

NIED Seismic Moment Tensor Catalogue

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By

Eiichi Fukuyama*, Mizuho Ishida*, Shigeki Horiuchi*, Hiroshi Inoue*,
Sadaki Hori*, Shoji Sekiguchi*, Atsuki Kubo*, Hiroyuki Kawai[†],
Hiroshi Murakami[‡] and Ken'ichi Nonomura[†]

*National Research Institute for Earth Science and Disaster Prevention

[†]Sun Microsystems K.K.

[‡] Earthquake Observation Research Technology Center

Abstract

We have routinely estimated the moment tensors of earthquakes occurring in and around Japanese islands. This report compiles all the moment tensor solutions we have estimated in 1997. In these computations, we used the FREESIA/KIBAN broadband seismic network developed by NIED (National Research Institute for Earth Science and Disaster Prevention) and STA (Science and Technology Agency). We mainly used STS-1 broadband seismometer records. VSE311 strong motion velocity-meter was additionally used in cases when STS-1 waveforms were unavailable. Moment tensor estimation is triggered by the JMA (Japan Meteorological Agency) e-mail of emergent hypocenter location information. This catalogue includes most $M > 4.0$ earthquakes and some $M > 3.5$ earthquakes. However, due to either incomplete station distribution or the quality of available data, our catalog missed several earthquakes that had been detected by JMA.

Key words: Seismic moment tensor, Earthquake catalogue

1. Method

Below is a brief description of the method used here to determine seismic moment tensors and their centroid depths. Fukuyama et al. (1998) describes the method and it would be helpful to refer to this in more details. All the information concerning this catalogue is also displayed at the World Wide Web page¹. We already published the seismic moment tensor catalogue for 1998 (Fukuyama et al., 1999) and for 1999 (Fukuyama et al., 2000).

Moment tensor analysis is triggered by the JMA (Japan Meteorological Agency) emergency hypocenter report received by e-mail. The following information is used from the

¹<http://argent.geo.bosai.go.jp>

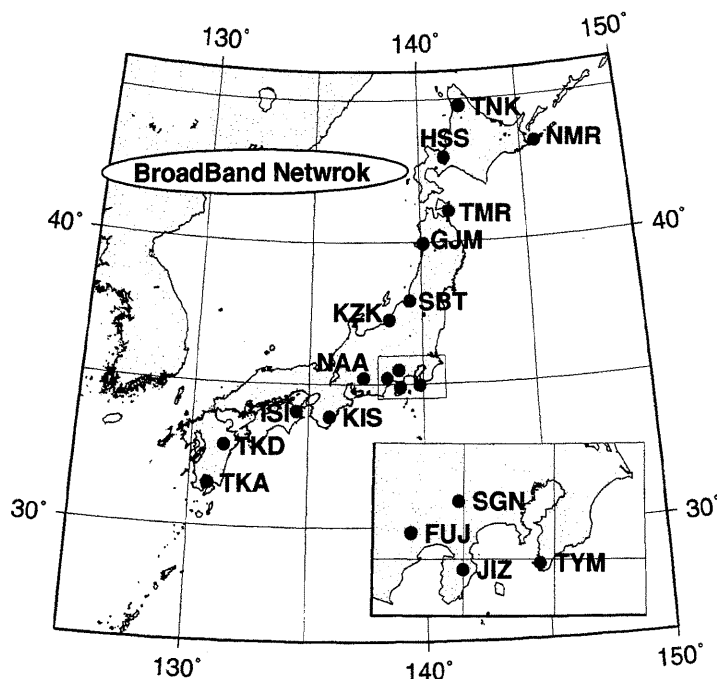


Fig. 1: Broadband station distribution used in the analysis.

report: origin time (in minutes), epicentral location (in 0.1 degree), depth (in 10km) and magnitude. This e-mail is dispatched for earthquakes with a maximum JMA scale intensity greater than 1 in the Kanto-Shinetsu-Chubu region (central part of Japan) and its surroundings. For other regions, the e-mail is dispatched only for earthquakes with a maximum intensity 3 or more. This information covers most $M > 3.5$ earthquakes. However, it sometimes misses off shore or deep $M > 3.5$ earthquakes, thus we used the information from the JWA (Japan Weather Association) World Wide Web page² as a supplement. We also took into account the relocated hypocenter information produced by JMA.

All the stations used in this analysis are shown in Fig. 1 and Table 1. Three stations at most are used for the moment tensor estimation. Filter coefficients and minimum epicentral distance are chosen according to the JMA magnitude (see Table 2). The JMA magnitude is used only for this purpose. The criterion for choosing stations is based on its epicentral distance. The closest three stations within the epicentral distance range are chosen as a first (automatic) trial. We then update it manually by examining station combinations, adjusting origin time offsets, or adjusting source depth. This is because if the waveforms are contaminated by long period noise, the solution is no more reliable. Manual operation is mainly employed to remove these noisy records. If the dataset is well examined, the moment tensor solution can be determined stably and uniquely by adjusting origin time offset and its source depth. In this catalogue, all solutions have been inspected and re-computed as final solutions.

Filtered displacement waveforms are used for the moment tensor inversion. The filter

²<http://tenki.or.jp/quake.html>

Table 1: Locations of stations used in the analysis.

Station Name	Station Code	Latitude ($^{\circ}N$)	Longitude ($^{\circ}E$)	Height (m)	Cooperative Organization	Funding Project
Fujigawa	FUJ	35.2267	138.4217	640	Tokyo U.	FREESIA
Gojyome	GJM	39.9517	140.1167	105	Tohoku U.	KIBAN
Sapporo	HSS	42.9647	141.2328	230	Hokkaido U.	FREESIA
Tokushima	ISI	34.0572	134.4580	27	Kyoto U.	FREESIA
Nakaizu	JIZ	34.9129	138.9972	263	—	FREESIA
Kiwa	KIS	33.8627	135.8933	70	Kyoto U.	FREESIA
Kashiwazaki	KZK	37.2951	138.5156	220	Tokyo U.	FREESIA
Asahi	NAA	35.2217	137.3650	200	Nagoya U.	FREESIA
Nemuro	NMR	43.3650	145.7430	20	Hokkaido U.	FREESIA
Shibata	SBT	37.9656	139.4538	160	Tohoku U.	KIBAN
Tsuru-Sugeno	SGN	35.5054	138.9475	800	—	FREESIA
Takakuma	TKA	31.5125	130.7853	535	Kagoshima U.	FREESIA
Takeda	TKD	32.8140	131.3900	751	Kyushu U.	FREESIA
Tomari	TMR	41.0990	141.3868	120	Hirosaki U.	KIBAN
Nakagawa	TNK	44.7757	142.0830	60	Hokkaido U.	FREESIA
Tateyama	TYM	34.9708	139.8481	30	Geogr. Surv. Jpn.	FREESIA

Table 2: Minimum epicentral distance, filter coefficients, and data length for initial magnitude reported by JMA

Magnitude range	Epicentral Dist. (km)	Frequency range (Hz)	Data length ($seconds$)
3.5 < M < 5.0	>50	0.02 – 0.05	120
5.0 < M < 6.5	>100	0.01 – 0.05	120
6.5 < M < 7.5	>300	0.01 – 0.05	150
7.5 < M	>600	0.005 – 0.02	180

coefficients vary according to JMA magnitude (Table 2). 1 Hz sampling displacement data produced from the original 20Hz data stream (VBB components) are used in order to reduce the latency caused by packeting during the transmission from each station.

The moment tensor estimation consists of two steps, an automatic process and a manual one with human inspections. In the automatic stage, by using JMA e-mail, three stations are chosen automatically to prepare the waveform dataset. Using these waveforms, a moment tensor inversion is conducted with several trial depths within $\pm 30km$ from the JMA hypocenter depth. Assumed depth points are shown in Table 3. In the manual determination stage, the combination of stations, optimum zero offset and depth have been examined by the operator in a Monte Carlo manner. At this point, the error function is set to variance

Table 3: Assumed source depths in km used in the analysis.

5	8	11	14	17	20	23	26	29	32	35	38	41	44	47	50	53	56	59	62	65	68
71	74	77	80	83	86	89	92	95	98	101	104	107	110	113	116	119	122				
125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200						
210	220	230	240	250	260	270	280	290	300	320	340	360	380	400							

Table 4: Velocity structure for Green's functions.

Depth (km)	Thickness (km)	P Velocity (km/s)	S Velocity (km/s)	Density (kg/m ³)	Q_P	Q_S
0	3	5.50	3.14	2300	600	300
3	15	6.00	3.55	2400	600	300
18	15	6.70	3.83	2800	600	300
33	67	7.80	4.46	3200	600	300
100	125	8.00	4.57	3300	600	300
225	100	8.40	4.80	3400	600	300
325	100	8.60	4.91	3500	600	300
425	—	9.30	5.31	3700	600	300

reduction (*VarRed*) defined as follows:

$$VarRed = 100 \times \sum_i w_i \int \left(1 - \frac{(s_i(t) - o_i(t))^2}{|s_i(t)| |o_i(t)|} \right) dt \quad [\%] \quad (1)$$

where $s_i(t)$ and $o_i(t)$ are synthetic and observed waveforms respectively. w_i is a weighting function proportional to the hypocentral distance.

The velocity structure used for Green's function is shown in Table 4. This structure is constructed by referring to Ukawa et al. (1984) for the shallower part and Fukao (1977) for the deeper part. Green's function is computed by using the discrete wavenumber method developed by Saikia (1994). The program named *tdmt_inv* is used for the moment tensor estimation which is developed by Pasyanos et al. (1996). *tdmt_sched.pl* is a Perl script developed here and used in the routine process. *tdmt_sched.pl* controls the automatic procedure. *tdmt_manual.pl* then supports the human inspection of the automatic moment tensor solution by referring to the automatic solution. In this inversion, since the time offset is shifted either automatically or manually, the centroid location is not estimated. This offset adjustment corrects both velocity structure misfit and the misfit between hypocenter and centroid location. As shown in Fukuyama et al. (1998), the shape of Green's function does not change for slight epicentral distance change, so that the above procedure works.

2. Results

The results are shown in Table 5, Figs. 2 and 3. In Table 5, origin times, latitudes, longitudes and region names are provided by JMA e-mail. Other parameters such as D (depth), Mw (moment magnitude) etc., are determined by this analysis. VarRed represents variance reduction, shown as percentages. (Str1, Dip1, Rak1) and (Str2, Dip2, Rak2) are two fault planes. Str, Dip, and Rak indicate strike, dip and rake angles, respectively. M_{xx} , M_{xy} , M_{xz} , M_{yy} , M_{yz} , and M_{zz} are the moment tensor components normalized by M_o (total scalar moment). In Fig. 2, moment tensors with the best fit double couples are shown in addition to their epicentral locations. The numerals appearing above each moment tensor represent the event ID shown in Table 5. In Fig 3, moment tensors are shown with lower hemisphere projection. P- and T- axes are also shown. Superscripted numerals again indicate event ID.

3. Conclusion

We have estimated 315 seismic moment tensors and their centroid depths by using FREESIA/KIBAN broadband waveforms.

Acknowledgments

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References

- 1) Fukao, Y. (1977): Upper mantle P structure on the ocean side of the Japan–Kurile Arc, *Geophys. J. Roy. astr. Soc.*, **50**, 621-642.
- 2) Fukuyama, E., M. Ishida, D. S. Dreger and H. Kawai (1998): Automated seismic moment tensor determination by using on-line broadband seismic waveforms, *Zisin*, **51**, 149-156 (in Japanese with English abstract).
- 3) Fukuyama, E., M. Ishida, S. Horiuchi, H. Inoue, S. Hori, S. Sekiguchi, H. Kawai, and H. Murakami (1999): NIED seismic moment tensor catalogue January - December, 1998, *Technical Note of the National Research Institute for Earth Science and Disaster Prevention*, **193**, 1-35.
- 4) Fukuyama, E., M. Ishida, S. Horiuchi, H. Inoue, S. Hori, S. Sekiguchi, H. Kawai, H. Murakami, S. Yamamoto, K. Nonomura, and A. Goto (2000): NIED seismic moment

tensor catalogue January - December, 1999, *Technical Note of the National Research Institute for Earth Science and Disaster Prevention*, **199**, 1-56.

- 5) Pasyanos, M. E., D. S. Dreger and B. Romanowicz (1996): Toward real-time estimation of regional moment tensors, *Bull. Seismol. Soc. Am.*, **86**, 1255-1269.
- 6) Saikia, C. K. (1994): Modified frequency-wavenumber algorithm for regional seismograms using Filon's quadrature: modelling of Lg wave in eastern North America, *Geophys. J. Int.*, **118**, 142-158.
- 7) Ukawa, M., M. Ishida, S. Matsumura, and K. Kasahara (1984): Hypocenter determination method of the Kanto-Tokai observational network for microearthquakes, *Research Notes of the National Research Center for Disaster Prevention*, **53**, 1-88 (in Japanese with English abstract).

NIED 地震モーメントテンソルカタログ 1997 年 1 月 – 12 月

福山英一*・石田瑞穂*・堀内茂木*・井上公*・堀貞喜*・関口渉次*・
久保篤規*・川井啓廉†・村上寛史‡・野々村健一†

要旨

我々は、日本及びその周辺で発生する地震のモーメントテンソルを定常的に決めている。このレポートは、1997 年に決められたすべての地震のモーメントテンソル解をコンパイルしたものである。防災科学技術研究所及び科学技術庁により整備された広帯域地震観測網のデータを用いて計算を行った。解析には主に STS-1 型広帯域地震計の波形を用いたが、利用できない場合は、VSE311 型速度型強震計を用いた。気象庁から発信される緊急震源情報を含んだ電子メールにより解析を開始させた。本カタログは、ほとんどのマグニチュード 4 以上の地震といくつかのマグニチュード 3.5 以上の地震をカバーしている。しかしながら、観測点分布の偏りや、波形データのノイズ状況により、気象庁により検知された地震のいくつかは解が決まらず、カタログからは洩れている。

キーワード：モーメントテンソル, 地震カタログ

*防災科学技術研究所

†サン・マイクロシステムズ株式会社

‡有限会社 地震観測技術センター

Table 5: Estimated moment tensors. A detailed explanation is given in the text.

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	Mo(Nm)	VarRed	Region name	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myy	Myz	Mzz	used Stations
1	1997/01/04 12:31	33.8	131.2	8	3.8	5.69e14	79.70	Suonada Setonakaï	312	78	52	207	40	161	0.4206	-0.1964	-0.6575	-0.7359	-0.3496	0.3152	TKD IS1
2	1997/01/11 08:48	33.6	132.4	26	5.4	1.95e14	77.39	Hyuganada region	16	76	91	195	37	89	-0.1233	0.2228	0.0857	-0.3738	-0.2493	0.9971	TKD IS1
3	1997/01/14 08:48	31.6	132.4	26	3.5	1.95e14	62.82	Bungo channel	252	73	134	356	45	19	0.0228	-0.6725	-0.0857	-0.4387	0.0243	0.3266	TKD IS1
4	1997/01/14 14:46	30.5	131.5	41	4.1	7.08e15	59.69	E off Tanegashima island	27	85	96	197	41	83	-0.0647	0.4104	0.1144	-0.8860	-0.1077	0.9221	TKD IS1
5	1997/01/16 06:10	31.7	131.5	23	3.9	7.29e14	86.31	Hyuganada region	23	85	90	208	5	95	-0.0647	0.4104	0.1144	-0.8860	-0.1077	0.9221	TKD IS1
6	1997/01/27 06:41	33.7	132.0	65	4.0	1.22e15	68.32	Iyonada Setonakaï	29	89	55	272	40	146	-0.5887	0.4279	0.0381	0.0343	-0.7116	0.5543	TKD IS1
7	1997/02/02 20:28	33.4	131.4	8	4.4	1.41e15	66.77	E off Tanegashima island	242	81	-130	141	41	-14	0.6851	0.2699	0.5654	-0.4513	-0.2338	-0.2338	TKD IS1
8	1997/02/16 20:22	35.6	140.1	86	4.7	1.28e16	87.71	central Chiba pref	174	88	-88	321	3	-123	0.4192	-0.0336	-0.0925	-0.1229	-0.9943	-0.2963	SGN SGN
9	1997/02/16 20:52	35.4	140.5	174	4.6	1.07e15	86.89	Kujukuri coast Boso pen	116	61	-37	226	59	144	0.8397	-0.2129	-0.1313	-0.3880	-0.6677	-0.4517	TYM SGN
10	1997/02/19 01:04	35.6	140.1	71	4.5	6.11e15	85.32	central Chiba pref	335	67	81	176	24	110	0.1433	-0.2926	-0.3086	-0.7421	-0.6236	0.5998	SGN SGN
11	1997/02/19 20:22	37.4	141.2	92	5.4	1.67e17	78.83	E off Futukushima pref	215	80	-77	341	17	-142	-0.0158	0.0318	0.6027	0.4238	-0.6948	-0.4080	KZK SGN
12	1997/02/20 07:55	41.8	142.9	47	6.0	1.07e18	78.25	S off Urukawa	38	66	71	213	24	87	-0.2769	0.3294	0.0154	-0.3239	-0.5239	-0.7957	TYM NMR
13	1997/02/21 08:16	35.8	141.2	29	4.0	1.15e15	71.03	near Choshi city	158	73	-7	253	32	106	-0.4712	0.2947	0.0154	-0.3239	-0.5239	-0.7957	TYM NMR
14	1997/02/28 19:46	35.4	140.4	23	4.0	1.24e15	78.96	Kujukuri coast Boso pen	162	73	57	283	17	100	-0.4712	0.2947	0.0154	-0.3239	-0.5239	-0.7957	SGN KZK
15	1997/03/03 04:27	34.9	139.1	8	3.8	6.06e14	88.99	central Izu peninsula	162	82	59	69	62	173	-0.4712	0.2947	0.0154	-0.3239	-0.5239	-0.7957	SGN KZK
16	1997/03/03 06:20	35.0	139.1	5	4.2	2.67e15	87.80	E off Izu peninsula	341	84	-35	75	57	-173	-0.5534	0.7101	0.1629	-0.3588	-0.4957	-0.1954	SGN SGN
17	1997/03/03 08:45	35.0	139.1	5	4.2	2.67e15	87.80	E off Izu peninsula	341	84	-35	75	57	-173	-0.5534	0.7101	0.1629	-0.3588	-0.4957	-0.1954	SGN SGN
18	1997/03/03 11:11	35.0	139.1	8	4.7	1.27e16	76.33	E off Izu peninsula	174	80	21	80	69	163	-0.2927	0.8594	0.3930	-0.1289	-0.3835	-0.1638	SGN SGN
19	1997/03/03 13:39	36.5	140.7	50	4.1	1.81e16	76.33	northern Ibaraki pref	16	70	100	167	22	63	-0.0025	0.0057	0.2786	-0.6524	-0.7083	-0.6549	TYM SGN
20	1997/03/03 14:09	35.0	139.1	5	5.2	6.98e16	80.07	E off Izu peninsula	264	81	-153	170	64	-10	0.4304	0.8643	0.3832	-0.1408	-0.0385	-0.2896	KZK KIS
21	1997/03/03 14:27	35.0	139.1	5	4.2	1.97e15	78.30	E off Izu peninsula	338	77	-40	79	51	-163	0.5641	0.6402	0.0745	-0.2598	-0.5864	-0.3043	SGN SGN
22	1997/03/03 15:30	35.0	139.2	5	5.0	3.60e16	81.42	E off Izu peninsula	264	80	-147	168	57	-12	0.3898	0.7947	0.4891	-0.1577	-0.1415	-0.2321	NAA KZK
23	1997/03/04 01:24	35.0	139.2	5	5.5	1.94e14	87.44	E off Izu peninsula	57	66	153	159	65	27	0.4973	0.4714	0.5305	-0.7857	0.1712	0.2884	SGN SGN
24	1997/03/04 03:51	34.9	139.1	5	5.5	2.09e17	77.93	central Izu peninsula	160	87	19	69	71	177	0.6401	0.7256	0.2162	-0.5566	0.2764	-0.0835	NAA KZK
25	1997/03/04 11:59	35.0	139.1	5	3.9	7.16e14	88.57	E off Izu peninsula	338	86	-40	79	50	-175	0.5504	0.5968	0.2511	-0.4313	0.5780	-0.1192	SGN SGN
26	1997/03/04 14:28	35.0	139.1	5	4.3	2.79e15	85.46	E off Izu peninsula	340	80	-42	71	49	-167	0.4928	0.6394	0.1135	-0.2620	0.6281	-0.2308	SGN SGN
27	1997/03/04 21:17	35.0	139.1	11	3.5	2.32e14	69.46	E off Izu peninsula	1	80	-10	93	80	-170	0.1197	0.9837	-0.0842	0.2351	0.0859	-0.3548	SGN SGN
28	1997/03/05 10:23	35.0	139.1	8	3.7	3.46e14	78.09	E off Izu peninsula	166	76	25	69	65	164	0.4577	0.6952	0.5128	-0.4475	0.3586	-0.0102	SGN SGN
29	1997/03/05 13:43	35.0	139.1	5	4.7	1.39e16	85.47	E off Izu peninsula	346	80	-31	82	59	-168	0.4417	0.8187	0.0817	-0.1575	0.4495	-0.2842	SGN SGN
30	1997/03/05 16:04	35.0	139.1	5	3.6	2.83e14	67.37	E off Izu peninsula	328	80	-55	72	37	-163	0.5785	0.4251	0.3613	-0.2936	-0.6680	-0.2849	SGN SGN
31	1997/03/05 19:01	35.0	139.1	5	3.7	4.19e14	84.27	E off Izu peninsula	333	69	-30	75	62	-156	0.8322	0.6774	-0.0011	-0.3549	-0.2900	-0.4773	SGN SGN
32	1997/03/05 04:25	34.9	139.2	4	4.4	3.90e15	90.43	E off Izu peninsula	104	83	-156	11	66	-8	-0.3651	0.8166	-0.4285	0.4083	0.0497	-0.0431	TYM SGN
33	1997/03/06 06:10	34.9	139.2	11	4.9	2.77e16	69.93	W off Aomori pref	197	81	101	327	14	-4	-0.0227	-0.1106	-0.3276	-0.3415	0.8751	-0.3643	KZK SGN
34	1997/03/06 10:12	34.9	139.2	5	4.0	1.33e15	89.08	E off Izu peninsula	331	82	-20	64	70	-172	0.8554	0.5518	0.0837	-0.6673	0.3069	-0.1881	SGN SGN
35	1997/03/06 17:36	35.0	139.1	5	4.4	4.12e15	84.79	E off Izu peninsula	347	81	-32	83	58	-170	-0.3362	0.7968	-0.0087	-0.1933	0.5172	-0.1709	SGN SGN
36	1997/03/06 20:23	34.9	139.2	17	4.0	1.10e15	90.25	E off Izu peninsula	343	89	105	76	15	3	-0.1366	-0.2253	-0.2815	-0.1155	-0.9280	0.0211	SGN SGN
37	1997/03/06 22:24	35.0	139.1	44	4.0	1.21e15	85.13	E off Izu peninsula	163	79	41	64	50	166	0.3882	0.5544	0.3026	-0.6393	0.5446	-0.0316	SGN SGN
38	1997/03/06 22:30	35.0	139.1	8	3.8	5.51e14	85.39	E off Izu peninsula	169	83	22	76	68	172	0.3761	0.8350	0.2704	-0.3445	0.3478	-0.0316	SGN SGN
39	1997/03/06 23:56	35.0	139.1	5	3.8	5.99e14	89.89	E off Izu peninsula	166	89	18	76	72	178	0.5058	0.8408	0.1699	-0.3798	0.2794	-0.1259	SGN SGN
40	1997/03/07 01:20	34.8	139.2	5	4.8	1.95e16	83.81	near Izu-Oshima island	172	82	35	77	55	175	0.2119	0.7644	0.0354	-0.4724	0.5265	0.2605	TYM SGN
41	1997/03/07 07:33	34.9	139.1	5	4.9	2.49e16	88.70	central Izu peninsula	346	88	-32	77	58	-178	0.4210	0.7594	0.1733	-0.3303	0.5058	-0.0908	SGN SGN
42	1997/03/07 12:35	35.0	139.2	5	4.6	8.97e15	86.34	E off Izu peninsula	346	78	-16	79	75	-168	0.5125	0.8630	-0.0908	-0.3020	0.2432	-0.2105	TYM SGN
43	1997/03/07 15:01	35.0	139.2	5	3.7	3.76e14	72.11	E off Izu peninsula	306	61	-96	138	29	-80	0.4524	0.5374	0.4440	0.3167	0.2902	-0.7692	SGN SGN
44	1997/03/08 03:18	35.0	139.1	5	3.8	5.48e14	88.55	E off Izu peninsula	171	89	17	81	73	179	0.2701	0.9093	0.0372	-0.3307	0.2831	0.0606	SGN SGN
45	1997/03/16 05:51	34.9	137.5	41	5.6	2.97e17	83.20	NE Aichi pref	302	68	-104	147	34	-69	0.4498	0.4307	0.4516	0.4465	0.1105	-0.8963	SGN SGN
46	1997/03/16 06:37	34.9	137.5	17	3.7	3.53e14	60.90	NE Aichi pref	332	68	-59	93	38	-142	0.5269	0.5408	-0.1672	0.0590	0.6133	-0.5859	SGN SGN
47	1997/03/20 08:58	34.2	139.3	17	3.3	9.58e13	71.80	near Niijima island	275	81	171	134	9	9	-0.0181	0.9490	-0.1010	-0.1729	-0.2040	-0.0715	JIZ SGN
48	1997/03/22 04:53	35.4	140.4	65	3.7	3.59e14	74.19	Kujukuri coast Boso pen	11	5	83	134	23	61	0.0581	-0.1010	0.2008	-0.1729	-0.9578	0.1909	SGN SGN
49	1997/03/22 05:53	35.4	140.4	53	3.8	5.76e14	89.36	Kujukuri coast Boso pen	5	68	103	184	23	61	0.0581	-0.1010	0.2008	-0.1729	-0.9578	0.1909	SGN SGN
50	1997/03/23 05:59	36.0	140.1	68	5.1	4.77e16	94.06	southern Ibaraki pref	360	68	88	184	22	94	0.1453	0.0263	-0.0056	-0.7547	-0.7303	-0.6094	SGN SGN
51	1997/03/26 08:31	32.0	130.4	8	6.1	1.40e18	91.17	NW Kagoshima pref	103	88	-9	193	81	-178	0.5344	0.8845	-0.1479	-0.3501	-0.0247	-0.1843	TKA TKD
52	1997/03/26 09:05	32.0	130.4	8	4.6	9.53e15	76.72	NW Kagoshima pref	9	88	178	211	82	2	0.4884	0.9377	0.1109	-0.1571	-0.1090	-0.3283	TKA TKD
53	1997/03/26 12:15	32.0	130.4	14	4.2	2.64e15	86.16	W off Amakusa island	120	87	-18	211	74	-177	0.8893	-0.4436	-0.2641	-0.7928	-0.1641	-0.0966	TKA TKD
54	1997/03/26 13:24	32.0	130.4	8	4.7	1.12e16	91.76	NW Kagoshima pref	253	75	-42	357	50	-160	-0.0257	-0.7601	0.5280	0.4612	-0.1119	-0.3914	TKA TKD
55	1997/03/26 20:19	32.0	130.4	14	4.1	1.39e15	60.82	NW Kagoshima pref	102	89	-5	192	85	-179	0.3464	-0.9088	-0.0732	-0.4602	0.0486	0.1138	TKA TKD
56	1997/03/26 20:43	32.0	130.3	5	3.8	4.93e14	74.77	NW Kagoshima pref	97	77	32	359	59	165	0.0081	-0.					

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	Mo(Nm)	Var(Ked)	Region name	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myy	Myz	Mzz	used Stations
71	1997/04/01,12:55	33.4	132.4	38	3.7	4.51e14	78.45	Bungo channel	170	73	-98	17	18	-65	0.0406	0.5336	-0.1957	0.5336	-0.8088	0.5742	TKD
72	1997/04/02,11:49	32.0	130.3	14	3.6	2.50e14	79.05	NW Kagoshima pref	214	86	142	307	52	72	0.7058	-0.2869	-0.1549	-0.4295	0.0422	TKD	
73	1997/04/02,11:57	32.0	130.4	11	3.7	3.46e14	81.80	NW Kagoshima pref	201	87	169	292	79	3	0.7344	-0.7139	-0.1549	-0.4295	0.0422	TKD	
74	1997/04/02,19:33	32.0	130.3	14	5.4	1.33e17	93.86	NW Kagoshima pref	99	89	-89	189	82	15	0.9414	-0.1381	-0.0574	-0.3914	-0.0605	TKD	
75	1997/04/02,21:47	33.4	132.4	44	5.0	3.89e16	94.33	Bungo channel	175	75	-88	345	15	-99	0.2023	0.0555	-0.0574	-0.3914	-0.0605	TKD	
76	1997/04/03,17:33	32.0	130.4	5	4.7	1.14e16	94.15	NW Kagoshima pref	198	76	-156	102	67	-15	0.5924	-0.8046	-0.0193	-0.2830	-0.3276	TKA	
77	1997/04/03,17:33	32.0	130.4	8	5.0	3.11e16	94.76	NW Kagoshima pref	195	86	-114	104	77	-4	0.5783	-0.8626	0.0636	-0.3331	-0.2452	TKD	
78	1997/04/05,04:24	32.0	130.4	41	3.5	1.81e14	75.15	Bungo channel	180	62	117	317	36	53	0.0360	-0.3476	-0.2058	-0.7345	0.1939	TKD	
79	1997/04/05,19:42	32.0	130.3	11	3.6	3.25e14	80.13	NW Kagoshima pref	306	67	42	196	52	150	0.3470	-0.5281	-0.3969	-0.8814	-0.1343	TKD	
80	1997/04/07,17:05	33.4	132.4	41	4.1	1.54e15	95.80	Bungo channel	176	72	-86	343	19	-102	0.1278	0.0939	-0.0292	0.5251	-0.7986	KIS	
81	1997/04/08,08:21	32.0	130.4	5	3.9	7.04e14	76.57	NW Kagoshima pref	105	67	-25	207	67	-155	0.7427	-0.6160	-0.1806	-0.4259	-0.3168	TKD	
82	1997/04/08,21:04	32.0	130.4	8	3.6	2.82e14	76.57	NW Kagoshima pref	297	67	-21	193	91	84	0.3427	-0.5981	-0.5318	-0.6722	-0.3295	TKD	
83	1997/04/09,03:50	33.2	140.6	56	4.7	1.15e16	66.87	E off Hachijima island	175	73	-92	348	77	-9	0.4639	-0.0696	0.0645	-0.5061	0.8308	SGN	
84	1997/04/09,14:20	32.0	130.4	8	4.8	2.04e16	94.41	NW Kagoshima pref	191	85	-167	89	77	-9	0.4639	-0.0696	0.0645	-0.5061	0.8308	FUJ	
85	1997/04/09,14:23	32.0	130.4	11	4.6	1.01e16	86.50	NW Kagoshima pref	358	85	-166	89	76	5	0.2748	-0.9190	-0.1972	-0.1741	-0.2727	TKA	
86	1997/04/09,19:46	32.0	130.4	14	3.5	2.13e14	91.12	NW Kagoshima pref	309	70	-188	104	86	5	0.2748	-0.9190	-0.1972	-0.1741	-0.2727	TKA	
87	1997/04/10,04:43	35.1	140.0	71	4.0	3.21e15	68.77	southern Ibaraki pref	232	58	178	125	32	-92	0.5780	-0.3243	-0.5325	-0.1712	-0.0897	FUJ	
88	1997/04/10,23:30	36.4	140.6	62	4.3	3.21e15	86.18	southern Ibaraki pref	232	70	128	344	43	30	0.5780	-0.3243	-0.5325	-0.1712	-0.0897	FUJ	
89	1997/04/13,15:55	32.0	130.4	14	3.5	2.22e14	68.49	NW Kagoshima pref	277	86	119	186	71	176	0.3627	-0.3443	-0.7262	-0.4597	-0.2823	SGN	
90	1997/04/17,20:11	35.2	140.2	26	3.4	1.60e14	63.59	southern Boso peninsula	238	72	112	5	28	41	0.0687	0.3411	-0.7262	-0.4597	-0.2823	SGN	
91	1997/04/18,12:42	35.7	140.9	29	3.7	4.02e14	75.76	near Choshi city	152	59	-73	302	35	-116	0.3444	0.5575	-0.1055	-0.4604	-0.8048	SGN	
92	1997/04/20,05:04	35.3	140.4	59	3.9	8.59e14	80.15	Kujukuri coast Boso pen	17	88	104	116	14	9	0.2454	-0.1266	0.2378	-0.2634	-0.9369	SGN	
93	1997/04/23,01:24	32.7	130.6	29	4.3	3.34e15	91.23	NW Kumamoto pref	234	80	-167	142	77	-10	0.9715	0.2528	0.0687	-0.8863	-0.9269	SGN	
94	1997/04/23,16:44	30.8	131.5	56	4.4	1.00e16	74.83	SE off Osumi pen	67	72	112	194	28	40	-0.1850	0.4033	-0.7607	-0.3773	-0.1586	TKD	
95	1997/04/25,11:07	37.3	141.3	56	4.4	5.01e15	84.85	E off Fukushima pref	235	78	89	61	12	96	-0.3020	0.1030	-0.7397	-0.1795	-0.5249	SGN	
96	1997/04/28,16:22	36.1	139.9	44	3.9	7.06e14	56.49	SW Ibaraki pref	50	66	81	251	26	109	-0.5776	0.3477	0.4561	-0.1614	-0.4677	JIZ	
97	1997/04/28,17:22	31.2	130.5	145	4.7	1.42e16	81.78	Satsuma peninsula region	353	71	65	229	31	142	0.2305	-0.3359	-0.1135	-0.7255	-0.6954	TKD	
98	1997/04/30,05:32	34.4	139.3	5	3.8	4.79e14	79.36	near Niijima island	185	82	26	91	64	171	-0.1128	0.8711	-0.1826	-0.0874	-0.4628	JIZ	
99	1997/05/01,07:19	32.0	130.4	11	3.6	3.00e14	81.01	NW Kagoshima pref	18	76	154	115	64	16	0.5067	-0.6338	0.4434	-0.6148	-0.3213	SGN	
100	1997/05/01,19:35	30.6	131.2	29	4.4	1.94e16	67.51	near Tanegashima island	210	89	107	302	17	3	0.4044	0.0338	-0.3684	-0.8916	-0.0813	TKD	
101	1997/05/02,10:34	36.2	140.1	74	3.5	1.83e14	58.12	SW Ibaraki pref	240	54	72	88	40	113	0.8563	0.2205	-0.1439	-0.0993	0.3368	SGN	
102	1997/05/02,23:59	32.0	130.3	17	3.8	2.65e14	78.21	NW Kagoshima pref	205	85	-174	114	84	5	0.5395	-0.6560	-0.0677	-0.5941	-0.1818	TKD	
103	1997/05/06,23:06	36.8	137.2	33	3.6	5.43e14	90.94	near Choshi city	57	63	107	204	32	61	-0.3082	0.3218	-0.3102	-0.4371	-0.2178	SGN	
104	1997/05/09,17:23	35.8	141.1	35	4.7	1.44e16	82.34	E off Hachijima island	206	85	98	327	9	150	0.4062	-0.1872	-0.5846	-0.2178	-0.8663	SGN	
105	1997/05/09,17:23	33.4	140.9	31	3.8	6.40e14	79.90	E off Hachijima island	317	78	56	211	14	95	-0.9832	0.2232	-0.3808	-0.7888	-0.5044	SGN	
106	1997/05/11,22:59	37.1	141.3	47	5.5	2.28e17	85.54	E off Fukushima pref	26	76	80	211	14	95	-0.9832	0.2232	-0.3808	-0.7888	-0.5044	SGN	
107	1997/05/12,00:31	35.5	141.2	47	4.4	4.79e15	85.72	near Choshi city	347	56	72	197	37	114	-0.1989	0.0568	-0.3504	-0.2852	-0.3213	SGN	
108	1997/05/12,03:18	35.3	139.7	50	3.8	6.22e14	75.86	Tokyo bay region	79	72	71	307	26	135	-0.5500	-0.2001	0.7315	-0.0982	-0.3253	SGN	
109	1997/05/13,05:38	31.9	130.3	11	6.0	1.22e18	95.30	NW Kagoshima pref	191	88	-175	101	85	-2	0.3391	-0.9133	-0.0283	-0.4389	-0.1084	TKD	
110	1997/05/13,23:32	31.9	130.3	5	4.9	2.21e16	88.57	NW Kagoshima pref	91	87	-37	184	53	-176	0.0781	-0.7873	-0.6040	-0.0282	-0.0506	TKA	
111	1997/05/17,21:24	32.4	130.6	11	4.6	8.47e15	92.40	southern Kumamoto pref	275	86	11	185	79	176	0.1035	-0.9679	-0.1770	-0.2273	0.0242	TKD	
112	1997/05/18,12:11	32.4	130.6	11	3.8	5.90e14	77.50	southern Kumamoto pref	274	89	4	184	86	179	0.0427	-0.9891	-0.0662	-0.2280	0.0242	TKD	
113	1997/05/20,04:21	34.0	140.0	86	4.8	1.65e16	84.29	far S off Boso peninsula	128	65	-138	17	53	-32	-0.3524	0.4384	-0.4754	-0.3790	-0.7866	SGN	
114	1997/05/20,10:23	32.0	132.2	8	4.2	2.15e15	91.48	Hyuganada region	165	72	-75	304	23	-129	0.1951	0.3297	-0.1203	-0.3790	-0.7866	TKD	
115	1997/05/21,23:11	34.2	139.2	5	5.1	4.44e16	80.40	near Niijima island	3	80	-39	101	52	-167	-0.1300	0.7796	0.0921	0.4816	0.5438	TKD	
116	1997/05/21,23:11	32.1	132.0	29	4.3	3.29e15	93.82	Hyuganada region	40	71	87	229	19	99	-0.2567	0.3881	0.4983	-0.2995	-0.6152	SGN	
117	1997/05/23,17:50	34.4	137.6	14	5.5	1.80e17	73.73	Ensyunada	310	80	-15	43	76	-170	0.8628	-0.1255	0.0632	-0.9950	0.3867	TKD	
118	1997/05/24,06:16	33.6	142.1	8	5.1	5.87e16	70.37	far E off Izu Islands	153	53	-124	21	49	-54	-0.1690	0.0549	-0.4231	0.9762	-0.8072	SGN	
119	1997/05/24,21:10	32.0	130.3	5	4.3	3.50e15	85.91	NW Kagoshima pref	16	84	-155	284	65	-7	0.5365	-0.7996	-0.0967	-0.3430	-0.1936	TKD	
120	1997/05/26,05:33	36.0	140.2	95	4.2	1.97e15	81.90	southern Ibaraki pref	169	63	-123	44	41	-43	-0.2390	-0.3421	-0.2469	-0.8927	-0.6537	SGN	
121	1997/05/26,16:09	37.3	141.7	44	4.9	2.35e16	89.39	E off Fukushima pref	94	63	94	197	27	82	0.0374	0.3219	0.2839	-0.7197	0.5235	SGN	
122	1997/05/28,05:00	32.0	132.0	32	3.6	3.33e14	79.67	Hyuganada region	26	67	120	165	37	30	0.1874	0.2380	0.5599	-0.8006	-0.3187	TKD	
123	1997/06/01,15:51	32.0	130.4	5	3.7	4.42e14	61.07	NW Kagoshima pref	290	90	-7	204	83	170	0.7682	-0.7882	-0.1361	-0.0117	-0.1520	TKD	
124	1997/06/06,07:19	36.5	137.5	11	3.6	2.60e14	80.82	Hida mountains region	143	89	17	234	73	-189	1.1561	0.3181	-0.3332	-0.6603	-0.0950	SGN	
125	1997/06/06,09:09	36.1	139.9	59	3.9	8.24e14	82.68	SW Ibaraki pref	37	67	67	264	52	132	-0.6077	0.2278	0.2064	-0.6776	-0.4959	SGN	
126	1997/06/08,09:36	35.4	139.0	17	3.6	2.42e14	69.21	eastern Yamanashi pref	23	69	40	276	33	153	-0.5997	0.6676	-0.0424	-0.1133	-0.5143	TKD	
127	1997/06/08,20:46	32.2	130.4	32	4.9	2.64e16	89.66	near Amami-Oshima island	217	73	42	112	50	157	-0.8094	0.3515	-0.1416	-0.4445	0.6053	FUJ	
128	1997/06/10,20:22	36.1	139.9	50	3.9	6.85e14	89.66	SW Ibaraki pref	63	62	79	266	30	110	-0.7848	0.2177	0.4416	-0.2177	-0.3320	SGN	
129	1997/06/11,04:41	34.0	139.0	14	4.6	9.43e15	76.21	near Niijima island	36	89	-10	126	80	-179	-0.8628	0.2968	-0.0754	-0.1521	-0.		

Table 5: Estimated moment tensors (continued).

No.	Origin Time (UT)	Lat (N)	Lon (E)	D (km)	Mw	Mo (Nm)	Var (red)	Region name	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myx	Myz	Mzz	used Stations
141	1997/06/26 02:45	36.8	131.7	5	3.9	8.26e14	82.09	Yamaguchi pref	234	76	-160	139	71	-15	1.00099	-0.7979	0.1078	-0.3240	-0.2029	TKD	SGN
142	1997/06/26 02:35	36.8	141.3	41	4.4	4.01e15	62.79	E off Ibaraki pref	211	49	86	262	20	167	-0.0421	-0.0991	0.3388	-0.9321	-0.7422	SGN	FUJ
143	1997/06/26 02:35	36.8	140.2	59	5.0	2.00e15	76.71	central Chiba pref	281	77	-102	249	41	86	0.0561	-0.1866	-0.0773	0.1091	-0.7979	SGN	FUJ
144	1997/07/01 03:00	35.5	144.7	56	4.2	3.84e16	84.81	SE off Tokachi	281	77	-102	249	41	86	0.0561	-0.1866	-0.0773	0.1091	-0.7979	SGN	FUJ
145	1997/07/05 06:27	35.0	139.3	32	3.9	1.19e15	77.33	SW Ibaraki pref	174	73	-108	42	25	-45	-0.0440	-0.2371	0.2453	-0.7688	-0.9358	TKD	SGN
146	1997/07/05 06:27	35.0	139.3	32	3.9	8.29e14	64.04	central Shizuoka pref	205	53	108	357	41	68	0.0199	-0.9805	-0.2737	0.2387	-0.9805	TKD	SGN
147	1997/07/05 19:28	38.0	139.3	33	3.5	2.20e14	73.86	NE Niigata pref	183	52	91	2	38	89	0.0191	-0.9805	-0.2737	0.2387	-0.9805	TKD	SGN
148	1997/07/05 19:28	38.0	139.3	33	3.5	2.20e14	73.86	NE Niigata pref	183	52	91	2	38	89	0.0191	-0.9805	-0.2737	0.2387	-0.9805	TKD	SGN
149	1997/07/05 22:09	38.0	139.3	33	4.1	1.35e15	81.85	NE Niigata pref	192	79	-60	300	32	-76	-0.1751	-0.8495	0.2778	-0.3160	0.9015	TKD	SGN
150	1997/07/08 23:39	32.0	132.1	35	3.6	2.74e14	71.17	Hyuganada region	192	79	-60	300	32	-76	-0.1751	-0.8495	0.2778	-0.3160	0.9015	TKD	SGN
151	1997/07/08 23:39	32.0	132.1	35	3.6	2.74e14	71.17	Hyuganada region	192	79	-60	300	32	-76	-0.1751	-0.8495	0.2778	-0.3160	0.9015	TKD	SGN
152	1997/07/08 23:39	32.0	132.1	35	3.6	2.74e14	71.17	Hyuganada region	192	79	-60	300	32	-76	-0.1751	-0.8495	0.2778	-0.3160	0.9015	TKD	SGN
153	1997/07/14 13:32	35.6	139.9	86	5.0	3.63e16	91.46	central Chiba pref	351	74	83	195	18	112	0.1117	-0.6004	-0.1435	-0.8239	-0.4887	SGN	FUJ
154	1997/07/14 13:32	35.6	139.9	86	5.0	3.63e16	91.46	central Chiba pref	351	74	83	195	18	112	0.1117	-0.6004	-0.1435	-0.8239	-0.4887	SGN	FUJ
155	1997/07/18 08:13	37.0	137.2	23	4.0	9.74e14	93.73	Tokyo bay region	354	84	119	266	24	147	-0.0884	-0.1059	-0.0433	-0.8534	-0.1943	SGN	FUJ
156	1997/07/22 14:16	34.0	139.5	5	3.7	3.66e14	67.19	Tokyo bay region	354	84	119	266	24	147	-0.0884	-0.1059	-0.0433	-0.8534	-0.1943	SGN	FUJ
157	1997/07/24 04:59	35.9	136.6	20	3.5	2.01e14	85.97	near Miyakejima island	329	90	-157	239	67	0	-0.8240	-0.4336	0.2342	-0.7925	0.3231	TKD	SGN
158	1997/07/26 09:36	32.0	130.4	5	4.3	2.30e15	83.27	Fukuji Gifu border region	124	65	-36	27	58	150	0.5523	-0.3101	-0.4053	-0.0909	-0.2782	TKA	TKD
159	1997/07/26 09:36	32.0	130.4	5	4.3	2.30e15	83.27	NE Kagoshima pref	92	78	-124	187	66	-167	0.1503	-0.8700	-0.4053	-0.0909	-0.2782	TKA	TKD
160	1997/07/26 09:36	32.0	130.4	5	4.3	2.30e15	83.27	NE Kagoshima pref	92	78	-124	187	66	-167	0.1503	-0.8700	-0.4053	-0.0909	-0.2782	TKA	TKD
161	1997/08/08 20:34	35.9	139.5	65	5.0	3.36e16	89.69	E off Hachijima island	211	82	40	115	51	170	-0.0788	-0.5795	-0.1897	-0.5625	-0.1462	SGN	FUJ
162	1997/08/08 20:34	35.9	139.5	65	5.0	3.36e16	89.69	E off Hachijima island	211	82	40	115	51	170	-0.0788	-0.5795	-0.1897	-0.5625	-0.1462	SGN	FUJ
163	1997/08/20 01:29	33.5	132.4	35	3.9	7.76e14	72.23	near Sagami-nada	321	86	-21	224	69	175	-0.0551	-0.1118	-0.1554	-0.9387	-0.8836	TKD	SGN
164	1997/08/22 08:11	36.4	140.6	62	4.4	4.39e14	94.53	SW Ibaraki pref	360	62	92	175	28	85	0.0135	-0.0384	0.0175	-0.8254	-0.5722	SGN	FUJ
165	1997/08/22 08:11	36.4	140.6	62	4.4	4.39e14	94.53	SW Ibaraki pref	360	62	92	175	28	85	0.0135	-0.0384	0.0175	-0.8254	-0.5722	SGN	FUJ
166	1997/08/22 10:43	33.4	131.8	80	3.9	7.75e14	76.27	SE off Setonaikai	271	68	110	44	64	28	-0.7788	-0.5795	-0.1897	-0.5625	-0.1462	SGN	FUJ
167	1997/08/22 10:43	33.4	131.8	80	3.9	7.75e14	76.27	SE off Setonaikai	271	68	110	44	64	28	-0.7788	-0.5795	-0.1897	-0.5625	-0.1462	SGN	FUJ
168	1997/08/24 10:40	31.4	131.5	32	3.7	4.58e14	84.68	SE off Osumi pen	331	65	151	74	64	28	-0.7788	-0.5795	-0.1897	-0.5625	-0.1462	SGN	FUJ
169	1997/08/28 22:48	34.9	139.4	8	3.4	1.57e14	61.65	near Sagami-nada	211	82	40	115	51	170	-0.0788	-0.5795	-0.1897	-0.5625	-0.1462	SGN	FUJ
170	1997/09/03 20:12	35.3	133.4	8	4.3	6.69e15	74.84	western Ibaraki pref	321	86	-21	224	69	175	-0.0551	-0.1118	-0.1554	-0.9387	-0.8836	TKD	SGN
171	1997/09/03 20:12	35.3	133.4	8	4.3	6.69e15	74.84	western Ibaraki pref	321	86	-21	224	69	175	-0.0551	-0.1118	-0.1554	-0.9387	-0.8836	TKD	SGN
172	1997/09/03 20:12	35.3	133.4	8	4.3	6.69e15	74.84	western Ibaraki pref	321	86	-21	224	69	175	-0.0551	-0.1118	-0.1554	-0.9387	-0.8836	TKD	SGN
173	1997/09/06 04:04	37.4	134.3	5	5.2	6.83e16	96.23	western Ibaraki pref	325	89	33	234	57	178	0.7921	-0.2864	-0.3545	-0.7887	-0.2004	TKD	SGN
174	1997/09/06 04:04	37.4	134.3	5	5.2	6.83e16	96.23	western Ibaraki pref	325	89	33	234	57	178	0.7921	-0.2864	-0.3545	-0.7887	-0.2004	TKD	SGN
175	1997/09/06 17:46	30.1	131.4	26	4.0	3.19e15	85.51	far E off Ibaraki pref	114	82	48	15	42	168	0.3207	-0.5131	0.6973	-0.5307	-0.1973	TKD	SGN
176	1997/09/06 17:46	30.1	131.4	26	4.0	3.19e15	85.51	far E off Ibaraki pref	114	82	48	15	42	168	0.3207	-0.5131	0.6973	-0.5307	-0.1973	TKD	SGN
177	1997/09/06 17:46	30.1	131.4	26	4.0	3.19e15	85.51	far E off Ibaraki pref	114	82	48	15	42	168	0.3207	-0.5131	0.6973	-0.5307	-0.1973	TKD	SGN
178	1997/09/06 17:46	30.1	131.4	26	4.0	3.19e15	85.51	far E off Ibaraki pref	114	82	48	15	42	168	0.3207	-0.5131	0.6973	-0.5307	-0.1973	TKD	SGN
179	1997/09/06 17:46	30.1	131.4	26	4.0	3.19e15	85.51	far E off Ibaraki pref	114	82	48	15	42	168	0.3207	-0.5131	0.6973	-0.5307	-0.1973	TKD	SGN
180	1997/09/15 03:03	31.1	131.5	29	4.8	1.50e16	66.98	SE off Osumi pen	20	75	97	176	16	67	-0.0014	-0.0030	0.3209	-0.5046	-0.8027	TKA	TKD
181	1997/09/16 05:28	34.7	136.0	11	3.6	3.00e14	69.68	northern Nara pref	35	47	111	186	47	69	-0.0630	0.3529	0.2370	-0.8695	0.8088	KIS	NAA
182	1997/09/16 05:28	34.7	136.0	11	3.6	3.00e14	69.68	northern Nara pref	35	47	111	186	47	69	-0.0630	0.3529	0.2370	-0.8695	0.8088	KIS	NAA
183	1997/09/26 14:12	34.4	138.2	11	4.1	6.39e14	60.81	eastern Yamaguchi pref	31	68	121	164	37	39	0.3683	0.1202	0.3644	-0.9340	-0.4698	FUJ	JIZ
184	1997/09/26 14:12	34.4	138.2	11	4.1	6.39e14	60.81	eastern Yamaguchi pref	31	68	121	164	37	39	0.3683	0.1202	0.3644	-0.9340	-0.4698	FUJ	JIZ
185	1997/09/27 05:22	36.2	140.9	41	3.8	1.79e15	88.35	Ensyunada	111	52	86	298	38	96	-0.8047	-0.3520	0.2350	-0.1755	0.0345	SGN	FUJ
186	1997/09/28 15:57	36.2	139.8	41	3.5	1.90e14	53.26	E off Ibaraki pref	52	53	103	211	39	74	-0.4037	0.2727	0.2775	-0.5147	-0.0559	SGN	FUJ
187	1997/09/28 15:57	36.2	139.8	41	3.5	1.90e14	53.26	E off Ibaraki pref	52	53	103	211	39	74	-0.4037	0.2727	0.2775	-0.5147	-0.0559	SGN	FUJ
188	1997/09/29 14:46	35.7	140.7	44	4.5	7.37e15	83.87	near Choshi city	11	58	98	176	33	77	-0.1036	0.0317	0.1754	-0.8429	-0.4139	TKM	SGN
189	1997/09/29 14:46	35.7	140.7	44	4.5	7.37e15	83.87	near Choshi city	11	58	98	176	33	77	-0.1036	0.0317	0.1754	-0.8429	-0.4139	TKM	SGN
190	1997/10/01 16:49	42.1	142.3	38	4.1	1.43e15	71.44	S off Urakawa	151	80	163	244	73	11	-0.9090	-0.5635	0.0251	-0.6394	0.2401	HSS	NMR
191	1997/10/01 16:49	42.1	142.3	38	4.1	1.43e15	71.44	S off Urakawa	151	80	163	244	73	11	-0.9090	-0.5635	0.0251	-0.6394	0.2401	HSS	NMR
192	1997/10/01 16:49	42.1	142.3	38	4.1	1.43e15	71.44	S off Urakawa	151	80	163	244	73	11	-0.9090	-0.5635	0.0251	-0.6394	0.2401	HSS	NMR
193	1997/10/01 16:49	42.1	142.3	38	4.1	1.43e15	71.44	S off Urakawa	151	80	163	244	73	11	-0.9090	-0.5635	0.0251	-0.6394	0.2401	HSS	NMR
194	1997/10/01 16:49	42.1	142.3	38	4.1	1.43e15	71.44	S off Urakawa	151	80	163	244	73	11	-0.9090	-0.5635	0.0251	-0.6394	0.2401	HSS	NMR
195	1997/10/08 08:48	34.8	140.1	38	4.7	2.94e14	60.92	SE off Boso peninsula	164	65	-59	290	38	-138	0.2126	0.6639	-0.0468	-0.4420	-0.3532	JIZ	SGN
196	1997/10/08 08:48	34.8	140.1	38	4.7	2.94e14	60.92	SE off Boso peninsula	164	65	-59	290	38	-138	0.2126	0.6639	-0.0468	-0.4420	-0.3532	JIZ	SGN
197	1997/10/08 08:48	34.8	140.1	38	4.7	2.94e14	60.92	SE off Boso peninsula	164												

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	M ₀ (Nm)	VarRed	Region name	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myx	Myz	Mzz	used Stations
211	1997/10/11/05:44	34.4	138.2	11	5.0	3.38e16	87.86	Ensyunada	112	52	81	307	39	102	-0.7284	-0.4139	0.2592	-0.2395	-0.0085	0.9680	JIZ
212	1997/10/11/08:24	34.0	135.3	8	3.5	3.03e16	78.94	NW Wakayama pref	325	73	49	217	43	165	-0.4386	0.0275	-0.5311	-0.8573	-0.4060	0.4187	KIS
213	1997/10/11/09:45	38.9	142.2	47	5.2	4.36e16	88.92	Ki-Kazun region	207	74	118	148	32	159	-0.3487	0.0591	-0.4094	-0.8007	-0.6011	0.4521	KZK
214	1997/10/11/19:39	42.0	145.0	5	5.4	2.79e17	77.59	SE off Tokachi	307	85	166	97	15	128	-0.1980	0.2542	-0.4375	-0.8493	-0.1565	0.1667	NMR
215	1997/10/11/20:32	42.0	145.0	5	4.3	1.47e16	77.59	SE off Tokachi	407	84	96	161	67	128	-0.0624	0.1603	-0.4431	-0.1043	-0.8711	0.1667	NMR
216	1997/10/13/07:55	35.0	139.1	8	3.3	1.76e15	85.01	E off Izu Peninsula	252	86	24	104	16	167	-0.4529	0.1926	0.0866	0.3474	0.4199	0.1667	SGN
217	1997/10/16/19:00	33.5	146.4	38	4.5	1.09e16	82.65	near Kuni-Oshima island	262	86	24	104	16	167	-0.4529	0.1926	0.0866	0.3474	0.4199	0.1667	SGN
218	1997/10/16/21:38	29.1	130.2	180	4.8	1.74e16	82.65	near S off Tokomai	290	63	90	206	19	168	-0.6577	0.2503	-0.4211	-0.4756	-0.1522	0.1667	TKN
219	1997/10/18/10:26	41.8	141.4	180	4.2	2.54e15	89.36	off Nemuro peninsula	262	77	97	286	26	17	-0.7469	0.2503	-0.4211	-0.4756	-0.1522	0.1667	TKN
220	1997/10/20/06:42	43.2	146.7	113	5.1	5.58e16	73.85	off Nemuro peninsula	285	88	140	17	50	2	-0.4240	0.6497	-0.6107	-0.1101	-0.0686	-0.8590	HSS
221	1997/10/21/14:12	36.3	140.9	38	4.4	4.53e15	88.38	E off Ibaraki pref	4	82	62	308	29	164	-0.0116	0.4811	0.0364	-0.2055	-0.8533	0.2171	SGN
222	1997/10/21/07:46	32.7	131.9	33	3.8	6.06e14	72.45	Hyuganada region	188	82	77	308	15	-148	-0.1829	0.1564	0.1080	-0.3820	-0.9321	-0.1991	KIS
223	1997/10/21/10:55	35.1	138.2	29	4.2	2.47e15	90.69	central Shizuoka pref	199	81	-73	318	19	-150	-0.2092	0.0920	0.3085	-0.8511	-0.2721	-0.7231	SGN
224	1997/10/22/06:41	36.0	140.1	36	3.9	7.34e14	84.48	southern Ibaraki pref	346	63	63	214	38	132	0.1248	0.1838	-0.3490	-0.8579	-0.4473	0.7331	SGN
225	1997/10/22/08:55	44.5	146.5	145	5.6	2.42e17	64.21	near Kunashiri island	40	67	-141	292	54	-29	0.8604	0.3389	-0.0228	-0.4143	-0.5748	-0.4461	NMR
226	1997/10/22/18:54	42.0	142.5	56	3.8	6.66e14	84.21	near Kunashiri island	265	76	-146	166	57	-17	0.4005	0.7652	-0.4802	-0.1412	-0.2446	-0.2593	HSS
227	1997/10/23/17:18	34.7	135.2	11	3.4	1.67e14	68.65	SE Hyogo pref	25	60	56	258	44	134	-0.4957	0.0808	-0.0674	-0.2170	-0.5040	0.7127	SGN
228	1997/10/23/19:59	33.6	141.1	98	4.0	1.33e15	87.09	E off Hachijima island	24	78	86	222	12	107	-0.2455	0.0896	0.3514	-0.2432	-0.8454	0.4877	KIS
229	1997/10/24/00:38	32.5	132.3	26	3.6	3.14e14	96.93	Hyuganada region	184	69	-62	309	34	-140	-0.0661	0.3816	0.2166	-0.6671	-0.6358	-0.6010	TKD
230	1997/10/24/08:03	43.2	147.2	47	4.0	1.08e15	66.17	E off Hokkaido	82	71	83	281	20	109	-0.5887	0.0271	0.7707	-0.0441	-0.1617	0.6327	NMR
231	1997/10/25/19:14	41.9	142.8	62	4.1	1.48e15	87.84	S off Urakawa	115	76	98	325	16	-61	0.2886	0.2959	-0.7998	0.1471	-0.3504	-0.4357	HSS
232	1997/10/25/23:00	43.5	147.9	17	4.6	8.63e15	64.77	E off Hokkaido	48	74	121	162	35	78	-0.2308	0.2299	-0.6857	-0.6858	-0.3424	-0.4550	NMR
233	1997/10/26/19:06	39.3	140.6	130	5.4	1.43e17	86.99	southern Akita pref	91	49	100	257	42	73	-0.9983	0.1027	0.1228	0.0289	0.1083	0.9684	KZK
234	1997/10/27/13:53	34.3	139.2	20	3.8	5.95e14	60.12	near Niijima island	295	63	142	35	47	-3	-1.0594	0.2667	-0.1396	-0.1396	-0.3132	-0.0686	FUJ
235	1997/10/28/15:25	44.1	148.7	29	4.0	9.89e14	60.38	SE off Etorofu	221	89	137	130	47	-2	-0.7557	-0.1492	-0.4937	-0.6871	-0.4671	-0.0686	NMR
236	1997/10/29/10:18	34.2	139.2	41	4.0	1.29e15	72.92	near Niijima island	135	86	165	226	75	4	-0.0962	-0.3249	0.1448	0.9147	0.2085	0.0952	FUJ
237	1997/10/30/06:30	41.3	142.6	32	4.1	1.48e15	71.37	E off Niijima island	123	55	52	356	50	131	-0.0962	-0.3249	0.1448	0.9147	0.2085	0.0952	FUJ
238	1997/11/01/02:34	41.9	142.7	74	4.3	2.67e15	74.87	S off Urakawa	320	77	100	103	16	54	-0.3952	0.3381	-0.5432	-0.0980	-0.7035	0.4142	HSS
239	1997/11/01/11:37	35.3	139.1	47	4.1	1.50e15	84.94	Hakone region	40	75	84	243	112	119	-0.2772	0.3381	-0.5432	-0.0980	-0.7035	0.4142	FUJ
240	1997/11/01/22:13	36.1	139.9	47	4.3	3.76e15	88.84	SW Ibaraki pref	44	61	71	259	34	119	-0.6731	0.3820	0.2210	-0.1548	-0.6698	0.4545	SGN
241	1997/11/02/18:19	41.5	141.8	53	3.9	6.89e14	83.63	E off Amori pref	85	79	130	188	41	16	-0.0871	0.6020	0.7576	-0.1789	0.2147	0.2554	HSS
242	1997/11/02/21:40	36.0	141.4	14	3.9	8.94e14	82.00	far E off Ibaraki pref	12	81	67	262	24	158	-0.0871	0.4372	0.1745	-0.1590	-0.8600	0.2461	SGN
243	1997/11/02/21:40	43.0	145.4	53	3.9	6.82e14	68.38	off Nemuro peninsula	237	80	-154	142	65	-11	0.9199	0.2911	0.2515	-0.7651	-0.3530	-0.1549	HSS
244	1997/11/03/08:35	36.0	140.1	8	4.0	7.35e14	78.61	southern Ibaraki pref	16	59	72	229	33	118	-0.3079	0.3680	-0.0842	-0.5885	-0.5031	0.8964	SGN
245	1997/11/04/01:31	35.2	139.1	8	4.0	1.21e15	76.35	Hakone region	56	68	84	251	23	104	-0.5752	0.4031	0.5832	-0.4031	-0.4138	0.8055	FUJ
246	1997/11/04/19:22	34.9	135.2	14	3.6	2.44e14	75.15	SE off Osumi pen	3	53	95	174	37	83	0.0857	0.0265	0.0558	-0.0278	-0.2781	0.9170	SGN
247	1997/11/05/03:26	31.1	131.7	32	4.2	1.99e15	52.39	SE off Osumi pen	19	73	82	224	19	114	-0.2265	0.2237	0.2078	-0.3878	-0.7933	0.6143	TKD
248	1997/11/05/09:44	36.6	141.2	41	4.6	1.00e16	85.63	E off Ibaraki pref	23	79	90	201	11	88	0.0759	0.2114	0.3596	-0.3612	-0.8599	0.2854	SGN
249	1997/11/05/13:00	32.2	139.7	32	4.3	2.84e15	50.96	near Hachijima island	227	87	170	317	80	33	0.8835	0.0741	-0.1139	-1.0840	0.1043	0.2005	JIZ
250	1997/11/05/13:49	40.7	142.6	116	4.1	1.49e15	61.80	E off Amori pref	111	72	90	292	18	91	-0.5502	-0.2514	0.7477	-0.0065	0.2865	0.5566	HSS
251	1997/11/05/20:04	43.0	144.4	116	4.9	2.19e16	90.93	Kushiro region	245	87	-89	41	3	-114	0.0962	-0.0666	0.9050	-0.0046	-0.4164	-0.0707	TKN
252	1997/11/06/05:27	31.7	131.9	14	3.9	1.51e14	80.37	Hyuganada region	158	79	-86	253	13	-62	0.1746	-0.1575	0.2445	0.2571	-0.8841	-0.4317	TKD
253	1997/11/06/15:18	34.7	134.4	5	3.4	1.34e14	70.37	Hachijima region	158	79	-86	253	13	-62	0.1746	-0.1575	0.2445	0.2571	-0.8841	-0.4317	TKD
254	1997/11/07/07:06	33.2	141.1	53	4.0	1.23e15	81.78	E off Hachijima island	326	65	57	271	41	-161	-0.7049	-0.3801	-0.0094	-0.4216	-0.5387	-0.2833	SGN
255	1997/11/07/17:46	36.4	137.6	5	4.0	1.29e15	92.75	Hida E off Ibaraki pref	178	82	57	271	41	-161	-0.7049	-0.3801	-0.0094	-0.4216	-0.5387	-0.2833	SGN
256	1997/11/08/02:16	36.7	141.5	47	3.8	4.97e14	58.68	near Ibaraki pref	237	66	132	140	19	24	-0.0256	0.4907	-0.8652	-0.1046	-0.1982	0.1332	KZK
257	1997/11/08/05:16	36.5	140.6	62	3.8	5.07e14	63.32	near Ibaraki pref	27	82	108	140	19	24	-0.0256	0.4907	-0.8652	-0.1046	-0.1982	0.1332	KZK
258	1997/11/08/18:41	36.2	140.8	41	3.9	7.05e14	66.39	E off Hachijima island	348	56	62	211	43	125	-0.0963	-0.3237	-0.5432	-0.2676	-0.8968	0.2057	SGN
259	1997/11/09/21:37	33.5	140.9	41	3.9	7.05e14	66.39	E off Hachijima island	348	56	62	211	43	125	-0.0963	-0.3237	-0.5432	-0.2676	-0.8968	0.2057	SGN
260	1997/11/11/15:40	38.1	142.6	32	3.5	1.94e14	81.76	E off Miyagi pref	197	86	76	93	15	165	-0.1483	0.2408	-0.2731	-0.5824	-0.3506	0.5570	JIZ
261	1997/11/11/19:59	43.4	146.9	44	4.8	1.66e16	86.48	far E off Hokkaido	261	72	142	5	54	22	-0.1035	0.7540	-0.5572	-0.2285	-0.2019	0.5777	TKD
262	1997/11/12/25:58	32.9	131.0	5	4.4	2.76e15	77.02	NE Kumamoto pref	123	70	-44	231	49	-153	0.1035	0.0366	-0.3554	-0.3220	-0.5484	-0.4907	TKA
263	1997/11/12/25:58	43.2	137.8	270	4.9	2.19e16	88.10	eastern sea of Japan	118	60	-127	354	46	-44	0.0410	0.9046	-0.1954	0.5911	-0.1945	-0.6321	HSS
264	1997/11/13/05:21	43.4	146.2	59	4.8	1.53e16	92.69	near Kunashiri island	197	51	74	42	109	-0.2500	0.3977	-0.1400	-0.0399	-0.2413	0.9756	TKN	
265	1997/11/13/17:56	33.7	139.9	110	4.8	1.73e16	93.36	far S off Boso peninsula	185	84	56	85	35	169	-0.0611	0.5716	-0.0399	-0.1196	0.8054	0.1807	JIZ
266	1997/11/13/23:01	34.5	137.4	300	4.5	5.52e15	65.20	Ensyunada	201	76	1										

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	M ₀ (Nm)	VarRed	Region name	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myy	Myz	Mzz	used Stations
281	1997/11/23/03:30	40.0	138.8	8	3.3	2.2e17	21.48	W off Akita pref	12	51	87	197	39	94	-0.0102	0.2524	0.0130	-0.9390	-0.2261	0.9491	TMR KZK
282	1997/11/23/08:39	40.0	138.9	11	3.8	5.6e14	24.30	W off Akita pref	38	74	124	150	37	27	0.3262	0.0959	0.6008	-0.7645	-0.4443	0.4383	TMR KZK
283	1997/11/23/08:39	40.0	138.9	53	3.8	1.0e14	78.64	NE off Iwate pref	123	73	96	178	19	66	-0.0096	0.0956	0.3571	-0.3584	-0.7398	0.5680	HSS
284	1997/11/28/04:36	33.4	137.2	29	3.3	6.9e15	86.30	far S off Tokai District	110	82	-167	278	77	143	-0.0595	0.7919	-0.3465	0.6150	-0.0611	-0.0555	KIS
285	1997/11/29/06:39	36.0	139.9	56	4.7	1.2e16	62.73	SW Ibaraki pref	41	67	176	278	32	173	-0.0621	0.2746	0.3430	-0.6912	-0.6648	0.5309	FUJ KZK
286	1997/12/01/18:17	40.0	138.9	8	4.7	1.2e16	88.39	W off Akita pref	50	67	177	176	22	143	-0.0621	0.2746	0.3430	-0.6912	-0.6648	0.5309	FUJ KZK
287	1997/12/02/08:18	34.0	136.4	400	4.6	8.5e15	58.70	SE off Kii Peninsula	205	88	88	116	39	175	-0.1894	0.3833	-0.3375	0.1798	-0.3357	0.6795	TMR HSS
288	1997/12/02/18:47	40.0	138.9	8	3.9	9.2e14	66.08	W off Akita pref	216	56	88	39	34	93	-0.3248	0.4723	-0.3375	-0.5892	0.3382	0.0129	FUJ SGN
289	1997/12/05/23:57	34.3	139.1	11	3.9	7.7e14	82.19	near Niijima island	310	86	149	42	59	4	-0.8666	0.1137	-0.3463	0.8197	-0.3983	0.9069	HSS
290	1997/12/06/06:40	35.7	140.1	32	4.7	1.3e16	89.42	northern Chiba pref	269	68	-29	10	64	-155	0.2686	-0.7910	0.3864	0.0178	-0.3852	-0.2864	SGN
291	1997/12/06/23:02	35.7	140.1	32	4.2	1.9e15	87.33	northern Chiba pref	16	69	-133	265	46	-29	0.3890	-0.8081	0.1615	0.0821	0.6539	-0.4711	SGN
292	1997/12/07/03:50	37.7	141.8	83	5.4	1.2e17	89.18	E off Fukushima pref	192	50	-96	21	40	-83	0.1048	-0.2628	-0.0335	0.8947	-0.1801	-0.9995	FUJ KZK
293	1997/12/08/06:49	37.7	141.1	65	3.7	4.67e14	51.38	E off Fukushima pref	131	88	154	222	64	2	-0.8470	0.1388	0.2601	0.9174	0.3860	-0.0704	SGN
294	1997/12/09/19:21	36.5	141.1	44	4.3	3.5e15	85.23	E off Ibaraki pref	88	74	127	198	39	25	-0.4052	0.6088	0.6768	-0.0105	0.0754	0.4157	SGN
295	1997/12/13/06:45	39.6	142.4	71	4.6	8.77e15	85.23	E off Iwate pref	254	65	-102	101	28	-65	0.6386	0.0575	0.5579	0.2657	-0.3588	-0.9043	TMR SBT
296	1997/12/16/11:34	40.5	140.0	165	4.3	3.3e15	83.86	western Amori pref	148	66	-28	250	65	-153	0.8333	0.5211	0.1435	-0.4704	-0.4327	-0.3629	GJM SBT
297	1997/12/19/13:07	36.3	136.2	8	4.3	3.22e15	86.56	central Fukui pref	202	58	71	55	36	118	-0.1885	0.6407	-0.0845	-0.5624	0.4069	0.7509	HSS
298	1997/12/21/21:03	43.1	146.4	44	5.1	5.4e16	70.49	off Nemuro peninsula	326	46	-81	134	45	-99	0.4068	0.4977	-0.0821	0.5816	0.0757	-0.9884	TNK
299	1997/12/22/16:31	40.2	142.5	47	5.3	1.19e17	91.30	NE off Iwate pref	22	70	94	191	20	81	-0.0980	0.1479	0.3023	-0.5774	-0.6953	0.6754	TMR
300	1997/12/22/19:08	43.0	143.5	113	5.1	4.62e16	77.23	Tokachi region	290	87	-62	25	28	-175	0.3863	-0.3293	0.8247	-0.3117	-0.2948	-0.0746	NMR
301	1997/12/23/06:18	36.2	140.9	38	4.3	3.32e15	89.43	E off Ibaraki pref	340	77	56	232	36	158	0.3119	0.2909	-0.3763	-0.6624	0.3505	0.3505	SGN
302	1997/12/23/11:08	41.0	139.3	17	3.9	7.38e14	91.48	W off Amori pref	2	89	-121	270	31	-2	0.0377	-0.5207	-0.0078	-0.0085	-0.8523	-0.3913	FUJ
303	1997/12/24/08:08	43.6	147.3	35	3.8	5.98e14	71.64	E off Hokkaido	114	73	134	220	47	24	-0.8766	0.2906	0.4734	0.4397	0.3516	0.4156	NMR
304	1997/12/24/11:30	31.1	127.9	14	4.4	4.96e15	88.62	east China sea region	227	87	-131	133	41	-5	0.7081	-0.0245	0.5364	-0.6162	-0.5176	-0.2919	TKD
305	1997/12/24/12:31	34.8	140.1	50	3.5	1.72e14	74.06	SE off Boso peninsula	27	82	49	287	41	168	-0.5691	0.4426	0.2047	-0.3659	-0.7152	0.2033	SGN
306	1997/12/24/15:17	31.8	130.3	11	4.0	9.89e14	96.77	NW Kagoshima pref	290	80	15	197	75	169	-0.5618	-0.7548	-0.3193	-0.5764	0.1033	0.0146	TKD
307	1997/12/26/04:26	33.2	132.2	41	3.7	4.08e14	85.77	Bungo channel	63	72	28	324	64	160	-0.9056	-0.3829	0.2175	0.6290	-0.4016	0.2768	TKD
308	1997/12/26/17:29	40.6	144.1	11	4.3	3.18e15	76.24	far E off Sanriku	30	56	105	185	37	69	0.0186	0.3282	0.2797	-0.8812	-0.2441	0.8628	TMR
309	1997/12/27/01:08	34.1	135.1	8	3.8	5.03e14	91.73	NW Wakayama pref	338	52	64	196	44	119	0.1424	-0.0580	-0.3149	-1.0038	-0.1197	0.8614	ISI
310	1997/12/28/05:13	40.6	144.0	8	4.6	1.00e16	51.93	far E off Sanriku	35	56	101	197	36	75	-0.1826	0.3559	0.3011	-0.7478	-0.2328	0.9304	TMR
311	1997/12/28/23:31	36.1	138.6	190	4.0	1.06e15	89.86	eastern Nagano pref	9	88	-48	100	42	-177	-0.1599	0.6359	-0.2054	0.1880	0.7235	-0.0280	SGN
312	1997/12/29/00:13	42.8	145.5	53	4.0	1.02e15	81.09	off Nemuro peninsula	241	85	-161	149	71	-5	0.6273	0.4820	0.2369	-0.7925	-0.2359	-0.0348	HSS
313	1997/12/29/16:11	35.7	140.8	47	4.1	1.40e15	89.99	near Choshi city	345	66	92	160	24	85	-0.0259	-0.2393	-0.1679	-0.6939	-0.6503	0.7198	SGN
314	1997/12/31/01:16	43.3	146.7	98	5.4	1.49e17	80.18	off Nemuro peninsula	283	83	138	19	48	10	-0.4739	0.6299	-0.6134	0.3114	-0.2389	0.1625	NMR
315	1997/12/31/22:27	34.1	135.2	5	3.5	2.32e14	66.07	NW Wakayama pref	14	57	114	155	40	58	0.1479	-0.1006	0.2856	-0.9731	-0.2944	0.8253	ISI

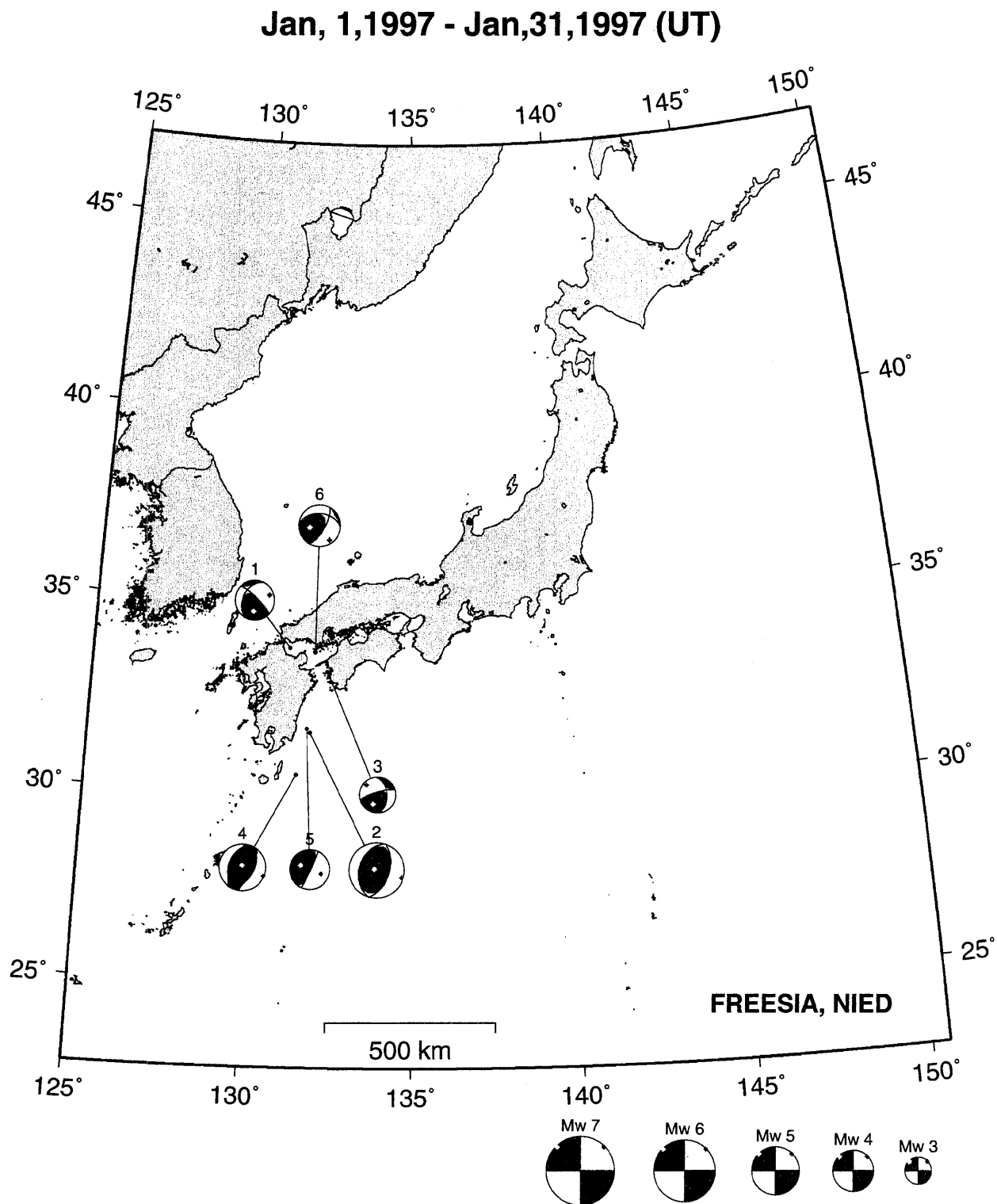


Fig. 2: Estimated moment tensors plotted with epicentral locations.

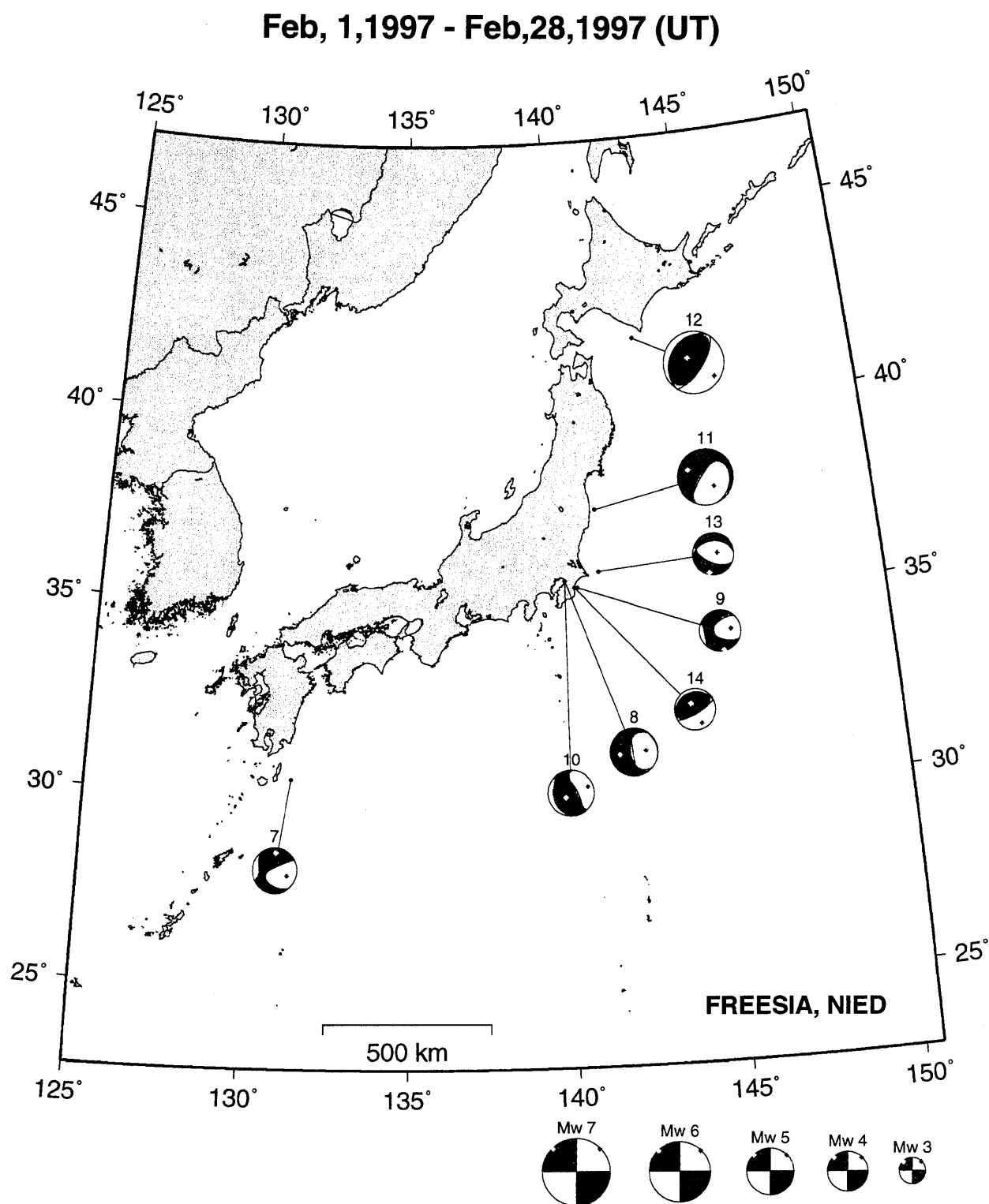


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

Mar, 1, 1997 - Mar, 31, 1997 (UT)

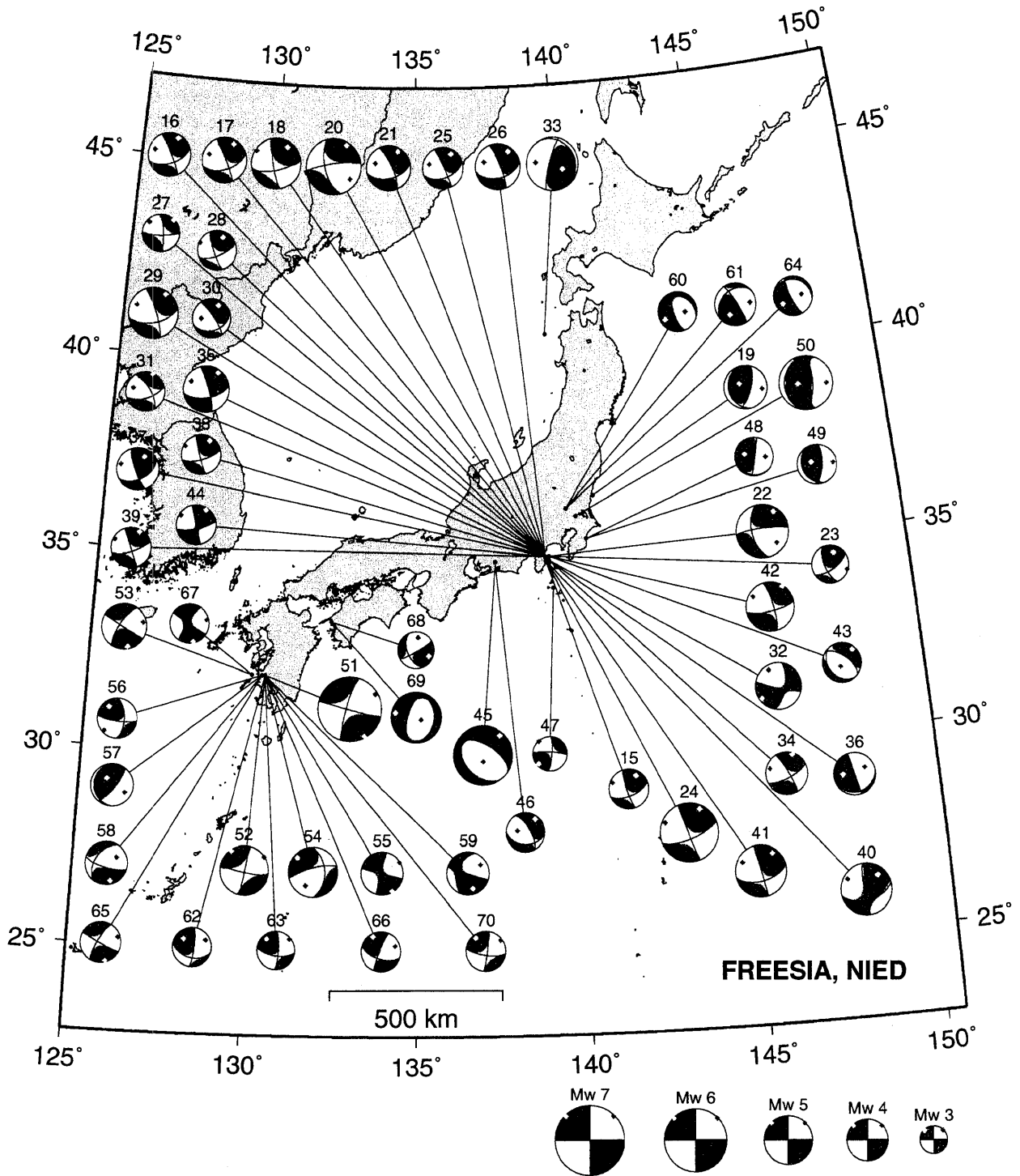


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

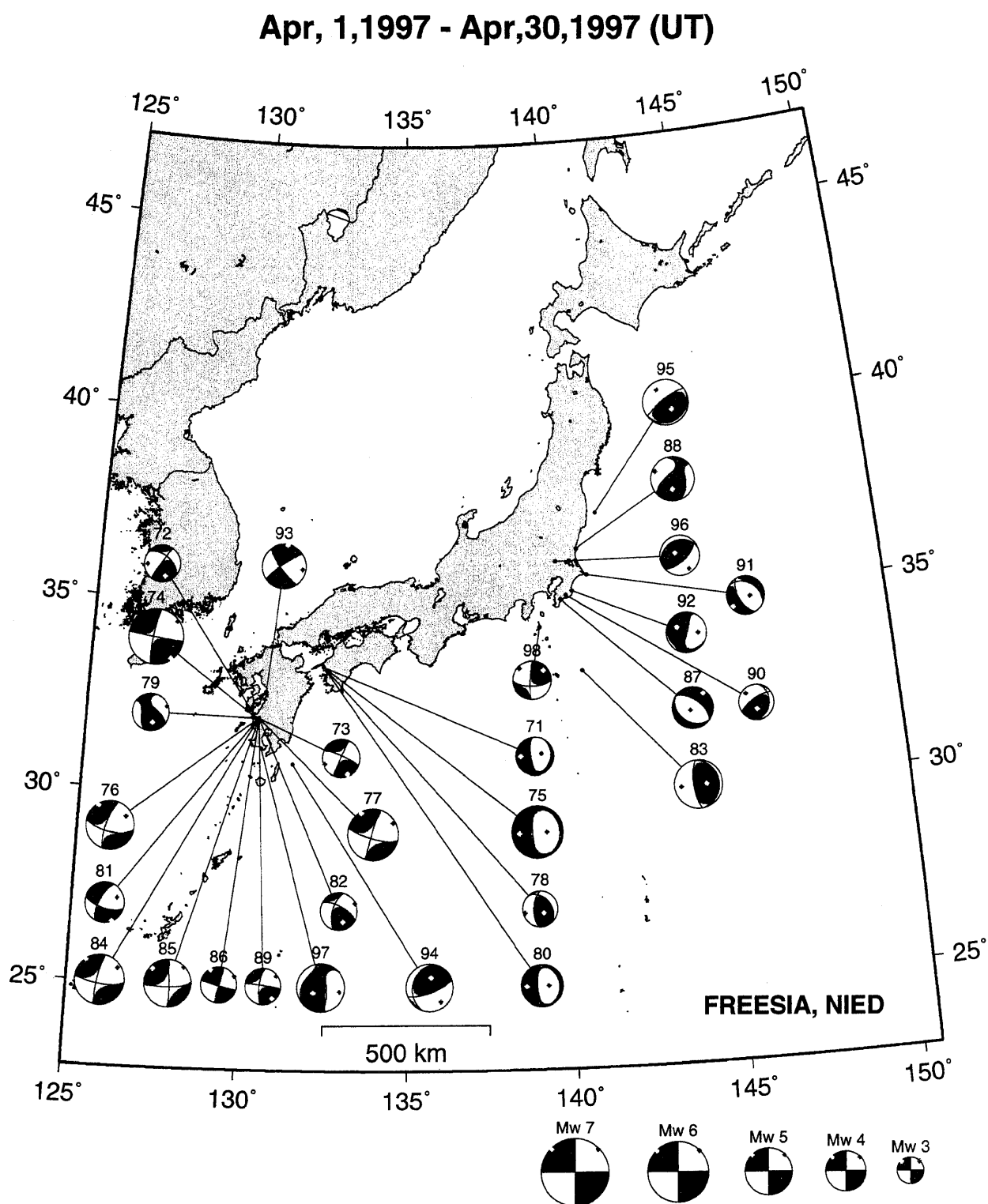


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

May, 1, 1997 - May, 31, 1997 (UT)

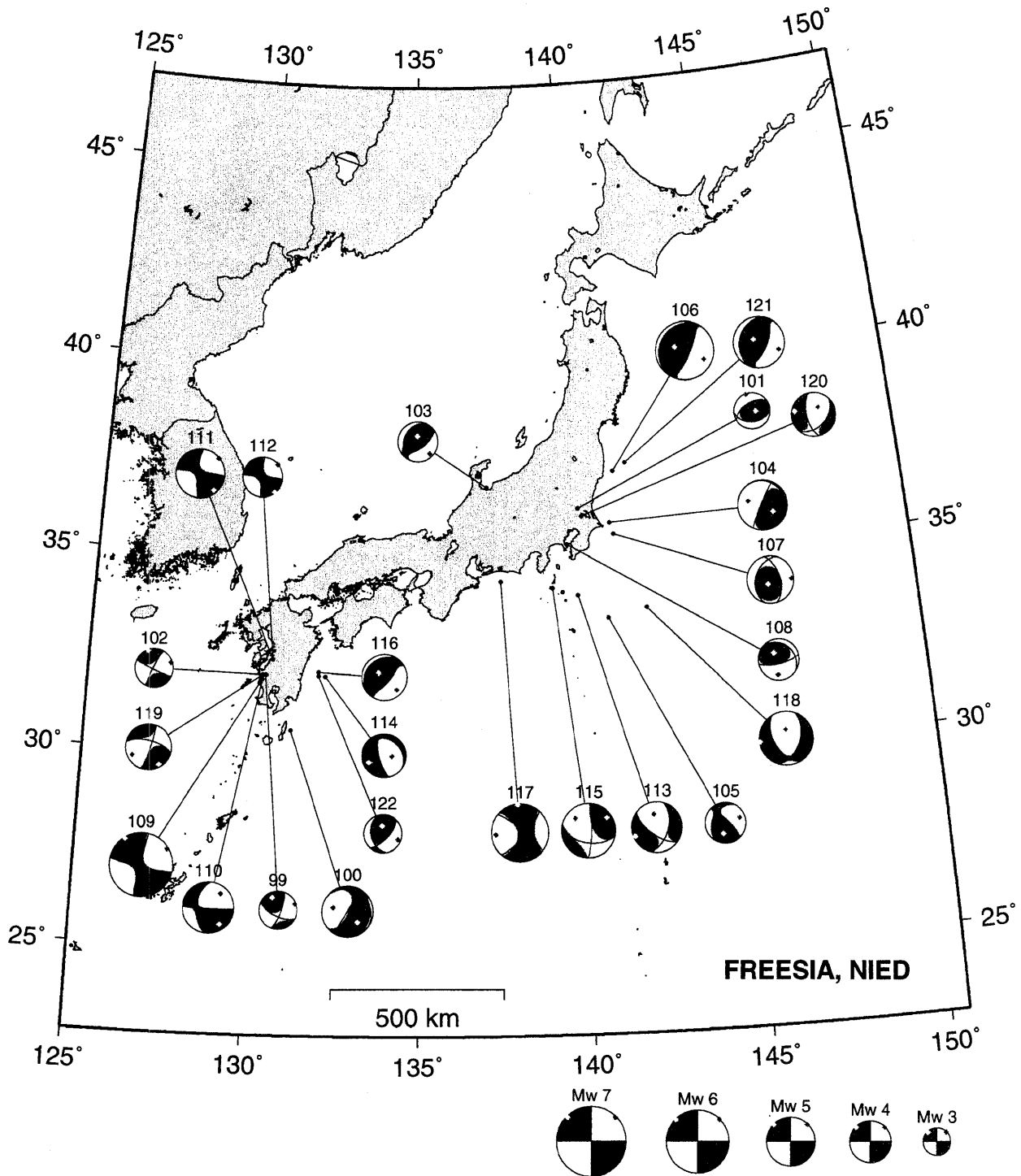


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

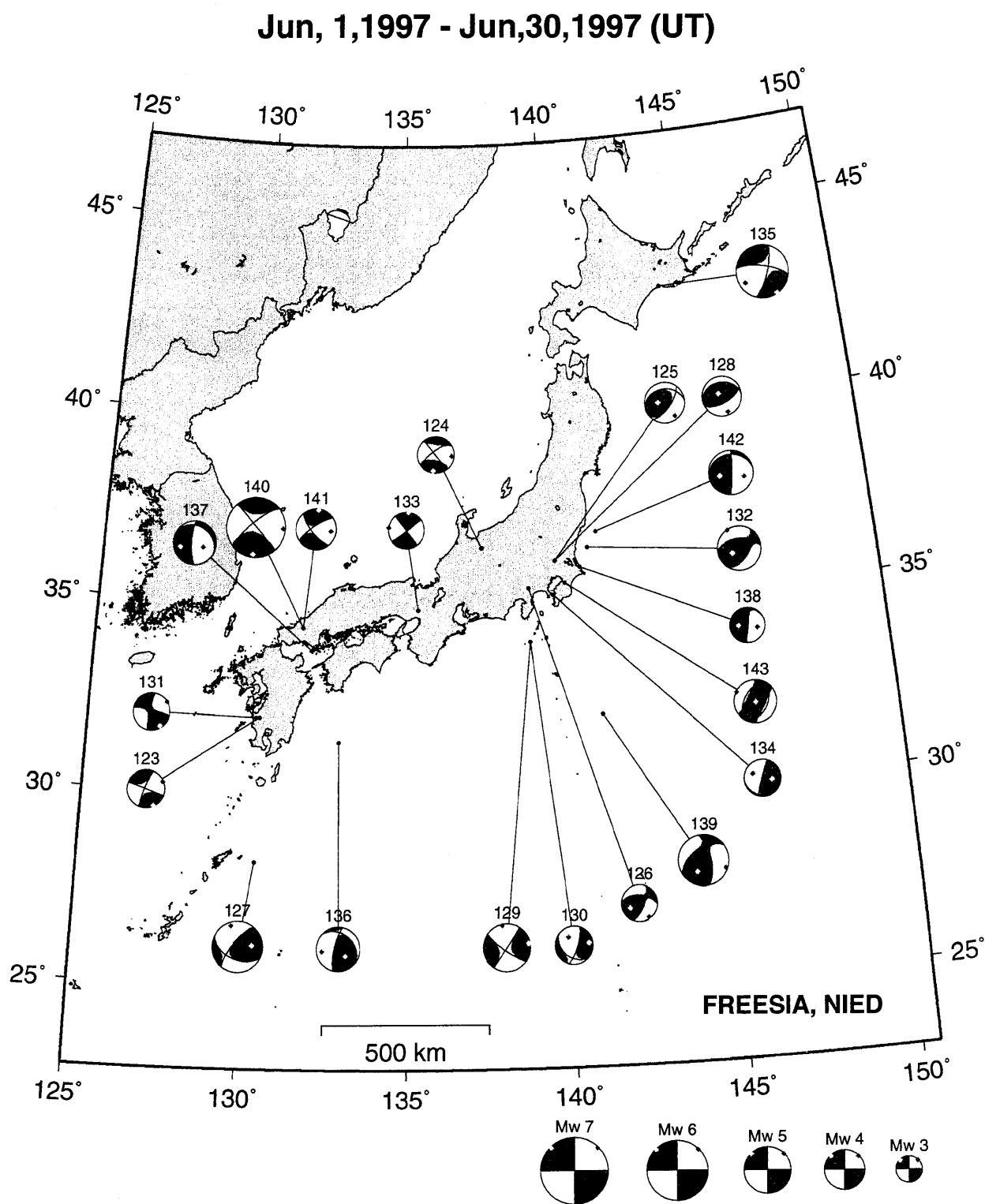


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

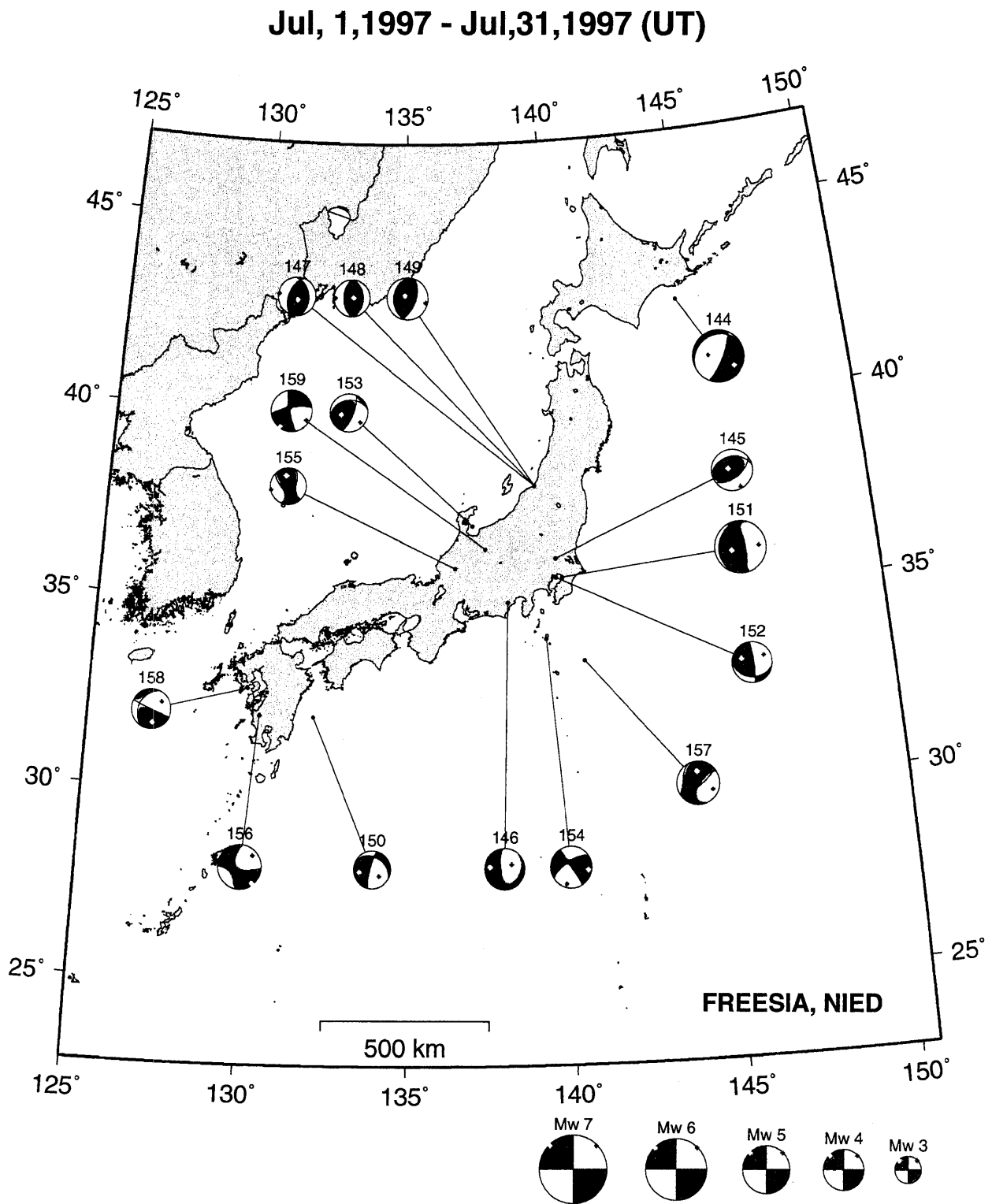


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

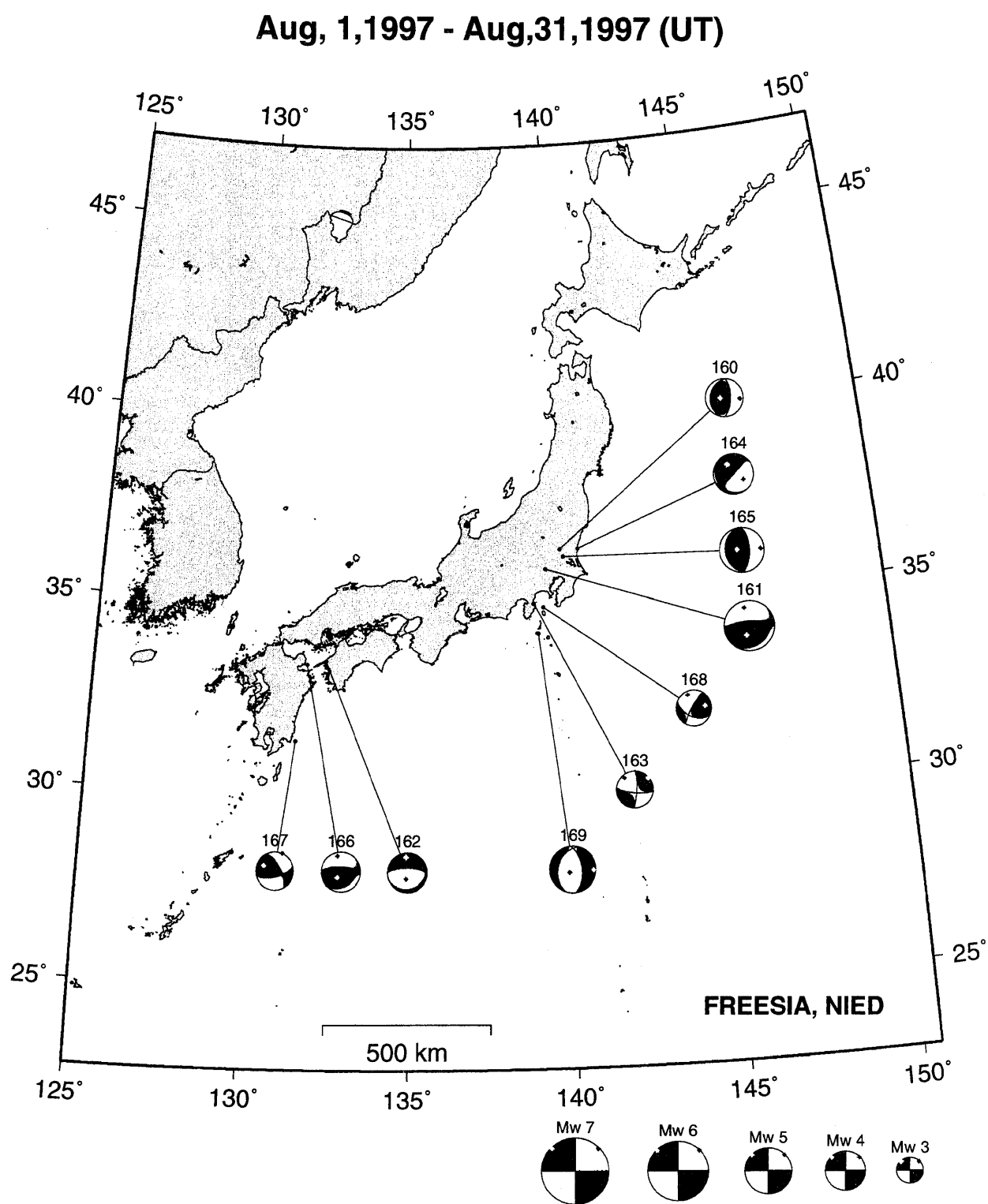


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

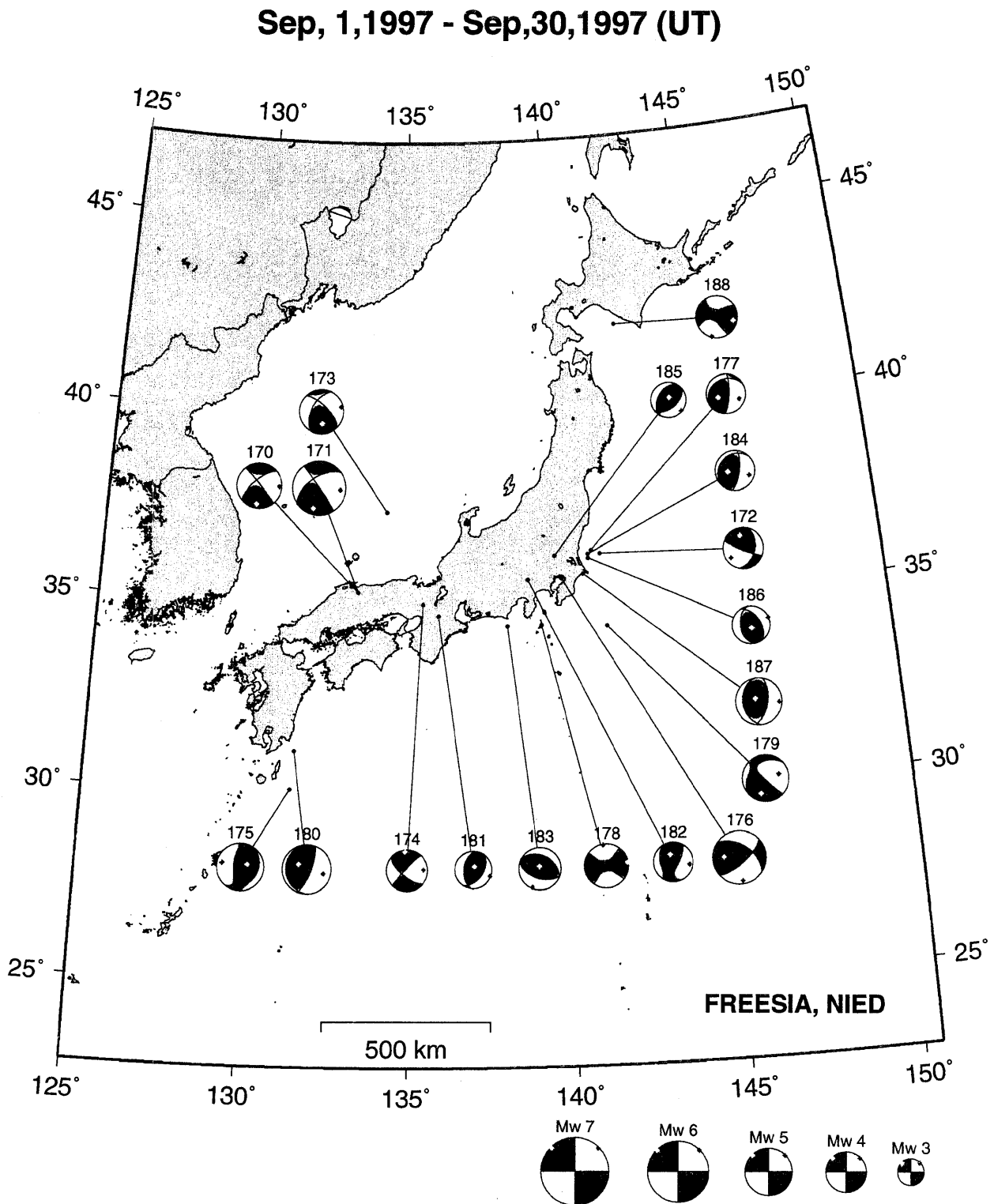


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

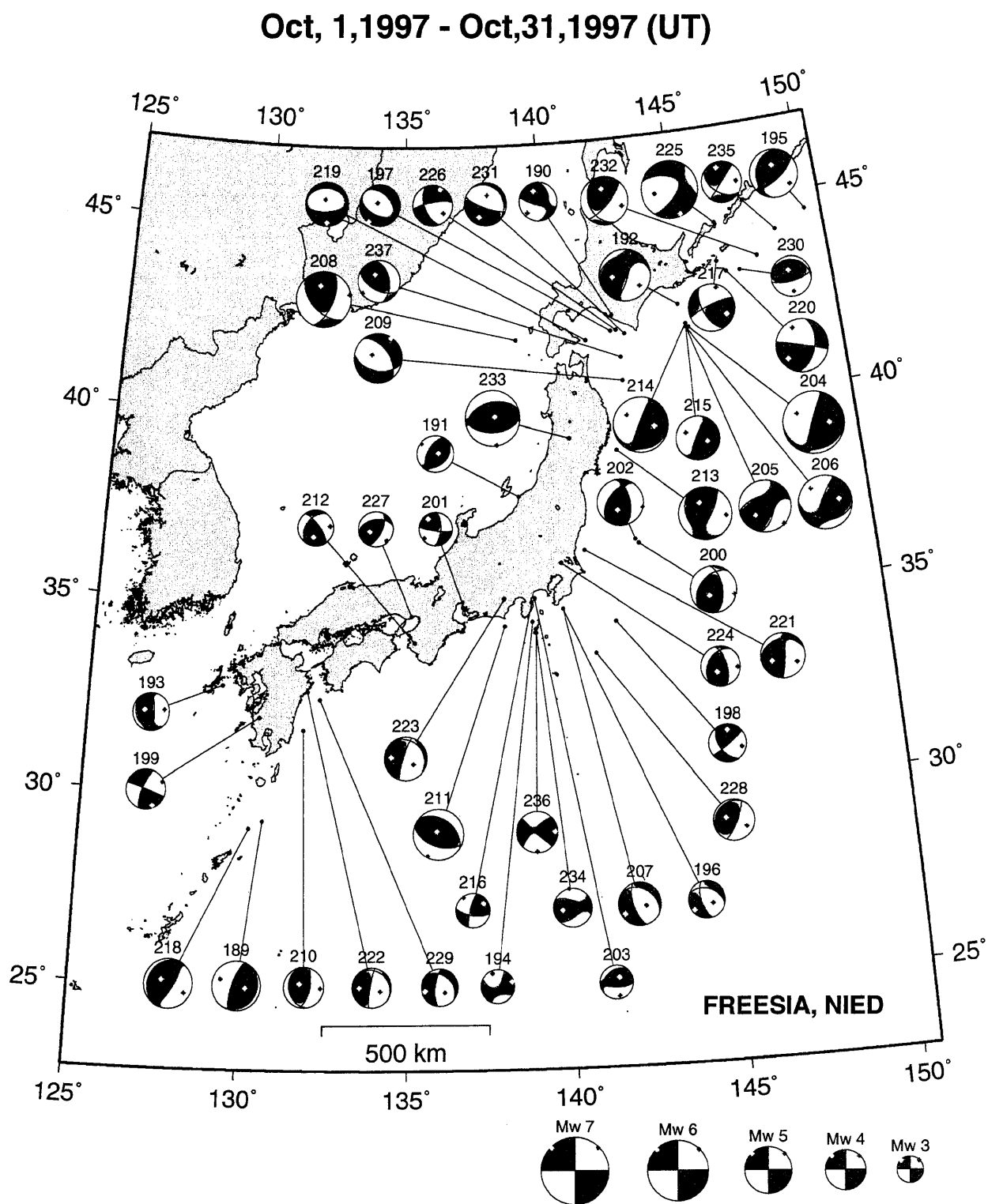


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

Nov, 1, 1997 - Nov, 30, 1997 (UT)

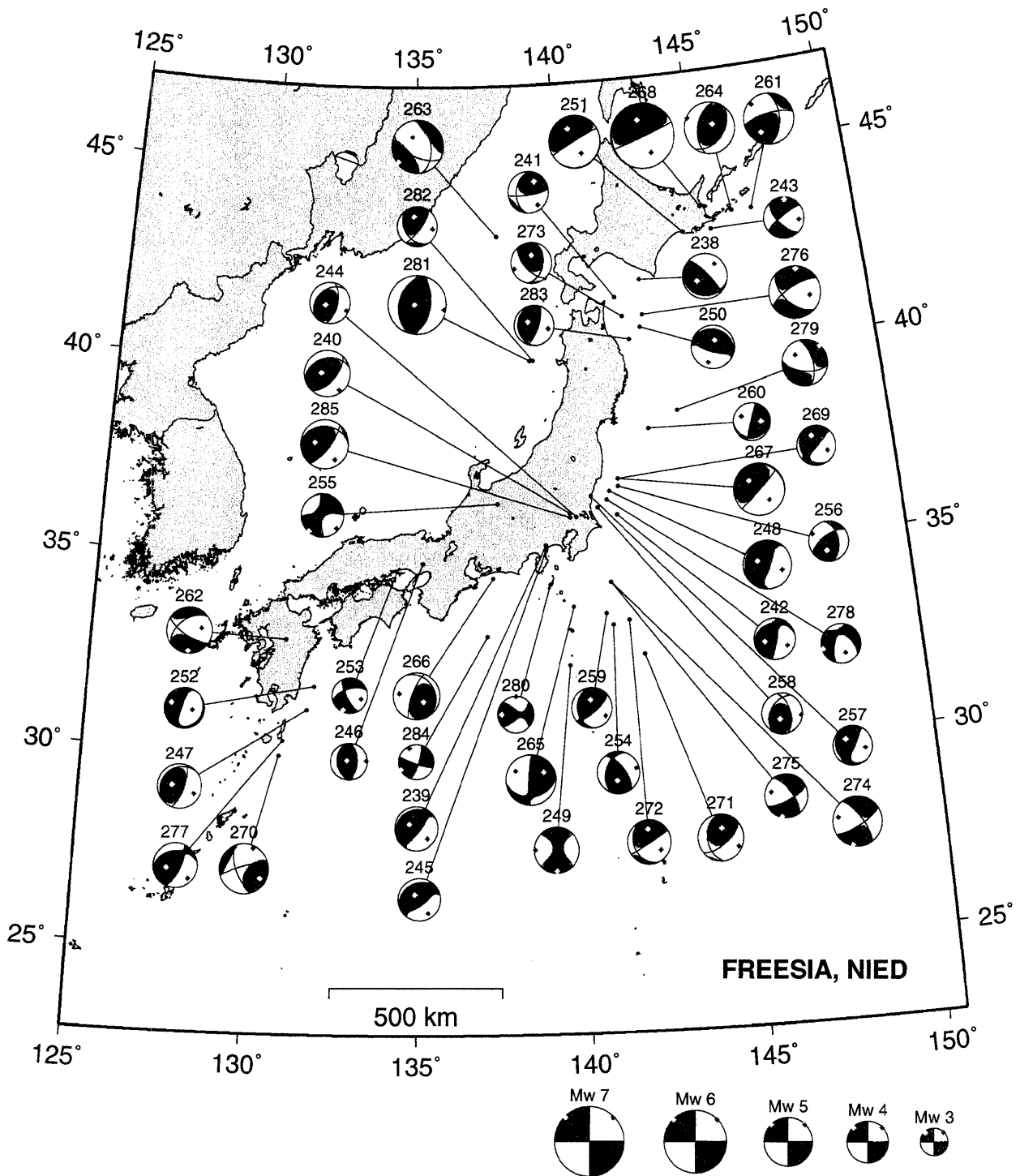


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

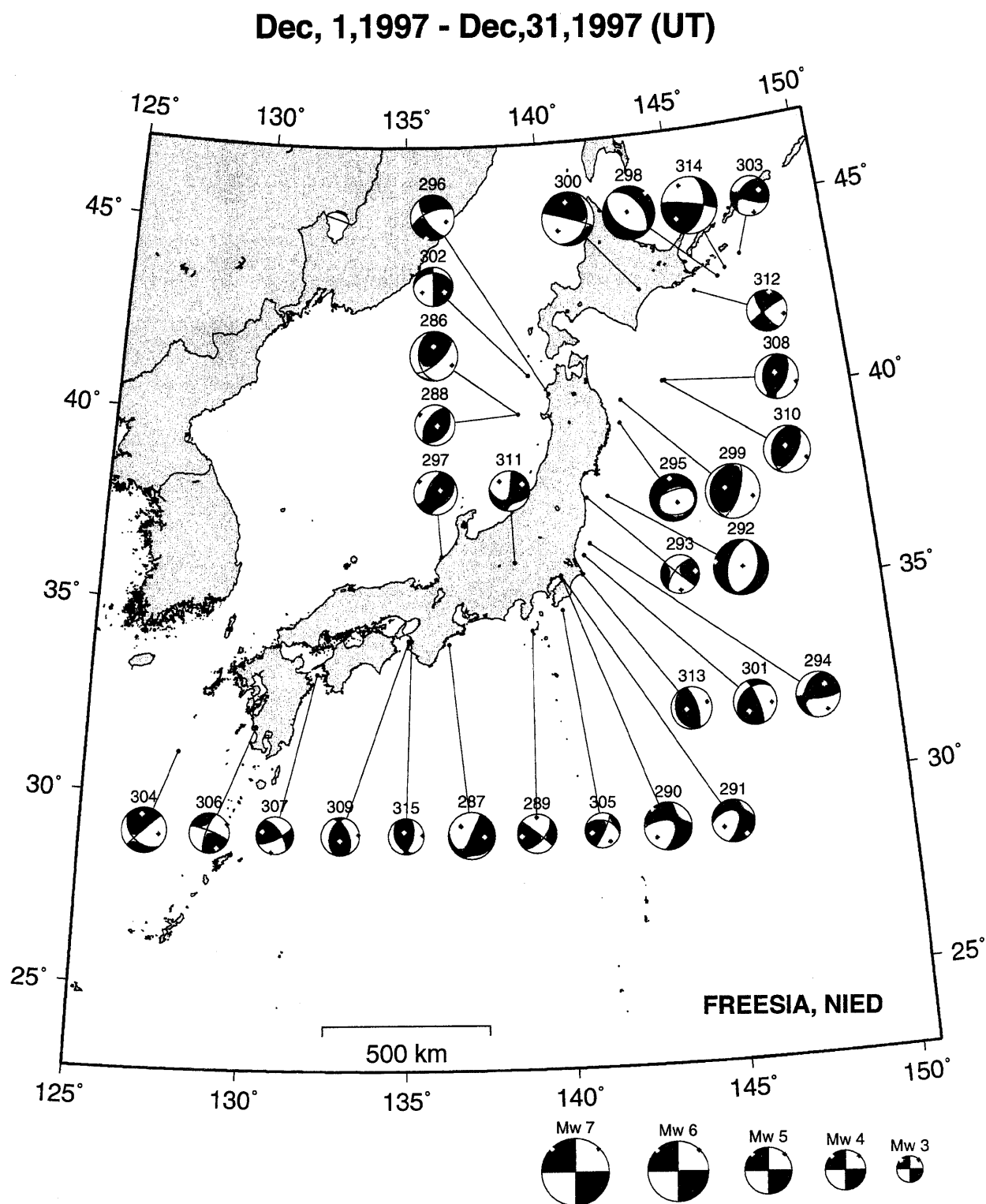


Fig. 2: Estimated moment tensors plotted with epicentral locations (continued).

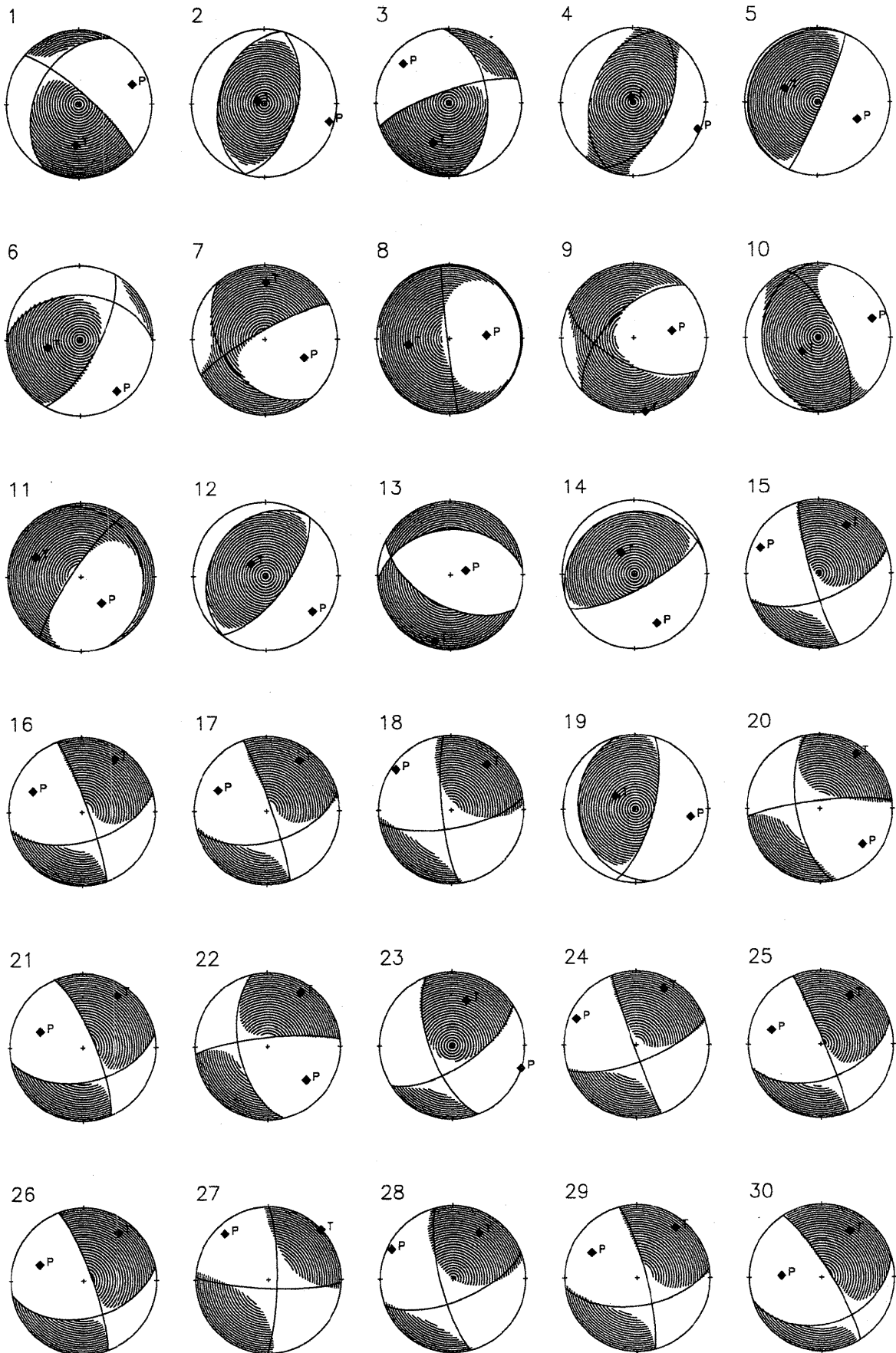


Fig. 3: Estimated moment tensors plotted in the lower hemisphere. P- and T- axes are also plotted.

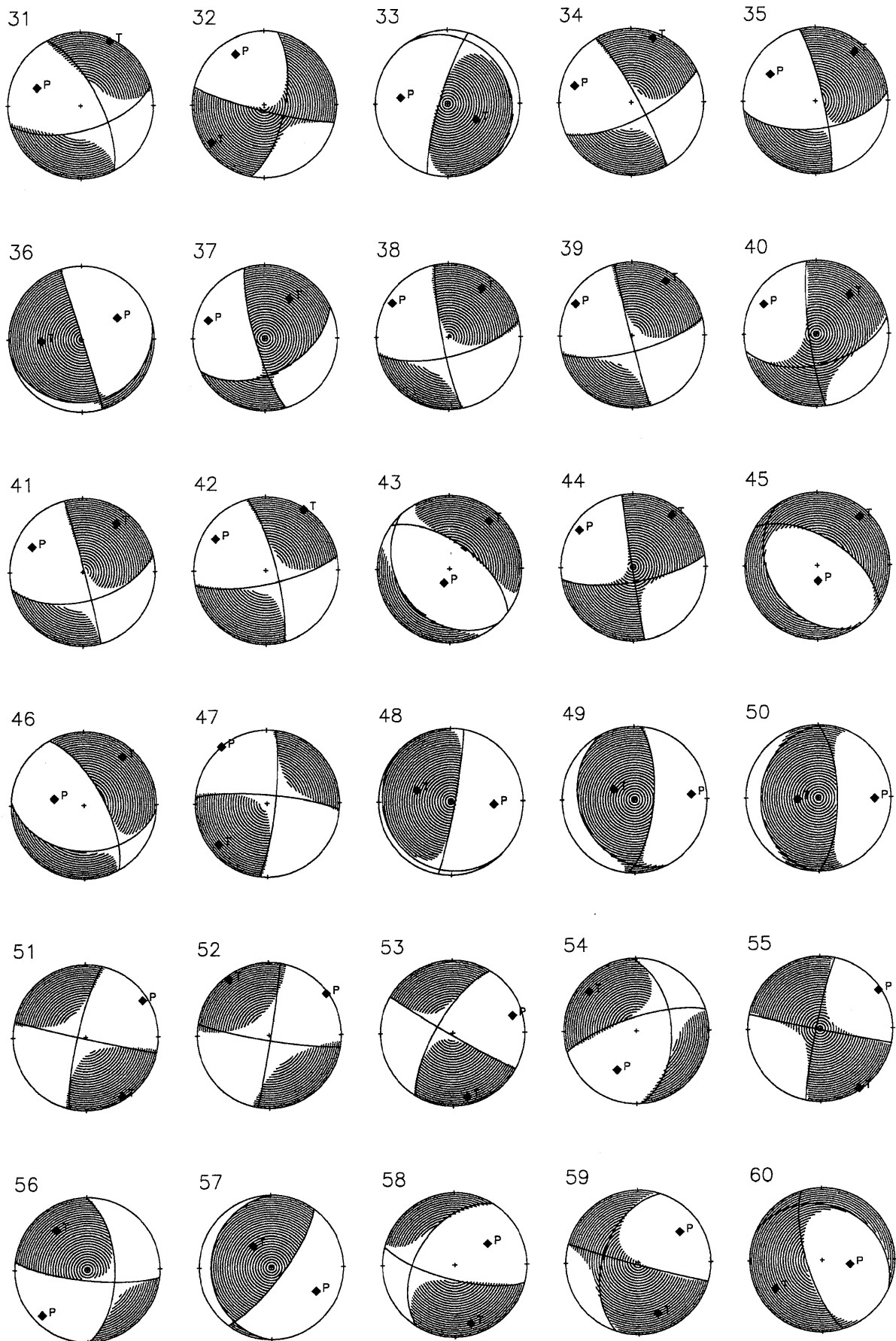


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

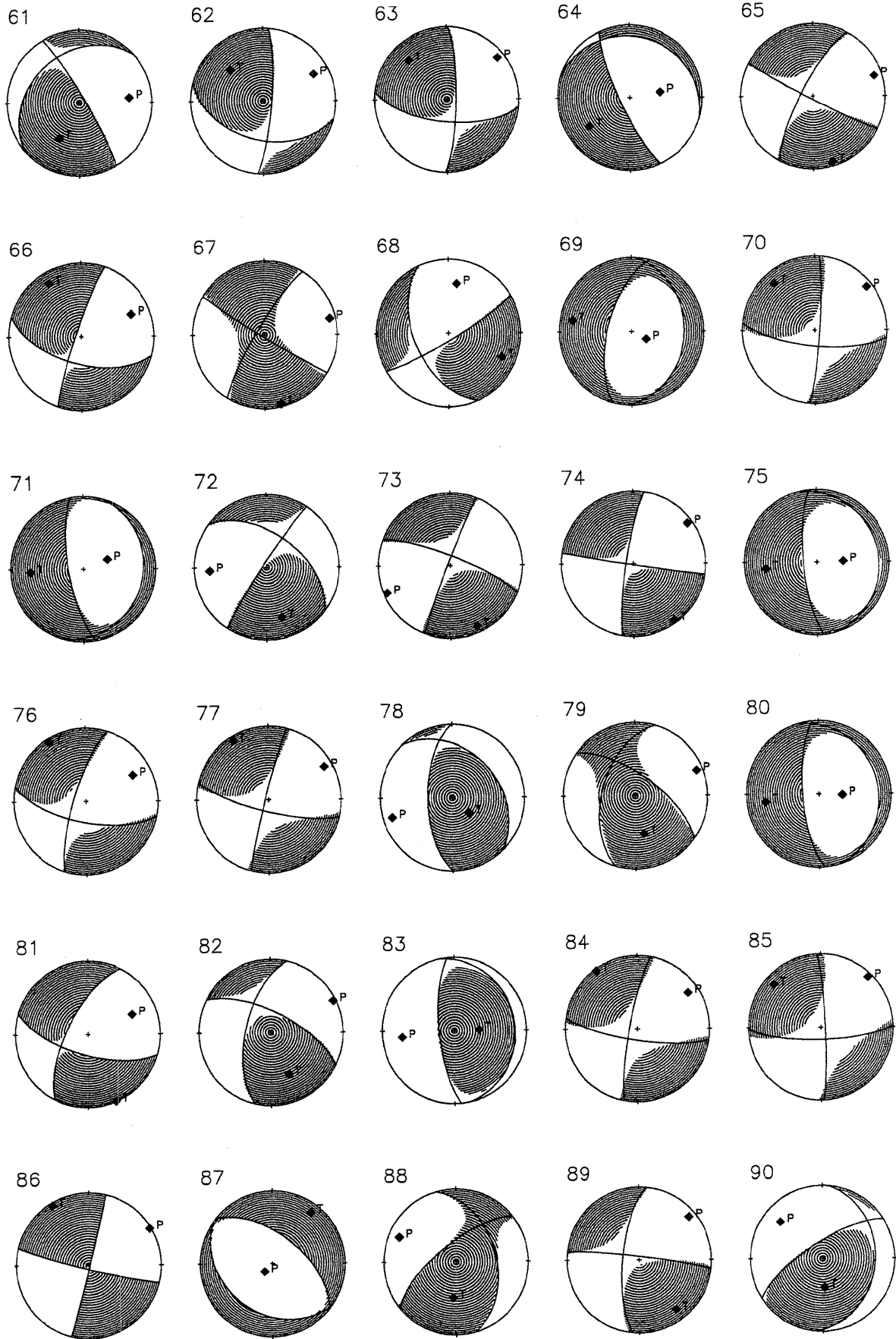


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

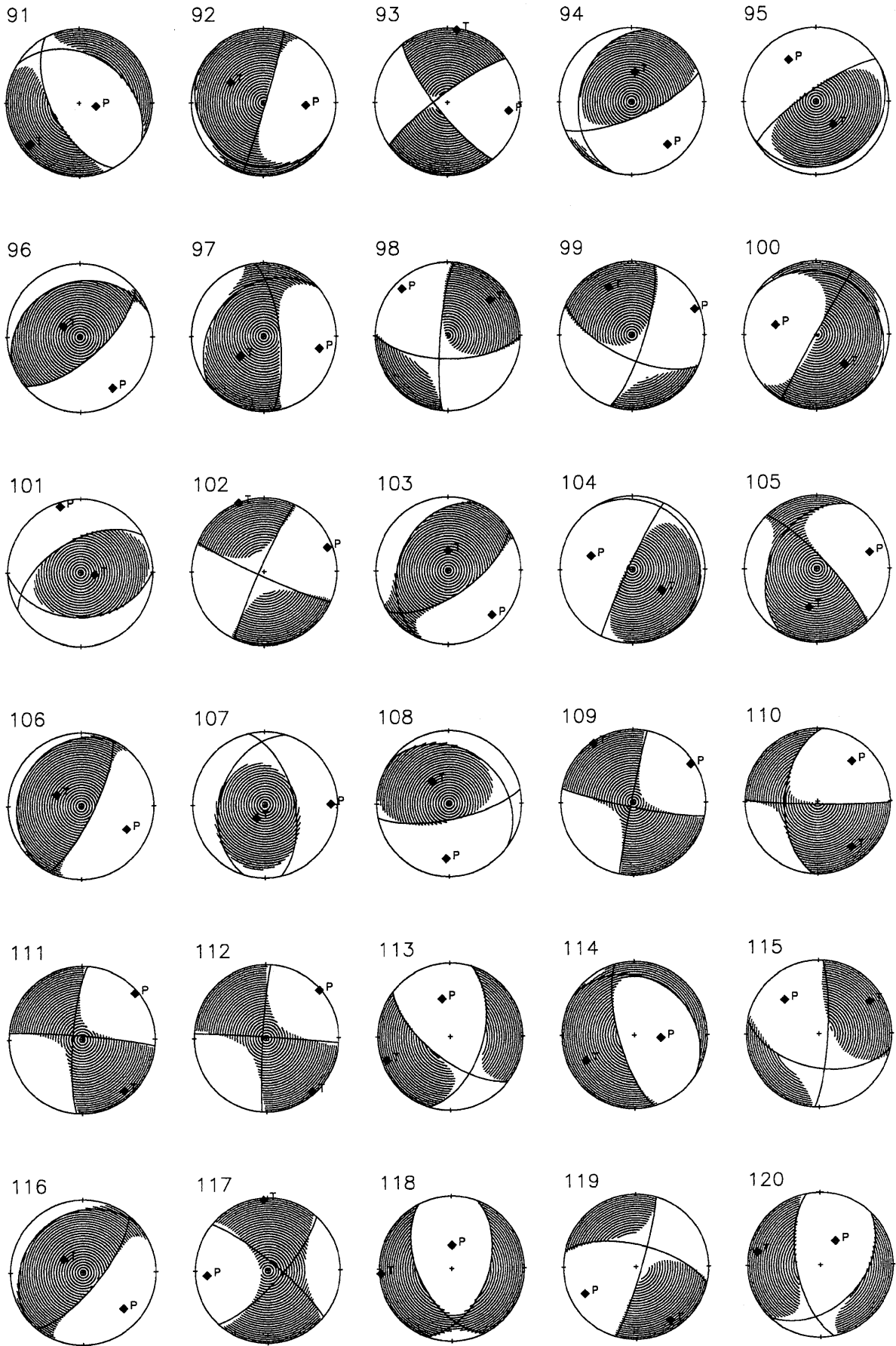


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

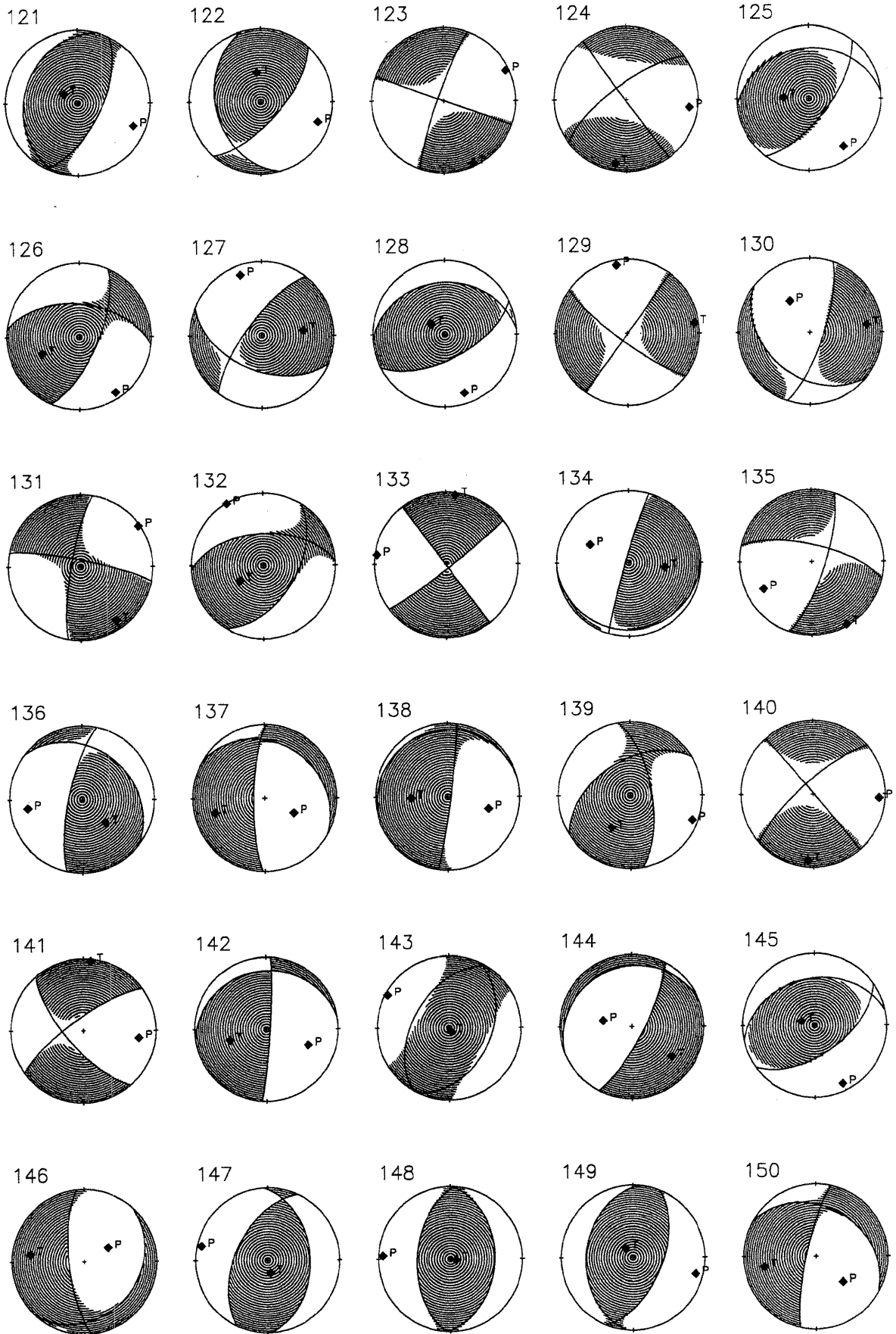


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

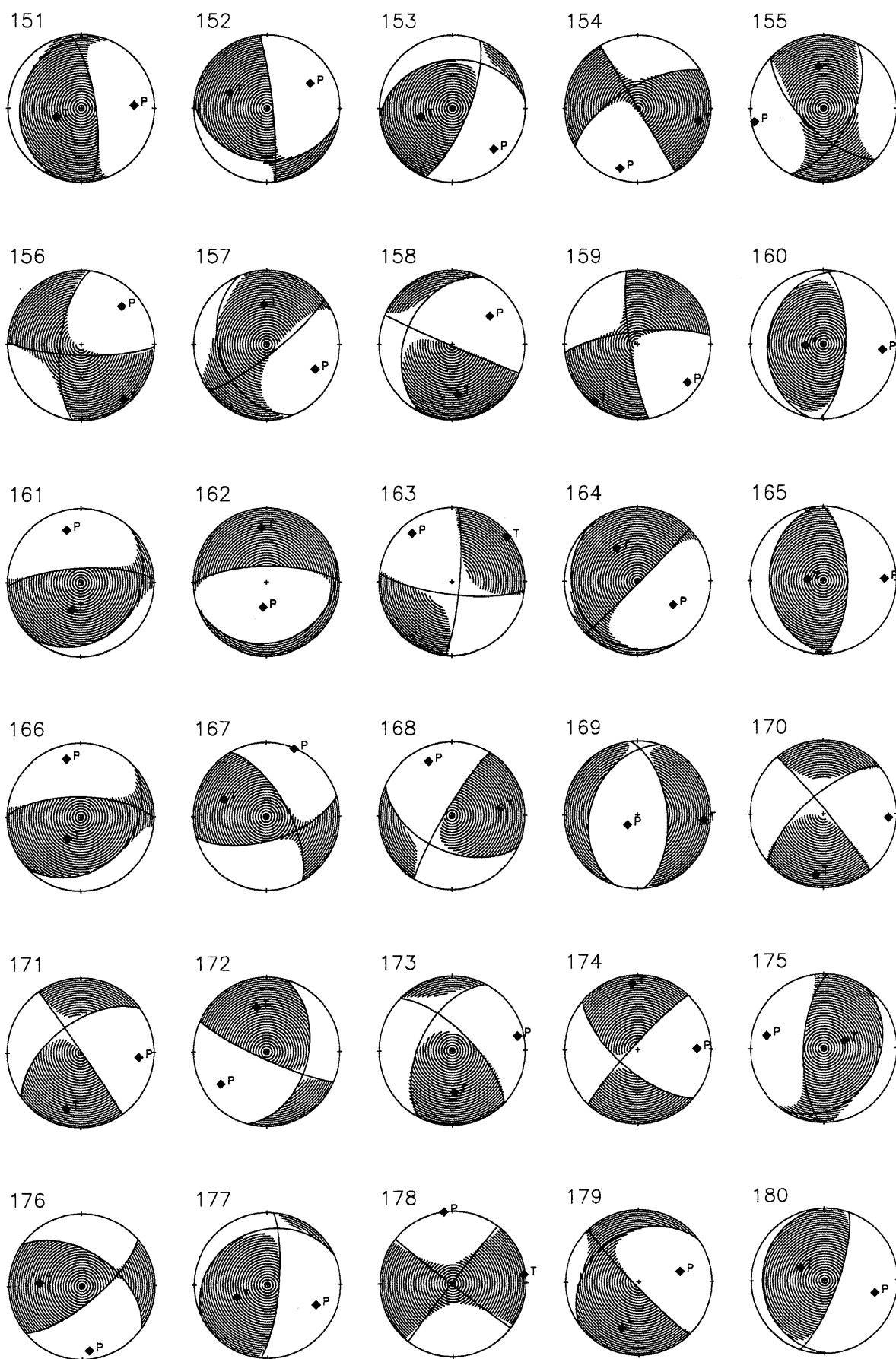


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

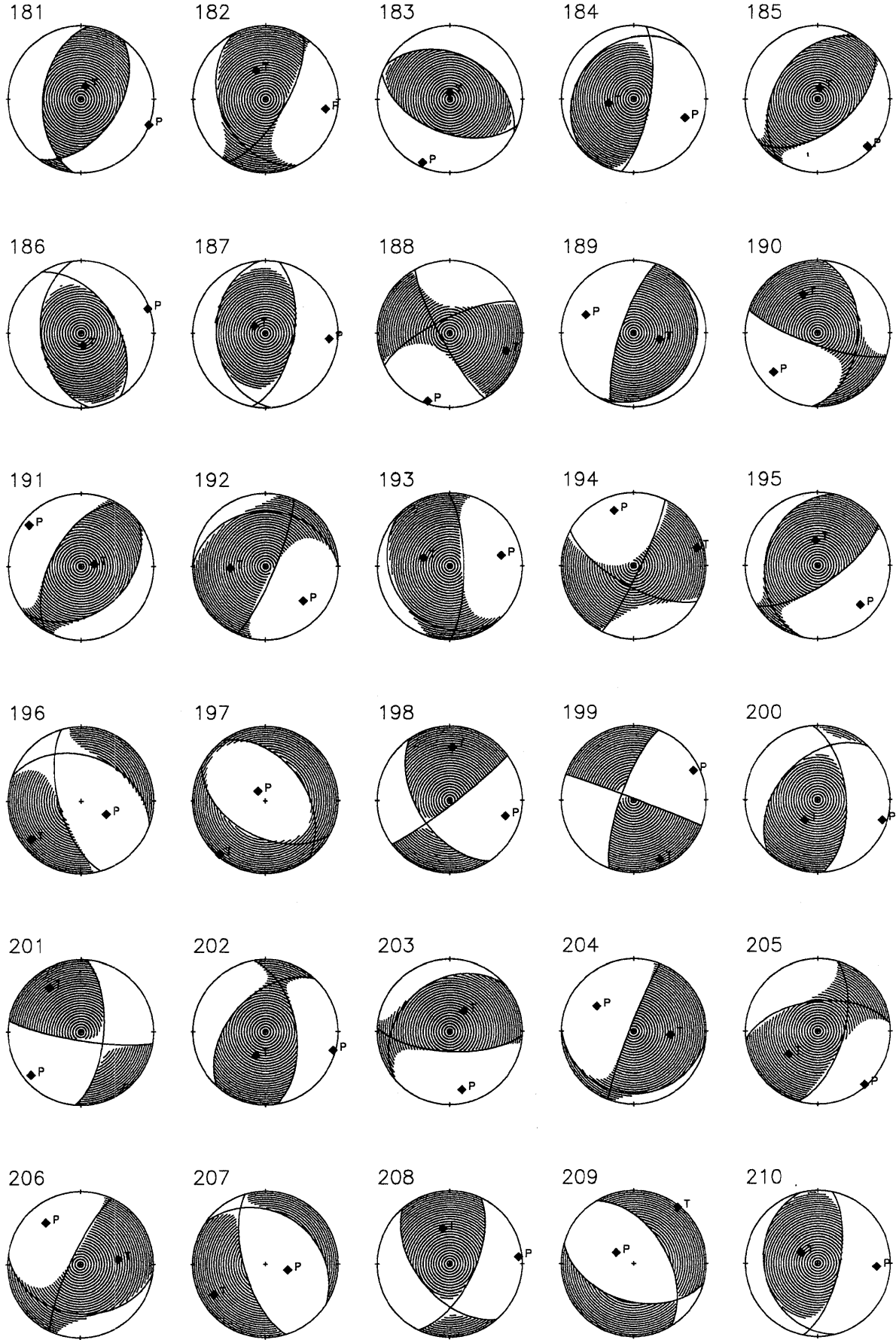


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

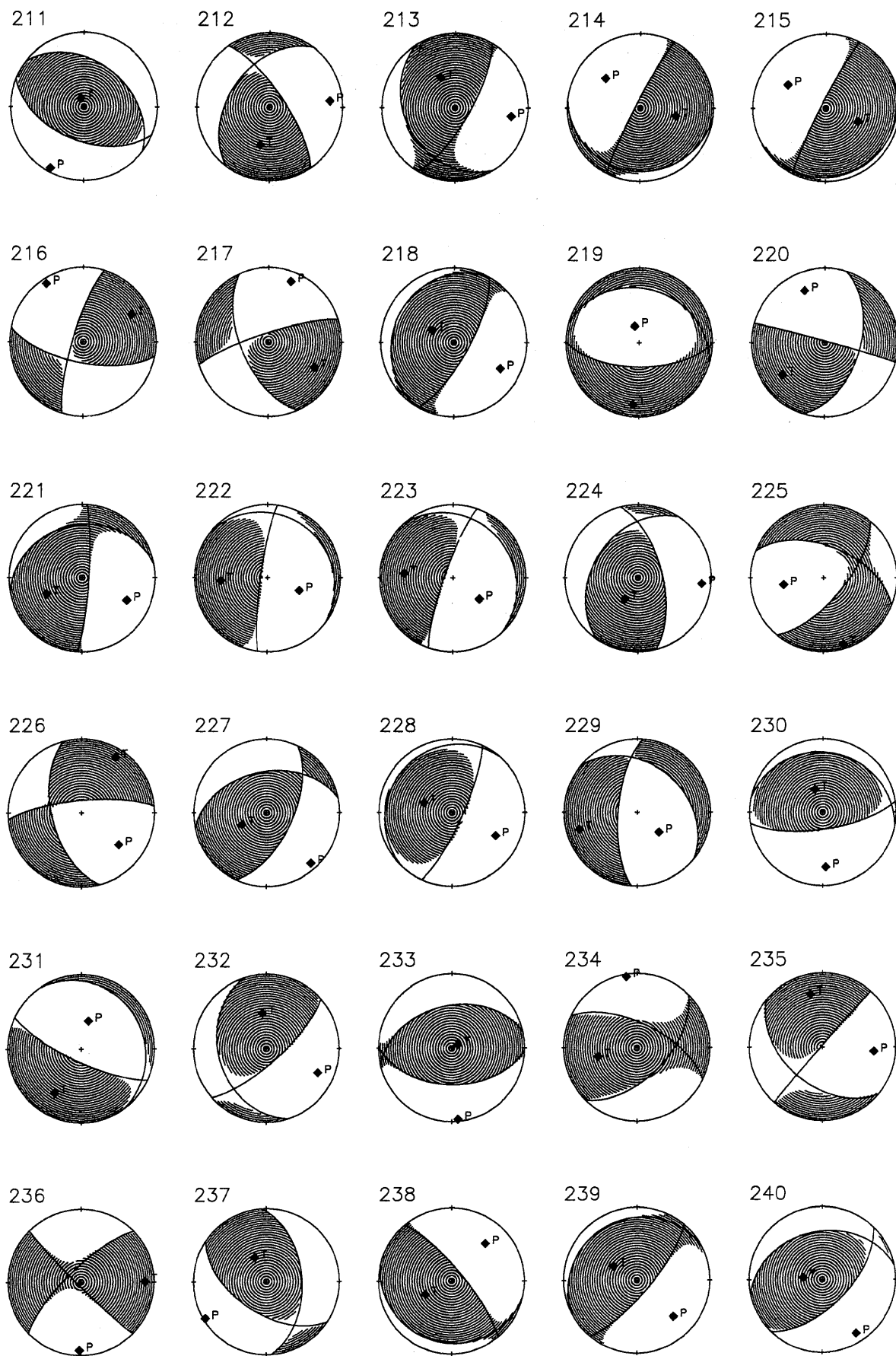


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

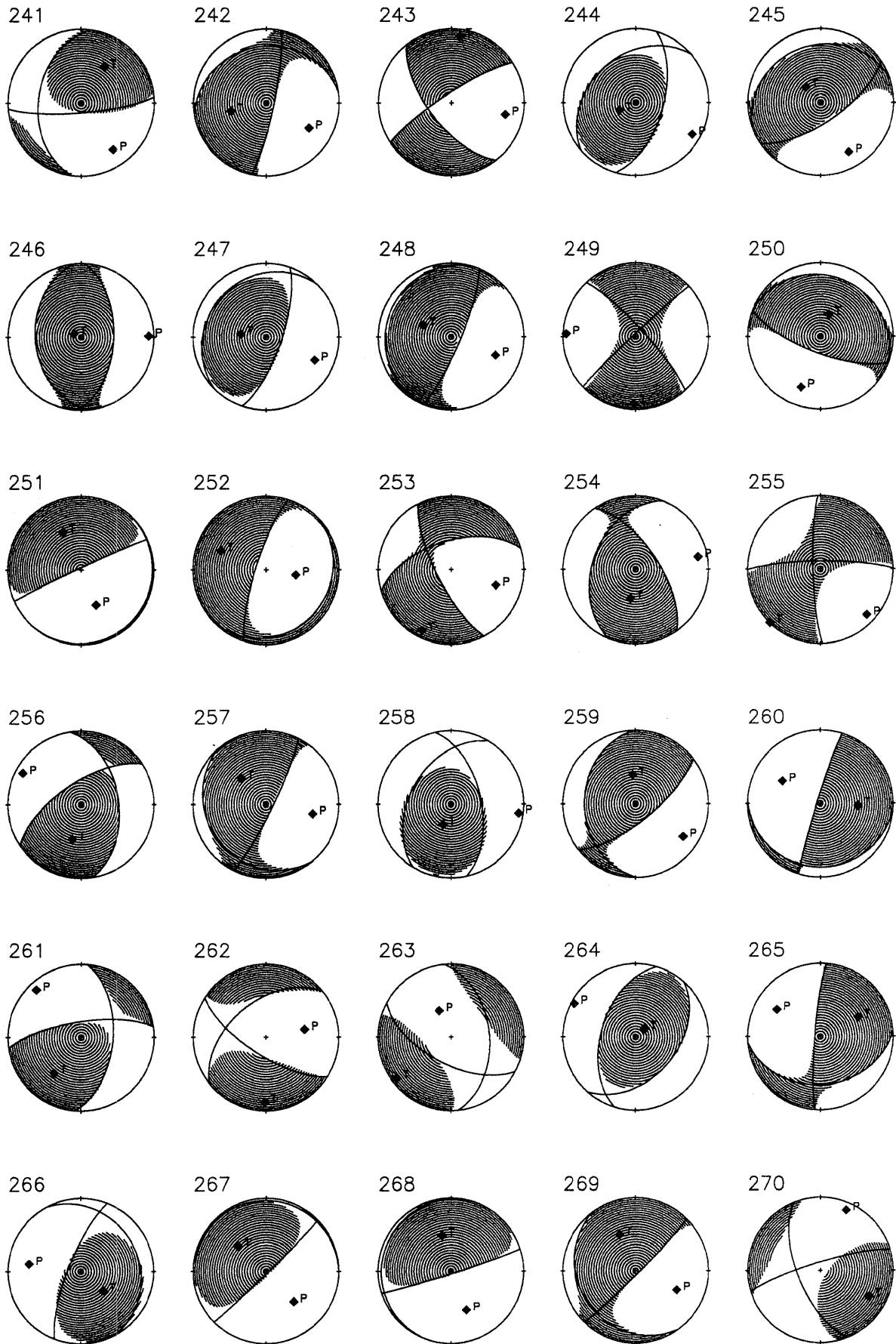


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

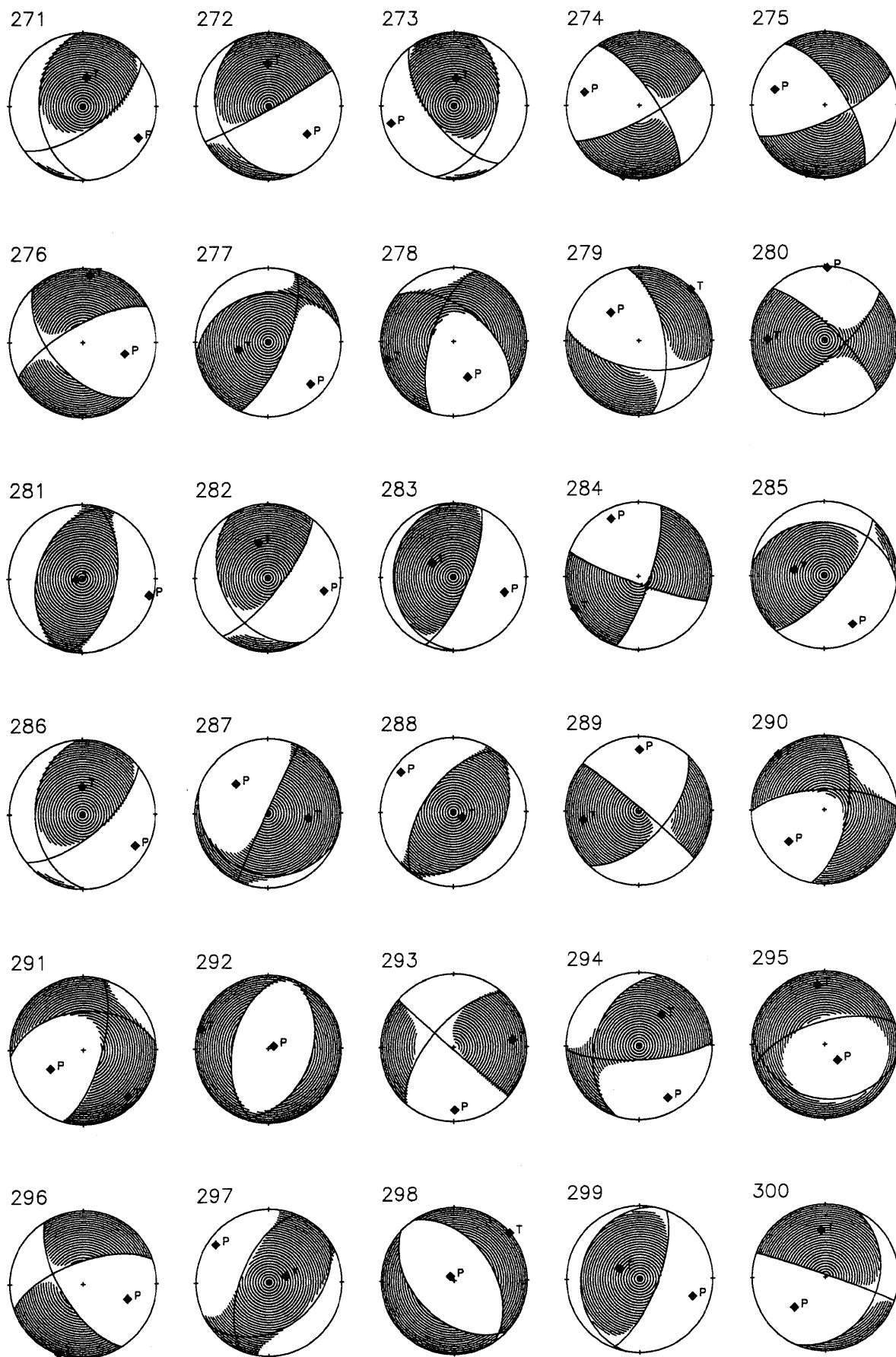


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

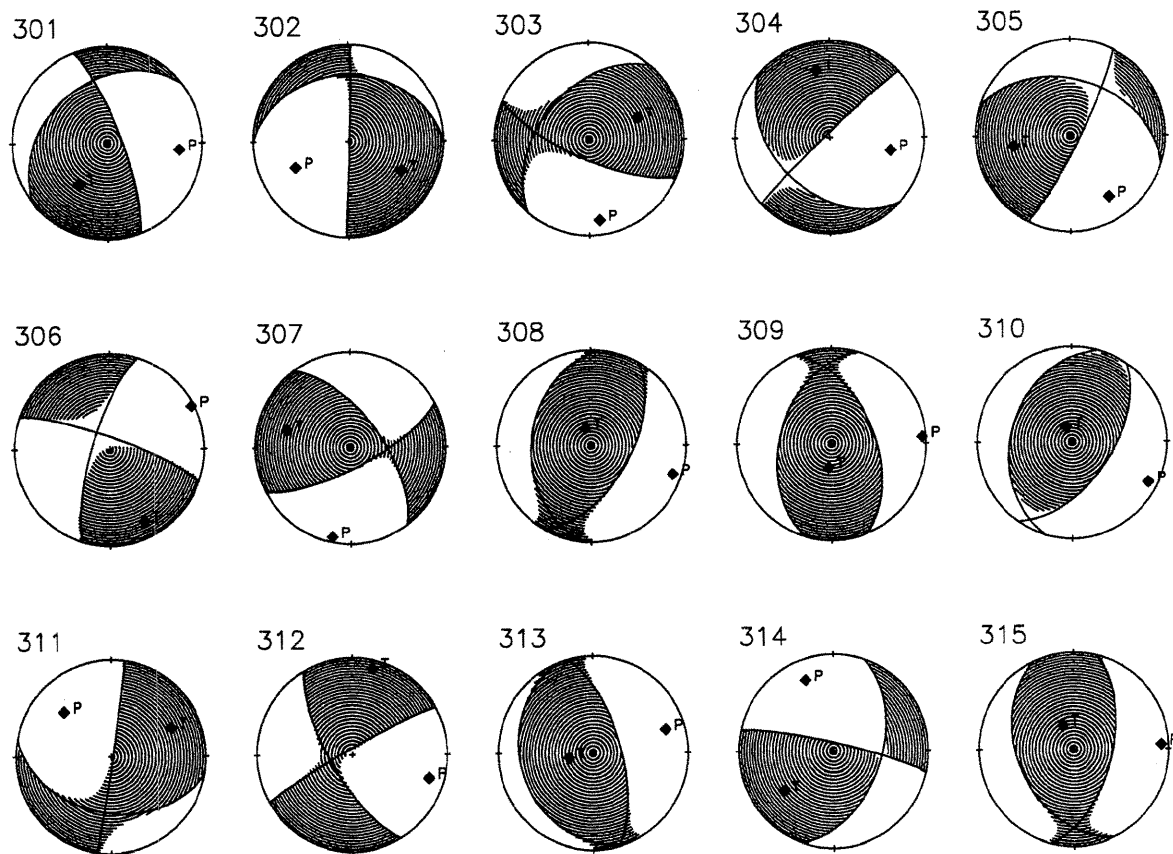


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).