1 Seismic Hazard

A representative offshore site location is chosen in Southeast Asia for seismic hazard calculations in the current study. The motivation behind choosing this location can be attributed to several reasons. First, the region is considered to be one of the highly active seismic regions worldwide and commonly experiences earthquakes of moderate-to-large magnitudes, where the seismic hazard is driven by different source types including active shallow crustal, and subduction interface and intraslab sources. Second, ambitious offshore wind development plans are set for that region, which urges careful consideration of the seismic risk imposed on such assets. It should be noted that this is not intended to act as a case study, but rather a realistic representative example to serve as a baseline framework for the probabilistic seismic risk-based assessment and to provide insights into the structural seismic risk drivers on jacket-supported turbines, where the different underlying assumptions are clearly stated where relevant.

The probabilistic seismic hazard analysis (PSHA) calculations for the site considered in this study are performed using the OpenQuake engine developed by the Global Earthquake Model (GEM) initiative (Pagani et al, 2014). The first-mode spectral acceleration $SA(T_1)$ is chosen as the conditioning intensity measure, IM_1, with $T_1 = 3.5$ s for the reference wind turbine structure under consideration. It should be noted that, in principle, the choice of the specific conditioning intensity measure used in the hazard calculations should not influence the obtained results for risk-based assessments involving multiple IMs of interest provided that the ground-motion selection is carried out properly taking into account the correlation between the different IMs (Baker et al, 2021; Lin et al, 2013; Bradley, 2012). The main output of PSHA calculations is a ground-motion hazard curve, which quantifies the full distribution of the IM levels, and their corresponding rates of exceedance, calculated as follows:

$$\lambda(IM > im) = \sum_{i=1}^{n_{rup}} P\left(IM > im \mid rup_i,\ site\right) \lambda\left(rup_i\right) \tag{1}$$

where $\lambda(IM > im)$ is the rate of occurrence of ground motions with IM greater than im, $P\left(IM > im \mid rup_i,\ site\right)$ is the probability of exceeding an intensity measure value, im, calculated from the ground-motion model (GMM), and $\lambda\left(rup_i\right)$ is the annual rate of occurrence of rupture, rup_i, which can be obtained from the seismic source model (SSM), summed over all considered rupture scenarios of potential significance for the considered hazard and risk study of interest. The hazard curve for $SA(3.5\text{ s})$ is provided for reference rock sites with $V_{s,30}$ of 760 m/s. To account for site effects, a subsequent site response analysis of the soil profile defined in Table **??** is conducted using the selected ground-motion records as detailed in **??**. The mean hazard curve is represented as an annual rate of exceedance curve, λ, as shown in Fig. 1. For the purpose of seismic risk assessment, 10 IM levels corresponding to 0.1%, 0.2%, 0.5%, 1%, 2%, 5%, 10%, 25%, 50%, and 75% probability of exceedance in 50 years with return periods of 50,000, 25,000, 10,000, 5000, 2500, 975, 475, 175, 70 and 35 years respectively, are considered. The corresponding $SA(3.5\text{ s})$ intensity level values are 0.294g, 0.250g, 0.196g, 0.156g, 0.123g, 0.085g, 0.062g, 0.038g, 0.024g,

and 0.016g, respectively, where a set of 30 ground motions is selected for each level. The corresponding hazard disaggregation results are also presented conditional on the occurrence of each IM level are shown in Fig. 2. The contribution of each source type to the hazard can be seen in Table 1, including mean magnitude, $\overline{M}$, distance, $\overline{R}$, and epsilon, $\bar{\varepsilon}$, for each $SA(3.5\text{ s})$ intensity level.

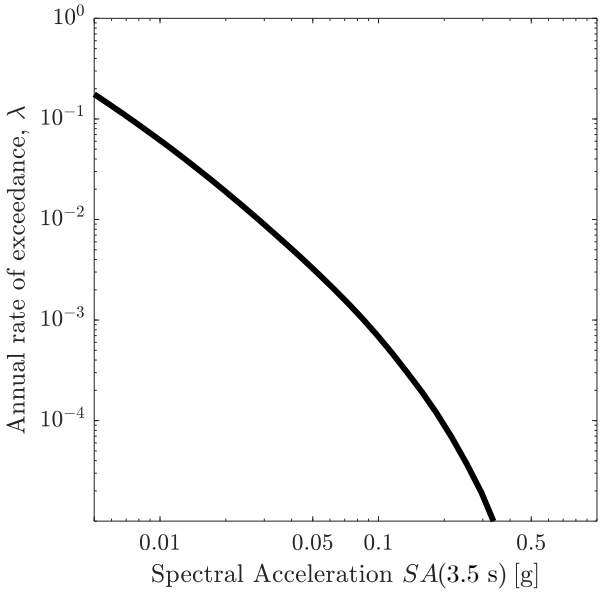


Fig. 1 $SA(3.5\text{ s})$ hazard curve for the site of interest.

Table 1 Hazard contribution, mean magnitude, $\overline{M}$, distance, $\overline{R}$, and epsilon, $\overline{\varepsilon}$, for each source type and $SA(3.5\text{ s})$ intensity level.

	IM level									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Active shallow crust										
Relative contribution	100 %	99.7 %	98.8 %	97.7 %	90.7 %	81.6 %	74.2 %	65.3 %	63.4 %	65.7 %
Mean magnitude, $\overline{M}$	6.75	6.86	6.94	6.81	6.7	6.84	6.77	6.78	6.76	6.71
Mean distance, $\overline{R}$ [km]	12.5	41.7	16.5	16.8	15.5	34.4	41	54	62.4	76
Mean epsilon, $\overline{\varepsilon}$	2.25	2.28	2.04	2.03	1.97	1.81	1.86	1.67	1.52	1.44
Subduction interface										
Relative contribution	0 %	0 %	0 %	0 %	5.4 %	10.8 %	14.4 %	18.1 %	17.1 %	13.8 %
Mean magnitude, $\overline{M}$	-	-	-	-	7.75	7.75	7.75	7.61	7.57	7.54
Mean distance, $\overline{R}$ [km]	-	-	-	-	150	150	150	164	186	187
Mean epsilon, $\overline{\varepsilon}$	-	-	-	-	2.5	2.5	2.5	2.14	1.91	1.79
Subduction intraslab										
Relative contribution	0 %	0.3 %	1.2 %	2.3 %	3.9 %	7.6 %	11.4 %	16.6 %	19.5 %	20.5 %
Mean magnitude, $\overline{M}$	-	-	7.75	7.67	7.75	7.52	7.43	7.36	7.24	7.19
Mean distance, $\overline{R}$ [km]	-	-	223	254	242	252	258	258	258	263
Mean epsilon, $\overline{\varepsilon}$	-	-	2.5	2.5	2.5	2.42	2.22	2.06	1.82	1.69

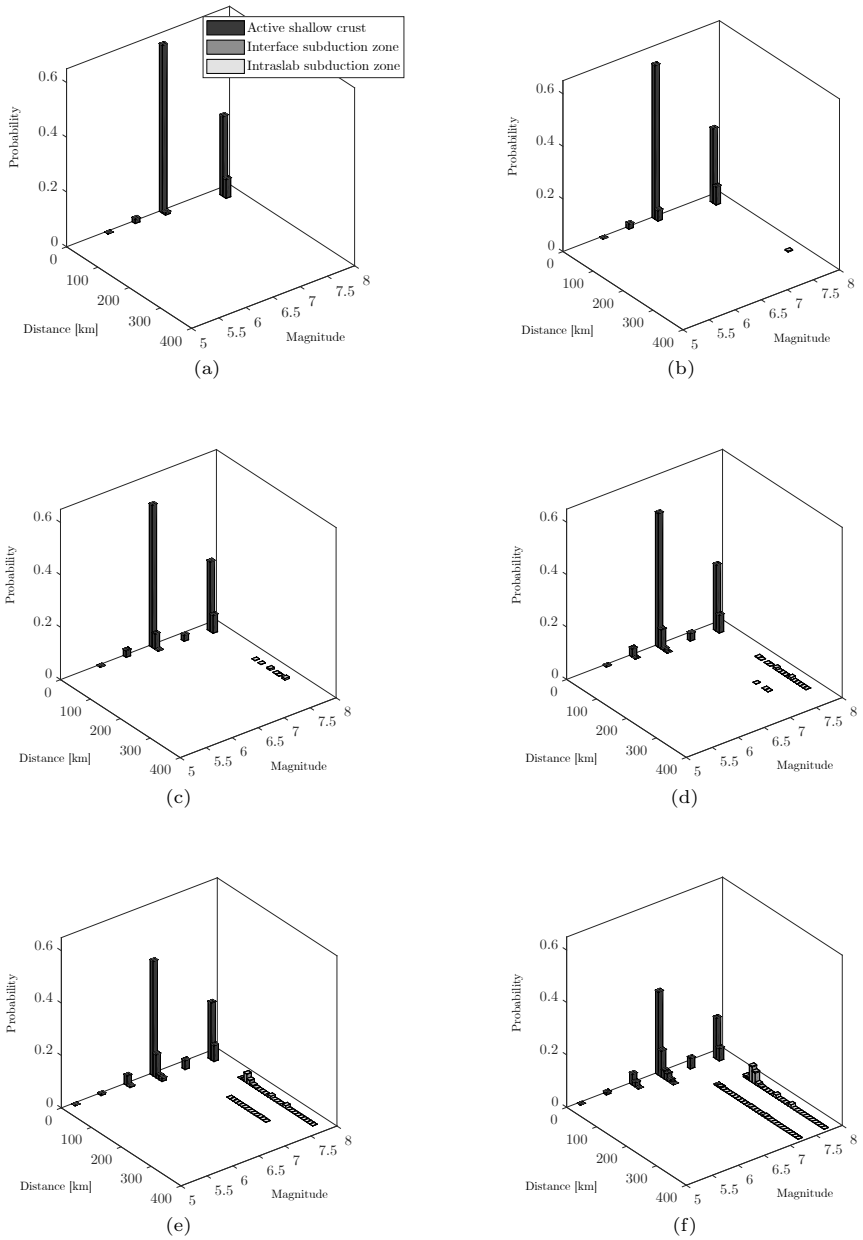
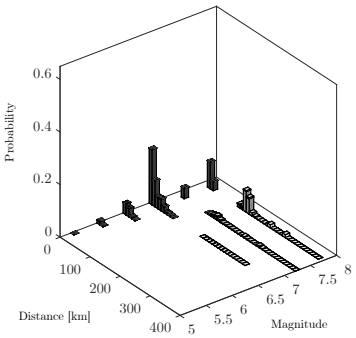
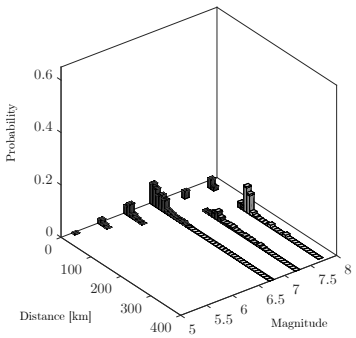


Fig. 2 Hazard disaggregation results represented as probability/contribution to hazard conditional on the occurrence of each considered $SA(3.5\text{ s})$ intensity level: (a) $SA(3.5\text{ s}) = 0.294$g, (b) $SA(3.5\text{ s}) = 0.250$g, (c) $SA(3.5\text{ s}) = 0.196$g, (d) $SA(3.5\text{ s}) = 0.156$g, (e) $SA(3.5\text{ s}) = 0.123$g, (f) $SA(3.5\text{ s}) = 0.085$g, (g) $SA(3.5\text{ s}) = 0.062$g, (h) $SA(3.5\text{ s}) = 0.038$g, (i) $SA(3.5\text{ s}) = 0.024$g, and (j) $SA(3.5\text{ s}) = 0.016$g.



(g)



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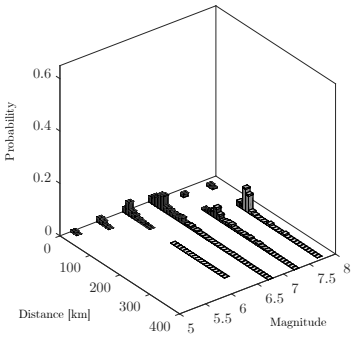
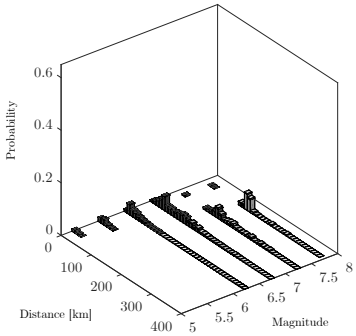


(i)



(j)

Fig. 2 Continued...

2 Selected ground motions

2.1 Selected ground motions match to targets

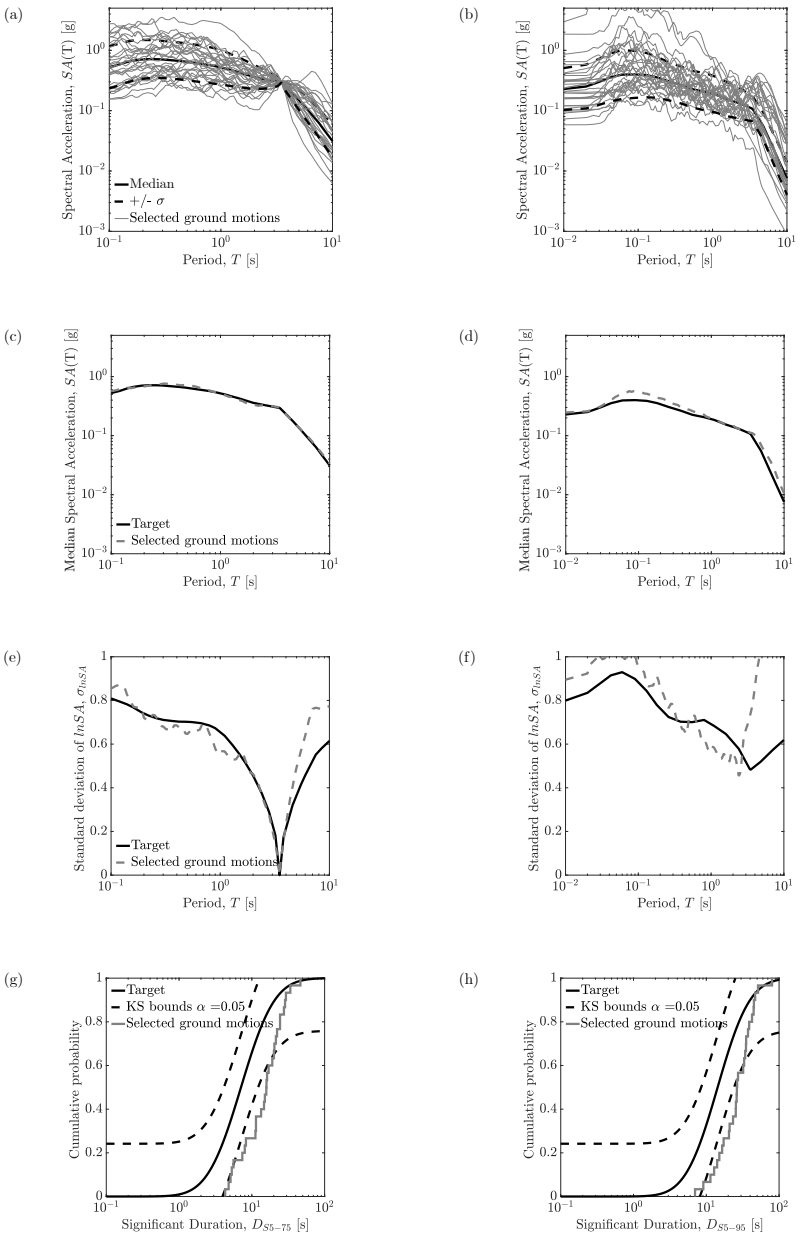


Fig. 3 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.294g$ corresponding to 0.1% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

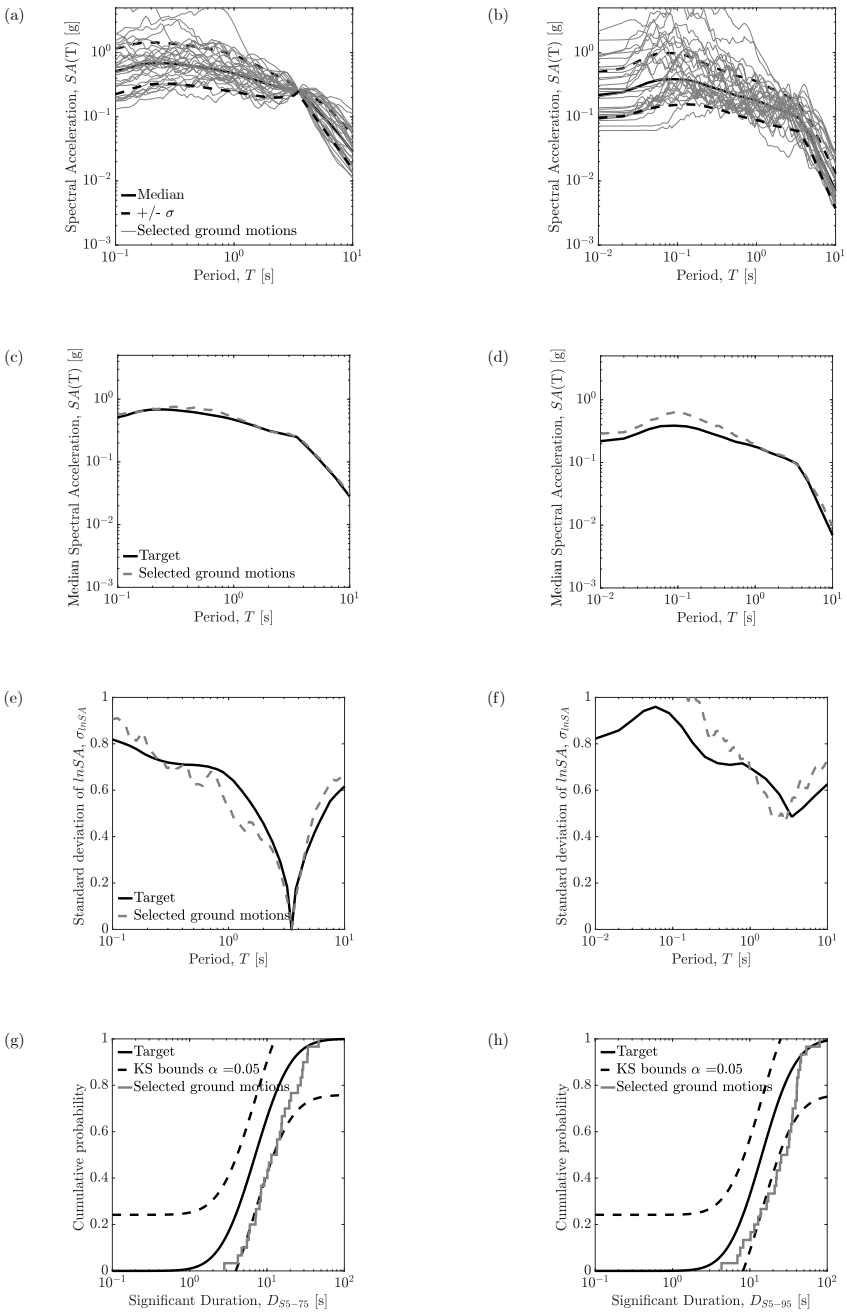


Fig. 4 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.250g$ corresponding to 0.2% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

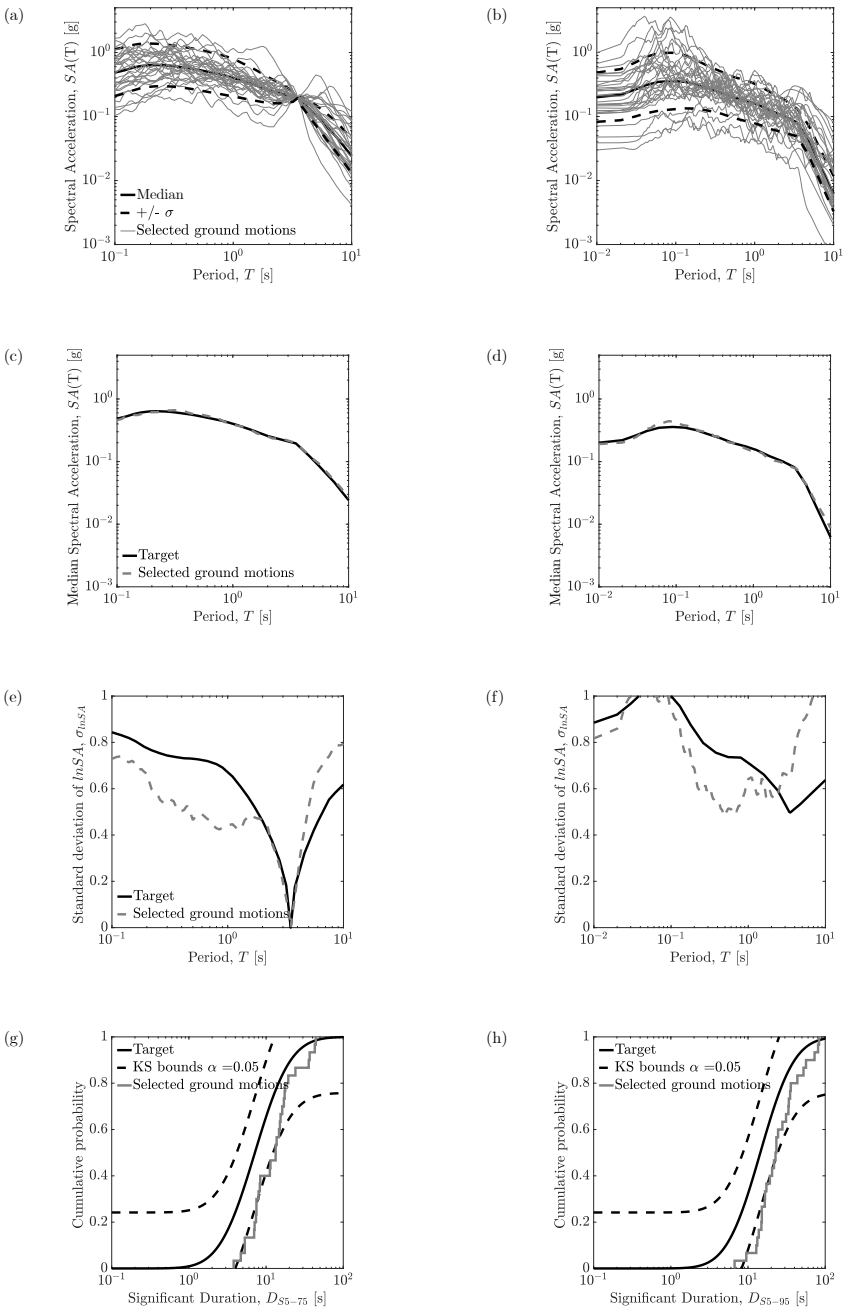


Fig. 5 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.196g$ corresponding to 0.5% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

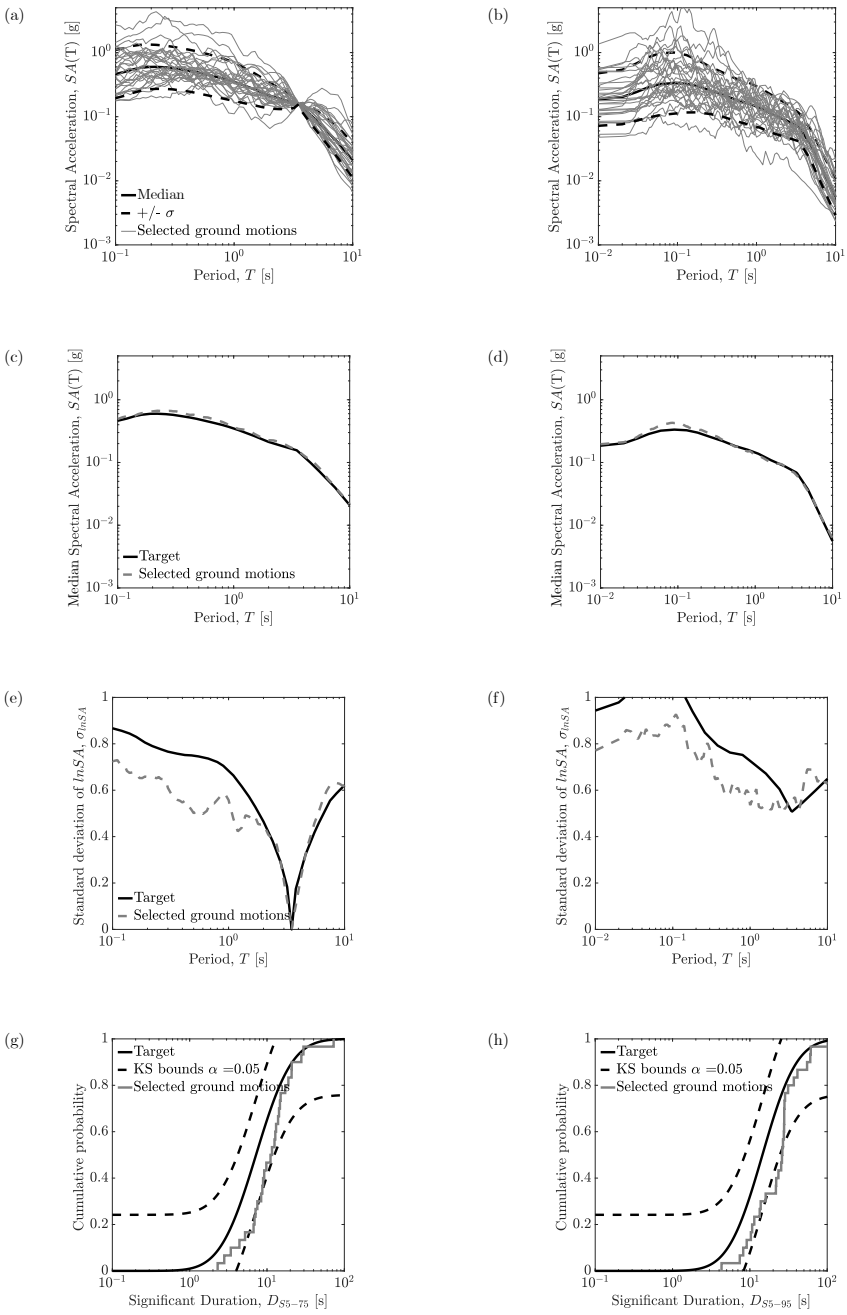


Fig. 6 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.156g$ corresponding to 1% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

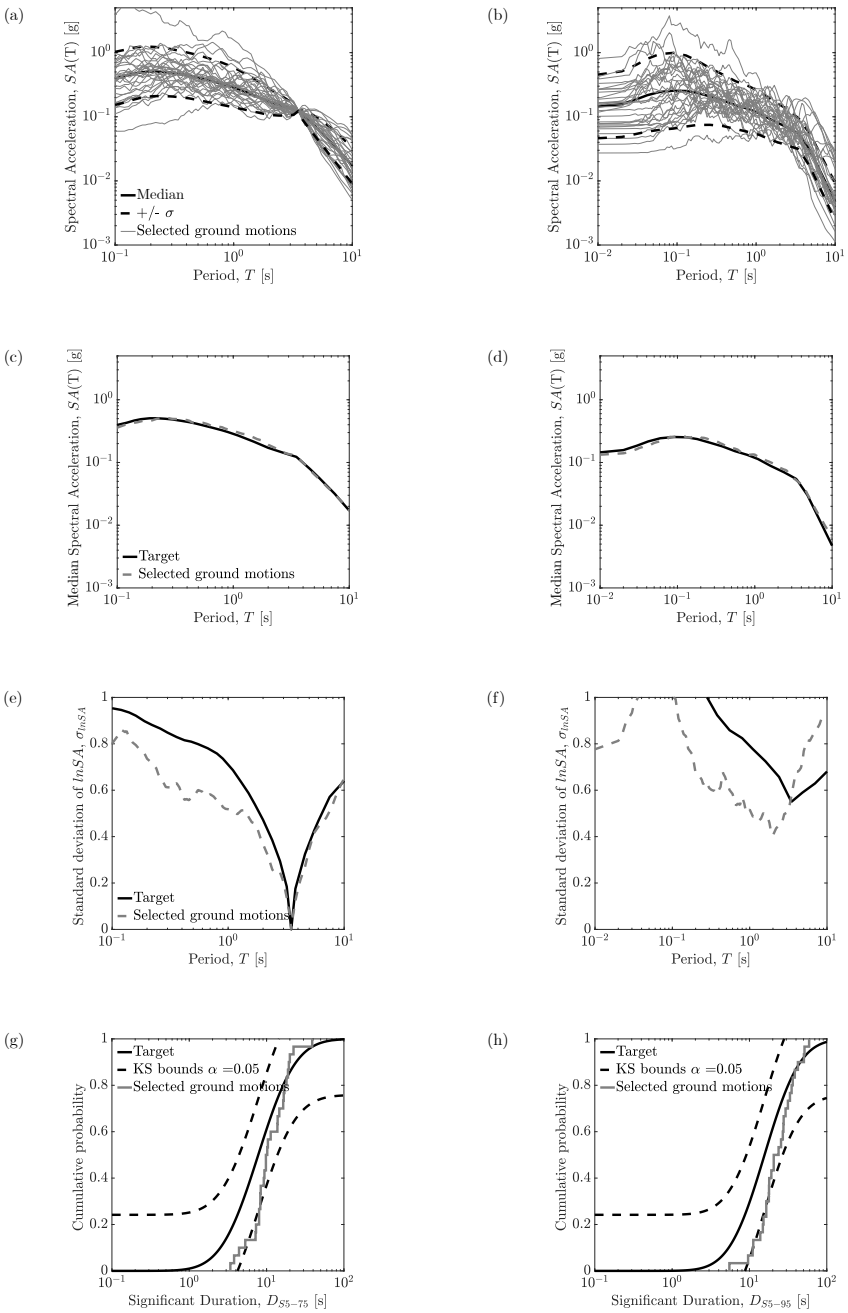


Fig. 7 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.123g$ corresponding to 2% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

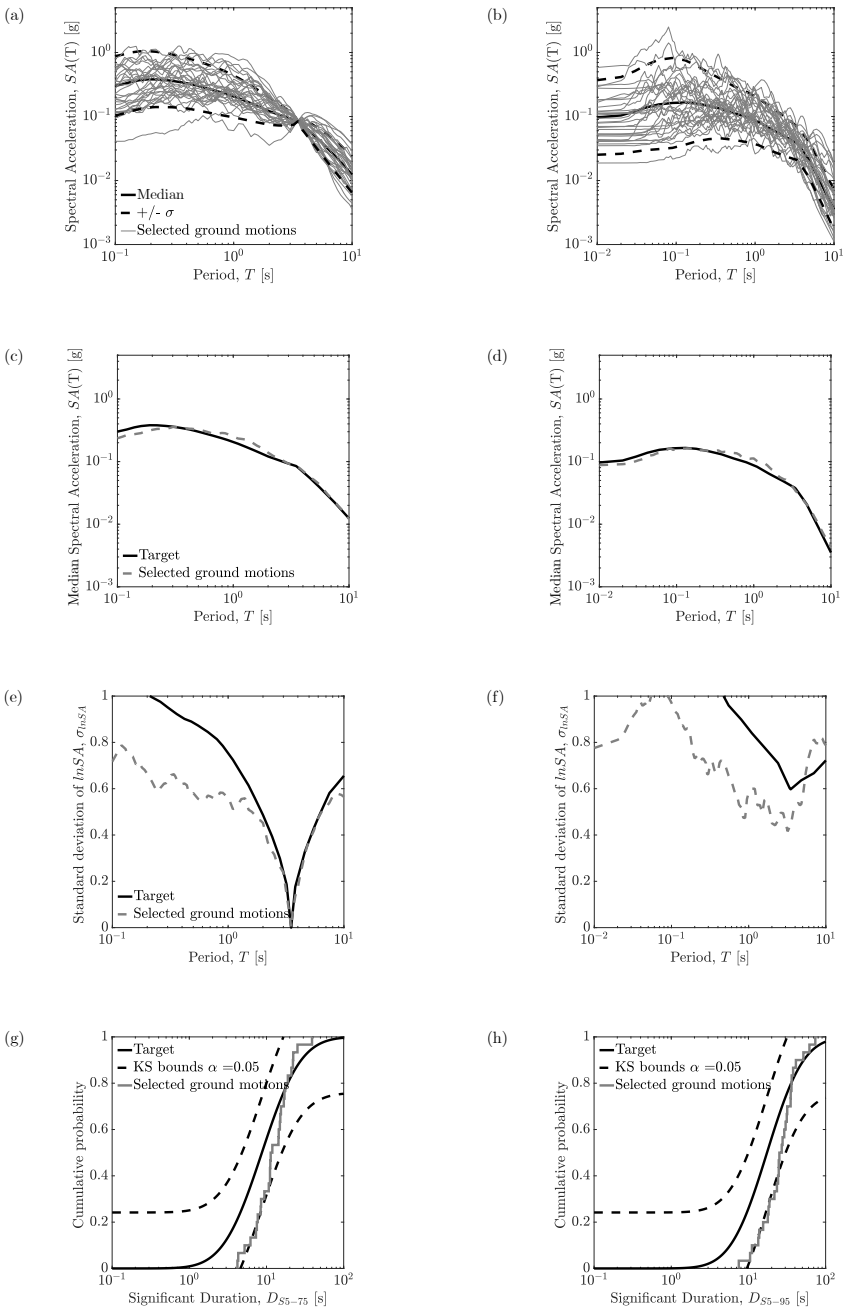


Fig. 8 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.085g$ corresponding to 5% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

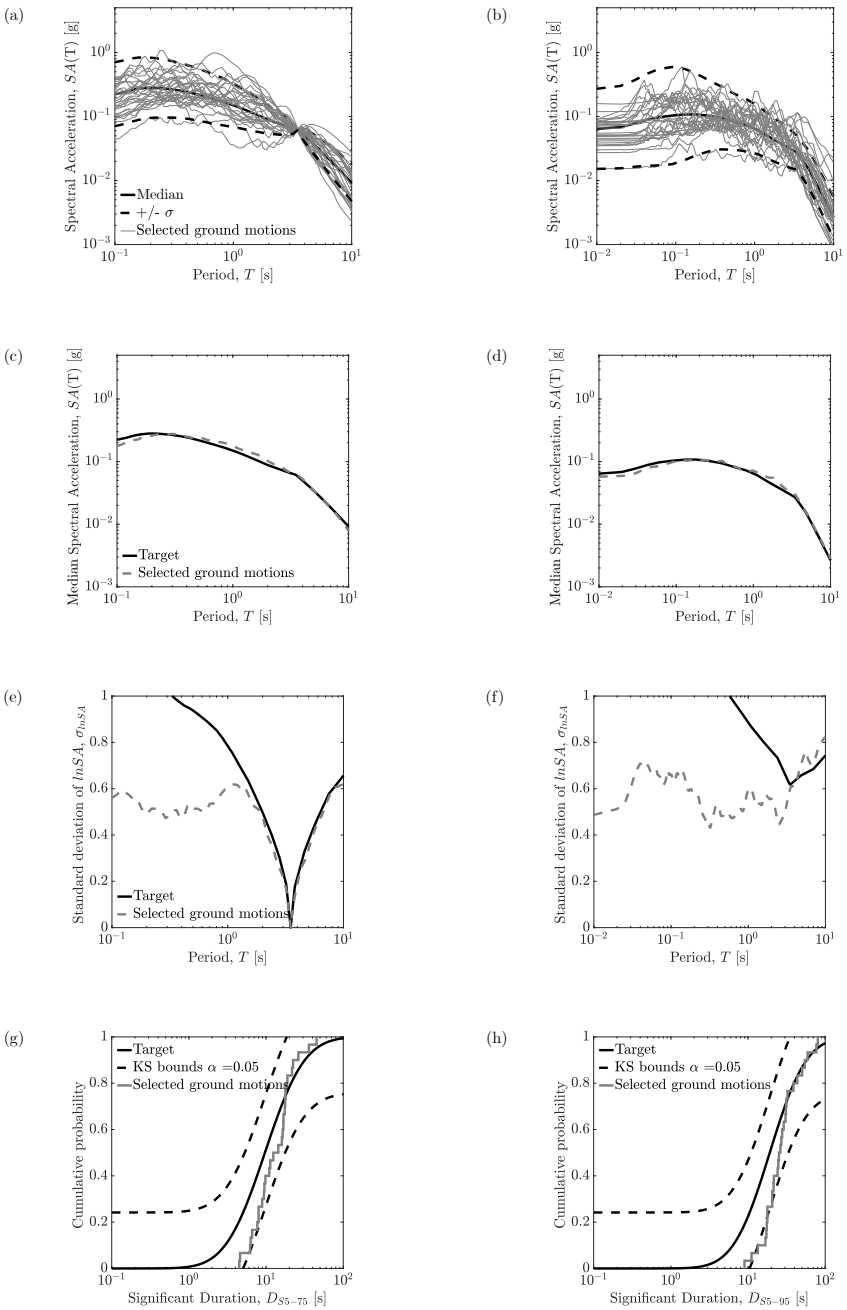


Fig. 9 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.062g$ corresponding to 10% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

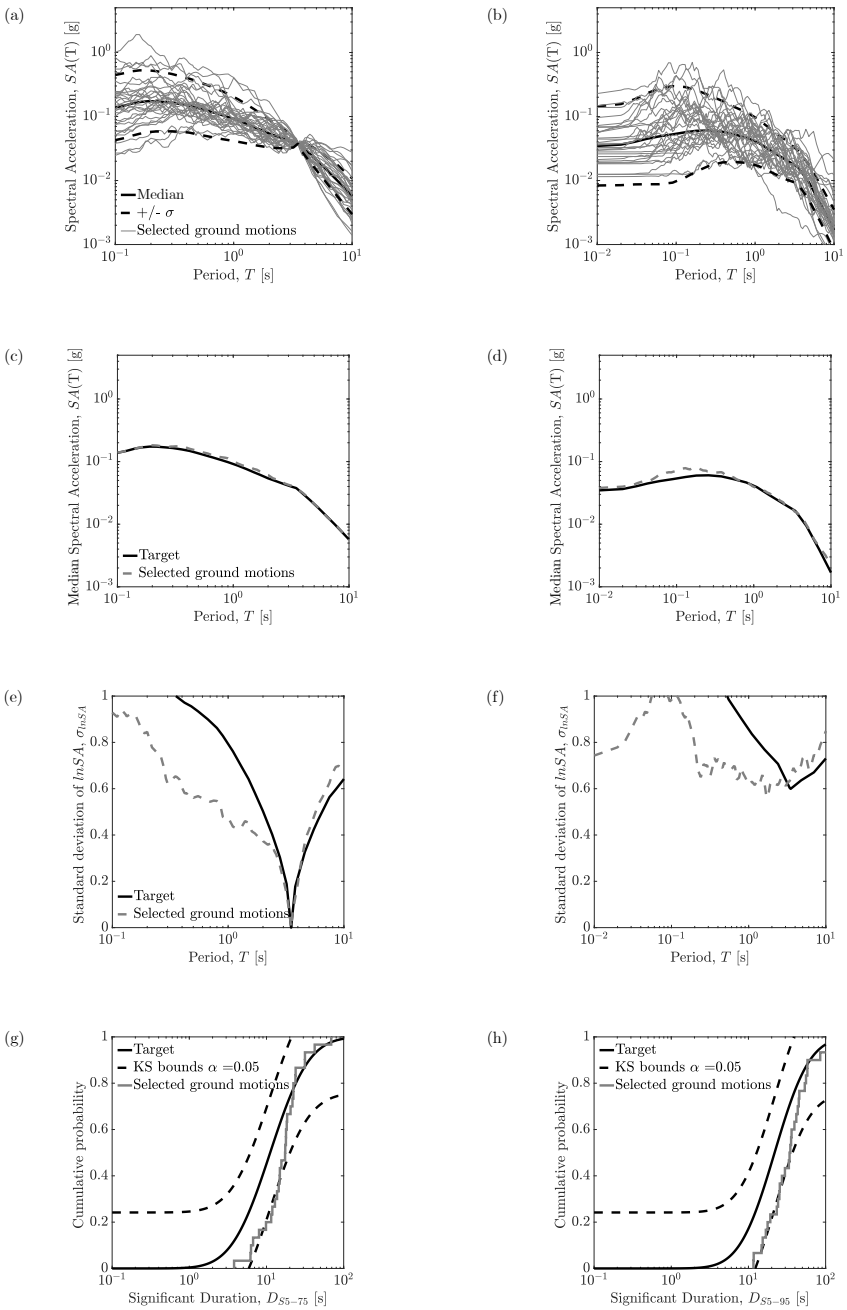


Fig. 10 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.038g$ corresponding to 25% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

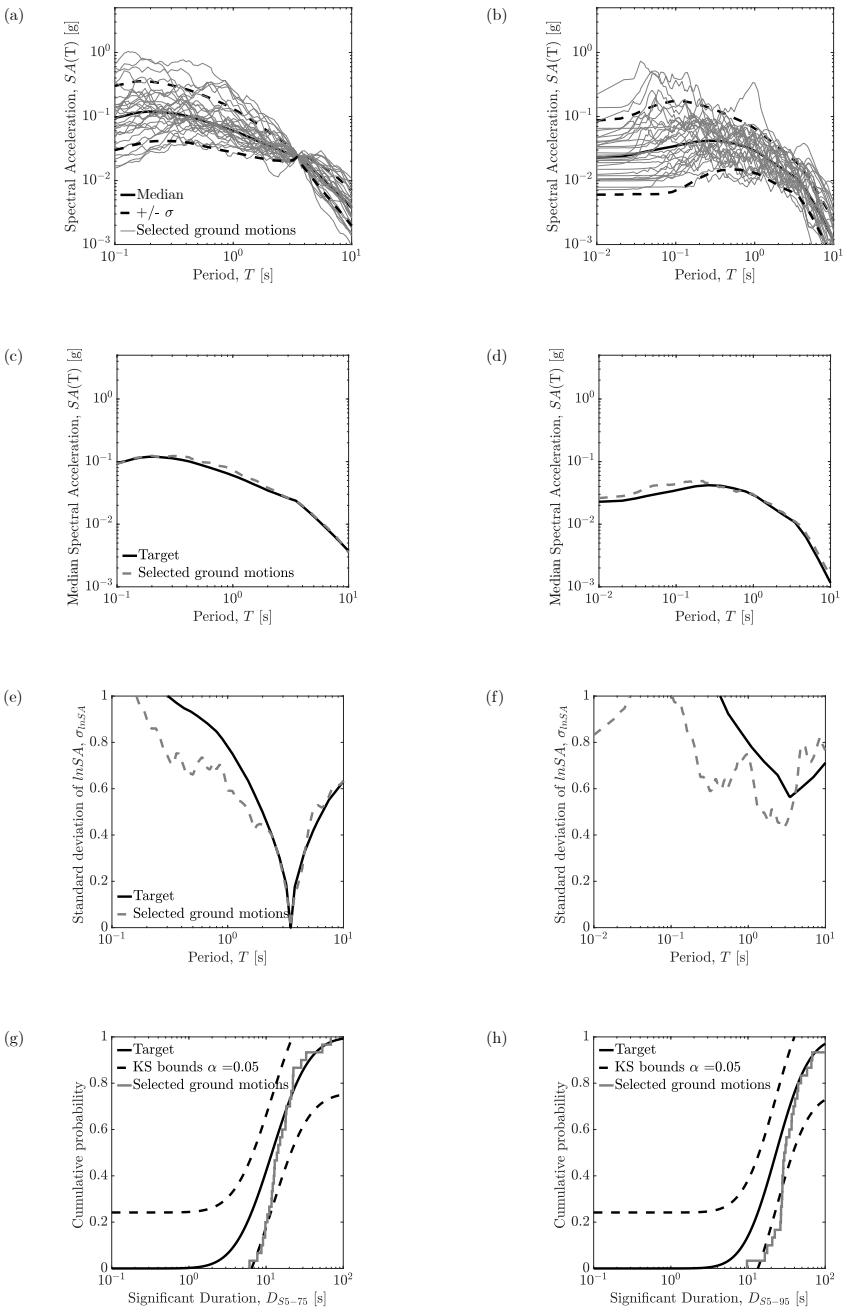


Fig. 11 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.024g$ corresponding to 50% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

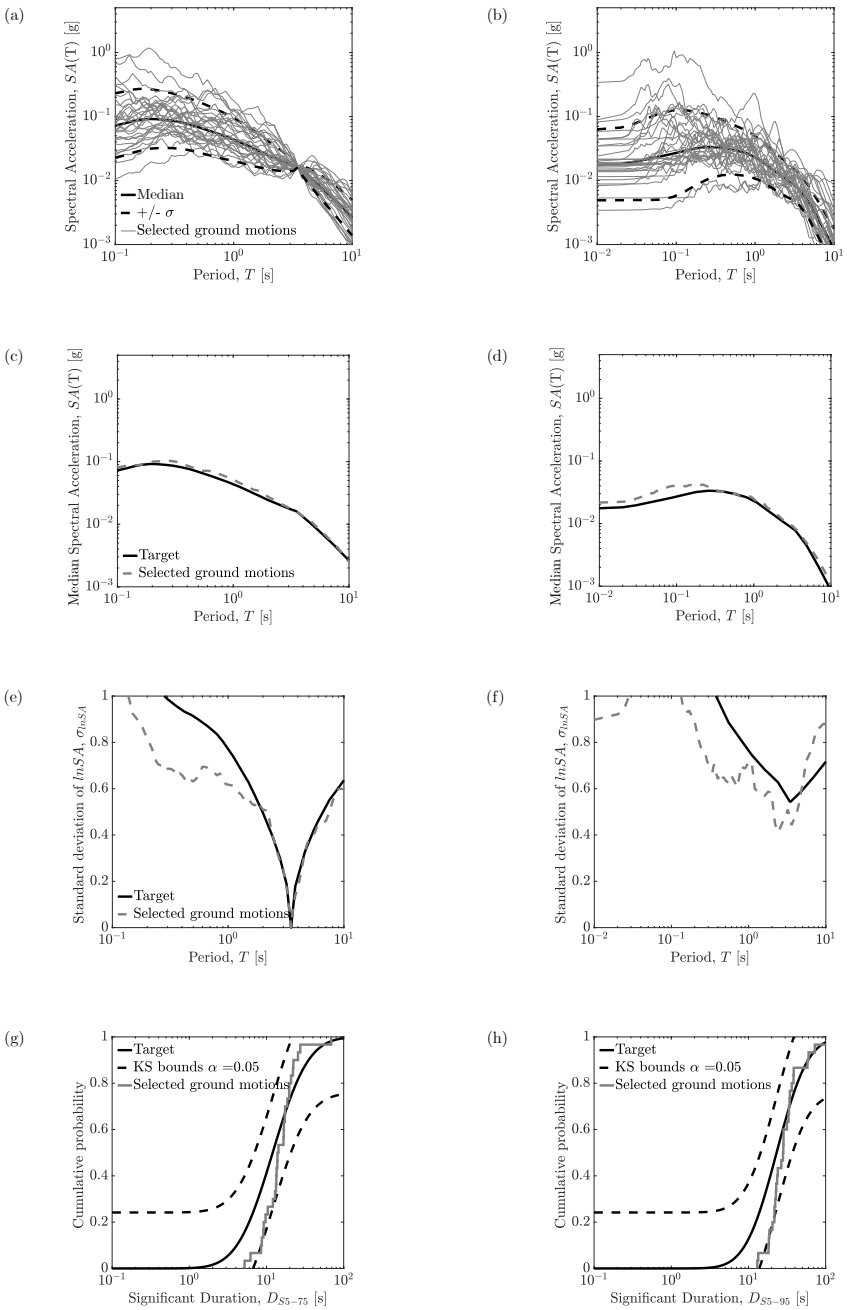


Fig. 12 Target IM distributions and match of 30 selected ground motion records to the targets conditional on $SA(3.5s) = 0.016g$ corresponding to 75% probability of exceedance in 50 years: (a) Horizontal response spectra, (b) Vertical response spectra, (c) Match to target mean for horizontal response spectra, (d) Match to target mean for vertical response spectra, (e) Match to target standard deviation for horizontal response spectra, (f) Match to target standard deviation for vertical response spectra, (g) Target and selected significant durations, D_{S5-75}, and (h) Target and selected significant durations, D_{S5-95}.

2.2 Selected ground motions metadata and scaling factors

Table 2 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 0.1% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	126	1.65	NGA West 2	Gazli USSR	1976	Karakyr	6.8	3.92	259.59	5.6	7
2	143	0.99	NGA West 2	Tabas Iran	1978	Tabas	7.35	1.79	766.77	8.3	16.5
3	169	2.86	NGA West 2	Imperial Valley-06	1979	Delta	6.53	22.03	242.05	24.4	51.4
4	173	2.10	NGA West 2	Imperial Valley-06	1979	El Centro Array #10	6.53	8.6	202.85	5.3	12.8
5	178	2.32	NGA West 2	Imperial Valley-06	1979	El Centro Array #3	6.53	10.79	162.94	5.1	14.1
6	578	2.64	NGA West 2	Taiwan SMART1(45)	1986	SMART1 O02	7.3	57.13	285.09	11.4	20.9
7	582	2.98	NGA West 2	Taiwan SMART1(45)	1986	SMART1 O08	7.3	54.8	357.43	13.4	34.2
8	1063	1.90	NGA West 2	Northridge-01	1994	Rinaldi Receiving Sta	6.69	0	282.25	4.3	9.1
9	1194	1.57	NGA West 2	Chi-Chi Taiwan	1999	CHY025	7.62	19.07	277.5	22.2	35.3
10	1195	1.69	NGA West 2	Chi-Chi Taiwan	1999	CHY026	7.62	29.52	226.01	33.8	44.7
11	1207	2.85	NGA West 2	Chi-Chi Taiwan	1999	CHY044	7.62	55.13	194.47	27.6	46.9
12	1240	2.54	NGA West 2	Chi-Chi Taiwan	1999	CHY094	7.62	37.1	221.92	46.5	80
13	1477	1.54	NGA West 2	Chi-Chi Taiwan	1999	TCU031	7.62	30.17	489.22	20.4	32.1
14	1482	1.66	NGA West 2	Chi-Chi Taiwan	1999	TCU039	7.62	19.89	540.66	15.8	26.3
15	1494	2.23	NGA West 2	Chi-Chi Taiwan	1999	TCU054	7.62	5.28	460.69	20.1	25.5
16	1501	1.15	NGA West 2	Chi-Chi Taiwan	1999	TCU063	7.62	9.78	476.14	21.4	33.1
17	1534	1.65	NGA West 2	Chi-Chi Taiwan	1999	TCU107	7.62	15.99	409	24.4	37.4
18	1537	1.24	NGA West 2	Chi-Chi Taiwan	1999	TCU111	7.62	22.12	237.53	29.4	45.1
19	1547	1.37	NGA West 2	Chi-Chi Taiwan	1999	TCU123	7.62	14.91	270.22	28.6	38.8
20	1634	0.74	NGA West 2	Manjil Iran	1990	Abhar	7.37	75.58	302.64	16.2	23.3
21	3674	2.72	NGA West 2	Taiwan SMART1(45)	1986	SMART1 M04	7.3	55.55	306.38	11.4	20.5
22	3679	2.83	NGA West 2	Taiwan SMART1(45)	1986	SMART1 M11	7.3	56.84	300.22	11.2	26.5
23	5664	0.86	NGA West 2	Iwate Japan	2008	MYG005	6.9	10.71	361.24	17	42.5
24	5775	2.27	NGA West 2	Iwate Japan	2008	Tamati Ono	6.9	28.9	561.59	8	17.3
25	5777	2.19	NGA West 2	Iwate Japan	2008	Shikama Town	6.9	31.87	334.55	14.7	25.4
26	5780	1.64	NGA West 2	Iwate Japan	2008	Iwadeyama	6.9	20.77	345.55	7.4	15.1
27	5801	1.22	NGA West 2	Iwate Japan	2008	Hirakamachi Asamai Yokote	6.9	34.76	325.79	19.1	26.1
28	5810	1.57	NGA West 2	Iwate Japan	2008	Machimukai Town	6.9	21.07	655.45	15.9	27.3
29	6886	2.80	NGA West 2	Darfield New Zealand	2010	Canterbury Aero Club	7	14.48	280.26	15.1	35.1
30	8063	1.13	NGA West 2	Christchurch New Zealand	2011	Christchurch Botanical Gardens	6.2	5.52	187	4.8	11.4

Table 3 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 0.2% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	143	0.8438	NGA West 2	Tabas Iran	1978	Tabas	7.35	1.79	766.77	8.3	16.5
2	185	1.4309	NGA West 2	Imperial Valley-06	1979	Holtville Post Office	6.53	5.35	202.89	4.7	12.8
3	495	2.4621	NGA West 2	Nahanni Canada	1985	Site 1	6.76	2.48	605.04	7.2	7.5
4	578	2.2406	NGA West 2	Taiwan SMART1(45)	1986	SMART1 O02	7.3	57.13	285.09	11.4	20.9
5	579	2.8061	NGA West 2	Taiwan SMART1(45)	1986	SMART1 O04	7.3	55.18	288.24	10.1	21.9
6	582	2.5319	NGA West 2	Taiwan SMART1(45)	1986	SMART1 O08	7.3	54.8	357.43	13.4	34.2
7	729	1.4116	NGA West 2	Superstition Hills-02	1987	Imperial Valley Wildlife Liquefaction Array	6.54	23.85	179	19.4	35.8
8	779	0.9055	NGA West 2	Loma Prieta	1989	LGPC	6.93	0	594.83	5.5	10.2
9	879	1.0109	NGA West 2	Landers	1992	Lucerne	7.28	2.19	1369	8.4	13.8
10	983	1.2352	NGA West 2	Northridge-01	1994	Jensen Filter Plant Generator Building	6.69	0	525.79	4.2	6.9
11	1161	2.0844	NGA West 2	Kocaeli Turkey	1999	Gebze	7.51	7.57	792	5.8	8.2
12	1195	1.4393	NGA West 2	Chi-Chi Taiwan	1999	CHY026	7.62	29.52	226.01	33.8	44.7
13	1240	2.1552	NGA West 2	Chi-Chi Taiwan	1999	CHY094	7.62	37.1	221.92	46.5	80
14	1244	0.7872	NGA West 2	Chi-Chi Taiwan	1999	CHY101	7.62	9.94	258.89	13.5	30.4
15	1265	2.7045	NGA West 2	Chi-Chi Taiwan	1999	HWA014	7.62	51.49	277.28	10.6	32.5
16	1336	2.3881	NGA West 2	Chi-Chi Taiwan	1999	ILA048	7.62	86.67	199.59	29.3	40.4
17	1463	2.7154	NGA West 2	Chi-Chi Taiwan	1999	TCU003	7.62	86.57	517.33	25.1	40.5
18	1477	1.3102	NGA West 2	Chi-Chi Taiwan	1999	TCU031	7.62	30.17	489.22	20.4	32.1
19	1542	1.3137	NGA West 2	Chi-Chi Taiwan	1999	TCU117	7.62	25.42	198.58	27.3	40.9
20	1547	1.1646	NGA West 2	Chi-Chi Taiwan	1999	TCU123	7.62	14.91	270.22	28.6	38.8
21	3311	2.8979	NGA West 2	Chi-Chi Taiwan-06	1999	CHY092	6.3	42.77	253.72	15.4	24.5
22	3317	2.1442	NGA West 2	Chi-Chi Taiwan-06	1999	CHY101	6.3	34.55	258.89	9.2	22.3
23	3968	1.9593	NGA West 2	Tottori Japan	2000	TTRH02	6.61	0.83	310.21	6	35.3
24	5664	0.7317	NGA West 2	Iwate Japan	2008	MYG005	6.9	10.71	361.24	17	42.5
25	5665	1.1068	NGA West 2	Iwate Japan	2008	MYG006	6.9	30.38	146.72	15.6	45.8
26	5775	1.9257	NGA West 2	Iwate Japan	2008	Tamati Ono	6.9	28.9	561.59	8	17.3
27	5777	1.8629	NGA West 2	Iwate Japan	2008	Shikama Town	6.9	31.87	334.55	14.7	25.4
28	5831	1.7671	NGA West 2	El Mayor-Cucapah Mexico	2010	EJIDO SALTILLO	7.2	14.8	242.05	33.3	53.8
29	6962	1.1672	NGA West 2	Darfield New Zealand	2010	ROLC	7	0	295.74	7.1	11.4
30	8119	1.1428	NGA West 2	Christchurch New Zealand	2011	Pages Road Pumping Station	6.2	1.92	206	2.8	4.3

Table 4 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 0.5% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	143	0.6605	NGA West 2	Tabas Iran	1978	Tabas	7.35	1.79	766.77	8.3	16.5
2	161	1.9411	NGA West 2	Imperial Valley-06	1979	Brawley Airport	6.53	8.54	208.71	5.3	14.9
3	185	1.1201	NGA West 2	Imperial Valley-06	1979	Holtville Post Office	6.53	5.35	202.89	4.7	12.8
4	527	2.8068	NGA West 2	N. Palm Springs	1986	Morongo Valley Fire Station	6.06	3.62	396.41	3.8	6.7
5	583	1.9299	NGA West 2	Taiwan SMART1(45)	1986	SMART1 O10	7.3	56.94	320.11	11.2	23.3
6	729	1.105	NGA West 2	Superstition Hills-02	1987	Imperial Valley Wildlife Liquefaction Array	6.54	23.85	179	19.4	35.8
7	879	0.7914	NGA West 2	Landers	1992	Lucerne	7.28	2.19	1369	8.4	13.8
8	1100	2.5074	NGA West 2	Kobe Japan	1995	Abeno	6.9	24.85	256	13.3	56.4
9	1176	0.6376	NGA West 2	Kocaeli Turkey	1999	Yarimca	7.51	1.38	297	7	15.1
10	1181	2.8264	NGA West 2	Chi-Chi Taiwan	1999	CHY004	7.62	47.32	271.3	35.7	80.8
11	1185	2.3893	NGA West 2	Chi-Chi Taiwan	1999	CHY012	7.62	59.04	198.4	42.8	83.3
12	1236	2.5843	NGA West 2	Chi-Chi Taiwan	1999	CHY088	7.62	37.48	318.52	17.4	33.8
13	1261	2.869	NGA West 2	Chi-Chi Taiwan	1999	HWA009	7.62	52.37	373.23	13.7	33.4
14	1264	2.3356	NGA West 2	Chi-Chi Taiwan	1999	HWA013	7.62	50.5	330.55	13.3	31.1
15	1343	2.0788	NGA West 2	Chi-Chi Taiwan	1999	ILA056	7.62	89.84	223.71	44.1	52.3
16	1489	1.5092	NGA West 2	Chi-Chi Taiwan	1999	TCU049	7.62	3.76	487.27	17.7	22.7
17	1505	0.4696	NGA West 2	Chi-Chi Taiwan	1999	TCU068	7.62	0	487.34	7.5	13.2
18	1528	1.5502	NGA West 2	Chi-Chi Taiwan	1999	TCU101	7.62	2.11	389.41	17	19.2
19	1554	2.3103	NGA West 2	Chi-Chi Taiwan	1999	TCU145	7.62	35.32	240.43	36.7	72.8
20	1629	1.1959	NGA West 2	St Elias Alaska	1979	Yakutat	7.54	80	336.98	24	43.6
21	1634	0.4931	NGA West 2	Manjil Iran	1990	Abhar	7.37	75.58	302.64	16.2	23.3
22	3269	2.8803	NGA West 2	Chi-Chi Taiwan-06	1999	CHY029	6.3	40.14	544.74	7.5	21.7
23	3311	2.2685	NGA West 2	Chi-Chi Taiwan-06	1999	CHY092	6.3	42.77	253.72	15.4	24.5
24	3674	1.8116	NGA West 2	Taiwan SMART1(45)	1986	SMART1 M04	7.3	55.55	306.38	11.4	20.5
25	5663	0.9422	NGA West 2	Iwate Japan	2008	MYG004	6.9	20.17	479.37	7.1	16.6
26	5775	1.5075	NGA West 2	Iwate Japan	2008	Tamati Ono	6.9	28.9	561.59	8	17.3
27	5780	1.0919	NGA West 2	Iwate Japan	2008	Iwadeyama	6.9	20.77	345.55	7.4	15.1
28	5805	2.3626	NGA West 2	Iwate Japan	2008	Yokote City - Nobita	6.9	39.65	253.07	14.7	27.9
29	6886	1.8622	NGA West 2	Darfield New Zealand	2010	Canterbury Aero Club	7	14.48	280.26	15.1	35.1
30	8124	2.3076	NGA West 2	Christchurch New Zealand	2011	Riccarton High School	6.2	9.43	293	5.3	9.5

Table 5 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 1% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	68	1.8276	NGA West 2	San Fernando	1971	LA - Hollywood Stor FF	6.61	22.77	316.46	5.2	13.4
2	171	0.6305	NGA West 2	Imperial Valley-06	1979	El Centro - Meloland Geot. Array	6.53	0.07	264.57	2.3	8.2
3	179	0.6588	NGA West 2	Imperial Valley-06	1979	El Centro Array #4	6.53	4.9	208.91	3.4	10.3
4	576	1.8001	NGA West 2	Taiwan SMART1(45)	1986	SMART1 M07	7.3	55.11	327.61	11.1	21.9
5	735	2.8726	NGA West 2	Loma Prieta	1989	APEEL 7 - Pulgas	6.93	41.68	415.27	8.9	16
6	737	2.037	NGA West 2	Loma Prieta	1989	Agnews State Hospital	6.93	24.27	239.69	9.8	27.5
7	832	2.5121	NGA West 2	Landers	1992	Amboy	7.28	69.21	382.93	17.2	28.5
8	856	2.8039	NGA West 2	Landers	1992	Fountain Valley - Euclid	7.28	146.89	270.54	20.9	27.7
9	879	0.6325	NGA West 2	Landers	1992	Lucerne	7.28	2.19	1369	8.4	13.8
10	963	2.2681	NGA West 2	Northridge-01	1994	Castaic - Old Ridge Route	6.69	20.11	450.28	6.7	9.1
11	1077	2.1547	NGA West 2	Northridge-01	1994	Santa Monica City Hall	6.69	17.28	336.2	6.9	10.7
12	1183	1.4118	NGA West 2	Chi-Chi Taiwan	1999	CHYOO8	7.62	40.43	210.73	27.8	61.3
13	1243	2.9066	NGA West 2	Chi-Chi Taiwan	1999	CHY100	7.62	53.46	230.11	29.6	54.9
14	1510	0.6941	NGA West 2	Chi-Chi Taiwan	1999	TCU075	7.62	0.89	573.02	20.8	31.2
15	1532	1.2787	NGA West 2	Chi-Chi Taiwan	1999	TCU105	7.62	17.16	575.54	18.9	28
16	2710	2.2411	NGA West 2	Chi-Chi Taiwan-04	1999	CHY036	6.2	30.81	233.14	13.1	26.3
17	2734	1.9449	NGA West 2	Chi-Chi Taiwan-04	1999	CHY074	6.2	6.02	553.43	4.4	7.4
18	2884	2.8846	NGA West 2	Chi-Chi Taiwan-04	1999	TCU110	6.2	38.7	212.72	15	26
19	3269	2.302	NGA West 2	Chi-Chi Taiwan-06	1999	CHY029	6.3	40.14	544.74	7.5	21.7
20	4855	2.9041	NGA West 2	Chuetsu-oki Japan	2007	Sanjo	6.8	21.4	245.45	13.9	27.8
21	5472	2.5296	NGA West 2	Iwate Japan	2008	AKT017	6.9	31.44	643.62	9.2	23.4
22	5492	1.8849	NGA West 2	Iwate Japan	2008	AKTH16	6.9	61.19	375	14.3	41.2
23	5656	0.763	NGA West 2	Iwate Japan	2008	IWTH24	6.9	3.1	486.41	8.7	26.8
24	5777	1.1656	NGA West 2	Iwate Japan	2008	Shikama Town	6.9	31.87	334.55	14.7	25.4
25	5838	1.6297	NGA West 2	El Mayor-Cucapah Mexico	2010	El Centro - Meloland Geotechnic	7.2	28.53	186.21	12.8	60.4
26	5976	2.7343	NGA West 2	El Mayor-Cucapah Mexico	2010	Calipatria Fire Station	7.2	54.77	205.78	72.7	149.5
27	6888	0.9163	NGA West 2	Darfield New Zealand	2010	Christchurch Cathedral College	7	19.89	198	11.6	27.8
28	6952	1.1846	NGA West 2	Darfield New Zealand	2010	Papanui High School	7	18.73	263.2	12.5	37
29	6962	0.7303	NGA West 2	Darfield New Zealand	2010	ROLC	7	0	295.74	7.1	11.4
30	8119	0.715	NGA West 2	Christchurch New Zealand	2011	Pages Road Pumping Station	6.2	1.92	206	2.8	4.3

Table 6 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 2% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	143	0.4153	NGA West 2	Tabas Iran	1978	Tabas	7.35	1.79	766.77	8.3	16.5
2	161	1.2204	NGA West 2	Imperial Valley-06	1979	Brawley Airport	6.53	8.54	208.71	5.3	14.9
3	180	0.4198	NGA West 2	Imperial Valley-06	1979	El Centro Array #5	6.53	1.76	205.63	3.8	9.6
4	718	2.1278	NGA West 2	Superstition Hills-01	1987	Imperial Valley Wildlife Liquefaction Array	6.22	17.59	179	7.3	15.2
5	731	2.0656	NGA West 2	Loma Prieta	1989	APEEL 10 - Skyline	6.93	41.71	391.91	8.3	16.5
6	737	1.6024	NGA West 2	Loma Prieta	1989	Agnews State Hospital	6.93	24.27	239.69	9.8	27.5
7	738	2.0343	NGA West 2	Loma Prieta	1989	Alameda Naval Air Stn Hanger	6.93	70.9	190	3.4	5.5
8	761	2.7097	NGA West 2	Loma Prieta	1989	Fremont - Emerson Court	6.93	39.66	284.79	7.2	17.9
9	811	2.9472	NGA West 2	Loma Prieta	1989	WAHO	6.93	11.03	388.33	8	11
10	826	1.9527	NGA West 2	Cape Mendocino	1992	Eureka - Myrtle & West	7.01	40.23	337.46	8	20.6
11	833	2.0701	NGA West 2	Landers	1992	Anaheim - W Ball Rd	7.28	144.9	269.29	22.3	27.7
12	879	0.4976	NGA West 2	Landers	1992	Lucerne	7.28	2.19	1369	8.4	13.8
13	1232	2.8679	NGA West 2	Chi-Chi Taiwan	1999	CHY081	7.62	41.36	573.04	18.9	36.3
14	1353	2.3966	NGA West 2	Chi-Chi Taiwan	1999	KAU006	7.62	113.37	218.49	38.9	51.5
15	1436	1.9227	NGA West 2	Chi-Chi Taiwan	1999	TAP052	7.62	98.51	433.88	13.9	25.6
16	1465	1.9231	NGA West 2	Chi-Chi Taiwan	1999	TCU007	7.62	87.63	463.88	18.1	33.4
17	1469	2.193	NGA West 2	Chi-Chi Taiwan	1999	TCU011	7.62	74.41	471.07	10.2	18
18	1515	0.7701	NGA West 2	Chi-Chi Taiwan	1999	TCU082	7.62	5.16	472.81	19.4	27
19	1528	0.747	NGA West 2	Chi-Chi Taiwan	1999	TCU101	7.62	2.11	389.41	17	19.2
20	3306	2.5401	NGA West 2	Chi-Chi Taiwan-06	1999	CHY082	6.3	60.95	193.69	9.2	35.1
21	3319	2.73	NGA West 2	Chi-Chi Taiwan-06	1999	CHY107	6.3	79.2	175.68	14.6	42.3
22	3994	2.4202	NGA West 2	San Simeon CA	2003	San Luis Obispo - Lopez Lake Grounds	6.52	48.07	365.15	9.8	20.6
23	5668	2.4249	NGA West 2	Iwate Japan	2008	MYG009	6.9	43.16	540.42	16.4	59.1
24	5760	2.2257	NGA West 2	Iwate Japan	2008	YMT017	6.9	34.61	410.57	10.4	50.6
25	6930	2.3243	NGA West 2	Darfield New Zealand	2010	LRSC	7	9.38	295.74	13.8	23.8
26	6942	0.9573	NGA West 2	Darfield New Zealand	2010	NNBS North New Brighton School	7	26.76	211	11.3	29.3
27	8123	0.5096	NGA West 2	Christchurch New Zealand	2011	Christchurch Resthaven	6.2	5.11	141	4.4	11.2
28	7004692	2.8216	NGA Sub	2944860	2002	HWA010	7.12	46.42	249.68	20	38.6
29	7004696	2.4707	NGA Sub	2944860	2002	HWA014	7.12	46.2	279.96	16.7	31.4
30	7005934	2.1606	NGA Sub	Pingtung.Doublet1	2006	KAU046	7.02	14.37	198.41	9.4	17.8

Table 7 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 5% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	15	2.4601	NGA West 2	Kern County	1952	Taft Lincoln School	7.36	38.42	385.43	10.7	30.3
2	68	0.9909	NGA West 2	San Fernando	1971	LA - Hollywood Stor FF	6.61	22.77	316.46	5.2	13.4
3	289	1.7936	NGA West 2	Irpinia Italy-01	1980	Calitri	6.9	13.34	455.93	14.9	24.2
4	316	0.6983	NGA West 2	Westmorland	1981	Parachute Test Site	5.9	16.54	348.69	6.2	18.7
5	760	1.5692	NGA West 2	Loma Prieta	1989	Foster City - Menhaden Court	6.93	45.42	126.4	7.3	15.5
6	762	2.2554	NGA West 2	Loma Prieta	1989	Fremont - Mission San Jose	6.93	39.32	367.57	8.5	18.2
7	771	1.9644	NGA West 2	Loma Prieta	1989	Golden Gate Bridge	6.93	79.71	584.17	4.2	7.5
8	862	2.2384	NGA West 2	Landers	1992	Indio - Coachella Canal	7.28	54.25	339.02	25.2	37.9
9	879	0.3429	NGA West 2	Landers	1992	Lucerne	7.28	2.19	1369	8.4	13.8
10	1148	1.4088	NGA West 2	Kocaeli Turkey	1999	Arcelik	7.51	10.56	523	7.7	11.1
11	1149	2.6377	NGA West 2	Kocaeli Turkey	1999	Atakoy	7.51	56.49	310.01	11.1	36.1
12	1194	0.4539	NGA West 2	Chi-Chi Taiwan	1999	CHY025	7.62	19.07	277.5	22.2	35.3
13	1232	1.9767	NGA West 2	Chi-Chi Taiwan	1999	CHY081	7.62	41.36	573.04	18.9	36.3
14	1353	1.6519	NGA West 2	Chi-Chi Taiwan	1999	KAU006	7.62	113.37	218.49	38.9	51.5
15	1480	0.5622	NGA West 2	Chi-Chi Taiwan	1999	TCU036	7.62	19.83	478.07	15.1	27
16	2452	2.1864	NGA West 2	Chi-Chi Taiwan-03	1999	CHY015	6.2	59.64	228.66	17.1	31.8
17	2500	2.7785	NGA West 2	Chi-Chi Taiwan-03	1999	CHY088	6.2	58.83	318.52	11.9	29.1
18	3269	1.2482	NGA West 2	Chi-Chi Taiwan-06	1999	CHY029	6.3	40.14	544.74	7.5	21.7
19	3680	0.8531	NGA West 2	Taiwan SMART1(45)	1986	SMART1 M12	7.3	57	275.82	11.1	23.4
20	4203	1.2466	NGA West 2	Niigata Japan	2004	NIG013	6.63	38	174.55	22	73.5
21	5492	1.022	NGA West 2	Iwate Japan	2008	AKTH16	6.9	61.19	375	14.3	41.2
22	5836	0.8687	NGA West 2	El Mayor-Cucapah Mexico	2010	El Centro - Meloland Geot. Array	7.2	28.53	264.57	11.2	24.7
23	6976	2.2362	NGA West 2	Darfield New Zealand	2010	TRCS	7	93.7	424.9	21	61.7
24	8090	0.5435	NGA West 2	Christchurch New Zealand	2011	Hulverstone Drive Pumping Station	6.2	4.32	206	4.3	10.5
25	7004685	2.8906	NGA Sub	2944860	2002	TCU081	7.12	132.39	427.14	11.3	24.7
26	7004689	2.9522	NGA Sub	2944860	2002	HWA007	7.12	43.95	378.85	14.4	25.2
27	7004690	1.8087	NGA Sub	2944860	2002	HWA008	7.12	46.29	297.03	15.4	35.2
28	7004691	2.8575	NGA Sub	2944860	2002	HWA009	7.12	44.31	461.07	16.8	27.7
29	7004701	2.1818	NGA Sub	2944860	2002	HWA019	7.12	45.37	503.52	17.5	31.4
30	7005934	1.4892	NGA Sub	Pingtung.Doublet1	2006	KAU046	7.02	14.37	198.41	9.4	17.8

Table 8 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 10% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	6	0.8764	NGA West 2	Imperial Valley-02	1940	El Centro Array #9	6.95	6.09	213.44	17.7	24.2
2	174	0.6351	NGA West 2	Imperial Valley-06	1979	El Centro Array #11	6.53	12.56	196.25	4.6	9
3	176	1.5317	NGA West 2	Imperial Valley-06	1979	El Centro Array #13	6.53	21.98	249.92	8.9	21.6
4	286	1.3853	NGA West 2	Irpinia Italy-01	1980	Bisaccia	6.9	17.51	496.46	16.8	27
5	341	1.2699	NGA West 2	Coalinga-01	1983	Parkfield - Fault Zone 2	6.36	37.92	294.26	9.5	31
6	509	2.3271	NGA West 2	Taiwan SMART1(40)	1986	SMART1 O01	6.32	60.77	267.67	4.5	21.4
7	746	1.9017	NGA West 2	Loma Prieta	1989	Bear Valley #5 Callens Ranch	6.93	53.46	391.01	11	17.8
8	777	0.5488	NGA West 2	Loma Prieta	1989	Hollister City Hall	6.93	27.33	198.77	6.6	17.5
9	781	1.771	NGA West 2	Loma Prieta	1989	Lower Crystal Springs Dam dwnst	6.93	48.24	586.08	6.2	13.4
10	812	0.9664	NGA West 2	Loma Prieta	1989	Woodside	6.93	33.87	453.98	6.3	16.8
11	826	0.773	NGA West 2	Cape Mendocino	1992	Eureka - Myrtle & West	7.01	40.23	337.46	8	20.6
12	1148	1.0229	NGA West 2	Kocaeli Turkey	1999	Arcelik	7.51	10.56	523	7.7	11.1
13	1217	0.7801	NGA West 2	Chi-Chi Taiwan	1999	CHY060	7.62	68.86	228.92	35.9	50.3
14	1308	2.1989	NGA West 2	Chi-Chi Taiwan	1999	ILA002	7.62	95.51	219.78	18	30.6
15	1545	0.4151	NGA West 2	Chi-Chi Taiwan	1999	TCU120	7.62	7.4	459.34	21.7	32.4
16	2722	2.3711	NGA West 2	Chi-Chi Taiwan-04	1999	CHY058	6.2	67.9	269.28	12.4	29
17	2994	2.9656	NGA West 2	Chi-Chi Taiwan-05	1999	CHY116	6.2	120.25	195.38	45.2	80.3
18	3758	0.8867	NGA West 2	Landers	1992	Thousand Palms Post Office	7.28	36.93	333.89	26.2	38.7
19	3994	1.2112	NGA West 2	San Simeon CA	2003	San Luis Obispo - Lopez Lake Grounds	6.52	48.07	365.15	9.8	20.6
20	5465	1.4661	NGA West 2	Iwate Japan	2008	AKT010	6.9	90.53	425.15	18.9	76.9
21	5668	1.2136	NGA West 2	Iwate Japan	2008	MYG009	6.9	43.16	540.42	16.4	59.1
22	5775	0.4743	NGA West 2	Iwate Japan	2008	Tamati Ono	6.9	28.9	561.59	8	17.3
23	7001786	2.9458	NGA Sub	951652	1996	ILA055	6.34	85.72	265.96	22.4	54.4
24	7004685	2.0989	NGA Sub	2944860	2002	TCU081	7.12	132.39	427.14	11.35	24.7
25	7004689	2.1436	NGA Sub	2944860	2002	HWA007	7.12	43.95	378.85	14.4	25.2
26	7004691	2.0748	NGA Sub	2944860	2002	HWA009	7.12	44.31	461.07	16.6	27.7
27	7004694	2.3279	NGA Sub	2944860	2002	HWA012	7.12	43.38	409.78	16	26.3
28	7004701	1.5842	NGA Sub	2944860	2002	HWA019	7.12	45.37	503.52	17.5	31.4
29	7005934	1.0813	NGA Sub	Pingtung.Doublet1	2006	KAU046	7.02	14.37	198.41	9.4	17.8
30	7006329	2.6033	NGA Sub	Pingtung.Doublet2	2006	CHY066	6.94	70.61	211.49	17.8	43.5

Table 9 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 25% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	140	2.5892	NGA West 2	Tabas Iran	1978	Ferdows	7.35	89.76	302.64	20.5	24.2
2	190	2.8116	NGA West 2	Imperial Valley-06	1979	Superstition Mtn Camera	6.53	24.61	362.38	6.2	11.6
3	393	2.0238	NGA West 2	Coalinga-03	1983	Sulphur Baths (temp)	5.38	12.77	617.43	6.7	11.7
4	812	0.5929	NGA West 2	Loma Prieta	1989	Woodside	6.93	33.87	453.98	6.3	16.8
5	1057	0.6885	NGA West 2	Northridge-01	1994	Playa Del Rey - Saran	6.69	24.42	345.72	14.8	29.7
6	1245	1.3648	NGA West 2	Chi-Chi Taiwan	1999	CHY102	7.62	36.06	804.36	21.7	36.2
7	1347	1.7024	NGA West 2	Chi-Chi Taiwan	1999	ILA063	7.62	57.69	996.51	13.7	23.3
8	1446	1.038	NGA West 2	Chi-Chi Taiwan	1999	TAP077	7.62	117.31	1022.77	11.5	19.2
9	1470	0.9015	NGA West 2	Chi-Chi Taiwan	1999	TCU014	7.62	92.26	496.47	18.5	34.9
10	1786	1.4832	NGA West 2	Hector Mine	1999	Heart Bar State Park	7.13	61.21	624.94	11.9	17.7
11	2070	2.9402	NGA West 2	Nenana Mountain Alaska	2002	Anchorage - K2-10	6.7	277.35	337.18	42.1	103.4
12	2477	1.1261	NGA West 2	Chi-Chi Taiwan-03	1999	CHY055	6.2	75.92	225.77	17.5	39.4
13	2757	2.1217	NGA West 2	Chi-Chi Taiwan-04	1999	CHY115	6.2	90.38	259.43	17.9	45.6
14	2836	2.011	NGA West 2	Chi-Chi Taiwan-04	1999	KAU085	6.2	89.08	260.75	22.3	41.7
15	3286	0.7282	NGA West 2	Chi-Chi Taiwan-06	1999	CHY055	6.3	82.76	225.77	15.6	44.9
16	3313	0.9285	NGA West 2	Chi-Chi Taiwan-06	1999	CHY094	6.3	58.8	221.92	23.7	55.7
17	3659	1.2763	NGA West 2	Taiwan SMART1(40)	1986	SMART1 O10	6.32	58.73	320.11	3.8	14.8
18	3750	0.3717	NGA West 2	Cape Mendocino	1992	Loleta Fire Station	7.01	23.46	515.65	8	15.3
19	3862	1.7789	NGA West 2	Chi-Chi Taiwan-05	1999	CHY012	6.2	101.35	198.4	31.5	85.1
20	5767	1.2602	NGA West 2	Iwate Japan	2008	YMTH08	6.9	57.23	320.31	14.9	35.7
21	7001751	2.7002	NGA Sub	951652	1996	ILA003	6.34	92.73	265.55	23.9	53.7
22	7004616	2.7368	NGA Sub	2944860	2002	CHY020	7.12	218.86	214.14	68.9	101.6
23	7004630	2.9745	NGA Sub	2944860	2002	CHY038	7.12	171.74	372.88	18.3	34.1
24	7004689	1.3151	NGA Sub	2944860	2002	HWA007	7.12	43.95	378.85	14.4	25.2
25	7004697	2.9258	NGA Sub	2944860	2002	HWA015	7.12	50.52	445.6	12.9	25.5
26	7005892	2.4449	NGA Sub	Pingtung.Doublet1	2006	CHY071	7.02	101.15	200.52	22.3	58.2
27	7005932	2.4046	NGA Sub	Pingtung.Doublet1	2006	CHY125	7.02	93.57	271.64	31.4	58
28	7006328	2.8033	NGA Sub	Pingtung.Doublet2	2006	CHY065	6.94	68.42	222.69	17.4	33.4
29	7006329	1.5972	NGA Sub	Pingtung.Doublet2	2006	CHY066	6.94	70.61	211.49	17.84	43.5
30	7006339	2.8106	NGA Sub	Pingtung.Doublet2	2006	CHY077	6.94	98.9	124.9	9.8	27.2

Table 10 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 50% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	160	0.4167	NGA West 2	Imperial Valley-06	1979	Bonds Corner	6.53	0.44	223.03	6.1	9.7
2	833	0.3996	NGA West 2	Landers	1992	Anaheim - W Ball Rd	7.28	144.9	269.29	22.3	27.7
3	1170	1.0271	NGA West 2	Kocaeli Turkey	1999	Mecidiyekoy	7.51	51.17	384.86	11	16.5
4	1202	0.3803	NGA West 2	Chi-Chi Taiwan	1999	CHY035	7.62	12.6	573.04	7.7	27.9
5	1308	0.848	NGA West 2	Chi-Chi Taiwan	1999	ILA002	7.62	95.51	219.78	18	30.6
6	1786	0.9323	NGA West 2	Hector Mine	1999	Heart Bar State Park	7.13	61.21	624.94	11.9	17.7
7	2080	1.6922	NGA West 2	Nenana Mountain Alaska	2002	Anchorage - K2-20	6.7	276.74	341.56	53.5	124.9
8	2720	0.9807	NGA West 2	Chi-Chi Taiwan-04	1999	CHY056	6.2	79.36	193	20.4	36.7
9	2968	1.2293	NGA West 2	Chi-Chi Taiwan-05	1999	CHY065	6.2	116.47	250	13.8	26.7
10	2984	1.8068	NGA West 2	Chi-Chi Taiwan-05	1999	CHY093	6.2	90.6	190.49	14.4	31.4
11	3270	0.358	NGA West 2	Chi-Chi Taiwan-06	1999	CHY030	6.3	44.17	204.71	15.2	28.7
12	3416	0.7232	NGA West 2	Chi-Chi Taiwan-06	1999	KAU085	6.3	112.02	260.75	21.2	36.9
13	3482	2.7644	NGA West 2	Chi-Chi Taiwan-06	1999	TCU091	6.3	111.8	479.54	16.2	26.8
14	3819	2.211	NGA West 2	Hector Mine	1999	San Diego - UCSD Hospital Grnds	7.13	203.32	516.97	12.6	28.5
15	3994	0.4671	NGA West 2	San Simeon CA	2003	San Luis Obispo - Lopez Lake Grounds	6.52	48.07	365.15	9.8	20.6
16	4222	0.9483	NGA West 2	Niigata Japan	2004	NIGH05	6.63	70.59	244.84	8.7	66.2
17	5249	0.5109	NGA West 2	Chuetsu-oki Japan	2007	NIG003	6.8	47.35	187.36	12.8	34.3
18	5462	2.4515	NGA West 2	Iwate Japan	2008	AKT007	6.9	117.61	232.58	18.3	48.6
19	5651	1.9885	NGA West 2	Iwate Japan	2008	IWTH19	6.9	28.49	482.08	12.2	26.3
20	6509	2.4526	NGA West 2	Niigata Japan	2004	FKS010	6.63	180.03	423.53	10.4	40.7
21	7001754	2.8958	NGA Sub	951652	1996	ILA006	6.34	75.69	276.37	9.7	22.2
22	7001788	2.4722	NGA Sub	951652	1996	ILA058	6.34	83.25	248.26	11.8	29.5
23	7004609	1.8595	NGA Sub	2944860	2002	CHY008	7.12	190.74	209.5	33.1	68.1
24	7004616	1.7204	NGA Sub	2944860	2002	CHY020	7.12	218.86	214.14	68.9	101.6
25	7004636	2.3536	NGA Sub	2944860	2002	CHY044	7.12	204.69	192.67	28.5	38.9
26	7004673	1.3924	NGA Sub	2944860	2002	CHY106	7.12	179.4	227.63	22.6	44.6
27	7004699	2.2649	NGA Sub	2944860	2002	HWA017	7.12	52.47	584.68	12.9	27.5
28	7005892	1.5369	NGA Sub	Pingtung.Doublet1	2006	CHY071	7.02	101.15	200.52	22.3	58.2
29	7006321	2.2496	NGA Sub	Pingtung.Doublet2	2006	CHY056	6.94	109.56	189	9.1	27.9
30	7006329	1.004	NGA Sub	Pingtung.Doublet2	2006	CHY066	6.94	70.61	211.49	17.8	43.5

Table 11 Selected ground motion records scaling factors and metadata for $SA(3.5s)$ intensity level corresponding to 75% probability of exceedance in 50 years.

Rec No	RSN	SF	Database	EQ name	Year	Station name	M	R_{jb} [km]	Station $V_{s,30}$ [m/s]	D_{S5-75} [s]	D_{S5-95} [s]
1	12	0.3961	NGA West 2	Kern County	1952	LA - Hollywood Stor FF	7.36	114.62	316.46	18.6	33.5
2	294	0.694	NGA West 2	Irpinia Italy-01	1980	Tricarico	6.9	51.74	496.46	16.8	22.9
3	315	2.7122	NGA West 2	Westmorland	1981	Niland Fire Station	5.9	15.16	212	5.2	13
4	762	0.4292	NGA West 2	Loma Prieta	1989	Fremont - Mission San Jose	6.93	39.32	367.57	8.5	18.2
5	781	0.4641	NGA West 2	Loma Prieta	1989	Lower Crystal Springs Dam dwnst	6.93	48.24	586.08	6.2	13.4
6	807	0.5418	NGA West 2	Loma Prieta	1989	Sunol - Forest Fire Station	6.93	47.41	400.62	10.4	21.7
7	1350	0.6042	NGA West 2	Chi-Chi Taiwan	1999	ILA067	7.62	33.27	665.2	8.7	18.4
8	1433	0.3527	NGA West 2	Chi-Chi Taiwan	1999	TAP047	7.62	83.57	403.2	14.3	28.3
9	1581	0.473	NGA West 2	Chi-Chi Taiwan	1999	TTN031	7.62	52.63	510.62	17.3	28.5
10	2852	1.6598	NGA West 2	Chi-Chi Taiwan-04	1999	TCU042	6.2	98.43	578.98	12.1	26.7
11	3111	0.8954	NGA West 2	Chi-Chi Taiwan-05	1999	KAU085	6.2	119.68	260.75	16.6	34.4
12	3229	1.5494	NGA West 2	Chi-Chi Taiwan-05	1999	TTN007	6.2	108.06	282.7	13.5	22.7
13	3427	2.0792	NGA West 2	Chi-Chi Taiwan-06	1999	TAP050	6.3	132.99	462.31	17.4	31.5
14	3526	2.6006	NGA West 2	Chi-Chi Taiwan-06	1999	TTN015	6.3	108.97	487.91	13.8	24
15	3891	1.5029	NGA West 2	Tottori Japan	2000	HRSHO9	6.61	65.98	495.15	13.3	21.7
16	3940	1.7914	NGA West 2	Tottori Japan	2000	SMN008	6.61	88.13	404.51	9.2	18.7
17	4248	2.5986	NGA West 2	Niigata Japan	2004	TCGH17	6.63	77.39	1432.75	13.4	20.5
18	5505	1.7605	NGA West 2	Iwate Japan	2008	AOM010	6.9	186.36	243.62	27.4	60.1
19	5535	1.072	NGA West 2	Iwate Japan	2008	AOMH12	6.9	154.46	281	25.6	72.5
20	6145	1.7919	NGA West 2	Tottori Japan	2000	EHM008	6.61	160	277.68	9.1	28
21	7001754	1.9678	NGA Sub	951652	1996	ILA006	6.34	75.69	276.37	9.7	22.2
22	7001802	2.1813	NGA Sub	951652	1996	TAP009	6.34	130.59	187.59	12.9	23.5
23	7004616	1.1691	NGA Sub	2944860	2002	CHY020	7.12	218.86	214.14	68.9	101.6
24	7004635	0.995	NGA Sub	2944860	2002	CHY043	7.12	188.13	225.41	20.81	34.1
25	7004659	1.6562	NGA Sub	2944860	2002	CHY083	7.12	153.27	374.02	16.7	33
26	7004661	1.6581	NGA Sub	2944860	2002	CHY087	7.12	170.8	508	19.7	28.5
27	7005857	2.3497	NGA Sub	Pingtung.Doublet1	2006	CHY021	7.02	100.47	212.34	22	38.4
28	7005878	2.946	NGA Sub	Pingtung.Doublet1	2006	CHY053	7.02	121.8	272.67	19.6	36.4
29	7005892	1.0444	NGA Sub	Pingtung.Doublet1	2006	CHY071	7.02	101.15	200.52	22.3	58.2
30	7006292	1.3217	NGA Sub	Pingtung.Doublet2	2006	CHY017	6.94	102.78	196.02	13.9	38.6

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