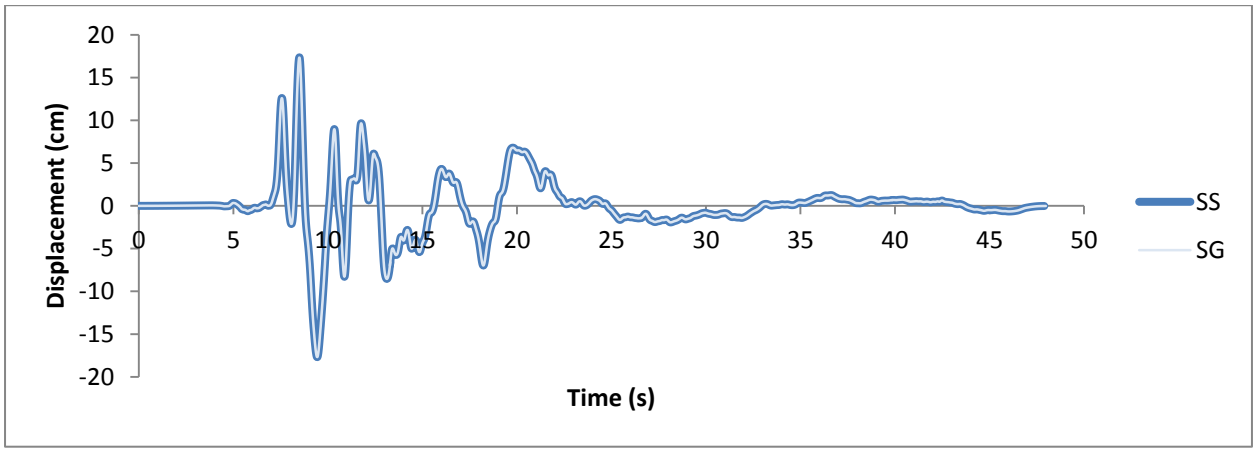
SEISMOGRAPH

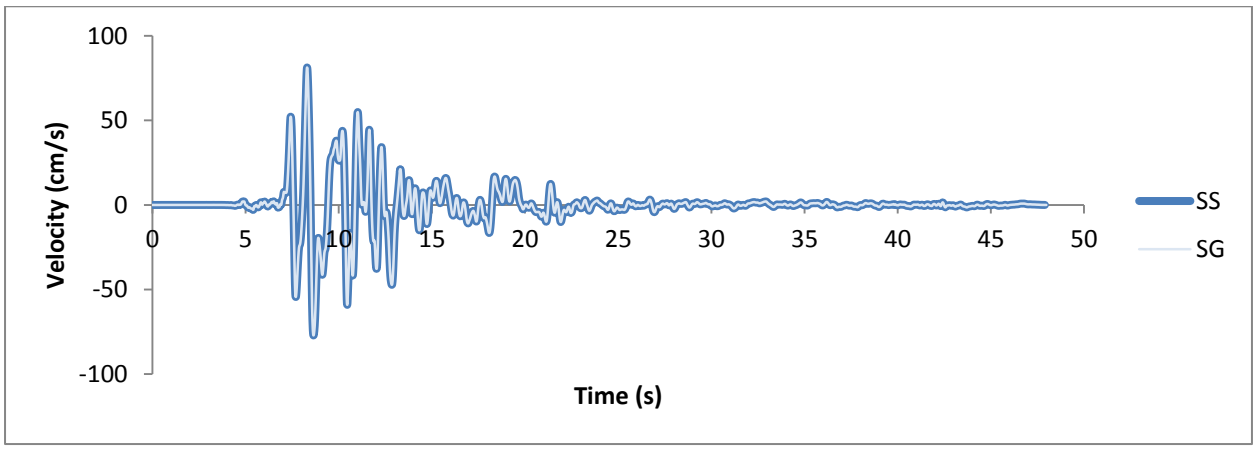
Verification Examples (B1)

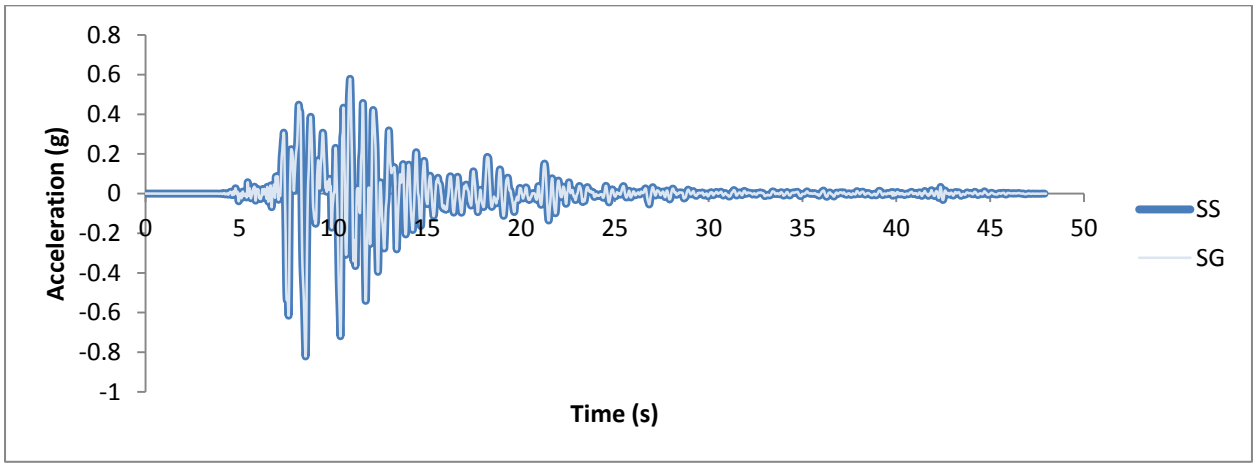
SMDA: Basic Functions

Example 1 – Time Series

A comparison between the Seismosignal results and SG results.

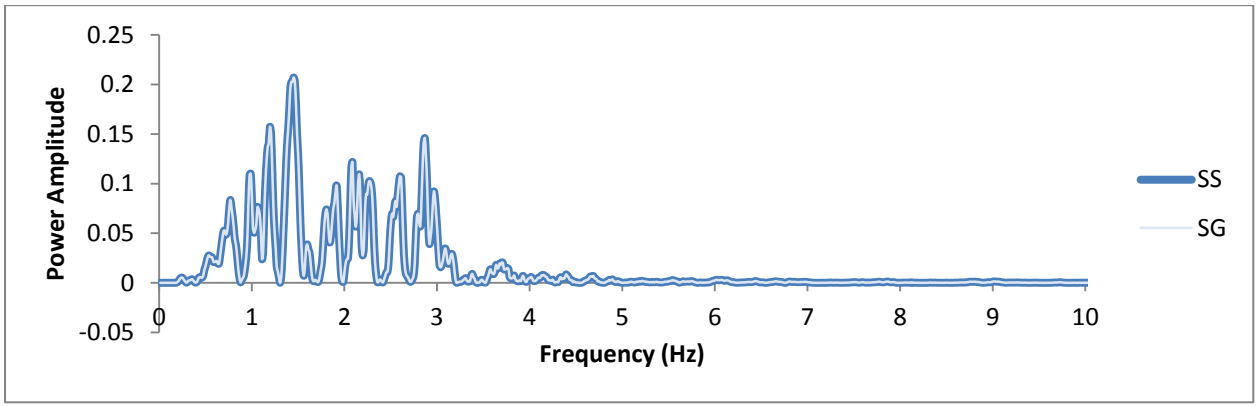


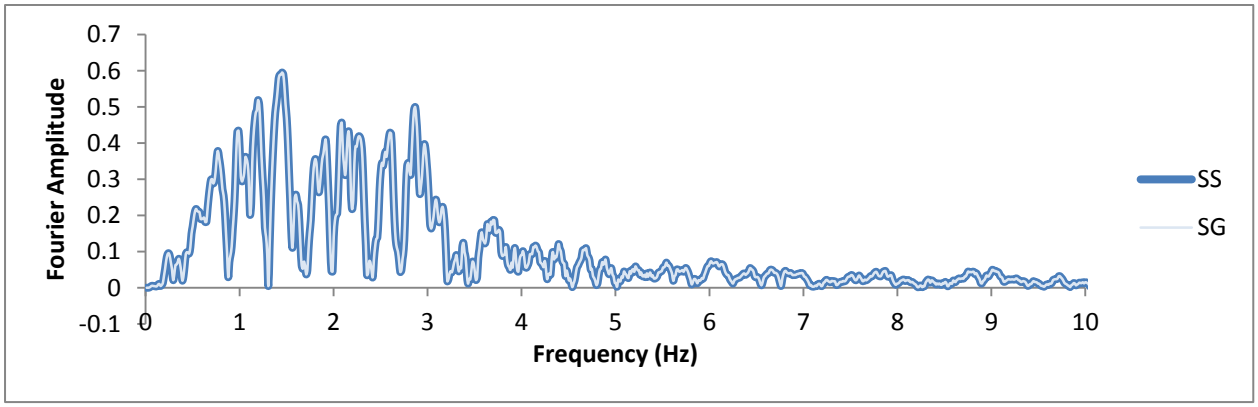




Example 2 – Fourier & Power Spectra

A comparison between the Seismosignal results and SG results.

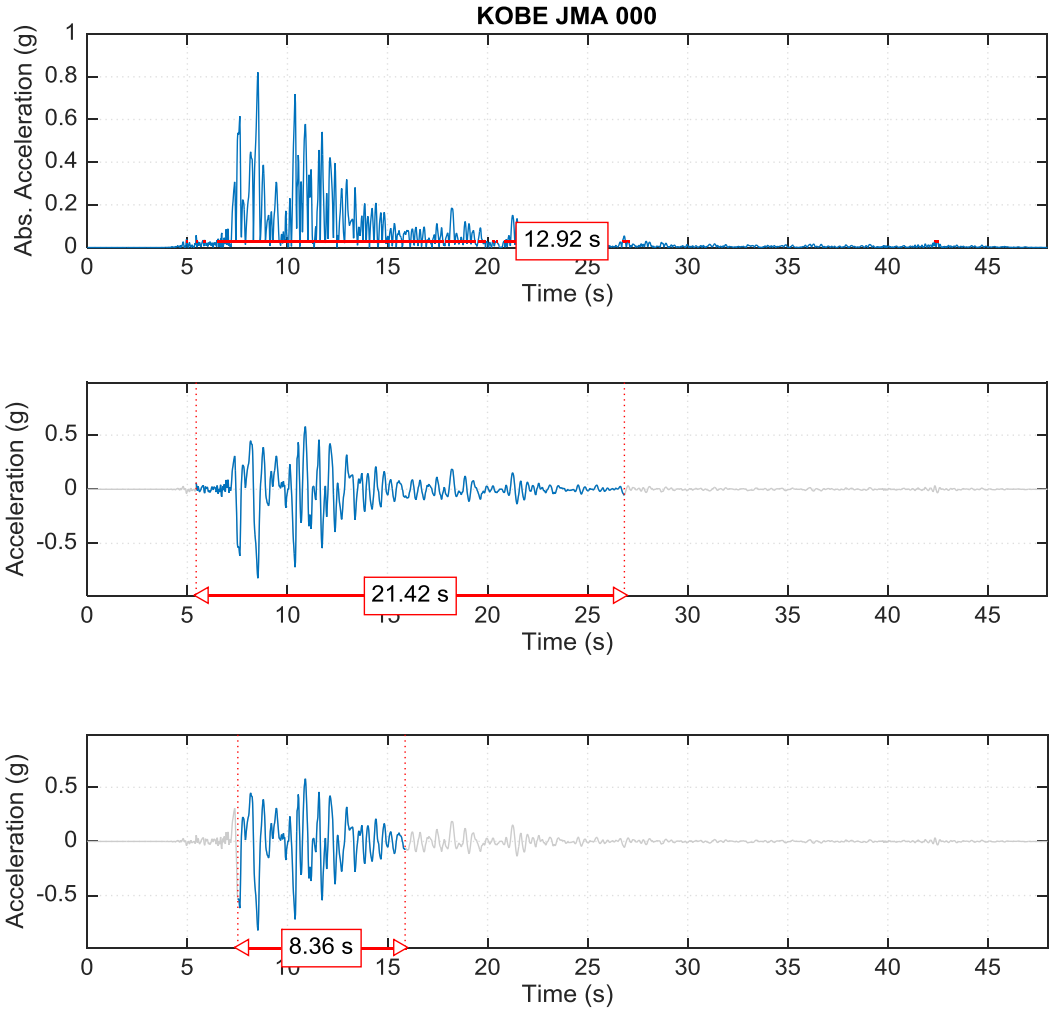


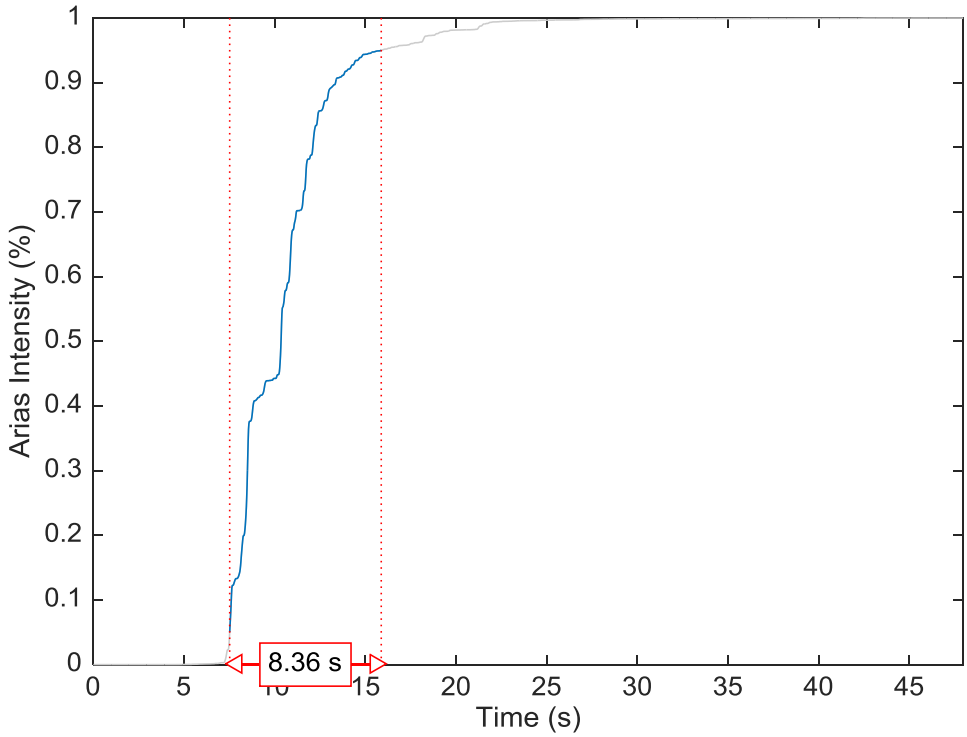


Example 3 – Durations

A comparison between the Seismosignal results and SG results.

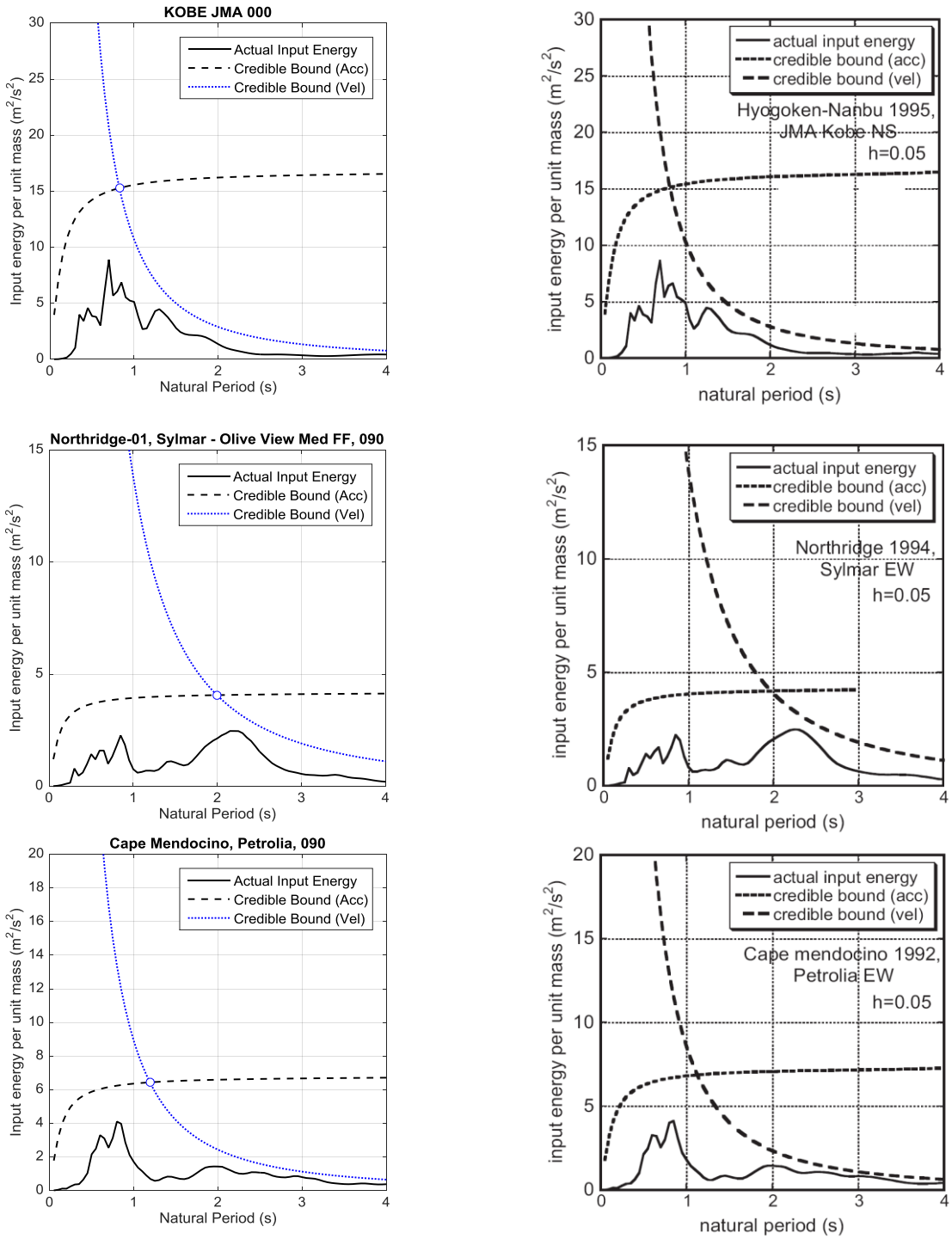
Seismosignal Results	
Acc Level Ao: 0.03g	Uniform Duration: 12.78000sec
Acc Level Ao: 0.05g	Bracketed Duration: 21.42000sec
Duration estimated between 5% and 95% of the Arias Intensity	Significant Duration: 8.36000sec



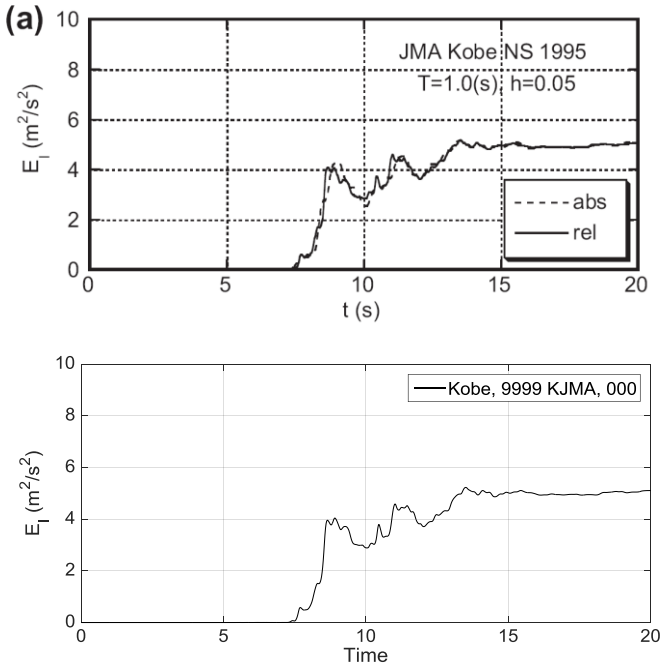

Arias Intensity (%)
Time (s)
8.36 s
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
5
15
20
25
30
35
40
45

Example 4 – Input Energy per Unit Mass

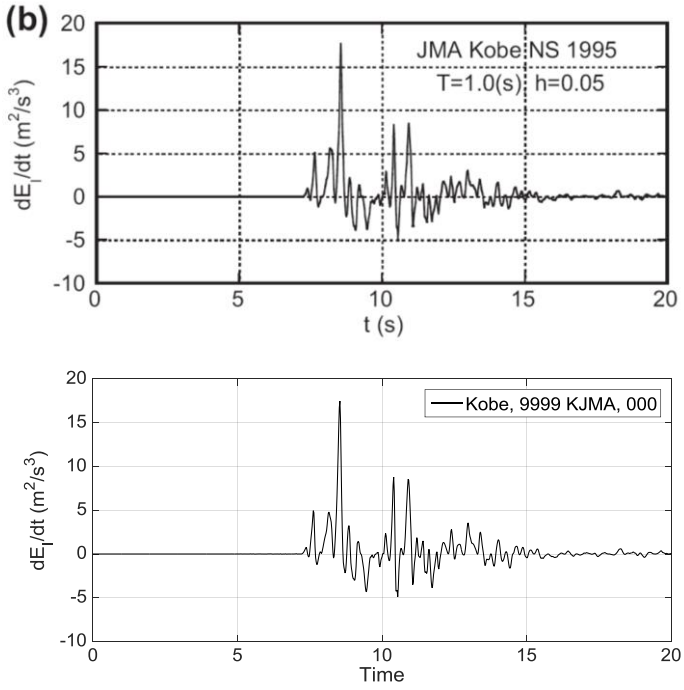
A comparison between the independent calculation [1] and SG results.



Earthquake Input Energy per Unit Mass Spectrum: Seismograph results (left) and independent calculation from the reference [1] (right).



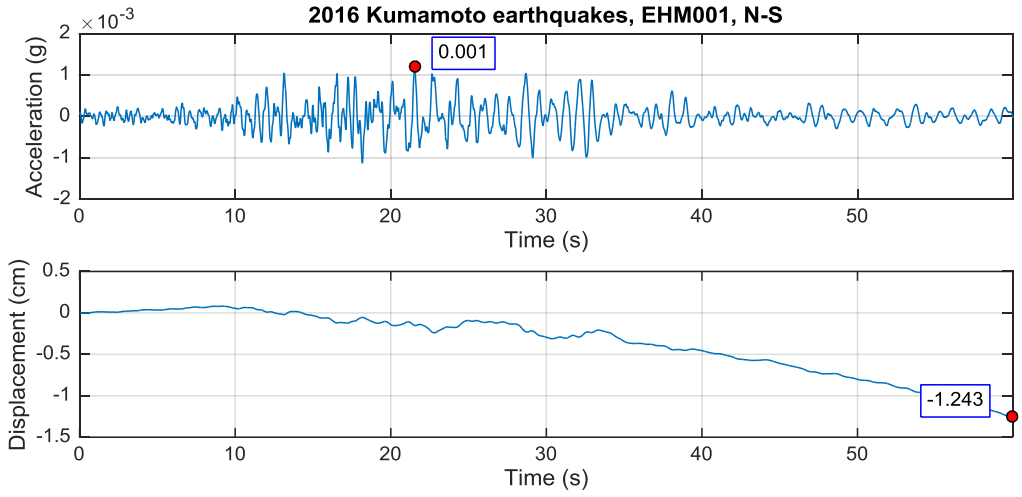
Time history of Earthquake Input Energy per Unit Mass: Seismograph results (bottom) and independent calculation from the reference [1] (top).

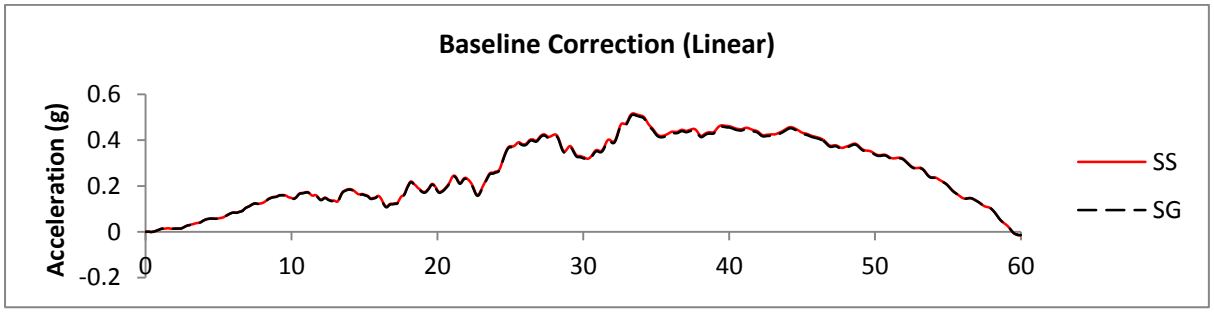


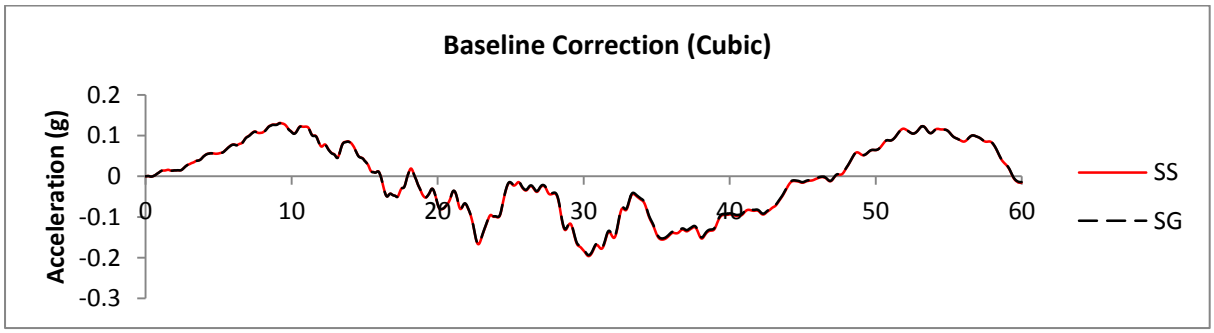
Rate of Earthquake Input Energy per Unit Mass: Seismograph results (bottom) and independent calculation from the reference [1] (top).

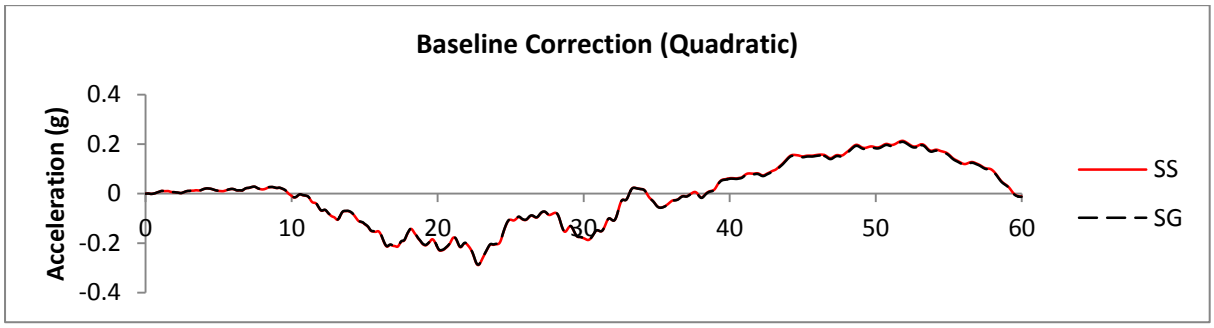
Example 5 – Filtering & Baseline Correction

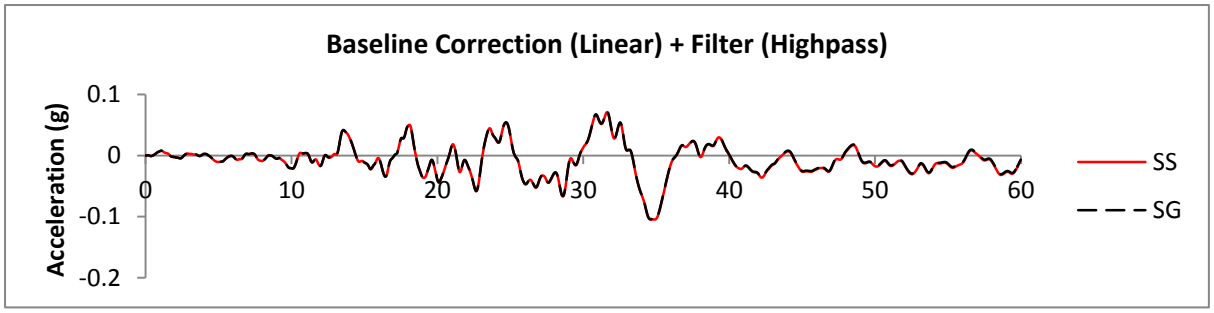
A comparison between the Seismosignal results and SG results.

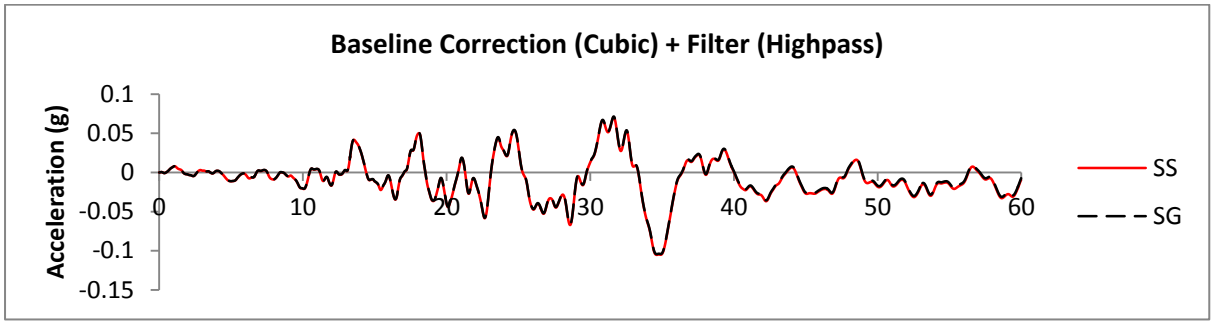


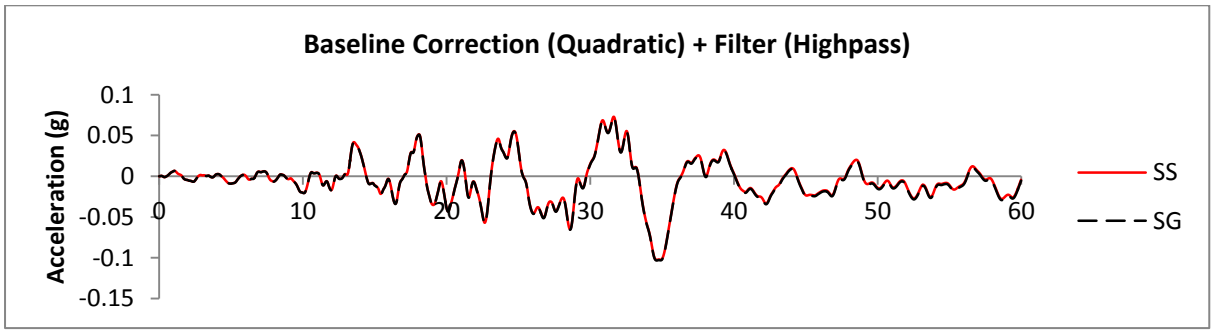


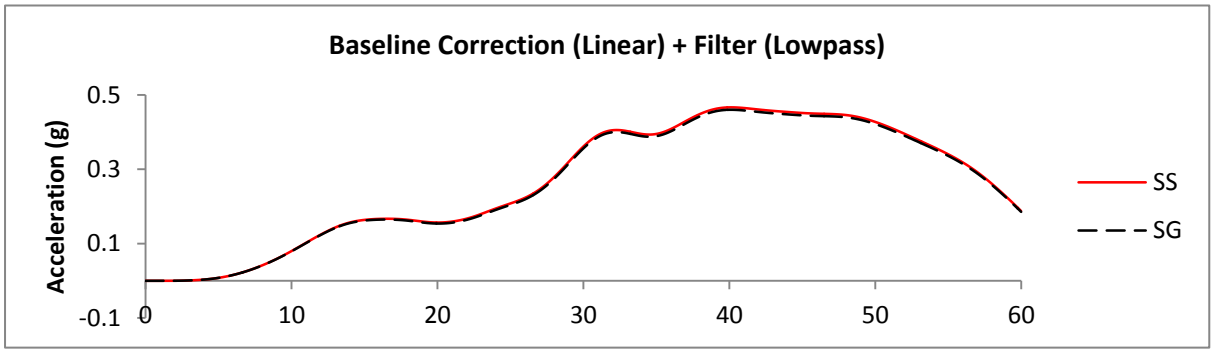





Baseline Correction (Linear) + Filter (Highpass)
Acceleration (g)
0.1
0
-0.1
-0.2
0
10
20
30
40
50
60
SS
SG


Baseline Correction (Cubic) + Filter (Highpass)
Acceleration (g)
0.1
0.05
0
-0.05
-0.1
-0.15
0
10
20
30
40
50
60
SS
SG


Baseline Correction (Quadratic) + Filter (Highpass)
Acceleration (g)
0.1
0.05
0
-0.05
-0.1
-0.15
0
10
20
30
40
50
60
SS
SG


Baseline Correction (Linear) + Filter (Lowpass)
Acceleration (g)
0.5
0.3
0.1
-0.1
0
10
20
30
40
50
60
SS
SG

REFERENCES

[1] Takewaki, I., 2004. Bound of earthquake input energy. *Journal of Structural Engineering, 130*(9), pp.1289-1297.

SEISMOGRAPH

earthquake engineering software