APPENDIX D: PARALLEL SENSOR TEST

Date: November 27th, 2007

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1. Introduction

Location:

BC 24 Gawler Curnamona Arrowie MT Transect	Location: UTM WGS 84 / Zone 53J Easting	Northing
BC 24	651602	6593560

Coil Azimuth: 90° true N (declination approx. 7˚ E)

Results:
BF7: BF7-9103 failed
P50: All good
BF4: All good

Tested a total of 31 coils:
18 Phoenix MTC-50 (P50)
10 BF7 EMI
4 BF4 EMI

BF7-9103 was put aside after decent coherency results could not be achieved.
Signal increased towards the end of testing due to approaching storm

Coil #	Coil Type	Result		Role	Comments
		Pass	Fail		
BF7-7001	EMI	Test 1		Hx	
BF7-7004	EMI	Test 3	Test 2	Hy	
BF7-7006	EMI	Test 1		Hz	
BF7-7007	EMI	Test 3	Test 2	Hx	
BF7-9103	EMI		Test 1,2,3,4, 5,10		Changed cables, ports and cleaned could not achieve good coherency
BF7-9104	EMI	Test 1		Hy	
BF7-9306	EMI	Test 3	Test 2	Hz	
BF7-9307	EMI	Test 1		Hx	
BF7-9602	EMI	Test 1		Hy	
BF7-9802	EMI	Test 3	Test 2	Hz	
BF4-9016	EMI	Test 5,10	Test 4	Spare	
BF4-9122	EMI	Test 4	Test 5,10	Spare	
BF4-9622	EMI	Test 4,5,10		Spare	
BF4-9623	EMI	Test 4,5,10		Spare	
P50-2010	Phoenix	Test 6		Hx	
P50-2017	Phoenix	Test 6		Hy	
P50-2114	Phoenix	Test 7	Test 6	Hz	Changed cable
P50-2117	Phoenix	Test 6		Hx	
P50-2126	Phoenix	Test 6		Hy	
P50-2202	Phoenix	Test 6		Hz	
P50-2236	Phoenix	Test 7		Hx	
P50-2237	Phoenix	Test 7		Hy	
P50-2436	Phoenix	Test 7		Hz	
P50-2445	Phoenix	Test 7		Hx	
P50-2447	Phoenix	Test 7		Hy	
P50-2448	Phoenix	Test 8,9		Hz	
P50-2451	Phoenix	Test 8		Hx	
P50-2455	Phoenix	Test 8,9		Hy	
P50-2456	Phoenix	Test 8,9		Hz	
P50-2457	Phoenix	Test 8,9		Hx	
P50-2459	Phoenix	Test 8,9		Hy	
P50-2461	Phoenix	Test 9		Hz	

2. Low Frequency Coils – Test 1

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	EMI	BF7-9104	Logger Site
2	EMI	BF7-9103	Logger Site
3	EMI	BF7-9602	Logger Site
4	EMI	BF7-9307	Logger Site
5	EMI	BF7-7006	Logger Site
6	EMI	BF7-7001	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

2.1 Test Results: 1000sps

NetEvent: PST_20081126.2249.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
BF7-9103: Bad coherency, F<1Hz connections cleaned and retested

Time Series

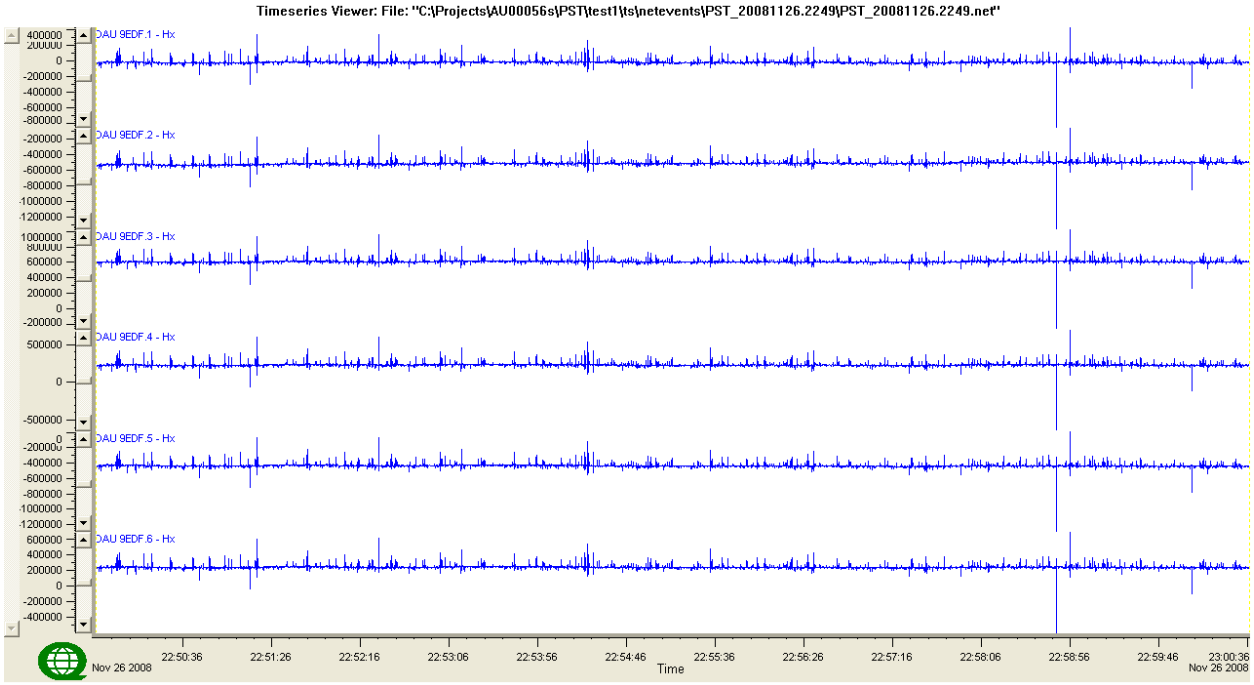
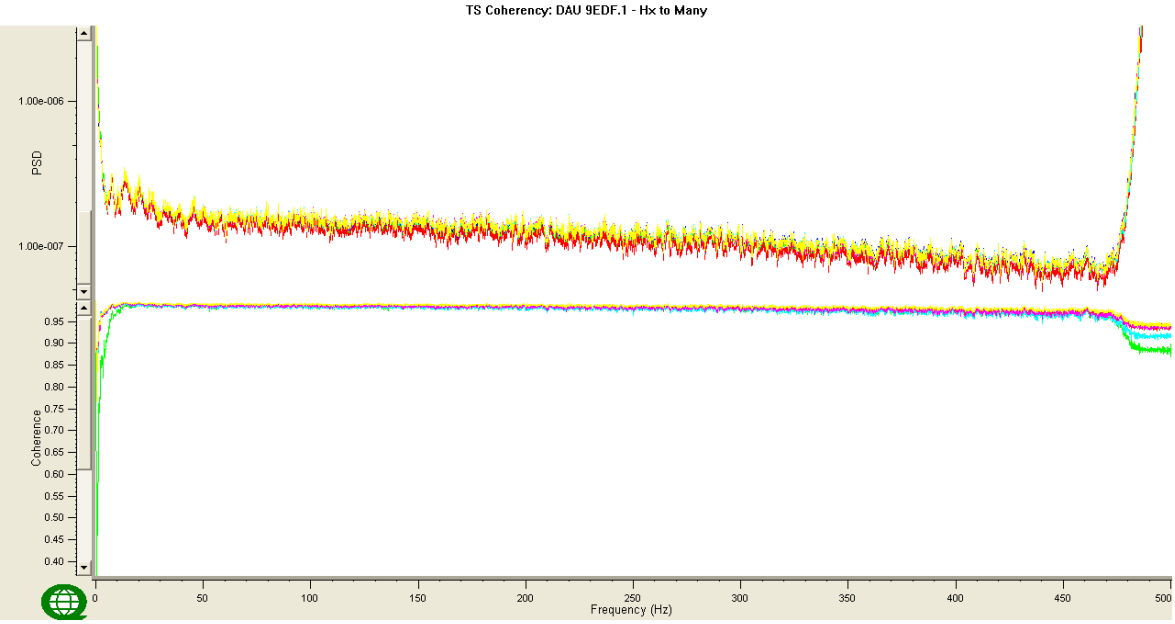


Figure 2-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to BF7-9104



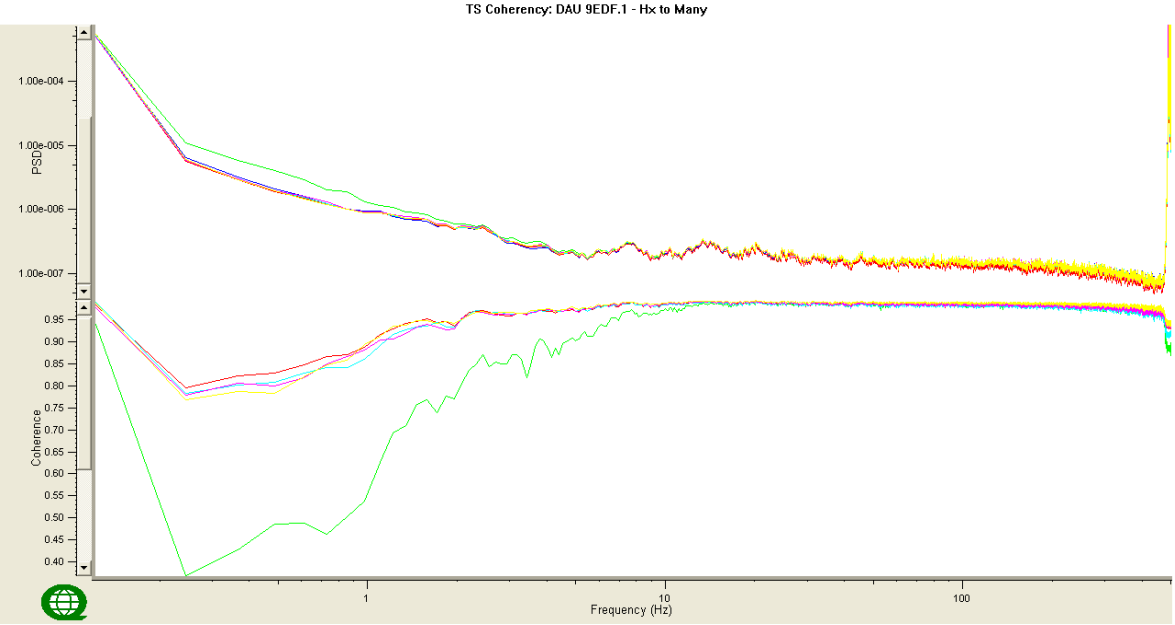


Figure 2-2: Coherencies are to BF7-9104 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	BF7-9104
Green	BF7-9103
Red	BF7-9602
Cyan	BF7-9307
Magenta	BF7-7006
Yellow	BF7-7001

3. Low Frequency Coils – Test 2

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	EMI	BF7-7007	Logger Site
2	EMI	BF7-9103	Logger Site
3	EMI	BF7-7004	Logger Site
4	EMI	BF7-9306	Logger Site
5	EMI	BF7-9802	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

3.1 Test Results: 1000sps

NetEvent: PST_20081126.2349
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
All coils retested with cleaned connections and ports swapped

Time Series

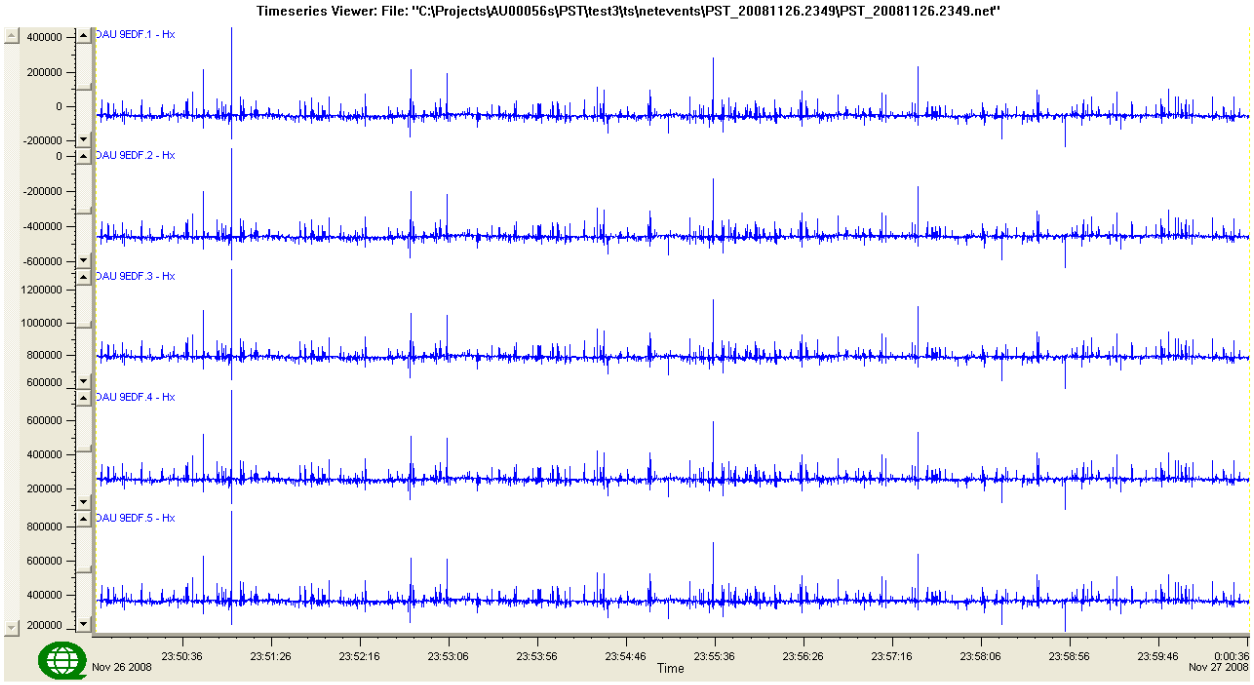
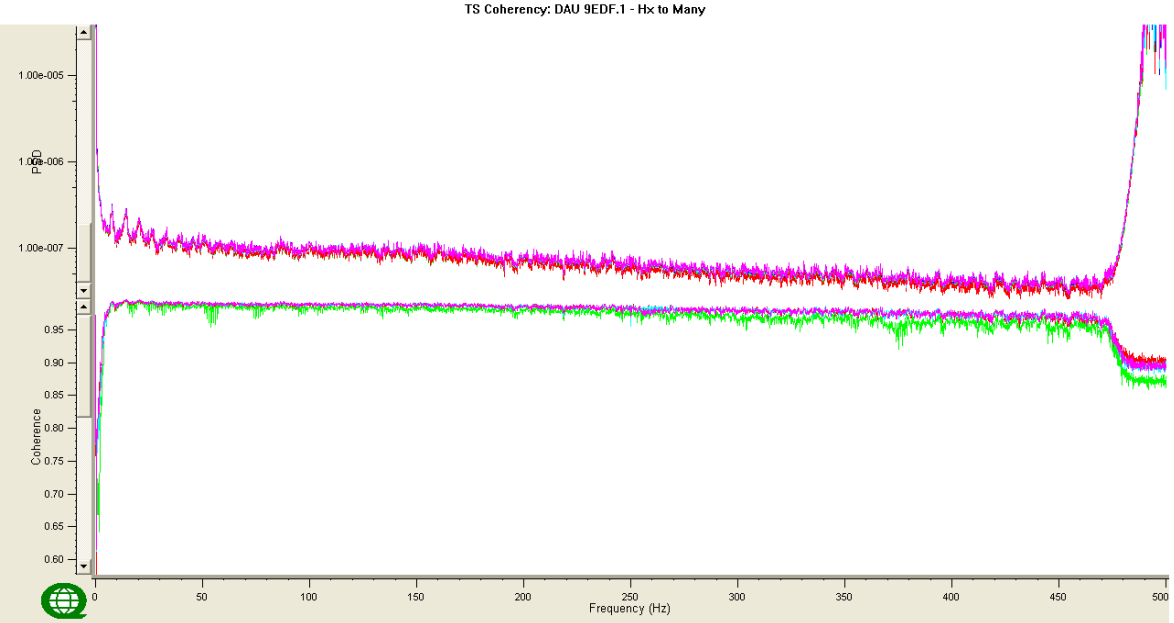


Figure 3-1: Complete time series at 1000sps

Low Frequency Coil Results: 1000sps
Coherency to BF7-7007



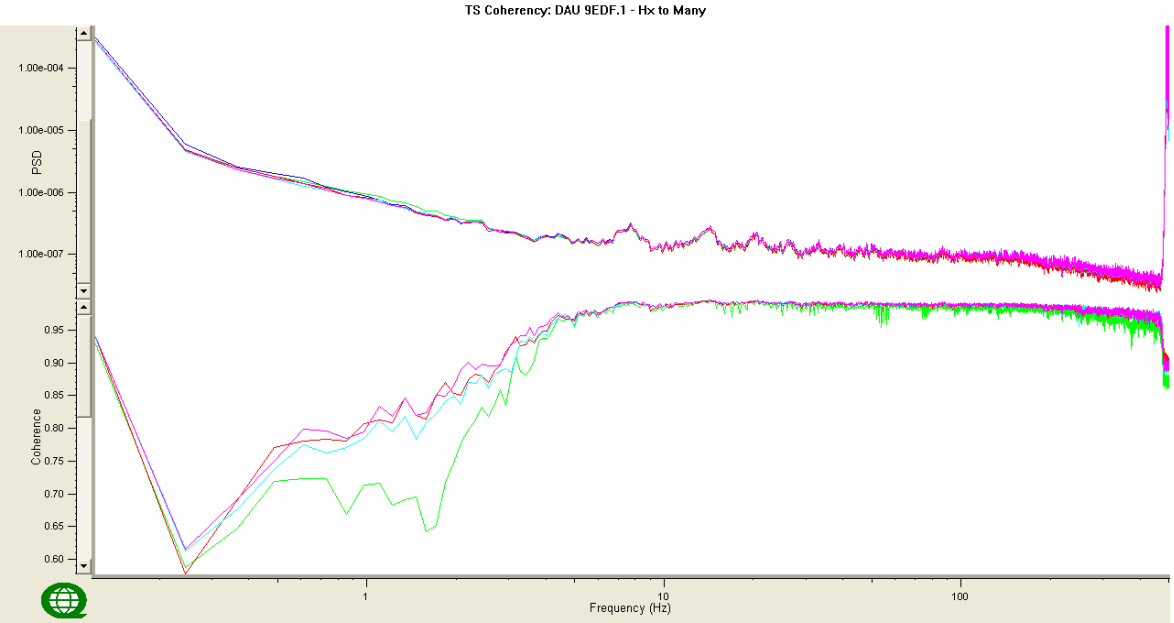


Figure 3-2: Coherencies are to BF7-7007 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	BF7-7007
Green	BF7-9103
Red	BF7-7004
Cyan	BF7-9306
Magenta	BF7-9802

4. Low Frequency Coils – Test 3

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	EMI	BF7-9306	Logger Site
2	EMI	BF7-9802	Logger Site
3	EMI	BF7-7007	Logger Site
4	EMI	BF7-9103	Logger Site
5	EMI	BF7-7004	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

4.1 Test Results: 1000sps

NetEvent: PST_20081127.0024.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
All good, except BF7-9103 changed cables for next test.

Time Series

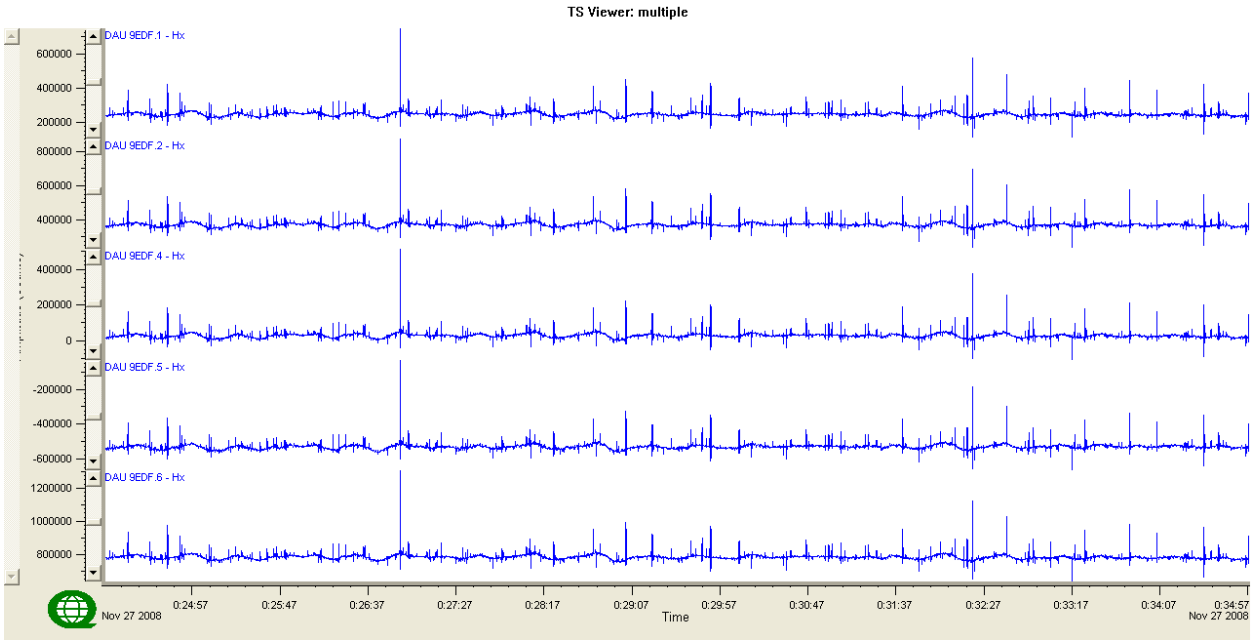
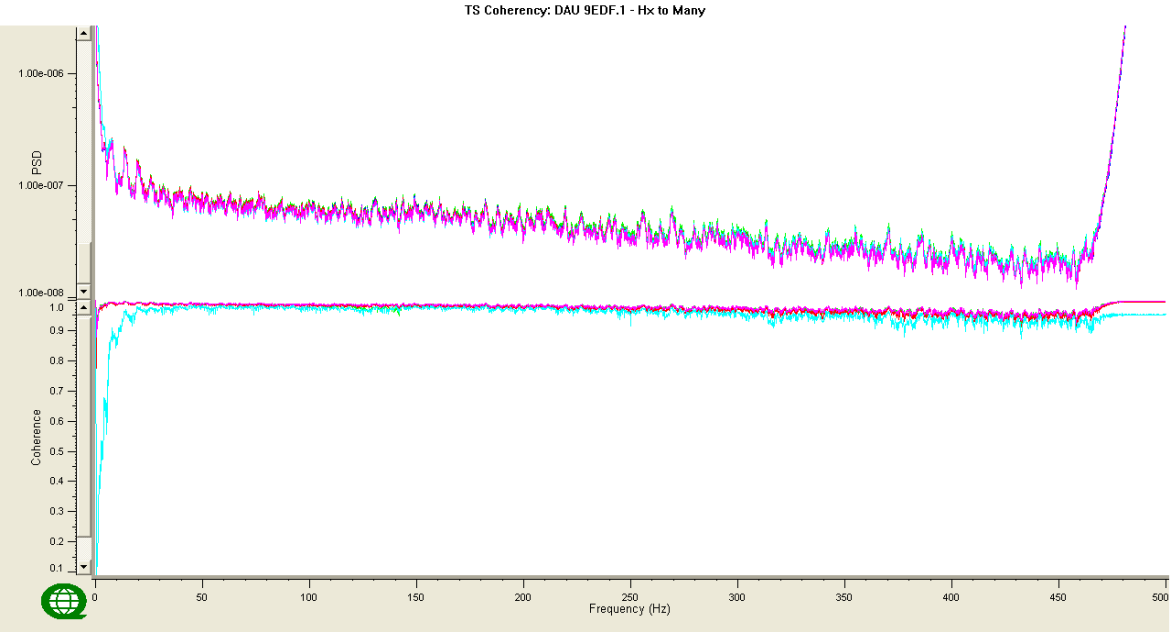


Figure 4-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to BF7-9306



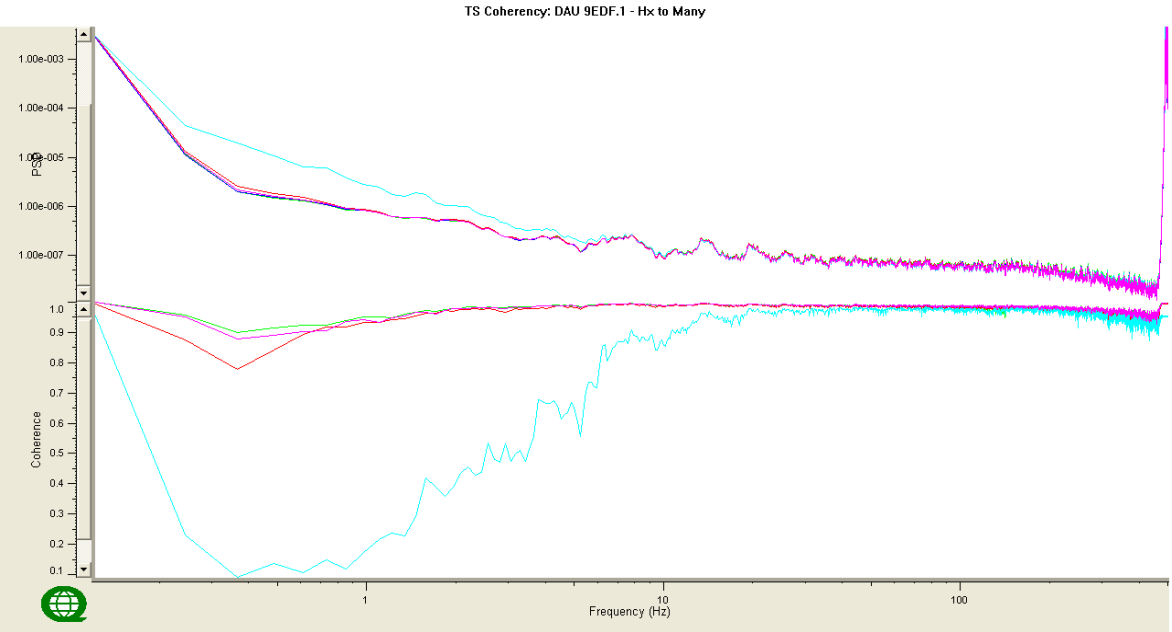


Figure 4-2: Coherencies are to BF7-9306 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	BF7-9306
Green	BF7-9802
Red	BF7-7007
Cyan	BF7-9103
Magenta	BF7-7004

5. Low Frequency Coils – Test 4

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	EMI	BF4-9016	Logger Site
2	EMI	BF7-9103	Logger Site
3	EMI	BF4-9122	Logger Site
4	EMI	BF4-9622	Logger Site
5	EMI	BF4-9623	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

Results:

All channels to be retested BF4-9016 & BF7-9103, fail due to low coherency

5.1 Test Results: 1000sps

NetEvent: PST_20081127.0109.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Time Series

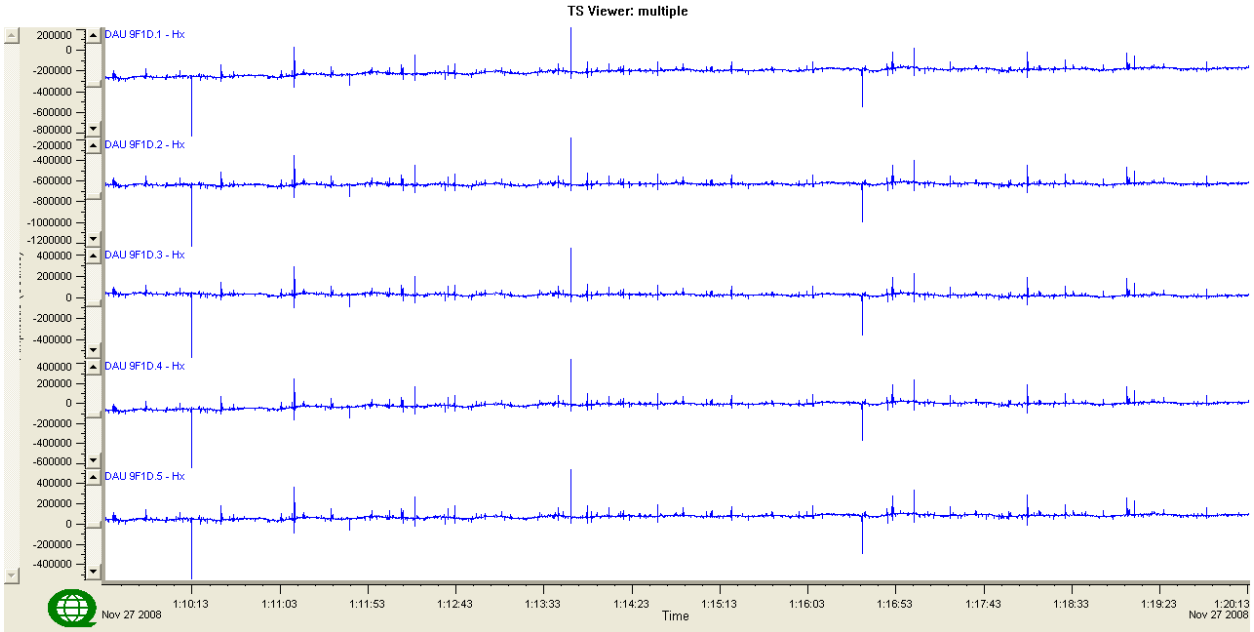
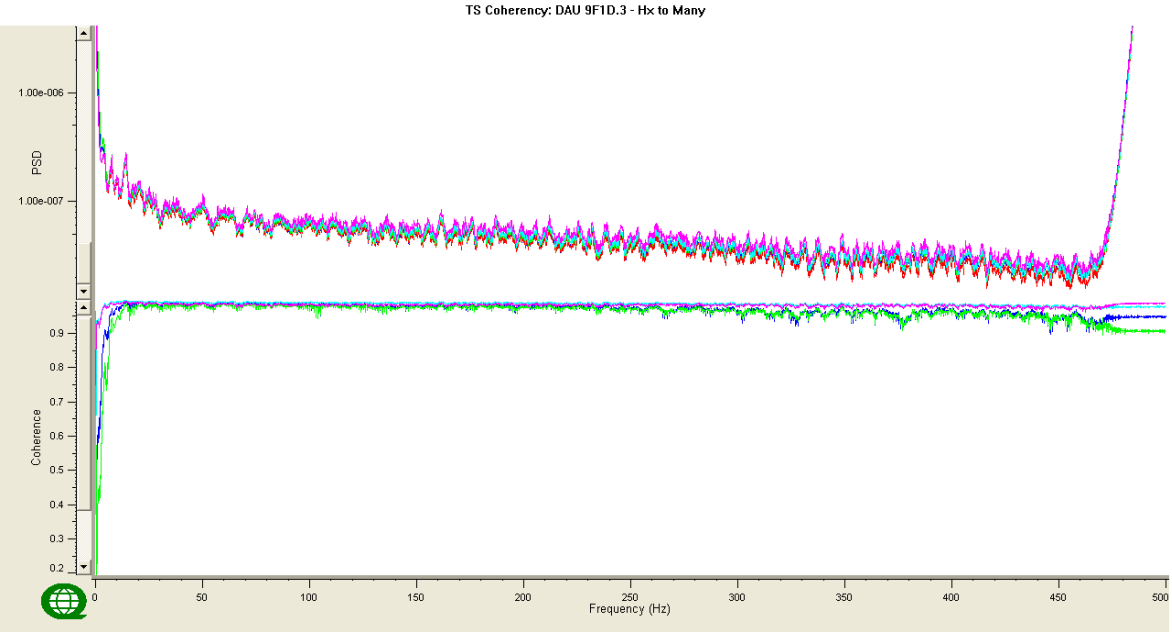


Figure 5-1: Complete time series at 1000sps

Low Frequency Coil Results: 1000sps
Coherency to BF4-9122



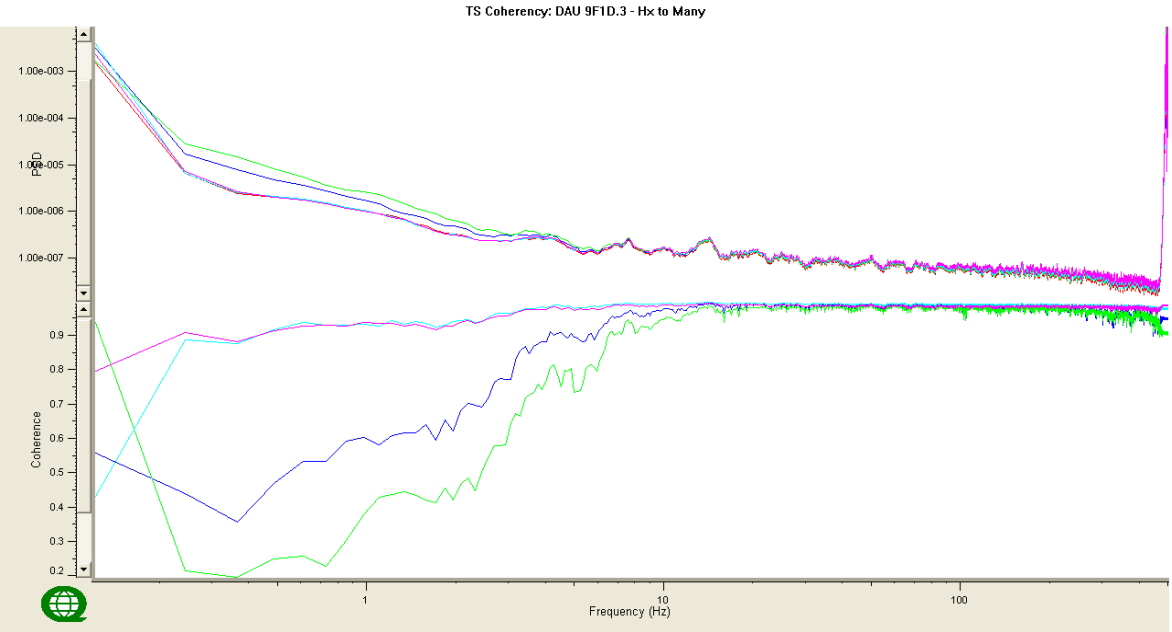


Figure 5-2: Coherencies are to BF4-9122 (Red).Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	BF4-9016
Green	BF7-9103
Red	BF4-9122
Cyan	BF4-9622
Magenta	BF4-9623

6. Low Frequency Coils – Test 5

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	EMI	BF4-9623	Logger Site
2	EMI	BF4-9622	Logger Site
3	EMI	BF4-9016	Logger Site
4	EMI	BF7-9103	Logger Site
5	EMI	BF4-9122	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

6.1 Test Results: 1000sps

NetEvent: PST_20081127.0148.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
Ok, BF7-9103 & BF4-9122 failed due to low coherency

Time Series

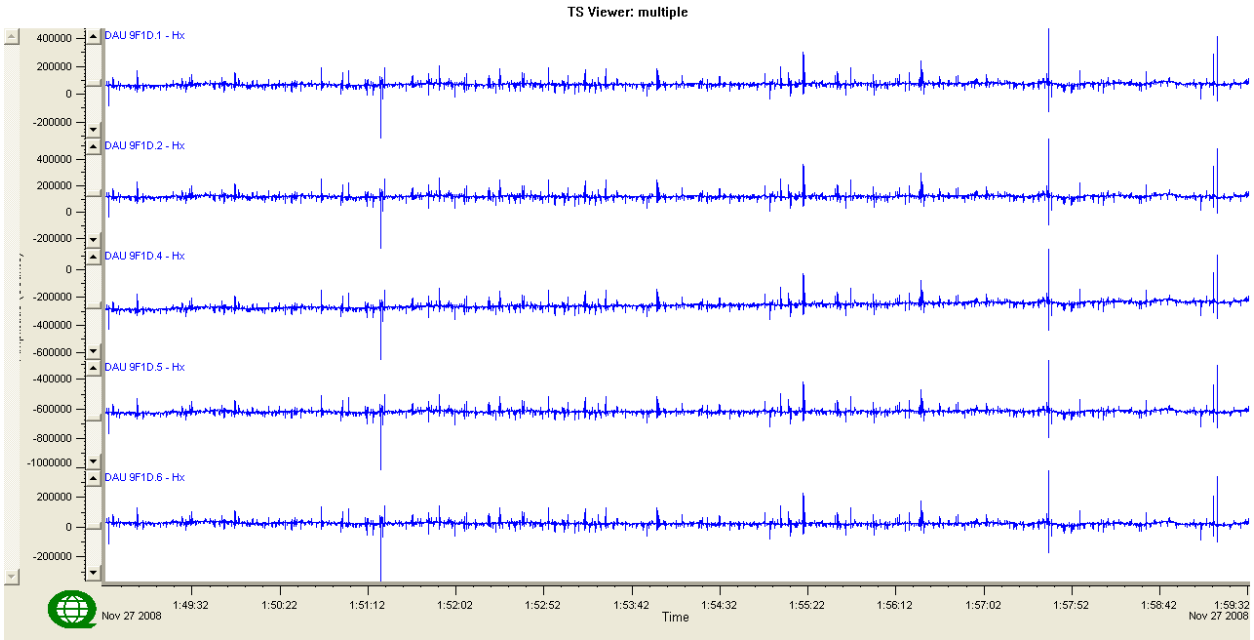
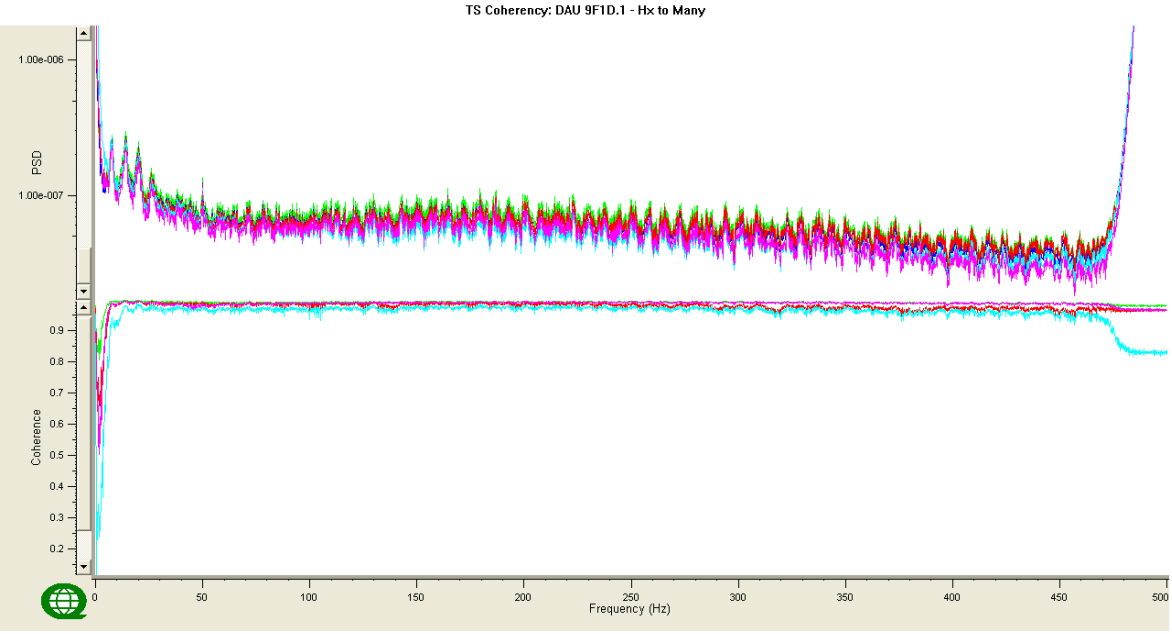


Figure 6-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to BF4-9623



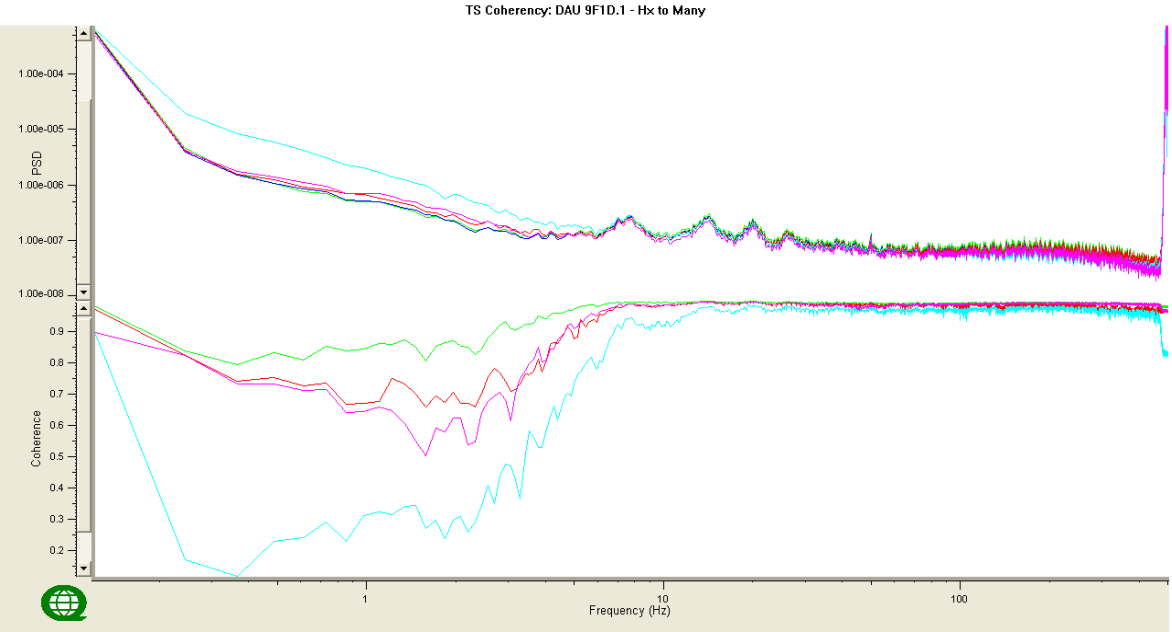


Figure 6-2: Coherencies are to BF4-9623 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	BF4-9623
Green	BF4-9622
Red	BF4-9016
Cyan	BF7-9103
Magenta	BF4-9122

7. Low Frequency Coils – Test 6

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	PHOENIX	P50-2010	Logger Site
2	PHOENIX	P50-2017	Logger Site
3	PHOENIX	P50-2202	Logger Site
4	PHOENIX	P50-2126	Logger Site
5	PHOENIX	P50-2114	Logger Site
6	PHOENIX	P50-2117	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

7.1 Test Results: 1000sps

NetEvent: PST_20081127.0314.net
Sample Rate: 1000sps
TS Length: 650000samples (~11min)

Results:
P50-2114 failed cable changed for next test, all other coils passed

Time Series

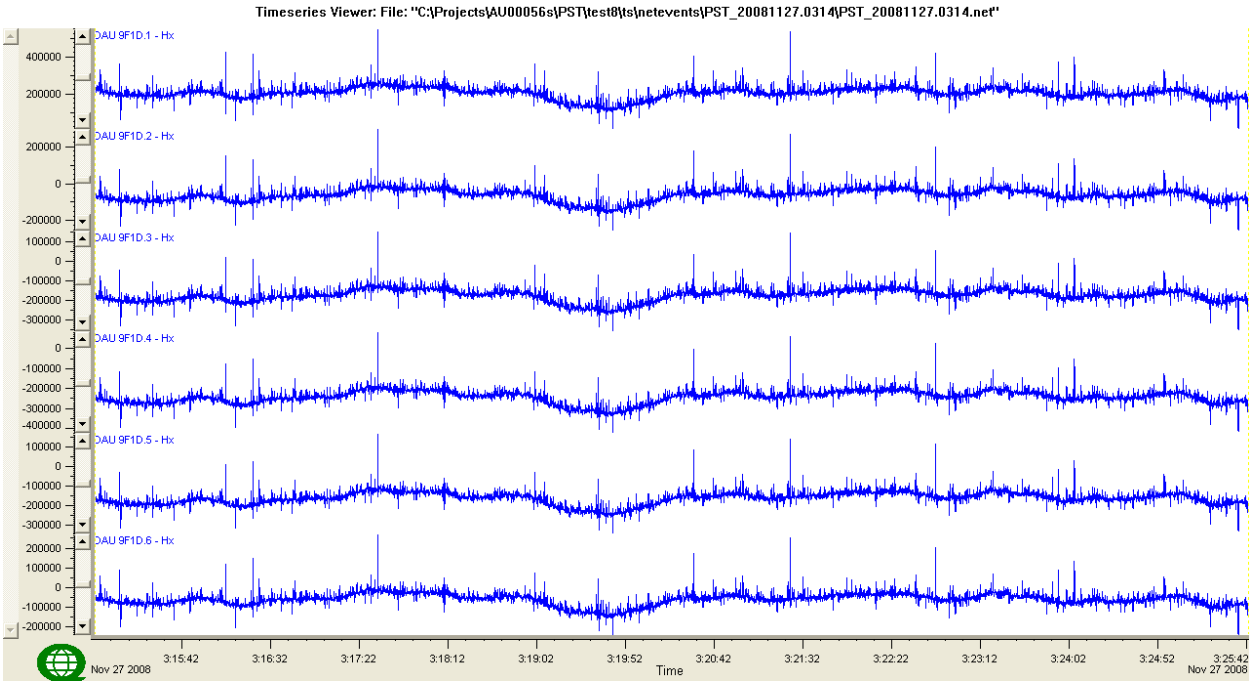


Figure 7-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to P50-2010

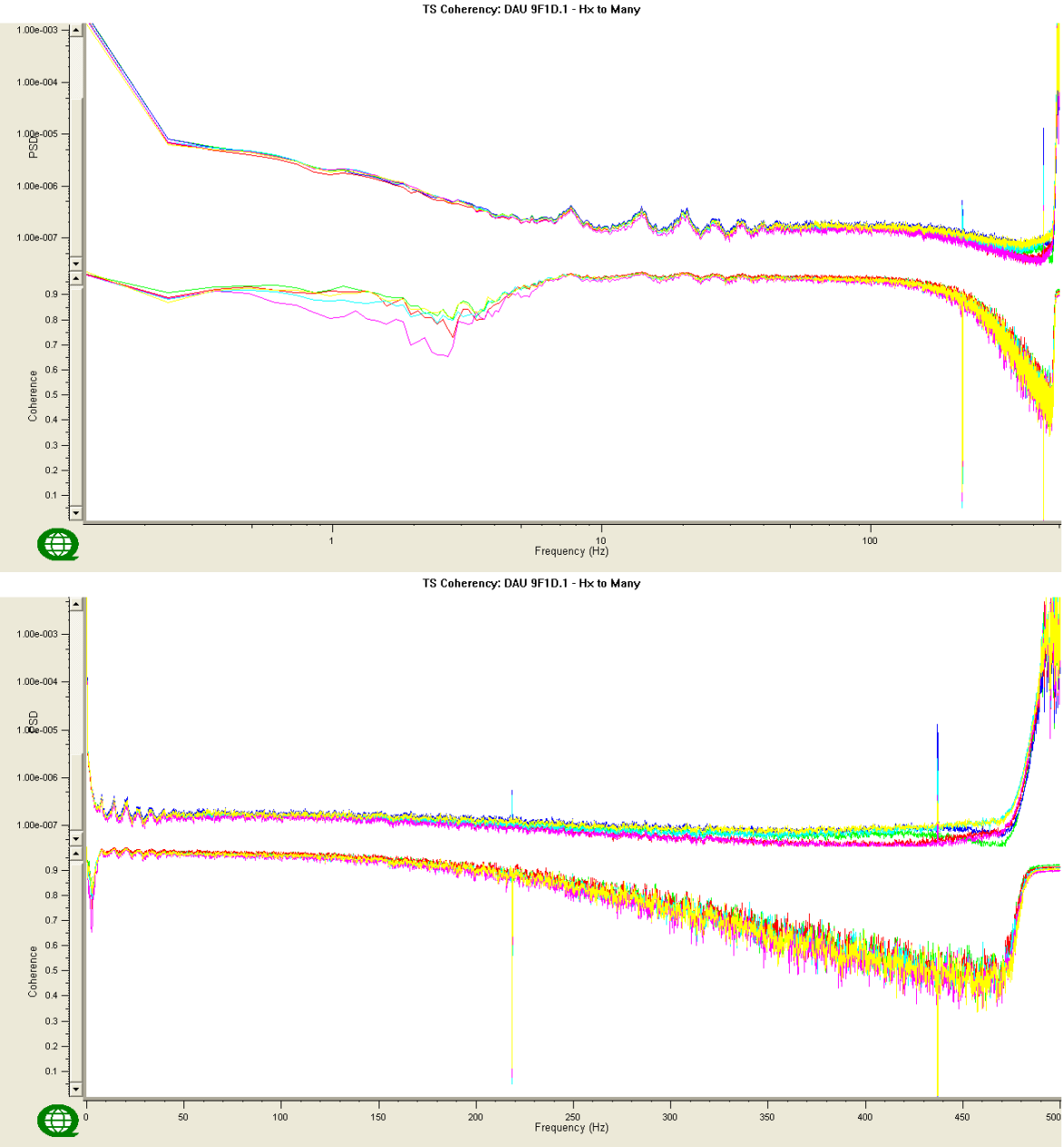


Figure 7-2: Coherencies are to P50-2010 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	P50-2010
Green	P50-2017
Red	P50-2202
Cyan	P50-2126
Magenta	P50-2114
Yellow	P50-2117

8. Low Frequency Coils – Test 7

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	PHOENIX	P50-2236	Logger Site
2	PHOENIX	P50-2237	Logger Site
3	PHOENIX	P50-2436	Logger Site
4	PHOENIX	P50-2445	Logger Site
5	PHOENIX	P50-2114	Logger Site
6	PHOENIX	P50-2447	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

8.1 Test Results: 1000sps

NetEvent: PST_20081127.0351.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
All good

Time Series

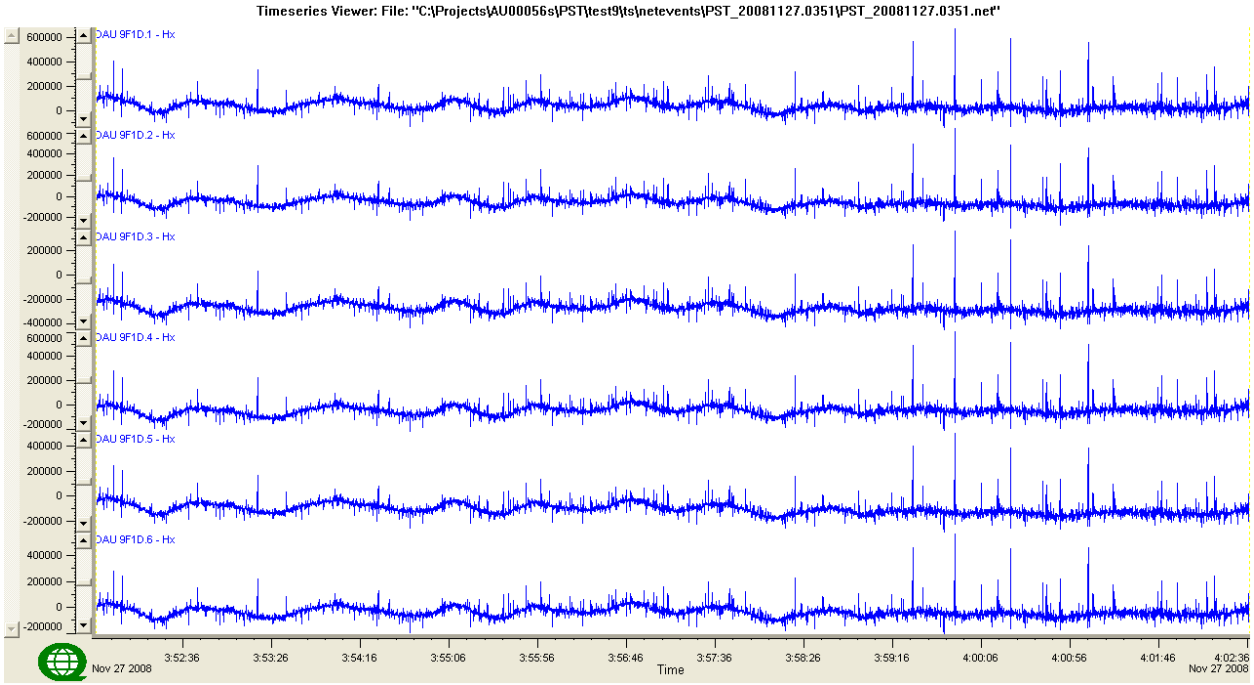


Figure 8-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to P50-2236

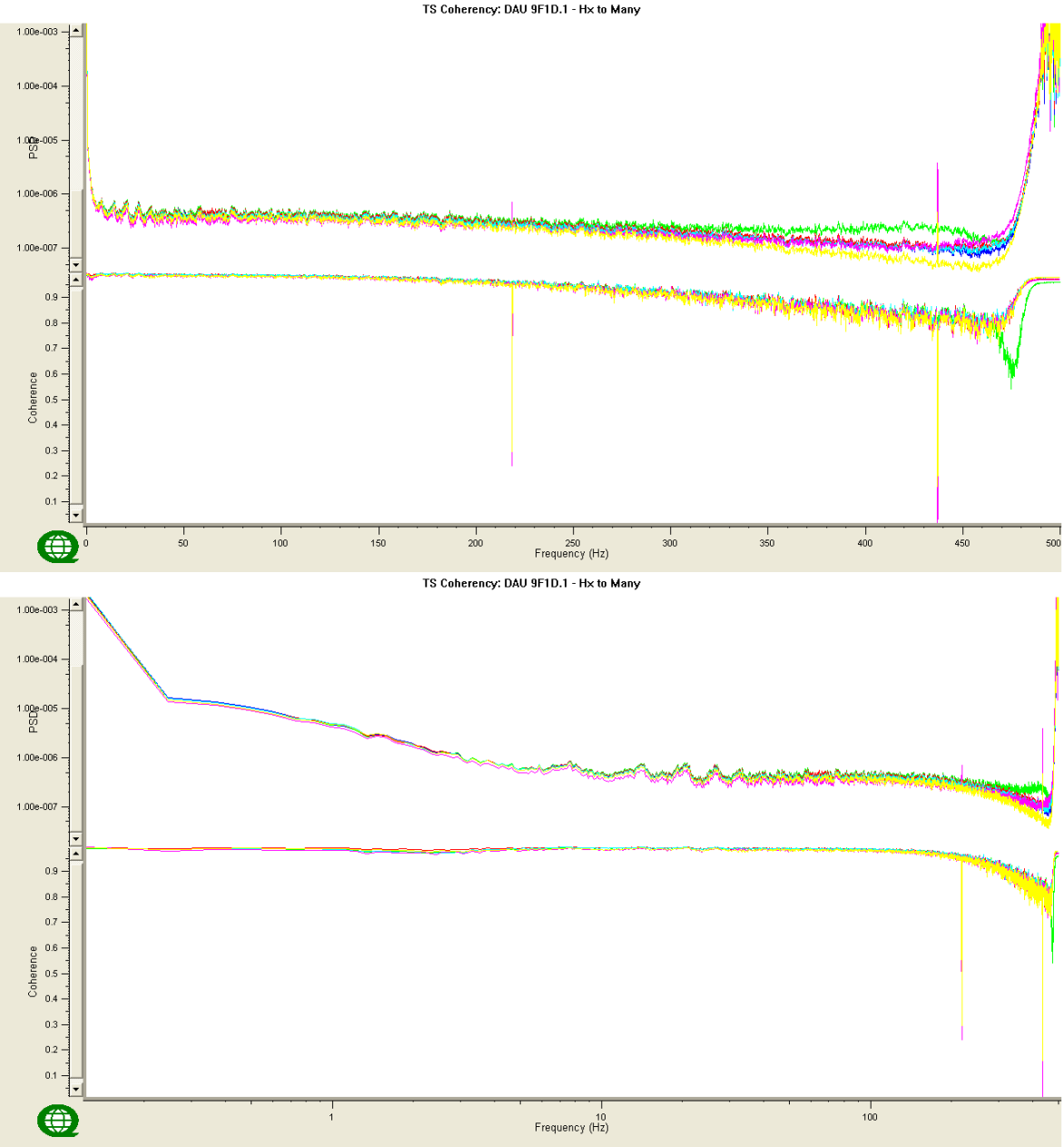


Figure 9-2: Coherencies are to P50-2236 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	P50-2236
Green	P50-2237
Red	P50-2436
Cyan	P50-2445
Magenta	P50-2114
Yellow	P50-2447

9. Low Frequency Coils – Test 8

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	PHOENIX	P50-2451	Logger Site
2	PHOENIX	P50-2448	Logger Site
3	PHOENIX	P50-2456	Logger Site
4	PHOENIX	P50-2455	Logger Site
5	PHOENIX	P50-2459	Logger Site
6	PHOENIX	P50-2457	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

9.1 Test Results: 1000sps

NetEvent: PST_20081127.0435.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
All good

Time Series

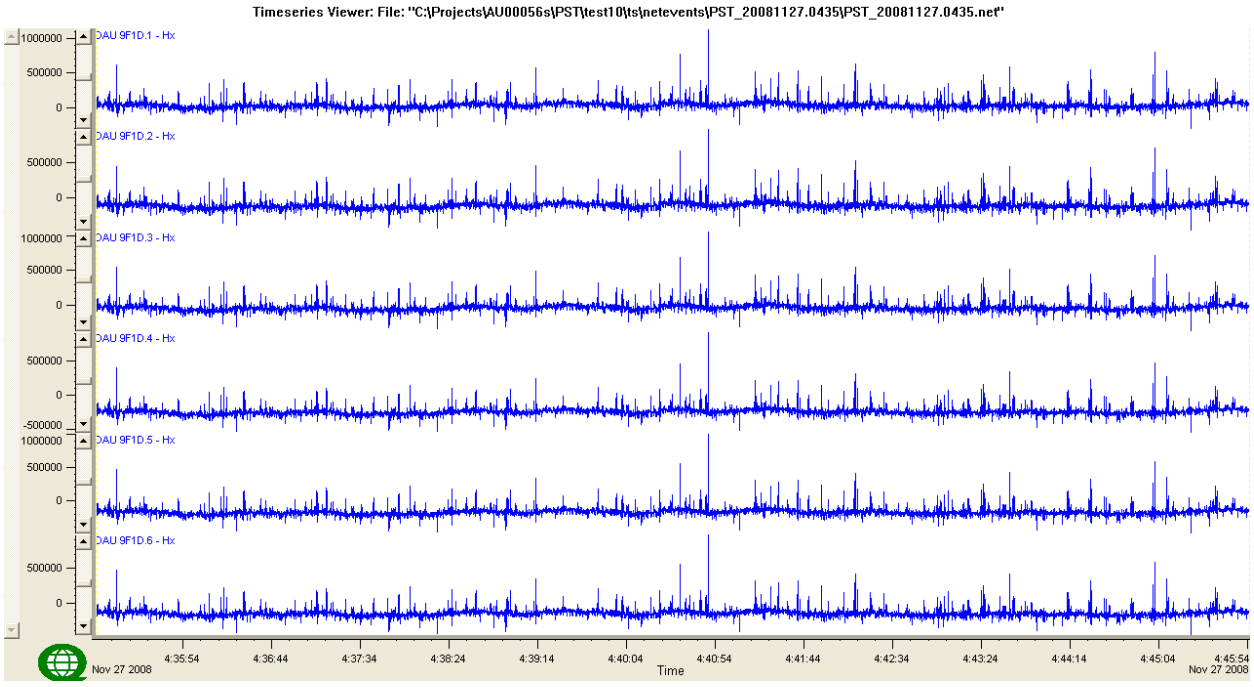
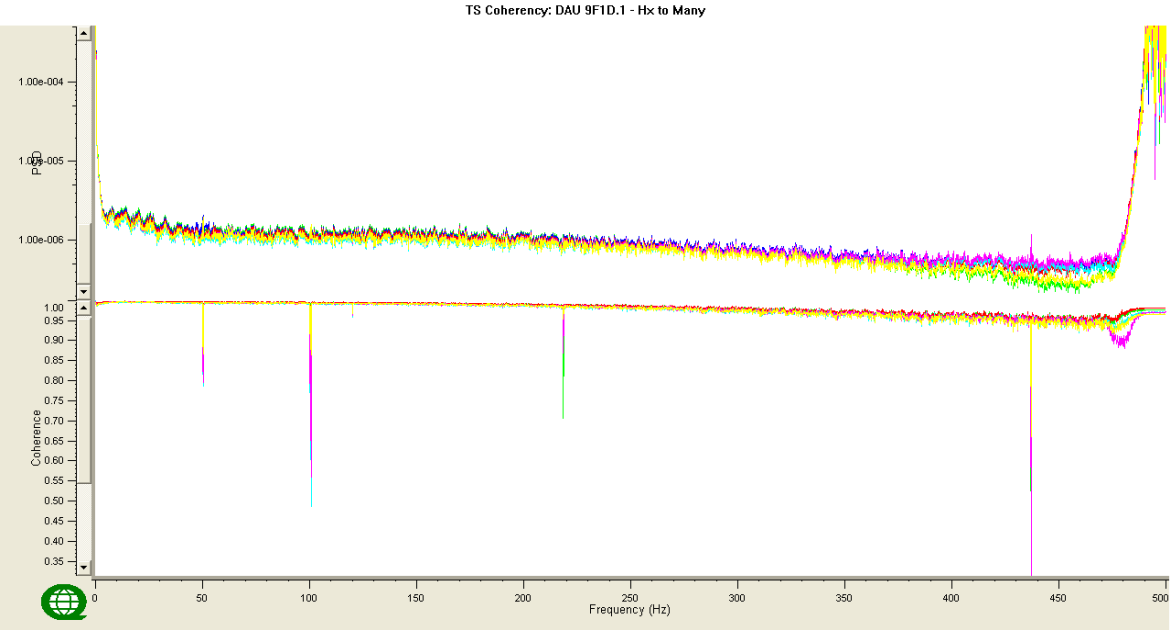


Figure 9-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to P50-2451



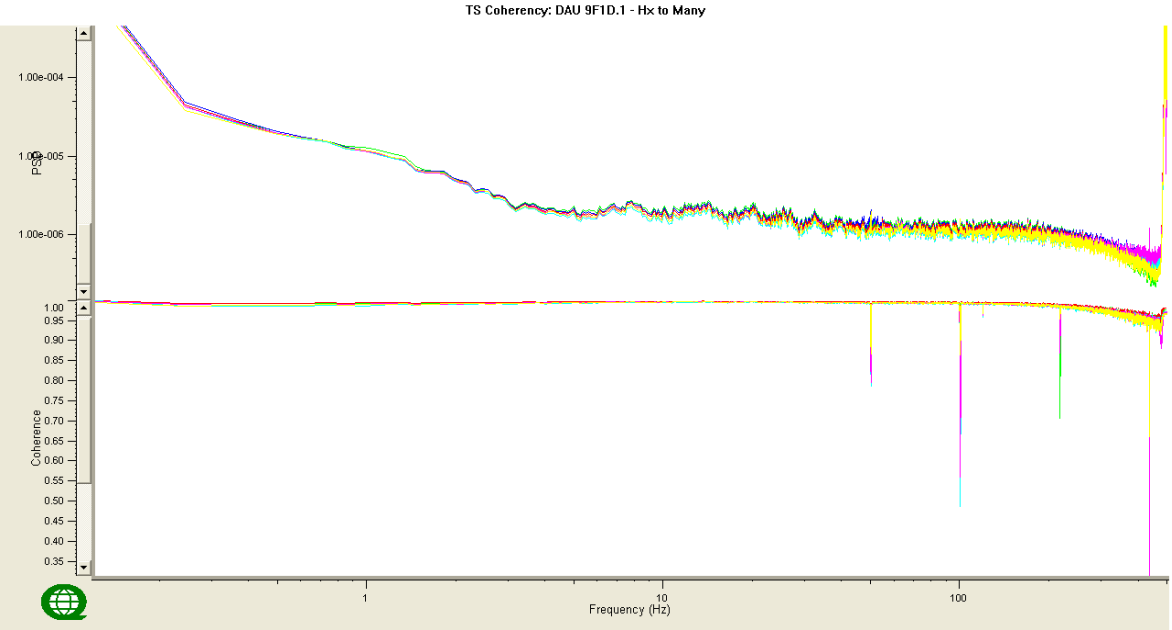


Figure 9-2: Coherencies are to P50-2451 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	P50-2451
Green	P50-2448
Red	P50-2456
Cyan	P50-2455
Magenta	P50-2459
Yellow	P50-2457

10. Low Frequency Coils – Test 9

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	PHOENIX	P50-2451	Logger Site
2	PHOENIX	P50-2448	Logger Site
3	PHOENIX	P50-2456	Logger Site
4	PHOENIX	P50-2455	Logger Site
5	PHOENIX	P50-2459	Logger Site
6	PHOENIX	P50-2457	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

10.1 Test Results: 1000sps

NetEvent: PST_20081127.0504.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
All Good

Time Series

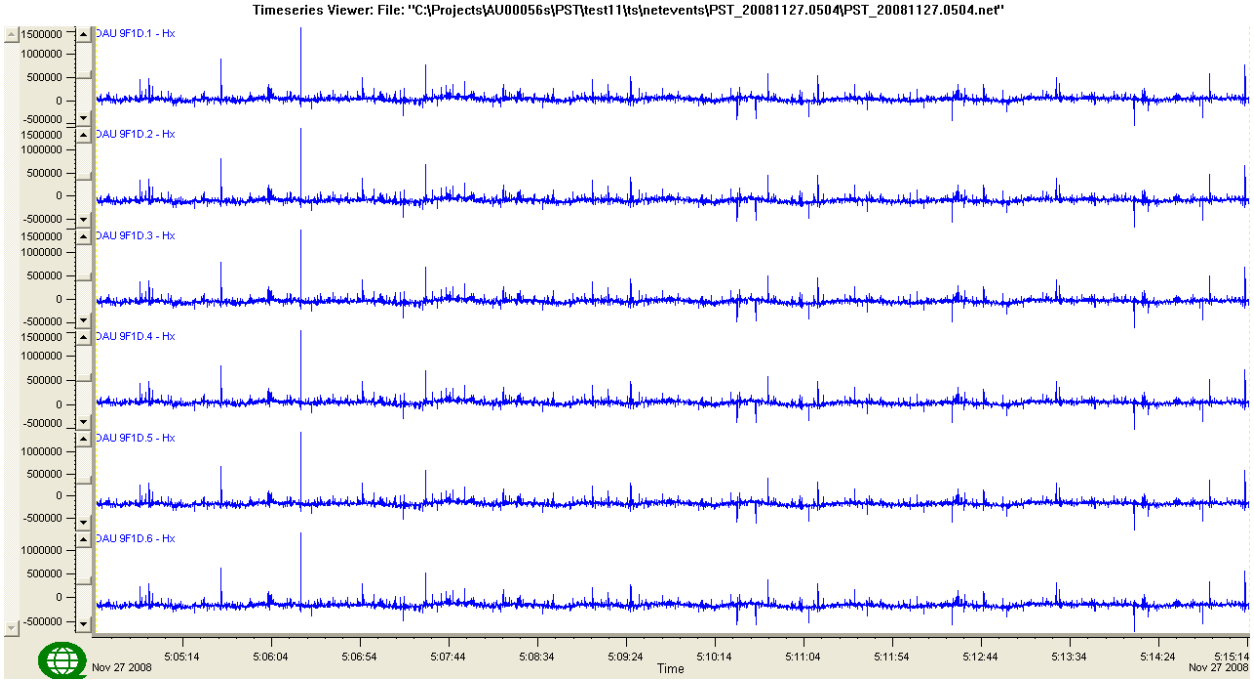
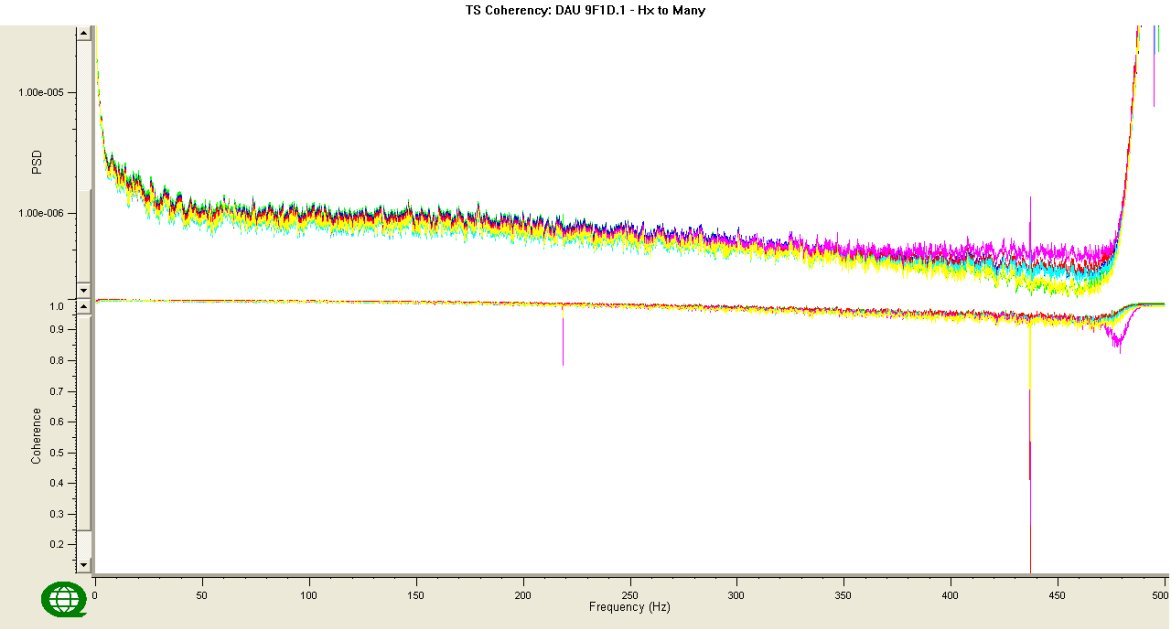


Figure 10-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to P50-2461



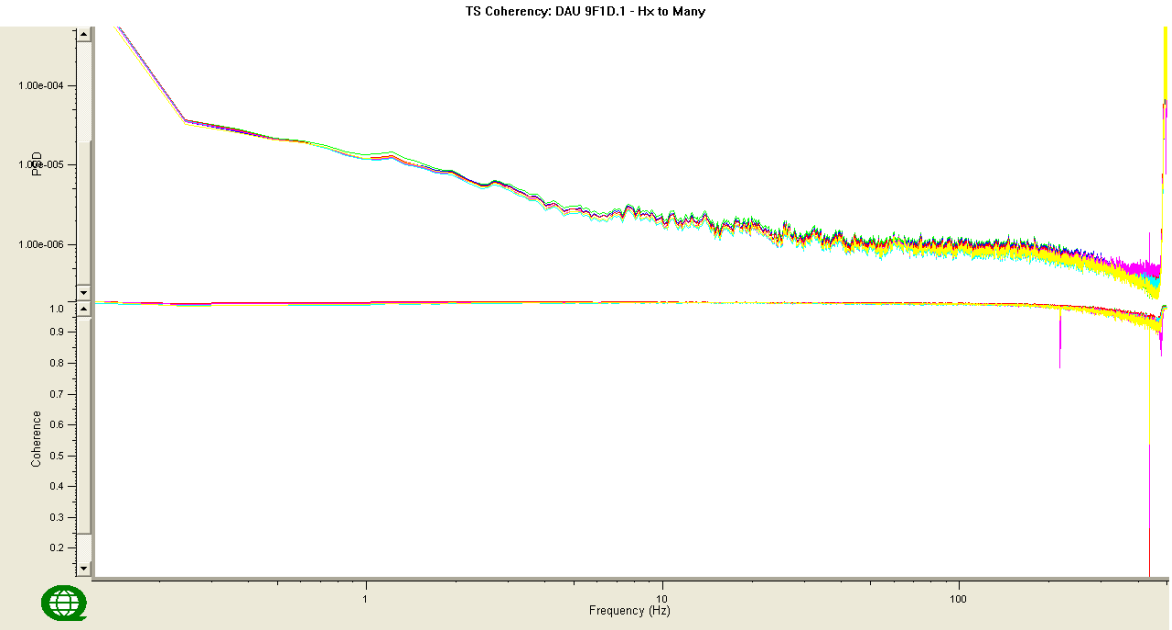


Figure 10-2: Coherencies are toP50-2461 (blue). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	P50-2461
Green	P50-2448
Red	P50-2456
Cyan	P50-2455
Magenta	P50-2459
Yellow	P50-2457

11. Low Frequency Coils – Test 10

Available Coils:

TS Strip	Manufacturer	Serial #	Tasked To
1	EMI	BF4-9622	Logger Site
2	EMI	BF4-9623	Logger Site
3	EMI	BF4-9016	Logger Site
4	EMI	BF4-9122	Logger Site
5	EMI	BF7-9103	Logger Site

Processing Parameters:

Parameter	Value
QuickLay Version	3_Alpha.33
PSD Method	Welch
Window	Hanning
Window length	8196
Segment Overlap	50%

11.1 Test Results: 1000sps

NetEvent: PST_20081129.0431.net
Sample Rate: 1000sps
TS Length: 650000 samples (~11min)

Results:
BF4-9122 & BF7-9103 failed due to low cohernecy

Time Series

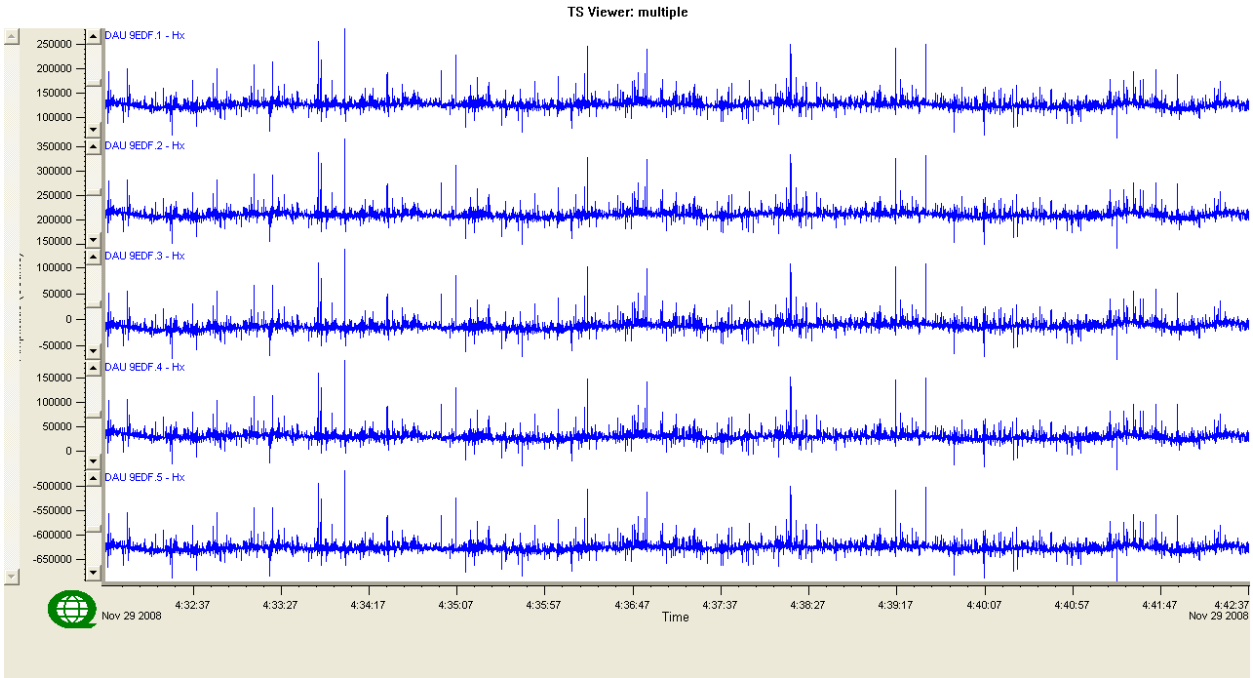


Figure 10-1: Complete time series @ 1000sps

Low Frequency Coil Results: 1000sps
Coherency to BF4-9623

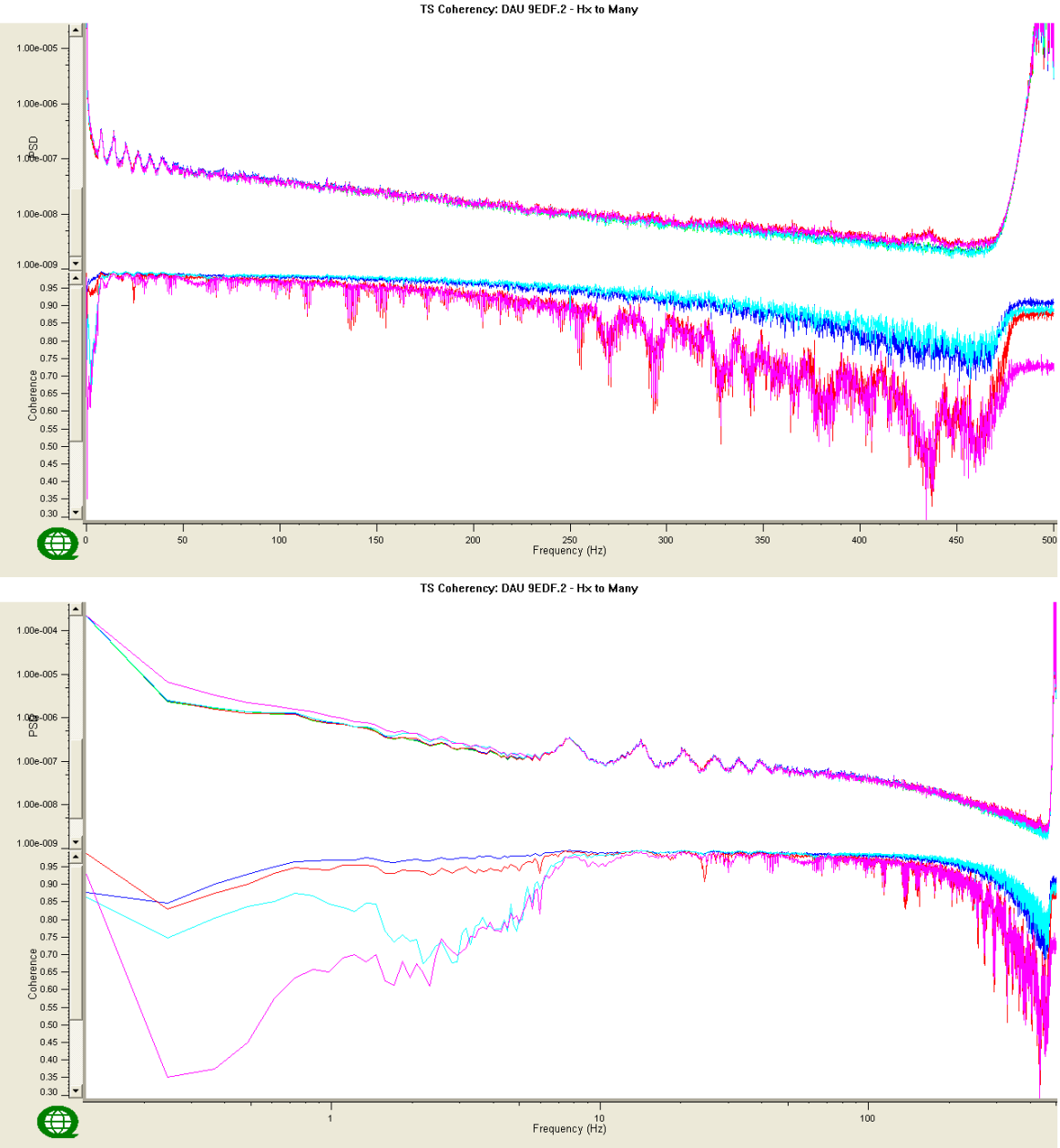


Figure 10-2: Coherencies are toBF4-9623 (green). Upper linear, lower logarithmic frequency scales.

Colour	Channel
Blue	BF4-9622
Green	BF4-9623
Red	BF4-9016
Cyan	BF4-9122
Magenta	BF7-9103