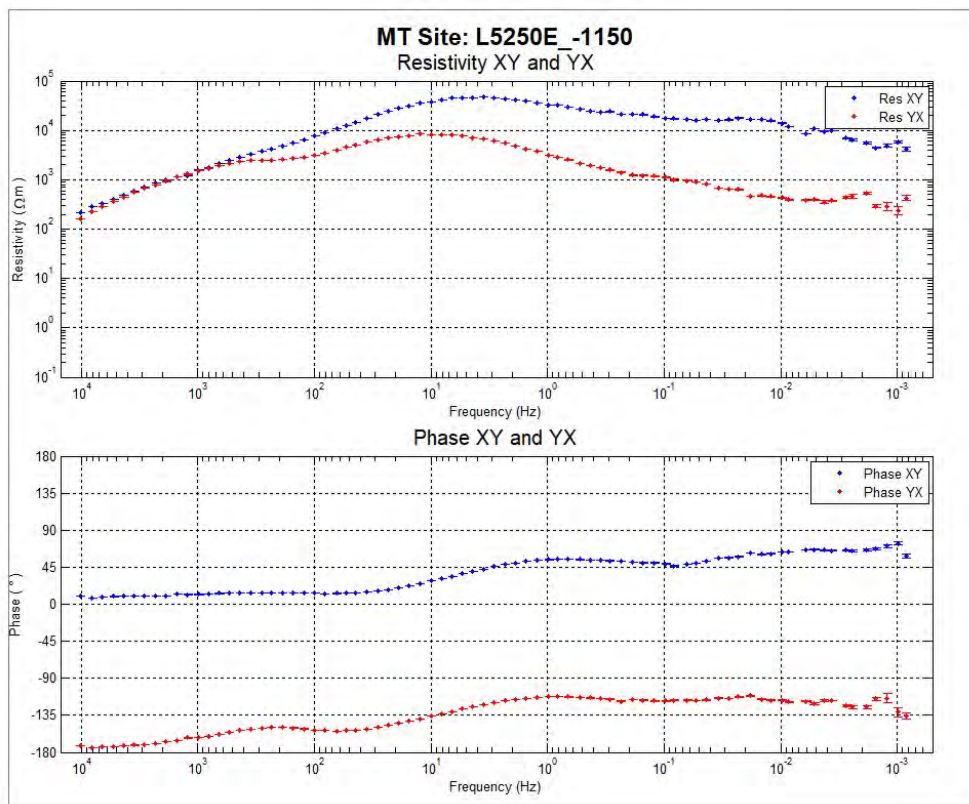
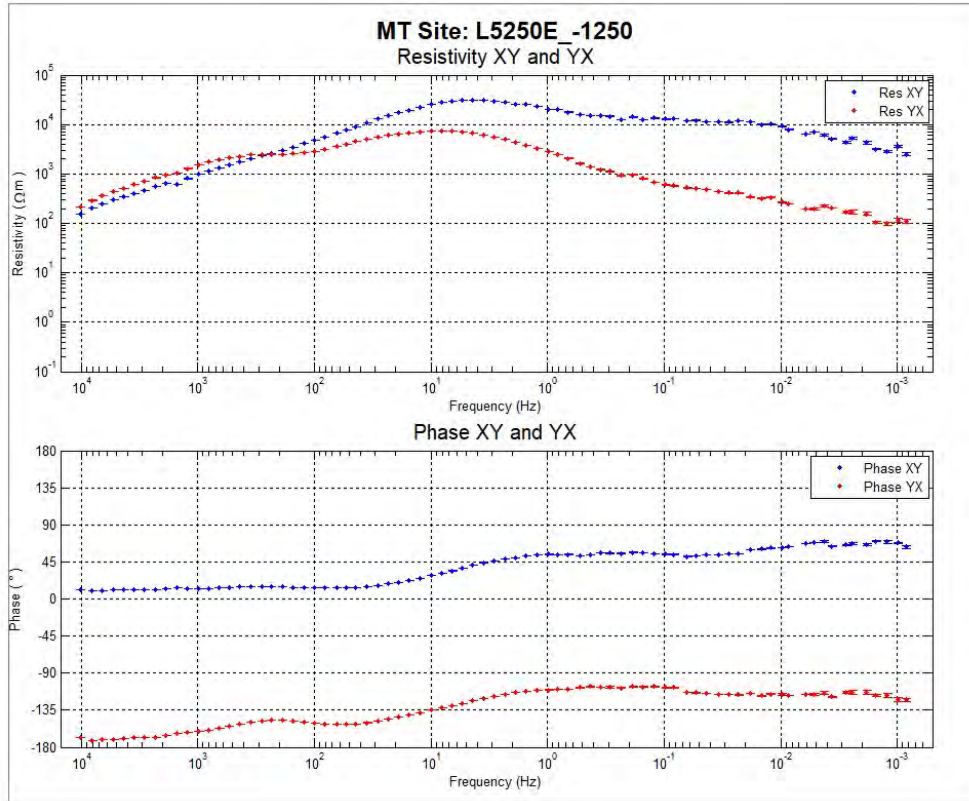


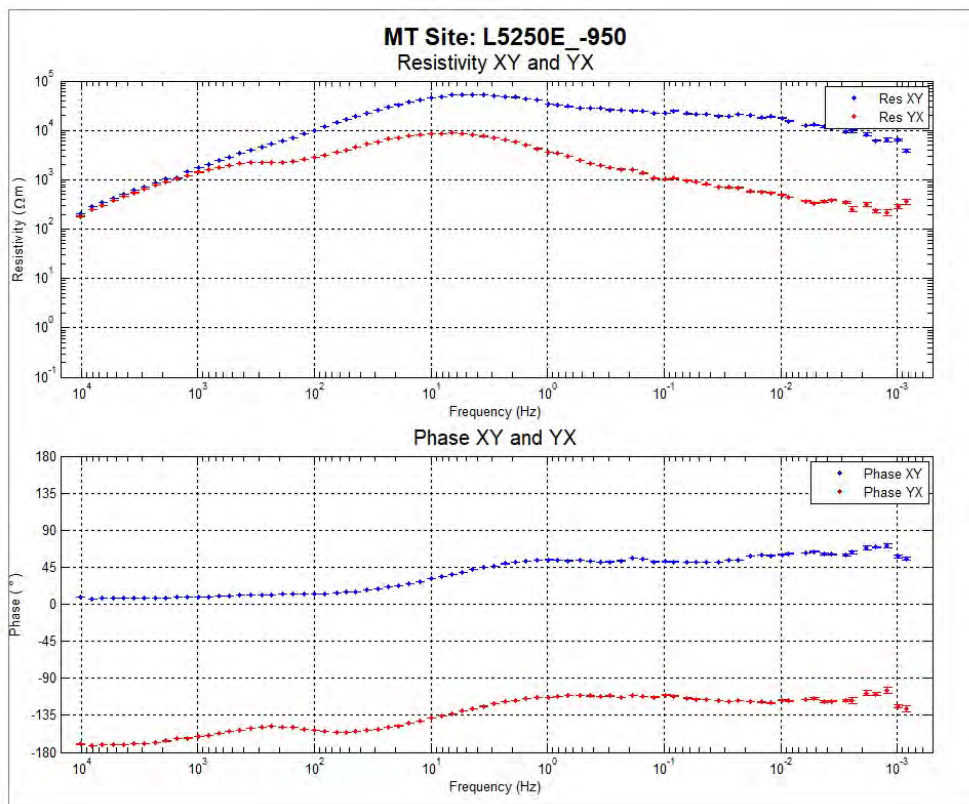
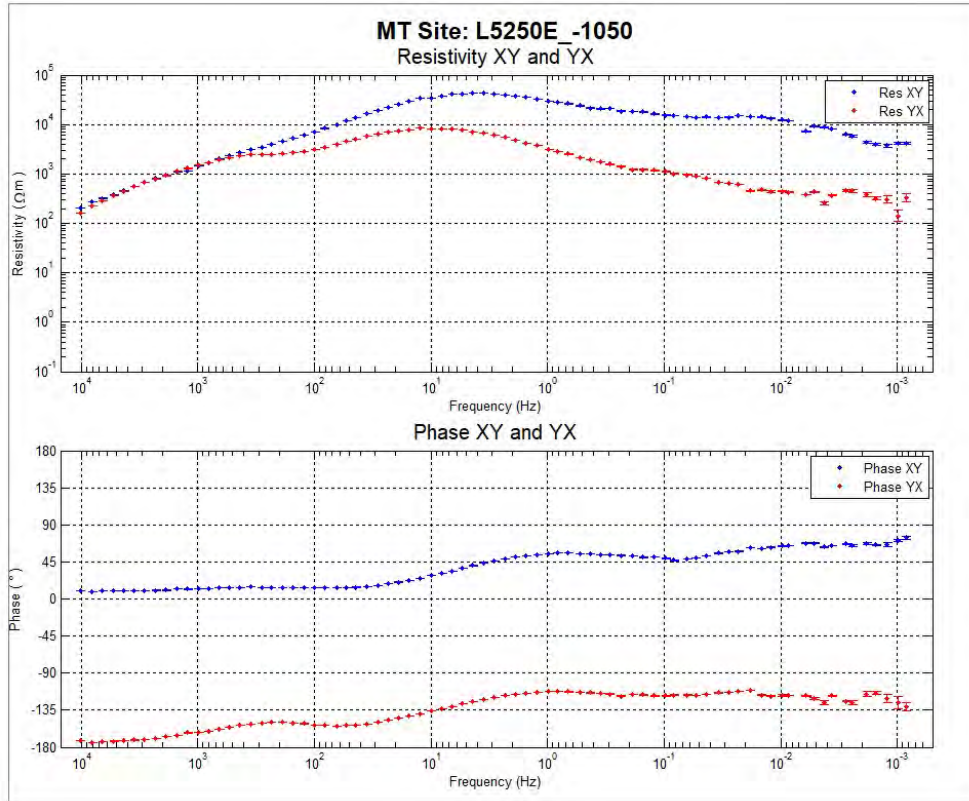


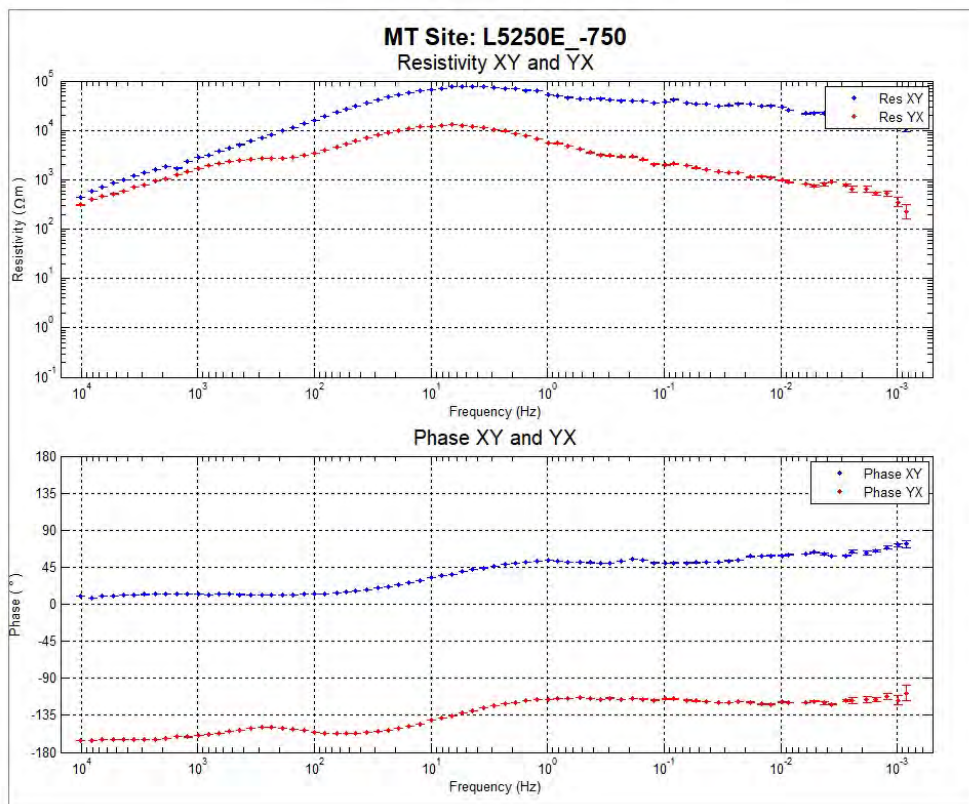
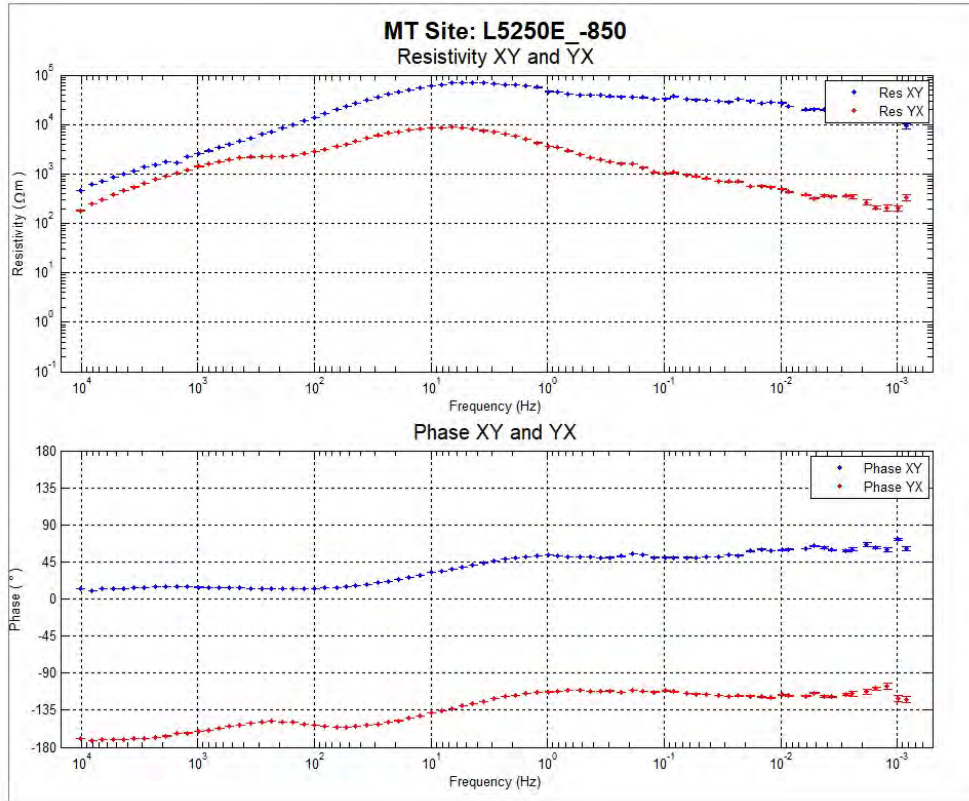




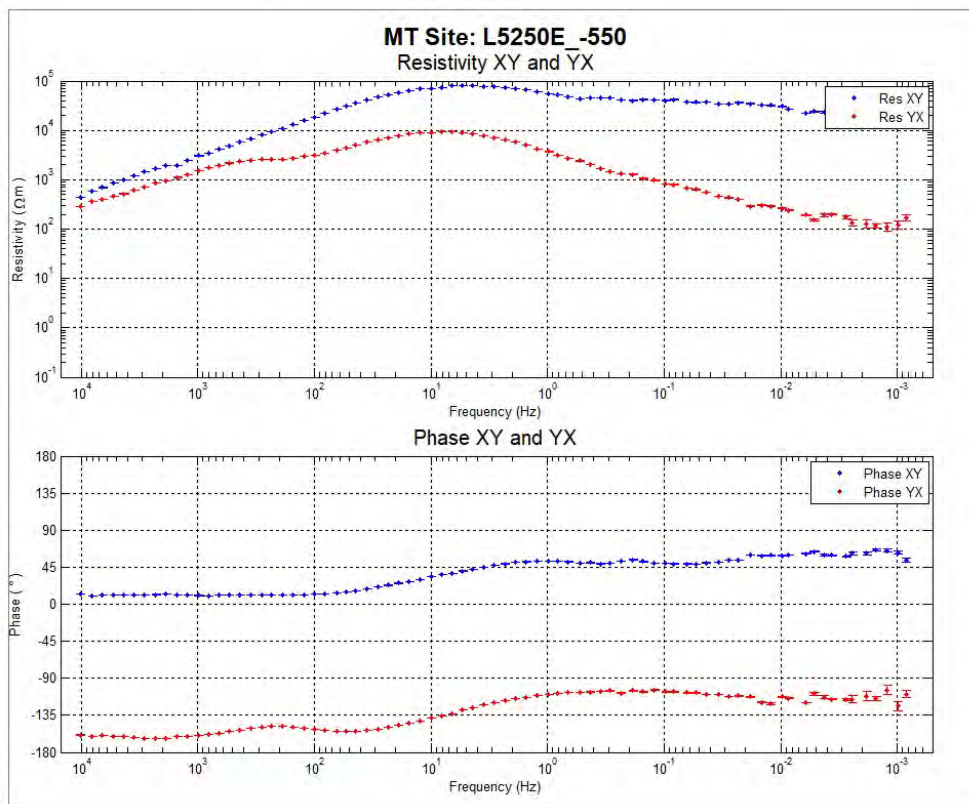
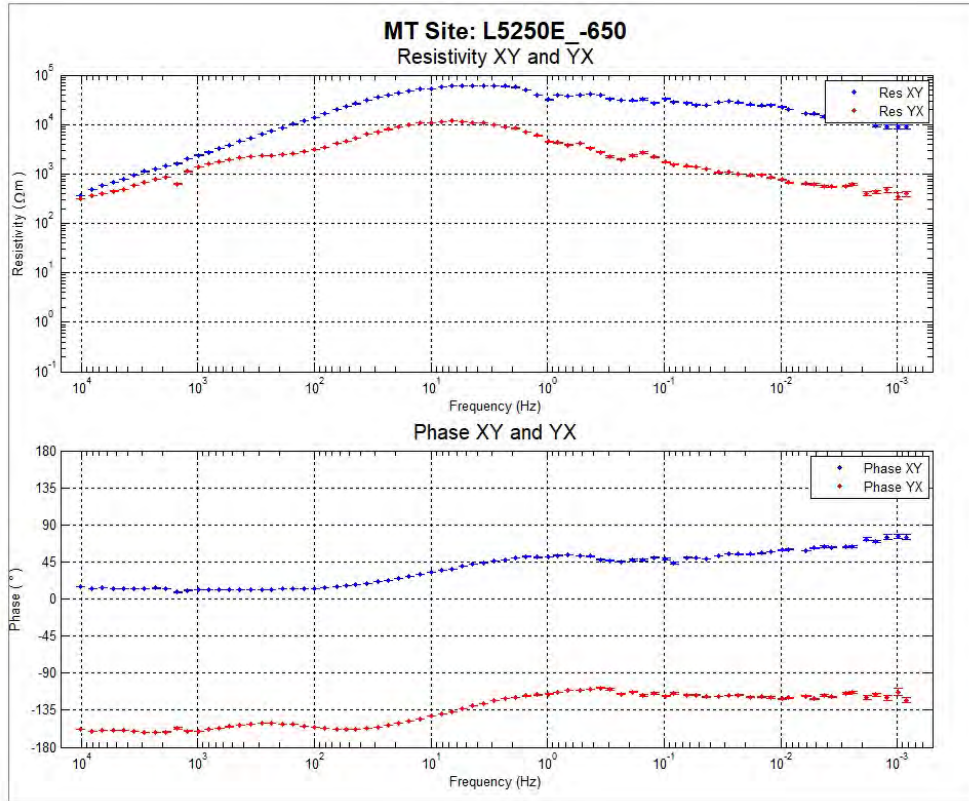


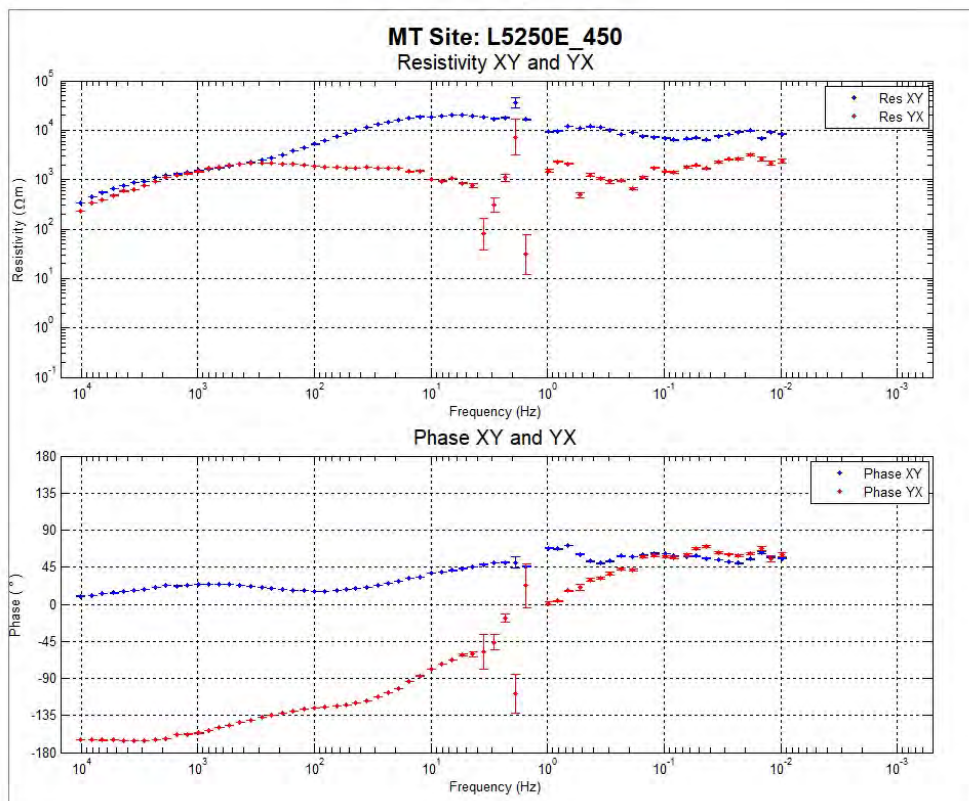
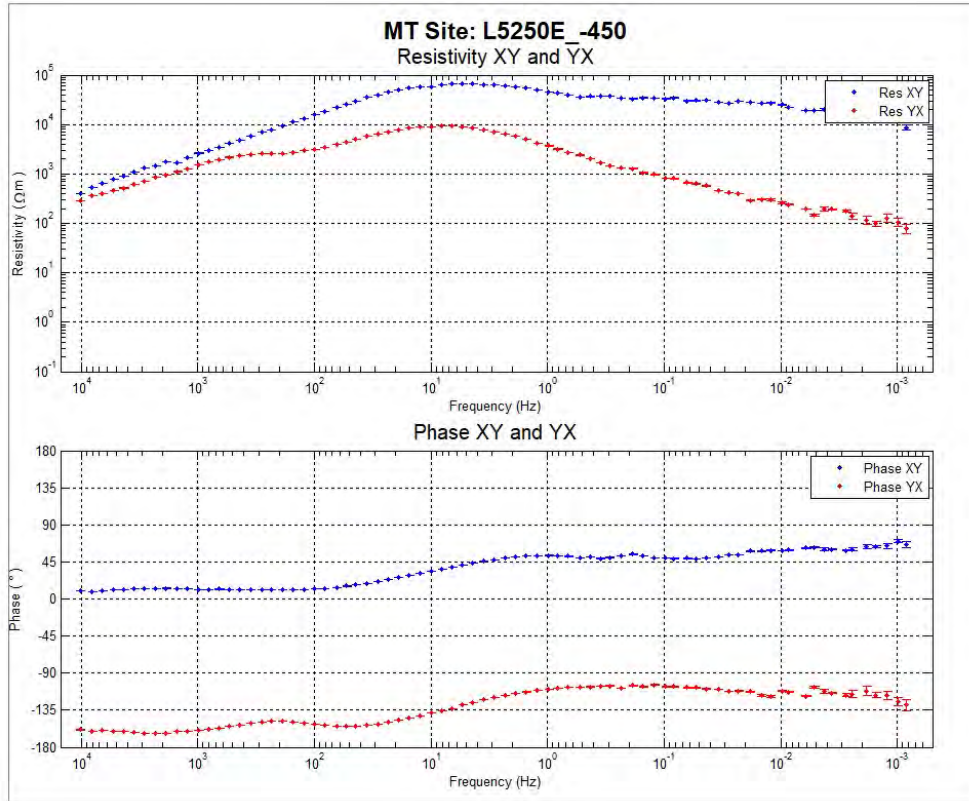


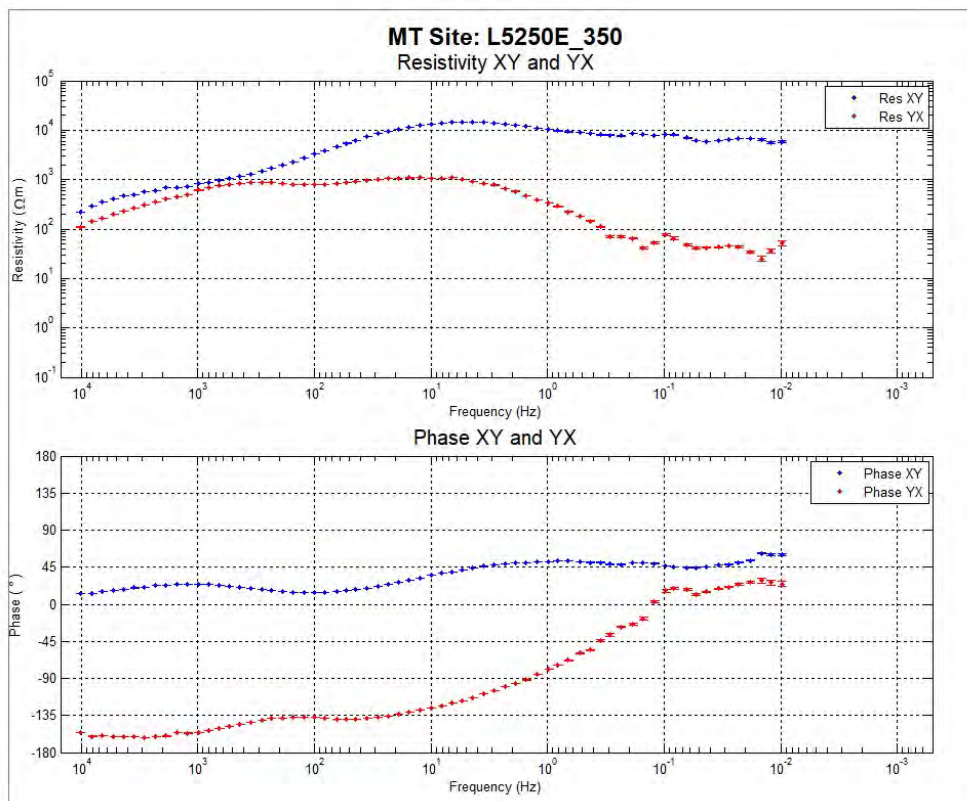
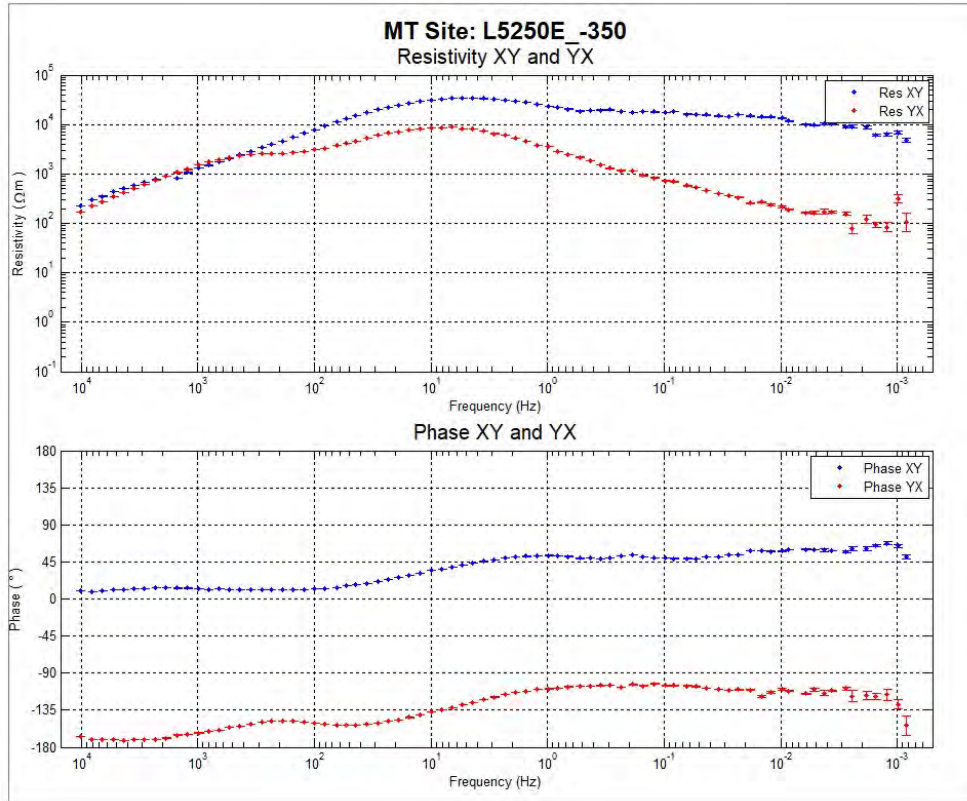


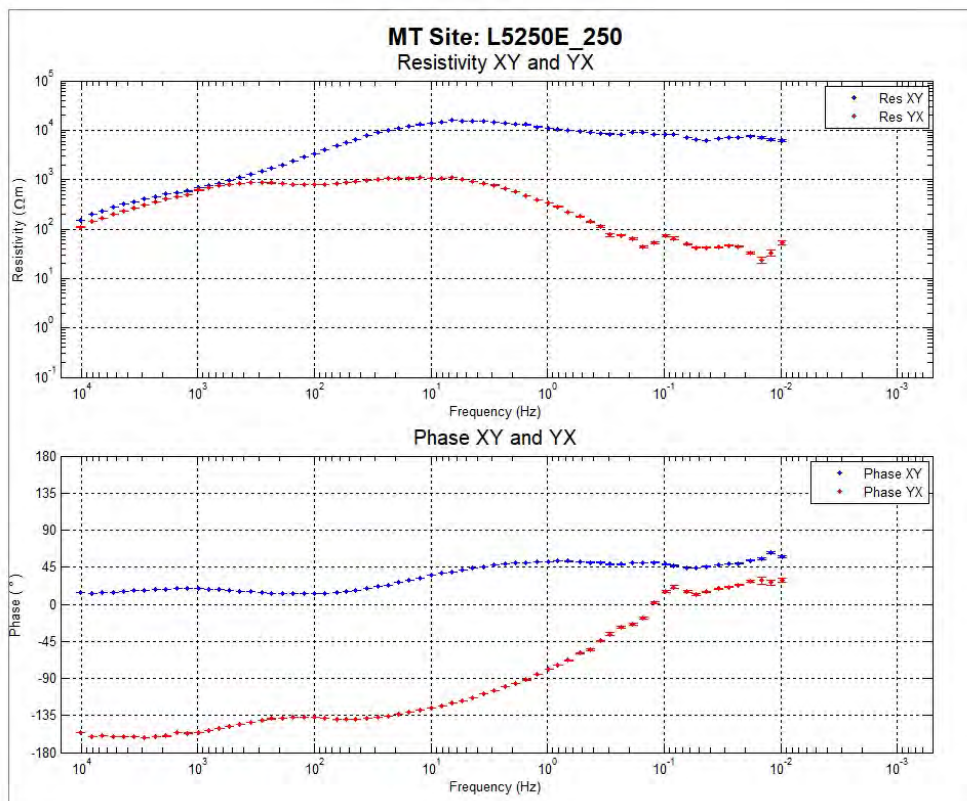
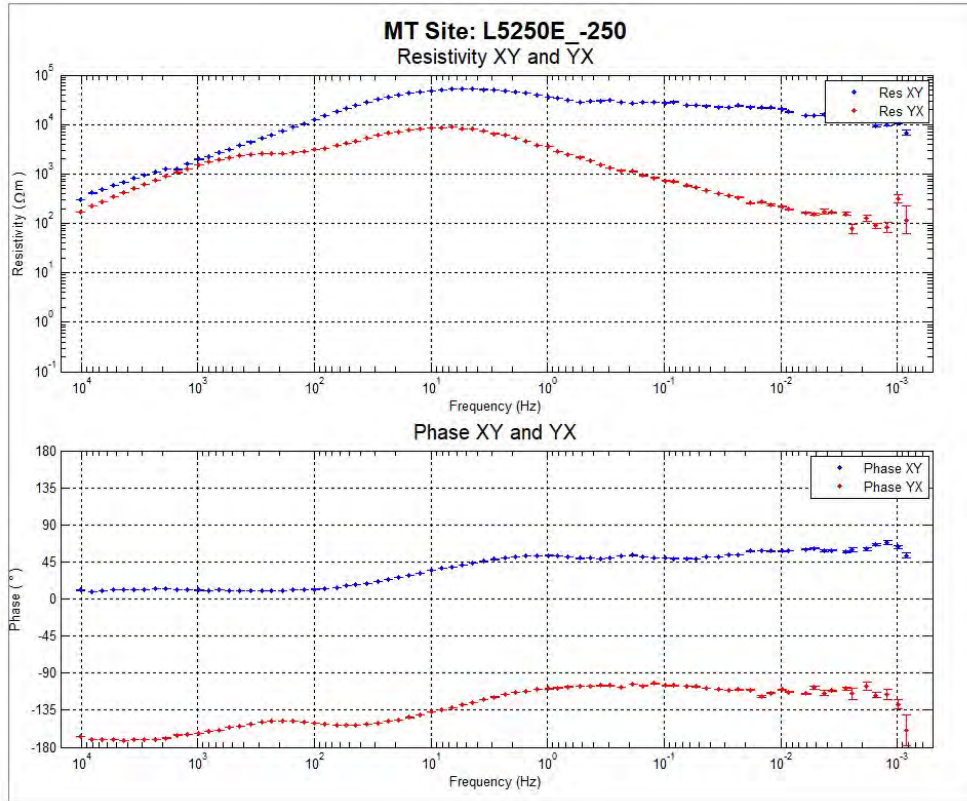


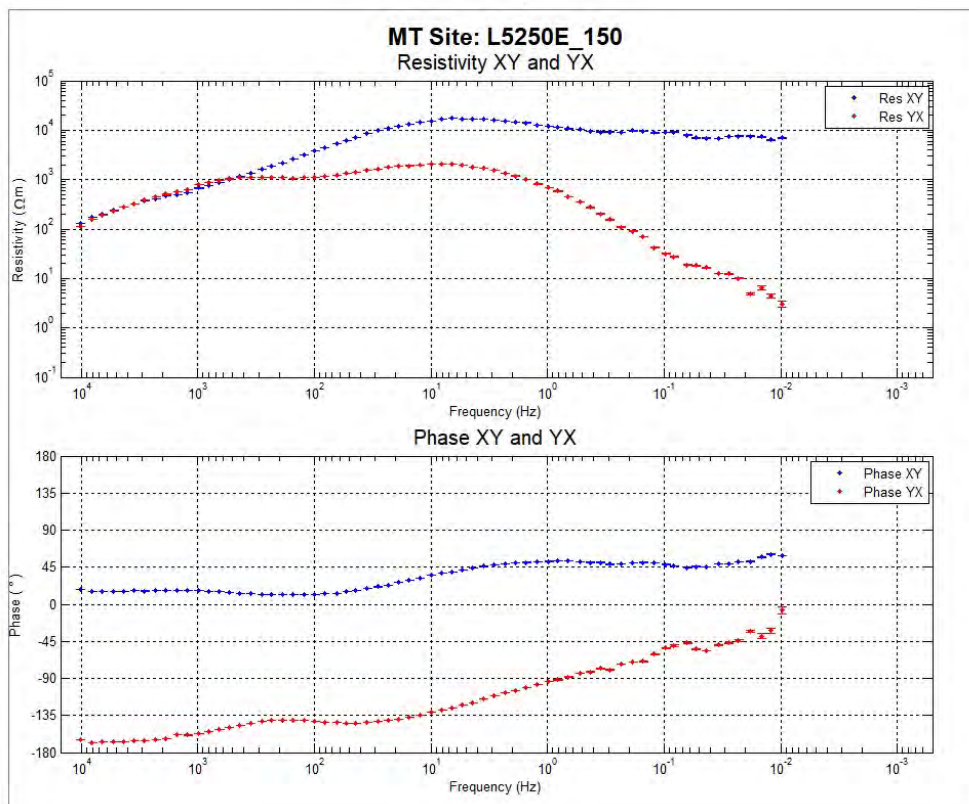
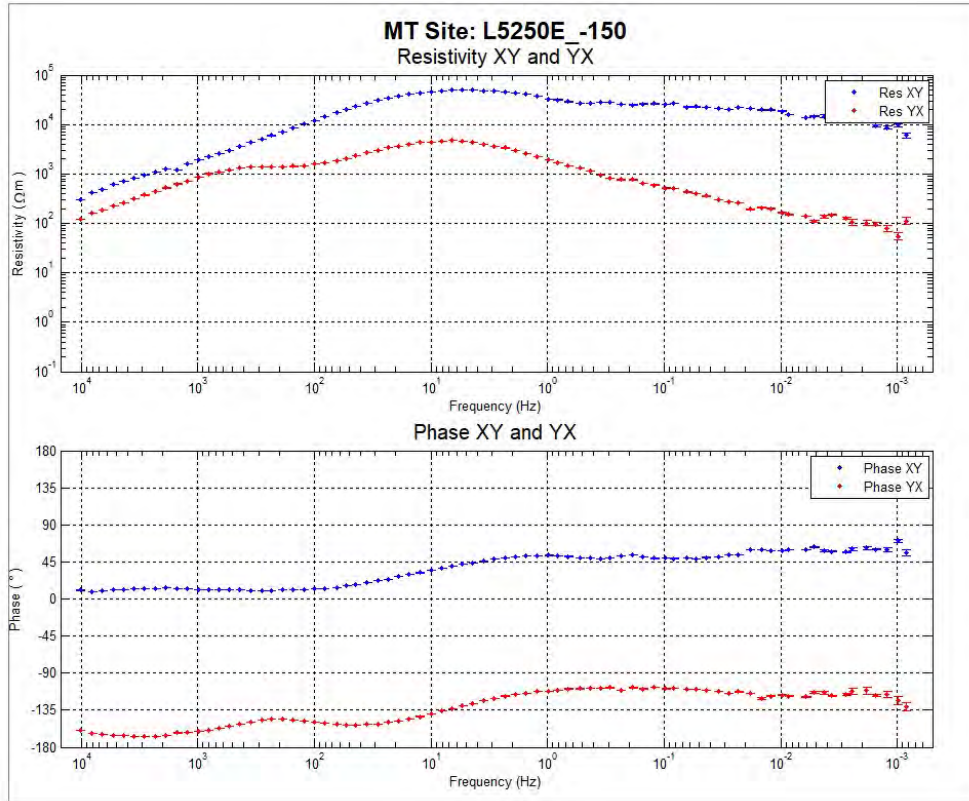


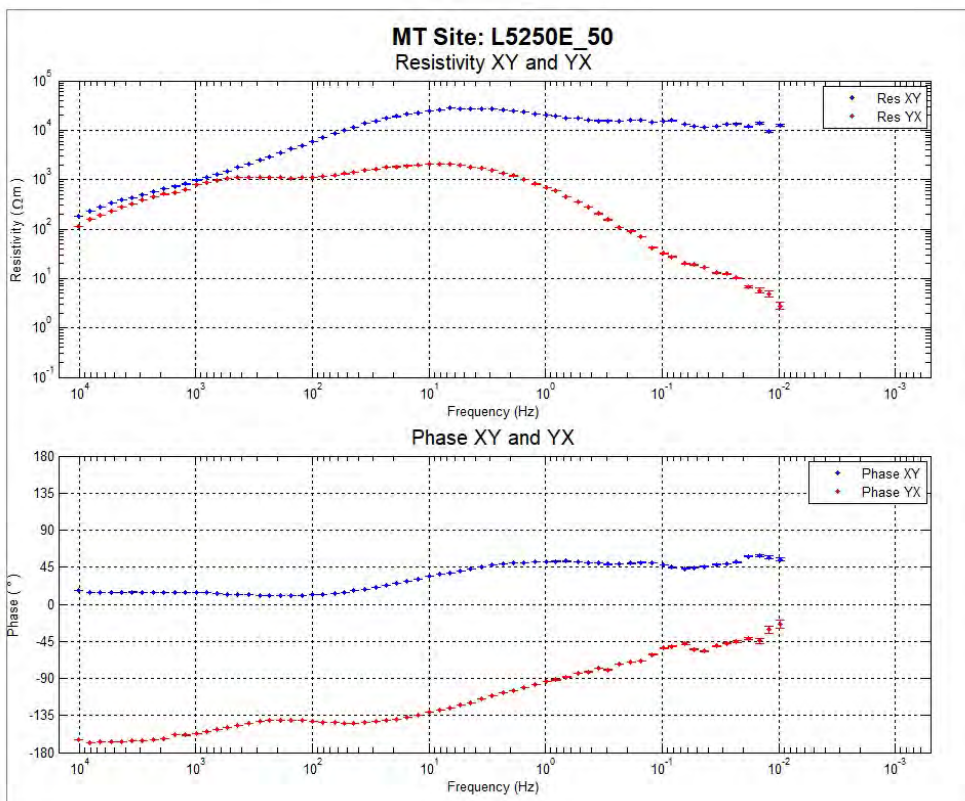
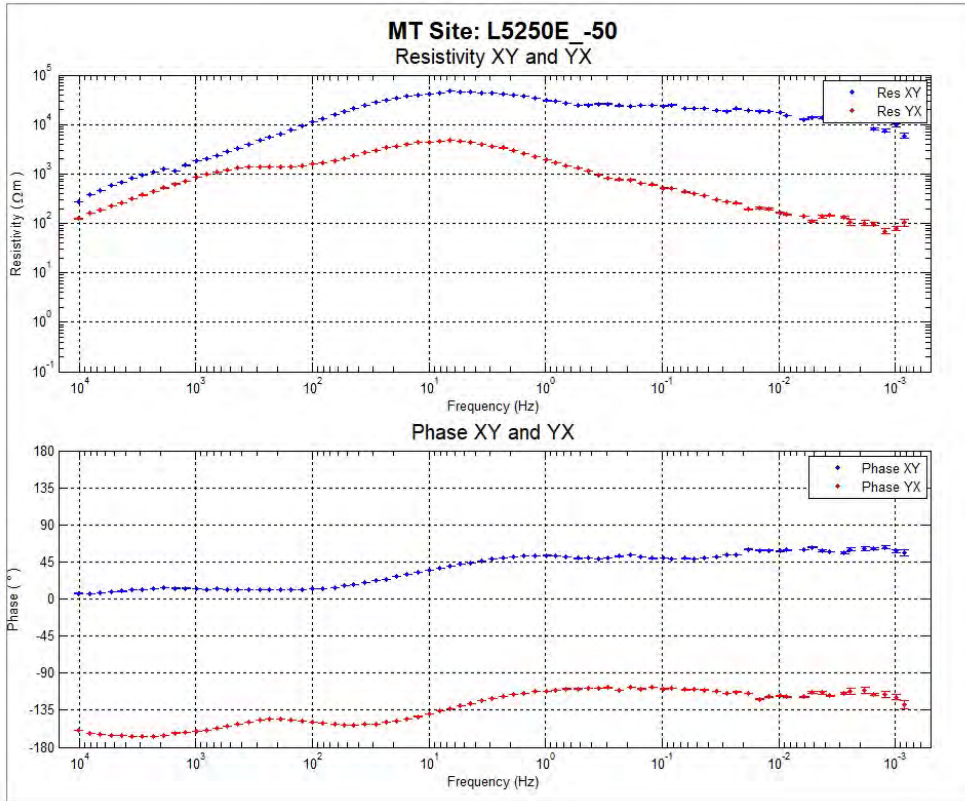


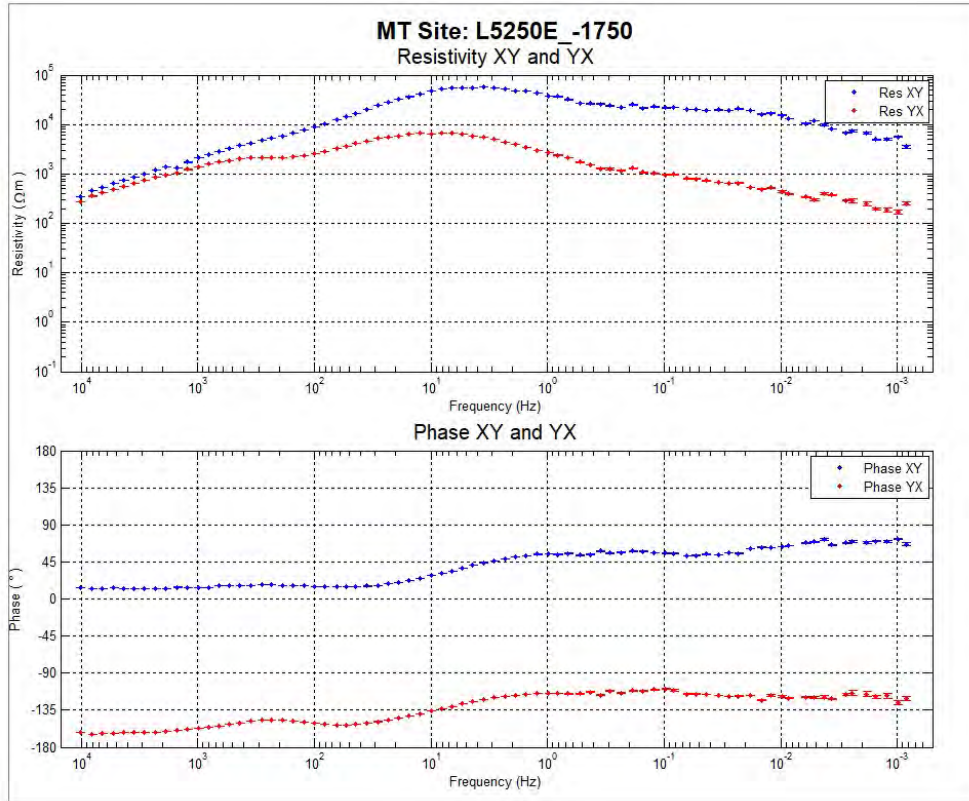


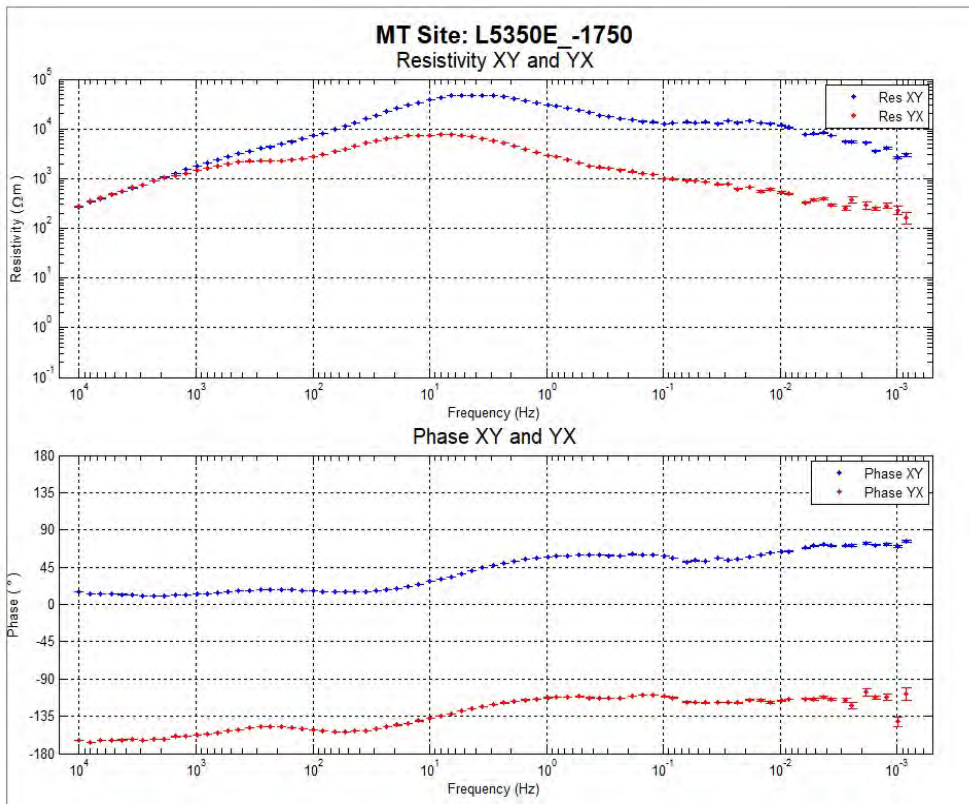
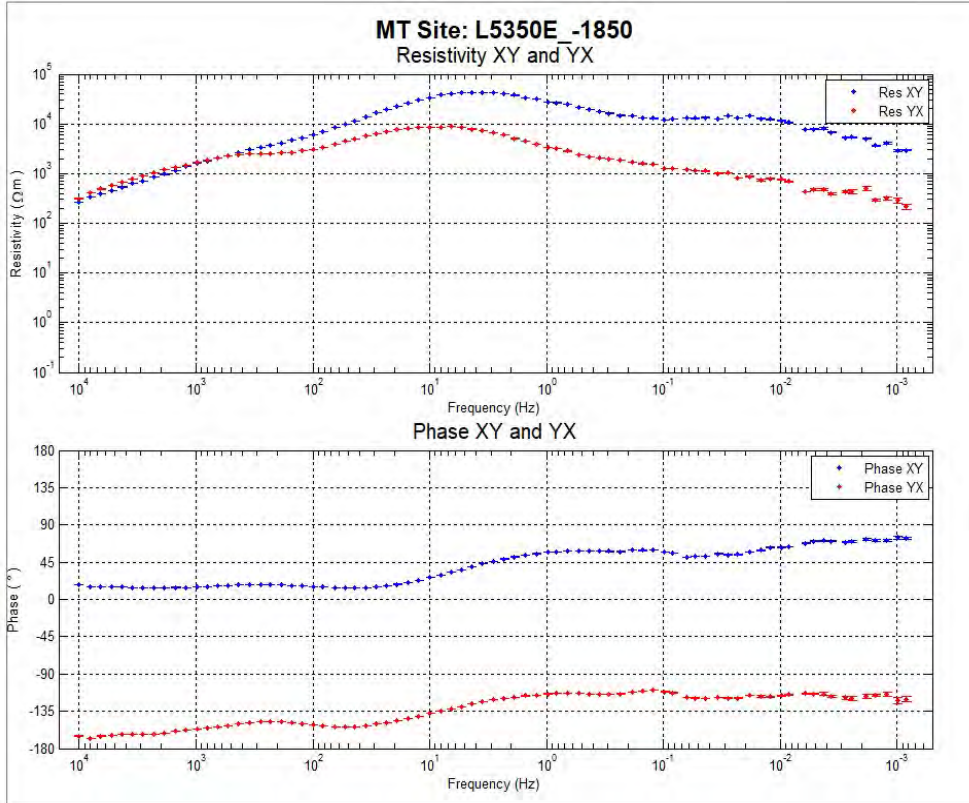




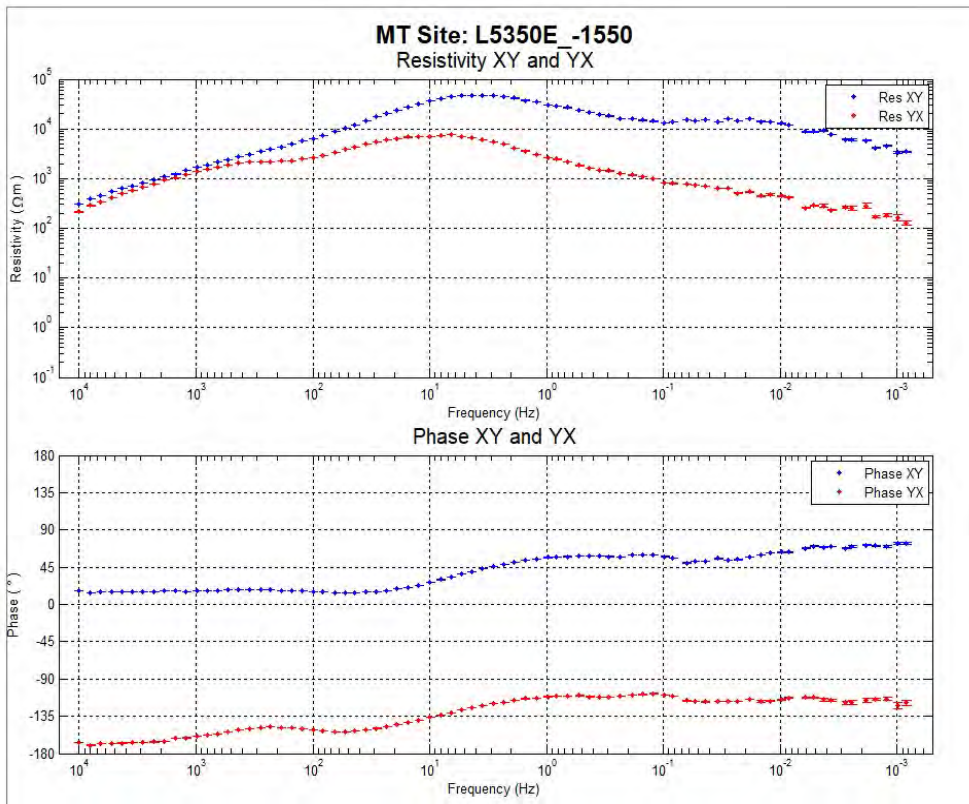
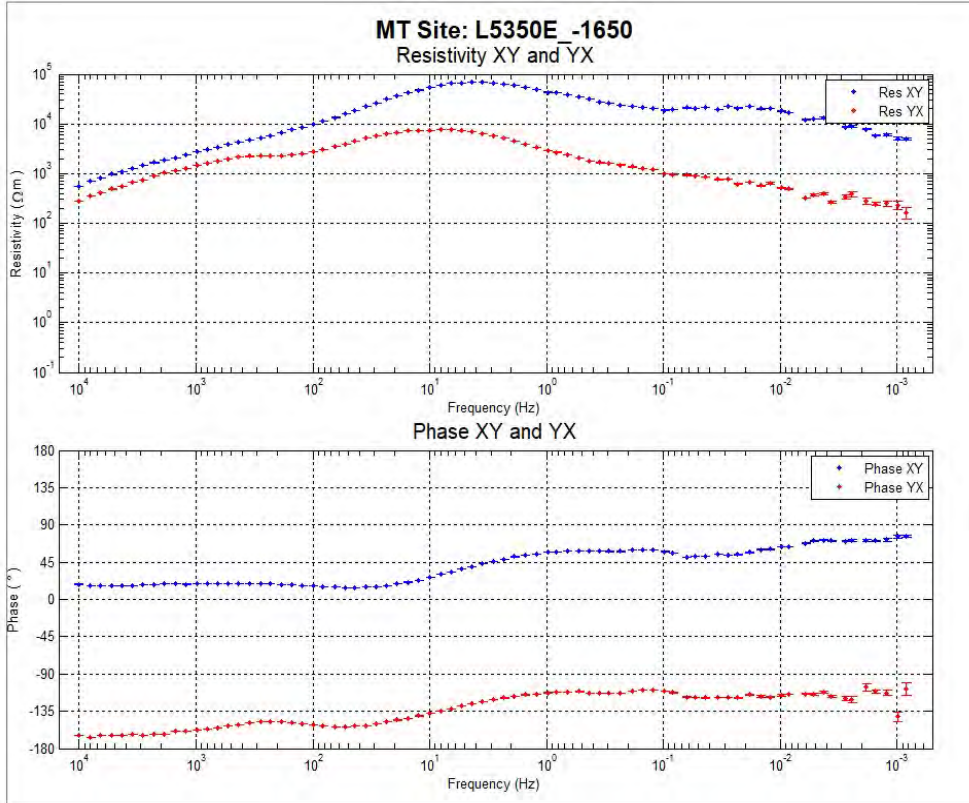


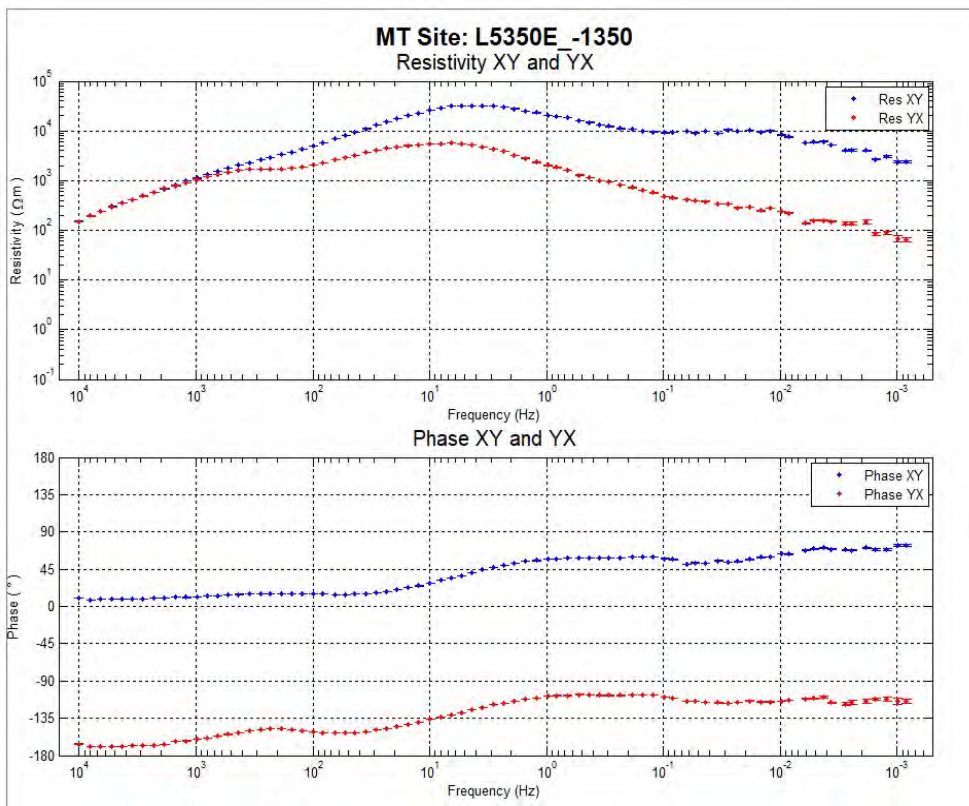
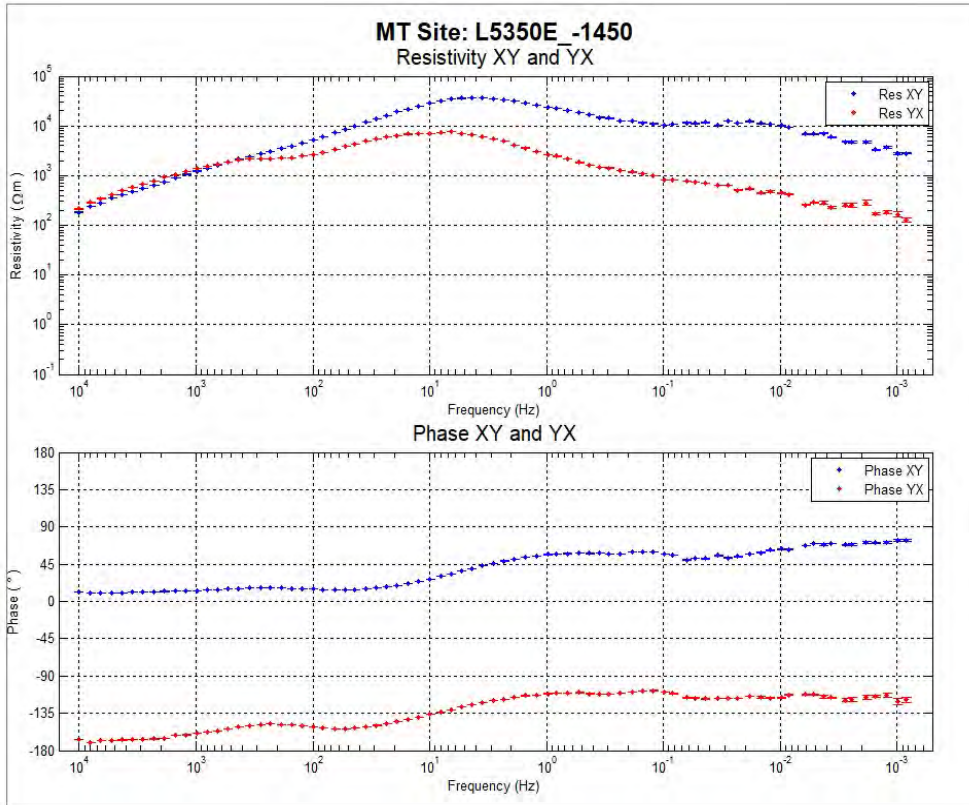


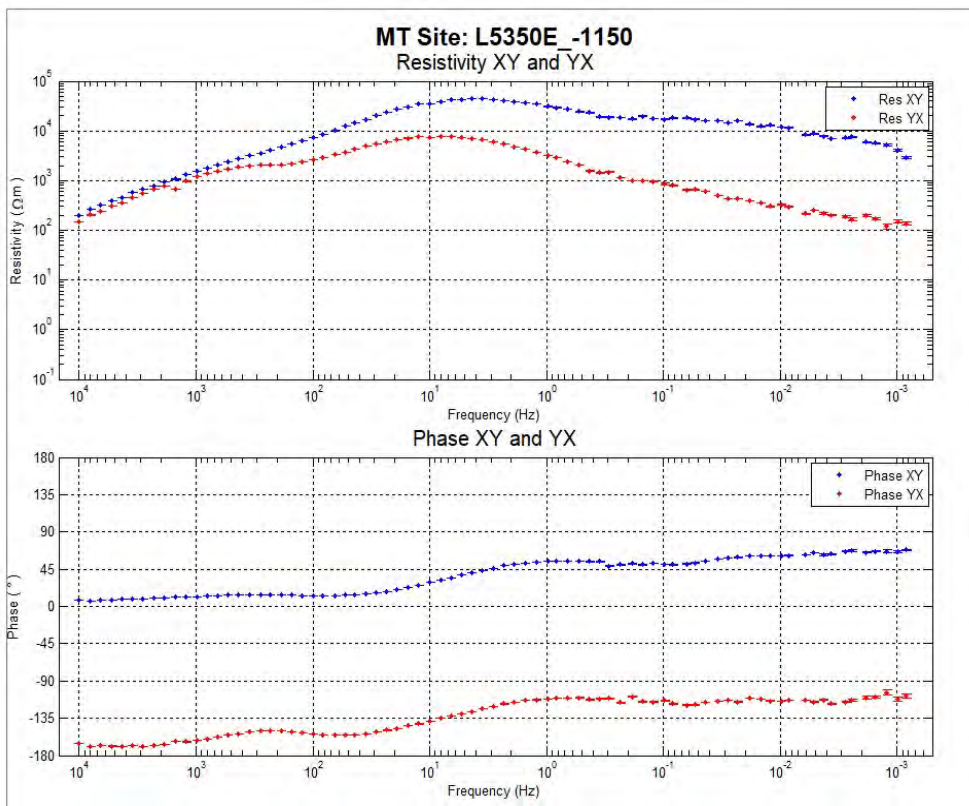
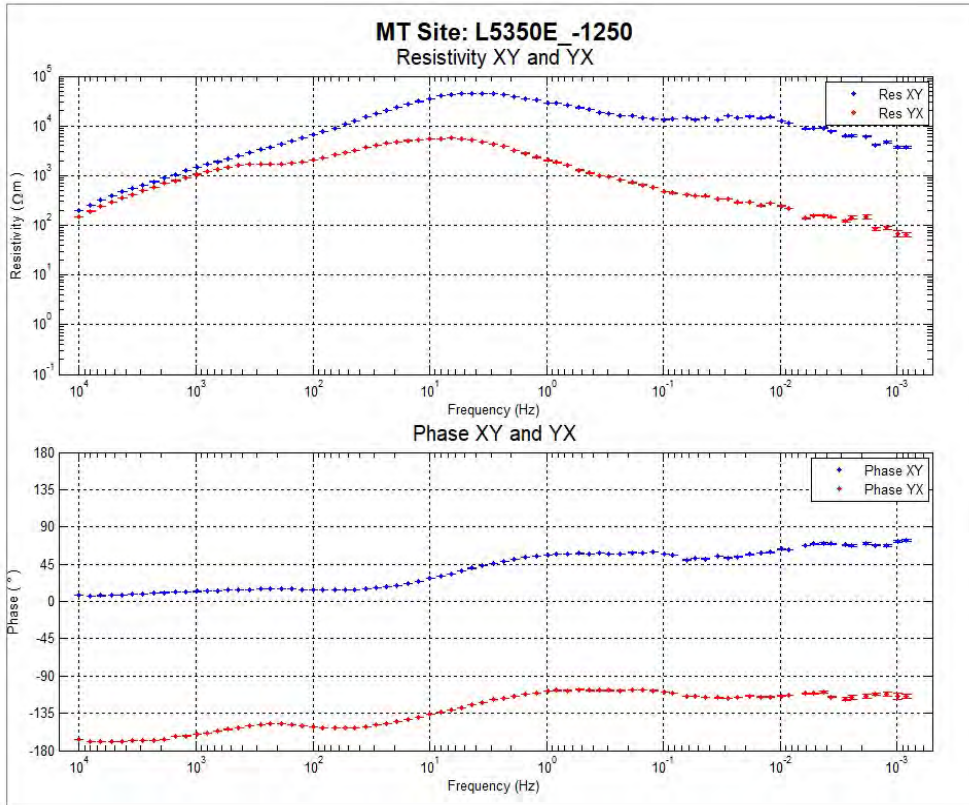


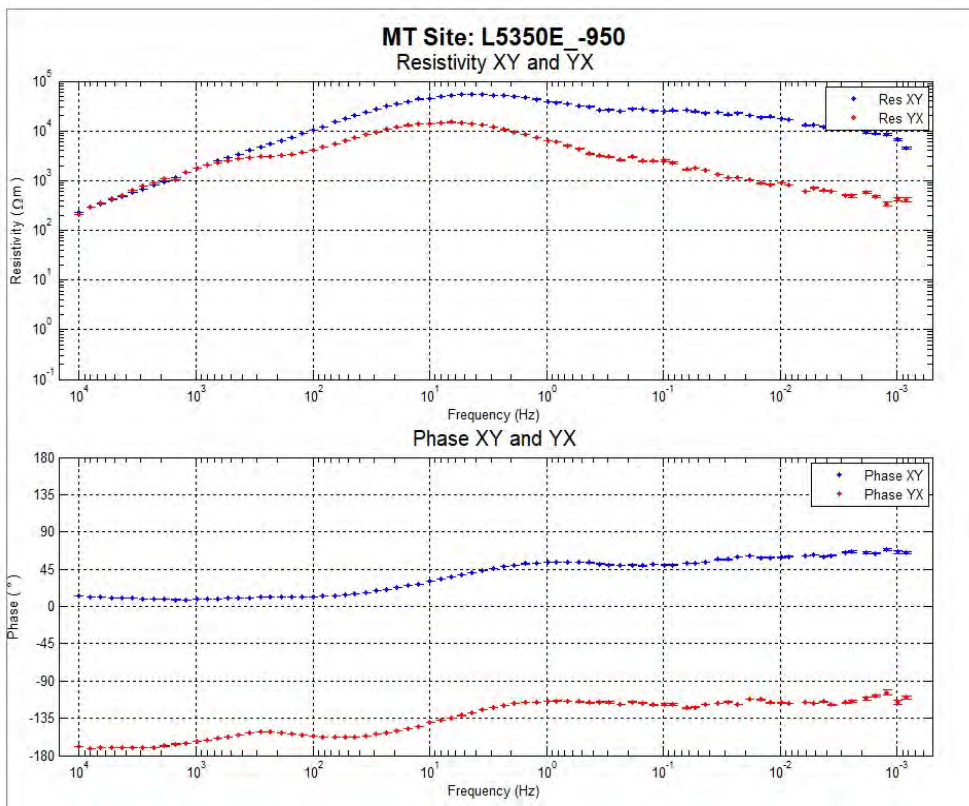
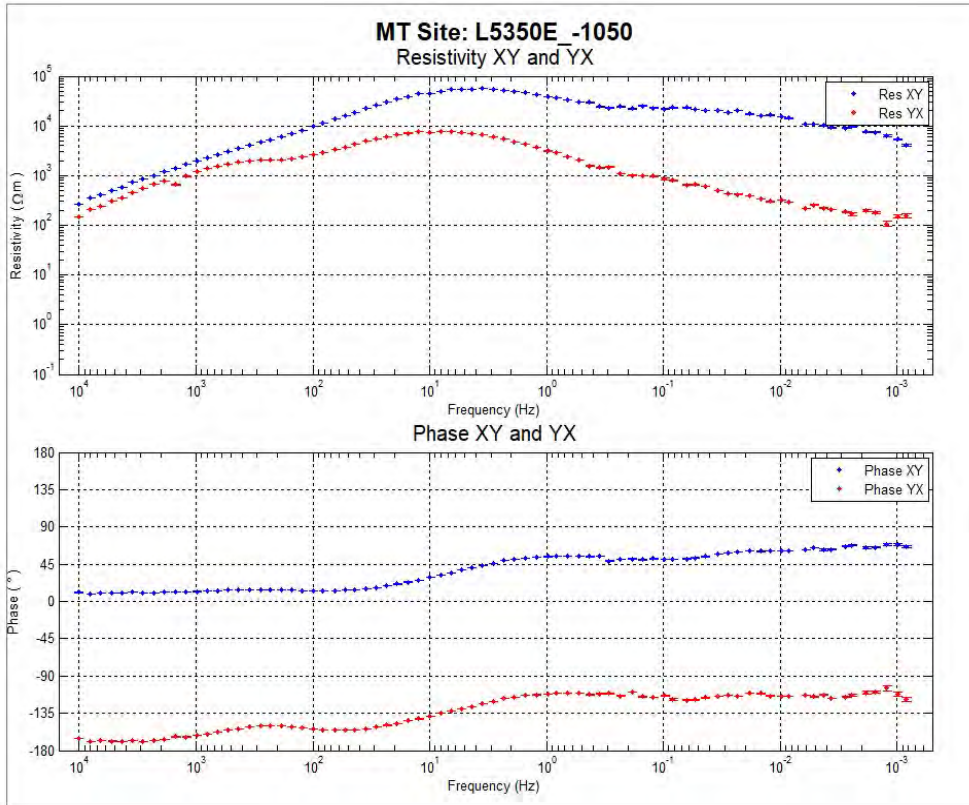


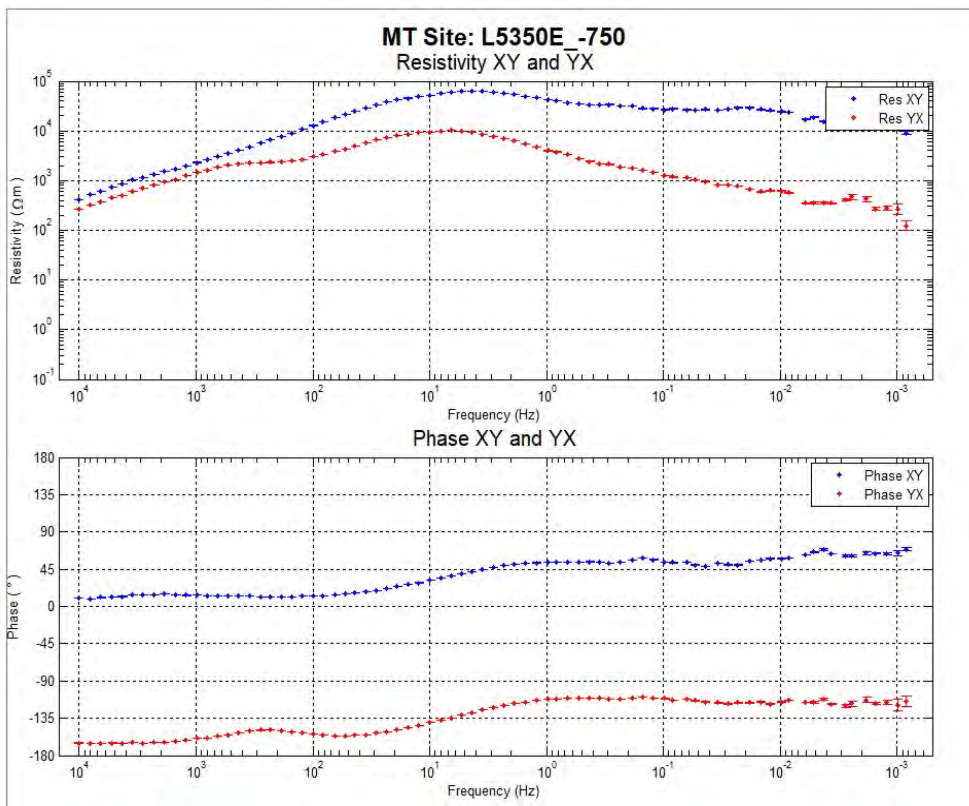
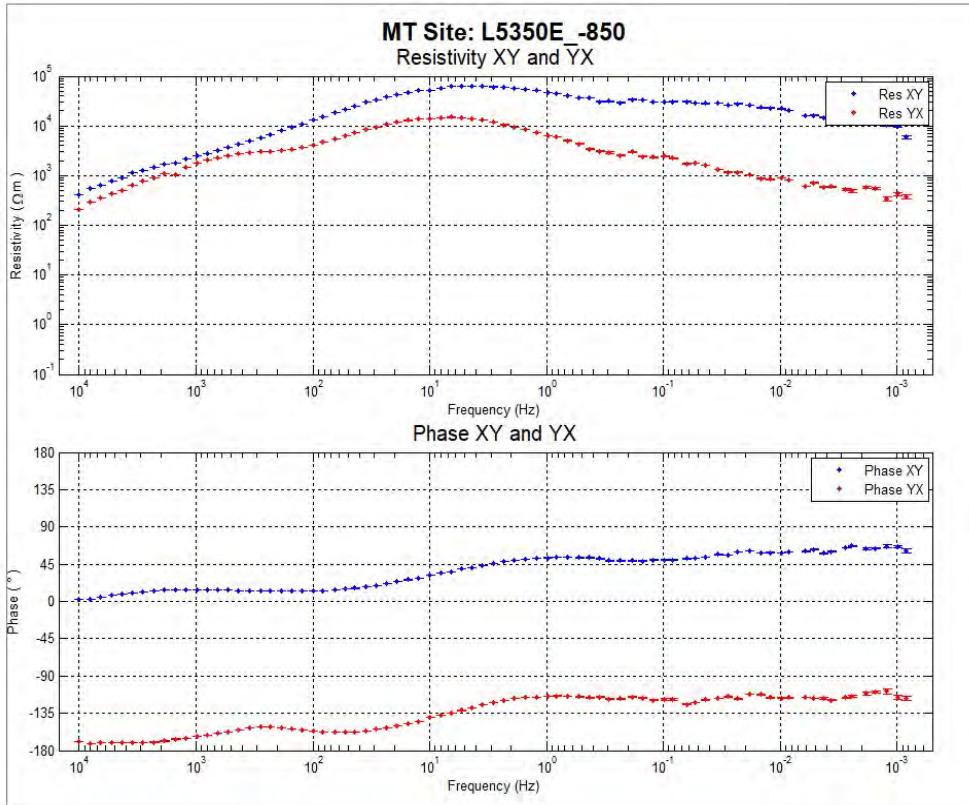


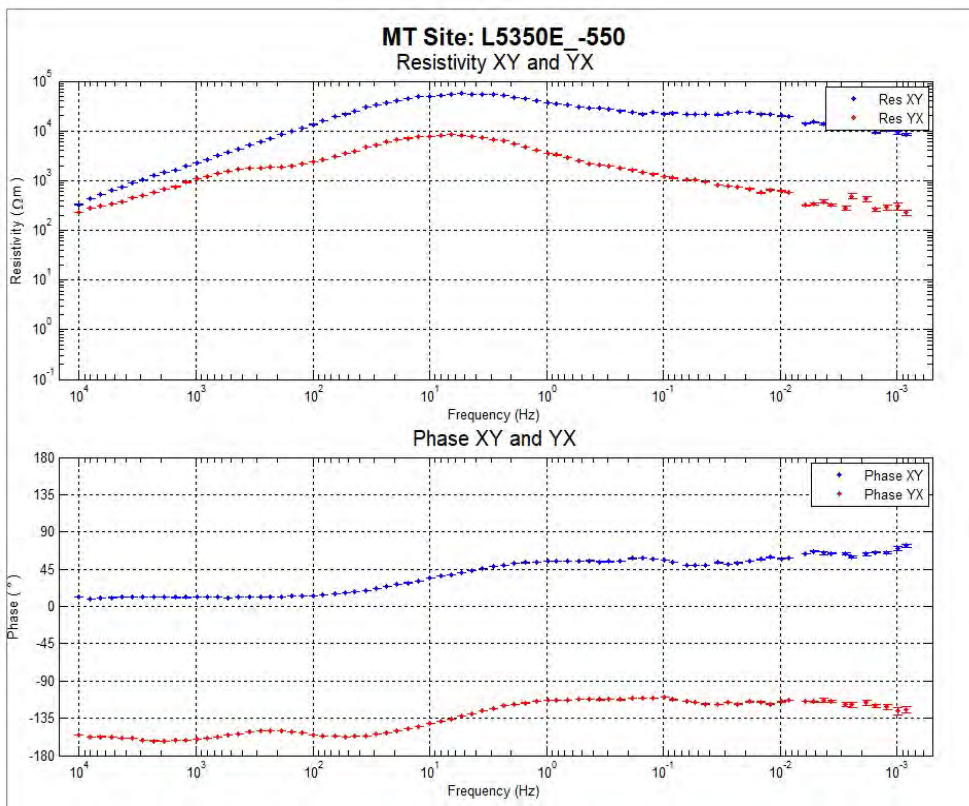
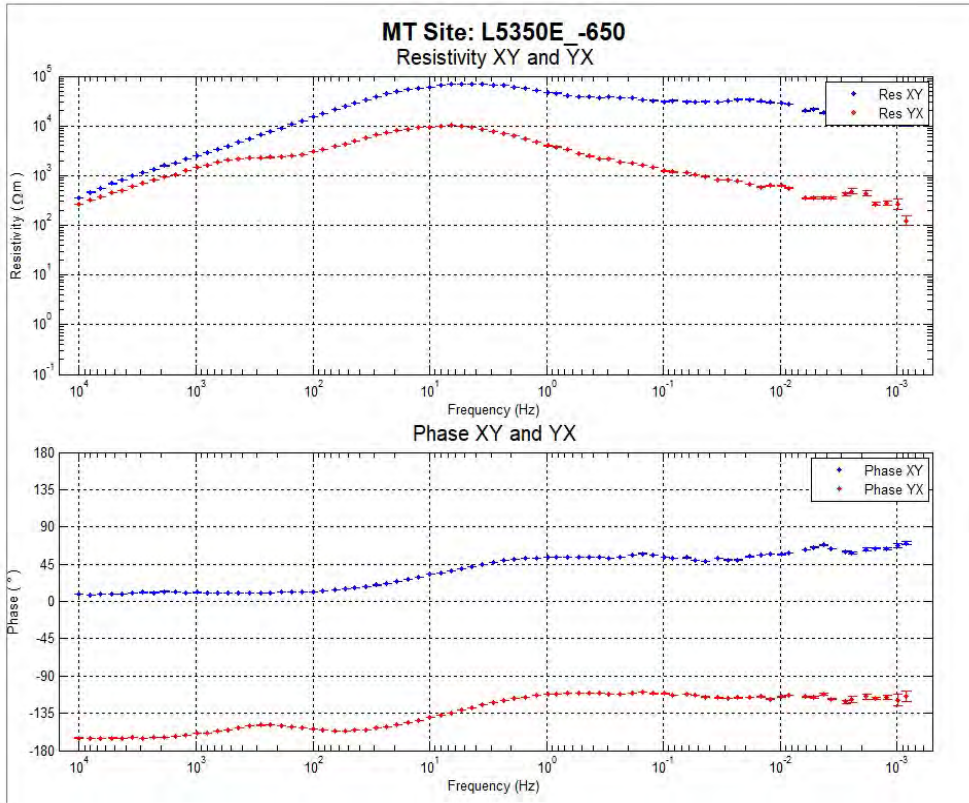


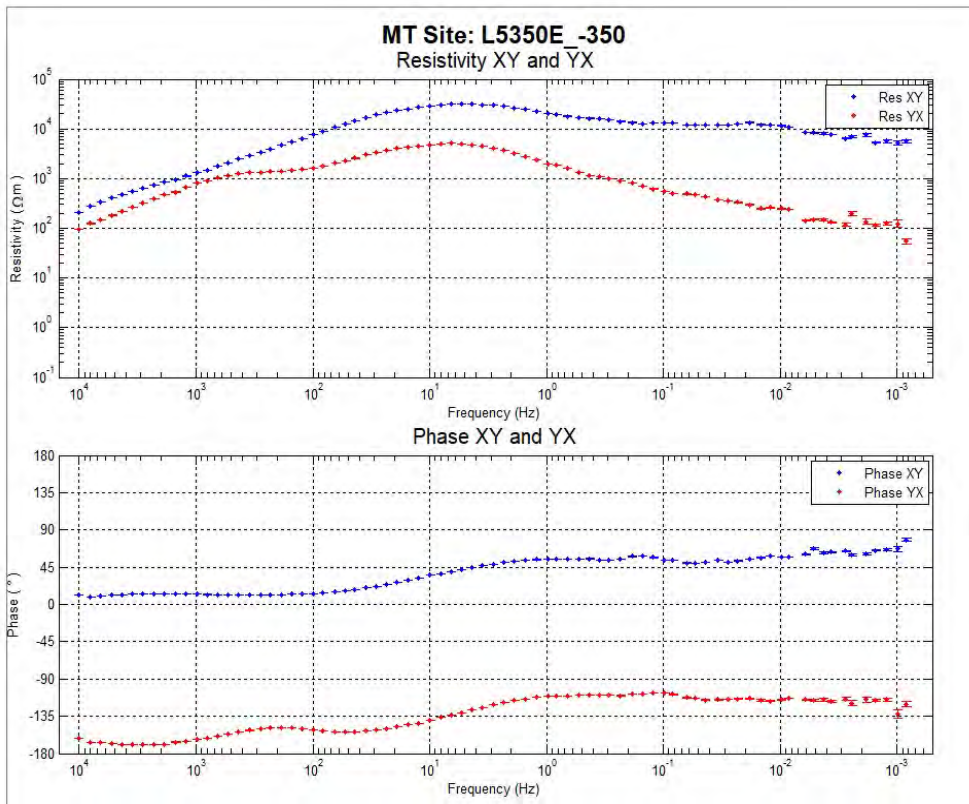
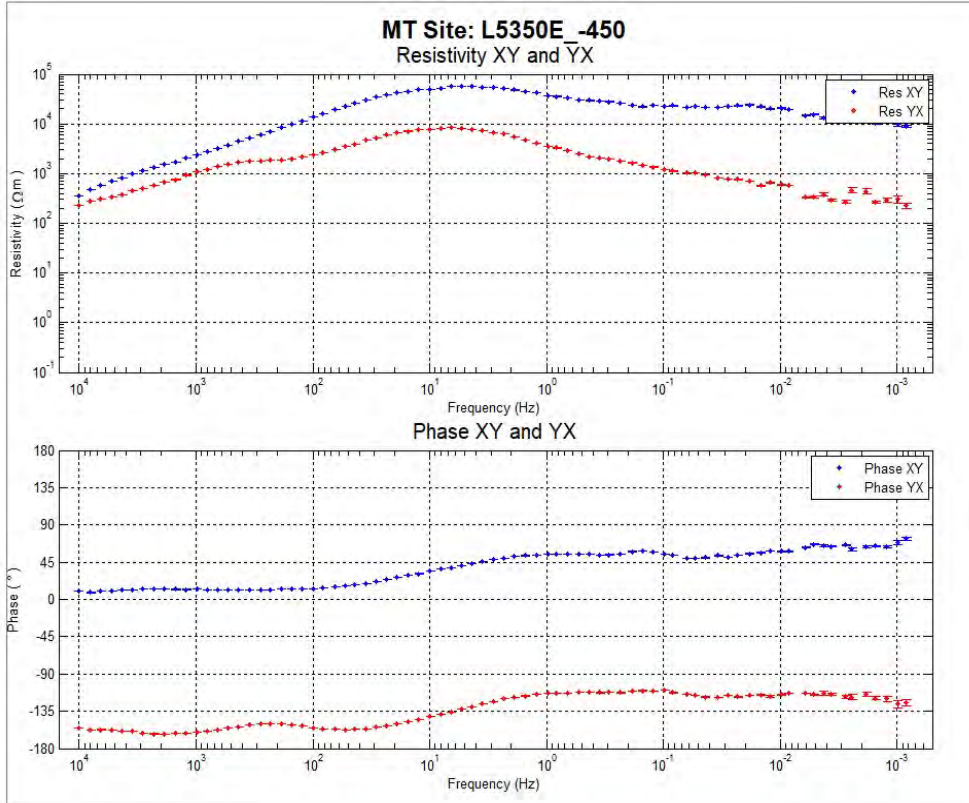


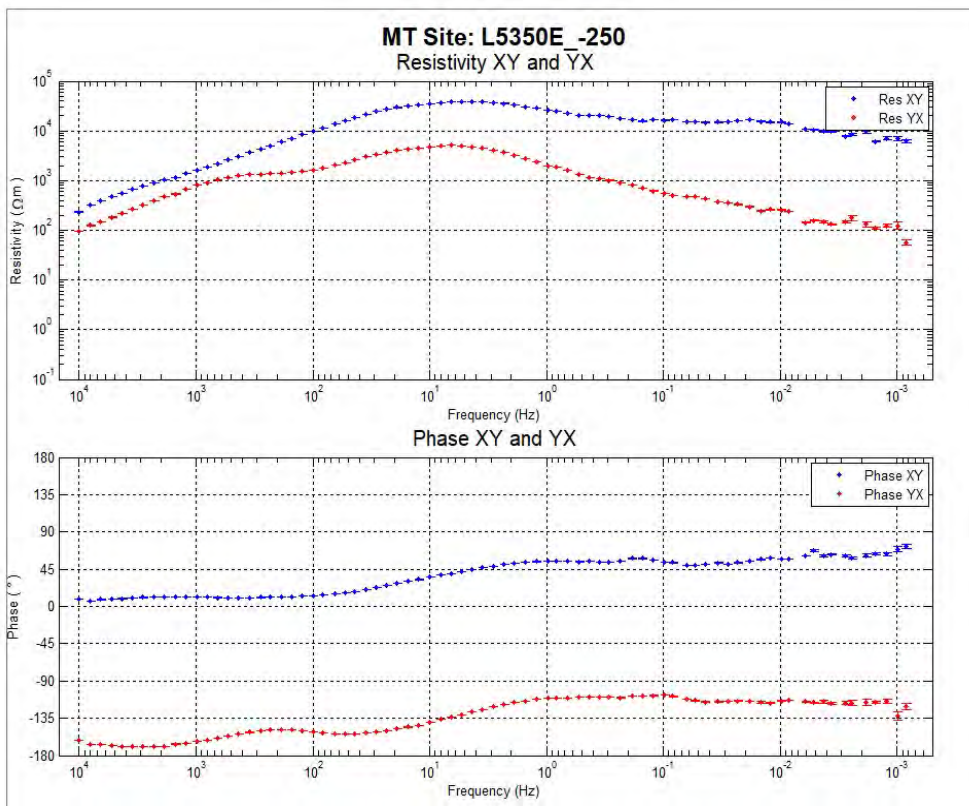
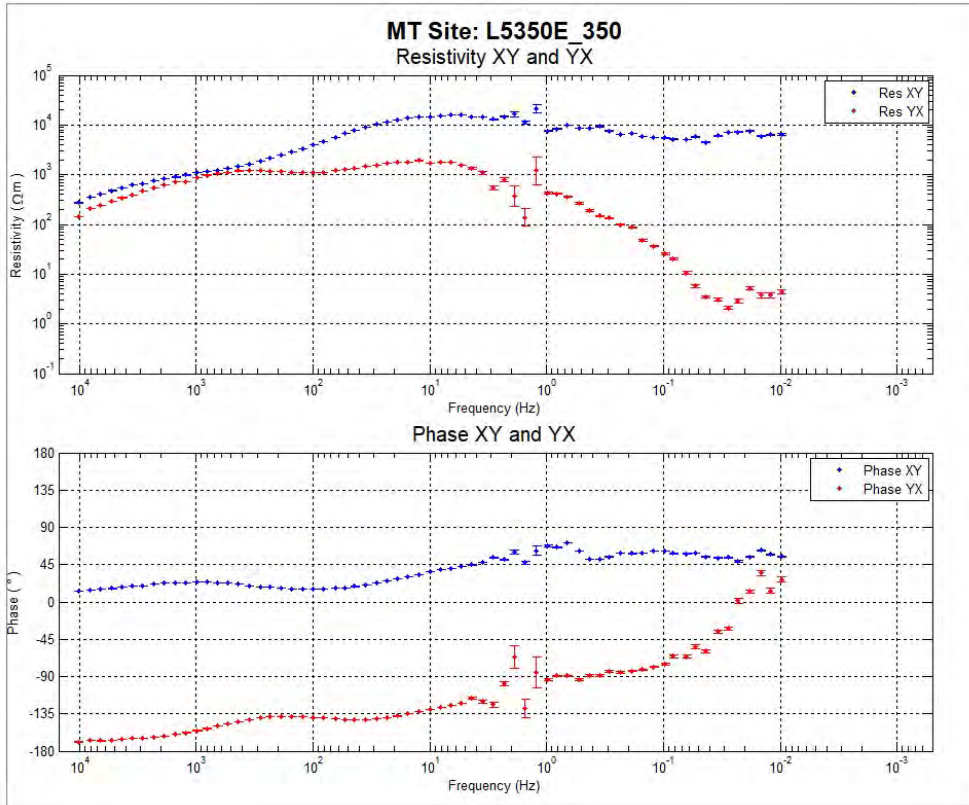




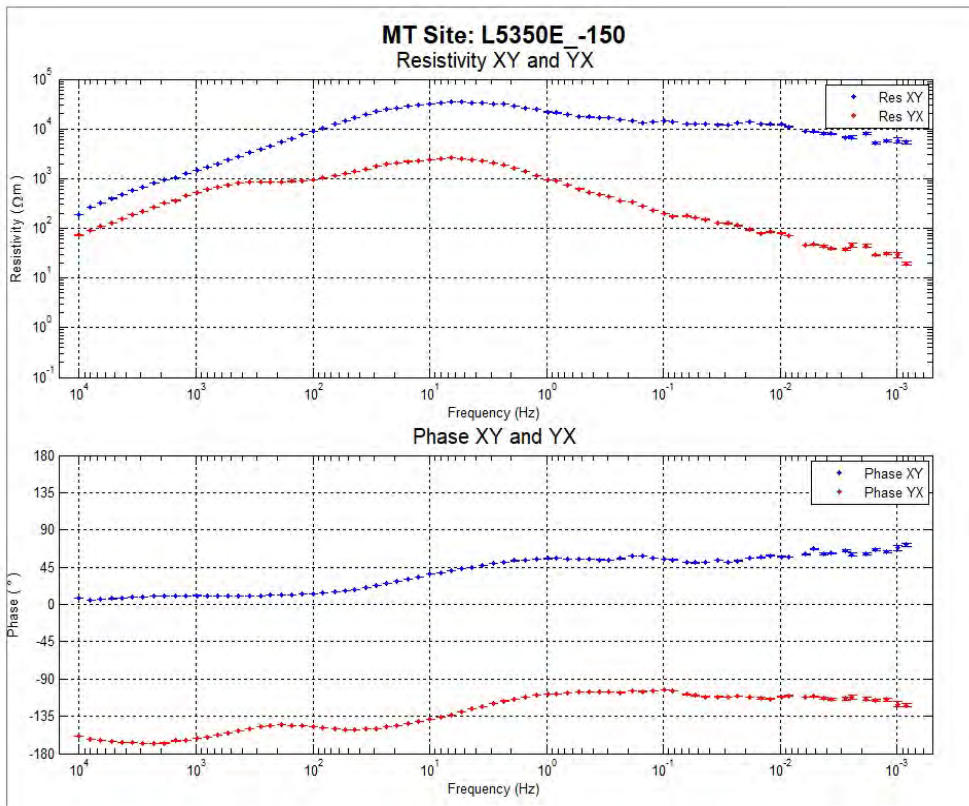
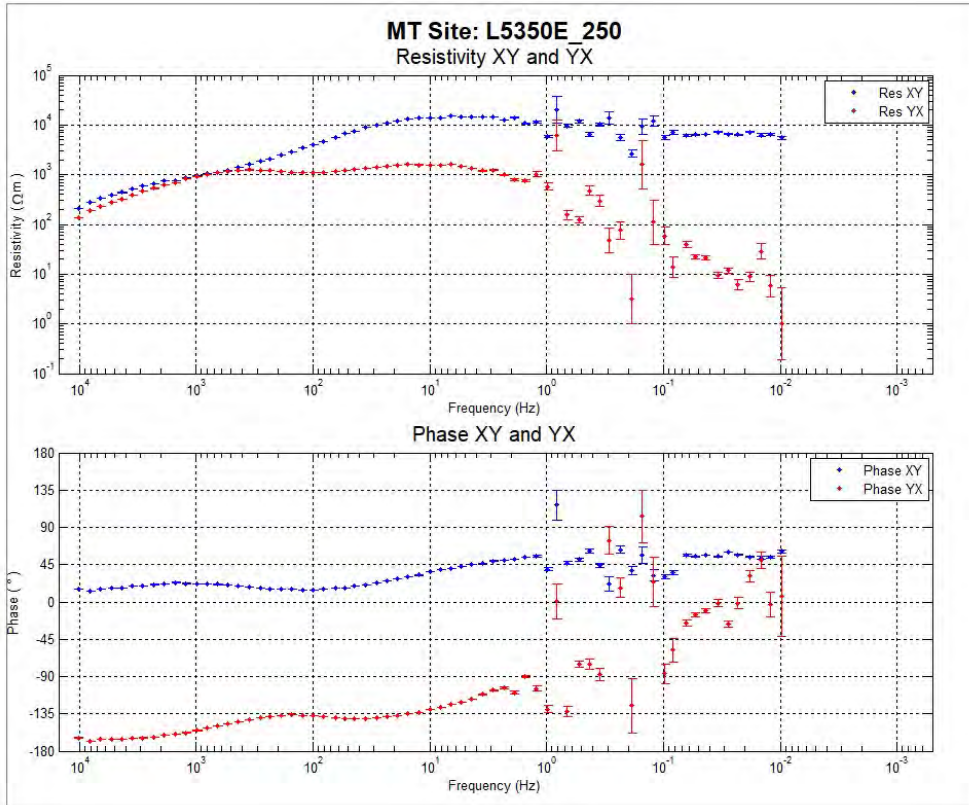


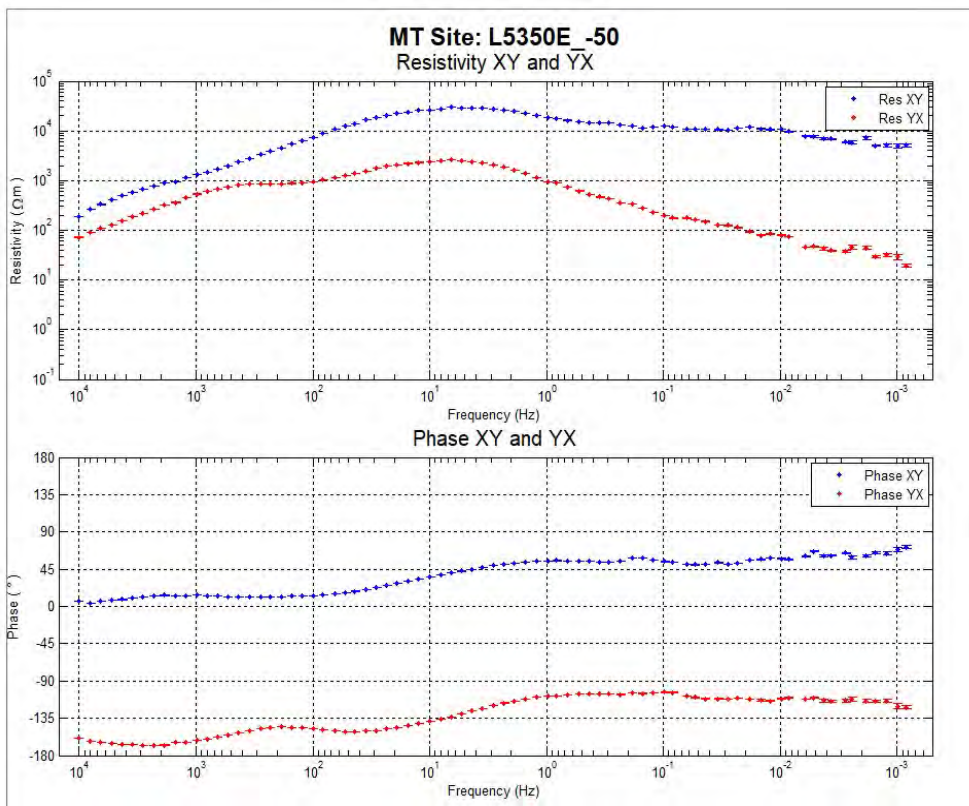
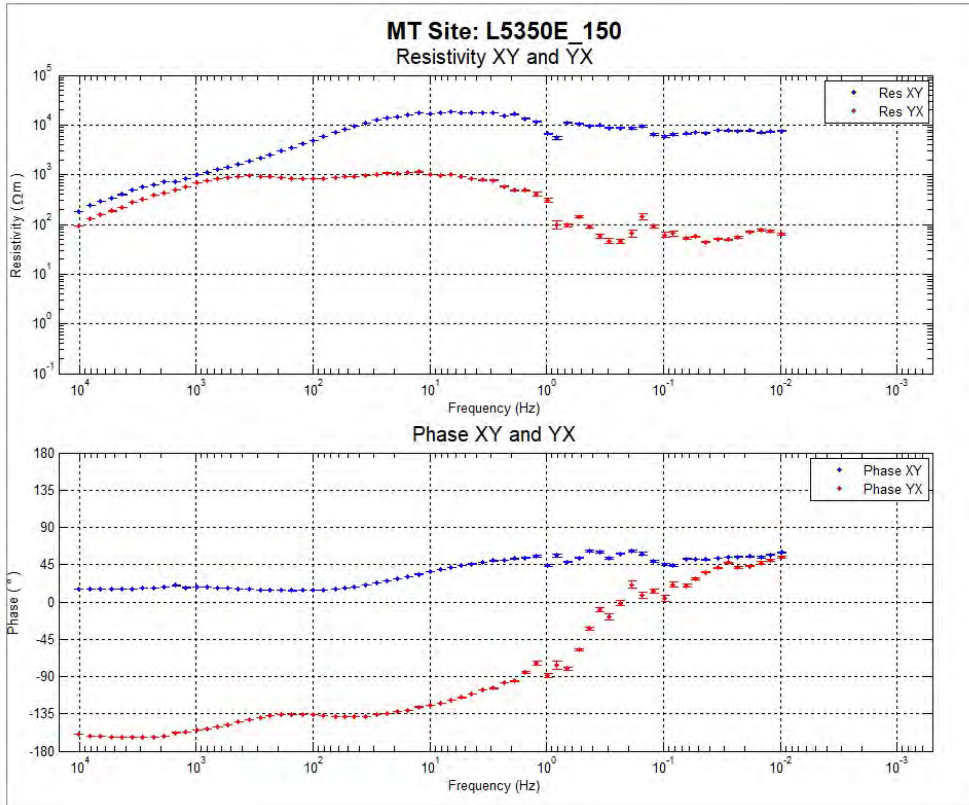


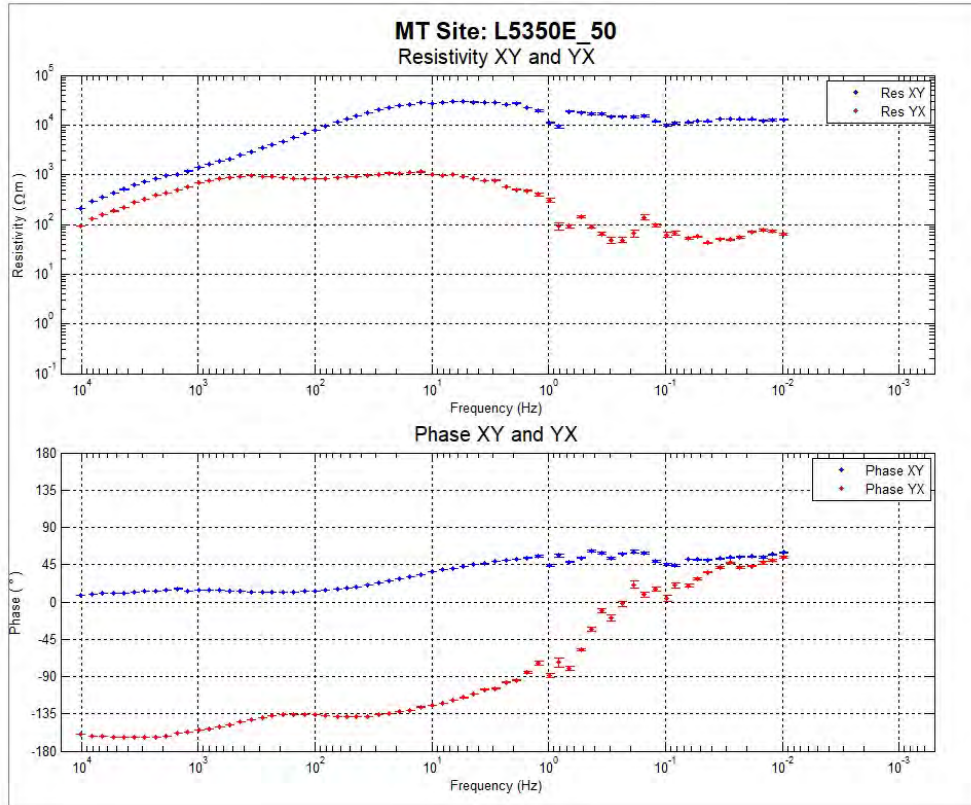


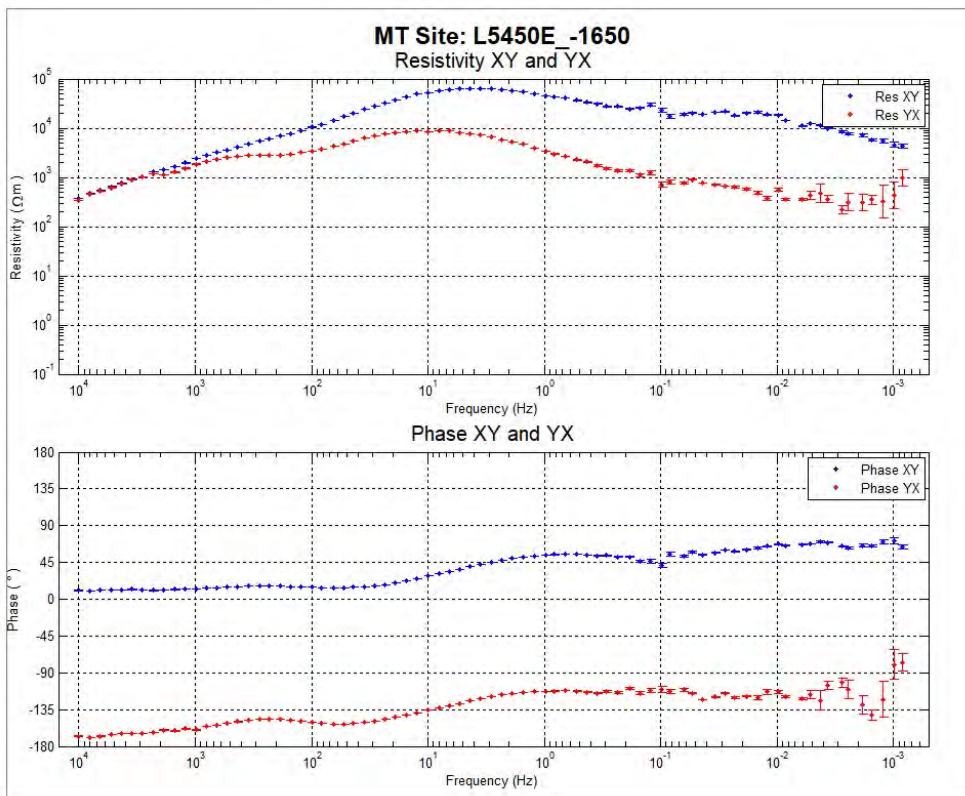
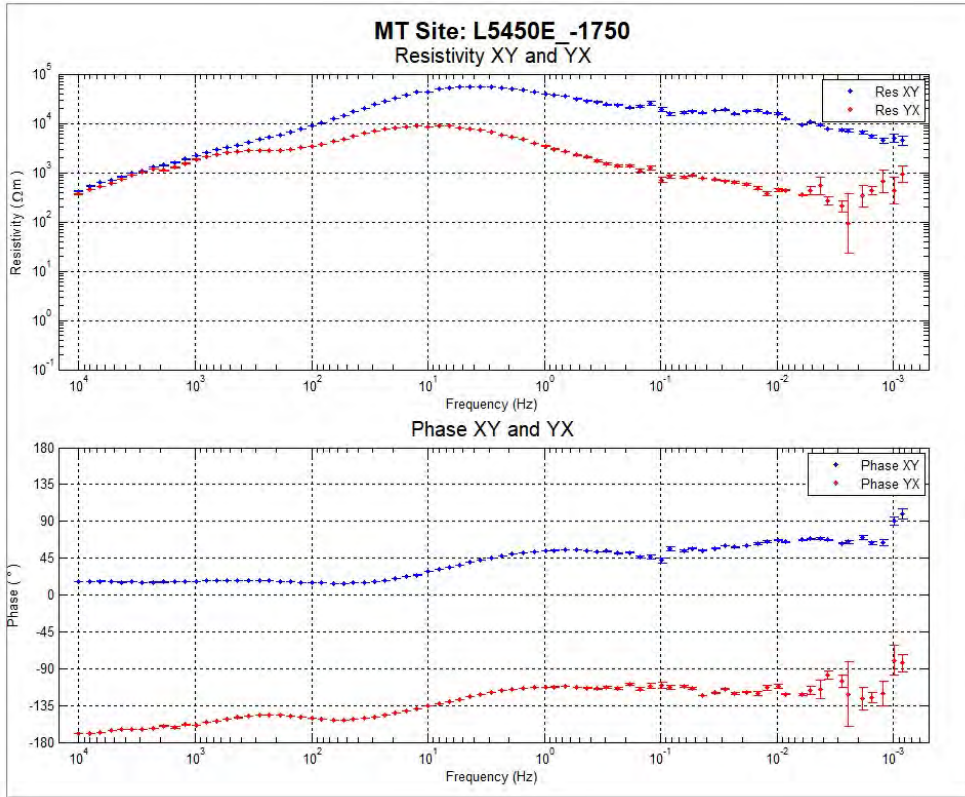


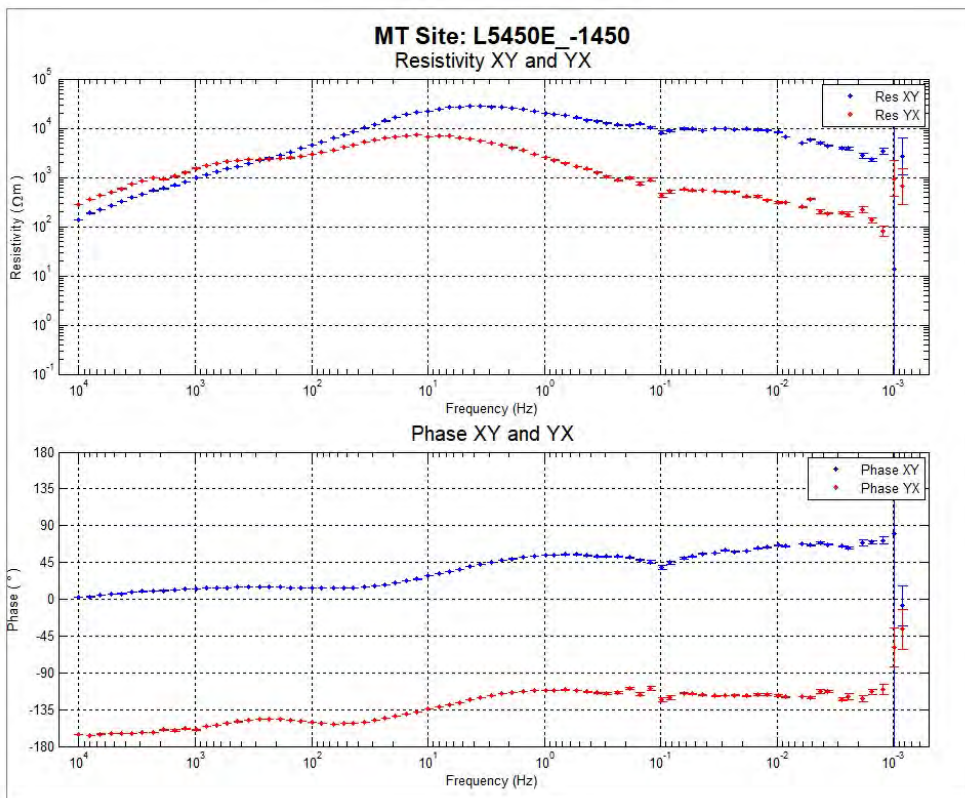
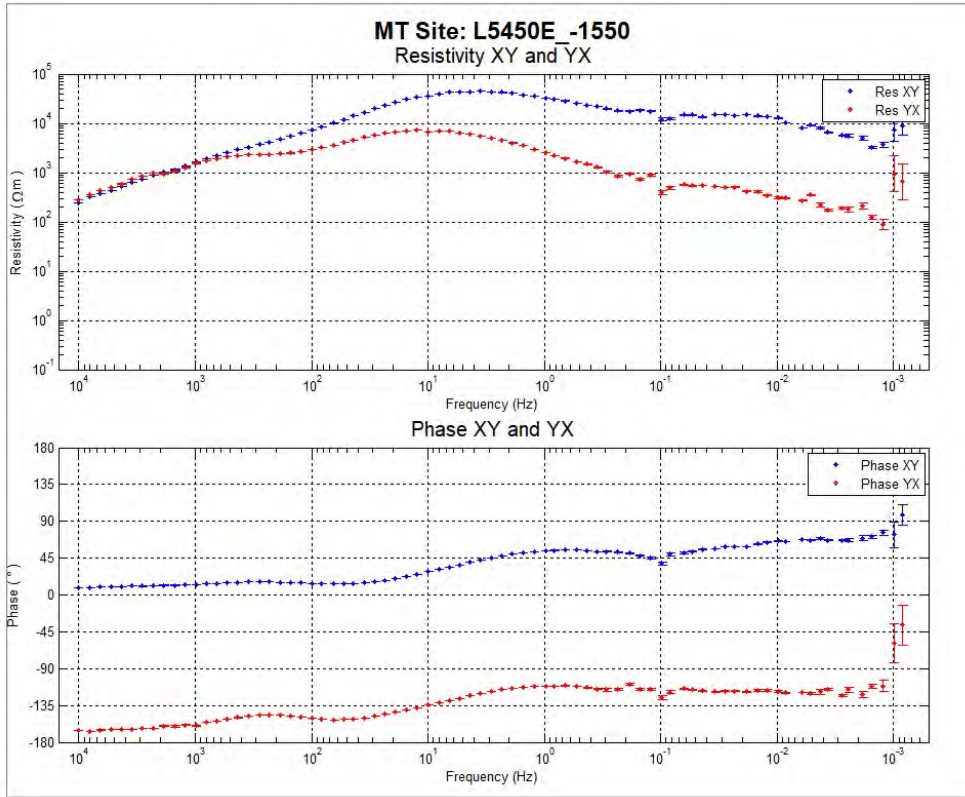


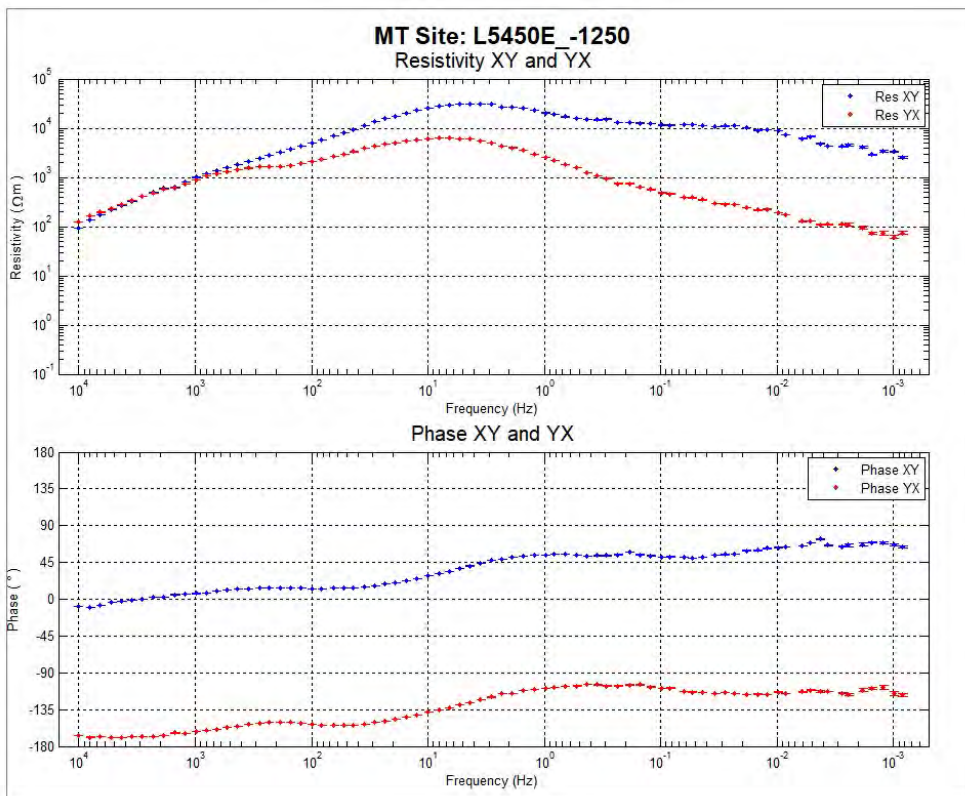
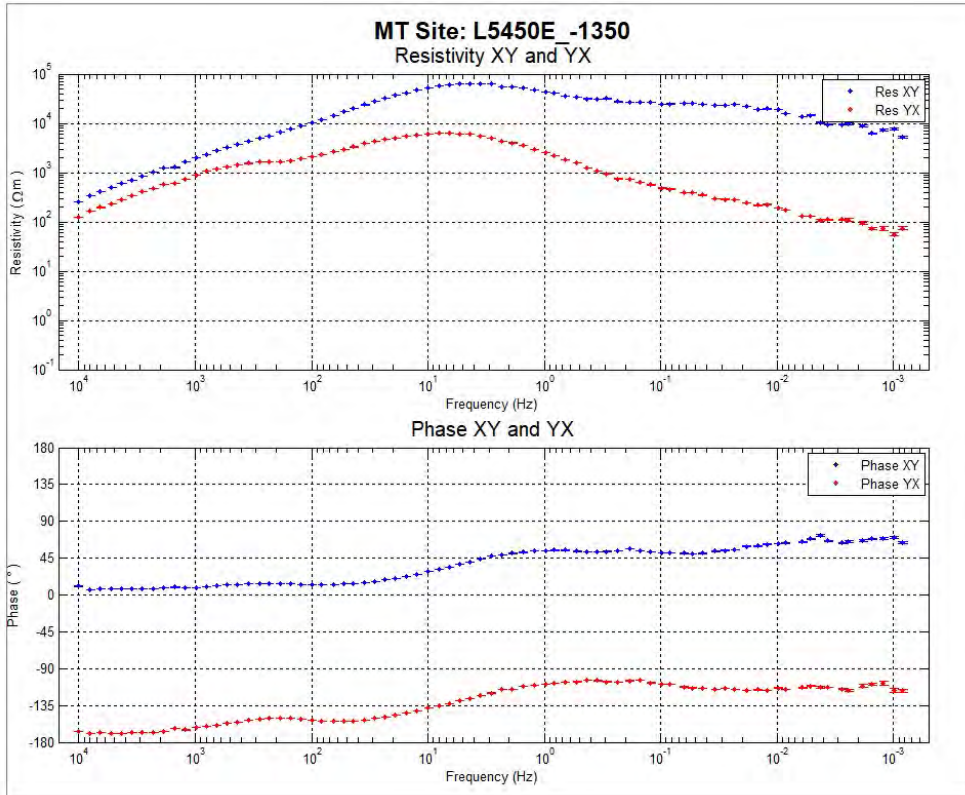


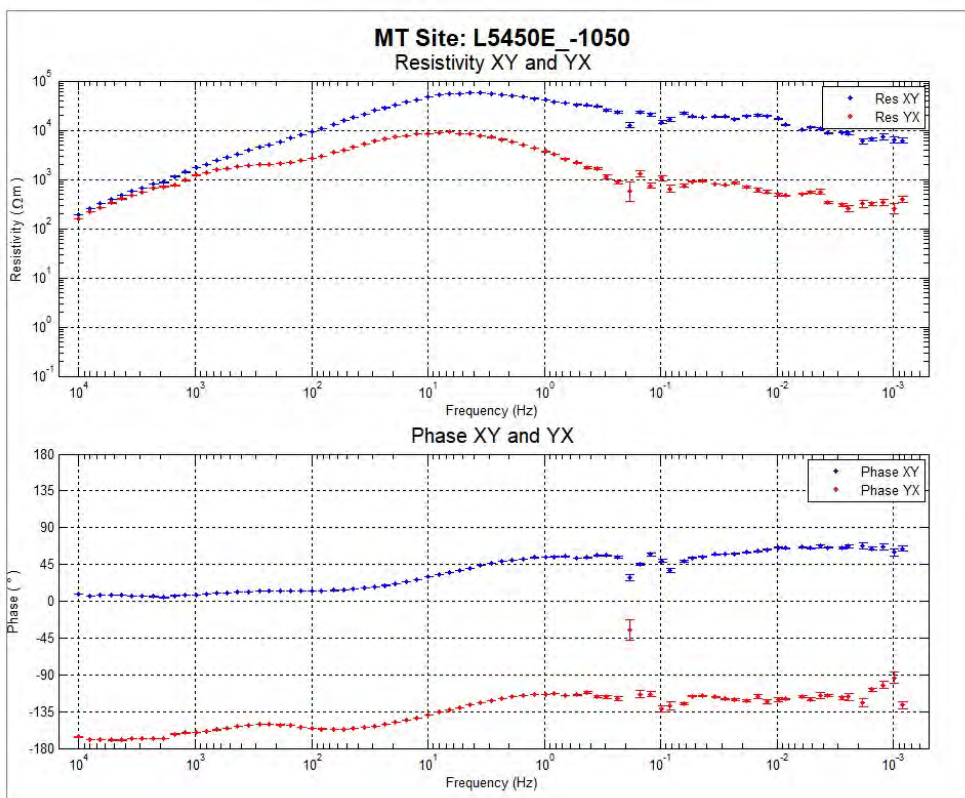
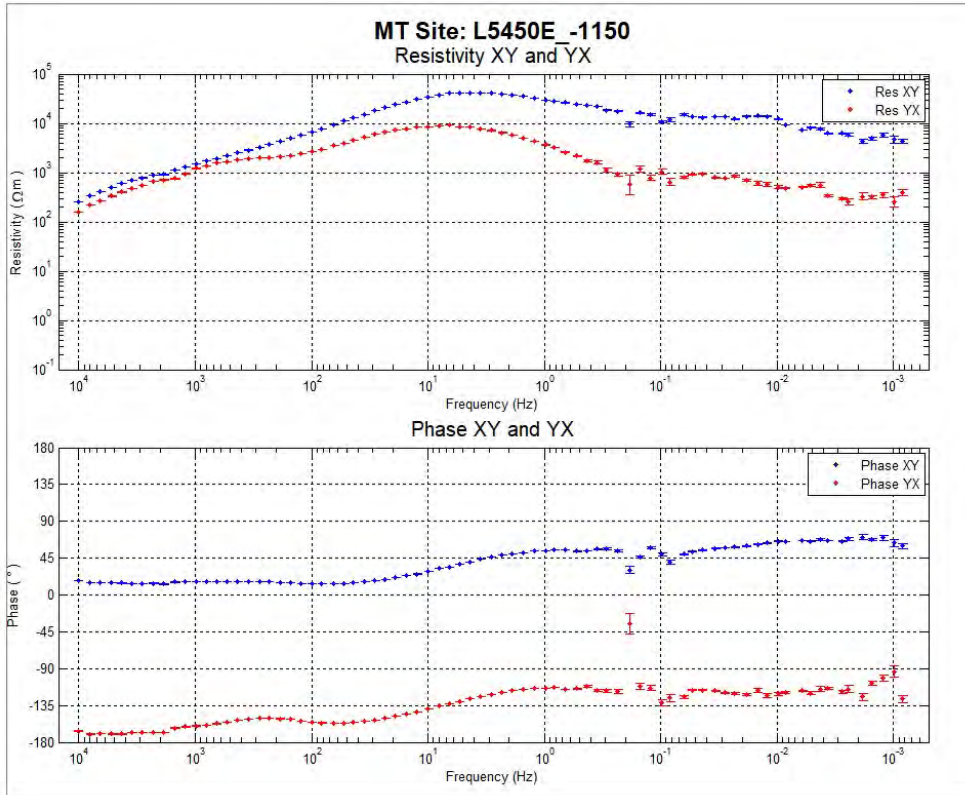


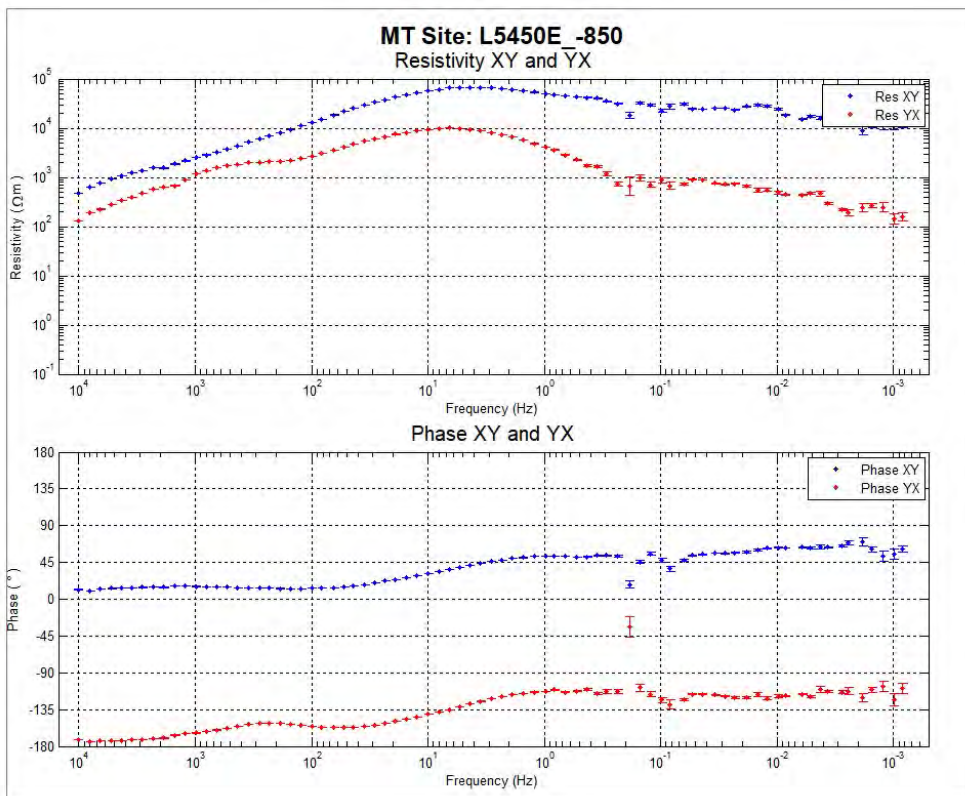
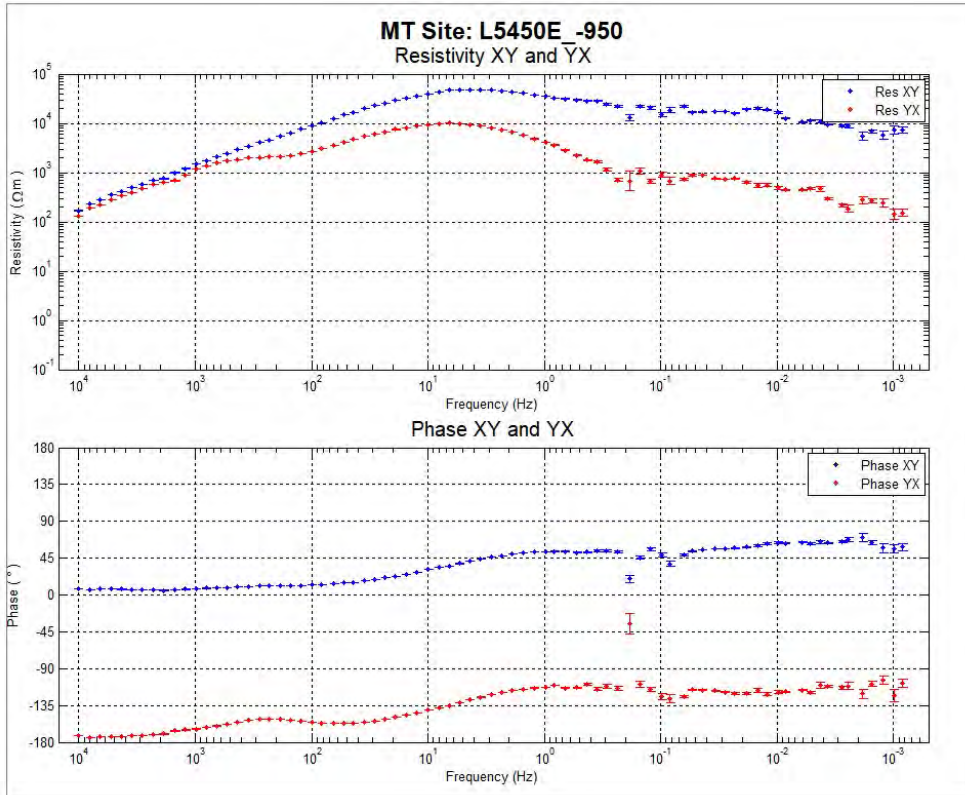




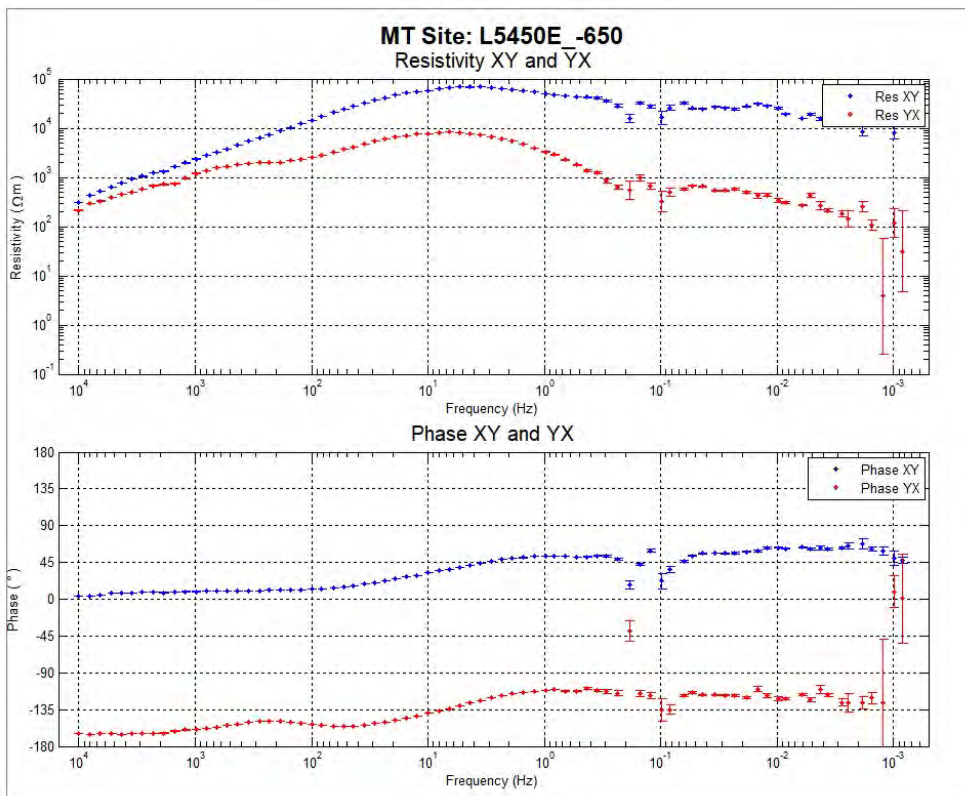
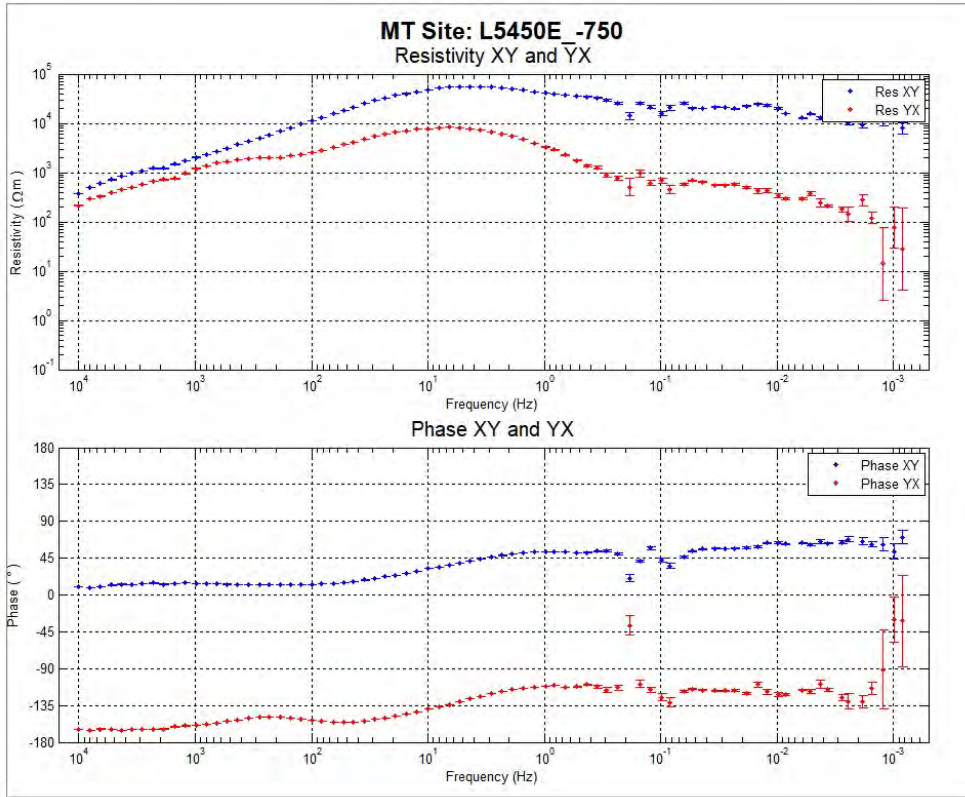


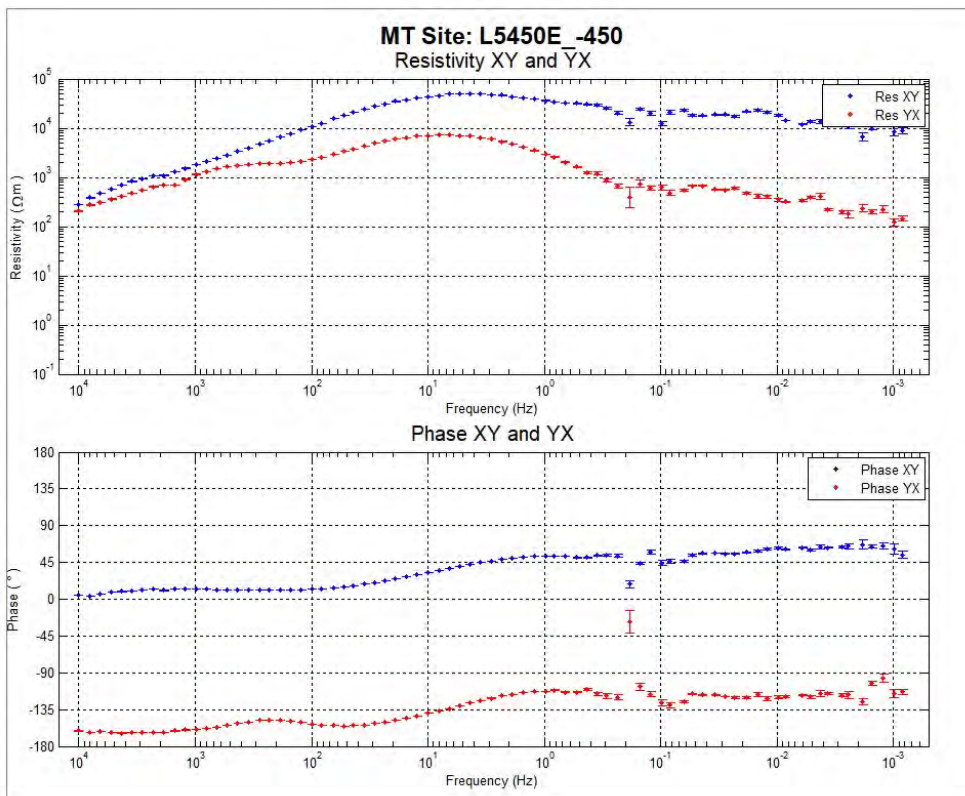
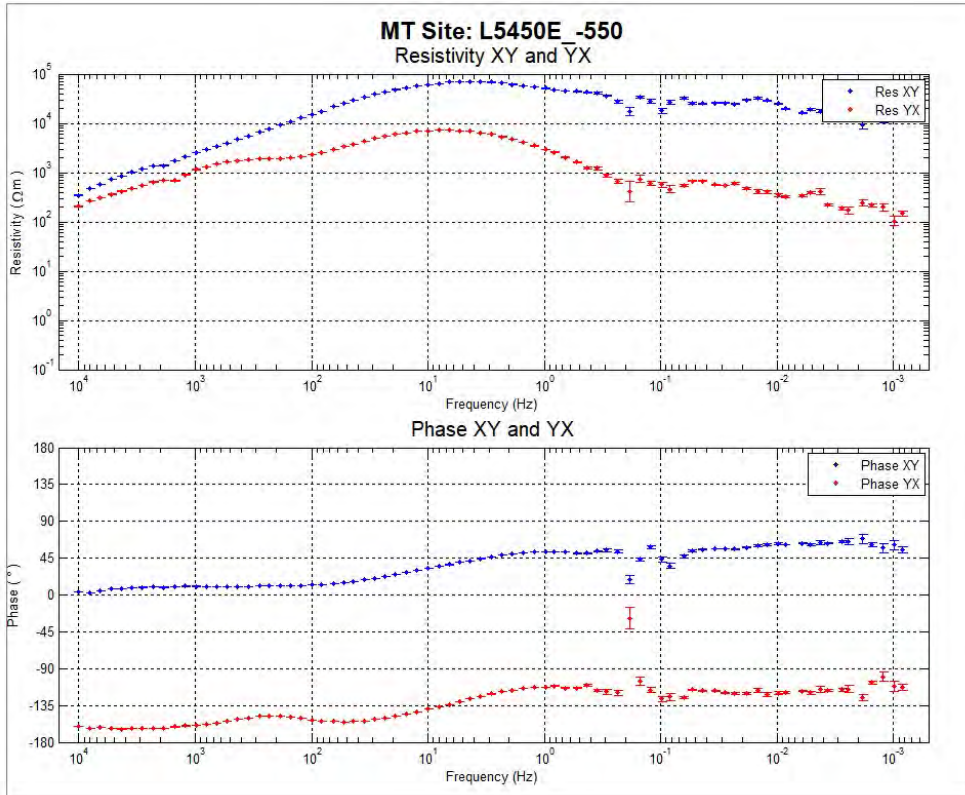


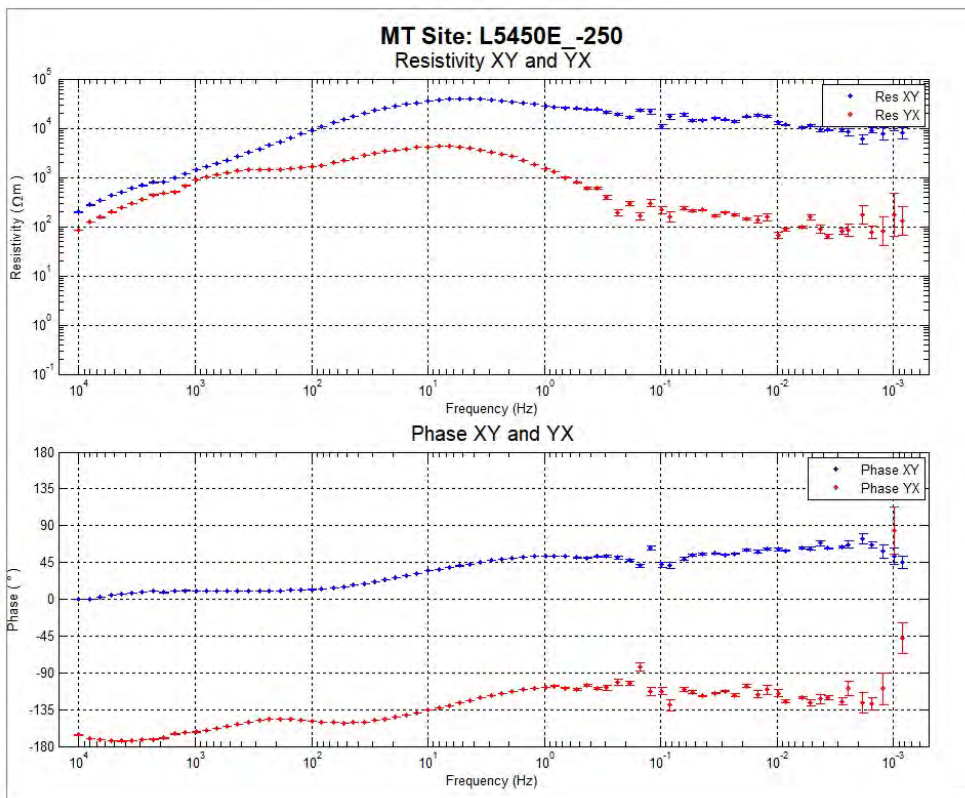
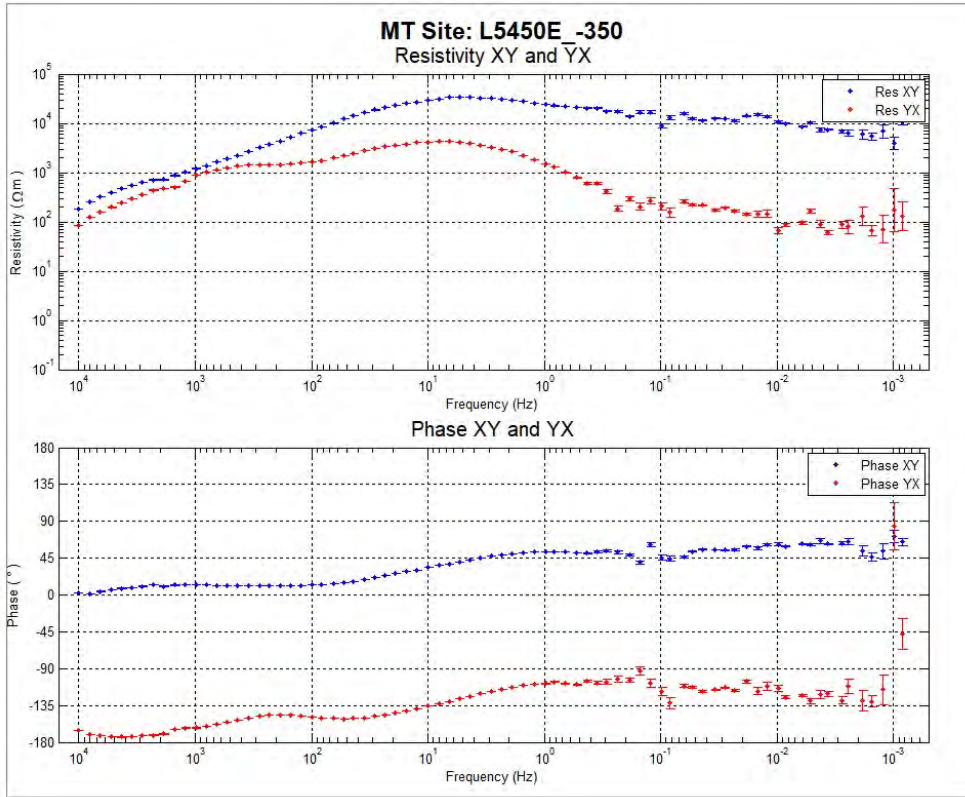


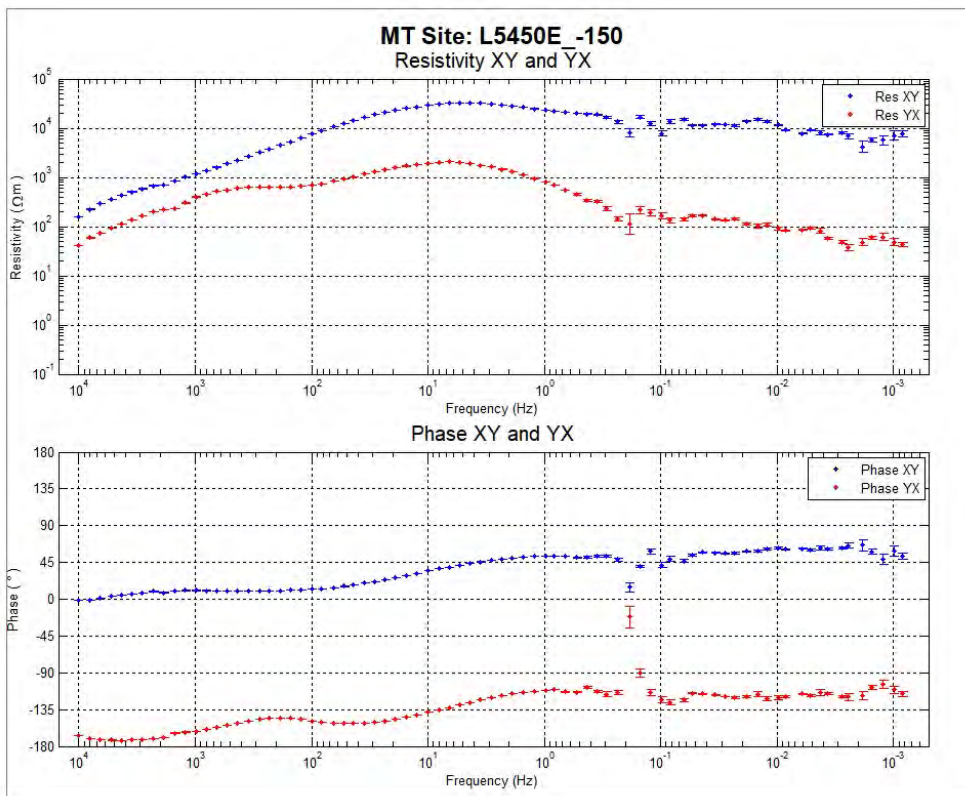
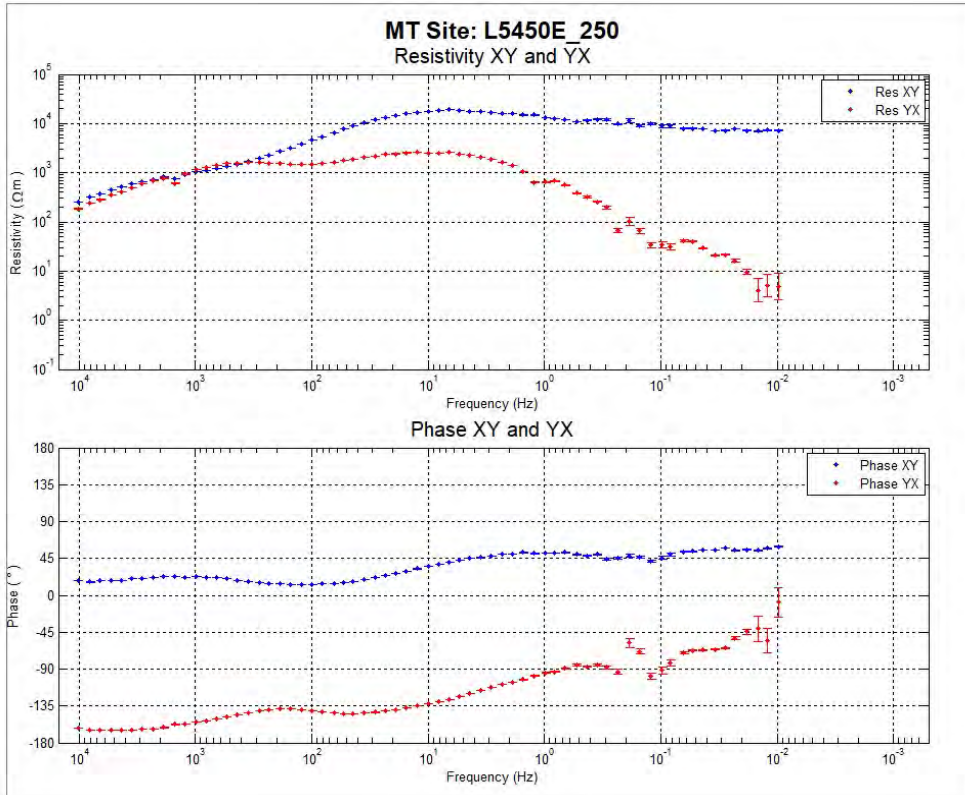


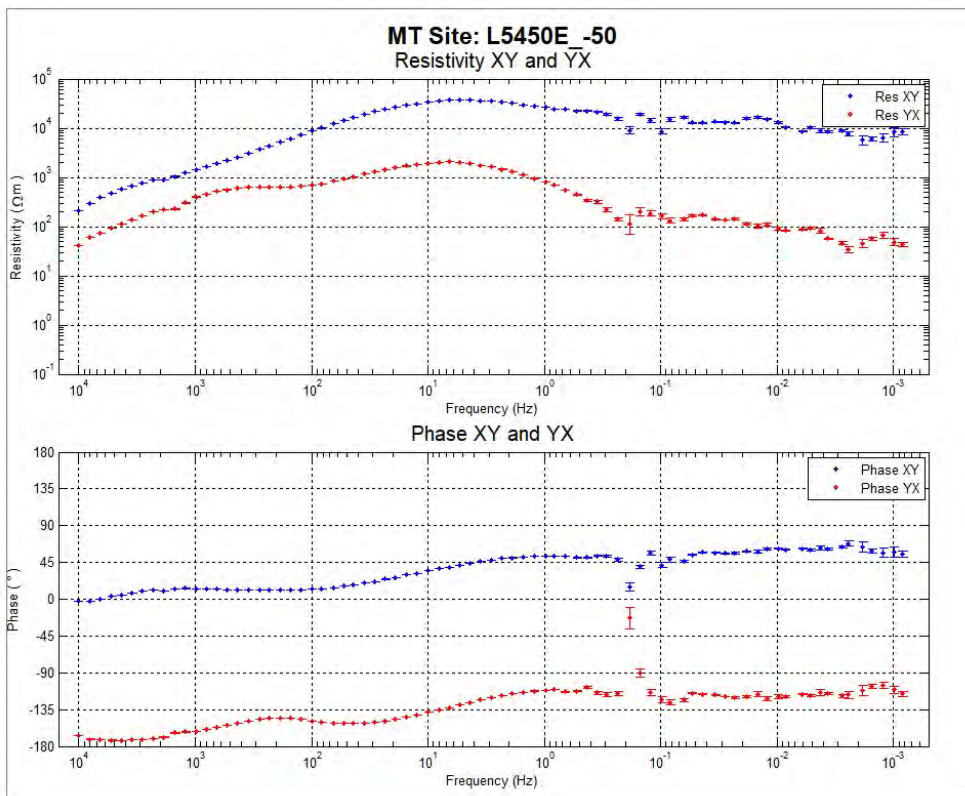
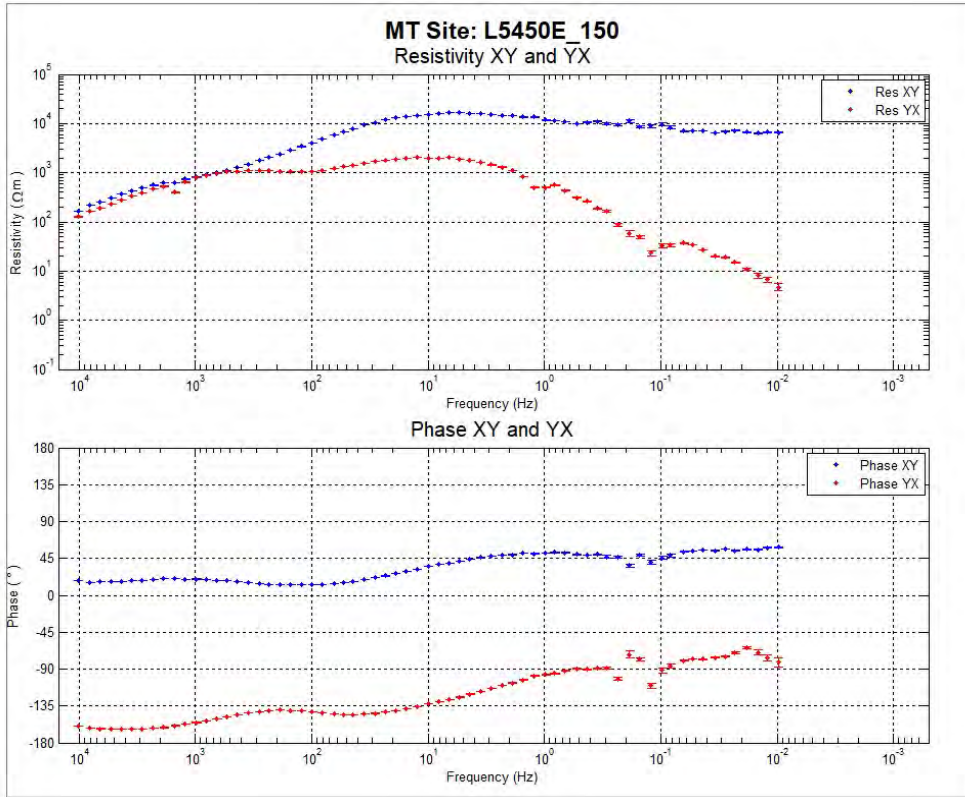


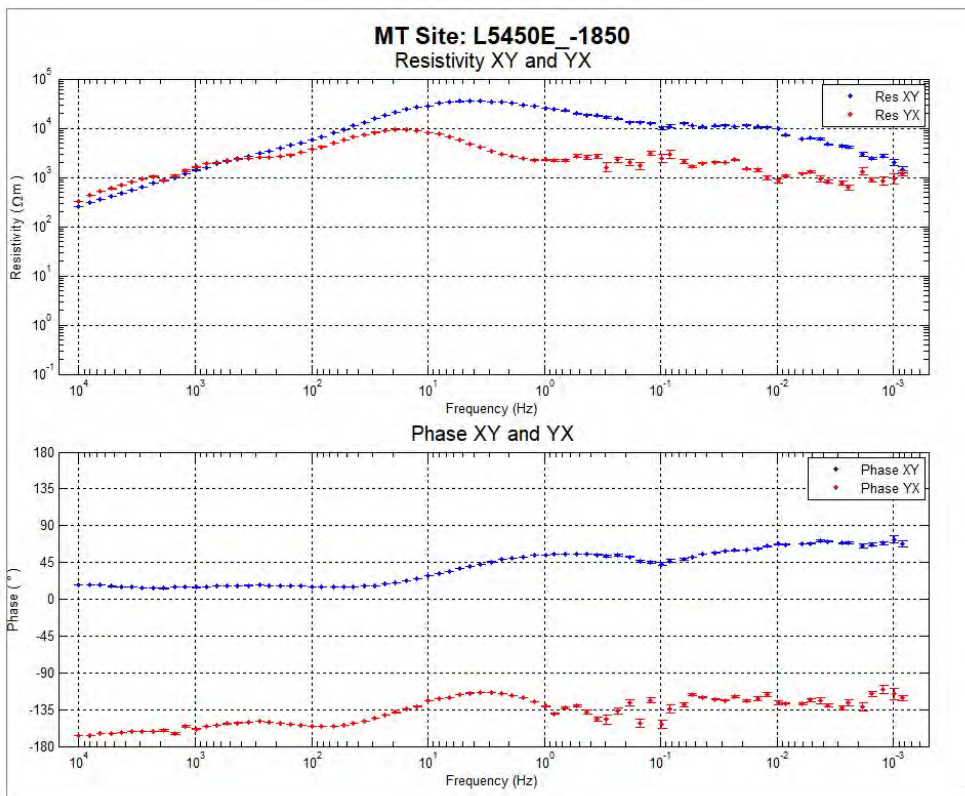
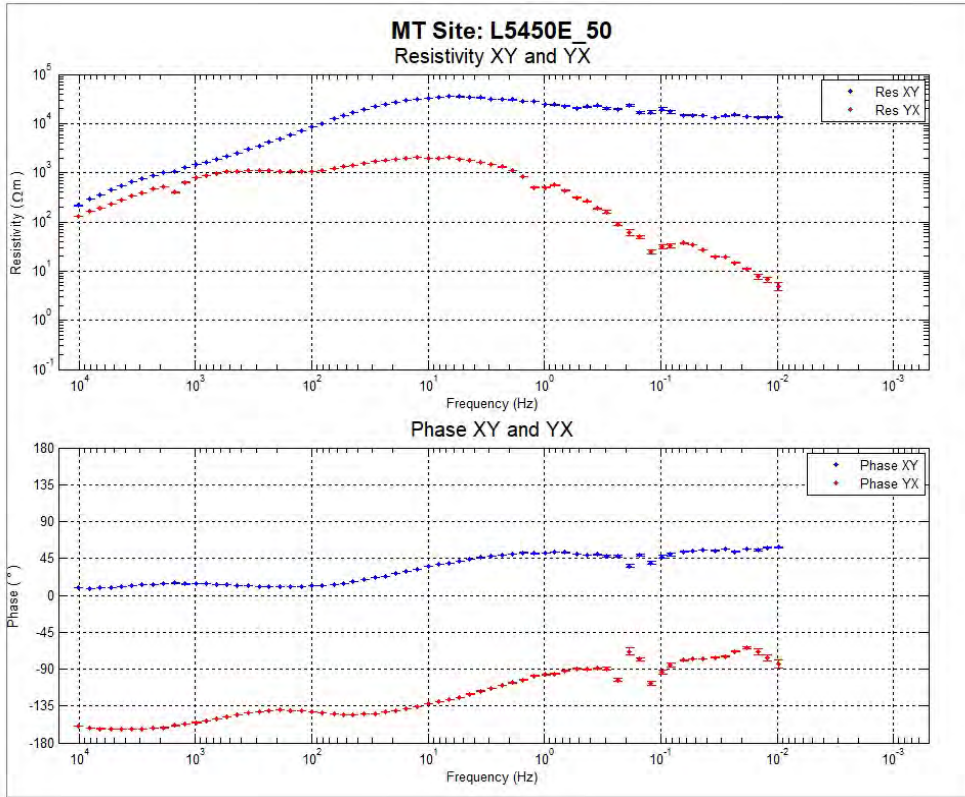


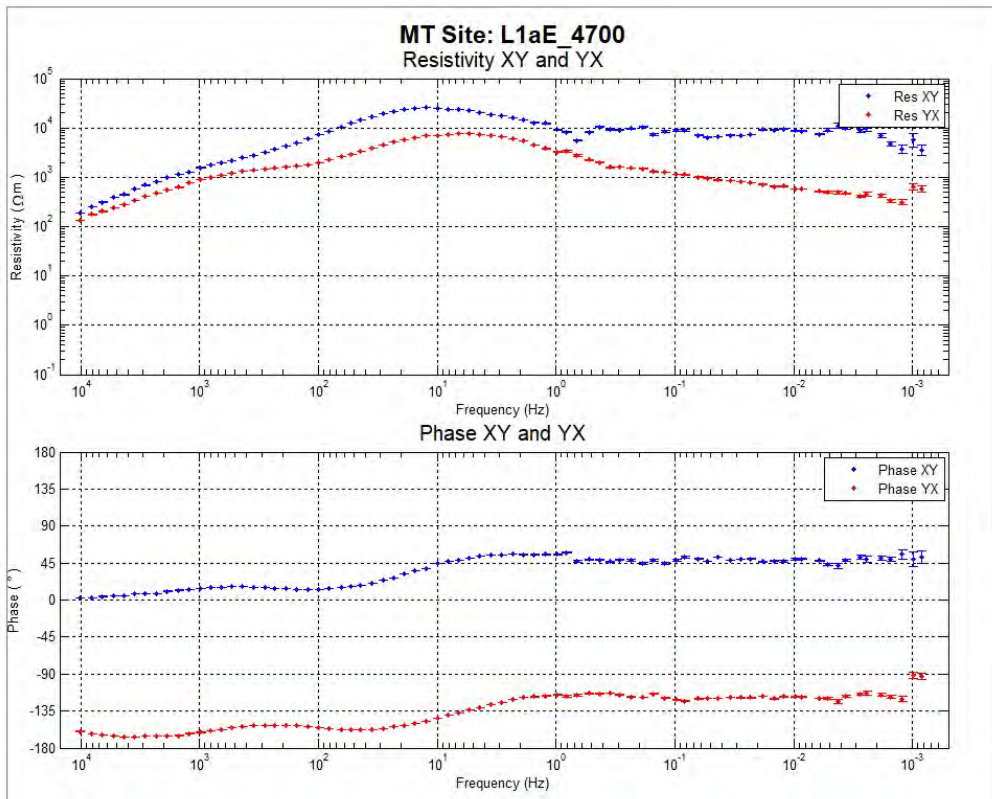
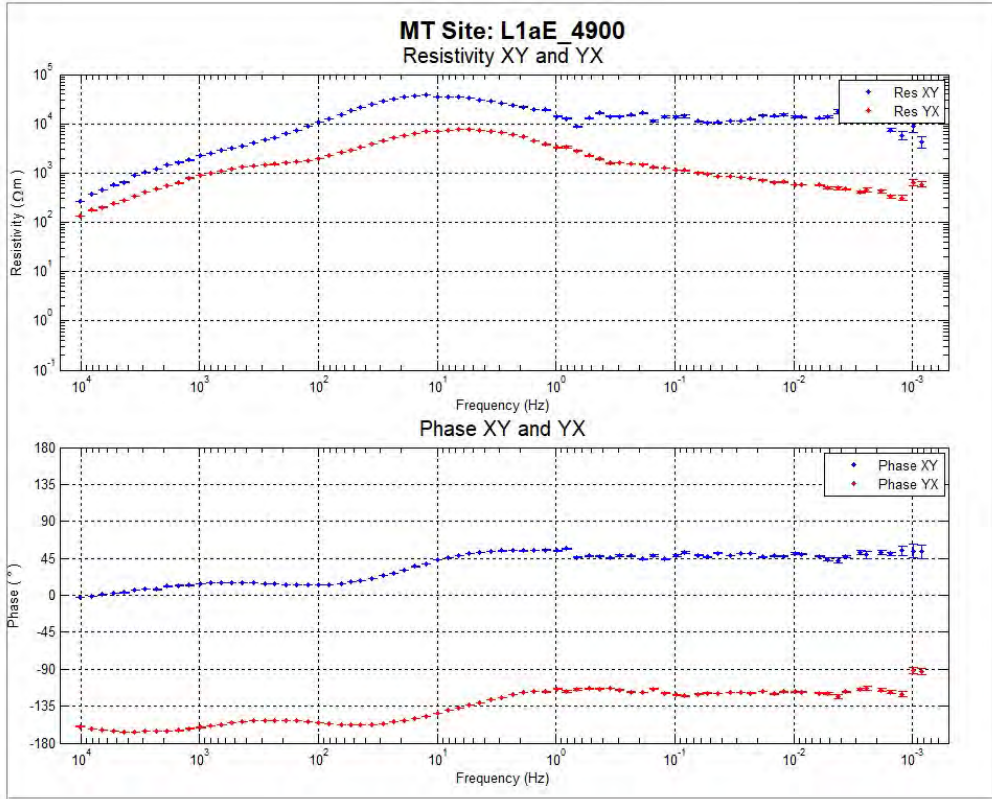


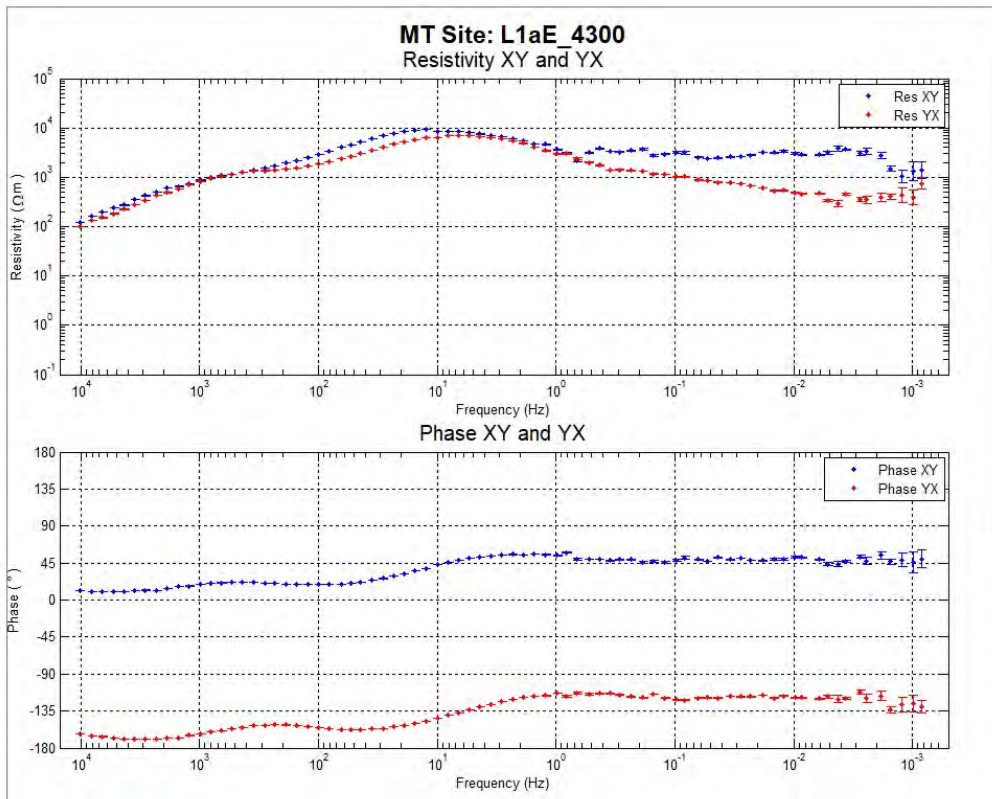
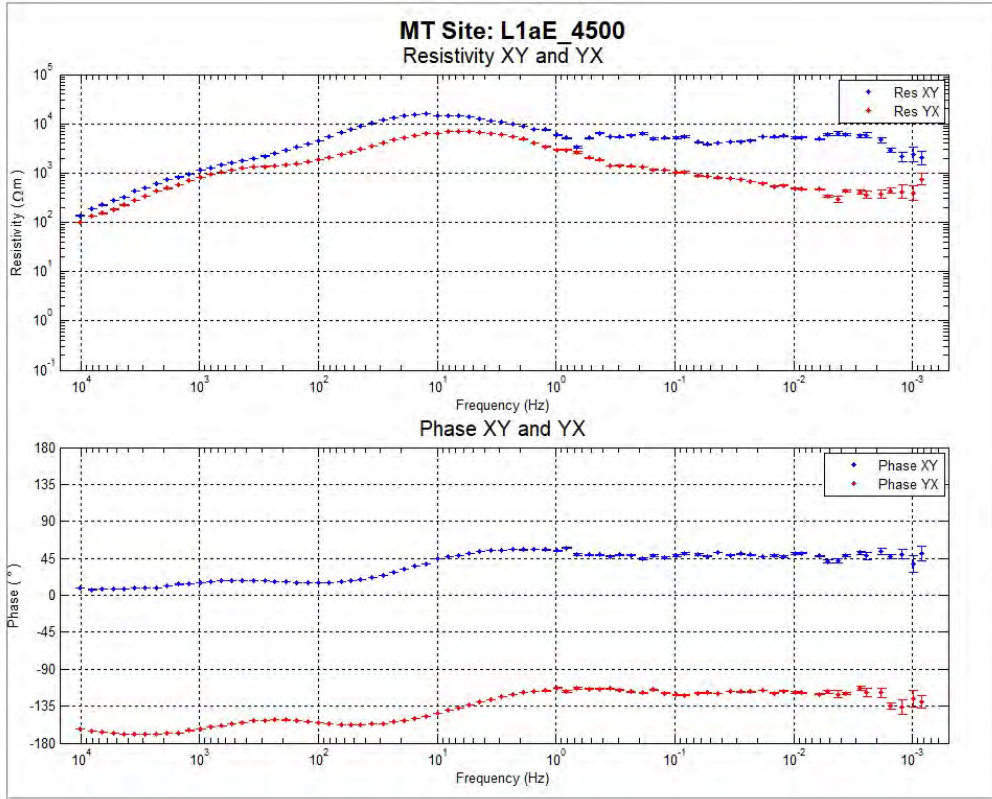




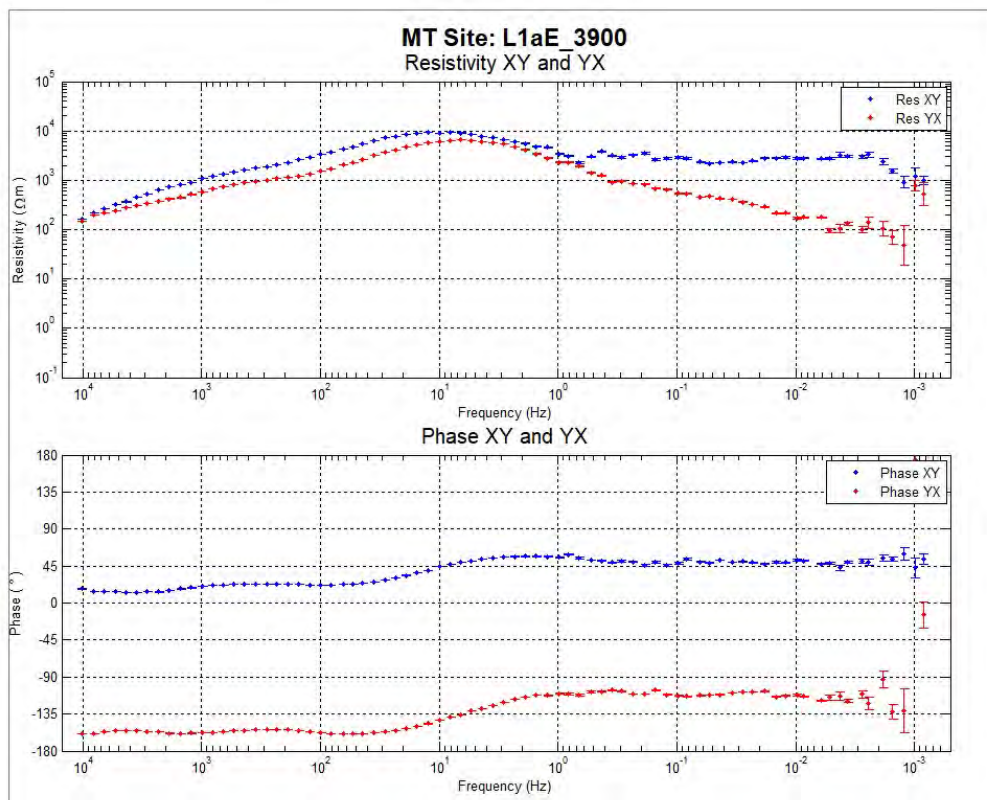
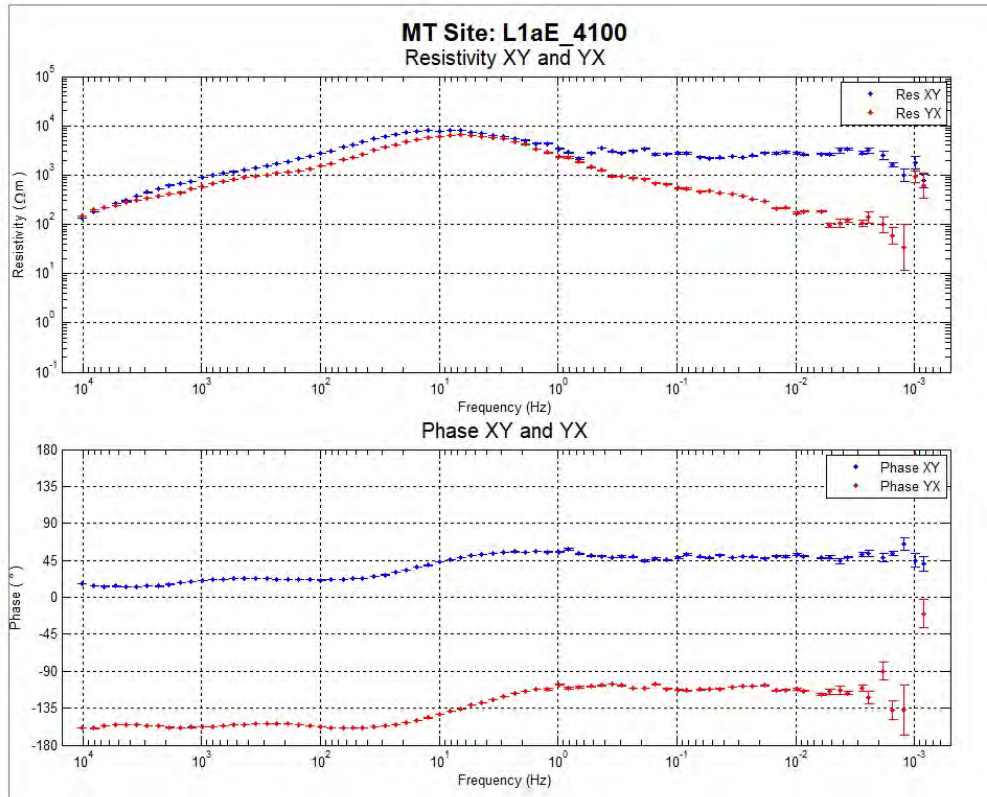


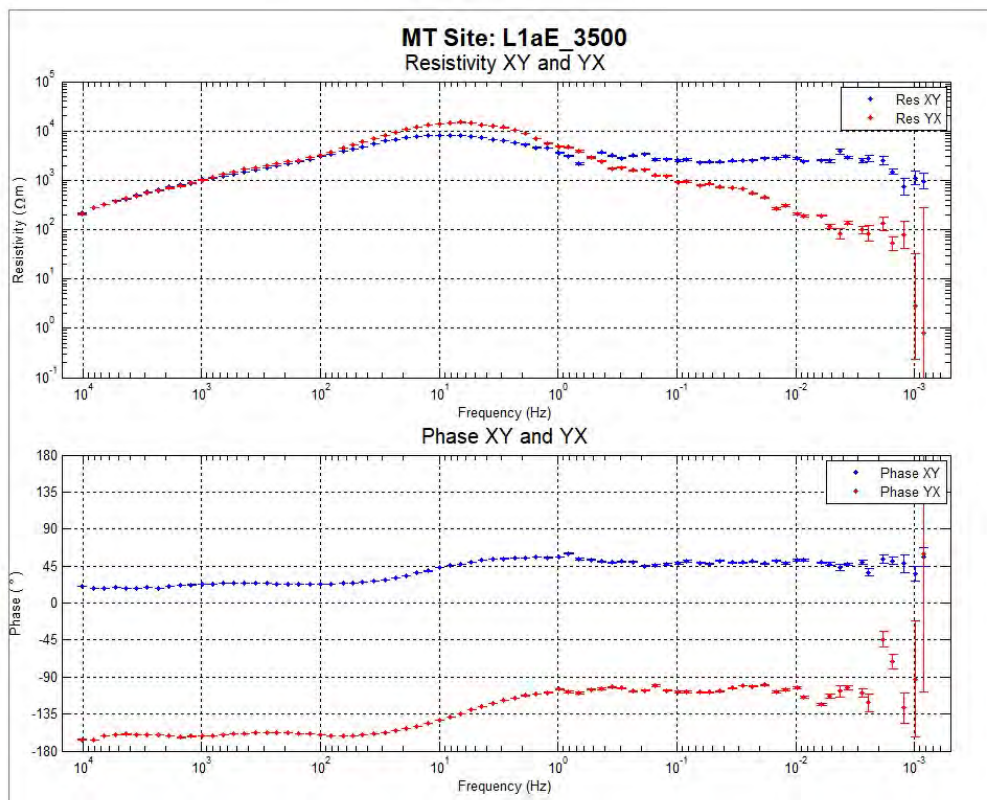
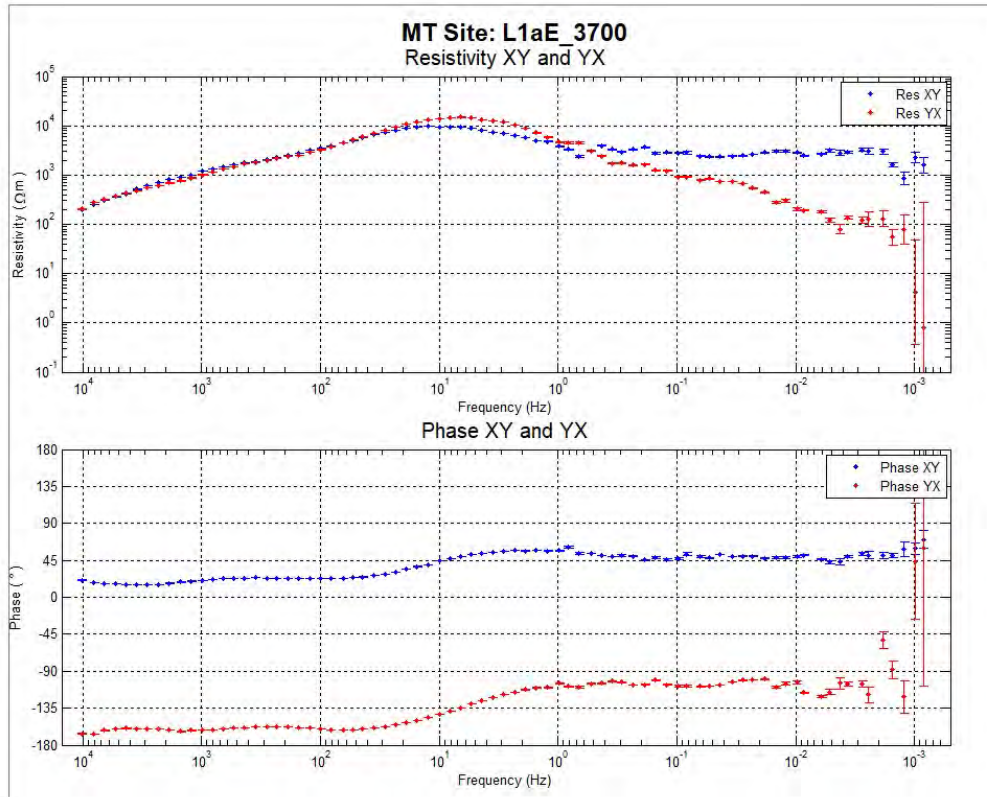


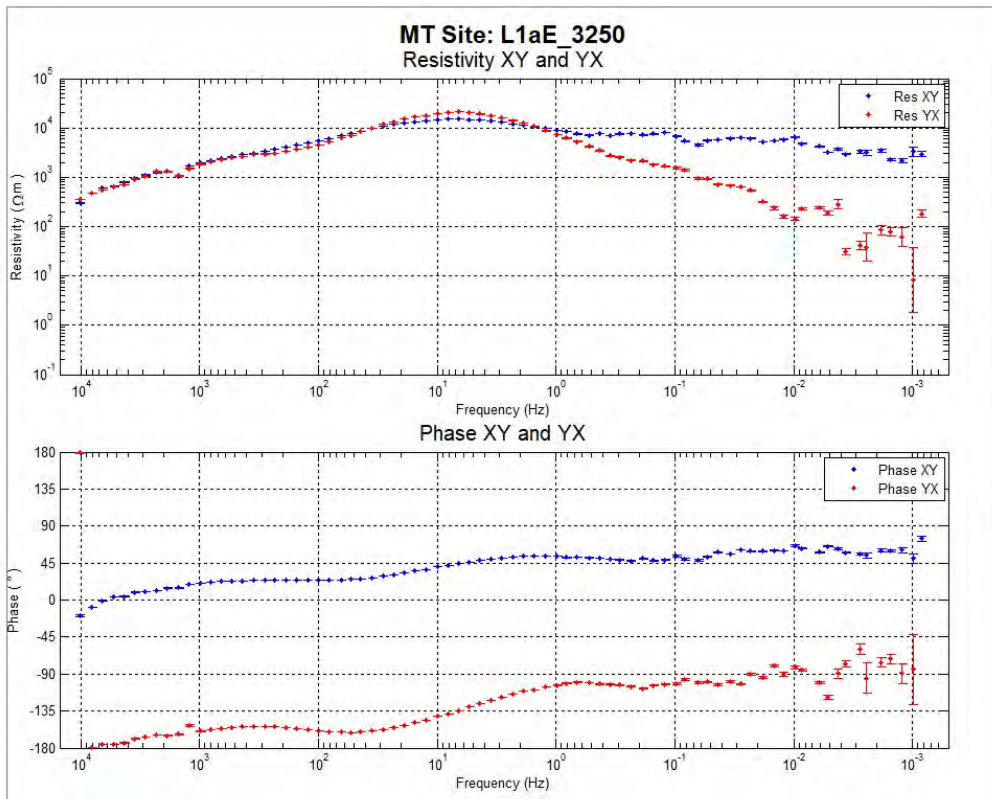
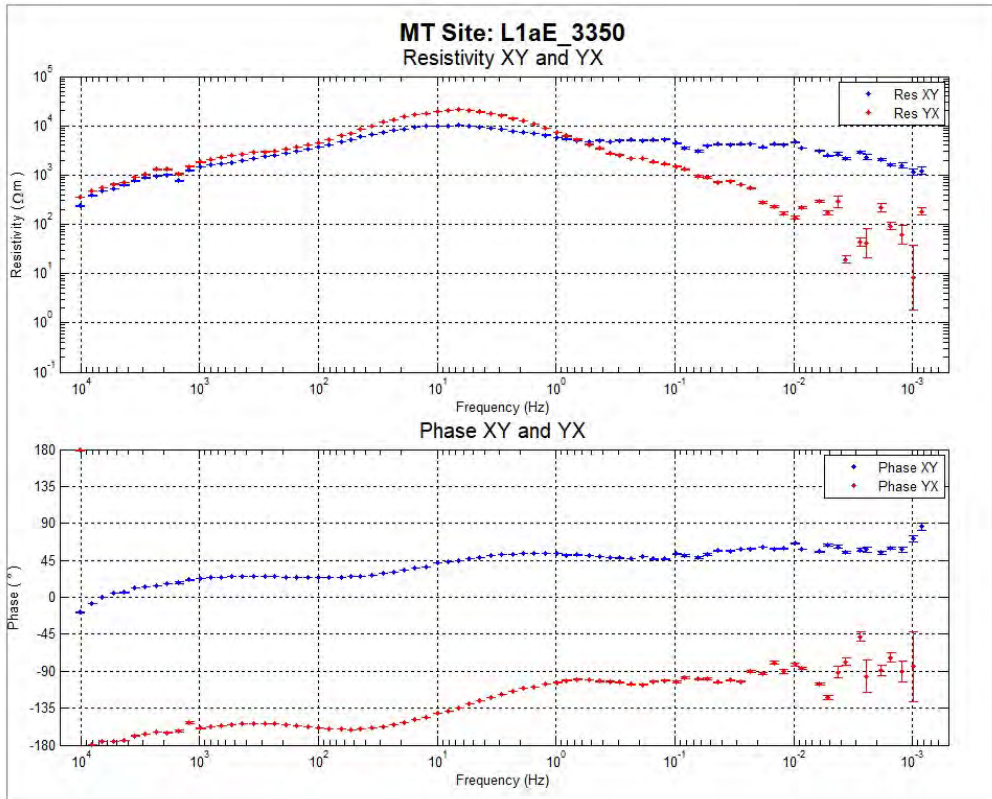


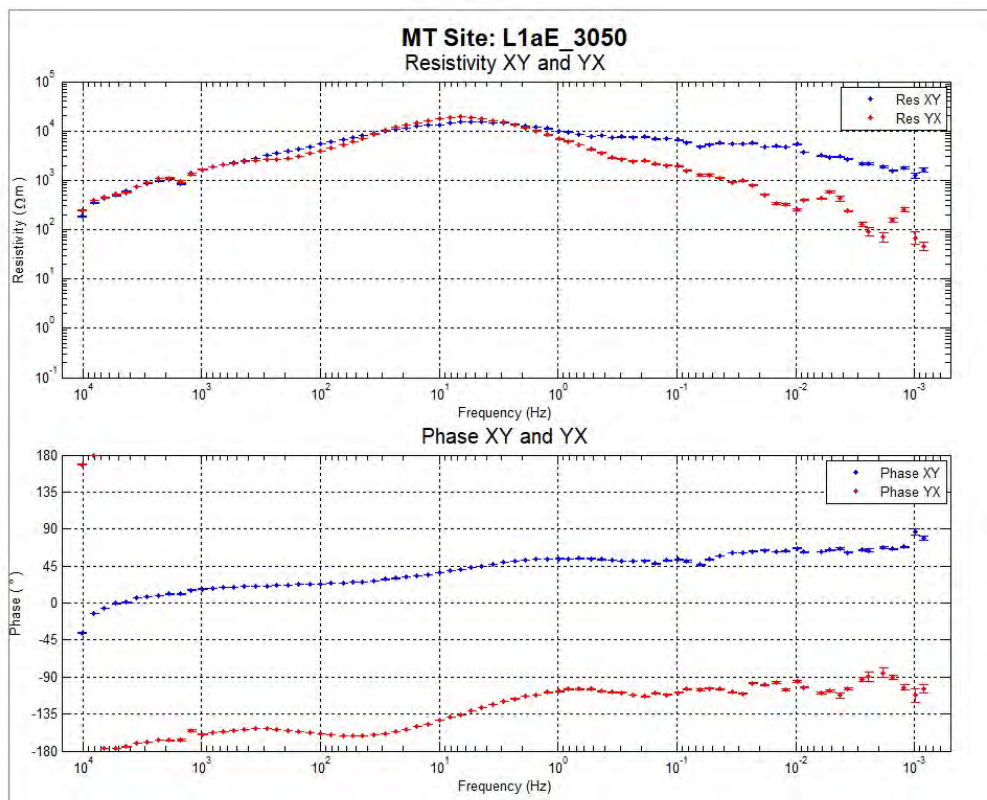
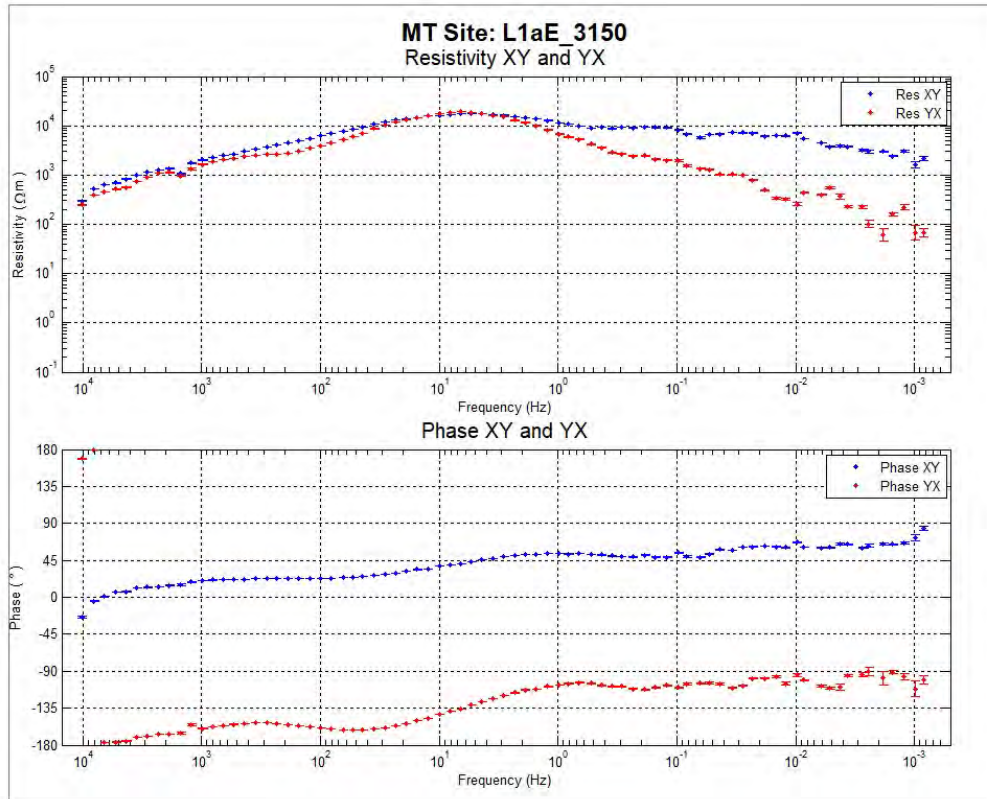


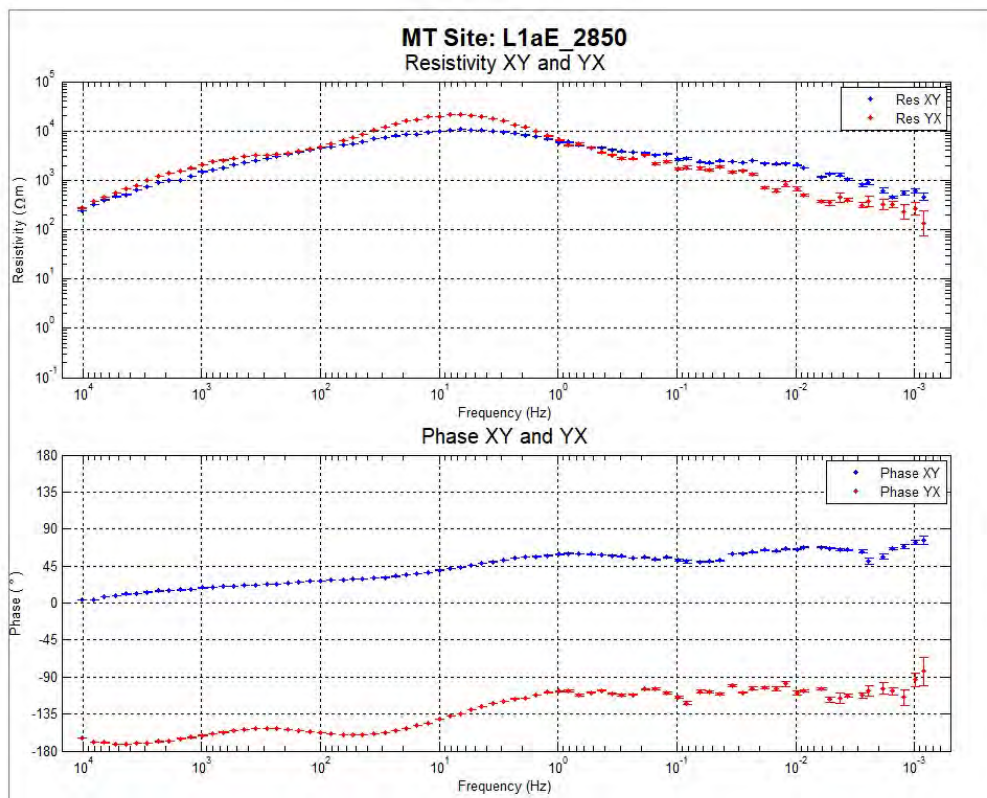
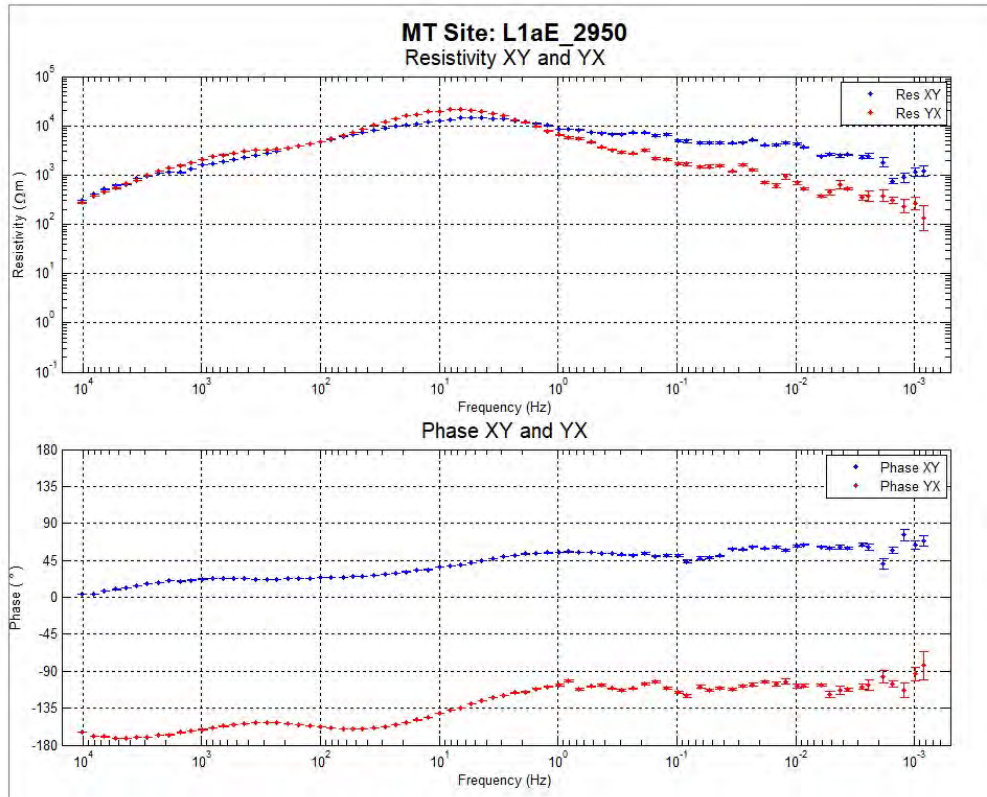


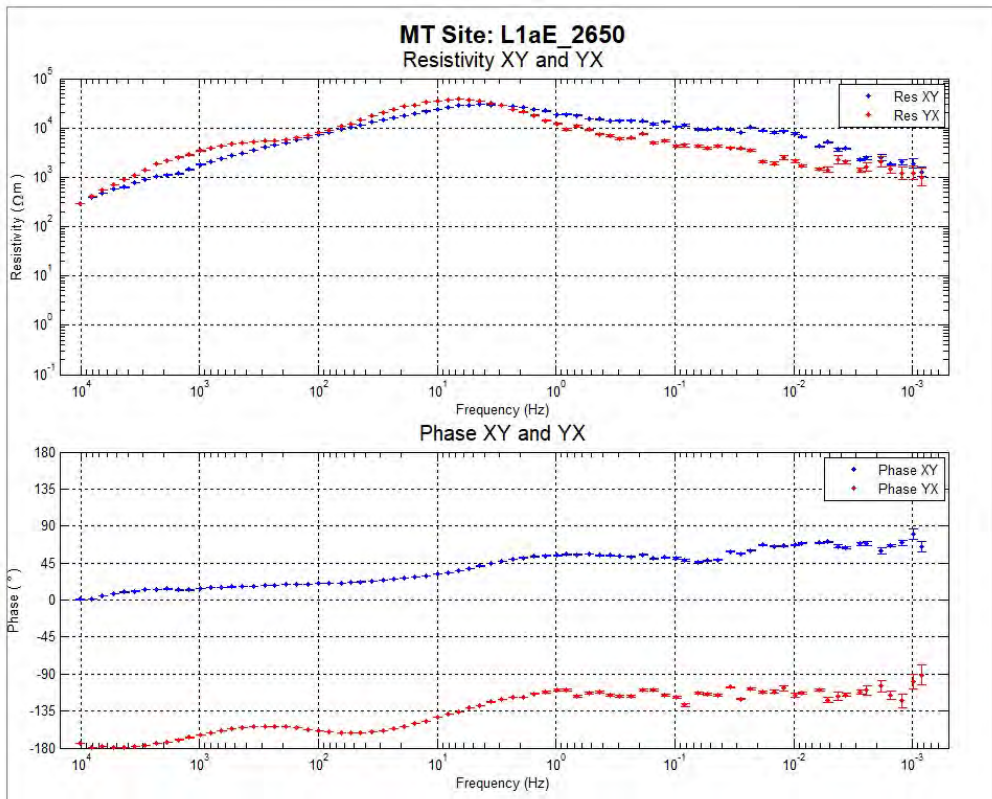
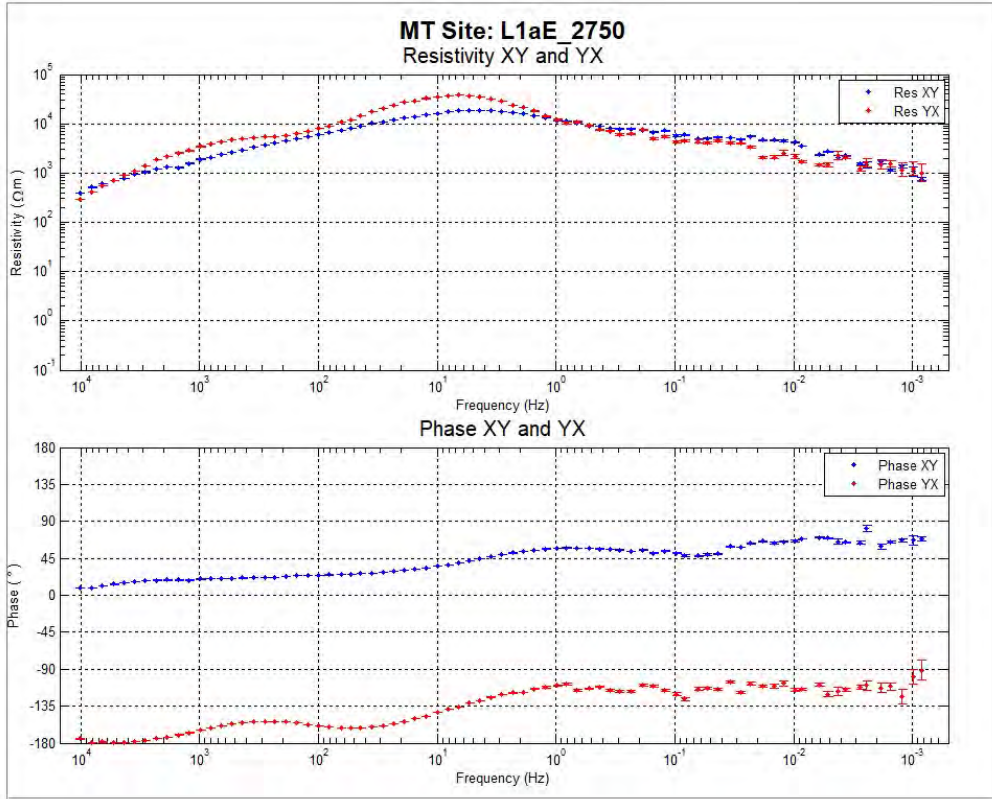


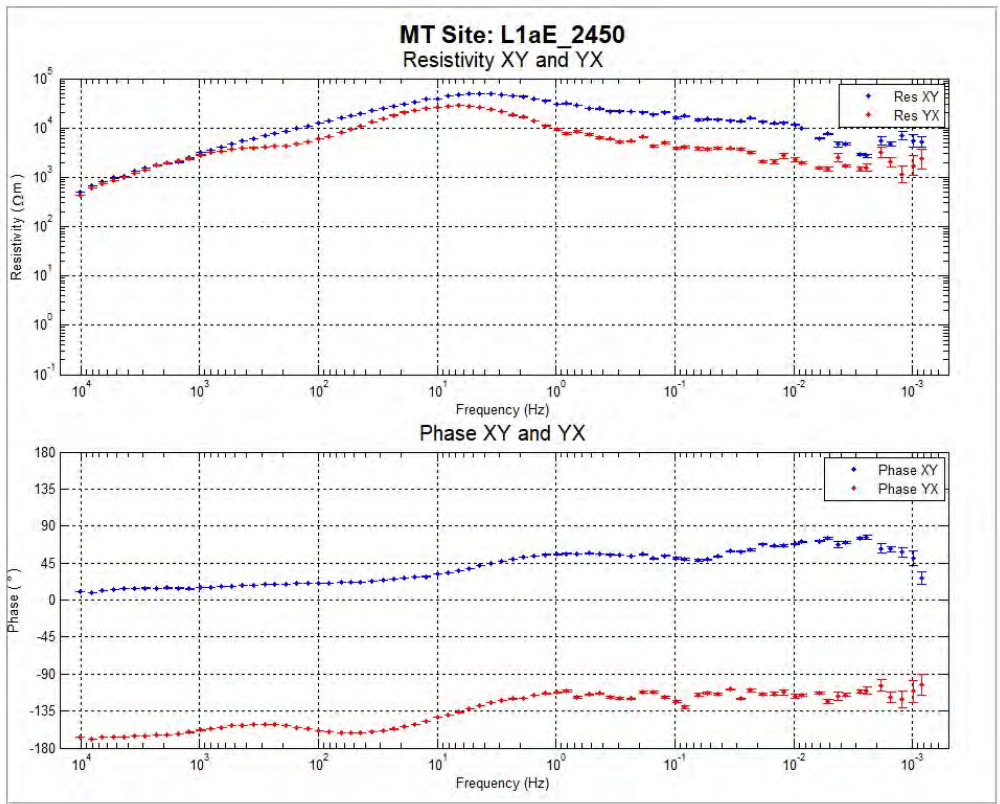
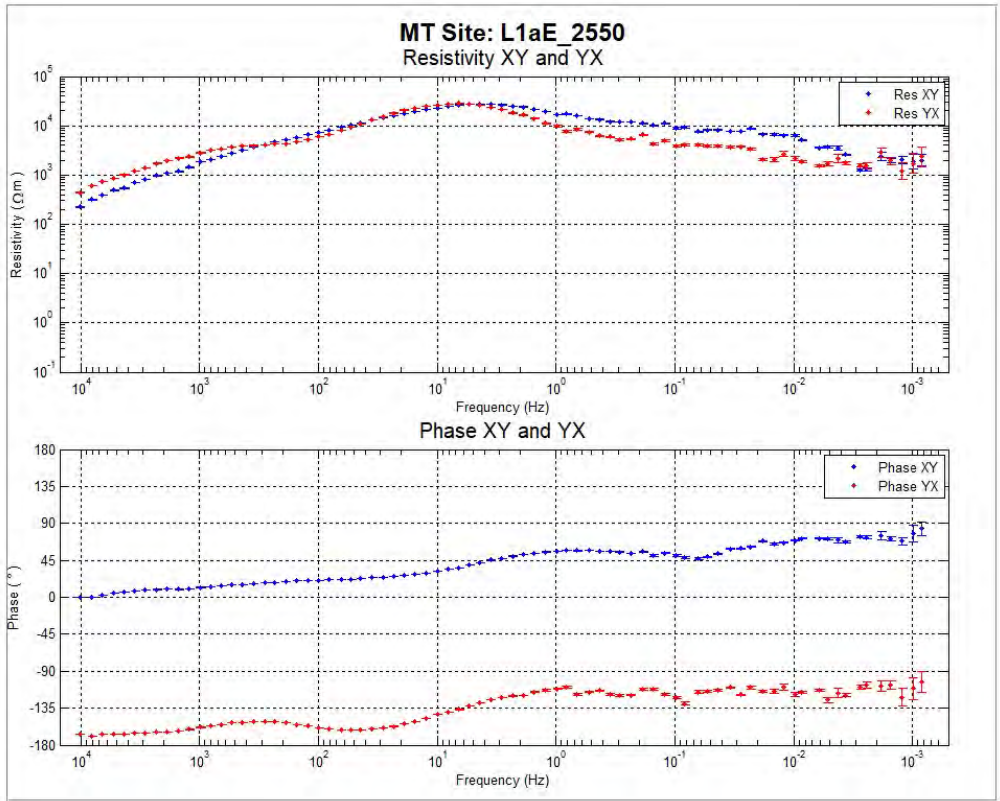


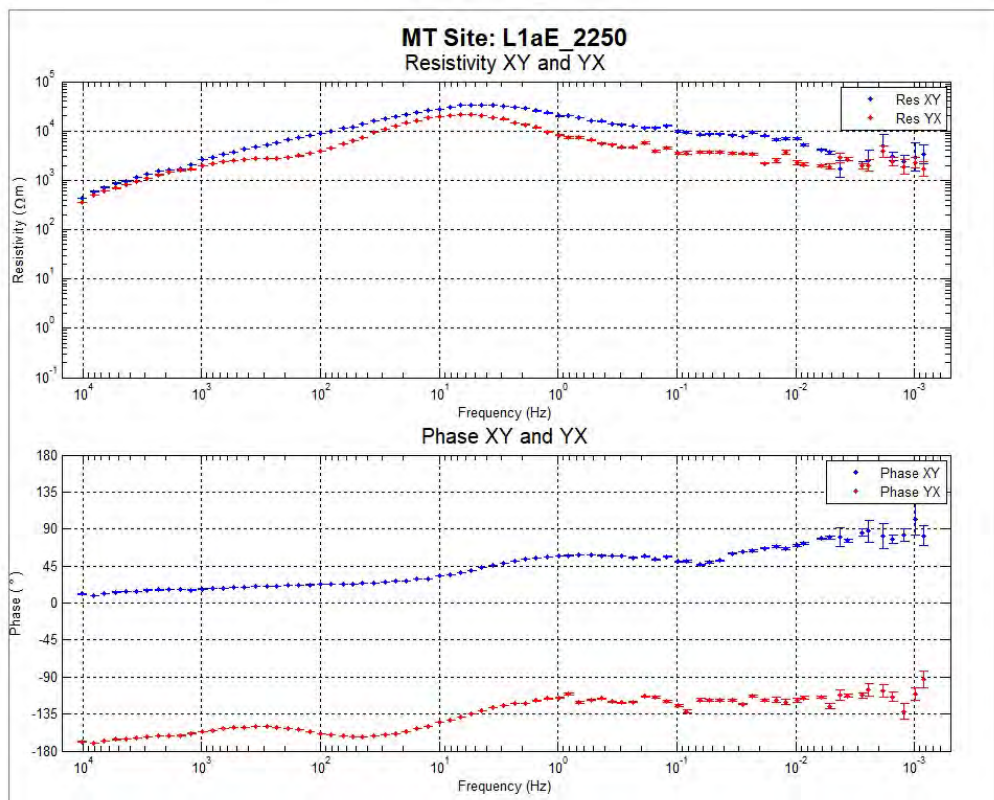
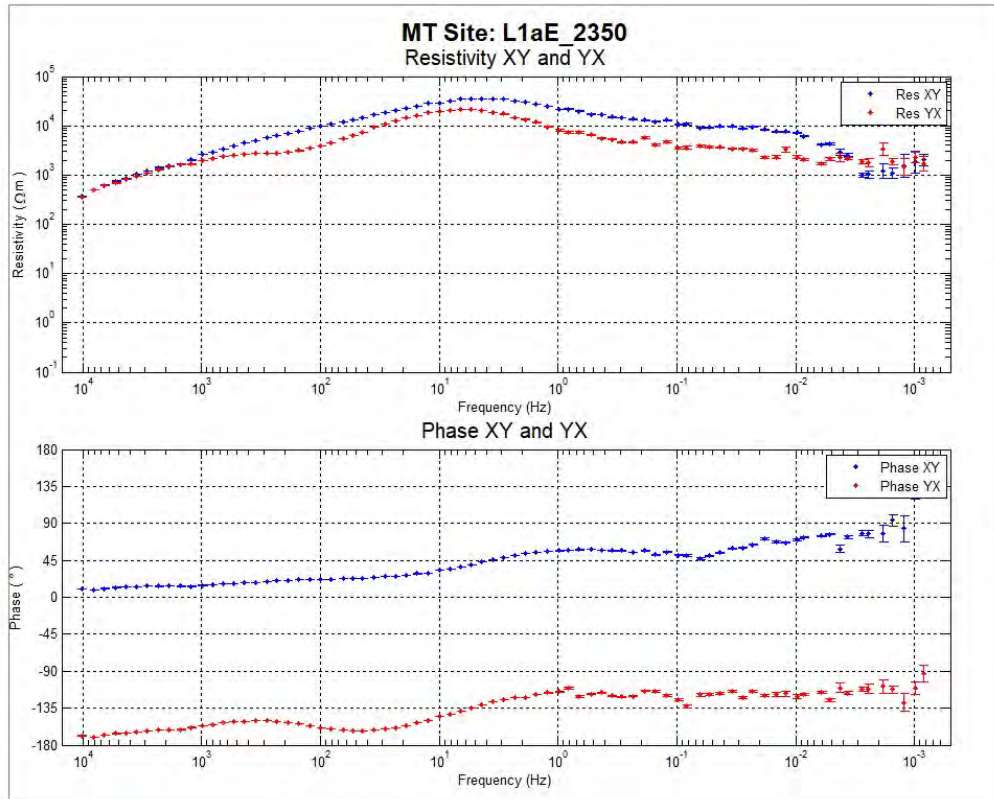




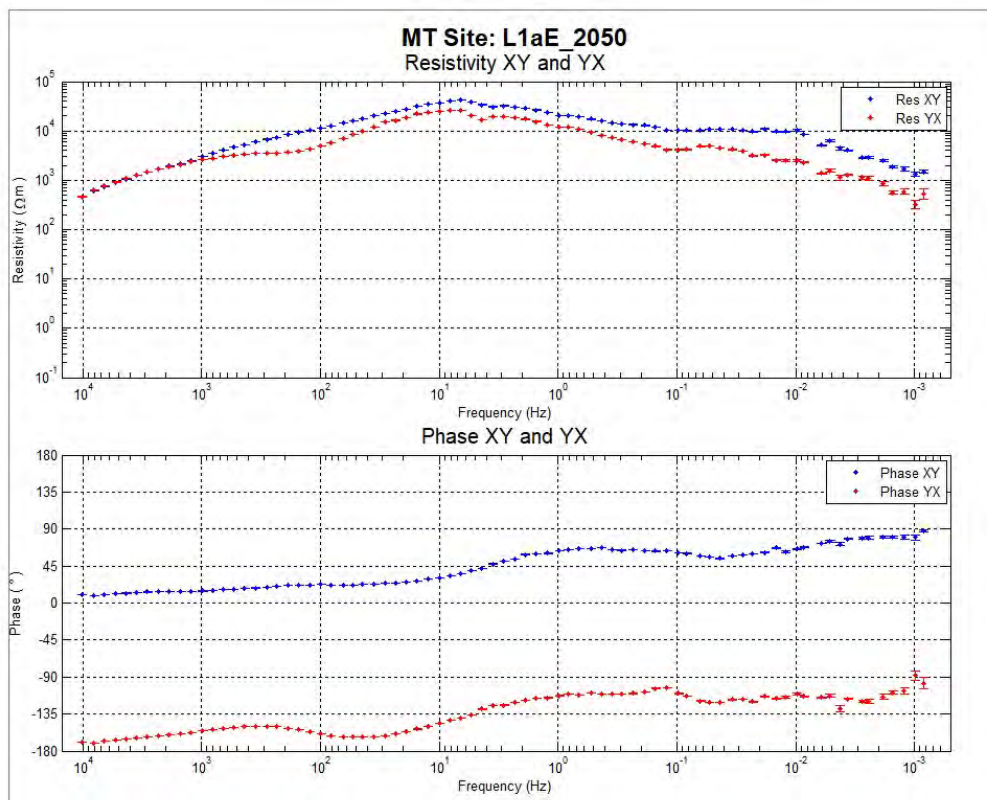
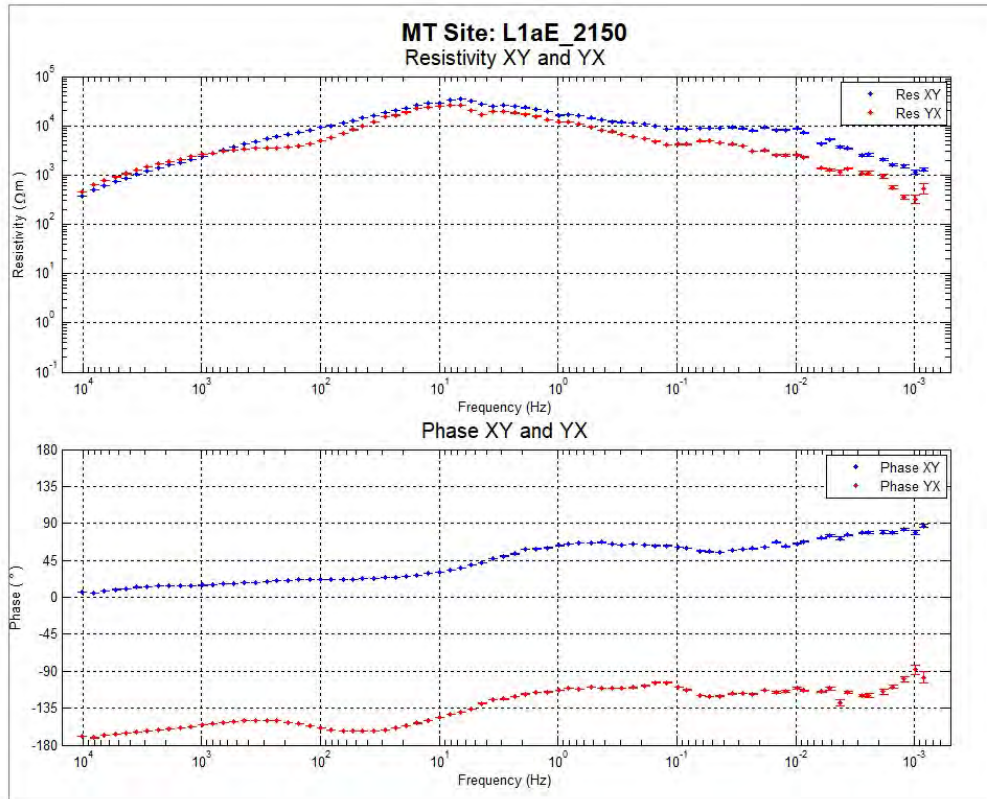


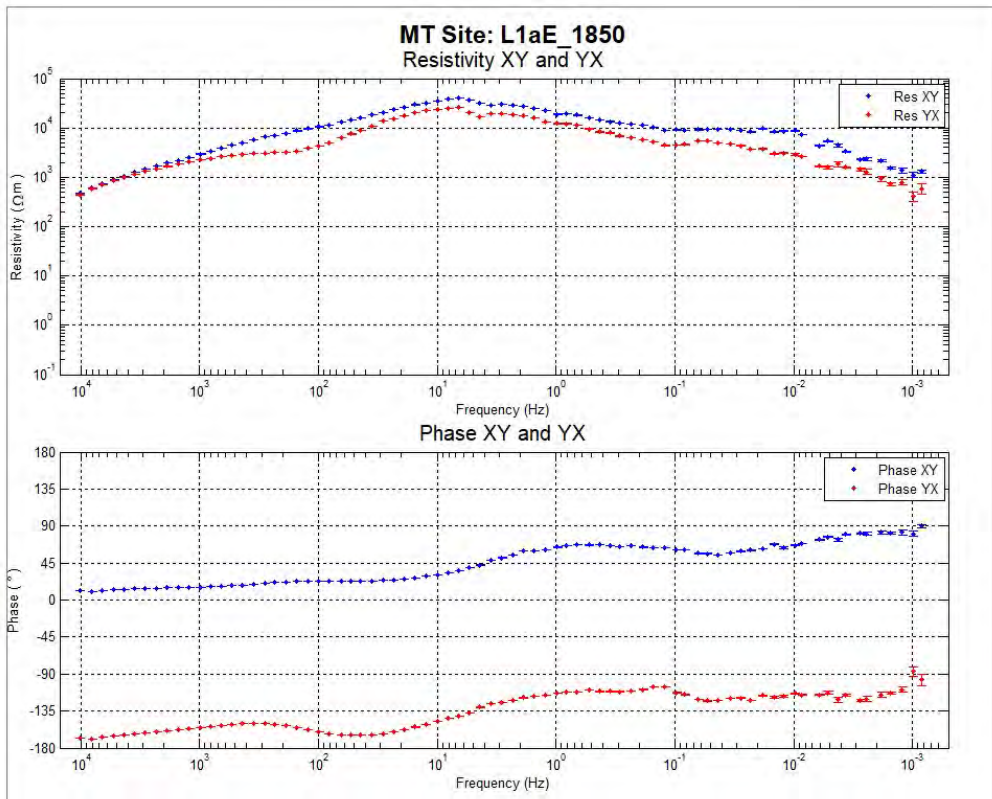
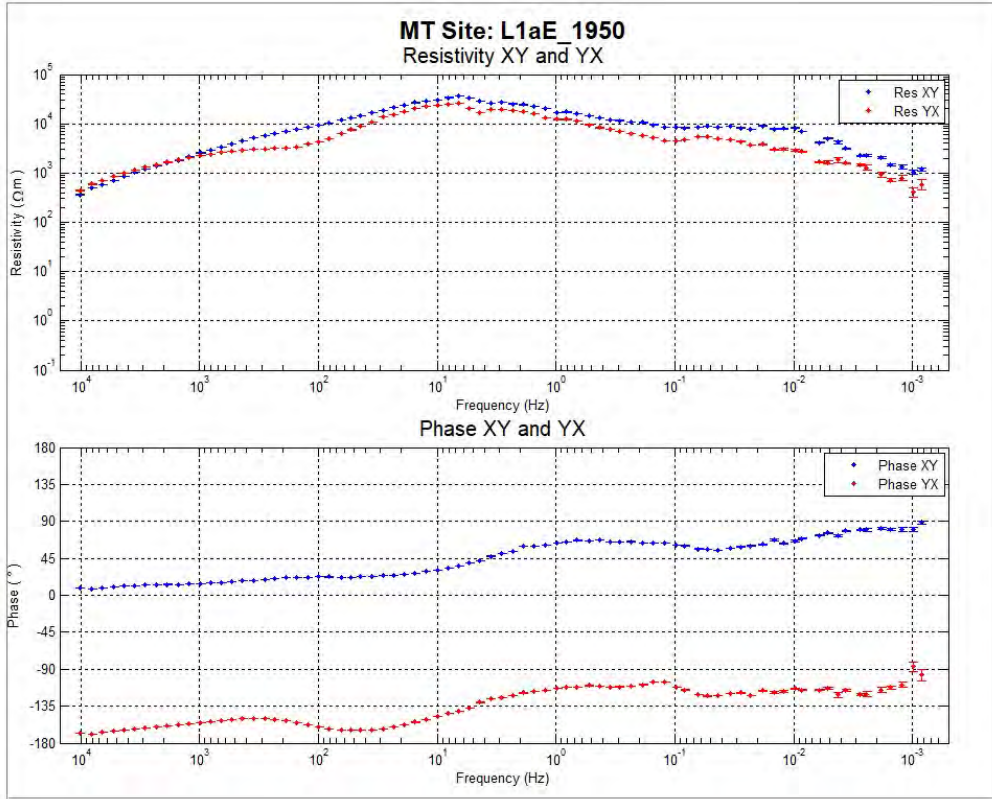


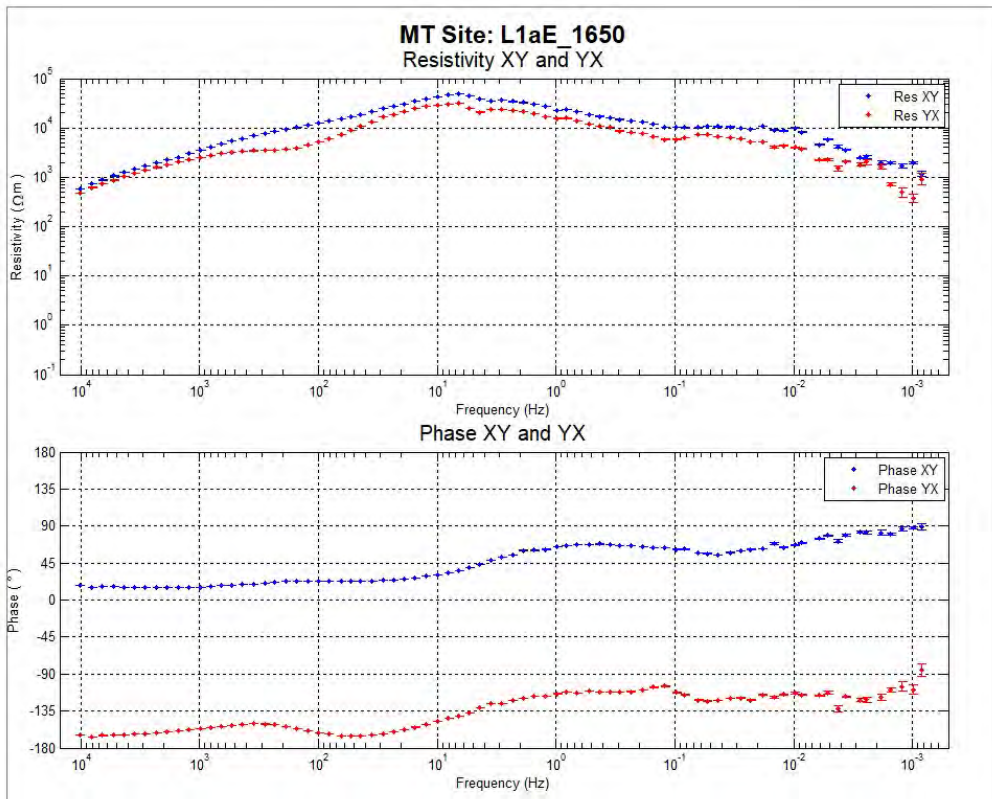
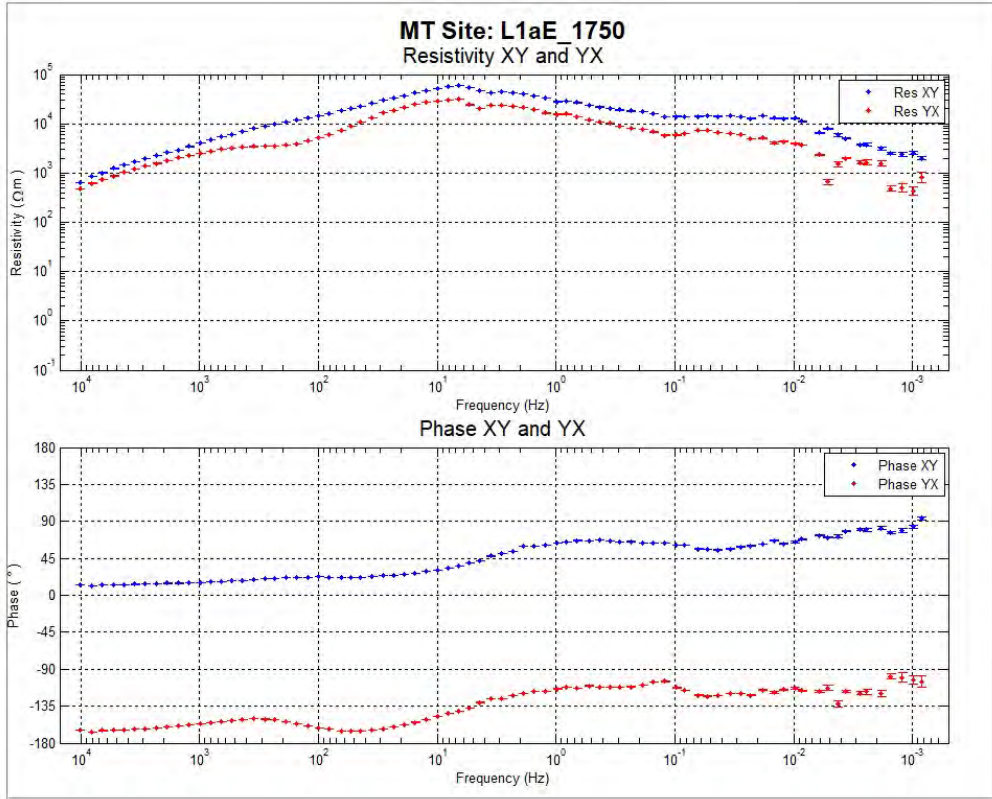


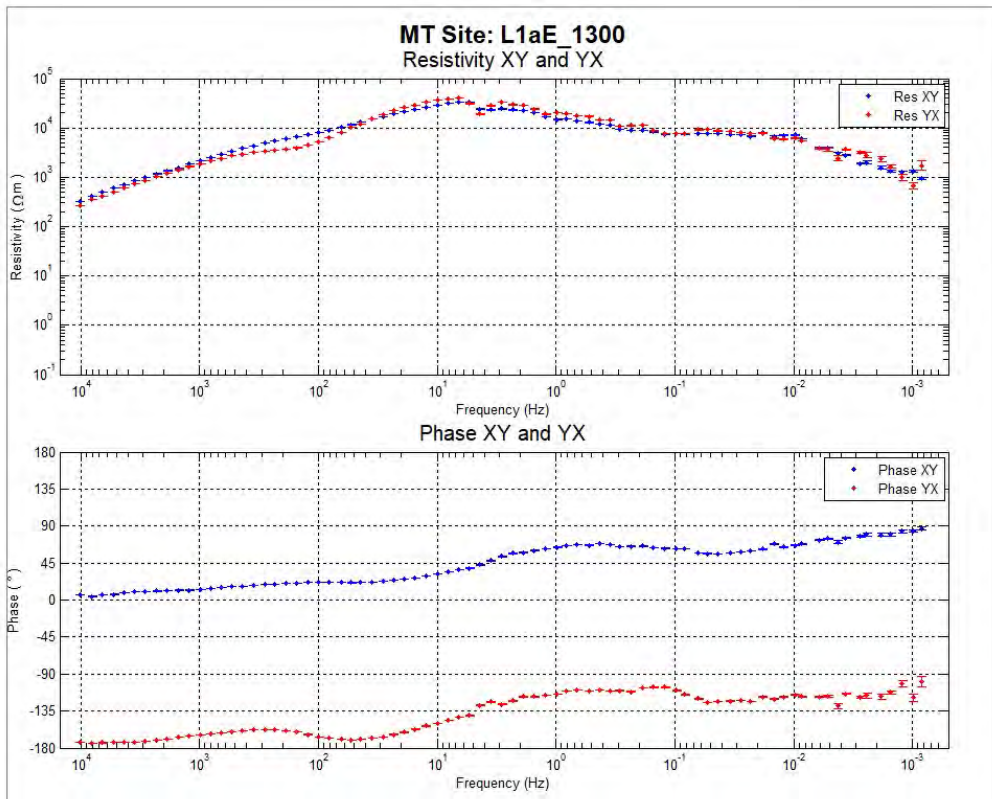
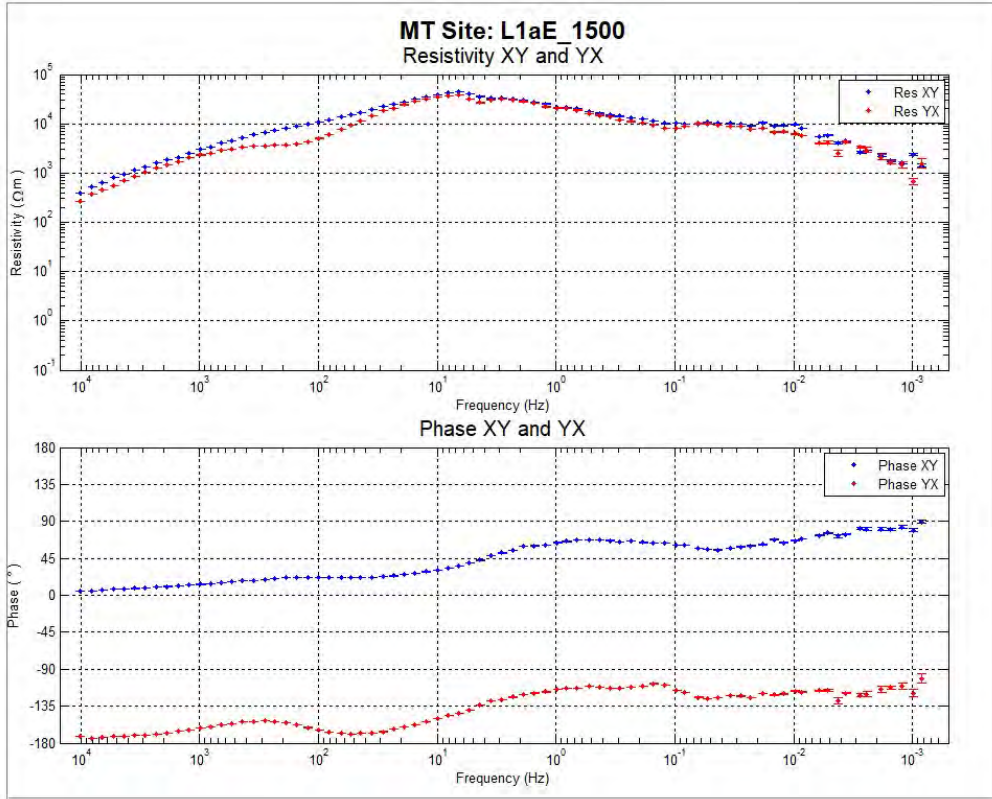


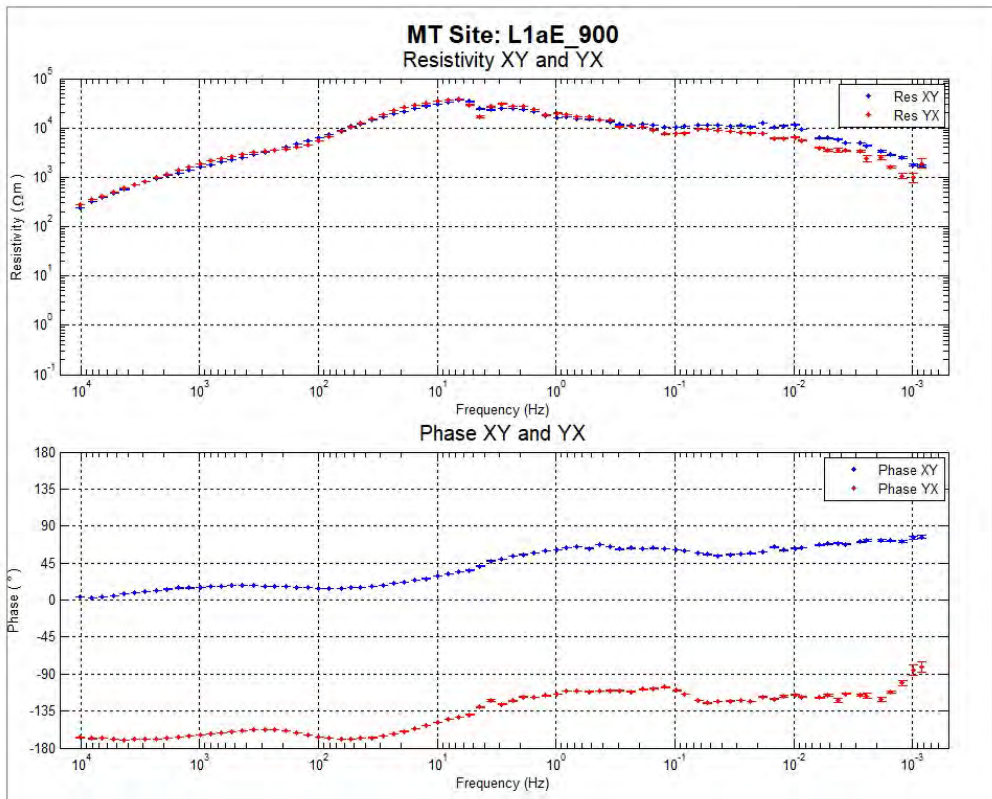
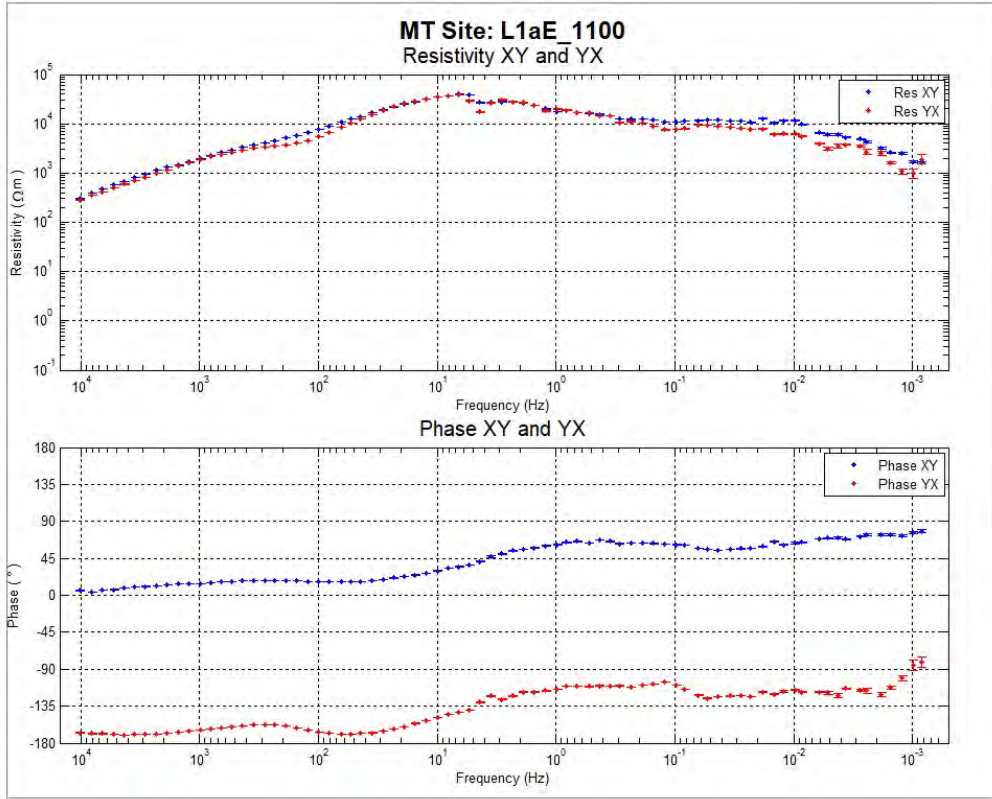


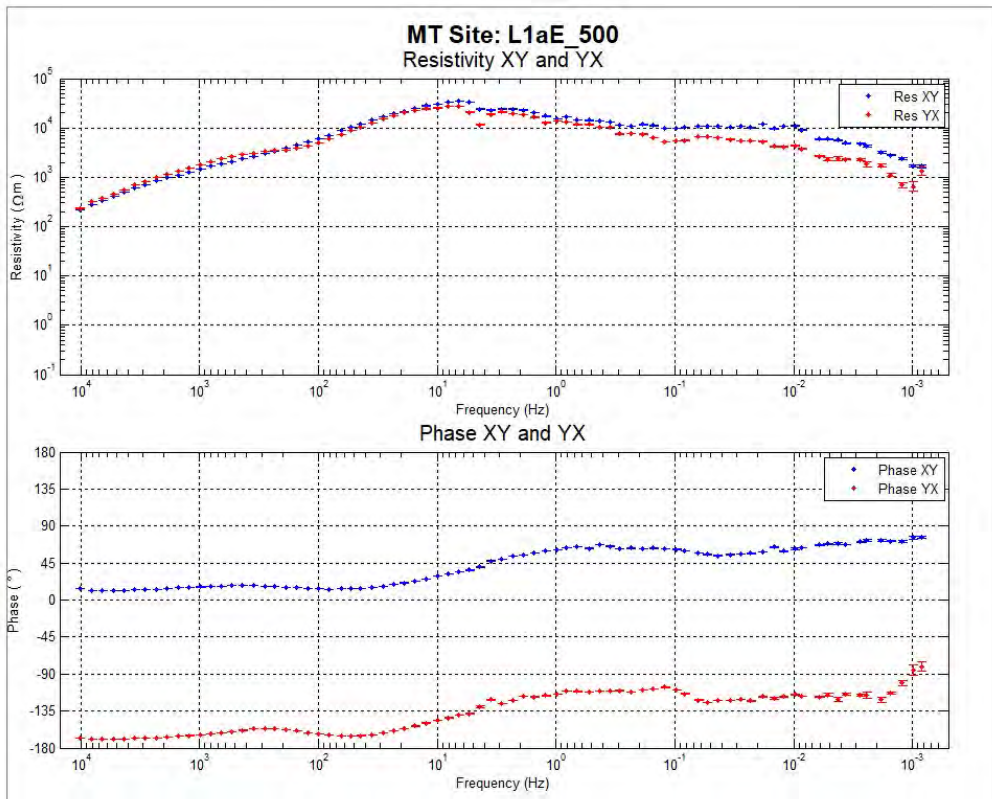
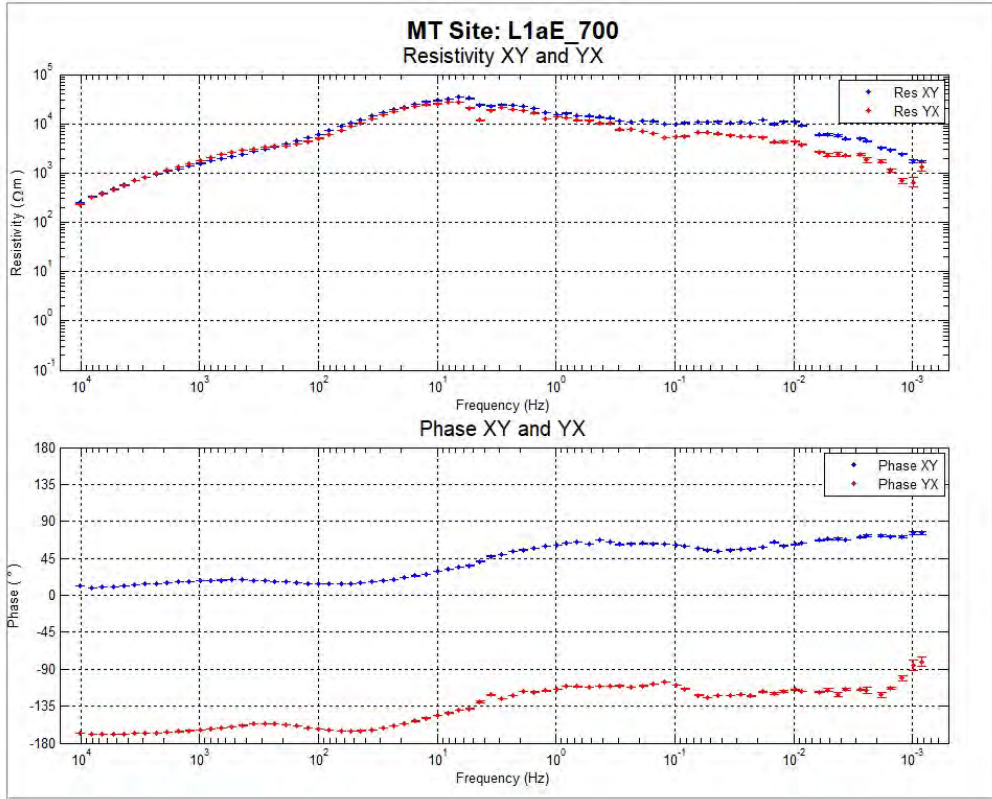


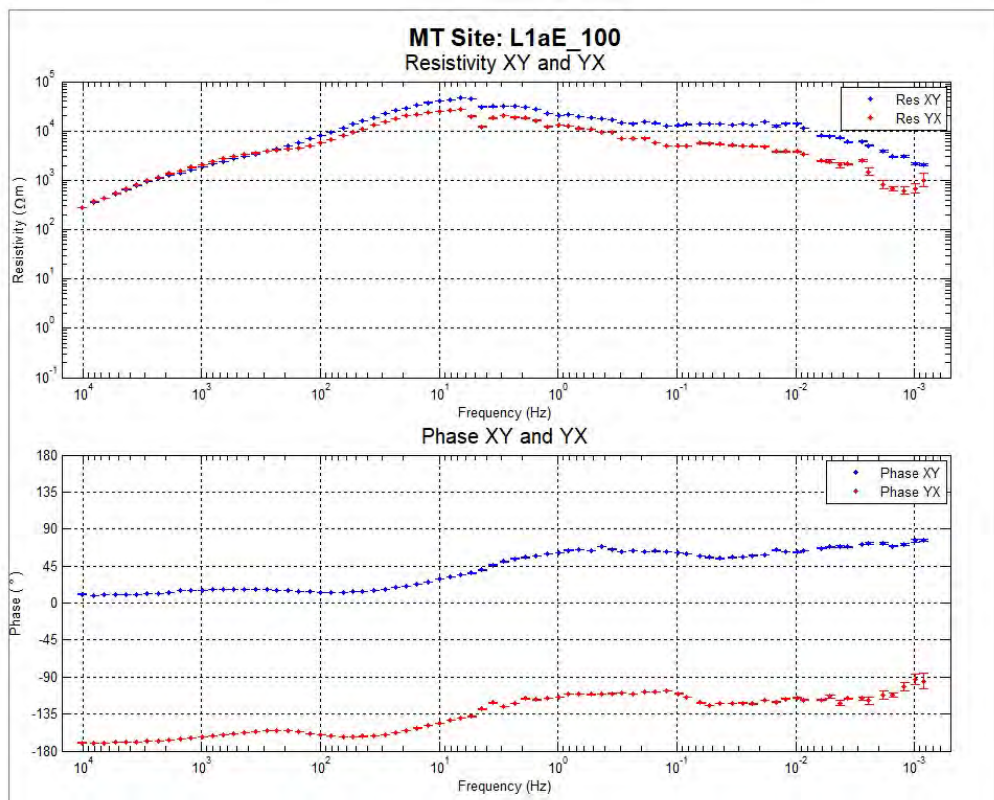
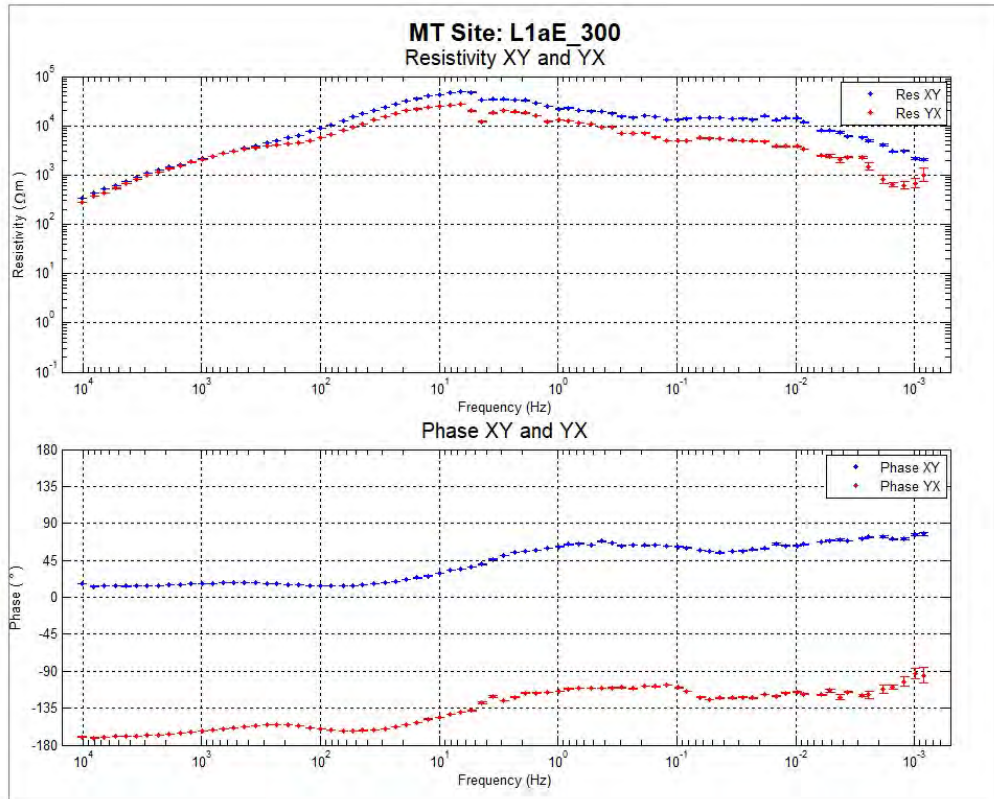


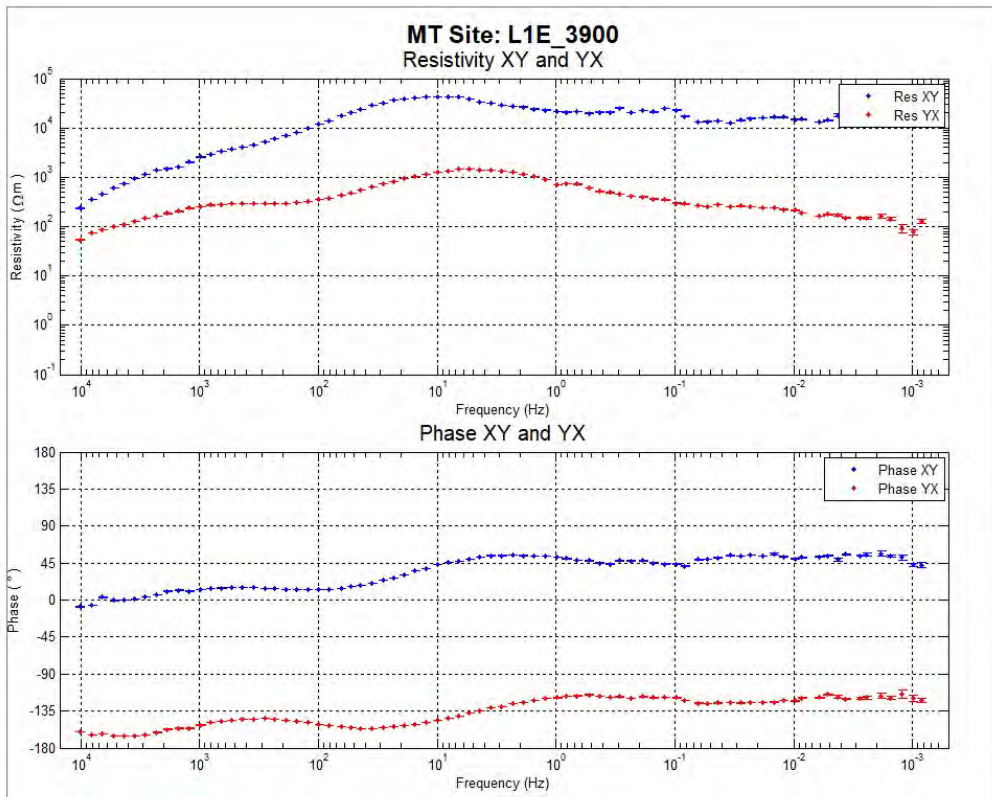
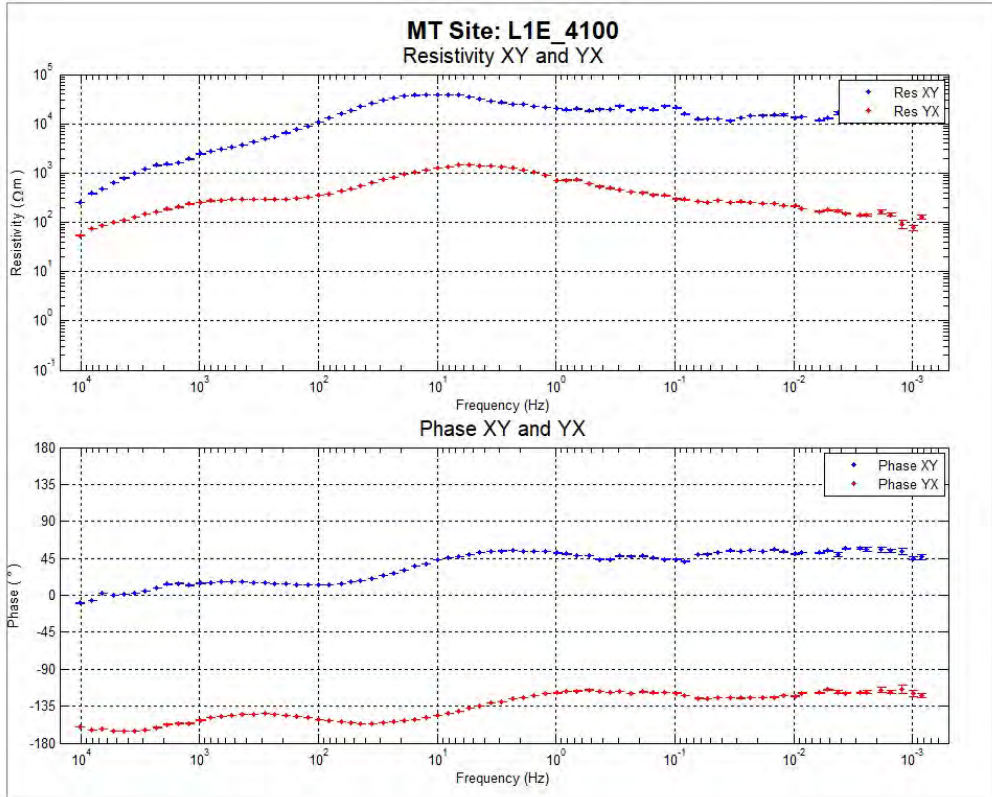




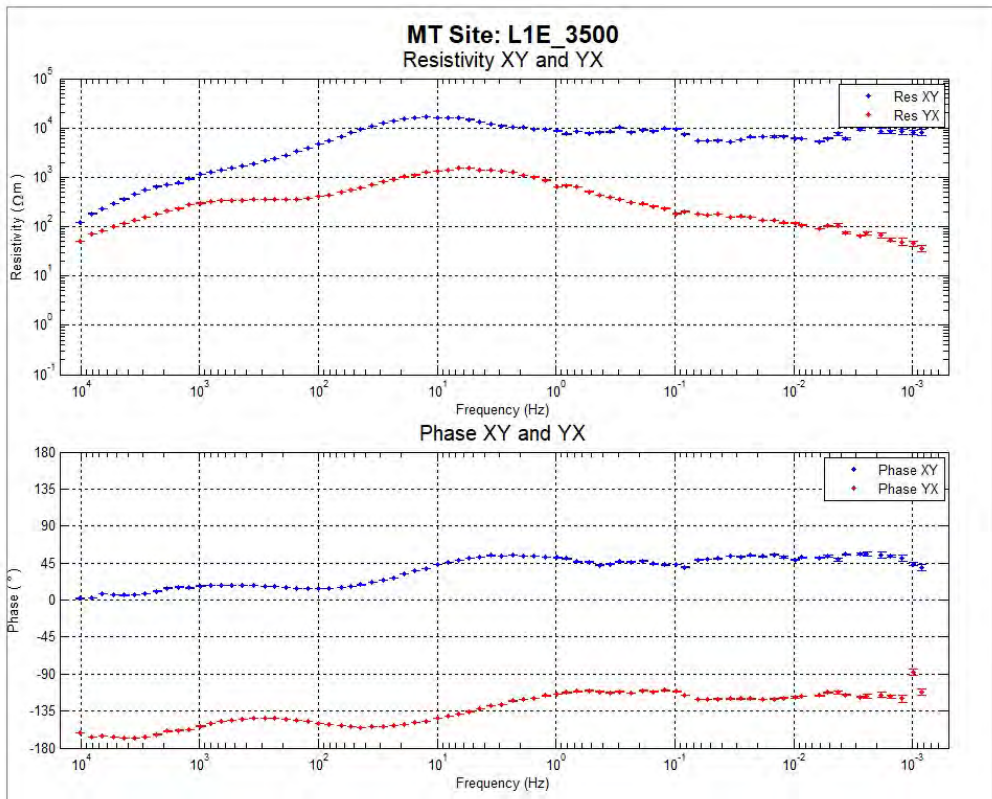
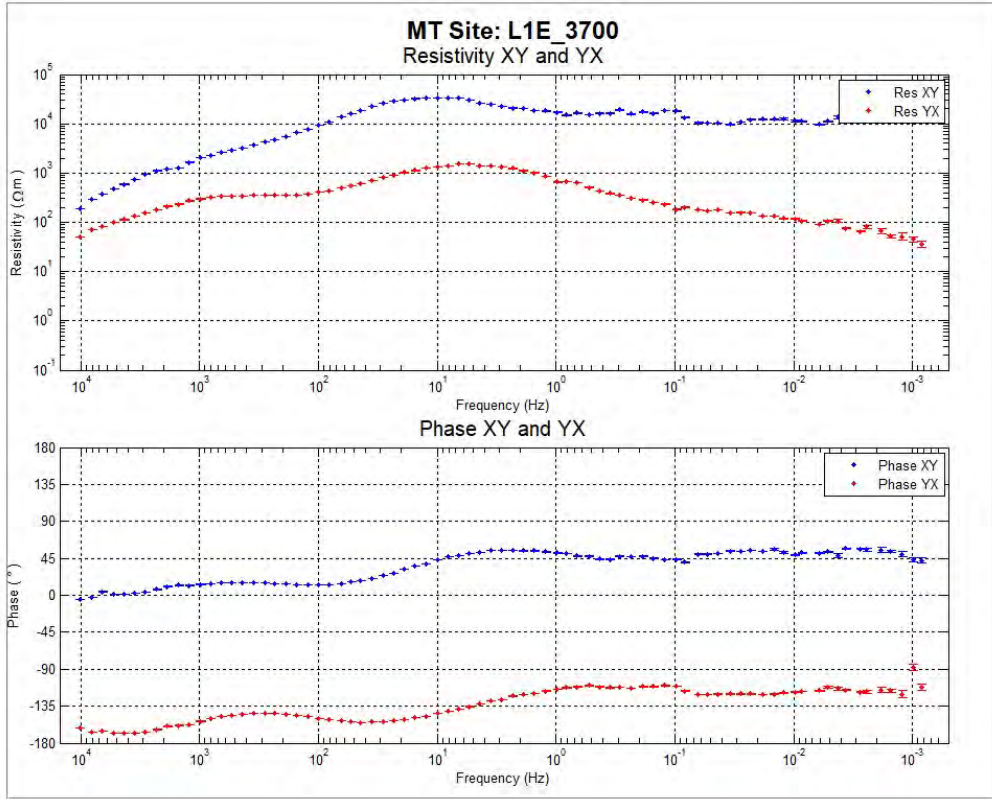


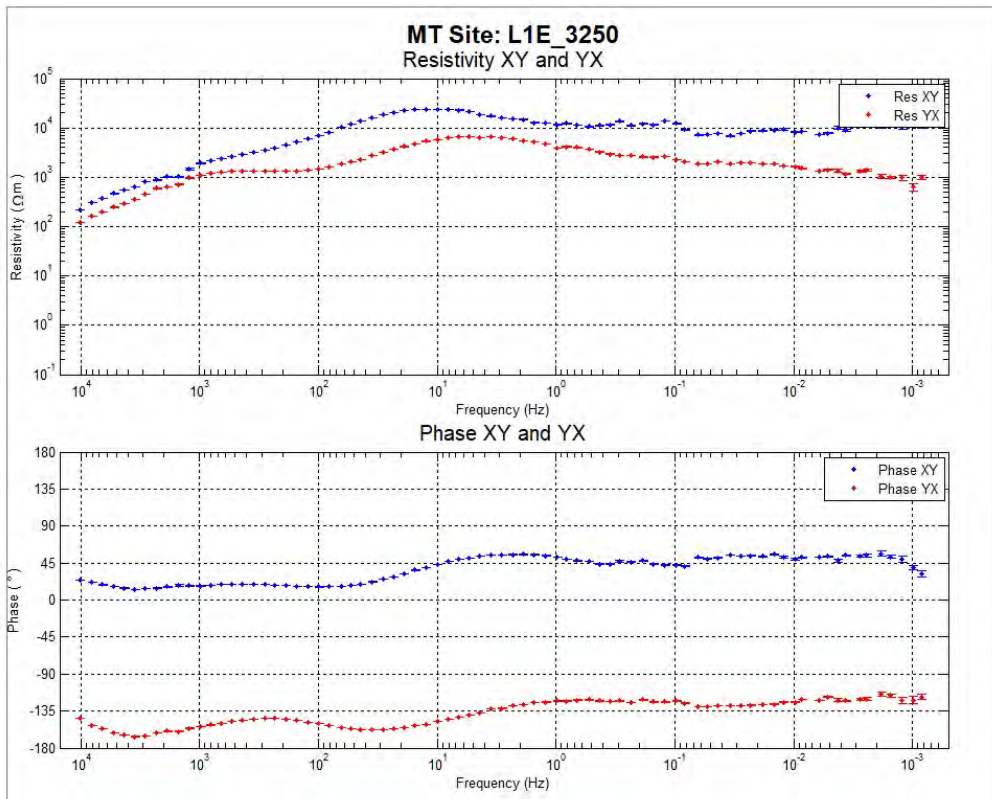
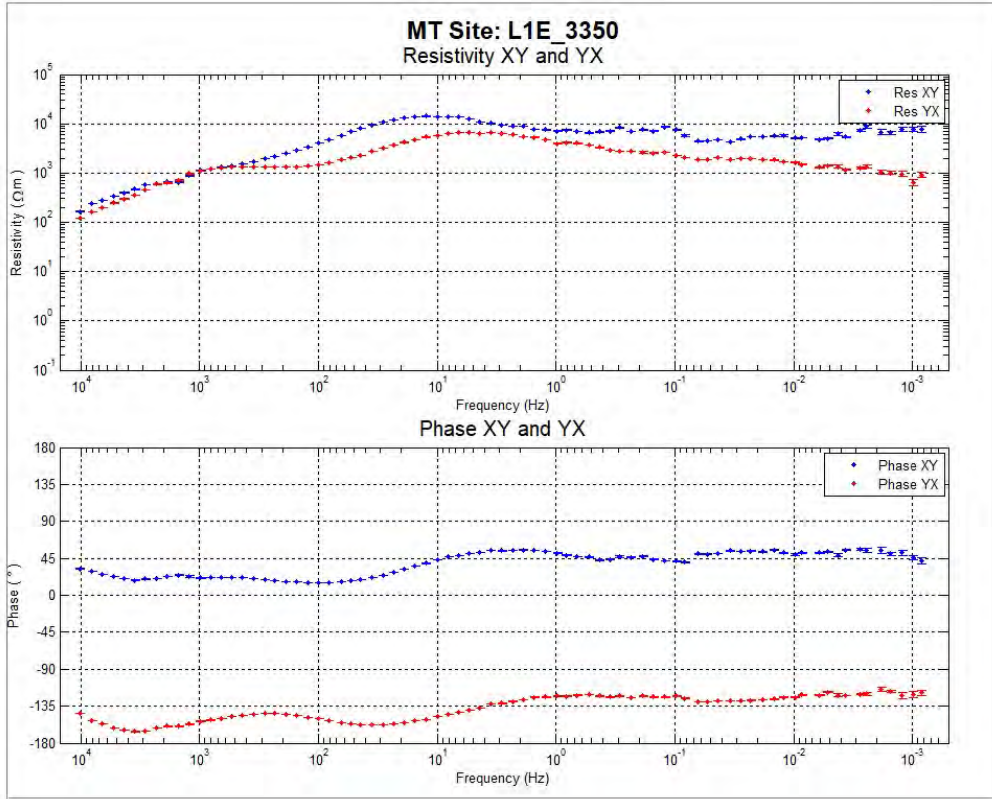


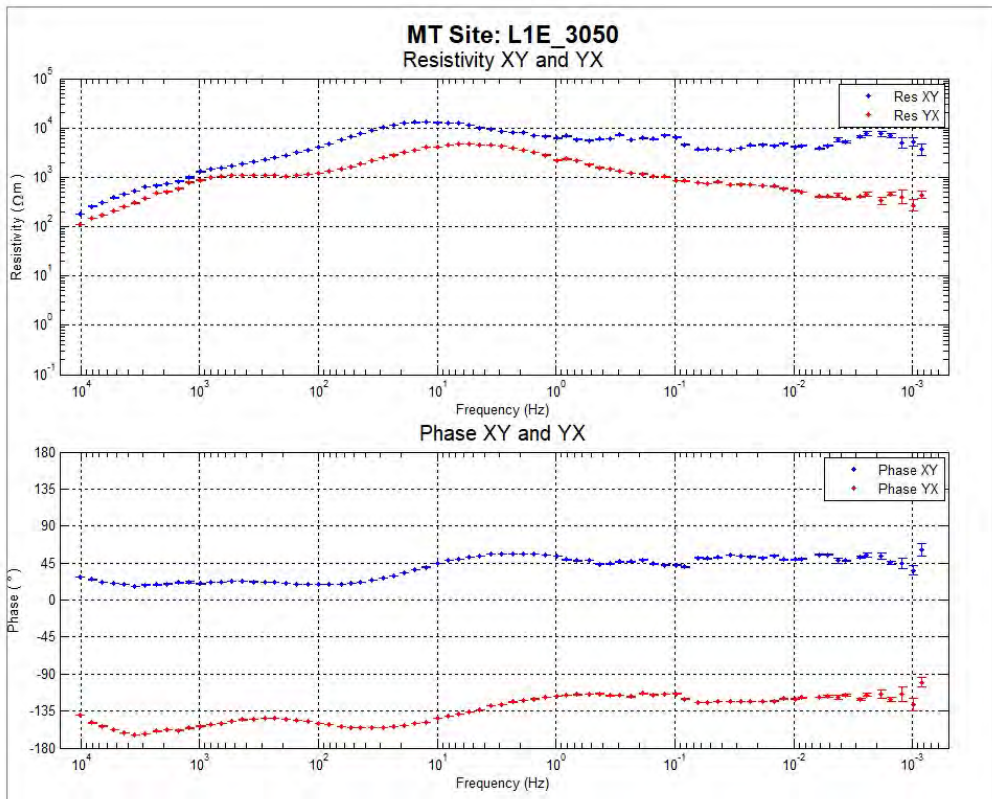
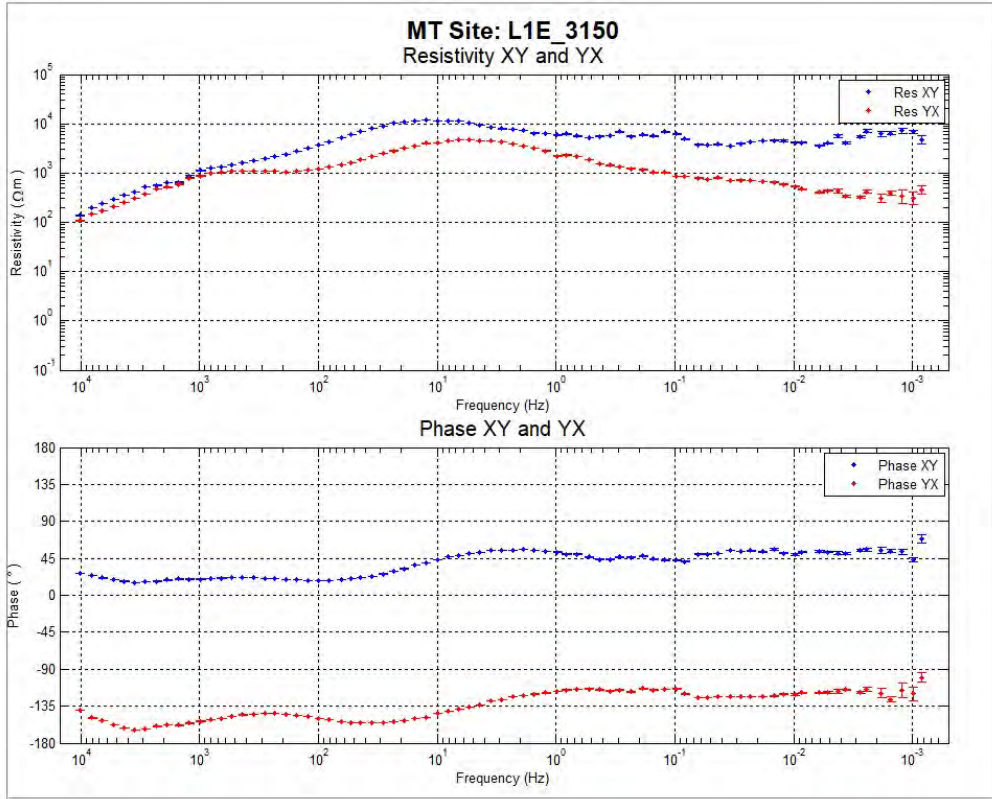


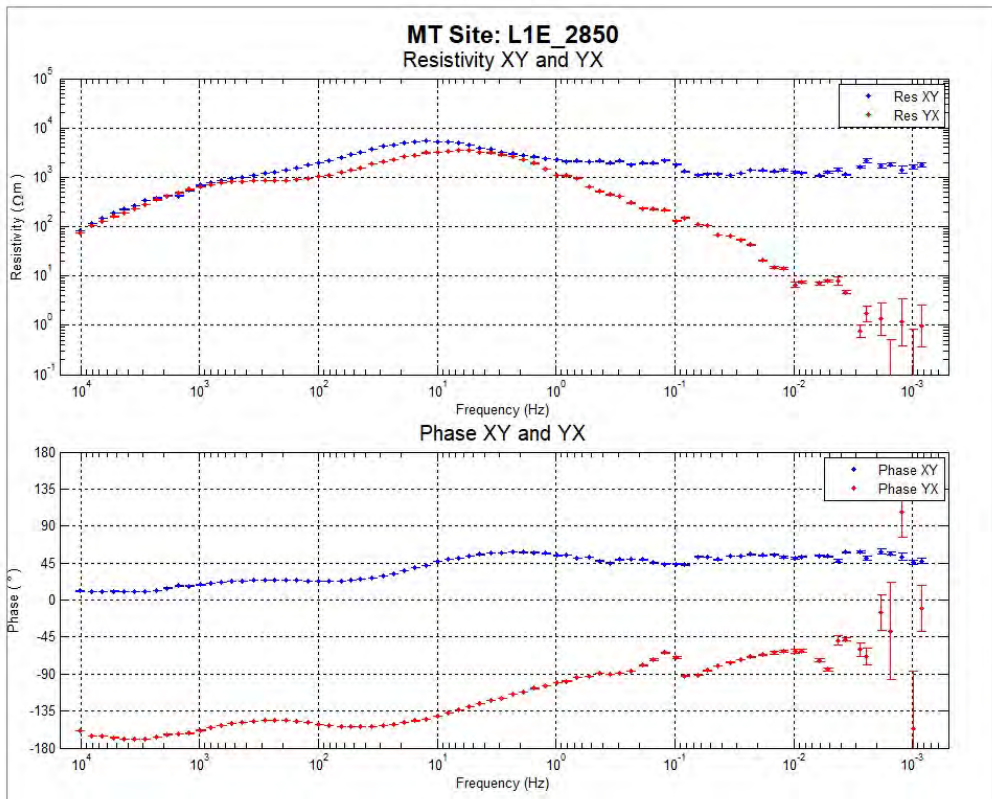
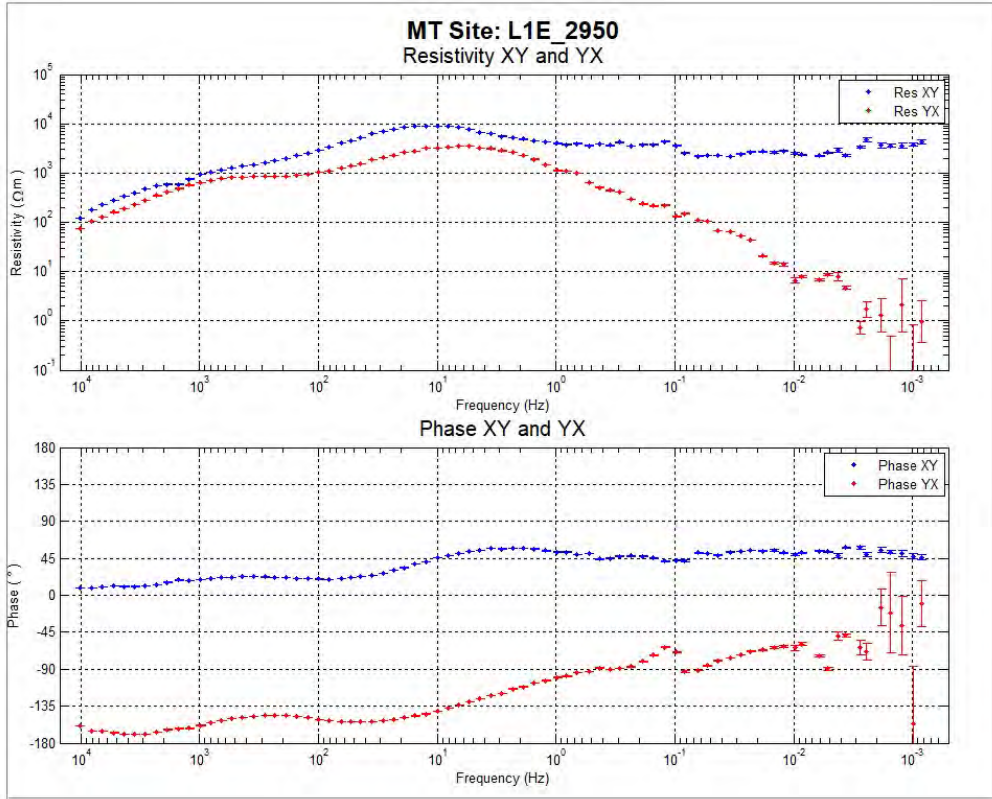


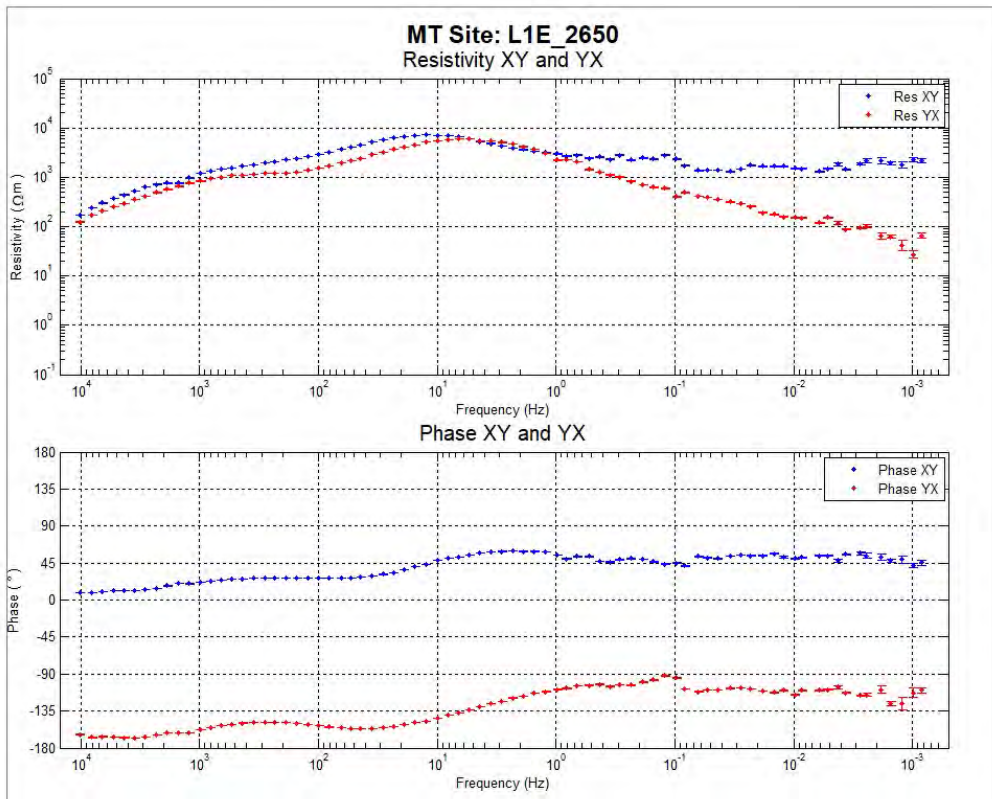
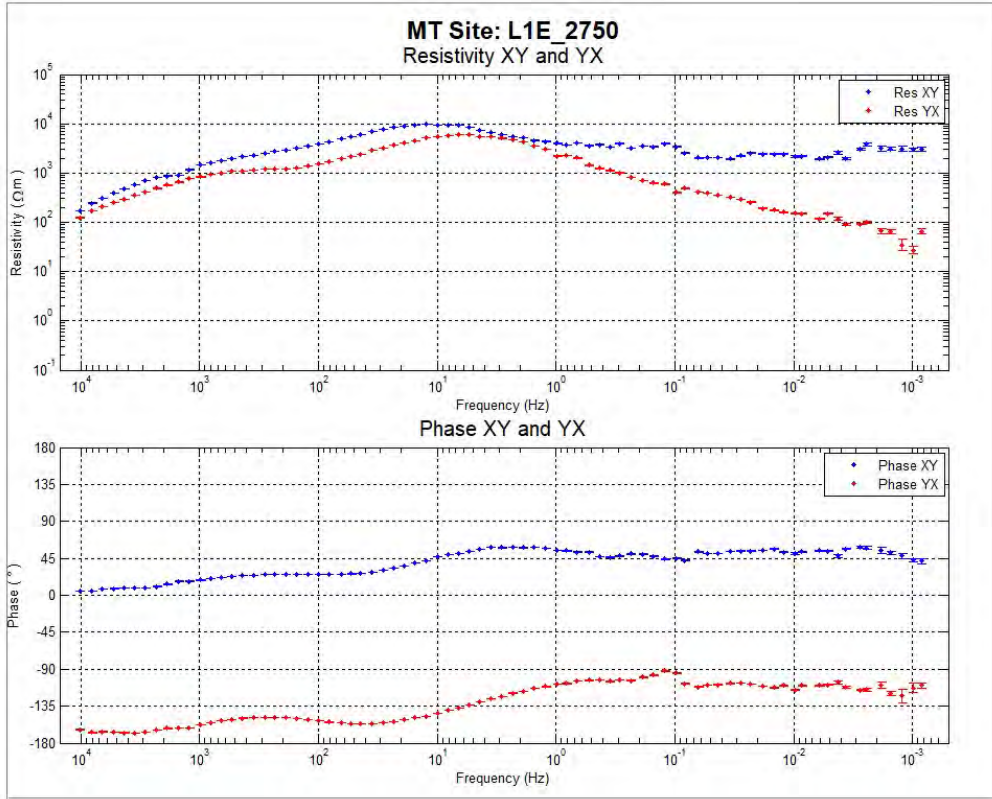


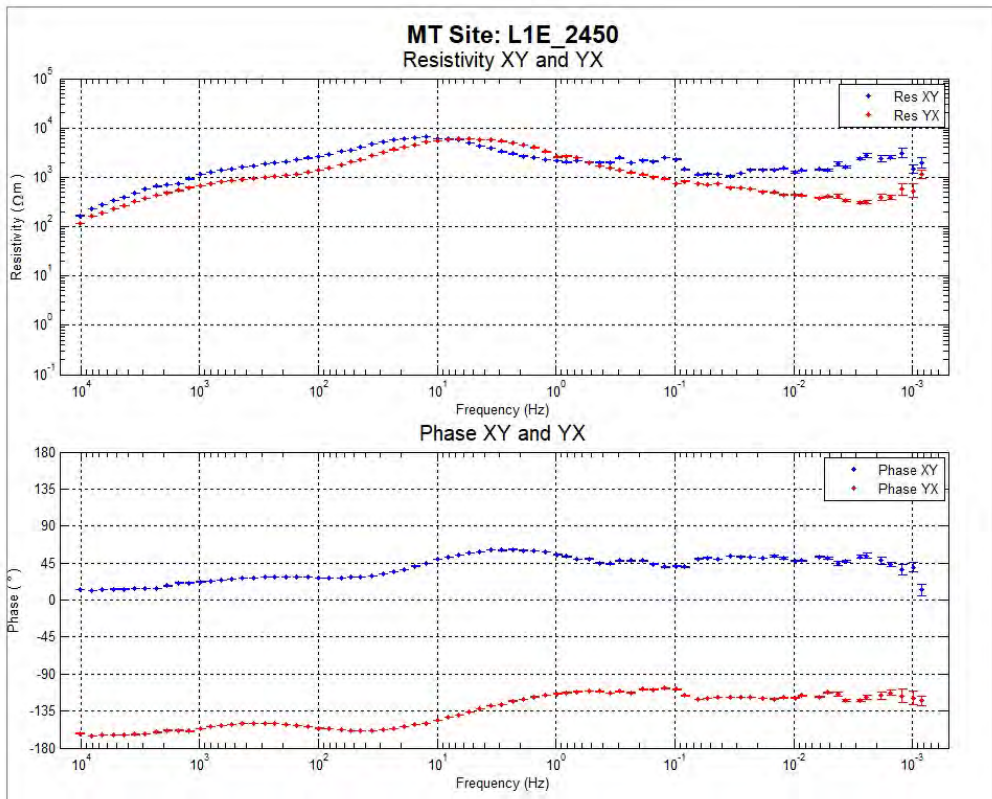
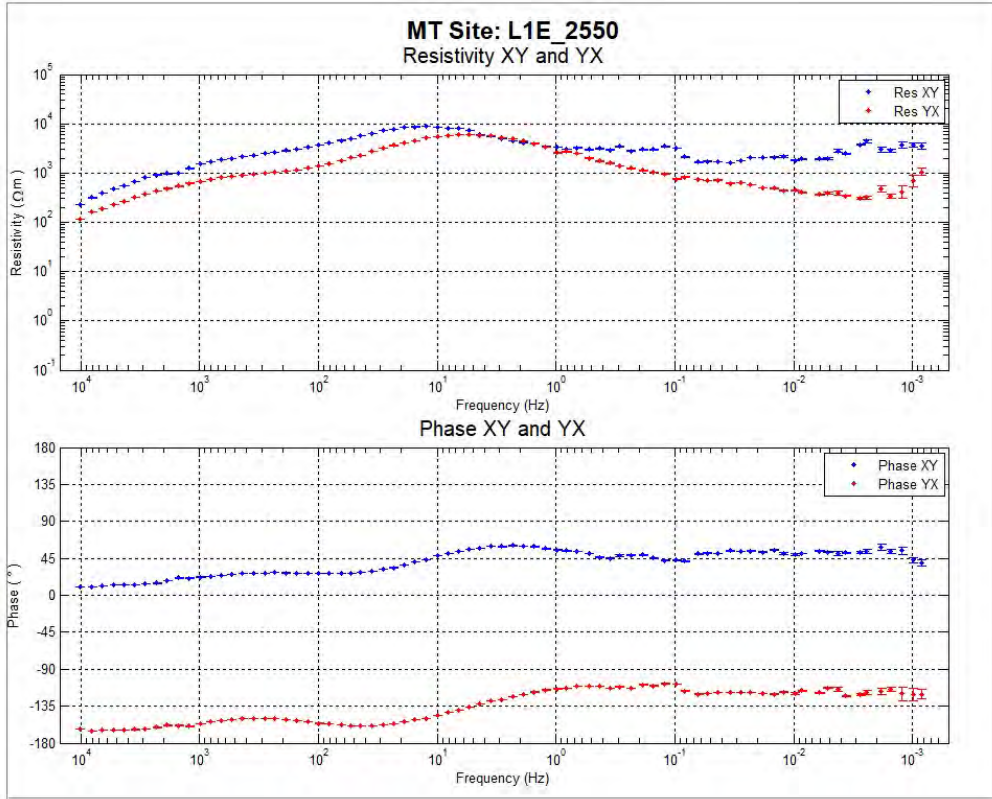


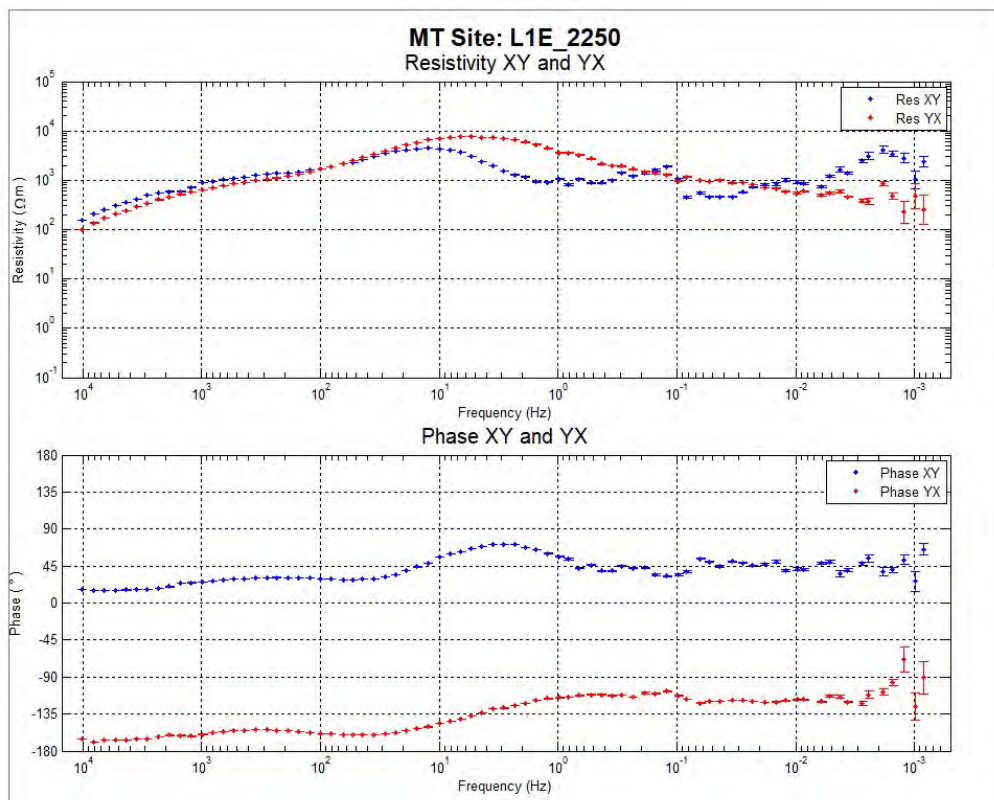
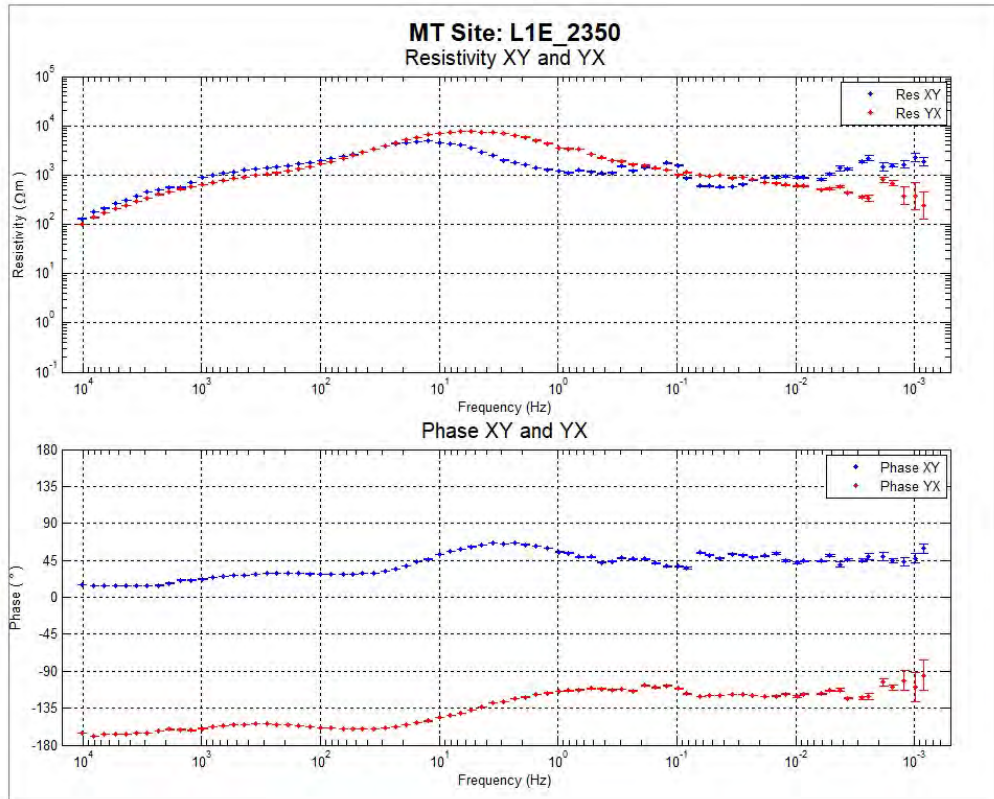


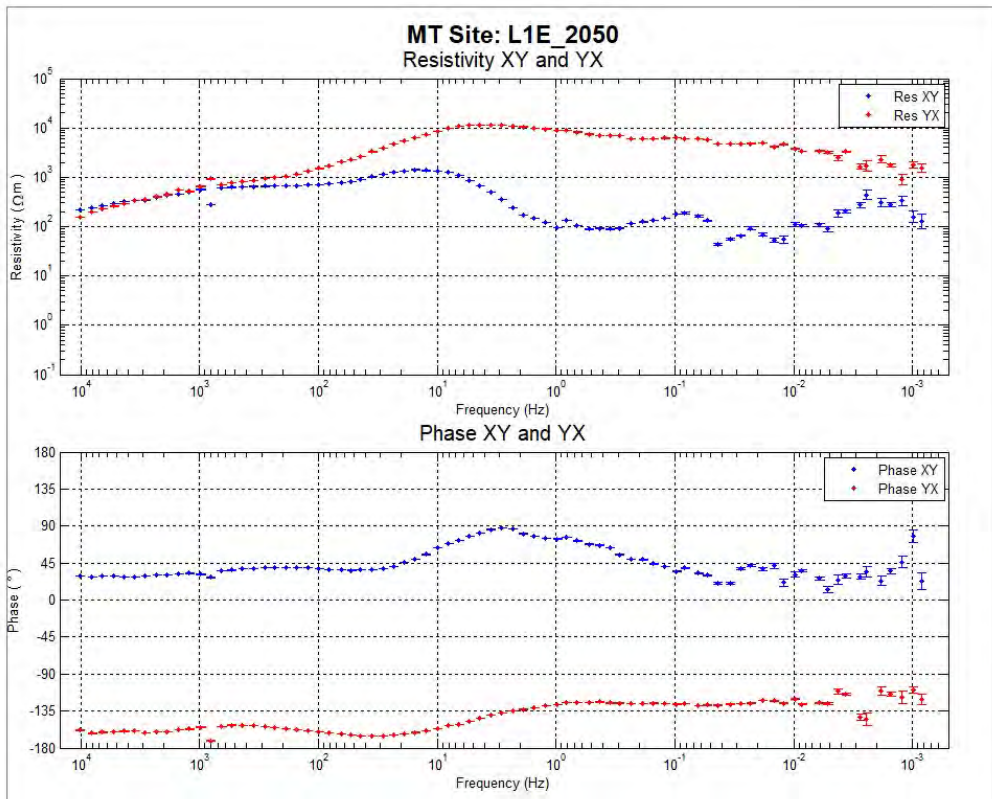
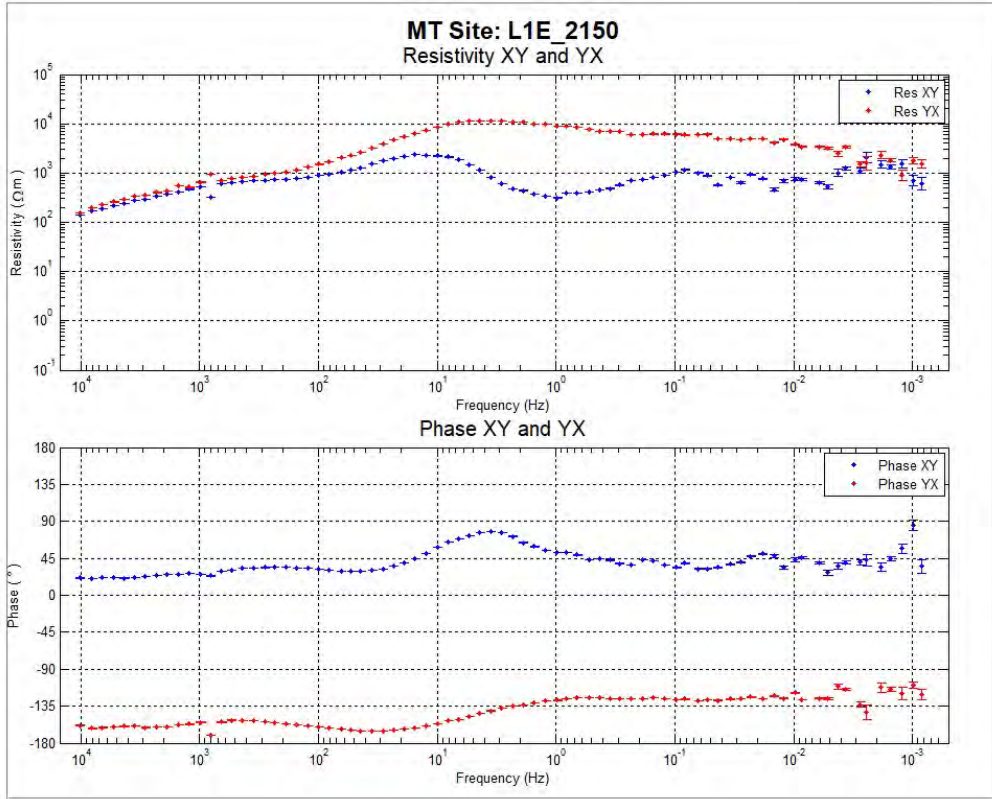




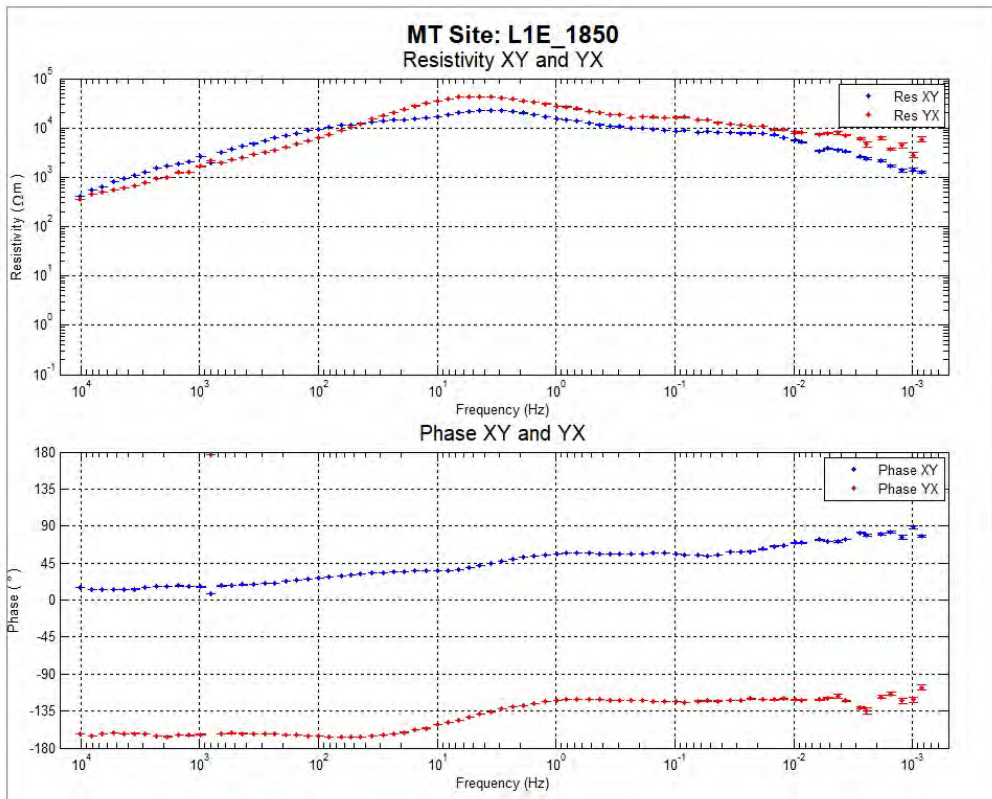
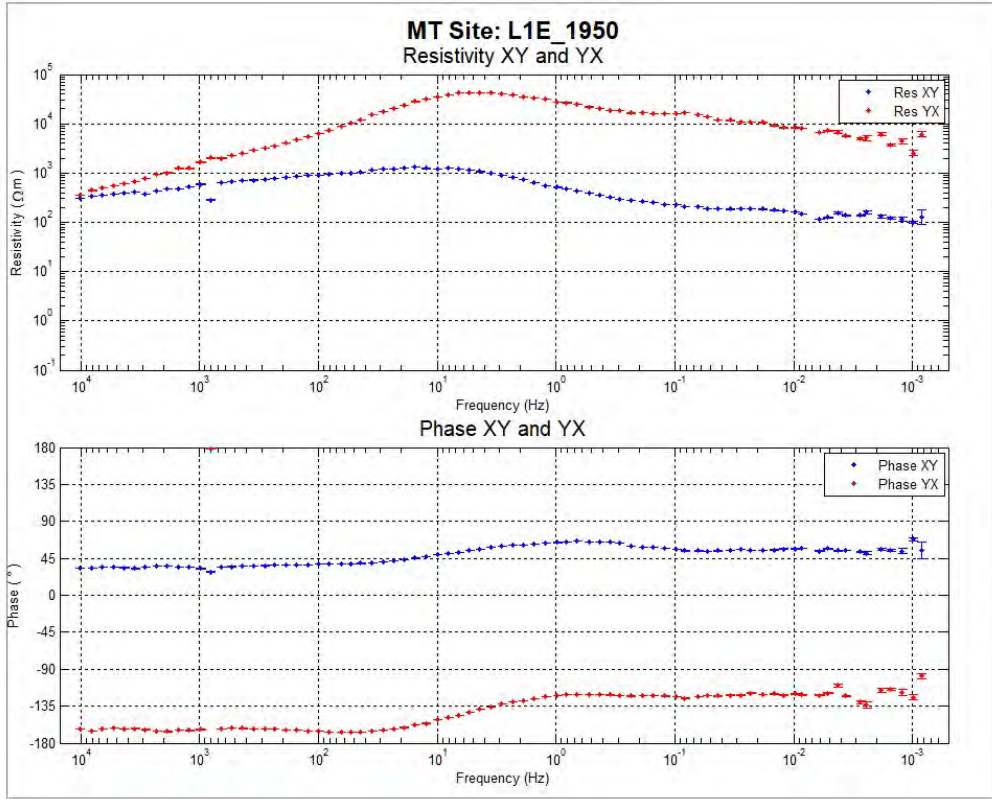


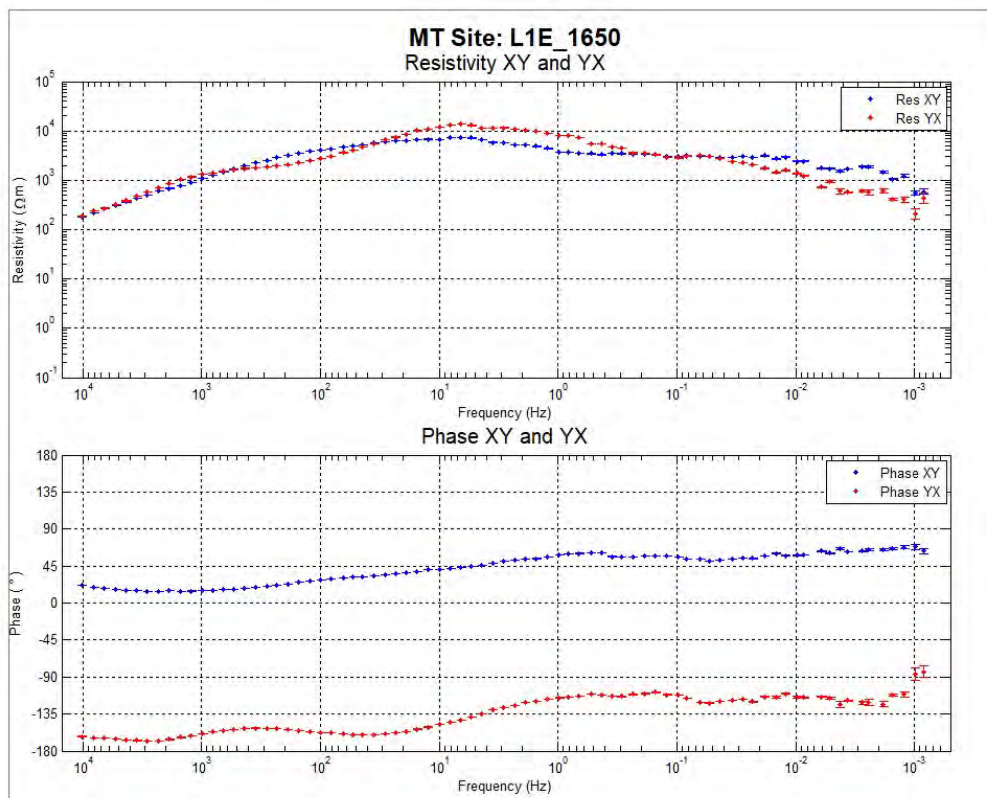
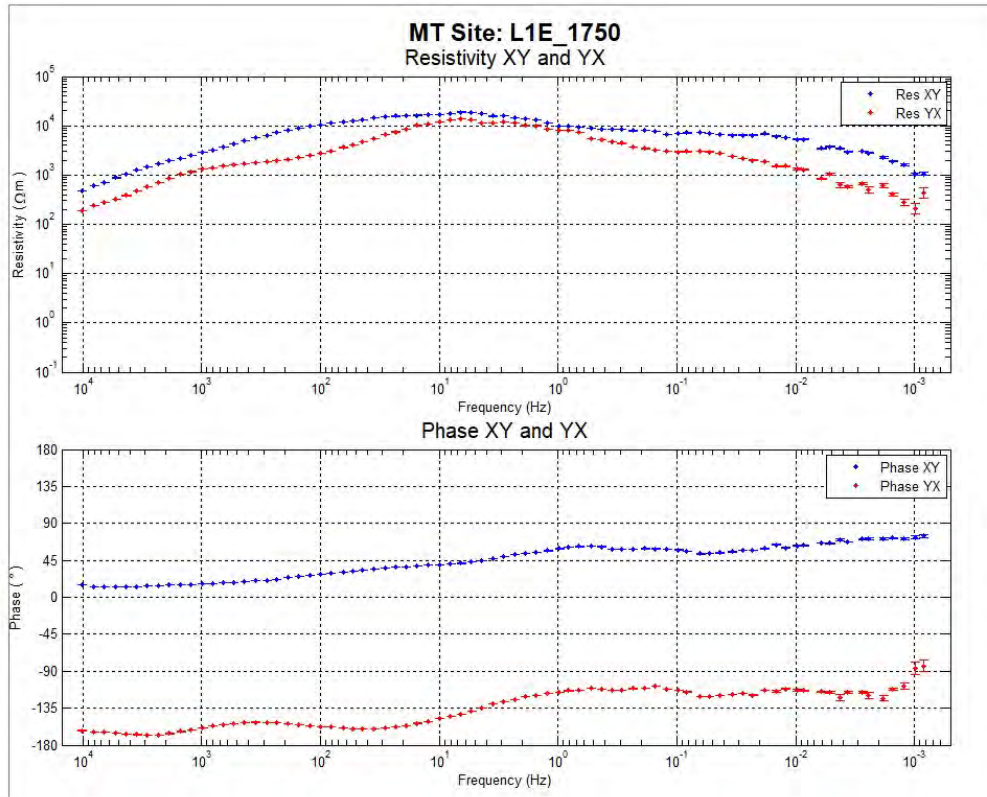


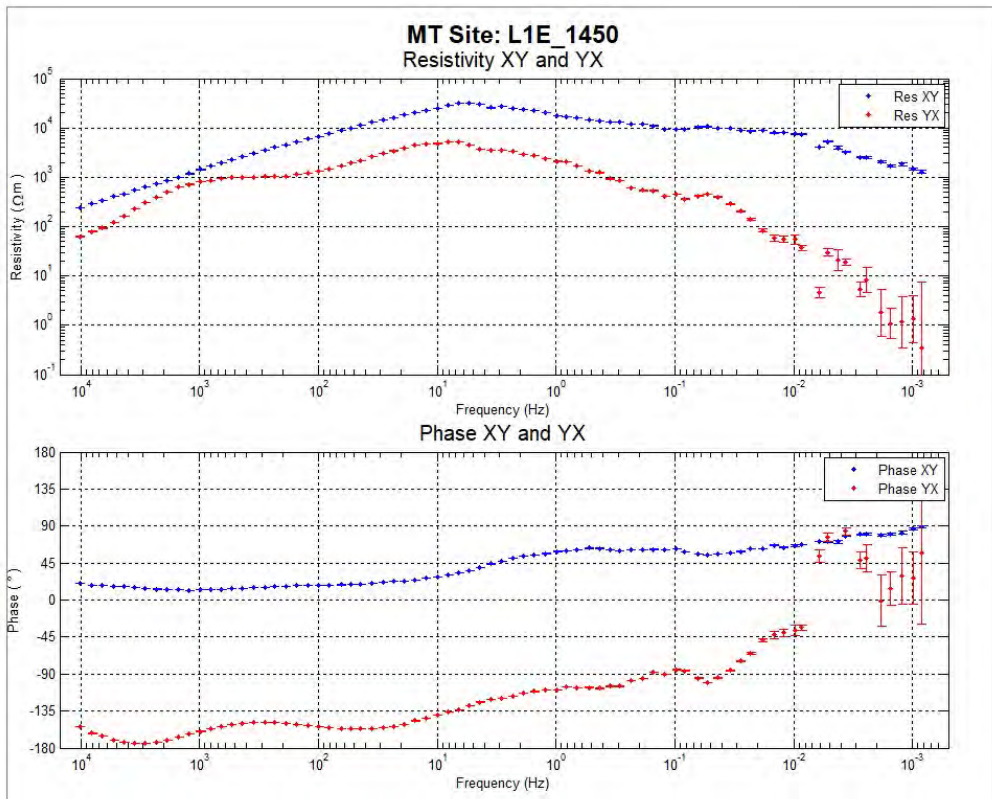
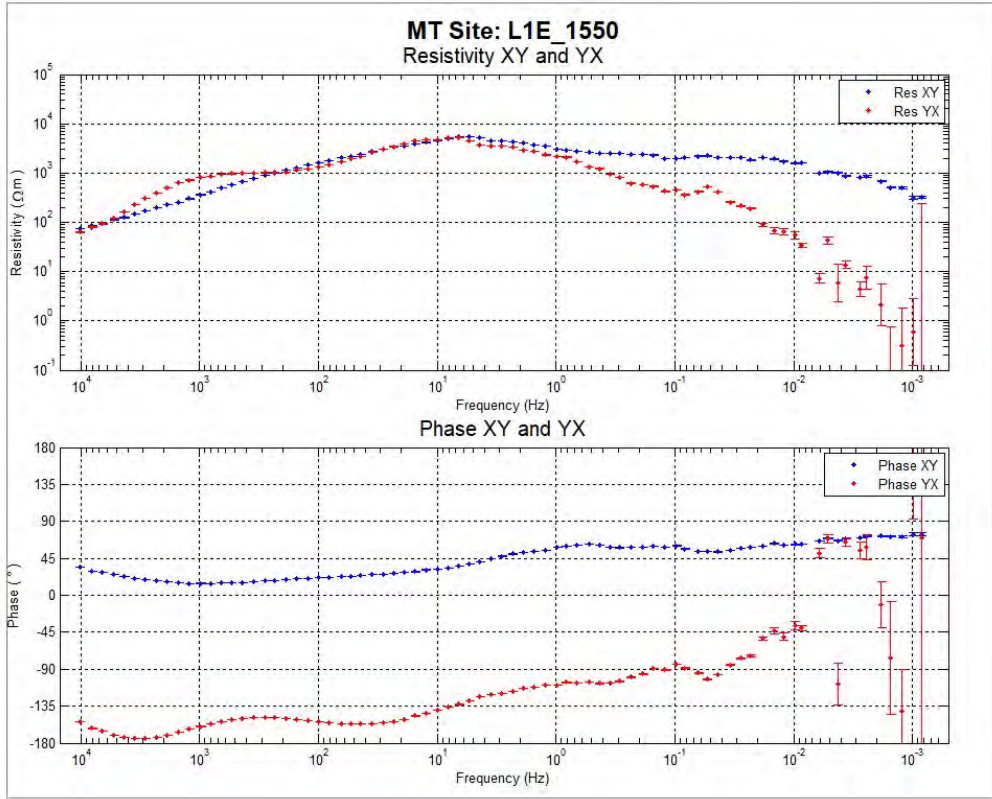


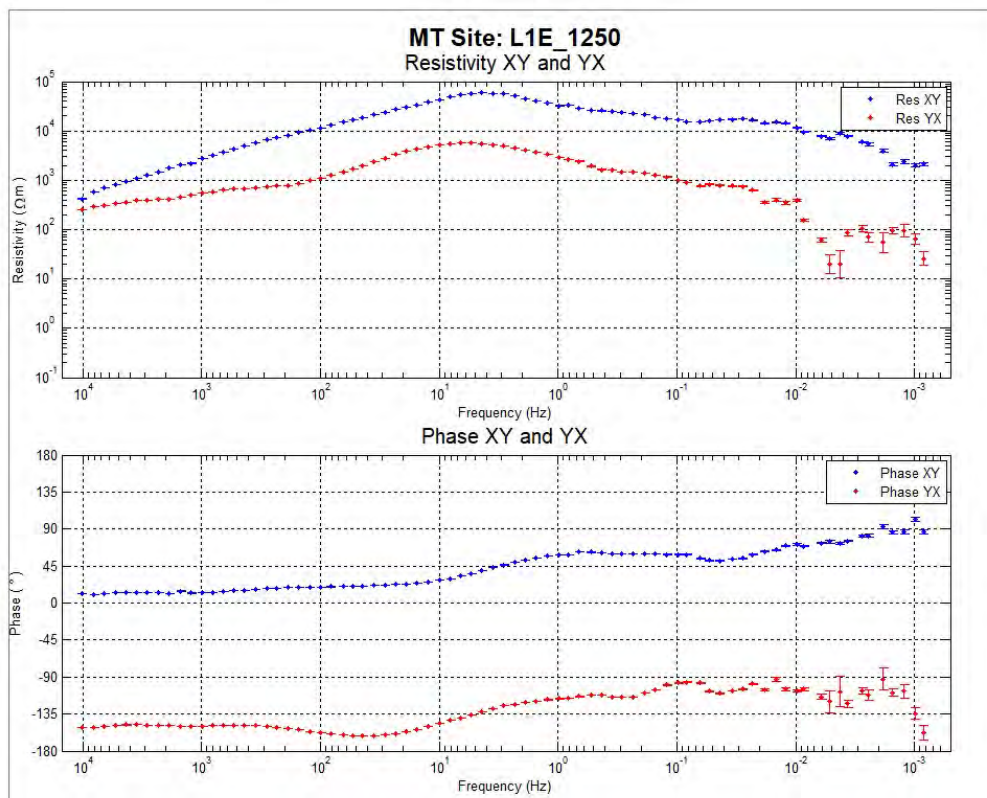
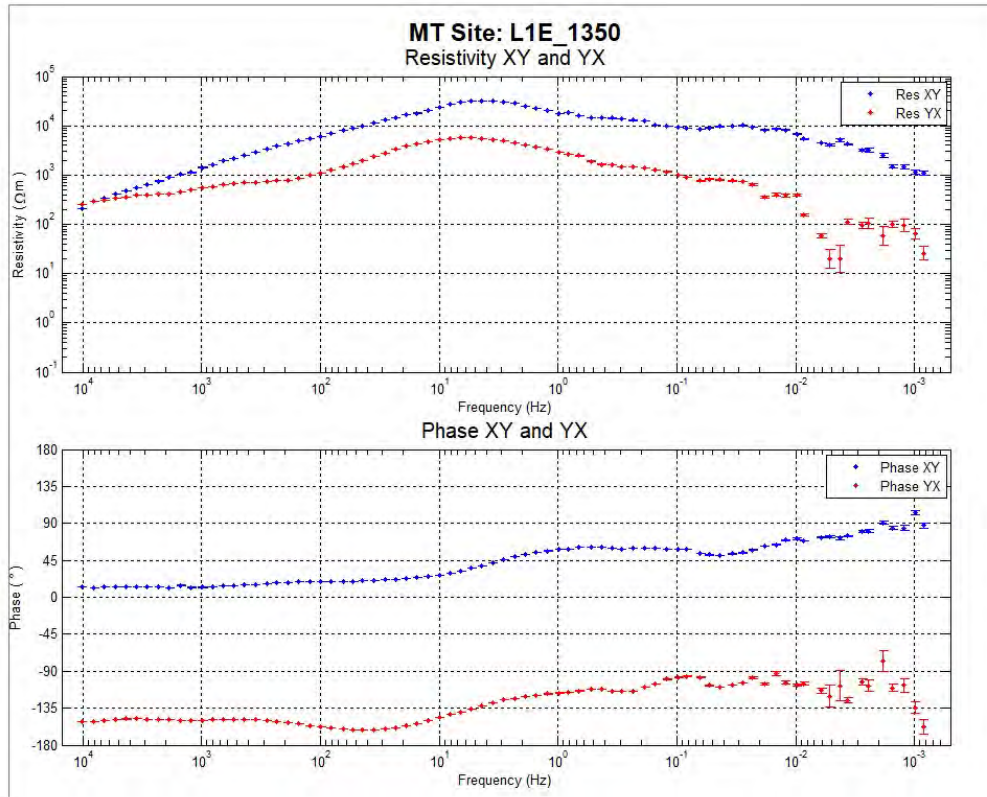


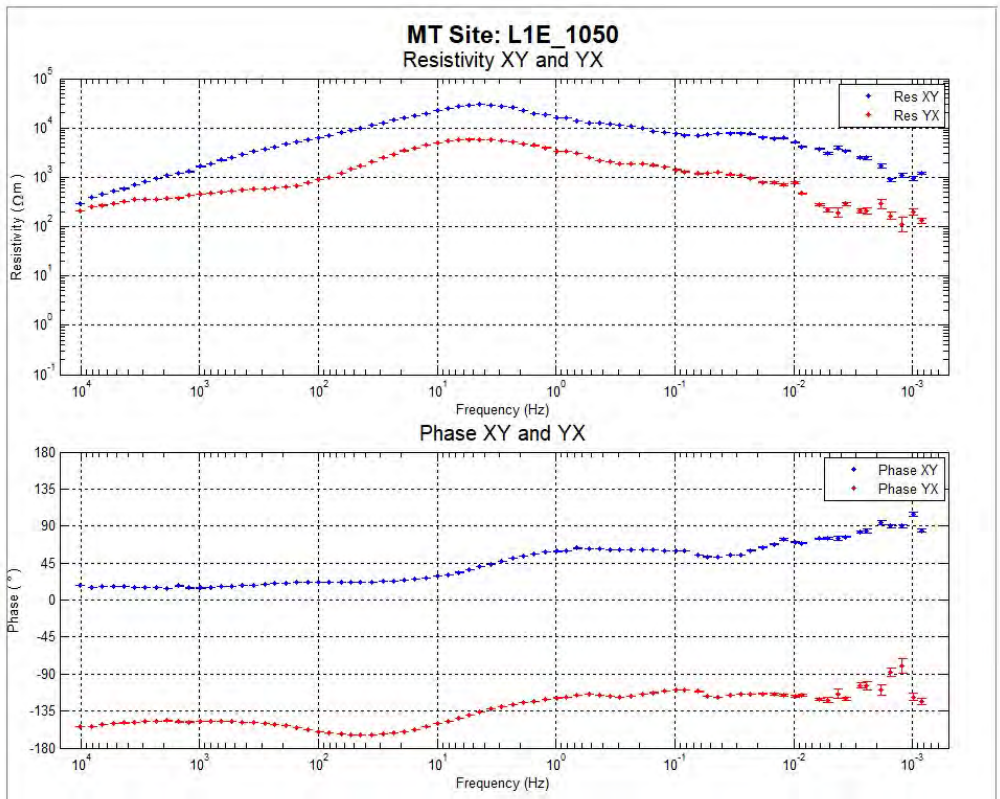
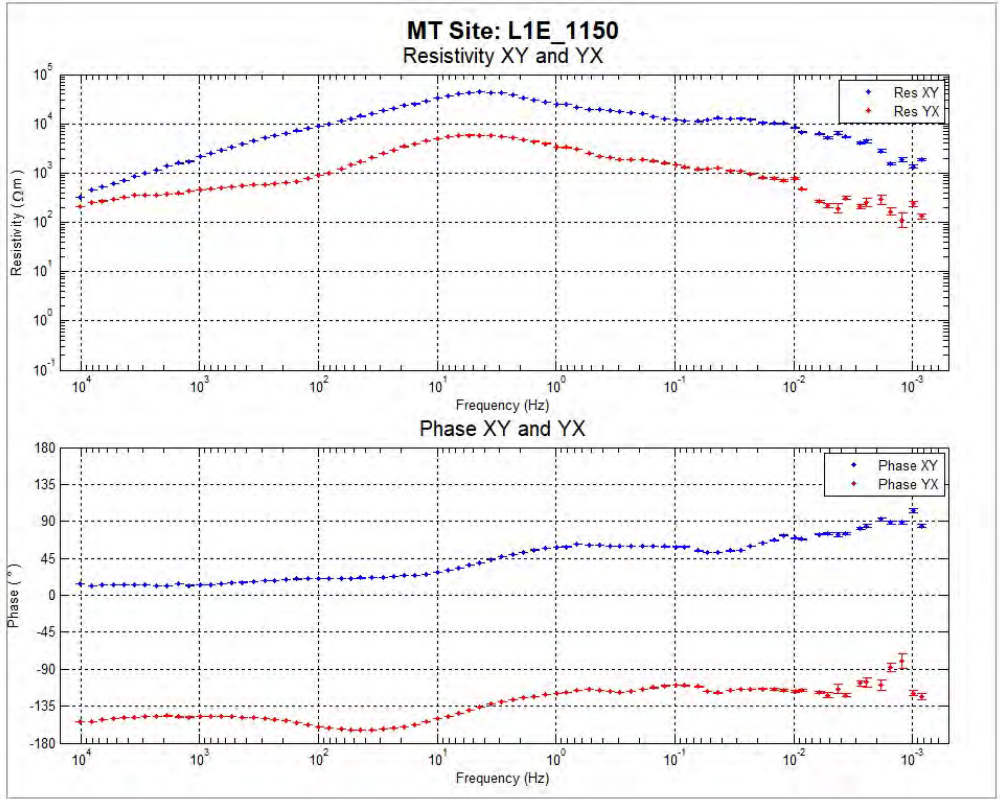


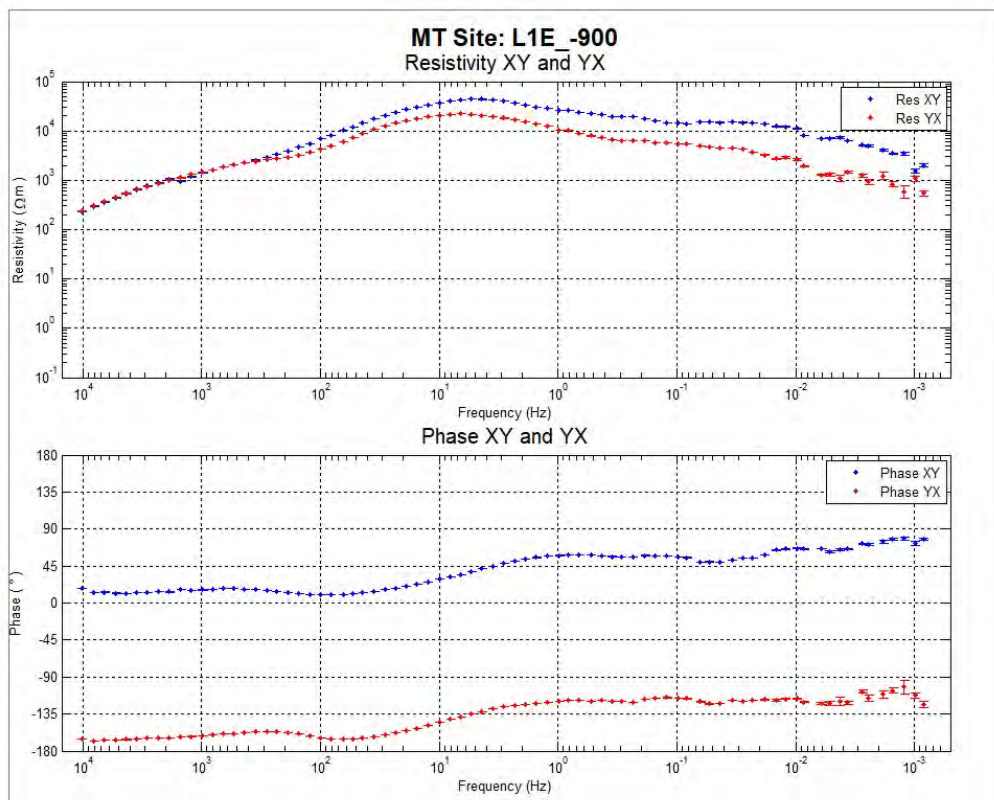
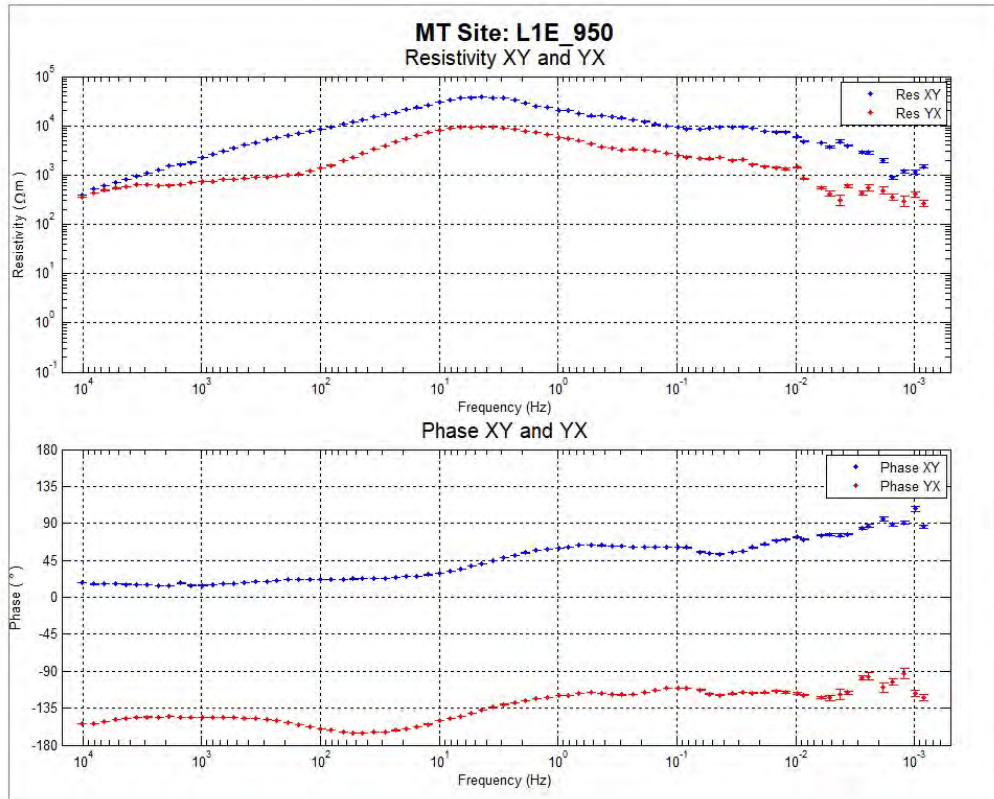


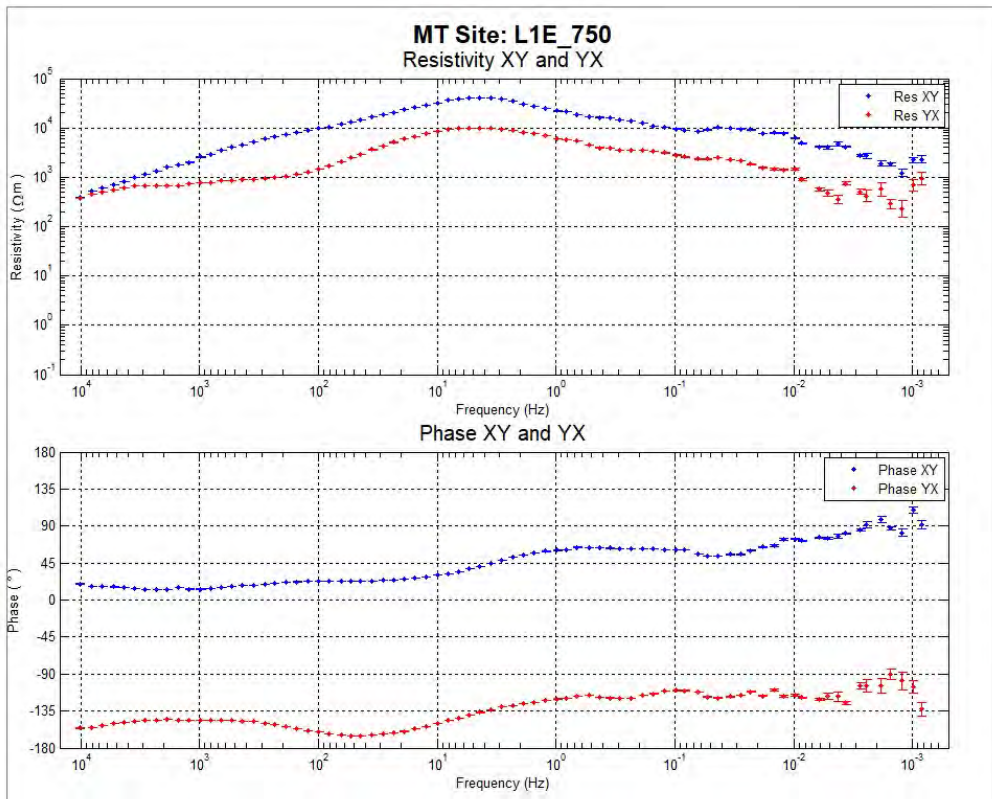
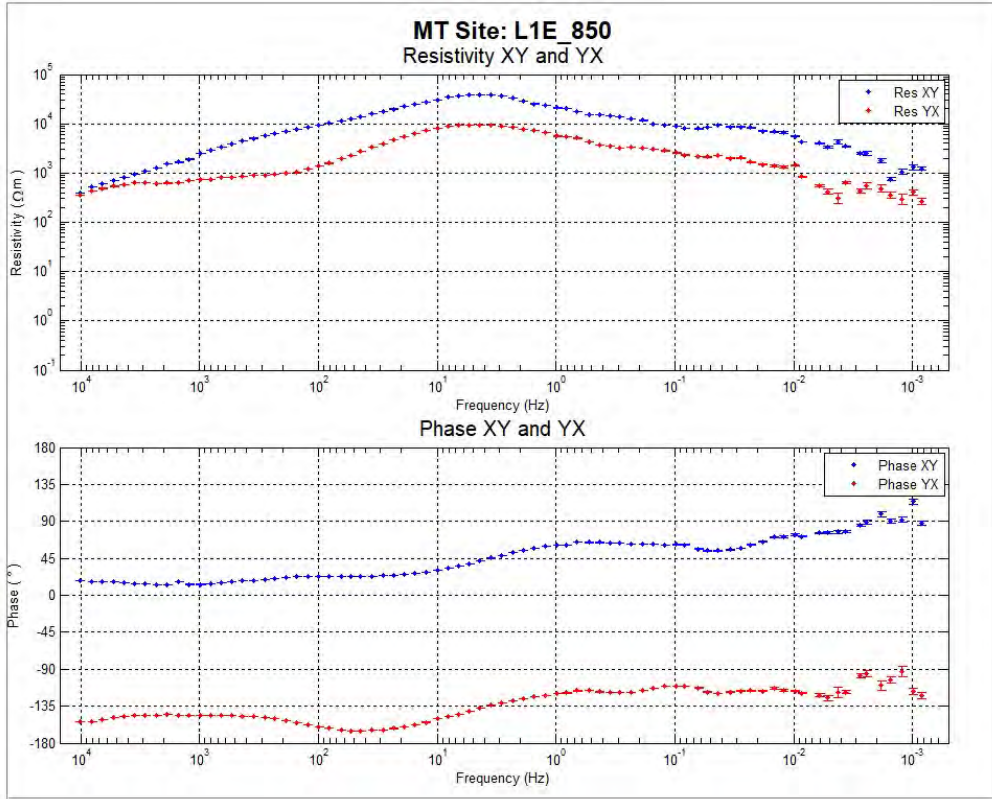


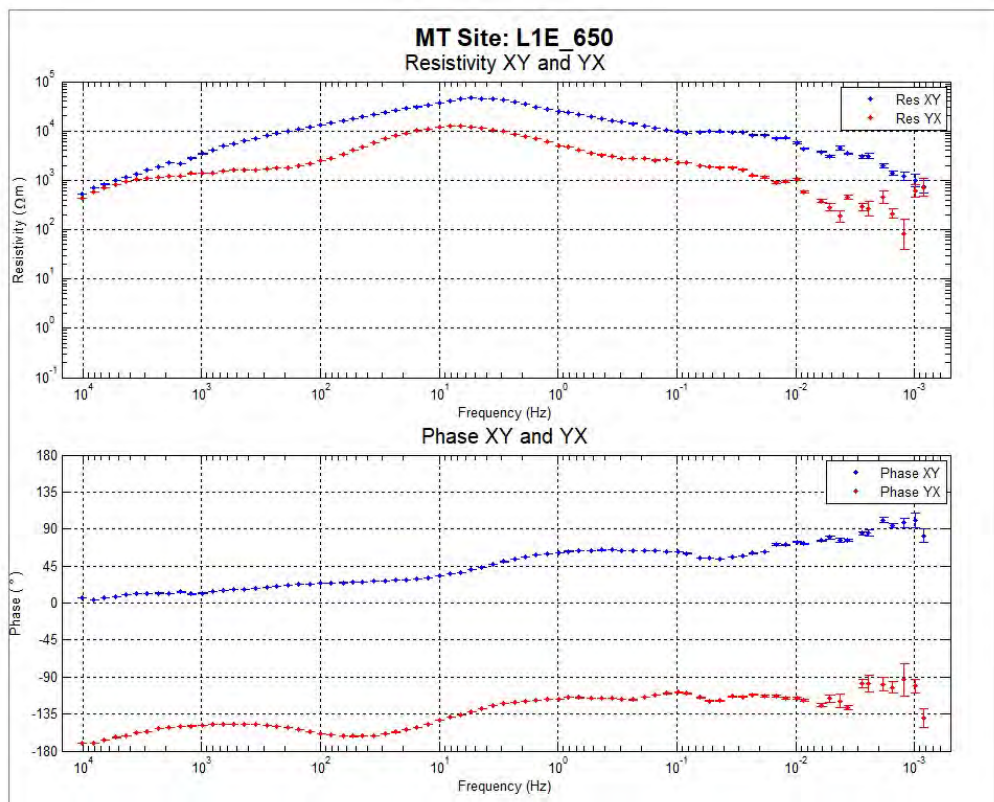
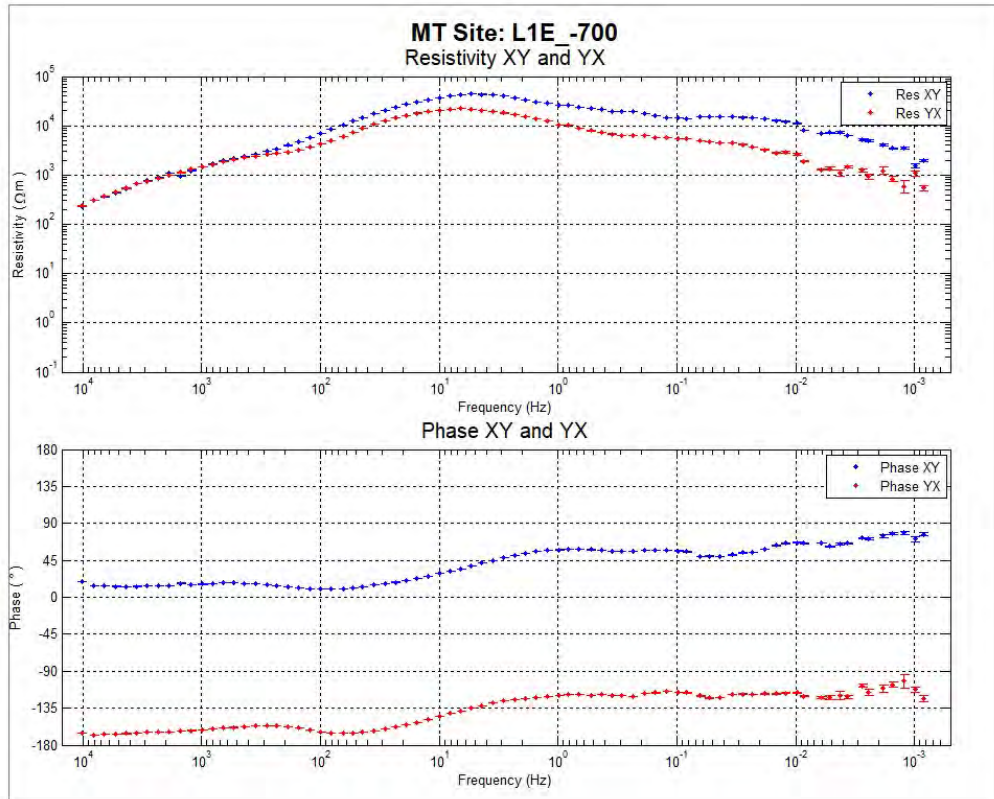




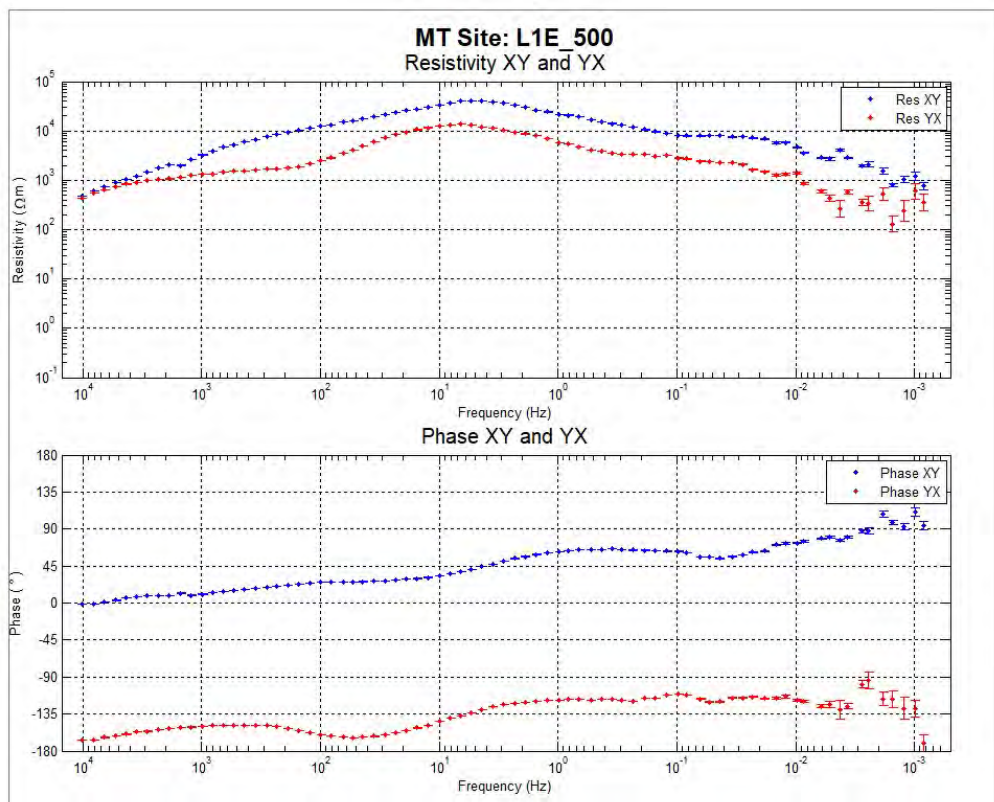
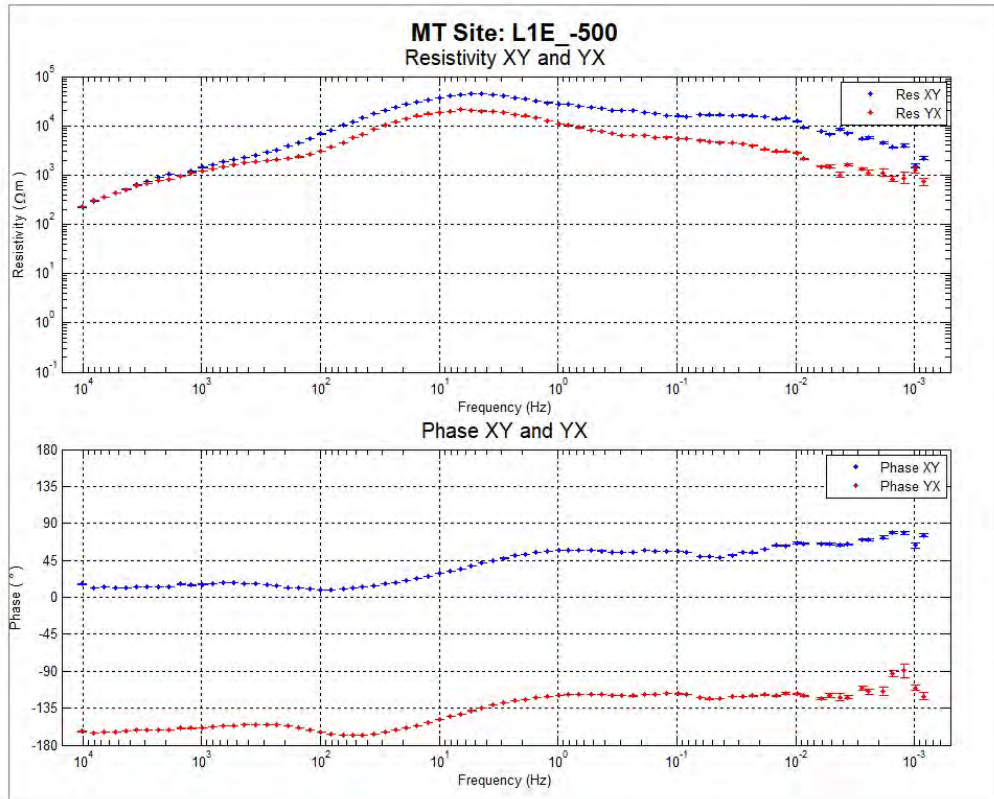


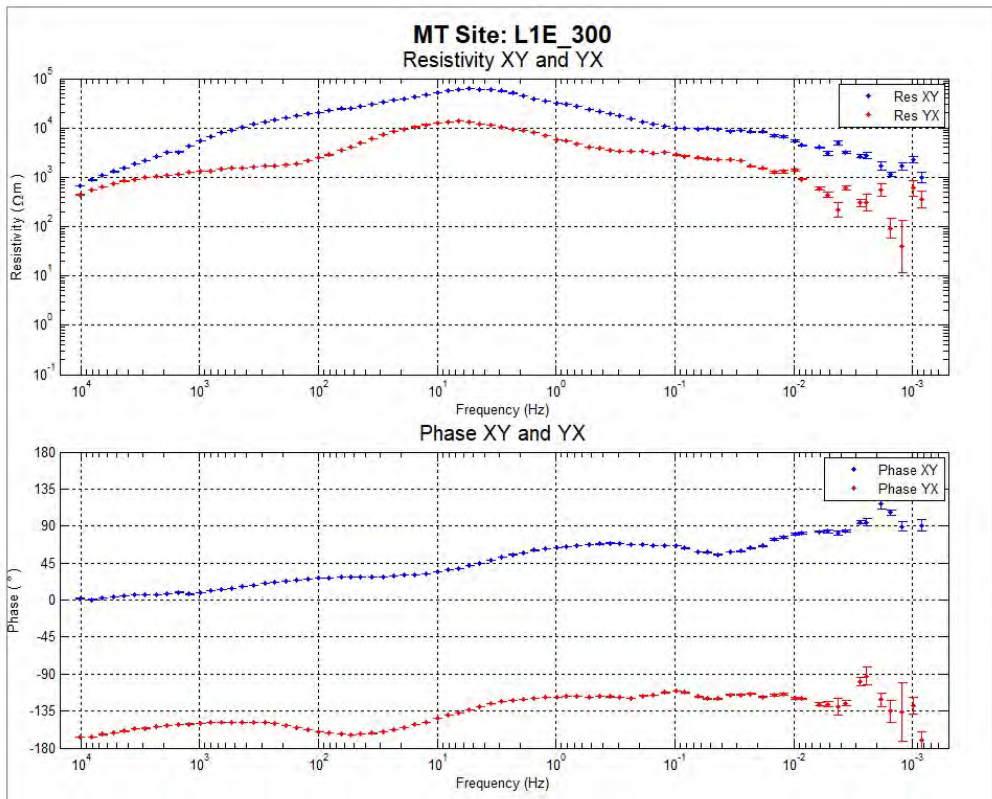
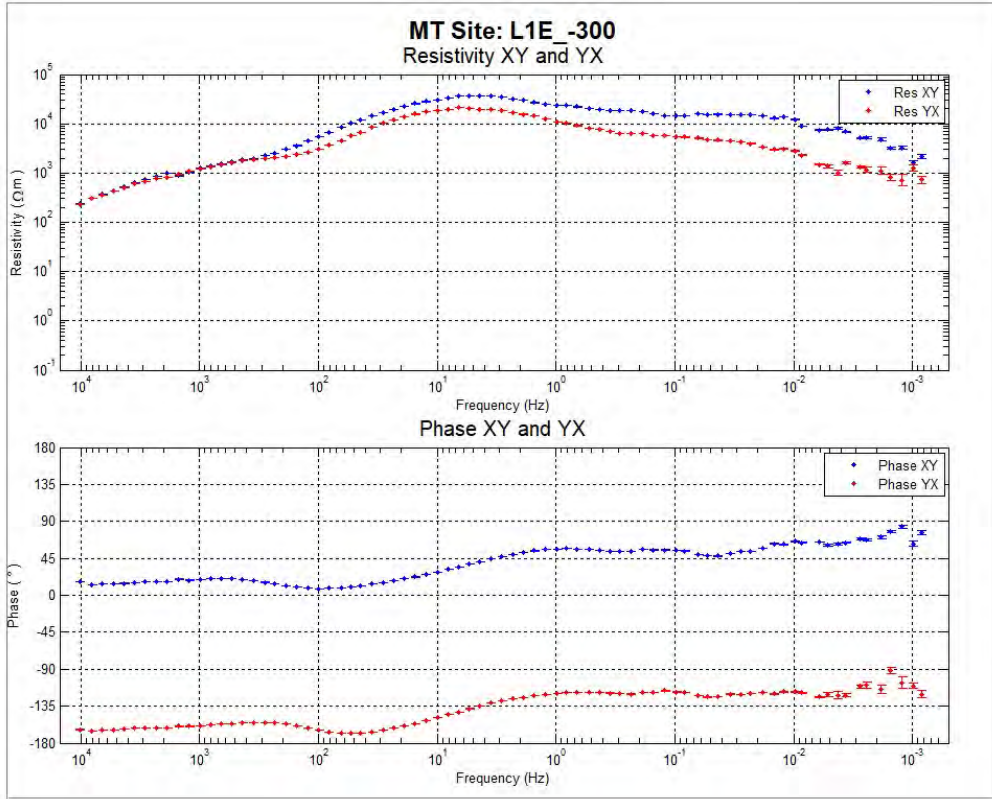


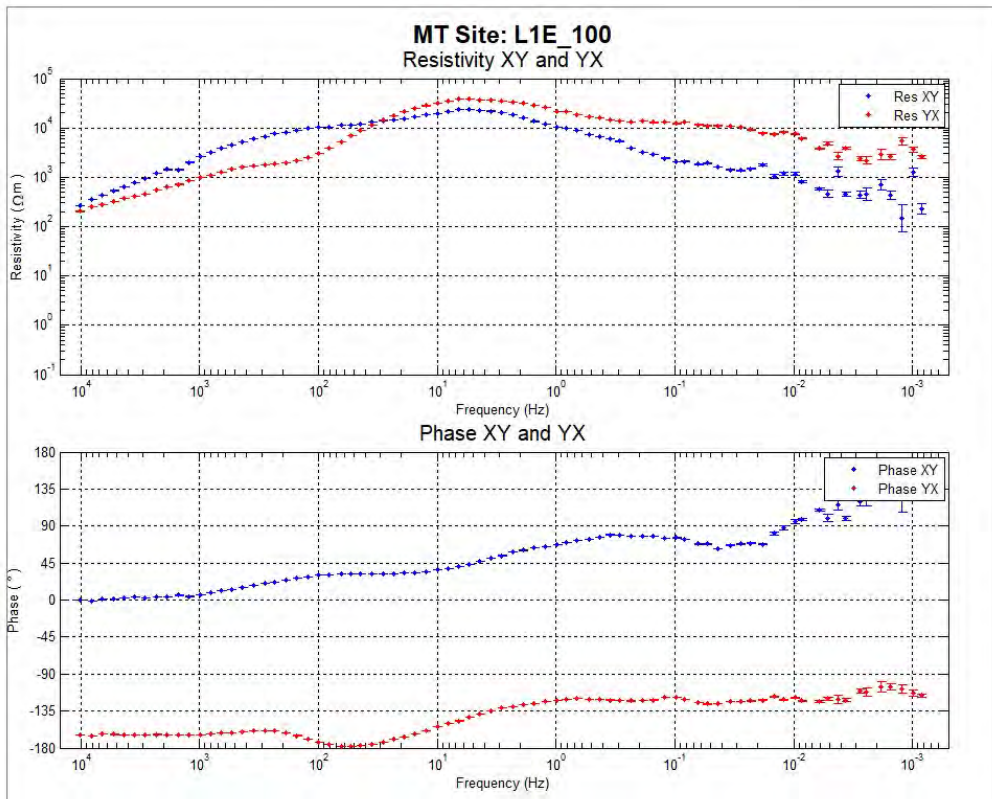
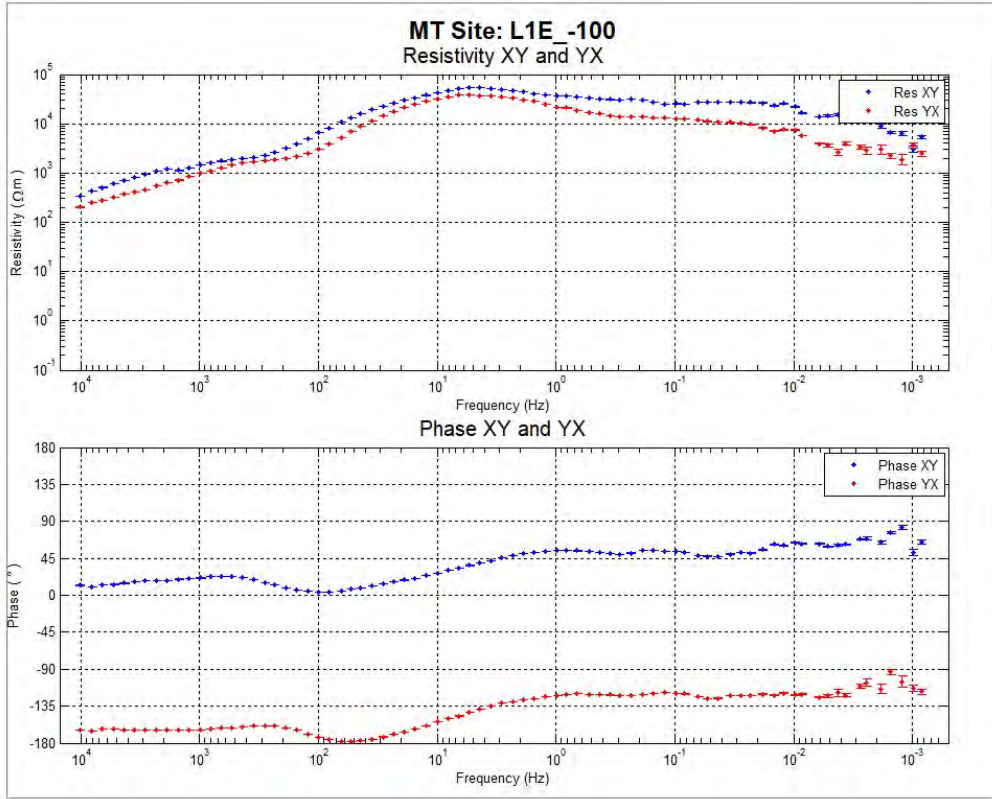


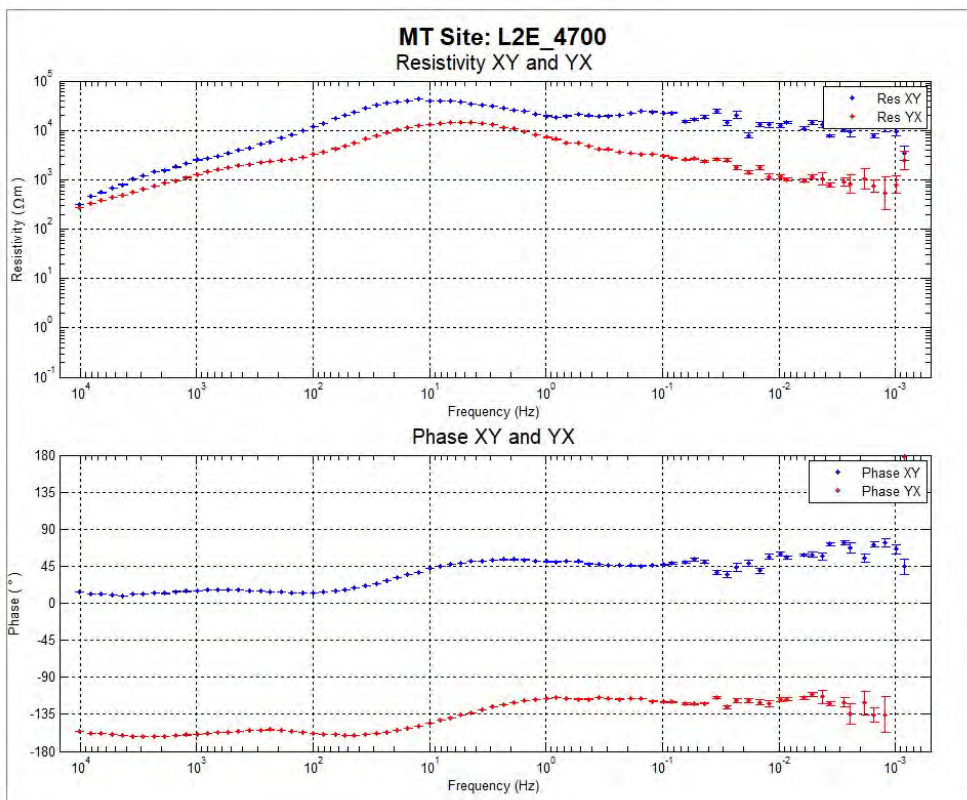
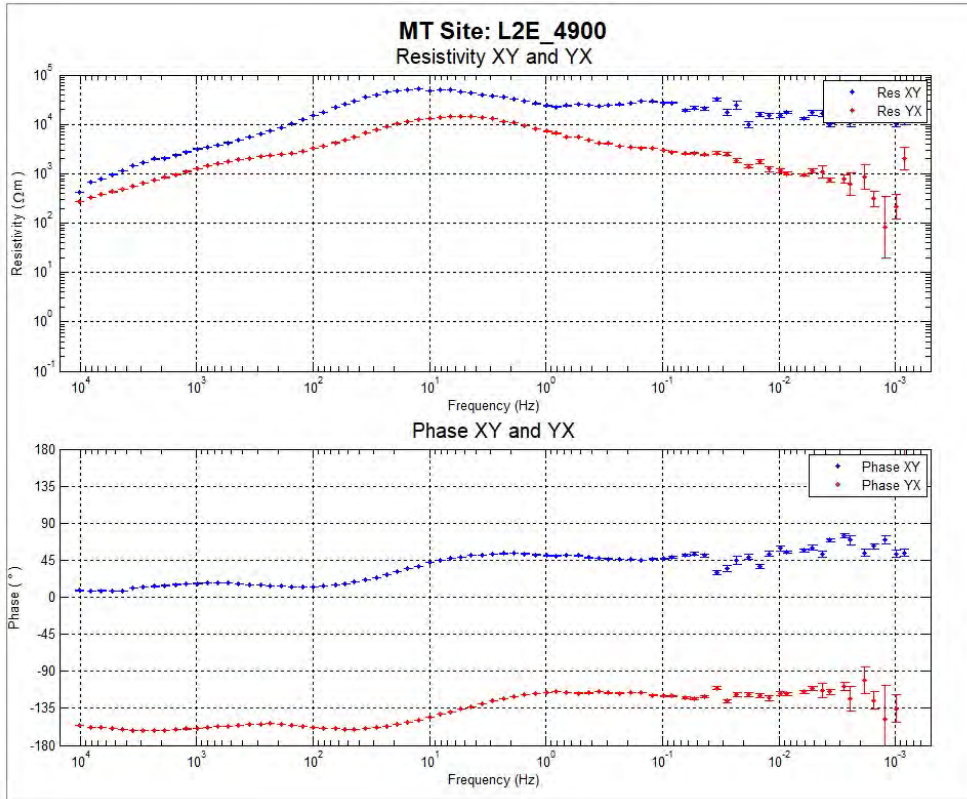


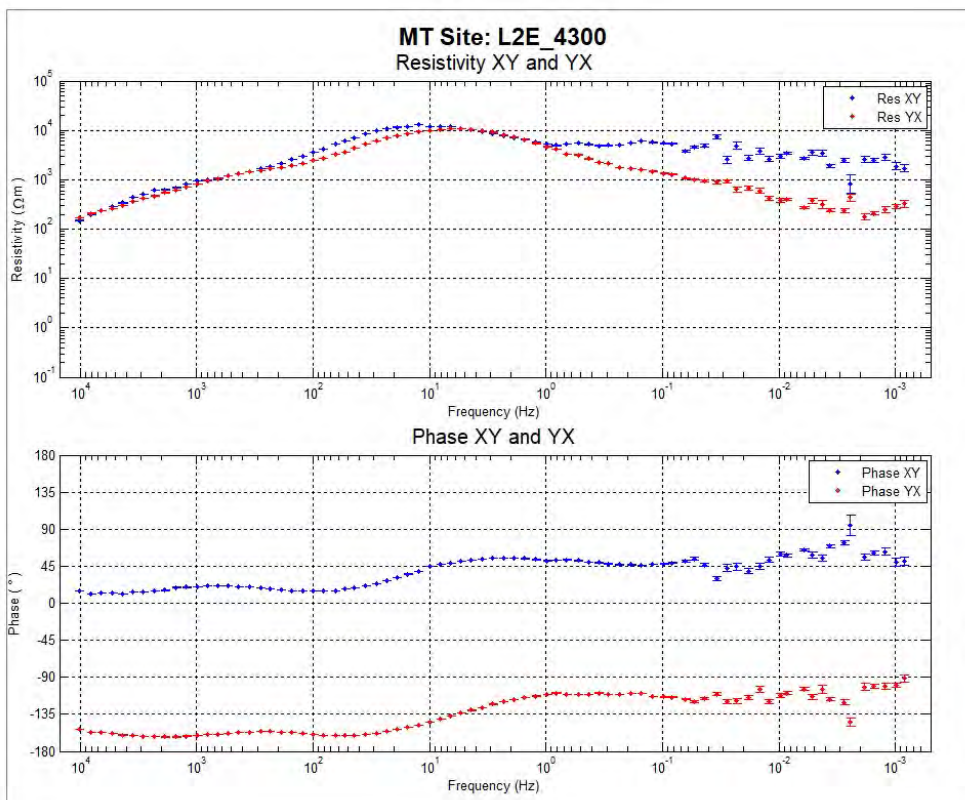
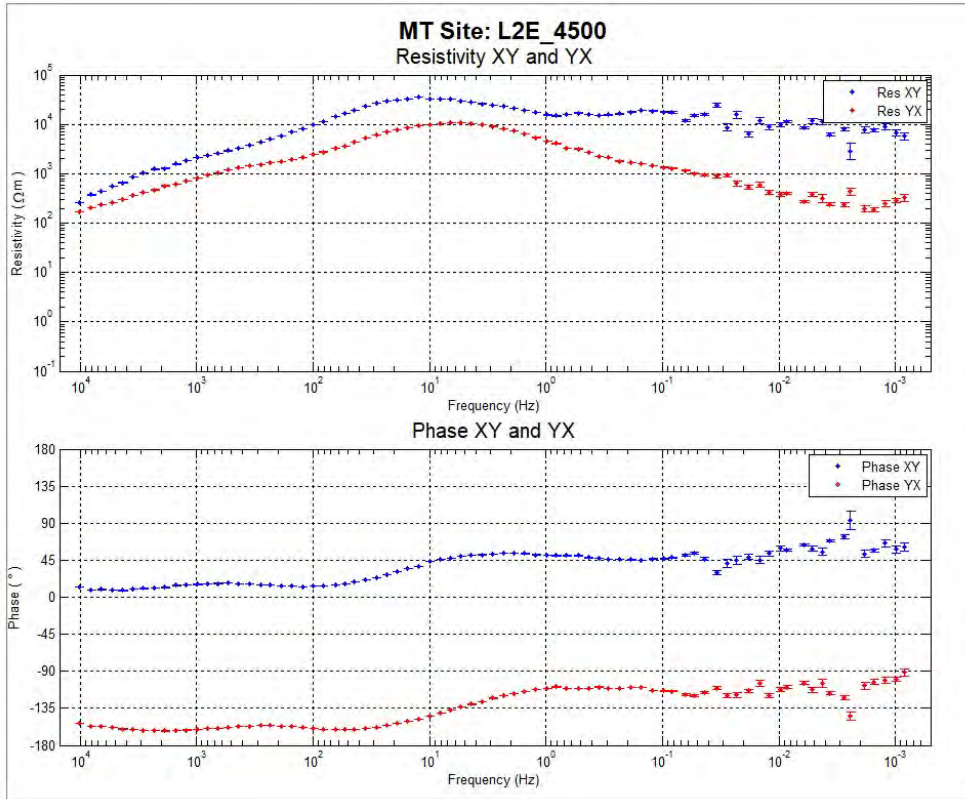


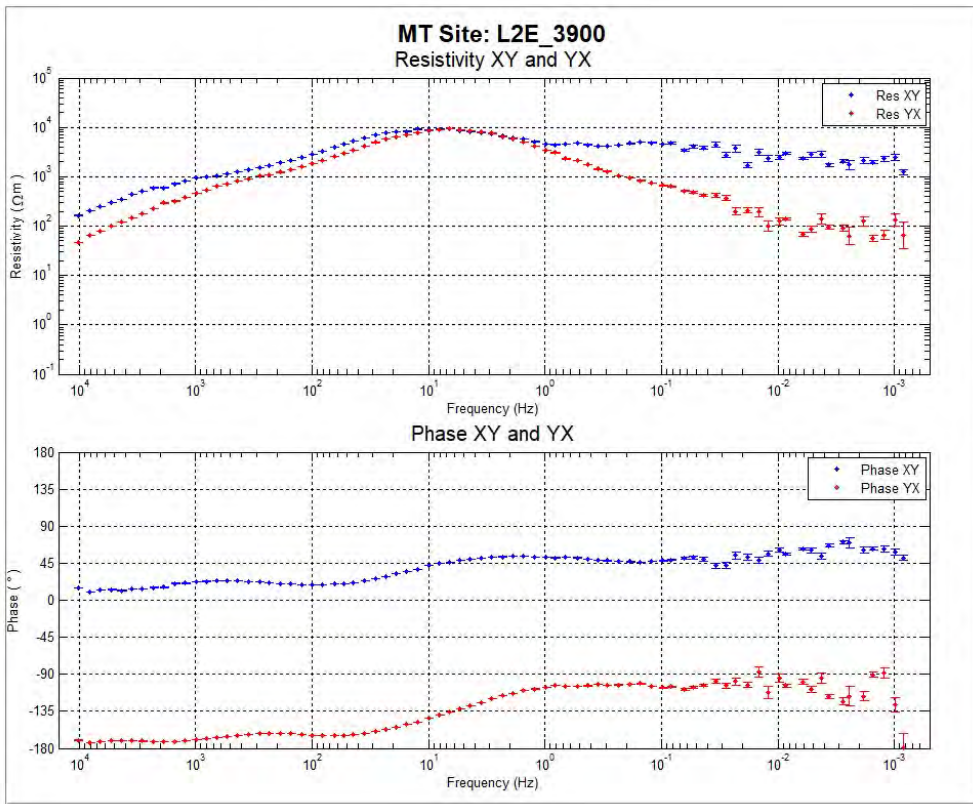
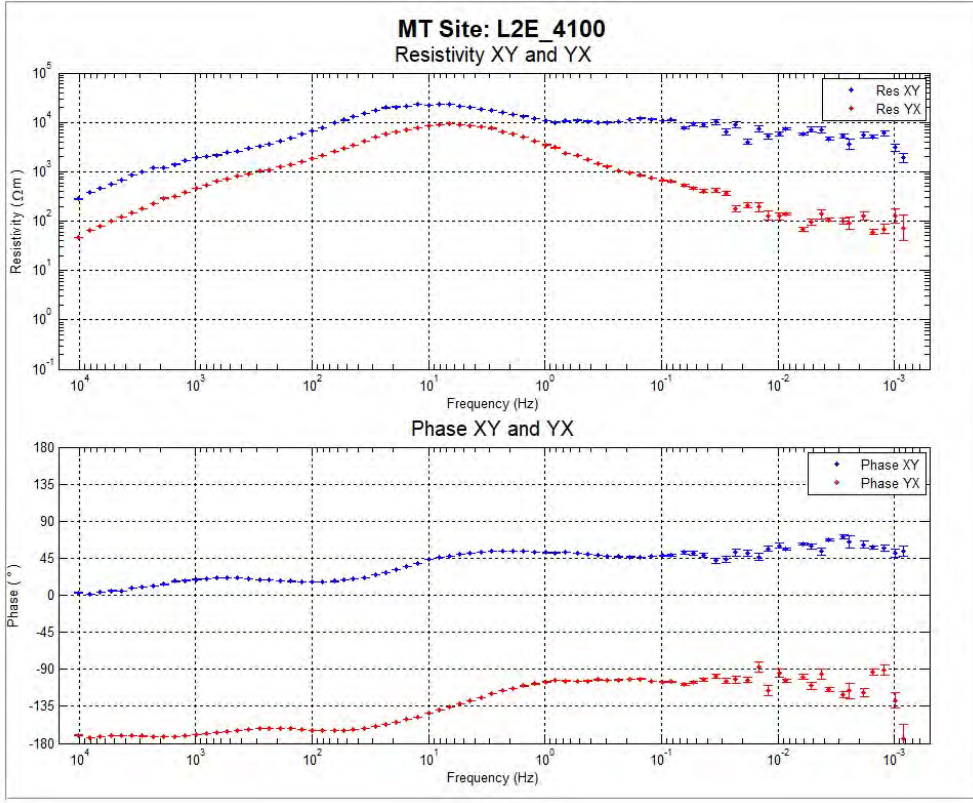


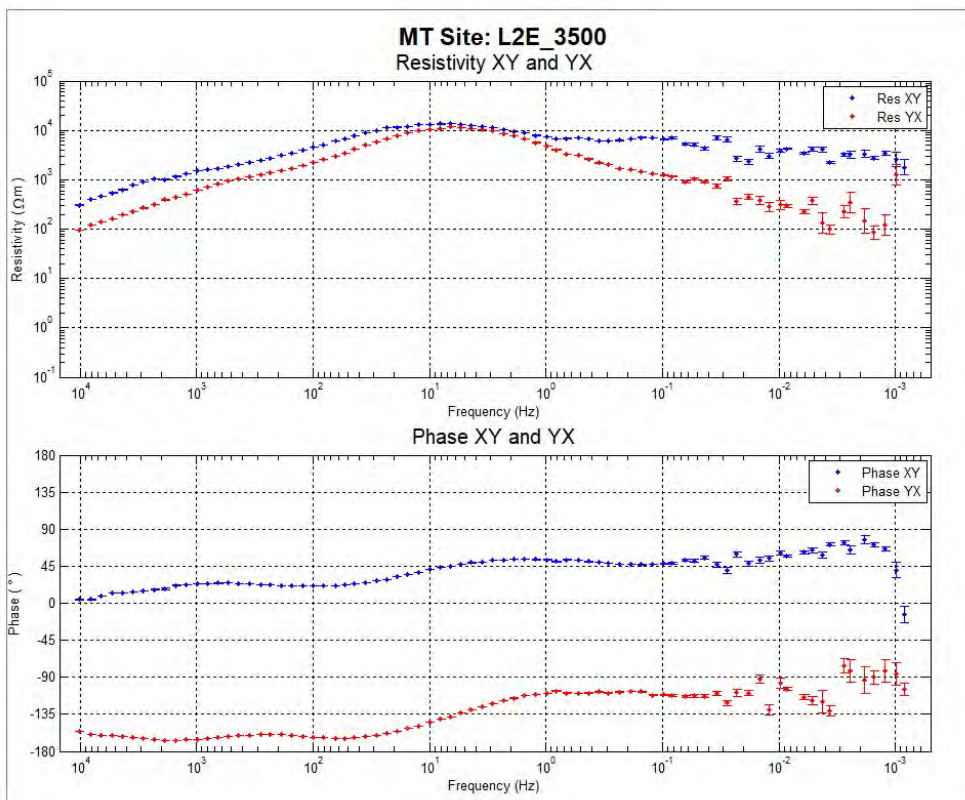
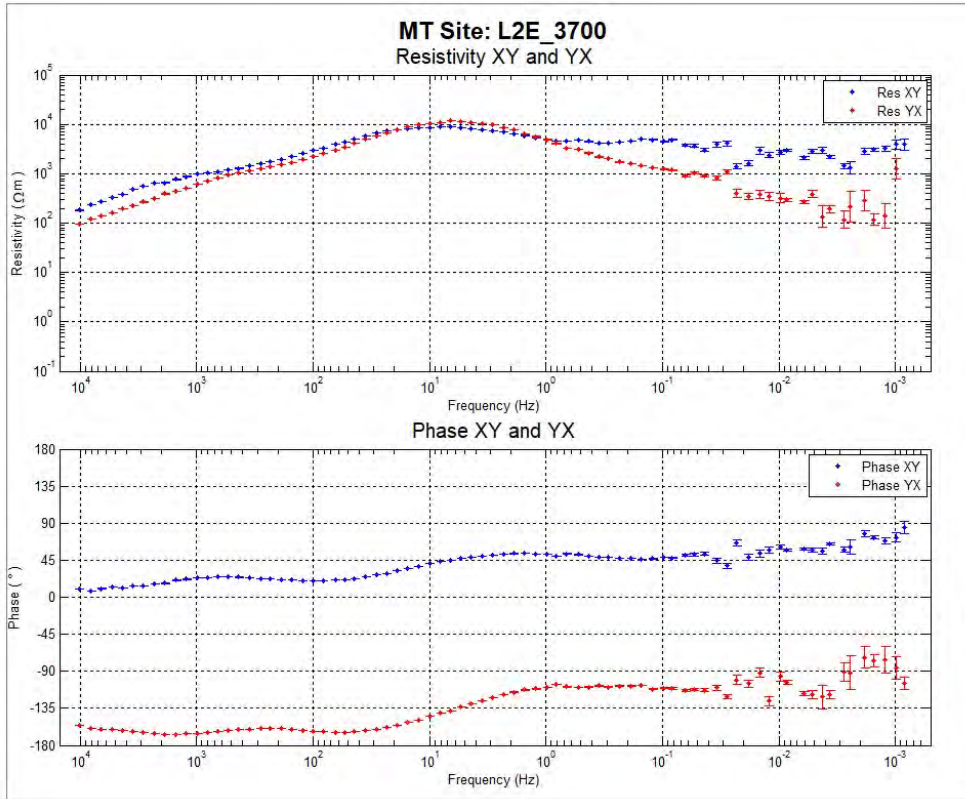


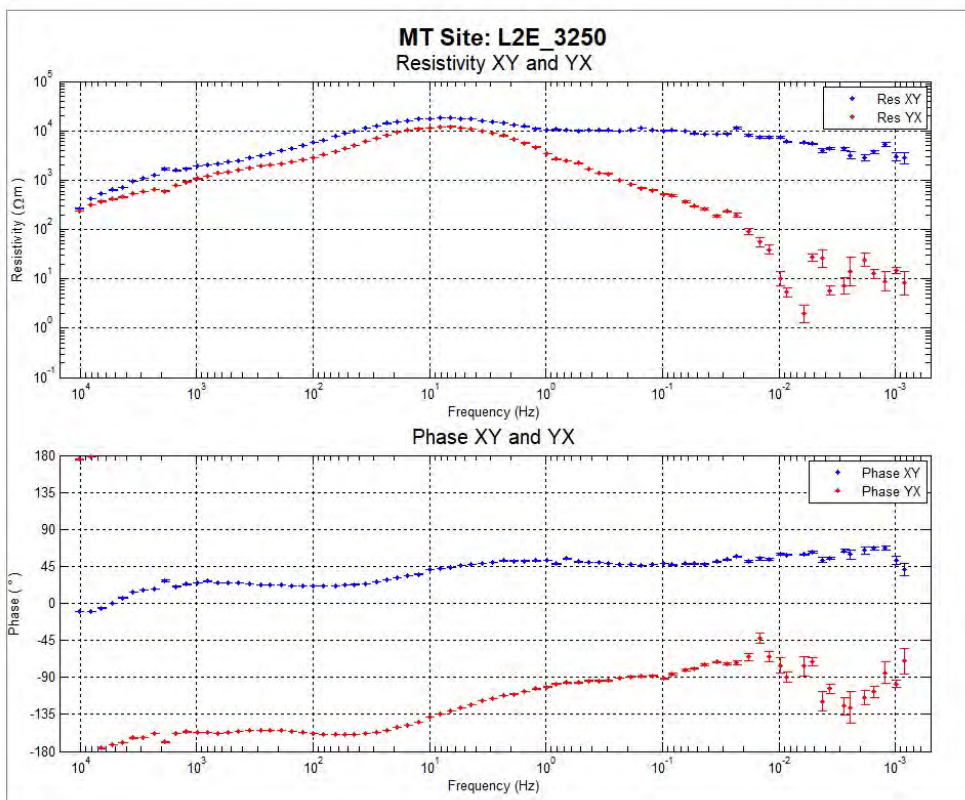
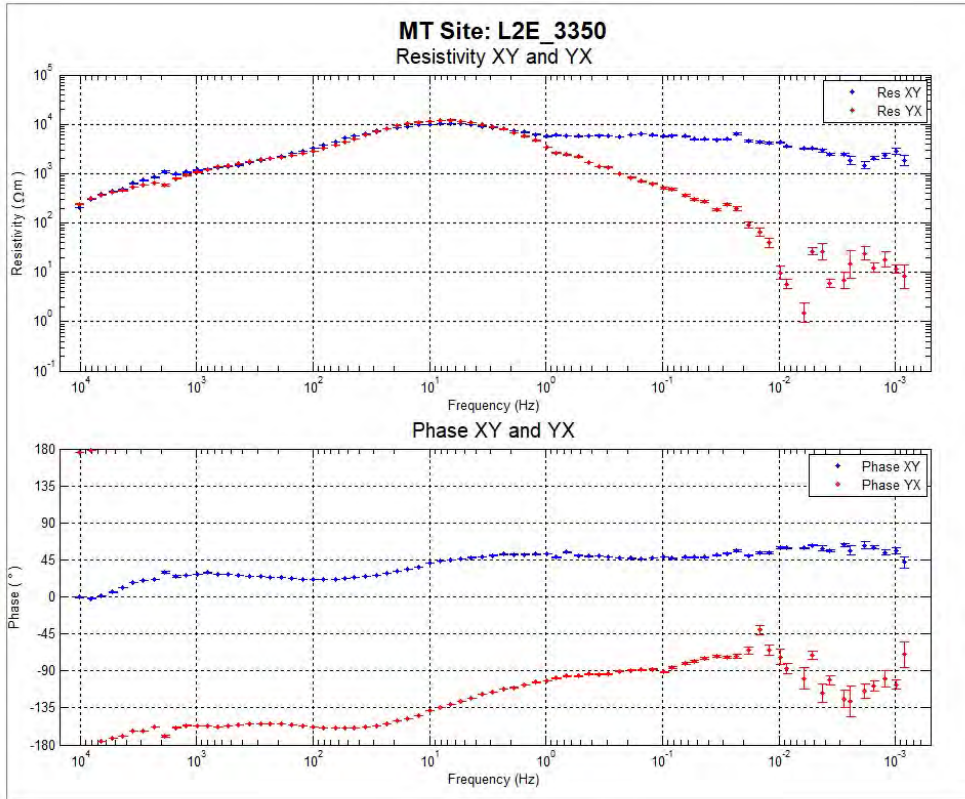




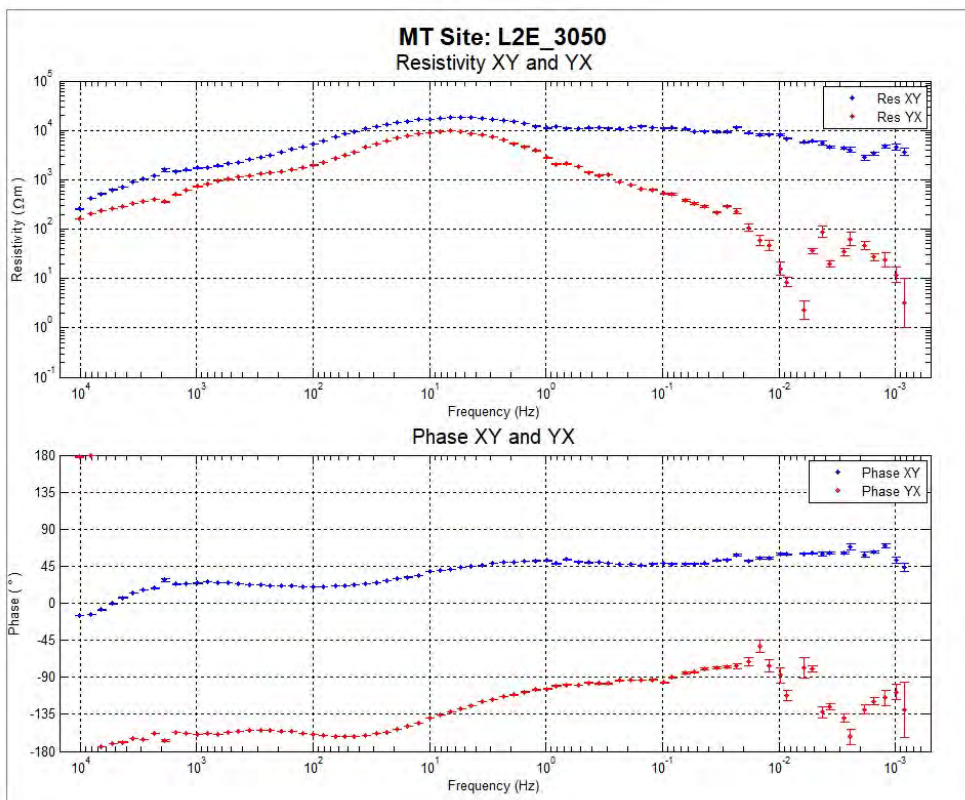
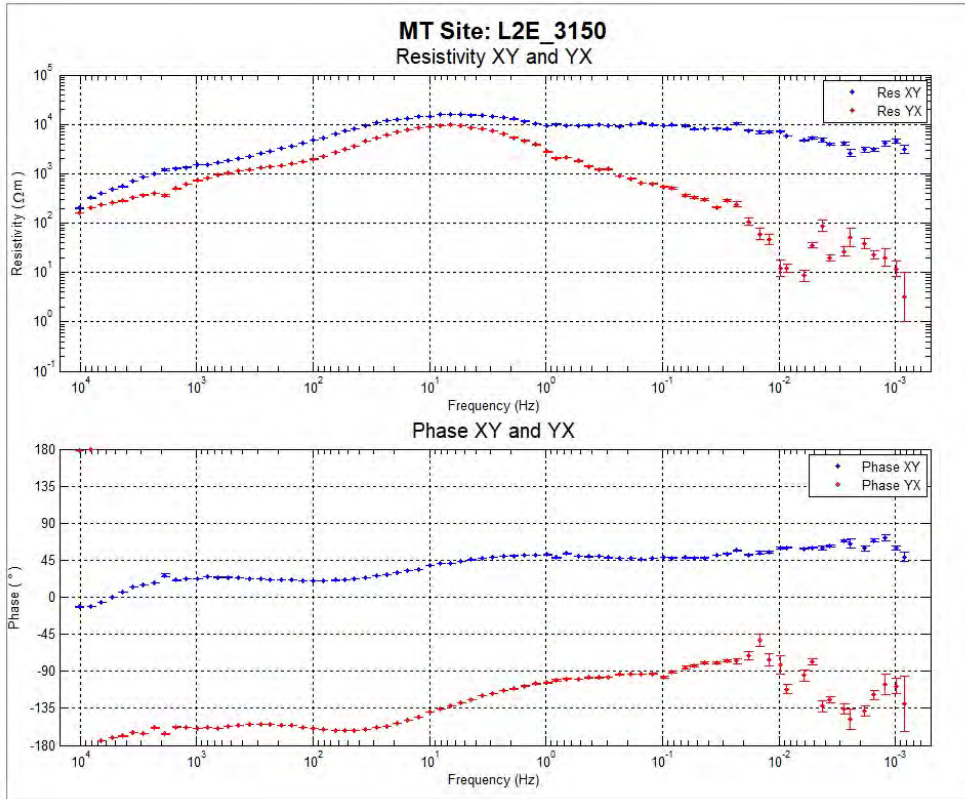


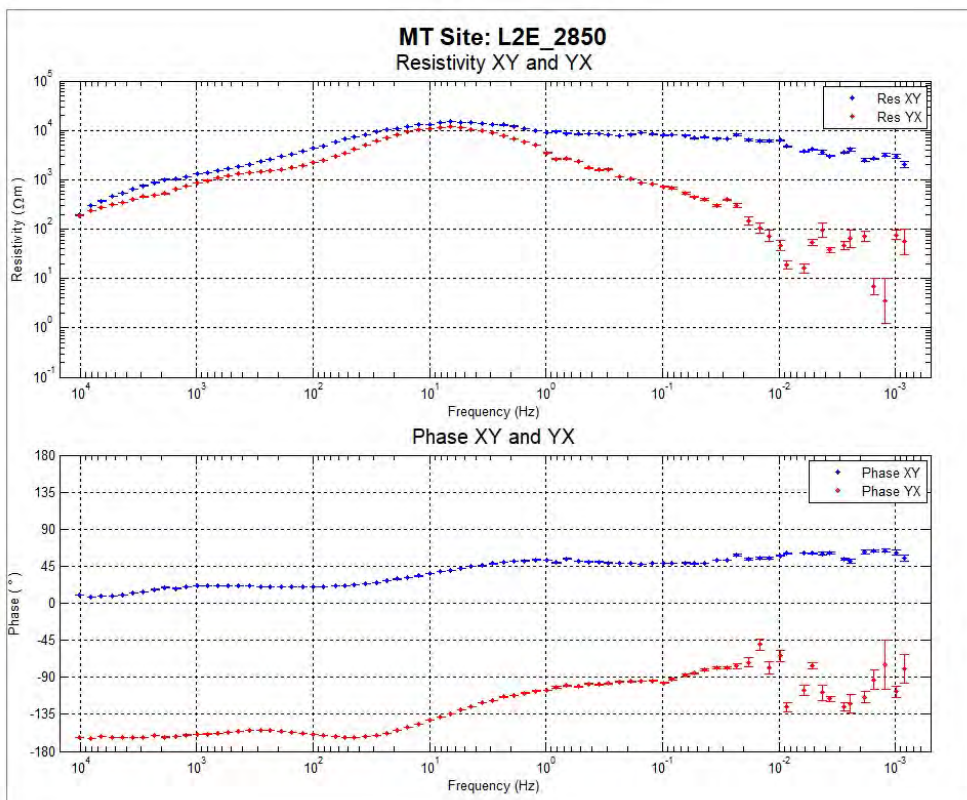
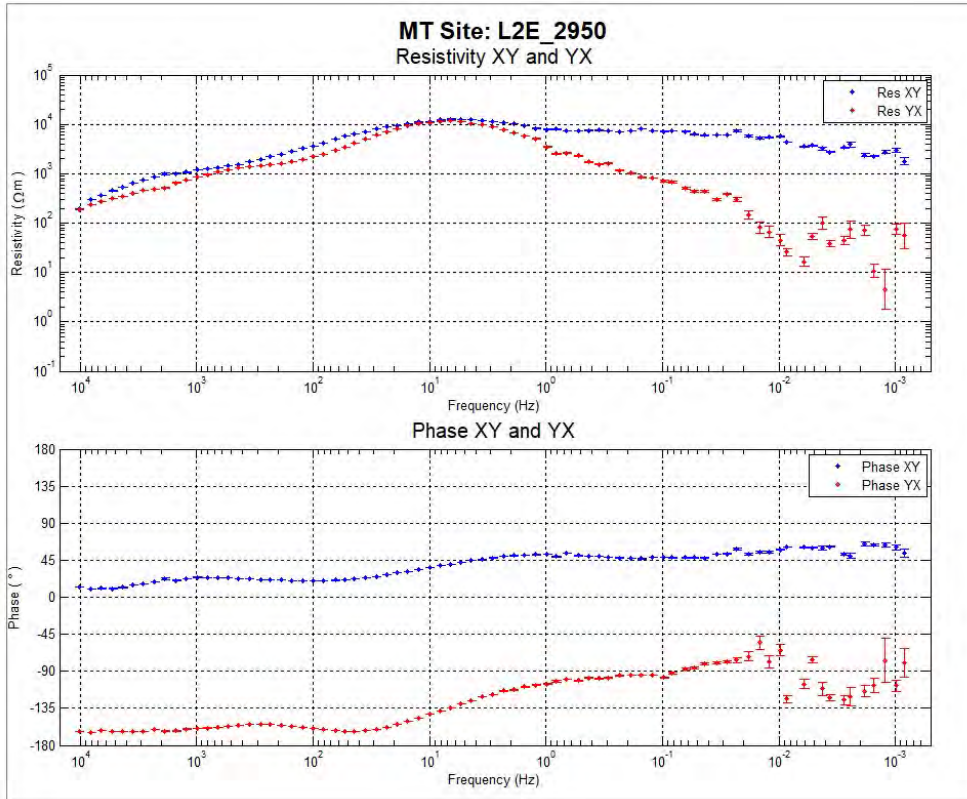


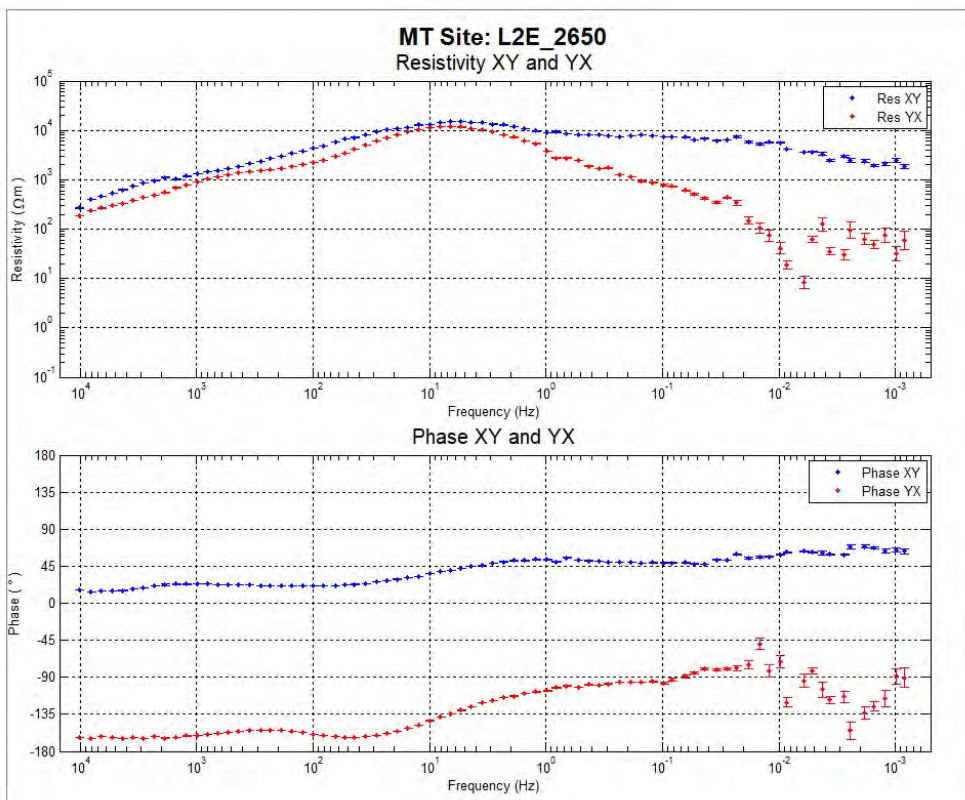
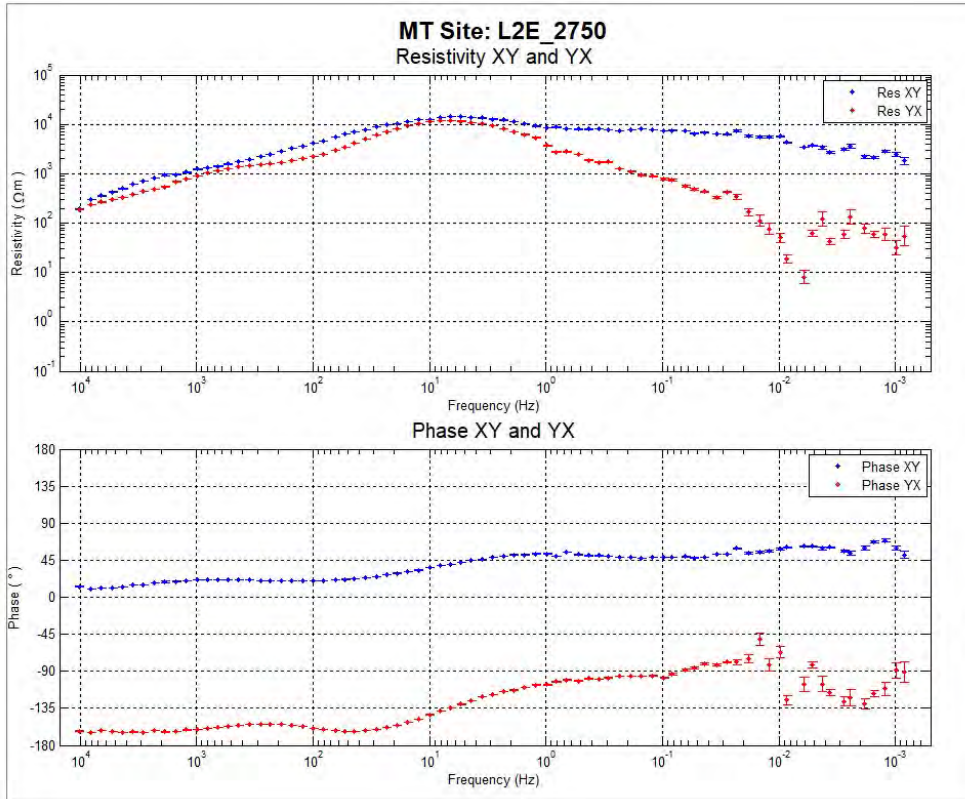


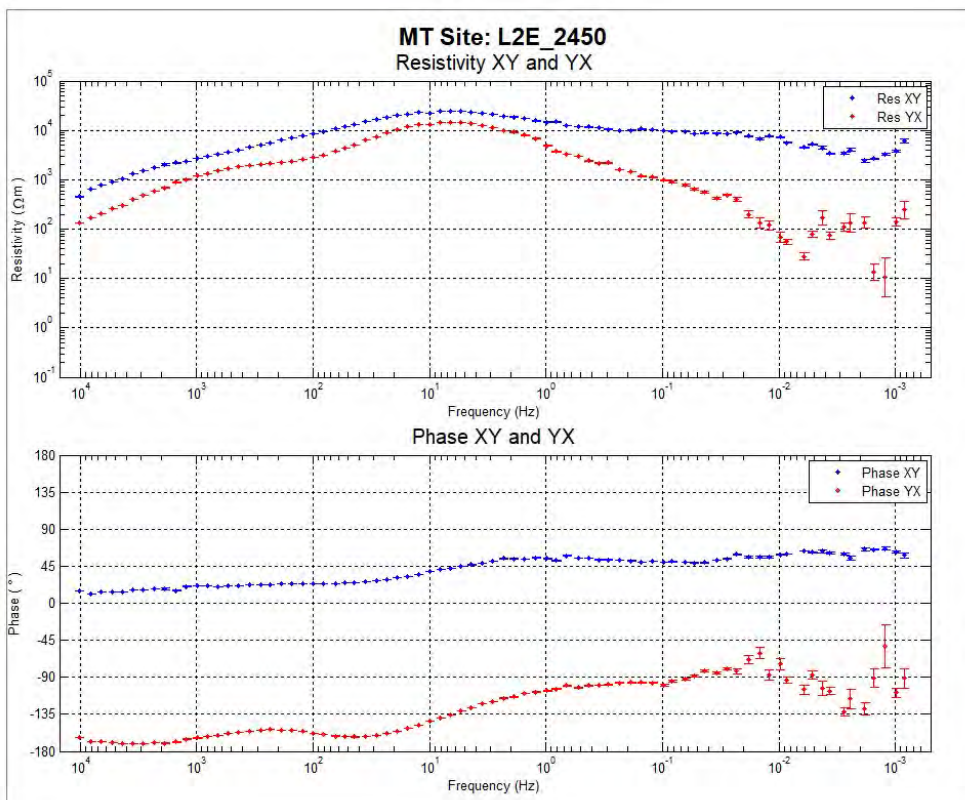
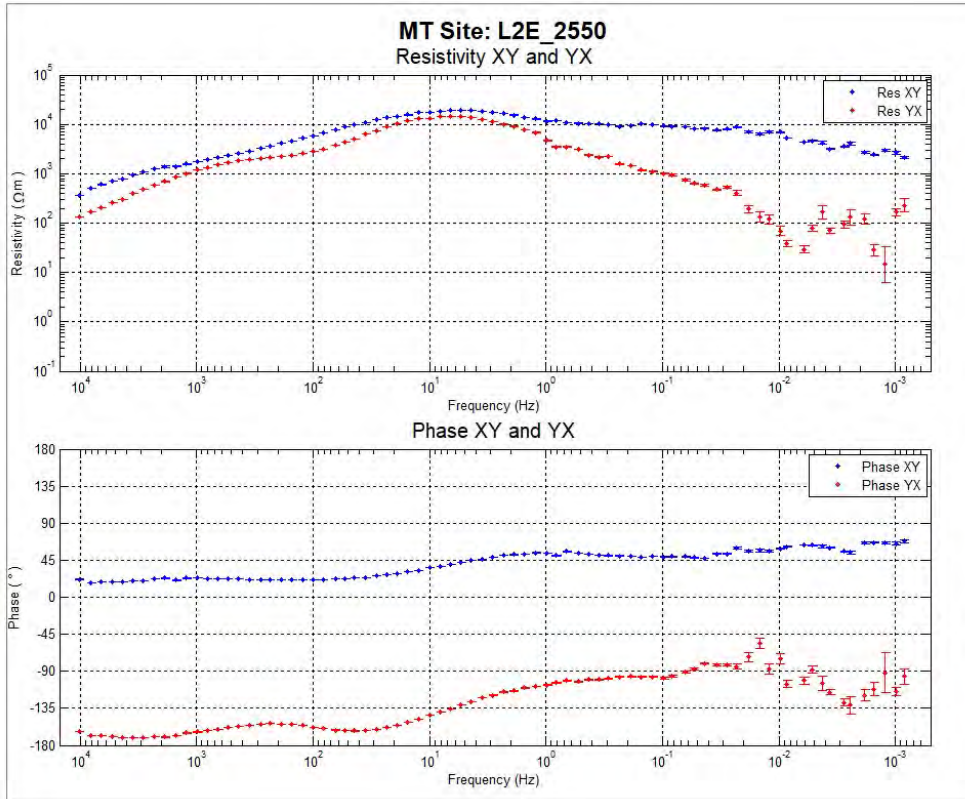


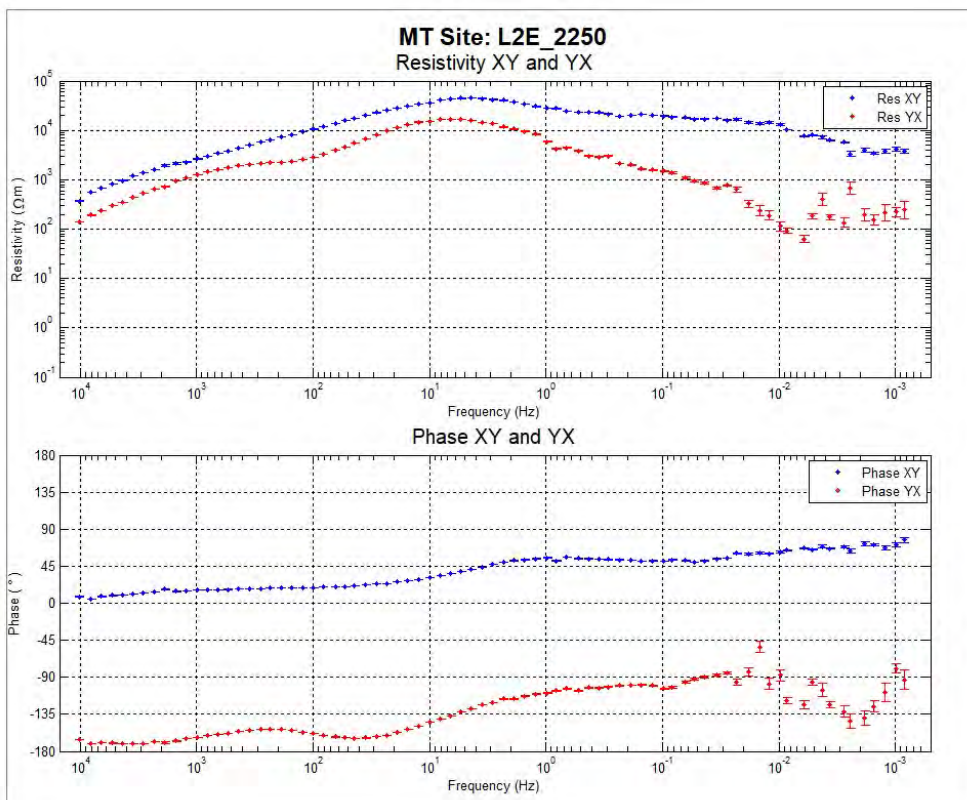
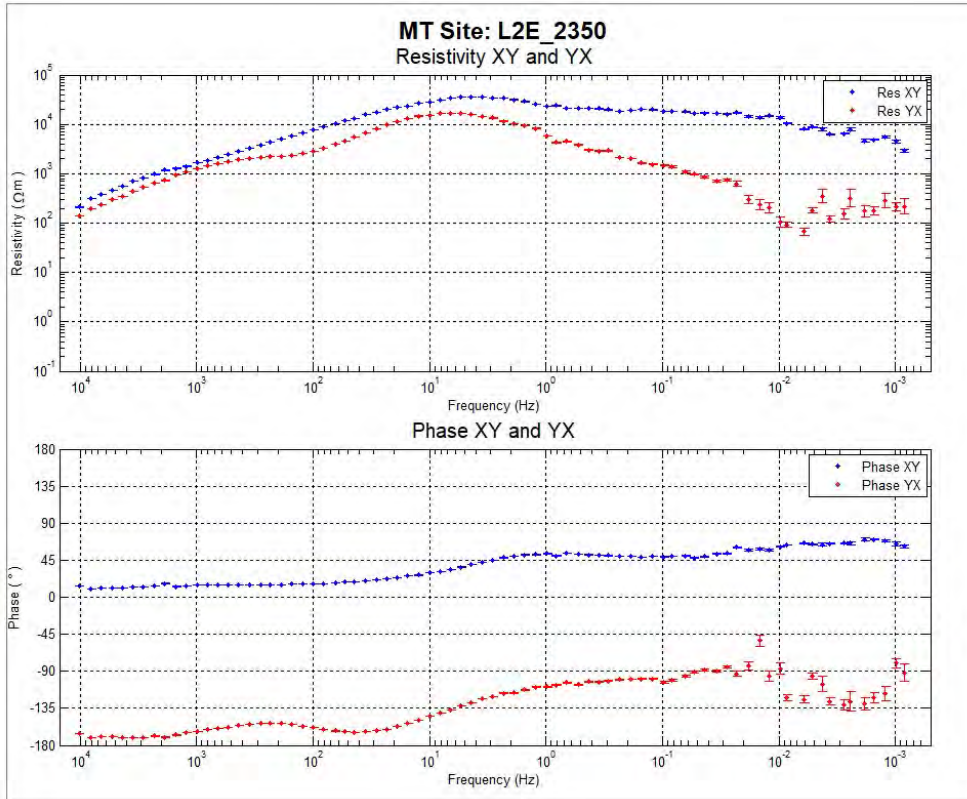


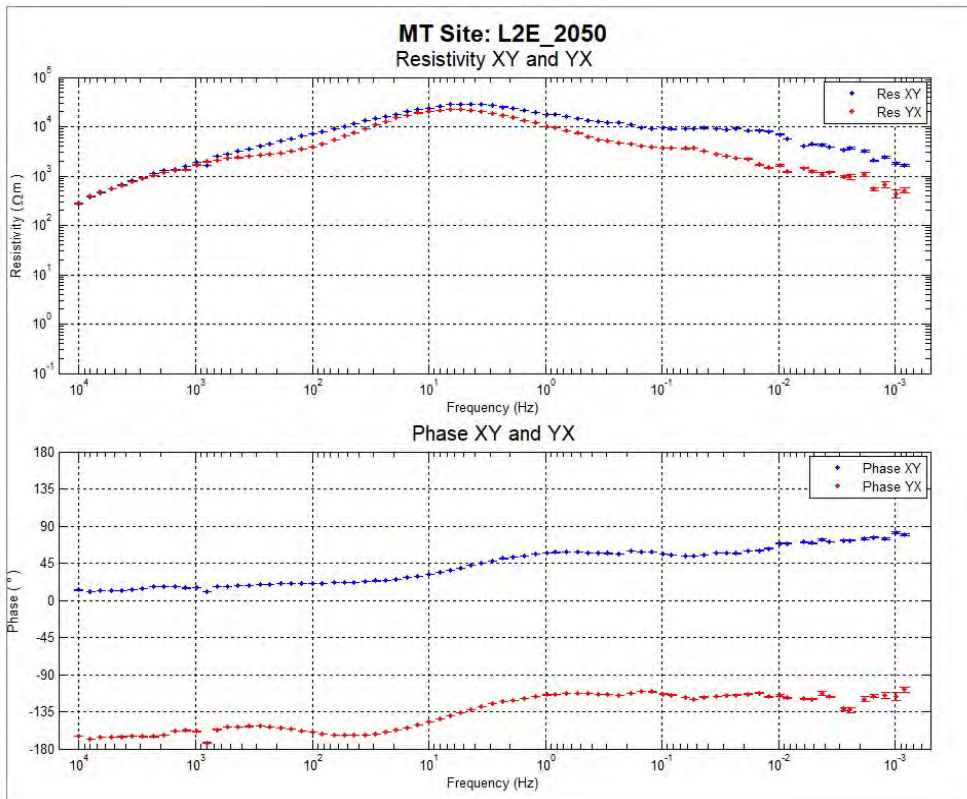
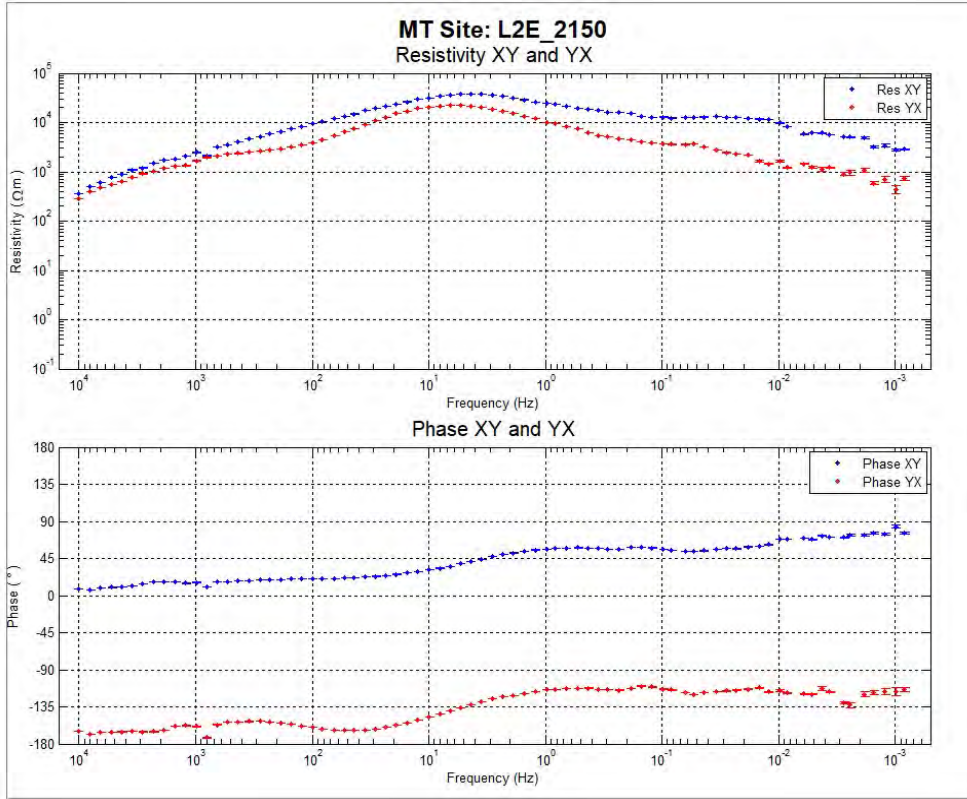


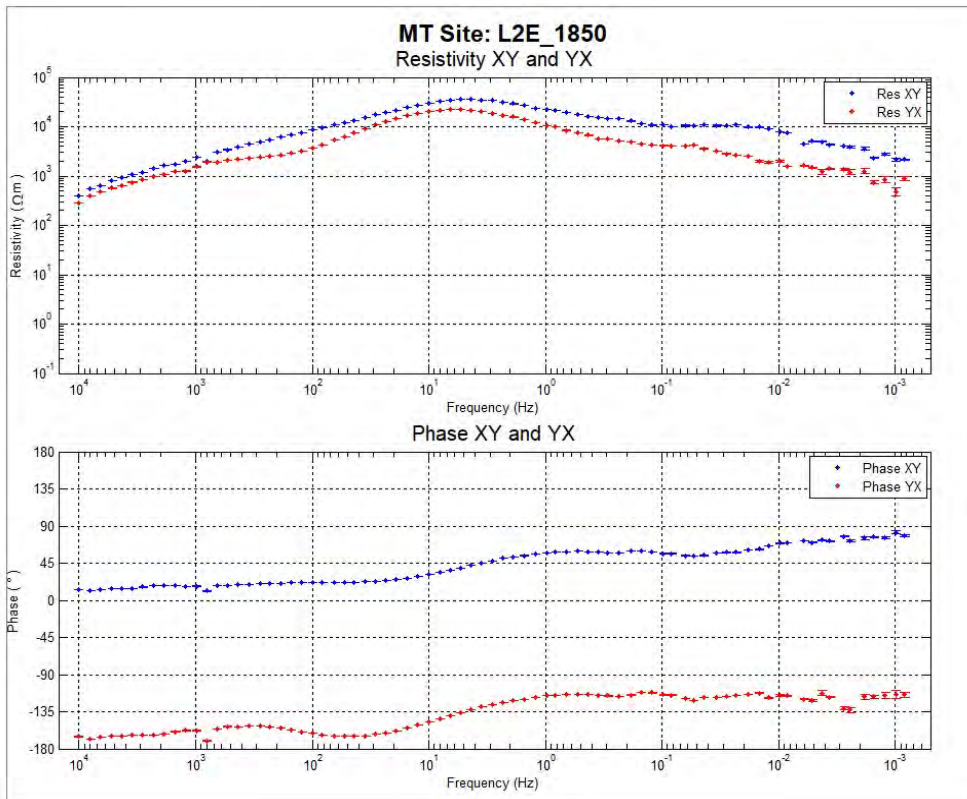
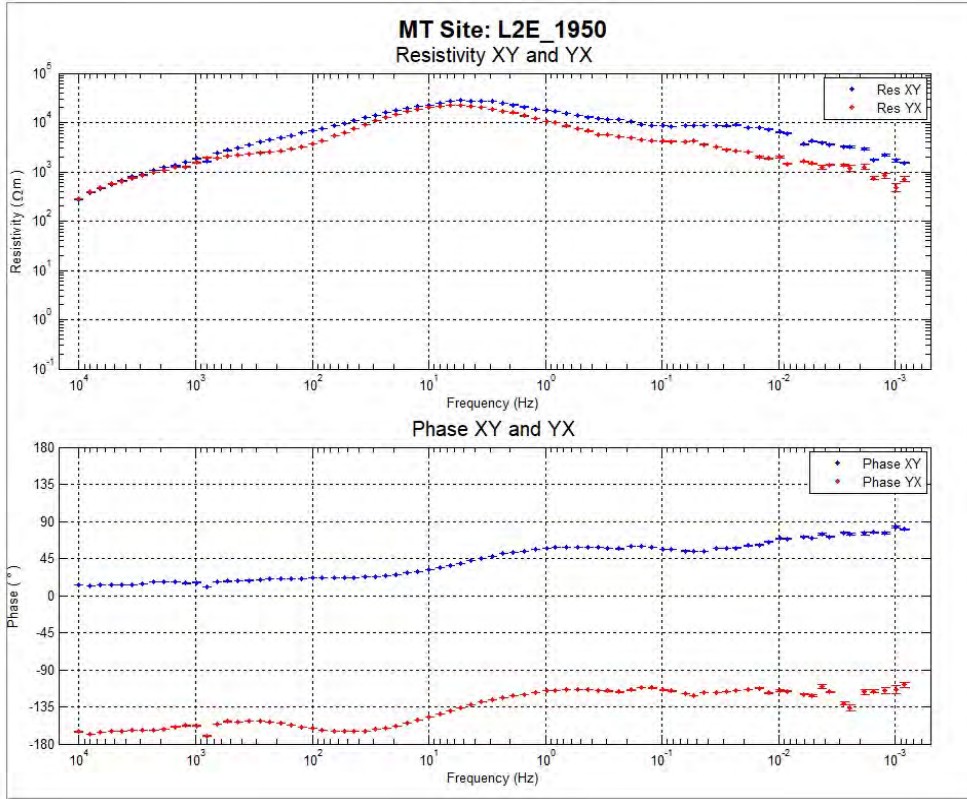


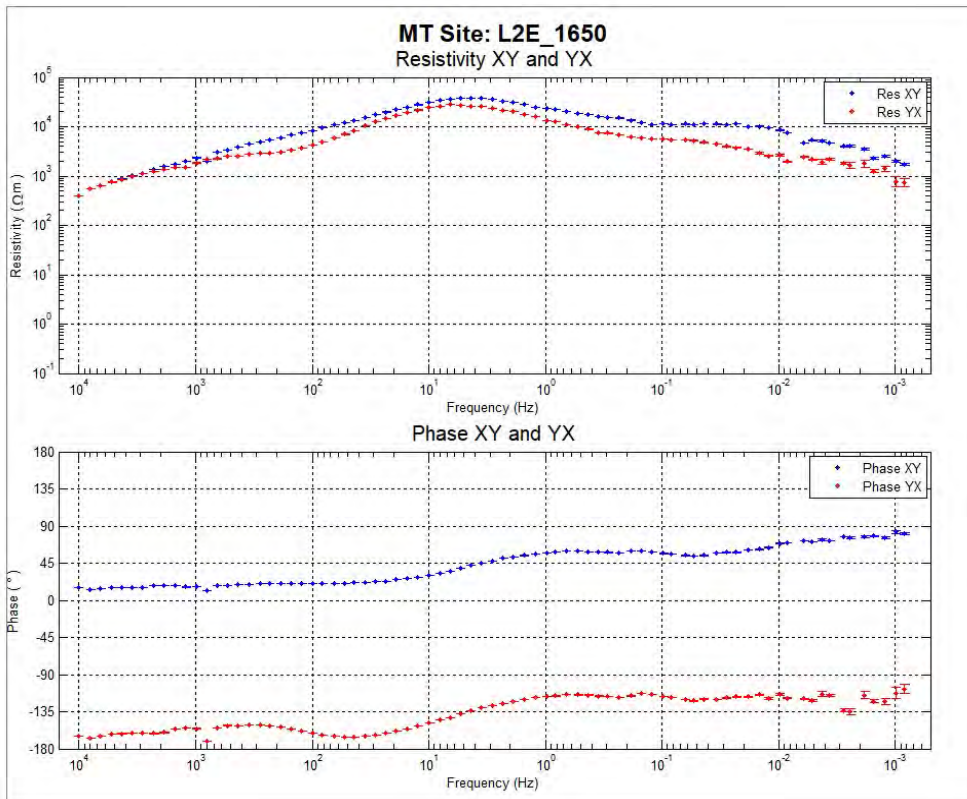
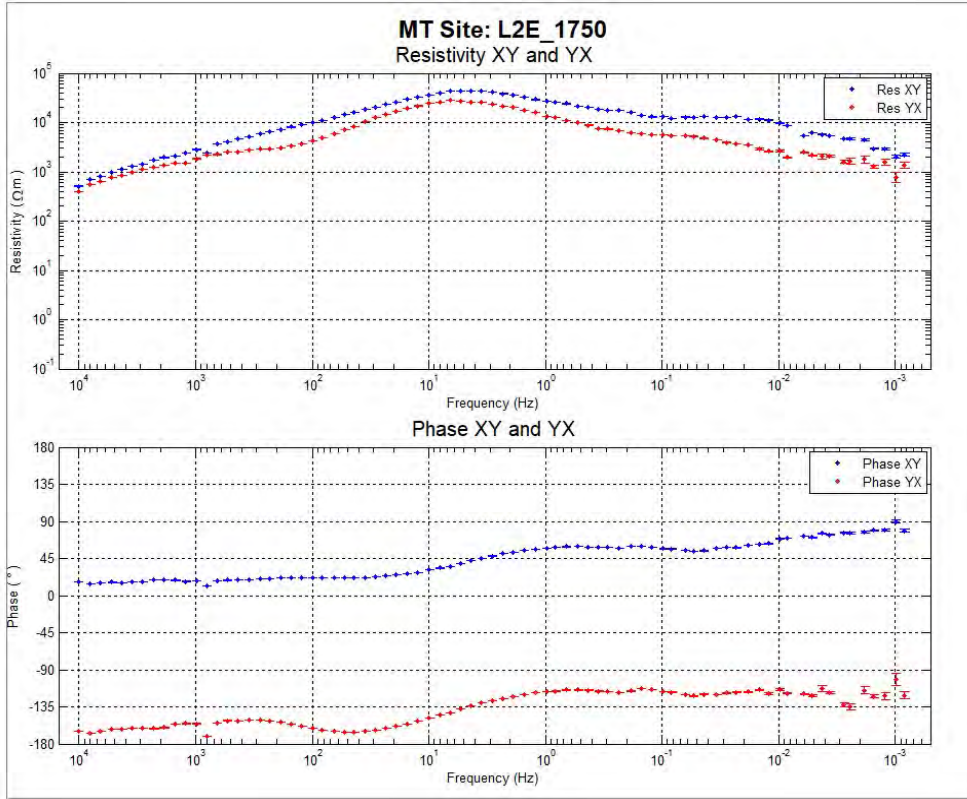




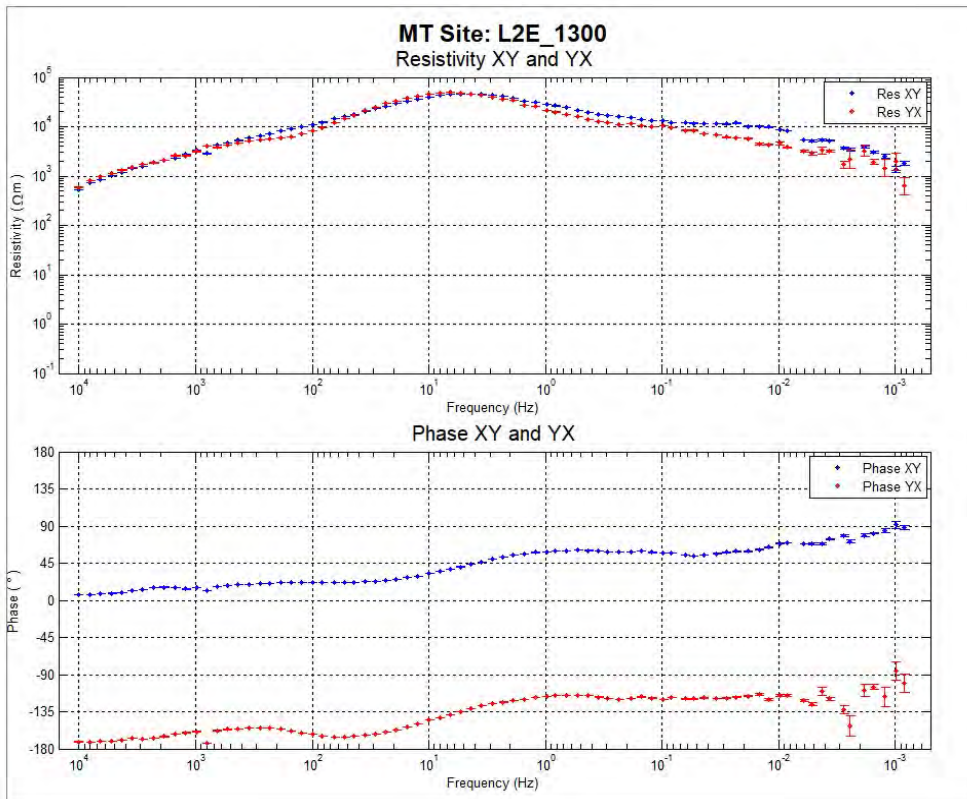
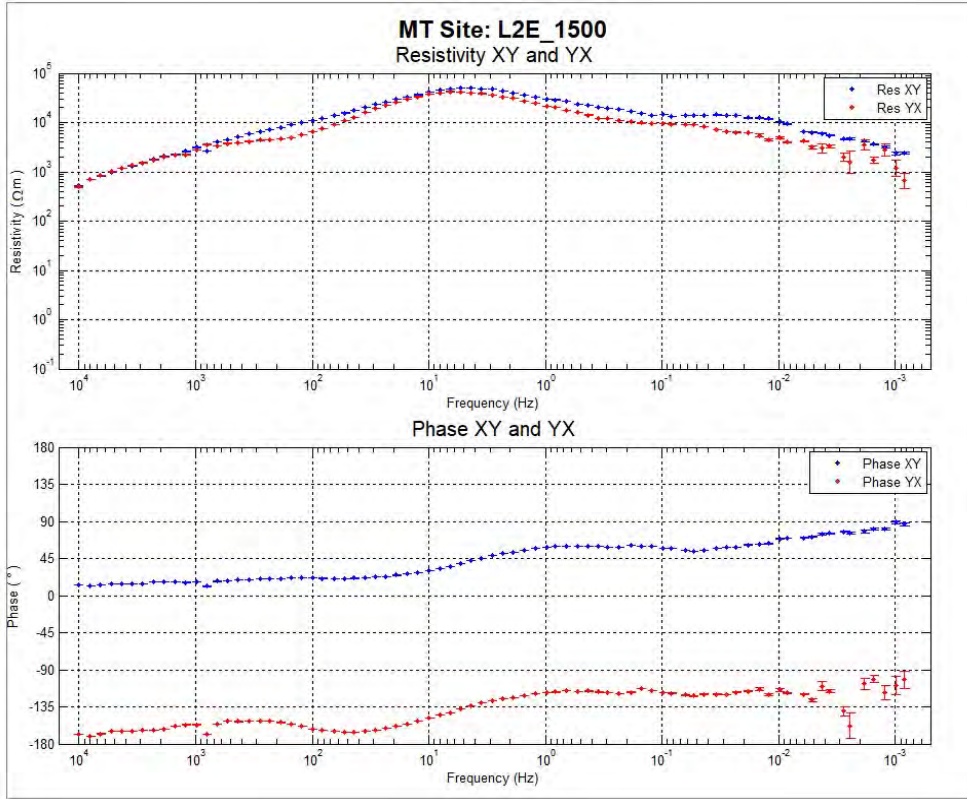


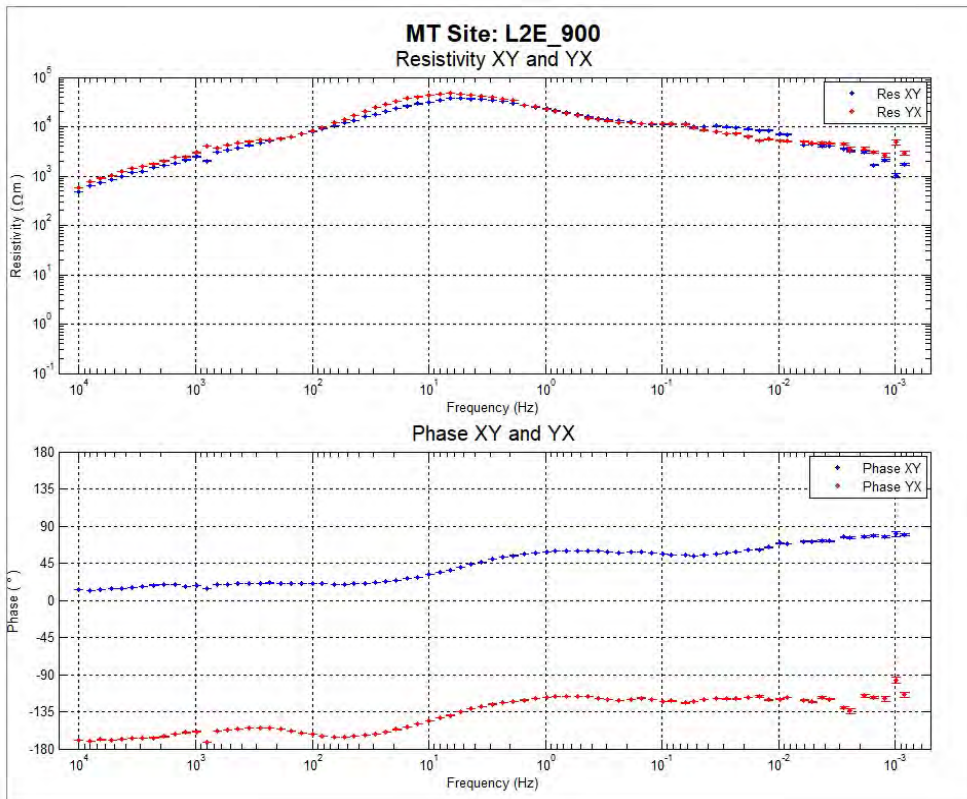
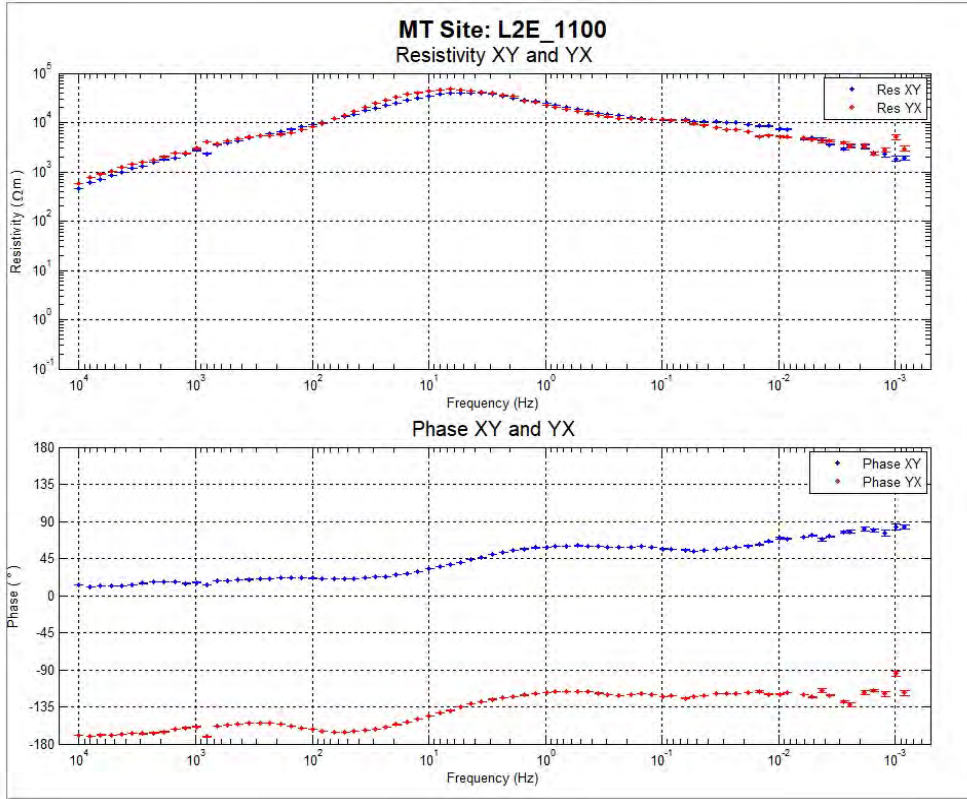


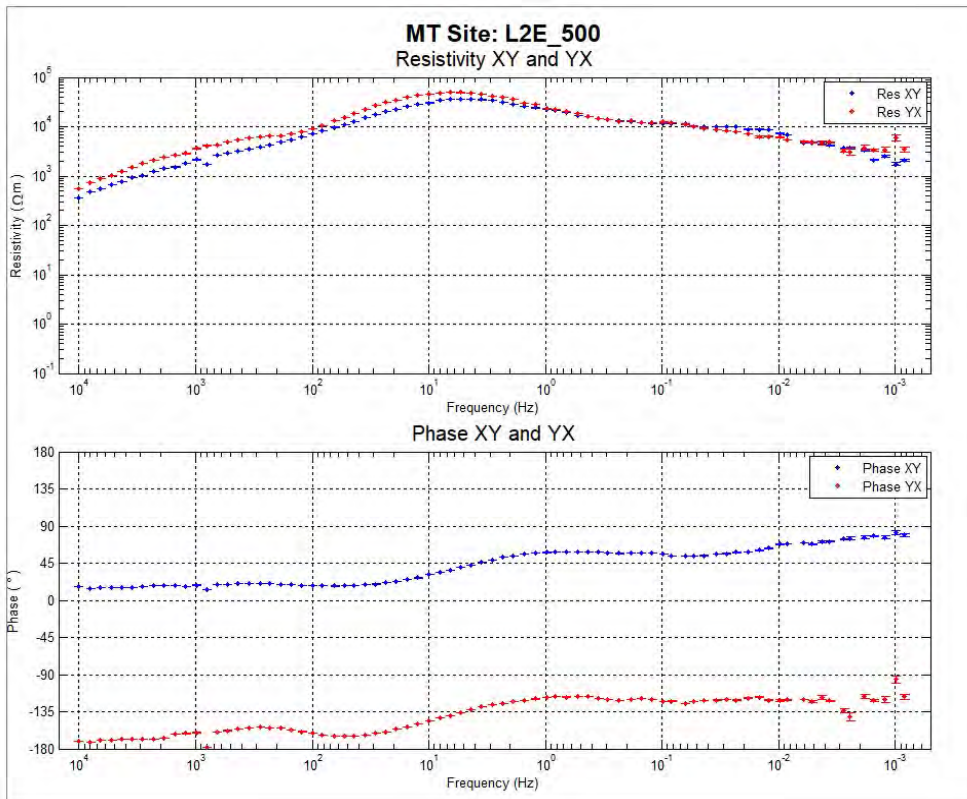
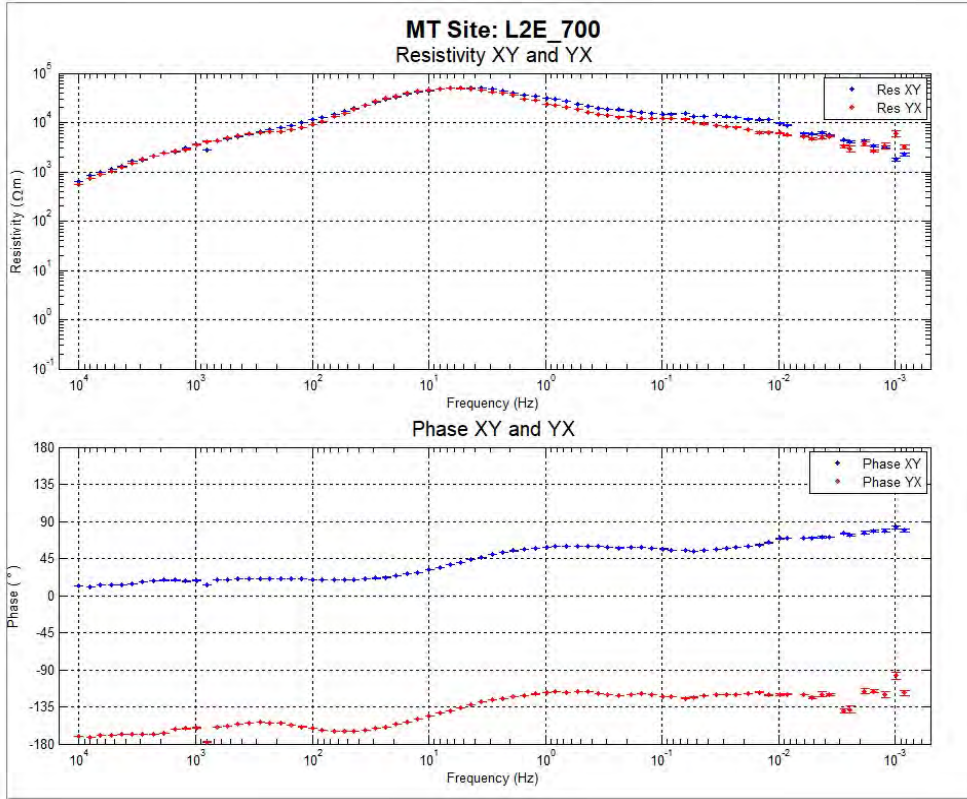


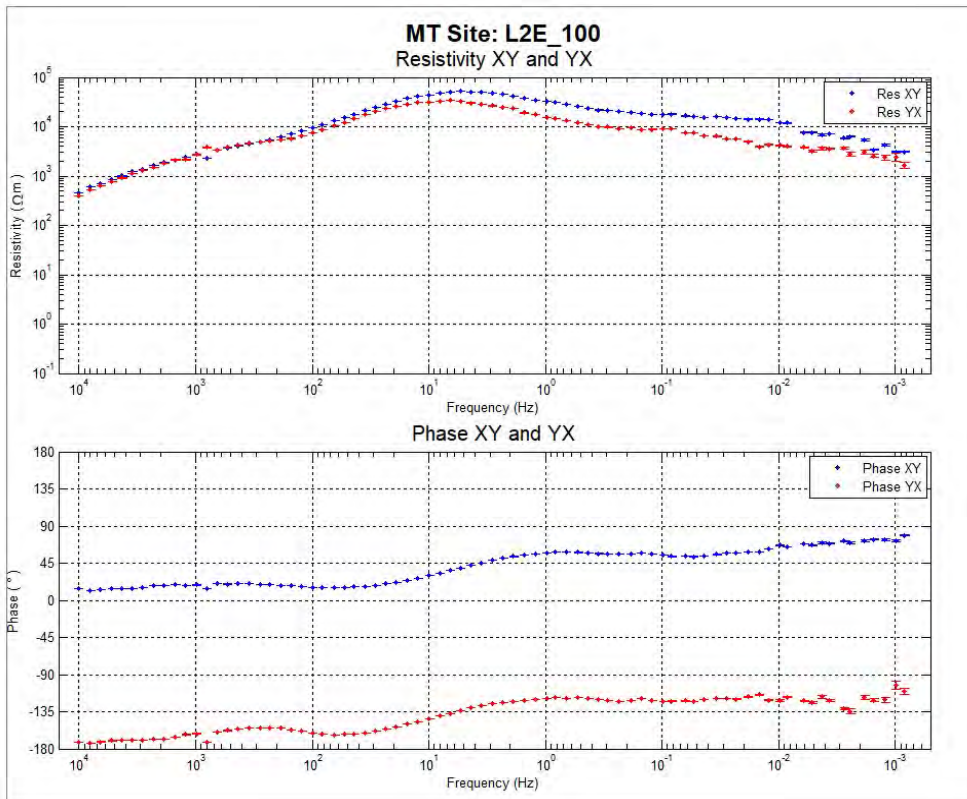
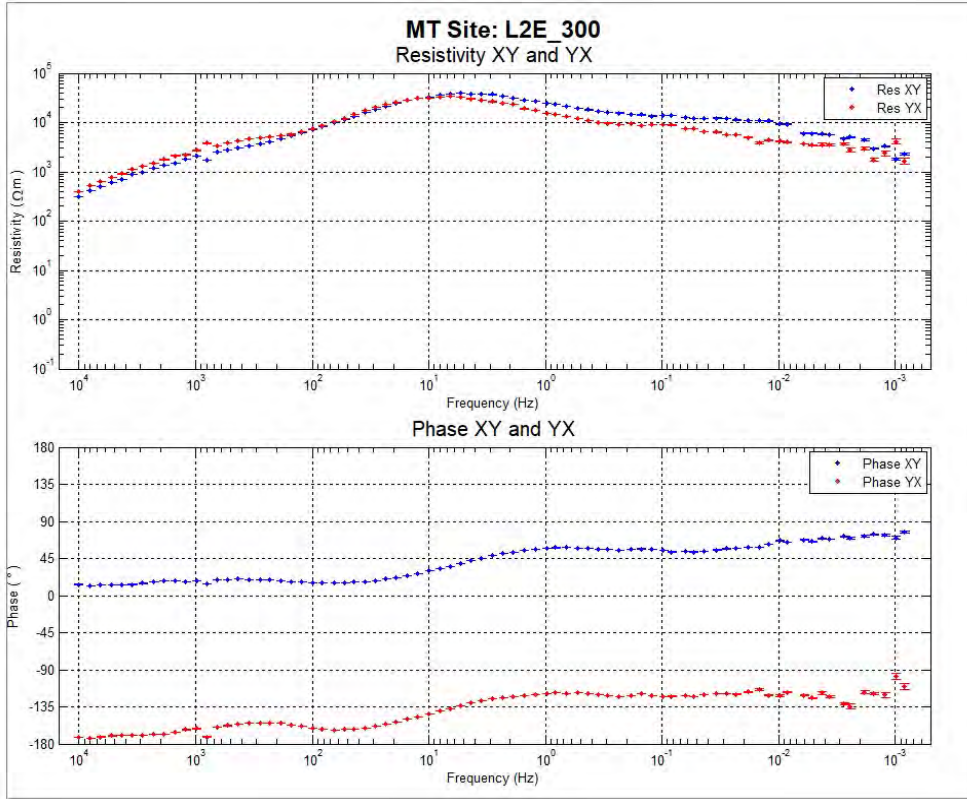


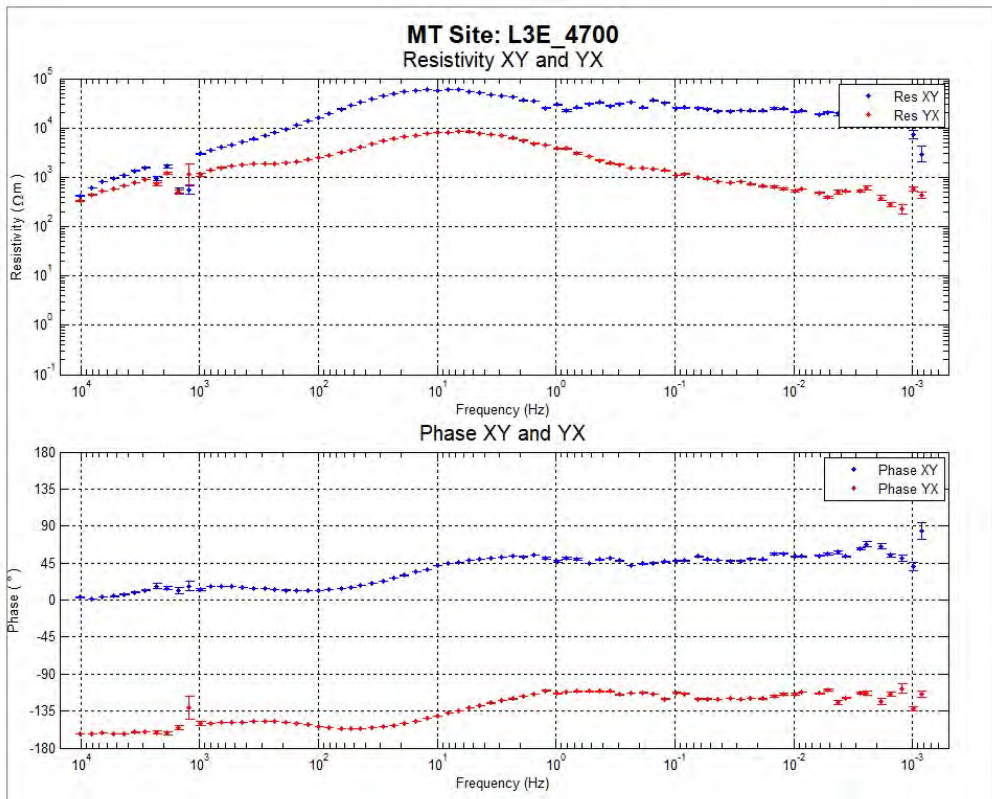
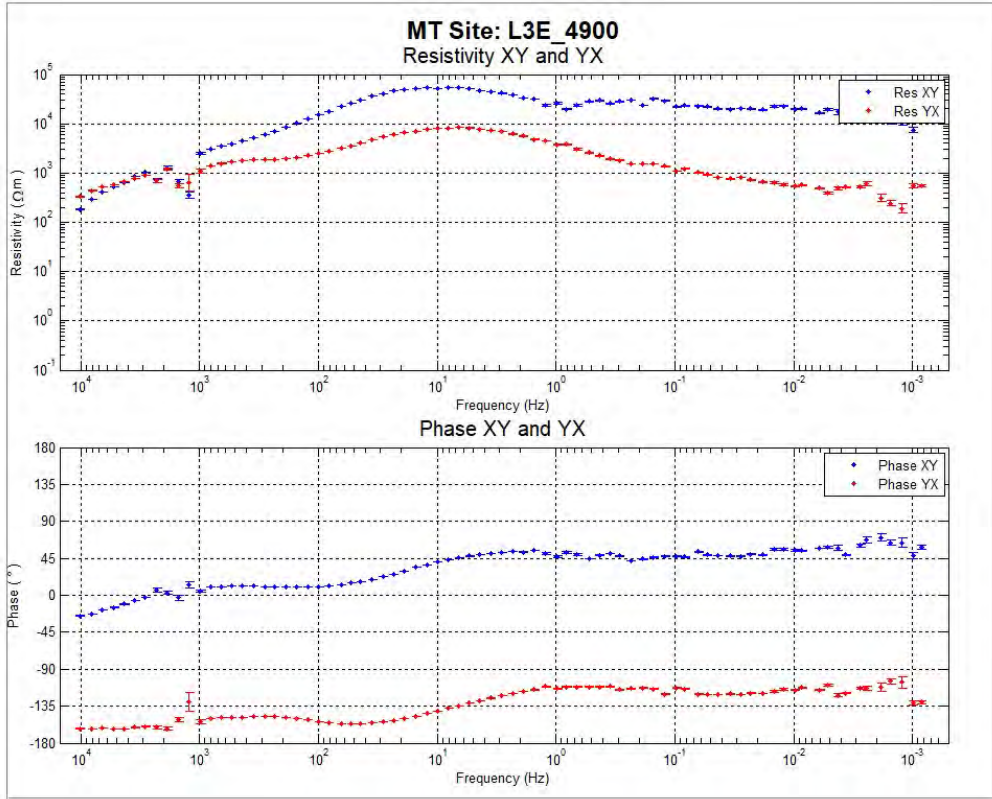


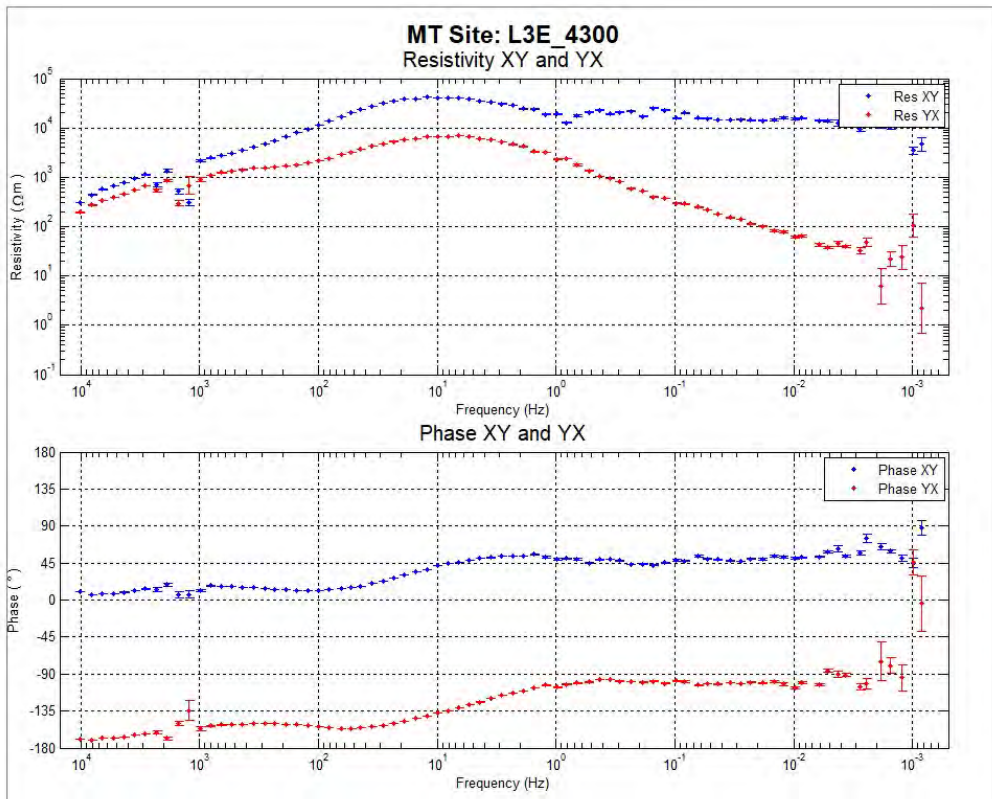
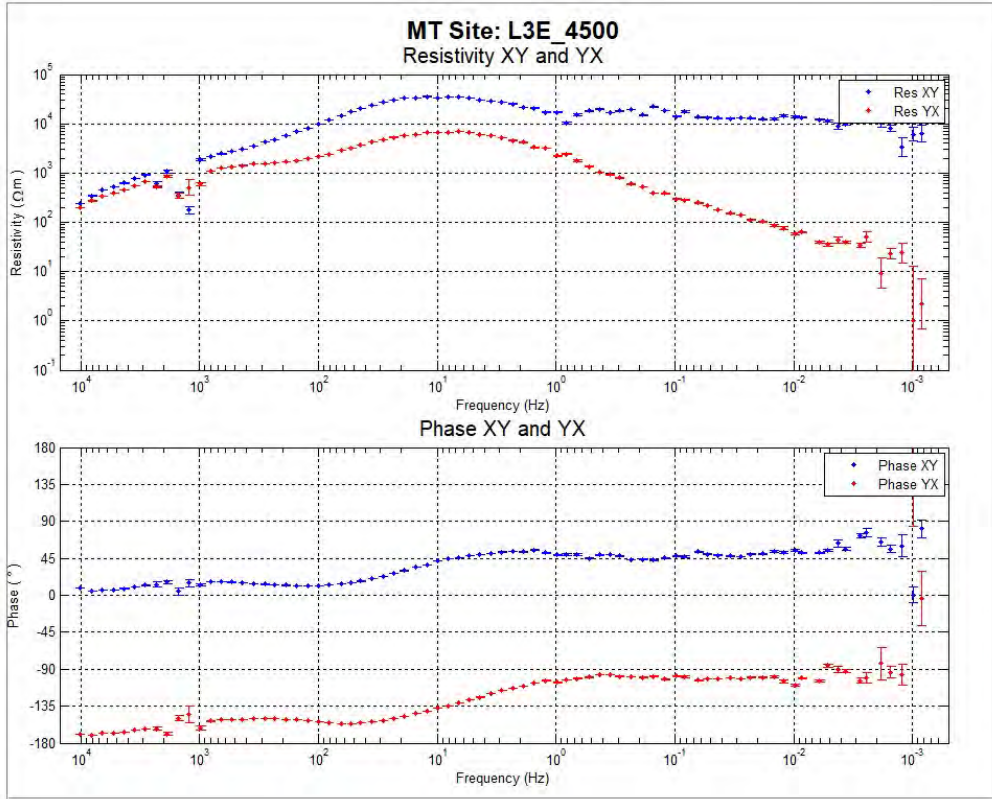


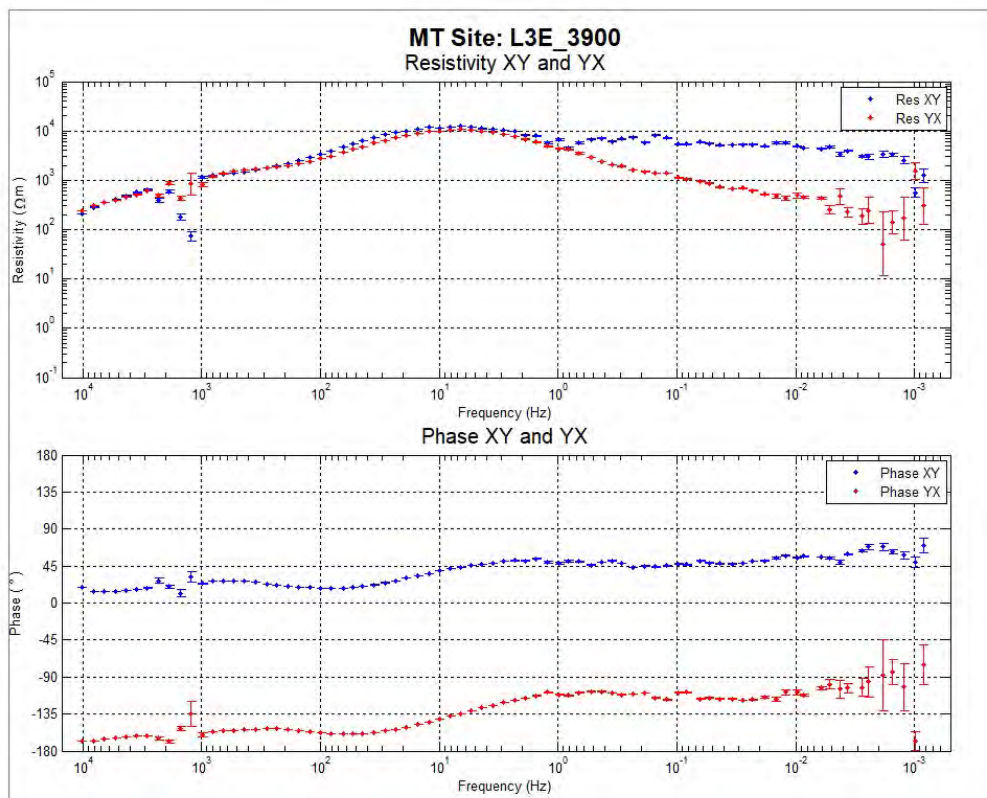
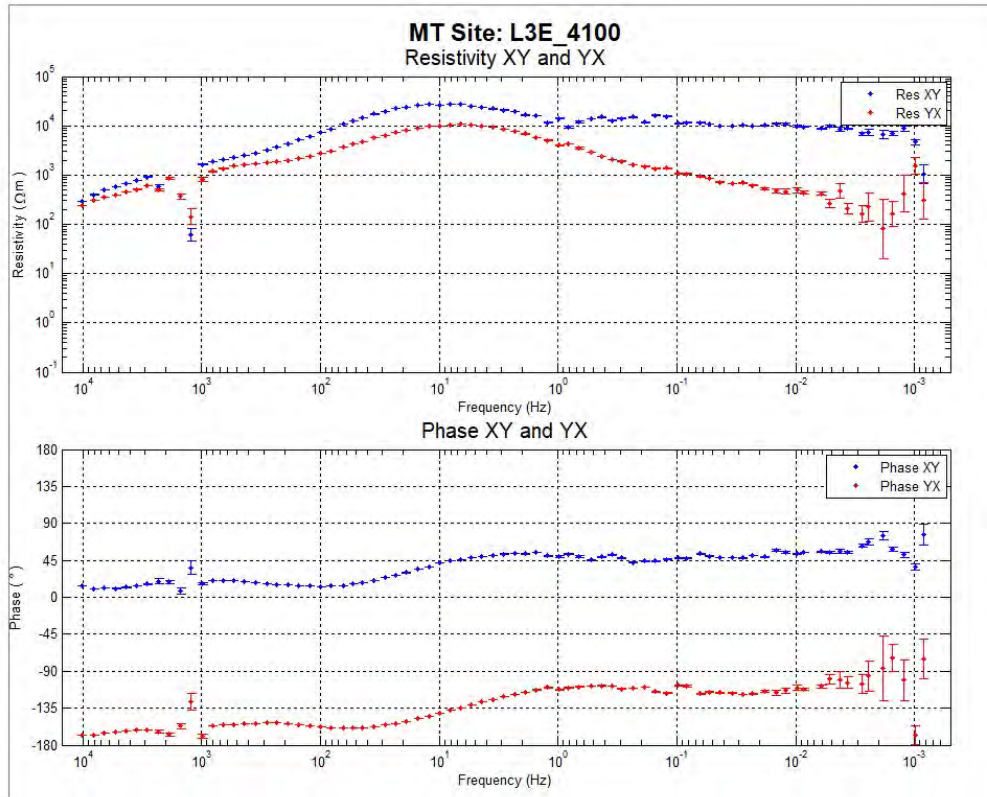


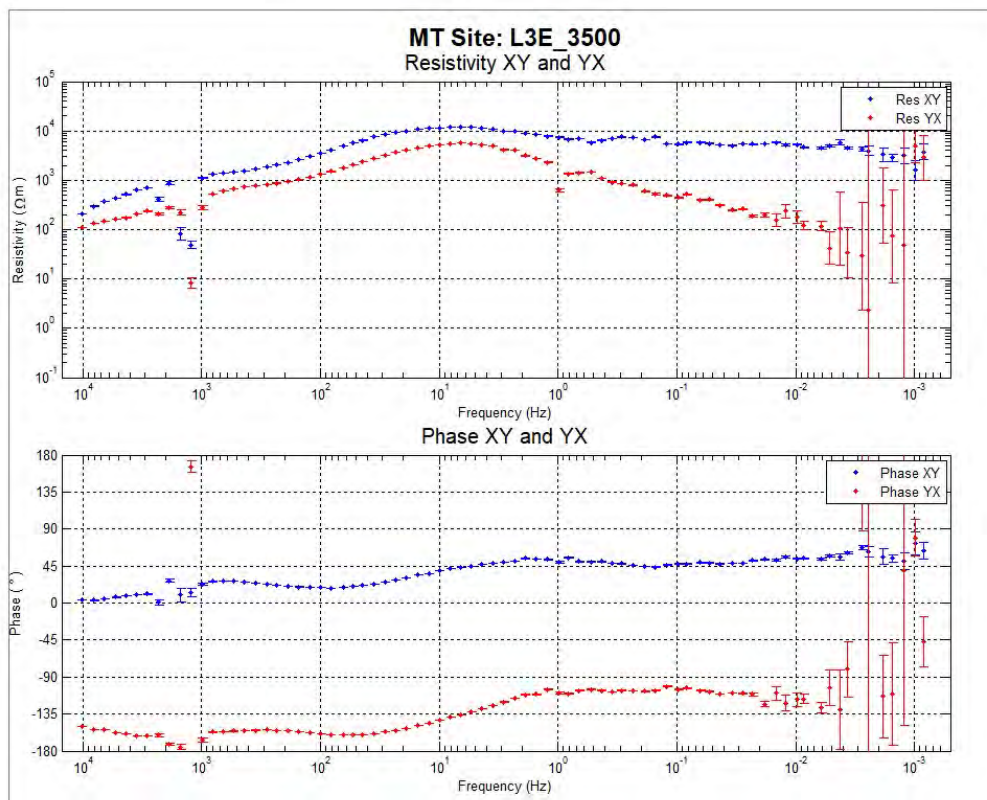
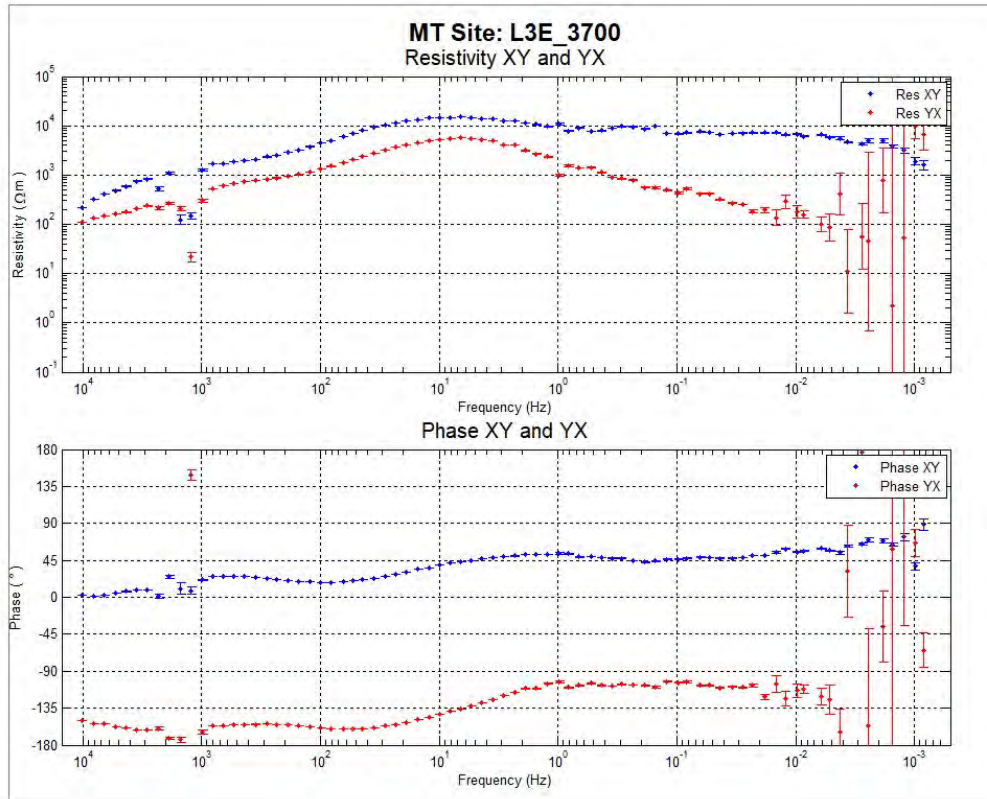




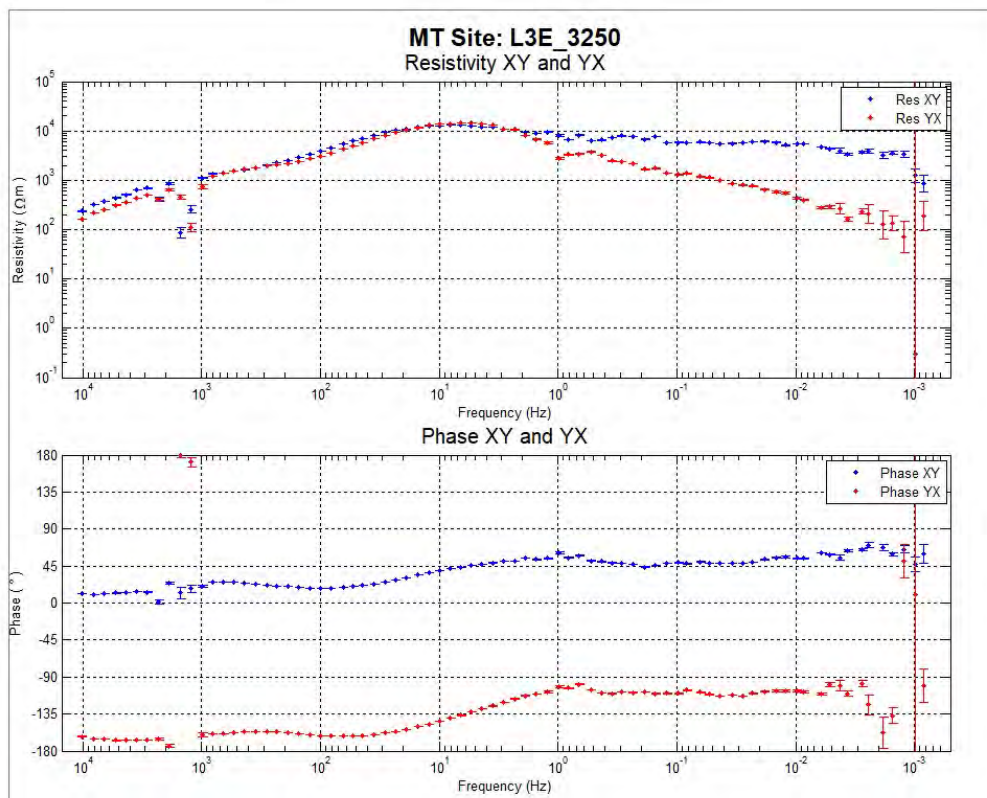
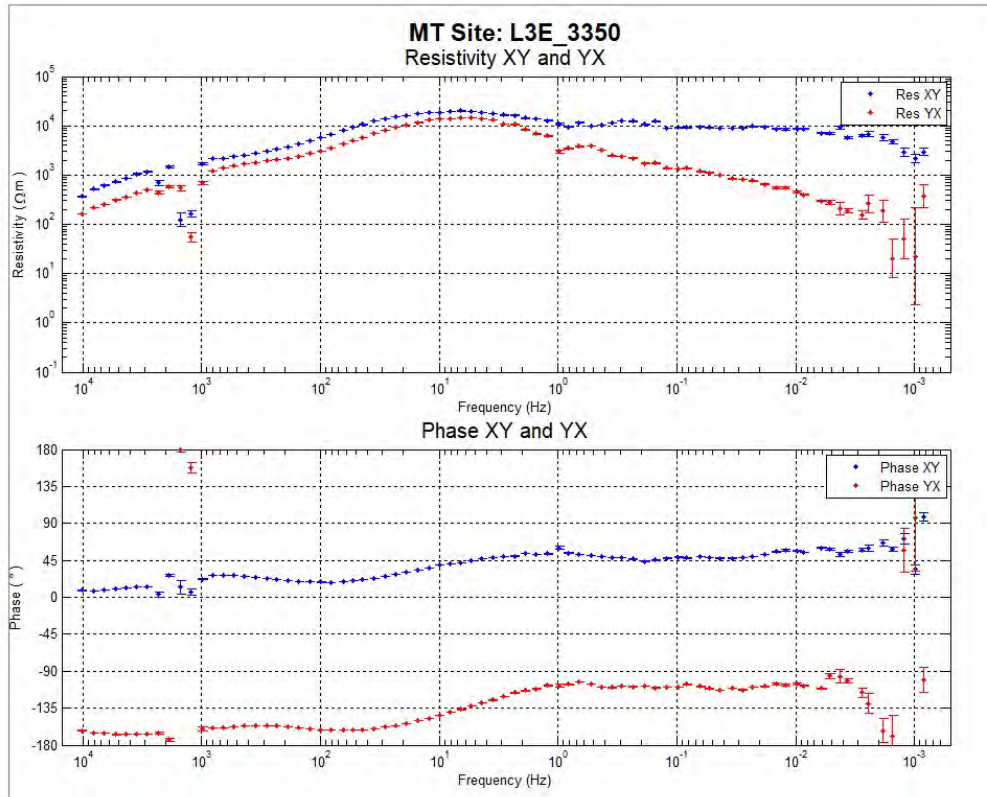


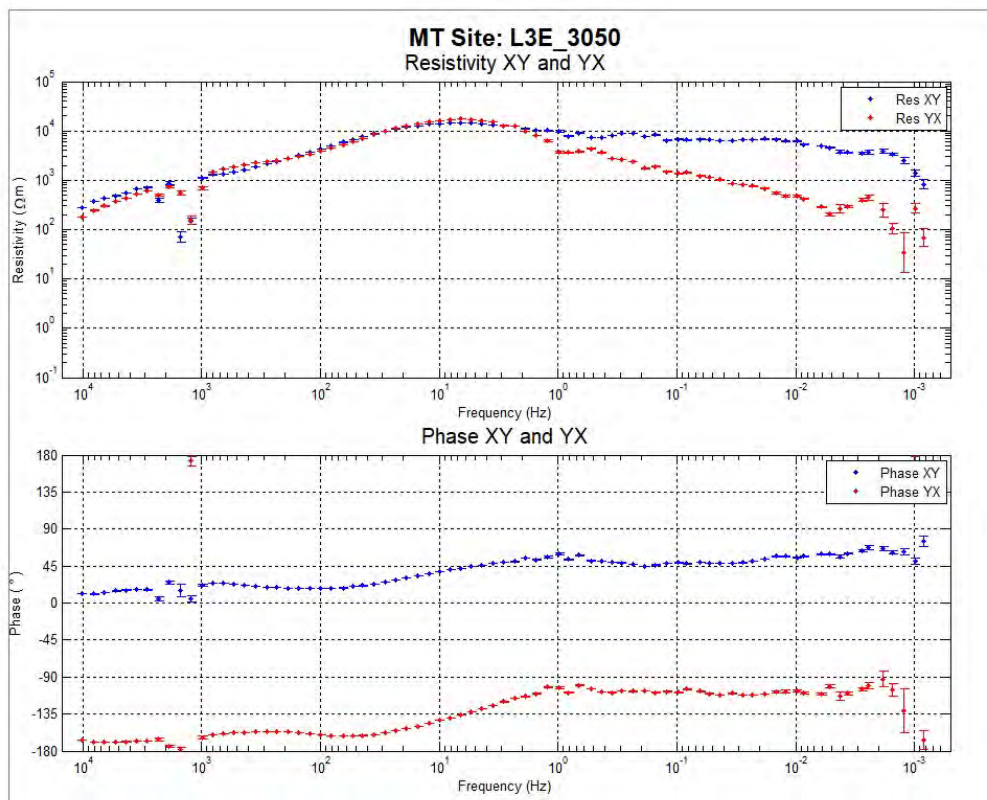
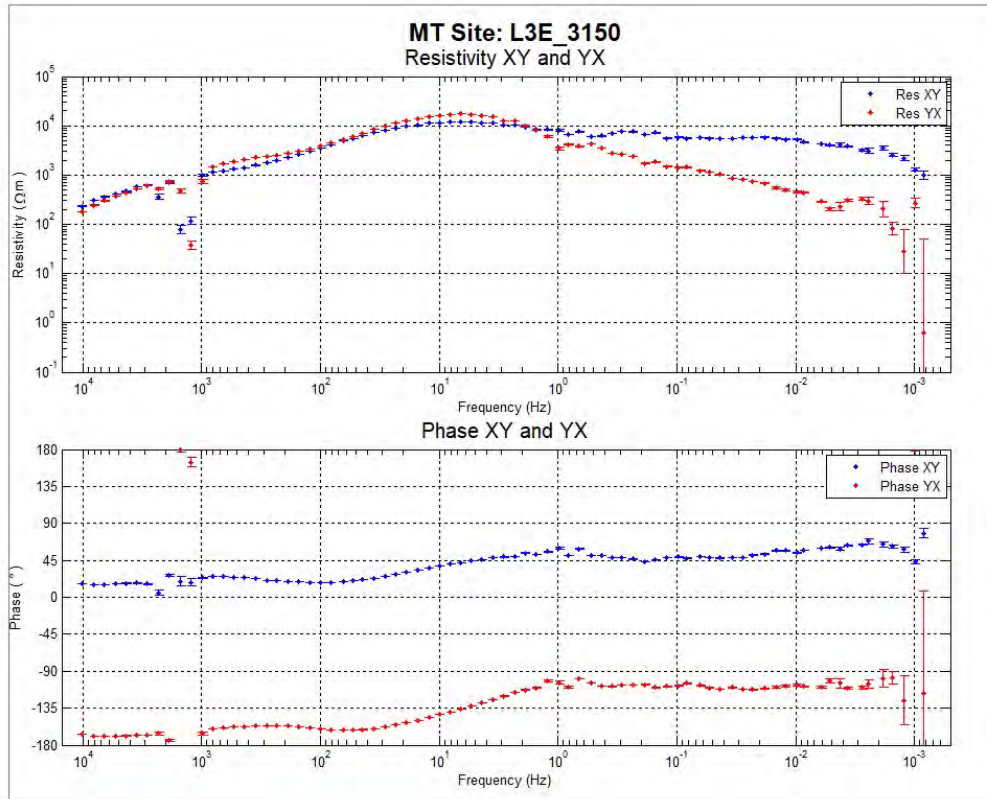


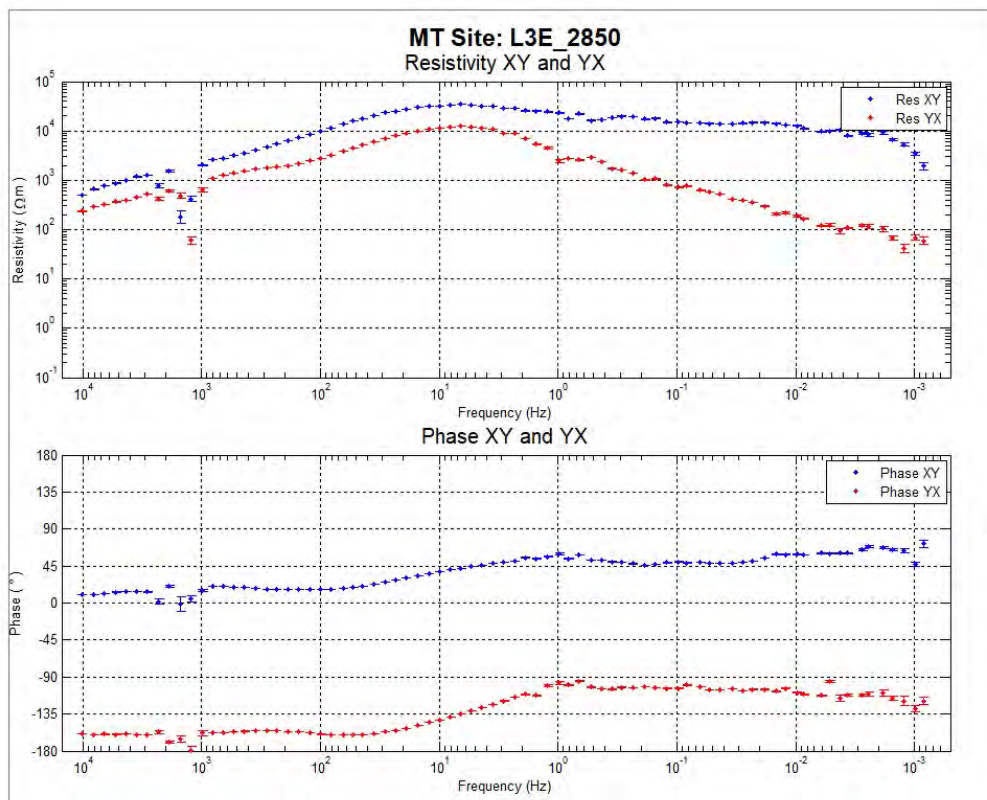
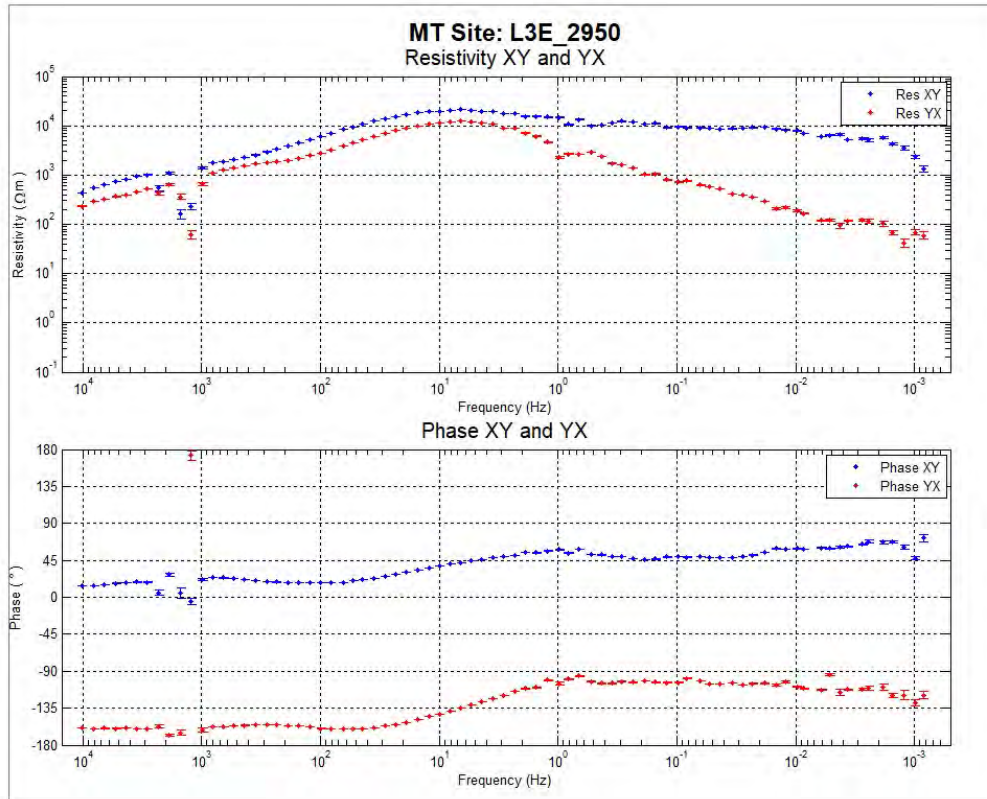


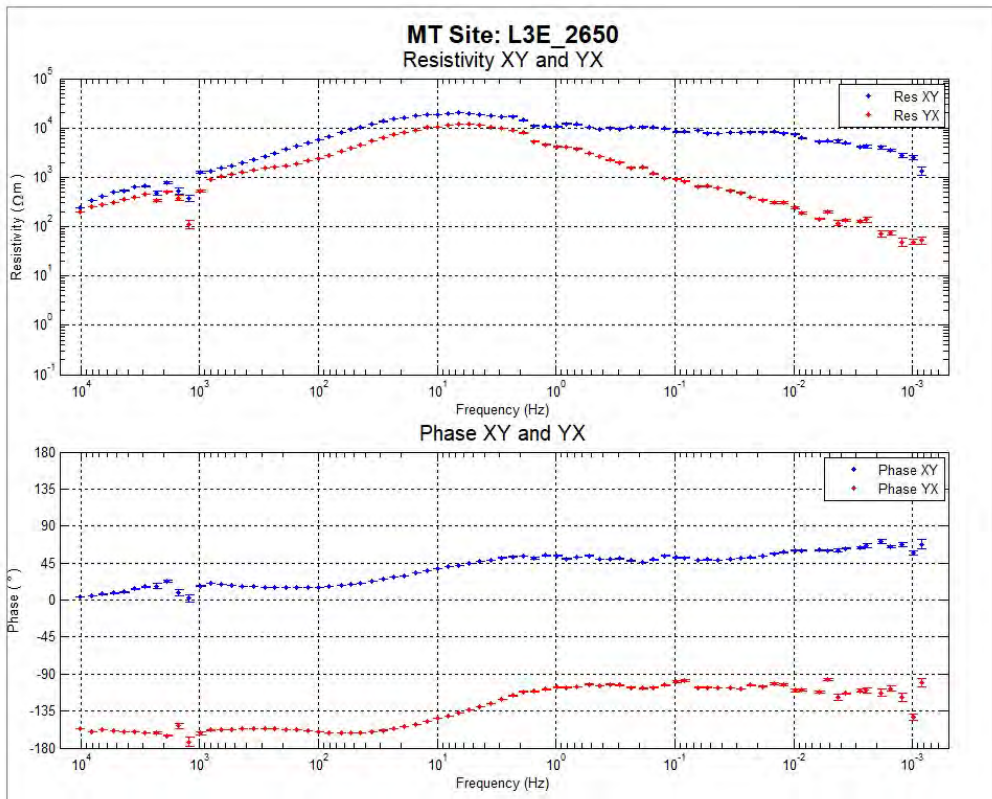
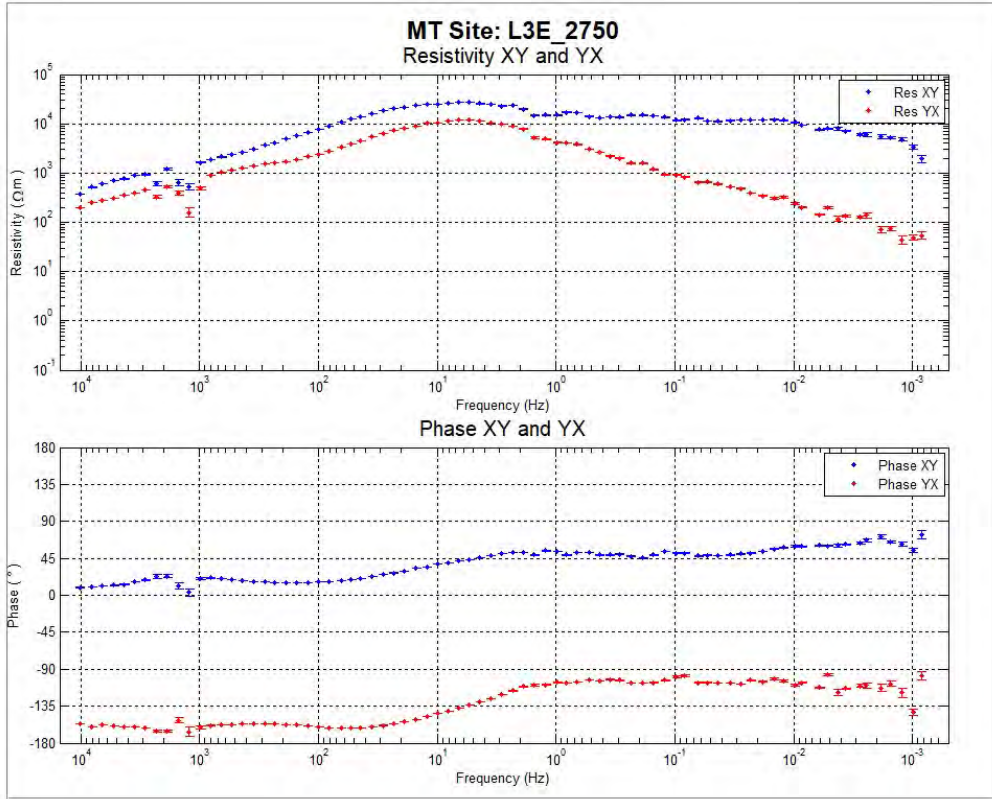


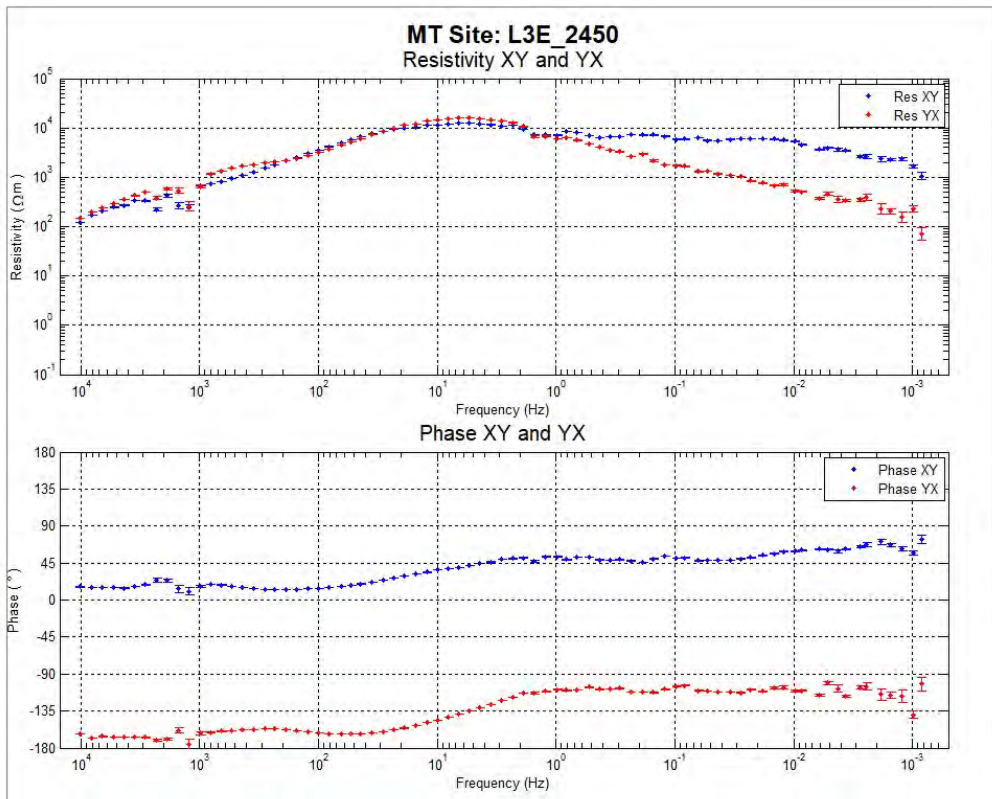
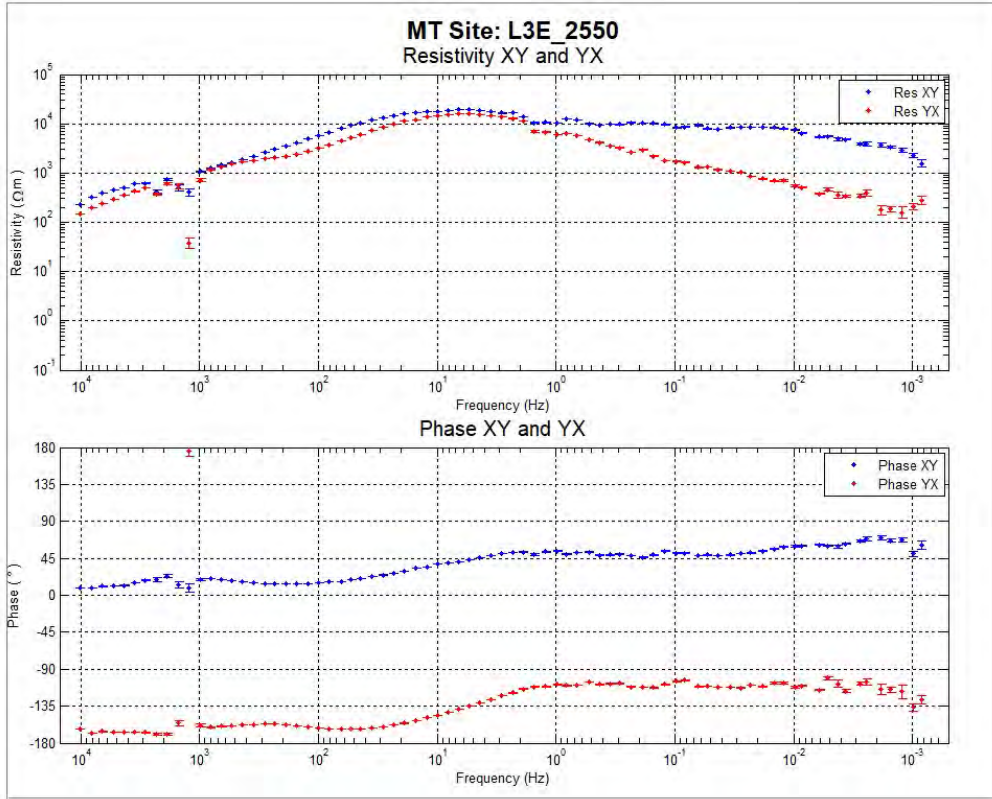


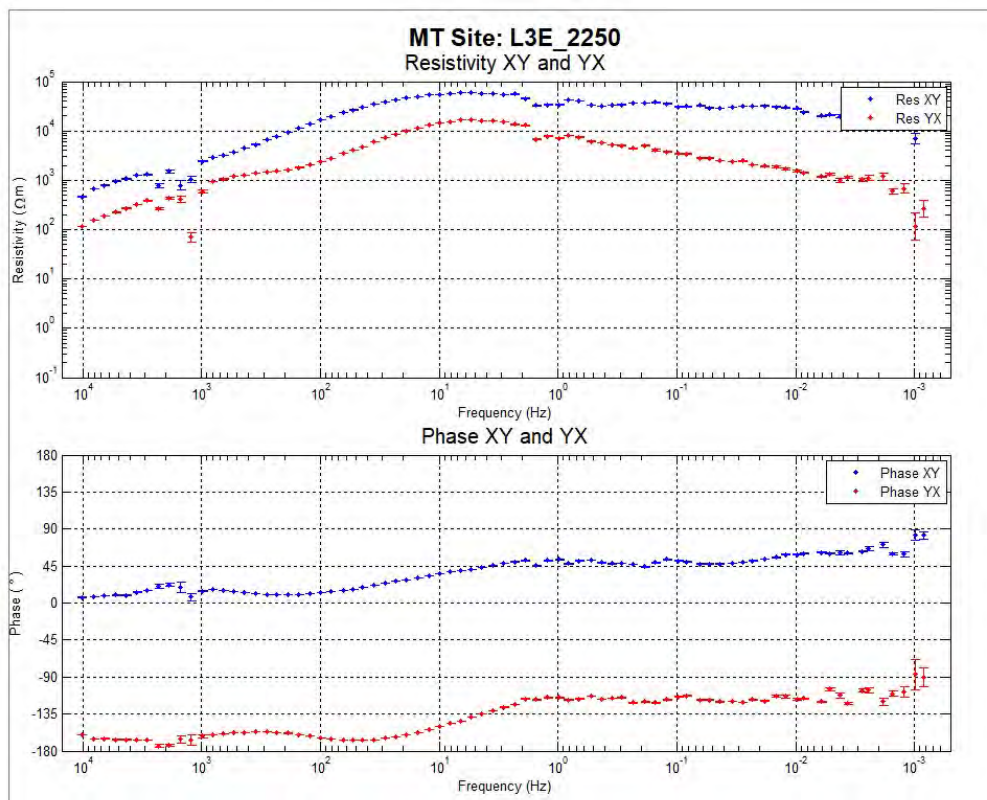
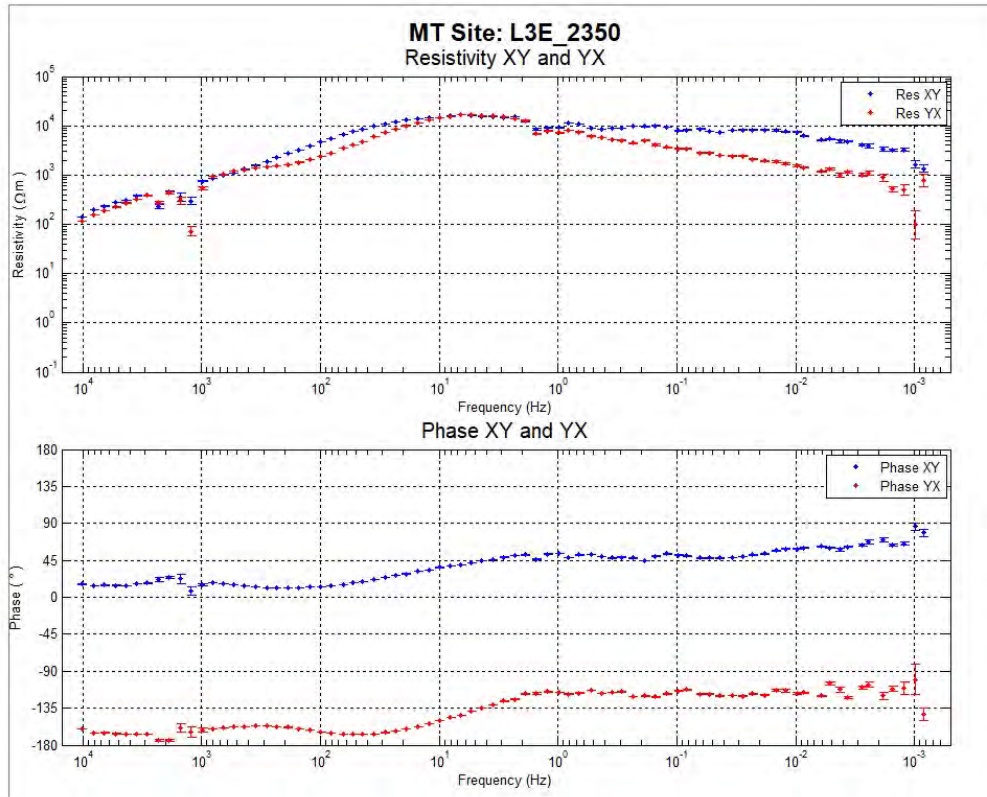


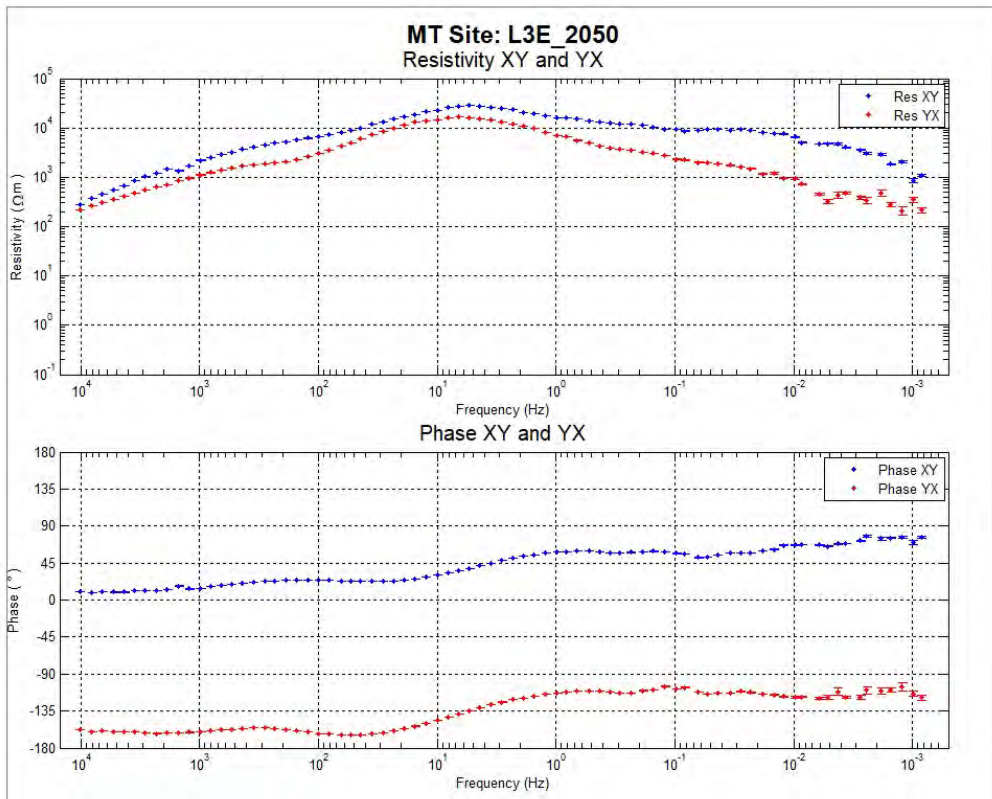
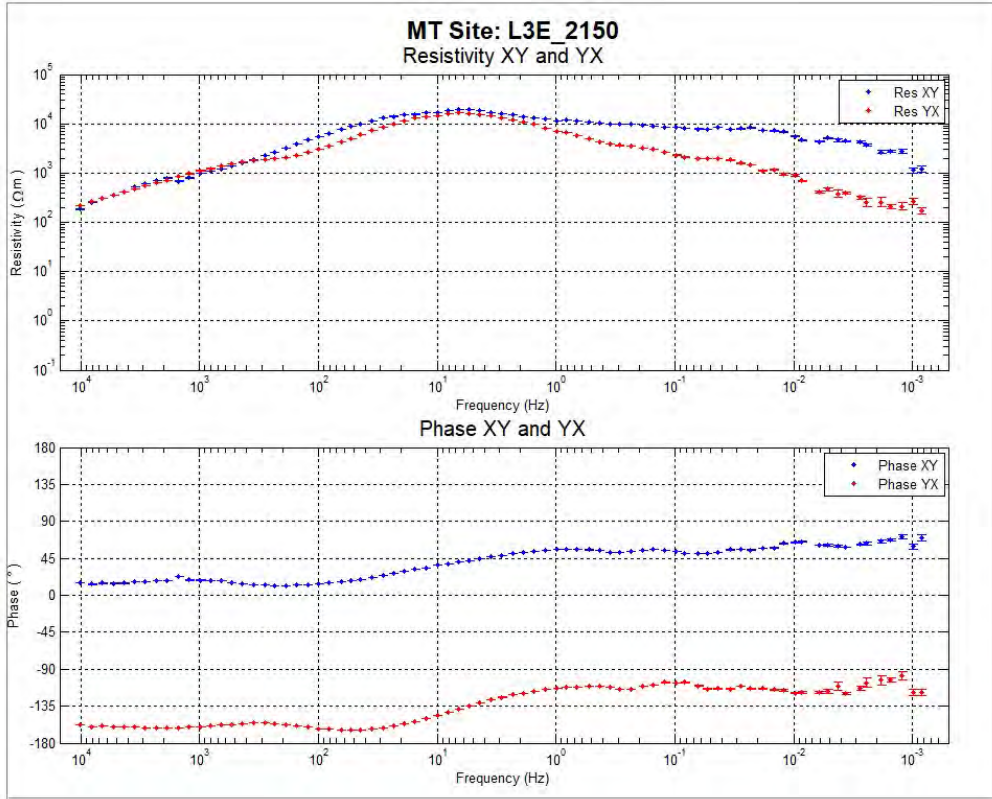


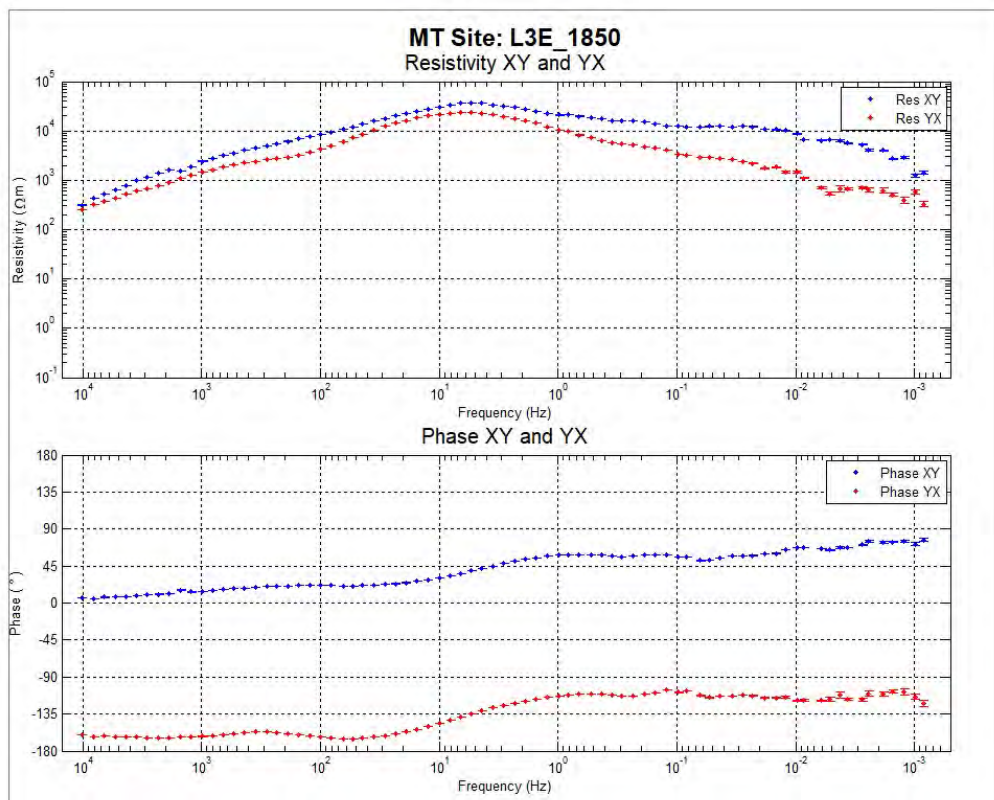
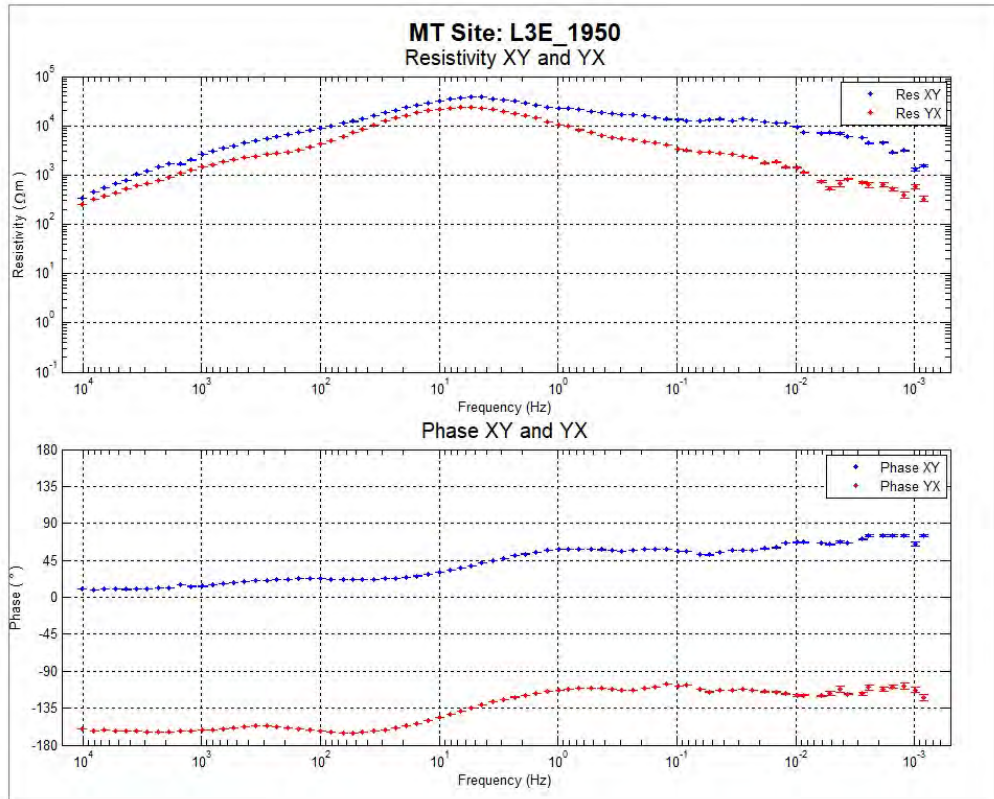




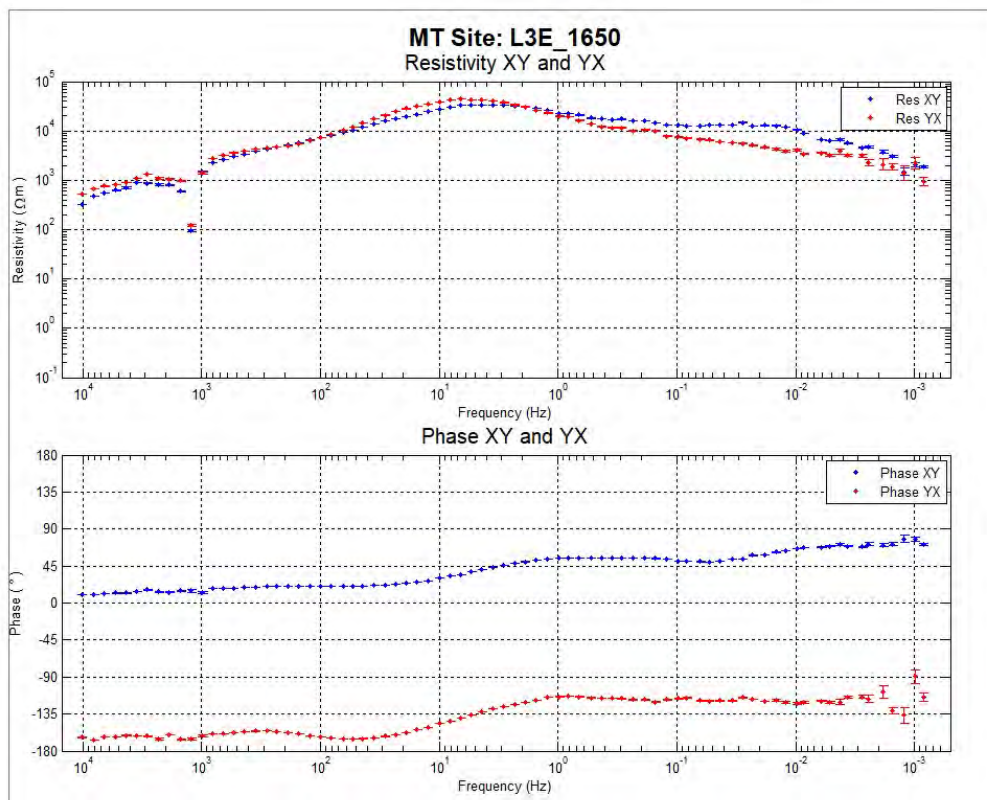
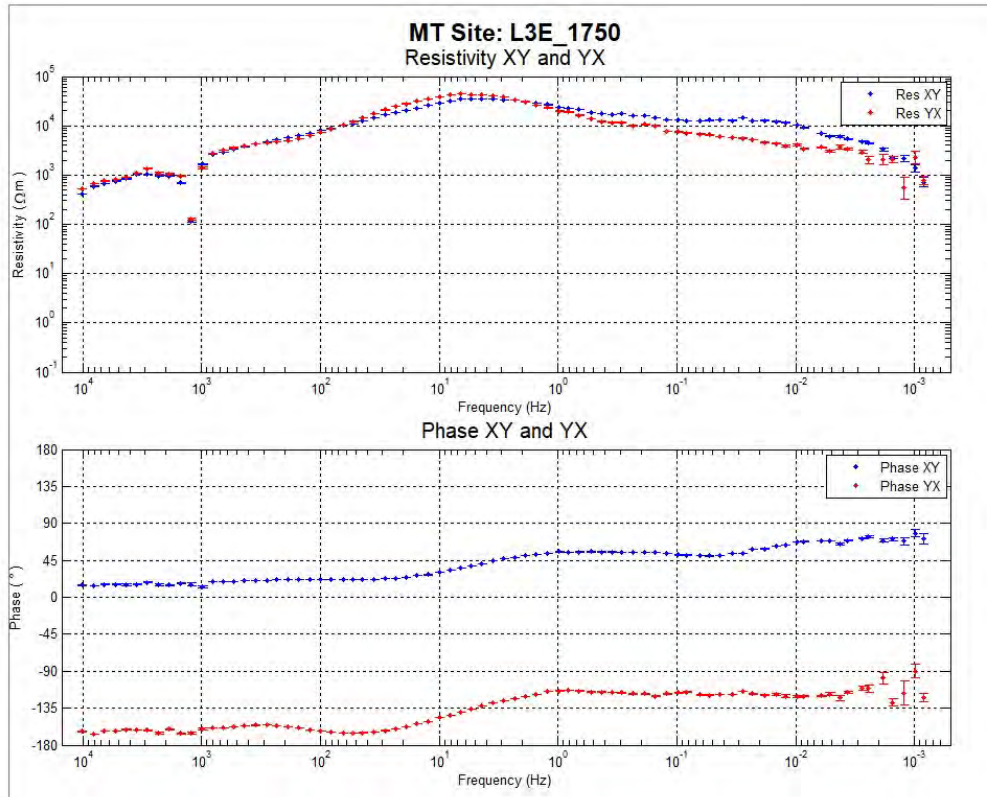


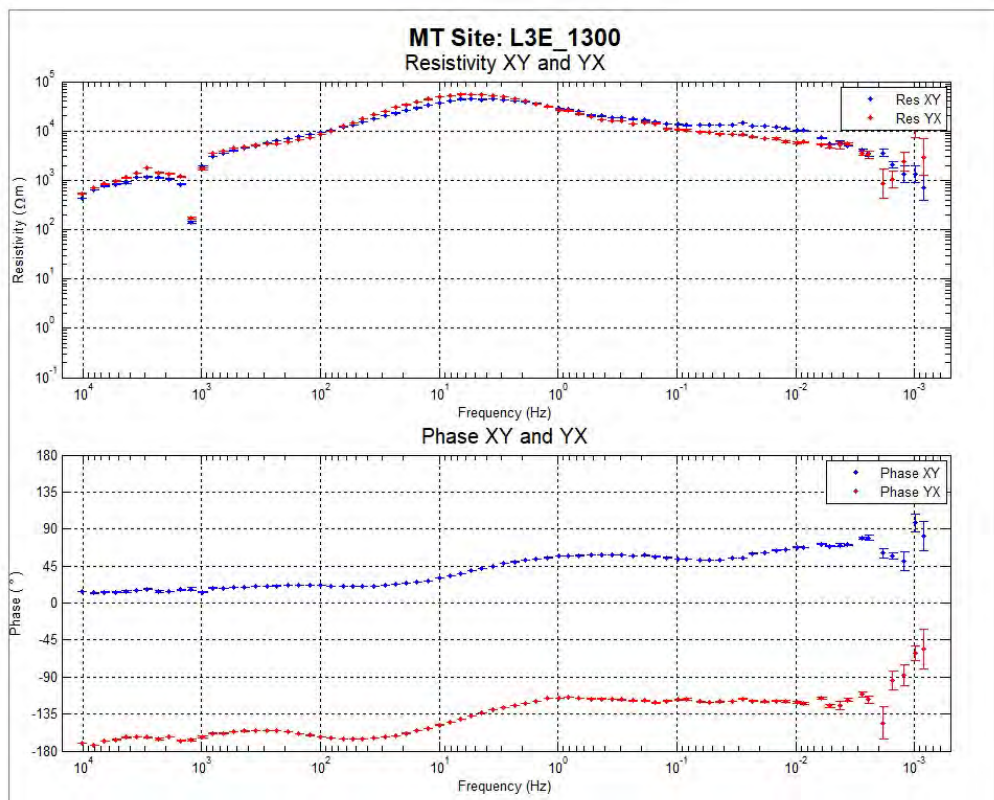
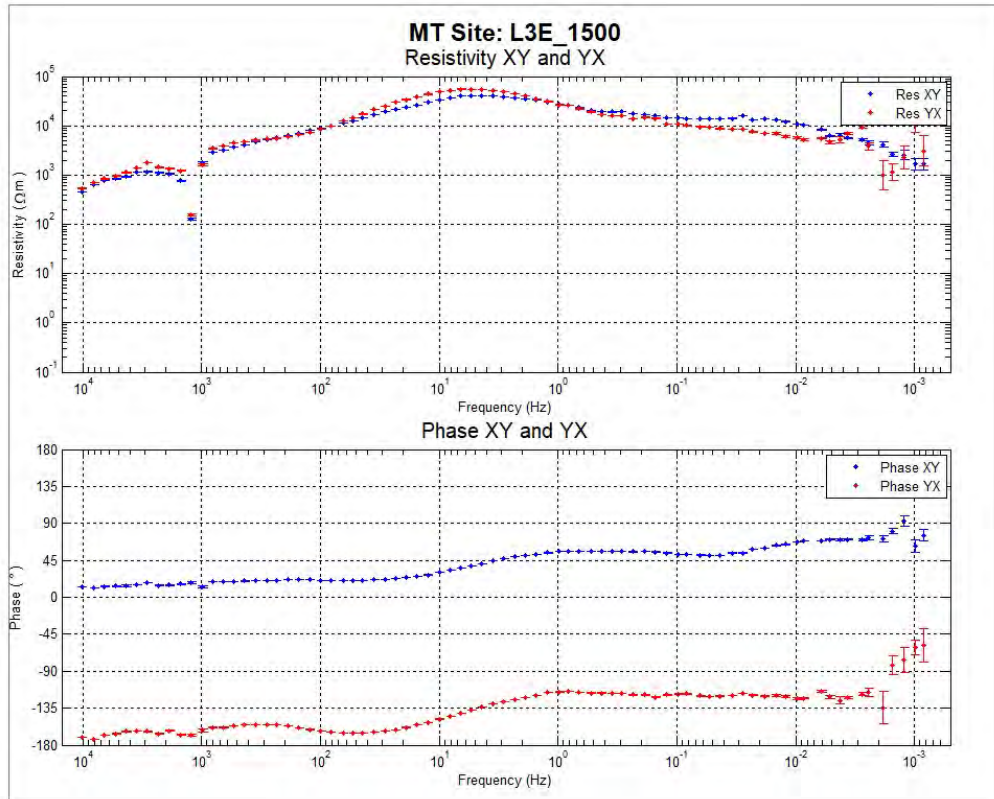


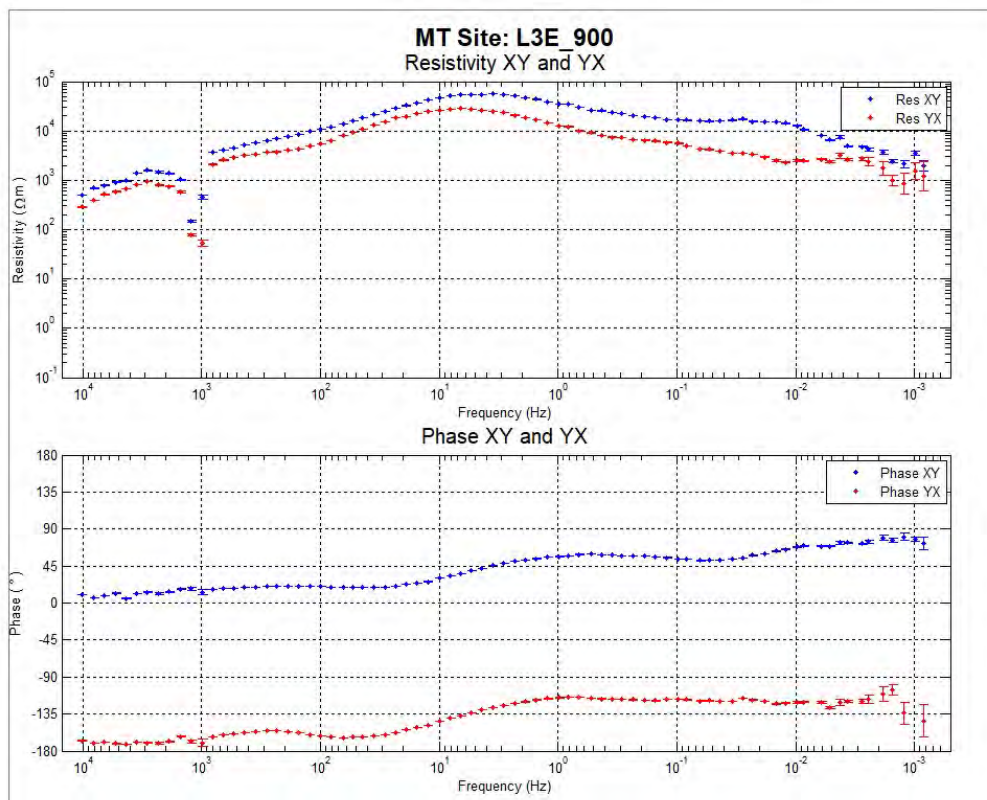
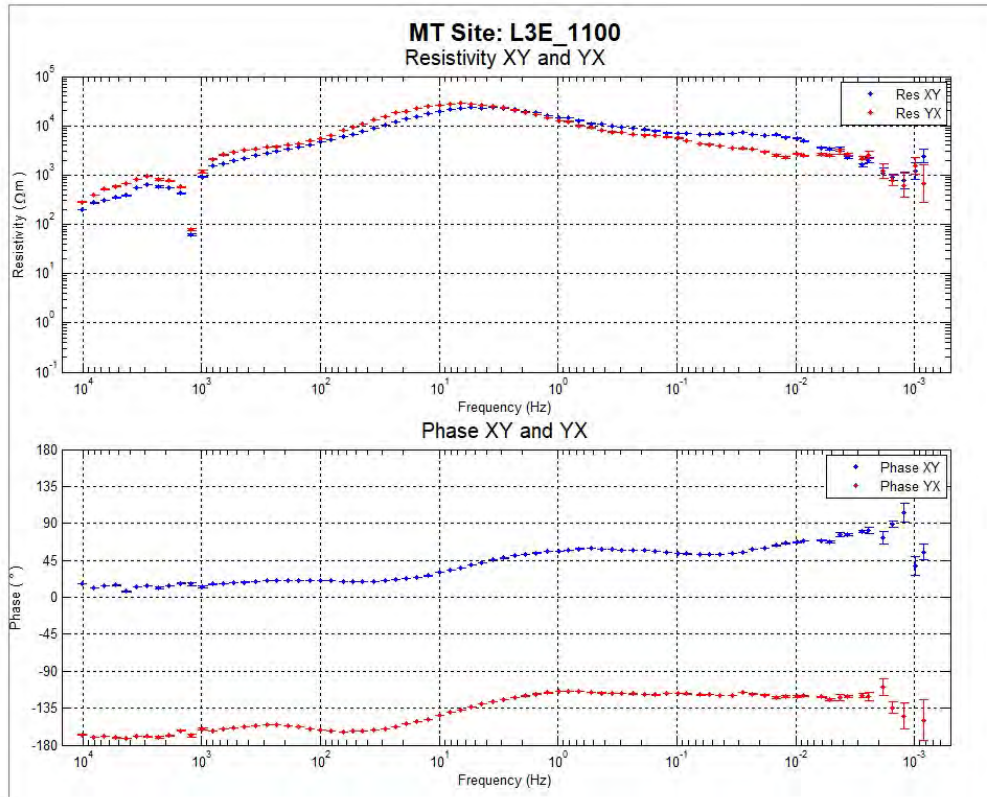


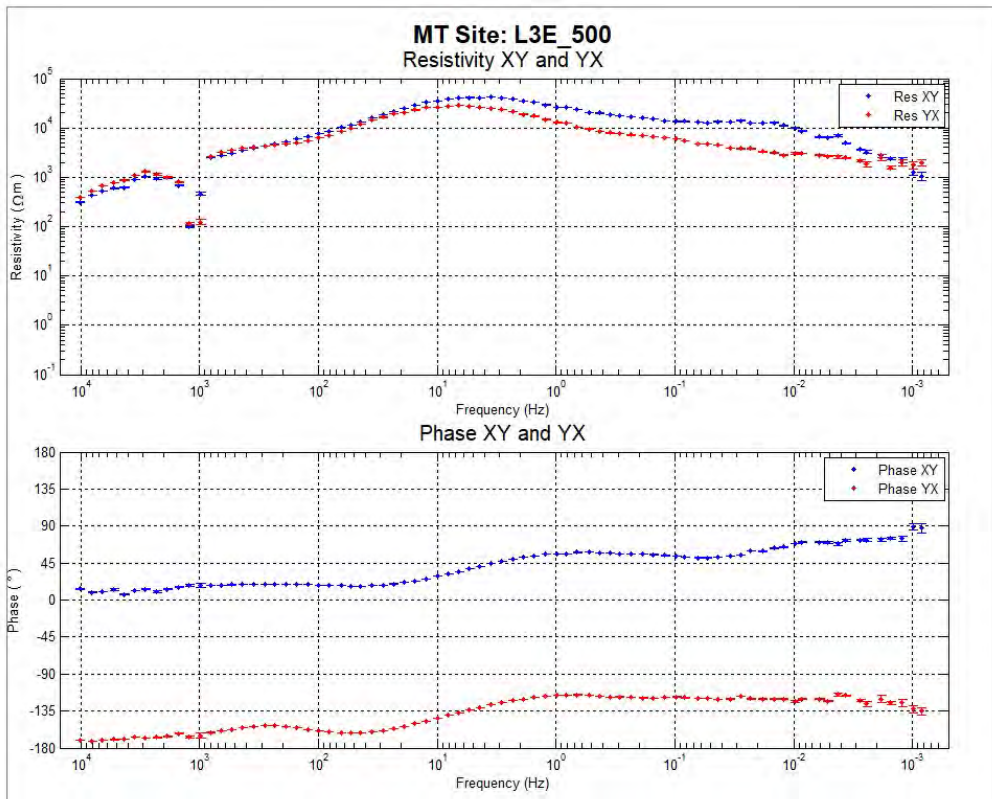
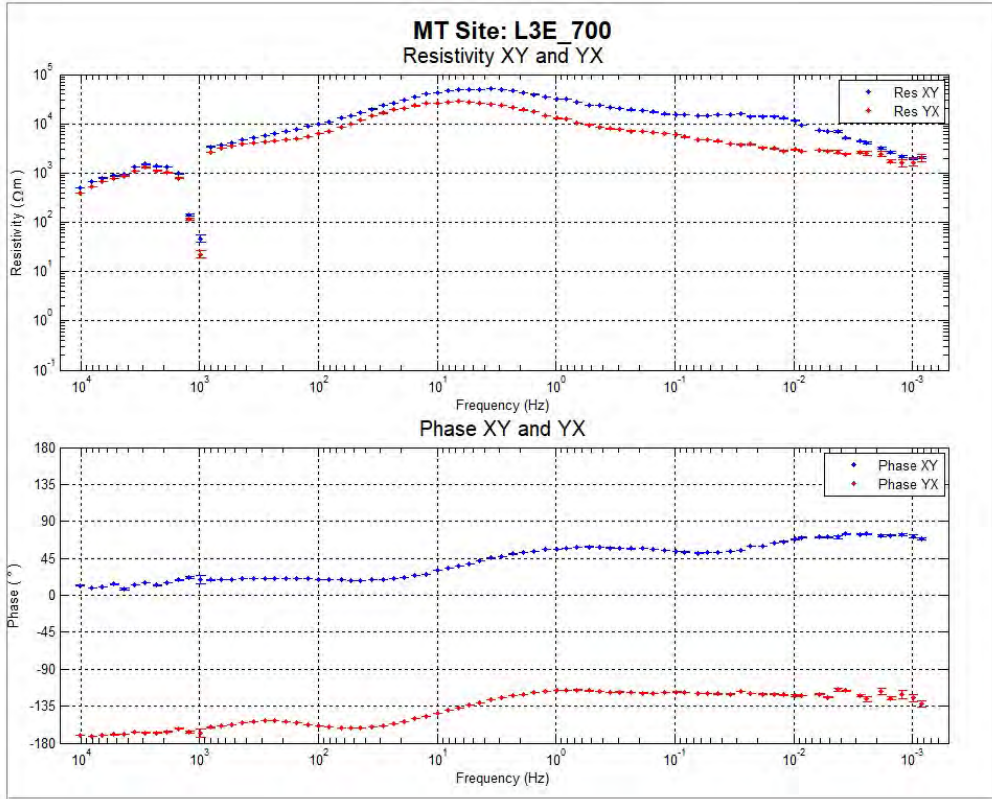


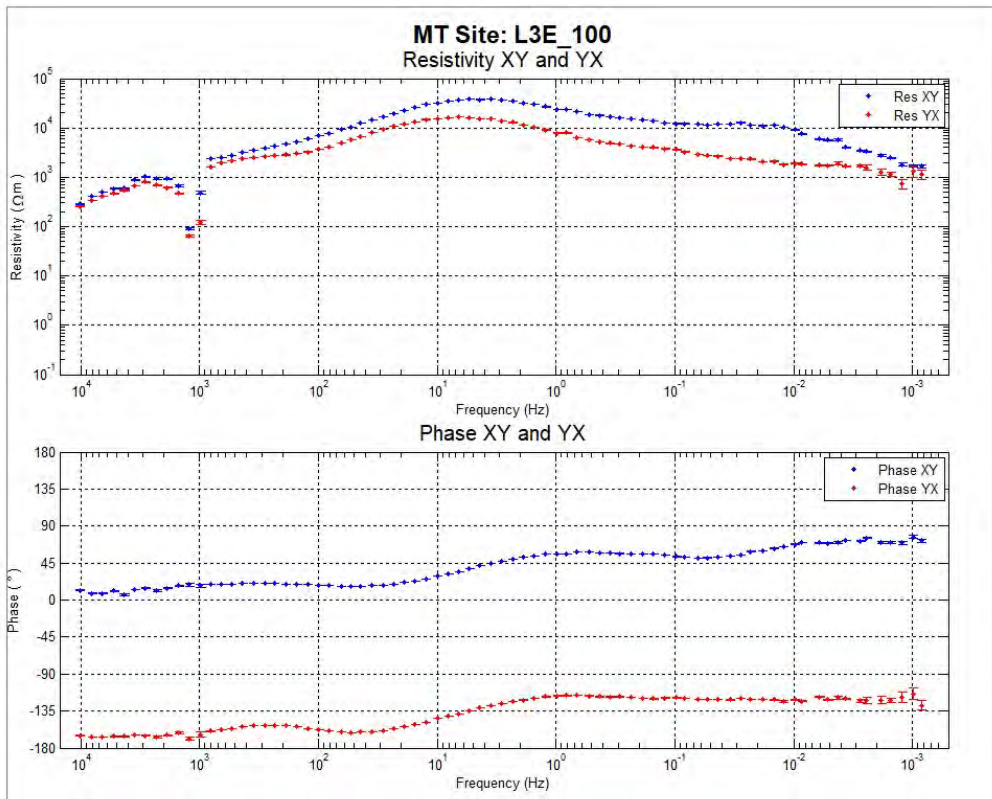
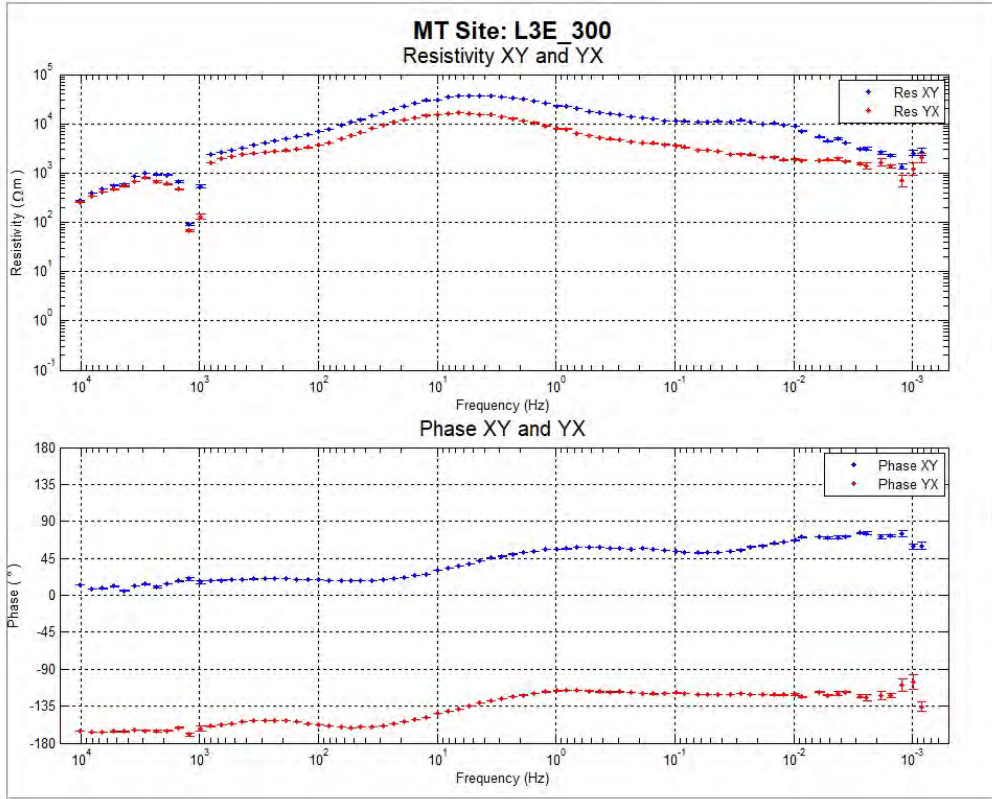


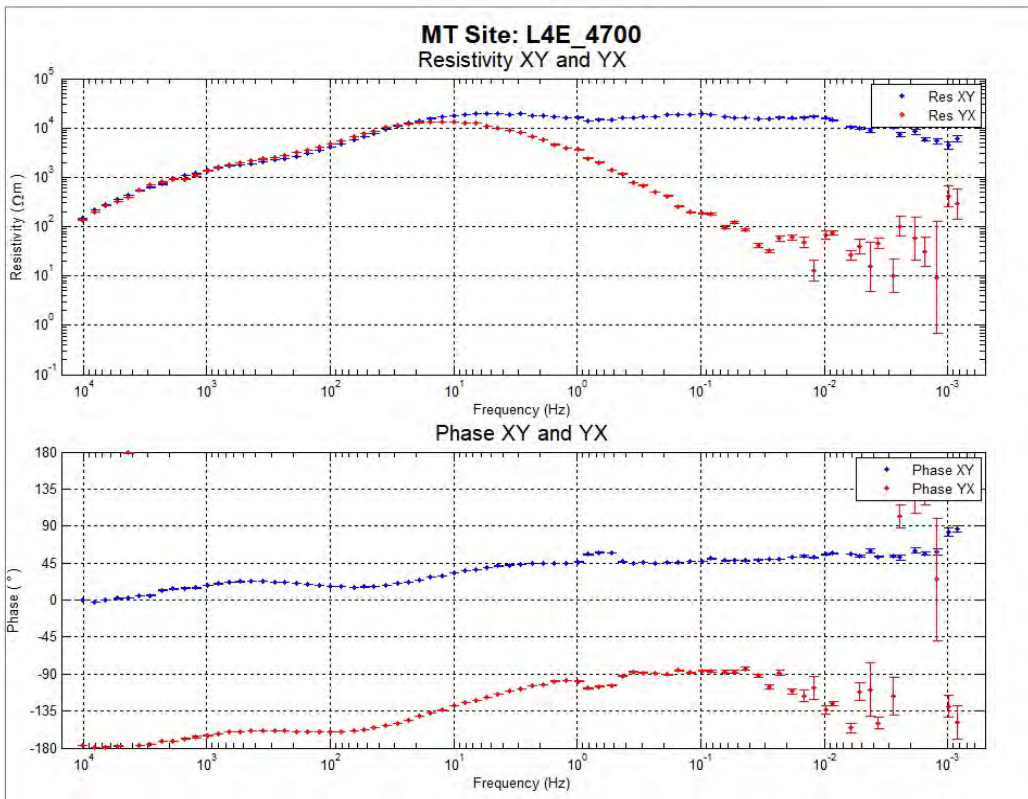
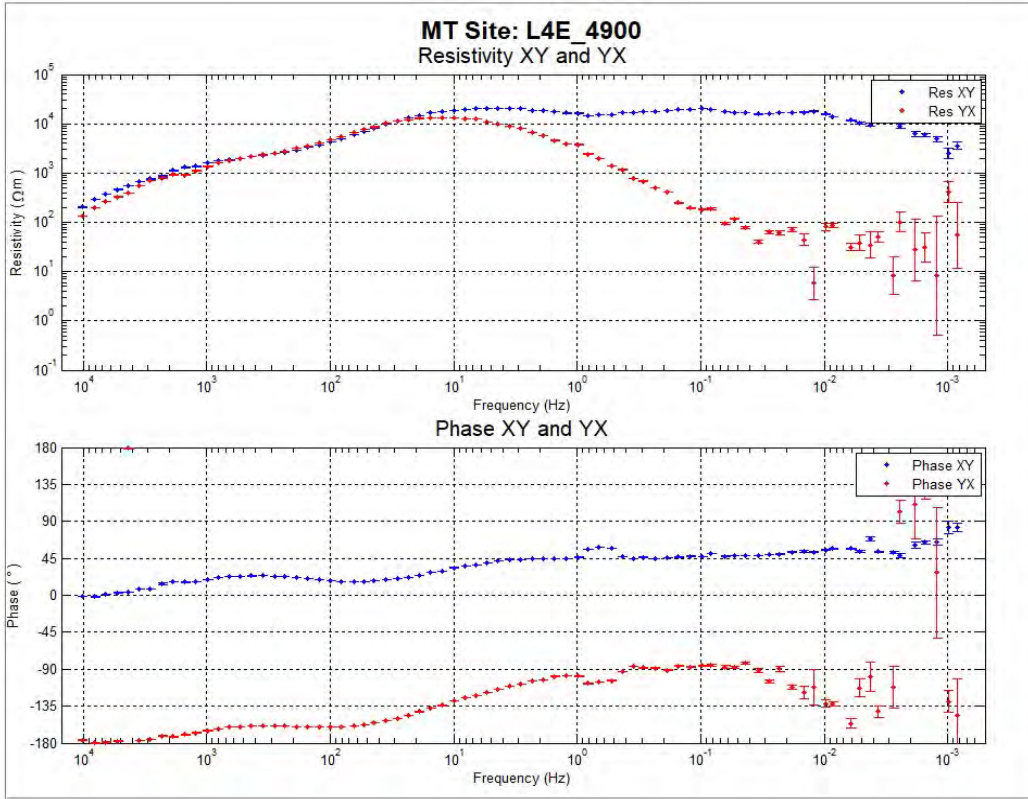


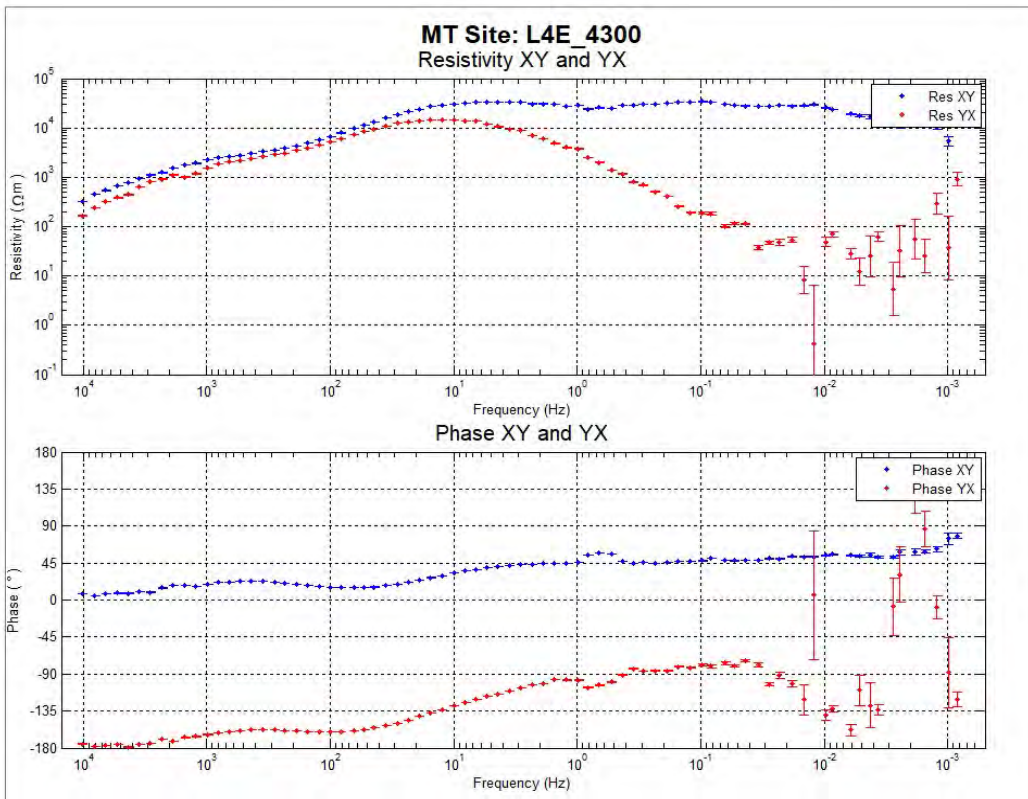
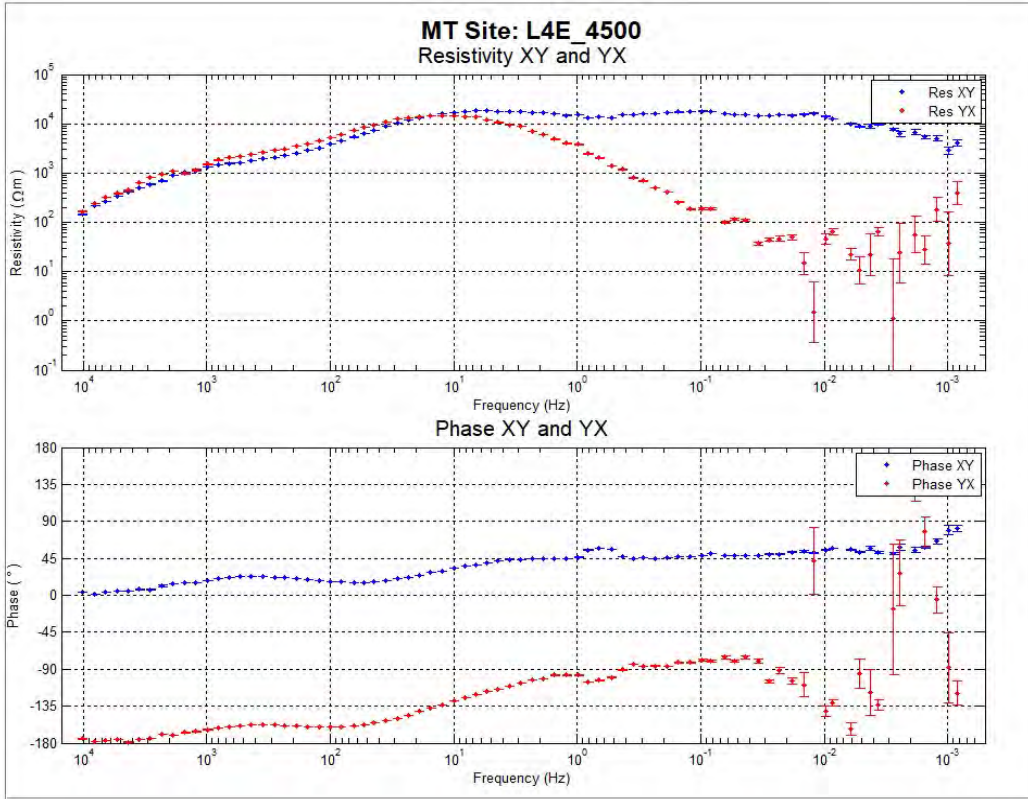


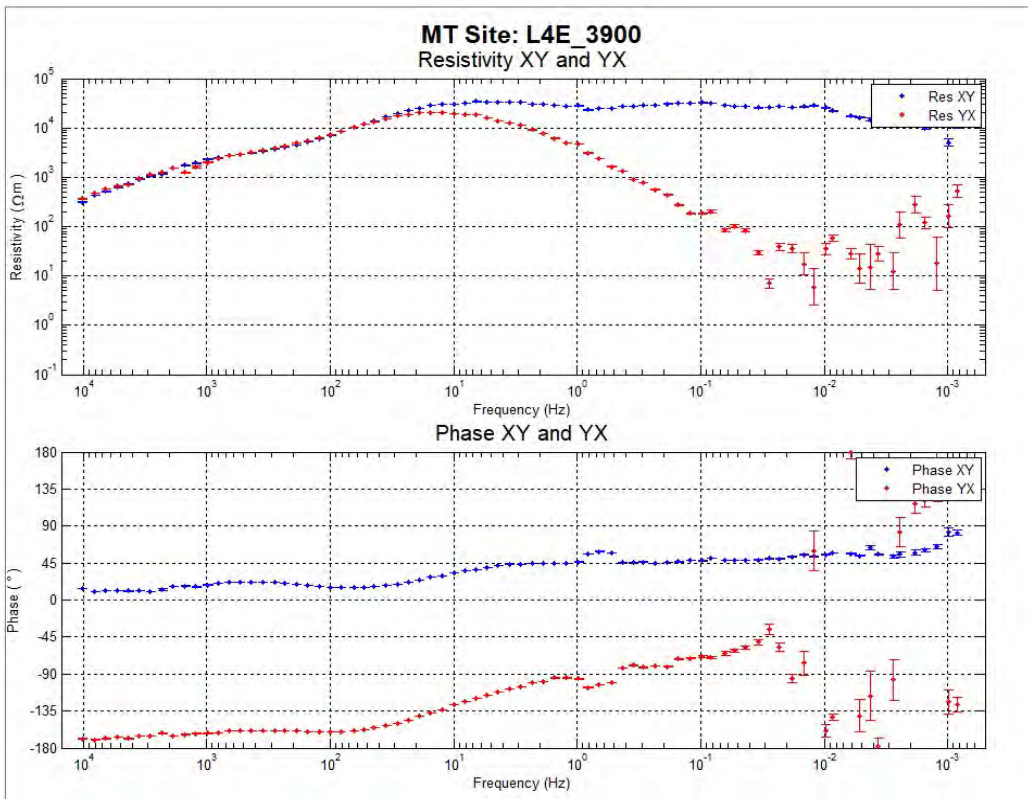
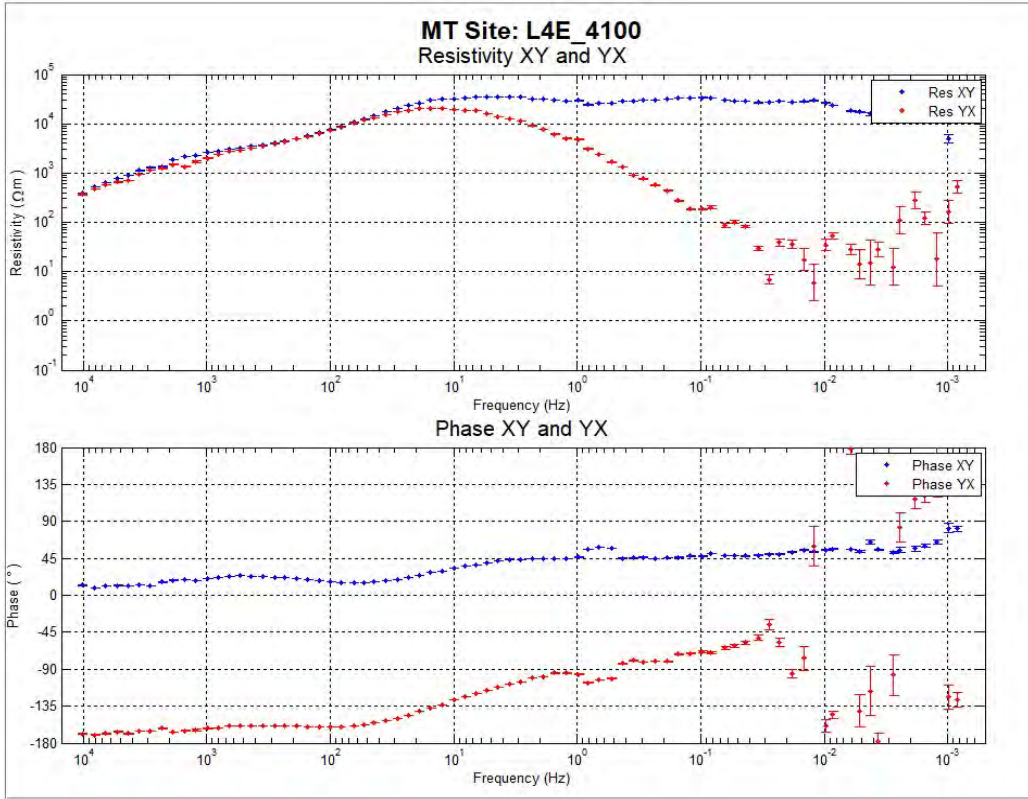




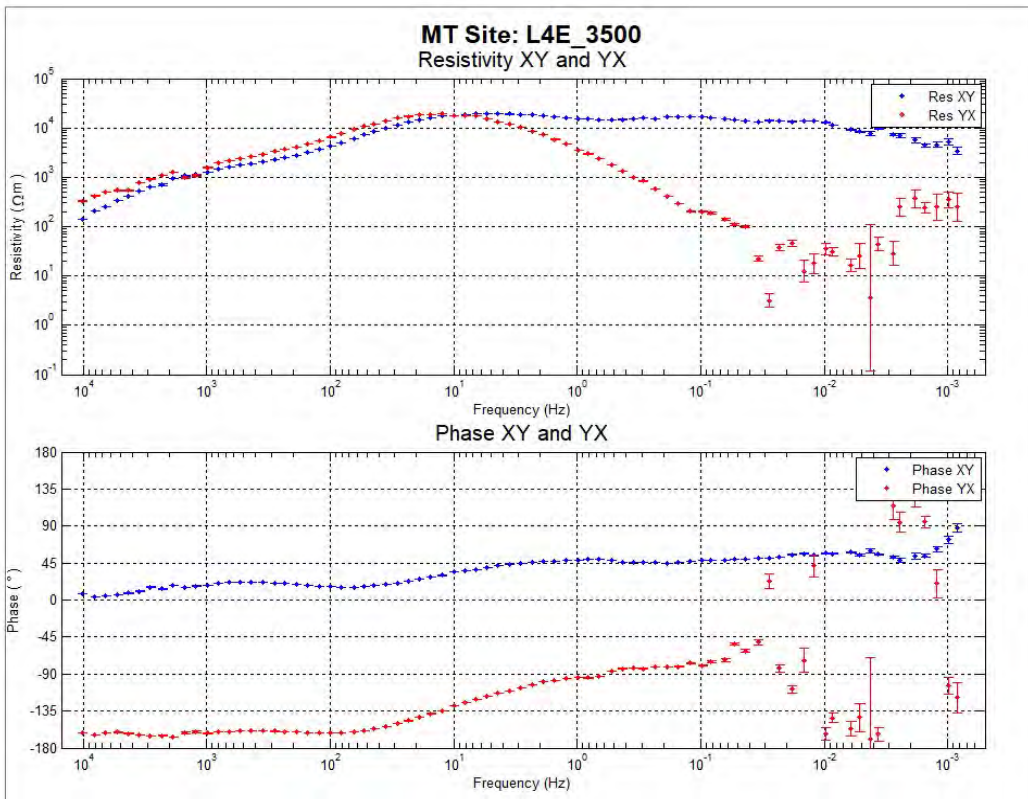
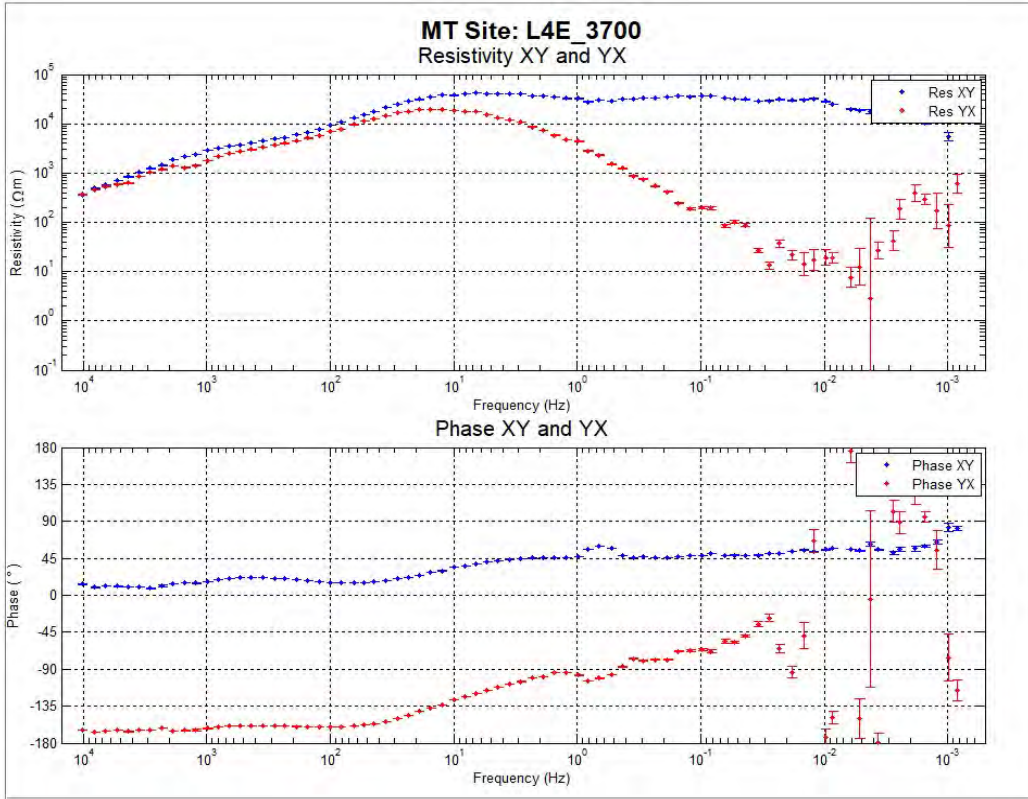


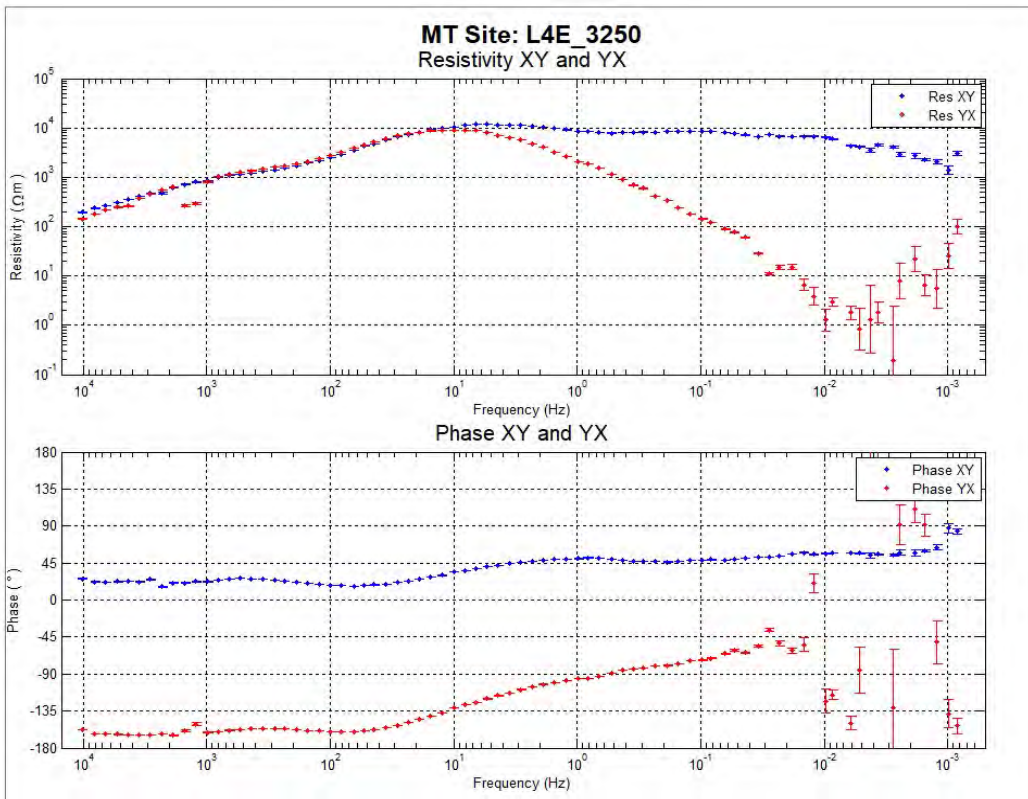
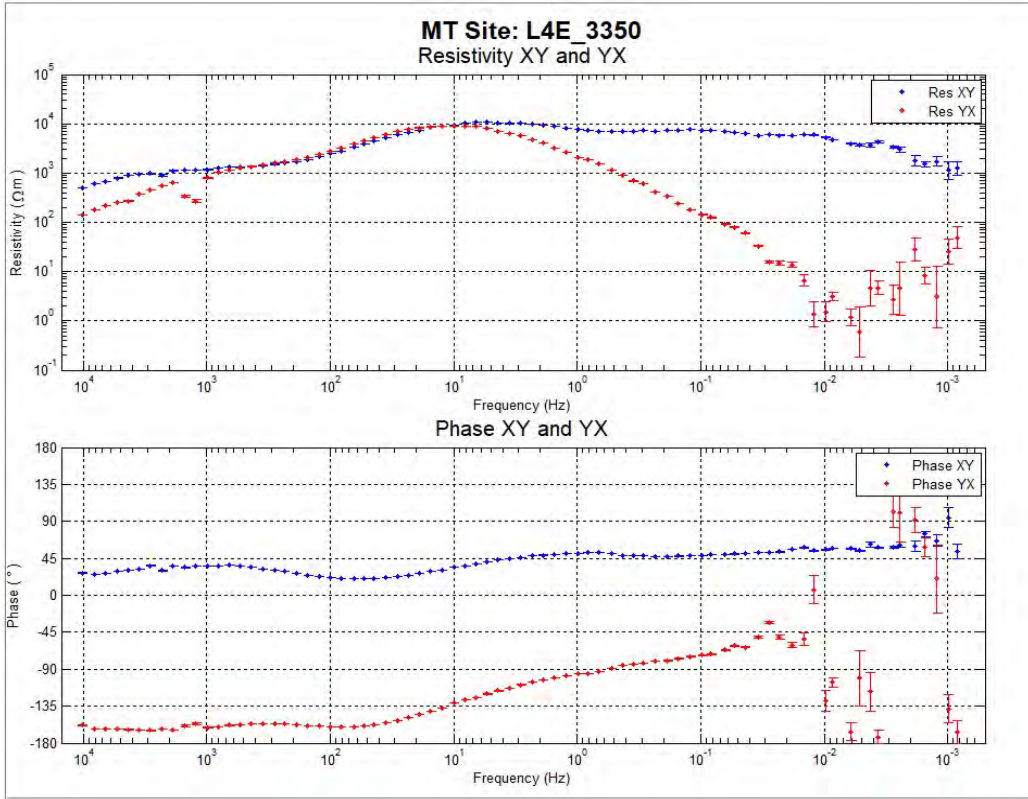


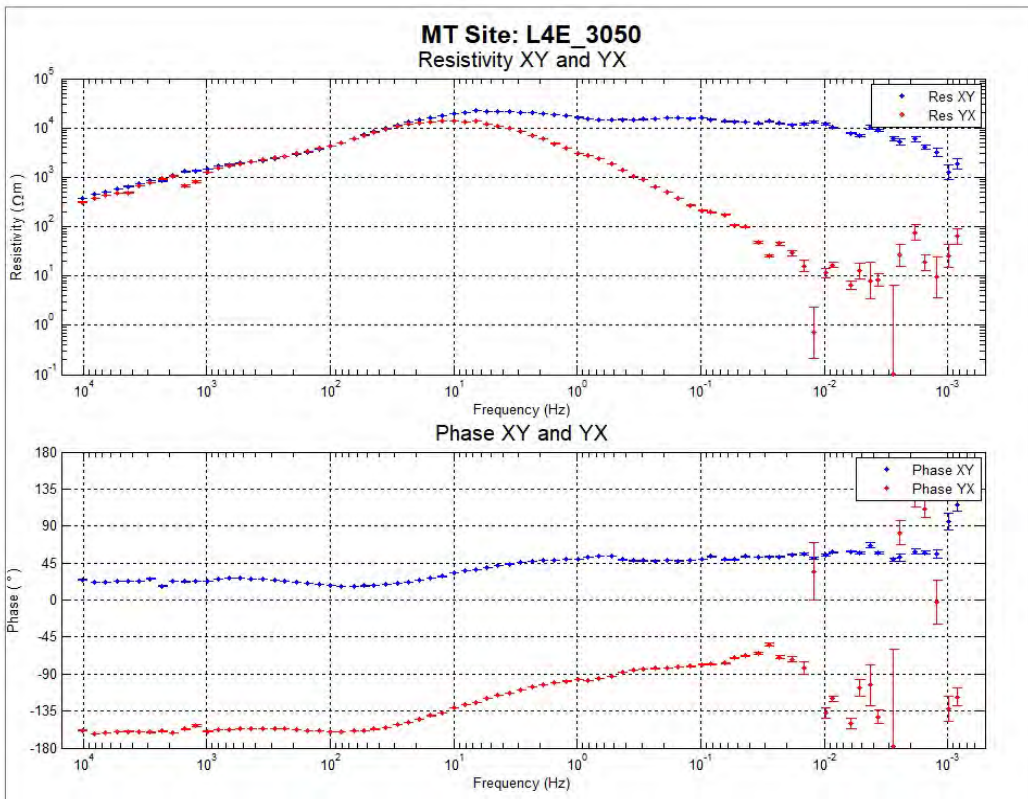
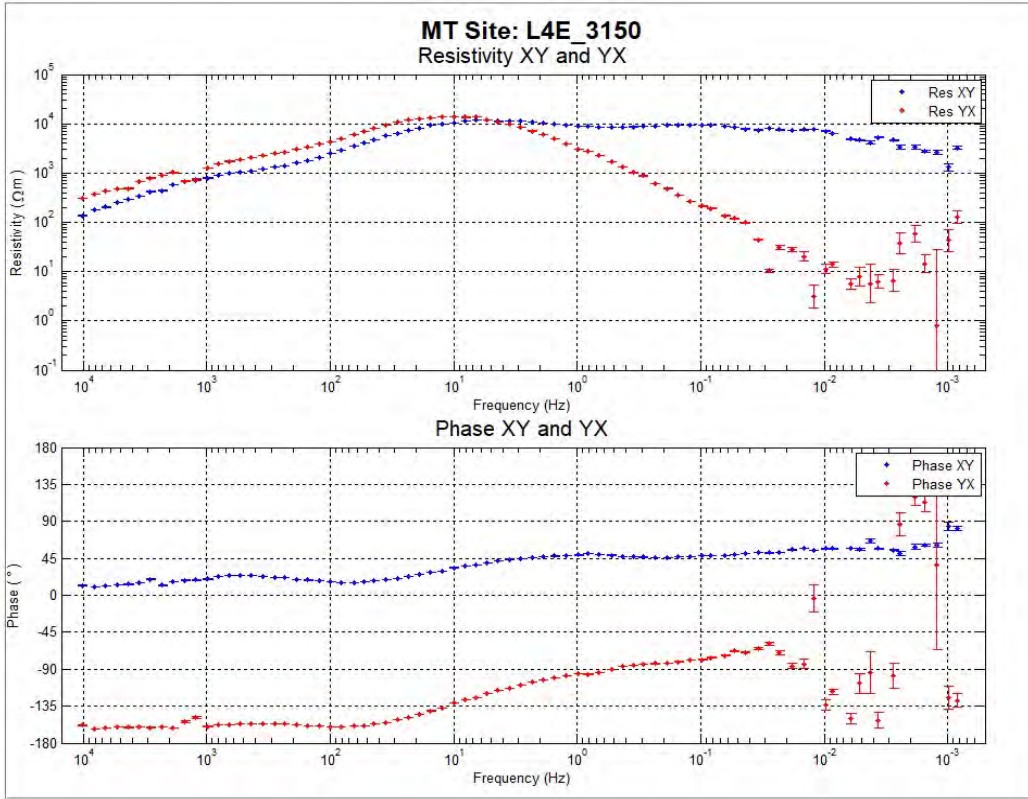


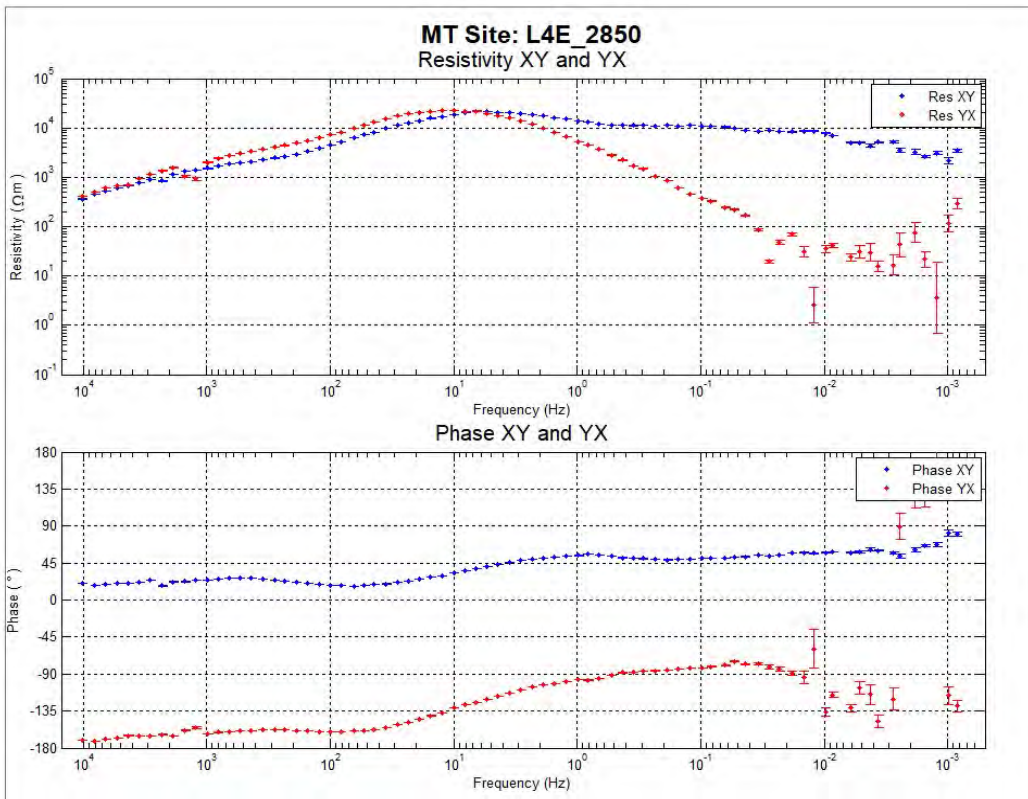
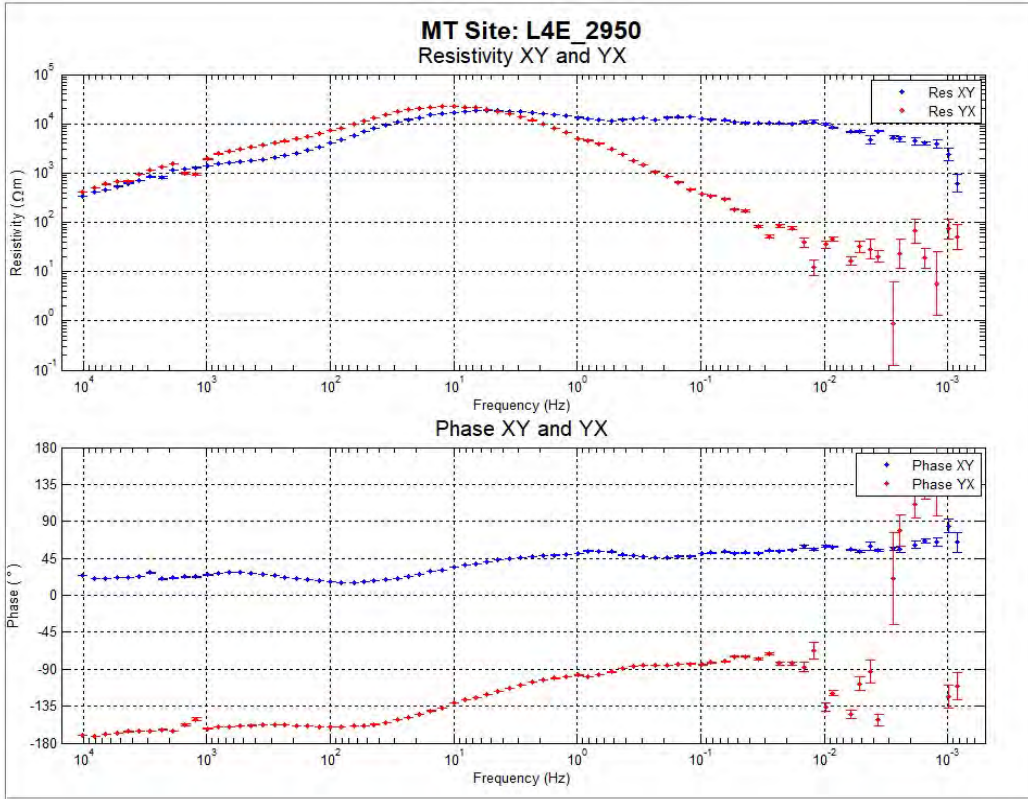


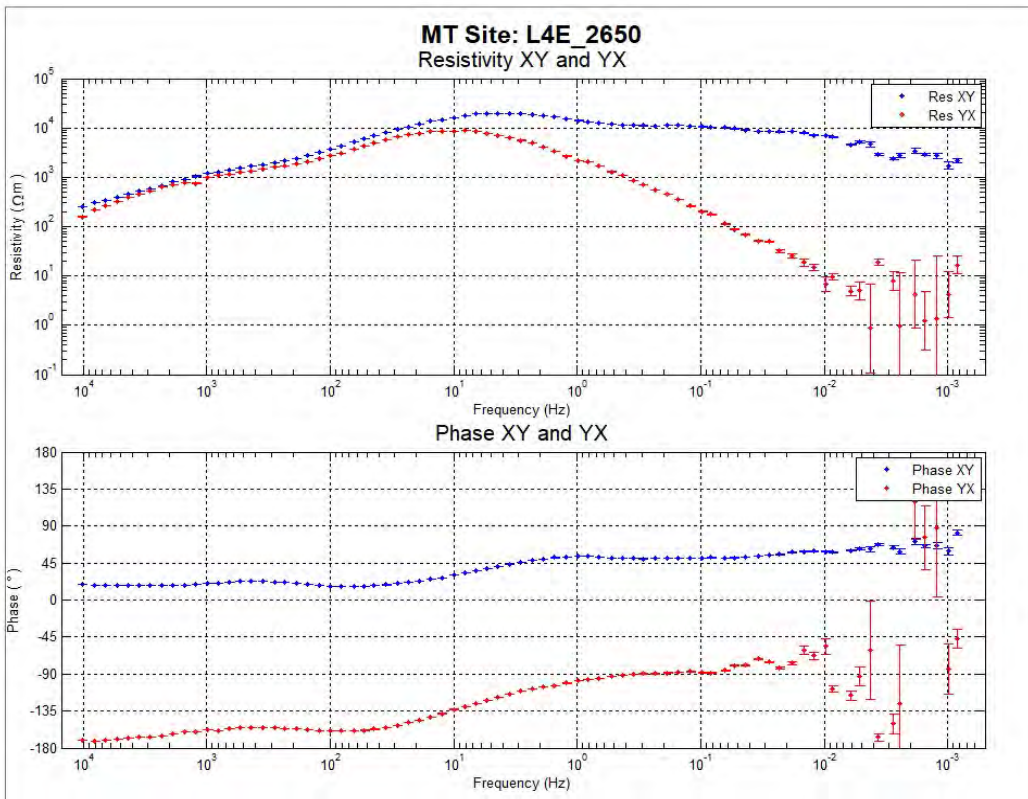
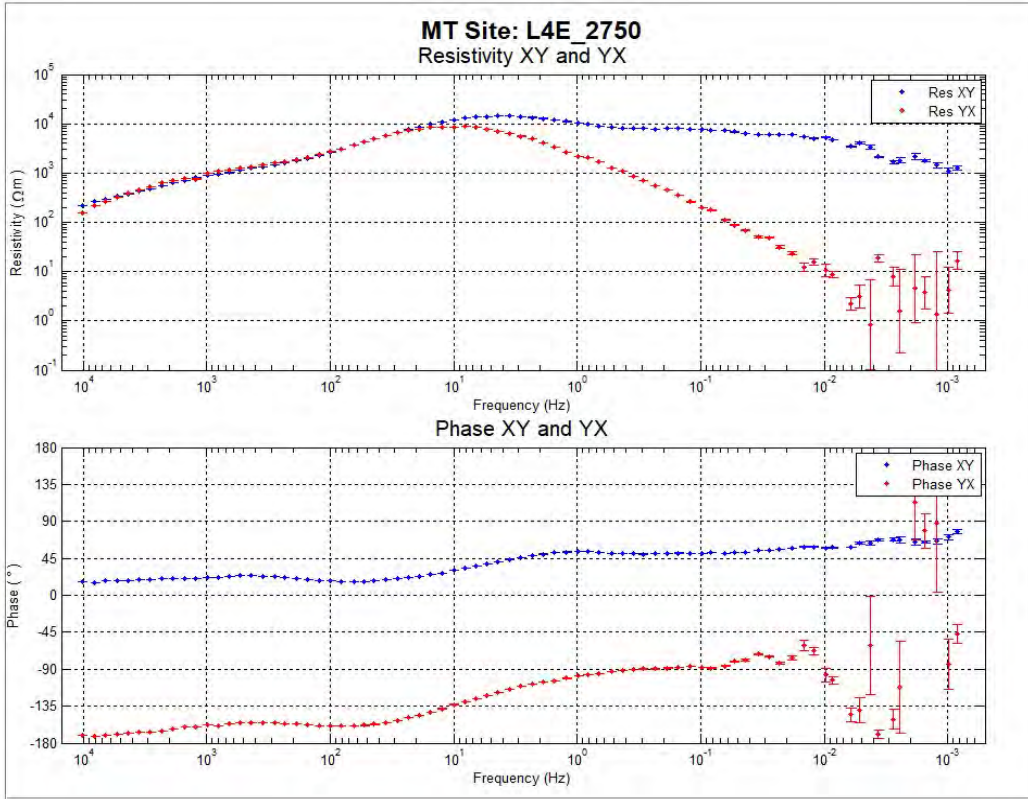


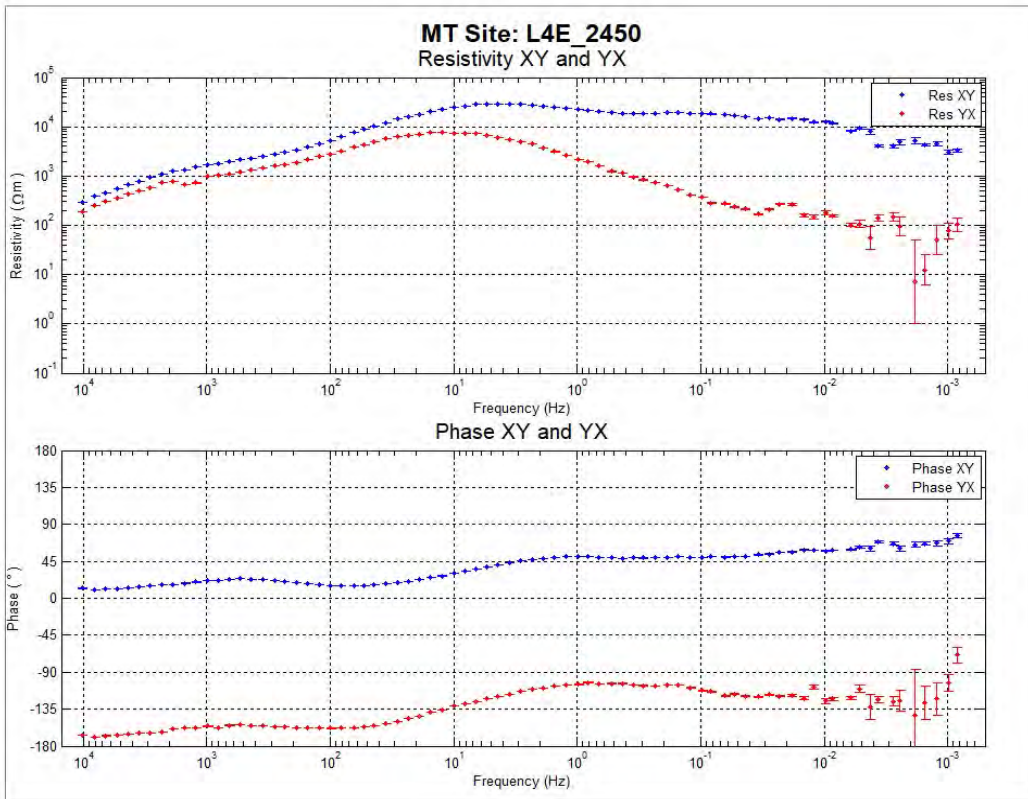
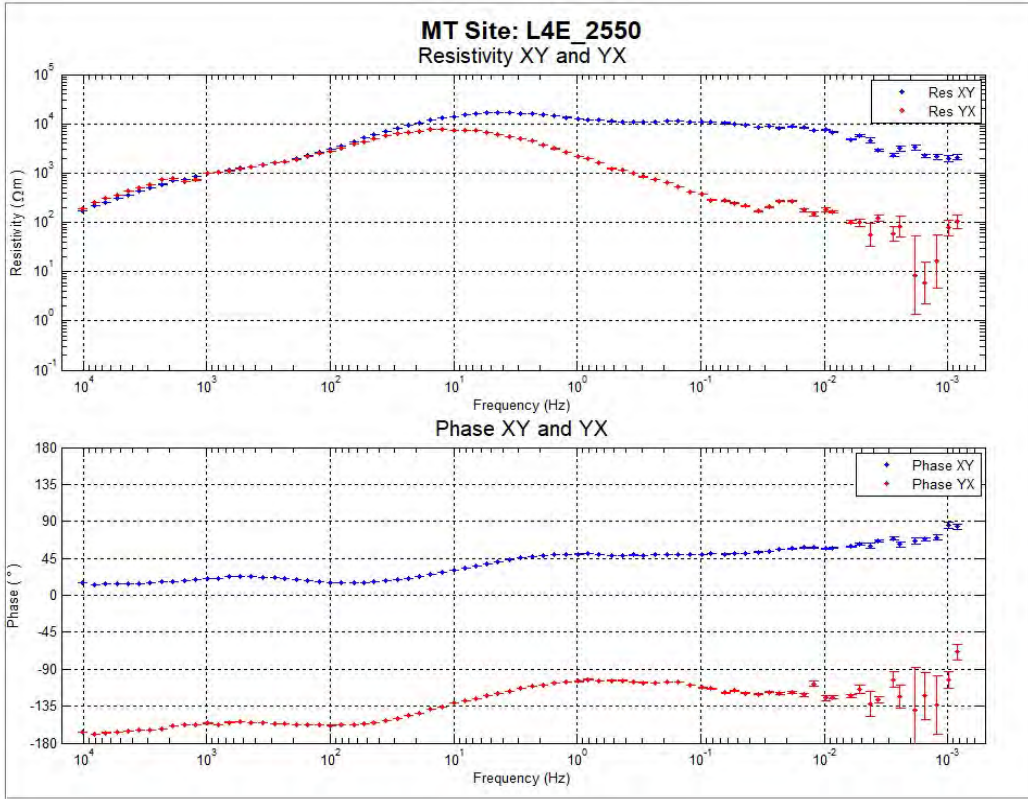


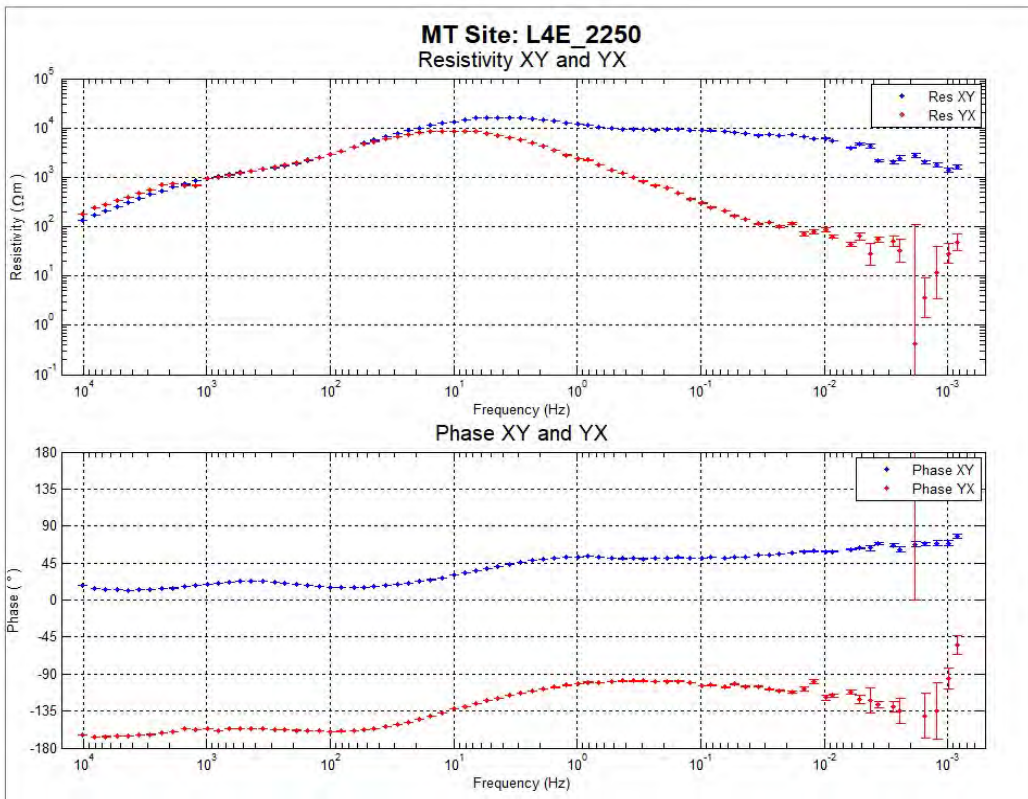
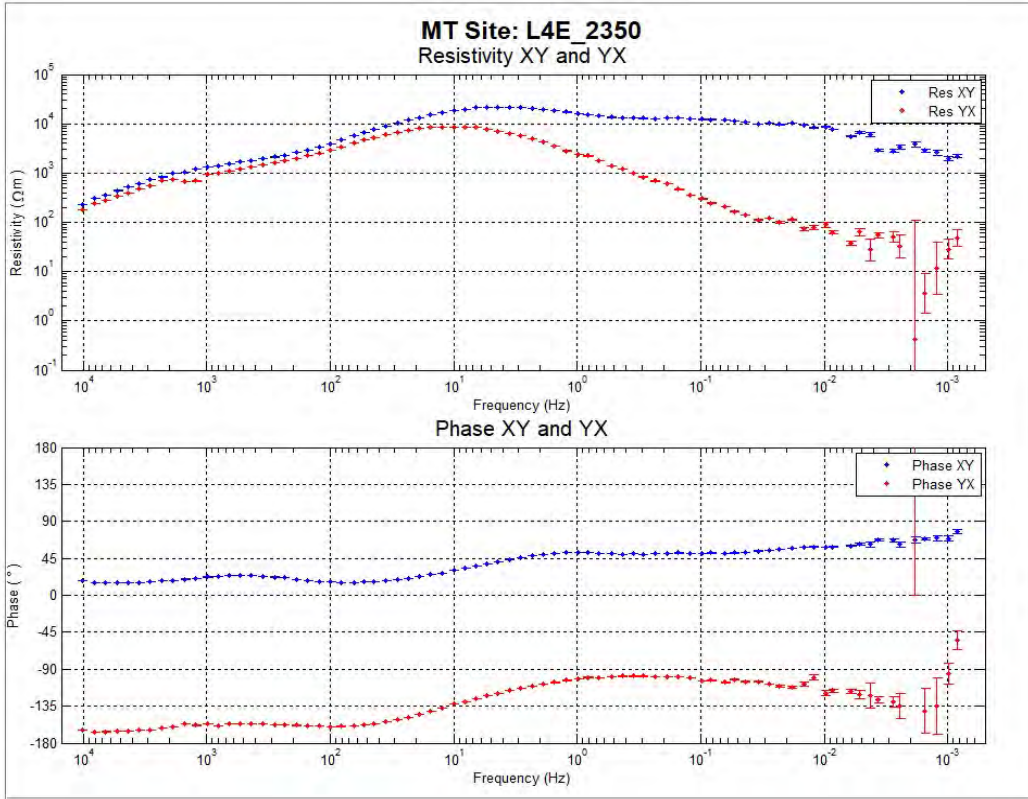


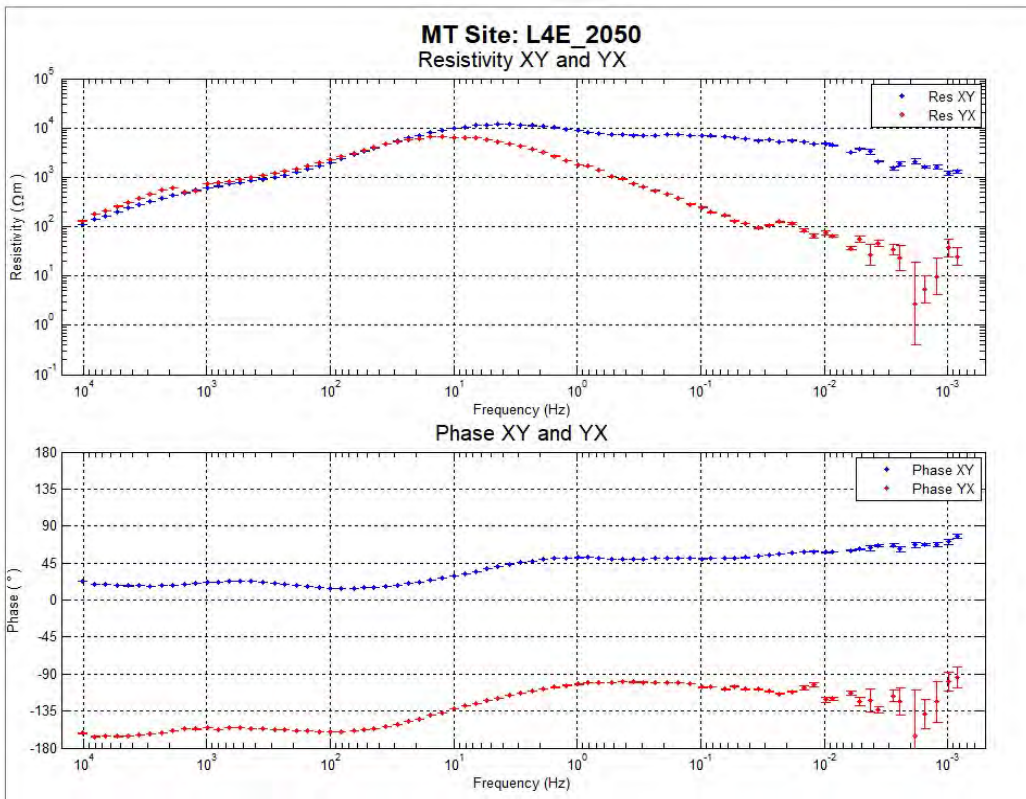
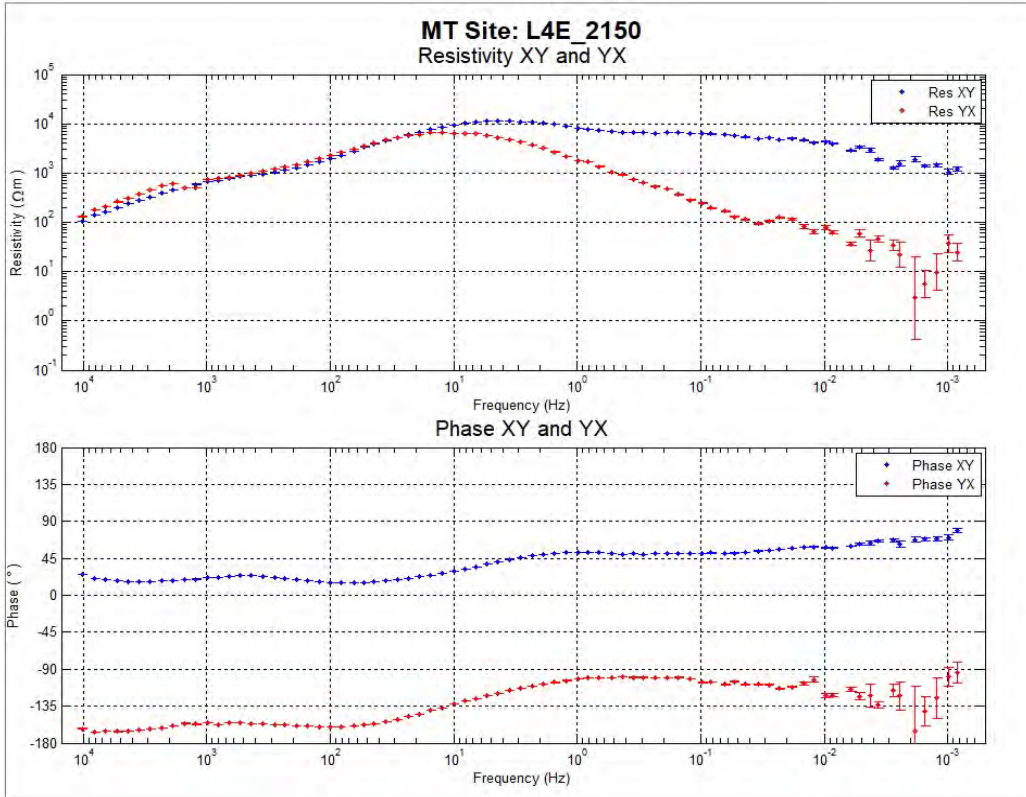




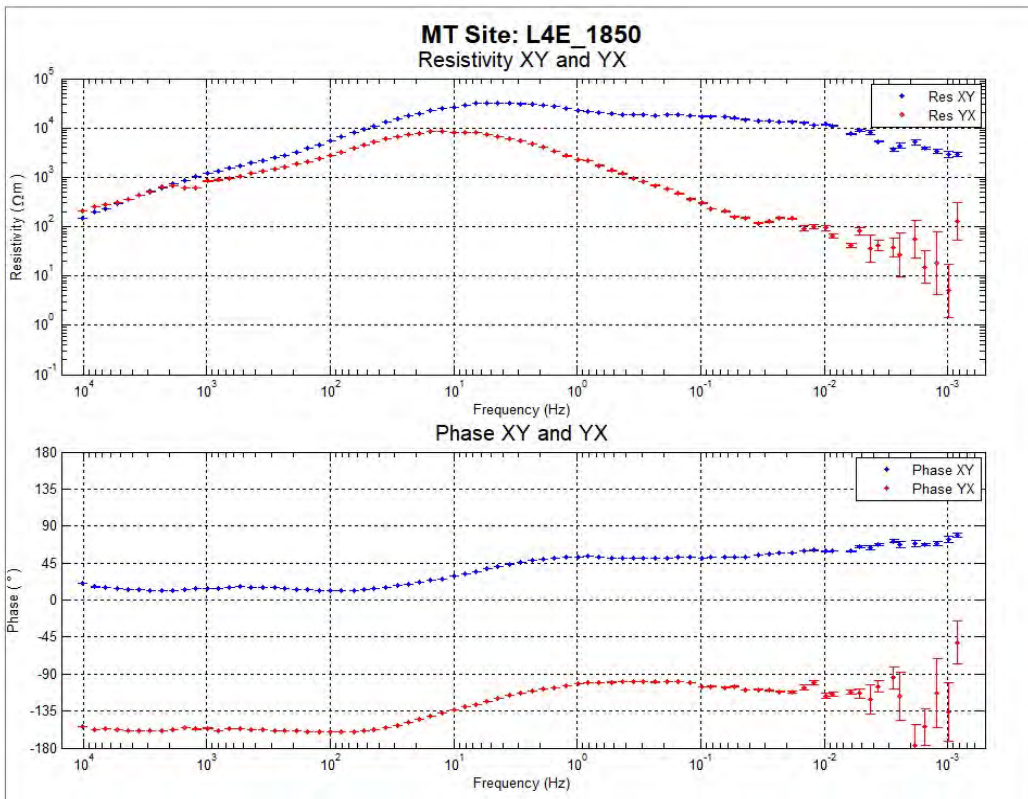
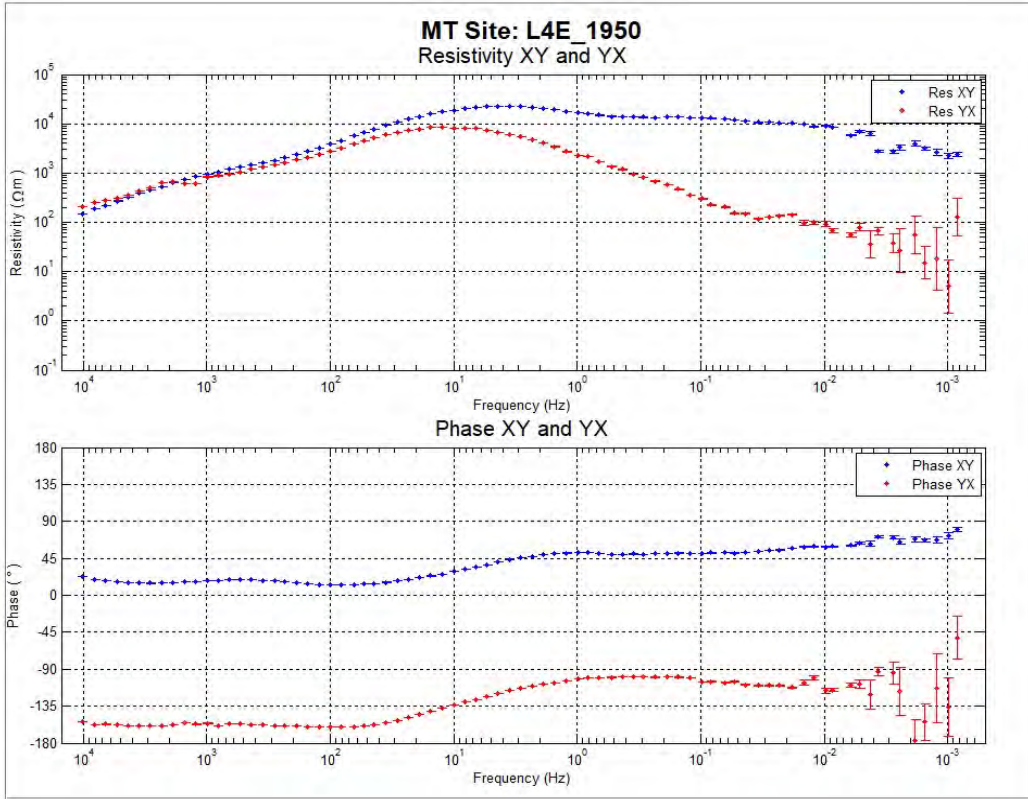


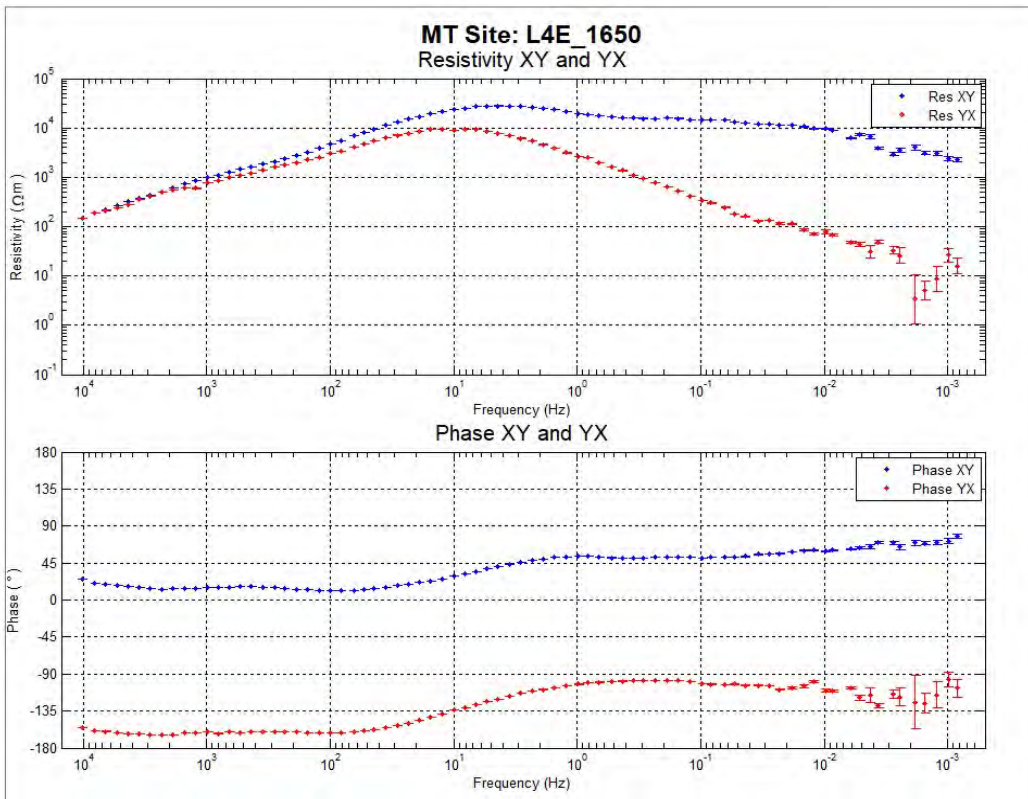
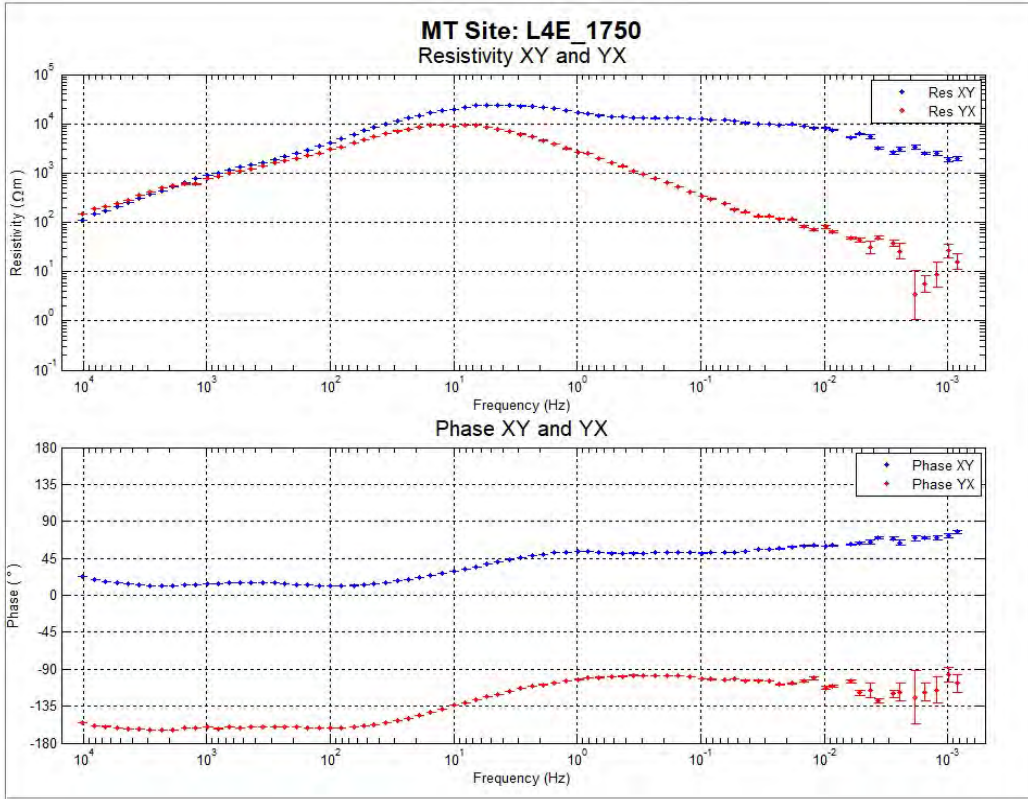


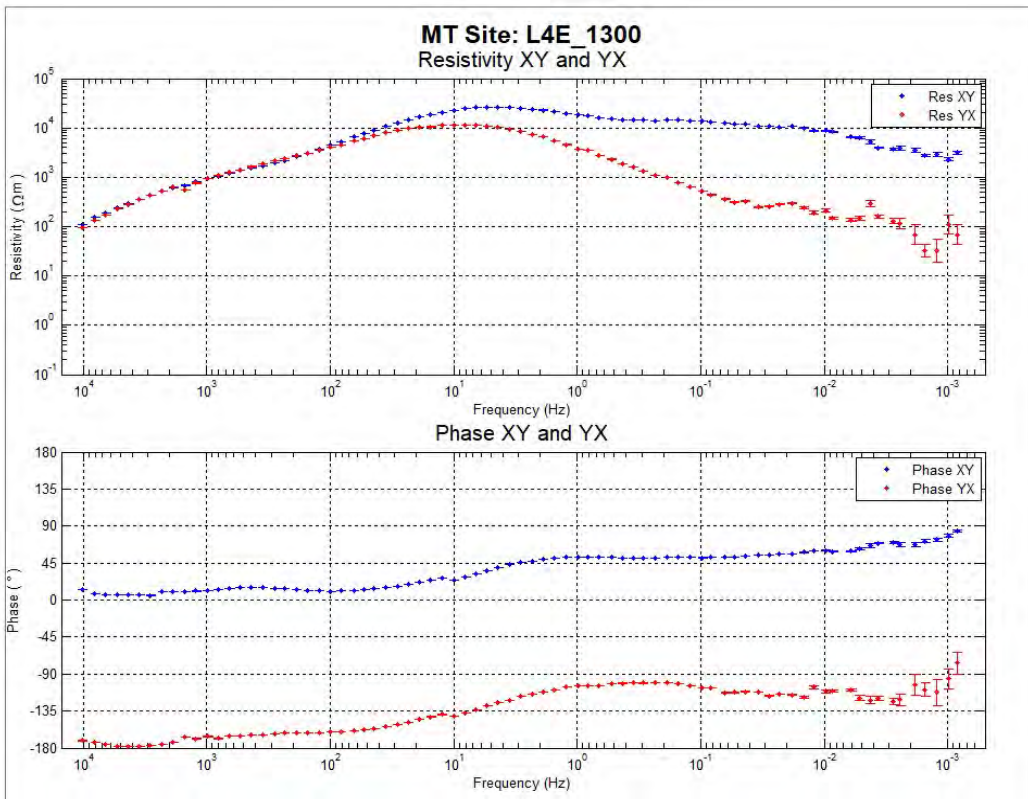
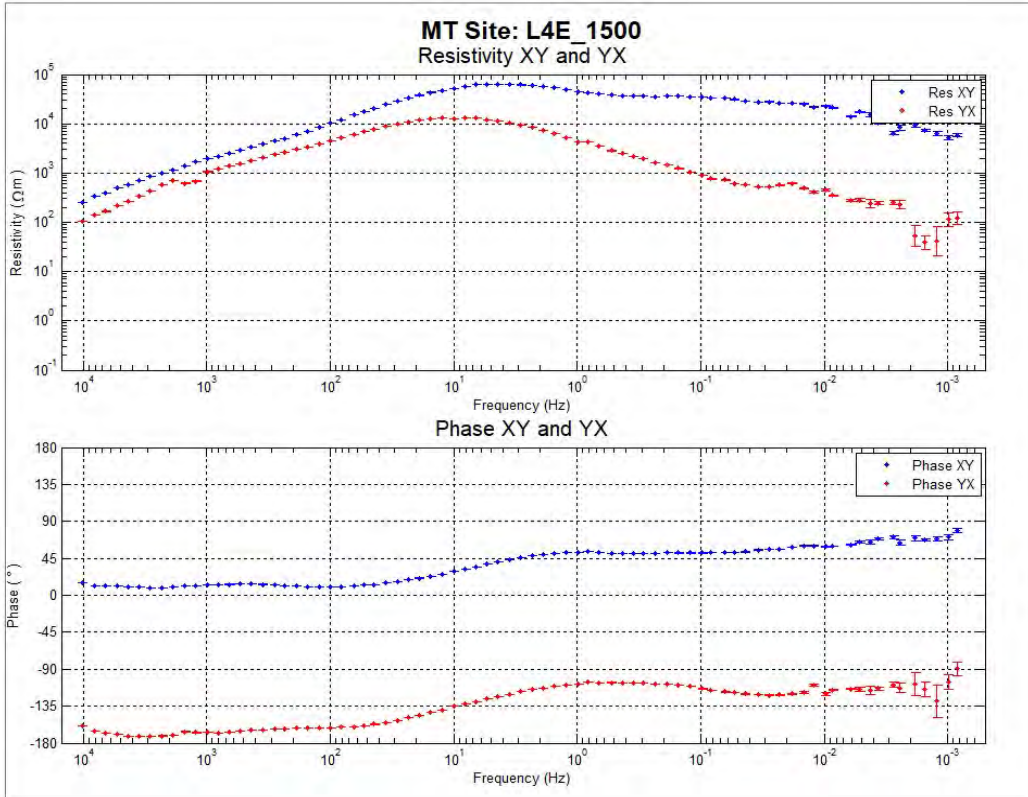


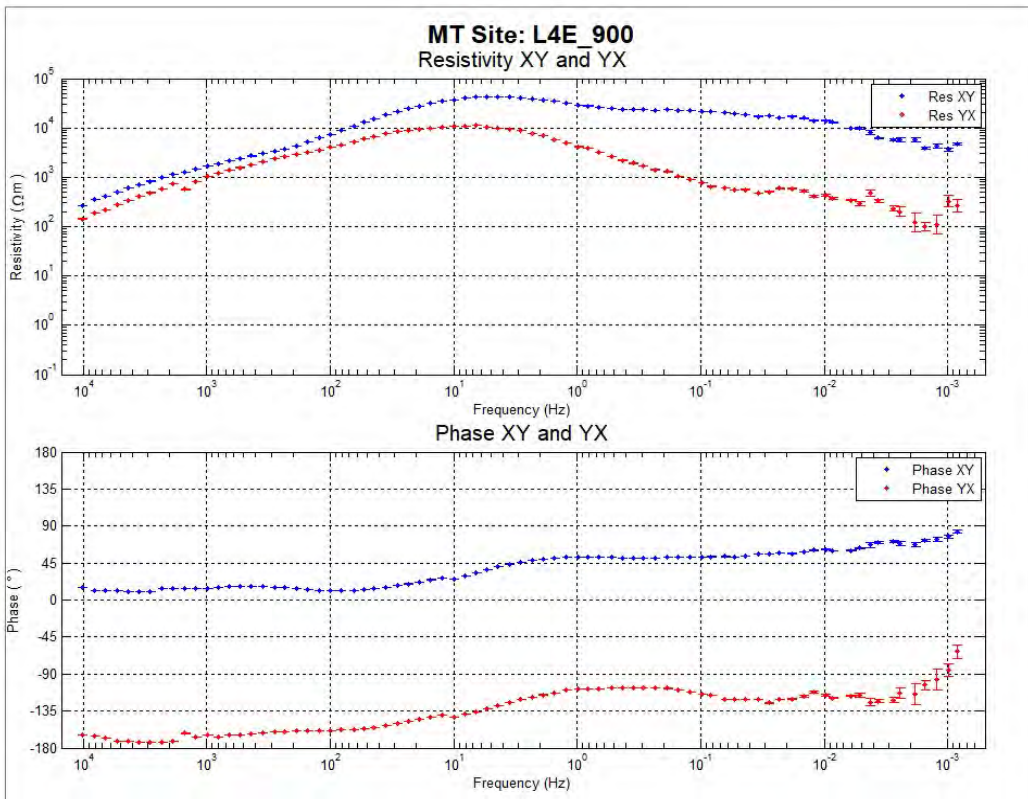
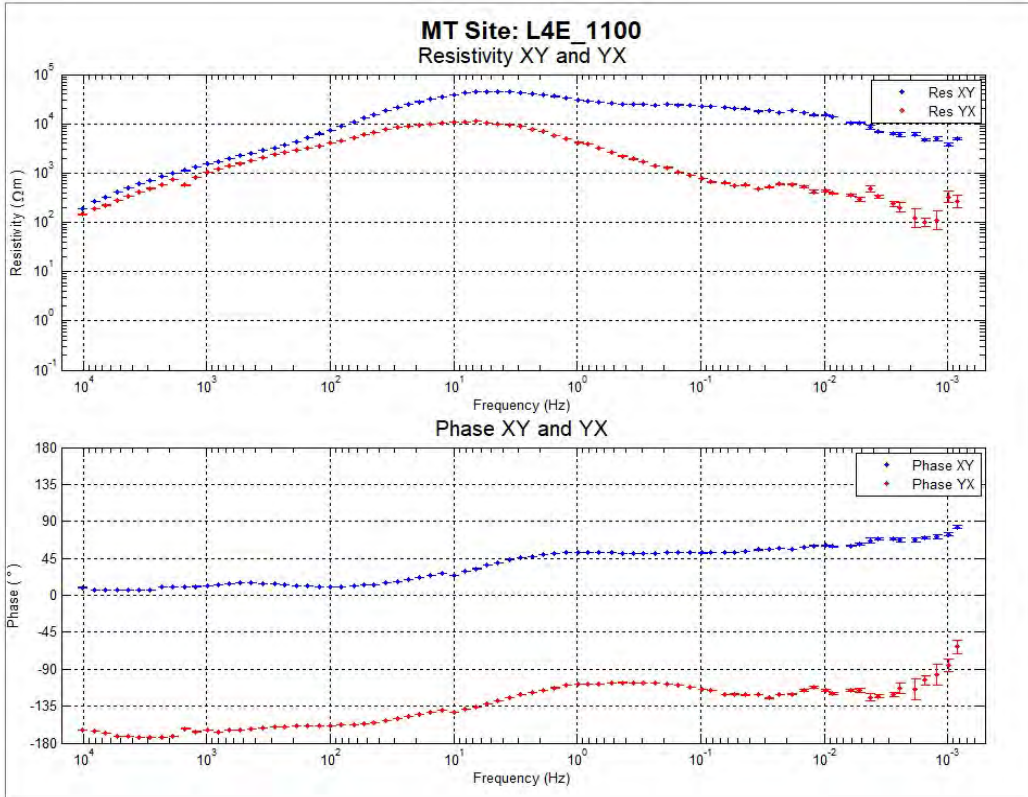


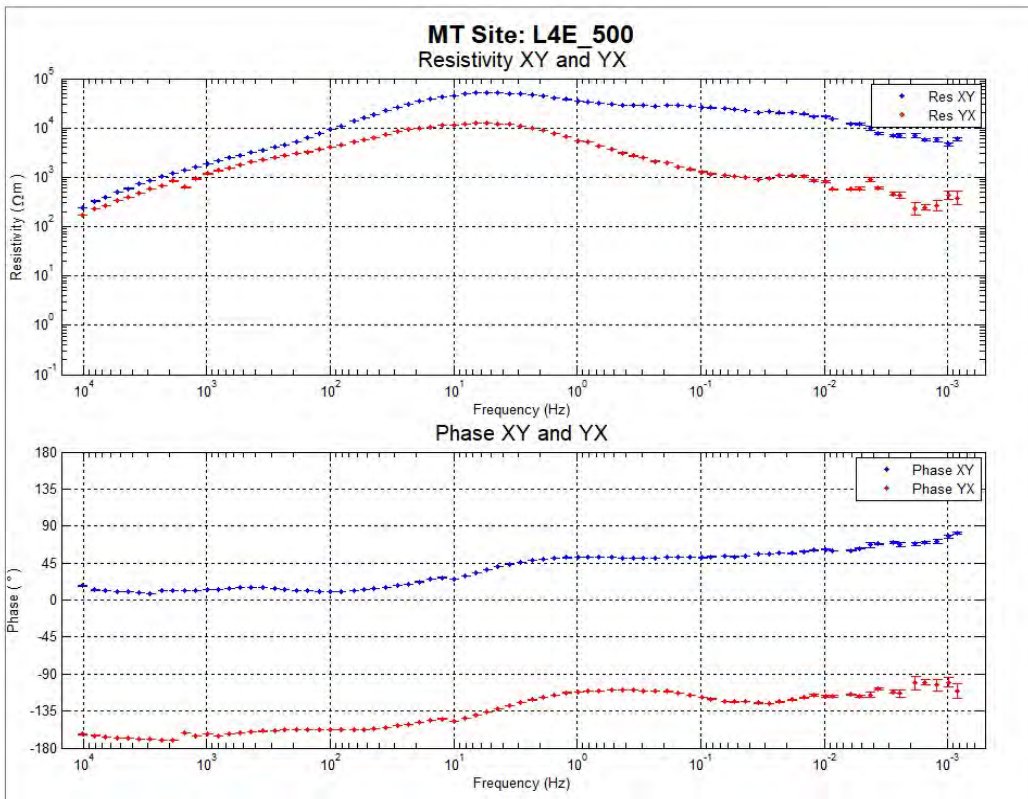
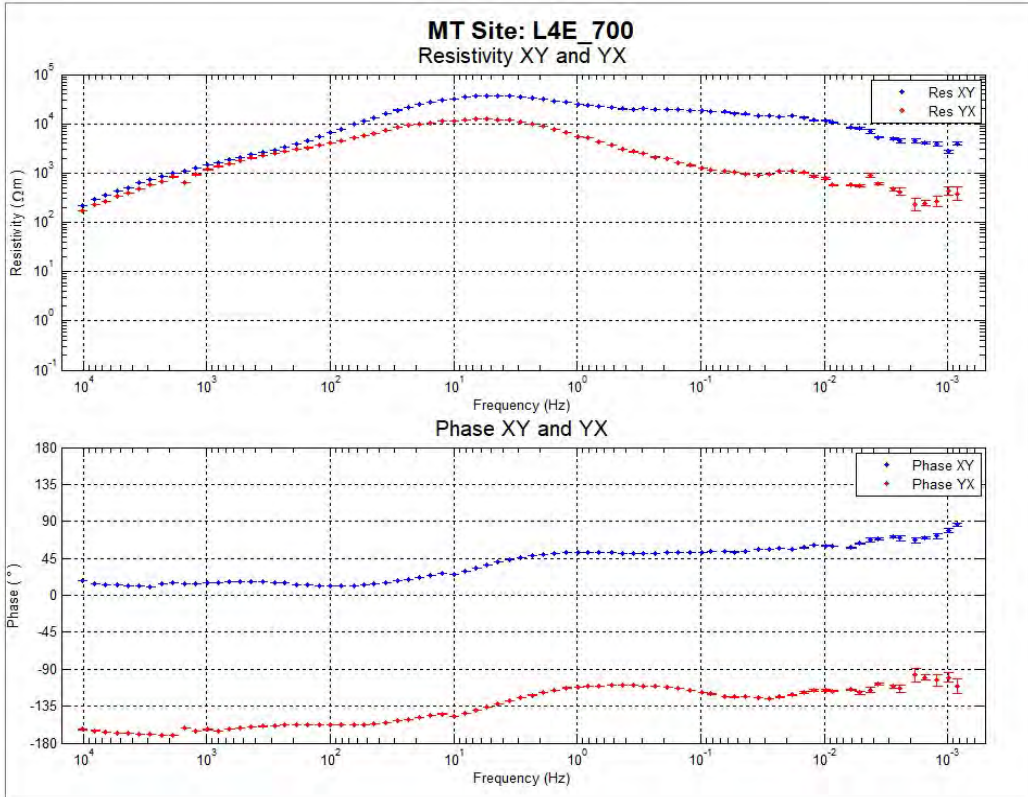


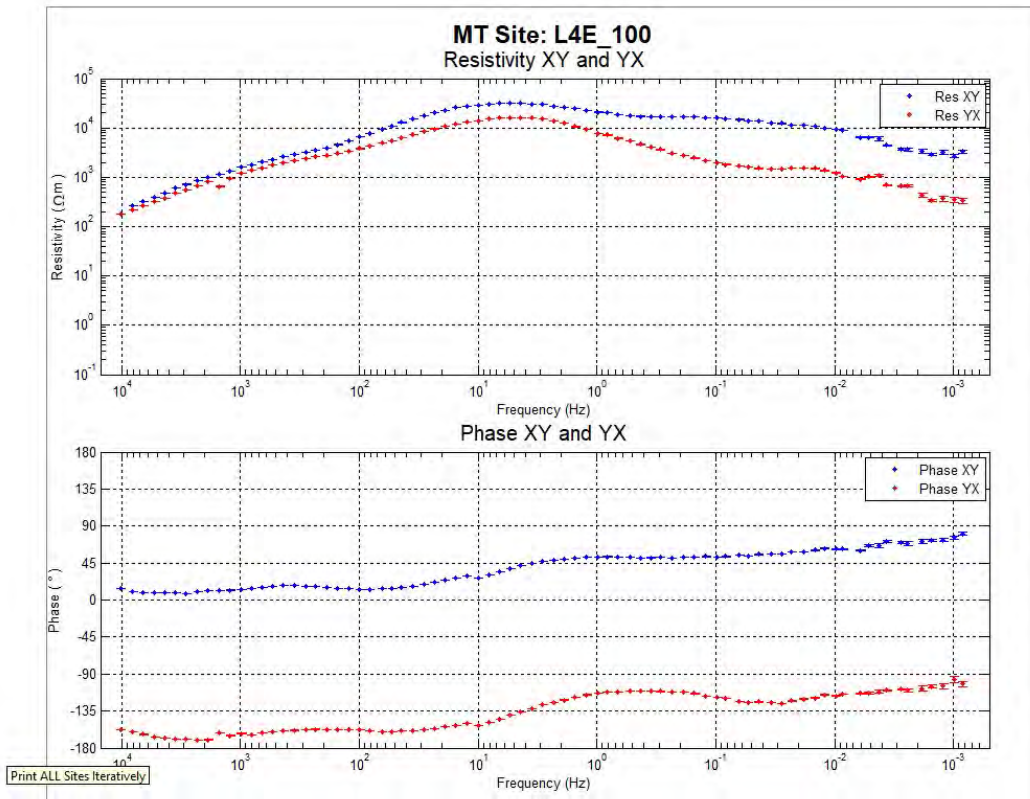
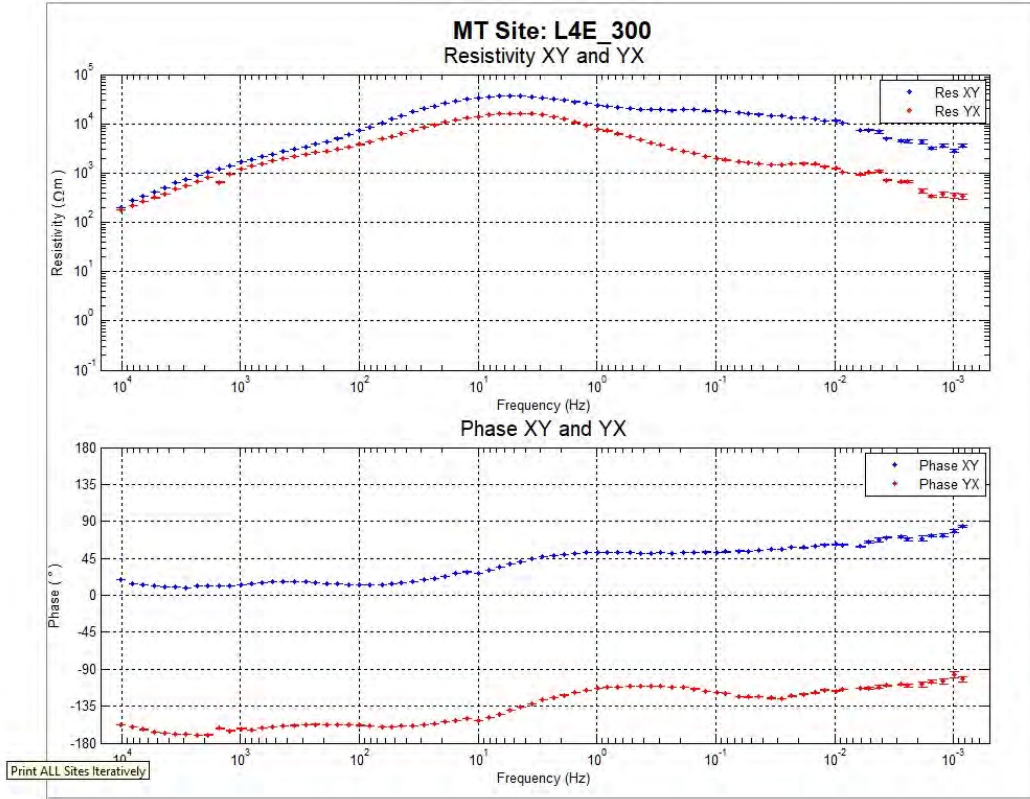






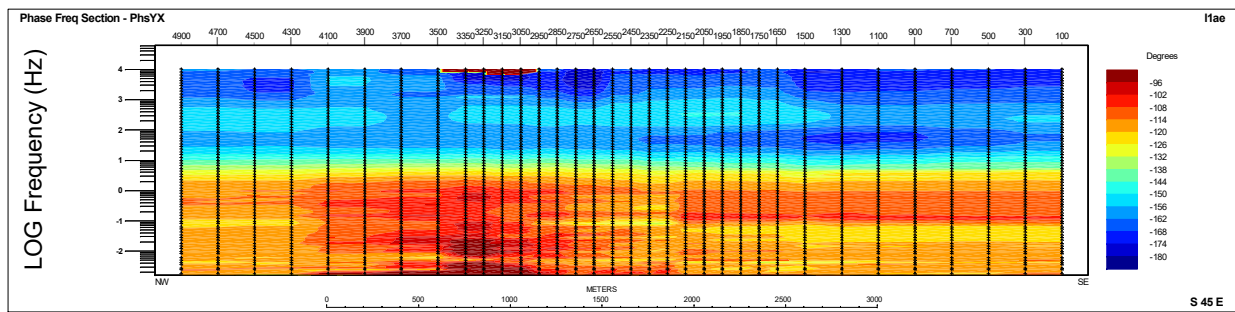
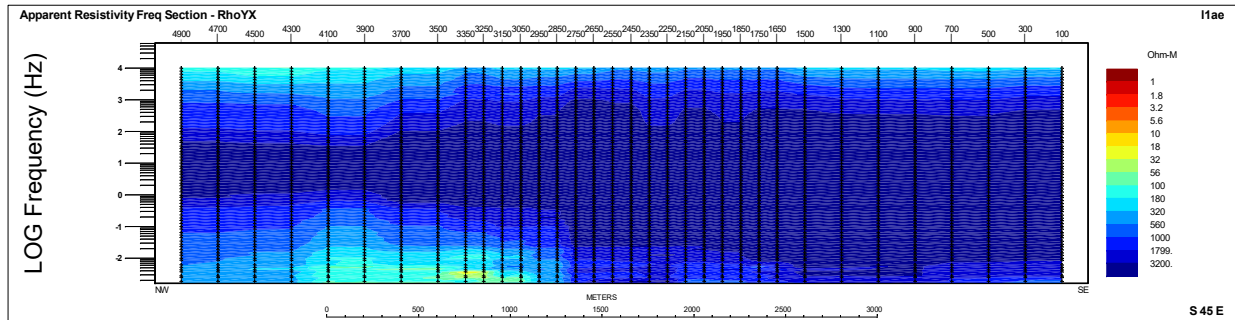
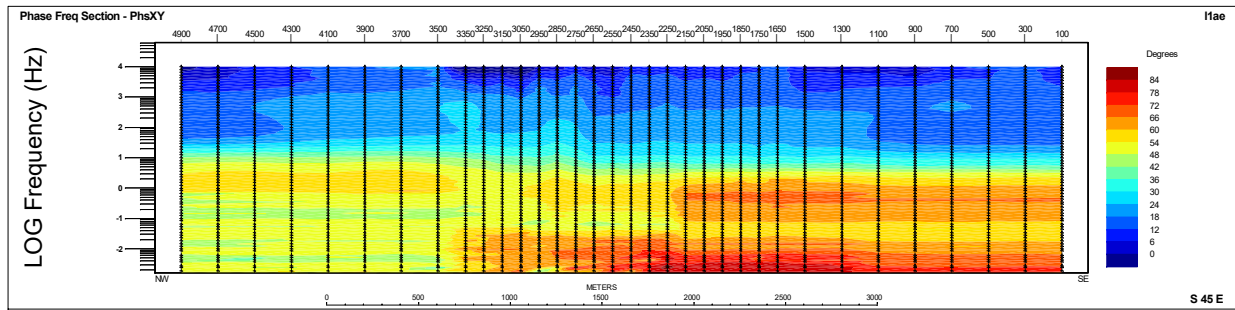
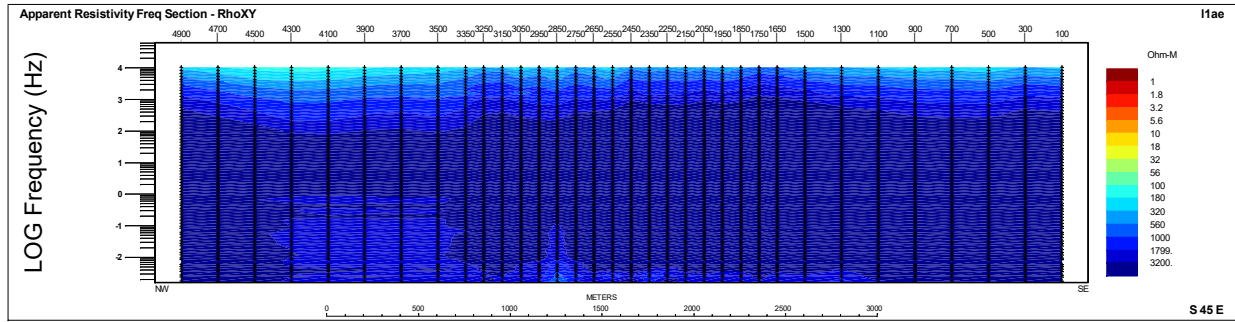


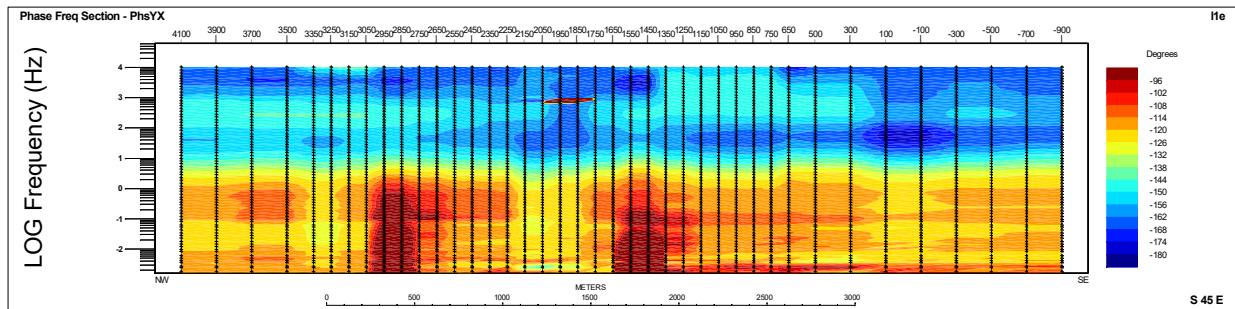
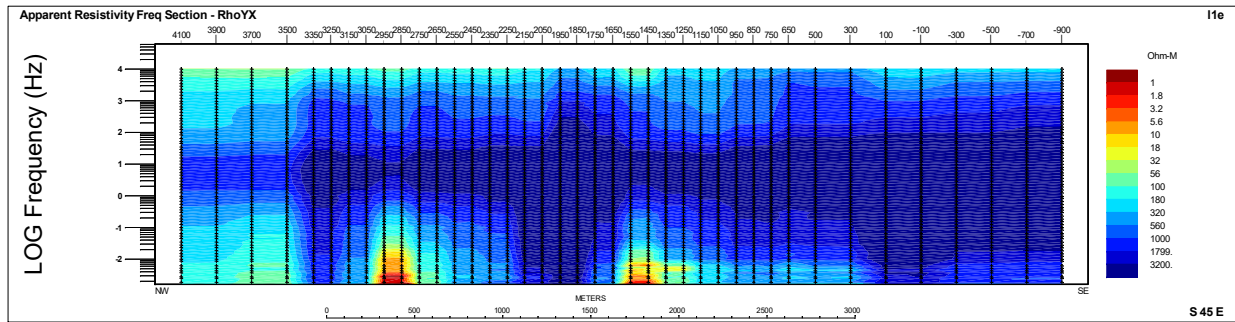
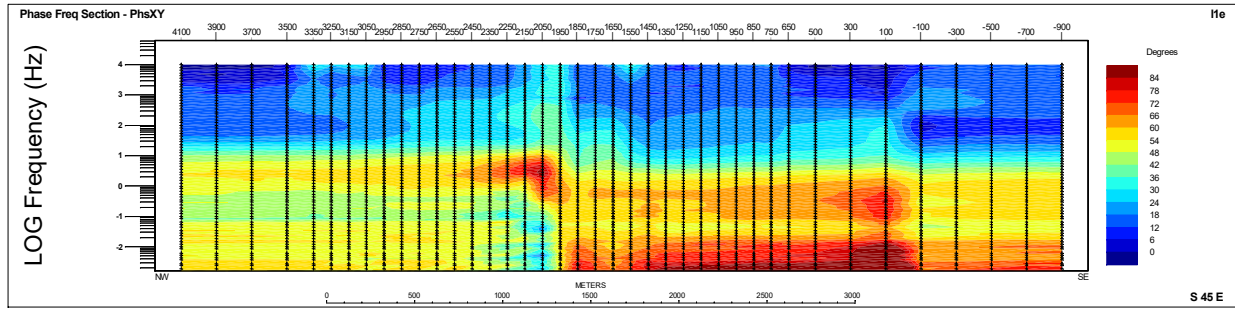
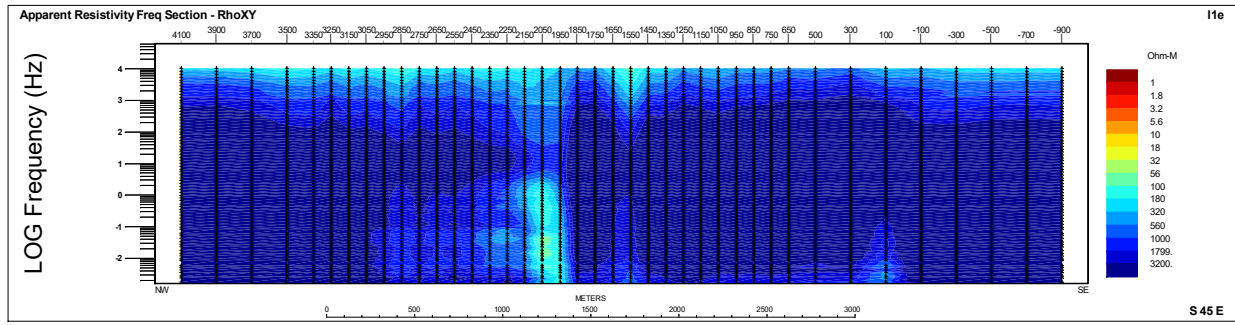




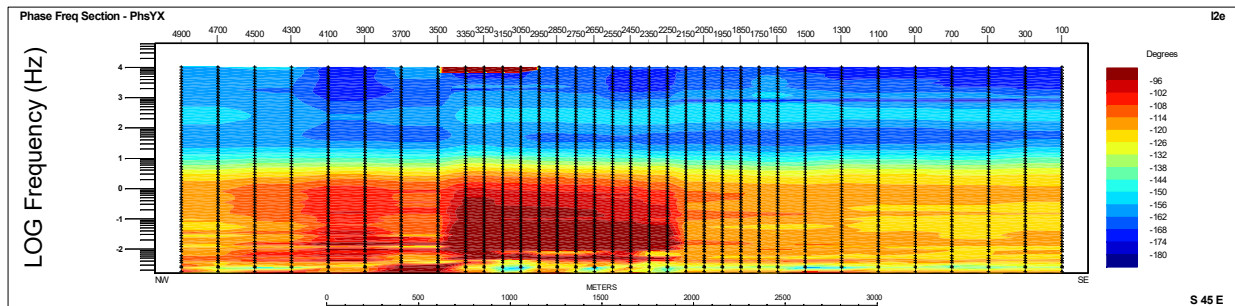
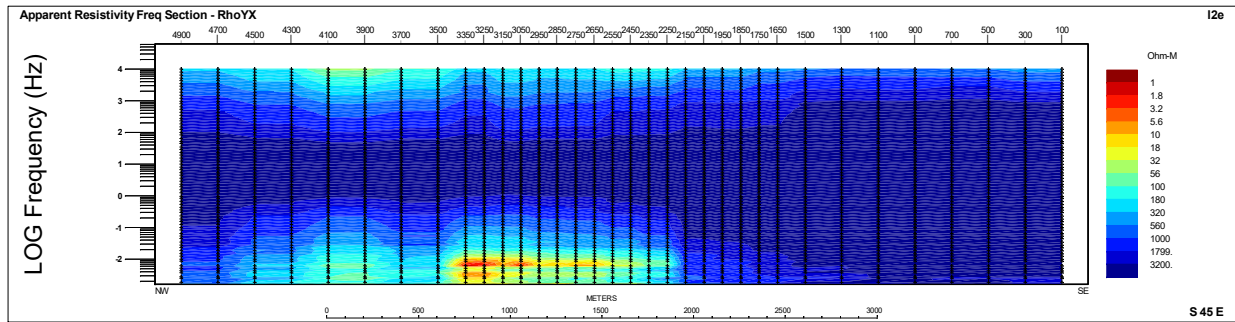
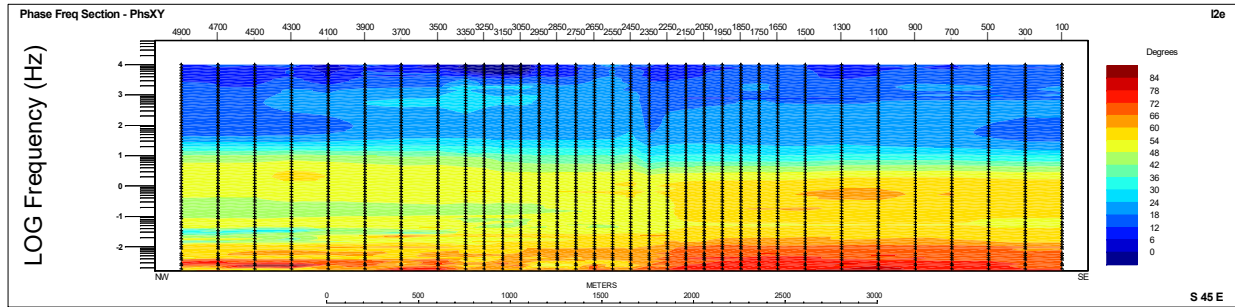
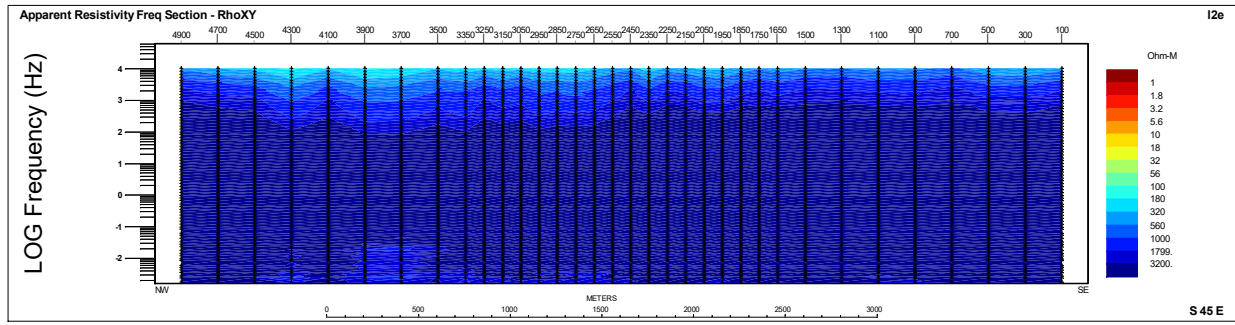
# C.1. KOPER LAKE PSEUDOSECTIONS

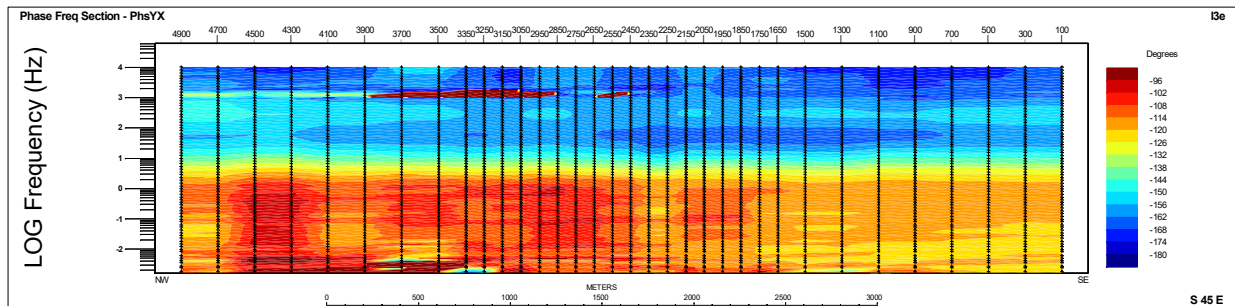
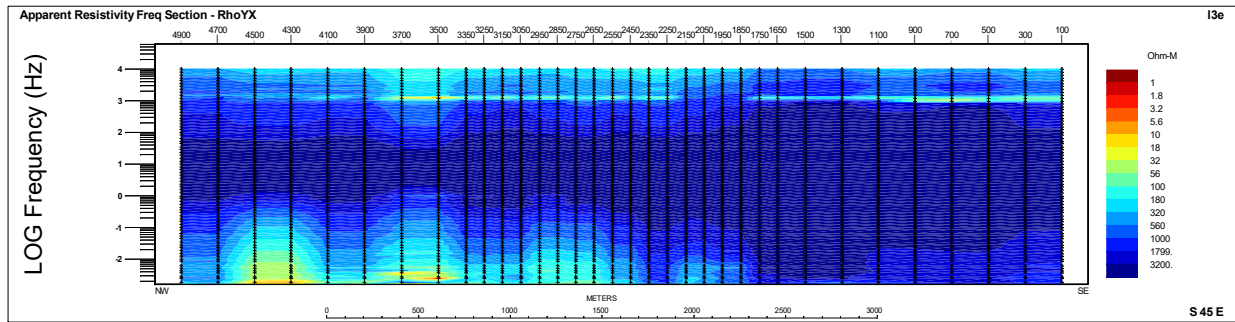
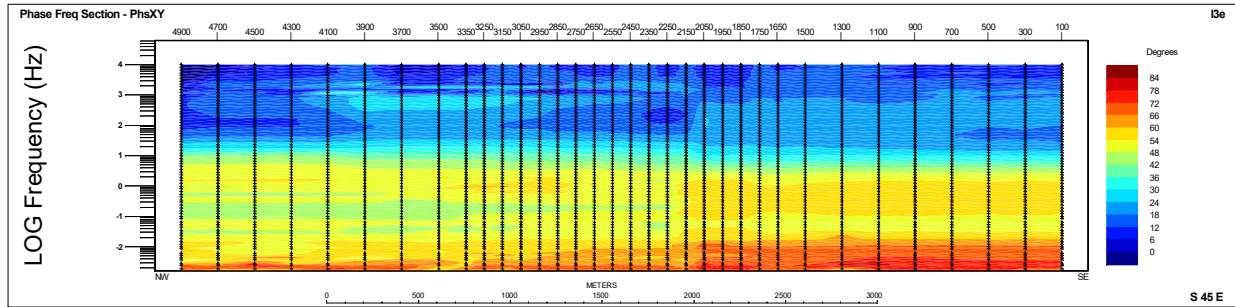
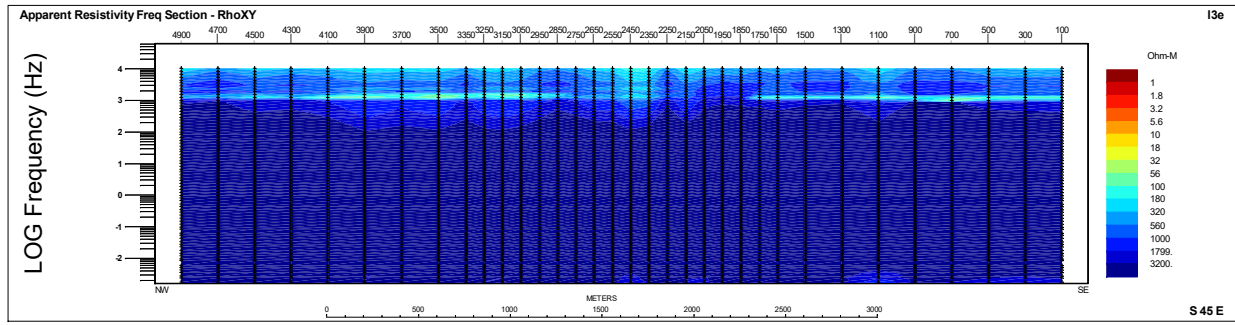
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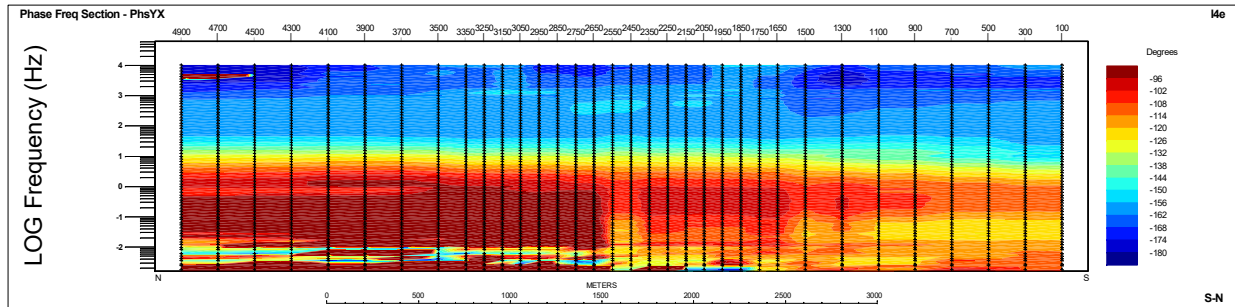
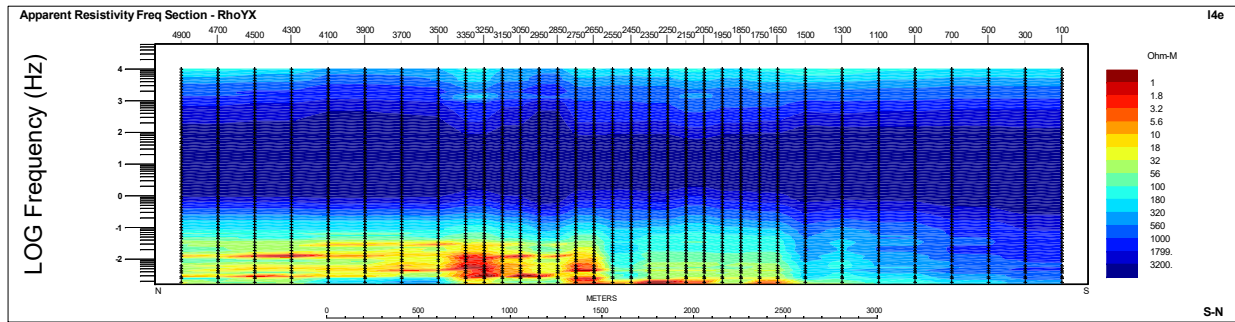
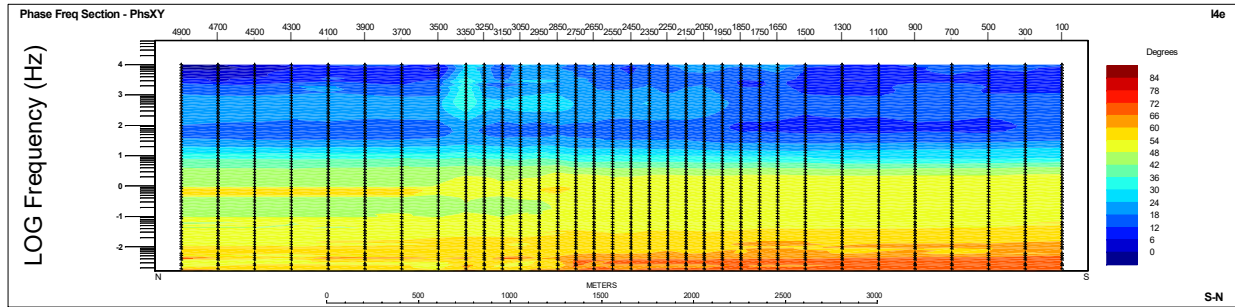
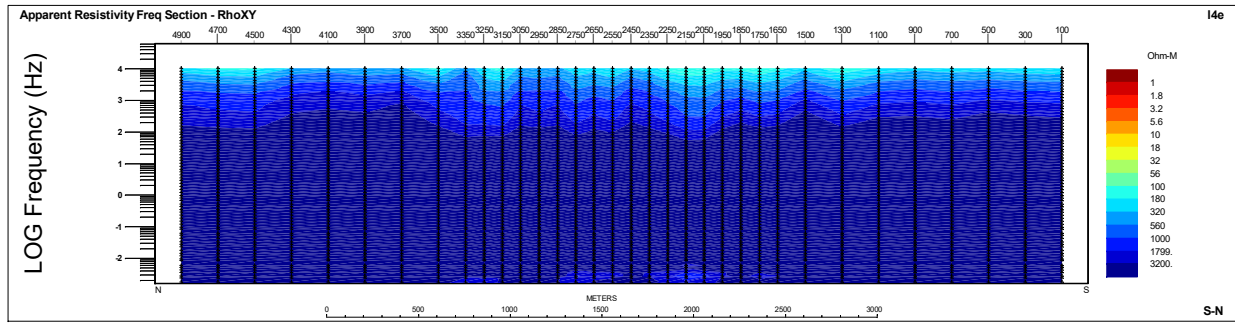




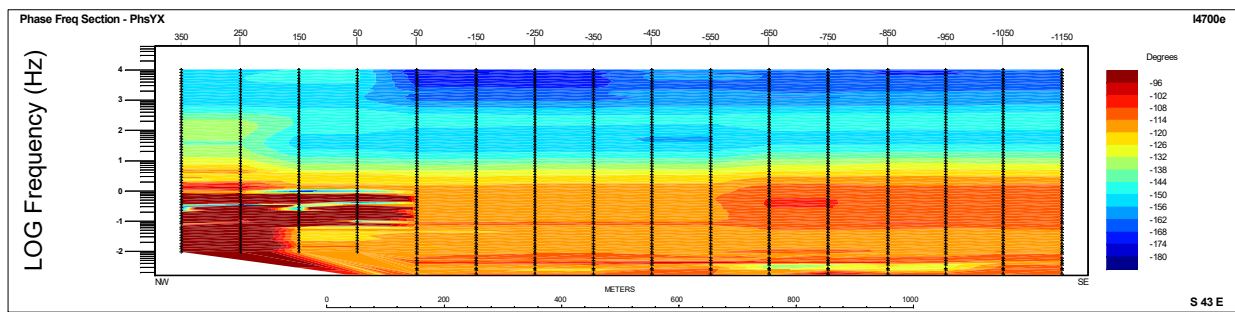
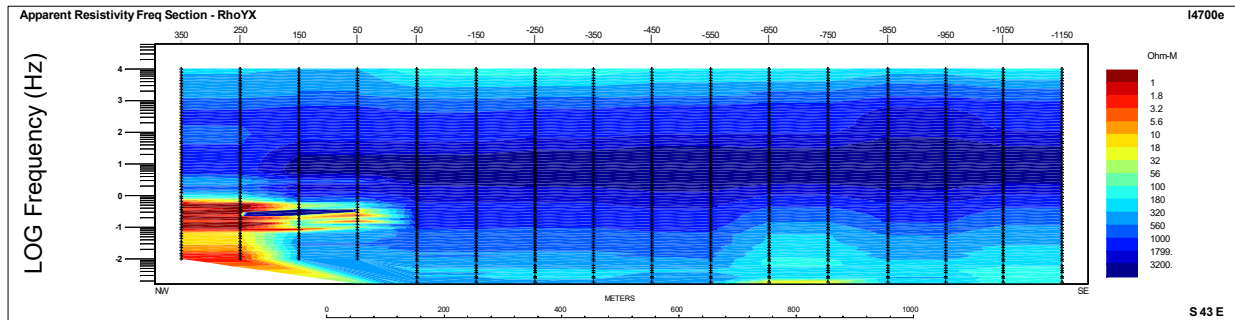
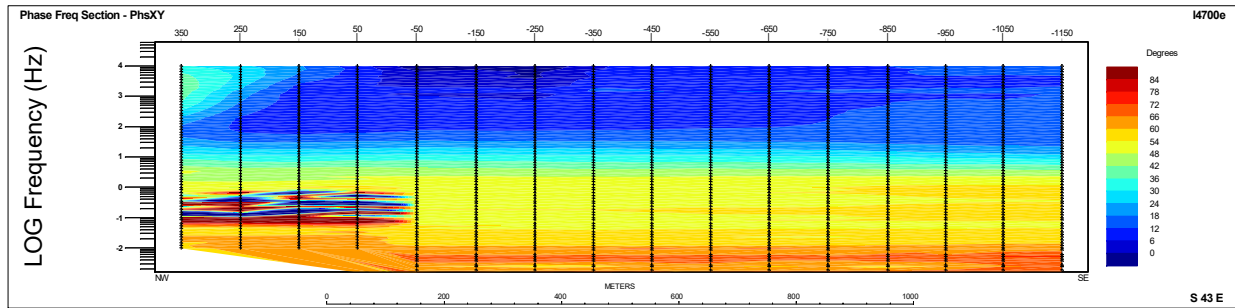
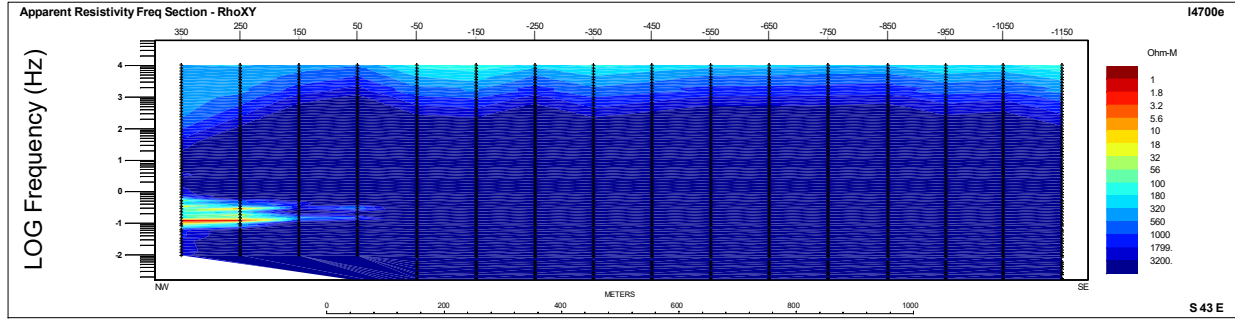




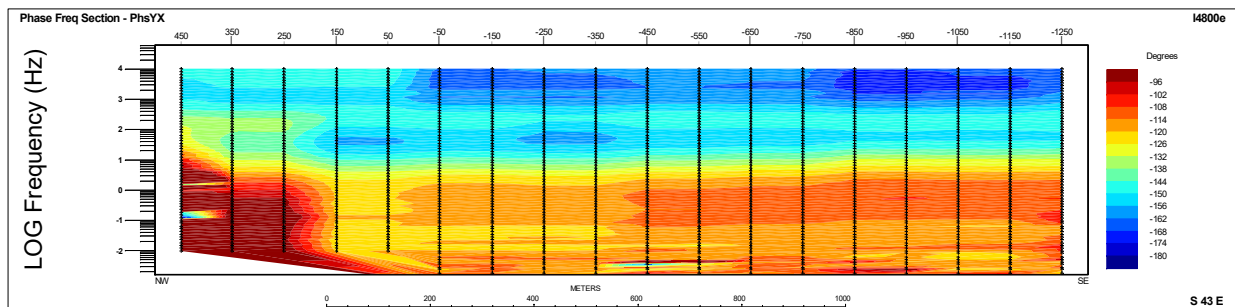
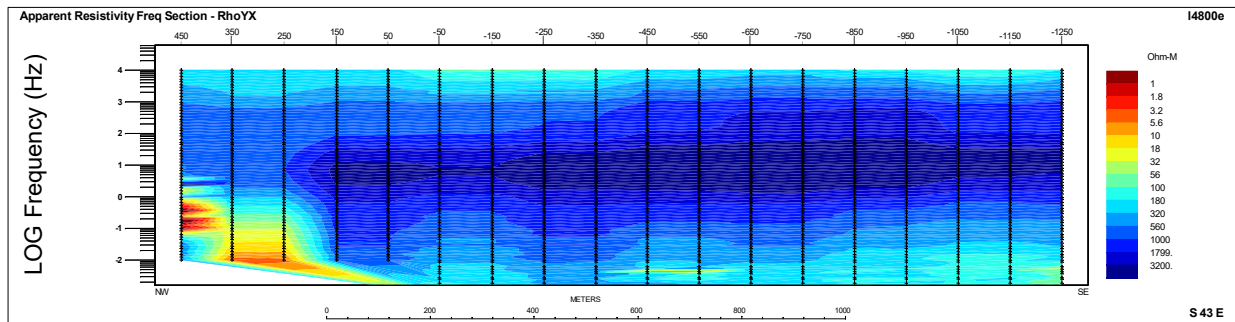
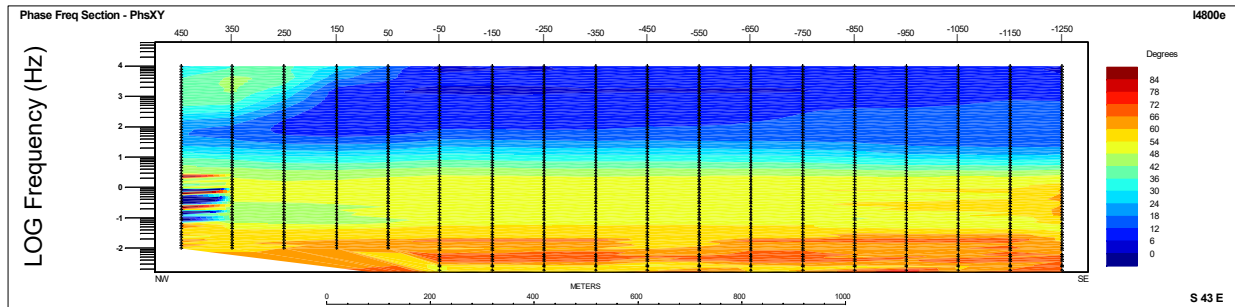
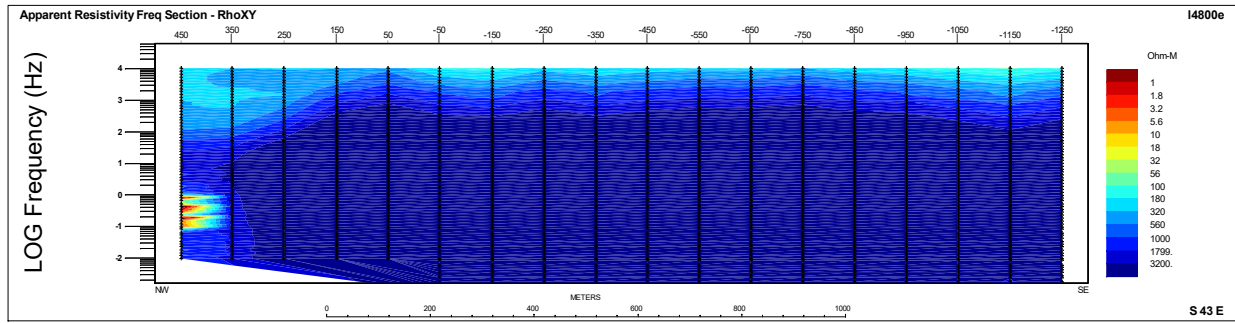




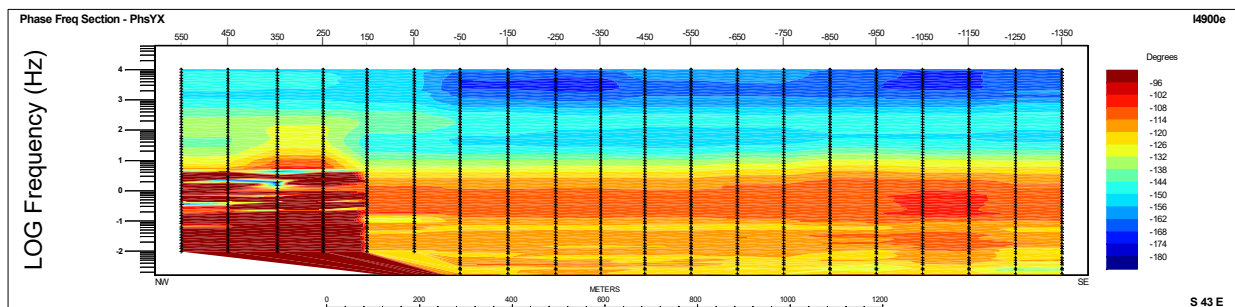
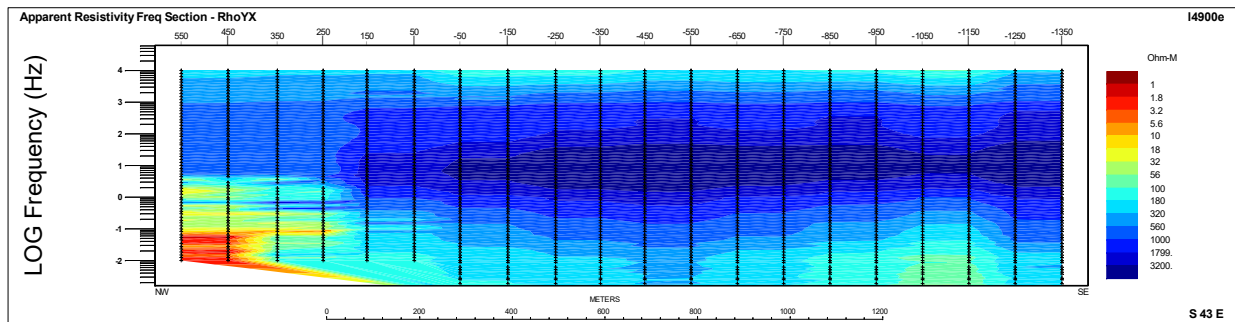
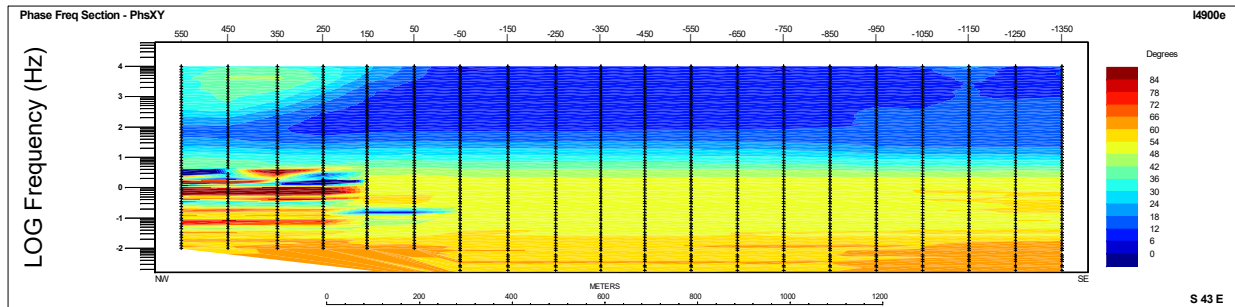
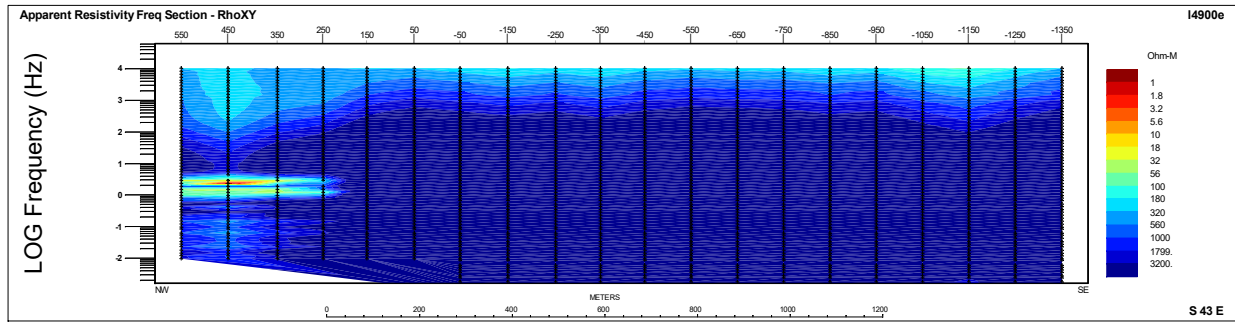
L4700E



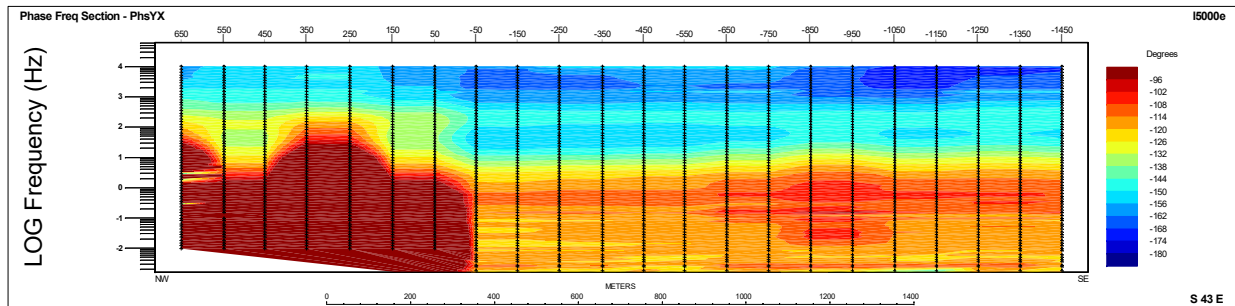
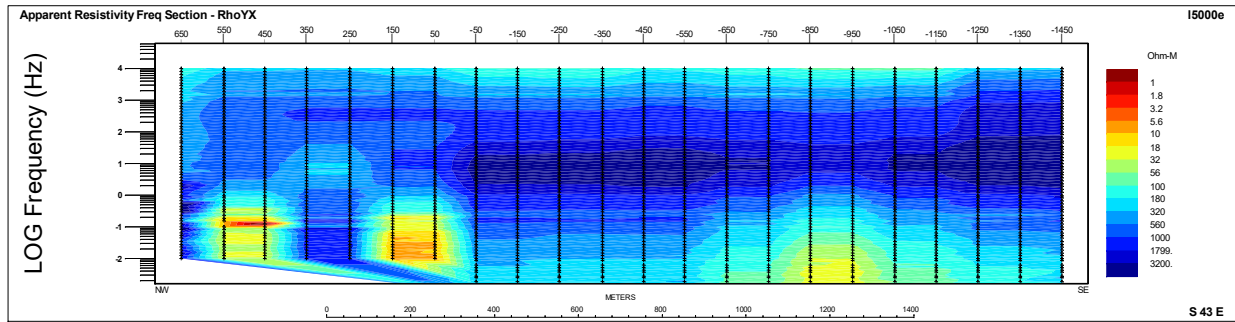
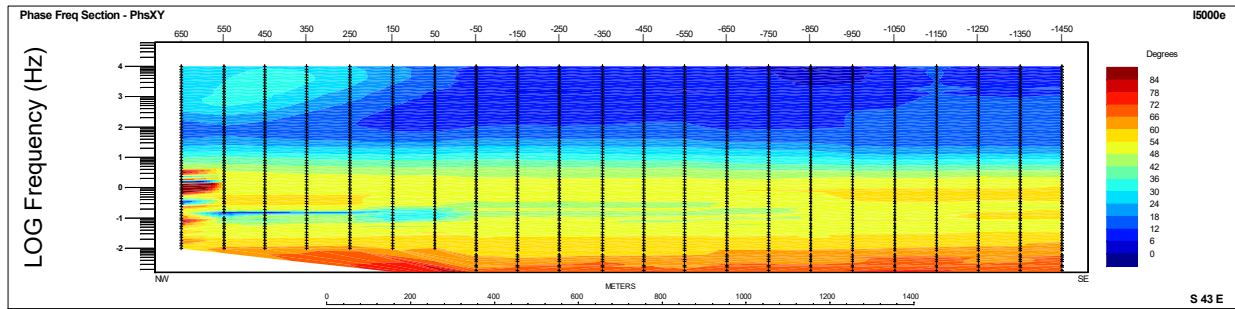
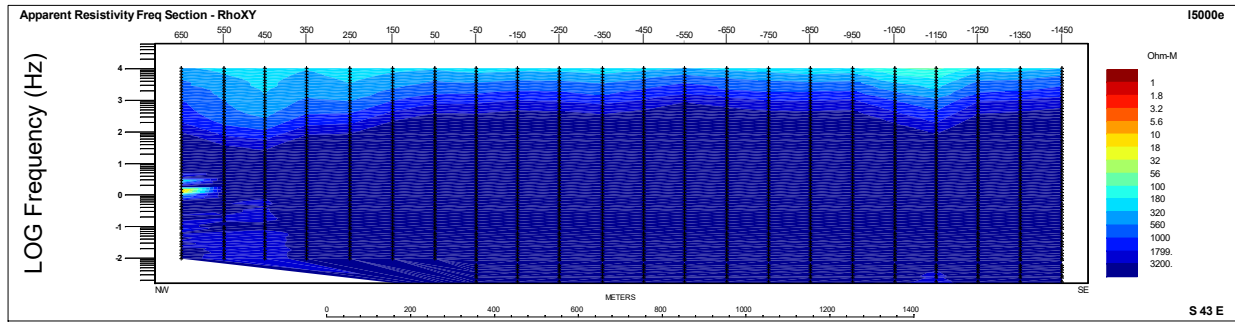
L4800E

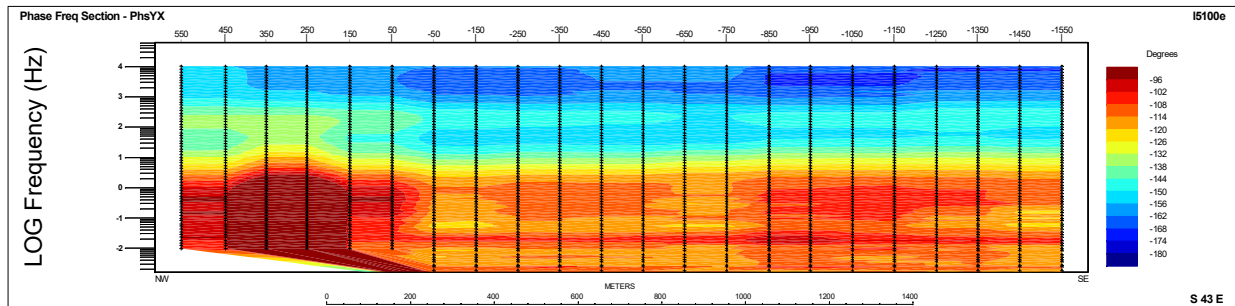
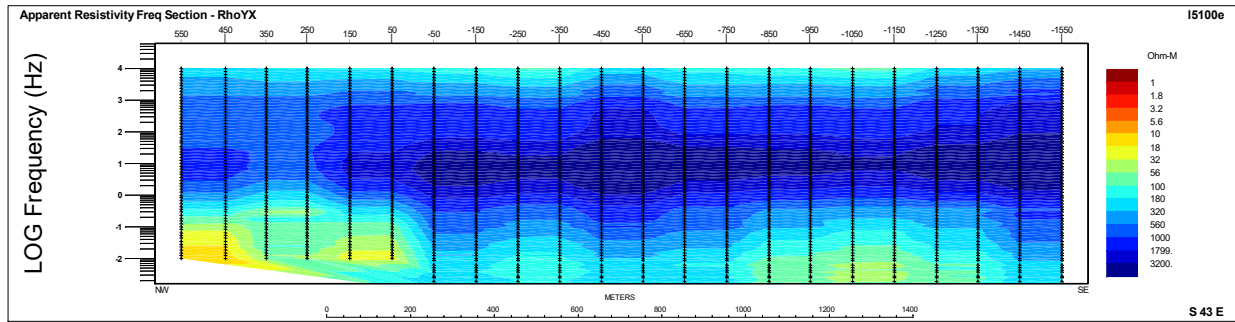
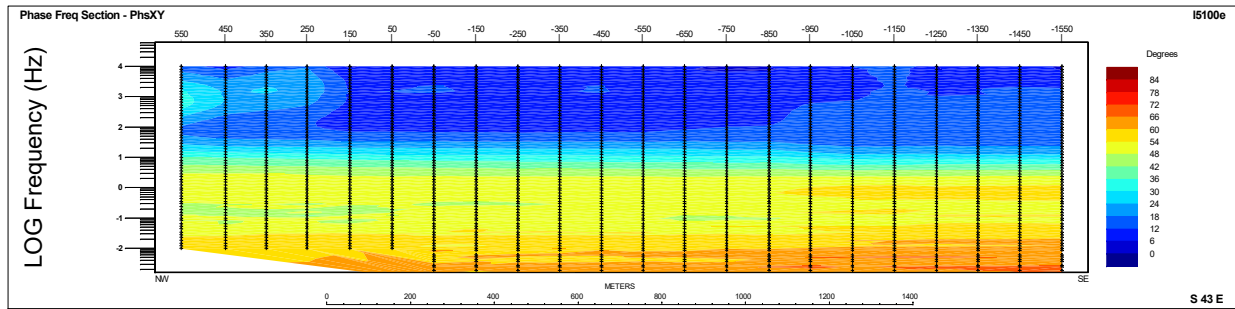
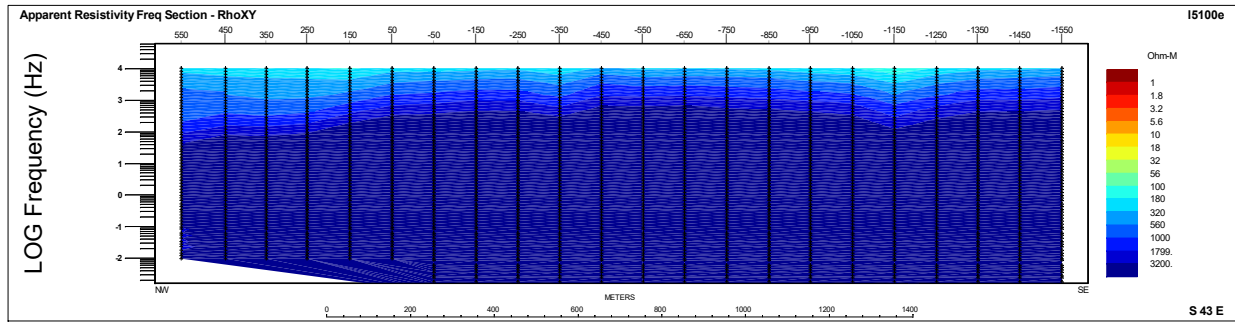


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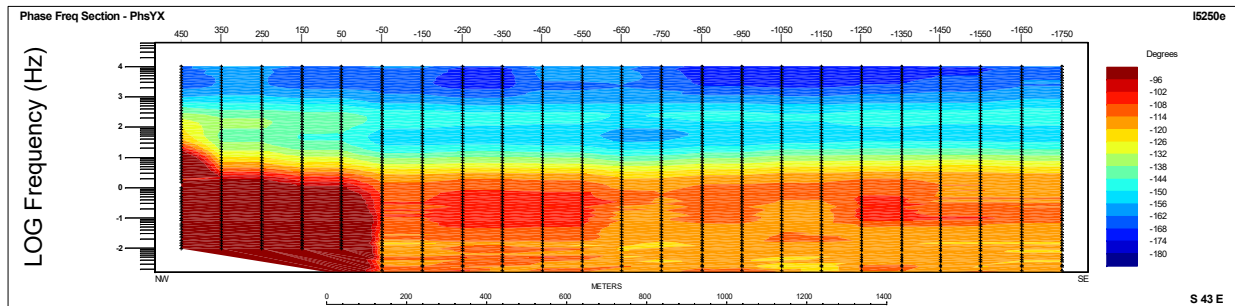
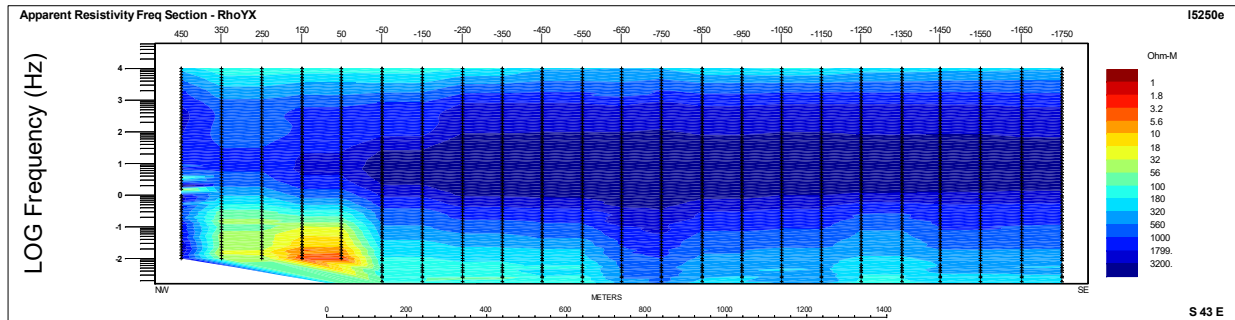
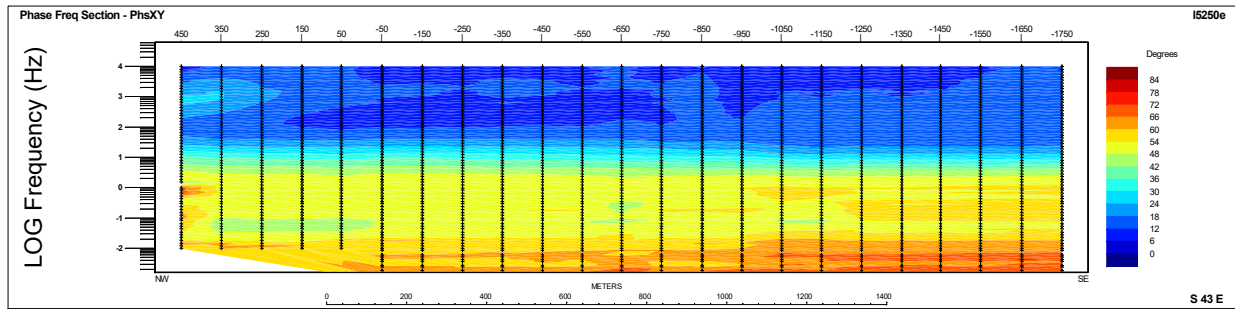
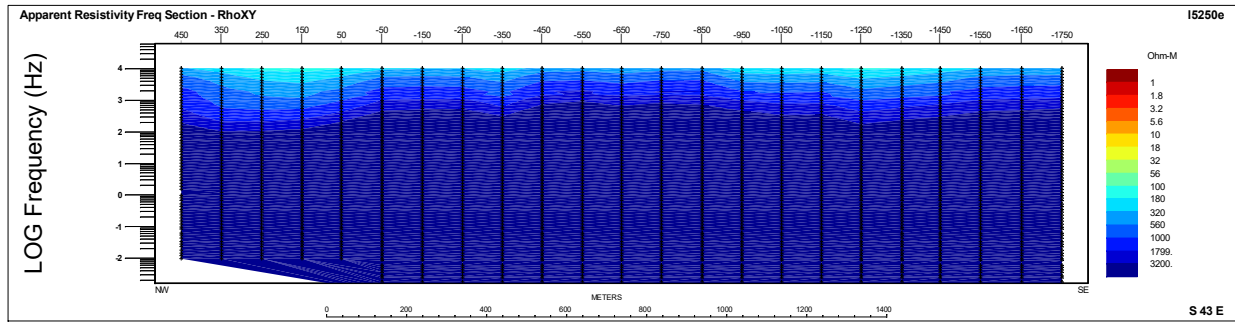


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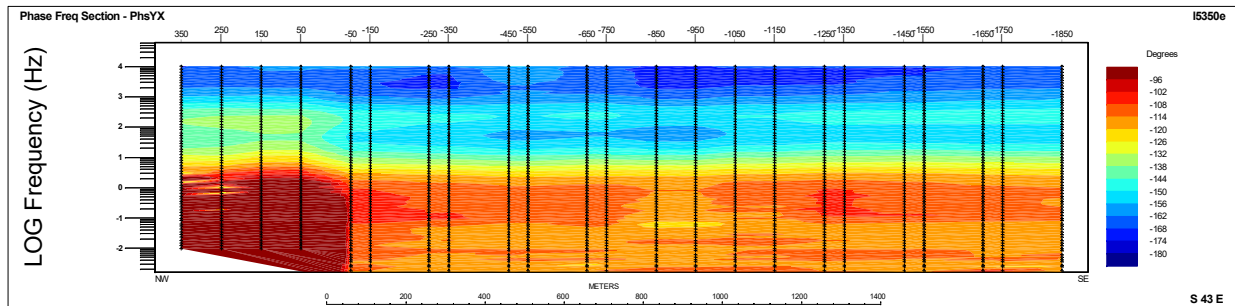
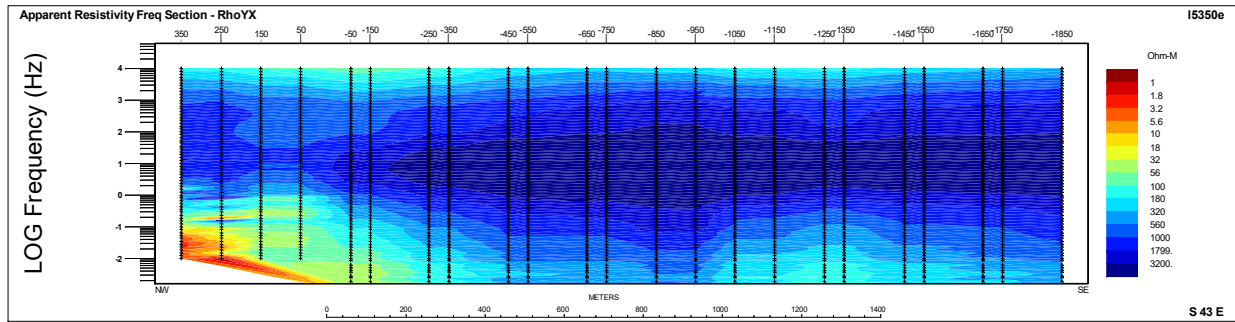
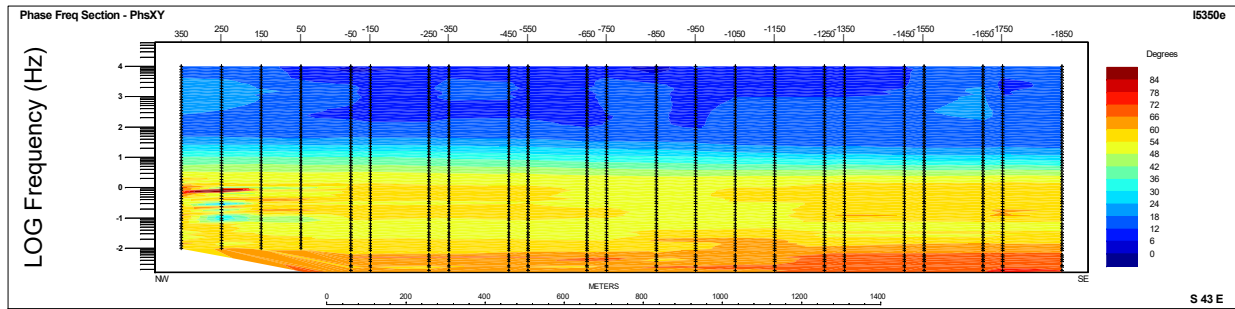
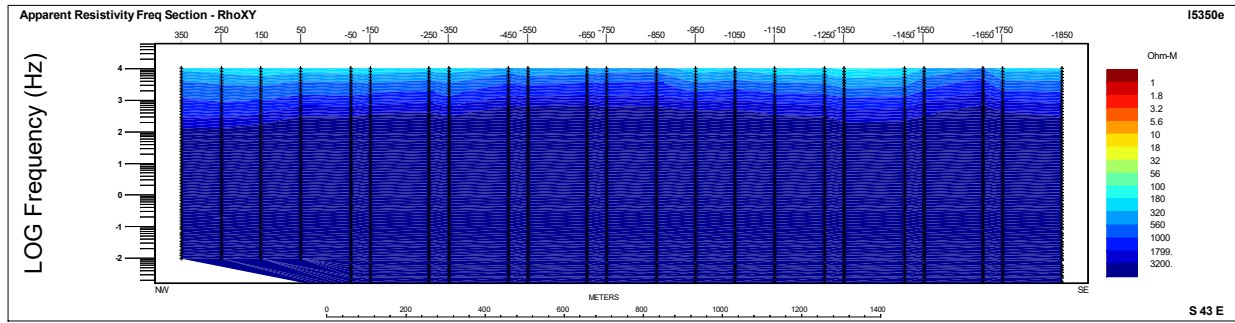


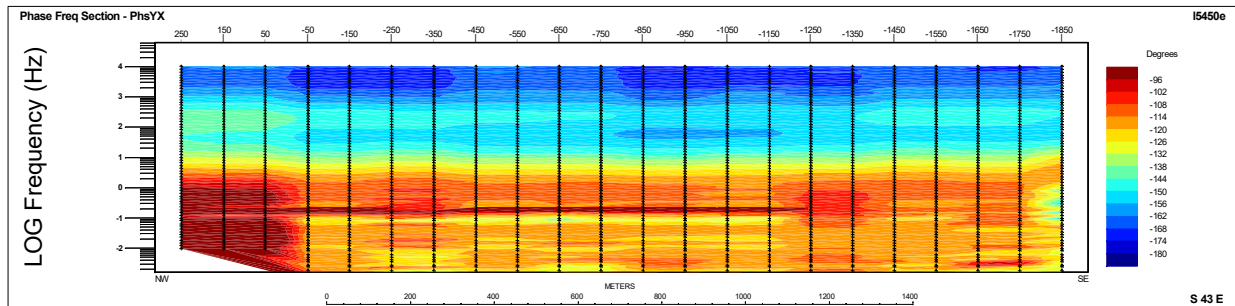
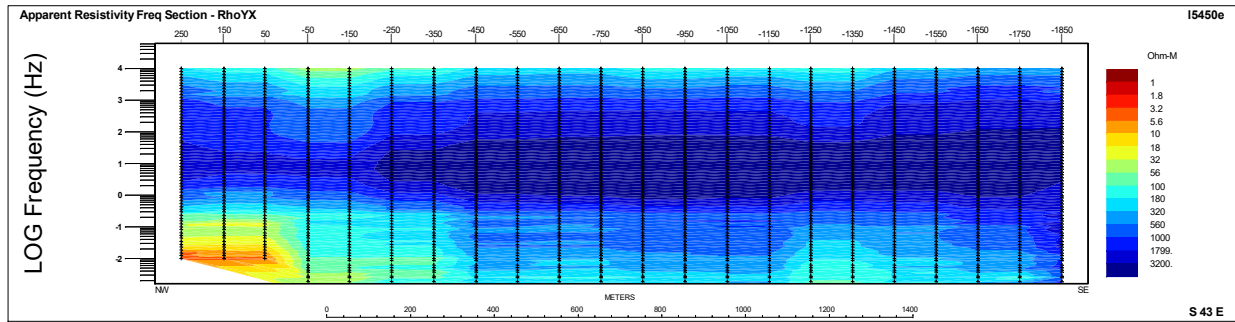
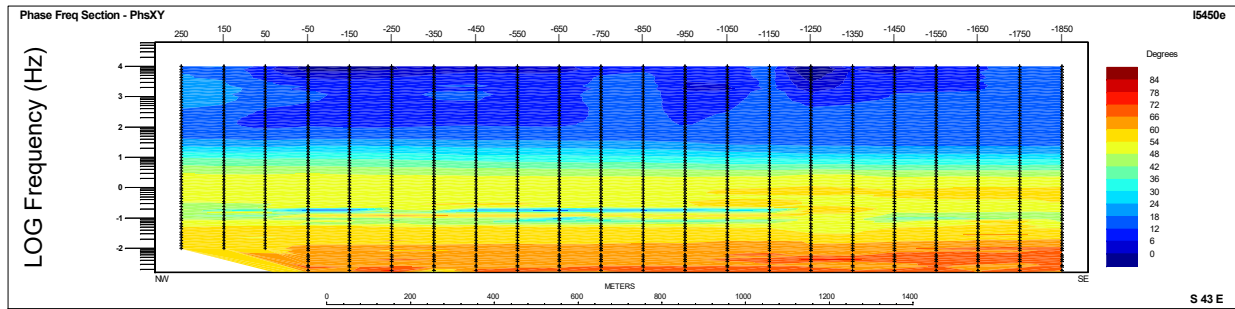
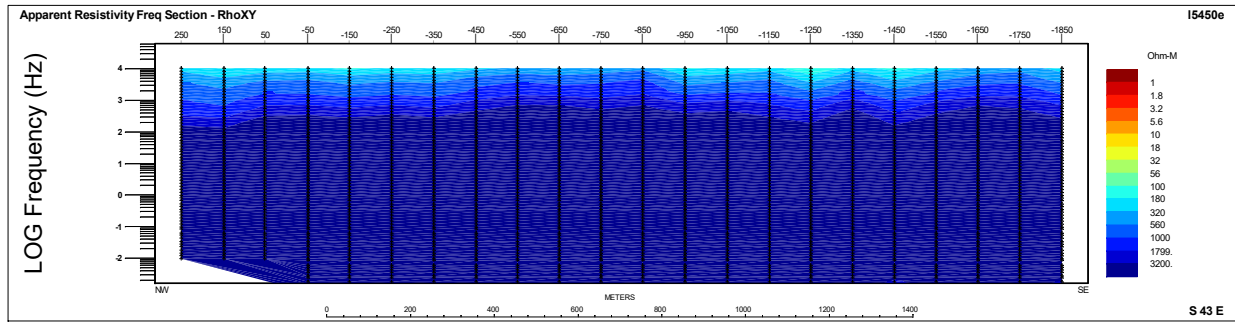






L5350E





## APPENDIX D. PARALLEL SENSOR TEST

### D.1. GENERAL INFORMATION

<b>Project:</b>	CA01326T
<b>Date:</b>	December 4, 2022
<b>Prepared by:</b>	Nicolae England
<b>Field Staff:</b>	Jesse Rondeau Jordan Reelis Tom Rittenhouse Brent Commanda
<b>QuickLay version:</b>	ver.5.8.1.6
<b>Common folder:</b>	ver.2.325 (released: 2022/11/29)
<b>Datum and Projection:</b>	WGS 84 / UTM Zone 16U
<b>Site Location (UTM):</b>	0547627E / 5844939N
<b>Coil Orientation:</b>	00° True
<b>Magnetic Declination:</b>	7° W



D.2.1. Photo(s) of the PST layout



D.2.2. Comments on test conditions (culture, noise, etc.)

1.3 km N of Esker Lake Mining Camp

PST location beside snowmobile track

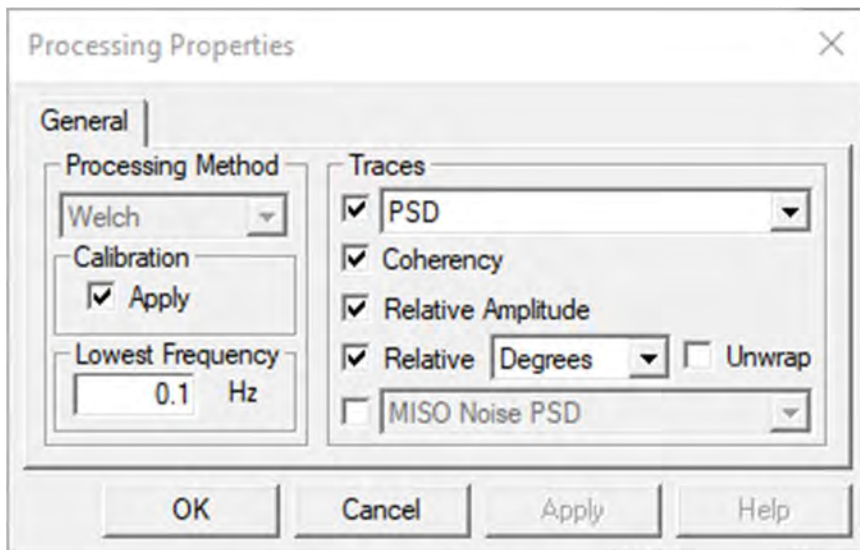
-30°C with lots of snow on top of a frozen bog

D.2.3. Comments on test results

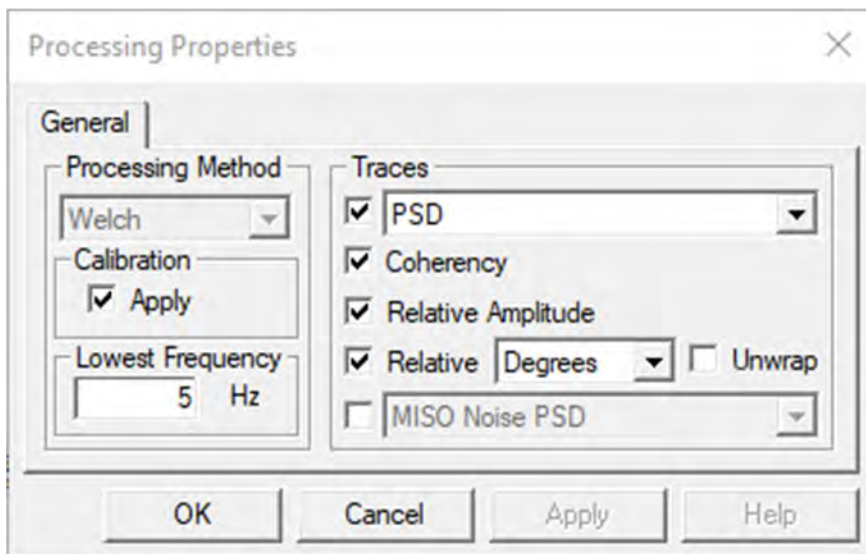
Test ID	Notes
Test LF1	All ok
Test HF1	All ok

### D.3. PST PROCESSING PARAMETERS

For Low Frequency (LF)



For High Frequency (HF)





## D.4. TEST LF 1 RESULTS

MT Event Editor: PST\_337215446\_1k.event

Event Extensions Sensor Association Tools Window

General

Name: PST\_337215446\_1k Type: MT  Mark as Bad

Description: Sub Type: Line

Sample Rate: 1000Hz

Start:  Use Limit 3/12/2022 21:54:50 21:54:50

End:  Use Limit 4/12/2022 13:26:59.9050 < 13:27:00

TS Viewer works only with event time range

Event Components Channels Processor View PST View (12)

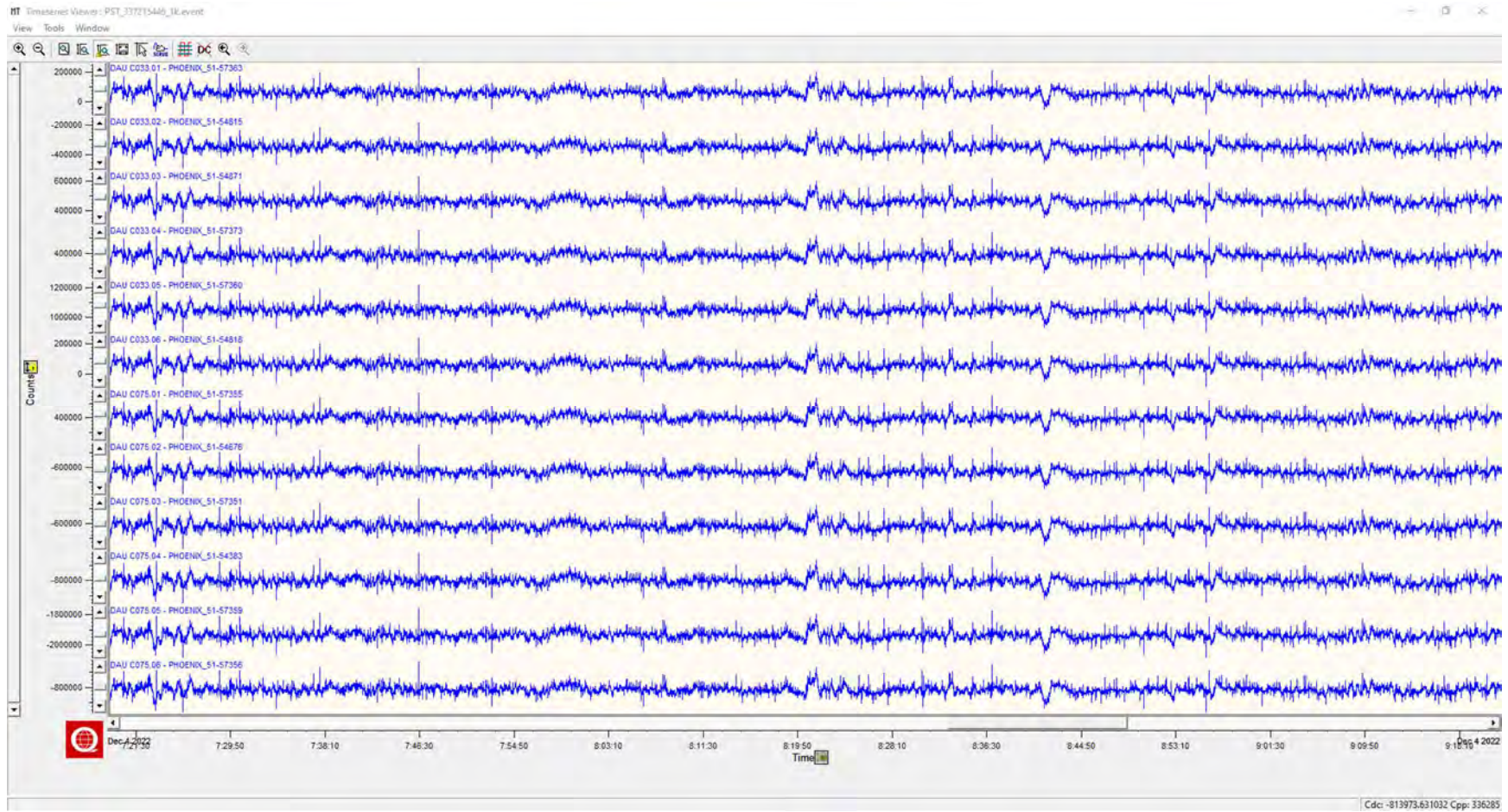
Channels	Sensor: Name	Sensor: Impedance	DAU: ID	DAU: Make	Instrument: Manuf...	DAU: Gain	Sensor: Type
DAU C033.01 ...	PHOENIX_51-57363	110	C033.01	RT160	Phoenix	16	Magnetometer
DAU C033.02 ...	PHOENIX_51-54815	110	C033.02	RT160	Phoenix	16	Magnetometer
DAU C033.03 ...	PHOENIX_51-54871	110	C033.03	RT160	Phoenix	16	Magnetometer
DAU C033.04 ...	PHOENIX_51-57373	110	C033.04	RT160	Phoenix	16	Magnetometer
DAU C033.05 ...	PHOENIX_51-57360	110	C033.05	RT160	Phoenix	16	Magnetometer
DAU C033.06 ...	PHOENIX_51-54818	110	C033.06	RT160	Phoenix	16	Magnetometer
DAU C075.01 ...	PHOENIX_51-57355	110	C075.01	RT160	Phoenix	16	Magnetometer
DAU C075.02 ...	PHOENIX_51-54676	110	C075.02	RT160	Phoenix	16	Magnetometer
DAU C075.03 ...	PHOENIX_51-57351	110	C075.03	RT160	Phoenix	16	Magnetometer
DAU C075.04 ...	PHOENIX_51-54383	110	C075.04	RT160	Phoenix	16	Magnetometer
DAU C075.05 ...	PHOENIX_51-57359	110	C075.05	RT160	Phoenix	16	Magnetometer
DAU C075.06 ...	PHOENIX_51-57356	110	C075.06	RT160	Phoenix	16	Magnetometer

Info

- Name: PST\_337215446\_1k
- Event: Intersecting
- MT Survey: MagnetoTellur
- Sample Rate: 1000
- Duration: 15h32m03.9
- Components [2]

Notes: All P-51 LF. Using 57363 as the reference coil.

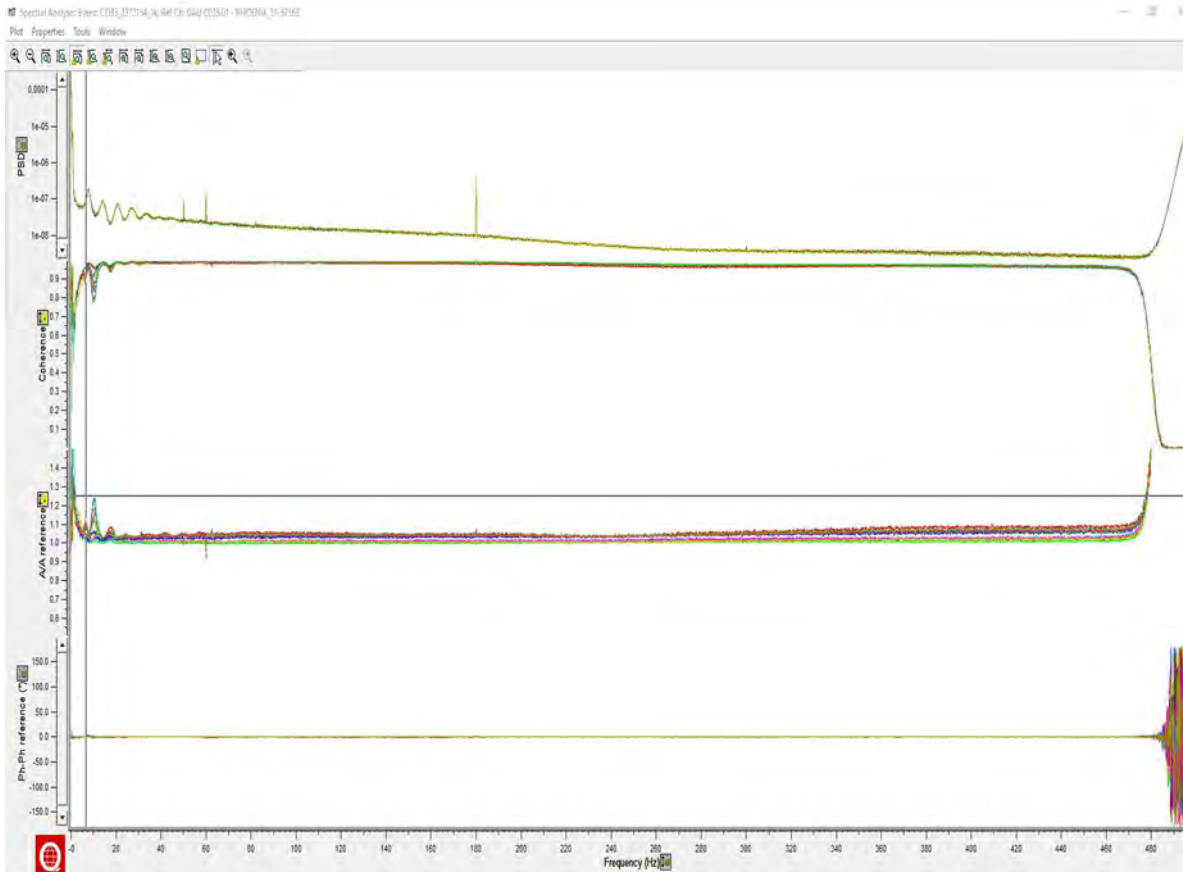
# Time Series @1000 samples per second



All look OK on TS

**Power Spectral Density (PSD) of channels (strip 1); Coherency (strip 2) and Response Function (strips 3 and 4; Amplitude and Phase)**  
 – Linear frequency scale –

**Test LF1**  
**Sampling @ 1000 samples/s**



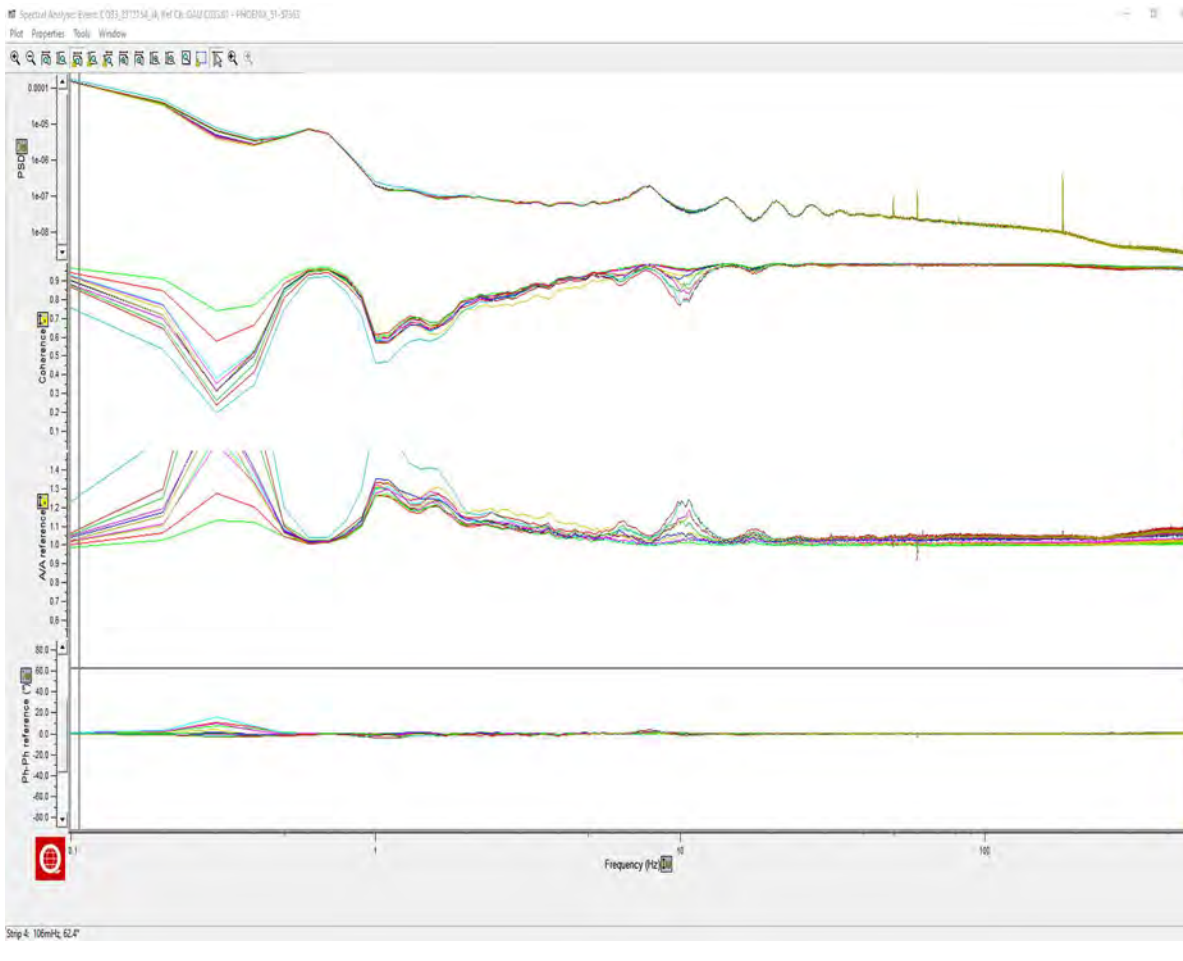
MT Legend

Name	Pen
DAU C033.01 - PHOENIX_51-57363	Blue
DAU C033.02 - PHOENIX_51-54815	Green
DAU C033.03 - PHOENIX_51-54871	Red
DAU C033.04 - PHOENIX_51-57373	Cyan
DAU C033.05 - PHOENIX_51-57360	Magenta
DAU C033.06 - PHOENIX_51-54818	Yellow
DAU C075.01 - PHOENIX_51-57355	Blue
DAU C075.02 - PHOENIX_51-54676	Green
DAU C075.03 - PHOENIX_51-57351	Red
DAU C075.04 - PHOENIX_51-54383	Cyan
DAU C075.05 - PHOENIX_51-57359	Magenta
DAU C075.06 - PHOENIX_51-57356	Yellow

Active Template: <None>

**Power Spectral Density (PSD) of channels (strip 1); Coherency (strip 2) and Response Function (strips 3 and 4; Amplitude and Phase) – Logarithmic frequency scale –**

**LF1**  
**Sampling @ 1000 samples/s**



MT Legend

Name	Pen
DAU C033.01 - PHOENIX_51-57363	Blue
DAU C033.02 - PHOENIX_51-54815	Green
DAU C033.03 - PHOENIX_51-54871	Red
DAU C033.04 - PHOENIX_51-57373	Cyan
DAU C033.05 - PHOENIX_51-57360	Magenta
DAU C033.06 - PHOENIX_51-54818	Yellow
DAU C075.01 - PHOENIX_51-57355	Blue
DAU C075.02 - PHOENIX_51-54676	Green
DAU C075.03 - PHOENIX_51-57351	Red
DAU C075.04 - PHOENIX_51-54383	Cyan
DAU C075.05 - PHOENIX_51-57359	Magenta
DAU C075.06 - PHOENIX_51-57356	Yellow

Active Template: <None>

## D.5. TEST HF 1 RESULTS

MT Event Editor: PST\_338013600\_48k.event

Event Extensions Sensor Association Tools Window

**General**

Name:  Type:   Mark as Bad

Description:  Sub Type:

Sample Rate: 48000Hz

Start:  Use Limit  4/12/2022  01:36:00

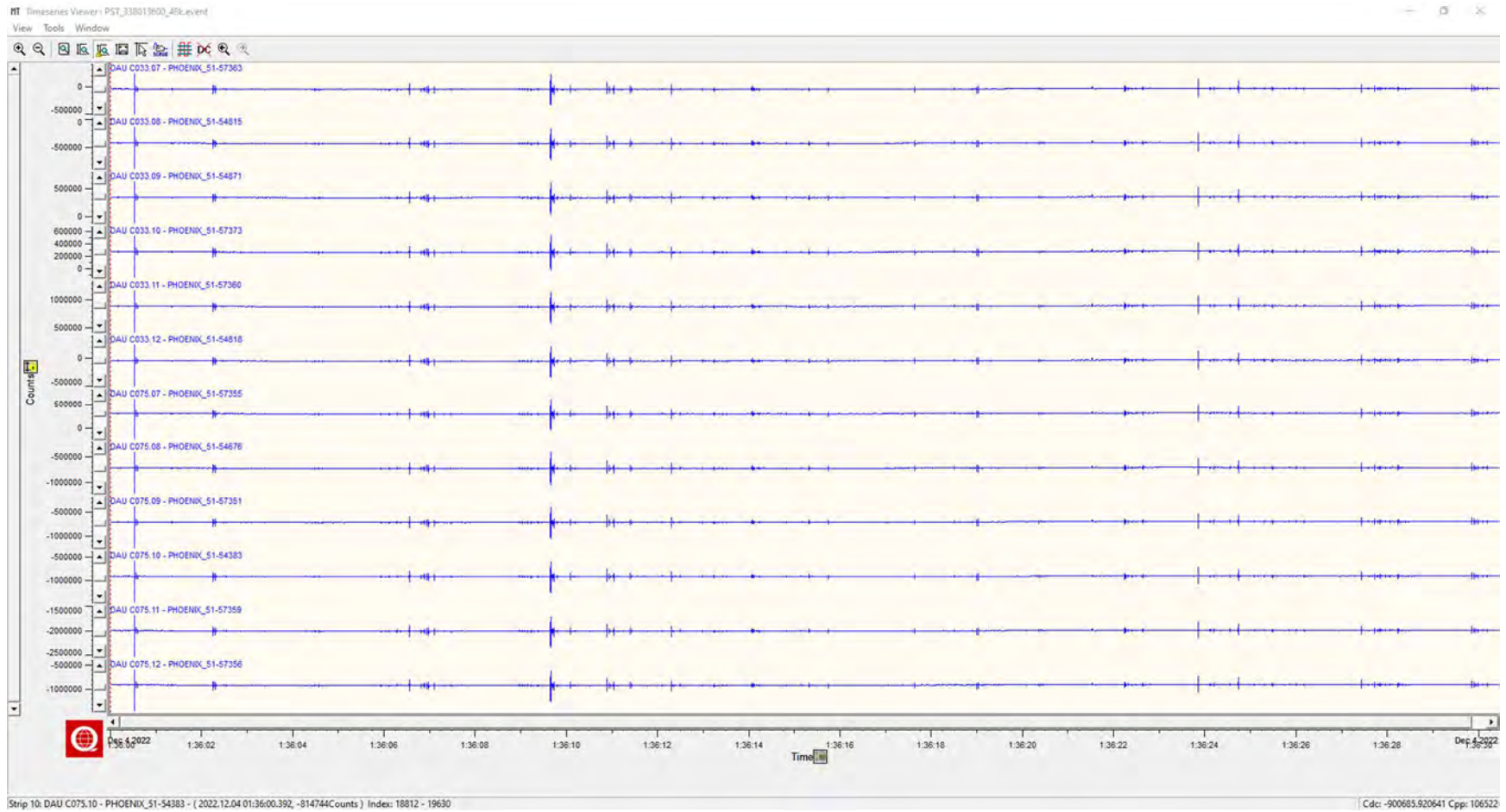
End:  Use Limit  4/12/2022  < 01:36:31

TS Viewer works only with event time range

Event	Components	Channels	Processor View	PST View (12)					
[-] MT Event: PST_338013600_48k									
[-] Info									
[-] Name: PST_338013600_48k									
[-] Event: Intersecting									
[-] MT Survey: MagnetoTelluric									
[-] Sample Rate: 48000									
[-] Duration: 30.449979s									
[-] Components (2)									
		Channels	Sensor: Name	Sensor: Impedance	DAU: ID	DAU: Make	Instrument: Manuf...	DAU: Gain	Sensor: Type
		DAU C033.07 ...	PHOENIX_51-573...	110	C033.07	RT160	Phoenix		16 Magnetometer
		DAU C033.08 ...	PHOENIX_51-548...	110	C033.08	RT160	Phoenix		16 Magnetometer
		DAU C033.09 ...	PHOENIX_51-548...	110	C033.09	RT160	Phoenix		16 Magnetometer
		DAU C033.10 ...	PHOENIX_51-573...	110	C033.10	RT160	Phoenix		16 Magnetometer
		DAU C033.11 ...	PHOENIX_51-573...	110	C033.11	RT160	Phoenix		16 Magnetometer
		DAU C033.12 ...	PHOENIX_51-548...	110	C033.12	RT160	Phoenix		16 Magnetometer
		DAU C075.07 ...	PHOENIX_51-573...	110	C075.07	RT160	Phoenix		16 Magnetometer
		DAU C075.08 ...	PHOENIX_51-546...	110	C075.08	RT160	Phoenix		16 Magnetometer
		DAU C075.09 ...	PHOENIX_51-573...	110	C075.09	RT160	Phoenix		16 Magnetometer
		DAU C075.10 ...	PHOENIX_51-543...	110	C075.10	RT160	Phoenix		16 Magnetometer
		DAU C075.11 ...	PHOENIX_51-573...	110	C075.11	RT160	Phoenix		16 Magnetometer
		DAU C075.12 ...	PHOENIX_51-573...	110	C075.12	RT160	Phoenix		16 Magnetometer

Notes: All P-51 HF. Using 57363 as the reference coil.

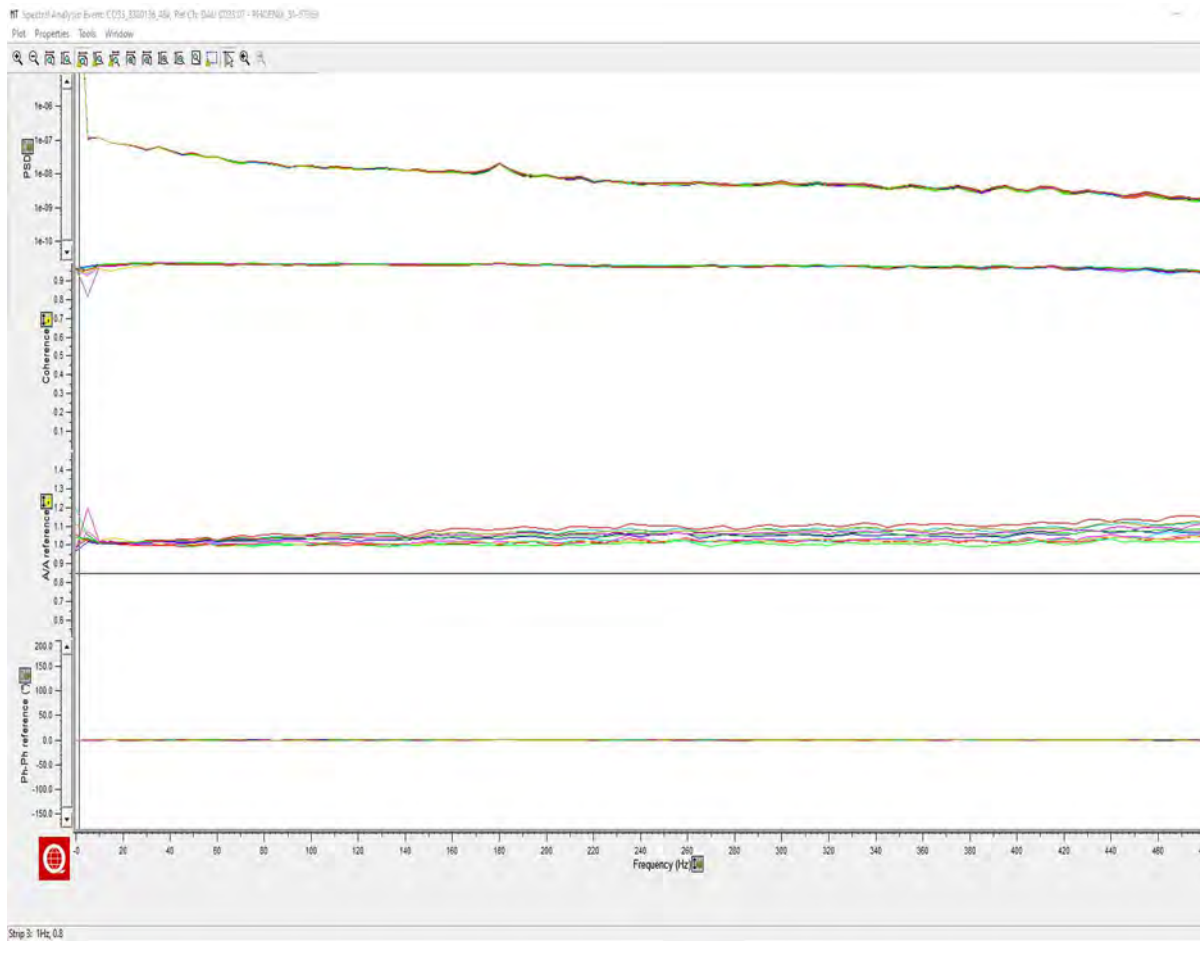
Time Series @48k samples per second.



All look ok on TS.

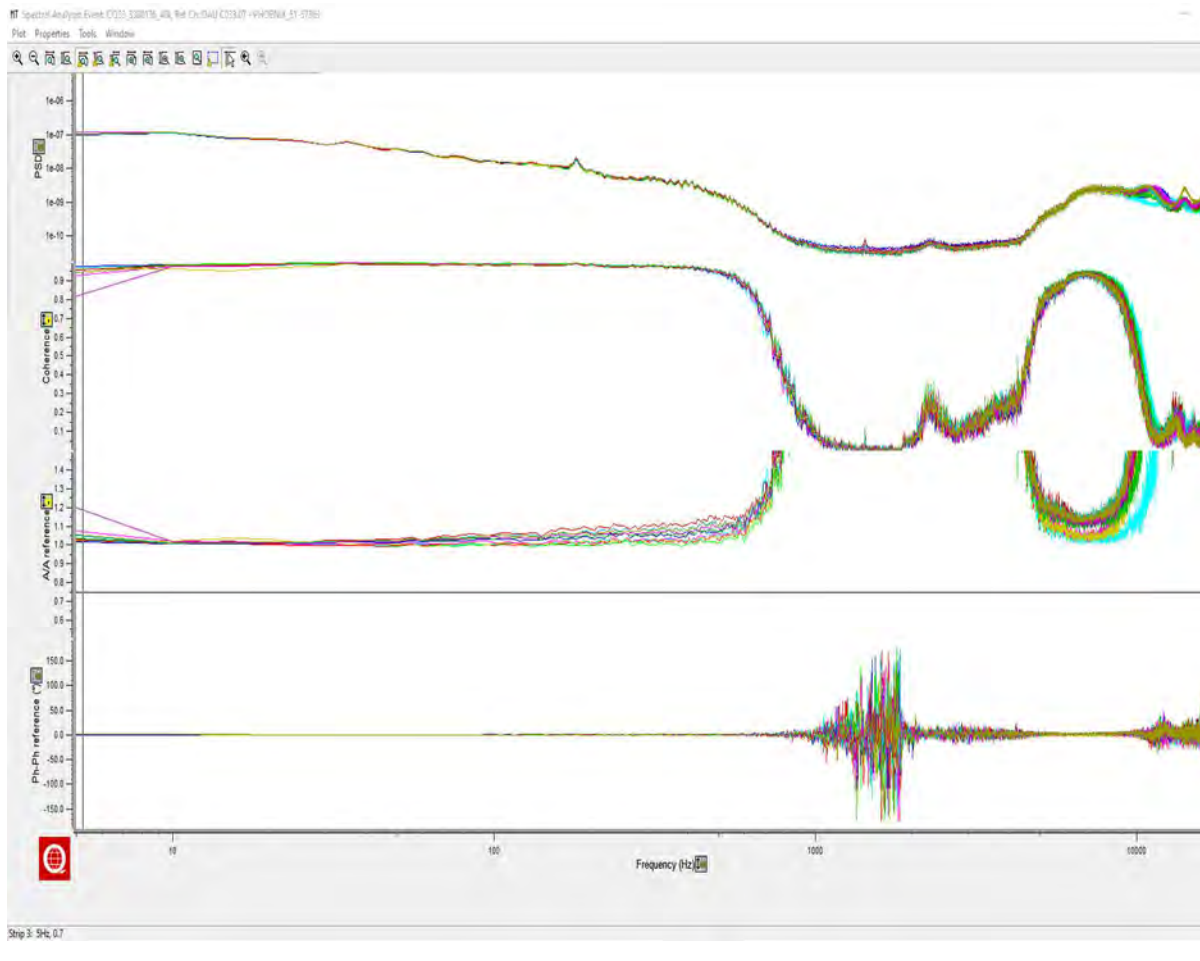
**Power Spectral Density (PSD) of channels (strip 1); Coherency (strip 2) and Response Function (strips 3 and 4; Amplitude and Phase)**  
 – *Linear frequency scale* –

**Test HF1**  
**Sampling @ 48k samples/s**



**Power Spectral Density (PSD) of channels (strip 1); Coherency (strip 2) and Response Function (strips 3 and 4; Amplitude and Phase) – *Logarithmic frequency scale* –**

**HF1**  
**Sampling @ 48k samples/s**



MT Legend

Name	Pen
DAU C033.07 - PHOENIX_51-57363	Blue
DAU C033.08 - PHOENIX_51-54815	Green
DAU C033.09 - PHOENIX_51-54871	Red
DAU C033.10 - PHOENIX_51-57373	Cyan
DAU C033.11 - PHOENIX_51-57360	Magenta
DAU C033.12 - PHOENIX_51-54818	Yellow
DAU C075.07 - PHOENIX_51-57355	Blue
DAU C075.08 - PHOENIX_51-54676	Green
DAU C075.09 - PHOENIX_51-57351	Red
DAU C075.10 - PHOENIX_51-54383	Cyan
DAU C075.11 - PHOENIX_51-57359	Magenta
DAU C075.12 - PHOENIX_51-57356	Yellow

Active Template: <None>



## APPENDIX E. MT REMOTE TEST

### E.1. GENERAL INFORMATION

<b>Project:</b>	CA01329T
<b>Date:</b>	January 19, 2023
<b>Prepared by:</b>	Nicolae England
<b>QuickLay version:</b>	ver.5.7.8
<b>Common folder:</b>	ver.2.325 (released: 2022/11/29)
<b>Datum and Projection:</b>	WGS 84 / UTM Zone 16 North
<b>Site Location (UTM):</b>	551195.41E / 5839792.08N
<b>Magnetic Declination:</b>	7°W
<b>Sensor Information:</b>	see table below.

Channel	Azimuth	Length	Channel	Azimuth
Ex	317° North	100 m	Hx	137° North
Ey	227° East	100 m	Hy	227° East

Channels /	Instrument Name	Sensor Name	Sensor Dipole Le.	Sensor Impedance	Sensor Azimuth	Sensor Component	Sensor Polarity	Sensor Start x	Sensor End x	Sensor Start y	Sensor End y
DAU C075.01 - RmHx	51-54676	RmHx		110	137	Inline	Positive	0.00		0.00	
DAU C075.02 - RmHy	51-57355	RmHy		110	227	Crossline	Positive	0.00		0.00	
DAU C075.04 - RmEx	GL	RmEx	100m	2400	317	Inline	Positive	-50.00		0.00	100.00
DAU C075.05 - RmEy	GL	RmEy	100m	1600	227	Crossline	Positive	0.00		-100.00	-50.00

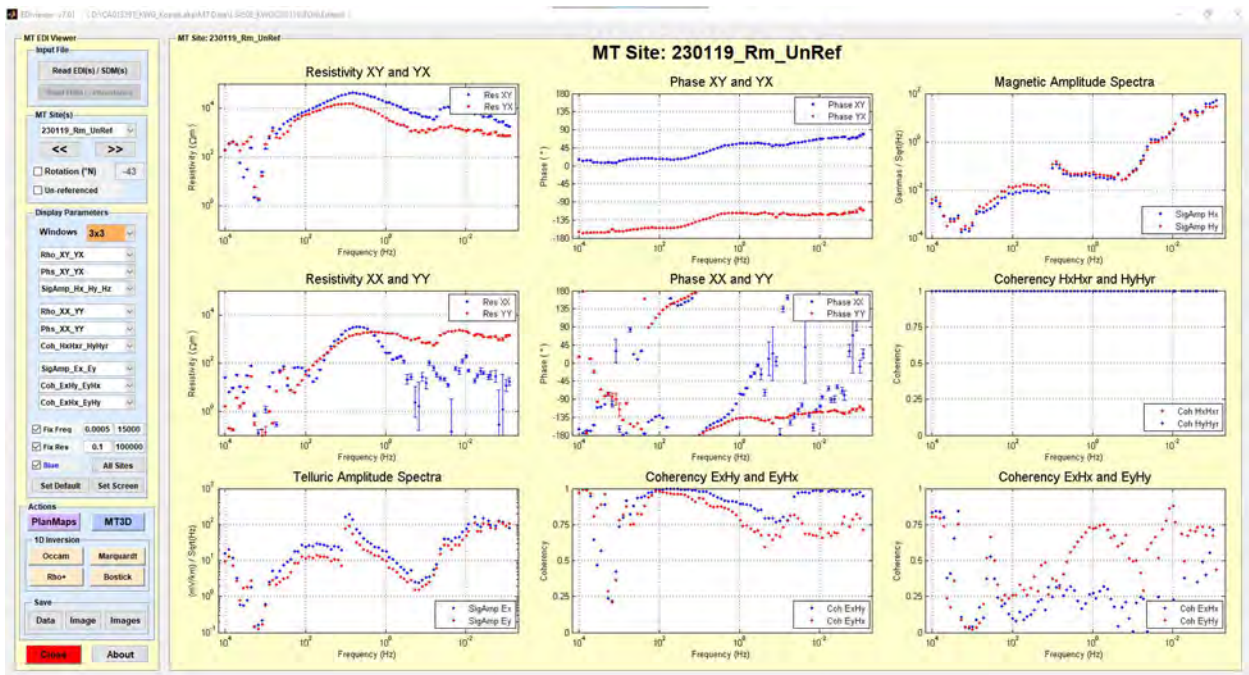
### E.2. SOUNDING CURVES

Apparent resistivity, phase, magnetic signal amplitude and off-diagonal coherences of the MT remote, data processed unreferenced.

**Comments:** all is ok

### E.3. EVENTS ACQUIRED AND USED IN PROCESSING

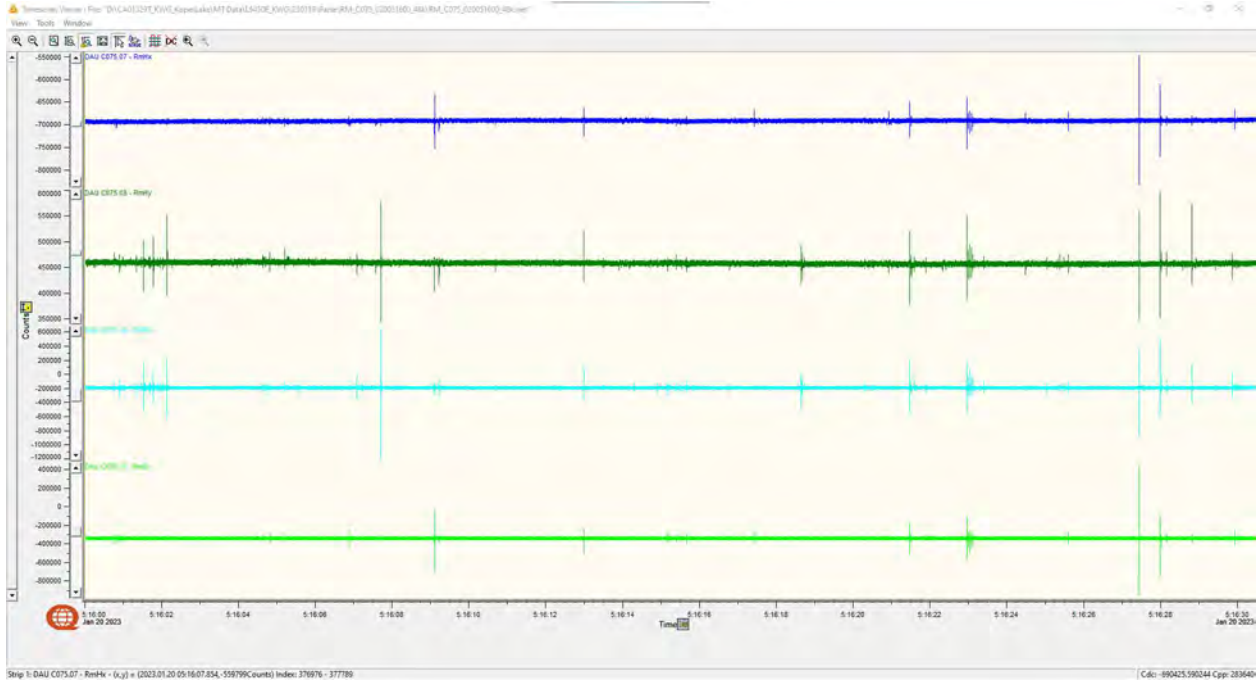
Sample rate	Net Events	TS Length	Observation
48,000 sps		30s	
12,000 sps		4m	
120 sps			
1,000 sps		22h15m	
40 sps		22h15m	



## E.4. SCREEN CAPTURE OF TIME SERIES

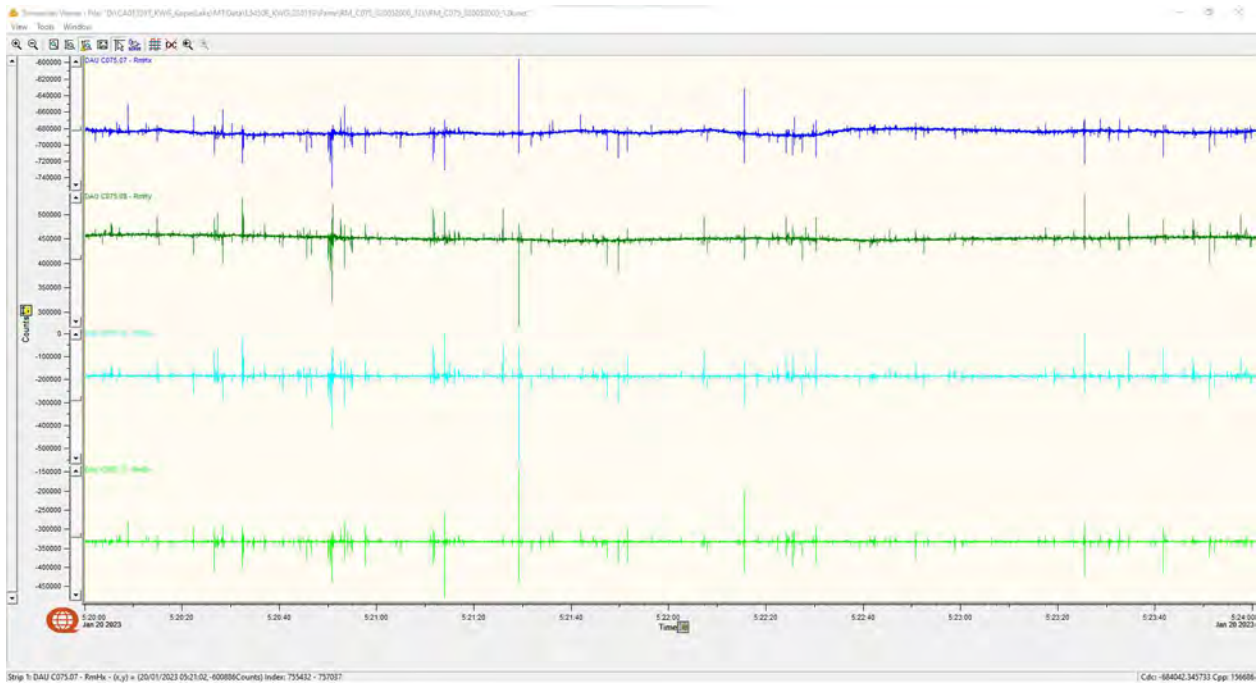
Time Series:

@48,000 samples per second



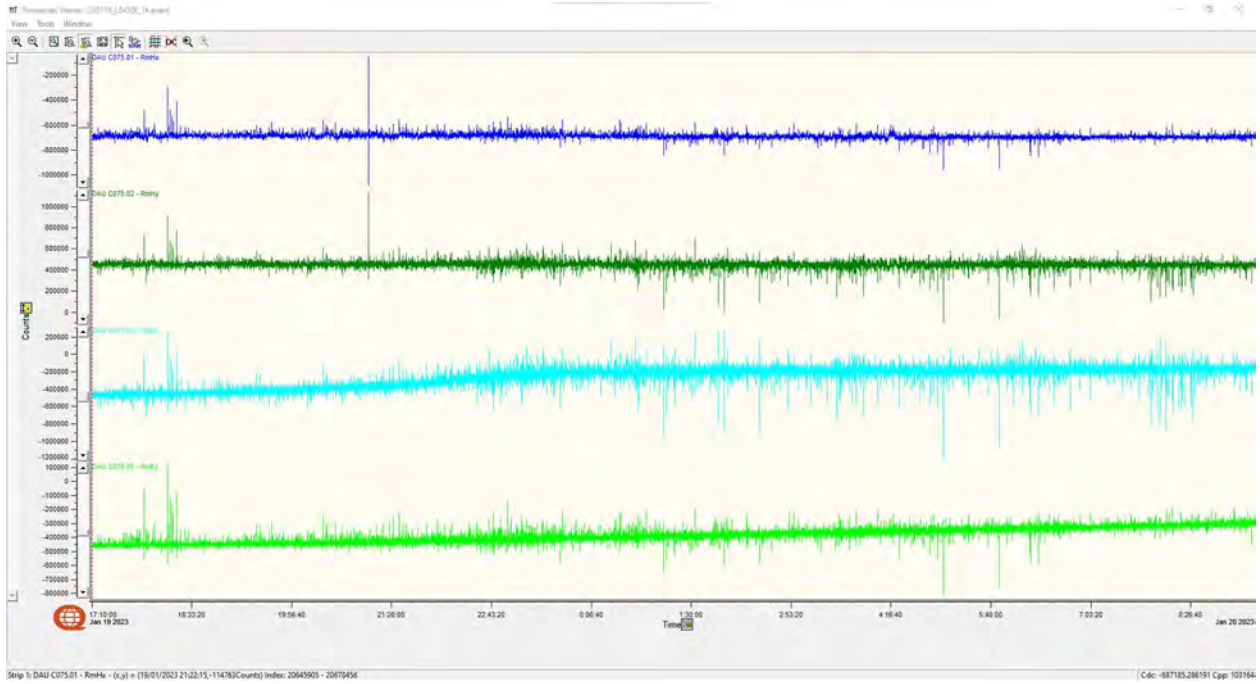
Time Series:

@ 12,000 samples per second



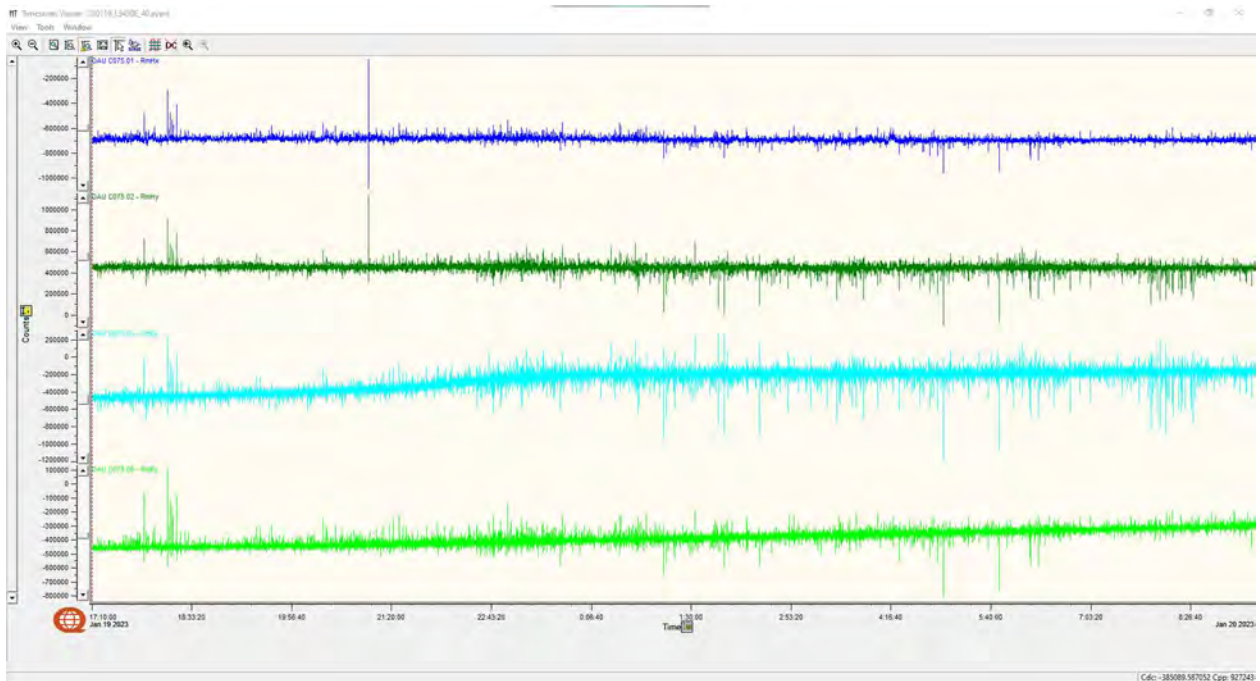
Time Series:

@1,000 samples per second



Time Series:

@40 samples per second



## APPENDIX F. INSTRUMENT SPECIFICATIONS

### F.1. REF TEK – 160 QUANTEC DATA ACQUISITION SYSTEM

Refraction Technology Inc. – Plano, Texas

Specification	Description			
<b>Mechanical – DAS</b>				
Size:	130mm high x 240mm wide x 400mm long			
Weight:	16 lbs			
Shock:	Survives a 1 meter drop on any axis			
Operating Temperature:	-20°C to +60°C			
<b>Connectors</b>				
Channel Input:	PTO7A14-19S (2 each for 6-Channel DAS)			
Power:	PTO7A12-4S			
GPS Antenna:	standard			
<b>Power</b>				
Input Voltage:	10 to 15 VDC			
Average Power:	~6 W (5-6 channel)			
	~8 W (10-12 channel)			
<b>A/D Converter</b>				
Type:	$\Delta$ - $\Sigma$ modulation, 256 KHz base rate, 24-bit output resolution			
Channels:	12 (6 @ LS and 6 @ HS)			
Input Impedance:	100 Mohm			
Sensor Input Signal Range:	<b>Gain</b>	<b>Input Full Scale (volts)</b>	<b>Bit Weight</b>	
			<b>Actual</b>	<b>Reported</b>
	1	± 32 V	3.81 $\mu$ V	
	2	± 16 V		
	4	± 8 V	954 nV	
	8	± 4 V		
	16	± 2 V	238 nV	
	32	± 1 V		
	64	± 500 mV	59.6 nV	
	128	± 250 mV		
256	± 125 mV	14.9 nV		

Specification	Description
Sample Rates HS:	48000, 12000, 9600, 8000 sps
Sample Rates LS:	4000, 2000, 1600, 1000, 960, 800, 500, 480, 400, 250, 240, 200, 125, 120, 100, 60, 50 sps

Specification	Description
<b>Time Base</b>	
Type:	GPS Receiver/Clock plus a disciplined oscillator
Accuracy with GPS:	+/- 100 $\mu$ sec after validated 3-D fix and locked
Free-Running Accuracy:	0.1 ppm over the temperature range of 0°C to 40°C, and 0.2 ppm from -20°C to 0°C
<b>Recording Modes</b>	
Continuous:	All LS modes
HS Mode 0	8000 sps for 360 s; once
HS Mode 1	8000 sps for 360 s; every 10 minutes on the 0, 10, 20, 30, 40, 50 minute marks
HS Mode 2	12000 sps for 240 s; every 10 minutes on the 0, 10, 20, 30, 40, 50 minute marks
HS Mode 3	48000 sps for 60 s; every 10 minutes on the 0, 10, 20, 30, 40, 50 minute marks
HS Mode 4	2 @ 12 ksps for 240 s and 1 @ 48 ksps for 30 s; repeated 20 minutes ( 12 ksps on 0, 8, 20, 28, 40, 48 minute marks and 48 ksps on 16, 36, and 56 minute marks)
<b>Recording Capacity</b>	
Battery Backed SRAM:	64 Mbytes
Removable Storage:	3 @ 8 GB industrial USB 2 sticks
<b>Recording Format</b>	
Format:	SEED and miniSEED Recording Formats

## **APPENDIX G. REFERENCES**

Egbert, G.D., 1997. Robust multiple station magnetotelluric data processing. *Geophys. J. Int.*, 130, 475-496.

Telford., W.M., Geldart, L., Sheriff, R., and Keys, D., 1976. *Applied Geophysics*: Cambridge University Press, New York, NY.

Wight, D.E., 1987. MT/EMAP Data Interchange Standard. The Society of Exploration Geophysicists Document.





## SUMMARY INFORMATION

QUANTEC OFFICE INFORMATION	
Office:	Quantec Geoscience Ltd.
Address:	146 Sparks Ave., Toronto, ON, M2H 2S4, Canada
Phone:	+1-416-306-1941
Web:	<a href="http://quantecgeo.com">quantecgeo.com</a>
Email:	<a href="mailto:info@quantecgeoscience.com">info@quantecgeoscience.com</a>
PROJECT INFORMATION	
Client Name:	KWG Resources Inc.
Project Name:	Koper Lake Project
Project Location:	Northern Ontario
Project Type:	Titan MT
Project Number:	CA01329T
Project Manager:	Mark Morrison
Project Period:	19/01/2023 to 11/02/2023
Report Type:	Logistics Report
Report Author(s):	Nicolae England
Report date:	March 6, 2023
Reference	<i>Logistics Report for a Titan MT survey over Koper Lake Project (Northern Ontario) by Quantec Geoscience Ltd. on behalf of KWG Resources Inc.</i>
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