

INFORME PRELIMINAR SISMO DE SAN PEDRO DE LLOC, PACASMAYO - LA LIBERTAD DEL 24 DE FEBRERO DEL 2020

ML = 5.3 (IGP) / Mw = 5.2 (USGS)

1. UBICACIÓN

El 24 de Febrero del 2020, se registró un evento sísmico. La ubicación del sismo tiene dos fuentes: IGP (Instituto Geofísico del Perú) y USGS (United States Geological Survey) que se comparan en la Tabla N° 1 y Figura N° 1.

Tabla N° 1 Ubicación y hora epicentral del sismo según el IGP/USGS

Fuente	Coordenadas geográficas (°)		Profundidad (Km)	Hora Local	Hora UTC
	Latitud Sur	Longitud Oeste			
IGP	-8.12	-80.26	21.00	23:14:57	04:14:57
USGS	-8.065	-79.957	31.00	23:15:02	04:15:02

Figura N° 1. Epicentro según IGP/USGS y ubicación de las estaciones acelerográficas



El Instituto Geofísico del Perú (IGP) ubica su epicentro a 114 km al Sur Oeste de San Pedro De Lloc, Pacasmayo (La Libertad), con intensidad máxima en la escala modificada de Mercalli de III-IV en San Pedro De Lloc.

El USGS ubica el epicentro a 80.0 Km al Oeste de Santiago de Cao (La Libertad), a 81.1 Km al Oeste-Suroeste de Paján (La Libertad), a 84.9 Km al Sur-Suroeste de Pacasmayo (La Libertad), a 86.3 Km al Suroeste de San Pedro de Lloc (La Libertad) y a 102.3 Km al Oeste de Trujillo (La Libertad).

2. ESTACIONES ACELEROGRÁFICAS

La Red Acelerográfica del CIP - Posgrado FIC UNI, ha podido acceder a las señales acelerográficas de las estaciones PACASMAYO, CIP CHEPEN, CIP LA LIBERTAD, UNT, USP, CIP CHIMBOTE, UPAO, USAT, CIP LAMBAYEQUE, CIP CAJAMARCA, UNC y UGEL-Yungay-CERESIS. Los equipos son digitales de marca REFTEK y han sido calibrados para una frecuencia de muestreo de 200 Hz.

La Tabla N° 2 resume la ubicación y características de las estaciones acelerográficas y el tipo de suelo correspondiente.

Tabla N° 2 Ubicación de las estaciones acelerográficas que registraron el sismo del 24 de Febrero del 2020

N°	INSTITUCIÓN	ESTACIÓN	UBICACIÓN	LUGAR DE ASIENTO	COORDENADAS GEOGRÁFICAS		DISTANCIA EPICENTRAL (KM)	DISTANCIA HIPOCENTRAL (KM)
					LATITUD SUR (°)	LONGITUD ESTE (°)		
1	POSGRADO FIC UNI	PACASMAYO	LA LIBERTAD, PACASMAYO, PACASMAYO	GRAVA ARENOSA	-7.4	-79.56	110.70	112.67
2	CIP	CIP CHEPEN	LA LIBERTAD, CHEPEN, CHEPEN	ARENA LIMOSA	-7.22	-79.44	134.38	136.01
3	CIP	CIP LA LIBERTAD	LA LIBERTAD, TRUJILLO, TRUJILLO	ARENA CON GRAVILLA	-8.12	-79.04	134.97	136.60
4	POSGRADO FIC UNI	UNT	LA LIBERTAD, TRUJILLO, TRUJILLO	ARENA CON GRAVILLA	-8.11	-79.04	134.48	136.11
5	UNIVERSIDAD SAN PEDRO	USP	ANCASH, SANTA, CHIMBOTE	ARENOSO	-9.05	-78.59	210.73	211.77
6	CIP	CIP CHIMBOTE	ANCASH, SANTA, NUEVO CHIMBOTE	ARENA MAL GRADADA	-9.13	-78.52	221.56	222.56
7	CIP / UPAO	UPAO	LA LIBERTAD, TRUJILLO, TRUJILLO	ARENA ARCILLOSA	-8.13	-79.03	135.19	136.81

8	POSGRADO FIC UNI / USAT	USAT	LAMBAYEQUE, CHICLAYO ,CHICLAYO	ARCILLA	-6.76	-79.86	156.65	158.06
9	CIP	CIP LAMBAYEQUE	LAMBAYEQUE, CHICLAYO ,PIMENTEL	ARCILLA CON LIMO	-6.82	-79.91	149.01	150.48
10	CIP	CIP CAJAMARCA	CAJAMARCA, CAJAMARCA ,CAJAMARCA	GRAVA ARCILLOSA	-7.17	-78.51	219.63	220.63
11	POSGRADO FIC UNI	UNC	CAJAMARCA, CAJAMARCA ,CAJAMARCA	LIMO ARCILLOSO	-7.17	-78.5	221.38	222.38
12	POSGRADO FIC UNI / CERESIS	UGEL-Yungay-CERESIS	ANCASH, YUNGAY ,YUNGAY	GRAVA ARCILLOSA	-9.15	-77.74	299.57	300.30

3. ACELERACIONES MÁXIMAS

Para realizar un tratamiento homogéneo de las señales del sismo ocurrido el 24 de Febrero del 2020, se transformaron los registros obtenidos a formato ASCII. Los registros fueron corregidos por línea base y filtrados (pasabanda de 0.1 hertz a 25 hertz) antes de proceder a identificar los picos máximos de aceleración, con el uso del programa SIPA (CIP - UNI) v. 2017

La máxima aceleración registrada fue en la Estación PACASMAYO componente NS de 48.26 cm/seg². En la Tabla N° 3 y en el Anexo 01 se presentan los valores máximos de aceleraciones registradas en cada componente.

4. ESPECTROS DE SEUDOACELERACIÓN

Se han obtenido los espectros de pseudoaceleración a fin de tener una representación gráfica de la respuesta elástica máxima del suelo para un amortiguamiento del 5%. El valor máximo del espectro de pseudoaceleración obtenido fue registrado en la Estación PACASMAYO componente NS de 156.83 cm/seg². En la Tabla N° 4 y en el Anexo 01 se presentan los valores máximos de los espectros de pseudoaceleración registrados.

En las Figuras del N° 3a al N° 14a se presentan las gráficas de comparación de espectros de pseudoaceleración por componentes de los registros procesados.

5. ESPECTRO DE AMPLITUDES DE FOURIER

Los Espectros de Amplitudes de Fourier presentan contenidos de frecuencias en el intervalo de 0.1 hertz a 100 hertz. Los valores máximos se presentan en las Figuras N° 3b al N° 14b.

6. OTROS PARÁMETROS DE INTENSIDAD

Se han obtenido otros parámetros de intensidad importantes que caracterizan a los movimientos de sísmico registrados y aluden a su potencial para causar daños los que se presentan en la Tabla N° 5

Peak ground acceleration	:	$PGA = \max a(t) $
Peak ground velocity	:	$PGV = \max v(t) $
Peak ground displacement	:	$PGD = \max d(t) $
Root-mean-square of acceleration	:	$a_{rms} = \sqrt{\frac{1}{t_r} \int_0^{t_r} [a(t)]^2 dt}$
Root-mean-square of velocity	:	$v_{rms} = \sqrt{\frac{1}{t_r} \int_0^{t_r} [v(t)]^2 dt}$
Root-mean-square of displacement	:	$d_{rms} = \sqrt{\frac{1}{t_r} \int_0^{t_r} [d(t)]^2 dt}$
Peak velocity-acceleration ratio	:	$v_{max} / a_{max} = PGV / PGA$
Arias intensity	:	$I_a = \frac{\pi}{2g} \int_0^{\infty} [a(t)]^2 dt$
Specific energy density	:	$SED = \int_0^{t_r} [v(t)]^2 dt$

Tabla N° 3 Valores máximos de aceleraciones registradas en las estaciones acelerográficas.

N°	INSTITUCIÓN	ESTACIÓN	UBICACIÓN	LUGAR DE ASIENTO	ACELERACIONES MÁXIMAS CON FILTRADO (cm/seg ²)			ACELERACIÓN MÁXIMA cm/seg ²	ACELERACIÓN MÁXIMA (g)
					PGA EO	PGA NS	PGA V		
1	POSGRADO FIC UNI	PACASMAYO	LA LIBERTAD, PACASMAYO ,PACASMAYO	GRAVA ARENOSA	28.89	48.26	16.29	48.26	0.049
2	CIP	CIP CHEPEN	LA LIBERTAD, CHEPEN ,CHEPEN	ARENA LIMOSA	16.53	13.53	5.44	16.53	0.017
3	CIP	CIP LA LIBERTAD	LA LIBERTAD, TRUJILLO ,TRUJILLO	ARENA CON GRAVILLA	6.73	6.53	12.34	12.34	0.013
4	POSGRADO FIC UNI	UNT	LA LIBERTAD, TRUJILLO ,TRUJILLO	ARENA CON GRAVILLA	4.92	6.21	10.90	10.90	0.011
5	UNIVERSIDAD SAN PEDRO	USP	ANCASH, SANTA ,CHIMBOTE	ARENOSO	7.59	9.81	5.14	9.81	0.010
6	CIP	CIP CHIMBOTE	ANCASH, SANTA ,NUEVO CHIMBOTE	ARENA MAL GRADADA	6.49	6.07	4.81	6.49	0.007

7	CIP / UPAO	UPAO	LA LIBERTAD, TRUJILLO ,TRUJILLO	ARENA ARCILLOSA	3.67	5.85	6.26	6.26	0.006
8	POSGRADO FIC UNI / USAT	USAT	LAMBAYEQUE, CHICLAYO ,CHICLAYO	ARCILLA	5.33	4.24	3.57	5.33	0.005
9	CIP	CIP LAMBAYEQUE	LAMBAYEQUE, CHICLAYO ,PIMENTEL	ARCILLA CON LIMO	3.01	3.21	2.33	3.21	0.003
10	CIP	CIP CAJAMARCA	CAJAMARCA, CAJAMARCA ,CAJAMARCA	GRAVA ARCILLOSA	3.11	2.66	1.39	3.11	0.003
11	POSGRADO FIC UNI	UNC	CAJAMARCA, CAJAMARCA ,CAJAMARCA	LIMO ARCILLOSO	2.72	1.48	0.91	2.72	0.003
12	POSGRADO FIC UNI / CERESIS	UGEL-Yungay-CERESIS	ANCASH, YUNGAY ,YUNGAY	GRAVA ARCILLOSA	2.12	1.38	1.35	2.12	0.002

Tabla N° 4 Valores máximos de espectros de pseudoaceleración en las estaciones acelerográficas.

N°	INSTITUCIÓN	ESTACIÓN	UBICACIÓN	LUGAR DE ASIENTO	SEUDOACELERACIÓN ESPECTRAL (cm/seg ²) 5% DE AMORTIGUAMIENTO (CON FILTRADO)			SEUDOACELERACIÓN ESPECTRAL MÁXIMA(cm/seg ²)
					EO	NS	V	
1	POSGRADO FIC UNI	PACASMAYO	LA LIBERTAD, PACASMAYO, PACASMAYO	GRAVA ARENOSA	121.47	156.83	70.85	156.83
2	CIP	CIP CHEPEN	LA LIBERTAD, CHEPEN, CHEPEN	ARENA LIMOSA	67.93	64.72	22.49	67.93
3	CIP	CIP LA LIBERTAD	LA LIBERTAD, TRUJILLO, TRUJILLO	ARENA CON GRAVILLA	37.98	28.61	69.37	69.37
4	POSGRADO FIC UNI	UNT	LA LIBERTAD, TRUJILLO, TRUJILLO	ARENA CON GRAVILLA	17.92	28.19	57.79	57.79
5	UNIVERSIDAD SAN PEDRO	USP	ANCASH, SANTA, CHIMBOTE	ARENOSO	29.34	36.69	23.21	36.69
6	CIP	CIP CHIMBOTE	ANCASH, SANTA, NUEVO CHIMBOTE	ARENA MAL GRADADA	21.57	24.55	21.46	24.55
7	CIP / UPAO	UPAO	LA LIBERTAD, TRUJILLO, TRUJILLO	ARENA ARCILLOSA	15.36	22.41	26.96	26.96
8	POSGRADO FIC UNI / USAT	USAT	LAMBAYEQUE, CHICLAYO, CHICLAYO	ARCILLA	25.50	19.08	15.79	25.50

9	CIP	CIP LAMBAYEQUE	LAMBAYEQUE, CHICLAYO ,PIMENTEL	ARCILLA CON LIMO	15.76	12.64	8.30	15.76
10	CIP	CIP CAJAMARCA	CAJAMARCA, CAJAMARCA ,CAJAMARCA	GRAVA ARCILLOSA	12.51	17.36	5.36	17.36
11	POSGRADO FIC UNI	UNC	CAJAMARCA, CAJAMARCA ,CAJAMARCA	LIMO ARCILLOSO	11.69	5.76	2.95	11.69
12	POSGRADO FIC UNI / CERESIS	UGEL-Yungay-CERESIS	ANCASH, YUNGAY ,YUNGAY	GRAVA ARCILLOSA	7.35	4.49	4.98	7.35

Tabla N° 5 Valores de otros parámetros de Intensidad.

ESTACIÓN	COMPONENTE	PGA cm/seg ²	PGV cm/seg	PGD cm	Vmax/Amax seg	RMS Acel. cm/seg ²	RMS Vel. cm/seg	RMS Desp. cm	la m/seg	Densidad de energía específica cm ² /seg	Intensidad de Housner cm
PACASMAYO	EO	28.89	1.63	0.11	0.06	1.71	0.07	0.01	0.01	0.99	2.92
	NS	48.26	1.98	0.14	0.04	1.98	0.09	0.01	0.01	1.60	3.43
	V	16.29	0.69	0.06	0.04	0.94	0.04	0.00	0.00	0.32	1.34
CIP CHEPEN	EO	16.53	0.58	0.05	0.03	0.83	0.03	0.00	0.00	0.26	1.36
	NS	13.53	0.55	0.05	0.04	0.87	0.03	0.00	0.00	0.23	1.27
	V	5.44	0.25	0.02	0.05	0.45	0.02	0.00	0.00	0.07	0.57
CIP LA LIBERTAD	EO	6.73	0.14	0.02	0.02	0.52	0.01	0.00	0.00	0.03	0.34
	NS	6.53	0.21	0.02	0.03	0.56	0.01	0.00	0.00	0.04	0.36
	V	12.34	0.16	0.01	0.01	0.73	0.01	0.00	0.00	0.02	0.17
UNT	EO	4.92	0.10	0.01	0.02	0.36	0.01	0.00	0.00	0.02	0.30
	NS	6.21	0.14	0.01	0.02	0.39	0.01	0.00	0.00	0.02	0.33
	V	10.90	0.11	0.01	0.01	0.53	0.01	0.00	0.00	0.01	0.15
USP	EO	7.59	0.10	0.01	0.01	1.00	0.02	0.00	0.00	0.03	0.18
	NS	9.81	0.19	0.01	0.02	0.94	0.02	0.00	0.00	0.03	0.21
	V	5.14	0.09	0.01	0.02	0.65	0.01	0.00	0.00	0.01	0.10
CIP CHIMBOTE	EO	6.49	0.09	0.00	0.01	0.55	0.01	0.00	0.00	0.01	0.11
	NS	6.07	0.13	0.00	0.02	0.51	0.01	0.00	0.00	0.01	0.14
	V	4.81	0.08	0.00	0.02	0.48	0.01	0.00	0.00	0.01	0.11

ESTACIÓN	COMPONENTE	PGA cm/seg ²	PGV cm/seg	PGD cm	Vmax/Amax seg	RMS Acel. cm/seg ²	RMS Vel. cm/seg	RMS Desp. cm	la m/seg	Densidad de energía especifica cm ² /seg	Intensidad de Housner cm
UPAO	EO	3.67	0.11	0.02	0.03	0.34	0.01	0.01	0.00	0.03	0.34
	NS	5.85	0.20	0.02	0.03	0.35	0.01	0.00	0.00	0.03	0.39
	V	6.26	0.12	0.01	0.02	0.40	0.01	0.00	0.00	0.01	0.18
USAT	EO	5.33	0.22	0.01	0.04	0.65	0.03	0.00	0.00	0.07	0.53
	NS	4.24	0.15	0.02	0.04	0.56	0.02	0.01	0.00	0.05	0.39
	V	3.57	0.08	0.01	0.02	0.48	0.01	0.00	0.00	0.02	0.24
CIP LAMBAYEQUE	EO	3.01	0.18	0.02	0.06	0.30	0.02	0.00	0.00	0.06	0.49
	NS	3.21	0.12	0.01	0.04	0.23	0.02	0.00	0.00	0.04	0.46
	V	2.33	0.07	0.01	0.03	0.25	0.01	0.00	0.00	0.01	0.20
CIP CAJAMARCA	EO	3.11	0.18	0.03	0.06	0.27	0.02	0.01	0.00	0.07	0.62
	NS	2.66	0.15	0.04	0.06	0.29	0.02	0.01	0.00	0.08	0.79
	V	1.39	0.08	0.02	0.06	0.14	0.01	0.00	0.00	0.02	0.33
UNC	EO	2.72	0.19	0.05	0.07	0.23	0.02	0.01	0.00	0.13	0.98
	NS	1.48	0.25	0.08	0.17	0.20	0.03	0.01	0.00	0.18	1.32
	V	0.91	0.10	0.02	0.11	0.12	0.02	0.00	0.00	0.05	0.49
UGEL-Yungay-CERESIS	EO	2.12	0.09	0.01	0.04	0.16	0.01	0.00	0.00	0.01	0.30
	NS	1.38	0.05	0.01	0.04	0.12	0.01	0.00	0.00	0.01	0.22
	V	1.35	0.05	0.01	0.03	0.10	0.01	0.00	0.00	0.01	0.16

Figura N°3a.

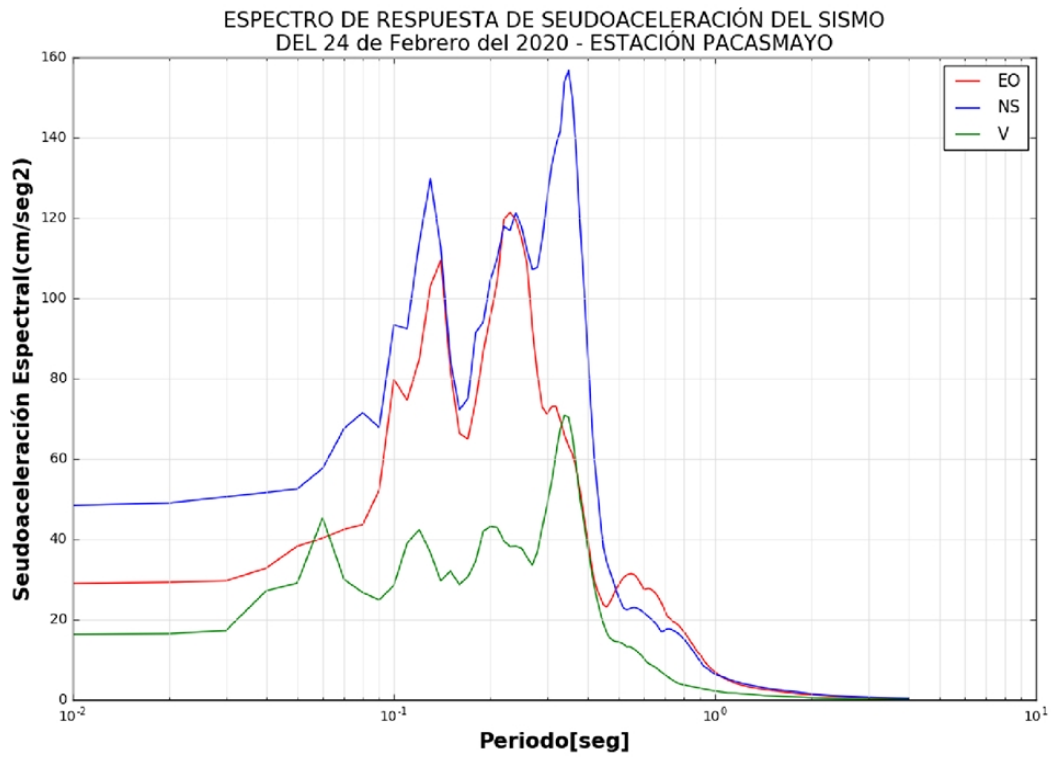


Figura N°3b.

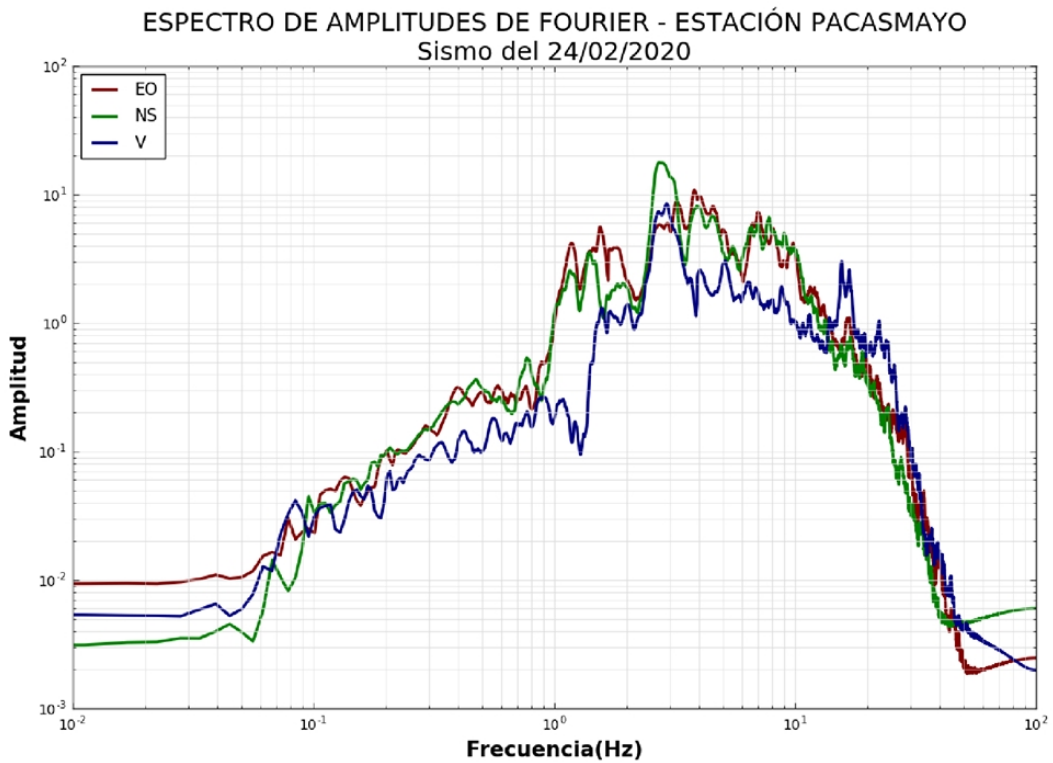


Figura N°4a.

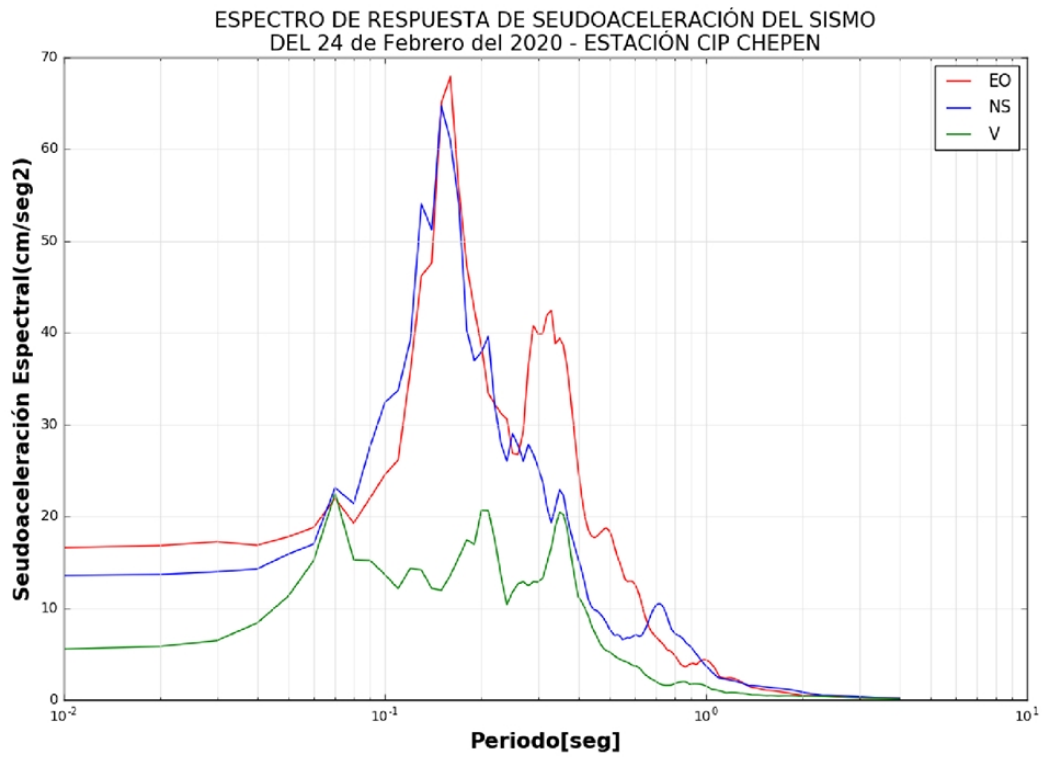


Figura N°4b.

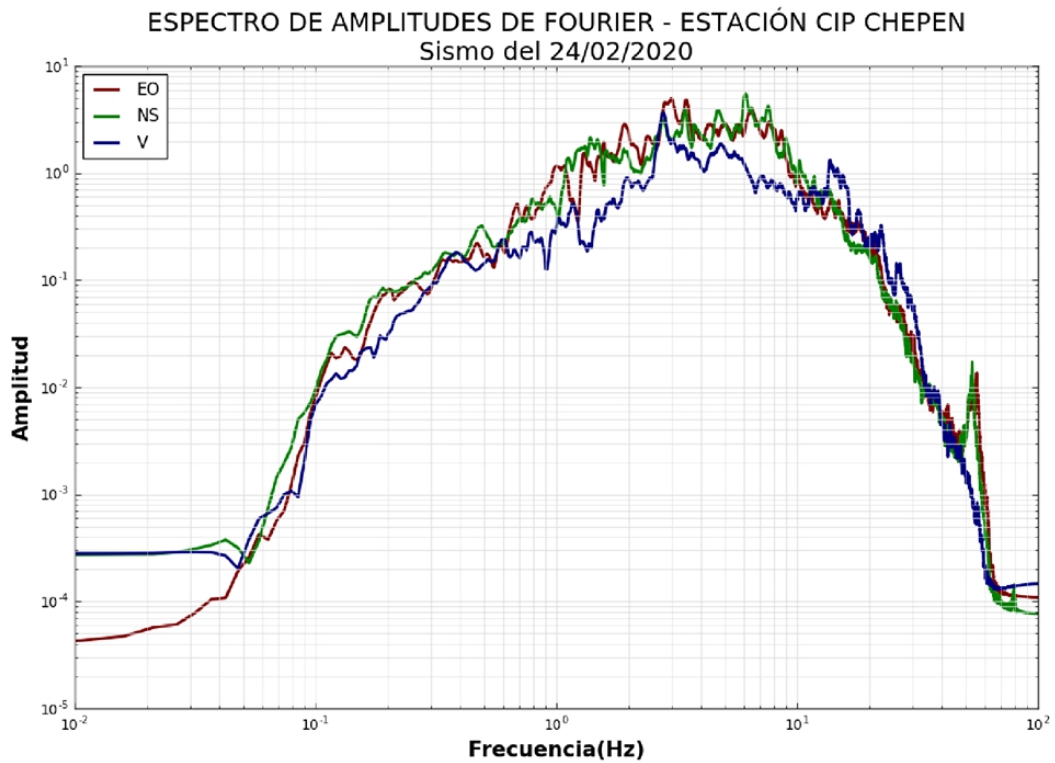


Figura N°5a.

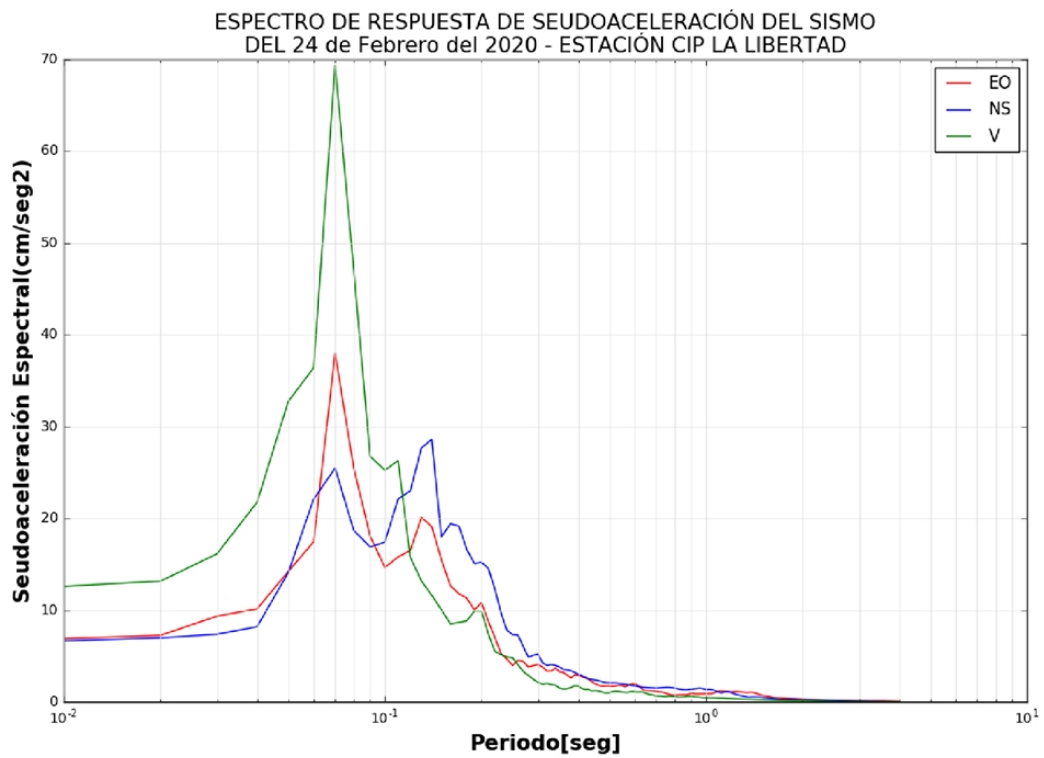


Figura N°5b.

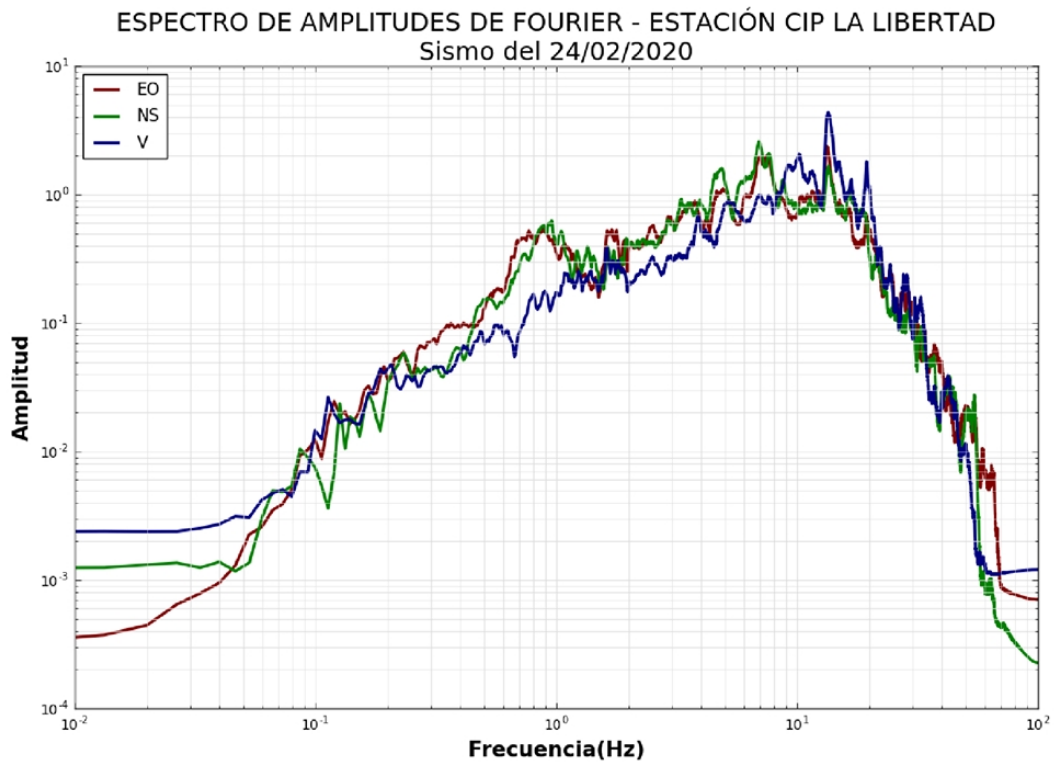


Figura N°6a.

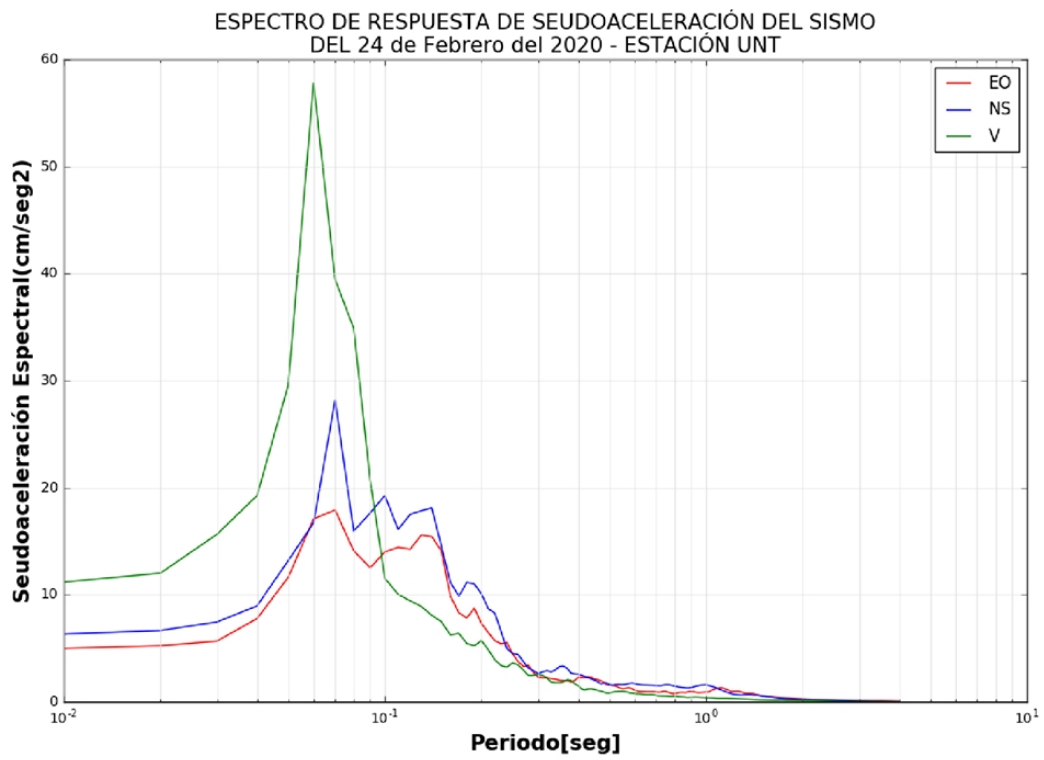


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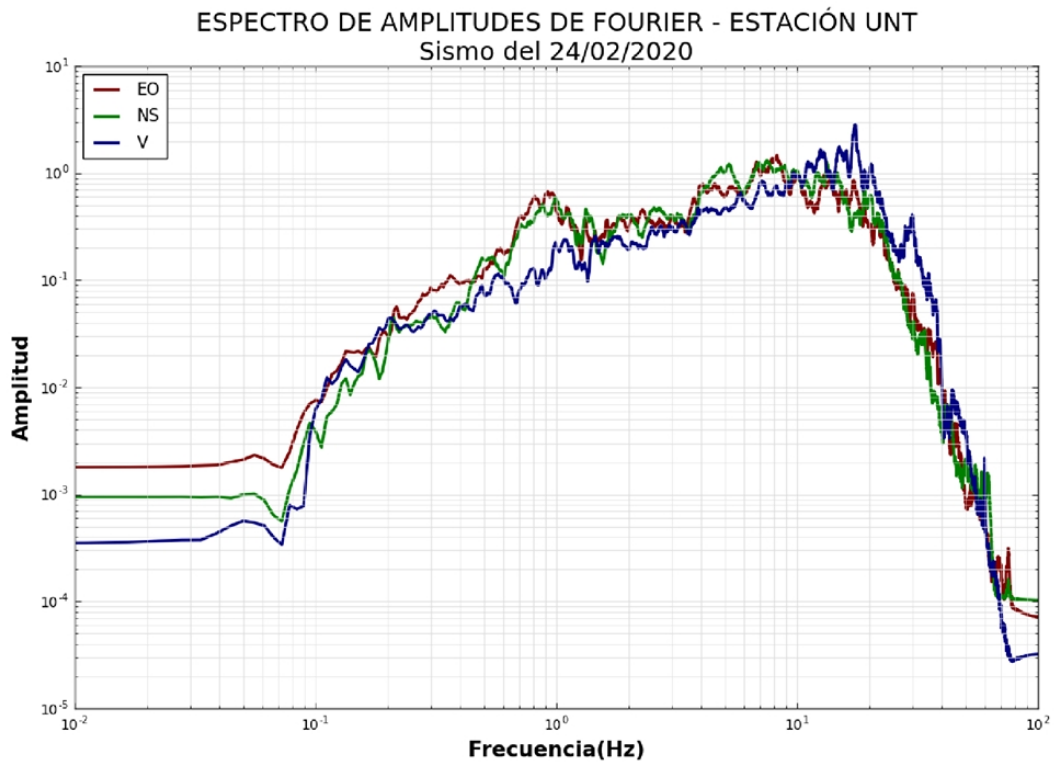


Figura N°7a.

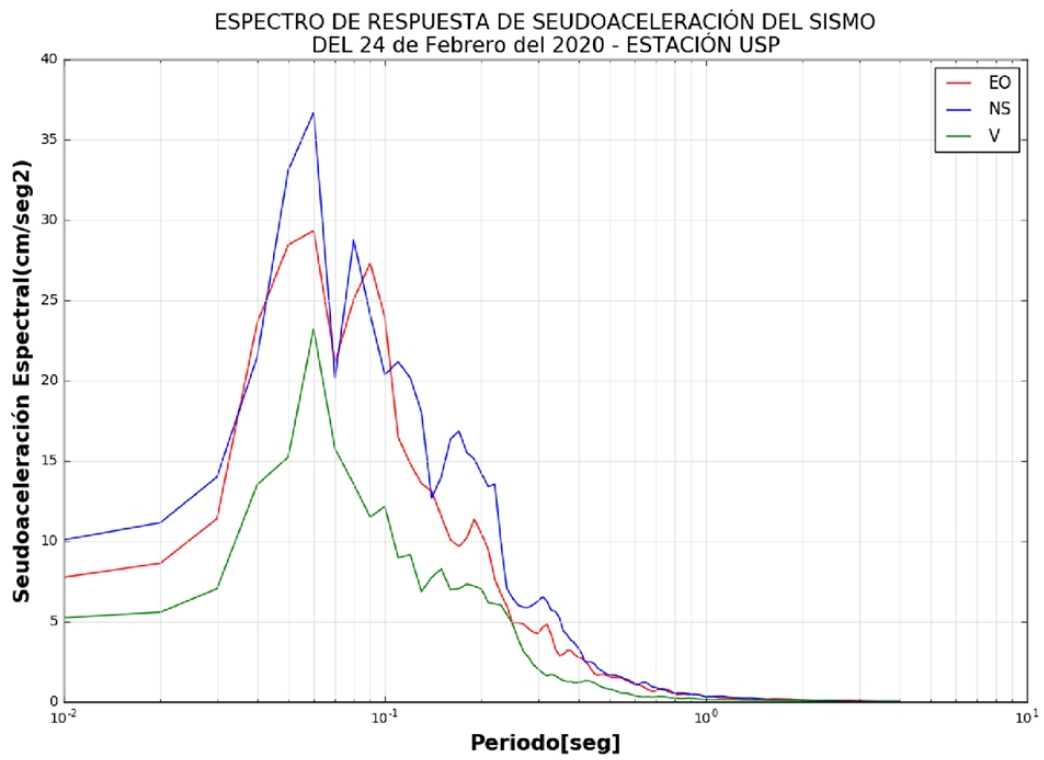


Figura N°7b.

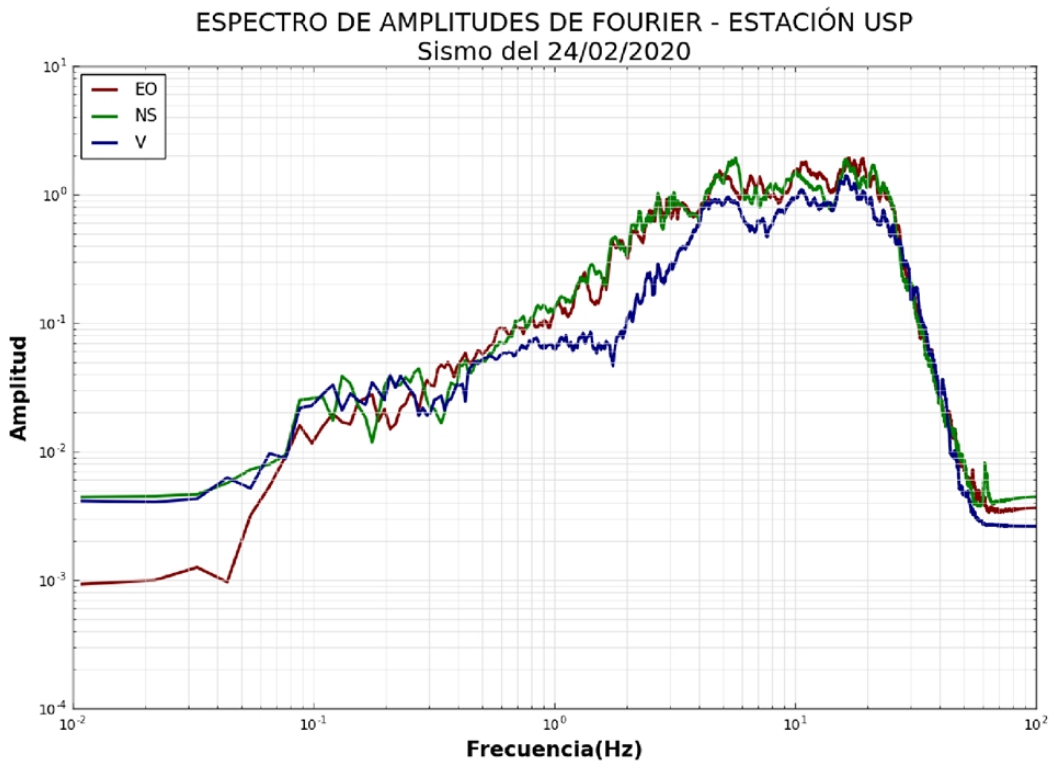


Figura N°8a.

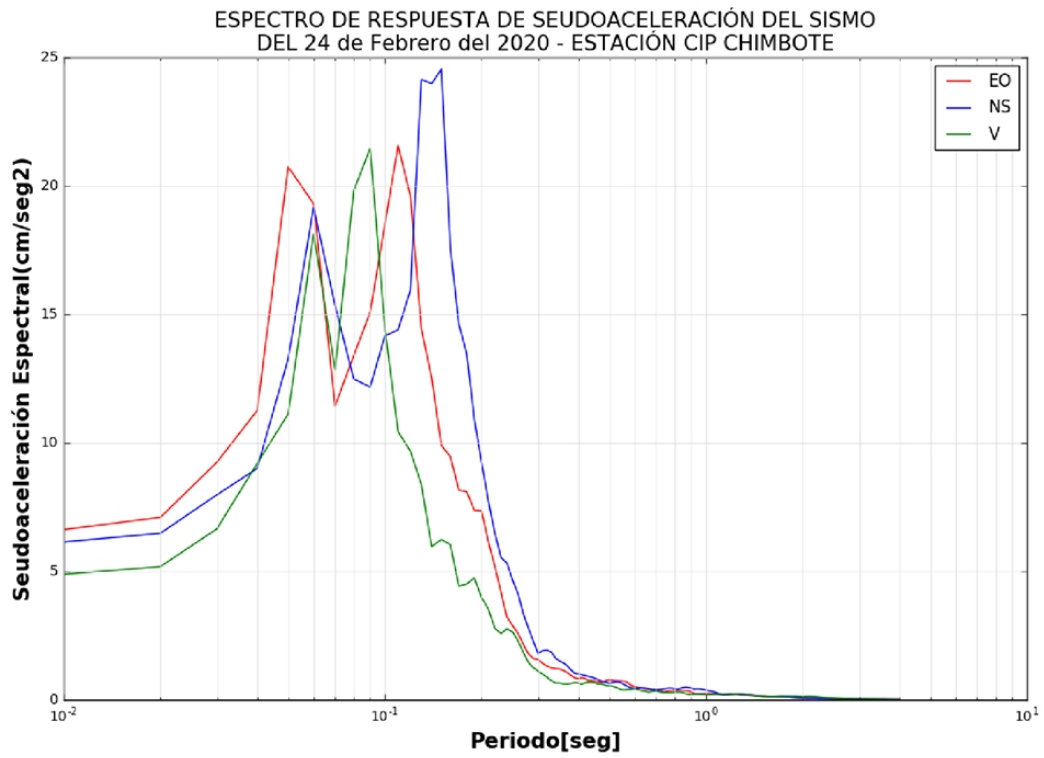


Figura N°8b.

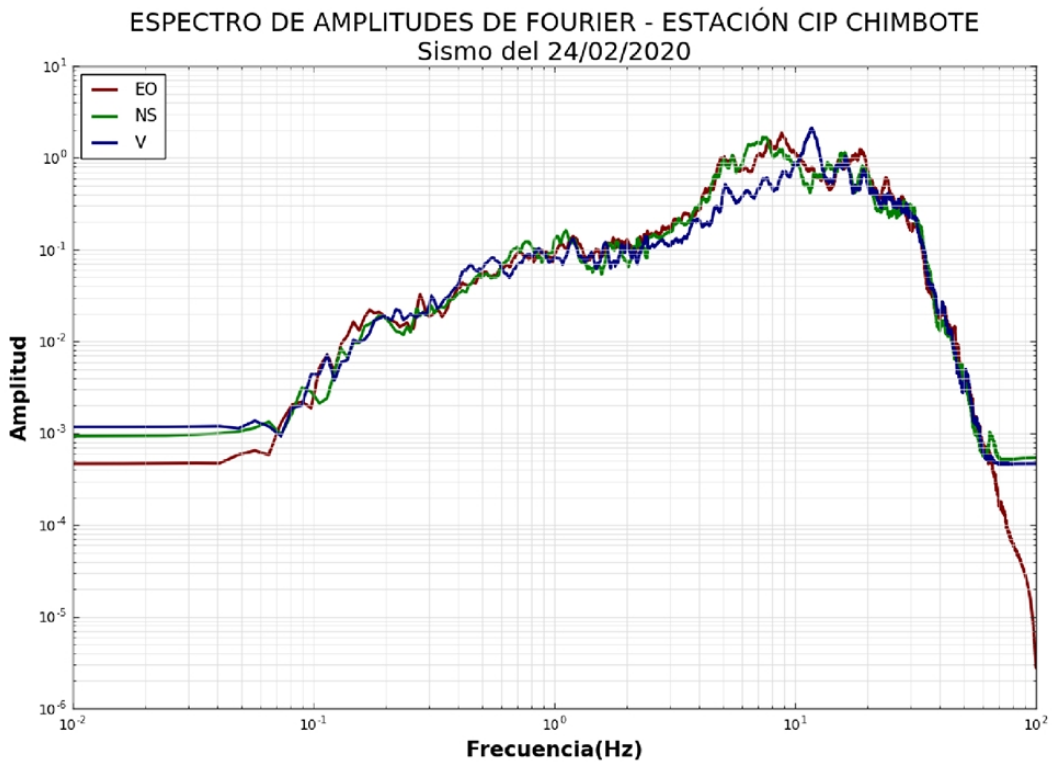


Figura N°9a.

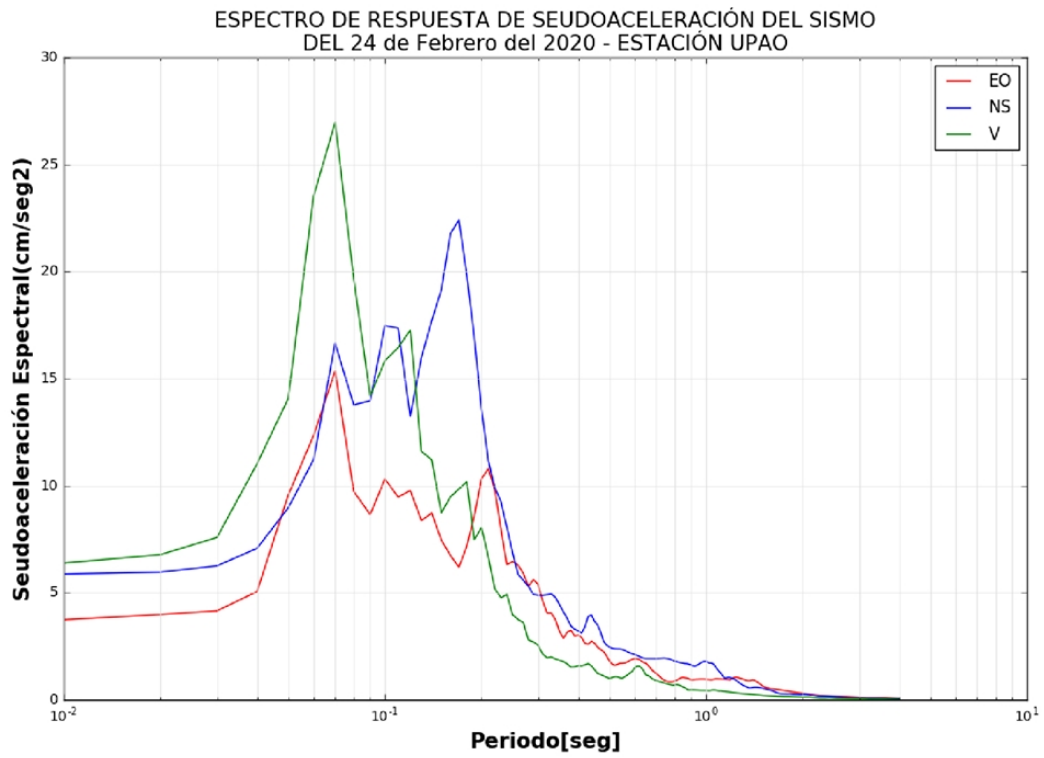


Figura N°9b.

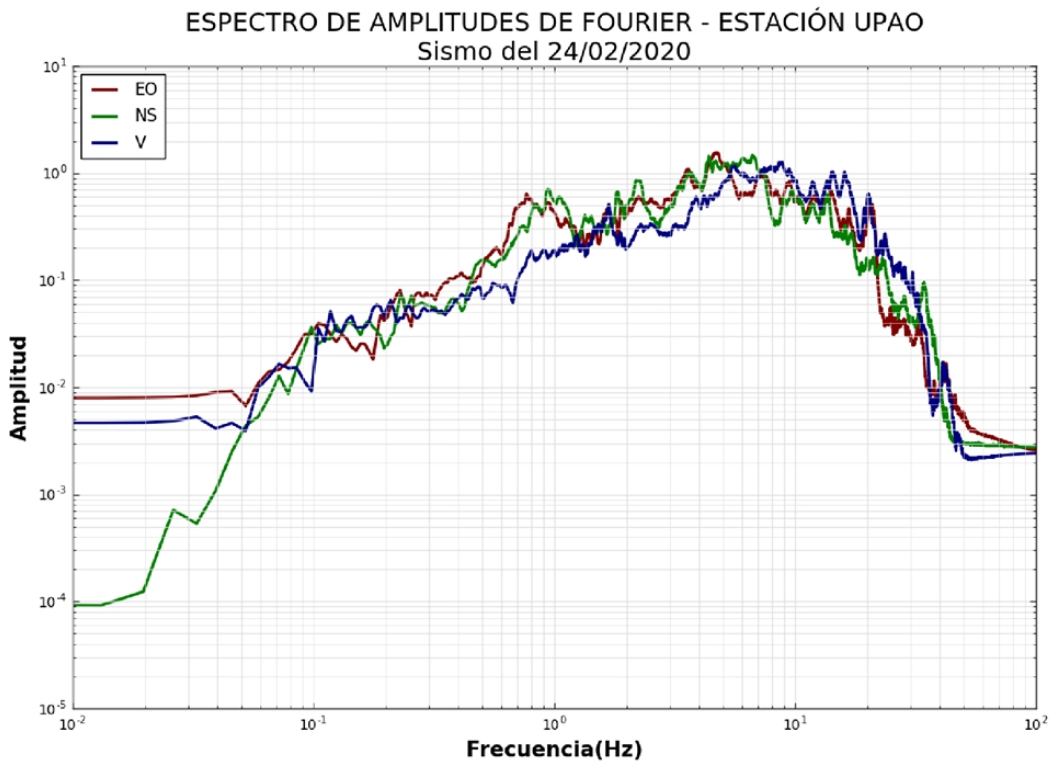


Figura N°10a.

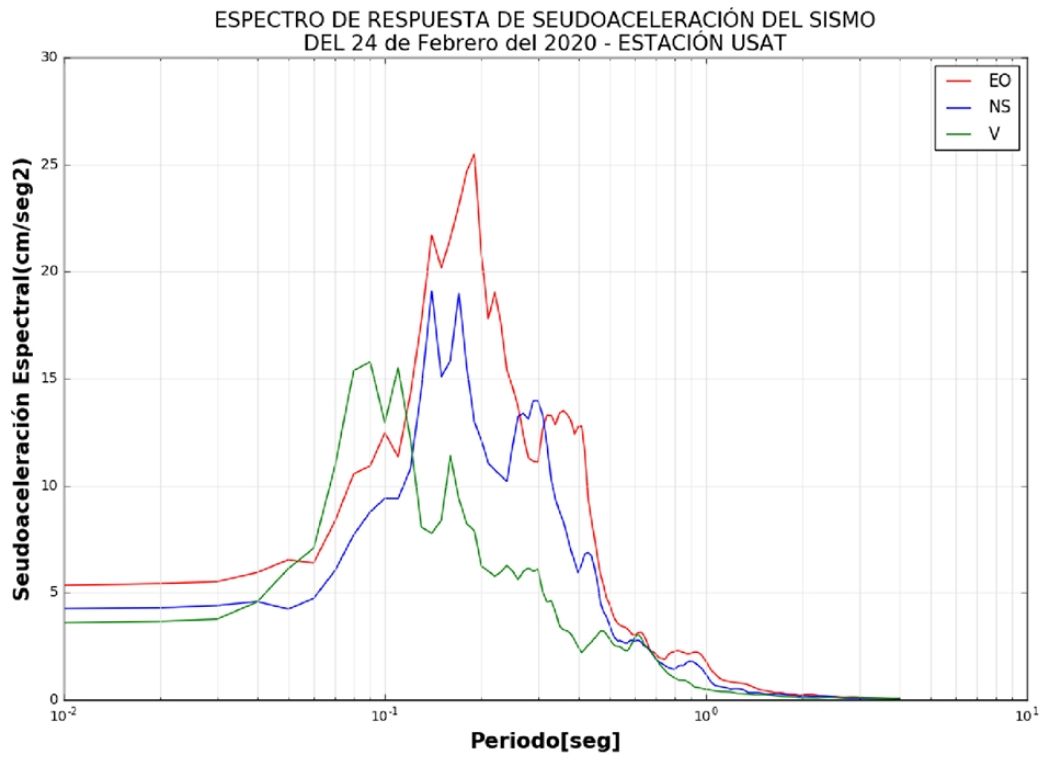


Figura N°10b.

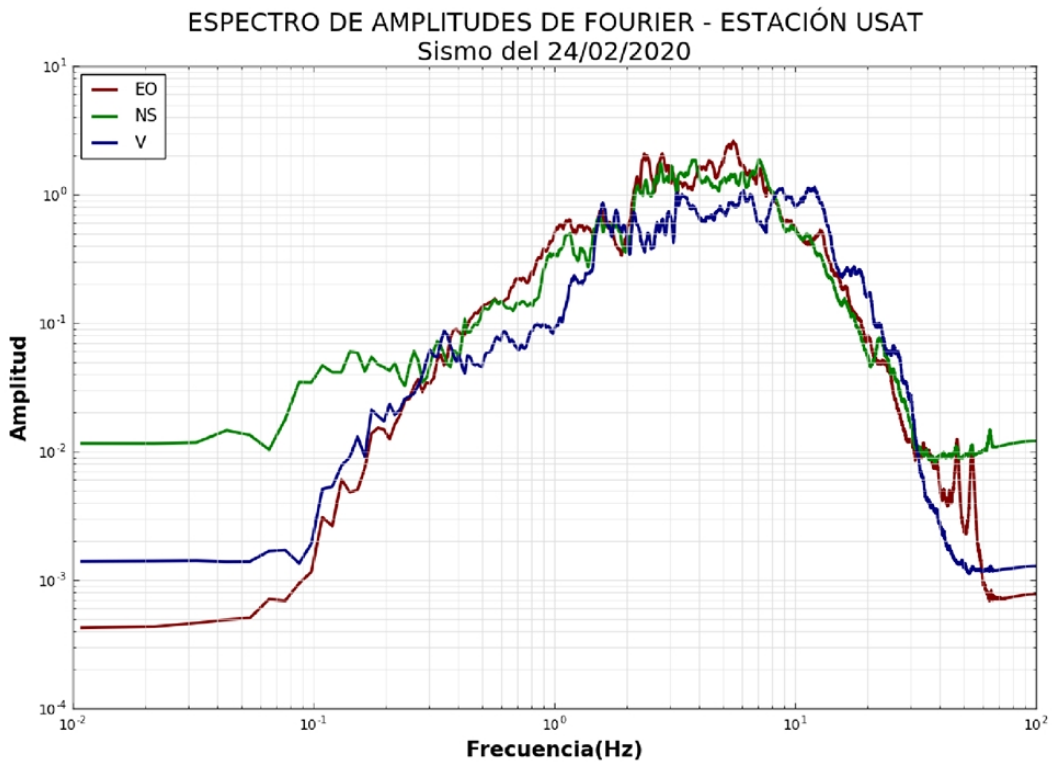


Figura N°11a.

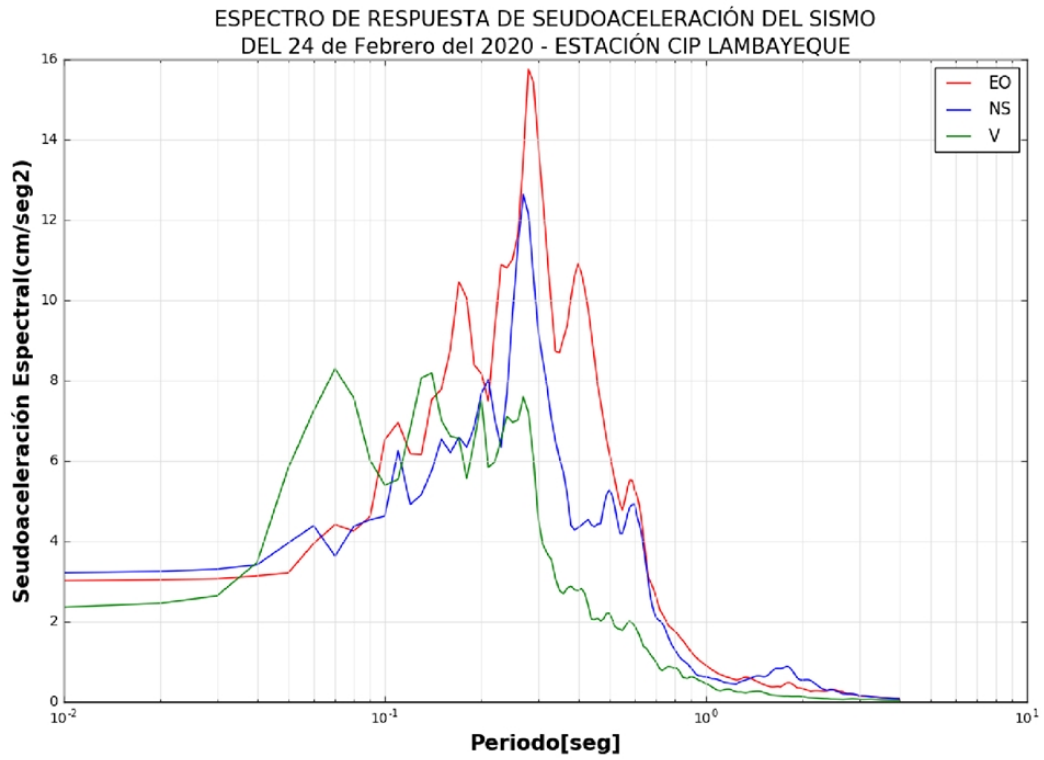


Figura N°11b.

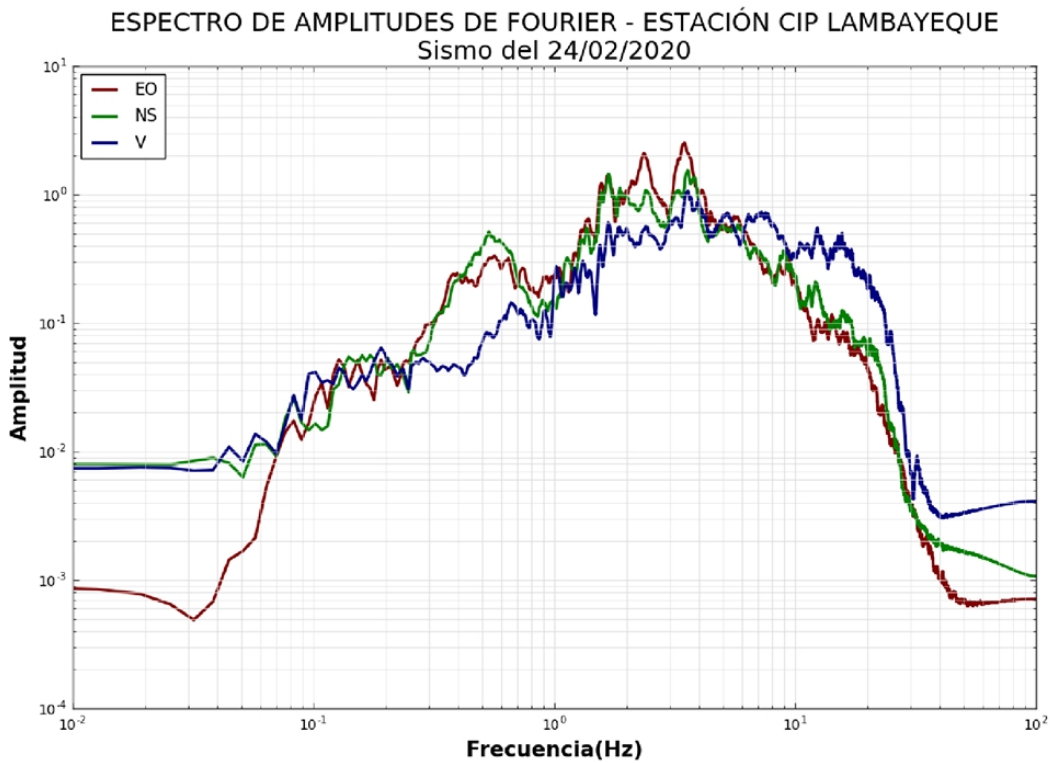


Figura N°12a.

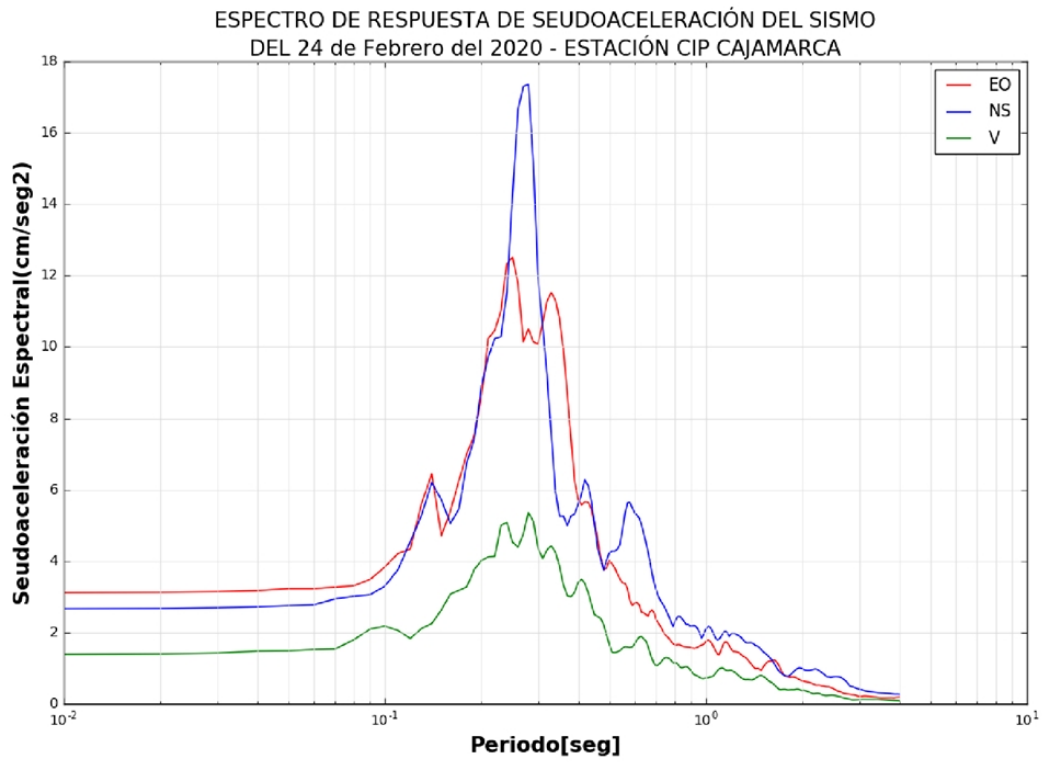


Figura N°12b.

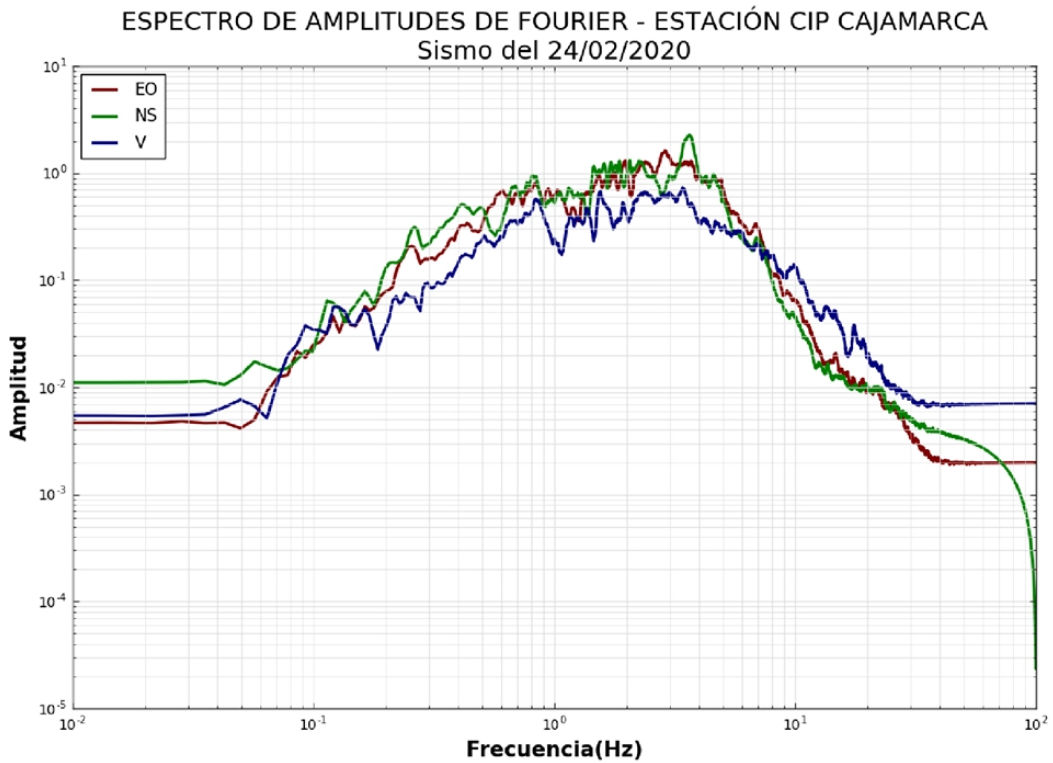


Figura N°13a.

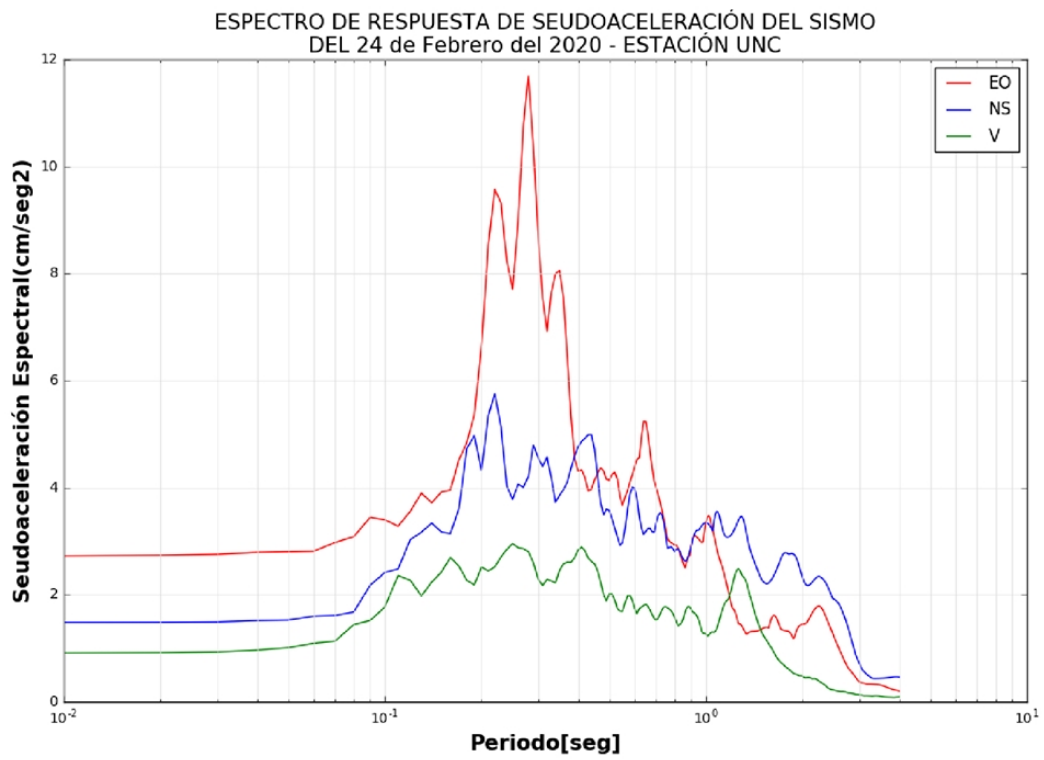


Figura N°13b.

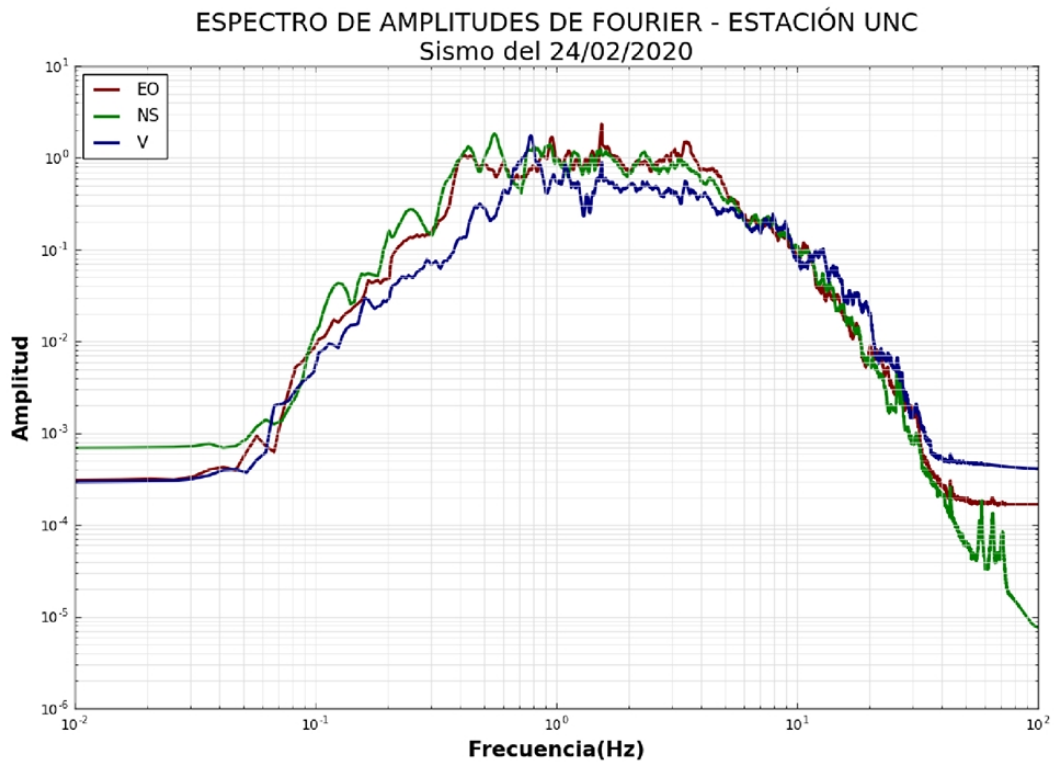


Figura N°14a.

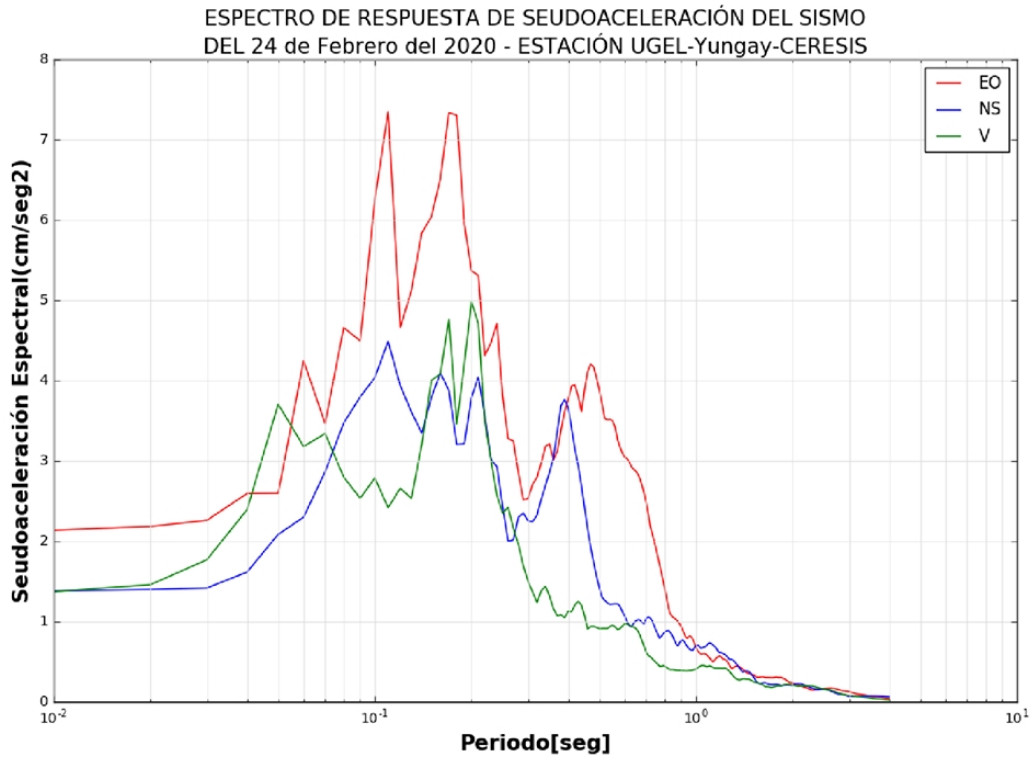
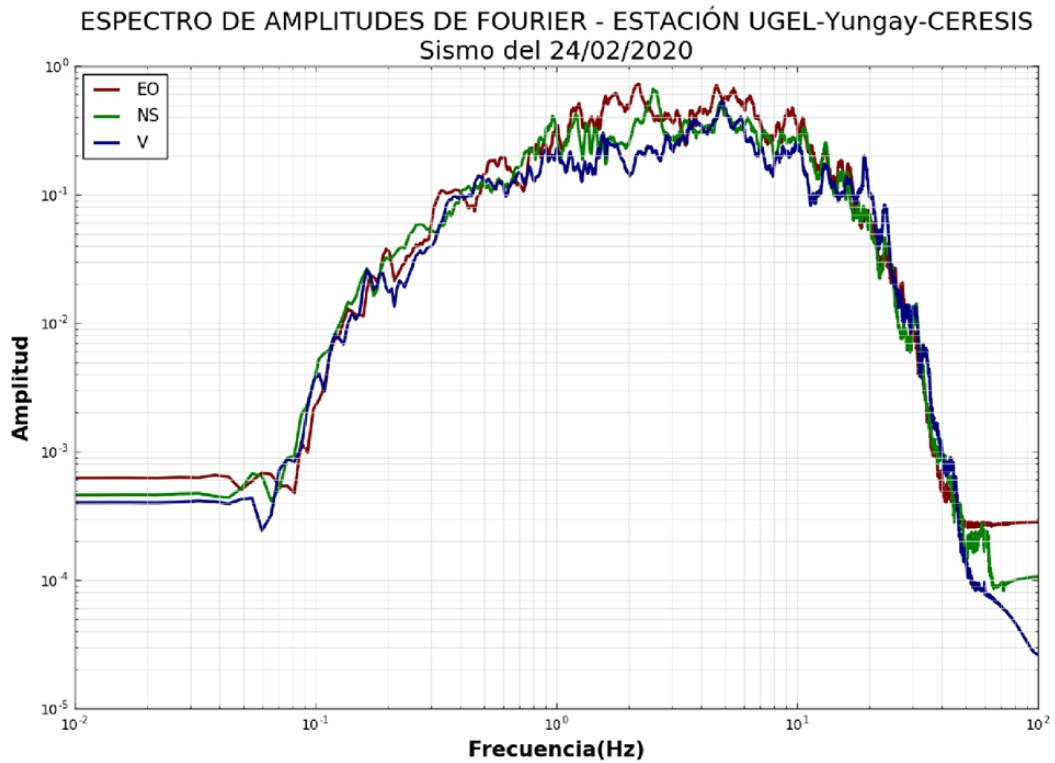


Figura N°14b.

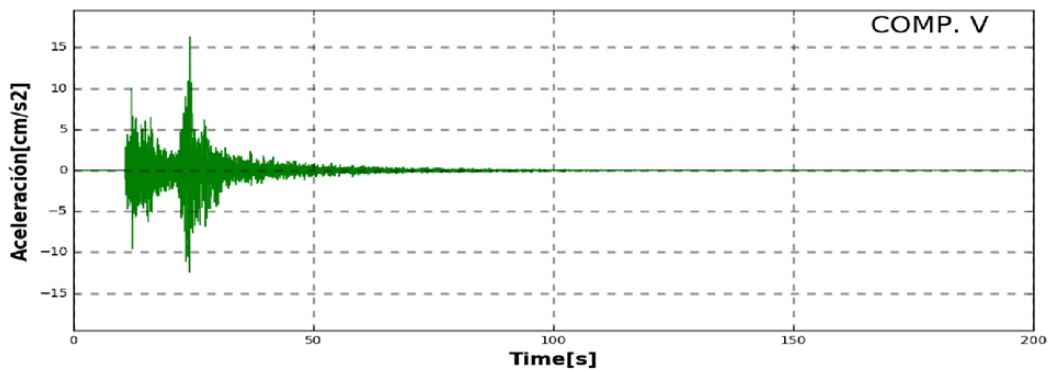
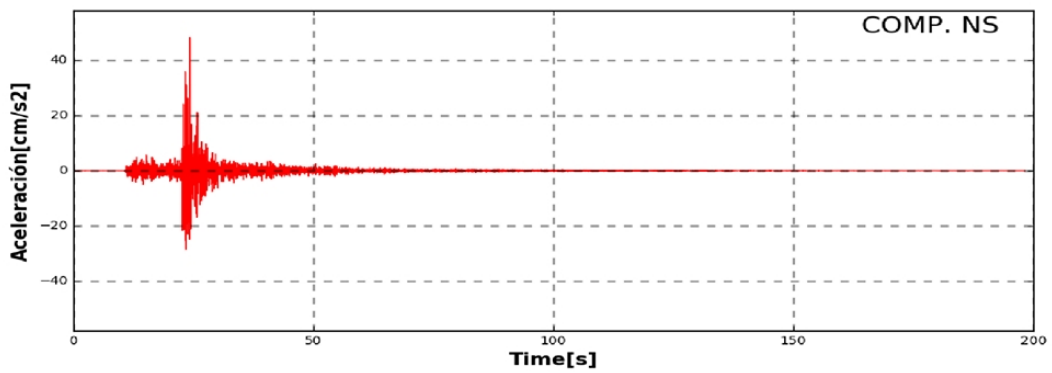
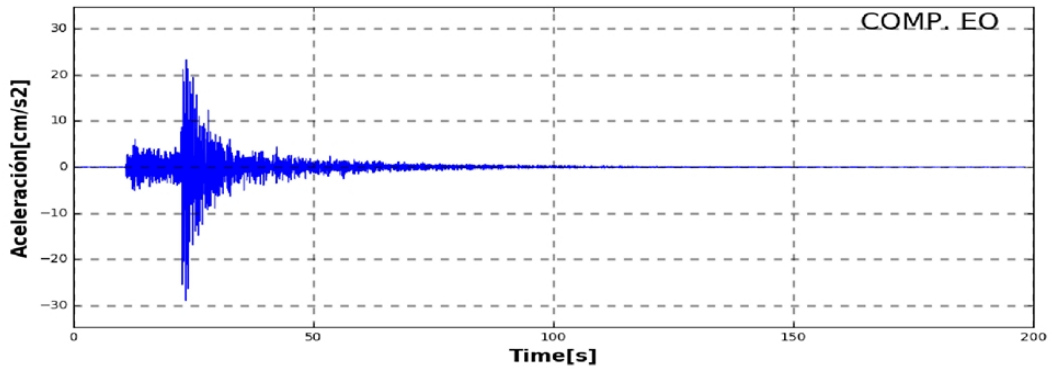


ANEXO 01

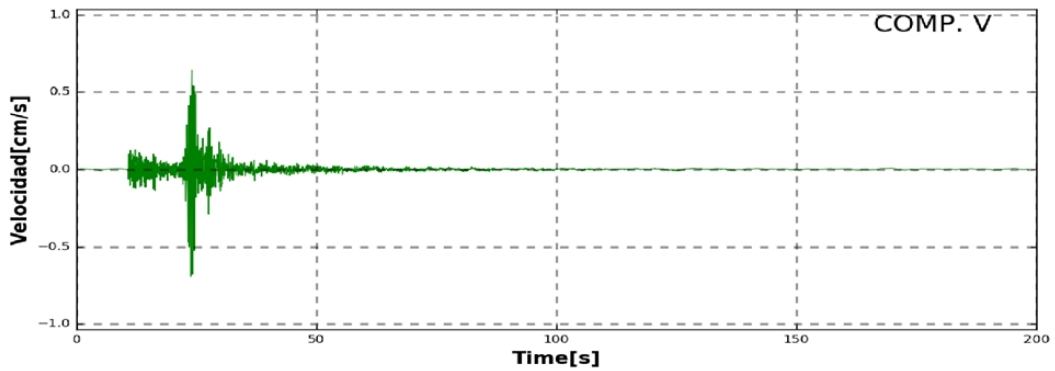
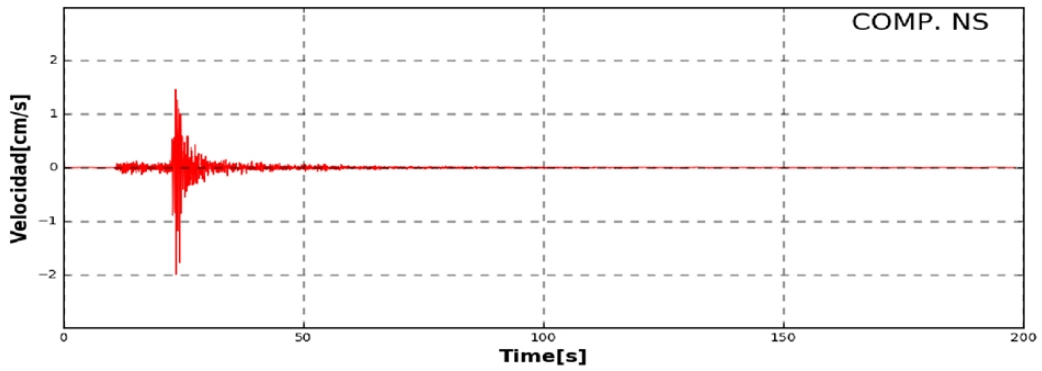
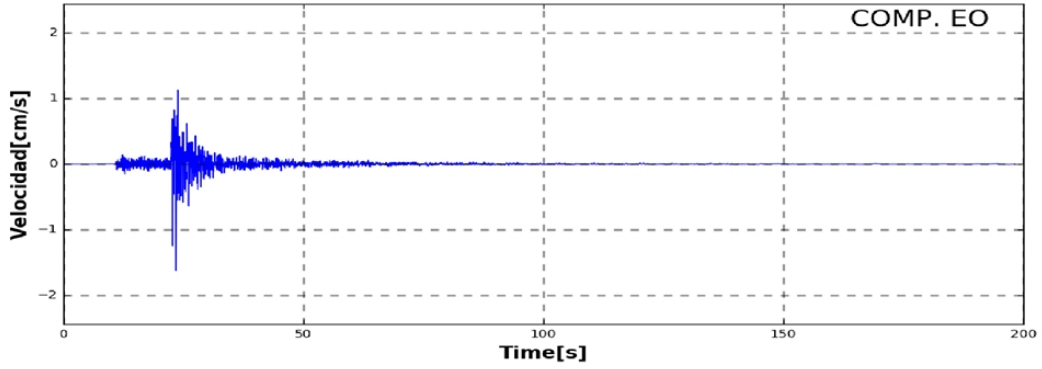
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. PACASMAYO

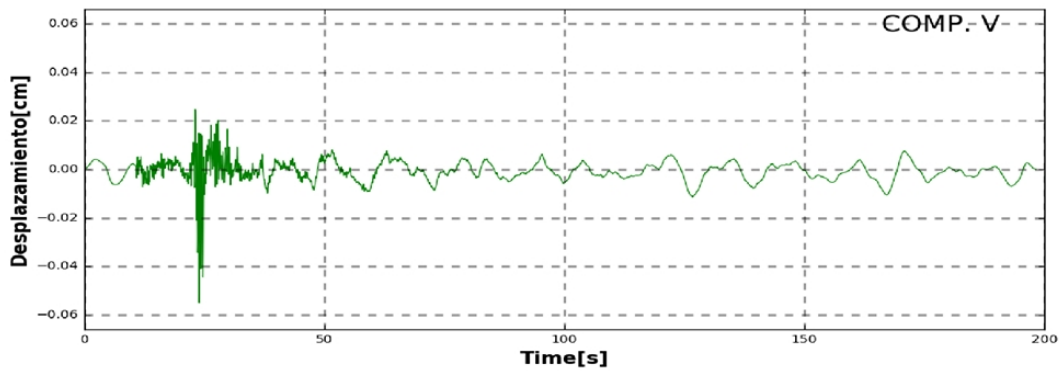
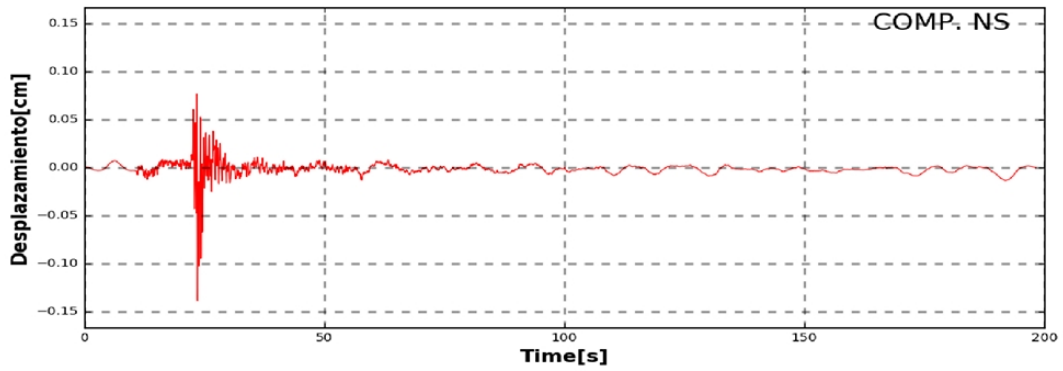
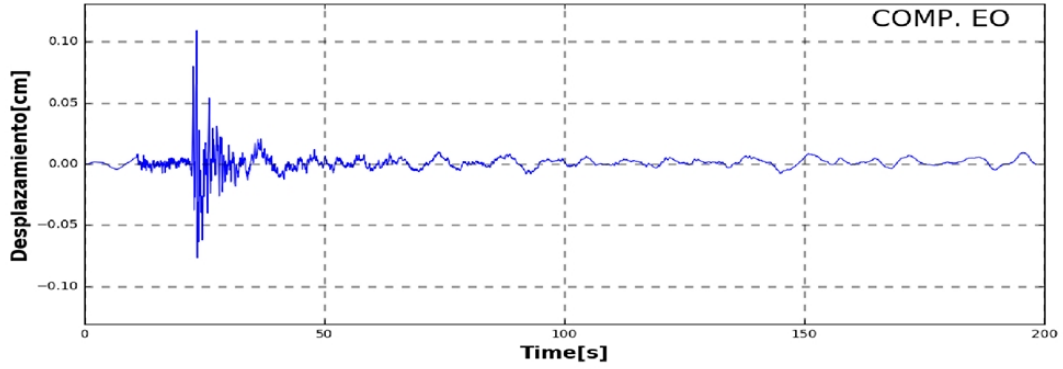
Aceleración Máxima(cm/seg ²)		
EO	NS	V
28.89	48.26	16.29



Velocidad Máxima(cm/seg)		
EO	NS	V
1.631	1.985	0.690



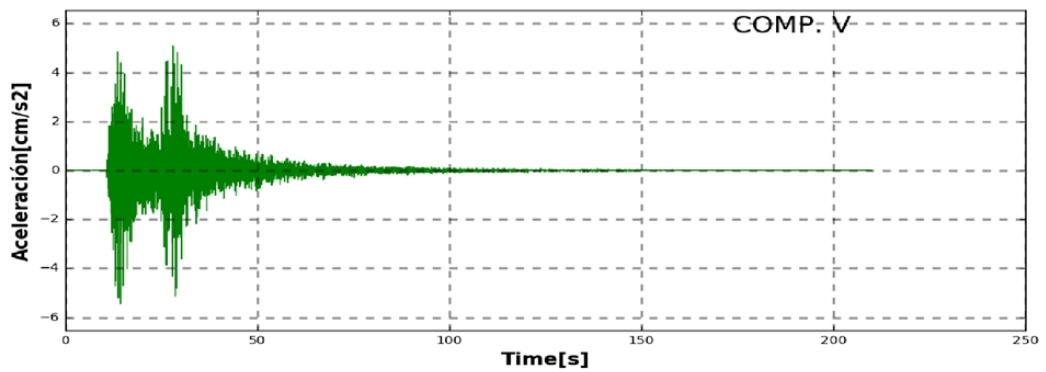
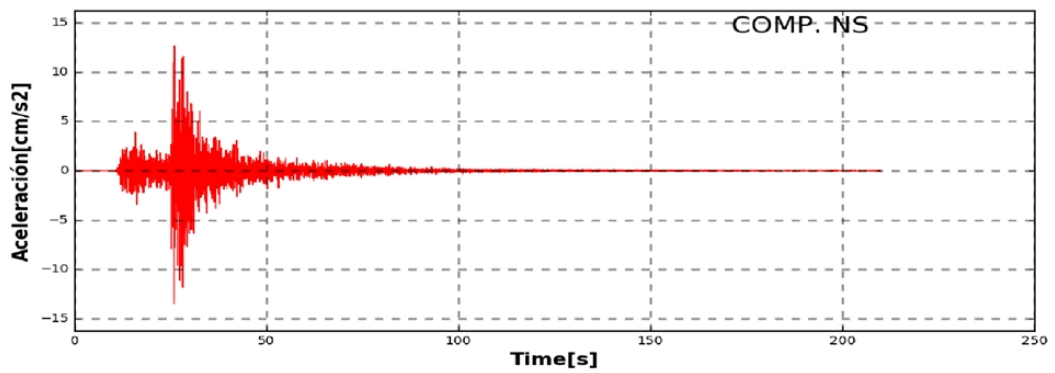
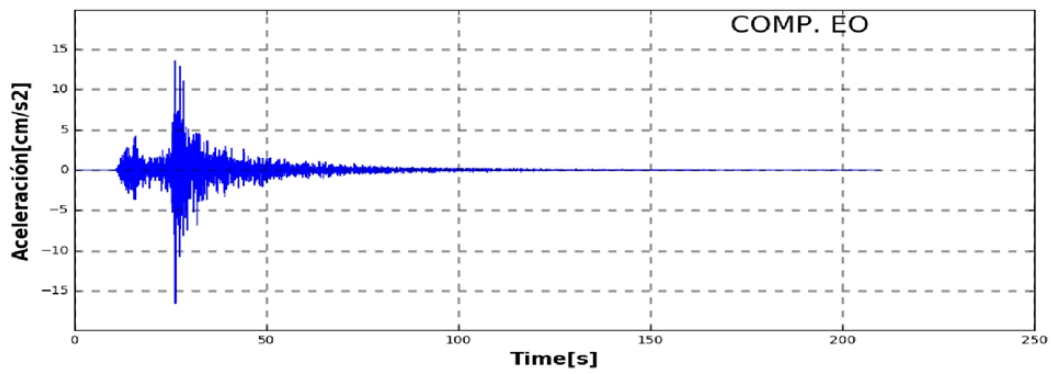
Desplazamiento Máximo(cm)		
EO	NS	V
0.109	0.139	0.055



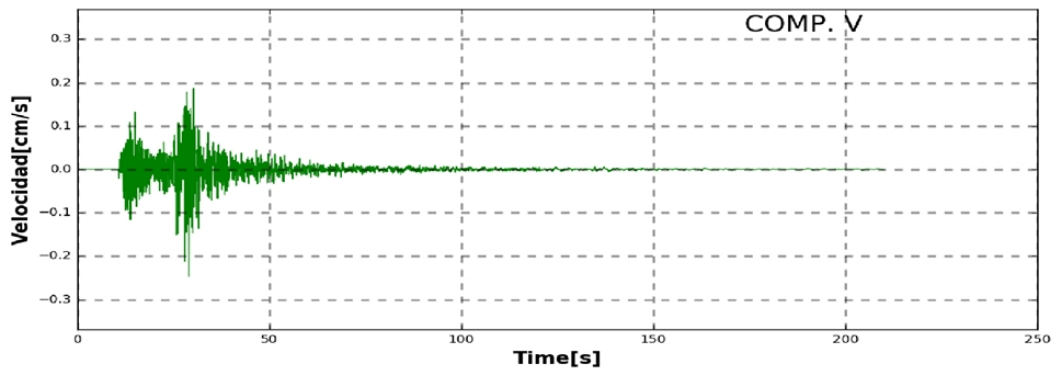
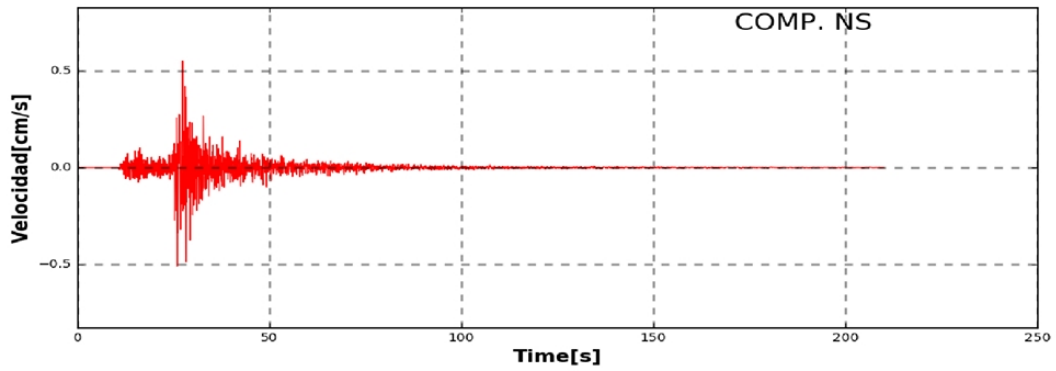
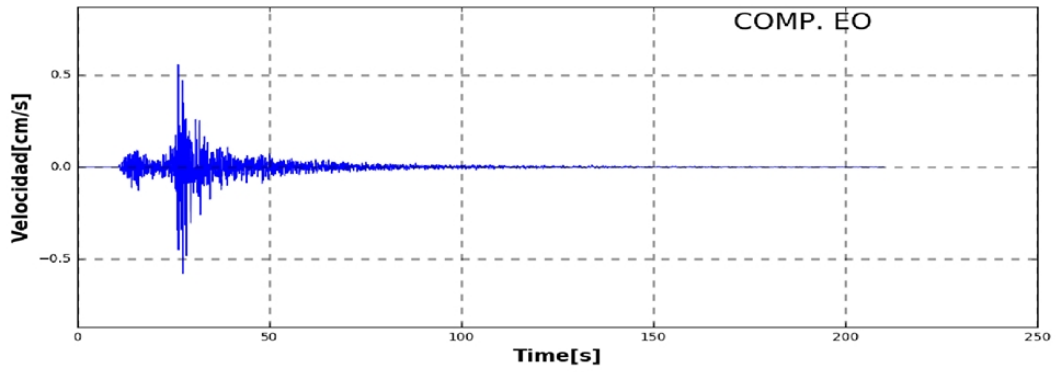
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. CIP CHEPEN

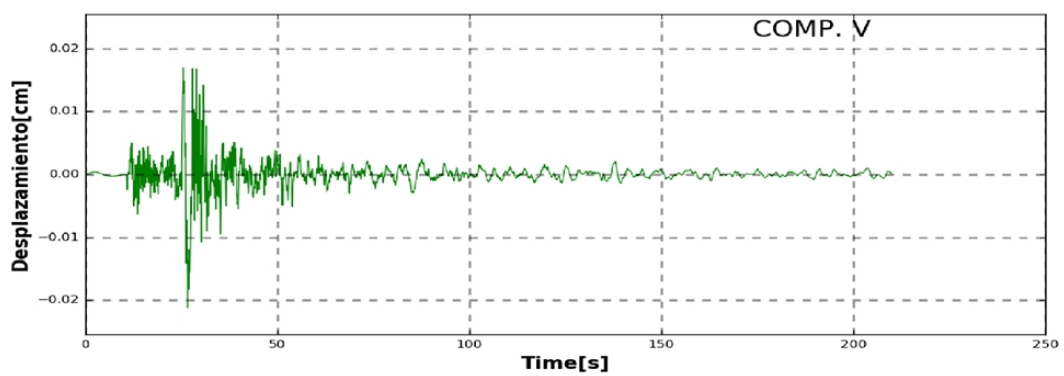
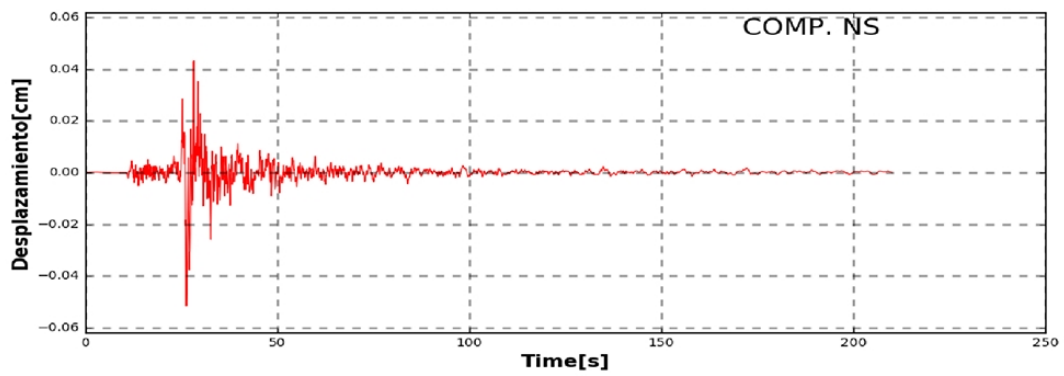
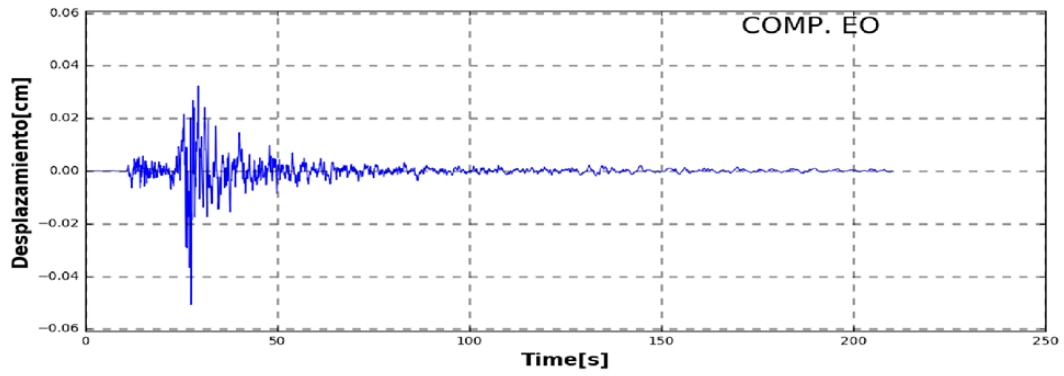
Aceleración Máxima(cm/seg ²)		
EO	NS	V
16.53	13.53	5.44



Velocidad Máxima(cm/seg)		
EO	NS	V
0.578	0.549	0.246



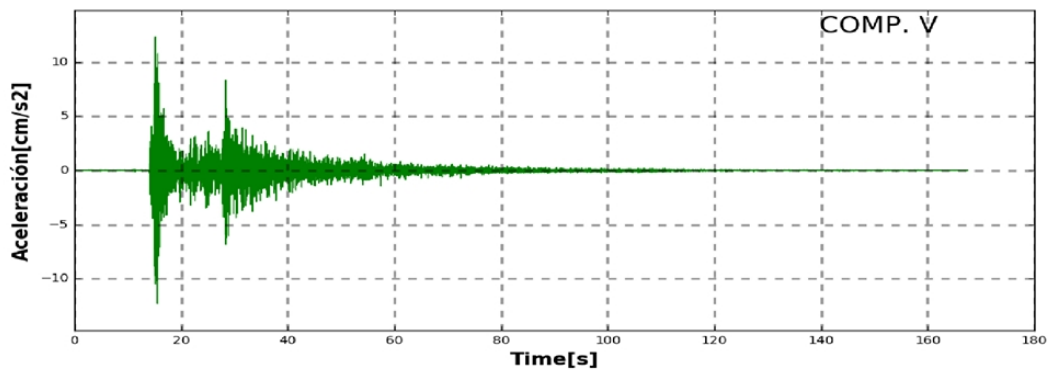
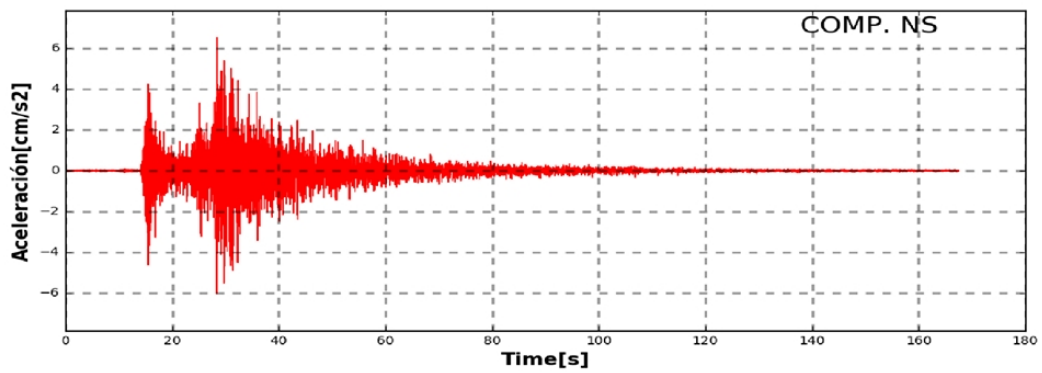
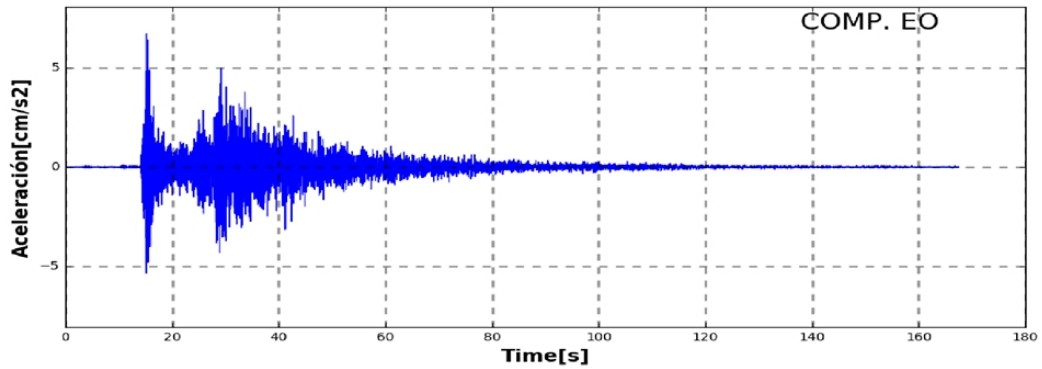
Desplazamiento Máximo(cm)		
EO	NS	V
0.051	0.052	0.021



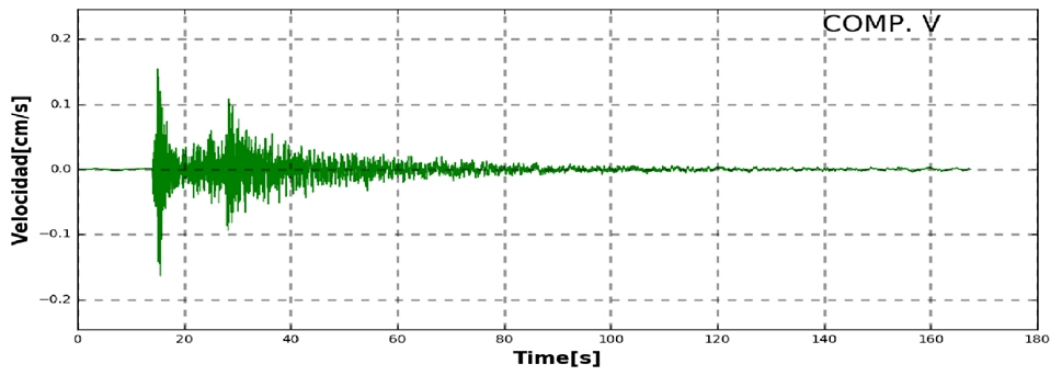
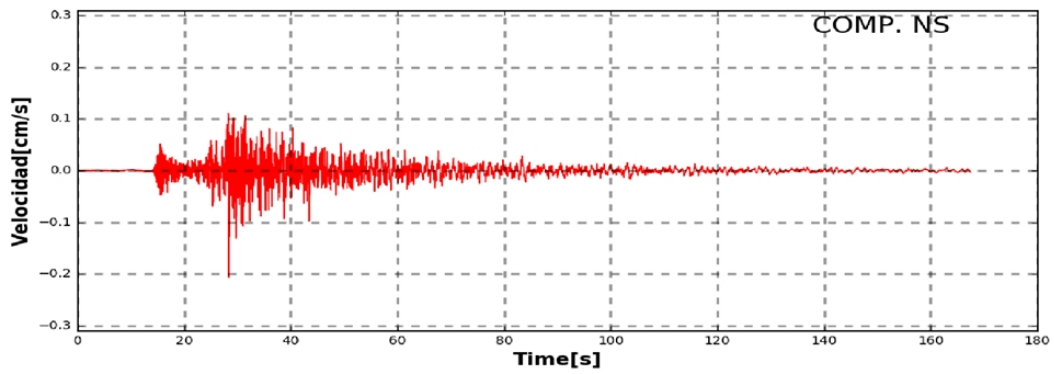
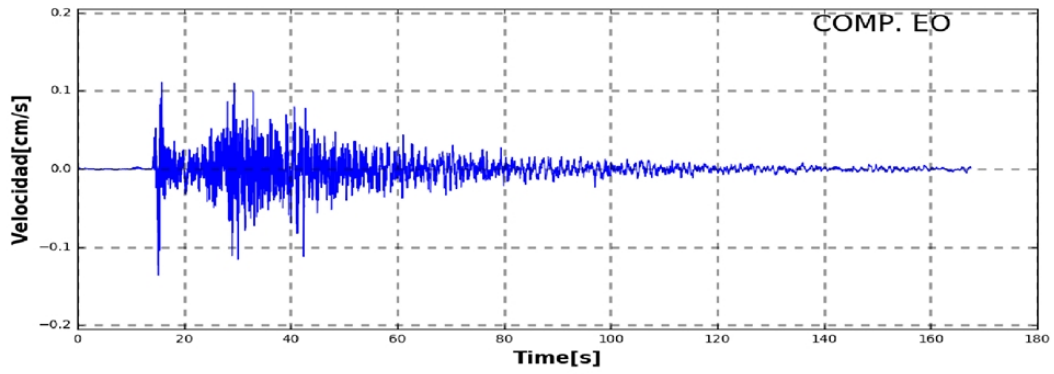
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. CIP LA LIBERTAD

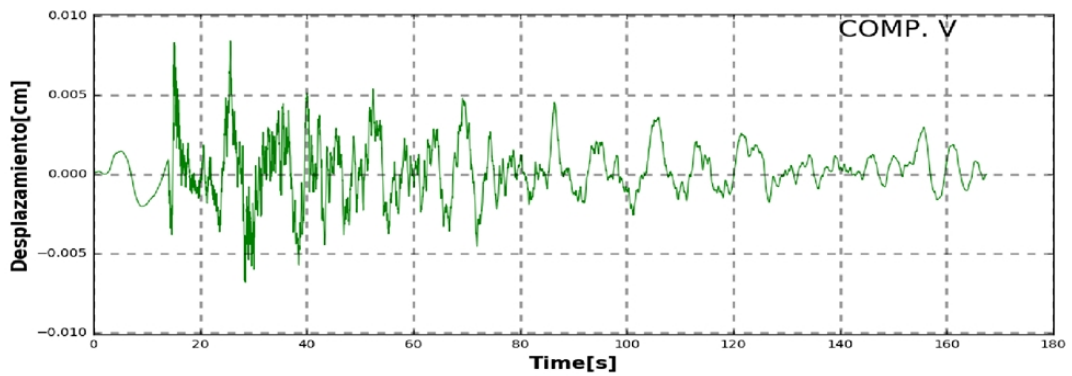
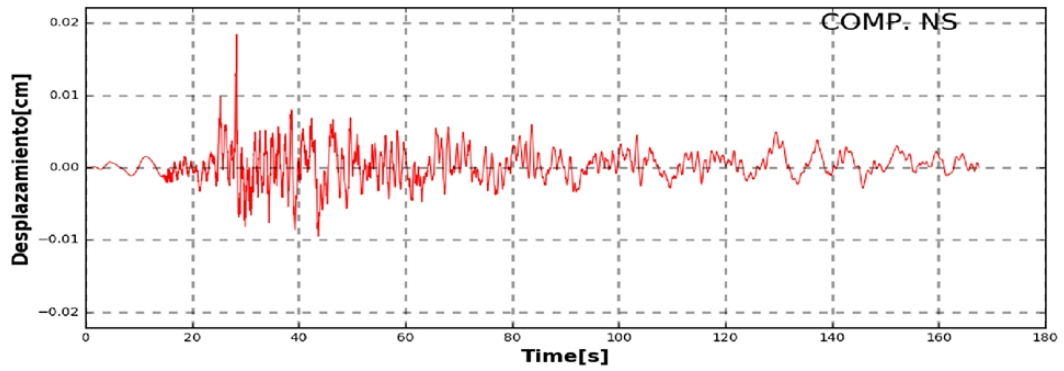
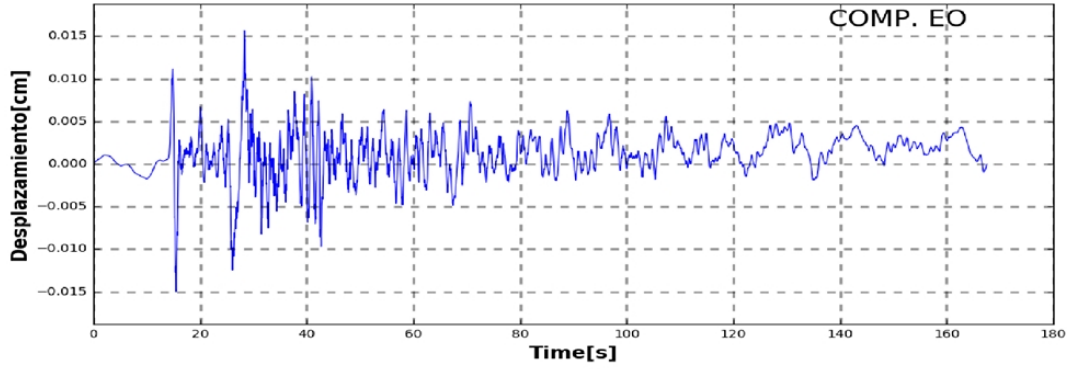
Aceleración Máxima(cm/seg ²)		
EO	NS	V
6.73	6.53	12.34



Velocidad Máxima(cm/seg)		
EO	NS	V
0.137	0.207	0.164



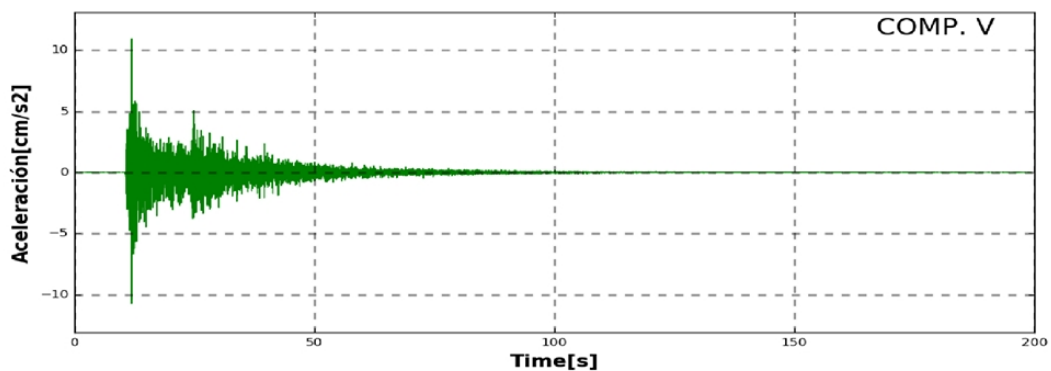
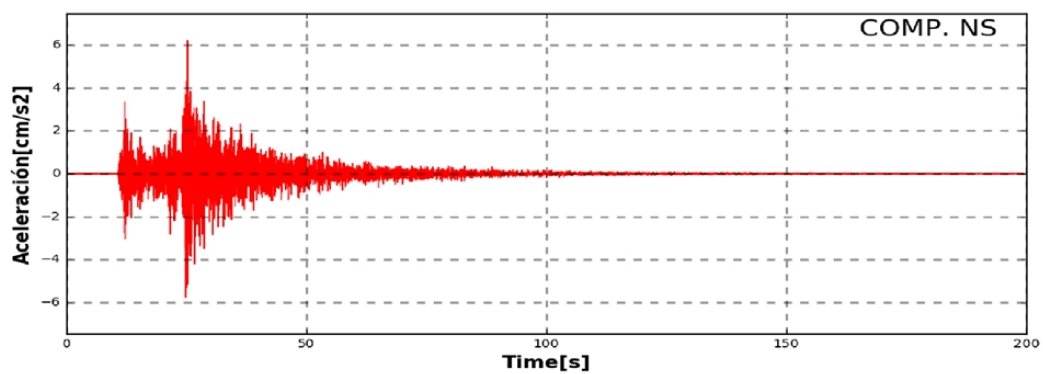
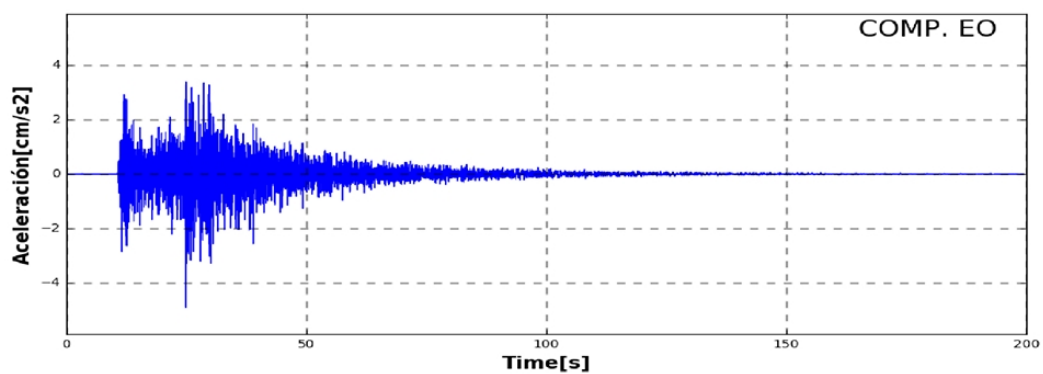
Desplazamiento Máximo(cm)		
EO	NS	V
0.016	0.018	0.008



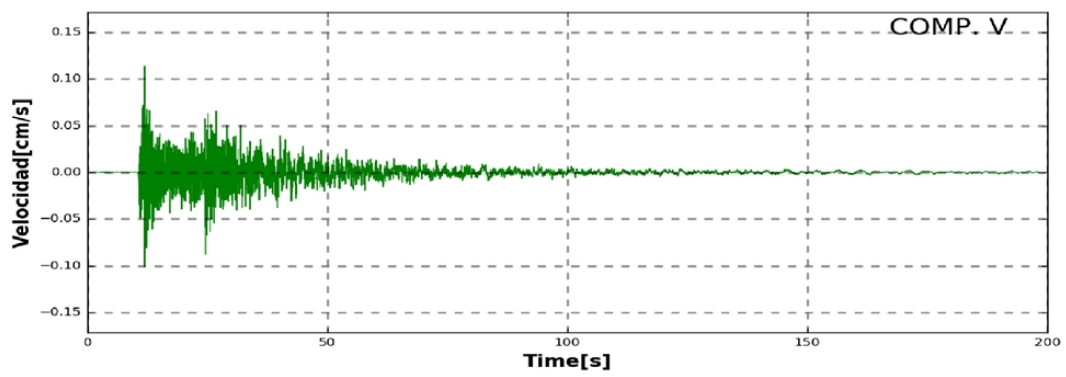
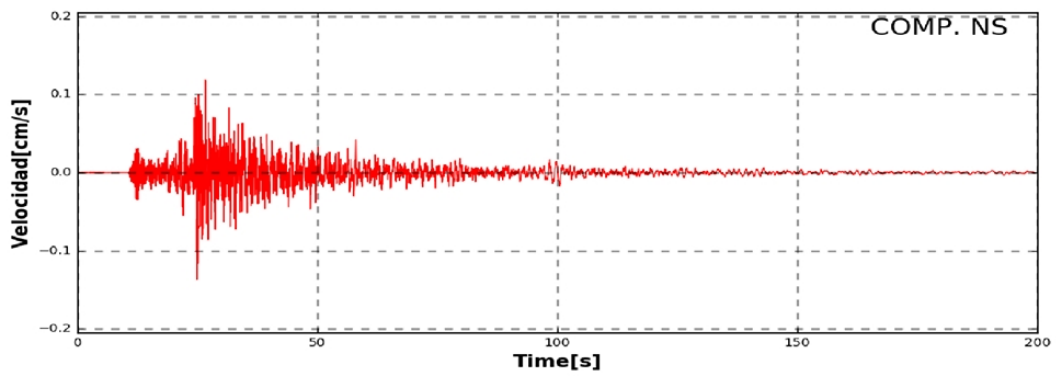
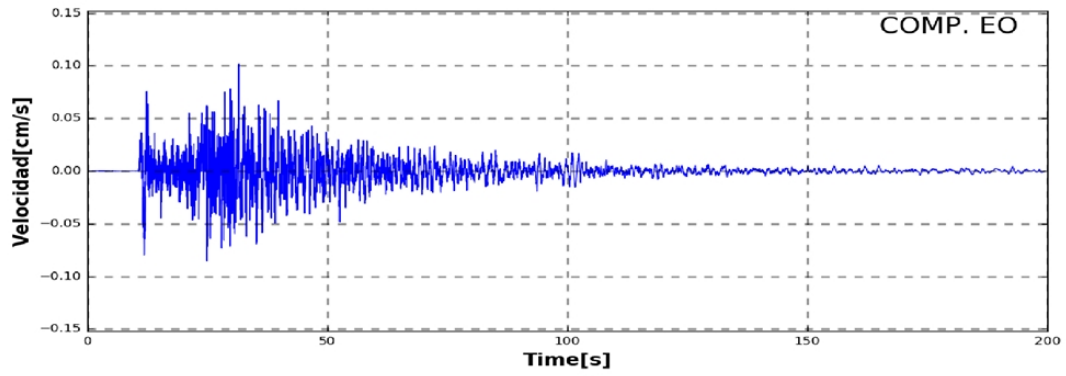
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. UNT

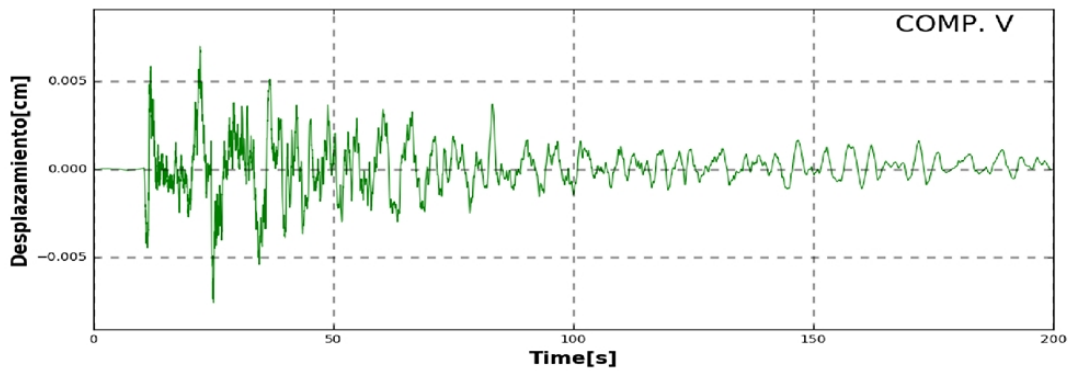
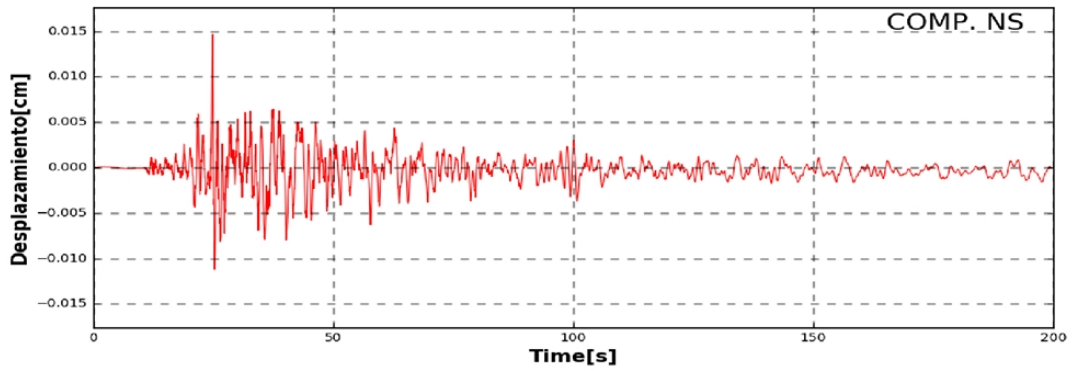
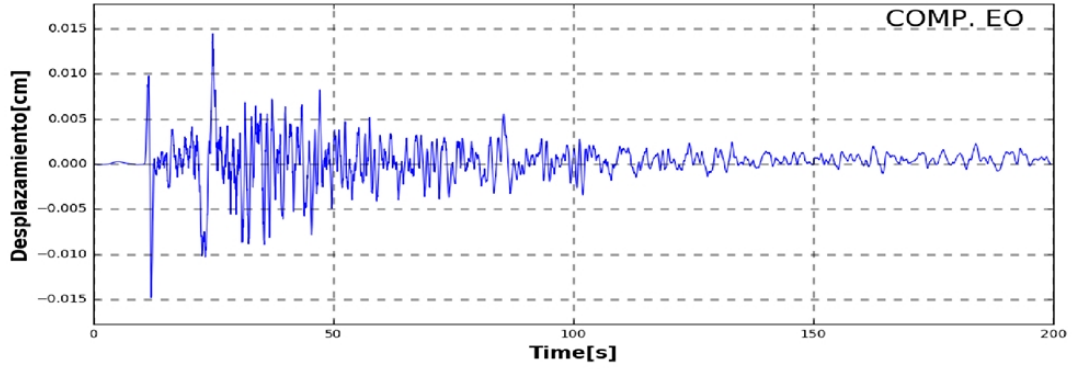
Aceleración Máxima(cm/seg ²)		
EO	NS	V
4.92	6.21	10.90



Velocidad Máxima(cm/seg)		
EO	NS	V
0.101	0.137	0.114



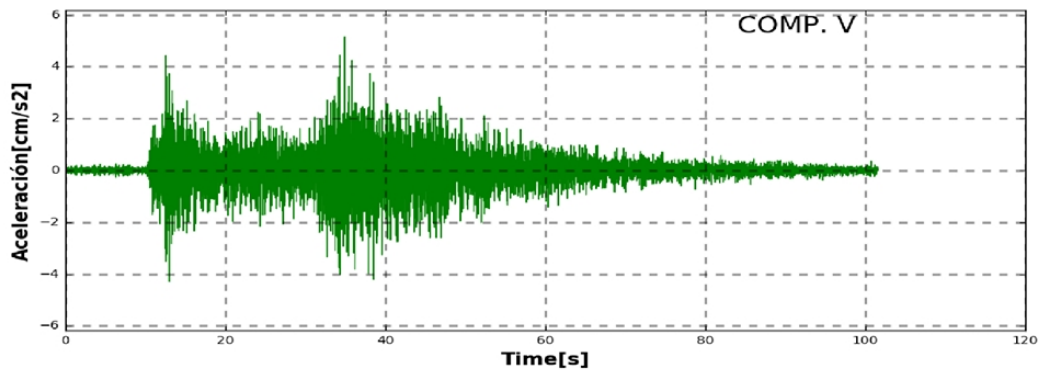
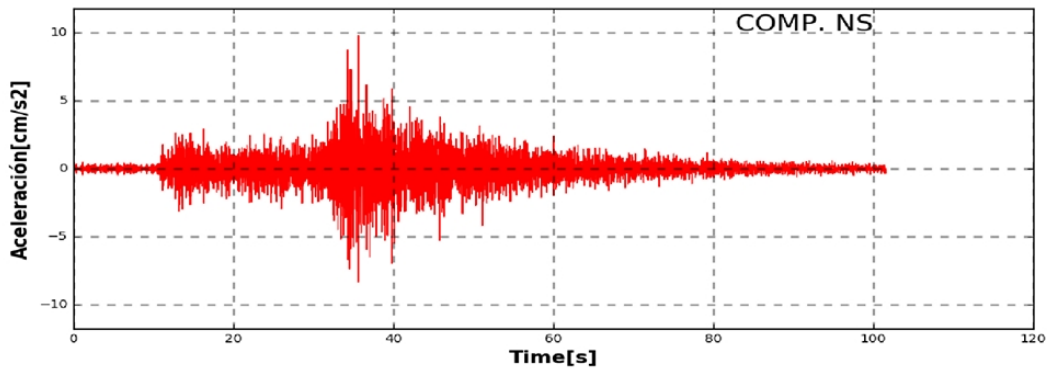
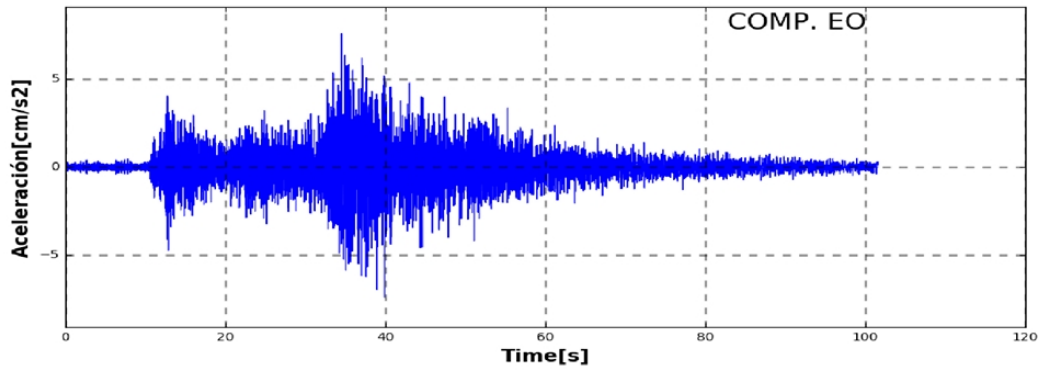
Desplazamiento Máximo(cm)		
EO	NS	V
0.015	0.015	0.008



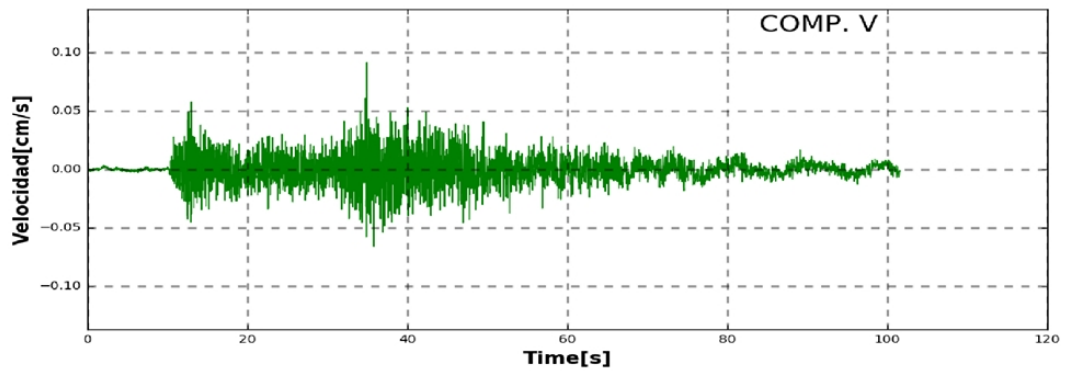
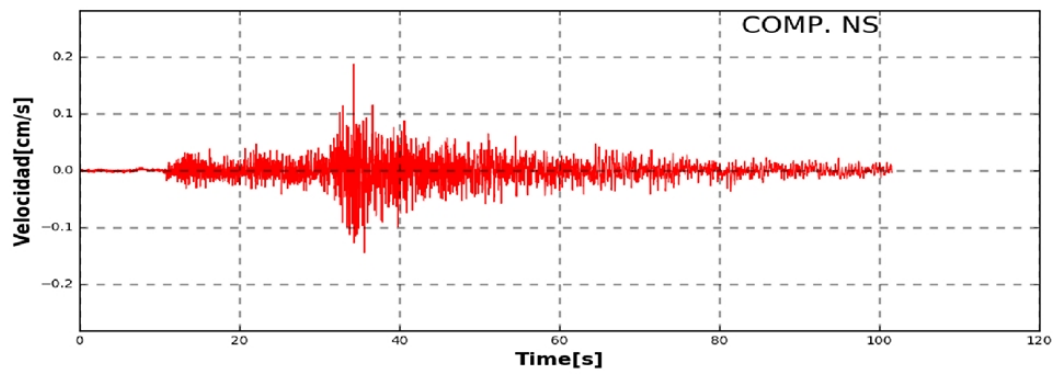
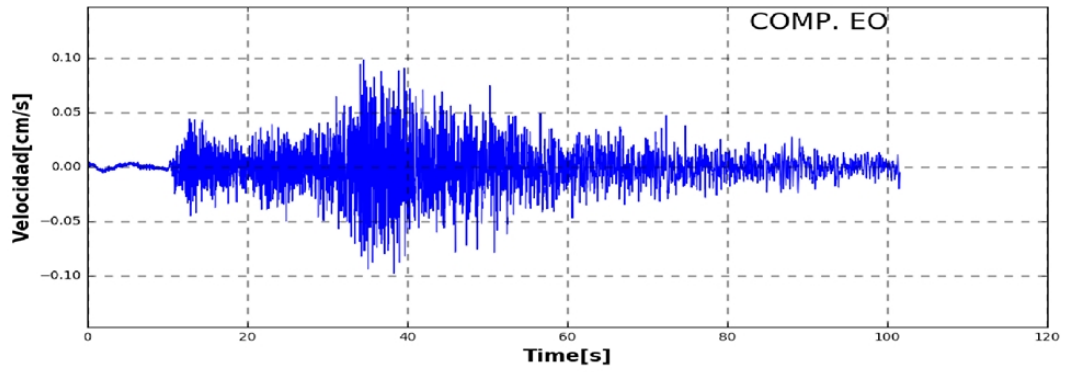
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. USP

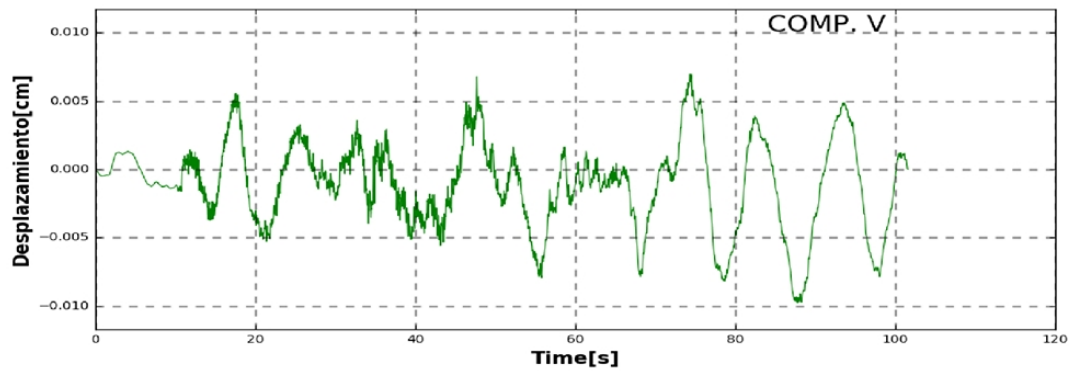
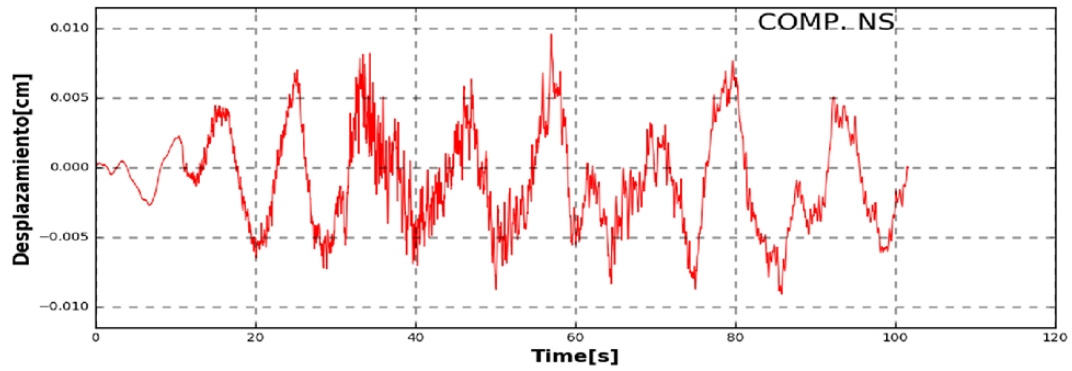
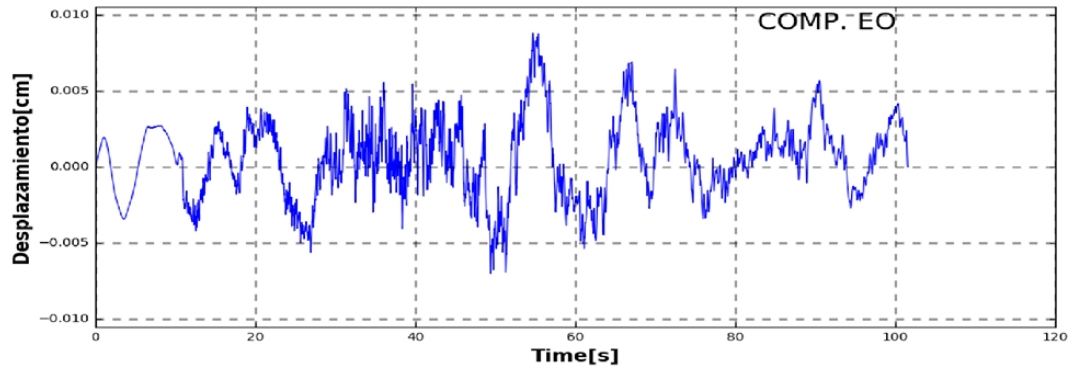
Aceleración Máxima(cm/seg ²)		
EO	NS	V
7.59	9.81	5.14



Velocidad Máxima(cm/seg)		
EO	NS	V
0.098	0.188	0.092



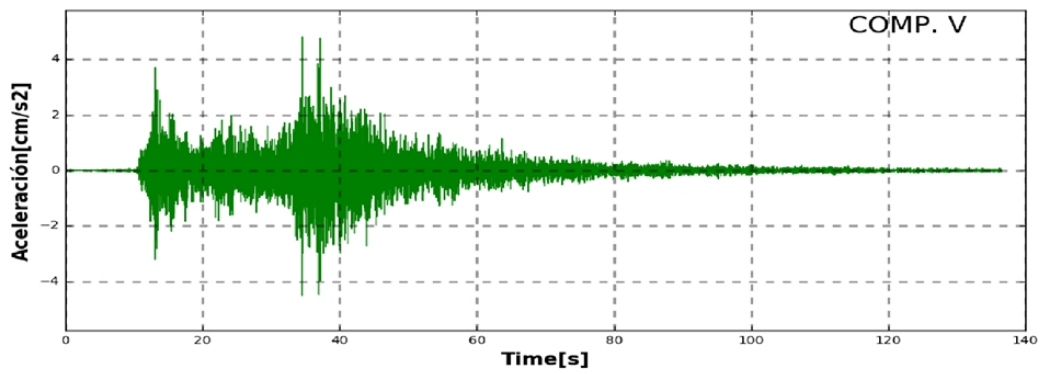
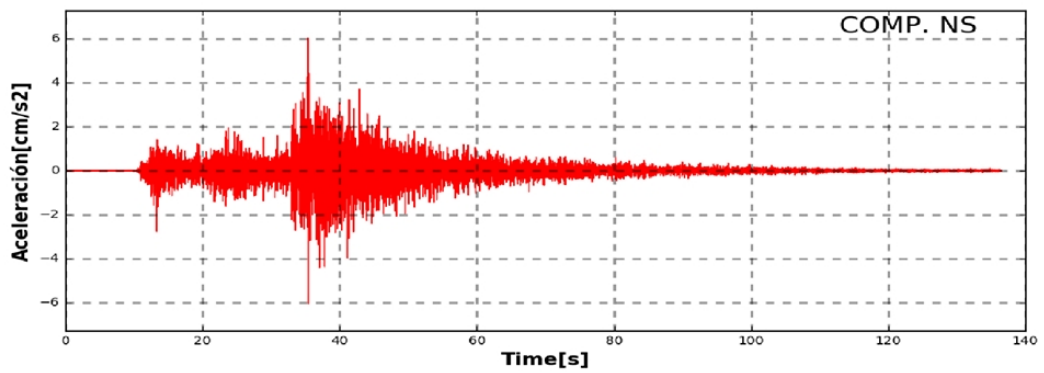
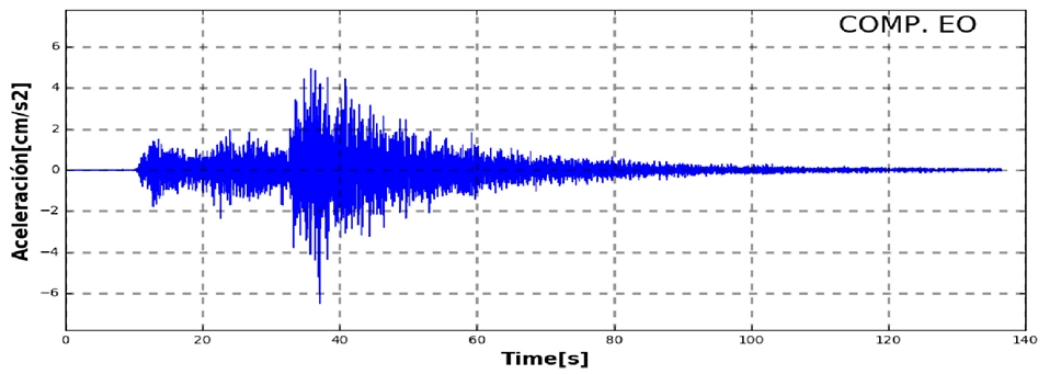
Desplazamiento Máximo(cm)		
EO	NS	V
0.009	0.010	0.010



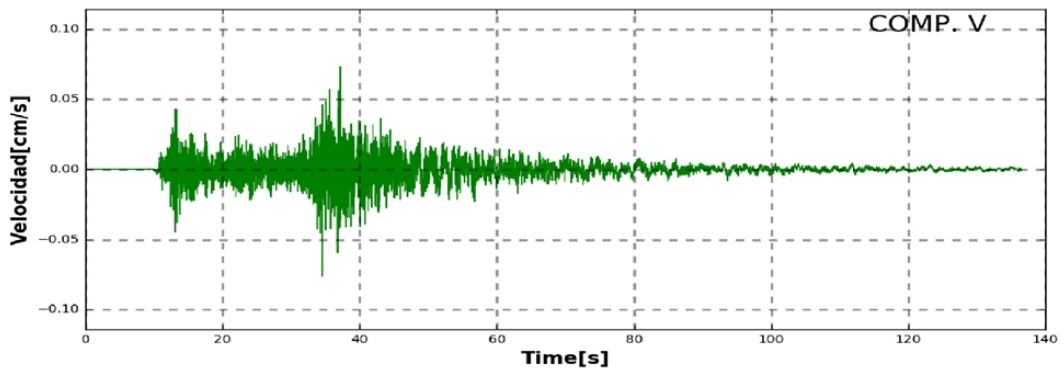
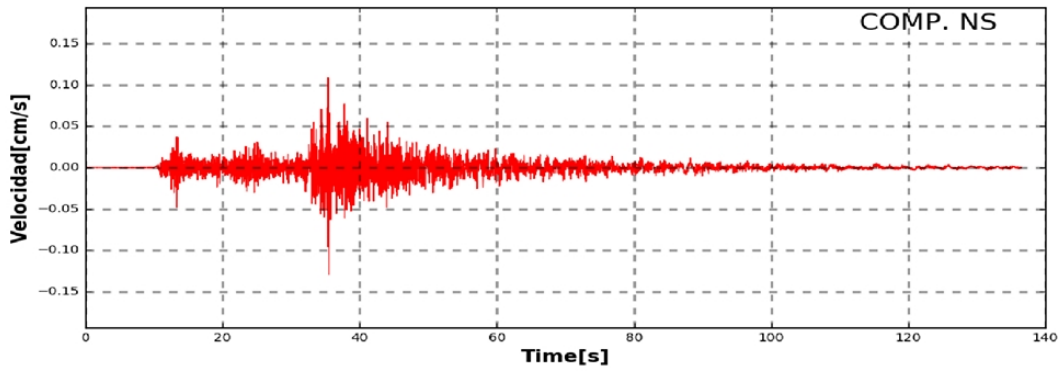
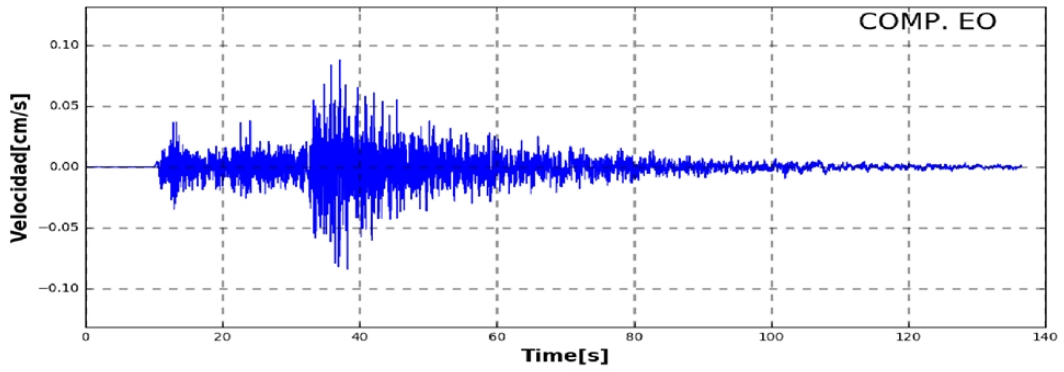
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. CIP CHIMBOTE

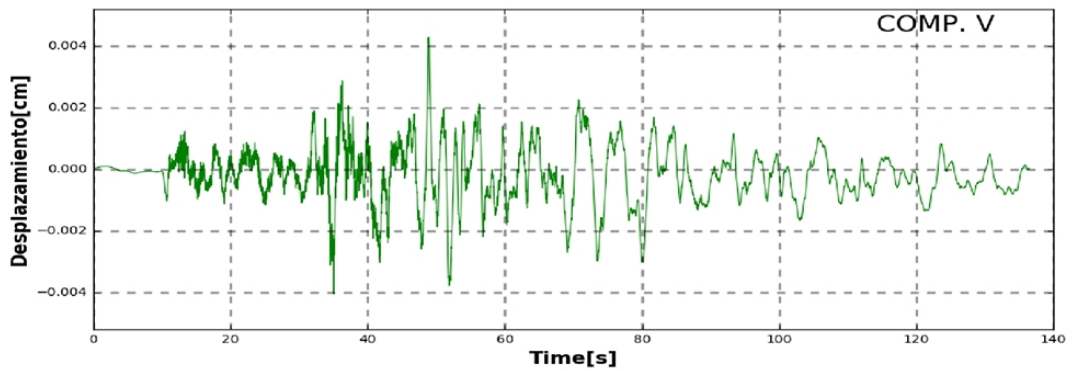
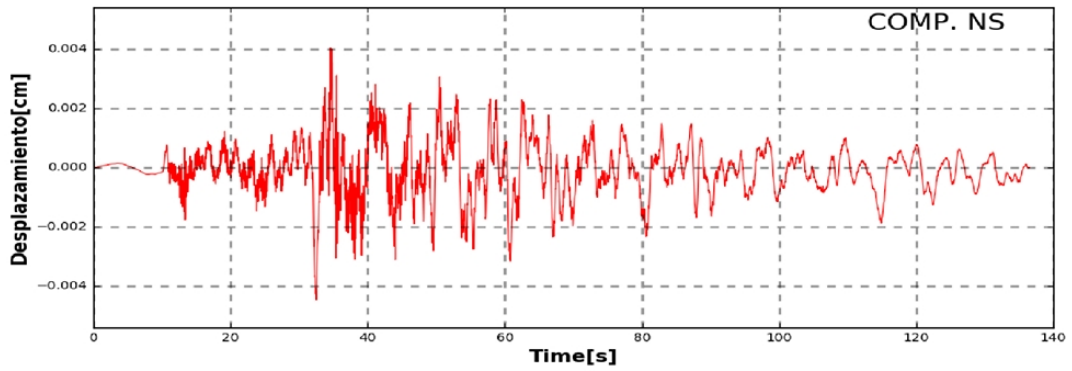
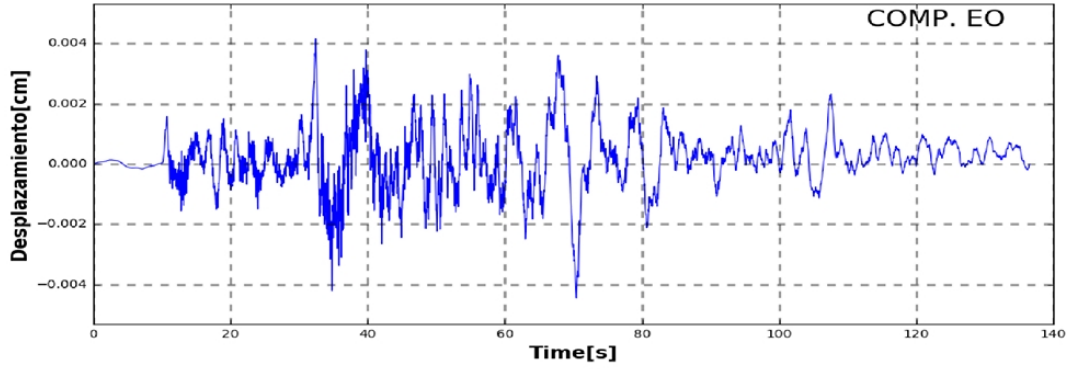
Aceleración Máxima(cm/seg ²)		
EO	NS	V
6.49	6.07	4.81



Velocidad Máxima(cm/seg)		
EO	NS	V
0.088	0.130	0.076



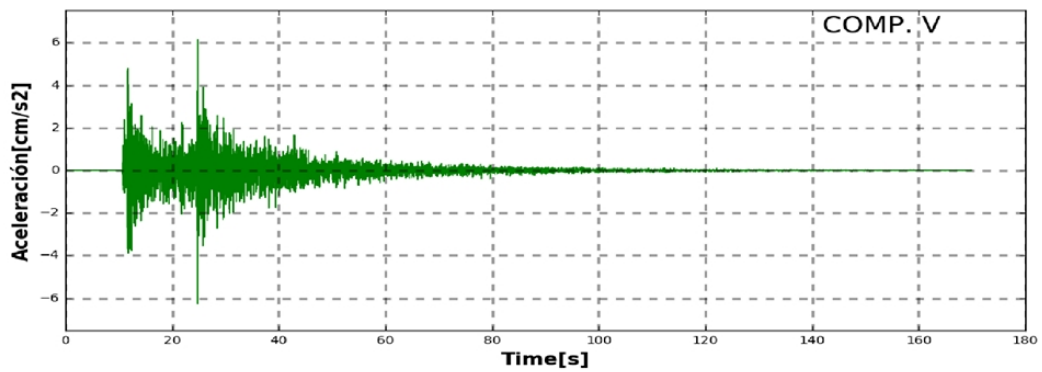
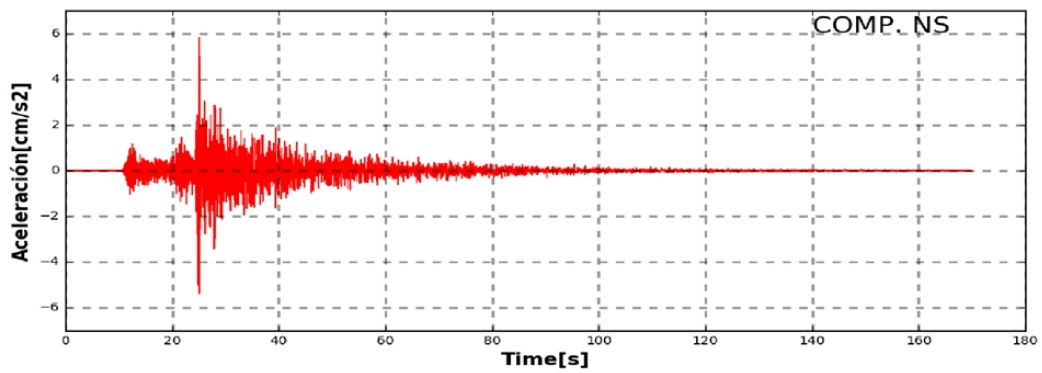
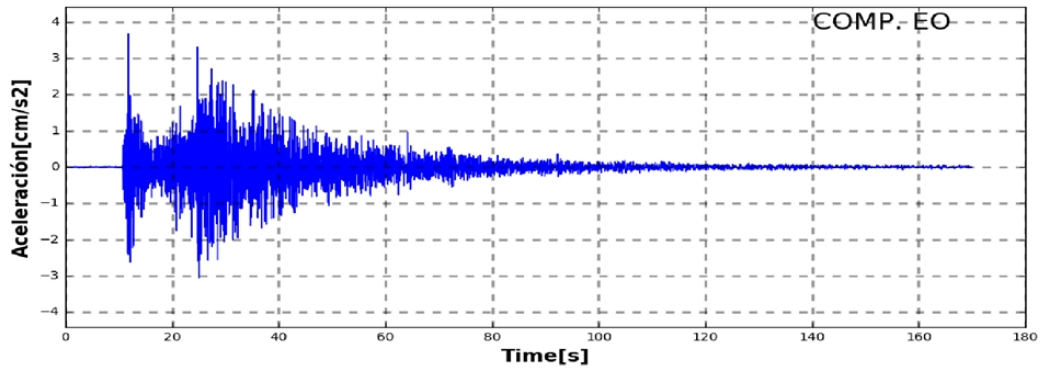
Desplazamiento Máximo(cm)		
EO	NS	V
0.004	0.004	0.004



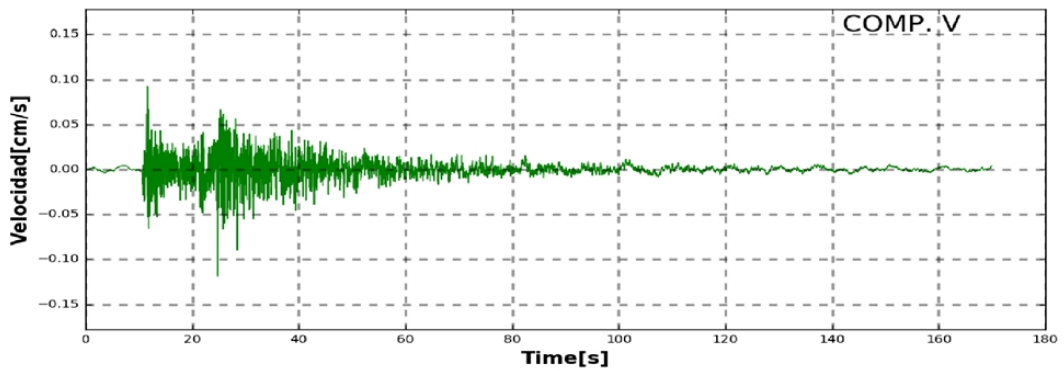
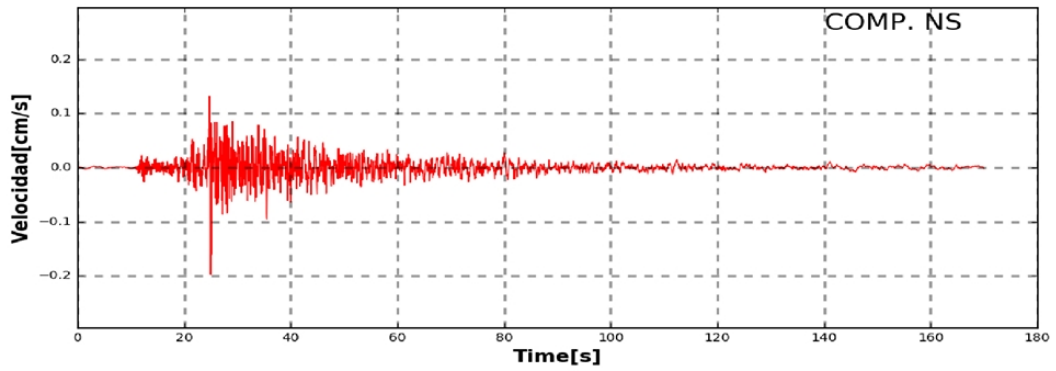
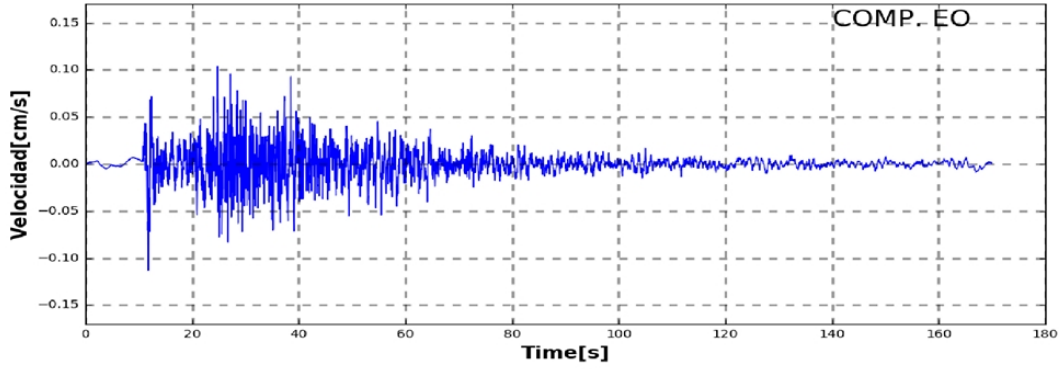
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. UPAO

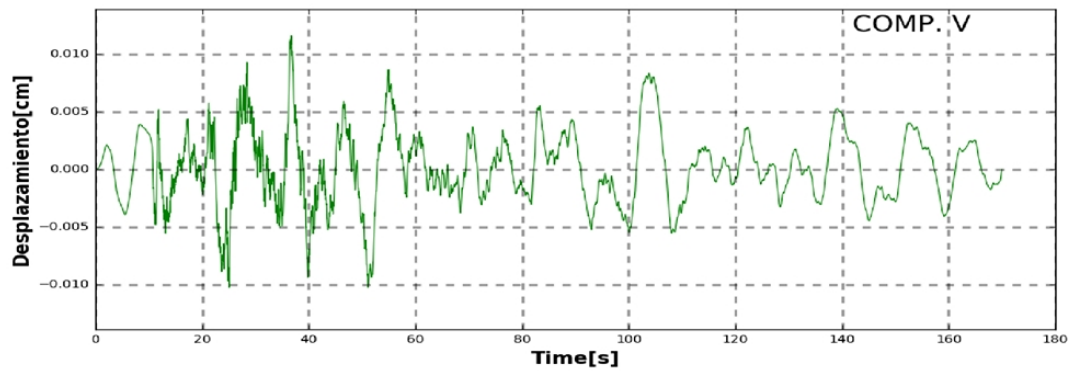
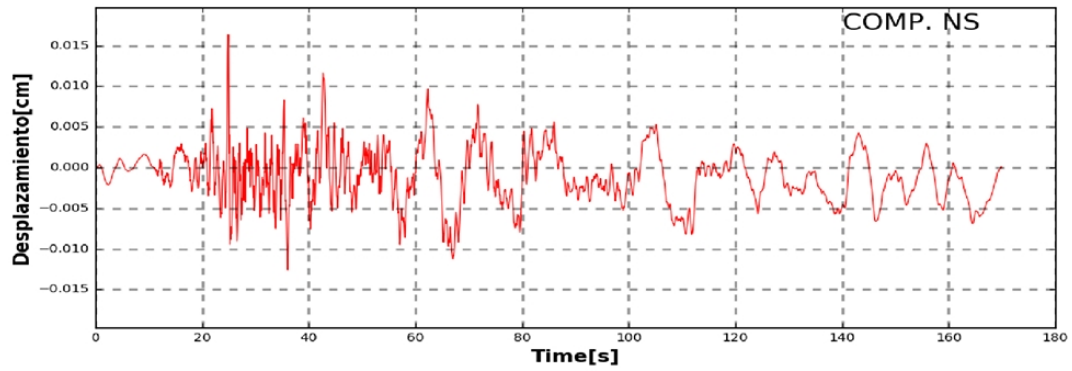
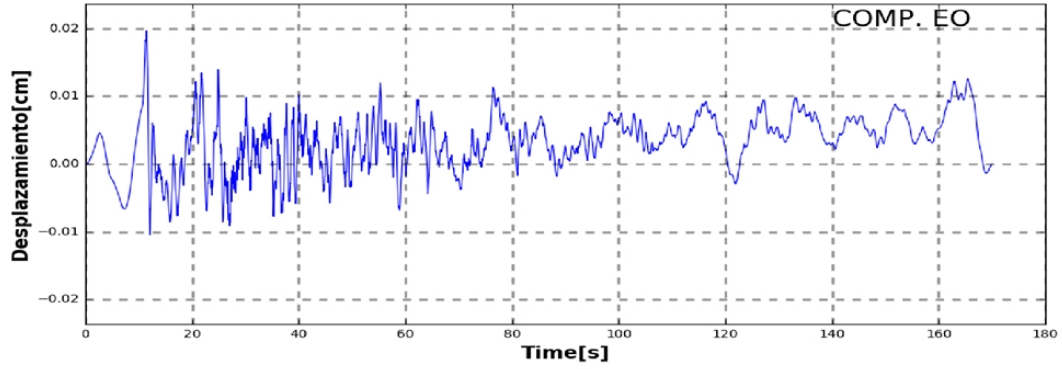
Aceleración Máxima(cm/seg ²)		
EO	NS	V
3.67	5.85	6.26



Velocidad Máxima(cm/seg)		
EO	NS	V
0.113	0.197	0.119



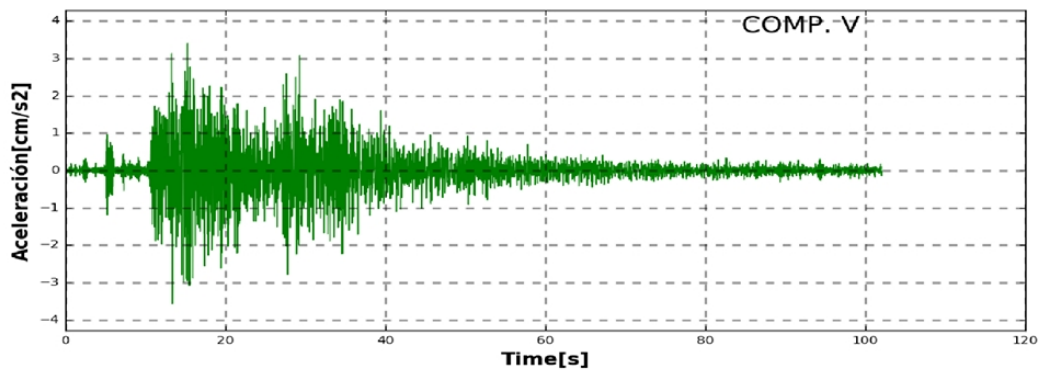
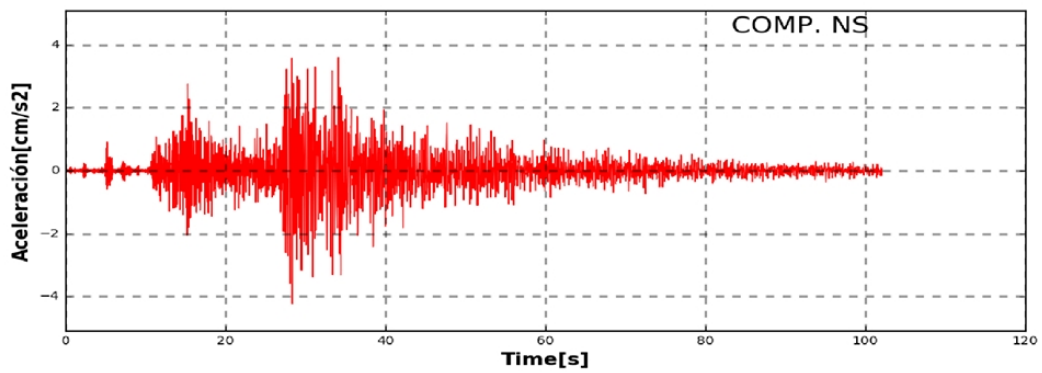
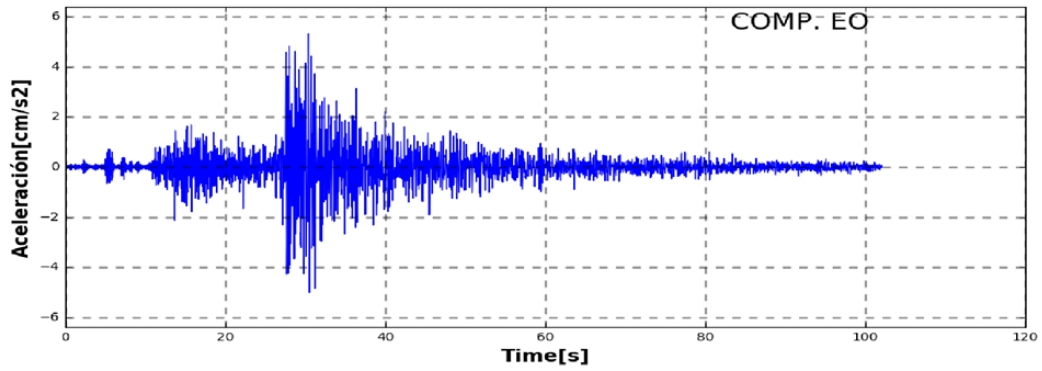
Desplazamiento Máximo(cm)		
EO	NS	V
0.020	0.016	0.012



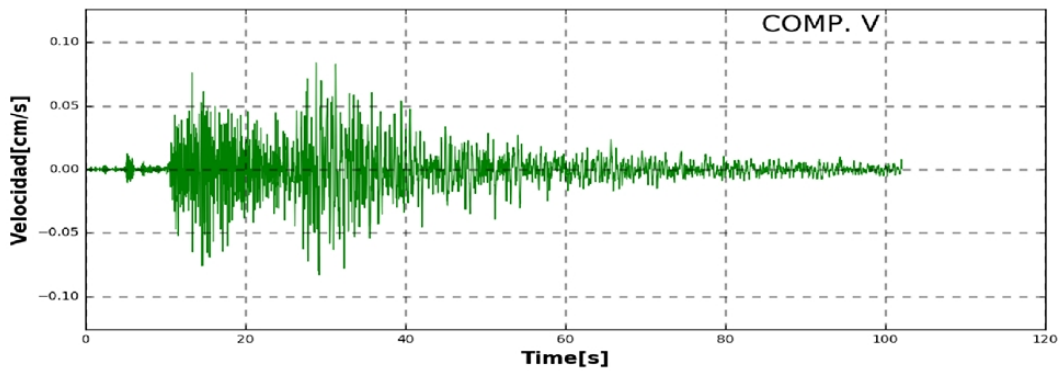
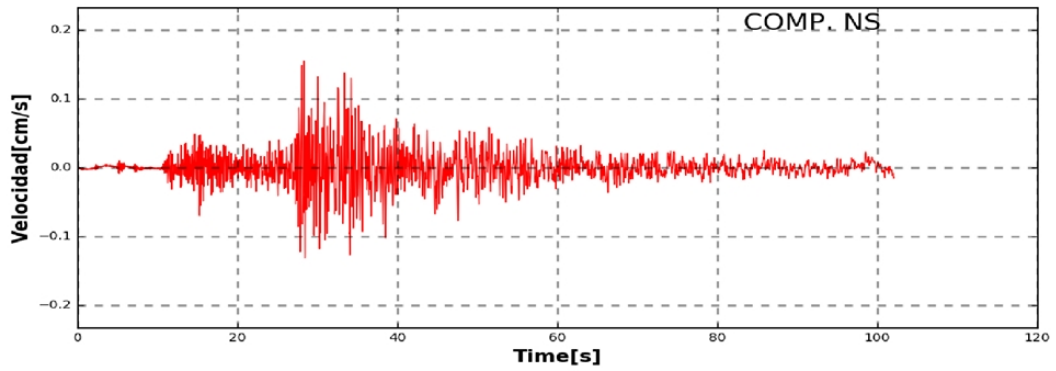
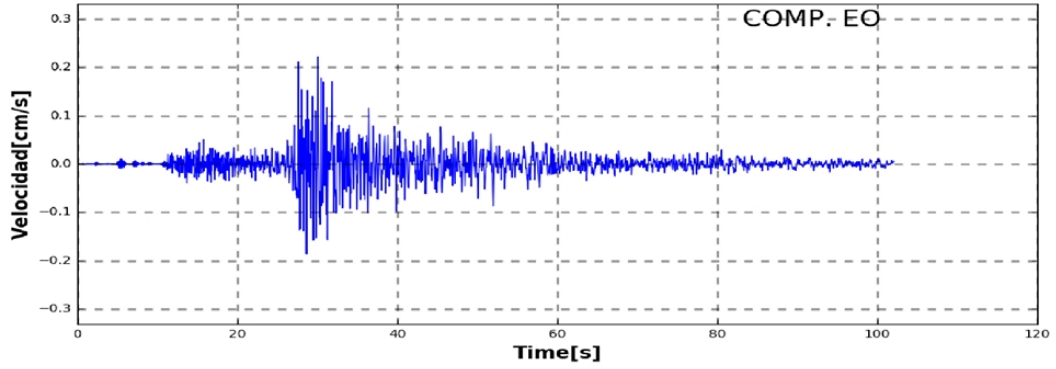
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. USAT

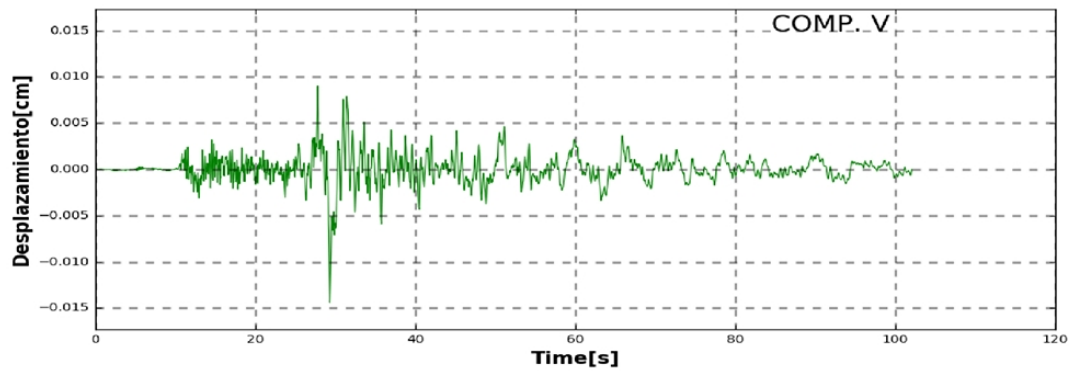
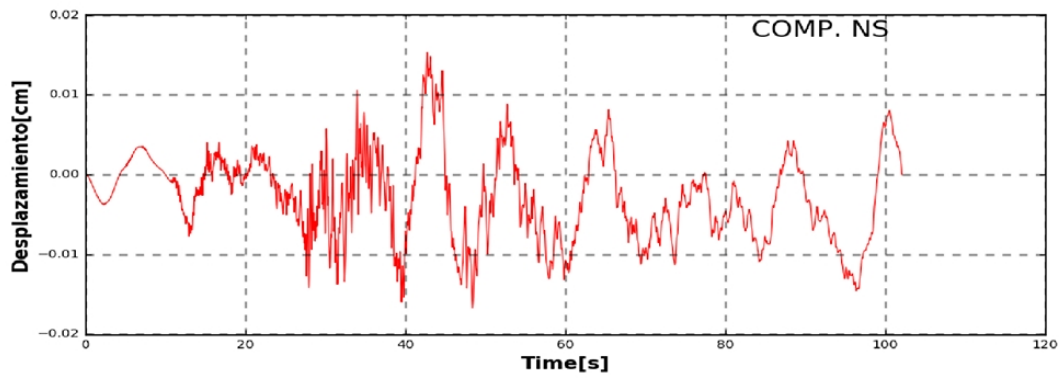
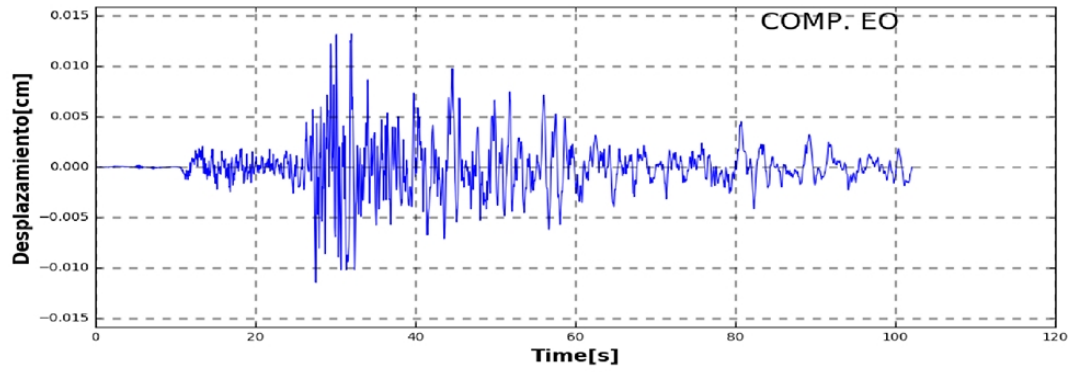
Aceleración Máxima(cm/seg ²)		
EO	NS	V
5.33	4.24	3.57



Velocidad Máxima(cm/seg)		
EO	NS	V
0.221	0.155	0.084



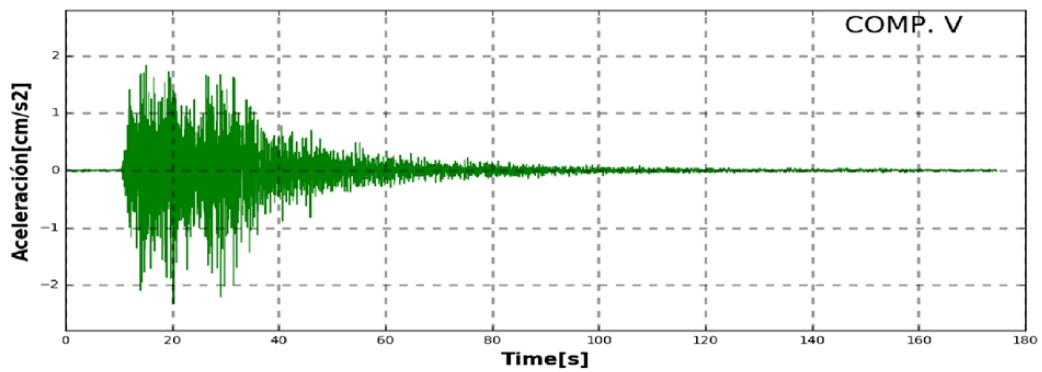
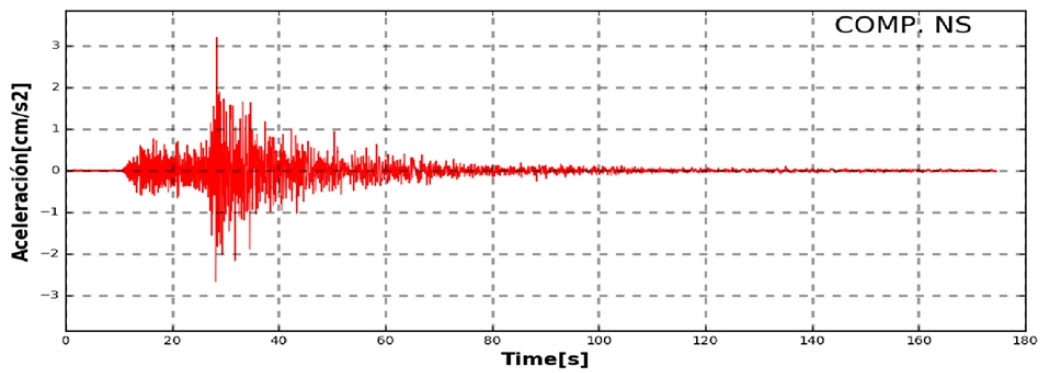
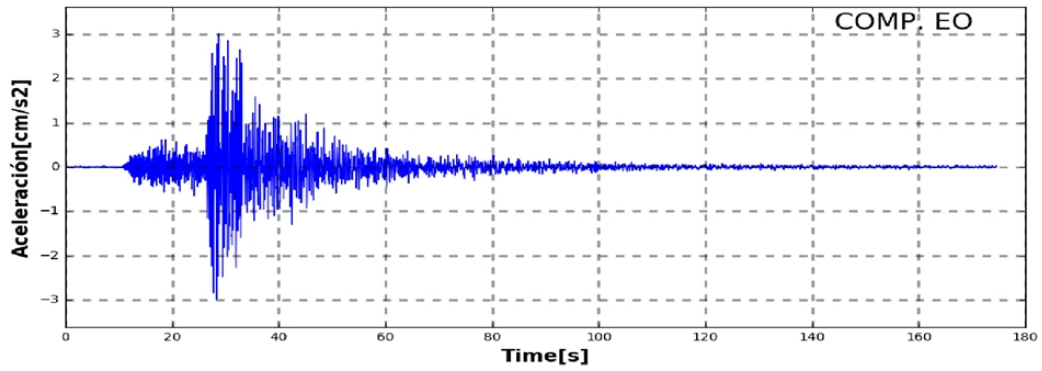
Desplazamiento Máximo(cm)		
EO	NS	V
0.013	0.017	0.014



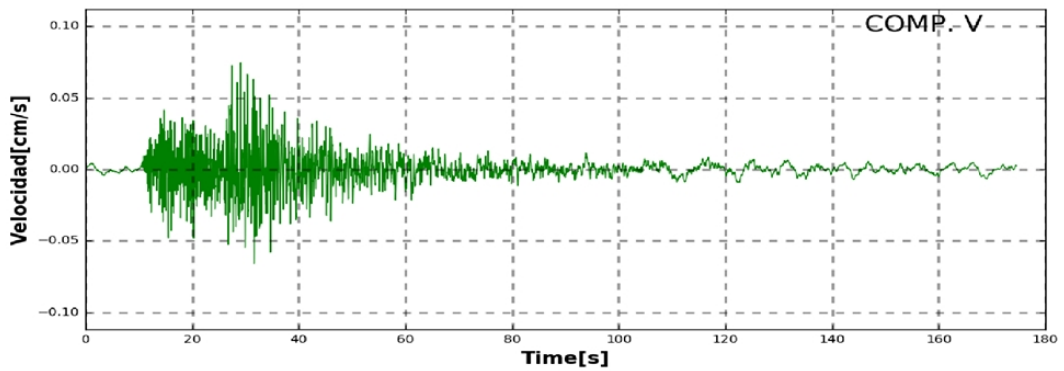
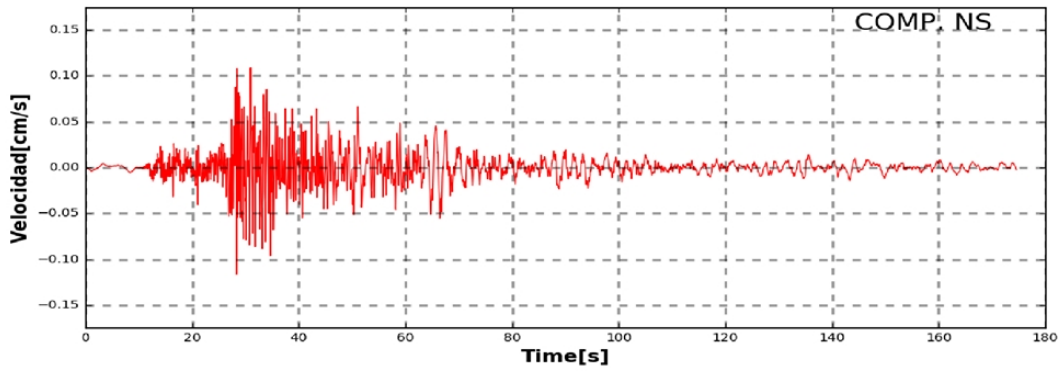
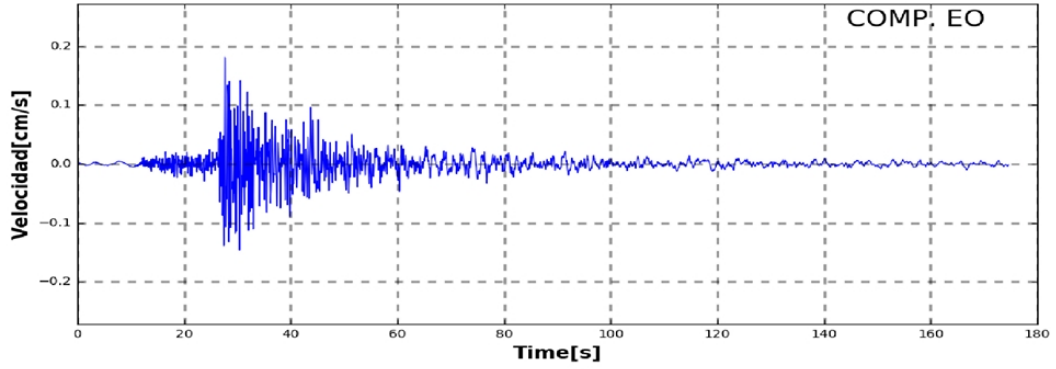
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. CIP LAMBAYEQUE

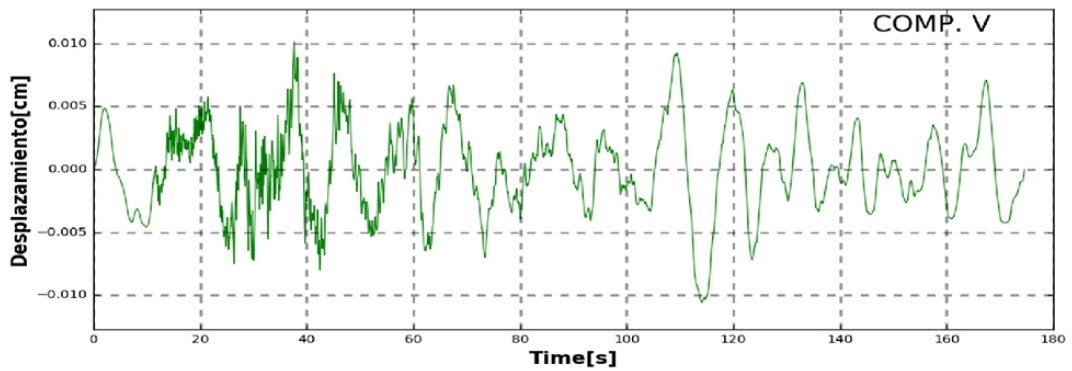
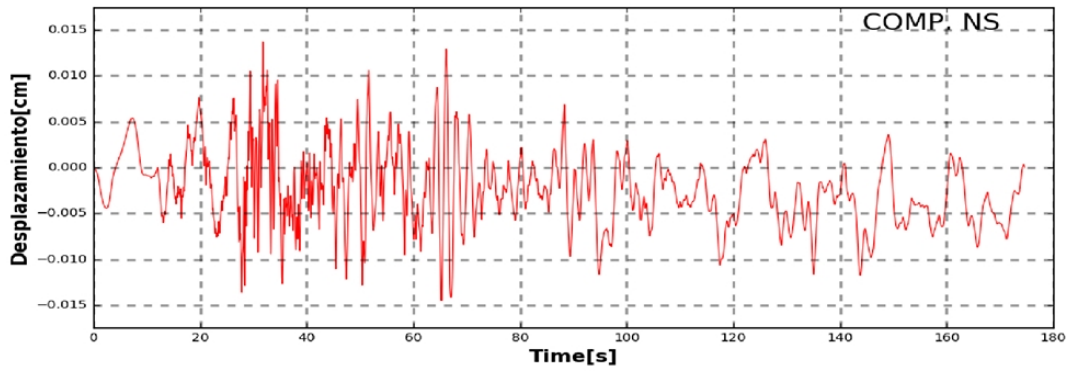
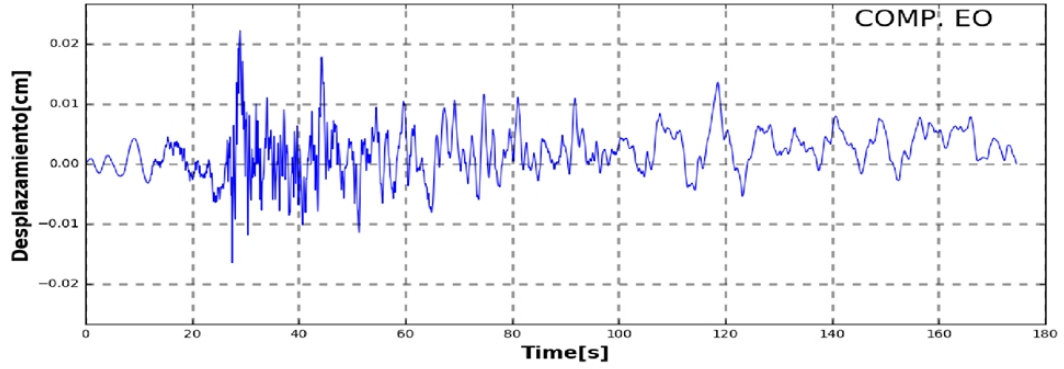
Aceleración Máxima(cm/seg ²)		
EO	NS	V
3.01	3.21	2.33



Velocidad Máxima(cm/seg)		
EO	NS	V
0.181	0.116	0.075



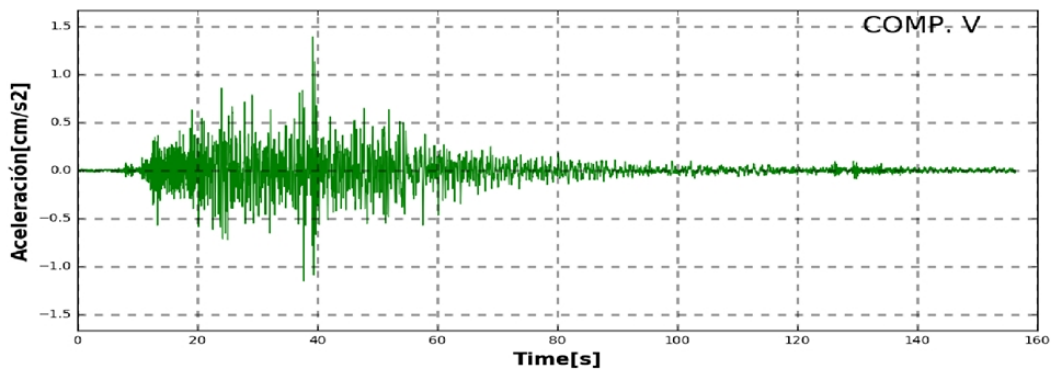
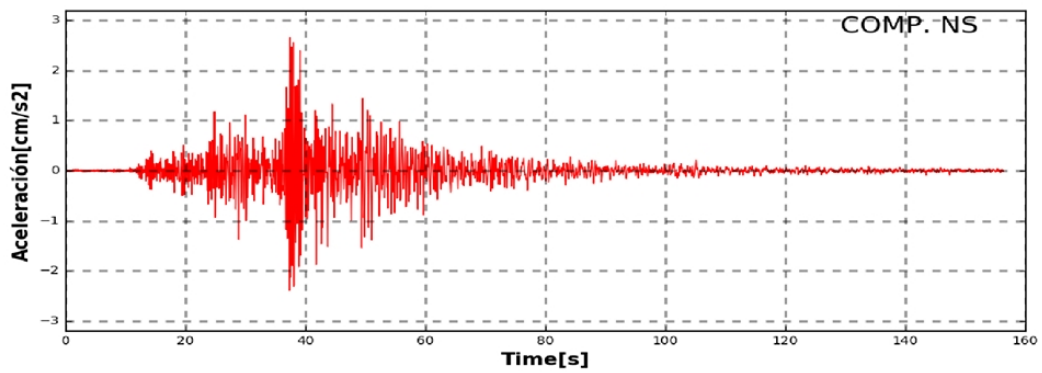
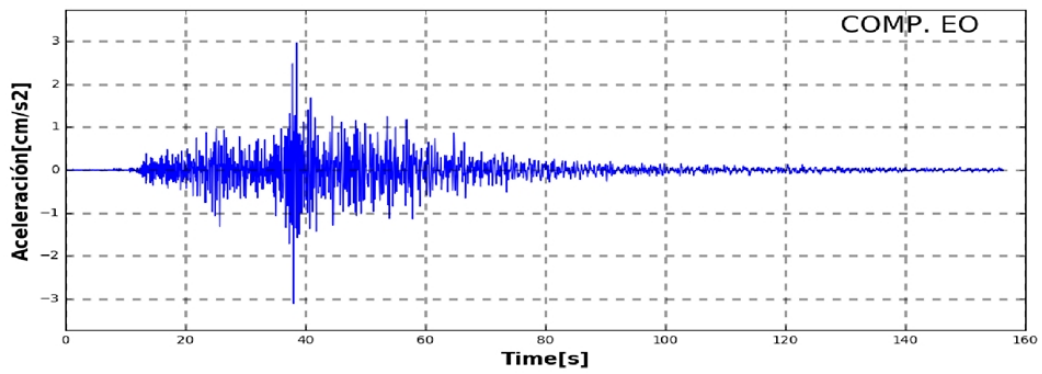
Desplazamiento Máximo(cm)		
EO	NS	V
0.022	0.014	0.011



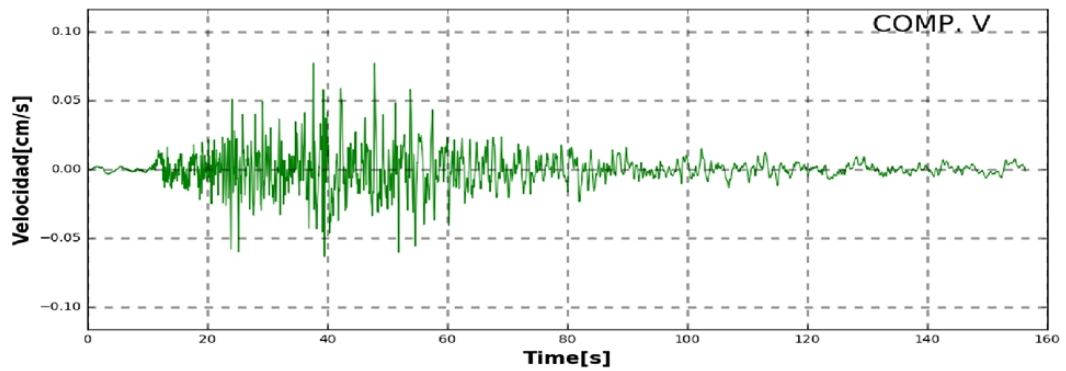
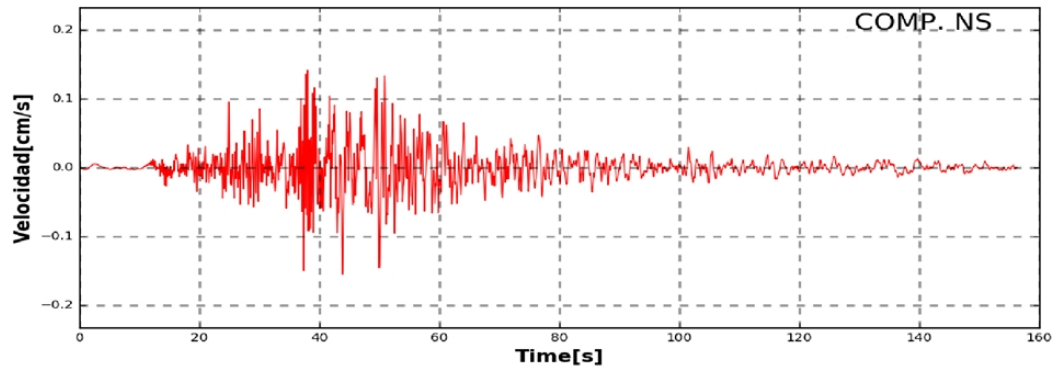
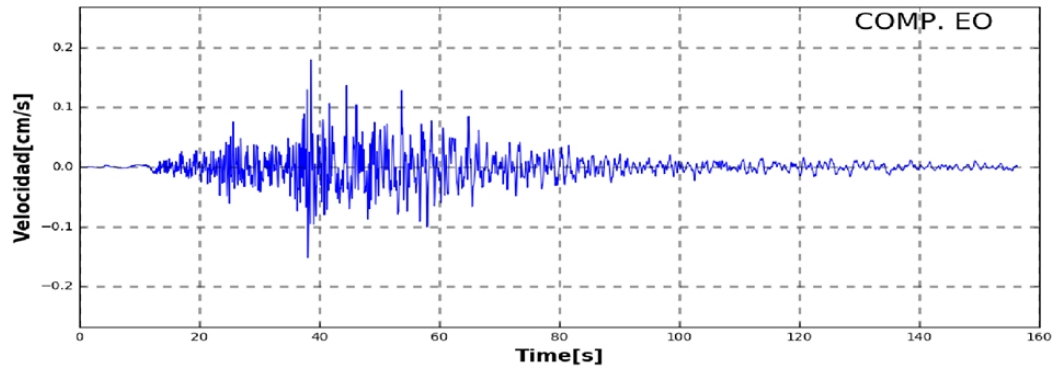
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. CIP CAJAMARCA

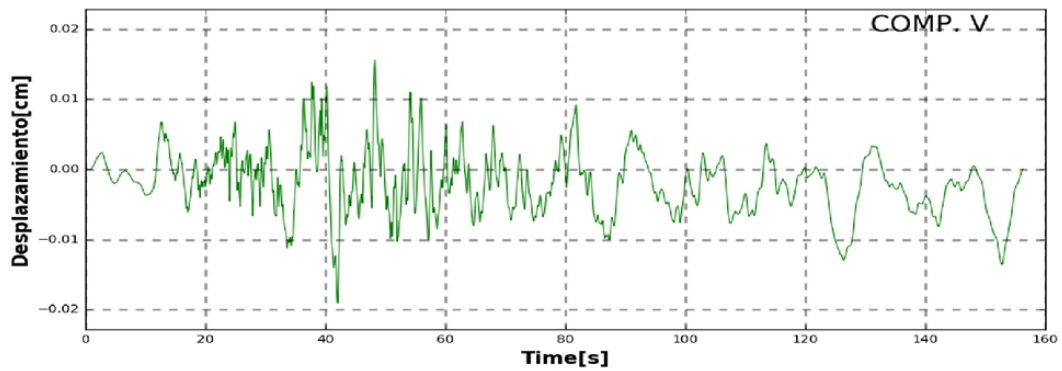
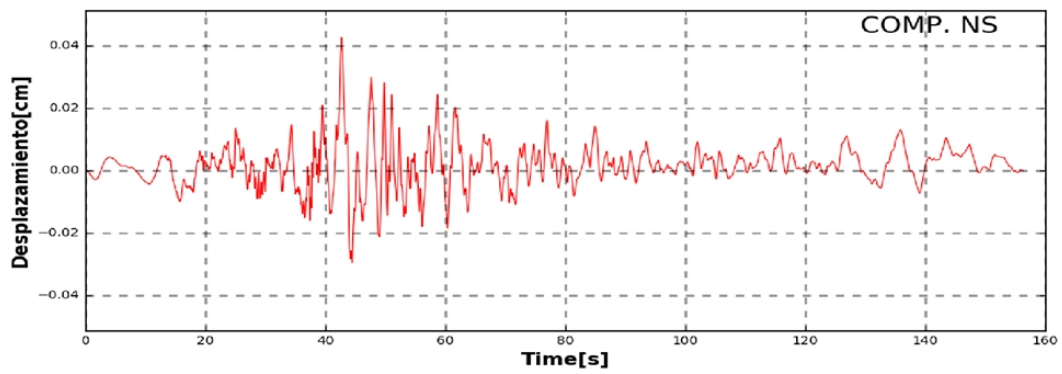
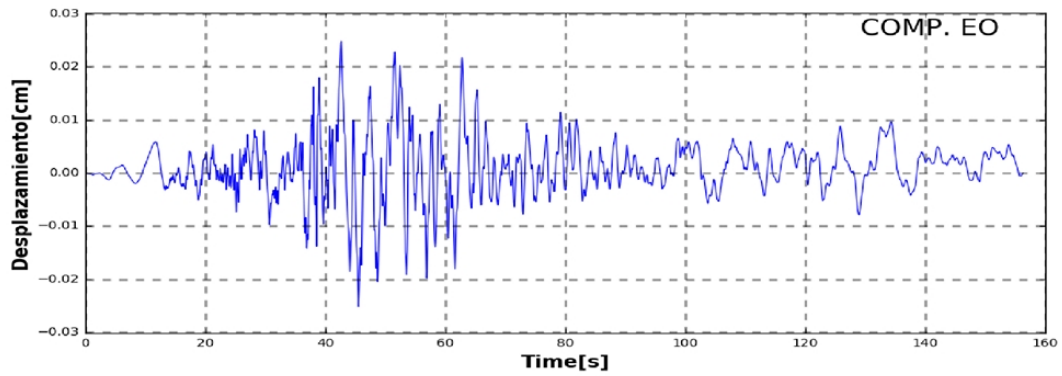
Aceleración Máxima(cm/seg ²)		
EO	NS	V
3.11	2.66	1.39



Velocidad Máxima(cm/seg)		
EO	NS	V
0.179	0.155	0.077



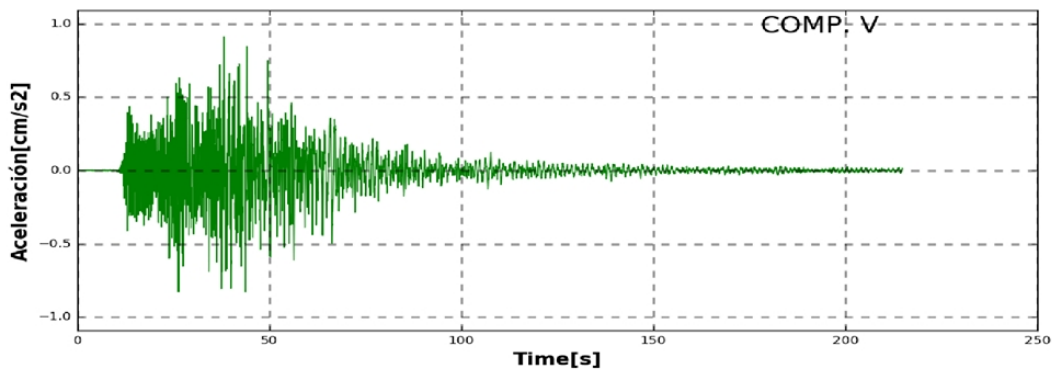
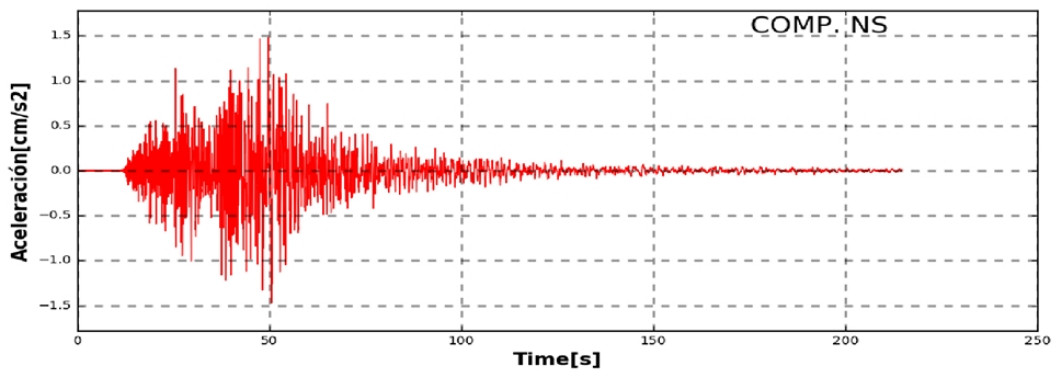
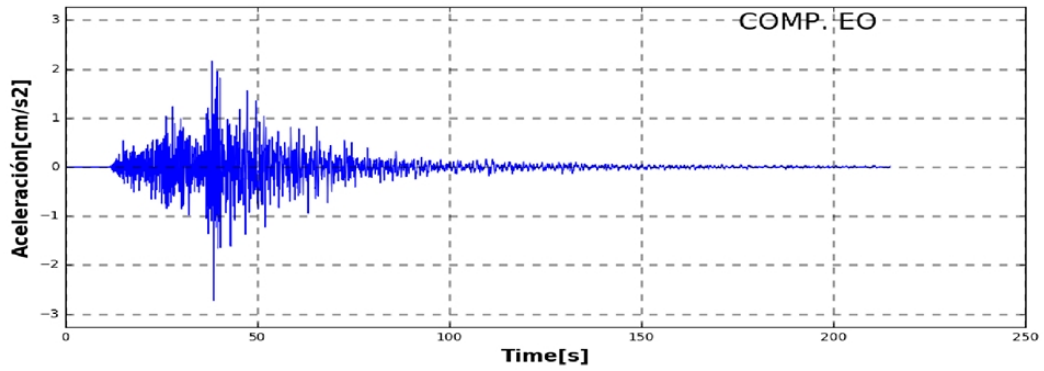
Desplazamiento Máximo(cm)		
EO	NS	V
0.025	0.043	0.019



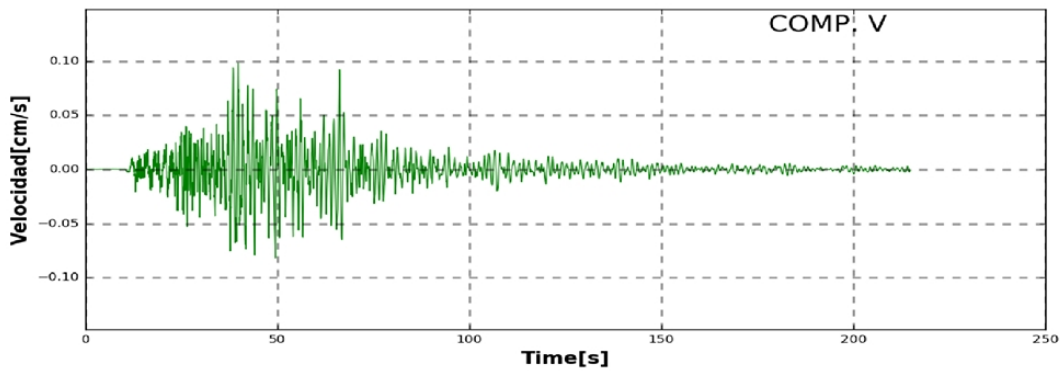
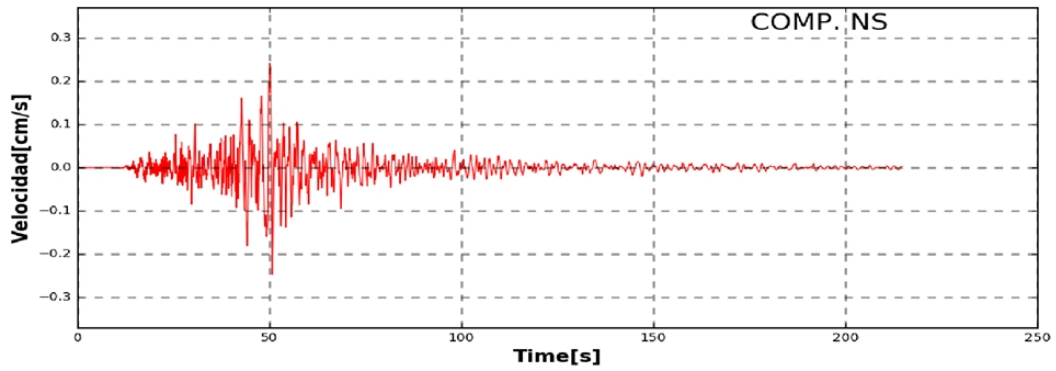
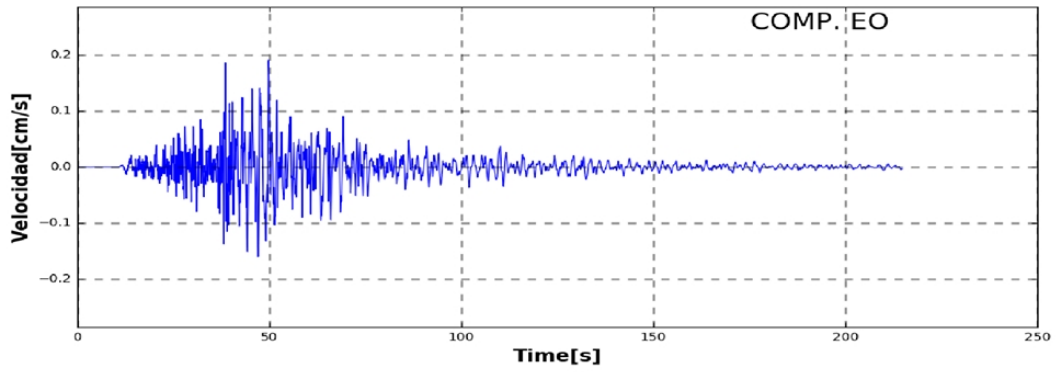
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. UNC

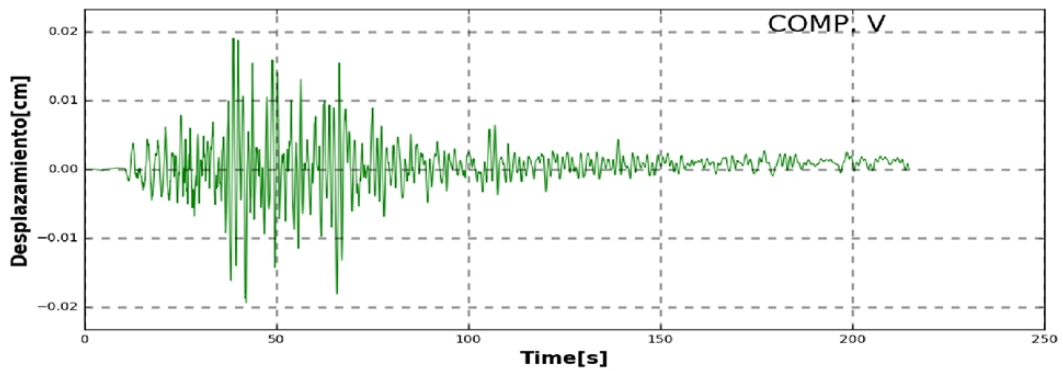
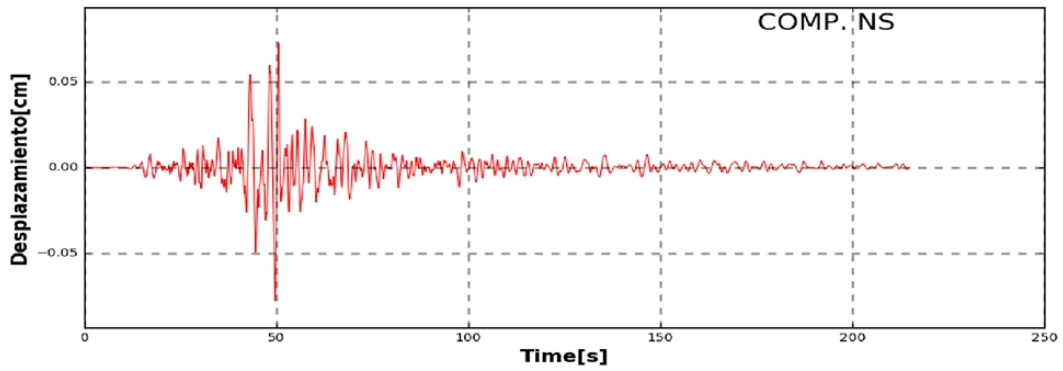
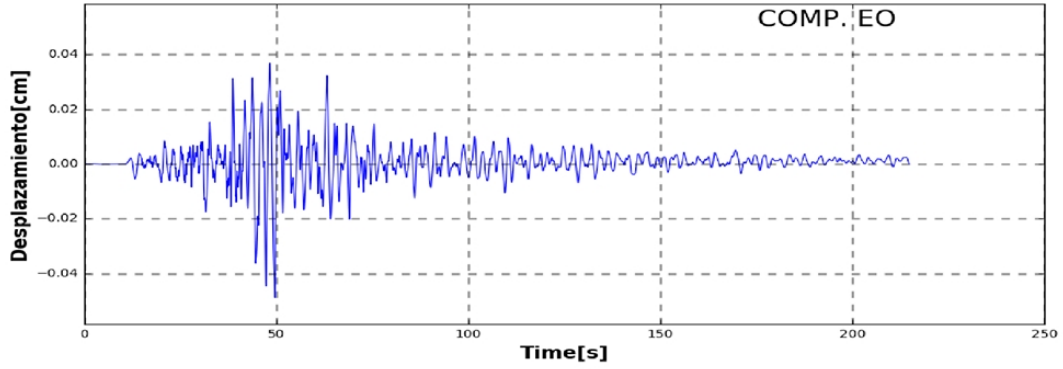
Aceleración Máxima(cm/seg ²)		
EO	NS	V
2.72	1.48	0.91



Velocidad Máxima(cm/seg)		
EO	NS	V
0.191	0.248	0.099



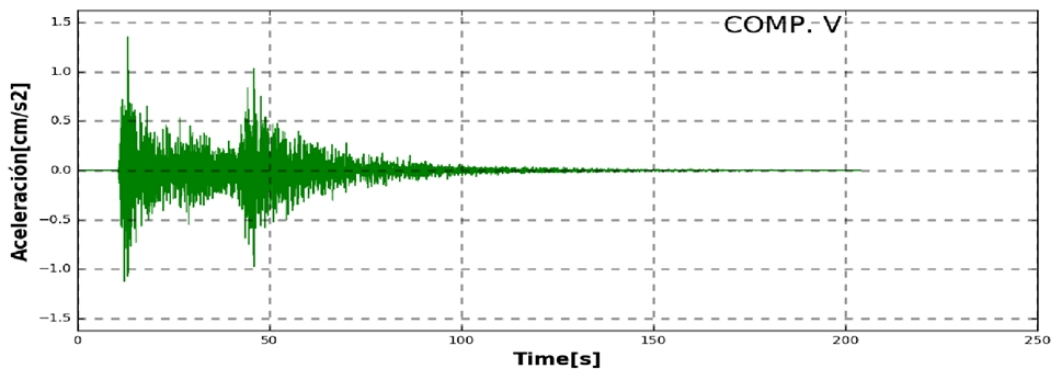
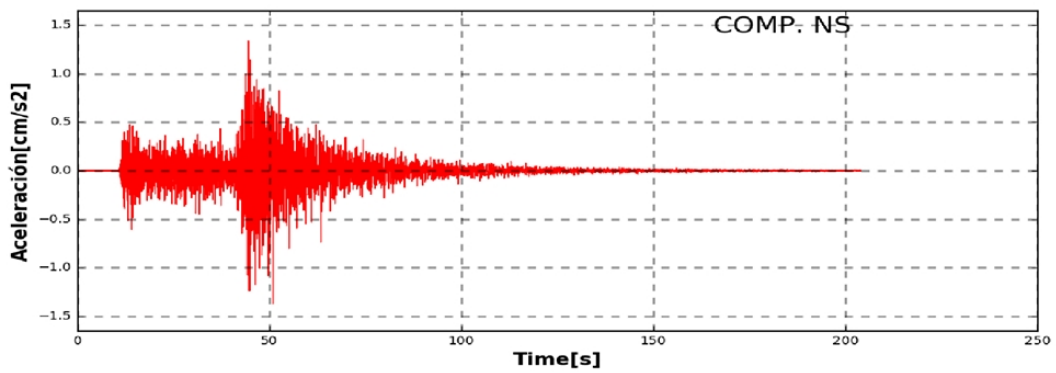
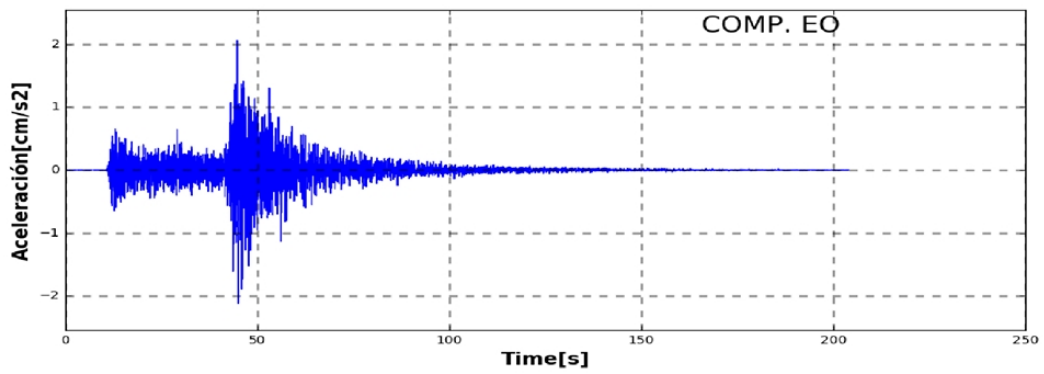
Desplazamiento Máximo(cm)		
EO	NS	V
0.049	0.078	0.019



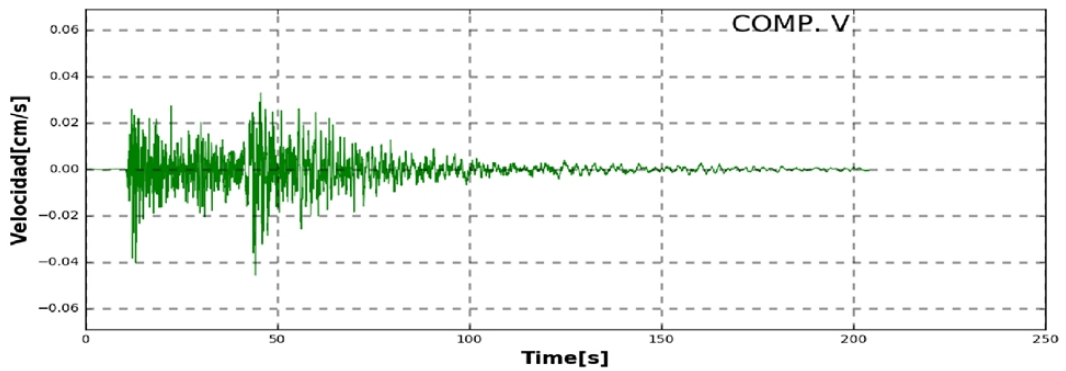
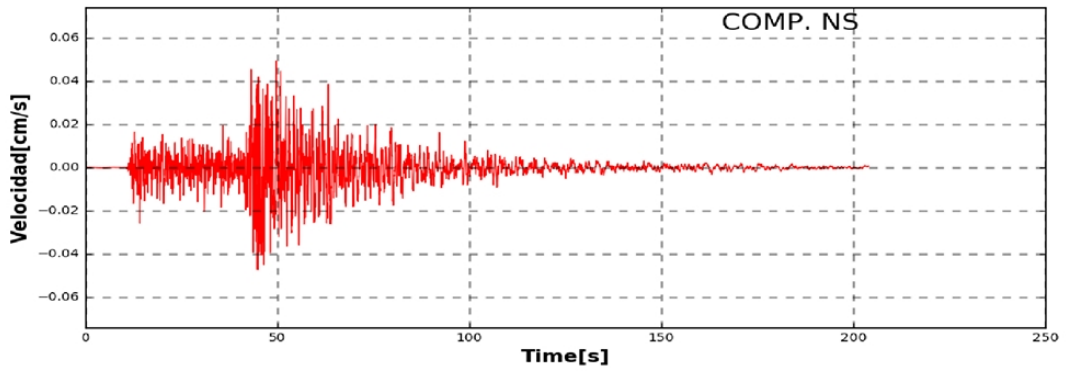
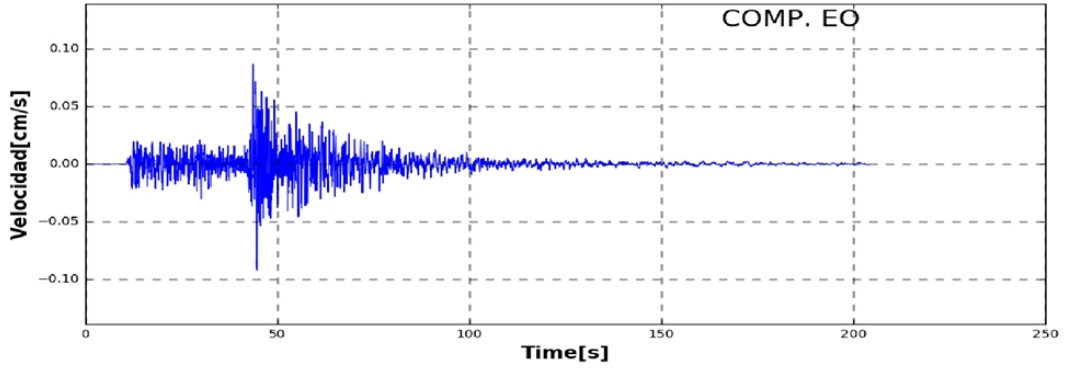
ANÁLISIS TIEMPO - HISTORIA: SISMO DEL 24 DE FEBRERO DEL 2020

EST. UGEL-Yungay-CERESIS

Aceleración Máxima(cm/seg ²)		
EO	NS	V
2.12	1.38	1.35



Velocidad Máxima(cm/seg)		
EO	NS	V
0.092	0.049	0.046



Desplazamiento Máximo(cm)		
EO	NS	V
0.013	0.013	0.007

