







APPENDIX B

Seismotectonics of the southern branch of North Anatolian Fault Zone along Bolu, Bursa, and İzmir cities and Değirmenlik (Milos) island in the Aegean Sea

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Earthquake focal parameters and focal mechanism solutions of the major seismic events.

ID	Earthquake focal parameters								Focal mechanism solutions											
	Date (y.m.d)	Time (GMT) (h:m:s)	Lat. (°N)	Lon. (°E)	Depth (km)	Mag.	MTyp	Ref	Str1 (°)	Dip1 (°)	Rake1 (°)	Str2 (°)	Dip2 (°)	Rake2 (°)	Pazm (°)	Pp1g (°)	Tazm (°)	Tp1g (°)	Beach ball	Ref
1	1953.03.18	19:06:13	40.0700	27.3900	10	7.4	Ms	DM, HE	59	76	174	150	84	14	284	6	16	14		DM, HE
2	1964.10.06	14:31:23	40.3000	28.2000	10.0	6.8	Ms	S16	302	36	-90	122	54	-90	32	81	212	9		S16
3	1966.08.21	01:30:43	40.3300	27.4000	12	4.9	Mw	DM	190	46	73	34	46	107	112	0	21	78		DM
4	1969.03.03	00:59:11	40.1200	27.4300	4	5.8	Mw	DM, HE	107	50	147	220	65	45	340	9	81	49		DM, HE
5	1974.02.01	00:01:01	38.5480	27.2830	11.3	5.6	Mw	K17	250	65	-151	147	64	-28	109	38	18	1		K17
6	1977.12.16	07:44:22	38.4730	27.2801	5.0	5.6	Mw	K17	304	70	-76	88	24	-124	235	63	23	24		K17





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7	1982.07.27	10:23:16	40.3450	28.9630	15	4.3	Md	KO	70	70	140	176	53	25	127	11	27	42		S16
8	1983.02.01	13:54:12	40.1670	28.9390	0.1	4.8	Md	KO	10	40	80	203	51	98	287	5	157	82		S16
9	1983.07.05	12:01:27	40.3300	27.2300	10	6.1	Ms	BP	248	70	-155	149	67	-23	109	32	18	2		BP
10	1983.10.21	20:34:49	40.1300	29.3800	15	5.4	Mw	EE	217	90	-180	127	90	0	82	0	352	0		EE
11	1992.11.06	19:08:09	38.0480	27.0040	9.8	6	Mw	K17	147	77	-5	238	85	-167	103	13	12	6		K17
12	1999.07.24	16:05:51	39.3830	27.9910	10.0	5	Mw	K17	334	50	-27	82	70	-136	306	44	204	12		K17
13	1999.07.25	06:56:56	39.3210	27.9840	21.2	5.2	Mw	K17	250	67	-158	151	70	-24	110	31	201	2		K17
14	1999.08.31	08:10:51	40.4300	30.2500	15	5.2	Mw	GC	329	33	-22	77	78	-121	315	48	192	27		GC
15	1999.09.13	11:55:32	40.3100	30.2900	15	5.8	Md	GC	268	59	-176	176	86	-31	128	24	226	19		GC
16	2001.05.24	03:18:09	39.3200	27.9000	7.0	4.4	Mw	K17	78	76	-143	338	54	-17	304	36	204	14		K17




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17	2001.06.22	11:54:52	39.3240	27.8910	7.0	5.2	Mw	K17	89	65	-148	344	61	-148	308	40	216	3		K17
18	2001.06.23	12:18:21	39.3200	27.9000	11	4.2	ML	KO	90	90	-90	0	0	0	0	45	180	45		TS
19	2001.10.29	20:21:53	39.1000	25.0100	15	4.4	ML	KO	10	65	80	213	27	110	107	19	260	68		TS
20	2003.04.10	00:40:15	38.2100	26.7900	15	5.9	ML	KO	40	85	-80	156	11	-153	321	49	121	39		TS
21	2003.04.17	22:34:27	38.1810	26.9590	15.0	5.2	Mw	K17	156	50	-15	256	78	-138	124	36	20	19		K17
22	2003.06.09	17:44:03	40.2100	27.9400	17	4.9	ML	KO	80	80	15	347	75	170	213	3	304	18		TS
23	2003.06.09	17:44:07	40.1540	28.0700	9.1	5.1	Md	S16	345	85	40	251	50	173	111	23	216	31		S16
24	2004.11.05	17:30:22	39.2144	27.7715	13.0	4.7	Mw	K17	142	56	-85	313	35	-97	70	79	228	11		K17
25	2004.12.02	15:51:48	39.2600	27.9600	11	4.5	ML	KO	170	90	180	260	90	0	35	0	305	0		TS
26	2004.12.02	15:51:48	39.2644	27.9677	11.0	4.5	Mw	K17	69	80	-156	334	67	-11	294	24	200	10		K17






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27	2005.01.13	11:00:48	39.1868	27.7347	8.9	4.3	Mw	K17	257	86	169	347	79	4	303	5	212	11		K17
28	2005.01.29	18:52:25	38.1800	26.6400	5	4.5	ML	KO	345	90	15	255	75	180	119	11	211	11		TS
29	2005.05.06	21:15:08	40.1070	27.8800	5.6	3	Md	S16	125	55	-90	305	35	-90	35	80	215	10		S16
30	2005.07.18	11:37:56	40.2780	29.2240	5	3.1	Md	KO	250	65	-10	344	81	-155	210	24	115	11		S16
31	2005.09.24	01:54:30	40.3600	28.7590	5.9	2.7	Md	KO	100	65	-160	1	72	-26	319	31	52	5		S16
32	2005.10.17	05:45:16	38.1455	26.5287	10.1	5.7	ML	KO	140	85	-15	231	75	-175	95	14	187	7		TS
33	2005.10.17	09:46:53	38.1570	26.5268	9.1	5.9	ML	KO	315	80	20	221	70	169	87	7	180	21		TS
34	2005.10.17	09:55:29	38.1500	26.5800	17	5.3	ML	KO	238	80	-165	145	75	-10	102	18	11	4		TS
35	2005.11.03	07:46:19	40.0850	27.6990	13.0	3.2	Md	S16	140	50	-30	250	67	-136	112	47	11	10		S16
36	2005.11.21	02:42:26	40.3160	30.6690	8.4	3.1	Md	KO	120	60	120	251	41	49	189	10	79	62		S16











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37	2005.12.24	01:54:37	40.2220	28.9830	7.6	3.1	Md	KO	90	75	-70	215	25	-142	25	56	164	27		S16
38	2006.02.17	00:09:36	40.0200	27.9220	17.5	3.4	Md	S16	105	35	-150	350	73	-59	296	52	57	22		S16
39	2006.03.09	03:18:20	37.8680	26.6502	7.3	4.3	ML	KO	217	80	-170	125	80	-10	81	14	351	0		TS
40	2006.03.11	19:12:57	40.2470	29.6360	6.1	3.1	Md	KO	75	55	50	311	51	133	192	2	286	58		S16
41	2006.03.15	19:45:59	40.0810	28.6550	9.6	3.7	Md	KO	60	70	-110	287	28	-47	301	60	165	23		S16
42	2006.05.06	21:05:04	40.0950	27.5860	5.5	2.9	Md	S16	25	50	-20	128	75	-138	355	40	251	16		S16
43	2006.10.06	15:14:57	40.0510	27.5400	5.0	3.3	Md	S16	10	45	60	229	52	117	301	4	201	69		S16
44	2006.10.20	18:15:24	40.2617	27.9850	10.9	5.2	ML	KO	340	85	-30	73	60	-174	292	24	30	17		TS
45	2006.10.20	18:15:24	40.2350	27.9910	7.0	4.4	Md	S16	230	80	140	328	51	13	285	19	181	35		S16
46	2006.12.12	09:31:47	40.1060	29.6430	9.1	2.9	Md	KO	188	62	-79	345	30	-110	123	71	270	16		S16

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47	2007.01.31	11:02:29	40.3170	29.1190	12.4	2.7	Md	KO	225	85	170	316	80	5	271	4	180	11		S16
48	2007.04.30	18:48:54	40.3320	30.5230	3.7	3.5	Md	KO	155	45	-30	267	69	-131	133	49	26	15		S16
49	2007.05.07	07:27:51	40.2690	29.6330	5.8	2.9	Md	KO	35	70	-170	302	81	-20	257	21	350	7		S16
50	2007.06.13	08:44:50	40.1580	28.9590	20.2	3.2	Md	KO	65	80	150	161	61	12	116	13	19	28		S16
51	2007.06.22	17:54:22	40.0680	28.3900	5.9	2.7	Md	S16	175	30	-100	7	61	-84	292	73	93	16		S16
52	2007.07.21	04:31:24	40.0750	27.5750	10.4	3.1	Md	S16	109	80	175	200	45	10	334	4	65	11		S16
53	2007.08.22	01:11:43	40.1280	28.2390	6.7	3	Md	S16	0	25	-40	127	74	-110	11	57	233	27		S16
54	2007.09.10	07:58:14	40.1220	27.6690	9.1	2.7	Md	KO	80	35	-100	272	56	-83	207	78	357	10		S16
55	2007.12.03	18:13:53	40.1400	28.9360	10	3.2	Md	KO	125	85	-20	217	70	-175	79	18	173	10		S16
56	2008.01.05	05:11:00	38.6100	26.9500	12	4.3	ML	KO	350	85	-20	82	70	-175	304	18	37	10		TS







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57	2008.01.28	00:50:42	40.0800	28.9680	24.4	3.5	Md	KO	65	90	175	155	85	0	110	4	20	4		S16
58	2008.02.04	19:22:21	40.1960	29.6580	5.7	2.8	Md	KO	73	54	-53	200	50	-130	44	61	138	2		S16
59	2008.03.01	07:01:08	37.8900	26.7500	12	4.3	ML	KO	305	55	-70	93	40	-116	266	72	21	8		TS
60	2008.03.15	11:52:14	39.0476	27.8478	11.8	4.0	Mw	K17	174	88	-2	264	88	-178	129	3	39	0		K17
61	2008.03.17	04:24:47	40.2340	28.0140	11.3	3.5	Md	S16	150	50	-40	268	61	-132	125	53	27	6		S16
62	2008.06.13	17:04:11	40.4500	28.0220	11.6	3	Md	KO	140	60	-110	356	36	-59	9	68	244	13		S16
63	2008.07.10	07:49:54	40.0260	27.7440	10.2	3.7	Md	S16	75	65	-170	341	81	-25	295	24	30	11		S16
64	2008.10.14	22:58:51	40.0210	28.2850	5.4	3.2	Md	S16	55	50	100	220	41	78	138	5	17	81		S16
65	2008.11.09	16:58:55	40.2060	29.6740	20.8	2.5	Md	KO	90	55	-90	270	35	-90	0	80	180	10		S16
66	2009.01.26	12:10:17	40.1430	28.9170	5.5	3.7	Md	KO	200	35	20	93	79	123	158	26	37	46		S16


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67	2009.02.18	17:22:39	40.1100	28.2130	8.5	3.1	Md	KO	65	70	-80	218	22	-116	351	64	147	24		S16
68	2009.03.08	01:16:18	40.1340	28.8860	5.4	3.1	Md	KO	145	65	-80	302	27	-110	75	68	228	19		S16
69	2009.04.25	09:59:39	40.1210	28.7450	5.6	2.9	Md	S16	90	35	-110	294	57	-77	216	77	7	11		S16
70	2009.06.20	16:00:50	40.1790	28.8050	5.7	3.3	Md	S16	70	55	-130	306	51	-47	281	58	187	2		S16
71	2009.08.01	16:42:39	40.3190	28.3170	16.9	3.8	Md	S16	70	90	-160	340	70	0	297	14	203	14		S16
72	2009.08.15	02:11:58	40.2500	28.9510	4.6	3.4	Md	KO	40	40	110	195	53	74	296	7	53	76		S16
73	2009.08.18	19:06:25	40.0730	27.6060	8.6	3.1	Md	S16	243	80	118	350	30	20	310	29	183	47		S16
74	2009.09.05	12:18:44	40.2040	30.0460	7.1	3.2	Md	KO	135	30	130	271	67	70	16	20	149	62		S16
75	2009.12.23	04:44:41	37.6793	26.3835	30	4.5	ML	KO	110	75	-35	210	56	-162	65	35	164	12		TS
76	2010.08.12	02:23:04	39.6943	27.5447	12.5	4.9	ML	KO	150	90	-10	240	80	-180	105	7	195	7		TS



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77	2010.09.08	20:51:55	40.2290	29.2620	5.9	3.2	Md	KO	105	50	-120	327	48	-59	308	68	216	1		S16
78	2011.02.22	20:37:01	38.9333	24.9277	9.6	4.4	ML	KO	180	85	175	270	85	5	225	0	135	7		TS
79	2011.02.23	05:06:26	40.2510	28.9930	5.7	3.1	Md	KO	120	50	-80	285	41	-102	83	81	203	5		S16
80	2011.03.30	17:07:20	40.0483	27.8310	7.9	4.3	ML	KO	170	80	-20	264	70	-169	125	21	218	7		TS
81	2011.03.30	17:07:20	40.0500	27.8070	9.8	3.9	Md	S16	75	65	170	169	81	25	300	11	35	24		S16
82	2011.04.10	18:51:17	40.3370	28.1640	7	3.2	Md	KO	120	15	-40	249	80	-102	145	53	349	34		S16
83	2011.07.11	16:09:12	40.1700	29.9600	6.5	4.6	ML	KO	110	65	-35	216	59	-150	71	42	164	4		TS
84	2015.01.10	04:32:08	38.2128	27.0510	14.4	4.3	ML	KO	170	70	40	64	53	155	293	11	33	42		TS
85	2015.01.23	10:19:42	40.0558	28.5933	11.4	4.5	ML	KO	217	57	156	320	70	35	86	8	182	39		TS
86	2016.06.07	04:09:45	40.2652	29.1523	15.8	4.6	ML	KO	320	75	-35	60	56	-162	275	35	14	12		TS











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87	2016.09.12	08:26:04	38.8977	27.7433	14	5	ML	KO	257	80	165	350	75	10	304	4	213	18		TS
88	2016.10.15	02:51:03	38.9393	27.7060	8.4	4.4	ML	KO	265	90	-155	175	65	0	133	17	37	17		TS
89	2017.02.06	03:51:41	39.5000	26.0700	12.0	5.4	Mw	GC	299	43	-94	123	47	-87	85	87	212	2		GC
90	2017.02.06	10:58:03	39.5400	26.0600	12.0	5.2	Mw	GC	119	43	-88	296	47	-92	174	88	28	2		GC
91	2017.02.07	02:24:04	39.4600	26.1000	12.0	5.4	Mw	GC	107	45	-99	299	46	-81	290	84	23	0		GC
92	2017.03.24	15:19:05	39.5490	26.0973	11.7	4.3	ML	KO	54	85	165	145	75	5	100	7	8	14		TS
93	2017.04.21	14:12:20	38.6513	27.6008	13.1	5.1	ML	KO	145	55	-70	293	40	-116	106	72	221	8		TS
94	2017.05.27	15:53:23	38.7390	27.8297	11.8	5.3	ML	KO	289	54	-110	140	40	-65	147	72	32	7		TS
95	2017.05.28	02:52:55	38.7425	27.7930	10.9	4.9	ML	KO	304	55	-93	130	35	-85	200	79	36	10		TS
96	2017.11.11	08:56:37	38.8530	27.4698	17.5	4.4	ML	KO	92	54	-127	325	50	-50	302	60	208	2		TS







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97	2017.12.25	05:13:50	38.5750	26.7358	17.5	4.8	ML	KO	70	90	-155	340	65	0	298	17	202	17		TS
98	2018.05.03	02:04:33	39.9797	26.9243	12.7	4.5	ML	KO	279	86	-115	180	25	-10	165	44	30	36		TS
99	2019.01.27	03:15:41	39.0222	27.7567	12.8	4.3	ML	KO	160	85	-45	255	45	-173	107	34	216	26		TS
100	2019.02.20	18:23:28	39.6173	26.4088	8.2	5.4	ML	KO	335	70	-30	76	62	-157	293	35	27	5		TS
101	2019.04.29	18:02:43	39.3995	26.3192	11.6	4.5	ML	KO	160	80	15	67	75	170	293	3	24	18		TS
102	2019.05.12	22:24:08	39.3307	27.9223	7.7	4.5	ML	KO	160	85	20	68	70	175	292	10	26	18		TS
103	2019.08.08	08:39:07	38.0182	26.8568	12.9	5	ML	KO	64	76	-164	330	75	-15	287	21	197	0		TS
104	2019.10.10	23:55:57	39.4137	25.6448	9.7	4.5	ML	KO	160	90	-10	250	80	-180	115	7	205	7		TS
105	2019.11.16	00:28:27	40.2125	29.0407	5.3	3.0	MI	KO	296	64	-106	150	30	-60	176	67	38	18		SR
106	2019.11.17	23:23:31	40.2045	29.0583	8.1	3.2	MI	KO	284	84	-114	180	25	-15	170	46	35	35		SR

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107	2019.12.10	20:14:02	39.4452	27.9245	9.2	5	ML	KO	320	80	-25	55	65	-169	275	25	9	10		TS
108	2020.01.22	19:22:15	39.0573	27.8445	12.0	5.5	Mw	SN	350	80	-15	83	75	-170	306	18	37	3		SN
109	2020.01.28	11:26:13	39.1300	27.7100	12.5	5.1	Mw	GC	327	28	-51	104	69	-108	346	62	208	22		GC
110	2020.08.14	02:40:38	38.9965	27.1593	9.3	3.0	ML	KO	235	73	-148	135	60	-20	99	34	3	8		TS
111	2020.08.29	03:36:26	39.6753	27.8110	5.6	3.7	ML	KO	266	67	-153	165	65	-25	126	35	35	2		TS
112	2020.08.29	03:45:32	39.6600	27.8000	11.0	3.3	ML	KO	271	82	-145	175	55	-10	139	30	38	18		TS
113	2020.10.30	11:51:27	37.9020	26.7942	11.8	6.9	Mw	KO	93	61	-91	276	29	-88	0	74	184	16		US
114	2020.10.30	12:19:09	37.7700	26.5202	8.6	4.0	ML	KO	133	57	-130	10	50	-45	346	57	250	4		TS
115	2020.10.30	20:35:24	37.7780	26.5223	3.6	4.1	ML	KO	42	80	165	135	75	10	89	4	358	18		TS
116	2020.10.31	01:40:31	37.8885	26.4998	11.1	4.2	ML	KO	5	75	25	268	66	164	135	6	228	28		TS

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117	2020.10.31	12:37:03	37.8957	26.5860	10.9	4.0	ML	KO	294	60	-145	185	60	-35	150	45	60	0		TS
118	2020.10.31	12:37:03	37.9100	26.6600	16.2	4.0	ML	KO	150	50	-60	288	48	-121	127	67	219	1		TS
119	2020.11.06	20:57:28	37.7528	26.0093	1.0	4.0	ML	KO	280	80	-15	13	75	-170	236	18	327	3		TS
120	2020.12.11	14:37:49	40.0047	28.1988	11.8	4.1	ML	KO	165	85	30	72	60	174	295	17	33	24		TS
121	2022.03.22	04:22:09	40.0638	28.6380	14.4	3.9	ML	KO	39	72	-154	300	65	-20	261	31	168	5		TS
122	2022.03.22	14:10:55	40.0655	28.6430	7.4	4.2	ML	KO	42	71	-159	305	70	-20	264	28	173	1		TS

TS: This Study; **KO:** KOERI earthquake catalog; **S16:** Seyitoğlu et al. (2016); **K17:** Kılıç et al. (2017); **GC:** GCMT catalog; **SR:** Seyitoğlu et al. (2019); **SN:** Seyitoğlu et al. (2020b); **US:** United States Geological Survey (USGS); **DM:** McKenzie (1972); **HE:** Eyidoğan (1988); **BP:** Papazachos et al. (1991); **EE:** Ekström and England (1989)