

## **APPENDIX A**

### **Velocity Records Corresponding to the Component of Maximum Peak-to-Peak Velocity from the Hayden et al. (2014) Pulse Classification Scheme**

Note that all records have a low-pass, three-pole, causal Butterworth  
Filter applied to the record (see Hayden et al. (2014))

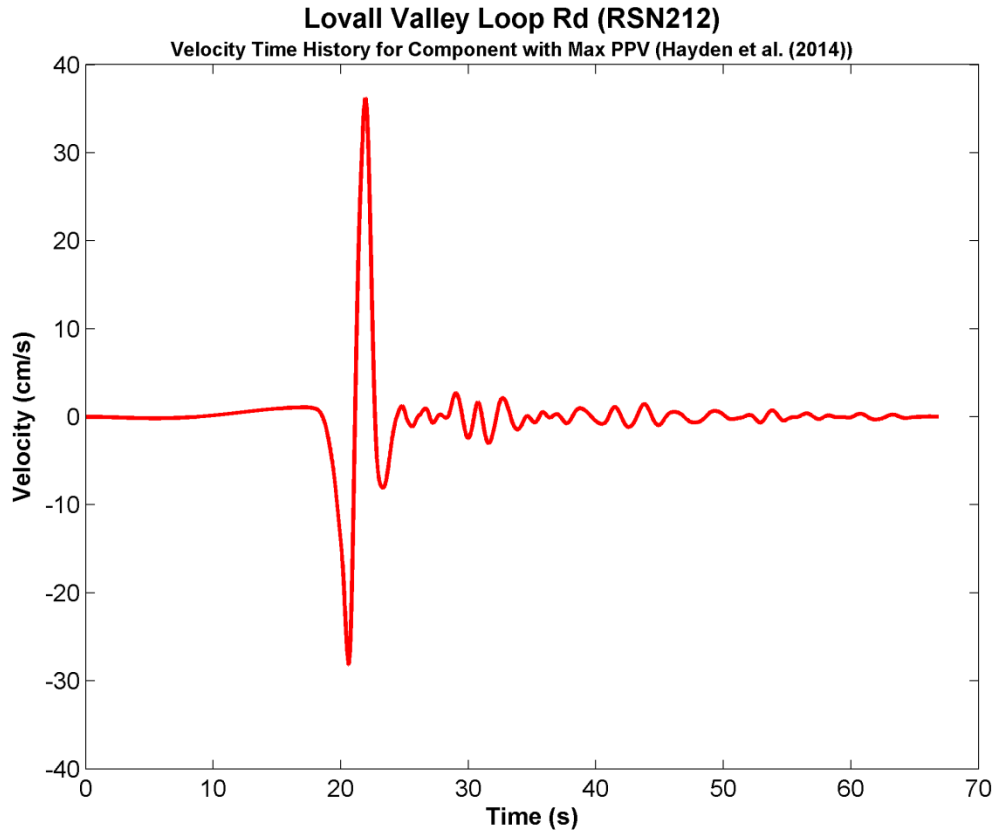
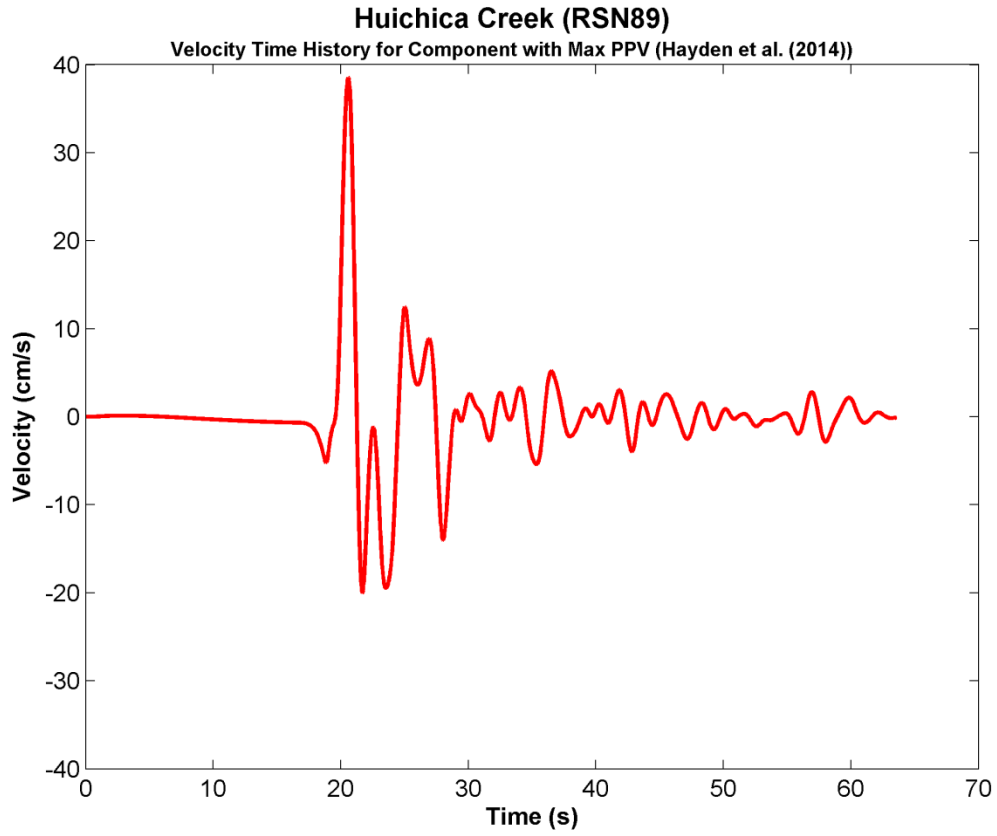
Table 1: Estimation of PGV and  $T_v$  using Bray et al. (2009) empirical relationship

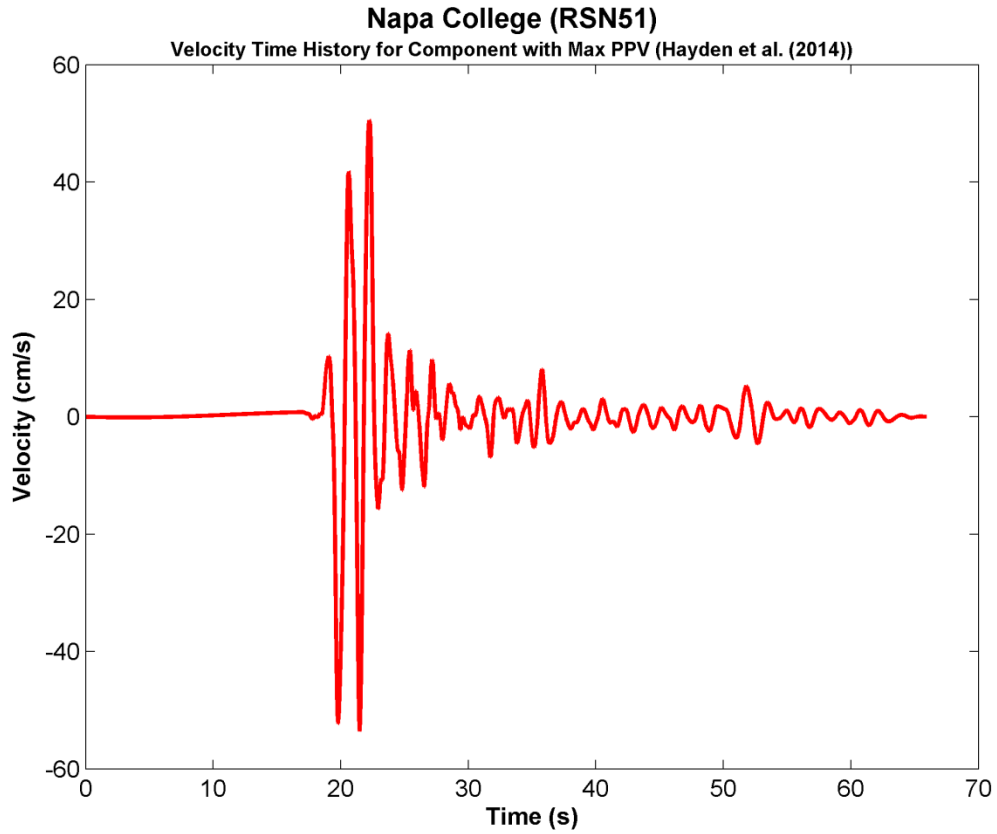
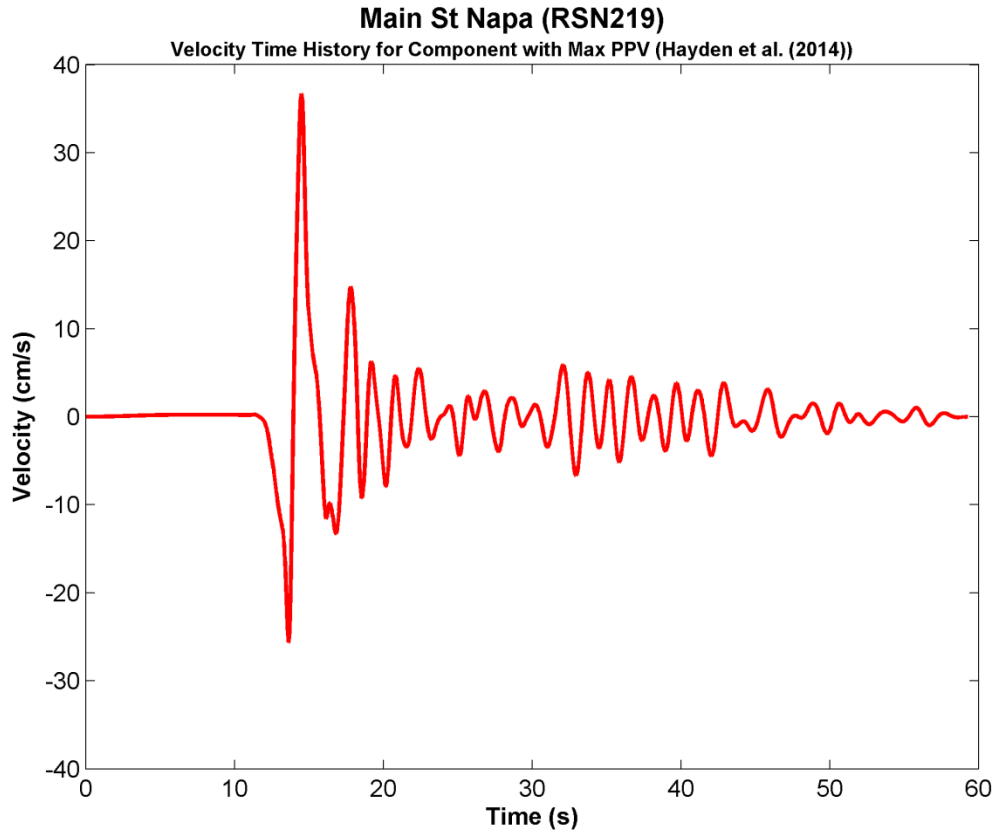
Station Name	$R_{rup}^1$ (km)	PGV RotD50 (cm/s)	PGV <sup>2</sup> Median (cm/s)	PGV - $\sigma_{total}$ (cm/s)	PGV + $\sigma_{total}$ (cm/s)	$T_v^3$ Median (s)	$T_v$ - $\sigma_{total}$ (s)	$T_v$ + $\sigma_{total}$ (s)
Fire Station No. 3	1.8	80	62	40	96	1.2	0.7	2.0
Huichica Creek	4.2	43	53	34	82	1.2	0.7	2.0
Lovall Valley Loop Rd.	5.1	46	49	32	76	1.2	0.7	2.0
Main St. Napa	4.9	42	50	32	80	1.2	0.7	2.0
Napa College	4.5	56	51	33	80	1.2	0.7	2.0

1)  $R_{rup}$  is closest distance between station and rupture plane

2) PGV = Peak Ground Velocity

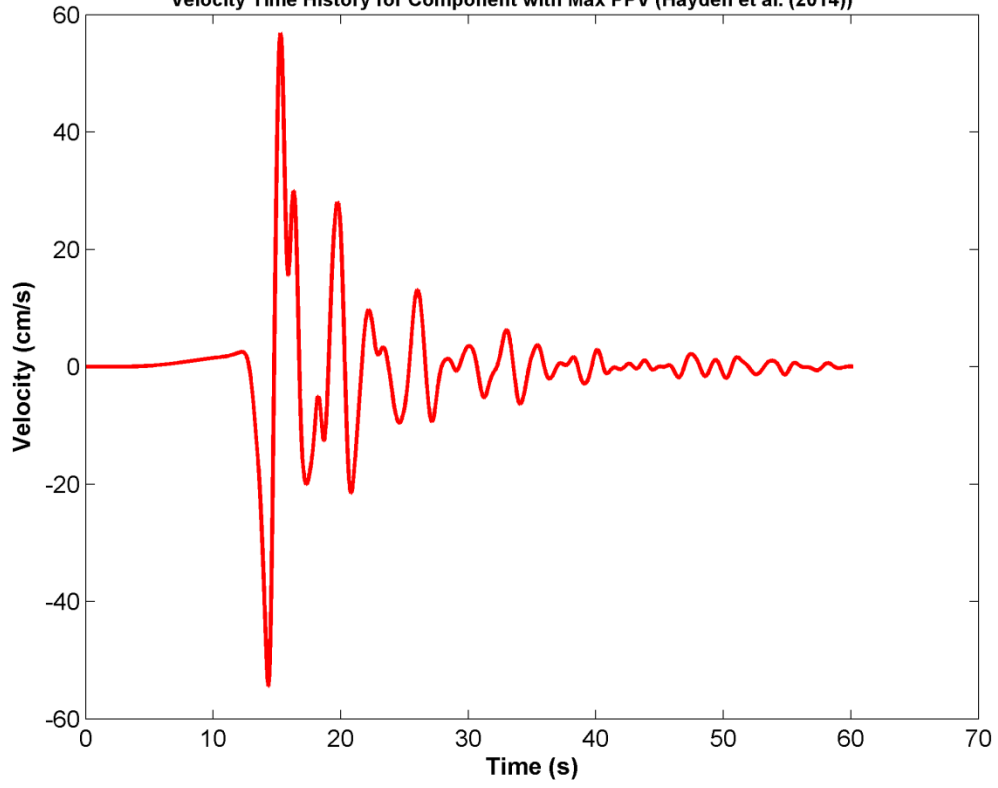
3)  $T_v$  = Pulse Period





### Napa Fire Station No 3 (RSN217)

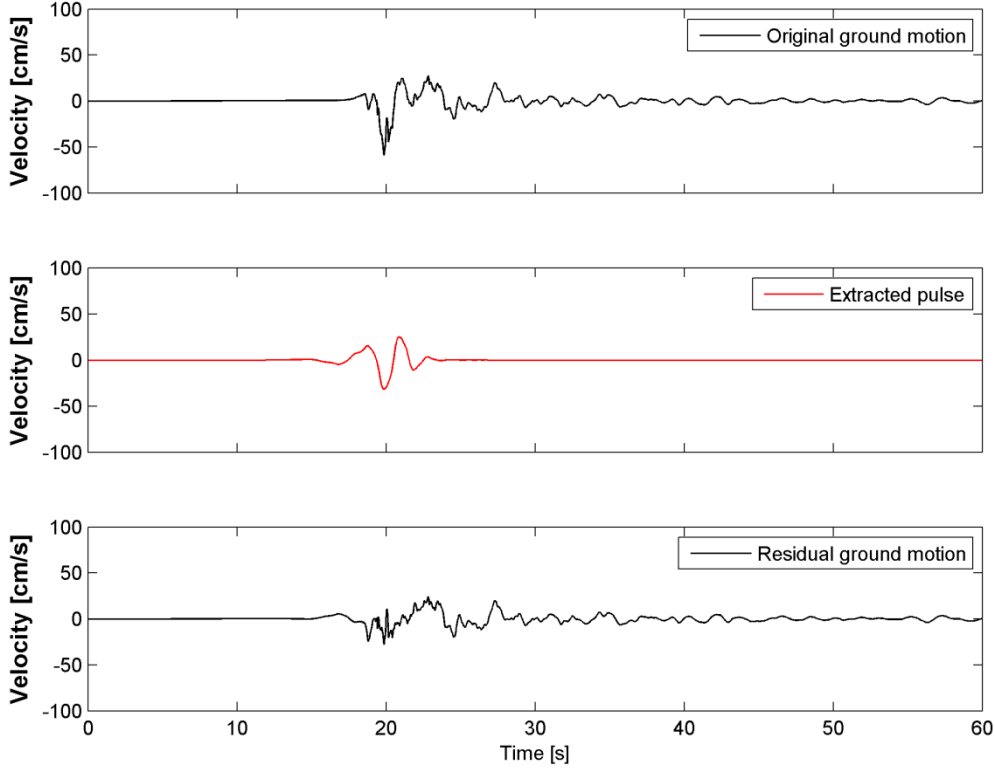
Velocity Time History for Component with Max PPV (Hayden et al. (2014))



**Velocity Records Corresponding to the Component with the  
Maximum Pulse Indicator for the Shahi (2013) Pulse  
Classification Scheme**

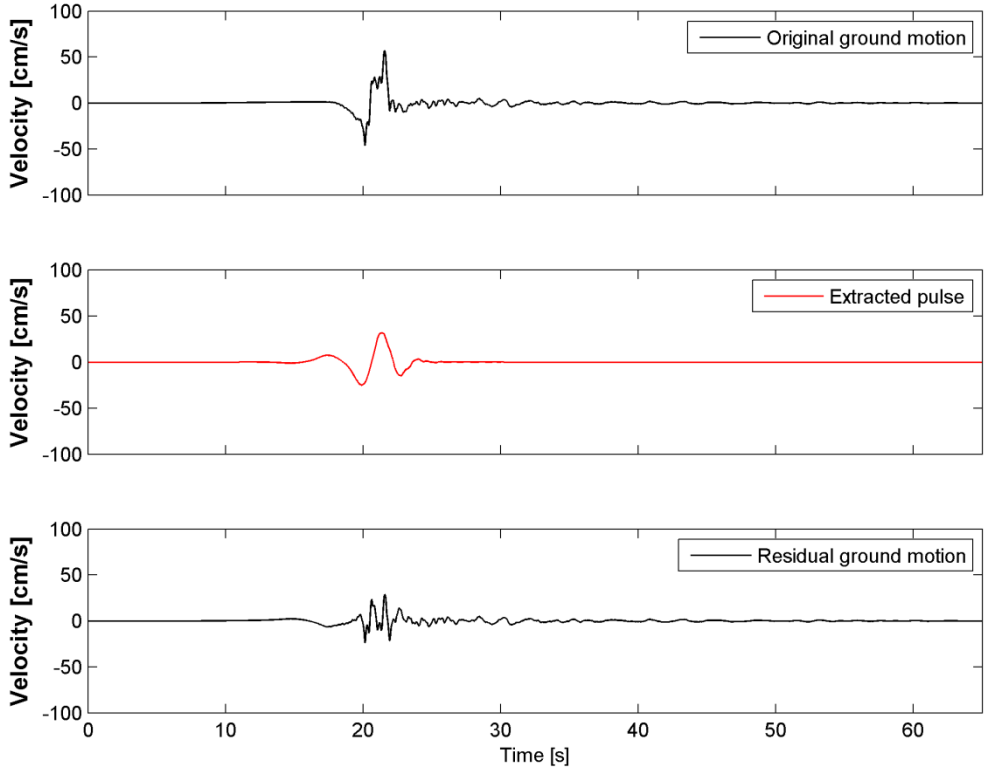
### Huichica Creek (RSN89)

#### Velocity Time History for Component with Max Pulse Indicator (Shahi (2013))



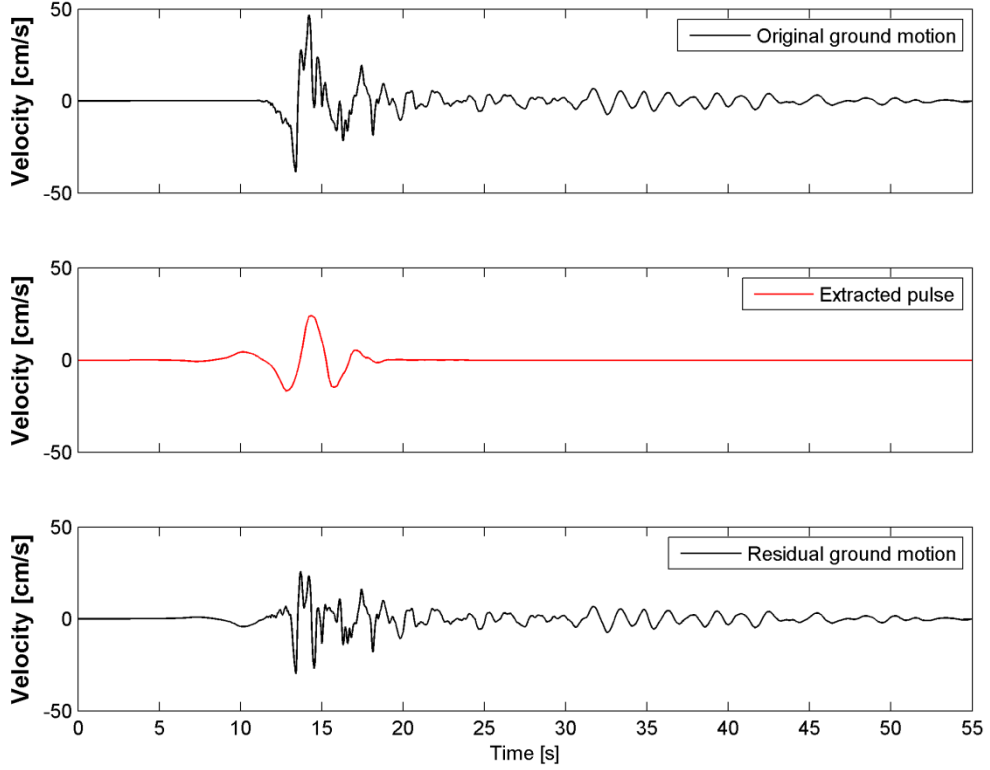
### Lovall Valley Loop Rd (RSN212)

#### Velocity Time History for Component with Max Pulse Indicator (Shahi (2013))



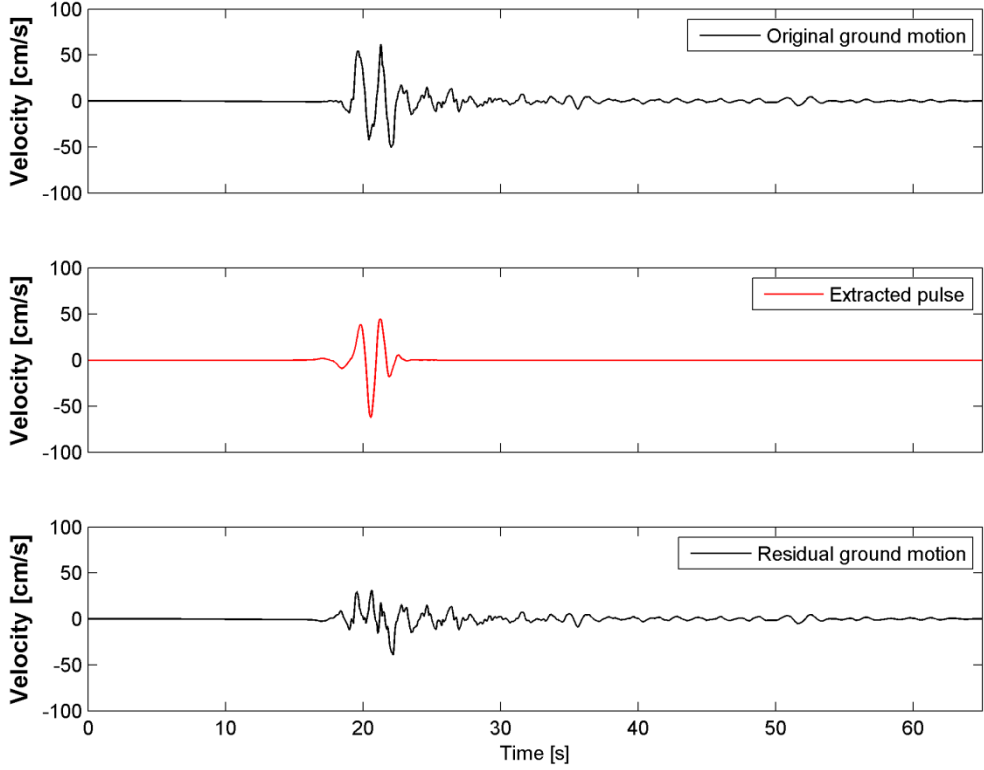
### Main St Napa (RSN219)

#### Velocity Time History for Component with Max Pulse Indicator (Shahi (2013))



### Napa College (RSN51)

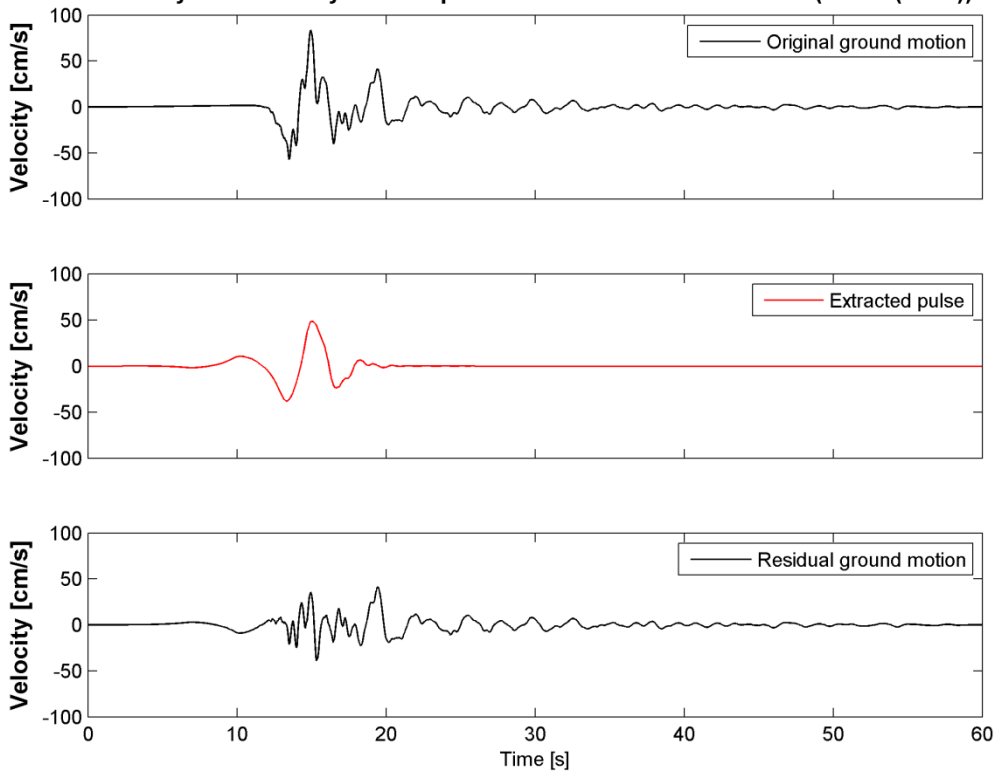
#### Velocity Time History for Component with Max Pulse Indicator (Shahi (2013))





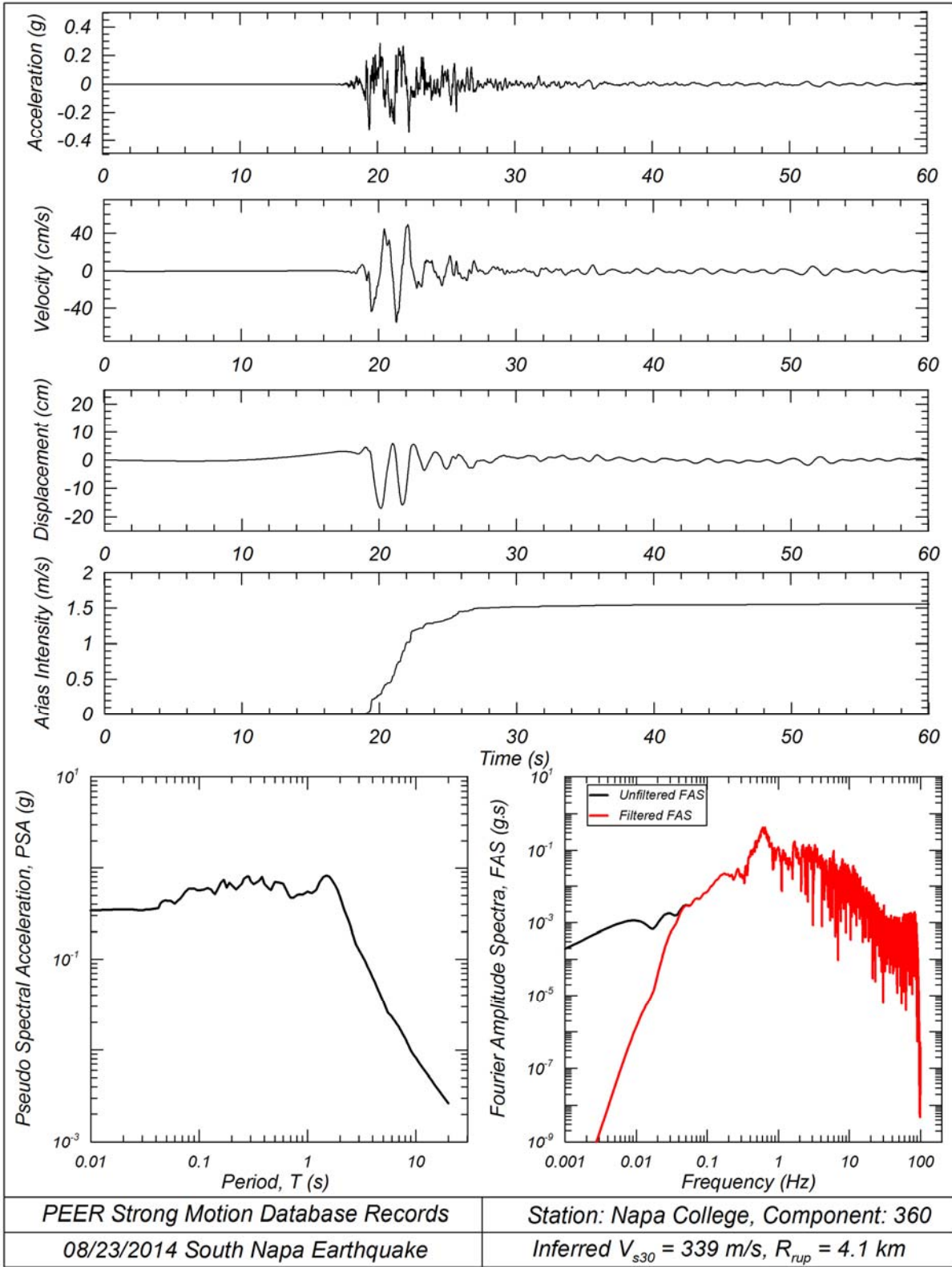
### Napa Fire Sta No3 (RSN217)

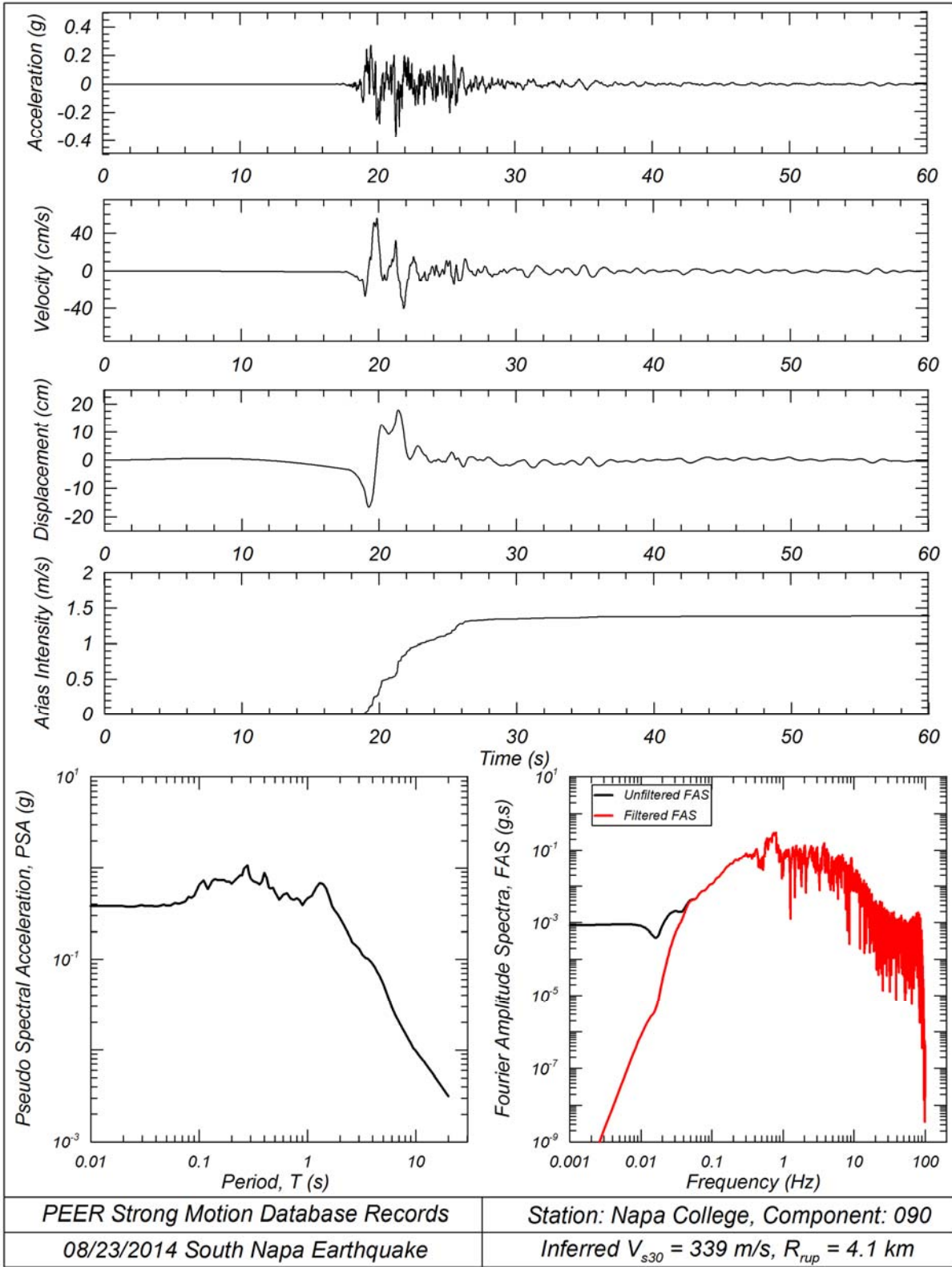
#### Velocity Time History for Component with Max Pulse Indicator (Shahi (2013))

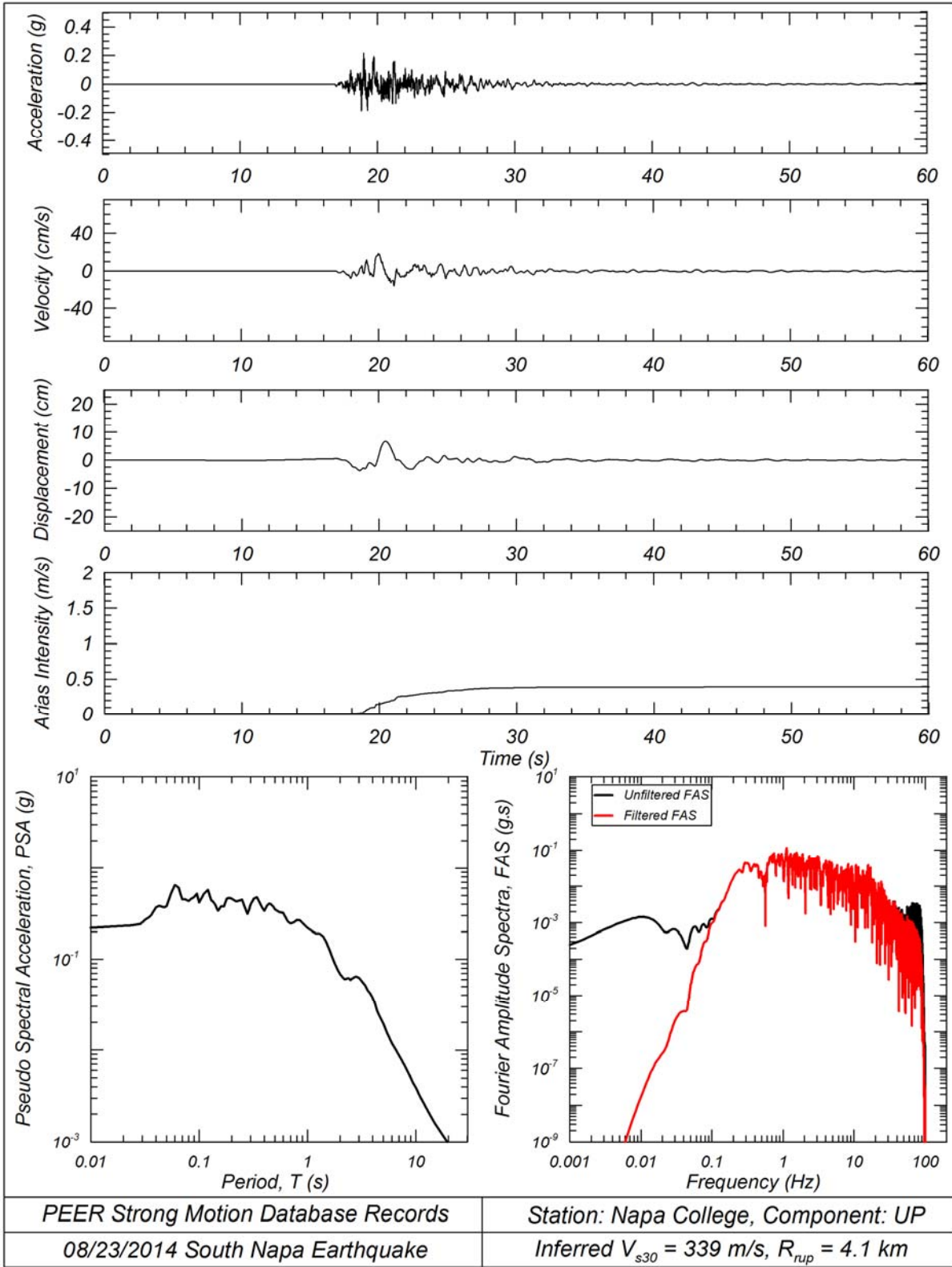


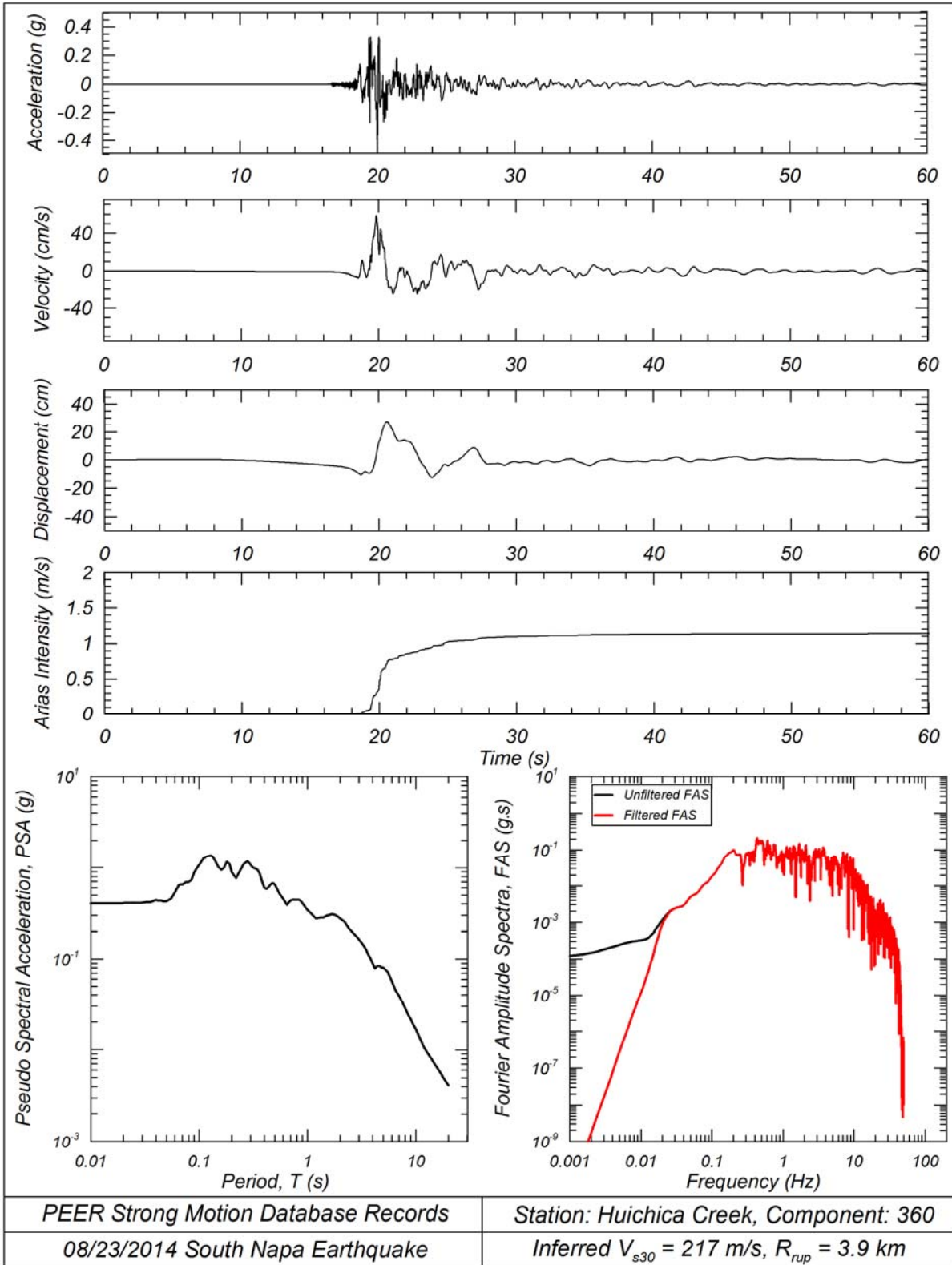
## **APPENDIX B**

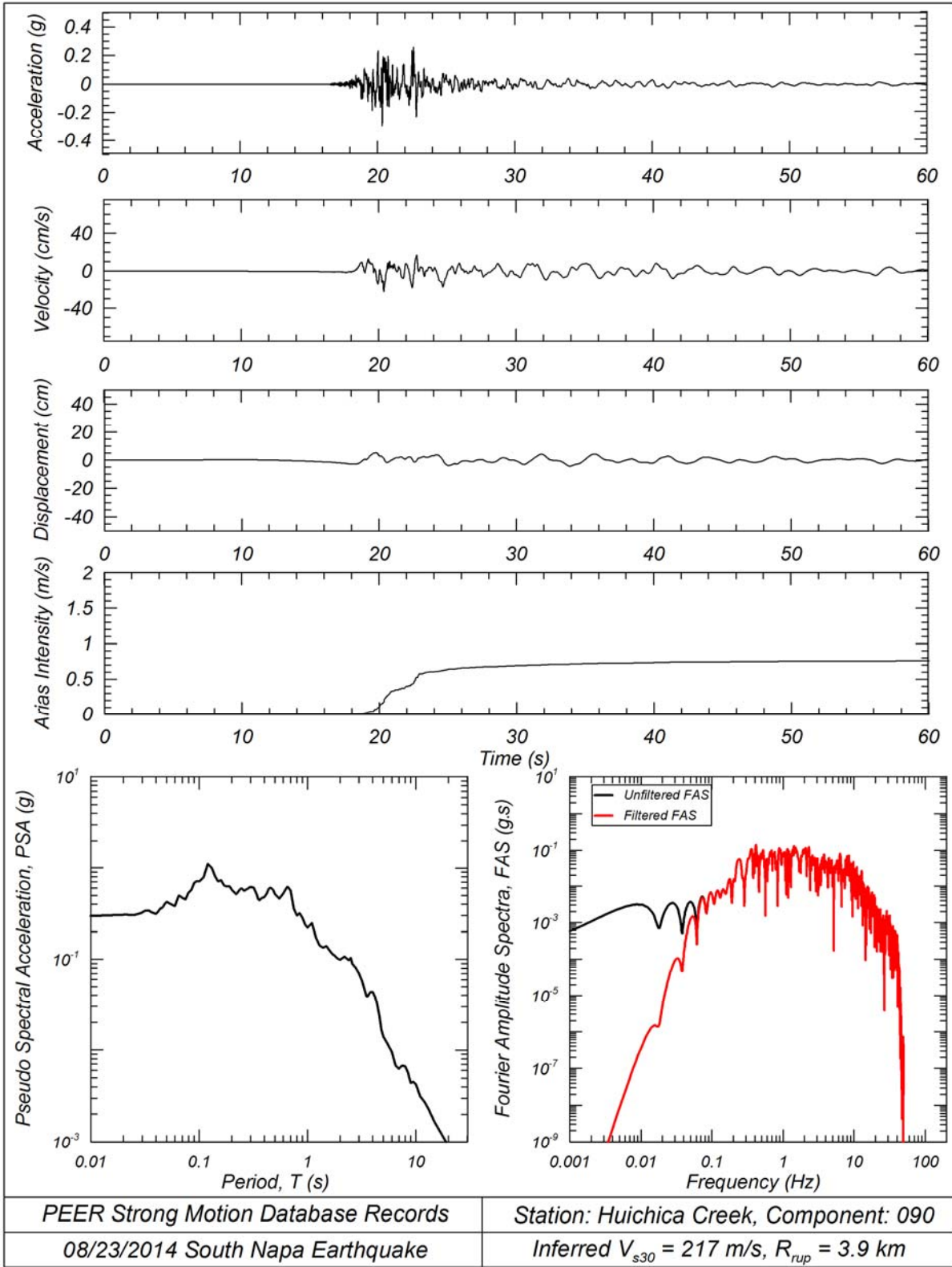
### **Acceleration, Velocity, Displacement Time Series, Pseudo-Spectral Acceleration, and Fourier Amplitude Spectra for Selected Recordings**



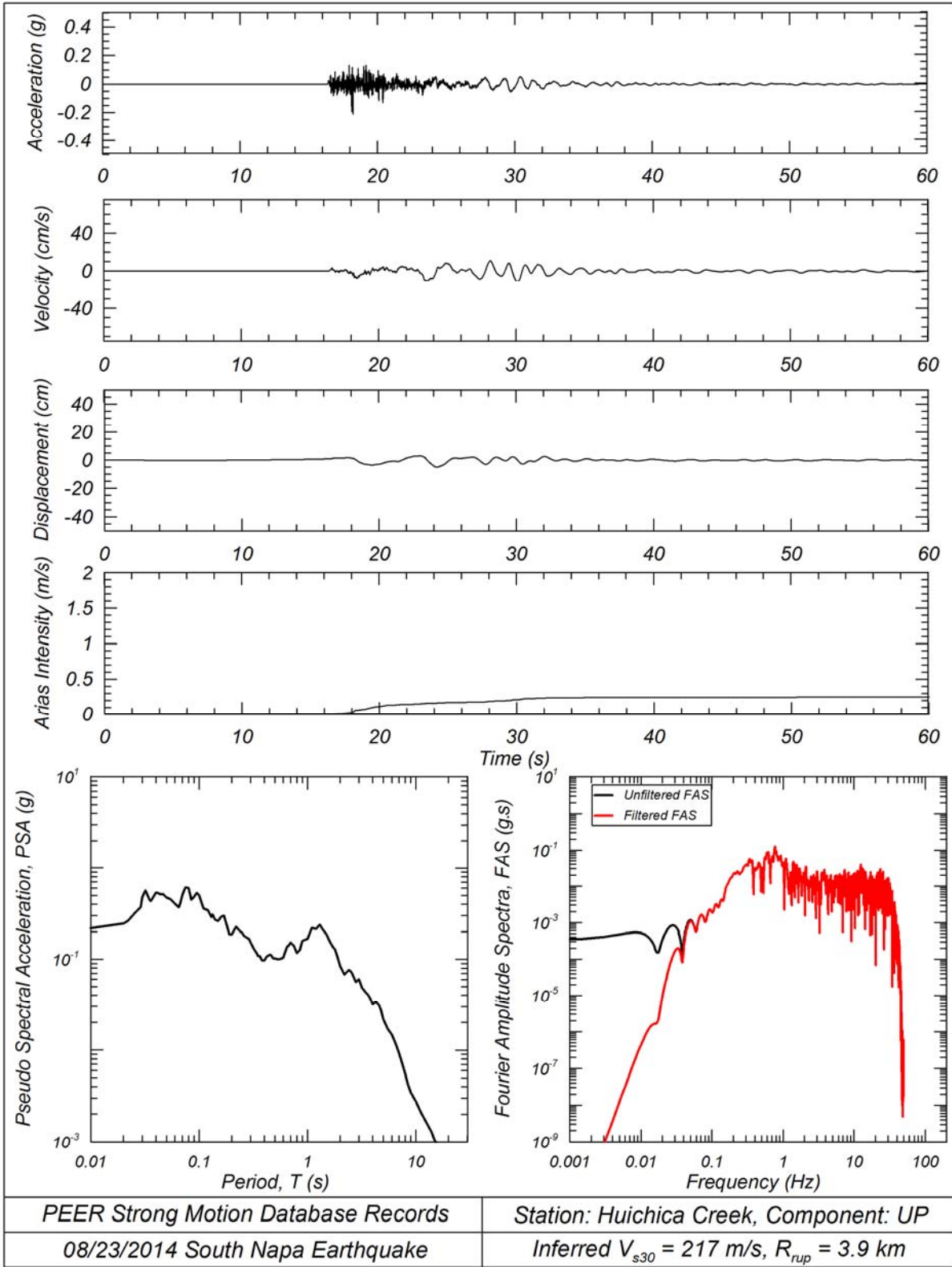




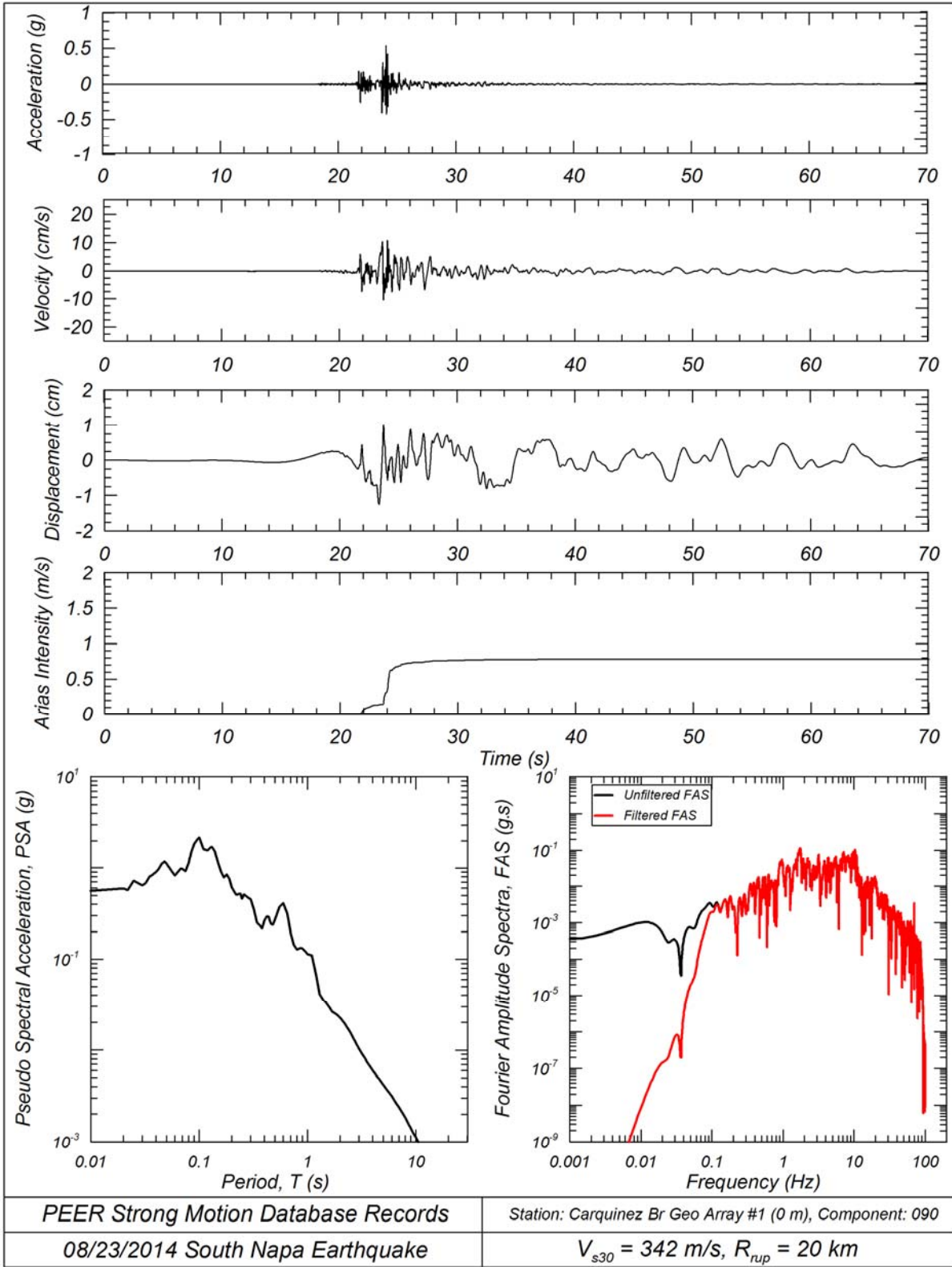


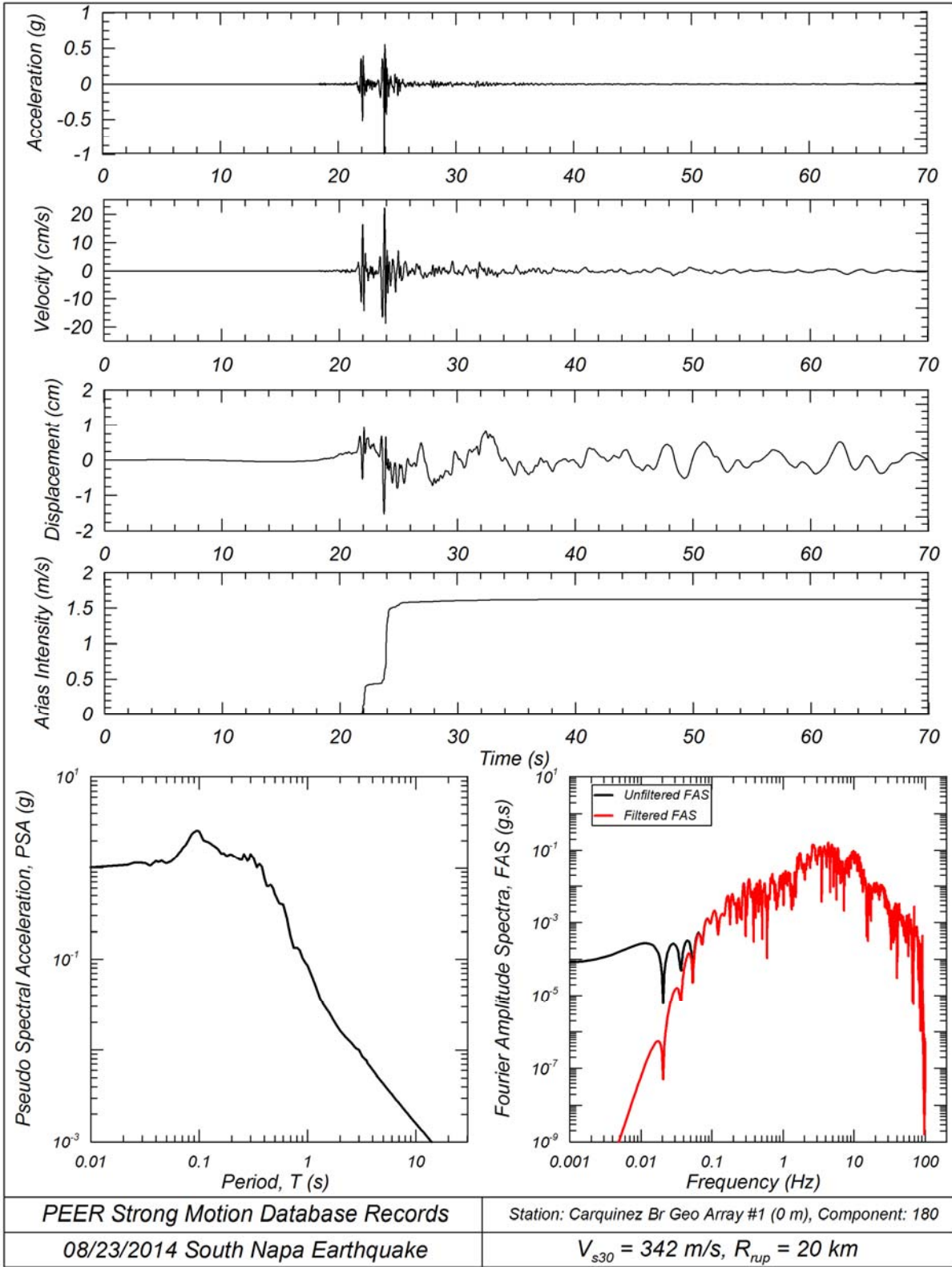


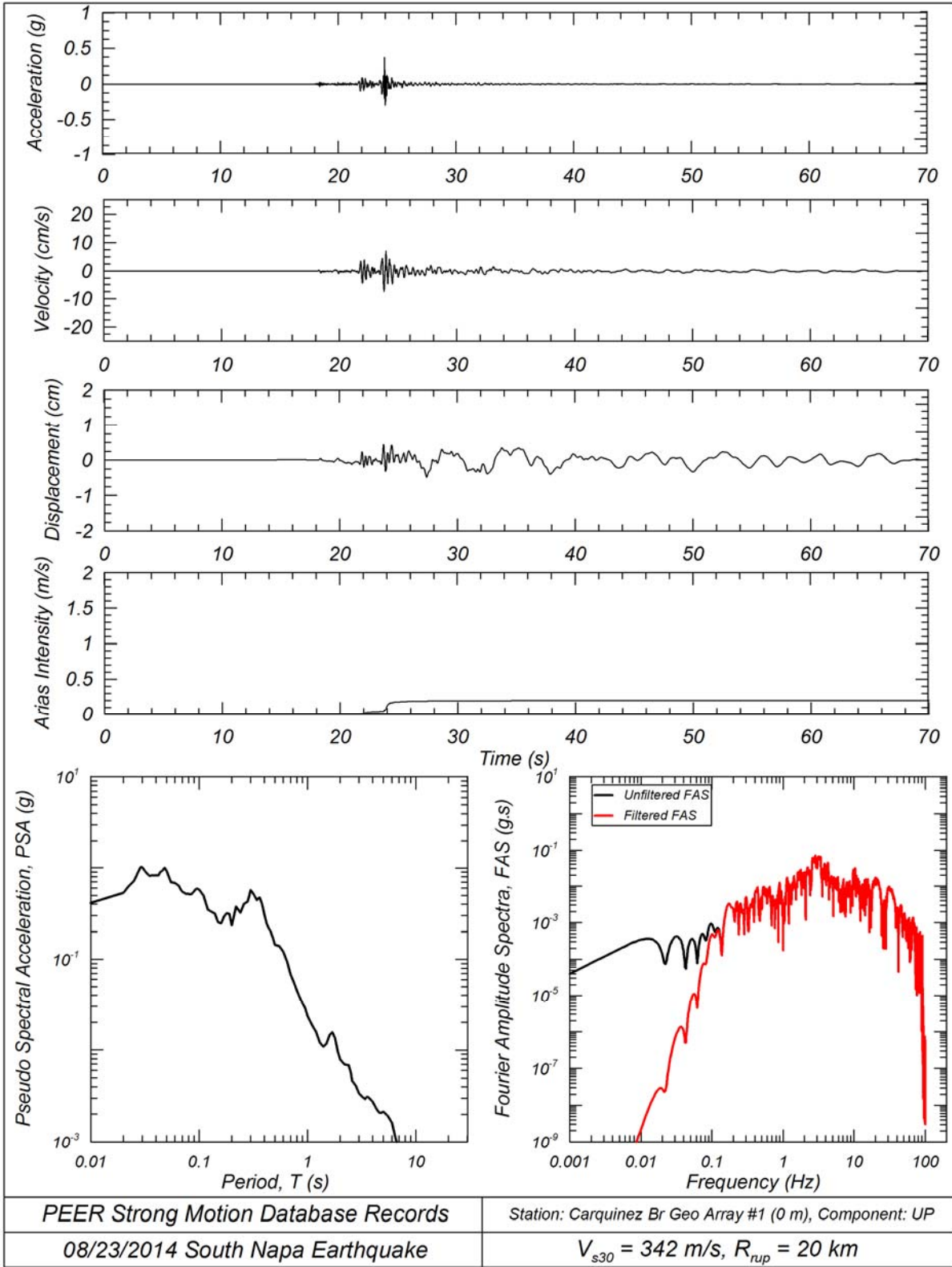


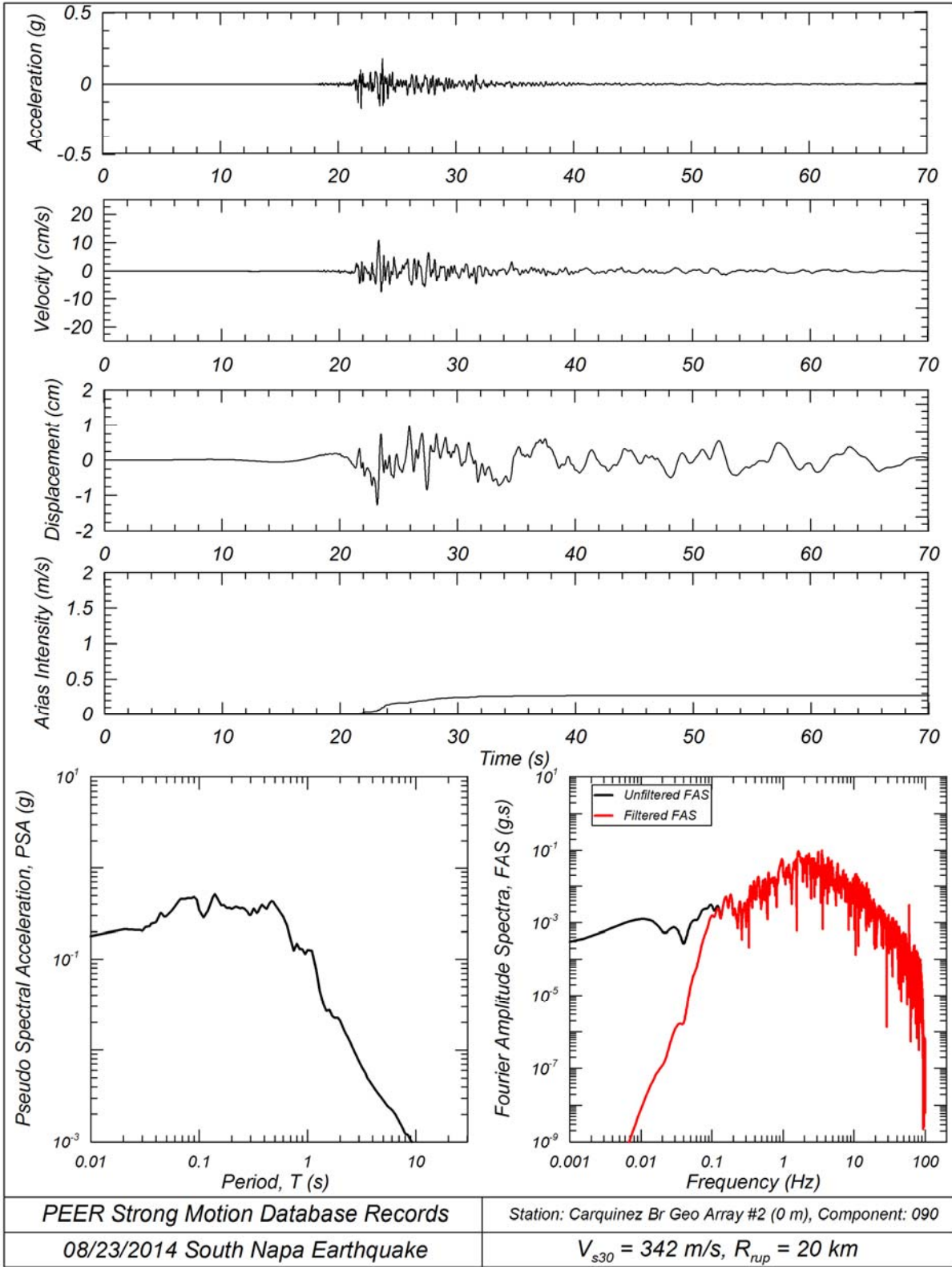


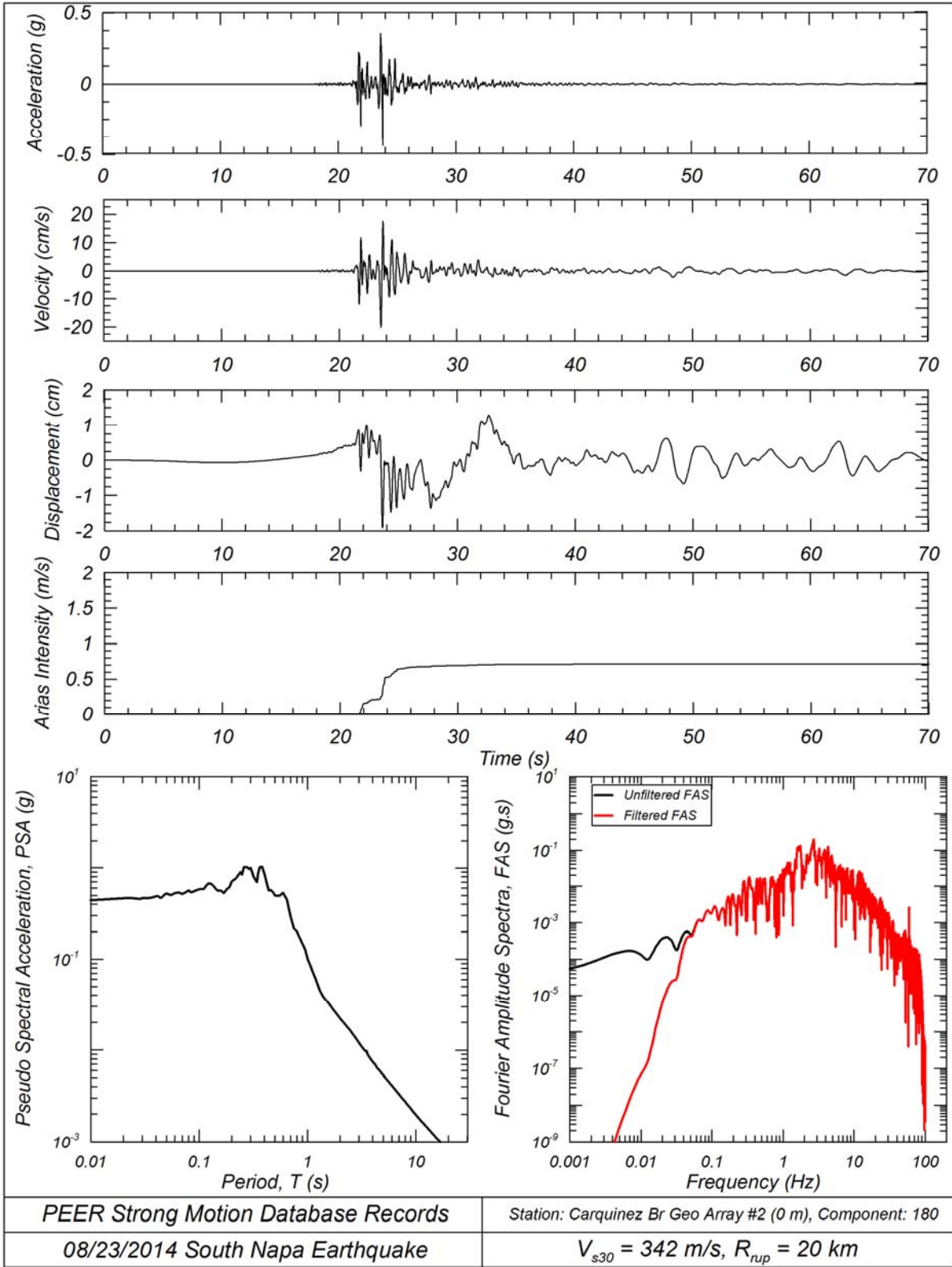




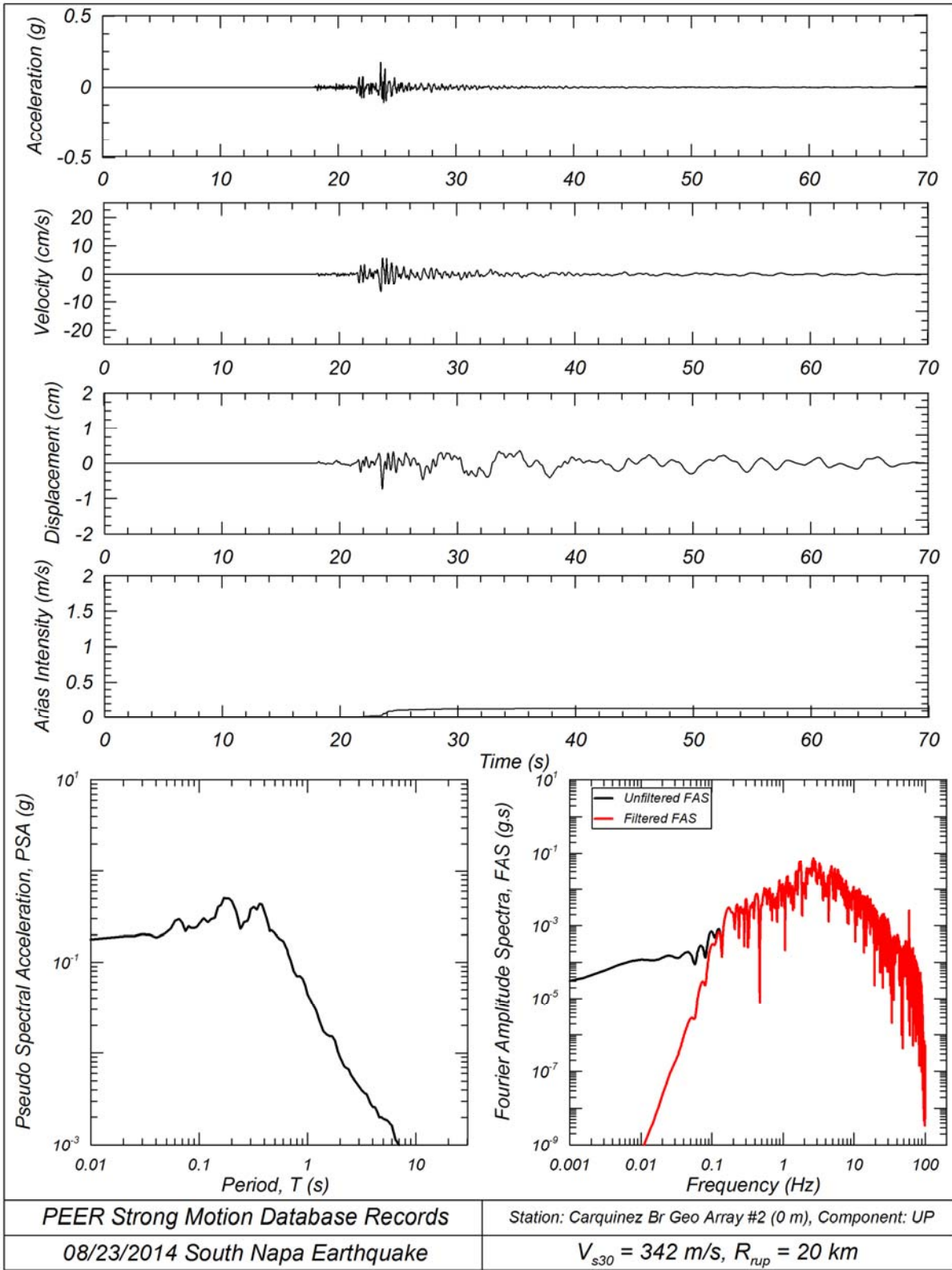


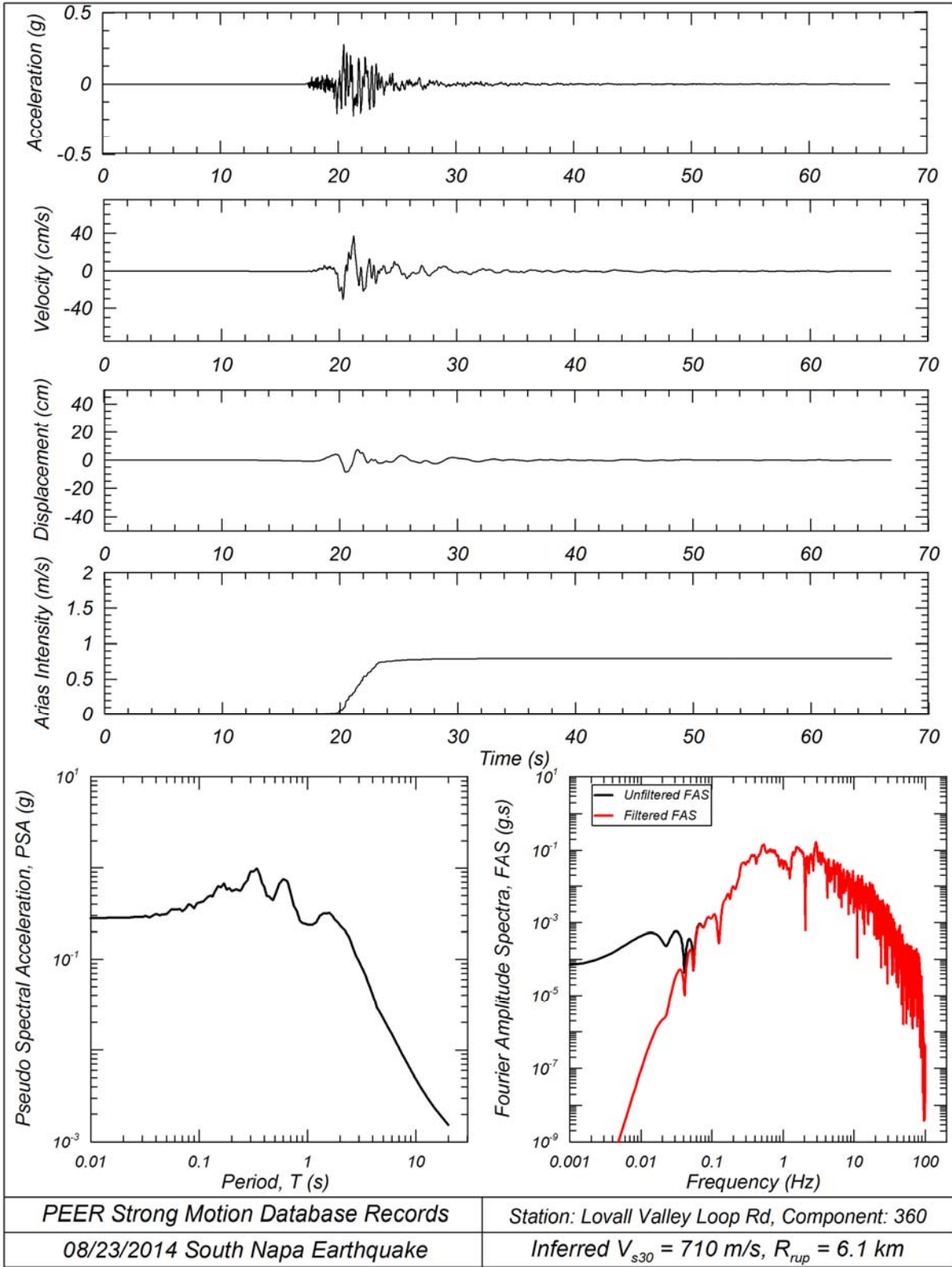


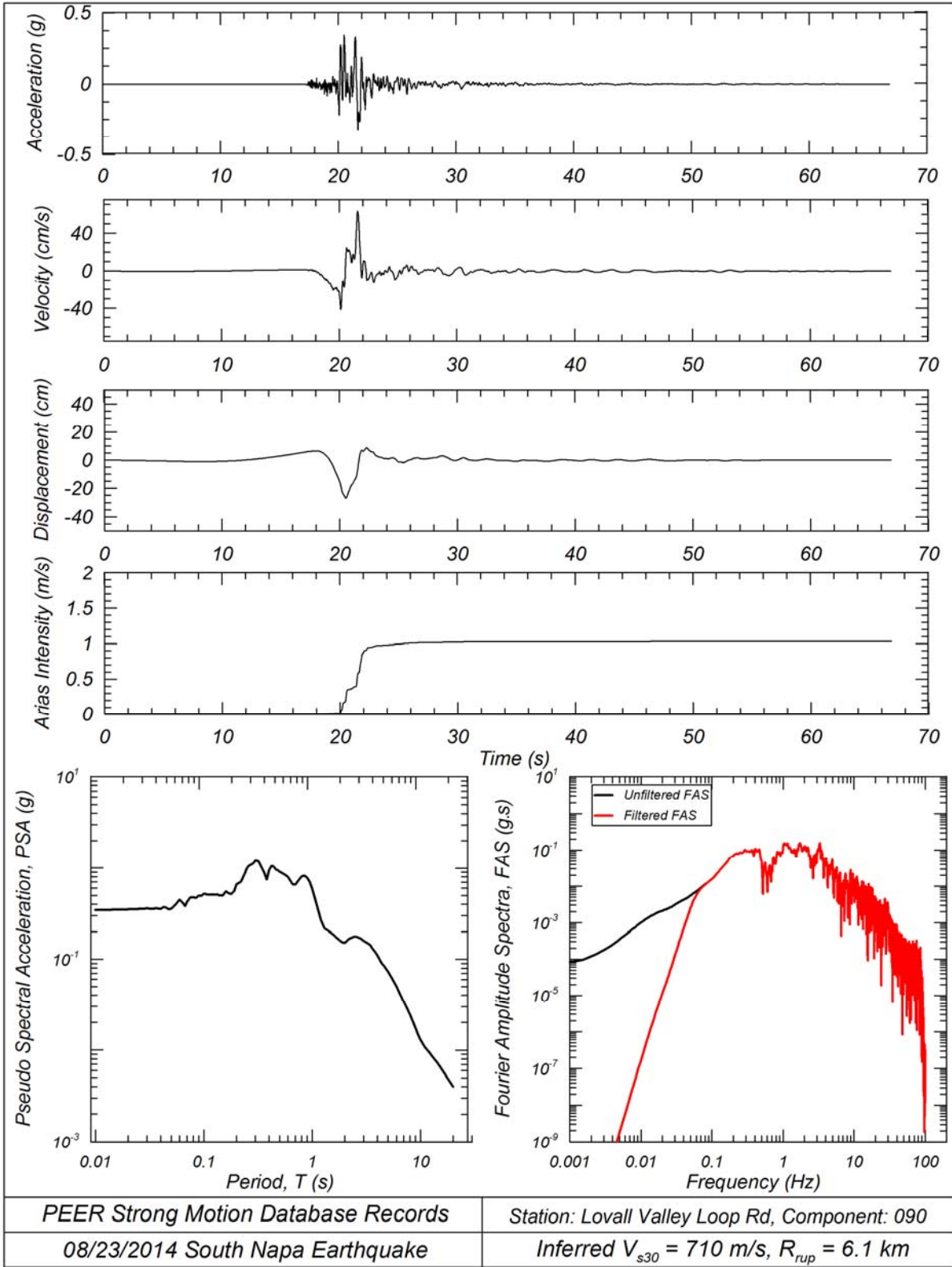




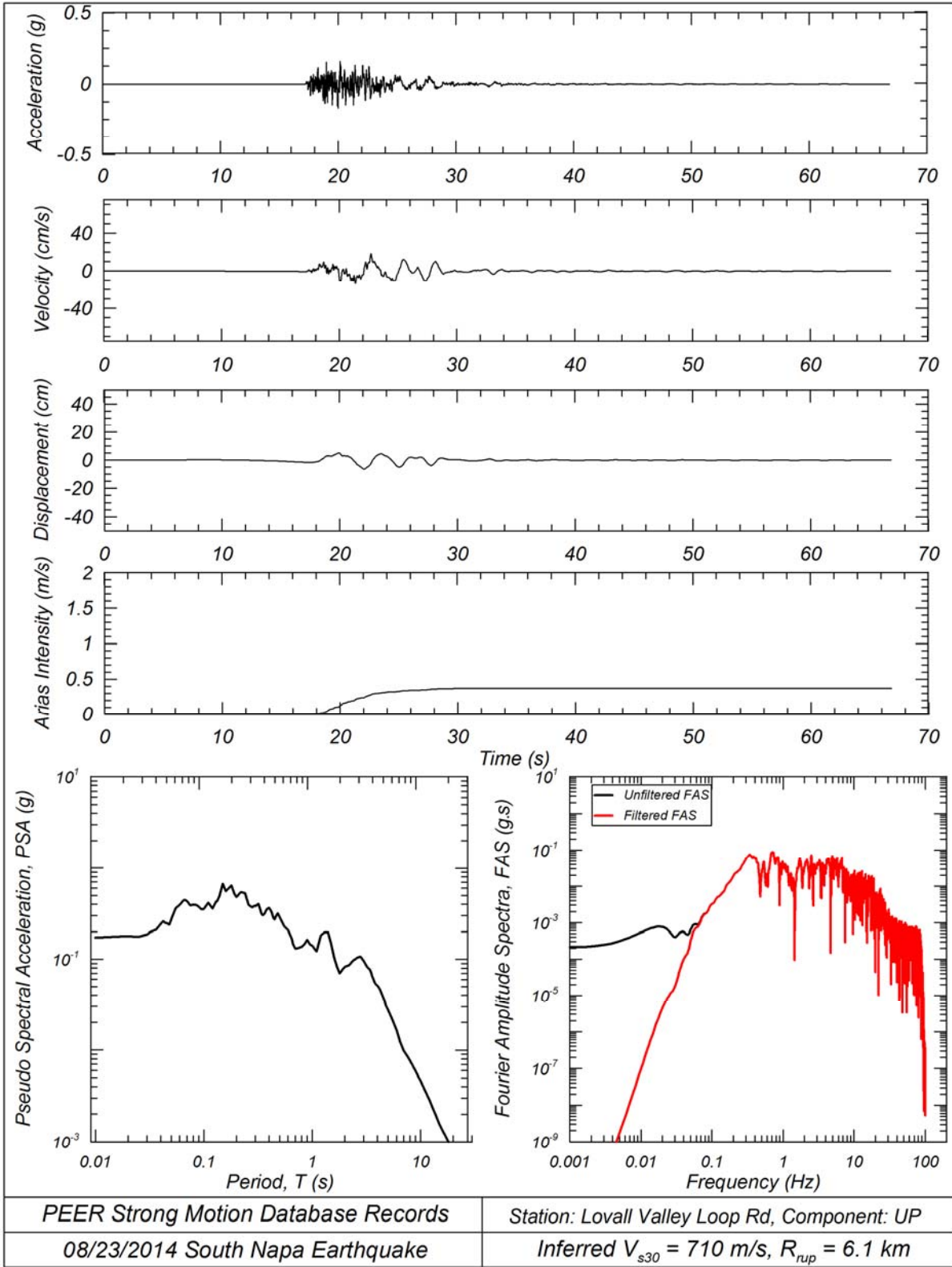


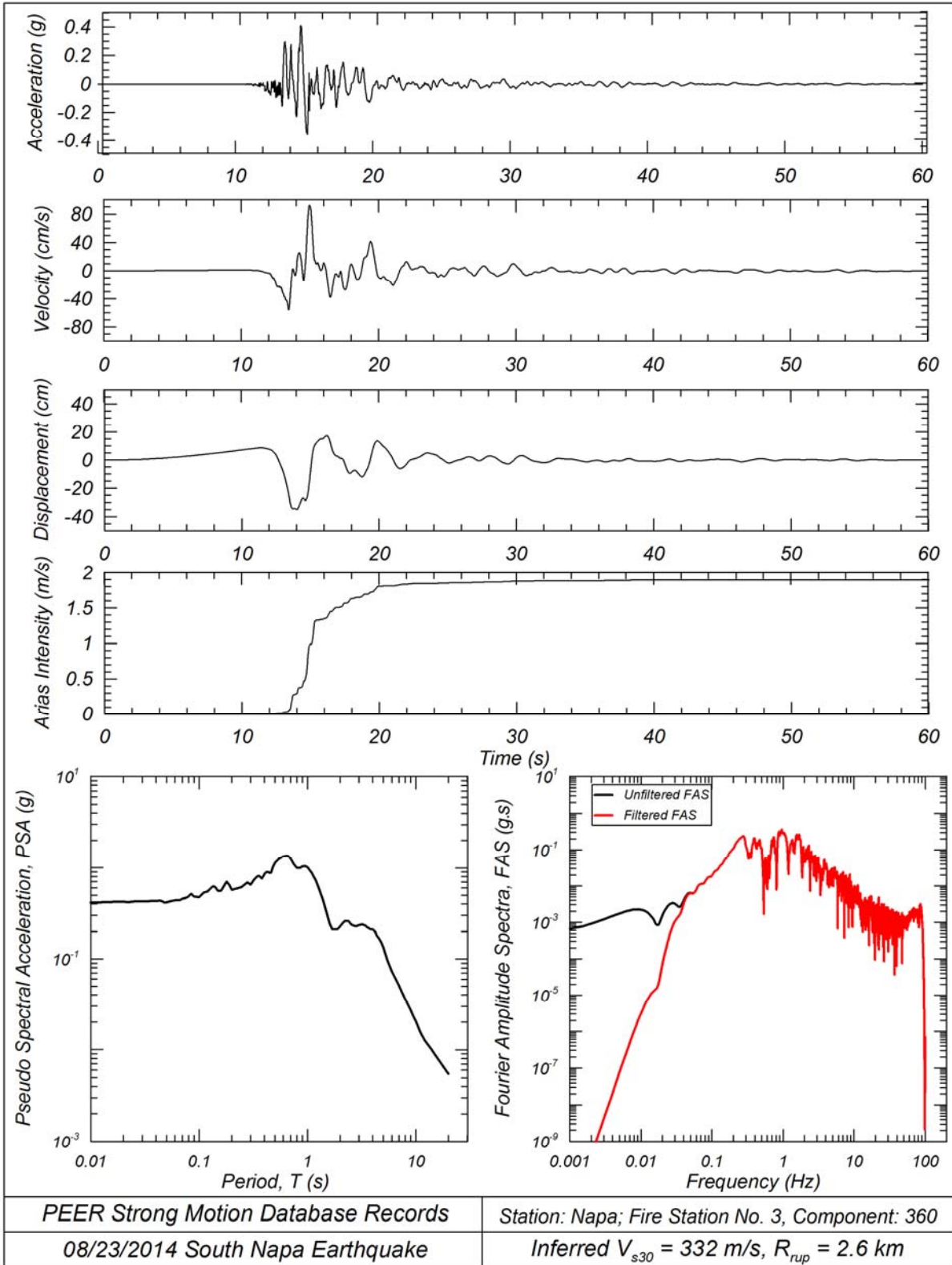


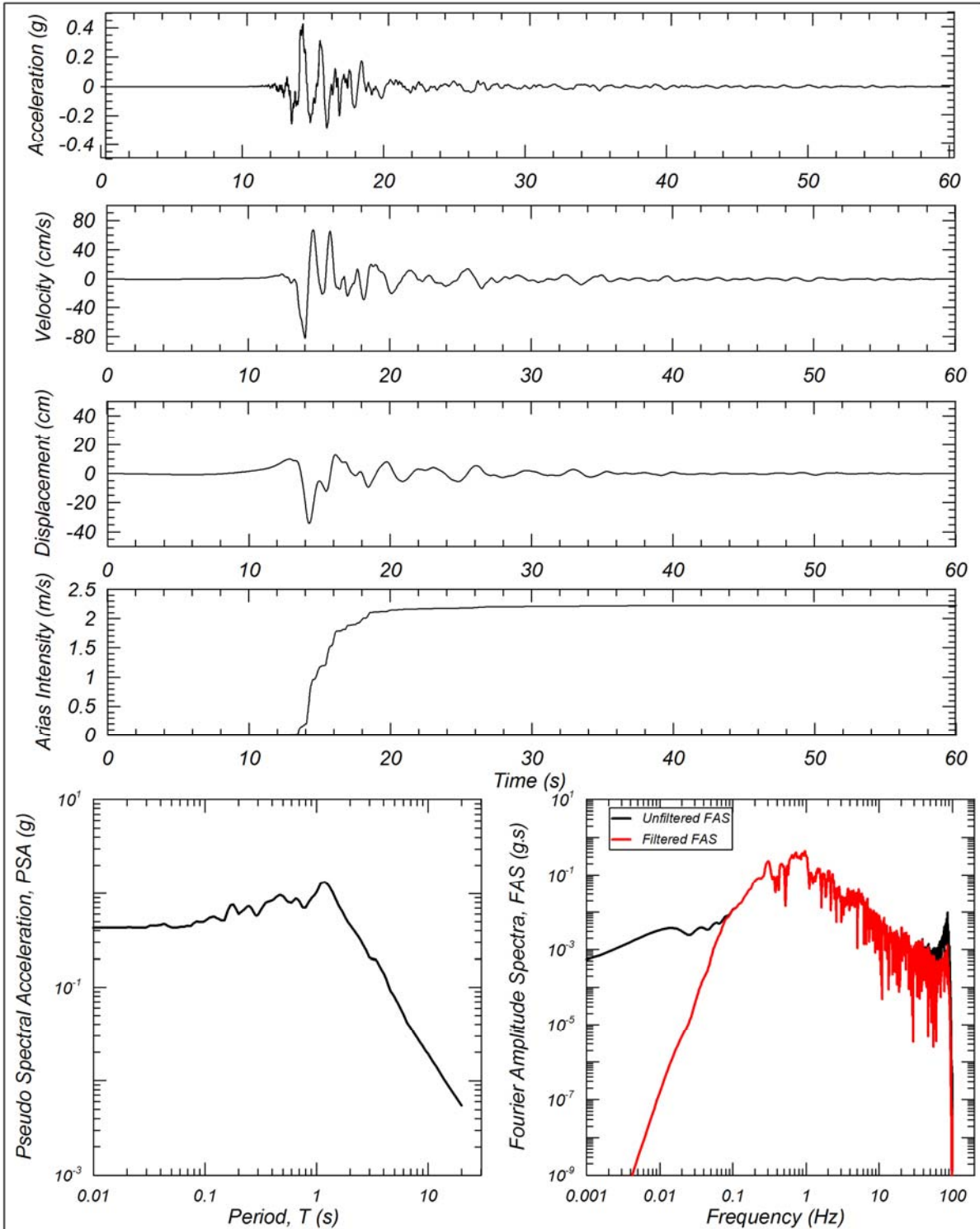




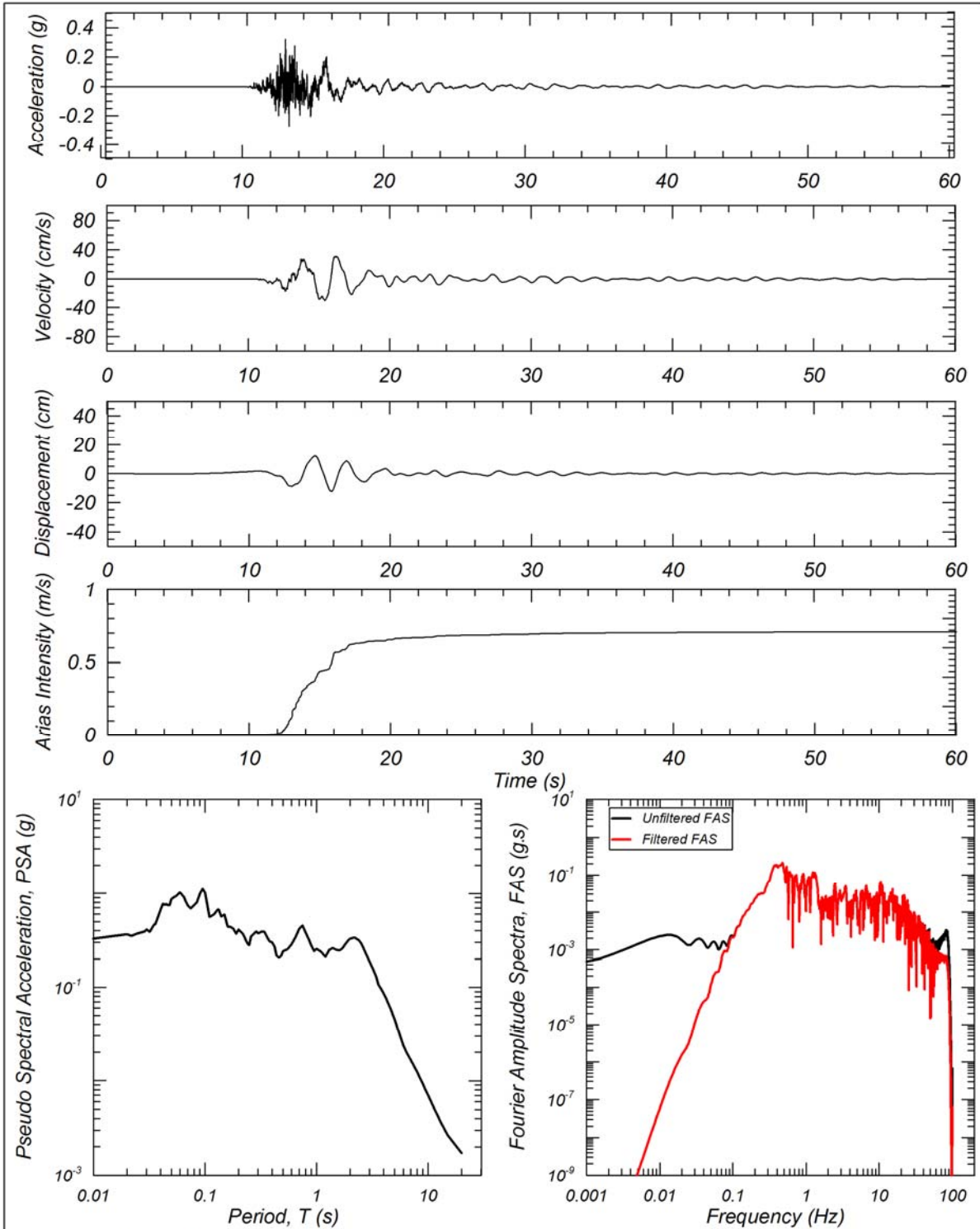




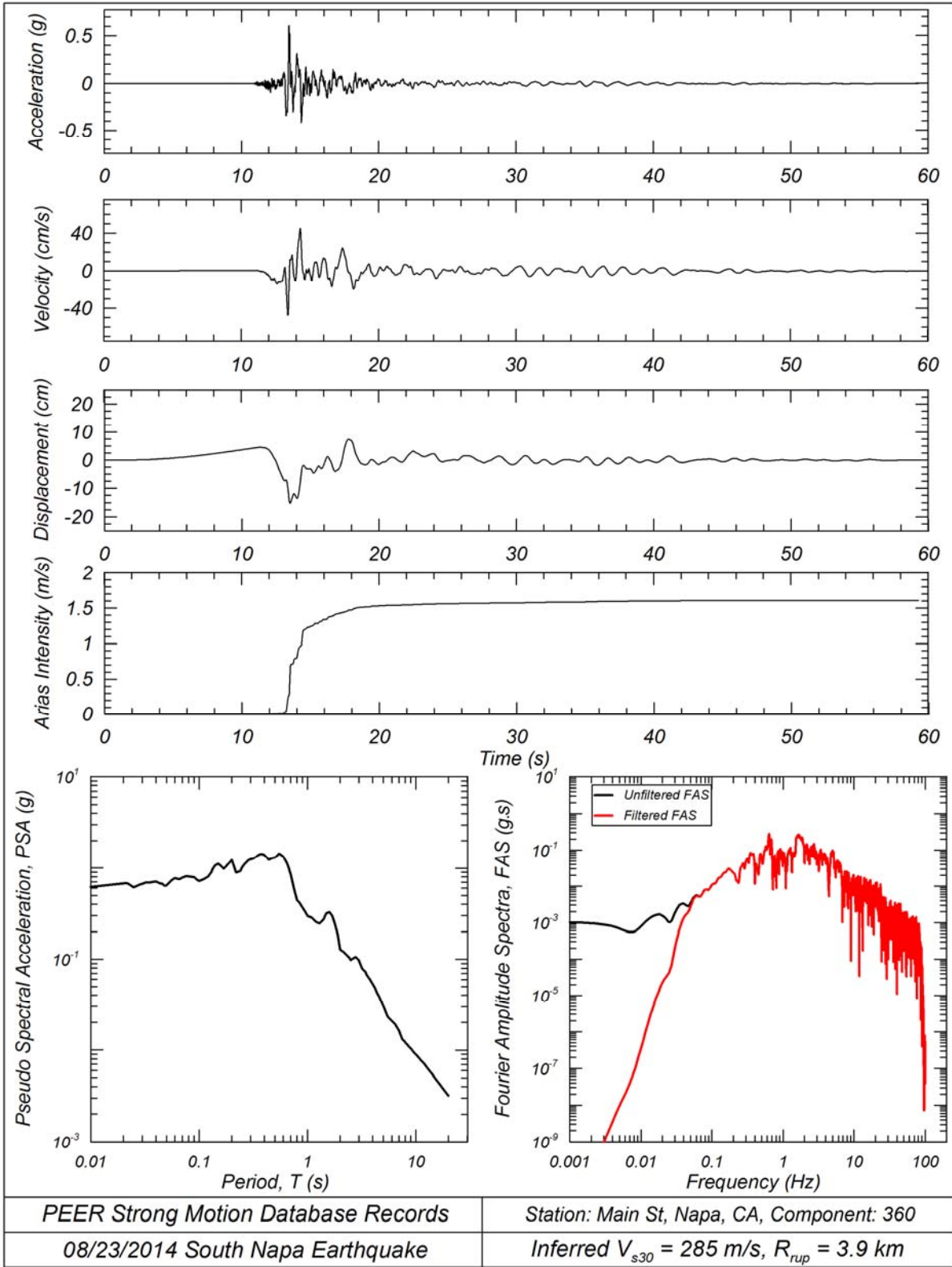




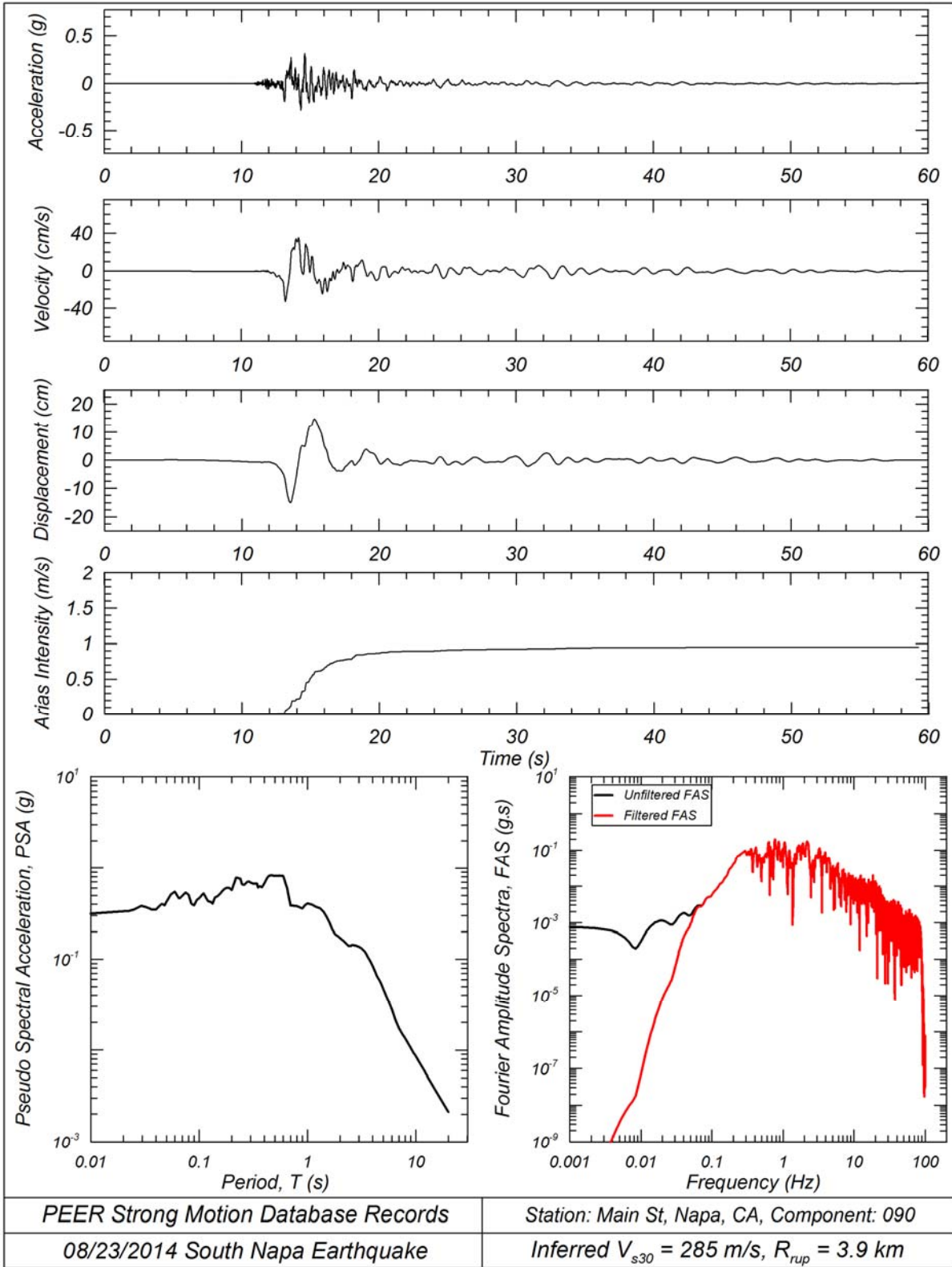
PEER Strong Motion Database Records	Station: Napa; Fire Station No. 3, Component: 090
08/23/2014 South Napa Earthquake	Inferred $V_{s30} = 332$ m/s, $R_{rup} = 2.6$ km

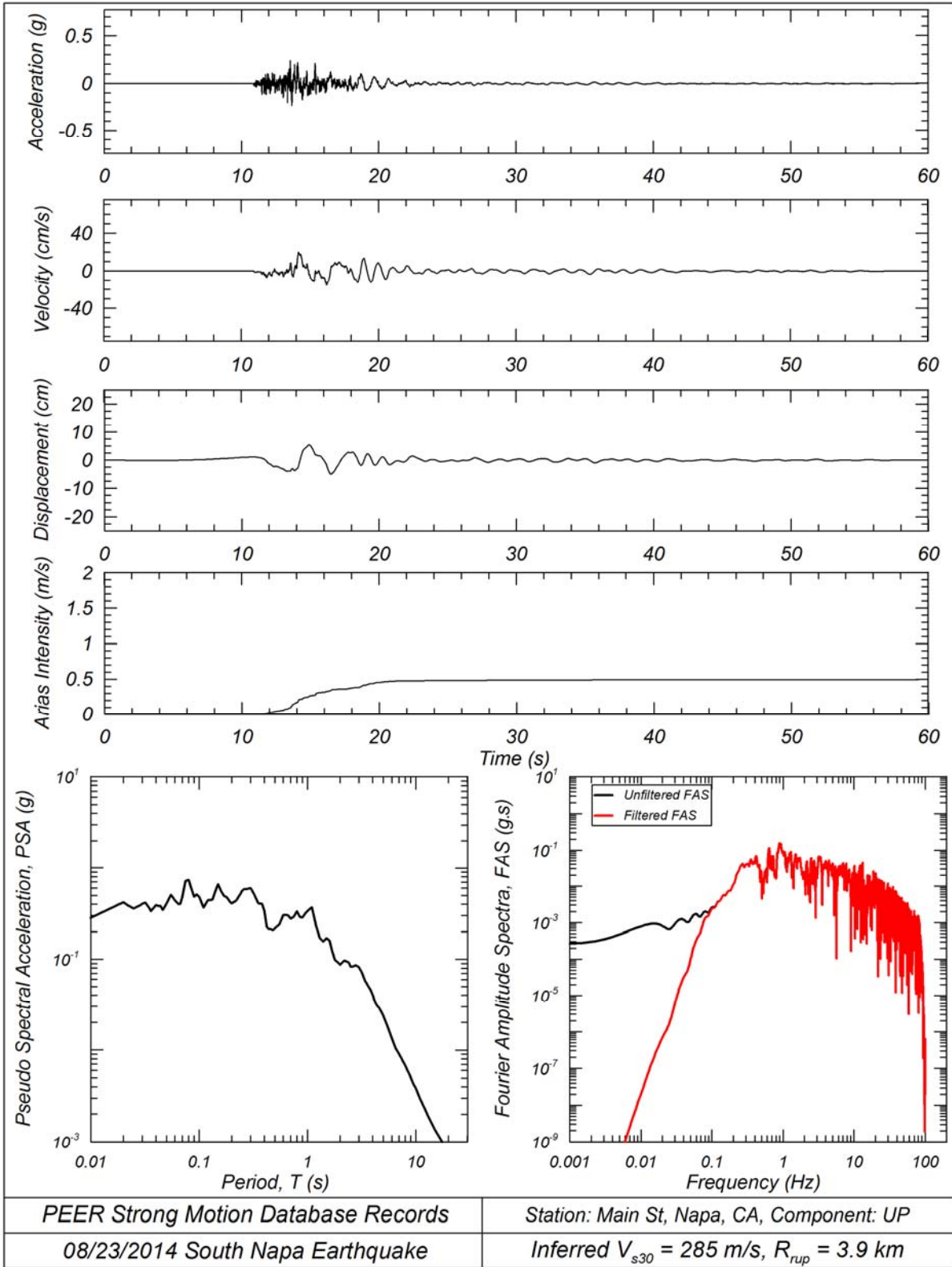


PEER Strong Motion Database Records	Station: Napa; Fire Station No. 3, Component: UP
08/23/2014 South Napa Earthquake	Inferred $V_{s30} = 332$ m/s, $R_{rup} = 2.6$ km







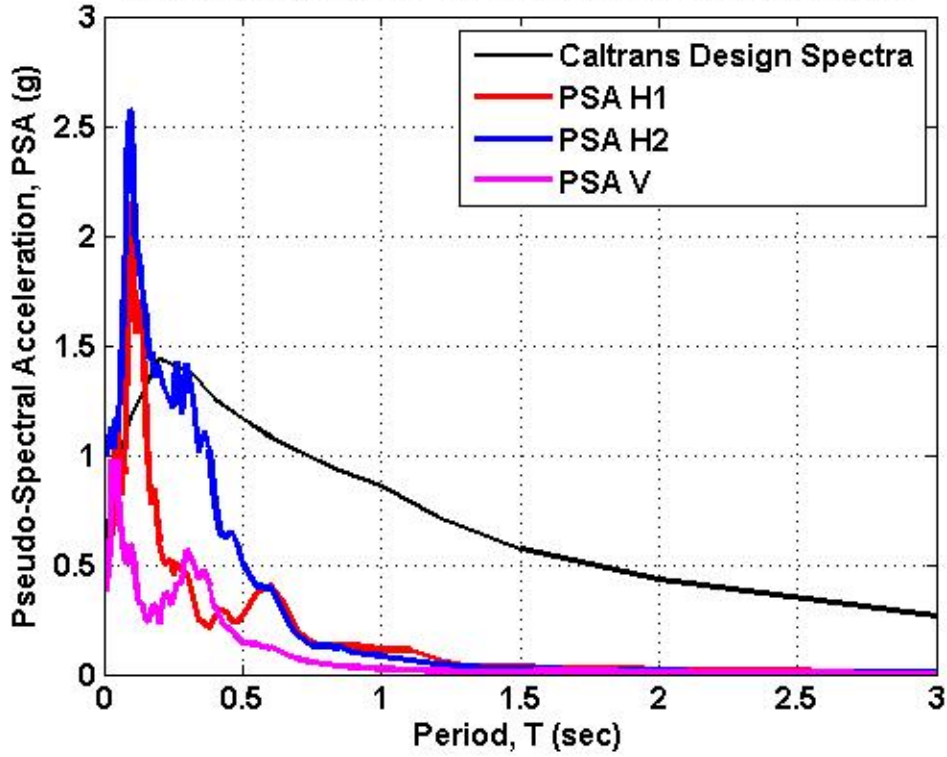


## **APPENDIX C**

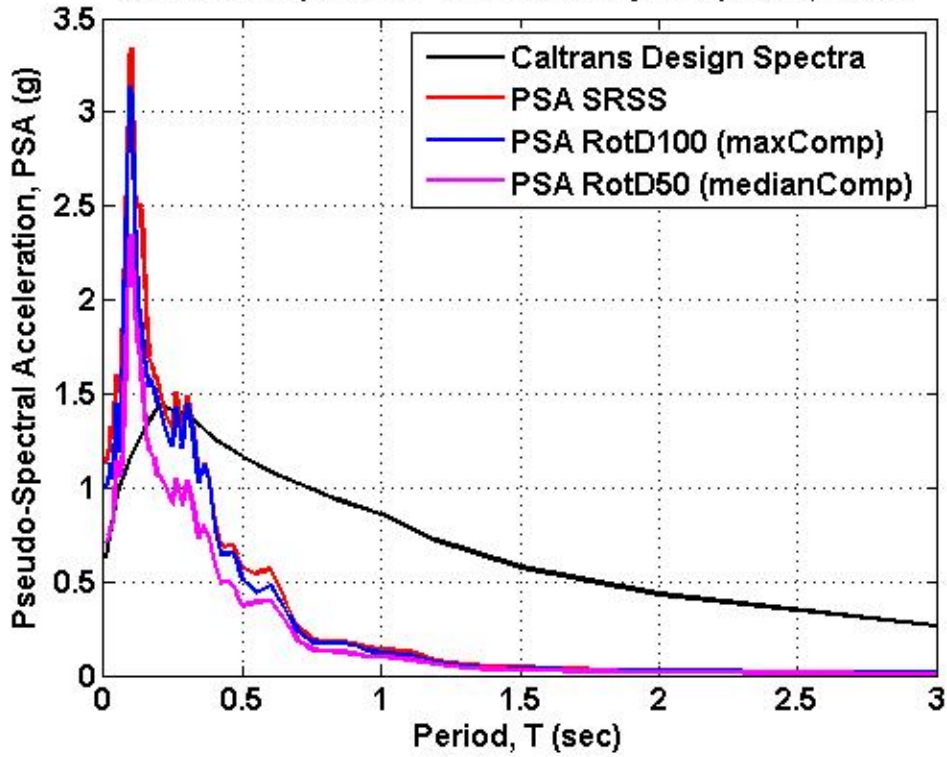
### **Comparison of Recorded Response Spectra and Cod-Based Design Spectra**



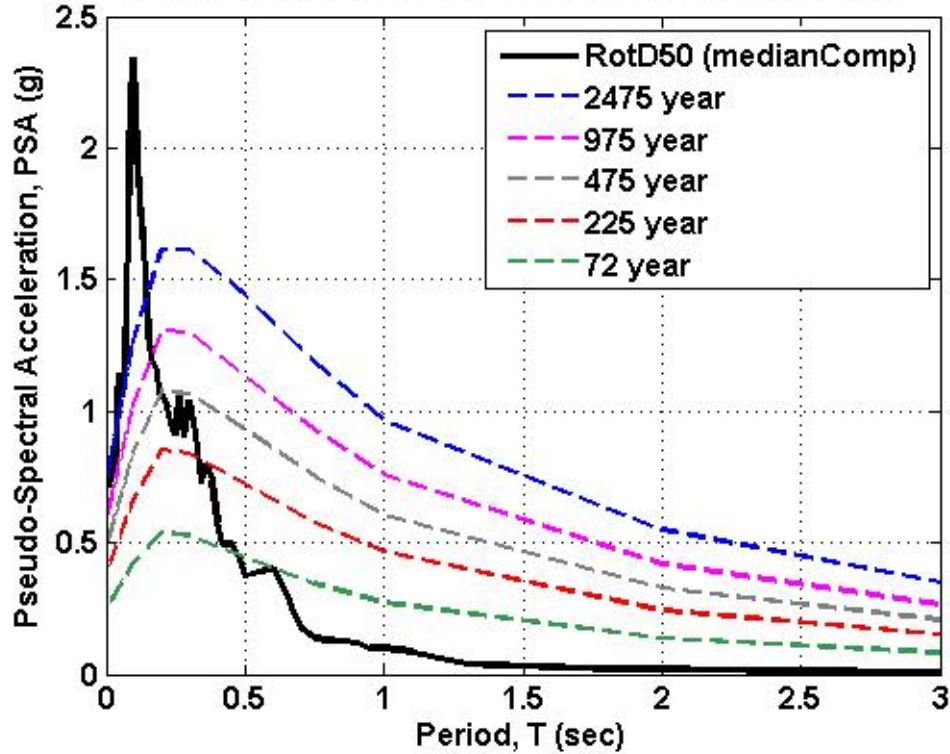
Crockett-Carquinez Br Geotech Array #1 Spectra, PSA-T



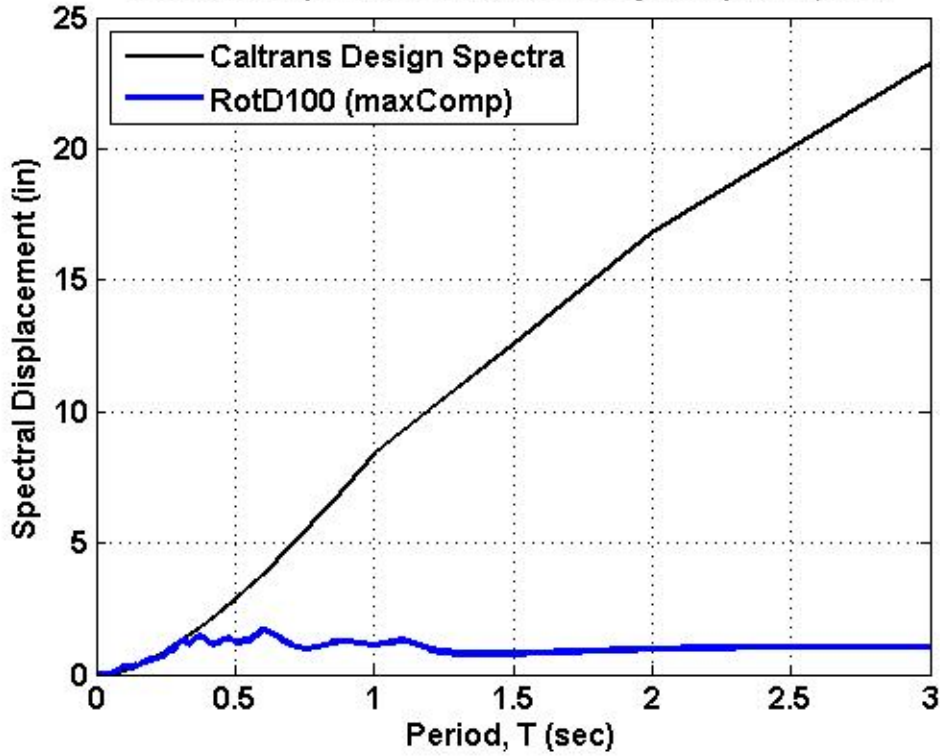
Crockett-Carquinez Br Geotech Array #1 Spectra, PSA-T



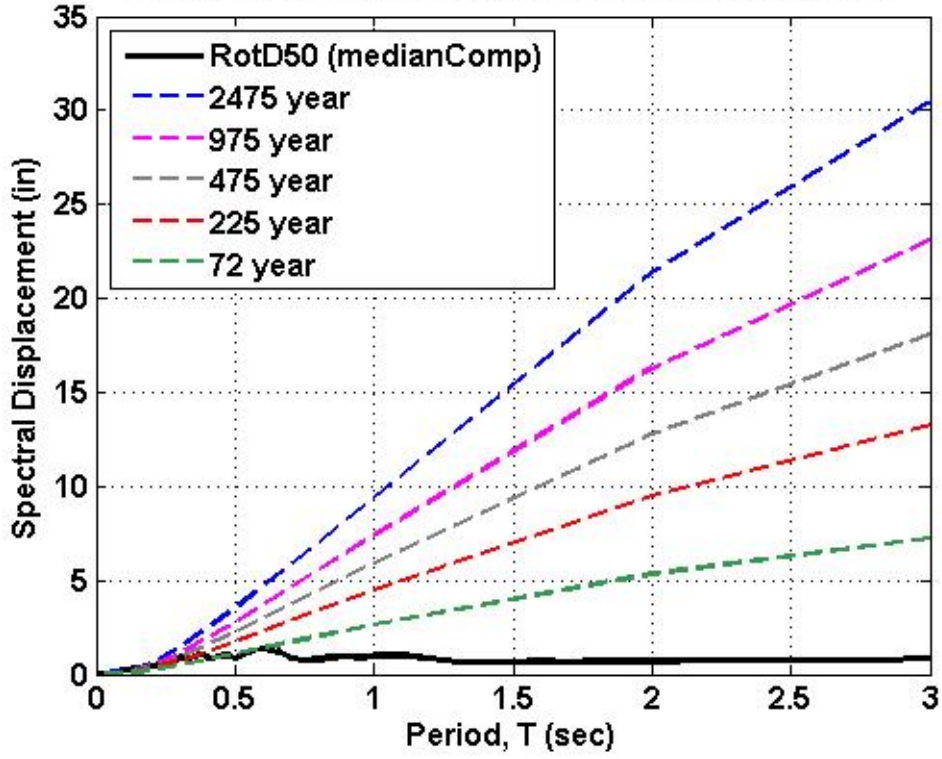
Crockett-Carquinez Br Geotech Array #1 Spectra, PSA-T

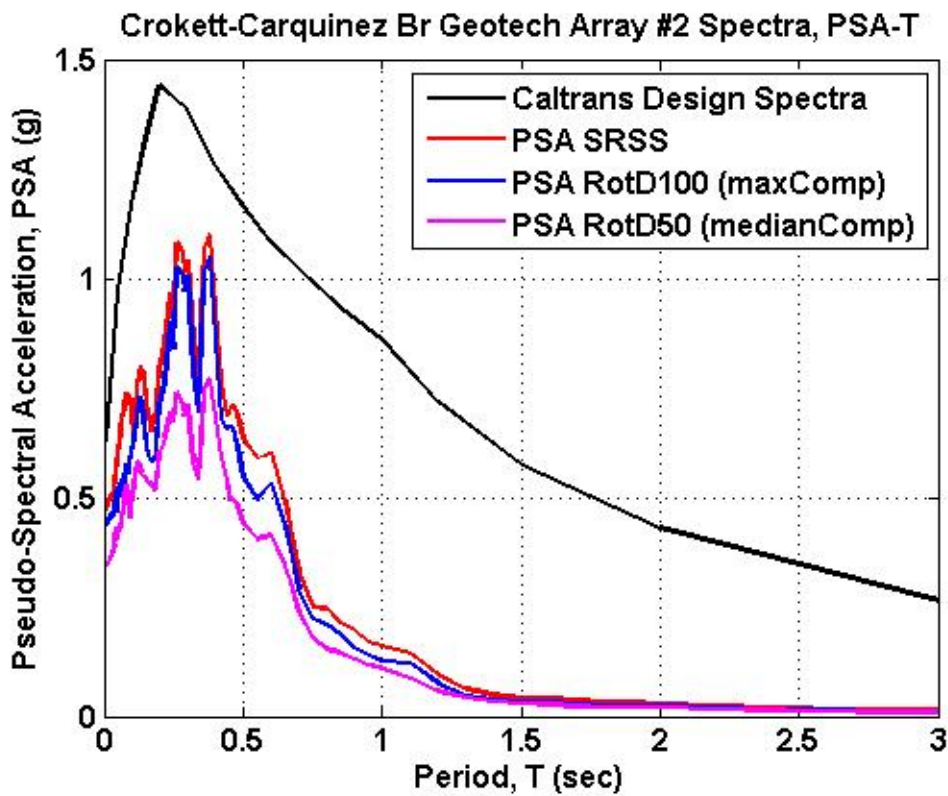
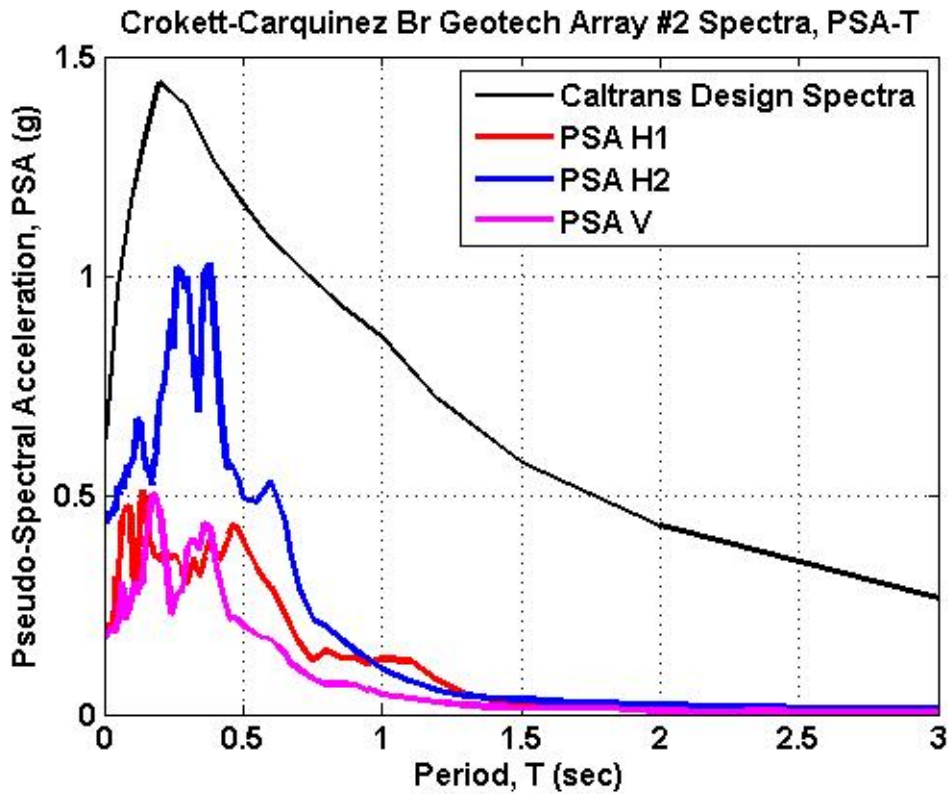


Crockett-Carquinez Br Geotech Array #1 Spectra, Sd-T

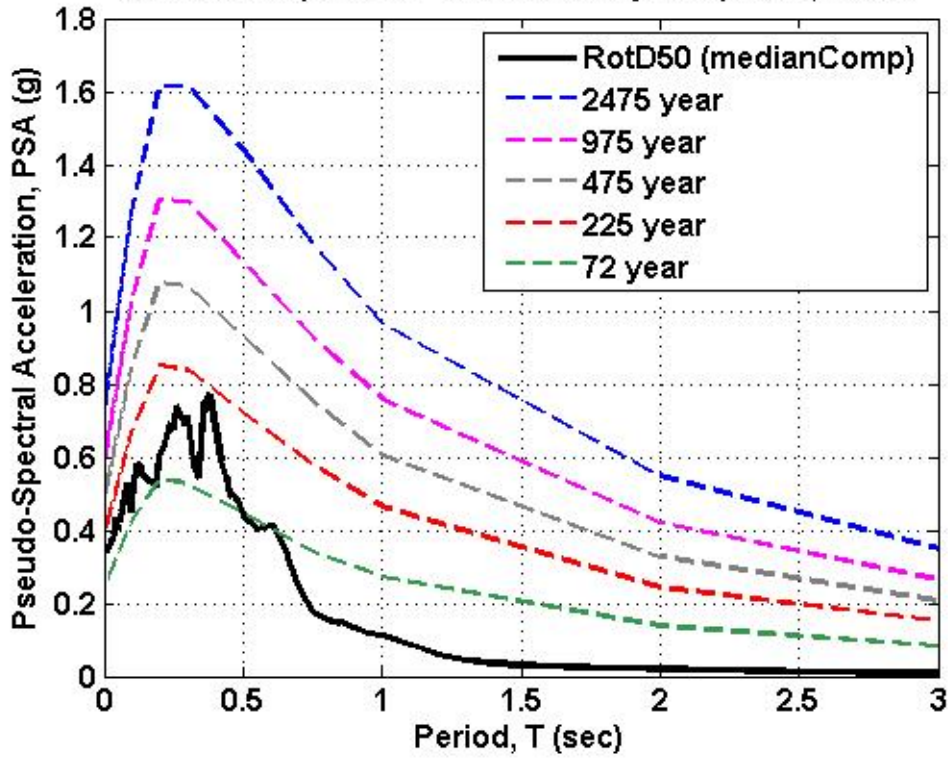


Crockett-Carquinez Br Geotech Array #1 Spectra, Sd-T

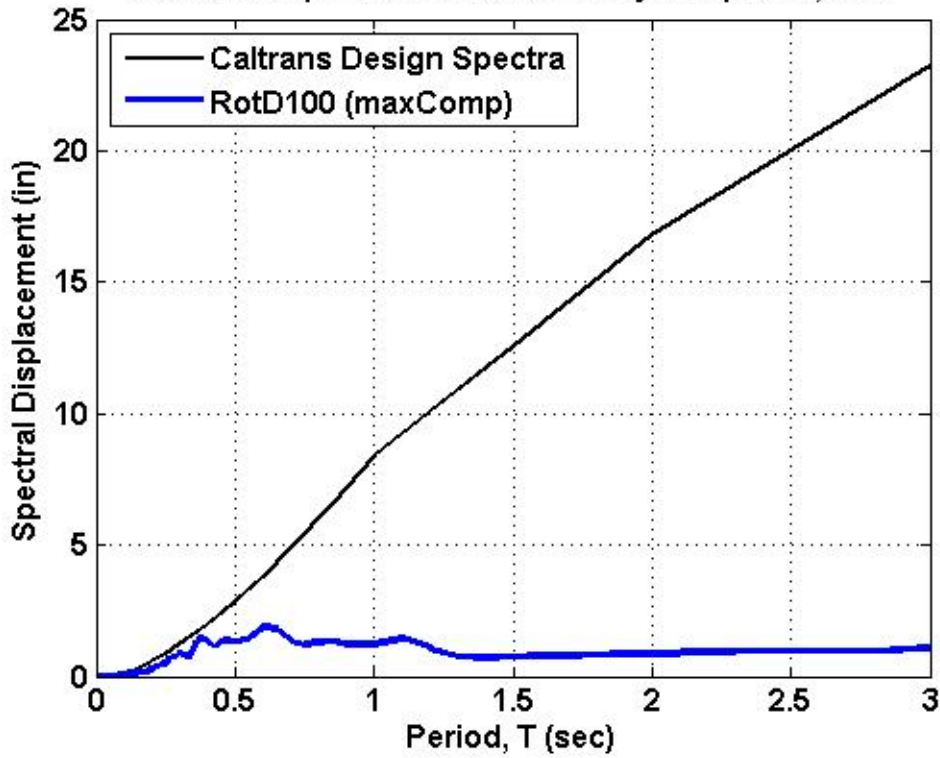




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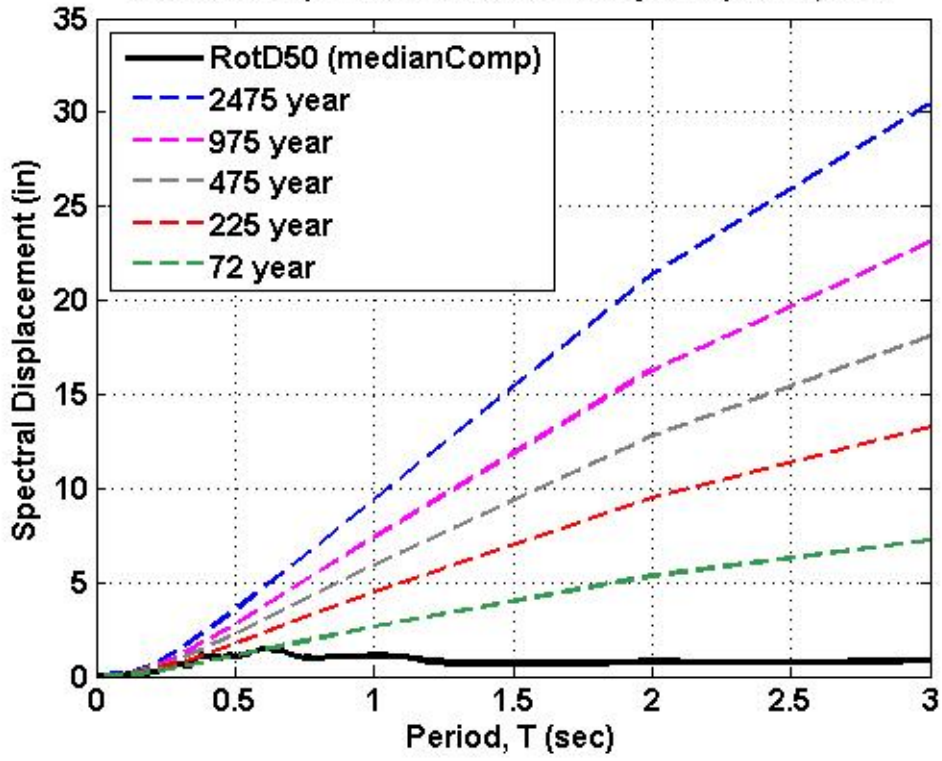


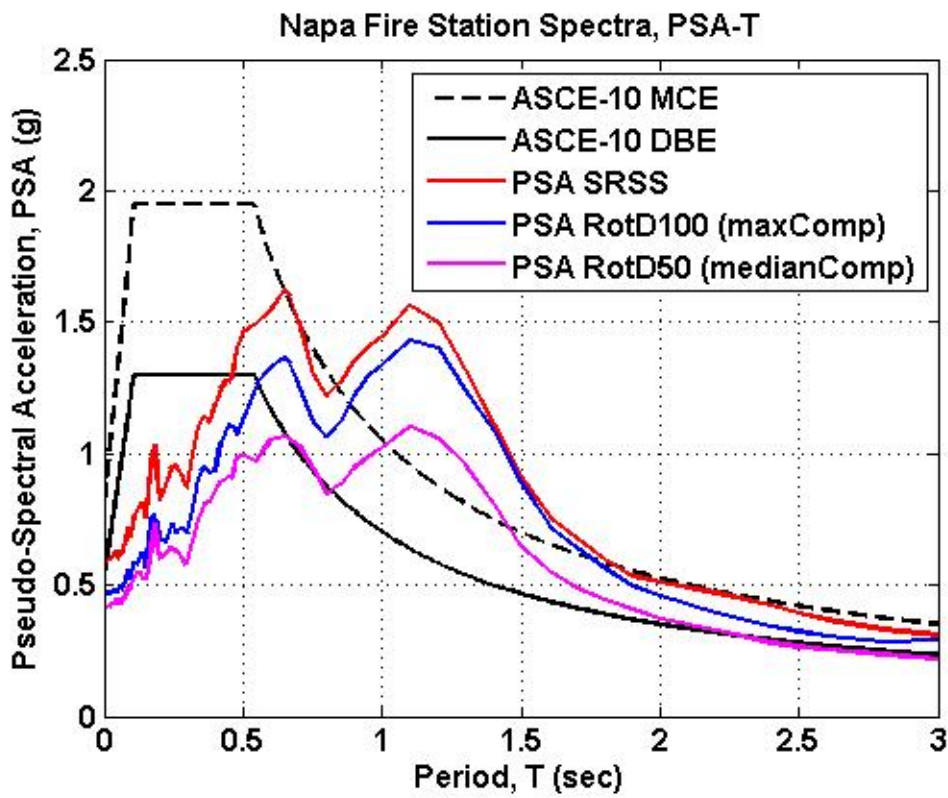
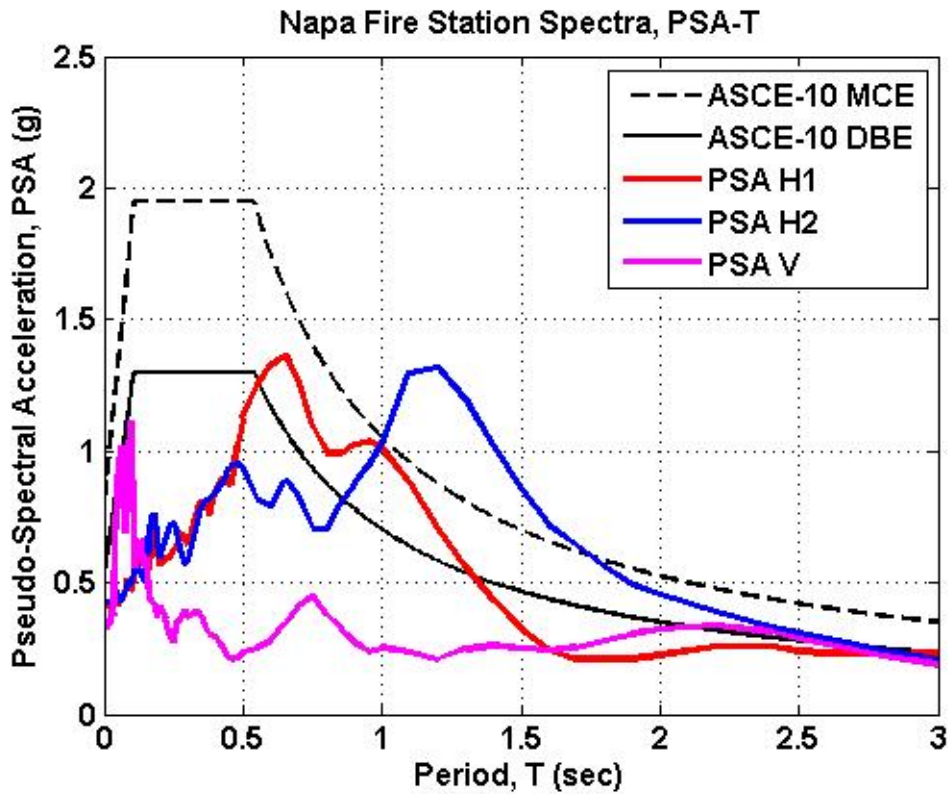
Crockett-Carquinez Br Geotech Array #2 Spectra, Sd-T



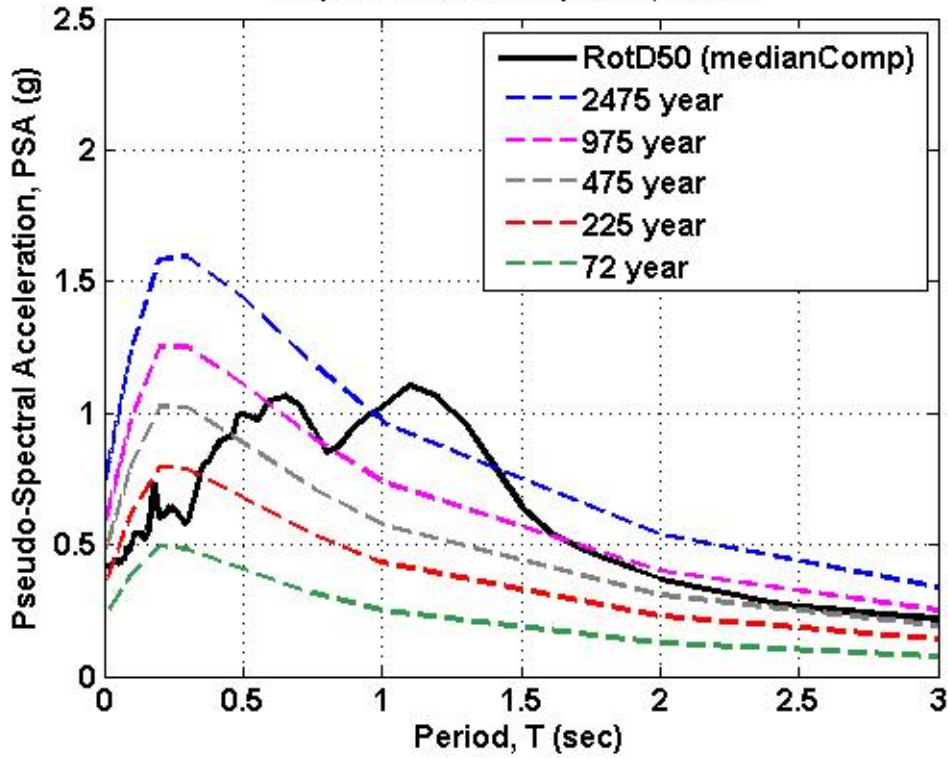


Crockett-Carquinez Br Geotech Array #2 Spectra, Sd-T

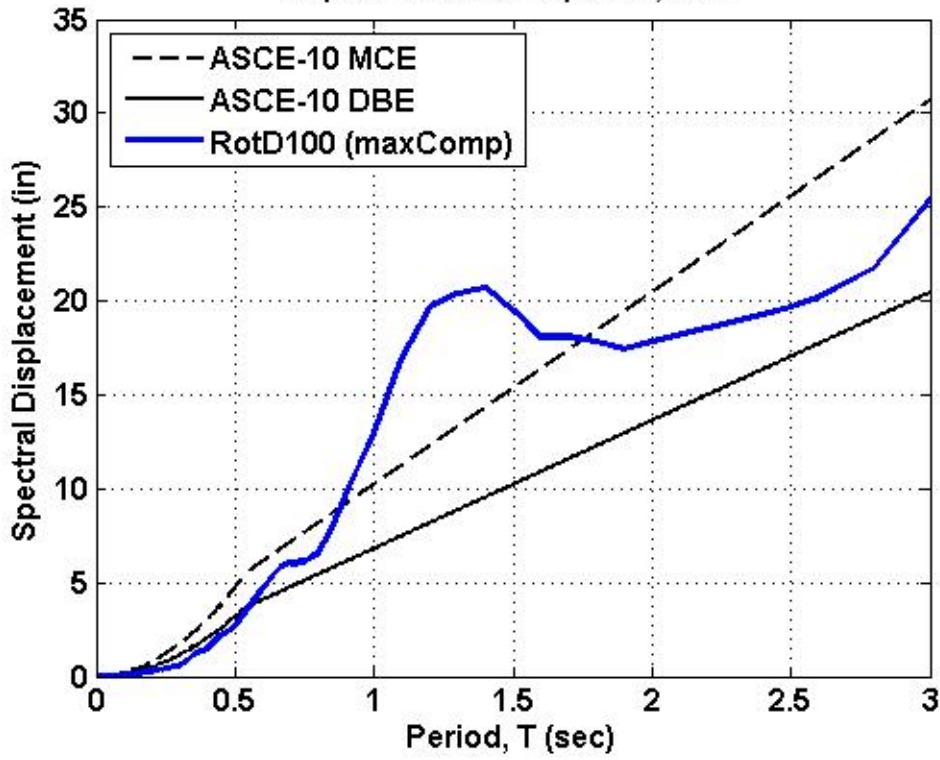




Napa Fire Station Spectra, PSA-T

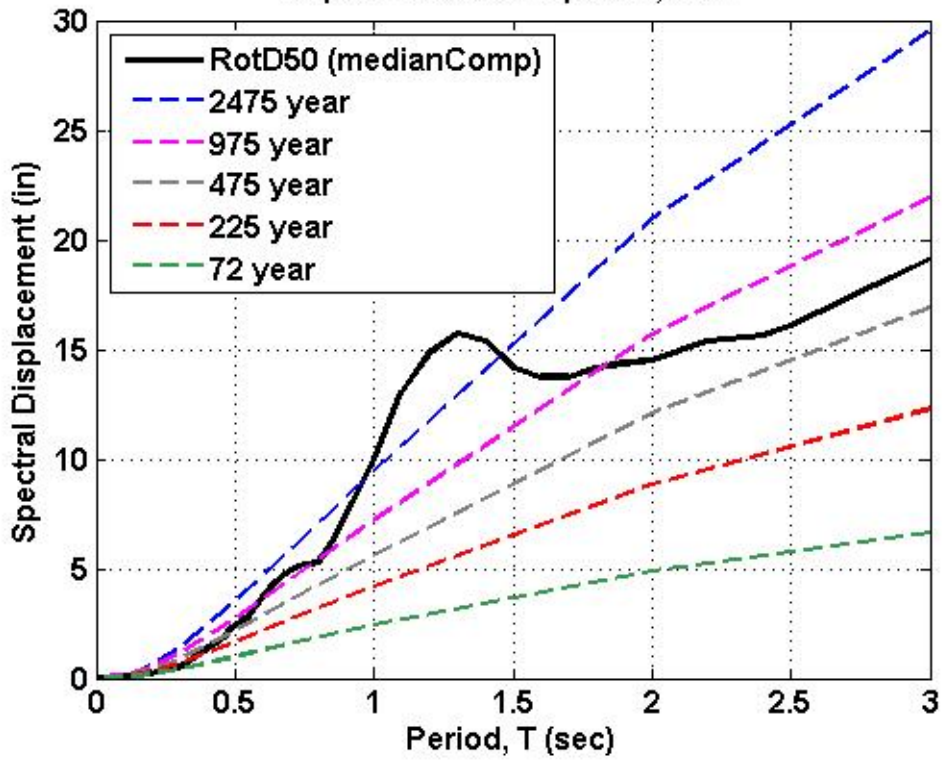


Napa Fire Station Spectra, Sd-T

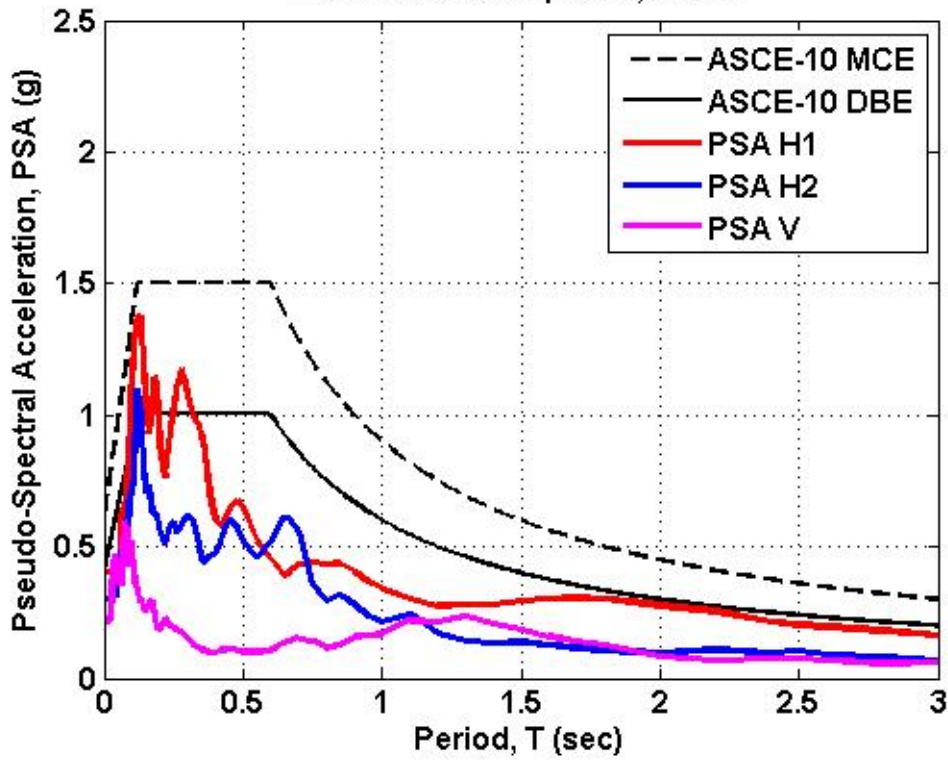




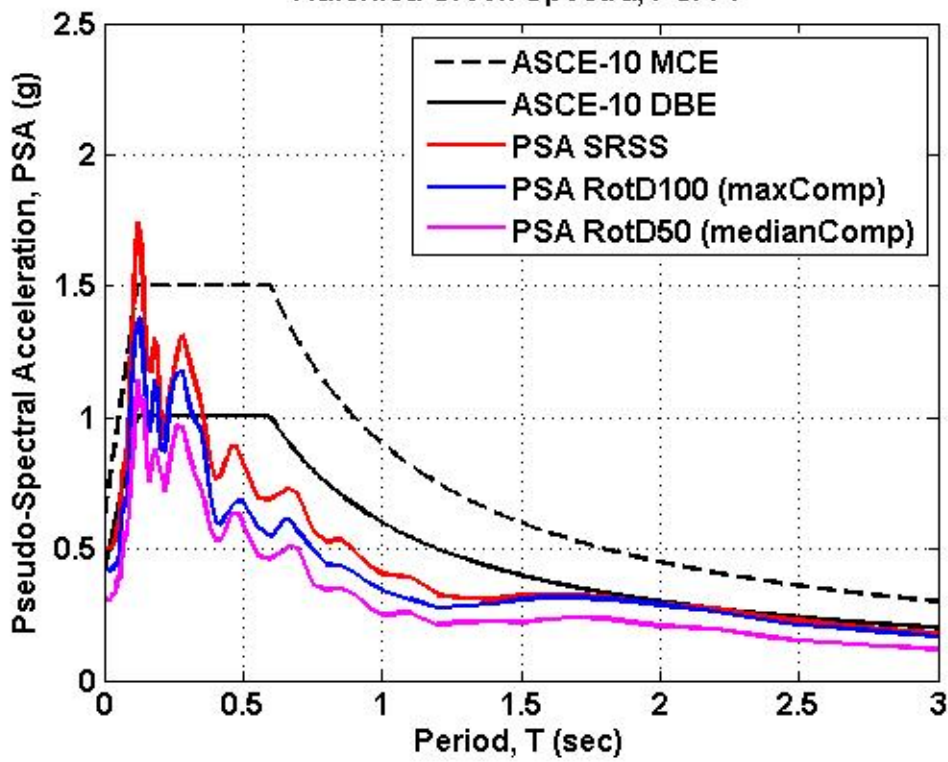
Napa Fire Station Spectra, Sd-T



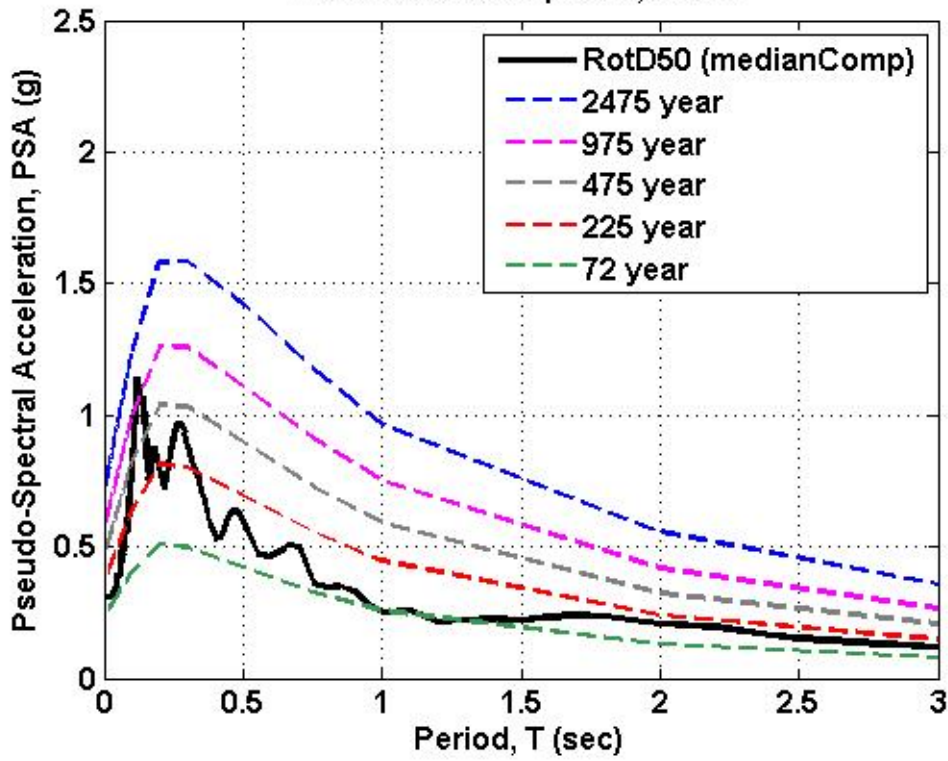
Huichica Creek Spectra, PSA-T



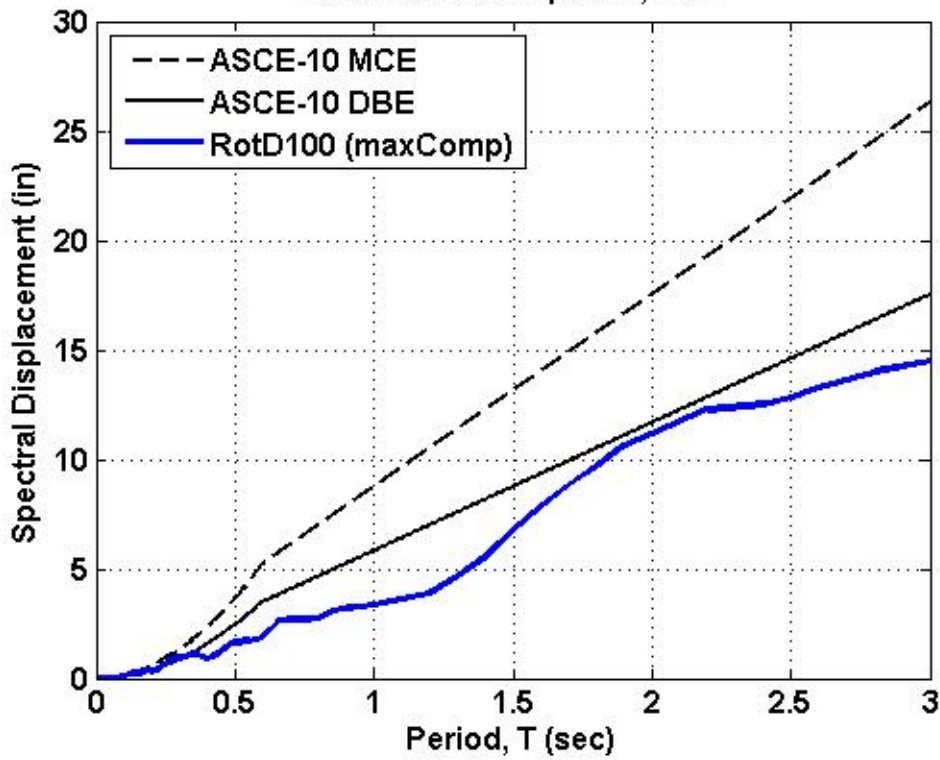
Huichica Creek Spectra, PSA-T



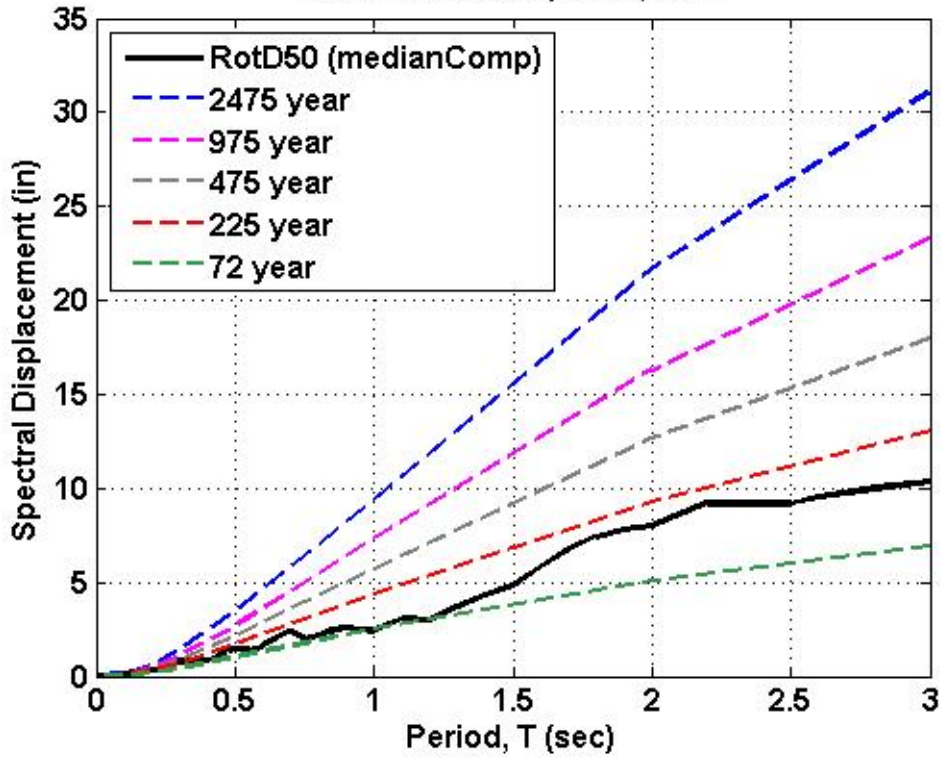
Huichica Creek Spectra, PSA-T



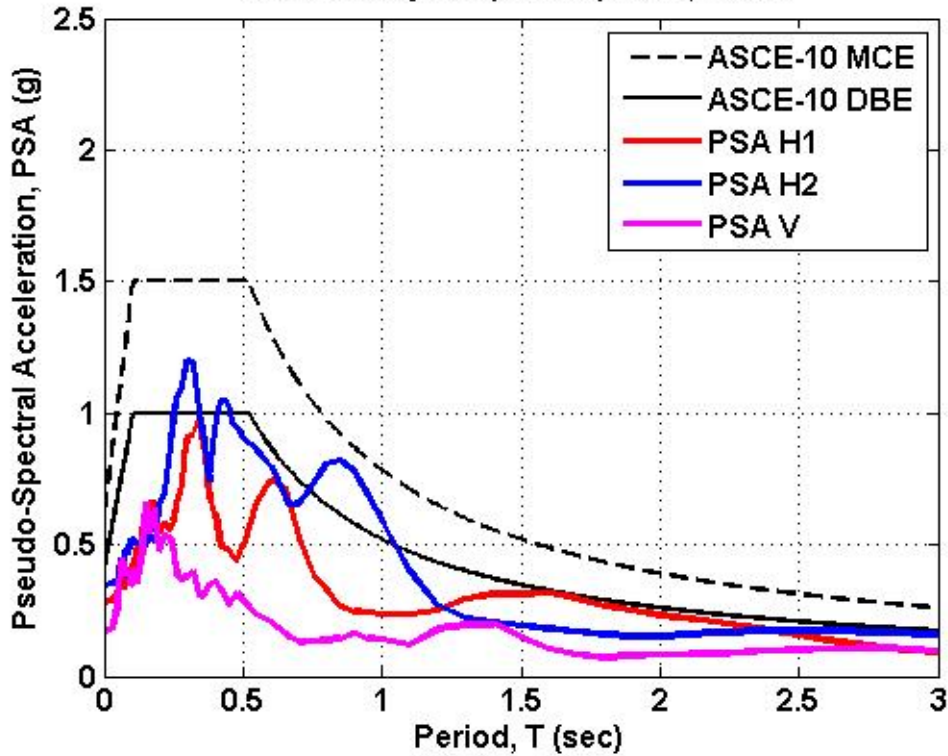
Huichica Creek Spectra, Sd-T



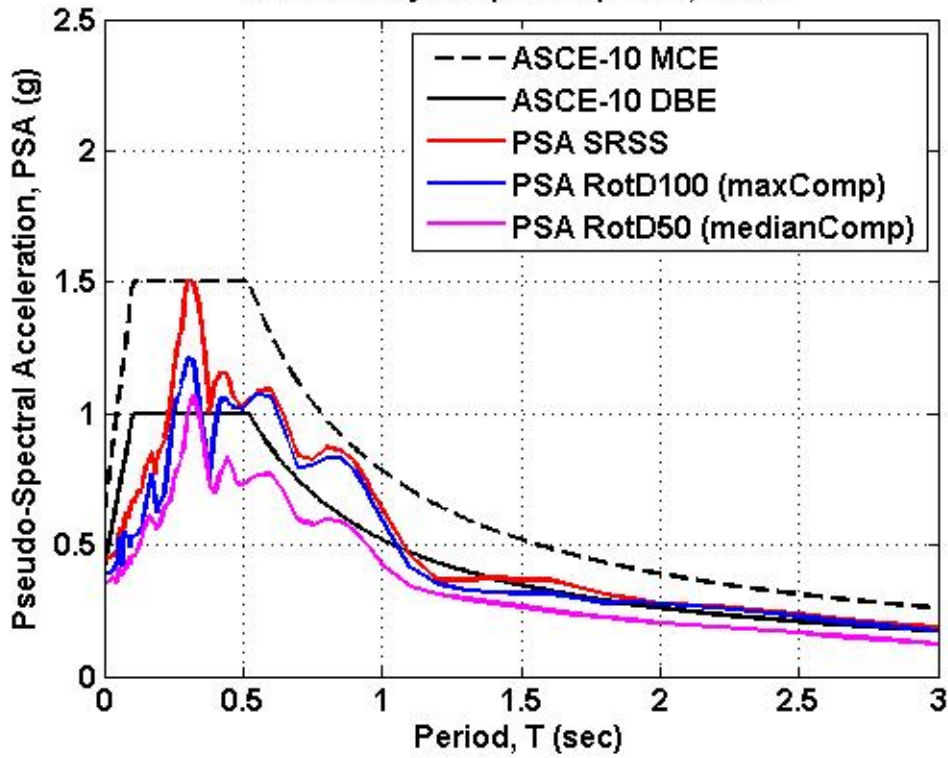
Huichica Creek Spectra, Sd-T



Lovall Valley Loop Rd. Spectra, PSA-T

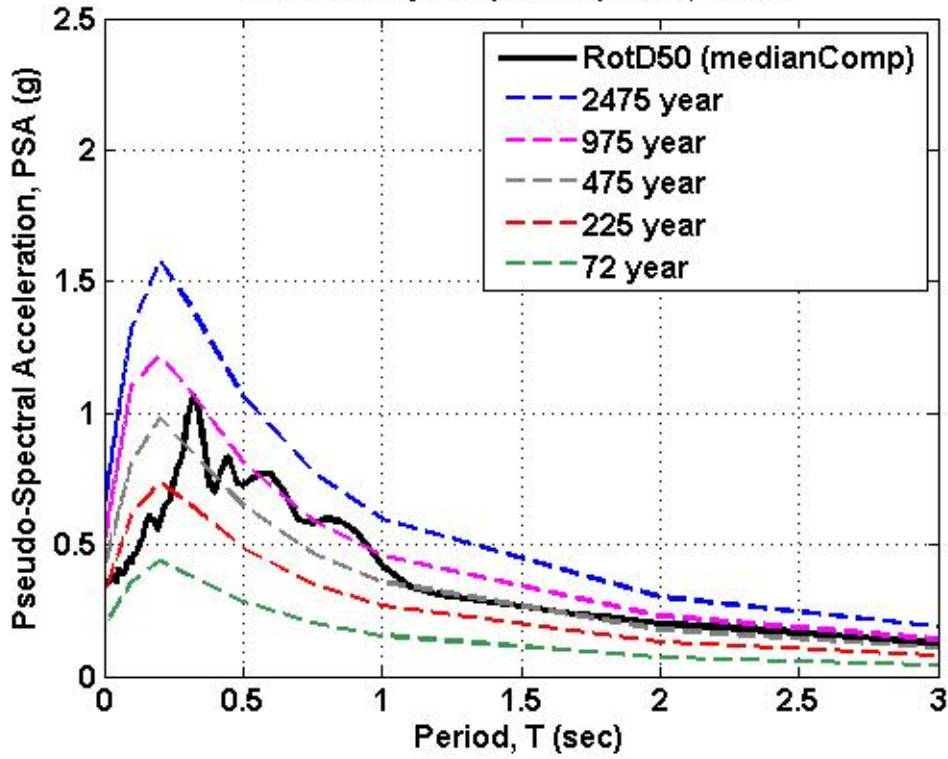


Lovall Valley Loop Rd. Spectra, PSA-T

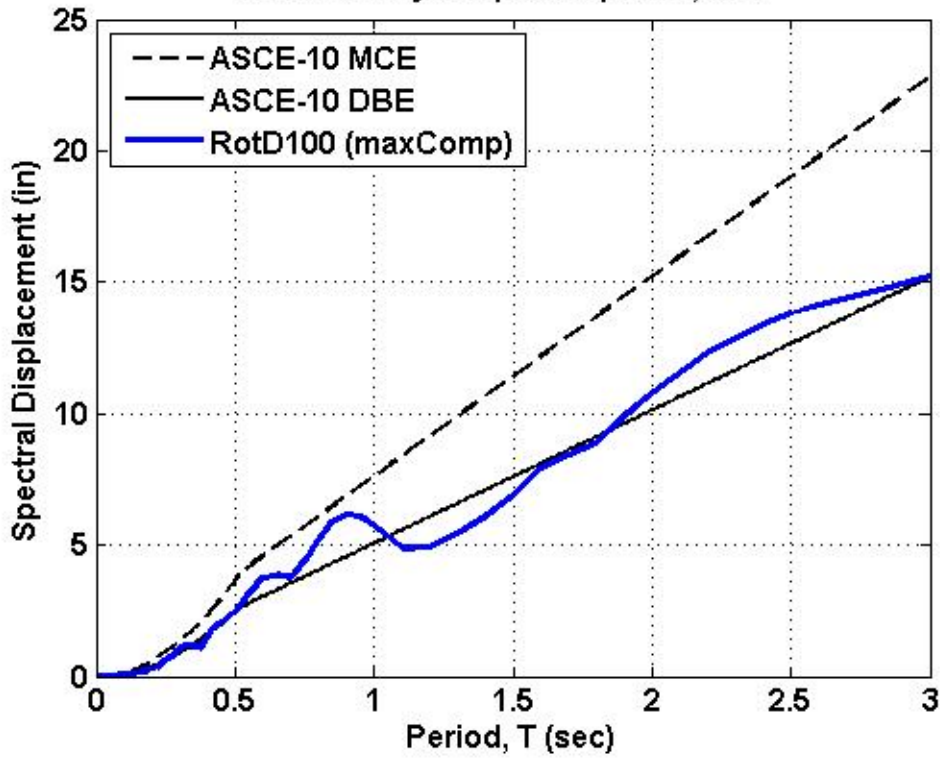




Lovall Valley Loop Rd. Spectra, PSA-T

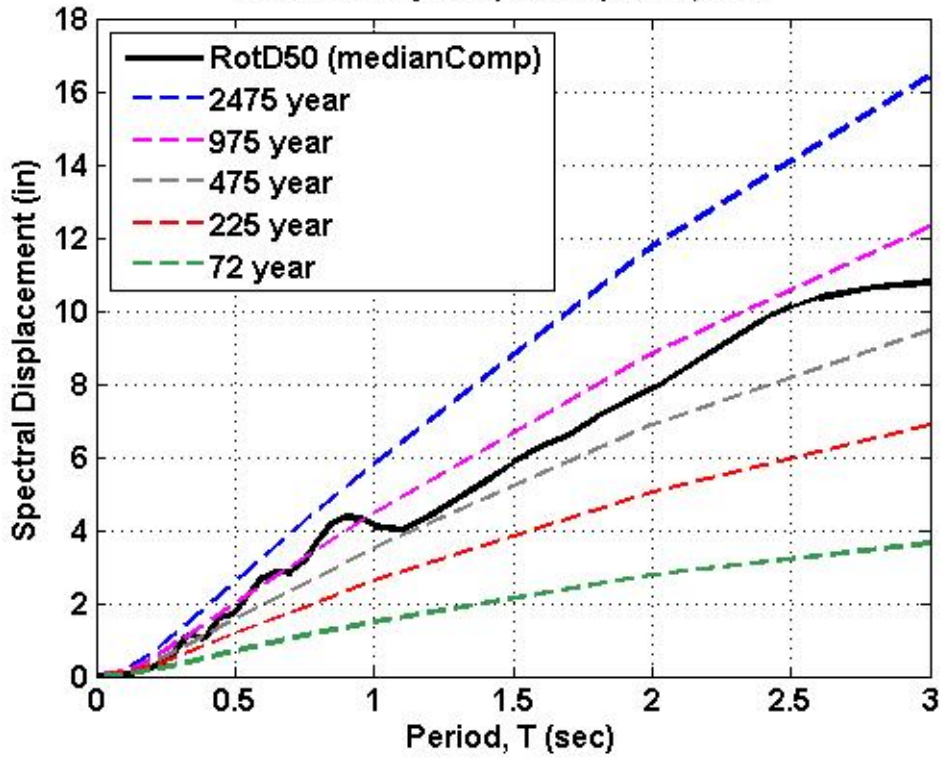


Lovall Valley Loop Rd. Spectra, Sd-T

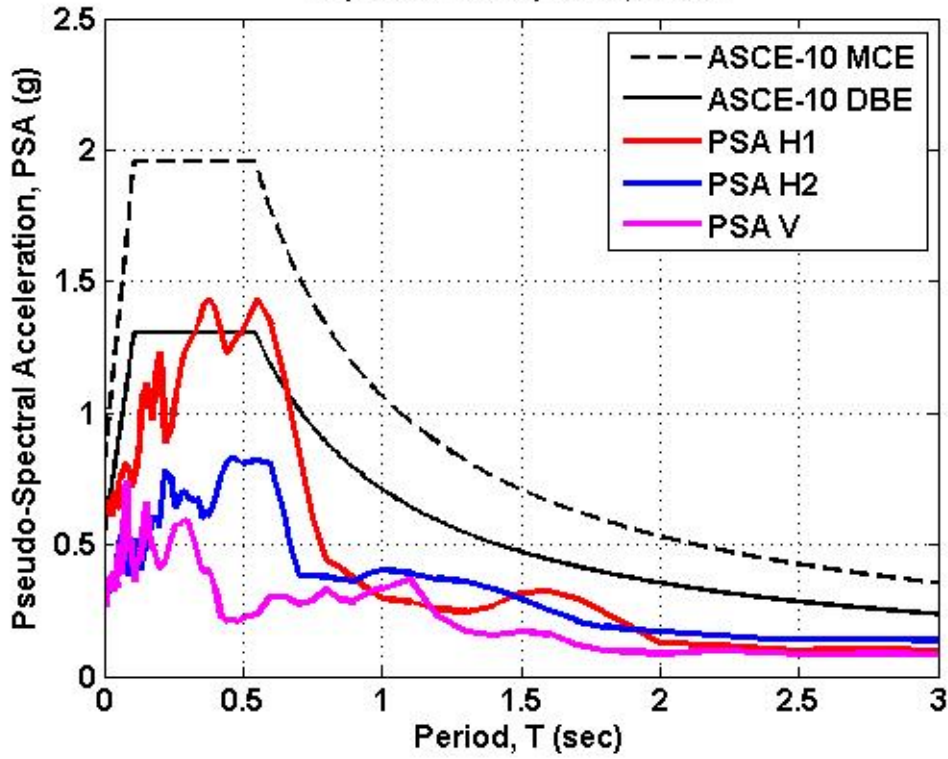




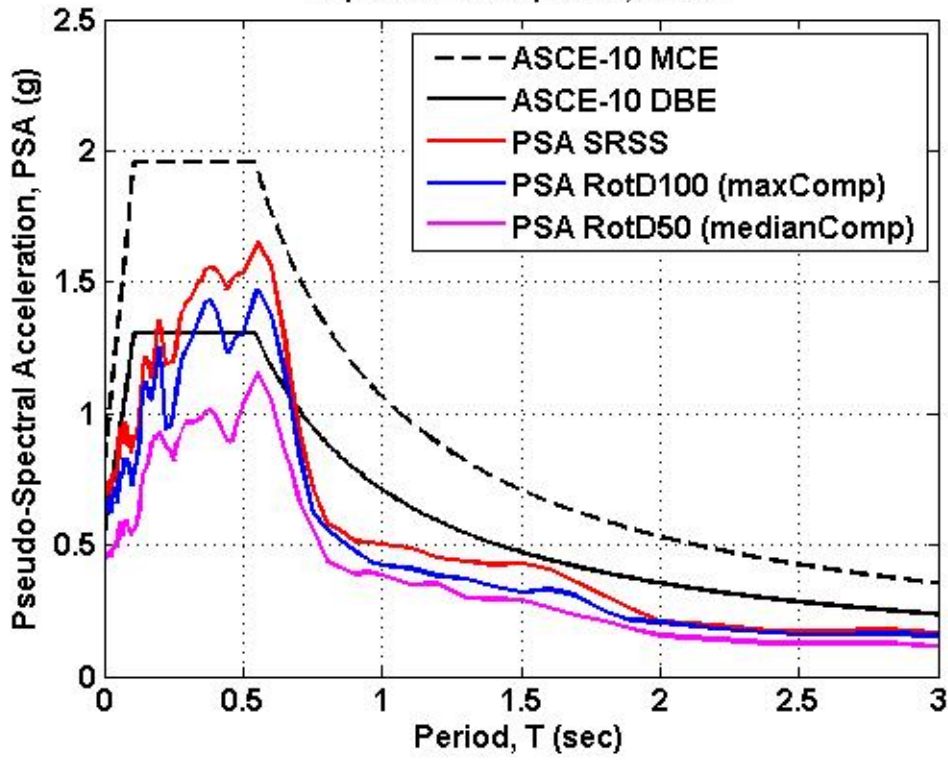
Lovall Valley Loop Rd. Spectra, Sd-T



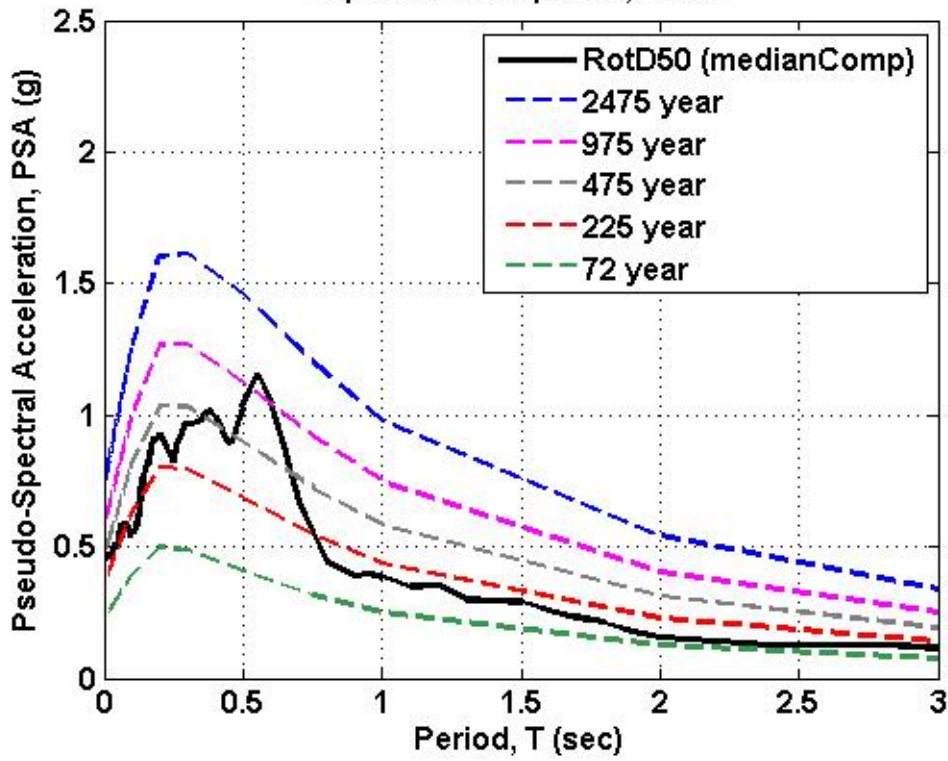
Napa Main St. Spectra, PSA-T



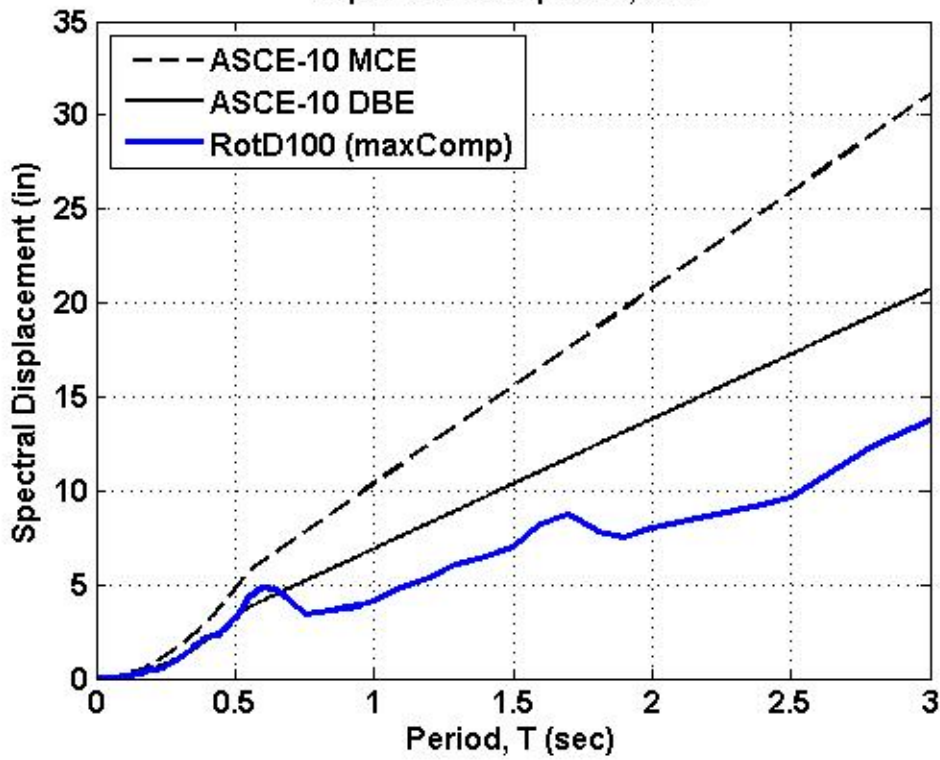
Napa Main St. Spectra, PSA-T



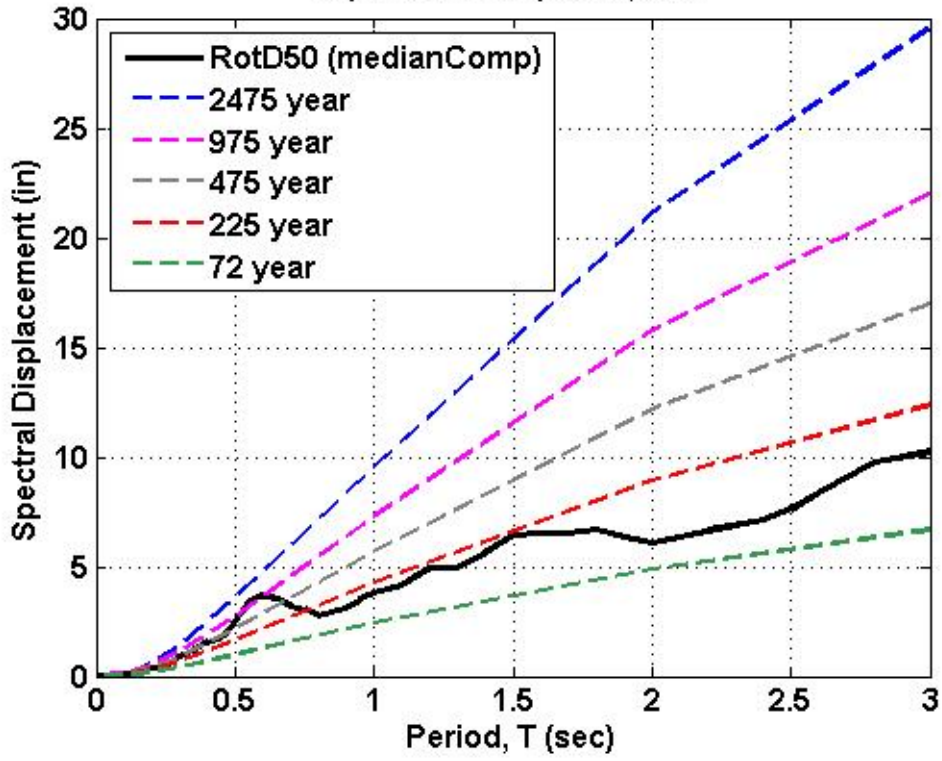
Napa Main St. Spectra, PSA-T

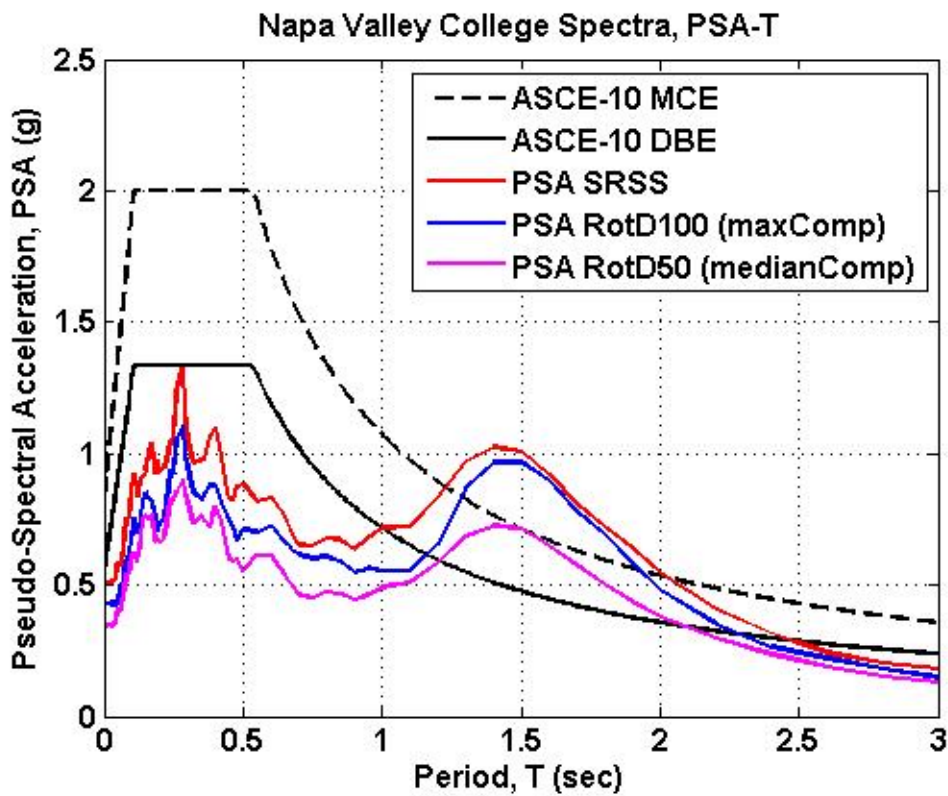
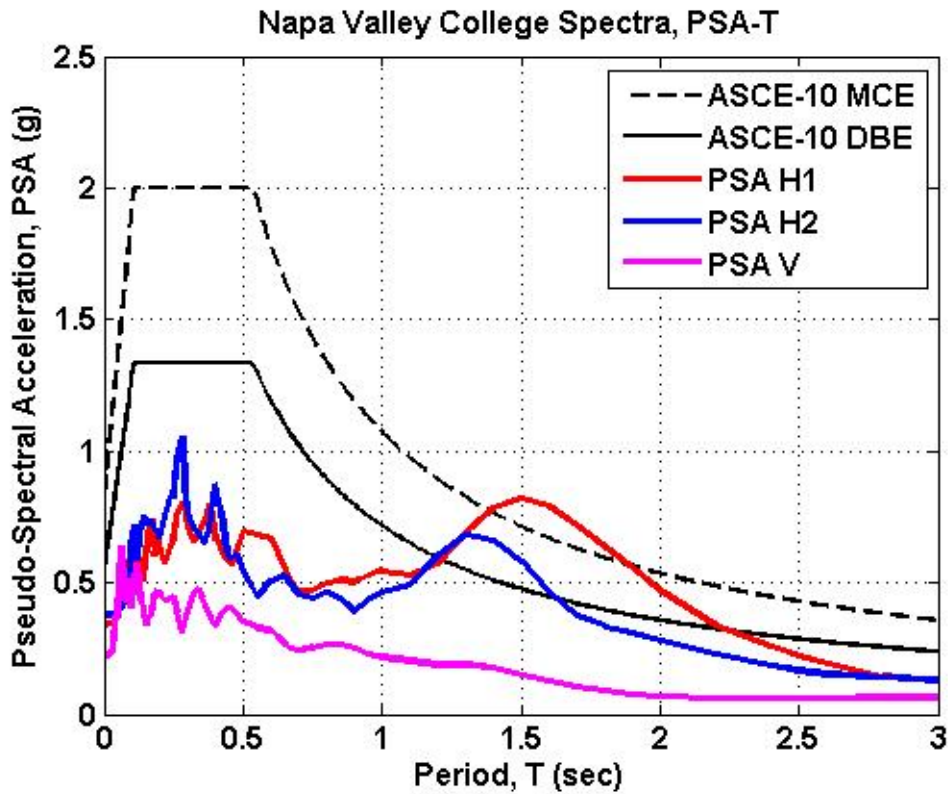


Napa Main St. Spectra, Sd-T



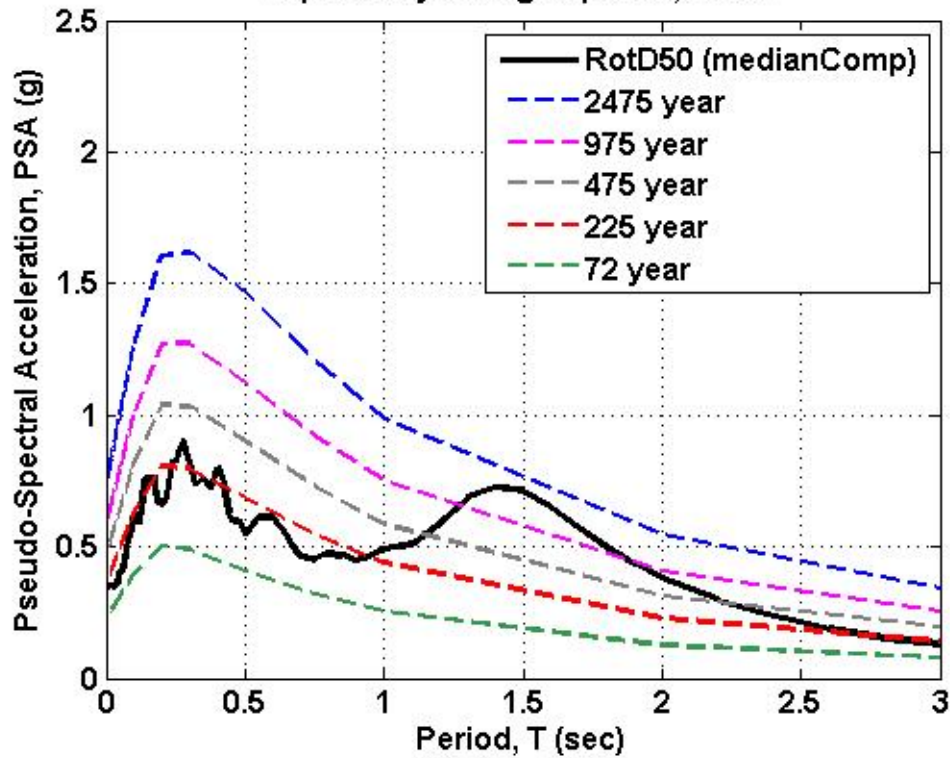
Napa Main St. Spectra, Sd-T



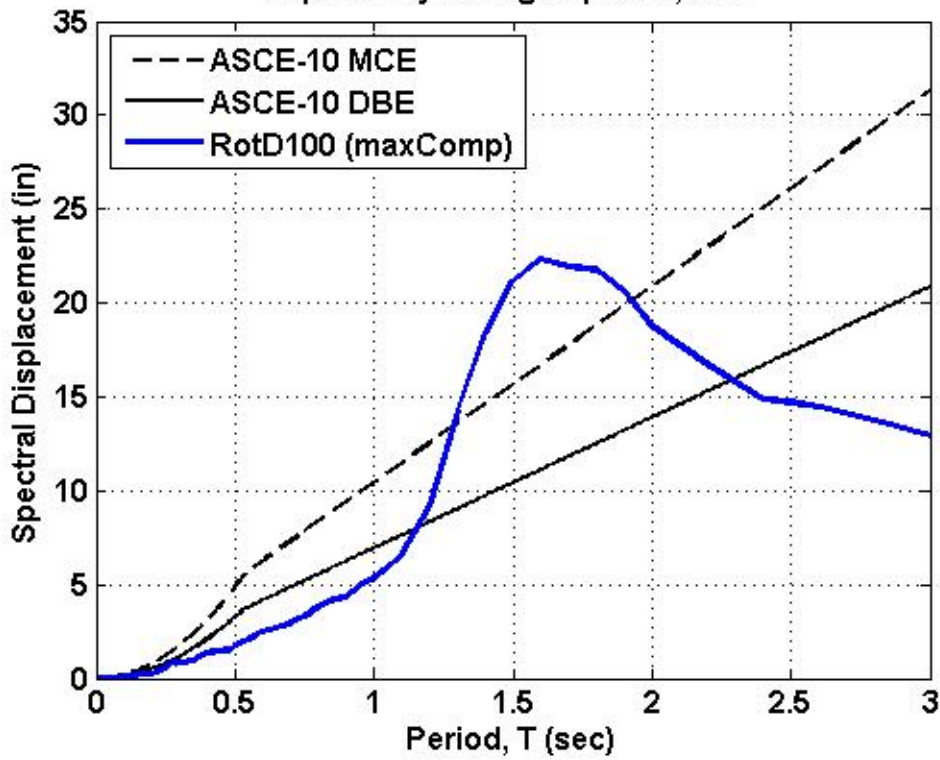




Napa Valley College Spectra, PSA-T

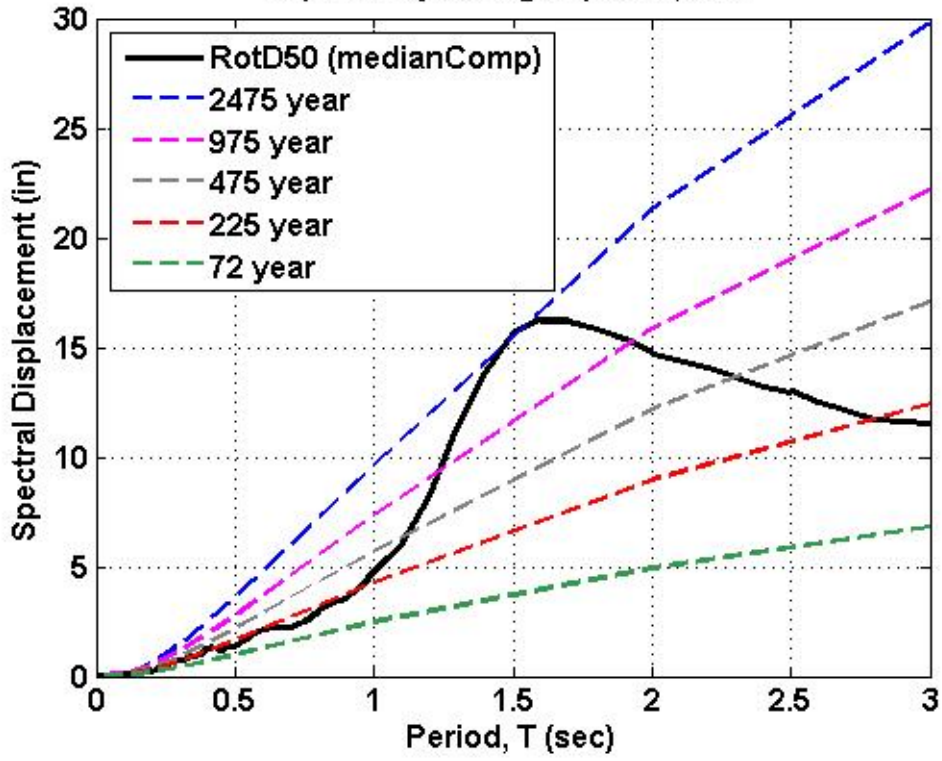


Napa Valley College Spectra, Sd-T

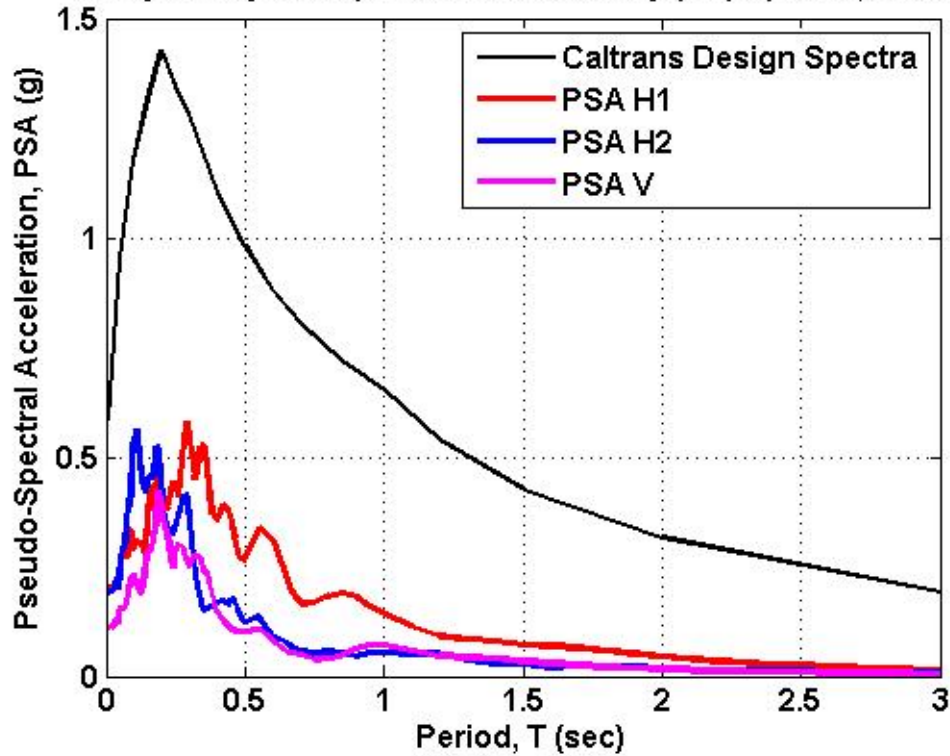




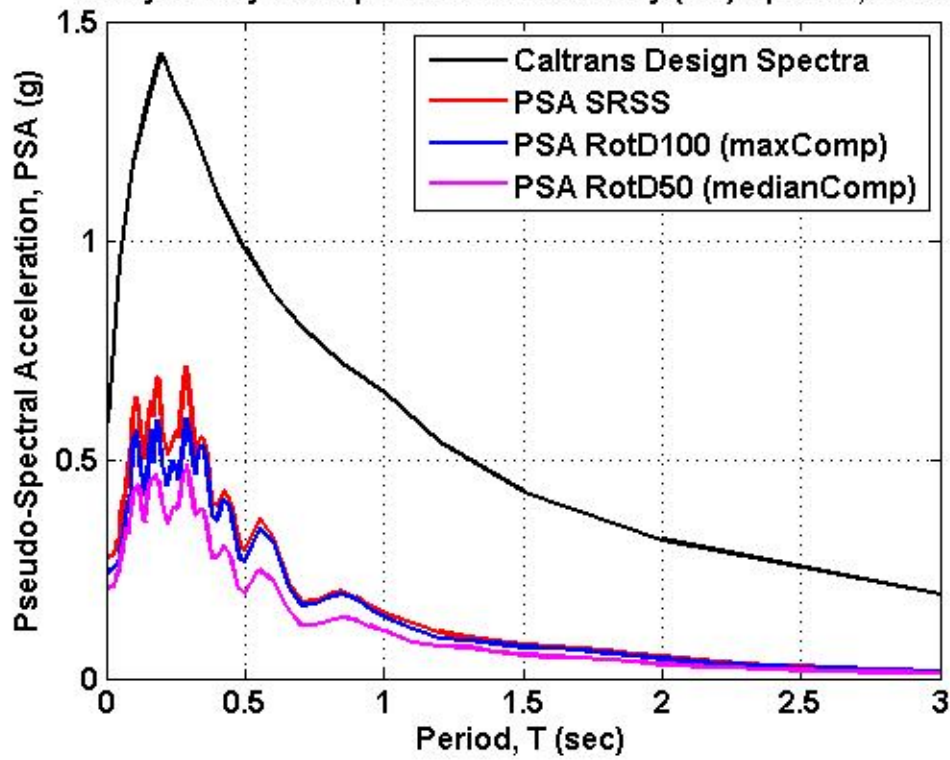
Napa Valley College Spectra, Sd-T

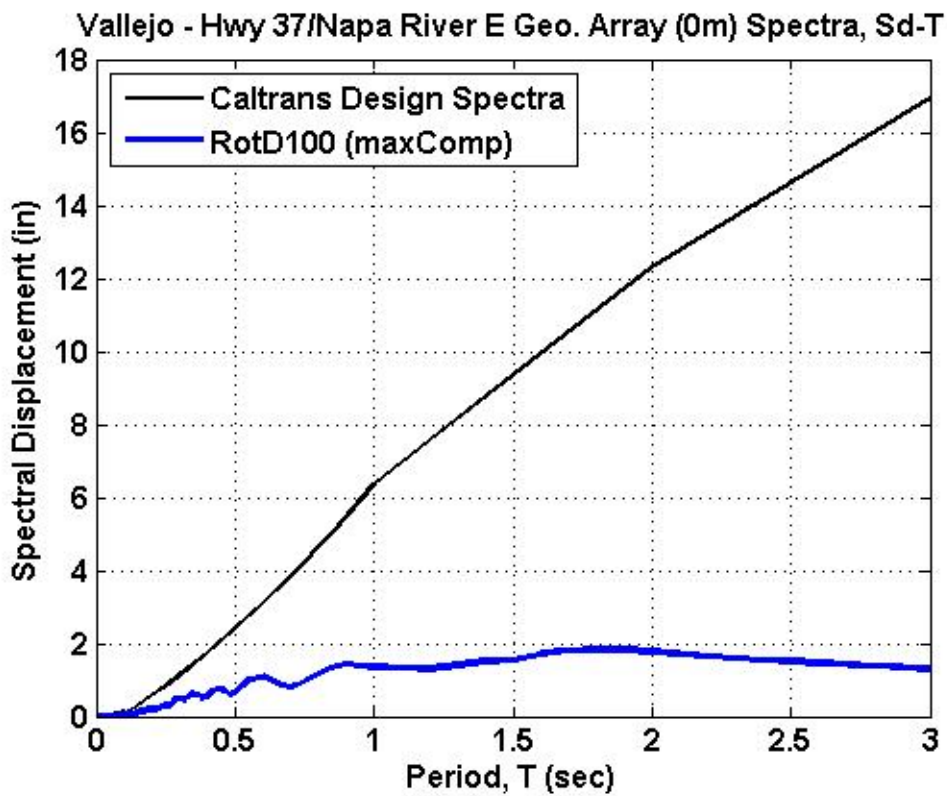
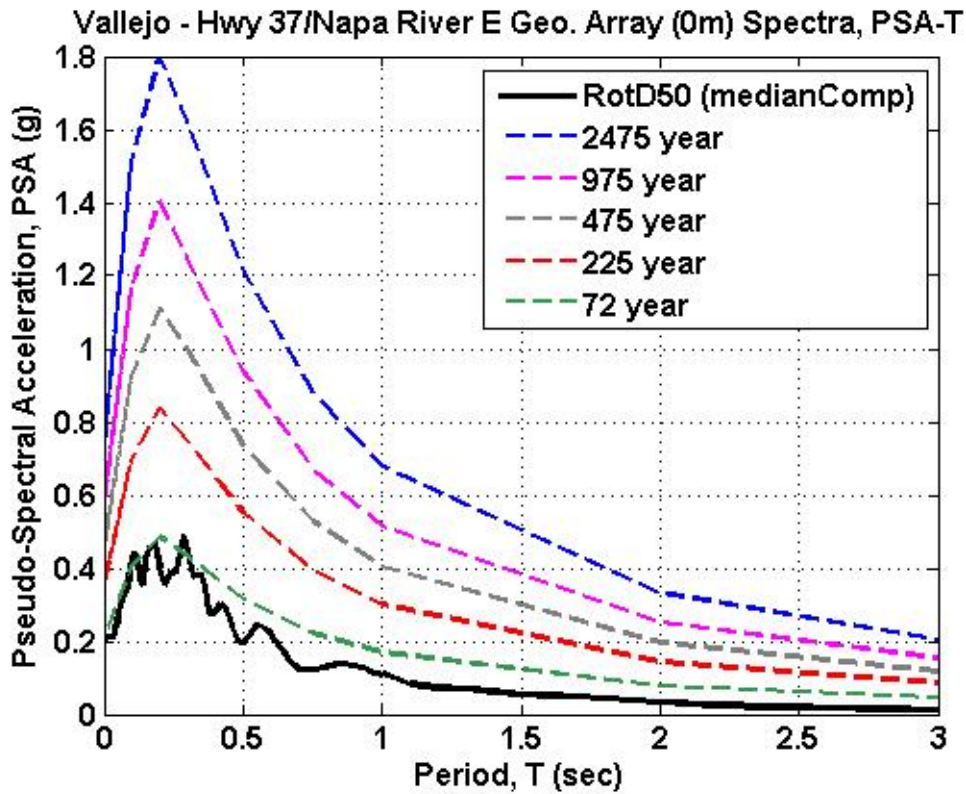


Vallejo - Hwy 37/Napa River E Geo. Array (0m) Spectra, PSA-T

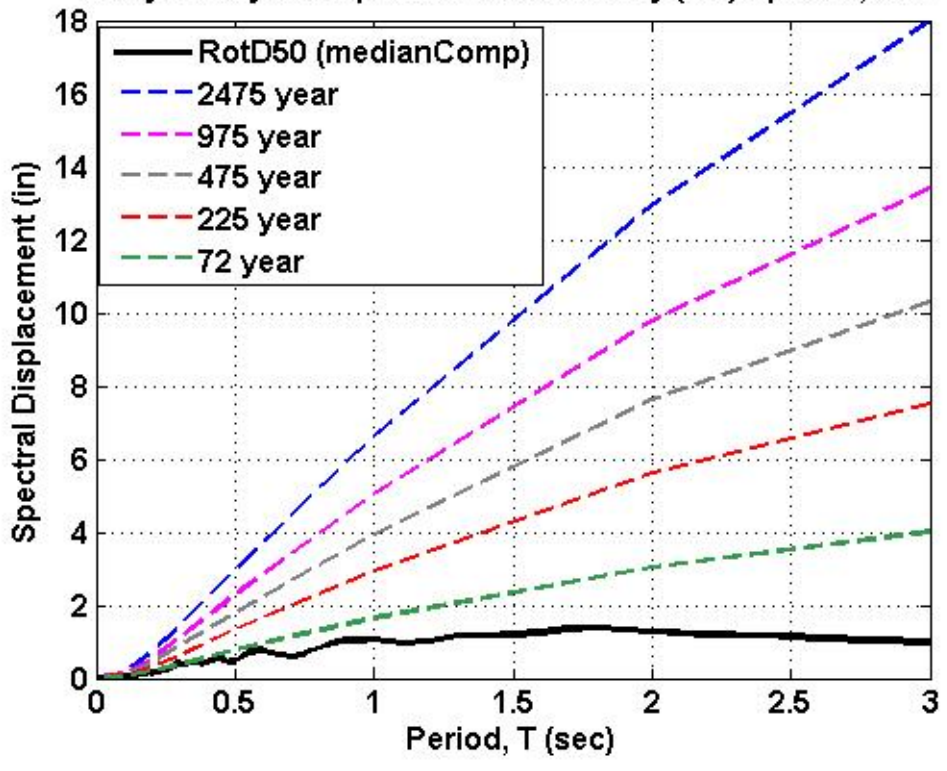


Vallejo - Hwy 37/Napa River E Geo. Array (0m) Spectra, PSA-T





Vallejo - Hwy 37/Napa River E Geo. Array (0m) Spectra, Sd-T



## **APPENDIX D**

### **Characterization of Near-fault Ground Motion Records by Lu and Panagiotou (2014)**

South Napa M6 EQ, Fire Station No. 3, FP Component

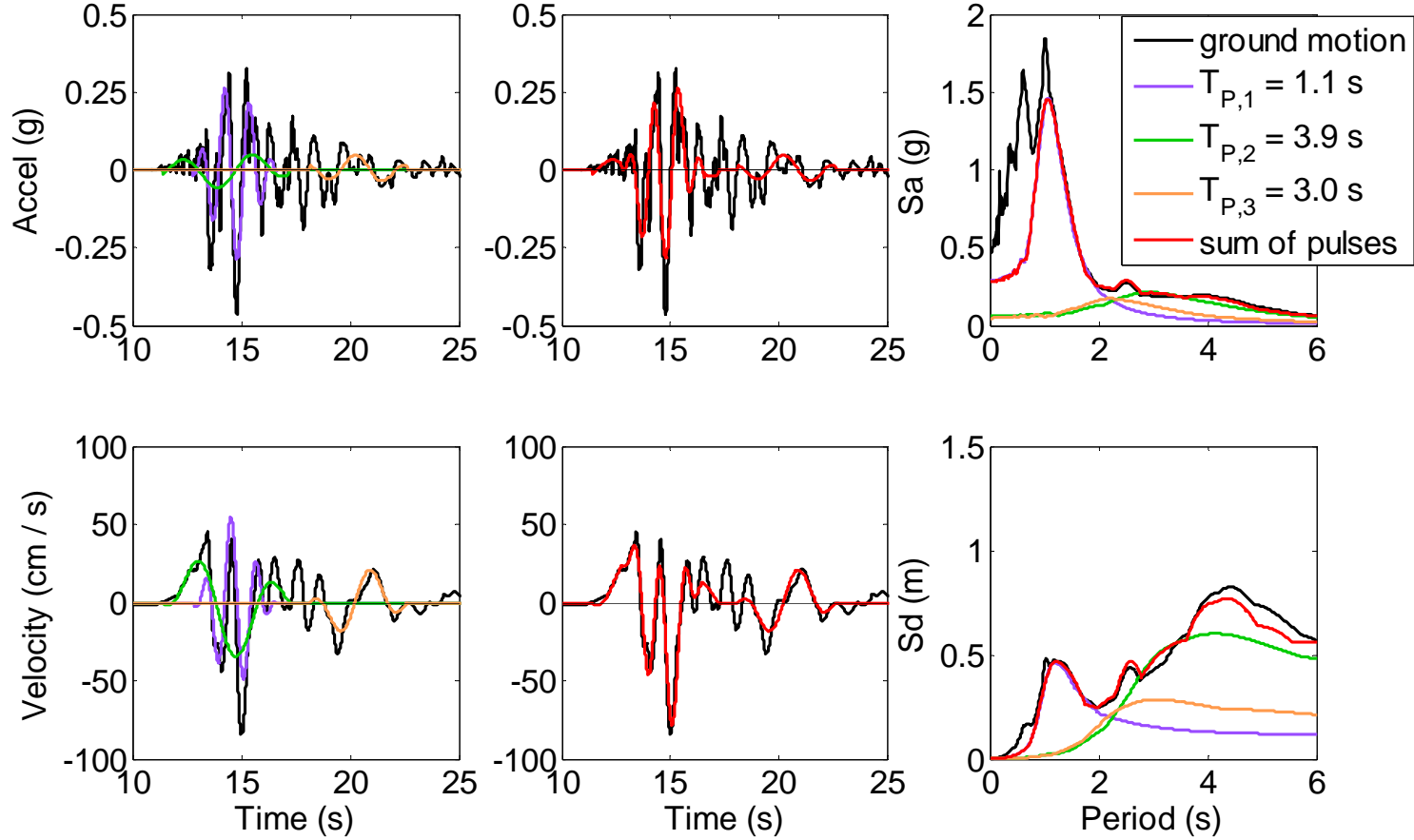


Figure 1. Fault-parallel component of ground acceleration and ground velocity histories recorded at the Fire Station No. 3; Extracted pulses using the  $CPE_{V,EN}$  method; and Linear acceleration and displacement response spectra (2% damping) of the recorded histories, the extracted pulses, and the representation of the motion using the sum of the extracted pulses.



South Napa M6 EQ, Fire Station No. 3, FN Component

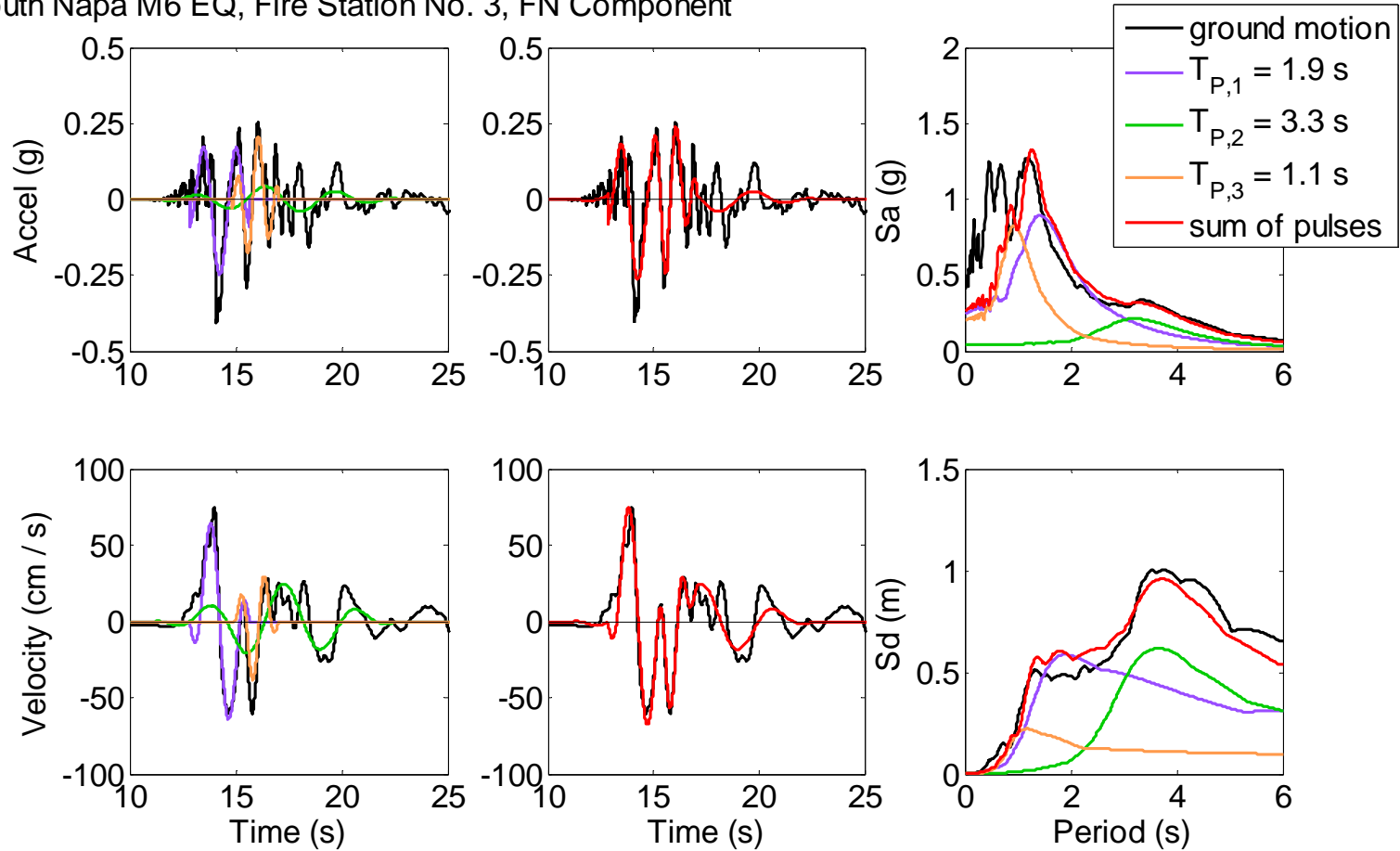


Figure 2. Fault-normal component of ground acceleration and ground velocity histories recorded at the Fire Station No. 3; Extracted pulses using the  $CPE_{V,EN}$  method; and Linear acceleration and displacement response spectra (2% damping) of the recorded histories, the extracted pulses, and the representation of the motion using the sum of the extracted pulses.

South Napa M6 EQ, Main St., FP Component

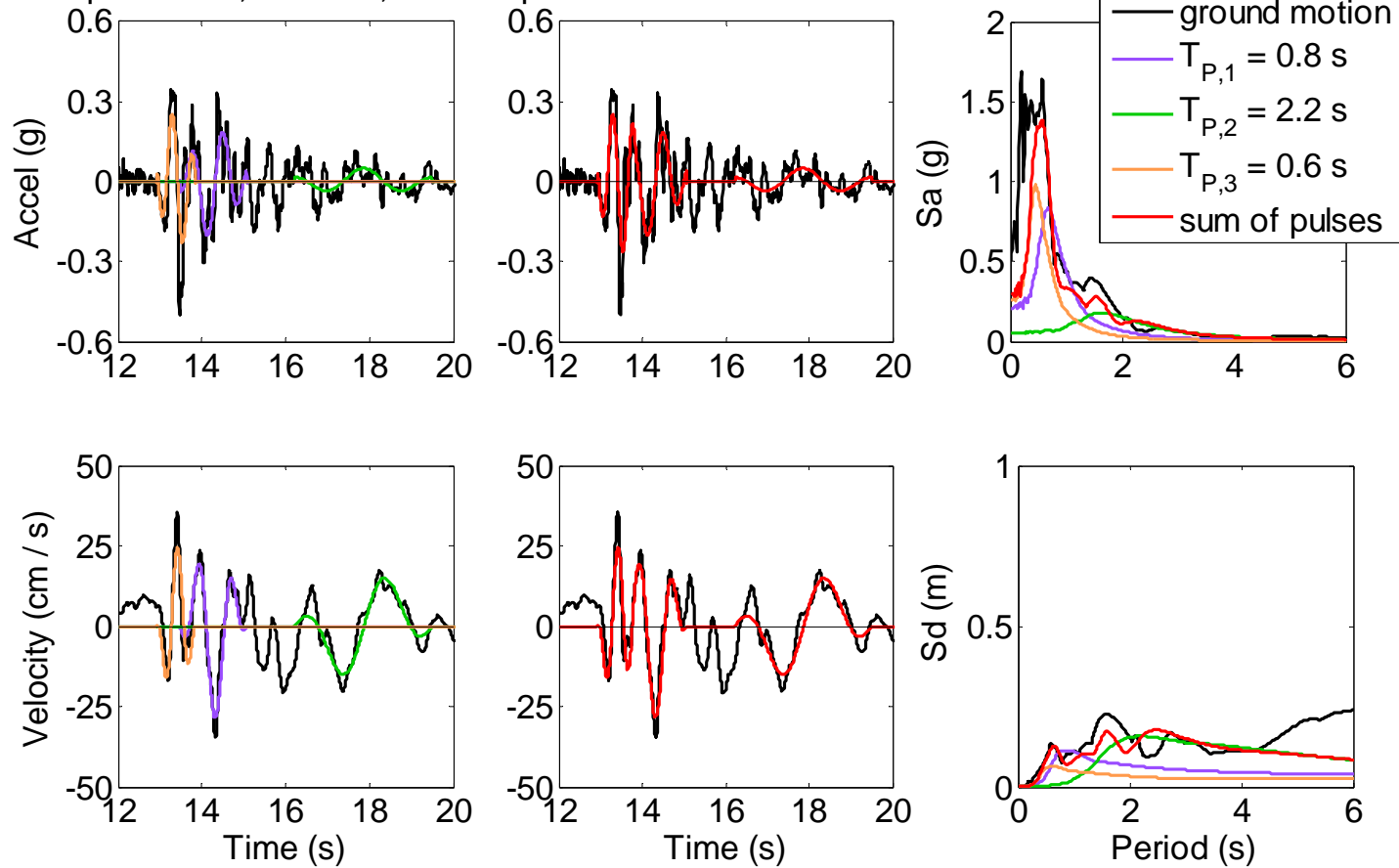


Figure 3. Fault-parallel component of ground acceleration and ground velocity histories recorded at Main St.; Extracted pulses using the  $CPE_{V,EN}$  method; and Linear acceleration and displacement response spectra (2% damping) of the recorded histories, the extracted pulses, and the representation of the motion using the sum of the extracted pulses.

South Napa M6 EQ, Main St., FN Component

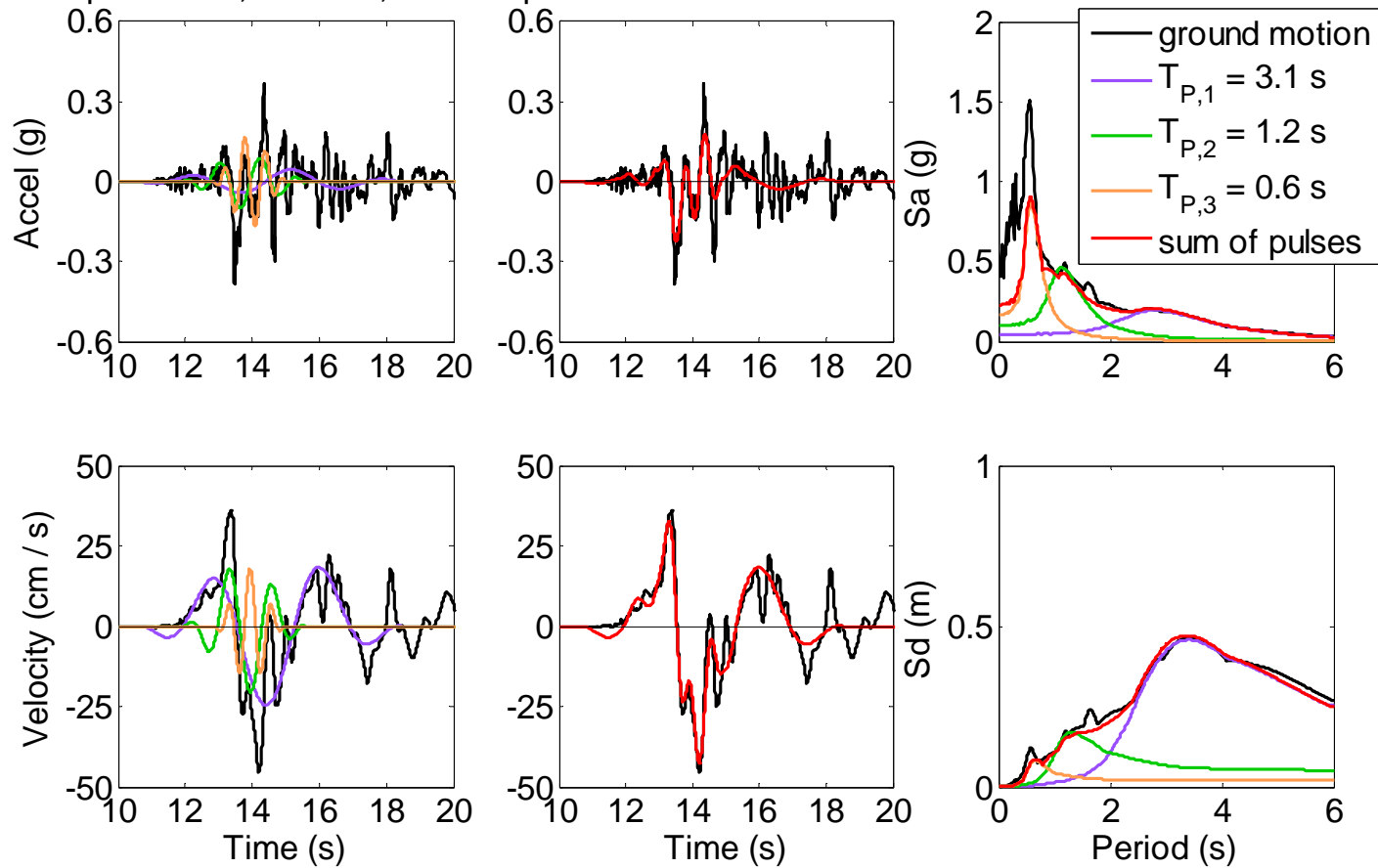


Figure 4. Fault-normal component of ground acceleration and ground velocity histories recorded at Main St.; Extracted pulses using the  $CPE_{V,EN}$  method; and Linear acceleration and displacement response spectra (2% damping) of the recorded histories, the extracted pulses, and the representation of the motion using the sum of the extracted pulses.