Geo-Science Applications in Visual Signal

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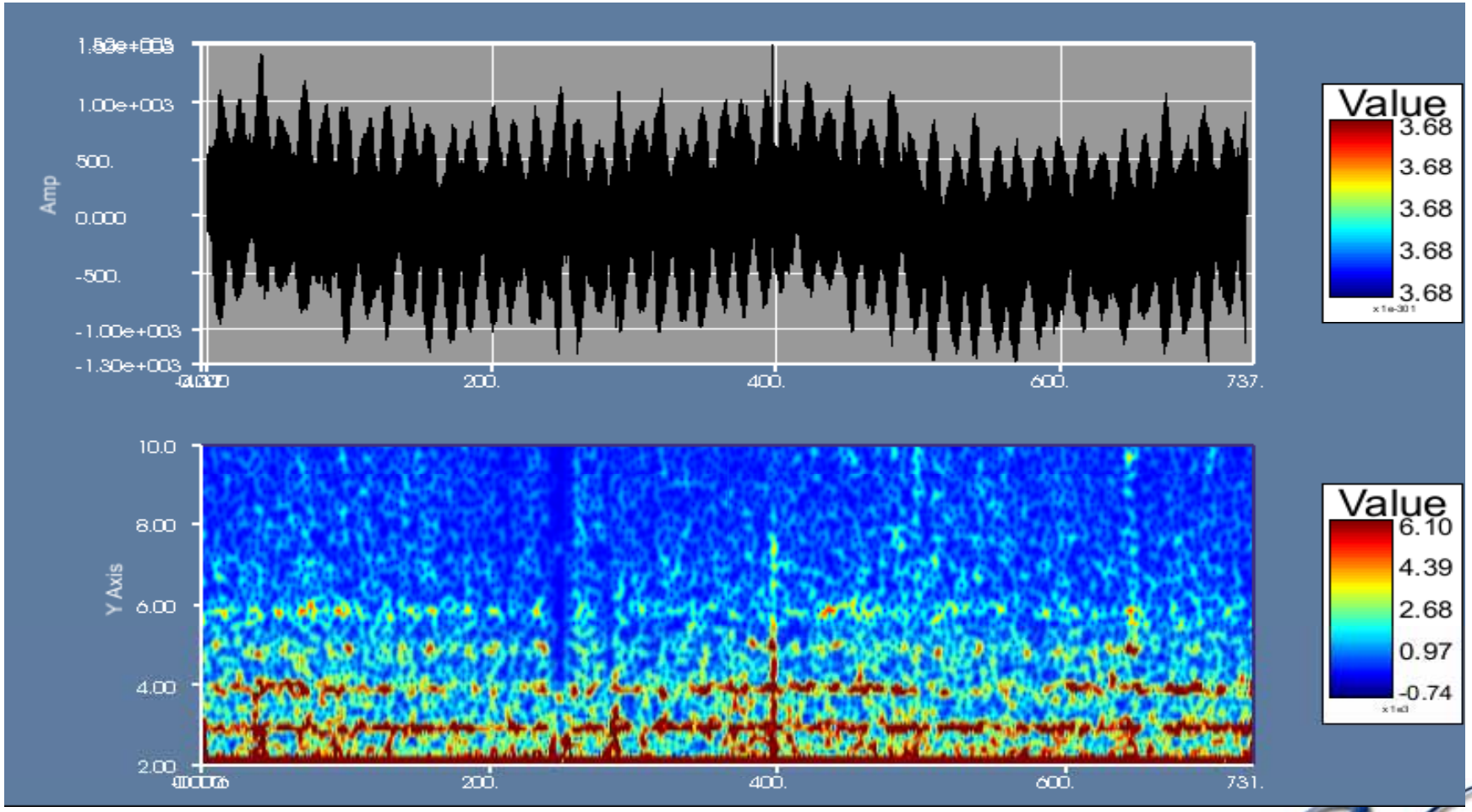
Tidal waves

Time unit: day

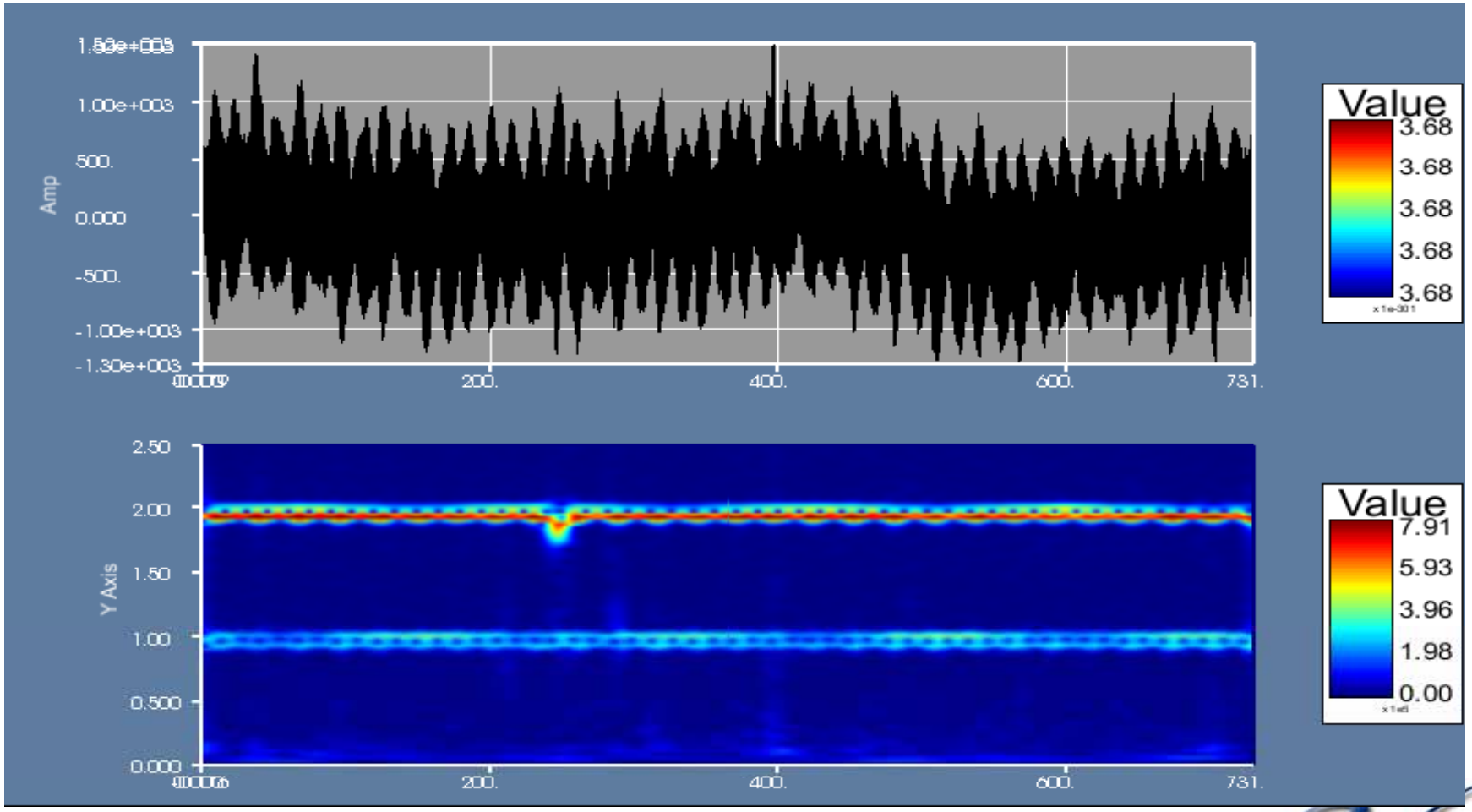
Recorded period: 2003/11/01:00 to 2003/12/31:23

Sampling: every 6 min.

Tide signal (2 years)

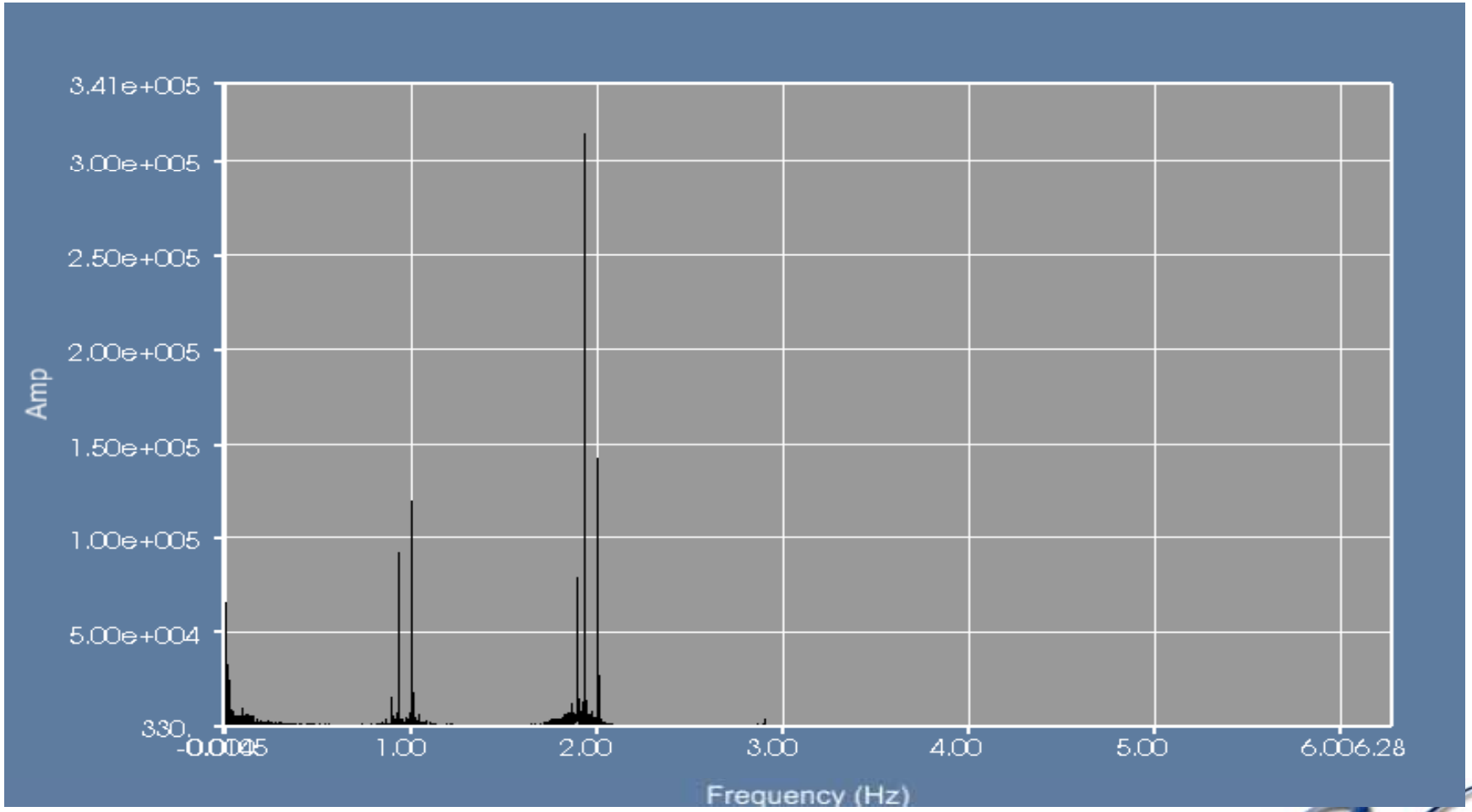


AnCAD


Amp
1.00e+003
500.
0.000
-500.
-1.00e+003
-1.30e+003
200.
400.
600.
731.
Value
3.68
3.68
3.68
3.68
3.68
Y Axis
2.50
2.00
1.50
1.00
0.500
0.000
200.
400.
600.
731.
Value
7.91
5.93
3.96
1.98
0.00

AnCAD

Tide signal - Spectrum (2 years)



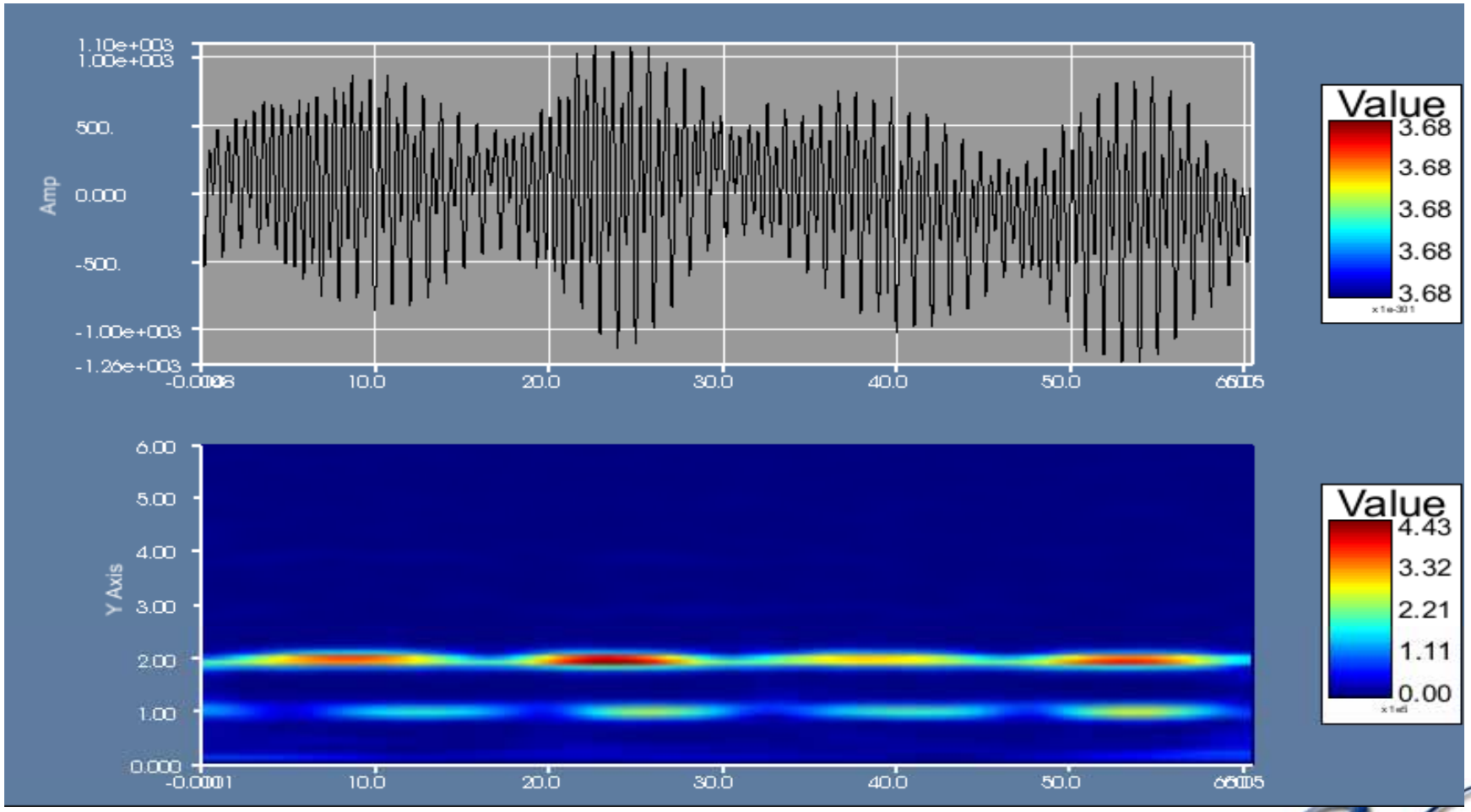
AnCAD

Tsunami

Time unit: day

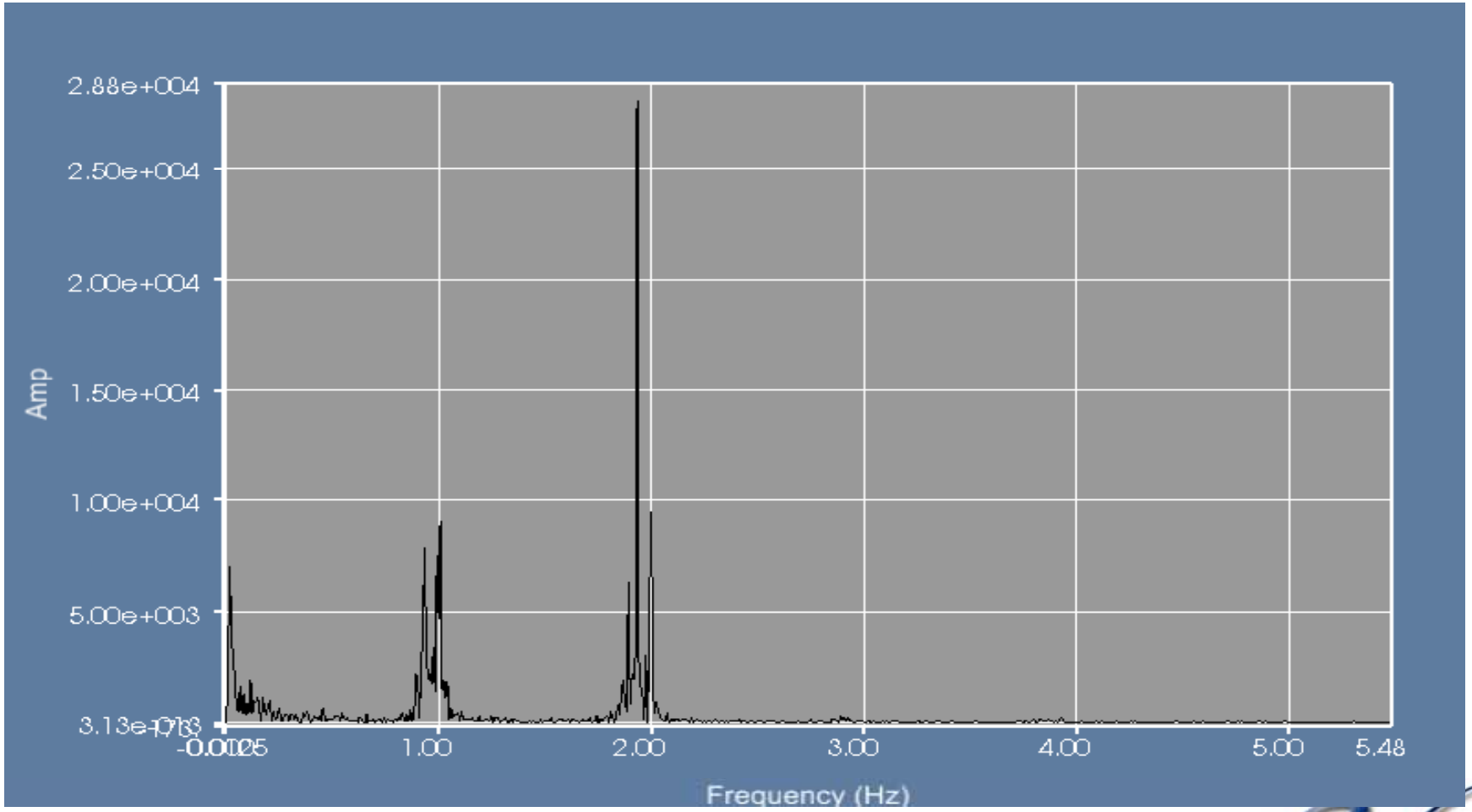
Recorded period: 2003/11/01:00 to 2003/12/31:23

Low frequency analysis



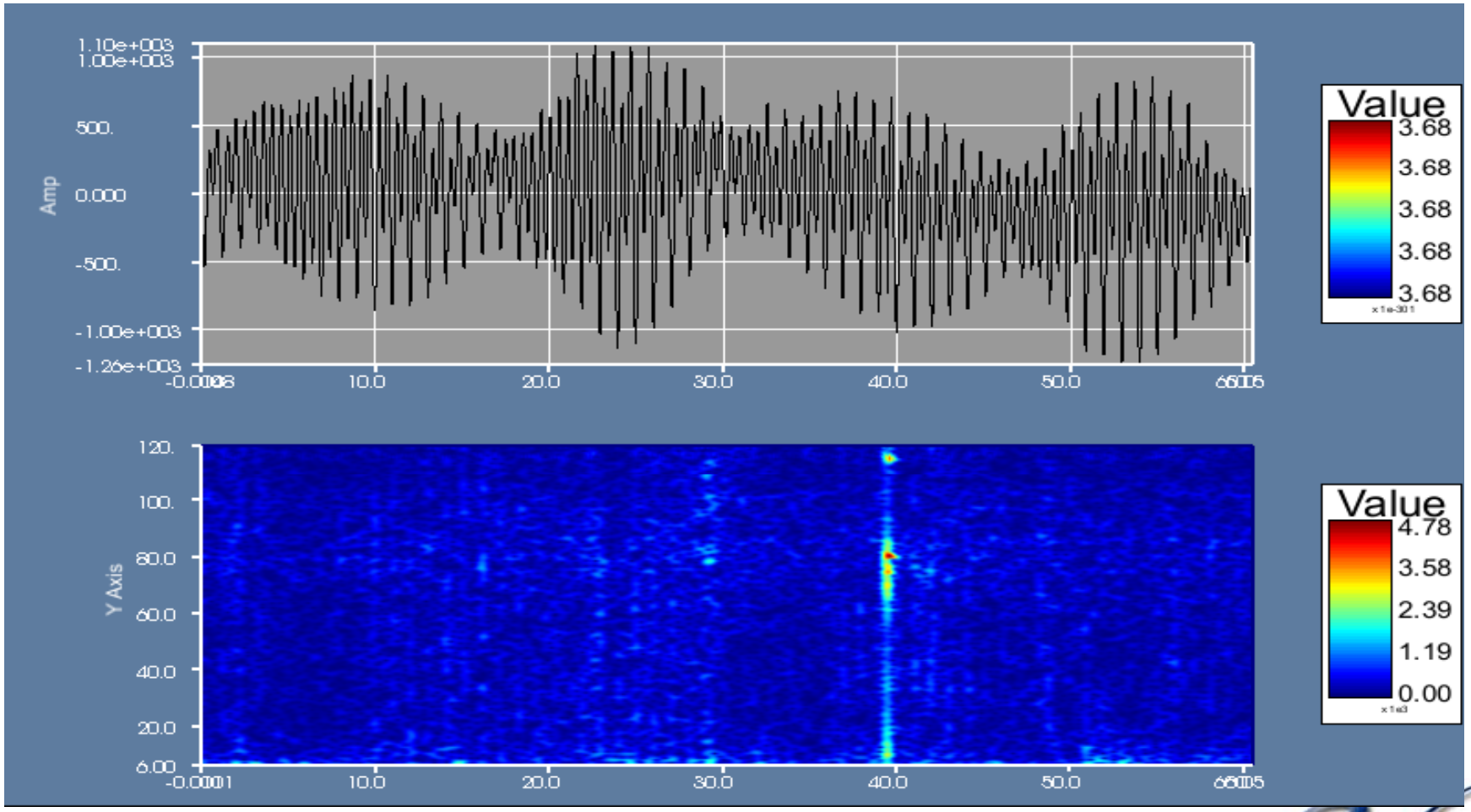
AnCAD

Spectrum



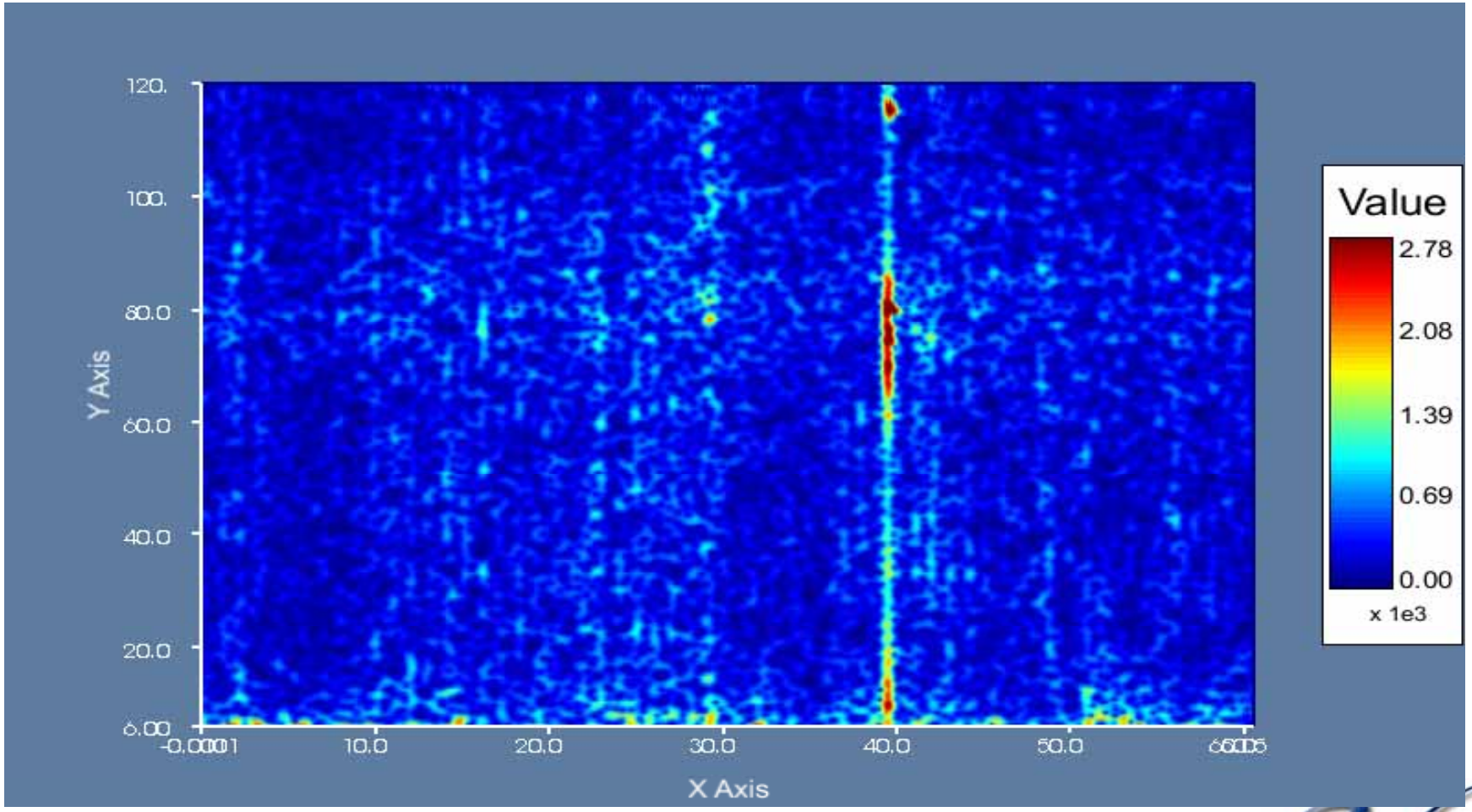
AnCAD

Freq. : 6 to 120 (1/day)



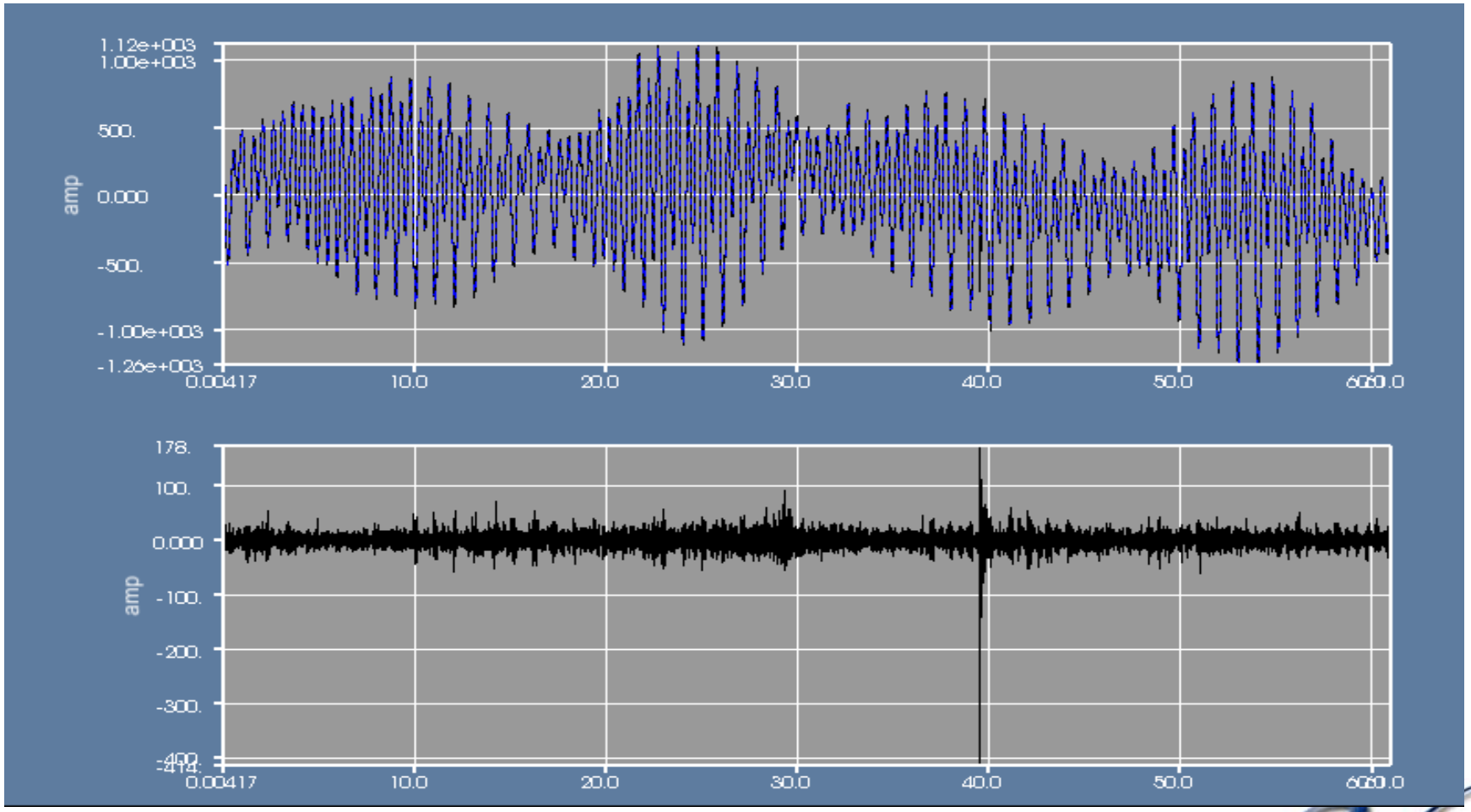
AnCAD

Freq. : 6 to 120 (1/day)

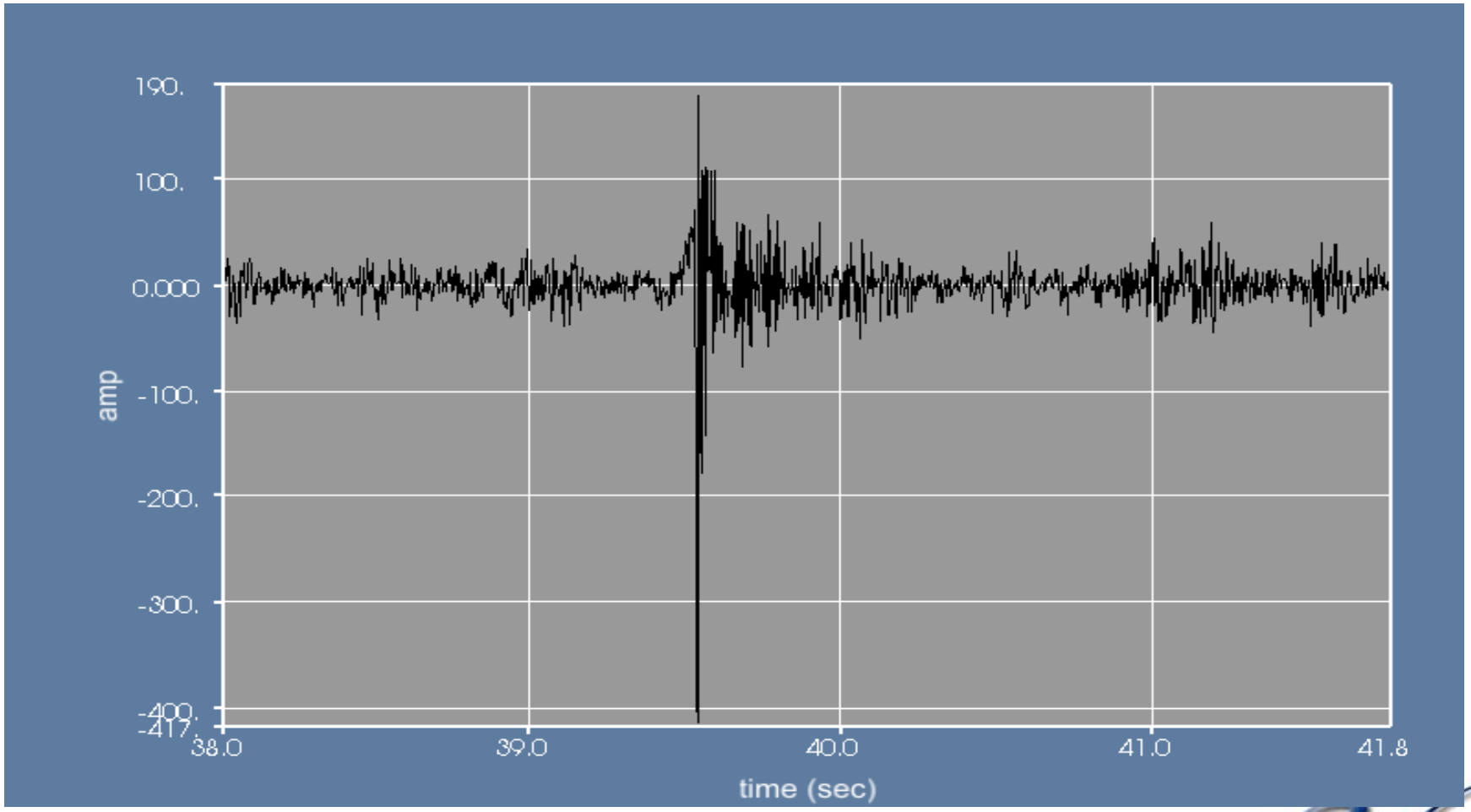


AnCAD

Apply Gaussian filter (fH=6, fL=fH/1.5)

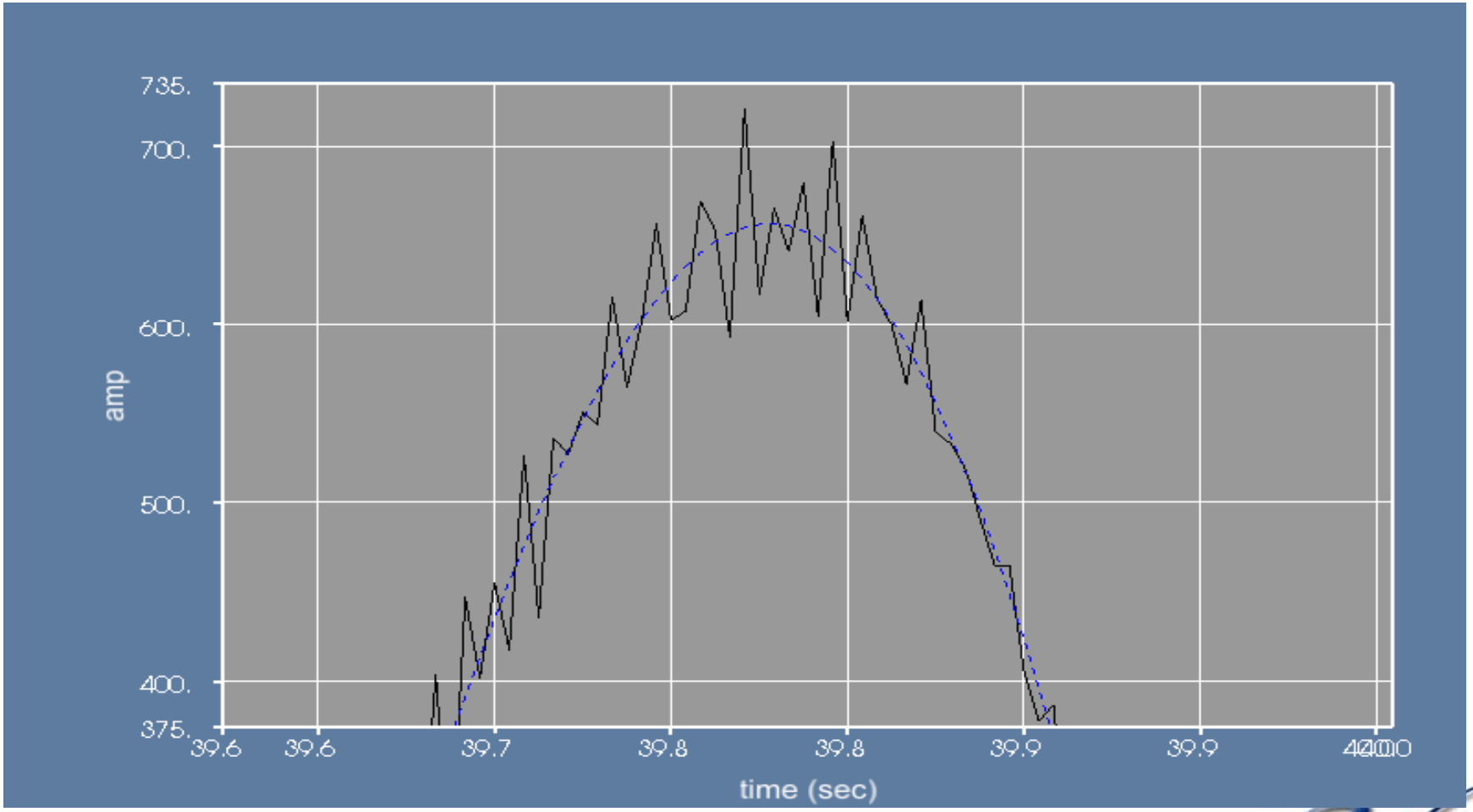


AnCAD


190.
100.
0.000
-100.
-200.
-300.
-400.
-417.
amp
38.0
39.0
40.0
41.0
41.8
time (sec)

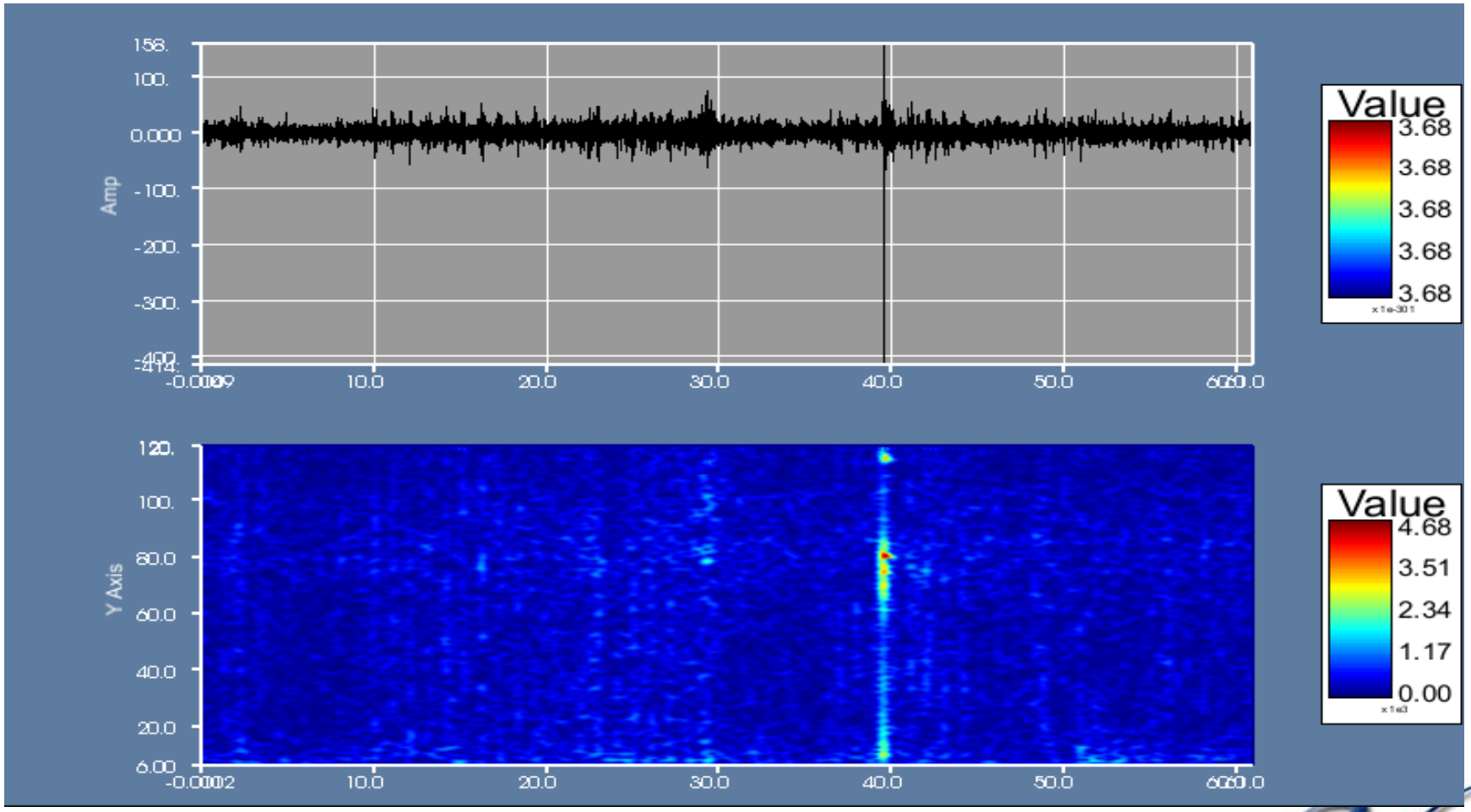
AnCAD

Original vs. filtered signals



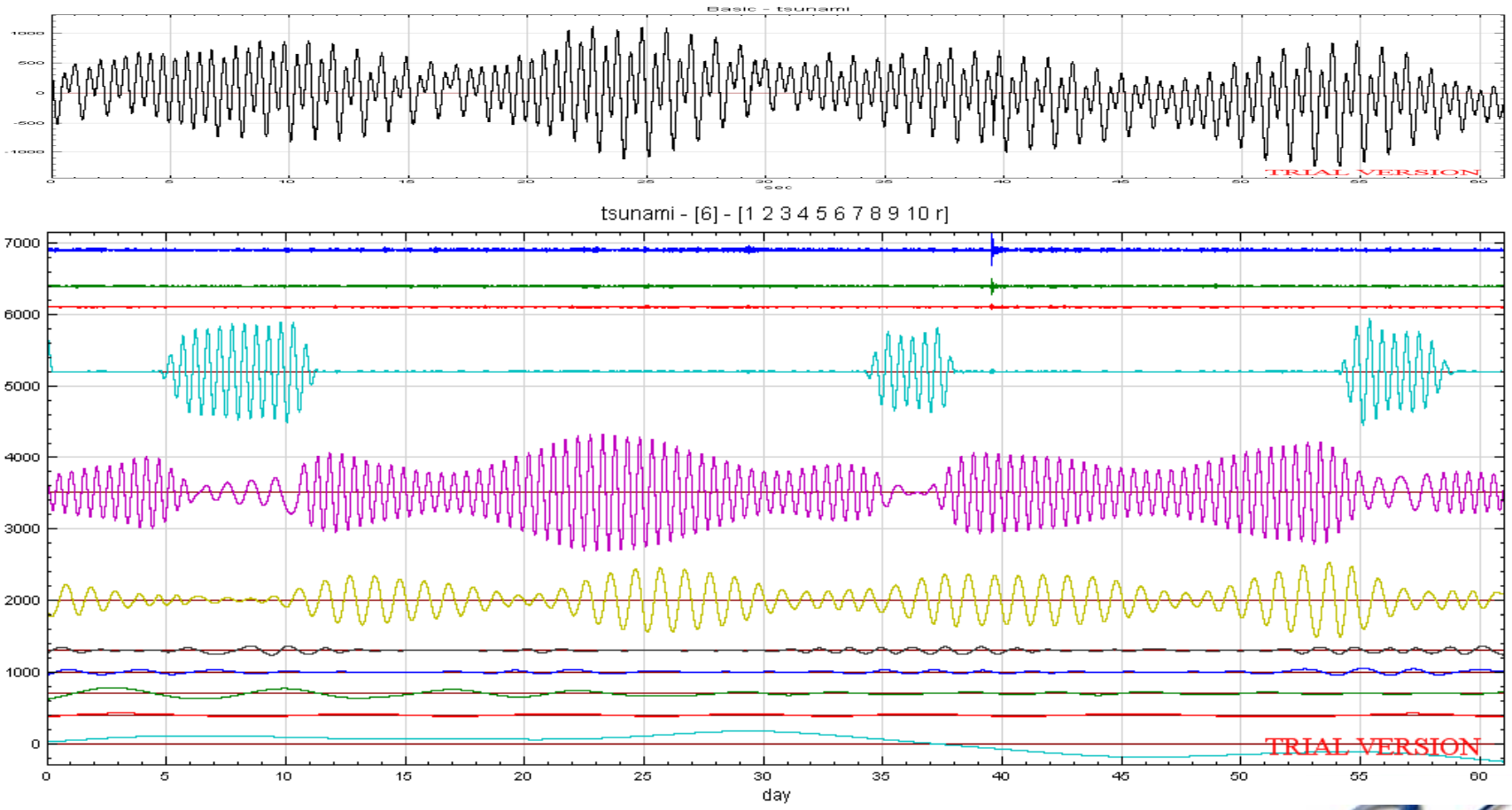
AnCAD

Time-Frequency plot of filtered signal

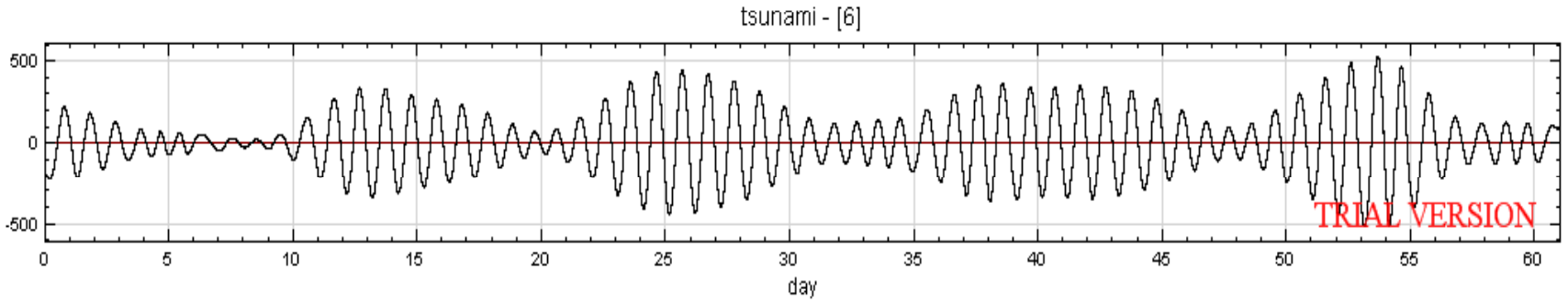


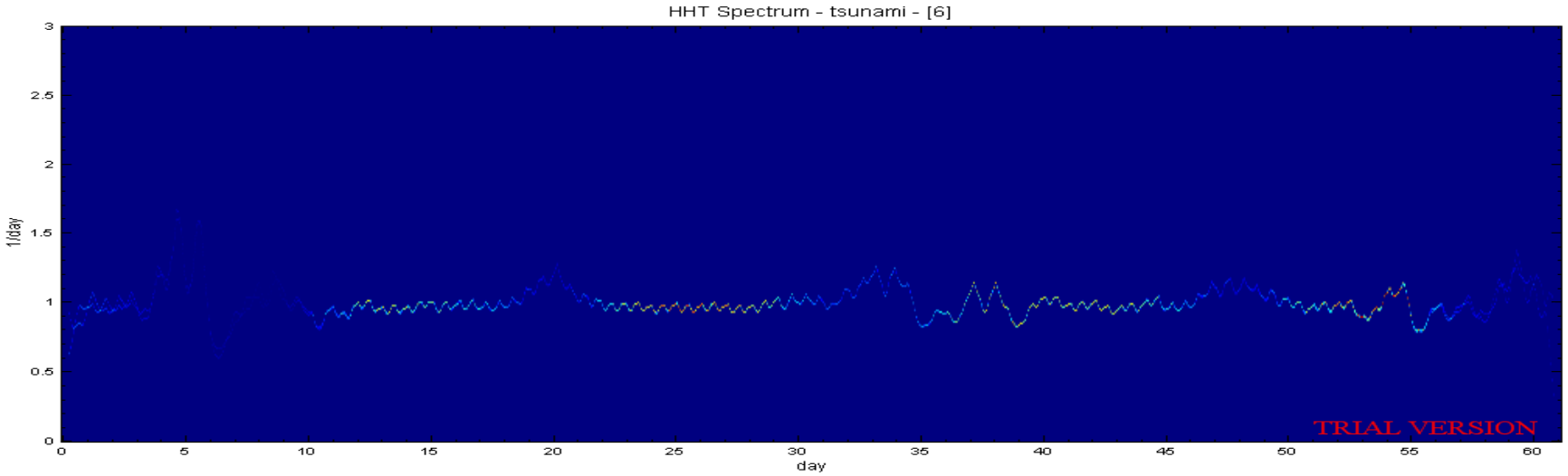
AnCAD

IMF


Basic - tsunami
TRIAL VERSION
tsunami - [6] - [1 2 3 4 5 6 7 8 9 10 r]
TRIAL VERSION
day

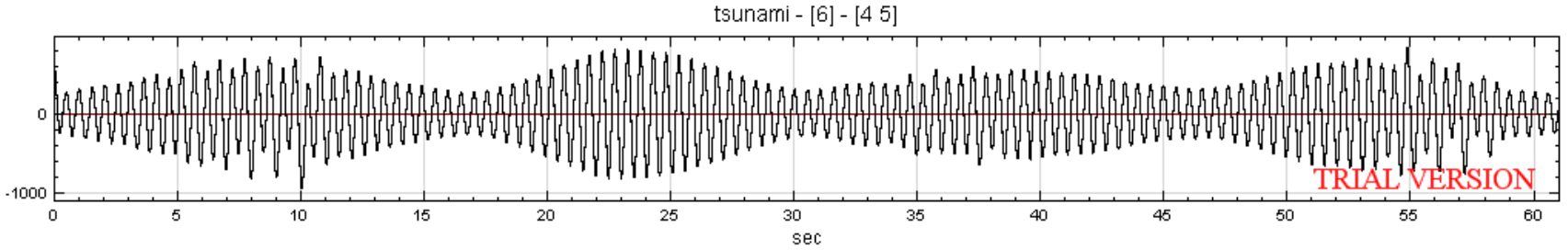
全日潮

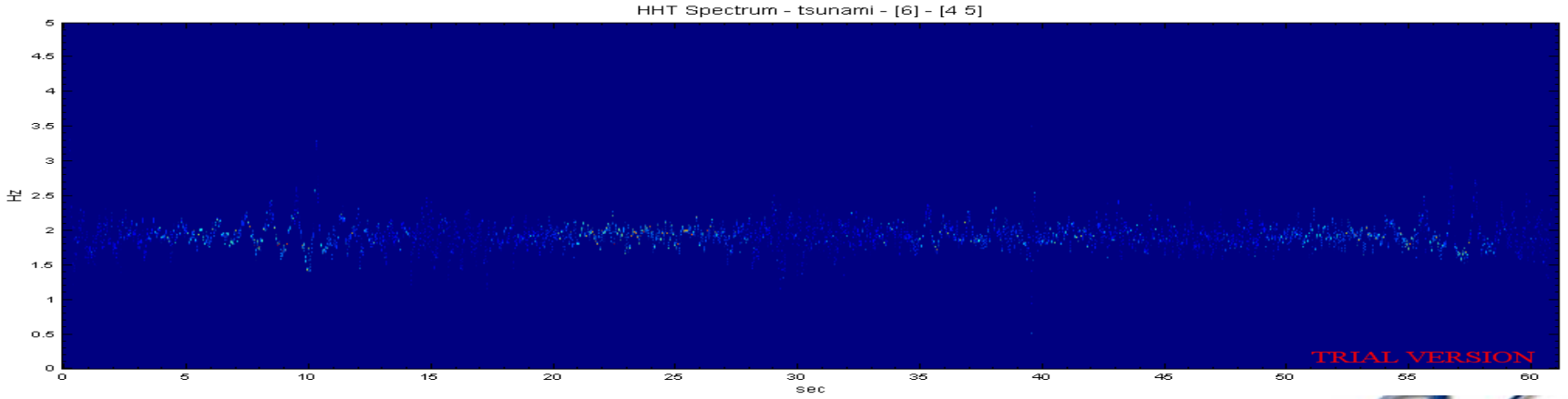

tsunami - [6]
500
0
-500
0
5
10
15
20
25
30
35
40
45
50
55
60
day
TRIAL VERSION


HHT Spectrum - tsunami - [6]
1/day
3
2.5
2
1.5
1
0.5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
day
TRIAL VERSION

AnCAD

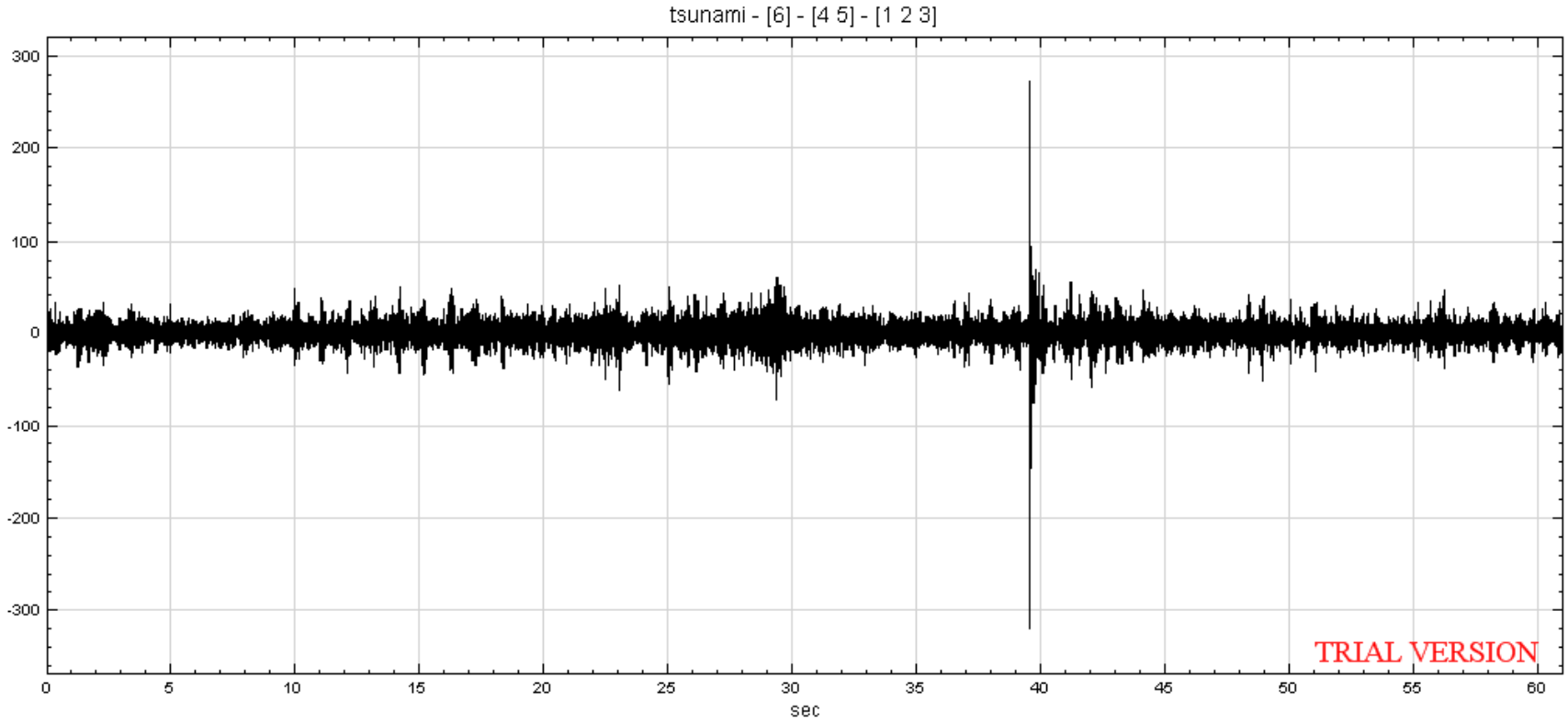
半日潮


tsunami - [6] - [4 5]
0
-1000
0
5
10
15
20
25
30
35
40
45
50
55
60
sec
TRIAL VERSION


HHT Spectrum - tsunami - [6] - [4 5]
보
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
sec
TRIAL VERSION

AnCAD

Identification of tsunami: 594cm

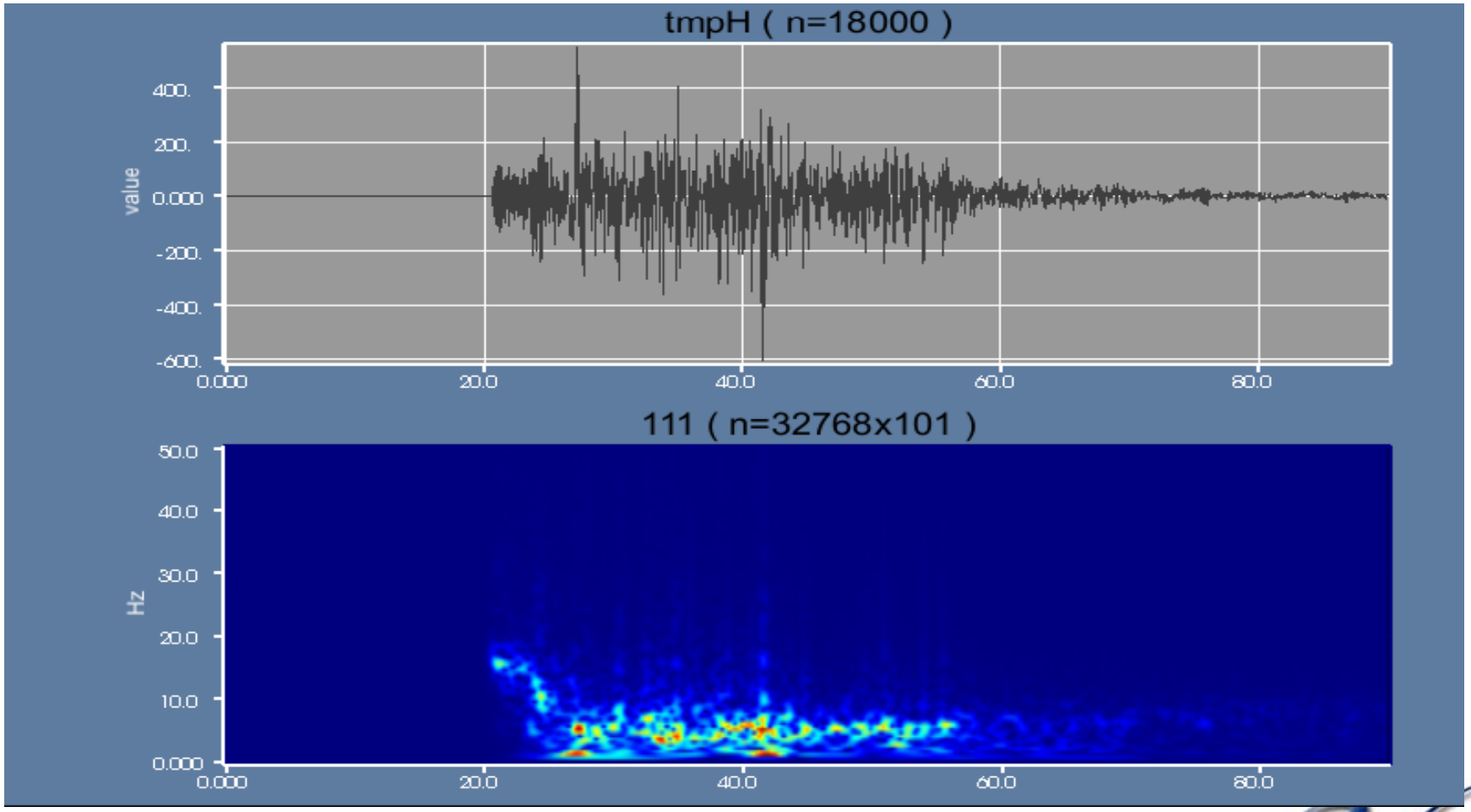


AnCAD

Earth Quake Signal

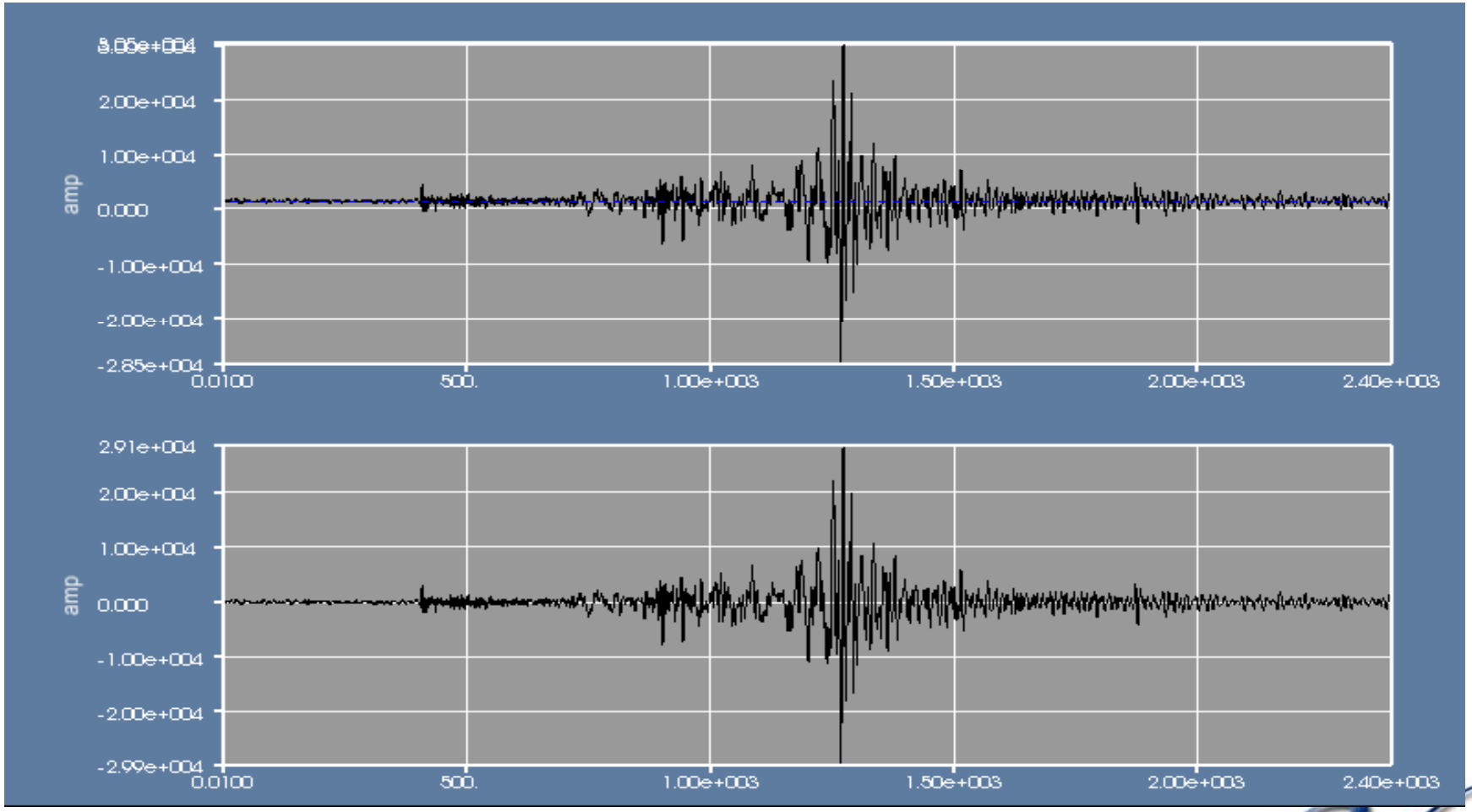
AnCAD

Chi-Chi (921) Earthquake



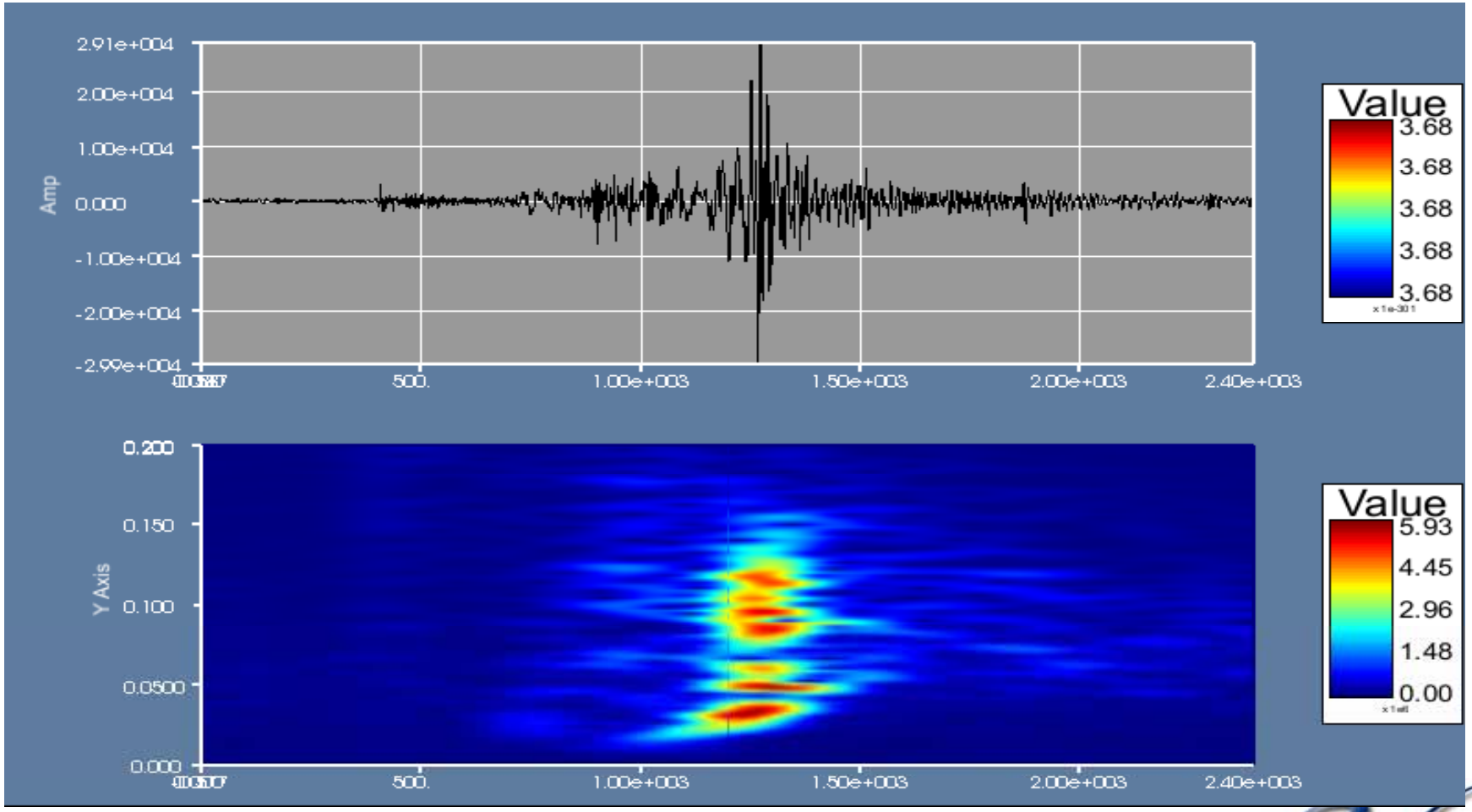
AnCAD

Earthquake (YHNB_V)



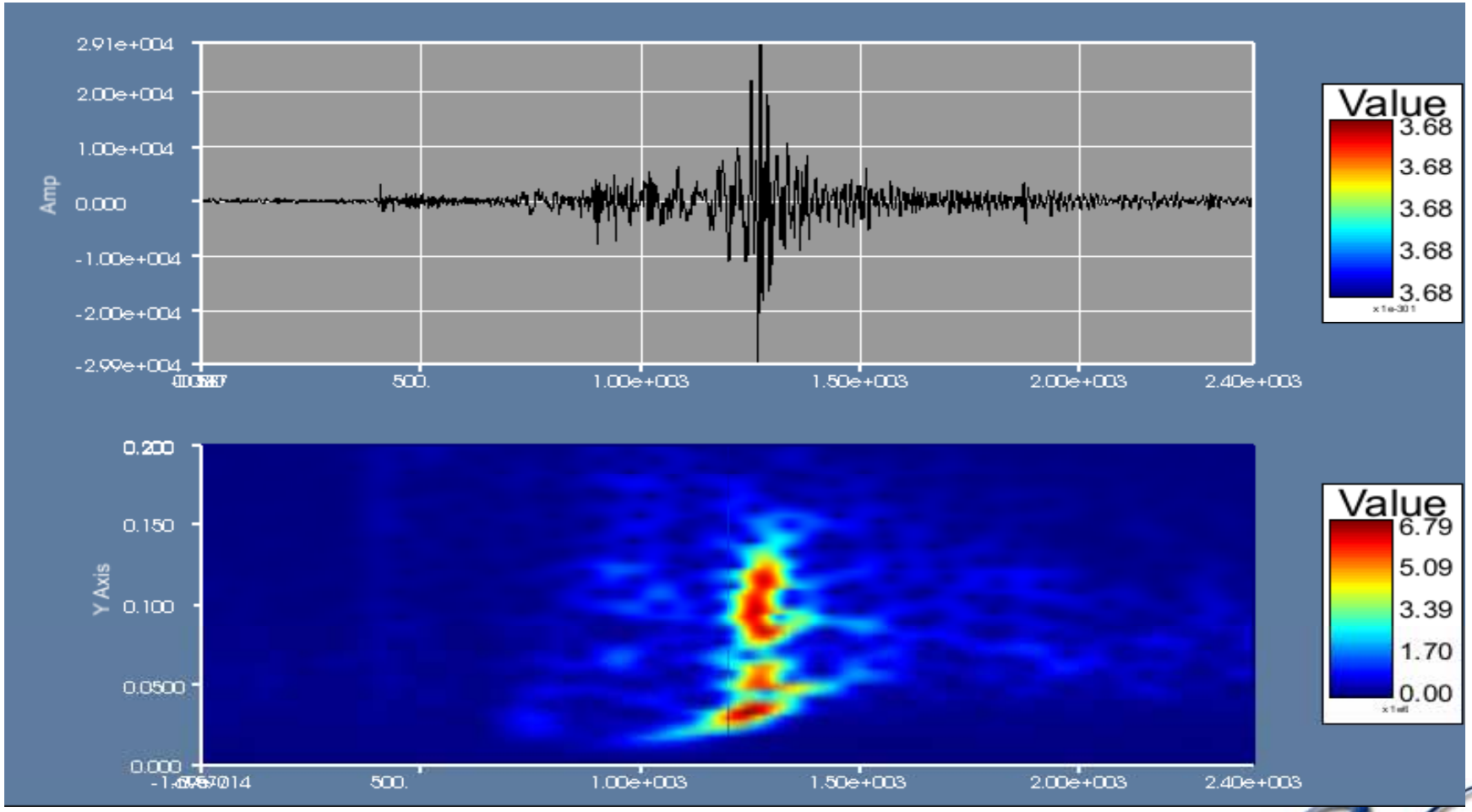
AnCAD

Uncertainty Principle (nf=100)



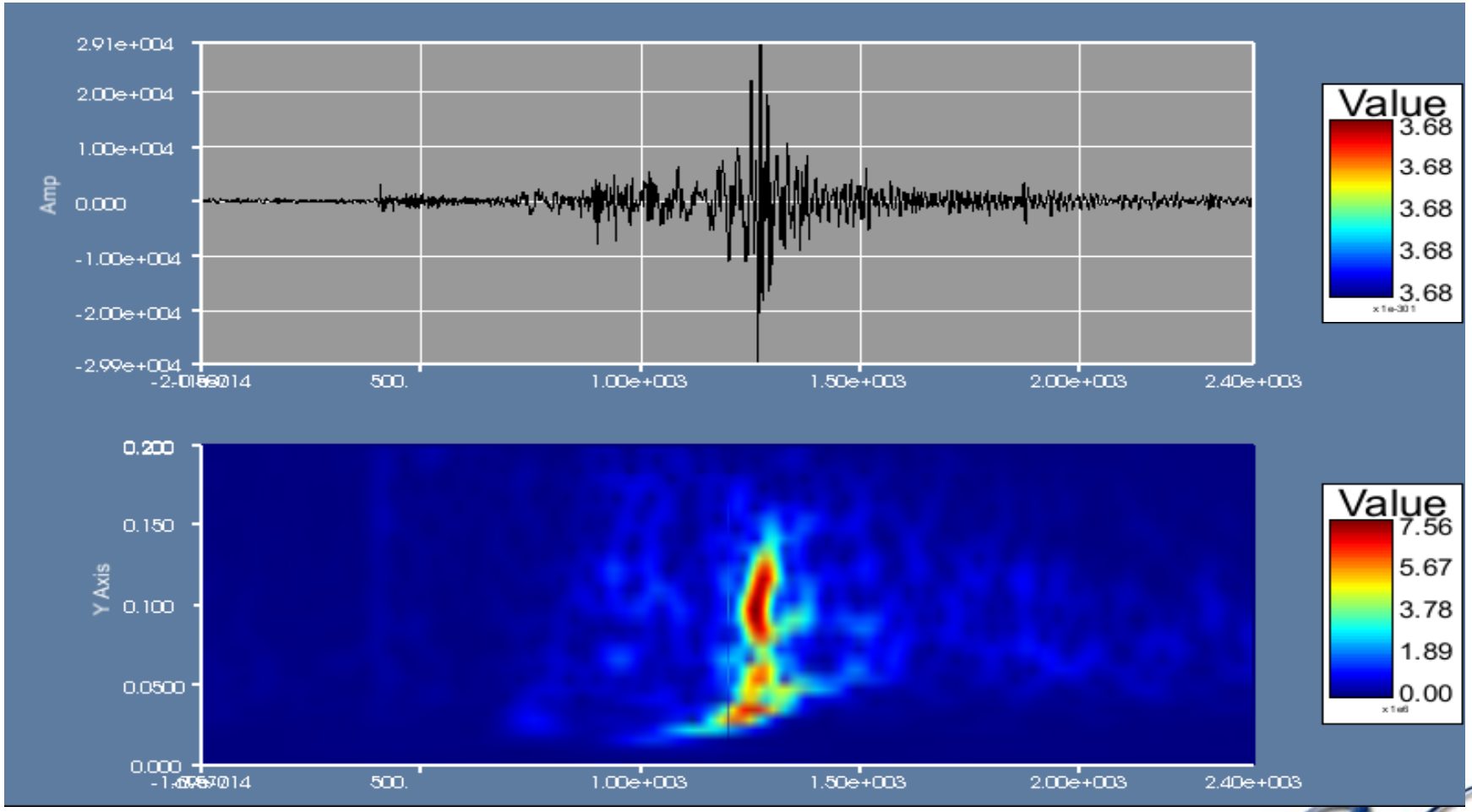
AnCAD

Uncertainty Principle (nf=50)



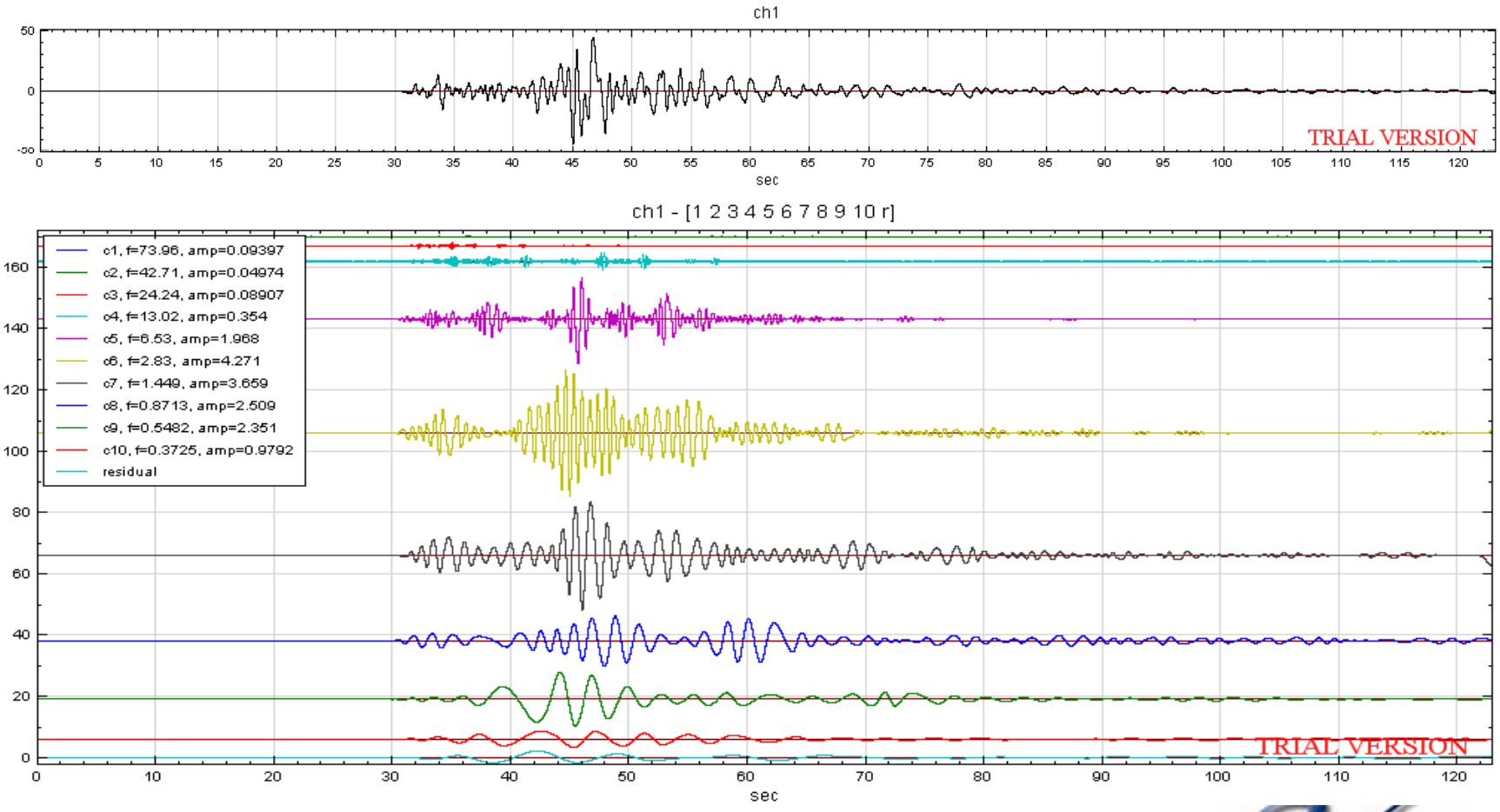
AnCAD

Uncertainty Principle (nf=30)



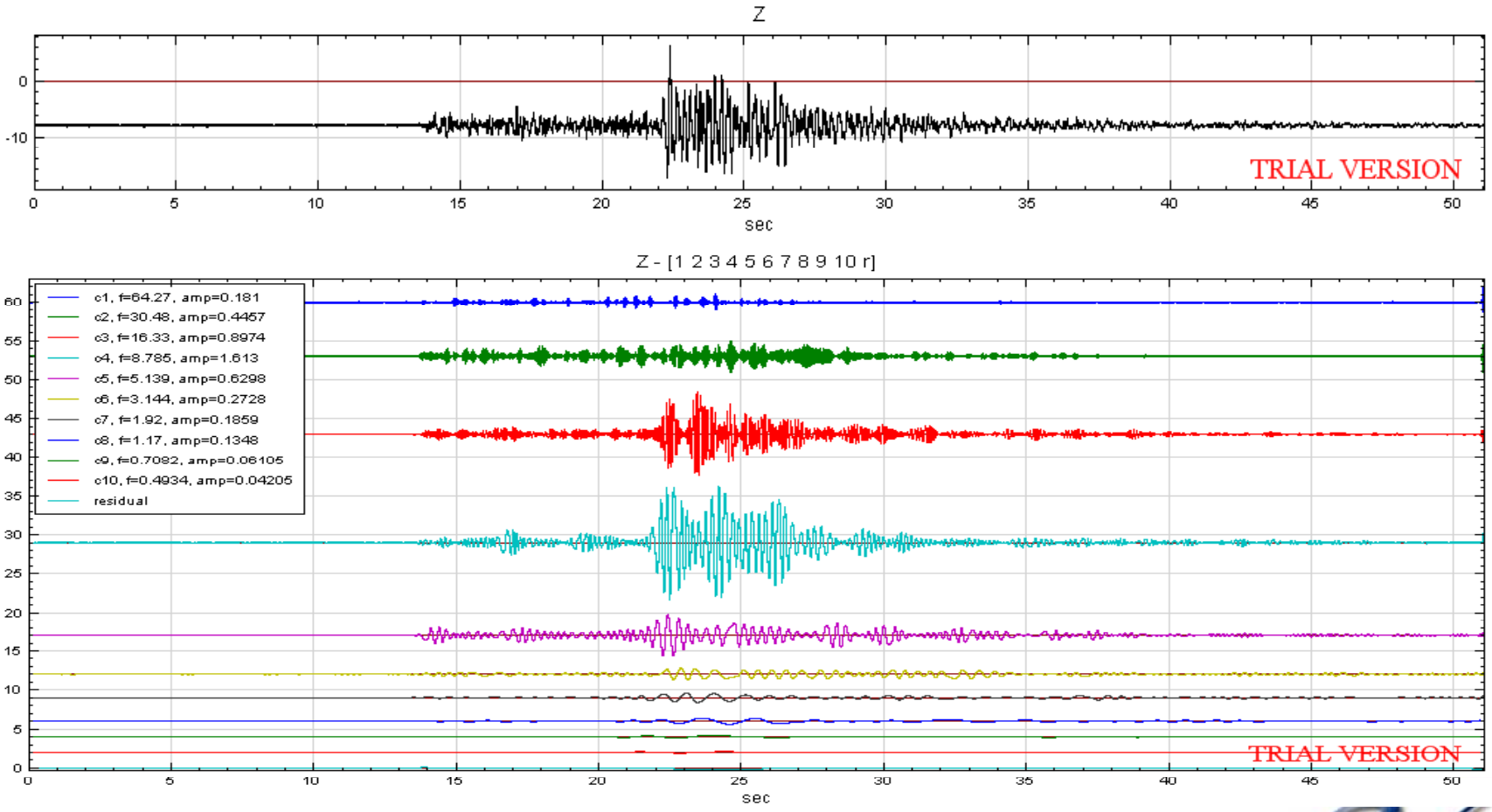
AnCAD

331 Earthquake

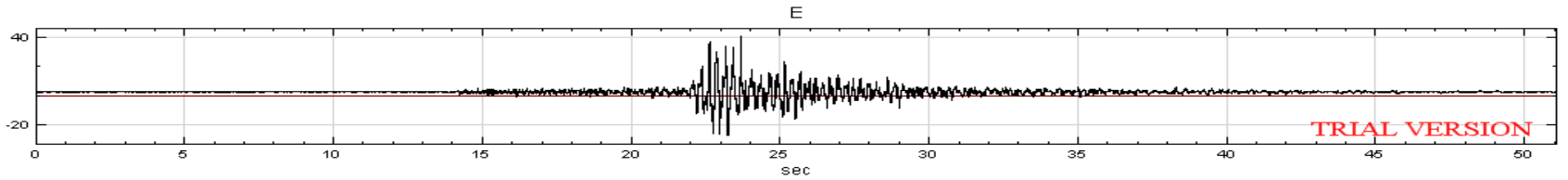


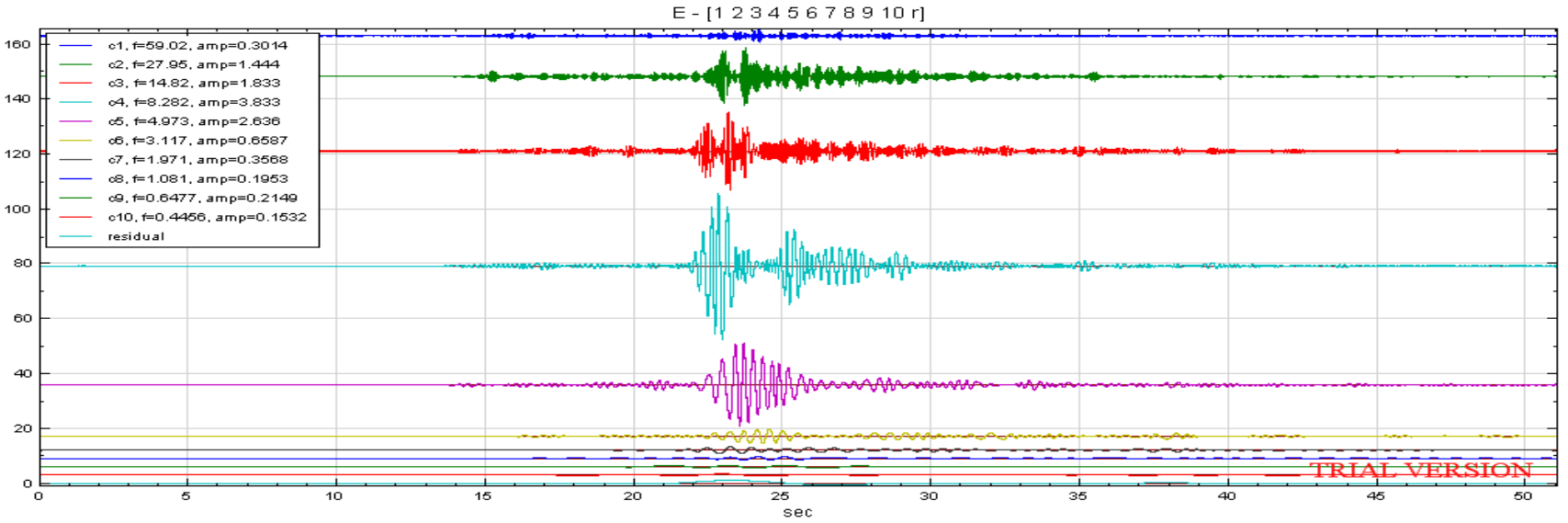
AnCAD

921 Z-axis

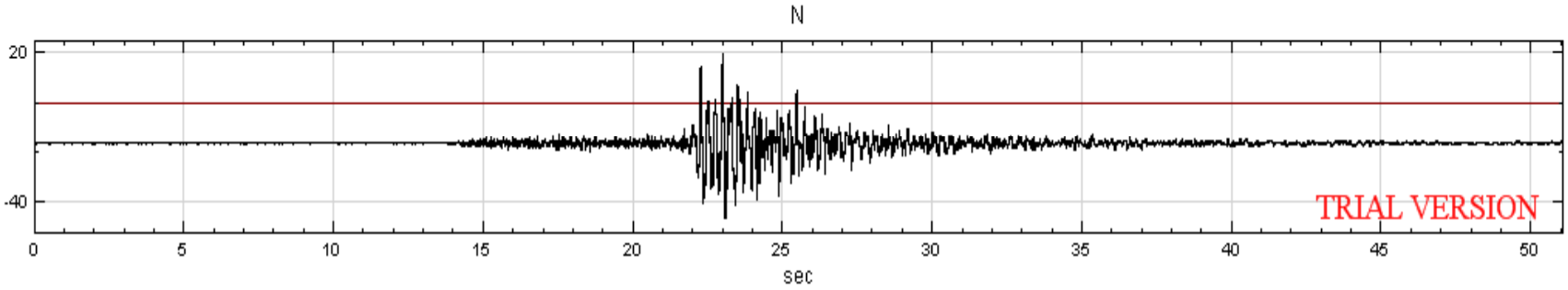

Z
0
-10
0
5
10
15
20
25
30
35
40
45
50
sec
TRIAL VERSION
Z - [1 2 3 4 5 6 7 8 9 10 r]
c1, f=64.27, amp=0.181
c2, f=30.48, amp=0.4457
c3, f=16.33, amp=0.8974
c4, f=8.785, amp=1.613
c5, f=5.139, amp=0.6298
c6, f=3.144, amp=0.2728
c7, f=1.92, amp=0.1859
c8, f=1.17, amp=0.1348
c9, f=0.7082, amp=0.06105
c10, f=0.4934, amp=0.04205
residual
60
55
50
45
40
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
sec
TRIAL VERSION

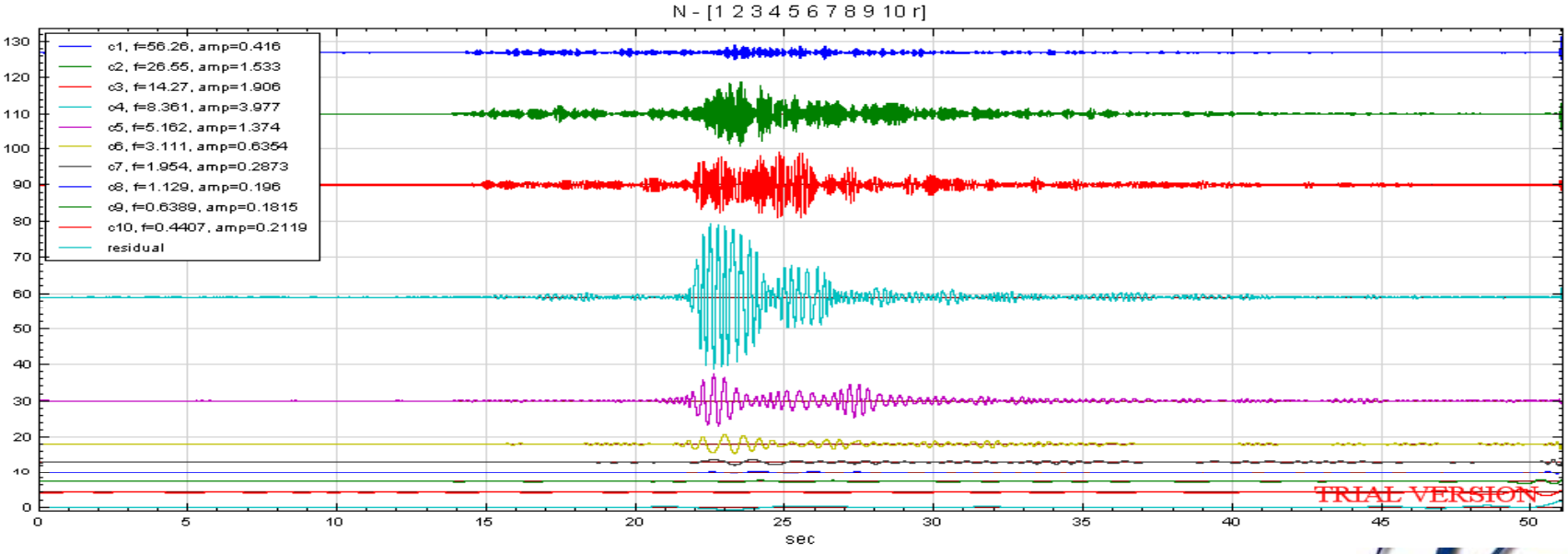
921 E-axis


E
40
-20
0
5
10
15
20
25
30
35
40
45
50
sec
TRIAL VERSION


E - [1 2 3 4 5 6 7 8 9 10 r]
c1, f=59.02, amp=0.3014
c2, f=27.95, amp=1.444
c3, f=14.82, amp=1.833
c4, f=8.282, amp=3.833
c5, f=4.973, amp=2.636
c6, f=3.117, amp=0.6587
c7, f=1.971, amp=0.3568
c8, f=1.081, amp=0.1953
c9, f=0.6477, amp=0.2149
c10, f=0.4456, amp=0.1532
residual
160
140
120
100
80
60
40
20
0
0
5
10
15
20
25
30
35
40
45
50
sec
TRIAL VERSION

921 N-Axis





AnCAD