



# PRELIMINARY STUDY OF L'AQUILA EARTHQUAKE GROUND MOTION RECORDS V3.00



Eugenio Chioccarelli, Flavia De Luca and Iunio Iervolino

[eugenio.chioccarelli@unina.it](mailto:eugenio.chioccarelli@unina.it); [flavia.deluca@unina.it](mailto:flavia.deluca@unina.it); [iunio.iervolino@unina.it](mailto:iunio.iervolino@unina.it)

*Dipartimento di Ingegneria Strutturale, Università di Napoli Federico II.*

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## 1. Introduction

Accelerometric National Network (RAN) has made available the records of the recent earthquake with epicenter in the Abruzzo (date 6/04/09 1.32AM – UTC; Magnitude 5.8).

Signals, corrected with a linear baseline correction and with a Butterworth bandpass filter (Freq1=0.1, Freq2=25, Order 4), have been processed to get preliminary information about characteristic parameters of the records. Peak values, integral parameters and two different measures of duration have been computed for each component registered by the 57 accelerometric stations. **Corrected records and details of correction are available on the Reluis website (<http://www.reluis.it>).**

In order to analyze peak values, data have been processed and compared to the Attenuation law of Sabetta and Pugliese (1996) in term of peak ground acceleration (PGA) and spectral acceleration (Sa) for stiff soil. Because each accelerometric station has produced two records of the same signal in two horizontal directions perpendicular to each other, the horizontal record chosen is that characterized by the higher PGA. As a function of epicentral distance and for fixed spectral ordinate, the average attenuation law (and its standard deviation) have been compared with the points corresponding to the values recorded at the various stations.

Signals recorded were also grouped in bin of 10 km of epicentral distance and the average spectrum of each bin was compared with the average spectrum obtained from the attenuation law for a distance equal to the average distance of the records of each bin.

Moreover *Peak Ground Acceleration* (PGA), *Peak Ground Velocity* (PGV) and *Peak Ground Displacement* (PGD) are calculated for the two horizontal direction and for the vertical one. They are reported in Tables 1, 2 3.

*Arias Intensity* ( $I_A$ ) and *Cosenza and Manfredi Index* ( $I_D$ ) are the integral parameters computed for each record. Iervolino et al. (2008) attenuation law in term of  $I_D$  has been compared with  $I_D$  values computed for horizontal component of each record.

Durations computed for each record are: *Significant Duration* ( $S_d$ ) and *Bracketed Duration* ( $B_d$ ), the former estimated between 5% and 95% of the  $I_A$ , the latter assuming as reference value 0.05 PGA.

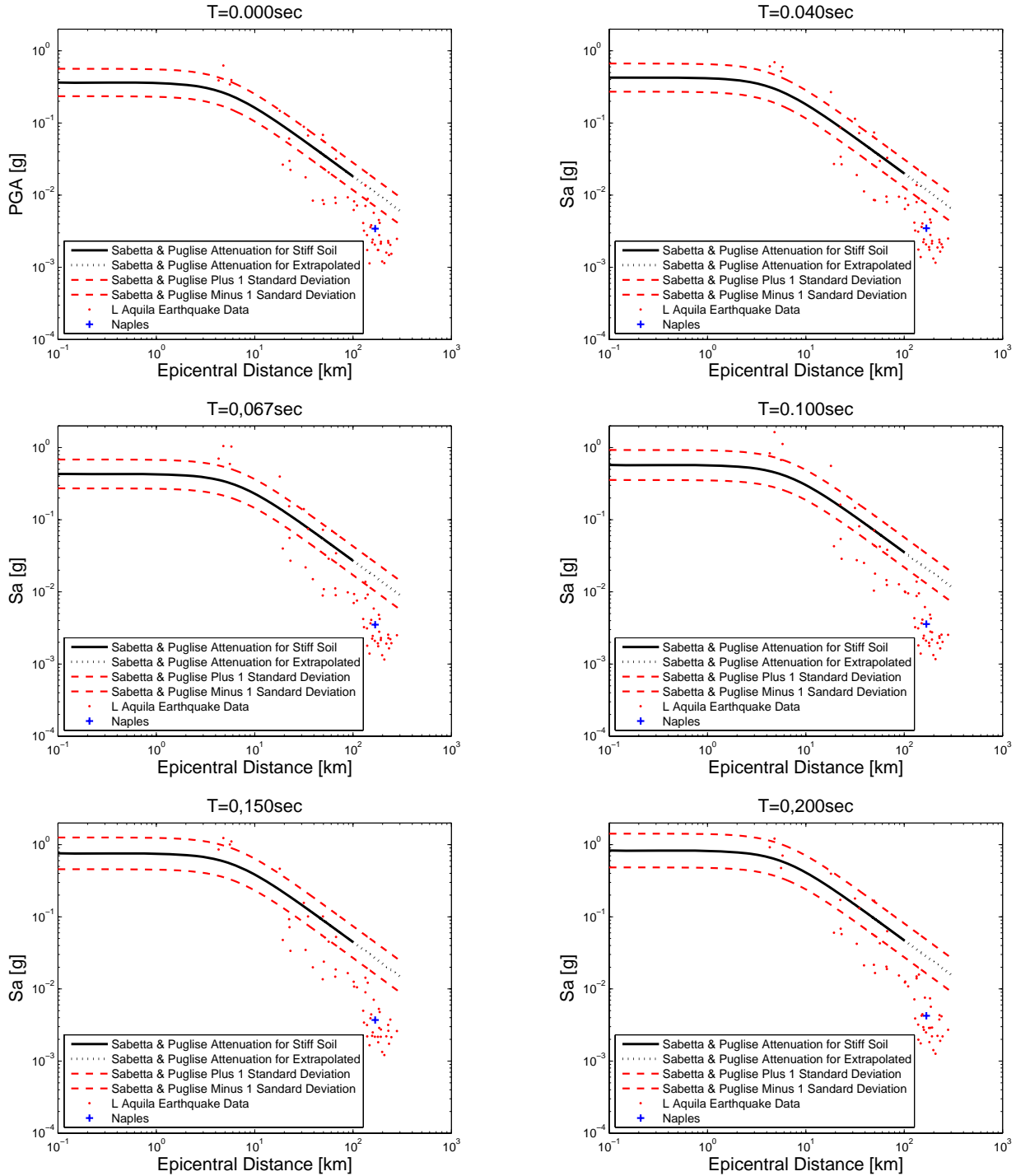
The same maximum PGA based criteria previously considered for peak parameters have been assumed to choose the values of  $I_A$ ,  $I_D$ ,  $S_d$  and  $B_d$  to be plotted.

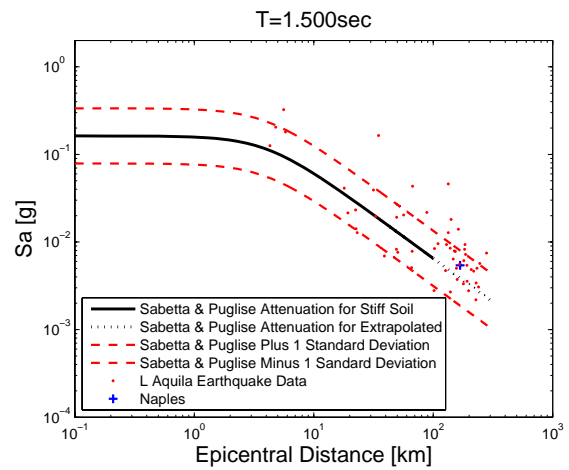
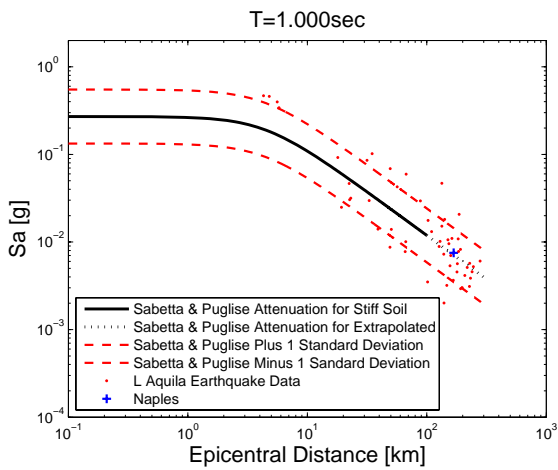
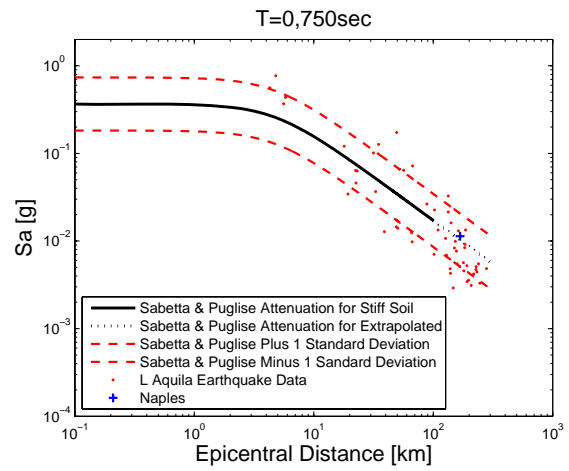
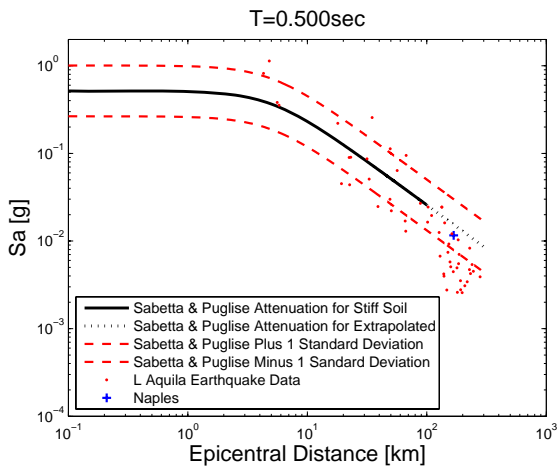
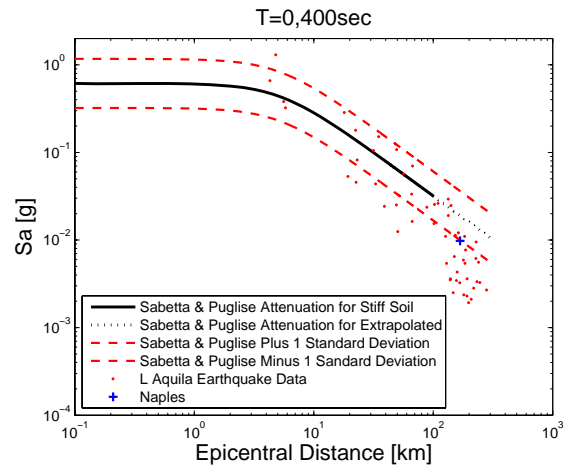
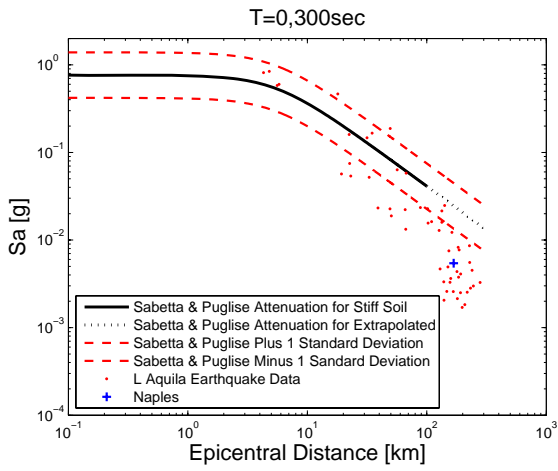
In Tables 4, 5 and 6 are reported integral parameters for the three directions of each record.

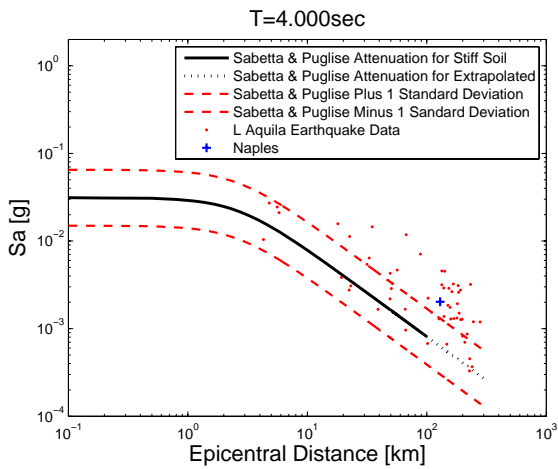
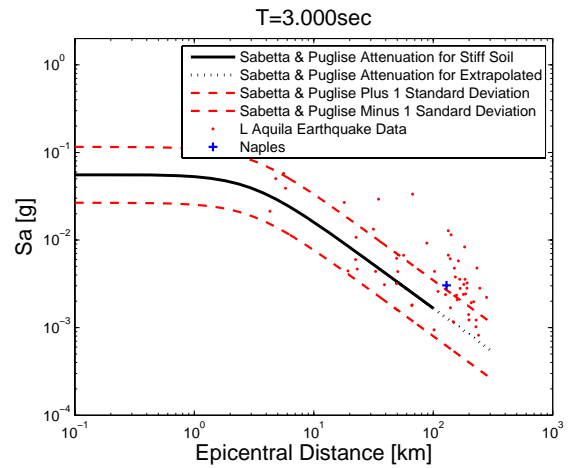
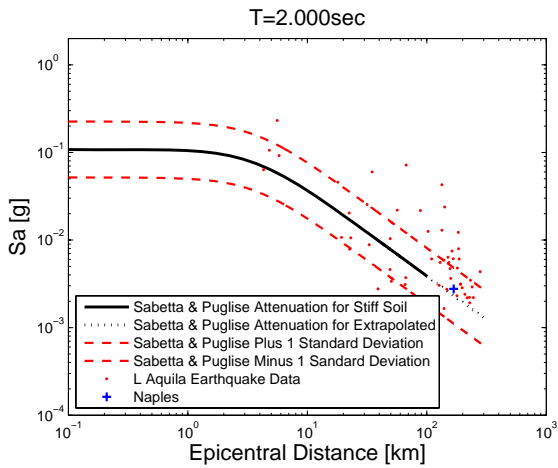
In the following are reported the results described above.

## 2. Horizontal Component - Plots for Spectral Periods

In this section are reported plots comparing the Attenuation law of Sabetta and Pugliese (1996) to spectral acceleration values recorded at different epicentral distance.

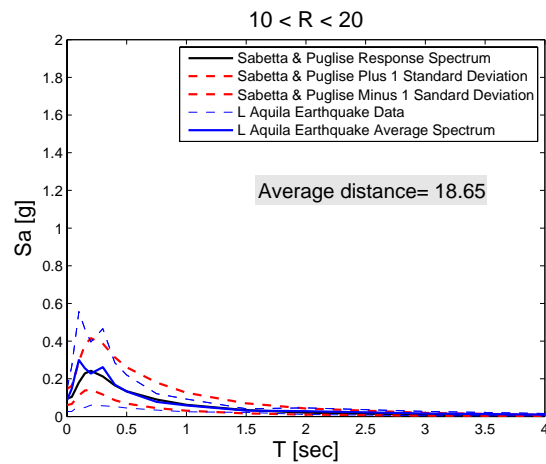
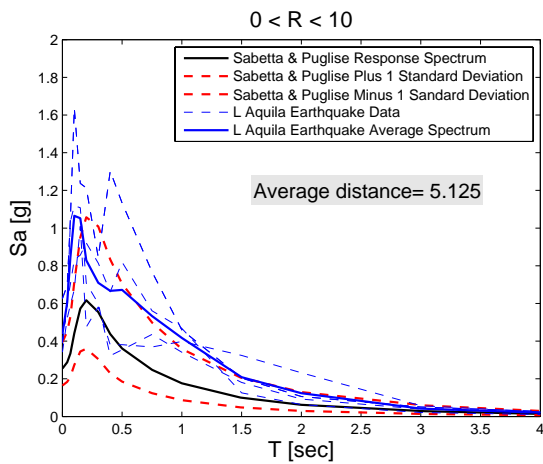


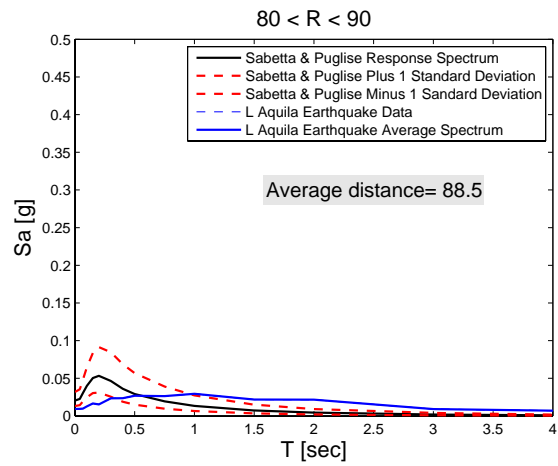
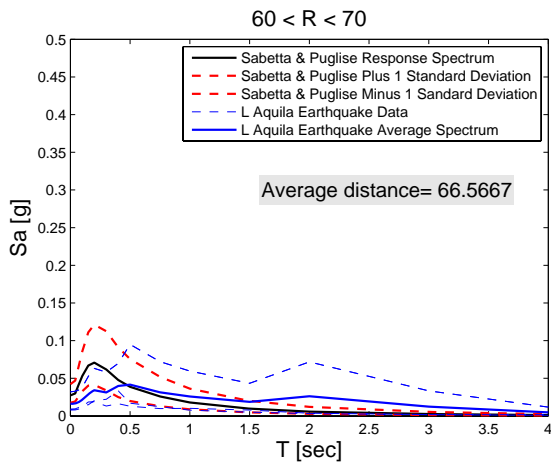
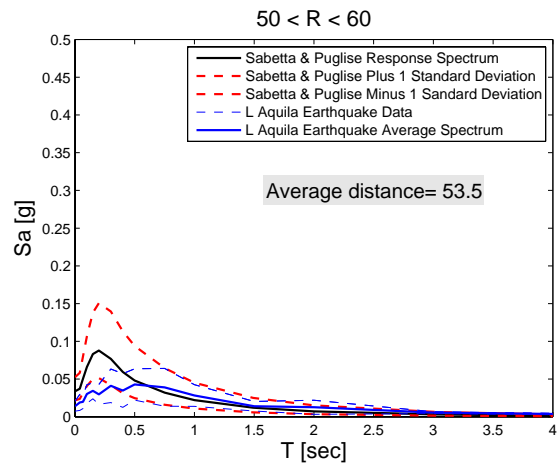
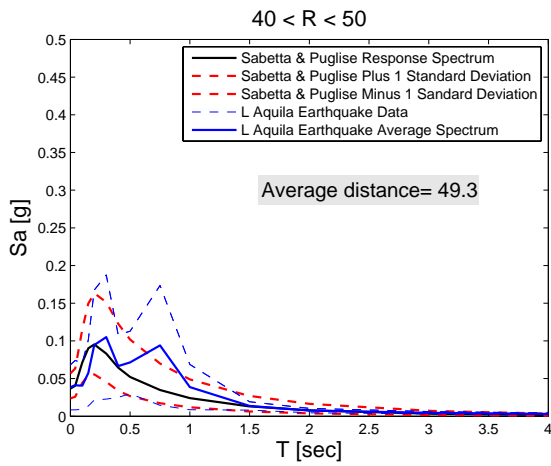
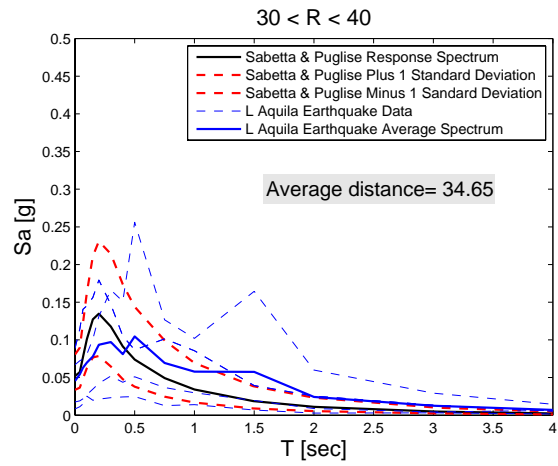
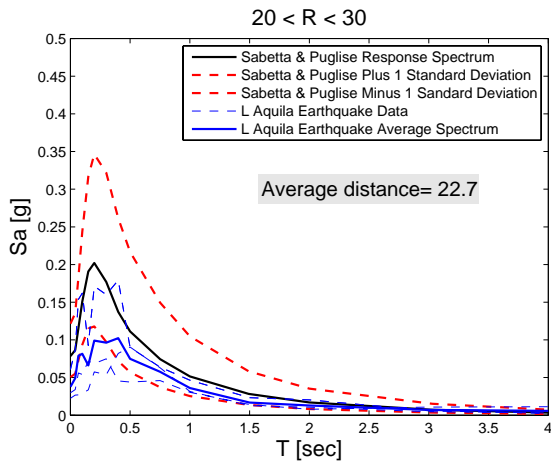


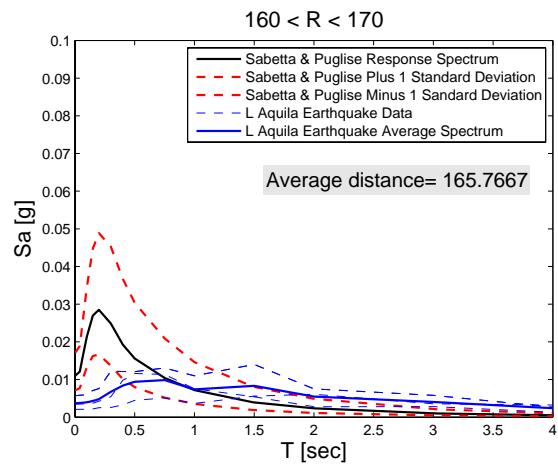
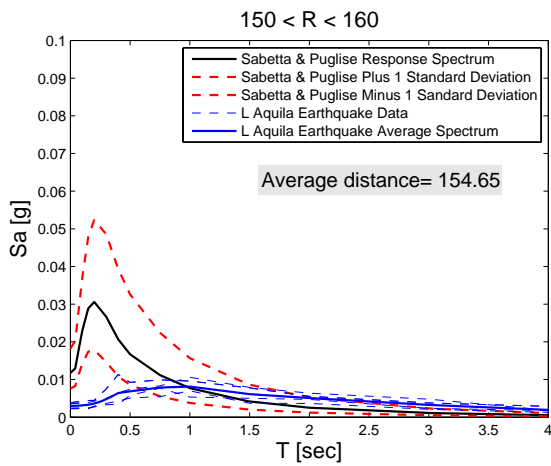
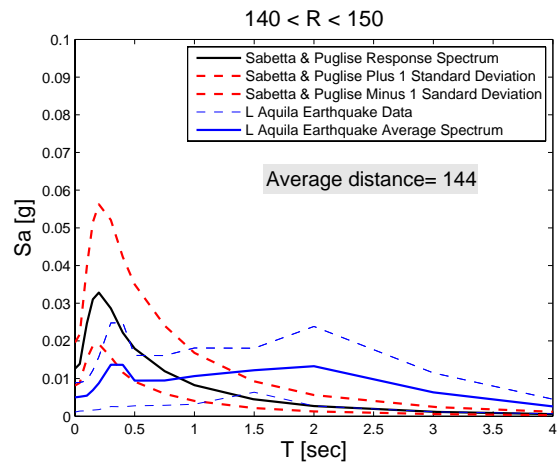
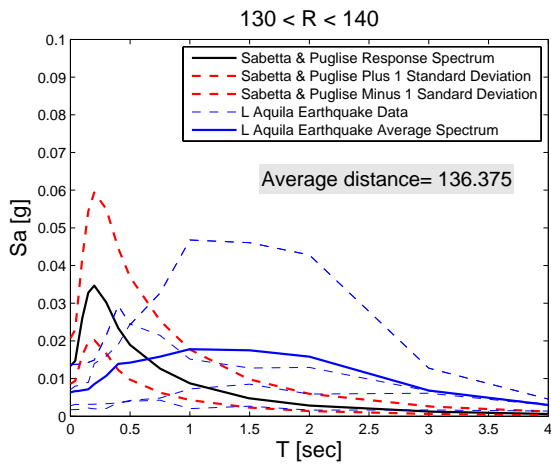
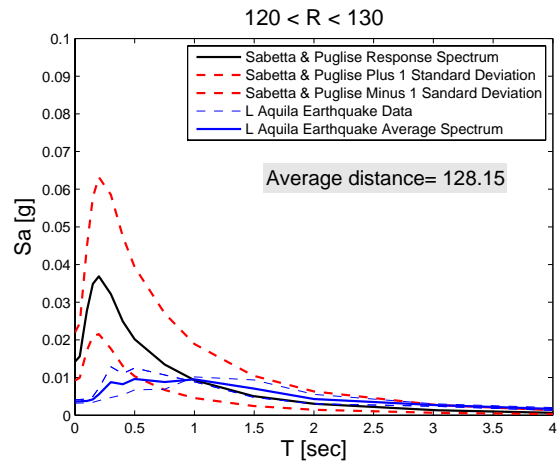
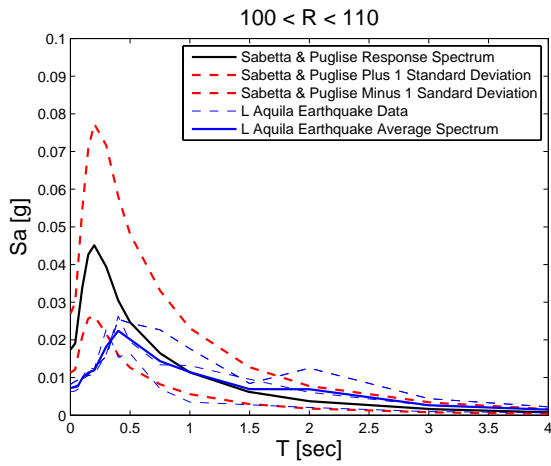


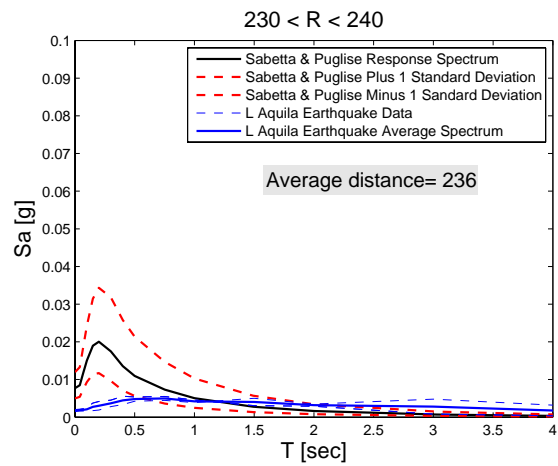
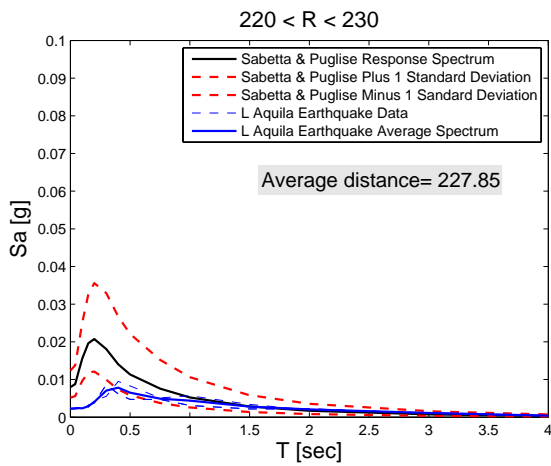
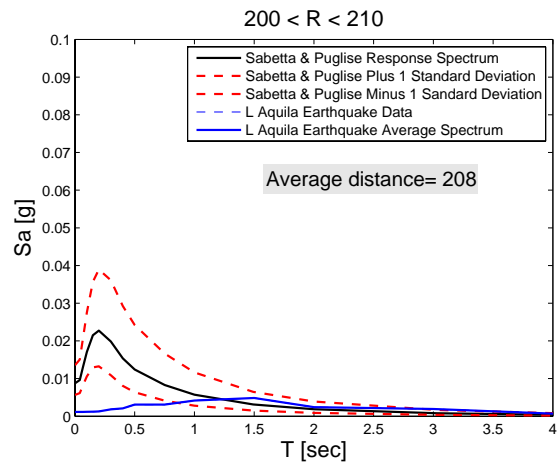
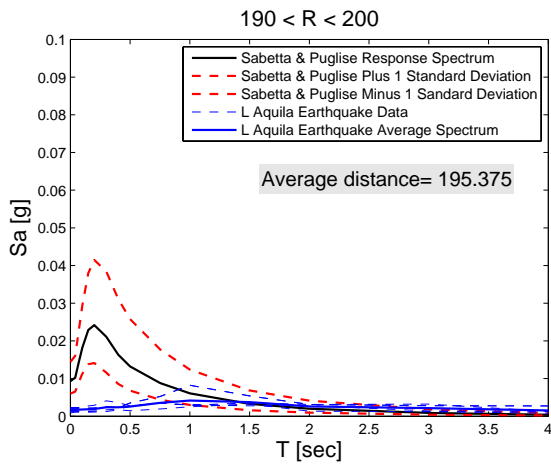
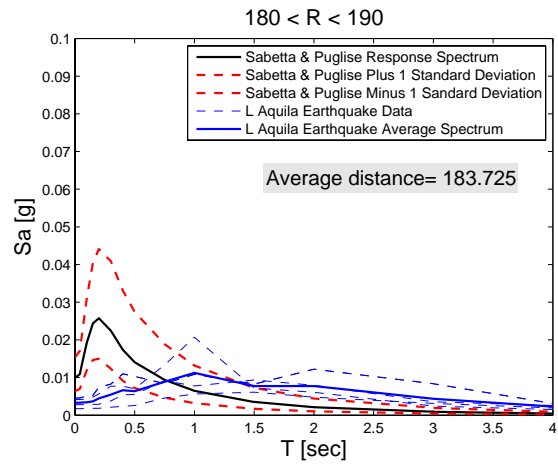
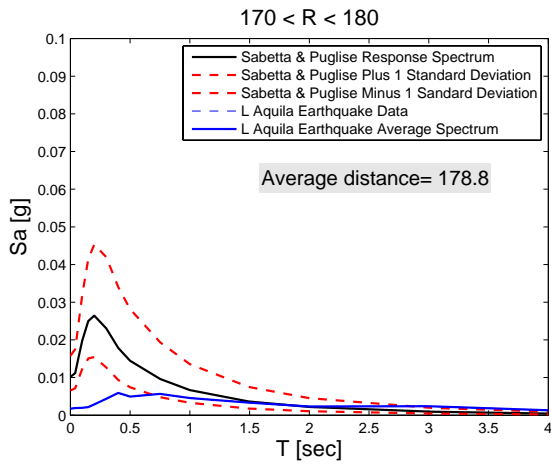
### 3. Horizontal Component - Plots for Distance Bins

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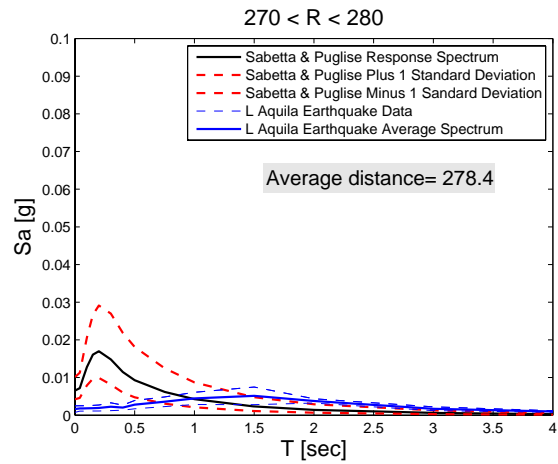
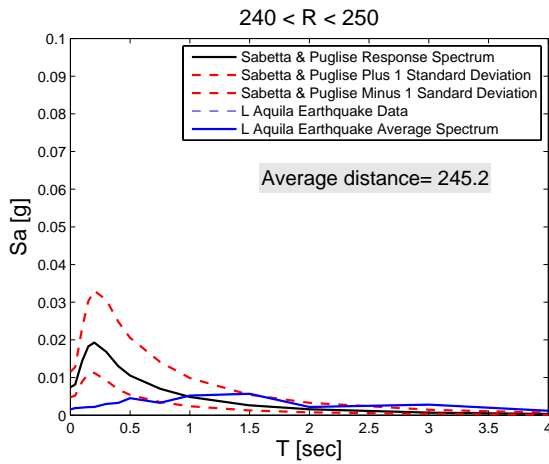






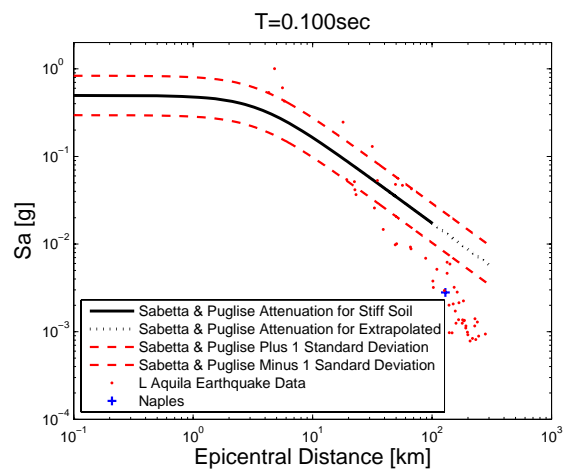
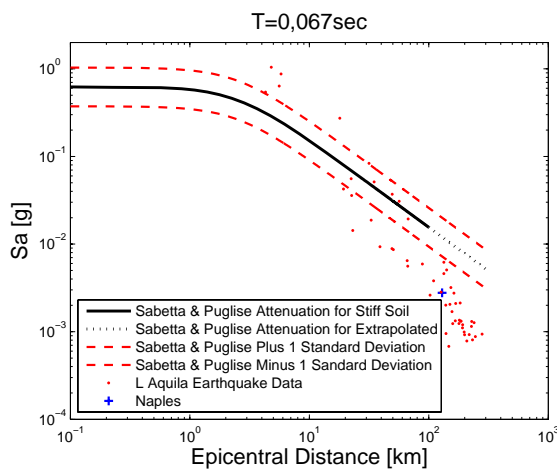
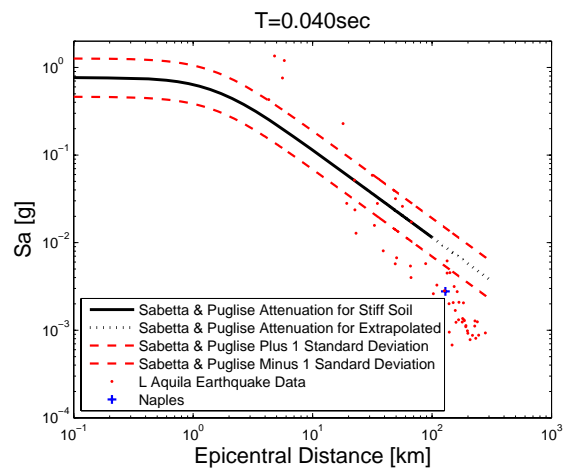
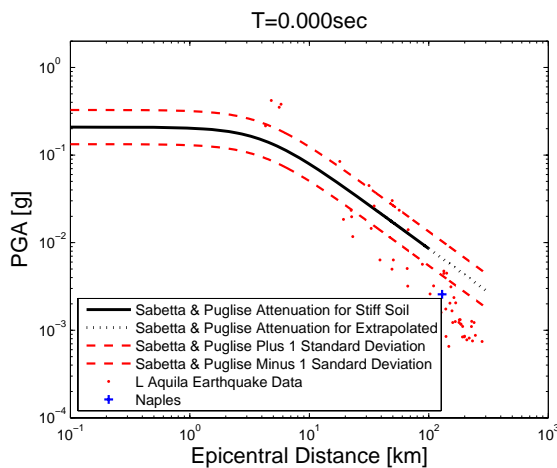


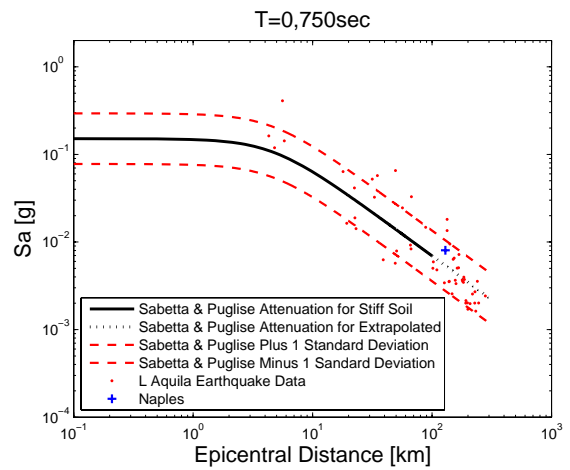
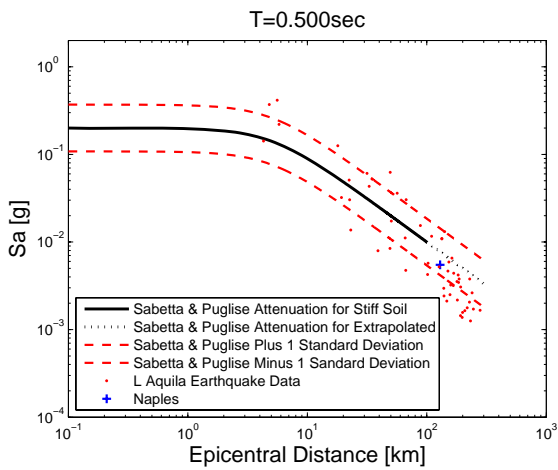
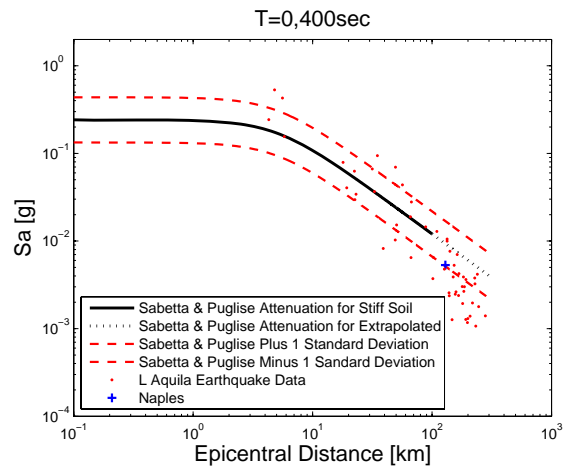
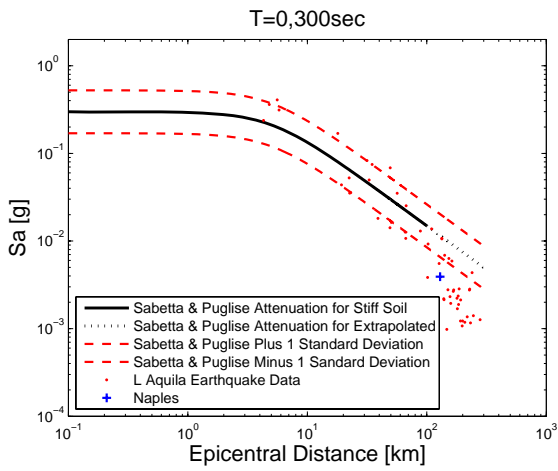
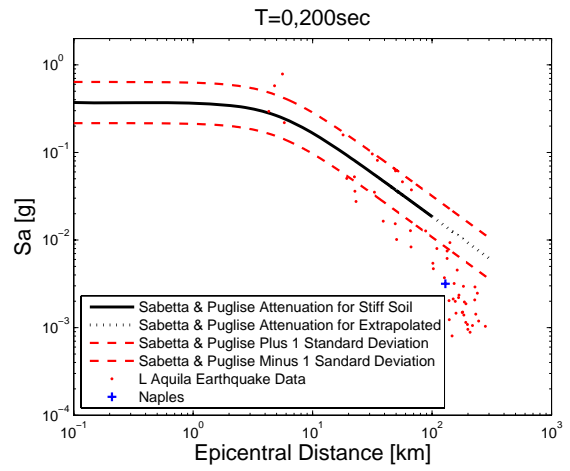
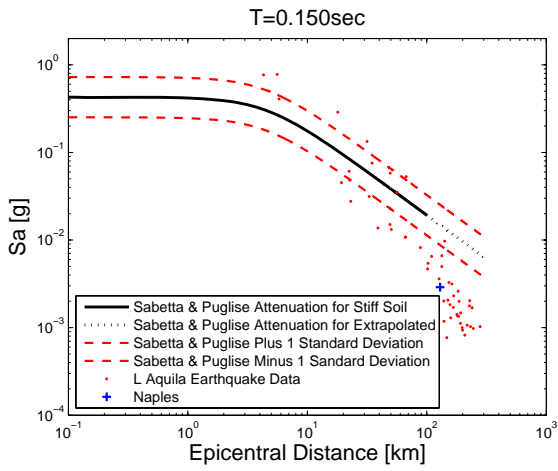


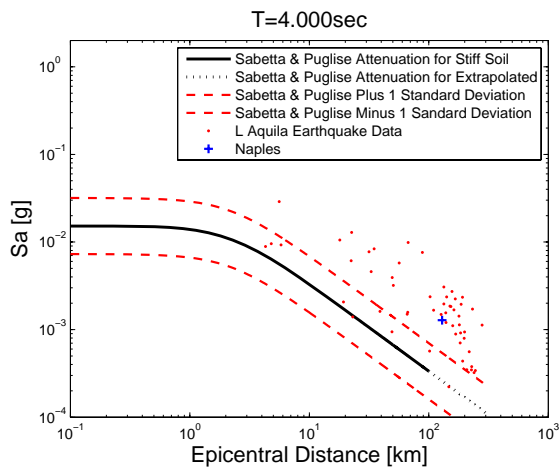
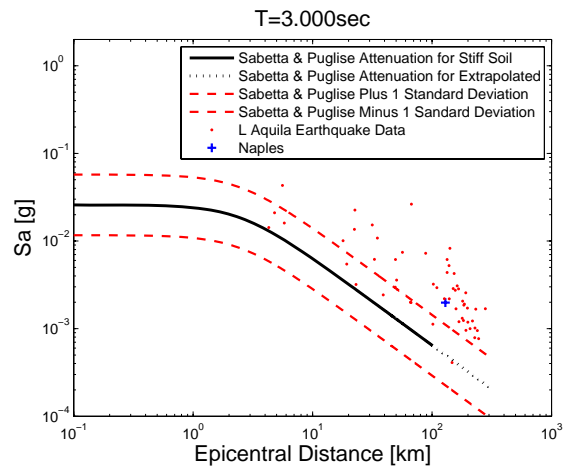
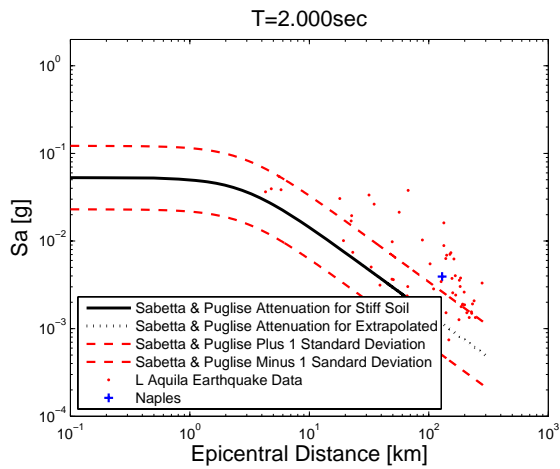
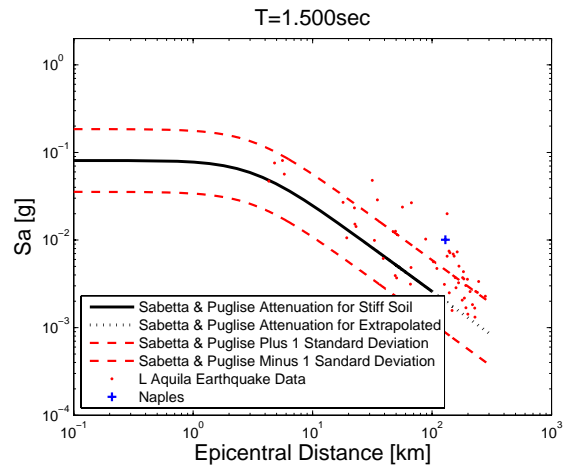
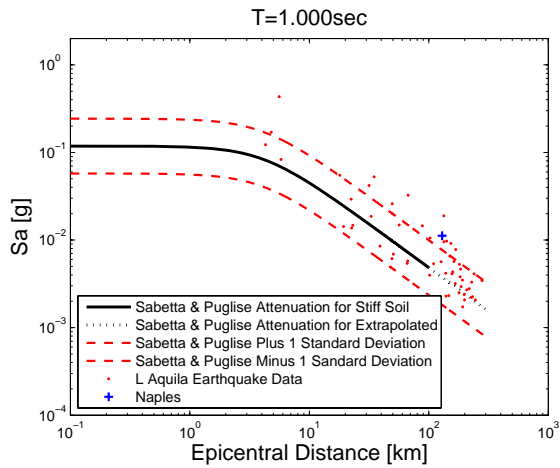


#### 4. Vertical Component - Plots for Spectral Periods

In this section are reported plots comparing the Attenuation law of Sabetta and Pugliese (1996) to spectral acceleration values recorded at different epicentral distance.

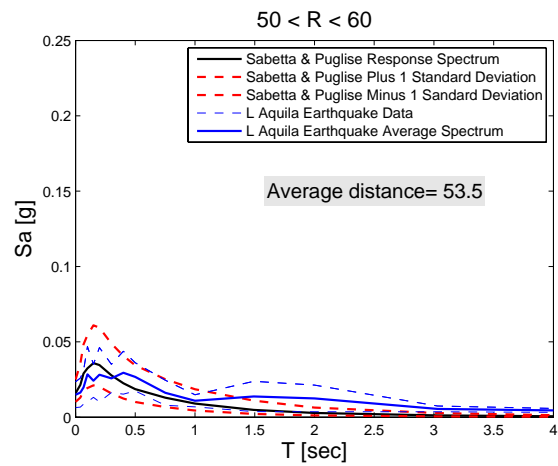
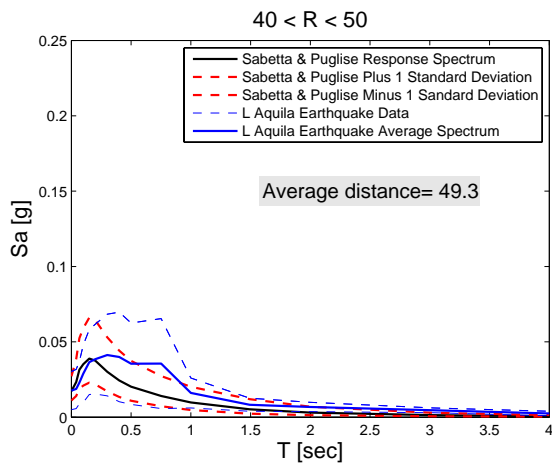
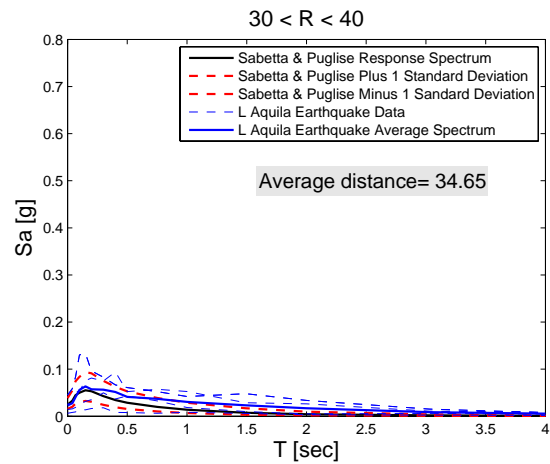
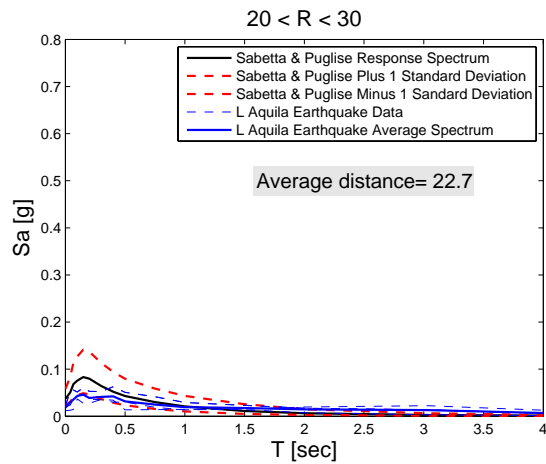
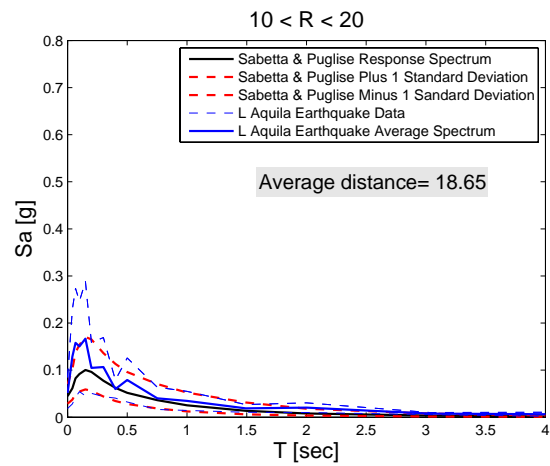
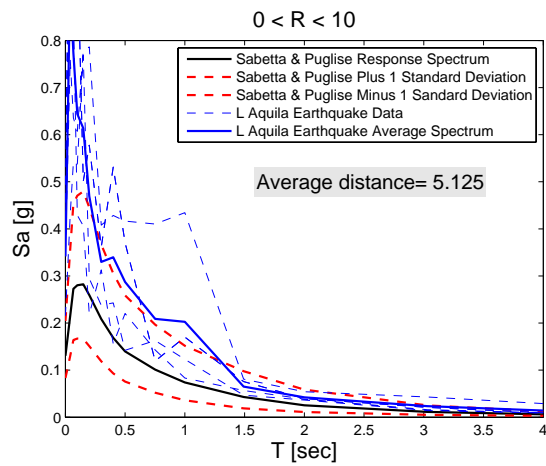


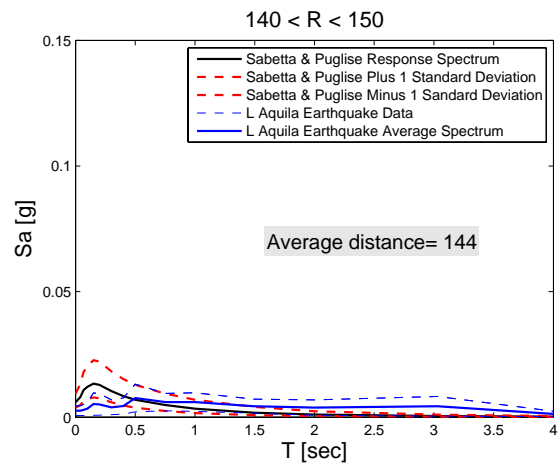
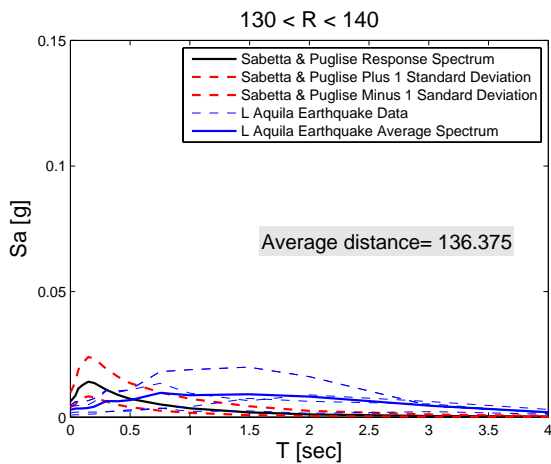
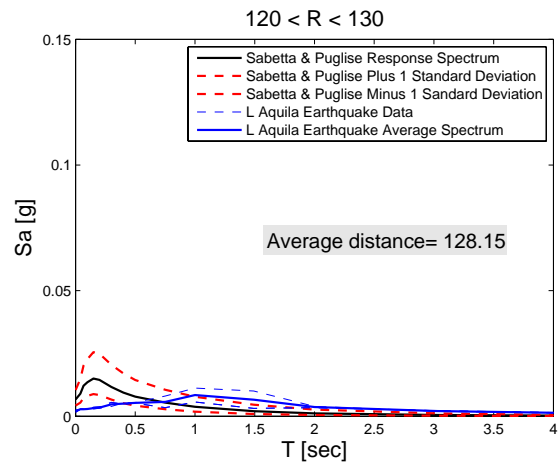
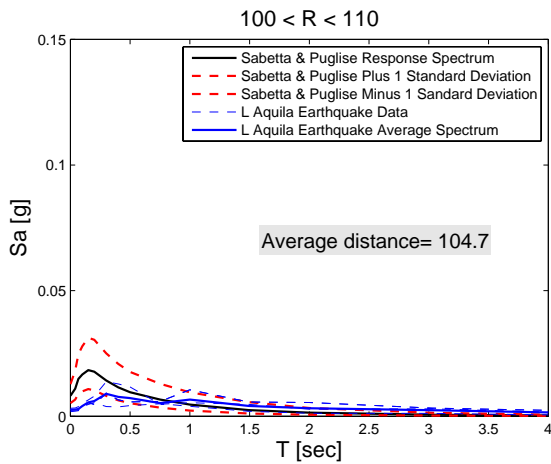
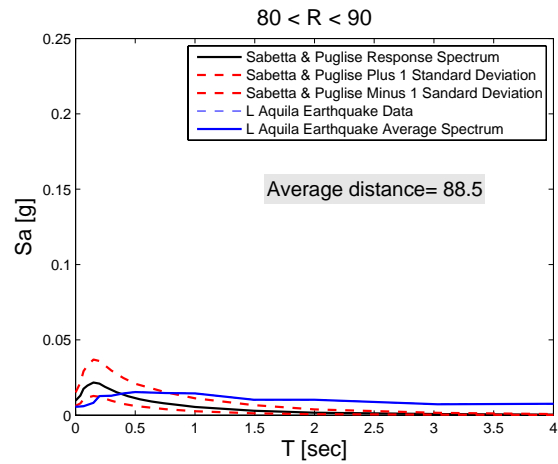
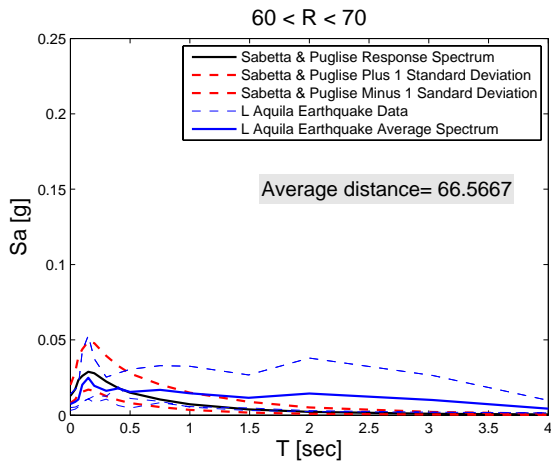


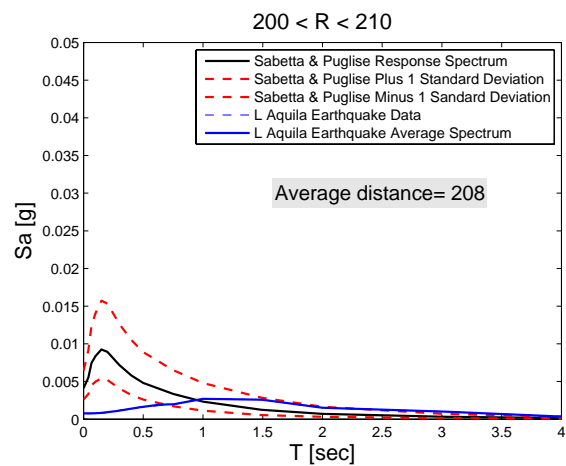
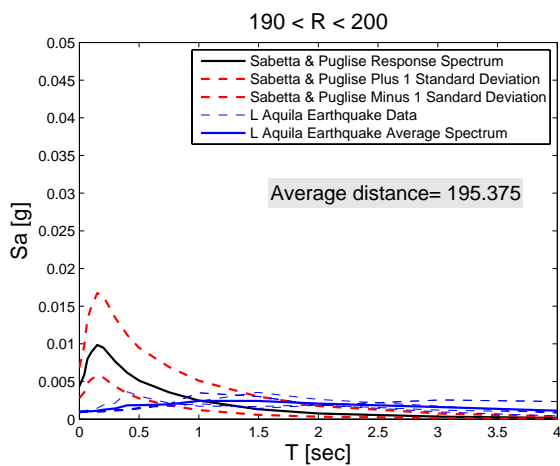
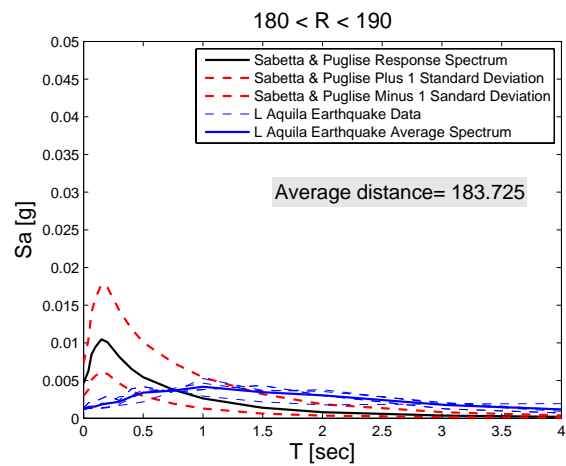
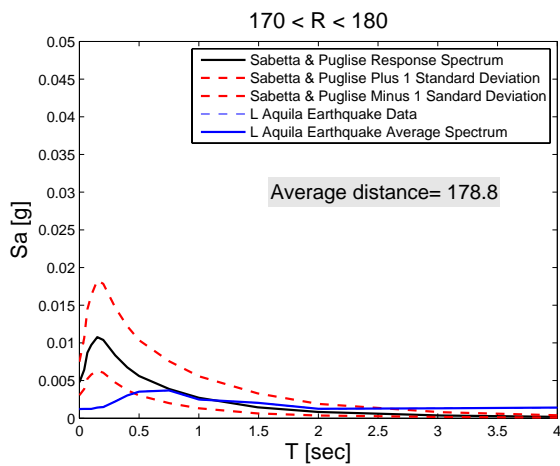
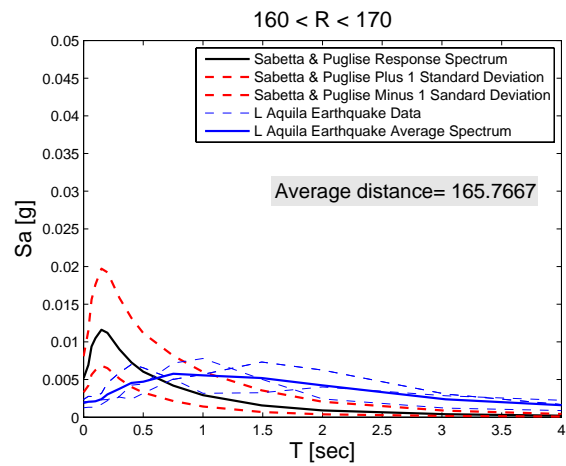
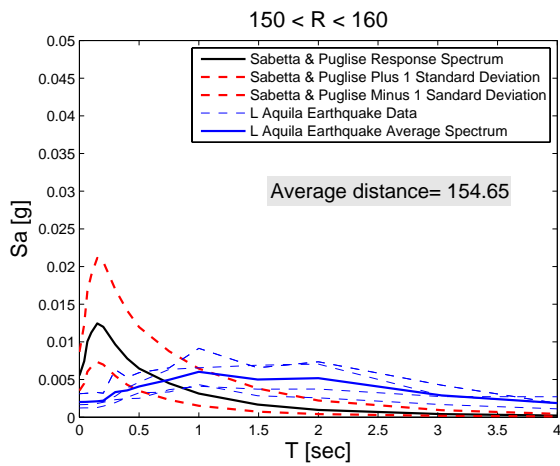


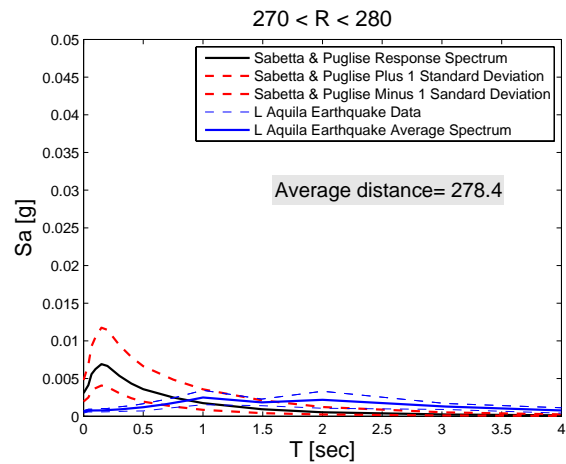
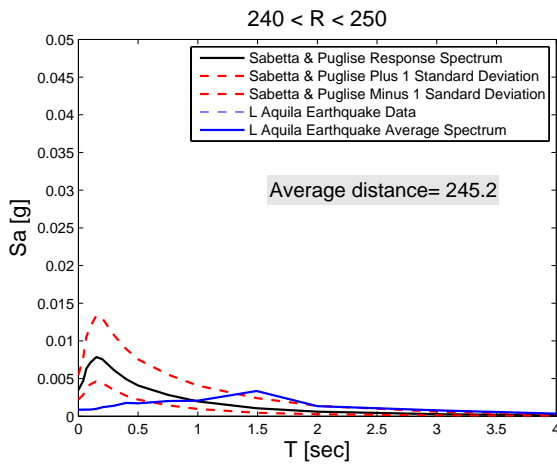
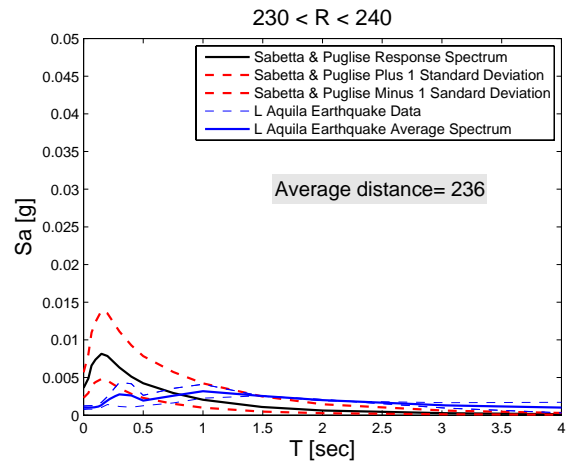
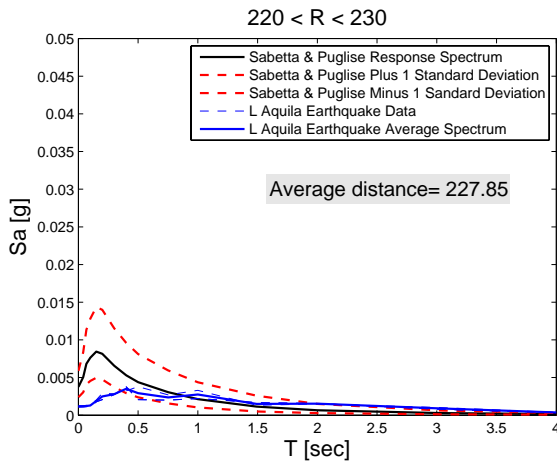
## 5. Vertical Component - Plots for Distance Bins

Signals recorded were grouped in bin of 10 km of epicentral distance and the average spectrum of each bin was compared with the average spectrum obtained from the attenuation law for a distance equal to the average distance of the records of each bin. Plots are reported below.









## 6. Peak Values Tables

Tables show peak values for all record in X direction (Table 1), Y direction (Table 2) and Z direction (Table 3).

Table 1 – Peak Values for Direction X

Record Identifier	PGA	PGV	PGD	Epicentral Distance
	[cm/s <sup>2</sup> ]	[cm/s]	[cm]	[km]
GX066	613.8	36.7	8.4	4.8
FA030	408.2	33.6	7.9	4.3
CU104	386.8	30.5	6.4	5.8
AM043	335.5	30.3	7.8	5.6
EF021	150.6	9.7	3.0	18
TK003	79.2	4.6	2.6	31.6
BI016	60.6	10.5	4.6	34.9
CR008	67.1	6.1	1.3	49.4
BY048	42.4	3.3	1.0	22.4
CR003	31.7	2.7	0.8	56.5
EK007	31.8	6.4	2.9	67.1
GE1463	20.1	3.5	1.6	22.6
BX007	23.7	2.5	1.2	19.3
DF006	19.6	1.9	0.4	23.1
BY003	17.3	2.2	1.0	33

<b>EI160</b>	13.4	3.5	1.0	133.5
<b>BH003</b>	9.1	2.4	0.8	88.5
<b>BN048</b>	9.6	2.5	0.8	140.9
<b>ZC002</b>	9.7	0.7	0.3	39.1
<b>HB060</b>	6.1	0.7	0.2	65.9
<b>BS029</b>	8.7	1.6	0.9	102.7
<b>CU008</b>	8.4	0.9	0.3	49.2
<b>BW024</b>	7.7	0.8	0.2	66.7
<b>BC018</b>	7.1	0.8	0.3	109.7
<b>AL104</b>	7.7	1.2	0.5	133.7
<b>CQ001</b>	5.4	0.9	0.6	50.5
<b>CB004</b>	6.1	0.4	0.1	101.7
<b>AY026</b>	2.9	0.7	0.3	162.4
<b>IY045</b>	3.9	1.1	0.4	183.4
<b>AU056</b>	5.5	0.8	0.3	126.9
<b>AY081</b>	4.0	0.7	0.3	186.6
<b>BD004</b>	3.2	0.8	0.5	153.2
<b>CA056</b>	4.3	0.7	0.2	168
<b>QX001</b>	3.1	0.8	0.4	129.4
<b>BB007</b>	3.5	0.8	0.7	150.4
<b>GK004</b>	2.9	1.1	0.7	138.9
<b>BM444</b>	2.4	0.9	0.5	184.5
<b>FO003</b>	2.4	0.6	0.3	158.5
<b>AY017</b>	2.2	0.7	0.4	156.5
<b>QI081</b>	2.3	0.2	0.1	227.3
<b>DF032</b>	2.1	0.8	0.5	191.8
<b>BU012</b>	2.1	0.3	0.1	228.4
<b>AR042</b>	2.0	0.5	0.3	279.4
<b>DM033</b>	2.0	0.3	0.1	239.7
<b>BX001</b>	1.7	0.5	0.3	180.4
<b>EC009</b>	1.8	0.4	0.2	218
<b>AV122</b>	1.8	0.3	0.1	178.8
<b>BS035</b>	1.3	0.2	0.1	192
<b>BQ056</b>	2.0	0.8	0.6	166.9
<b>EB150</b>	1.8	0.5	0.2	245.2
<b>AT182</b>	1.6	0.6	0.4	232.3
<b>AR006</b>	1.7	0.3	0.2	139.4
<b>BG067</b>	1.1	0.4	0.2	208
<b>BA125</b>	1.0	0.3	0.2	198.1
<b>BM130</b>	0.9	0.2	0.1	147.1
<b>AO008</b>	0.7	0.2	0.2	199.6
<b>EH008</b>	1.1	0.3	0.1	277.4

Table 2 – Peak Values for Direction Y

Record Identifier	PGA	PGV	PGD	Epicentral Distance
	[cm/s <sup>2</sup> ]	[cm/s]	[cm]	[km]
<b>GX066</b>	586.2	40.5	4.1	4.8
<b>FA030</b>	426.1	35.9	3.9	4.3
<b>CU104</b>	442.0	24.5	3.9	5.8
<b>AM043</b>	333.6	38.5	11.8	5.6
<b>EF021</b>	146.6	7.4	2.2	18
<b>TK003</b>	87.1	6.7	1.9	31.6



<b>BI016</b>	69.6	10.6	4.4	34.9
<b>CR008</b>	39.9	3.7	0.9	49.4
<b>BY048</b>	59.6	3.1	0.7	22.4
<b>CR003</b>	25.9	2.8	1.1	56.5
<b>EK007</b>	29.9	5.4	2.6	67.1
<b>GE1463</b>	29.2	3.1	1.8	22.6
<b>BX007</b>	26.0	1.7	0.6	19.3
<b>DF006</b>	25.8	2.2	0.5	23.1
<b>BY003</b>	17.1	1.4	0.6	33
<b>EI160</b>	14.5	3.0	0.8	133.5
<b>BH003</b>	10.3	1.7	1.0	88.5
<b>BN048</b>	8.7	2.6	1.2	140.9
<b>ZC002</b>	7.6	0.7	0.2	39.1
<b>HB060</b>	9.1	0.9	0.3	65.9
<b>BS029</b>	9.7	1.4	0.6	102.7
<b>CU008</b>	6.3	0.6	0.4	49.2
<b>BW024</b>	5.7	0.8	0.2	66.7
<b>BC018</b>	5.9	0.7	0.3	109.7
<b>AL104</b>	6.7	1.0	0.6	133.7
<b>CQ001</b>	8.1	1.3	0.7	50.5
<b>CB004</b>	3.3	0.4	0.2	101.7
<b>AY026</b>	5.6	1.0	0.4	162.4
<b>IY045</b>	4.4	1.6	0.7	183.4
<b>AU056</b>	4.0	0.7	0.5	126.9
<b>AY081</b>	3.3	0.8	0.3	186.6
<b>BD004</b>	3.9	0.8	0.5	153.2
<b>CA056</b>	3.4	0.5	0.2	168
<b>QX001</b>	3.2	0.8	0.3	129.4
<b>BB007</b>	3.3	0.9	0.7	150.4
<b>GK004</b>	3.0	0.9	0.6	138.9
<b>BM444</b>	2.7	1.0	0.6	184.5
<b>FO003</b>	2.0	0.6	0.3	158.5
<b>AY017</b>	2.6	0.6	0.4	156.5
<b>QI081</b>	1.3	0.3	0.2	227.3
<b>DF032</b>	1.8	0.7	0.6	191.8
<b>BU012</b>	2.1	0.3	0.2	228.4
<b>AR042</b>	2.4	0.6	0.2	279.4
<b>DM033</b>	1.9	0.5	0.2	239.7
<b>BX001</b>	2.0	0.7	0.4	180.4
<b>EC009</b>	1.4	0.3	0.2	218
<b>AV122</b>	1.9	0.4	0.2	178.8
<b>BS035</b>	2.2	0.5	0.3	192
<b>BQ056</b>	2.0	0.8	0.5	166.9
<b>EB150</b>	1.2	0.3	0.2	245.2
<b>AT182</b>	1.4	0.5	0.4	232.3
<b>AR006</b>	1.3	0.4	0.2	139.4
<b>BG067</b>	1.0	0.3	0.2	208
<b>BA125</b>	1.3	0.3	0.4	198.1
<b>BM130</b>	1.3	0.3	0.1	147.1
<b>AO008</b>	1.0	0.2	0.1	199.6
<b>EH008</b>	0.8	0.2	0.1	277.4

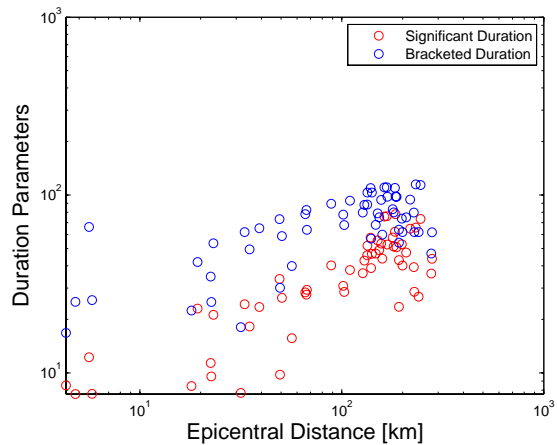
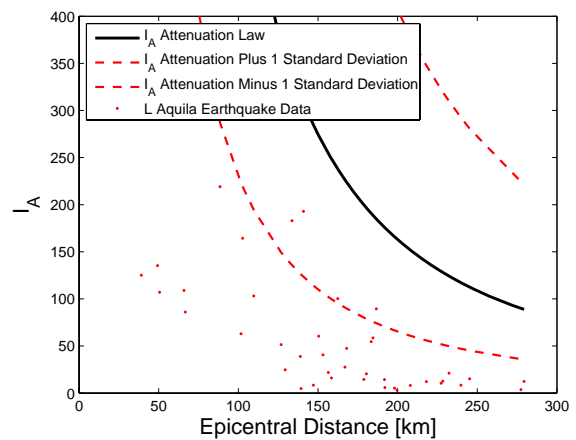
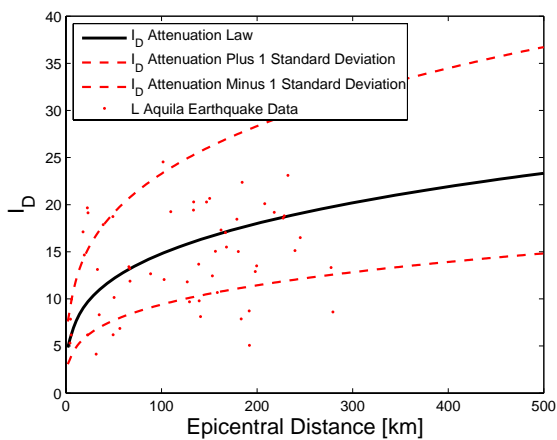
Table 3 – Peak Values for Direction Z

Record Identifier	PGA	PGV	PGD	Epicentral Distance
	[cm/s <sup>2</sup> ]	[cm/s]	[cm]	[km]
GX066	411.7	13.4	2.5	4.8
FA030	211.4	9.1	1.9	4.3
CU104	373.2	9.4	1.9	5.8
AM043	343.8	15.0	4.9	5.6
EF021	110.3	5.5	1.5	18
TK003	44.1	5.7	1.9	31.6
BI016	25.7	3.6	1.3	34.9
CR008	29.7	3.8	0.6	49.4
BY048	22.9	3.2	0.8	22.4
CR003	23.0	2.1	1.0	56.5
EK007	16.7	3.6	1.7	67.1
GE1463	19.4	3.0	1.8	22.6
BX007	18.5	1.5	0.4	19.3
DF006	11.5	1.1	0.2	23.1
BY003	14.8	2.0	0.7	33
EI160	6.0	1.4	0.5	133.5
BH003	5.6	1.8	0.9	88.5
BN048	4.4	1.0	0.4	140.9
ZC002	6.2	0.5	0.3	39.1
HB060	5.0	0.7	0.3	65.9
BS029	2.5	0.8	0.6	102.7
CU008	4.9	0.4	0.2	49.2
BW024	3.5	0.6	0.2	66.7
BC018	3.1	0.5	0.3	109.7
AL104	4.4	0.9	0.4	133.7
CQ001	6.2	0.8	0.6	50.5
CB004	1.9	0.3	0.1	101.7
AY026	2.7	0.5	0.2	162.4
IY045	2.0	0.3	0.1	183.4
AU056	2.7	0.5	0.3	126.9
AY081	1.3	0.4	0.2	186.6
BD004	3.1	0.6	0.2	153.2
CA056	2.0	0.4	0.2	168
QX001	2.7	0.5	0.3	129.4
BB007	2.0	0.7	0.6	150.4
GK004	2.0	0.9	0.5	138.9
BM444	1.3	0.4	0.3	184.5
FO003	1.2	0.3	0.3	158.5
AY017	1.6	0.5	0.4	156.5
QI081	1.1	0.2	0.1	227.3
DF032	1.1	0.4	0.2	191.8
BU012	1.2	0.2	0.1	228.4
AR042	0.9	0.3	0.1	279.4
DM033	1.2	0.2	0.1	239.7
BX001	1.3	0.5	0.3	180.4
EC009	0.8	0.2	0.1	218
AV122	1.2	0.4	0.2	178.8
BS035	1.1	0.2	0.1	192
BQ056	1.3	0.6	0.4	166.9

<b>EB150</b>	0.9	0.2	0.1	245.2
<b>AT182</b>	0.8	0.4	0.2	232.3
<b>AR006</b>	0.9	0.3	0.2	139.4
<b>BG067</b>	0.8	0.2	0.1	208
<b>BA125</b>	1.0	0.4	0.3	198.1
<b>BM130</b>	0.7	0.1	0.0	147.1
<b>AO008</b>	0.9	0.2	0.2	199.6
<b>EH008</b>	0.6	0.2	0.1	277.4

## 7. Horizontal Component – Plots of Integral parameters

Plots show integral parameters for the horizontal direction of higher PGA of each accelerometric station.



## 8. Integral Values Tables

Tables show integral values for all record in X direction (Table 4), Y direction (Table 5) and Z direction (Table 6).

Table 4 – Integral parameters for Direction X

Record Identifier	I <sub>A</sub>	I <sub>B</sub>	S <sub>d</sub>	B <sub>d</sub>	I <sub>A</sub> /( $\pi/2g$ )	Epicentral Distance
	[cm/s]	[/]	[s]	[s]	[cm <sup>2</sup> /s <sup>3</sup> ]	[km]
GX066	283.0	7.8	7.6	25.1	176732.8	4.8
FA030	129.6	5.9	8.0	15.4	80950.8	4.3
CU104	158.9	8.4	7.4	67.0	99228.7	5.8
AM043	100.3	6.2	12.2	66.2	62620.4	5.6
EF021	40.0	17.1	8.4	22.5	24962.4	18
TK003	3.7	6.3	6.6	20.3	2334.5	31.6
BI016	7.8	7.7	20.9	50.5	4866.3	34.9
CR008	4.1	6.2	9.8	30.1	2546.7	49.4
BY048	3.4	15.1	15.1	40.7	2098.5	22.4
CR003	1.0	6.9	15.7	39.9	595.0	56.5
EK007	3.9	11.9	29.3	63.8	2404.8	67.1
GE1463	0.6	5.5	11.6	31.9	387.2	22.6
BX007	1.2	12.5	18.6	51.0	746.9	19.3
DF006	0.9	14.2	24.6	58.6	538.4	23.1
BY003	0.8	13.1	24.4	61.9	495.4	33
EI160	1.3	17.7	55.1	88.6	822.2	133.5
BH003	0.4	11.6	31.3	91.4	252.8	88.5
BN048	0.3	8.1	46.7	103.3	193.0	140.9
ZC002	0.2	17.9	23.5	65.0	125.0	39.1
HB060	0.1	16.3	29.2	83.9	65.3	65.9
BS029	0.2	8.4	25.9	63.4	116.2	102.7
CU008	0.2	18.7	33.7	73.3	135.2	49.2
BW024	0.1	13.2	27.5	82.5	86.0	66.7
BC018	0.2	19.3	37.9	93.0	103.1	109.7
AL104	0.3	20.3	52.0	103.3	182.9	133.7
CQ001	0.1	13.7	24.9	61.9	65.3	50.5
CB004	0.1	24.5	30.9	77.5	63.1	101.7
AY026	0.1	29.1	82.1	111.5	60.2	162.4
IY045	0.1	10.2	54.9	109.6	44.2	183.4
AU056	0.1	11.8	36.3	79.8	51.5	126.9
AY081	0.1	30.1	50.9	97.7	89.3	186.6
BD004	0.1	18.6	42.6	74.9	49.3	153.2
CA056	0.1	15.5	52.7	97.9	47.5	168
QX001	0.0	12.0	47.8	88.0	29.8	129.4
BB007	0.1	20.7	55.6	78.9	60.4	150.4
GK004	0.1	13.0	54.1	107.8	40.1	138.9
BM444	0.1	22.9	74.7	98.0	49.7	184.5
FO003	0.0	10.7	43.8	59.9	16.0	158.5
AY017	0.0	16.6	57.0	93.7	23.5	156.5
QI081	0.0	18.6	39.3	79.8	10.4	227.3
DF032	0.0	8.7	43.1	63.9	14.4	191.8
BU012	0.0	18.8	28.6	62.0	12.6	228.4
AR042	0.0	12.0	43.5	61.9	12.8	279.4
DM033	0.0	15.1	26.8	62.0	8.4	239.7
BX001	0.0	23.1	49.4	79.7	18.2	180.4
EC009	0.0	19.2	64.7	94.3	12.1	218
AV122	0.0	22.5	55.5	81.0	11.5	178.8
BS035	0.0	10.3	36.8	53.8	2.5	192
BQ056	0.0	17.0	75.9	110.6	27.6	166.9

<b>EB150</b>	0.0	16.5	73.4	114.0	15.1	245.2
<b>AT182</b>	0.0	23.1	65.7	114.8	21.1	232.3
<b>AR006</b>	0.0	9.8	38.9	56.9	4.9	139.4
<b>BG067</b>	0.0	20.1	47.5	74.9	8.1	208
<b>BA125</b>	0.0	18.5	55.9	73.9	6.0	198.1
<b>BM130</b>	0.0	29.0	54.3	68.0	4.5	147.1
<b>AO008</b>	0.0	15.4	43.7	61.9	2.4	199.6
<b>EH008</b>	0.0	13.3	36.2	46.9	3.6	277.4

Table 5 – Integral parameters for Direction Y

Record Identifier	IA	ID	Sd	Bd	IA/( $\pi/2g$ )	Epicentral Distance
	[cm/s]	[ ]	[s]	[s]	[cm2/s3]	[km]
<b>GX066</b>	199.7	5.3	7.7	25.0	124699.3	4.8
<b>FA030</b>	129.8	5.3	8.5	16.8	81038.2	4.3
<b>CU104</b>	172.6	10.0	7.6	25.6	107794.1	5.8
<b>AM043</b>	119.8	5.8	11.3	66.3	74811.7	5.6
<b>EF021</b>	43.7	25.1	8.8	25.4	27268.2	18
<b>TK003</b>	3.9	4.1	7.7	18.1	2428.2	31.6
<b>BI016</b>	9.8	8.3	18.3	49.5	6105.5	34.9
<b>CR008</b>	2.5	10.8	13.7	42.3	1578.6	49.4
<b>BY048</b>	5.8	19.7	11.4	34.8	3636.1	22.4
<b>CR003</b>	1.0	8.6	14.7	46.1	628.0	56.5
<b>EK007</b>	3.2	12.6	30.4	63.5	2012.5	67.1
<b>GE1463</b>	0.9	6.2	9.5	25.0	551.9	22.6
<b>BX007</b>	1.0	14.7	23.0	42.0	640.4	19.3
<b>DF006</b>	1.8	19.1	21.2	53.6	1102.5	23.1
<b>BY003</b>	0.6	14.5	24.6	56.2	358.1	33
<b>EI160</b>	1.4	19.4	45.9	88.5	848.6	133.5
<b>BH003</b>	0.4	12.7	40.3	89.5	219.2	88.5
<b>BN048</b>	0.3	8.0	44.1	100.9	183.9	140.9
<b>ZC002</b>	0.2	17.8	29.6	74.3	99.0	39.1
<b>HB060</b>	0.2	13.4	28.3	78.0	109.0	65.9
<b>BS029</b>	0.3	12.1	28.5	67.8	164.4	102.7
<b>CU008</b>	0.1	22.2	35.2	82.1	85.6	49.2
<b>BW024</b>	0.1	16.7	31.1	80.0	73.9	66.7
<b>BC018</b>	0.2	24.3	37.3	87.0	102.1	109.7
<b>AL104</b>	0.3	24.0	63.5	107.2	167.7	133.7
<b>CQ001</b>	0.2	10.1	26.4	58.8	107.0	50.5
<b>CB004</b>	0.0	24.2	39.3	90.6	29.8	101.7
<b>AY026</b>	0.2	17.3	75.7	110.3	100.2	162.4
<b>IY045</b>	0.1	7.9	62.2	109.6	54.6	183.4
<b>AU056</b>	0.1	14.9	40.8	81.7	40.2	126.9
<b>AY081</b>	0.1	26.2	56.3	99.7	71.4	186.6
<b>BD004</b>	0.1	12.4	49.0	75.0	40.6	153.2
<b>CA056</b>	0.1	23.0	55.3	97.1	40.9	168
<b>QX001</b>	0.0	9.7	42.8	88.0	24.8	129.4
<b>BB007</b>	0.1	19.2	52.0	79.0	57.7	150.4
<b>GK004</b>	0.1	13.7	57.6	109.5	38.9	138.9
<b>BM444</b>	0.1	22.4	78.2	98.0	58.6	184.5
<b>FO003</b>	0.0	15.8	41.0	60.0	17.7	158.5
<b>AY017</b>	0.0	15.0	53.4	93.9	21.9	156.5
<b>QI081</b>	0.0	15.3	38.5	79.8	6.4	227.3

<b>DF032</b>	0.0	8.4	44.5	63.8	10.5	191.8
<b>BU012</b>	0.0	17.3	28.5	60.7	10.2	228.4
<b>AR042</b>	0.0	8.6	43.8	61.8	12.4	279.4
<b>DM033</b>	0.0	10.1	27.3	62.0	9.5	239.7
<b>BX001</b>	0.0	15.0	51.4	79.9	20.5	180.4
<b>EC009</b>	0.0	26.3	60.0	95.1	12.8	218
<b>AV122</b>	0.0	18.4	57.8	83.2	14.5	178.8
<b>BS035</b>	0.0	5.1	23.6	54.0	5.8	192
<b>BQ056</b>	0.0	15.4	71.7	109.7	23.4	166.9
<b>EB150</b>	0.0	33.3	72.6	115.0	11.7	245.2
<b>AT182</b>	0.0	17.5	68.5	115.0	13.2	232.3
<b>AR006</b>	0.0	11.8	43.9	56.9	6.0	139.4
<b>BG067</b>	0.0	21.0	54.0	75.0	6.6	208
<b>BA125</b>	0.0	12.9	53.0	73.7	5.3	198.1
<b>BM130</b>	0.0	20.3	46.9	68.0	8.3	147.1
<b>AO008</b>	0.0	13.5	40.1	62.0	3.1	199.6
<b>EH008</b>	0.0	16.0	39.2	47.0	2.7	277.4

Table 6 – Integral parameters for Direction Z

Record Identifier	IA	ID	Sd	Bd	IA/( $\pi/2g$ )	Epicentral Distance
	[cm/s]	[/]	[s]	[s]	[cm <sup>2</sup> /s <sup>3</sup> ]	[km]
<b>GX066</b>	89.6	10.1	6.1	14.1	55933.9	4.8
<b>FA030</b>	31.4	10.2	8.3	16.7	19598.1	4.3
<b>CU104</b>	52.9	9.4	6.7	12.0	33034.1	5.8
<b>AM043</b>	111.4	13.5	10.5	23.0	69557.0	5.6
<b>EF021</b>	13.5	14.0	9.5	21.3	8445.4	18
<b>TK003</b>	1.7	4.2	8.3	25.4	1059.4	31.6
<b>BI016</b>	2.4	16.3	17.9	55.3	1491.6	34.9
<b>CR008</b>	0.9	4.8	13.3	28.3	531.0	49.4
<b>BY048</b>	1.3	11.3	19.4	45.1	824.1	22.4
<b>CR003</b>	0.5	6.3	22.8	46.1	304.3	56.5
<b>EK007</b>	1.3	13.7	35.3	66.2	824.6	67.1
<b>GE1463</b>	0.6	6.5	14.4	33.0	386.6	22.6
<b>BX007</b>	0.8	18.3	21.6	45.1	509.3	19.3
<b>DF006</b>	0.3	15.3	22.4	56.1	193.1	23.1
<b>BY003</b>	0.5	10.3	20.6	50.1	299.8	33
<b>EI160</b>	0.3	19.3	59.1	93.0	162.8	133.5
<b>BH003</b>	0.2	11.6	33.6	92.1	118.5	88.5
<b>BN048</b>	0.1	16.1	78.4	105.6	68.1	140.9
<b>ZC002</b>	0.1	14.2	32.1	73.0	48.1	39.1
<b>HB060</b>	0.1	11.1	33.3	81.2	39.5	65.9
<b>BS029</b>	0.0	12.8	40.4	89.2	27.5	102.7
<b>CU008</b>	0.1	23.2	37.0	81.7	45.4	49.2
<b>BW024</b>	0.1	14.7	41.6	84.0	32.5	66.7
<b>BC018</b>	0.1	19.1	38.8	92.0	31.3	109.7
<b>AL104</b>	0.1	17.5	58.0	106.2	66.9	133.7
<b>CQ001</b>	0.1	11.9	25.0	60.8	59.6	50.5
<b>CB004</b>	0.0	17.9	42.9	90.0	10.2	101.7
<b>AY026</b>	0.0	22.6	72.2	113.4	30.7	162.4
<b>IY045</b>	0.0	15.3	69.7	111.9	10.4	183.4
<b>AU056</b>	0.0	10.7	55.5	81.8	16.0	126.9
<b>AY081</b>	0.0	17.6	65.2	102.4	8.1	186.6

<b>BD004</b>	0.1	17.2	52.3	75.0	33.9	153.2
<b>CA056</b>	0.0	21.5	62.6	101.1	16.2	168
<b>QX001</b>	0.0	19.2	37.6	85.7	25.3	129.4
<b>BB007</b>	0.0	20.2	56.9	79.0	28.1	150.4
<b>GK004</b>	0.0	15.4	69.2	111.7	27.7	138.9
<b>BM444</b>	0.0	27.0	76.2	98.0	12.4	184.5
<b>FO003</b>	0.0	15.5	43.6	60.0	6.0	158.5
<b>AY017</b>	0.0	18.1	54.3	93.8	14.8	156.5
<b>QI081</b>	0.0	18.2	55.4	81.0	3.1	227.3
<b>DF032</b>	0.0	13.1	48.3	64.0	5.5	191.8
<b>BU012</b>	0.0	13.7	34.8	62.0	3.0	228.4
<b>AR042</b>	0.0	18.2	45.0	62.0	5.0	279.4
<b>DM033</b>	0.0	15.0	31.5	62.0	4.4	239.7
<b>BX001</b>	0.0	19.8	51.9	80.0	12.7	180.4
<b>EC009</b>	0.0	22.9	81.9	96.0	3.9	218
<b>AV122</b>	0.0	12.0	63.3	83.7	6.3	178.8
<b>BS035</b>	0.0	9.0	27.8	54.0	2.4	192
<b>BQ056</b>	0.0	21.6	73.6	111.7	15.6	166.9
<b>EB150</b>	0.0	28.0	83.5	116.0	5.4	245.2
<b>AT182</b>	0.0	17.2	82.9	115.0	5.2	232.3
<b>AR006</b>	0.0	12.9	46.3	57.0	3.9	139.4
<b>BG067</b>	0.0	15.7	53.0	75.0	2.9	208
<b>BA125</b>	0.0	12.6	42.9	74.0	4.4	198.1
<b>BM130</b>	0.0	24.2	51.3	68.0	2.0	147.1
<b>AO008</b>	0.0	10.5	44.7	61.9	2.2	199.6
<b>EH008</b>	0.0	8.1	35.3	47.0	0.8	277.4

## 9. References

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