

NIED Seismic Moment Tensor Catalogue January – December, 1999

By

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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 1999. 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/VSE355 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.

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>

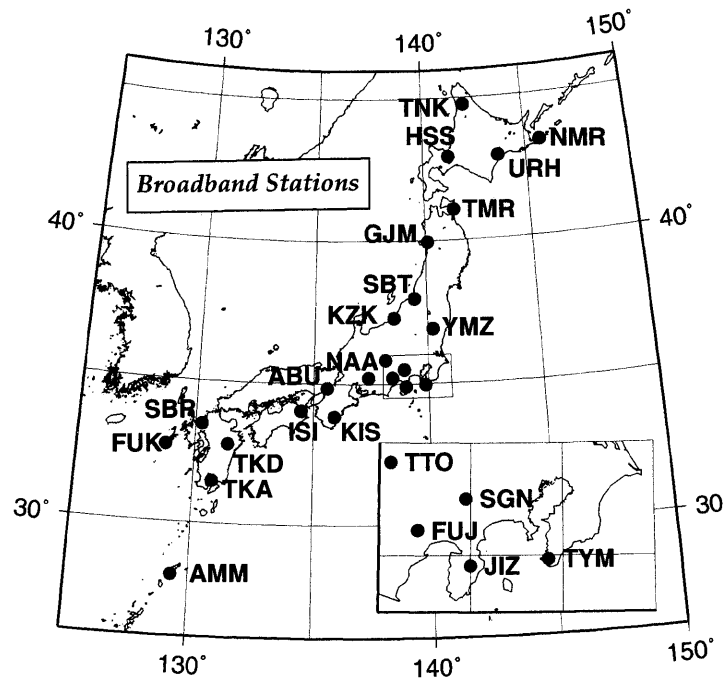


Fig. 1: Broadband station distribution used in the analysis.

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.

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 basically 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 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 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

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
Abuyama	ABU	34.8603	135.5734	138	Kyoto U.	KIBAN
Amami-Oshima	AMM	28.1534	129.3022	12	—	KIBAN
Fujigawa	FUJ	35.2267	138.4217	640	Tokyo U.	FREESIA
Fukue	FUK	32.7144	128.7594	75	Kyushu U.	KIBAN
Gojyome	GJM	39.9517	140.1167	105	Tohoku U.	KIBAN
Sapporo	HSS	42.9647	141.2328	230	Hokkaido U.	KIBAN
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
Sefuri	SBR	33.5024	130.2555	265	Kyushu U.	KIBAN
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
Takato	TTO	35.8332	138.1238	1150	—	KIBAN
Tateyama	TYM	34.9708	139.8481	30	Geogr. Surv. Jpn.	FREESIA
Urahoro	URH	42.9270	143.6746	75	Hokkaido U.	KIBAN
Yamizo	YMZ	36.9241	140.2479	555	Tohoku U.	KIBAN

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 $\pm 30\text{km}$ 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 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

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

Magnitude range	Epicentral Dist. (<i>km</i>)	Frequency range (<i>Hz</i>)	Data length (<i>seconds</i>)
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

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							

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 centroid location misfit. 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.

Table 4: Velocity structure for Green's functions.

Depth (<i>km</i>)	Thickness (<i>km</i>)	P Velocity (<i>km/s</i>)	S Velocity (<i>km/s</i>)	Density (<i>kg/m</i> 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

2. Results

The results are shown in Table 4, Figs. 2 and 3. In Table 3, 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, the best fit double couples are shown with their epicentral locations. The numerals appearing above each focal mechanism 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 621 seismic moment tensors and their centroid depths by using FREESIA/KIBAN broadband waveforms.

Acknowledgments

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NIED 地震モーメントテンソルカタログ

1999 年 1 月－12 月

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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、1999 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 型速度型強震計および VSE355 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

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

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
1	1999/01/01/11:47	44.2	148.7	44	4.6	7.6e15	63.57	SE off Etorofu	34	82	155	128	65	8	0.8292	-0.2840	0.2033	0.8292	0.2479	0.9237	NMR
2	1999/01/01/14:30	33.3	131.3	17	4.2	1.92e15	82.42	far E off Ibaraki pref	25	68	98	229	113	-113	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
3	1999/01/01/15:46	36.2	141.8	17	4.5	5.80e15	86.54	far E off Ibaraki pref	25	68	97	229	113	-113	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
4	1999/01/01/16:20	36.2	141.8	17	4.5	5.80e15	86.54	far E off Ibaraki pref	25	68	97	229	113	-113	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
5	1999/01/01/16:43	36.2	141.7	17	4.2	6.96e15	78.63	far E off Ibaraki pref	17	76	67	235	132	132	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
6	1999/01/01/18:30	36.2	141.7	17	4.3	3.61e15	76.36	far E off Ibaraki pref	17	76	67	235	132	132	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
7	1999/01/01/22:08	36.2	141.7	26	4.4	5.26e15	82.78	far E off Ibaraki pref	30	72	68	231	117	117	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
8	1999/01/02/00:00	36.2	141.7	20	4.2	8.56e14	84.65	far E off Ibaraki pref	21	70	61	238	118	118	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
9	1999/01/02/00:06	36.2	141.8	20	4.2	2.28e15	82.65	far E off Ibaraki pref	21	70	61	238	118	118	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
10	1999/01/02/07:19	36.2	141.7	17	4.0	9.21e14	80.45	far E off Ibaraki pref	173	77	48	278	44	-180	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
11	1999/01/02/15:45	36.2	141.8	17	4.2	5.26e15	79.96	far E off Ibaraki pref	32	73	94	198	17	77	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
12	1999/01/04/04:58	32.3	142.1	47	4.1	1.60e15	94.33	E off Hachijima island	330	86	63	233	172	172	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
13	1999/01/04/18:58	40.1	142.9	26	3.4	1.55e14	66.00	E off Amori pref	27	76	89	211	14	94	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
14	1999/01/04/18:58	40.1	142.9	26	3.4	1.55e14	66.00	E off Amori pref	27	76	89	211	14	94	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
15	1999/01/07/05:38	43.7	146.8	35	4.5	1.42e15	58.43	NE off Iwate pref	260	81	-163	167	73	-10	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
16	1999/01/07/05:38	43.7	146.8	35	4.5	1.42e15	58.43	NE off Iwate pref	260	81	-163	167	73	-10	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
17	1999/01/07/05:38	43.7	146.8	35	4.5	1.42e15	58.43	NE off Iwate pref	260	81	-163	167	73	-10	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
18	1999/01/07/05:38	43.7	146.8	35	4.5	1.42e15	58.43	NE off Iwate pref	260	81	-163	167	73	-10	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
19	1999/01/07/05:38	43.7	146.8	35	4.5	1.42e15	58.43	NE off Iwate pref	260	81	-163	167	73	-10	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
20	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
21	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
22	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
23	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
24	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
25	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
26	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
27	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
28	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
29	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
30	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
31	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
32	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
33	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
34	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
35	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
36	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
37	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
38	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
39	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
40	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
41	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
42	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
43	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
44	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
45	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
46	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
47	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
48	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
49	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
50	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
51	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
52	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
53	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
54	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
55	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
56	1999/01/16/06:41	36.7	141.5	20	4.4	4.11e15	76.51	E off Ibaraki pref	66	89	89	227	46	2	0.8077	-0.2219	0.1849	0.8077	0.2037	0.9120	TKA
57	1999/01/16/06:41	36																			

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	Mo(Nm)	VarRed	Region name	Sr1	Dip1	Rak1	Sr2	Dip2	Rak2	Mxx	Mxy	Mxz	Myx	Myy	Myz	Mzz	used Stations
71	1999/02/20:10:30	33.6	142.2	11	6.2	6.7e16	56.16	far E off Kanto	178	61	62	38	46	120	0.0111	0.3213	0.3141	-0.8793	-0.5221	0.1867	0.8683	YMR SGN KZK
72	1999/02/20:10:30	33.6	148.2	59	4.1	3.27e16	75.53	E off Hokkaido	309	62	78	154	34	112	-0.3245	-0.3590	-0.5142	-0.5221	-0.2533	0.8467	NMR URH KZK	
73	1999/02/21:01:51	37.9	140.0	8	4.0	1.0e16	88.48	western Fukushima pref	35	57	94	208	34	84	-0.2389	0.4194	0.2524	-0.6769	0.9018	0.9645	YMR SGN SBT	
74	1999/02/21:01:56	37.9	143.6	8	3.9	3.6e16	83.40	far E off Kanto	35	49	102	197	43	77	-0.1489	0.4231	0.1774	-0.8056	-0.0321	0.9645	YMR SGN SBT	
75	1999/02/22:07:37	39.6	143.6	11	3.9	8.4e16	83.40	far E off Sanriku	71	51	64	289	46	119	-0.9464	0.0003	0.0759	0.0365	-0.3732	0.9099	GJM SGN JIZ	
76	1999/02/26:05:18	39.6	143.6	41	4.2	2.68e16	83.95	near Itohoshi city	11	75	94	175	46	174	-0.0004	0.0247	0.1892	0.0913	-0.5017	0.5017	SGN JIZ	
77	1999/02/26:05:18	39.2	139.2	11	3.8	2.49e16	83.94	W off Akita pref	181	76	79	126	35	113	0.0037	0.0986	0.0946	-0.8032	-0.6621	0.7215	SGN JIZ	
78	1999/03/01:05:37	37.7	143.2	11	3.8	3.0e17	50.68	southern Aite pref	234	71	119	144	34	35	0.2821	-0.0986	-0.1280	-0.8032	-0.5314	0.5211	ABU KZK	
79	1999/03/01:05:37	37.7	143.2	35	4.3	3.15e16	53.62	far E off Kanto	383	62	82	189	59	108	0.0636	-0.0085	-0.1280	-0.8032	-0.5314	0.5211	ABU KZK	
80	1999/03/02:14:20	32.6	132.7	35	4.3	3.15e16	53.62	far E off Miyazaki pref	383	62	82	189	59	108	0.0636	-0.0085	-0.1280	-0.8032	-0.5314	0.5211	ABU KZK	
81	1999/03/02:16:51	44.2	148.7	35	4.0	1.05e15	65.25	SE off Etorofu	31	60	110	176	36	60	0.0139	0.2146	0.4003	-0.2937	0.8507	0.8368	NMR SGN FUJ	
82	1999/03/03:00:18	36.4	140.8	53	3.6	2.79e14	62.13	E off Ibaraki pref	22	67	107	164	28	56	0.1591	0.0821	0.3232	-0.8146	-0.5774	0.6355	YMR SGN FUJ	
83	1999/03/03:06:24	42.0	142.5	44	4.4	4.37e15	71.38	S off Utsunomiya	26	74	83	229	17	111	-0.1876	0.2842	0.3468	-0.3423	-0.7643	0.5300	TMR URH NAA	
84	1999/03/03:06:24	42.0	142.5	44	4.4	4.37e15	71.38	S off Utsunomiya	26	74	83	229	17	111	-0.1876	0.2842	0.3468	-0.3423	-0.7643	0.5300	TMR URH NAA	
85	1999/03/03:06:24	36.1	139.5	45	4.4	4.76e15	93.05	SE off Hokkaido	234	81	-125	130	36	116	0.0973	0.0618	0.5516	-0.4312	-0.5672	-0.2662	NMR URH NAA	
86	1999/03/06:03:54	41.9	142.3	80	4.7	1.05e16	83.74	eastern Saitama pref	109	58	97	275	33	79	-0.8489	-0.1704	0.3934	-0.0675	0.2126	0.9164	SGN URH NAA	
87	1999/03/06:08:22	37.1	141.5	47	4.0	1.11e15	87.27	S off Utsunomiya	8	84	91	177	6	80	-0.1085	-0.0130	0.1373	-0.1568	-0.9651	0.2653	TMR HSS URH	
88	1999/03/06:11:50	37.1	141.5	47	4.0	1.11e15	87.27	E off Fukushima region	34	72	104	176	23	54	0.0581	0.2160	0.4825	-0.6146	-0.6147	0.5565	YMR SBT KZK	
89	1999/03/06:22:11	37.8	142.3	20	3.8	4.73e14	64.56	Satsuma peninsula pref	231	81	165	324	75	110	0.8498	0.2515	-0.2648	-0.9959	0.0441	0.1461	SGN SBT GJM	
90	1999/03/07:01:03	43.0	145.8	26	4.9	2.54e16	74.51	SE off Miyagi pref	197	51	73	43	42	110	-0.1975	0.4688	0.1149	-0.7290	0.2318	0.9265	YMR SBT GJM	
91	1999/03/08:01:58	36.3	140.1	53	4.0	1.03e15	87.89	SW Ibaraki pref	43	73	75	265	23	130	-0.5085	0.2817	0.4839	-0.0486	-0.6392	0.5571	YMR KZK FUJ	
92	1999/03/08:08:46	39.2	139.9	41	4.1	1.70e15	67.39	W off Akita pref	190	60	92	240	30	87	0.0426	-0.1286	-0.0969	-0.8531	-0.4829	0.8403	GJM SBT KZK	
93	1999/03/08:22:38	30.6	131.3	50	3.8	6.78e14	67.39	near Tanigashima island	28	52	67	240	43	116	0.4729	0.3929	-0.0969	-0.8531	-0.4829	0.8403	GJM SBT KZK	
94	1999/03/09:01:36	36.7	141.0	41	3.5	2.70e16	83.97	E off Ibaraki pref	133	72	-74	286	34	-115	0.6513	0.5208	-0.2705	-0.1181	-0.3897	-0.7694	FUJ SBT KZK	
95	1999/03/09:03:53	32.9	131.0	46	4.3	2.70e16	83.97	NE Kuma moto pref	133	72	-74	286	34	-115	0.6513	0.5208	-0.2705	-0.1181	-0.3897	-0.7694	FUJ SBT KZK	
96	1999/03/09:07:04	36.4	141.5	28	4.1	1.57e15	87.32	near Aomori pref	215	61	50	240	47	135	-0.0069	0.2543	-0.4639	-0.5020	-0.4908	0.4908	SGN SBT KZK	
97	1999/03/09:22:32	29.6	130.5	68	4.6	8.98e15	70.99	near Aomori-Oshima island	215	61	50	240	47	135	-0.0069	0.2543	-0.4639	-0.5020	-0.4908	0.4908	SGN SBT KZK	
98	1999/03/10:22:20	31.3	131.9	23	3.9	6.99e14	51.53	SE off Oshima island	203	61	50	240	47	135	-0.0069	0.2543	-0.4639	-0.5020	-0.4908	0.4908	SGN SBT KZK	
99	1999/03/11:14:09	39.6	141.9	26	4.1	4.41e15	81.13	near Iwate pref	269	62	71	126	31	122	-0.5751	-0.3132	-0.5125	-0.4861	-0.5060	0.7552	TKA SBT KZK	
100	1999/03/12:14:09	41.5	142.7	41	3.6	2.59e14	70.20	near Aomori pref	286	62	71	126	31	122	-0.5751	-0.3132	-0.5125	-0.4861	-0.5060	0.7552	TKA SBT KZK	
101	1999/03/12:14:24	35.0	135.6	14	3.8	5.46e14	74.23	Kyoto Osaka border reg	213	61	132	331	49	39	0.3641	0.0559	0.4658	-0.9909	0.1605	0.6268	KIS ISI NAA	
102	1999/03/12:15:39	37.9	140.4	11	3.7	1.64e14	75.56	mid Fukushima pref	212	61	132	331	49	39	0.3641	0.0559	0.4658	-0.9909	0.1605	0.6268	KIS ISI NAA	
103	1999/03/13:19:52	33.5	138.2	8	3.4	4.47e14	87.68	far S off Tokai District	226	68	128	125	64	156	-0.0961	0.2673	-0.2938	-0.9786	-0.0413	0.8510	YMR SBT KZK	
104	1999/03/14:00:04	34.2	139.1	5	4.9	2.39e16	80.37	near Niijima island	348	70	-118	225	34	-37	-0.1979	-0.1195	-0.0135	0.6650	0.4992	0.3031	JIZ FUJ NAA	
105	1999/03/14:00:21	34.2	139.2	17	3.7	3.38e14	59.58	near Niijima island	335	60	153	60	63	11	-0.8888	-0.2836	-0.2607	0.7444	0.6395	0.5466	JIZ FUJ SGN	
106	1999/03/14:00:37	34.2	139.2	5	4.3	2.90e15	86.04	near Niijima island	353	59	-104	199	34	-68	-0.0340	-0.1001	-0.1859	0.8954	0.4256	0.8615	JIZ FUJ SGN	
107	1999/03/14:00:44	34.2	139.2	5	3.6	2.62e14	63.37	near Niijima island	160	56	-135	32	54	-43	-0.3285	-0.0216	-0.5075	0.9768	-0.0337	-0.6483	JIZ FUJ NAA	
108	1999/03/14:01:34	34.3	139.2	5	4.1	1.37e15	86.73	near Niijima island	349	61	-106	199	33	-64	-0.0734	-0.0672	0.2170	0.8825	-0.4789	-0.8091	JIZ FUJ SGN	
109	1999/03/14:01:50	34.2	139.2	5	3.6	3.10e14	81.50	near Niijima island	157	77	-133	53	44	-19	-0.4650	-0.3174	-0.3091	0.8153	-0.5586	-0.3503	JIZ FUJ NAA	
110	1999/03/14:04:47	34.3	139.2	14	4.0	1.29e15	84.10	near Niijima island	323	61	164	55	74	7	-1.0592	-0.3063	-0.1266	-0.7730	-0.1889	0.2862	JIZ FUJ SGN	
111	1999/03/15:01:46	33.6	138.2	320	4.6	9.17e15	87.25	far S off Tokai District	14	89	-46	105	44	178	0.2852	0.6274	-0.2765	0.2858	0.6784	-0.0096	JIZ FUJ ABU	
112	1999/03/15:03:51	44.6	149.4	28	4.7	1.41e16	81.96	SE off Etorofu	14	89	-46	105	44	178	0.2852	0.6274	-0.2765	0.2858	0.6784	-0.0096	JIZ FUJ ABU	
113	1999/03/15:09:45	43.4	139.2	47	4.7	1.27e16	83.73	NW off Shikotan pen	26	78	94	190	20	80	-0.3594	0.2132	-0.3594	-0.5594	-0.2861	-0.4573	NMR URH KZK	
114	1999/03/16:07:43	35.3	135.9	8	4.8	1.83e16	89.88	NW Shiga peninsula	17	60	101	175	26	67	0.1401	0.0932	0.2301	-0.9087	-0.6233	0.6667	FUJ KIS ISI	
115	1999/03/17:06:57	35.0	140.1	50	3.8	4.97e14	66.49	SE off Boso peninsula	176	59	48	56	51	138	0.1240	0.0530	0.3062	-0.7745	0.2042	0.6505	FUJ YMR KZK	
116	1999/03/18:12:27	43.6	147.2	50	4.3	3.69e15	89.49	E off Aomori pref	193	75	25	96	67	138	-0.4227	0.8531	0.1038	-0.1607	0.3638	0.2820	NMR URH KZK	
117	1999/03/18:12:27	41.1	142.4	44	4.3	3.56e15	92.13	E off Aomori pref	332	77	35	233	56	164	0.5977	0.3531	-0.4099	-0.8431	-0.3759	0.2454	TMJR GJM	
118	1999/03/18:17:55	41.1	143.2	35	5.9	7.16e17	73.68	E off Aomori pref	22	62	77	229	31	113	-0.2031	0.4816	0.1340	-0.5611	-0.5347	0.7642	TMJR GJM	
119	1999/03/19:07:55	45.3	143.1	5	3.9	7.16e17	83.15	eastern sea of Japan	32	61	92	207	29	86	-0.2070	0.3666	0.2937	-0.6447	-0.4321	0.8526	HSS URH SBT	
120	1999/03/19:10:33	36.4	140.9	41	4.0	1.13e15	90.80	E off Ibaraki pref	14	68	83	214	23	108	-0.0990	0.2706	0.1283	-0.5892	-0.6997	0.6882	YMR SBT	
121	1999/03/19:22:54	34.7	142.0	14	4.3	2.75e15	55.65	far E off central Honshu	355	63	35	248	60	148	0.1183	0.6907	-0.3924	-0.5792	-0.3017	0.4609	JIZ YMR FUJ	
122	1999/03/20:00:08	29.5	128.3	5	4.4	4.89e15	73.59	NW off Amami-Oshima is	122	71	-44	229	49	-155	0.8445	-0.1376	-0.3197	-0.4514	-0.6018	-0.3931	AMM TKA FUJ	
123	1999/03/21:10:18	40.2	142.5	41	4.7	1.09e16	90.87	NE off Iwate pref	22	71	103	167	23	57	0.0387	0.0411	0.3658	-0.6492	-0.6863	0.6105	TMJR GJM SBT	
124	1999/03/22:17:26	37.2	141.9	32	4.1	1.38e15	65.57	E off Fukushima pref	178	52	67	32	43	116	0.0120	0.2639	0.2552	-0.9135	0.2167	0.9015	YMR KZK SGN	
125	1999/03/22:20:54	40.9	142.0	65	4.2	2.05e15	65.56	E off Aomori pref	77	79	250	161	24	129	-0.2918	0.2421	-0.3861	-0.1652</				

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	Mo(Nm)	VarRed	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myy	Myz	Mzz	used Stations
141	1999/03/28 15:45	27.7	130.1	1	4.3	3.68e15	69.40	330	84	-67	72	24	-166	0.3364	0.3304	0.4830	-0.1943	0.7466	-0.1421	AMM
142	1999/03/29 01:25	31.9	131.1	8	3.5	1.93e14	73.60	215	80	-147	119	58	-11	0.8480	0.3764	0.1921	-0.0628	-0.4762	-0.1952	TKD
143	1999/03/31 00:39	36.4	141.8	35	3.8	6.60e14	81.99	26	69	95	192	22	76	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
144	1999/03/31 23:08	41.9	139.4	5	3.5	1.93e14	58.55	351	57	100	153	35	75	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
145	1999/04/01 18:45	31.9	130.3	11	4.3	3.68e14	73.60	14	82	166	106	76	9	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
146	1999/04/02 20:45	41.9	142.4	60	4.0	2.28e14	70.08	25	69	79	231	21	119	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
147	1999/04/03 18:17	42.3	143.0	62	3.8	6.63e14	80.08	33	69	87	221	21	119	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
148	1999/04/04 13:33	27.7	126.7	5	4.1	1.57e15	70.49	88	49	-69	238	45	-112	0.8983	0.3140	0.3895	-0.0302	-0.2303	-0.0285	AMM
149	1999/04/04 13:31	43.9	145.5	165	4.0	1.18e15	80.44	77	83	91	252	7	84	0.8983	0.3140	0.3895	-0.0302	-0.2303	-0.0285	AMM
150	1999/04/05 00:06	35.8	137.6	3	3.9	9.10e14	93.68	1	66	72	220	30	125	0.8983	0.3140	0.3895	-0.0302	-0.2303	-0.0285	AMM
151	1999/04/05 06:37	34.2	138.9	175	4.4	5.09e15	88.03	191	82	53	90	37	167	0.1732	0.6332	0.1507	-0.0500	0.7469	0.2251	JIZ
152	1999/04/05 10:28	40.1	142.4	41	4.3	2.86e15	87.37	30	74	102	114	58	-11	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
153	1999/04/05 18:07	35.9	147.5	26	4.4	3.36e15	81.99	212	73	-113	217	25	37	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
154	1999/04/07 14:12	43.9	140.5	33	3.3	3.86e14	81.99	30	74	102	114	58	-11	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
155	1999/04/08 08:22	37.2	135.2	400	4.3	2.65e15	82.50	130	55	113	211	25	37	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
156	1999/04/08 08:22	41.9	142.5	62	4.3	2.65e15	82.50	130	55	113	211	25	37	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
157	1999/04/10 05:22	42.3	142.5	62	4.3	2.65e15	82.50	130	55	113	211	25	37	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
158	1999/04/10 05:22	42.3	142.5	62	4.3	2.65e15	82.50	130	55	113	211	25	37	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
159	1999/04/10 05:22	42.3	142.5	62	4.3	2.65e15	82.50	130	55	113	211	25	37	0.8050	0.3291	0.3321	-0.0628	-0.4762	-0.1952	TKD
160	1999/04/11 05:24	33.8	137.0	320	4.9	2.26e15	93.70	169	88	96	277	6	17	-0.0836	-0.0930	0.1738	-0.0030	0.9769	0.0866	AMM
161	1999/04/11 21:59	37.2	142.2	23	3.5	2.16e14	69.41	20	78	107	145	21	37	0.1254	0.0918	0.3653	-0.5202	-0.7937	0.4038	SBT
162	1999/04/12 00:22	37.2	142.2	23	3.5	2.16e14	69.41	20	78	107	145	21	37	0.1254	0.0918	0.3653	-0.5202	-0.7937	0.4038	SBT
163	1999/04/15 15:01	25.9	138.5	26	4.8	1.51e16	89.47	9	84	100	129	11	31	0.0417	-0.1349	0.1615	-0.2434	-0.9513	0.2017	YMZ
164	1999/04/15 22:54	36.2	139.8	50	3.3	1.14e14	59.83	312	54	-124	181	47	-52	-0.2523	0.2149	0.4019	0.0063	0.8526	0.2461	AMM
165	1999/04/16 07:07	40.7	142.7	29	3.6	2.93e14	82.03	14	80	111	128	23	26	0.0073	0.4094	0.4424	0.7939	-0.0720	-0.8012	YMZ
166	1999/04/17 02:51	38.6	142.9	11	4.2	1.96e15	85.97	265	88	-135	174	65	-2	0.2414	0.8832	0.4252	-0.1363	-0.0046	-0.1051	GJM
167	1999/04/17 02:51	38.6	142.9	11	4.2	1.96e15	85.97	265	88	-135	174	65	-2	0.2414	0.8832	0.4252	-0.1363	-0.0046	-0.1051	GJM
168	1999/04/17 07:35	25.9	128.5	26	4.4	5.31e15	89.71	211	78	56	104	36	159	-0.5662	0.4231	-0.2994	0.2338	0.6989	0.3324	AMM
169	1999/04/17 07:35	25.9	128.5	26	4.4	5.31e15	89.71	211	78	56	104	36	159	-0.5662	0.4231	-0.2994	0.2338	0.6989	0.3324	AMM
170	1999/04/18 06:50	33.8	134.7	8	3.6	2.78e14	78.07	294	87	-166	134	77	-13	0.7256	-0.6384	-0.3433	-0.6621	-0.0343	-0.0635	ABU
171	1999/04/18 18:44	39.0	140.9	119	4.4	5.06e15	90.54	157	48	92	14	42	88	-0.1660	0.2164	-0.0584	-0.8811	0.0952	-0.0158	TKD
172	1999/04/18 23:14	34.3	139.7	5	4.9	2.88e16	86.33	158	68	52	42	42	146	0.4116	0.1990	0.2918	-0.9637	0.4372	0.5511	GJM
173	1999/04/19 08:42	34.3	139.7	5	4.9	2.88e16	86.33	158	68	52	42	42	146	0.4116	0.1990	0.2918	-0.9637	0.4372	0.5511	GJM
174	1999/04/19 08:42	34.3	139.7	5	4.9	2.88e16	86.33	158	68	52	42	42	146	0.4116	0.1990	0.2918	-0.9637	0.4372	0.5511	GJM
175	1999/04/21 19:18	30.6	131.4	47	4.0	1.11e15	90.00	356	72	99	149	20	64	-0.0207	-0.1885	-0.0125	-0.5543	-0.8077	0.5750	YMZ
176	1999/04/22 08:21	29.1	130.1	32	4.0	1.01e15	58.39	355	51	-112	208	44	-65	-0.0160	-0.2028	0.2675	-0.9340	0.1817	-0.9181	TKA
177	1999/04/22 21:38	41.1	142.0	32	3.9	9.13e14	69.47	24	64	89	206	26	92	0.8433	-0.2467	0.3992	-0.1400	0.4049	-0.7033	AMM
178	1999/04/23 13:51	44.6	149.6	38	4.3	3.05e15	88.95	24	50	77	225	41	106	-0.1359	0.3008	0.2484	-0.6413	-0.5746	0.7773	GJM
179	1999/04/23 20:39	31.2	130.5	165	4.4	3.85e15	73.71	42	77	86	193	20	100	-0.2991	0.4756	-0.0606	-0.6591	-0.2277	0.9582	NMR
180	1999/04/24 09:38	36.3	141.6	20	4.0	1.12e15	84.47	2	77	98	190	15	59	-0.0043	0.0914	0.163	-0.3519	-0.6604	0.5843	KZK
181	1999/04/24 18:12	30.6	133.7	20	4.0	1.12e15	84.47	2	77	98	190	15	59	-0.0043	0.0914	0.163	-0.3519	-0.6604	0.5843	KZK
182	1999/04/25 09:13	35.5	140.3	89	4.4	4.49e15	86.99	146	48	-111	356	46	-68	0.0636	-0.9853	0.1260	-0.0145	-0.1497	-0.0491	TKD
183	1999/04/25 12:37	36.5	140.5	56	5.2	6.24e16	94.66	16	70	95	182	20	77	0.0077	0.1068	0.2338	-0.8993	0.0341	-0.9152	YMZ
184	1999/04/26 06:14	38.6	141.9	44	3.6	2.52e14	56.63	21	66	76	232	27	119	-0.1361	0.4904	0.1876	-0.5142	-0.6261	0.6503	GJM
185	1999/04/26 07:57	32.2	140.8	98	4.5	6.43e15	72.00	334	66	90	155	24	91	-0.0669	-0.3656	-0.2968	-0.6319	-0.5935	0.6888	JIZ
186	1999/04/27 03:25	35.0	141.6	29	4.5	2.13e14	76.63	92	77	-140	351	51	-17	0.1967	0.7300	-0.6083	-0.0621	0.2261	-0.2588	GJM
187	1999/04/27 18:24	43.1	145.9	32	3.5	2.36e14	62.12	47	65	134	160	49	33	0.3242	0.2865	0.5574	-0.8613	-0.0629	0.5370	URH
188	1999/04/29 12:16	36.1	141.0	71	3.6	2.85e14	59.16	31	83	91	203	7	82	-0.1710	0.3431	0.4921	-0.2379	-0.8339	0.0668	KZK
189	1999/04/30 01:50	37.8	142.1	32	3.8	6.36e14	58.50	193	65	-69	331	32	-127	0.0106	0.1395	0.3485	0.7515	-0.5495	-0.7621	GJM
190	1999/04/30 04:42	36.2	142.5	5	4.1	1.67e15	71.00	14	69	92	187	21	84	-0.2280	0.3897	-0.0657	-0.7472	-0.2552	0.9762	YMZ
191	1999/04/30 09:35	39.8	141.8	65	3.9	7.39e14	89.03	19	77	87	203	43	93	0.2038	0.1933	0.1738	-0.7568	-0.7178	0.5530	GJM
192	1999/05/02 06:56	36.1	136.4	81	3.5	1.73e14	74.17	223	68	128	339	43	33	0.2844	0.1880	0.6320	-0.8288	0.2201	0.5444	ABU
193	1999/05/02 17:55	42.0	142.6	50	4.1	1.55e15	77.09	27	65	87	214	25	96	-0.2121	0.3136	0.2760	-0.5600	-0.5960	0.7721	URH
194	1999/05/02 20:58	44.7	149.6	33	4.5	7.28e15	80.38	269	71	-143	127	56	28	0.4336	-0.4058	0.4296	-0.8749	-0.2777	0.4413	NMR
195	1999/05/03 09:27	26.8	130.3	32	3.7	4.70e14	56.82	142	74	47	35	45	157	0.0051	-0.8708	0.4303	-0.0681	0.3532	0.0630	AMM
196	1999/05/03 10:55	37.0	142.2	10	3.9	4.50e14	64.85	142	74	47	35	45	157	0.0051	-0.8708	0.4303	-0.0681	0.3532	0.0630	AMM
197	1999/05/03 14:46	36.4	138.0	11	3.9	9.11e14	84.22	352	70	39	247	54	155	0.1974	0.6636	-0.2681	-0.6315	-0.4235	0.4341	TKD
198	1999/05/03 14:49	32.5	140.7	29	3.7	4.17e14	61.64	275	57	84	106	34	99	-0.1101	0.1693	0.4042	-0.0212	0.0183	0.9089	GJM
199	1999/05/03 15:00	36.4	138.0	20																

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	Mo(Nm)	VarRed	Region name	Str1	Dip1	Rat1	Str2	Dip2	Rat2	Mscv	Mscv	Mscv	Mscv	Mscv	Mscv	Mscv	Mscv	used Stations
211	1999/05/09:23:45	37.8	142.6	23	4.1	1.36e15	59.80	far E off Fukushima pref	32	65	102	156	28	66	0.0331	0.2651	0.4768	0.7522	0.7192	0.4768	0.7522	0.7192	YMZ SBT GJM
212	1999/05/09:23:45	37.8	142.7	23	3.5	1.36e15	59.80	far E off Fukushima pref	32	65	102	156	28	66	0.0331	0.2651	0.4768	0.7522	0.7192	0.4768	0.7522	0.7192	YMZ SBT GJM
213	1999/05/10:07:09	37.5	141.9	35	4.8	1.81e15	83.74	near Amami-Oshima pref	196	63	98	177	13	53	0.1210	0.2694	0.5644	0.8082	0.6863	0.5644	0.8082	0.6863	YMR SBT KZK
214	1999/05/10:10:20	28.1	130.6	17	4.0	1.31e15	83.07	near Amami-Oshima island	196	63	98	177	13	53	0.1210	0.2694	0.5644	0.8082	0.6863	0.5644	0.8082	0.6863	YMR SBT KZK
215	1999/05/12:17:59	43.0	143.9	101	6.1	2.76e15	91.92	E off Hachijima island	275	78	109	130	18	56	0.0500	0.2294	0.8597	0.8597	0.0500	0.8597	0.8597	0.0500	HSS TMR
216	1999/05/12:23:52	32.6	140.2	29	3.7	2.06e15	50.01	SE off Boso peninsula	187	78	89	12	42	54	0.0483	0.0571	0.1996	0.1996	0.0483	0.0571	0.1996	0.1996	HSS TMR
217	1999/05/13:08:22	33.1	140.2	29	3.7	2.06e15	50.01	SE off Boso peninsula	187	78	89	12	42	54	0.0483	0.0571	0.1996	0.1996	0.0483	0.0571	0.1996	0.1996	HSS TMR
218	1999/05/13:08:22	33.1	140.2	29	3.7	2.06e15	50.01	SE off Boso peninsula	187	78	89	12	42	54	0.0483	0.0571	0.1996	0.1996	0.0483	0.0571	0.1996	0.1996	HSS TMR
219	1999/05/14:08:08	33.3	141.3	29	4.0	6.02e15	89.43	far SE off Boso pen	108	68	98	266	23	70	0.0686	0.0896	0.8672	0.8672	0.0686	0.8672	0.8672	0.0686	SGN URH
220	1999/05/14:18:23	26.8	127.8	11	4.5	7.49e15	81.40	near Okinawa island	309	57	94	136	33	84	0.4766	0.5411	0.3258	0.3258	0.4766	0.5411	0.3258	0.3258	YMR SBT GJM
221	1999/05/15:11:19	34.4	141.2	35	3.9	6.83e14	79.94	far S off Boso peninsula	68	66	90	24	24	90	0.6494	0.2811	0.6264	0.6264	0.6494	0.2811	0.6264	0.6264	JIZ TMR
222	1999/05/16:00:25	34.4	136.1	8	3.4	1.60e14	84.22	southern Mie pref	9	74	136	114	48	22	0.1971	0.5984	0.3006	0.3006	0.1971	0.5984	0.3006	0.3006	KIS TMR
223	1999/05/16:21:20	41.9	142.5	56	4.4	4.36e15	76.21	S off Urawaka	137	73	98	171	19	65	0.2363	0.1348	0.2367	0.2367	0.2363	0.1348	0.2367	0.2367	YMR SBT KZK
224	1999/05/19:12:23	28.9	129.9	14	3.7	3.45e14	83.29	near Amami-Oshima island	339	53	104	162	39	72	0.0486	0.1770	0.2168	0.2168	0.0486	0.1770	0.2168	0.2168	YMR SBT KZK
225	1999/05/20:08:43	40.2	143.1	62	3.8	1.39e15	64.81	far E off Sanriku	186	53	67	41	33	118	0.1504	0.3427	0.2617	0.2617	0.1504	0.3427	0.2617	0.2617	YMR SBT KZK
226	1999/05/20:11:54	40.2	143.1	62	3.8	1.39e15	64.81	far E off Sanriku	186	53	67	41	33	118	0.1504	0.3427	0.2617	0.2617	0.1504	0.3427	0.2617	0.2617	YMR SBT KZK
227	1999/05/20:11:58	43.0	146.9	35	4.3	2.76e15	74.33	E off Amori pref	187	78	89	12	42	54	0.0483	0.0571	0.1996	0.1996	0.0483	0.0571	0.1996	0.1996	HSS TMR
228	1999/05/20:12:26	43.1	146.8	29	3.8	2.76e15	74.33	E off Amori pref	187	78	89	12	42	54	0.0483	0.0571	0.1996	0.1996	0.0483	0.0571	0.1996	0.1996	HSS TMR
229	1999/05/20:15:22	33.2	140.6	74	3.7	3.87e14	52.34	E off Hachijima island	258	73	114	167	29	37	0.1066	0.1574	0.5512	0.5512	0.1066	0.1574	0.5512	0.5512	YMR SBT KZK
230	1999/05/21:03:23	27.7	130.5	5	3.9	7.07e14	77.49	near Amami-Oshima island	187	82	115	80	26	19	0.2038	0.8596	0.3650	0.3650	0.2038	0.8596	0.3650	0.3650	YMR SBT KZK
231	1999/05/21:18:28	27.1	127.7	8	4.1	1.81e15	94.52	near Okinawa island	100	61	126	336	45	43	0.5185	0.6413	0.4394	0.4394	0.5185	0.6413	0.4394	0.4394	YMR SBT KZK
232	1999/05/22:00:48	30.1	139.1	28	4.1	1.81e15	84.22	near Okinawa island	100	61	126	336	45	43	0.5185	0.6413	0.4394	0.4394	0.5185	0.6413	0.4394	0.4394	YMR SBT KZK
233	1999/05/22:00:48	30.1	139.1	28	4.1	1.81e15	84.22	near Okinawa island	100	61	126	336	45	43	0.5185	0.6413	0.4394	0.4394	0.5185	0.6413	0.4394	0.4394	YMR SBT KZK
234	1999/05/22:00:48	30.1	139.1	28	4.1	1.81e15	84.22	near Okinawa island	100	61	126	336	45	43	0.5185	0.6413	0.4394	0.4394	0.5185	0.6413	0.4394	0.4394	YMR SBT KZK
235	1999/05/22:10:09	30.8	141.0	5	4.1	1.63e15	92.08	NW off Amami-Oshima is	293	77	42	34	29	163	0.7715	0.4055	0.4903	0.4903	0.7715	0.4055	0.4903	0.4903	YMR SBT KZK
236	1999/05/23:00:28	30.9	143.4	23	3.9	9.94e14	54.55	far E off Miyagi pref	113	56	84	203	35	98	0.0132	0.3076	0.0382	0.0382	0.0132	0.3076	0.0382	0.0382	YMR SBT KZK
237	1999/05/23:08:19	43.2	146.1	11	4.0	9.94e14	60.00	far E off Miyagi pref	113	56	84	203	35	98	0.0132	0.3076	0.0382	0.0382	0.0132	0.3076	0.0382	0.0382	YMR SBT KZK
238	1999/05/23:08:19	43.2	146.1	11	4.0	9.94e14	60.00	far E off Miyagi pref	113	56	84	203	35	98	0.0132	0.3076	0.0382	0.0382	0.0132	0.3076	0.0382	0.0382	YMR SBT KZK
239	1999/05/24:08:59	40.4	142.4	56	3.7	3.50e14	93.21	near Kunashiri island	191	83	115	295	25	15	0.4942	0.3682	0.2835	0.2835	0.4942	0.3682	0.2835	0.2835	YMR SBT KZK
240	1999/05/25:02:35	31.5	131.9	32	3.6	7.17e14	69.51	NE off Iwate pref	283	56	128	137	50	47	0.4700	0.6107	0.3679	0.3679	0.4700	0.6107	0.3679	0.3679	YMR SBT KZK
241	1999/05/27:06:01	29.0	130.1	20	3.5	1.75e14	63.77	E off Fukushima pref	157	81	121	53	32	16	0.3300	0.2588	0.3972	0.3972	0.3300	0.2588	0.3972	0.3972	YMR SBT KZK
242	1999/05/28:03:11	35.5	139.5	18	3.5	2.30e14	59.23	near Amami-Oshima island	283	70	112	54	29	44	0.7237	0.1755	0.3402	0.3402	0.7237	0.1755	0.3402	0.3402	YMR SBT KZK
243	1999/05/28:11:19	36.8	142.2	37	4.5	5.86e15	89.76	Kanagawa pref	23	75	88	211	16	97	0.0000	0.2860	0.6716	0.6716	0.0000	0.2860	0.6716	0.6716	YMR SBT KZK
244	1999/05/29:12:09	36.5	141.6	35	3.5	2.09e14	57.25	E off Ibaraki pref	336	80	55	233	33	164	0.4831	0.2179	0.2346	0.2346	0.4831	0.2179	0.2346	0.2346	YMR SBT KZK
245	1999/05/31:00:36	36.0	140.3	56	3.6	3.07e14	74.03	southern Ibaraki pref	245	79	38	343	53	166	0.4831	0.2179	0.2346	0.2346	0.4831	0.2179	0.2346	0.2346	YMR SBT KZK
246	1999/05/31:03:22	43.1	144.6	62	4.0	2.89e15	89.83	Kushiro region	129	69	96	191	52	30	0.8512	0.0627	0.1184	0.1184	0.8512	0.0627	0.1184	0.1184	YMR SBT KZK
247	1999/05/31:05:11	36.7	142.3	20	4.3	3.13e15	90.49	E off Fukushima pref	26	69	96	191	52	30	0.8512	0.0627	0.1184	0.1184	0.8512	0.0627	0.1184	0.1184	YMR SBT KZK
248	1999/06/01:14:08	37.0	141.5	35	3.5	2.18e14	64.30	E off Fukushima pref	149	82	59	252	32	165	0.4775	0.2335	0.4434	0.4434	0.4775	0.2335	0.4434	0.4434	YMR SBT KZK
249	1999/06/01:14:12	43.1	146.4	4	3.8	6.32e14	76.68	E off Nemuro peninsula	206	73	104	66	21	52	0.3497	0.2711	0.2614	0.2614	0.3497	0.2711	0.2614	0.2614	YMR SBT KZK
250	1999/06/02:22:47	37.7	140.3	130	4.0	1.15e15	63.77	mid Fukushima pref	197	75	111	322	26	38	0.1450	0.1501	0.3333	0.3333	0.1450	0.1501	0.3333	0.3333	YMR SBT KZK
251	1999/06/03:11:15	43.5	147.3	32	3.5	1.75e14	52.28	E off Hokkaido	135	80	37	10	171	0.1199	0.0469	0.7167	0.7167	0.1199	0.0469	0.7167	0.7167	YMR SBT KZK	
252	1999/06/03:11:30	35.9	136.7	8	3.4	1.63e14	81.05	Fukui Gifu border region	27	56	110	174	39	63	0.2734	0.1233	0.3985	0.3985	0.2734	0.1233	0.3985	0.3985	YMR SBT KZK
253	1999/06/03:19:30	34.7	138.6	200	4.2	2.39e15	82.45	southern Suruga bay reg	10	88	39	102	51	177	0.0279	0.7109	0.1209	0.1209	0.0279	0.7109	0.1209	0.1209	YMR SBT KZK
254	1999/06/04:08:55	42.3	143.1	56	3.7	4.38e14	79.04	Hidaka mountains region	37	65	87	235	25	146	0.0266	0.4120	0.3770	0.3770	0.0266	0.4120	0.3770	0.3770	YMR SBT KZK
255	1999/06/04:13:59	36.1	141.6	14	4.2	2.62e15	80.22	far E off Ibaraki pref	353	77	70	232	23	166	0.0266	0.4120	0.3770	0.3770	0.0266	0.4120	0.3770	0.3770	YMR SBT KZK
256	1999/06/04:21:32	32.5	141.9	17	3.9	2.50e15	86.02	E off Hachijima island	163	88	19	254	71	177	0.6484	0.8037	0.1927	0.1927	0.6484	0.8037	0.1927	0.1927	YMR SBT KZK
257	1999/06/04:22:58	27.4	129.6	14	4.1	2.43e15	75.17	near Amami-Oshima island	272	80	98	133	13	50	0.2702	0.1429	0.9357	0.9357	0.2702	0.1429	0.9357	0.9357	YMR SBT KZK
258	1999/06/05:03:53	27.6	129.4	14	4.1	2.43e15	75.17	near Amami-Oshima island	332	64	89	149	26	93	0.0500	0.1660	0.2223	0.2223	0.0500	0.1660	0.2223	0.2223	YMR SBT KZK
259	1999/06/05:04:22	27.6	129.4	14	4.2	2.43e15	75.08	near Amami-Oshima island	332	64	89	149	26	93	0.0500	0.1660	0.2223	0.2223	0.0500	0.1660	0.2223	0.2223	YMR SBT KZK
260	1999/06/05:04:24	27.4	129.6	11	4.2	2.04e15	79.72	near Amami-Oshima island	307	8													

Table 5: Estimated moment tensors (continued).

Stn	Origination Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	M0(Nm)	VarRef	Region name	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myx	Myz	Mzz	used	Stations
281	1999/08/15/07:47	43.0	146.0	32	5.1	3.09e16	0.057	off Nemuro peninsula	67	74	141	170	53	20	0.2547	0.6329	0.5933	-0.5754	0.0218	0.3207	URH	HSS
282	1999/08/15/10:46	43.4	142.2	34	5.1	3.29e14	88.52	E off Iwate pref	126	74	83	230	17	114	-0.0695	0.3840	0.3655	-0.7641	0.4282	0.4357	TMR	GJM
283	1999/08/16/11:22	40.4	143.2	30	3.3	2.69e15	73.57	E off Aomori pref	92	57	-64	201	41	-124	0.10795	-0.1815	-0.3017	-0.3458	-0.7338	0.9050	URH	HSS
284	1999/08/17/11:32	40.5	143.9	30	4.3	2.69e15	73.57	E off Aomori pref	92	58	-64	201	41	-124	0.10795	-0.1815	-0.3017	-0.3458	-0.7338	0.9050	TMR	GJM
285	1999/08/17/12:32	32.3	141.1	11	4.0	1.19e15	63.22	E off Hiroshima pref	292	72	105	207	98	161	0.05037	-0.6252	-0.3375	-0.8127	0.3091	JIZ	YJZ	
286	1999/08/17/13:38	35.8	140.1	11	3.9	6.81e14	88.06	northern Chitosa pref	356	72	105	207	98	161	-0.06560	-0.2542	0.0635	-0.5150	-0.7923	0.3800	SGN	YJZ
287	1999/08/18/07:08	38.2	140.1	7	4.1	1.55e15	90.01	Kiama region	356	72	105	207	98	161	-0.06560	-0.2542	0.0635	-0.5150	-0.7923	0.3800	SGN	YJZ
288	1999/08/18/07:08	38.2	141.7	53	4.0	1.55e15	90.01	SE off Miyagi pref	20	73	91	298	16	127	-0.1713	0.2401	0.2230	-0.2779	-0.5853	0.4492	GJM	TMR
289	1999/08/18/22:50	37.7	142.4	38	4.4	4.76e15	85.91	SE off Osumi pen	25	70	87	211	30	98	-0.2833	0.2129	0.2562	-0.4036	-0.7816	0.9401	FUK	SBR
290	1999/08/19/21:49	34.0	140.0	11	3.3	1.05e14	51.29	far S off Boso peninsula	3	86	-18	94	72	-176	-0.1446	0.9364	-0.1431	-0.6063	0.0753	0.0753	JIZ	FUK
291	1999/08/19/22:32	40.7	142.6	35	4.2	1.89e15	88.31	E off Aomori pref	21	72	81	227	20	115	-0.1144	0.3480	0.2565	-0.4360	0.5504	0.5504	TMR	GJM
292	1999/06/20/02:26	43.7	139.5	250	4.6	1.06e16	88.91	NW off Shakotan pen	210	72	79	71	16	131	-0.3476	0.1524	-0.3697	-0.1337	0.4813	0.4813	HSS	TMR
293	1999/06/21/16:52	43.2	145.9	44	4.9	2.57e16	88.32	off Nemuro peninsula	32	62	83	227	28	103	-0.3086	0.4358	0.2559	-0.4876	0.7963	0.7963	URH	HSS
294	1999/06/22/20:48	28.8	130.3	20	3.9	8.55e14	84.34	near Amami-Oshima island	158	73	-27	257	64	-161	0.5904	0.6901	0.1451	-0.3810	-0.4886	-0.2094	AMM	AMM
295	1999/06/24/06:08	37.8	140.7	95	4.2	2.19e15	83.01	mid Fukushima pref	24	74	60	268	34	149	-0.4378	0.1638	0.0396	-0.8248	-0.4736	-0.4736	YJZ	YJZ
296	1999/06/24/12:18	32.0	131.9	40	4.0	1.02e15	79.66	Hyuganada region	178	77	-78	312	18	-134	0.0778	0.2188	0.0286	-0.3659	-0.8757	-0.8757	SBR	FUK
297	1999/06/24/12:52	44.4	146.4	175	4.6	5.67e15	94.15	near Kunashiri island	327	77	-35	66	56	-165	0.7820	0.4295	0.1050	-0.5638	-0.2152	-0.2152	URH	URH
298	1999/06/25/21:39	42.2	147.7	5	3.8	7.27e14	70.88	far SE off Hokkaido	284	63	-75	72	31	-117	0.8623	-0.0272	0.5202	-0.0924	0.2384	-0.7699	URH	URH
299	1999/06/26/15:06	37.3	141.7	38	3.5	1.96e14	69.24	E off Fukushima pref	153	74	90	197	16	91	0.0158	0.1569	0.5217	-0.5046	0.8282	0.8282	YJZ	YJZ
300	1999/06/26/21:16	43.2	147.5	44	4.3	2.71e15	65.19	E off Hokkaido	153	68	27	157	65	156	0.6028	0.3577	0.5438	-0.8410	-0.2353	-0.2353	KZK	SGN
301	1999/06/27/05:04	36.1	139.1	38	3.9	8.92e14	70.32	E off Hachijojima island	175	50	96	346	40	83	0.0137	0.1652	-0.0435	-0.9010	0.1841	0.1841	FUJ	TTO
302	1999/06/27/05:04	36.1	139.8	59	4.1	1.65e15	94.88	SW Ibaraki pref	47	67	83	244	24	106	-0.4392	0.3192	0.4611	-0.2444	-0.7396	-0.7396	YJZ	TTO
303	1999/06/27/11:19	28.1	130.2	14	3.7	3.61e14	84.23	near Amami-Oshima island	55	72	85	250	19	104	-0.0773	0.2628	0.0646	-0.4739	0.3648	0.3648	AMM	AMM
304	1999/06/28/03:36	29.1	130.5	17	3.7	3.61e14	84.23	near Amami-Oshima island	55	72	85	250	19	104	-0.0773	0.2628	0.0646	-0.4739	0.3648	0.3648	AMM	AMM
305	1999/07/01/04:33	41.8	142.2	92	4.2	2.46e15	82.39	S off Utsunomiya	223	58	-128	99	48	20	0.8187	-0.3367	-0.0824	-0.3463	-0.8704	-0.8704	AMR	AMR
306	1999/07/01/11:12	42.0	142.5	50	4.3	3.22e15	83.30	S off Utsunomiya	25	58	-128	99	48	20	0.8187	-0.3367	-0.0824	-0.3463	-0.8704	-0.8704	AMR	AMR
307	1999/07/01/19:17	36.5	140.7	56	3.7	4.68e14	72.22	northern Ibaraki pref	115	75	86	217	18	101	-0.1410	0.2759	0.3958	-0.1949	0.1356	0.1356	TMR	AMR
308	1999/07/01/21:38	34.5	139.3	17	3.8	5.62e14	90.75	near Niijima island	113	87	-171	92	81	-93	0.0852	0.1832	0.2352	-0.3243	-0.8132	-0.8132	AMR	AMR
309	1999/07/05/01:05	42.3	138.2	290	4.3	3.60e15	91.97	eastern sea of Japan	65	77	-139	325	50	14	0.7517	-0.3834	-0.4798	-0.5262	0.0292	0.0292	HSS	GJM
310	1999/07/05/03:46	43.5	147.5	56	5.1	4.29e16	59.36	E off Hokkaido	59	77	98	207	15	59	-0.1934	0.2281	0.7877	-0.2456	-0.4390	-0.4390	NMR	URH
311	1999/07/05/08:49	32.4	142.0	5	4.6	8.06e15	70.76	far E off Izu Islands	305	57	85	135	33	98	-0.5325	-0.4680	-0.3655	-0.3620	-0.1994	-0.1994	JIZ	JIZ
312	1999/07/05/21:44	49.2	147.0	65	3.8	5.64e14	72.48	E off Hokkaido	67	86	89	266	4	108	-0.1310	0.0159	0.9110	-0.0320	-0.3843	-0.3843	AMM	AMM
313	1999/07/06/01:10	29.2	130.6	29	4.3	2.90e15	70.16	near Amami-Oshima island	24	55	92	201	35	88	-0.2247	0.2706	0.1613	-0.7670	0.1937	0.1937	URH	URH
314	1999/07/06/15:16	32.1	140.8	11	4.4	3.81e15	90.06	E off Hachijojima island	291	75	-148	191	59	-18	0.2799	0.7198	0.5852	-0.0129	-0.3053	-0.3053	JIZ	JIZ
315	1999/07/07/11:10	43.5	147.8	35	3.9	9.05e14	79.64	E off Hokkaido	286	70	-123	168	38	-34	0.2154	0.5640	0.6776	-0.3252	-0.0129	-0.0129	URH	URH
316	1999/07/07/13:09	42.9	145.4	50	3.6	2.41e14	64.07	off Nemuro peninsula	16	76	66	258	28	149	-0.1500	0.5176	0.2039	-0.2354	-0.7737	-0.7737	URH	URH
317	1999/07/07/17:19	25.3	128.4	62	4.7	1.22e16	84.35	near Okinawajima island	11	86	94	155	6	54	0.0379	-0.0221	0.1930	-0.2071	-0.9619	-0.9619	AMM	AMM
318	1999/07/07/19:57	34.0	142.5	5	4.5	6.87e15	67.72	far E off central Honshu	186	59	-103	291	34	-70	0.0391	-0.2719	-0.0664	0.8239	-0.8629	-0.8629	SGN	YJZ
319	1999/07/08/05:38	34.6	137.0	320	4.2	2.59e15	91.62	Mikawa bay region	214	84	101	331	12	27	0.1255	0.0292	-0.5538	-0.3080	0.7881	0.7881	KIS	ABU
320	1999/07/10/15:19	36.7	141.6	26	3.5	1.85e14	72.37	E off Ibaraki pref	359	72	98	204	20	-66	-0.1084	-0.1215	-0.0896	-0.5284	-0.7981	-0.7981	NAA	SGN
321	1999/07/13/04:28	34.6	140.6	38	3.9	7.66e14	83.09	SE off Boso peninsula	39	72	121	149	34	24	0.3740	0.1068	0.5329	-0.7366	0.3636	0.3636	JIZ	TTO
322	1999/07/14/09:18	39.1	142.9	26	3.7	4.26e14	86.35	far E off Sanriku	23	73	97	187	19	69	-0.1285	0.2133	0.3288	-0.4119	-0.743	-0.743	FUJ	COM
323	1999/07/14/22:56	36.0	140.5	56	5.1	5.33e16	94.38	southern Ibaraki pref	8	72	97	187	19	69	-0.0367	0.0383	0.1505	-0.5780	-0.8673	-0.8673	TMR	COM
324	1999/07/15/10:25	34.6	135.1	3	3.8	4.73e14	81.39	Osaka bay region	28	55	102	188	37	73	0.1757	0.4441	0.1896	-0.9540	-0.7754	-0.7754	ABU	ABU
325	1999/07/15/17:59	34.4	133.2	17	4.2	2.12e15	95.25	eastern Hiroshima pref	201	83	161	293	71	8	0.6522	-0.6772	-0.2966	-0.6153	0.2597	0.2597	SGN	KIS
326	1999/07/15/23:13	28.5	128.3	92	4.9	2.40e16	98.52	NW off Amami-Oshima is	356	70	-151	109	43	-150	0.0995	0.5977	0.2116	-0.2066	-0.0370	-0.0370	ISI	ABU
327	1999/07/19:08:09	42.1	142.4	14	3.6	2.51e14	62.50	far E off Miyagi pref	37	75	106	170	22	44	0.2281	0.3557	0.4617	-0.4820	-0.5502	-0.5502	YJZ	ABU
328	1999/07/16/02:01	43.5	147.5	8	4.7	1.32e16	69.04	near Tokara Islands	271	62	-104	113	40	-73	0.9443	0.2097	0.2245	-0.0040	-0.1426	-0.1426	AMM	FUK
329	1999/07/17/03:25	29.2	130.5	32	4.5	5.33e15	83.46	E off Hokkaido	61	64	90	242	26	91	-0.6212	0.3781	0.5390	-0.1269	-0.3010	-0.3010	NMR	URH
330	1999/07/17/03:25	29.2	130.5	32	4.3	3.42e15	73.08	near Amami-Oshima island	210	67	100	6	25	67	-0.0307	0.2374	-0.4038	-0.6748	0.7055	0.7055	AMM	AMM
331	1999/07/17/15:27	34.2	135.8	50	3.9	6.99e14	82.71	southern Nara pref	65	63	-148	319	62	31	0.9400	0.3269	-0.1198	-0.4980	-0.4421	-0.4421	ABU	ISI
332	1999/07/17/15:27	42.2	142.6	44	3.6	3.22e14	73.09	Hidaka region	95	87	-36	187	54	-177	0.3408	-0.7842	-0.5881	-0.1471	0.1247	0.1247	URH	HSS
333	1999/07/18/00:29	35.3	141.2	41	4.1	1.43e15	61.21	E off Boso peninsula	212	67	132	325	47	32	0.5430	0.0305	-0.2419	-0.1985	0.5554	0.5554	YJZ	SGN
334	1999/07/18/00:34	33.8	141.2	23	4.3	3.53e15	75.21	E off Boso peninsula	224	76	-43	326	49	-162	-0.2795	-0.2156	0.3585	-0.9637	-0.3842	-0.3842	YJZ	KZK
335	1999/07/18/20:14	33.8	134.3	11	3.9	7.20e14	91.62	Tokushima pref	200	73	152	299	64	19	0.5164	-0.5605	-0.3985	-0.7597	0.2755	0.275		

Table 5: Estimated moment tensors (continued).

No.	Origin Time (UT)	Lat (N)	Lon (E)	D (km)	Mw	M (Nm)	Var (E)	Region name	Str1	Dip1	Rak1	Str2	Dip2	Rak2	Mxx	Mxy	Mxz	Myx	Myy	Myz	Mzz	used Stations
351	1999/07/27 05:30	39.9	143.0	29	5.0	3.30e16	75.51	far E off north Honshu	36	65	-48	152	48	-145	-0.4214	-0.1226	-0.4307	0.0004	0.2269	-0.5791	TMR URH	
352	1999/07/27 14:14	39.7	142.2	26	3.6	2.51e14	69.42	E off Iwate pref	249	85	80	135	10	159	-0.2364	-0.0579	-0.9114	0.1328	0.3543	0.1036	TMR URH	
353	1999/07/28 09:59	34.0	133.5	23	3.4	4.43e14	69.42	Huchindaka Setonai	325	87	-10	185	80	-177	-0.1305	-0.0679	-0.0494	0.1363	0.0657	0.1036	ABU KIS	
354	1999/07/28 10:16	43.1	146.7	44	3.8	5.17e14	67.17	off Nemuro peninsula	71	60	88	254	30	93	-0.8028	0.2642	0.4600	-0.0529	-0.1754	-0.8556	URH KIS	
355	1999/07/28 17:59	32.5	130.6	48	3.7	4.58e14	89.32	southern Kumamoto pref	113	72	-23	211	69	-161	-0.1991	-0.0322	-0.1991	-0.6322	-0.4935	-0.1088	SGN SBR	
356	1999/07/28 19:01	32.5	130.6	48	3.6	4.24e14	87.26	southern Kumamoto pref	299	90	42	209	48	186	0.6226	-0.3948	-0.5863	-0.6263	-0.3339	-0.0038	SGN SBR	
357	1999/07/28 20:56	34.3	149.1	44	4.4	4.24e15	81.03	SE off Etorofu	52	85	100	168	11	26	0.0655	0.1678	0.2277	-0.1917	-0.5982	-0.1262	NMR TKD	
358	1999/07/28 20:56	34.3	149.1	44	4.4	4.24e15	81.03	SE off Etorofu	52	85	100	168	11	26	0.0655	0.1678	0.2277	-0.1917	-0.5982	-0.1262	NMR TKD	
359	1999/07/30 22:55	32.0	130.1	89	4.0	1.82e15	88.67	W off Amakusa island	178	83	-87	333	76	-115	0.2675	-0.4800	-0.0070	0.1038	-0.1665	-0.0898	FUK KZK	
360	1999/07/31 04:32	41.5	142.1	53	4.6	9.80e15	78.19	E off Iwate pref	25	71	93	197	20	82	-0.1142	0.1784	-0.0362	-0.7016	-0.9706	-0.3713	TMR URH	
361	1999/08/01 19:58	34.4	135.3	11	3.8	5.10e14	94.81	Osaka bay region	187	58	110	334	37	62	0.1163	-0.1704	-0.2038	0.0365	0.3843	0.8233	ABU KIS	
362	1999/08/02 07:00	34.9	141.1	17	3.9	6.92e14	92.97	E off Boso peninsula	319	80	-139	220	74	-14	-0.0343	-0.0632	-0.4826	0.0365	-0.3843	-0.8233	SGN URH	
363	1999/08/02 07:00	34.9	141.1	17	3.9	6.92e14	92.97	western Nagano pref	338	89	12	247	78	178	0.0742	0.0917	-0.0867	0.0365	-0.3843	-0.8233	SGN URH	
364	1999/08/02 09:51	36.0	137.5	8	3.8	4.89e14	91.45	western Nagano pref	159	88	-16	250	74	-178	0.0742	0.0917	-0.0867	0.0365	-0.3843	-0.8233	SGN URH	
365	1999/08/02 15:32	40.1	142.1	56	4.3	1.11e14	91.23	NE off Iwate pref	14	75	92	186	62	82	-0.0018	-0.0064	-0.0064	-0.0064	-0.0064	-0.0064	TMR URH	
366	1999/08/04 04:10	44.3	149.3	47	4.5	6.78e15	76.73	SE off Etorofu	39	77	132	130	62	15	0.1439	0.4819	0.3613	-1.0095	-0.2238	-0.2660	NMR URH	
367	1999/08/04 09:42	33.4	135.3	35	3.4	1.61e14	81.23	SE off Kii peninsula	214	69	32	111	69	136	-0.0018	-0.0064	-0.0064	-0.0064	-0.0064	-0.0064	ABU KIS	
368	1999/08/04 11:26	38.1	143.2	38	3.5	1.87e14	50.00	S off off Miyagi pref	18	63	59	219	29	143	-0.3113	0.3763	0.1112	0.6468	-0.5702	0.7781	SGN TMR	
369	1999/08/04 13:46	42.7	142.7	59	3.4	1.51e14	71.87	Hidaka mountains region	288	77	-87	339	38	-143	0.0517	0.0191	-0.4460	-0.3746	-0.3641	-0.5772	URH URH	
370	1999/08/05 16:26	35.7	140.6	35	4.5	5.35e15	93.33	near Choshi city	339	73	95	161	18	73	-0.0833	-0.0917	0.0311	-0.5162	-0.8231	-0.5996	YMR JIZ	
371	1999/08/06 16:17	41.6	142.1	50	3.7	4.31e14	71.40	E off Amori pref	23	71	90	203	19	90	0.0973	0.2184	0.3059	-0.5253	-0.7230	-0.6225	TMR HSS	
372	1999/08/07 03:30	34.4	136.2	4	3.3	9.22e13	50.76	southern Mie pref	4	69	151	105	63	24	0.0974	-0.8118	0.2665	-0.4761	-0.2996	-0.3789	ABU NAA	
373	1999/08/07 11:12	37.4	142.3	11	3.6	3.16e14	52.94	E off Fukushima pref	39	65	117	169	36	46	0.1004	0.2260	0.5299	-0.8028	-0.3098	-0.7024	YMR SBT	
374	1999/08/08 15:42	40.5	142.0	104	3.7	4.21e14	86.02	E off Amori pref	30	61	-45	147	52	-141	-0.4216	0.0275	-0.4148	-0.0335	-0.1516	-0.6119	TMR GJM	
375	1999/08/08 15:42	36.1	140.0	89	3.8	6.38e14	78.20	SW Ibaraki pref	359	77	83	207	14	117	-0.0146	0.1028	-0.0497	-0.4211	-0.8972	-0.4356	SGN TTO	
376	1999/08/08 21:39	35.1	139.9	113	4.6	8.17e15	87.92	eastern Saitama pref	164	70	-113	35	30	-42	-0.3763	-0.0953	-0.1805	-0.8704	-0.6706	-0.4941	SGN TTO	
377	1999/08/10 18:38	43.2	147.9	17	5.1	4.73e16	90.34	E off Hokkaido	250	71	-43	357	50	-155	-0.0689	-0.6888	0.5526	0.5020	-0.0028	-0.4331	SGN URH	
378	1999/08/11 09:28	35.4	139.8	53	4.0	9.93e14	75.31	Tokyo bay region	62	85	73	317	17	164	-0.3561	-0.1038	0.8256	0.1969	-0.4614	-0.1592	SGN URH	
379	1999/08/11 17:47	34.8	136.9	47	3.3	9.07e13	64.12	Mikawa bay region	80	22	301	62	26	61	-0.8436	0.3713	0.0385	0.8096	-0.4318	-0.0840	NAA URH	
380	1999/08/12 20:50	43.5	147.5	47	4.8	1.65e16	82.19	E off Hokkaido	72	67	104	220	26	61	-0.4868	0.3576	0.6869	-0.2194	-0.1150	-0.7061	NMR URH	
381	1999/08/15 01:20	32.6	140.8	50	4.1	1.72e15	55.12	E off Hachijojima island	202	62	84	35	29	101	-0.1580	0.3812	-0.1610	-0.4931	-0.5194	-0.6334	JIZ URH	
382	1999/08/15 22:32	42.2	142.9	47	4.0	1.12e15	78.44	Hidaka region	32	70	87	221	108	108	-0.0308	0.3812	-0.3876	-0.4931	-0.5194	-0.6334	JIZ URH	
383	1999/08/16 07:29	31.9	138.2	380	5.0	3.71e16	88.20	near Torishima is	6	75	-71	203	48	-173	-0.0308	0.3812	-0.3876	-0.4931	-0.5194	-0.6334	JIZ URH	
384	1999/08/16 18:41	43.9	147.6	44	4.1	1.52e15	76.14	E off Hokkaido	40	67	61	193	34	88	-0.1580	0.3812	-0.1610	-0.4931	-0.5194	-0.6334	JIZ URH	
385	1999/08/16 20:42	33.7	141.1	47	4.3	2.91e15	93.38	E off Hachijojima island	320	67	81	197	37	138	-0.1580	0.3812	-0.1610	-0.4931	-0.5194	-0.6334	JIZ URH	
386	1999/08/17 04:24	29.0	130.2	62	4.9	2.14e16	83.88	near Amami-Oshima island	56	56	-91	197	34	88	-0.1580	0.3812	-0.1610	-0.4931	-0.5194	-0.6334	JIZ URH	
387	1999/08/17 06:16	40.1	142.8	35	4.8	2.02e16	83.88	near Amami-Oshima island	17	72	91	193	18	86	-0.1580	0.3812	-0.1610	-0.4931	-0.5194	-0.6334	JIZ URH	
388	1999/08/18 06:17	25.9	128.6	17	4.0	2.12e15	83.96	near NE off Iwate pref	23	85	-87	143	18	86	-0.1580	0.3812	-0.1610	-0.4931	-0.5194	-0.6334	JIZ URH	
389	1999/08/18 07:43	25.9	128.6	17	4.0	2.12e15	83.96	near NE off Iwate pref	23	85	-87	143	18	86	-0.1580	0.3812	-0.1610	-0.4931	-0.5194	-0.6334	JIZ URH	
390	1999/08/18 17:30	43.0	146.9	32	3.9	7.71e14	75.74	near Okinawa-jima island	266	80	78	173	55	141	-0.2205	0.2568	-0.3746	-0.1012	-0.8446	-0.3217	NMR URH	
391	1999/08/19 04:01	33.6	138.7	32	3.6	2.67e14	75.76	far S off Tokai District	291	62	143	40	58	33	-0.9503	0.3684	-0.1693	-0.4356	-0.4037	-0.5147	JIZ URH	
392	1999/08/19 22:34	43.1	146.8	32	4.4	3.84e15	82.71	E off Hokkaido	77	60	106	227	33	64	-0.6807	0.3969	-0.1429	-0.4037	-0.5147	-0.6334	JIZ URH	
393	1999/08/19 23:57	41.6	141.9	340	4.4	3.75e14	57.04	E off Amori pref	29	66	112	165	32	50	0.2046	0.1633	0.3815	-0.8642	-0.4770	-0.6596	TMR URH	
394	1999/08/20 07:09	25.9	128.6	20	3.9	8.75e14	81.75	near Okinawa-jima island	24	88	-91	238	2	-55	-0.0064	-0.0664	-0.0664	-0.0664	-0.0664	-0.0664	AMM URH	
395	1999/08/20 08:46	35.4	137.4	47	3.6	2.97e14	84.25	SE Gifu pref	218	66	-31	322	62	-152	-0.5915	0.0008	0.6120	0.9123	-0.0456	-0.3208	TTO URH	
396	1999/08/20 15:21	40.7	142.6	38	4.2	1.97e15	77.12	E off Amori pref	339	71	79	191	22	120	-0.0535	-0.0121	-0.3680	-0.6014	-0.6894	-0.6549	TTO URH	
397	1999/08/20 20:33	34.0	135.5	65	5.6	2.79e17	93.15	central Wakayama pref	319	78	-08	175	25	-151	0.4952	0.3591	0.5713	-0.1883	-0.6189	-0.3069	NAA URH	
398	1999/08/21 10:36	35.2	139.3	50	4.1	1.35e15	89.62	near Choshi city	283	68	98	183	23	72	-0.1180	0.0972	0.3423	-0.6303	-0.6300	-0.7483	SGN URH	
399	1999/08/21 11:15	36.2	140.7	130	3.9	7.83e14	69.78	western Saitama pref	23	74	-39	25	52	-160	0.6240	-0.6000	0.4823	-0.2960	0.3385	-0.3280	SGN URH	
400	1999/08/21 19:00	43.1	145.8	62	4.0	1.14e15	91.11	off Nemuro peninsula	340	81	37	244	54	169	-0.4861	0.5510	-0.2343	-0.7150	-0.5032	-0.2289	URH HSS	
401	1999/08/22 03:51	37.9	142.0	38	4.2	2.24e15	88.66	SE off Miyagi pref	23	77	98	169	15	57	0.0784	0.0757	0.3672	-0.4771	-0.8147	-0.3987	YMR SBT	
402	1999/08/22 06:29	36.2	136.9	8	3.7	4.24e14	92.97	Toyama Gifu border reg	151	80	6	243	84	-179	0.8087	0.5355	-0.0219	-0.8675	-0.1108	-0.0888	NAA TTO	
403	1999/08/23 06:11	41.7	143.6	50	3.7	3.71e16	87.82	SE off Erimomaki	151	80	6	243	84	-179	0.8087	0.5355	-0.0219	-0.8675	-0.1108	-0.0888	NAA TTO	
404	1999/08/23 10:08	41.9	142.7	50	3.9	3.97e16	81.63	S off Urakawa	29	69	84	225	55	-138	-0.2493	0.3312	0.3932	-0.4272	-0.6585	-0.9174	URH HSS	
405	1999/08/24 02:52	36.0	137.5	38	4.3	3.97e16	81.63	western Nagano pref	313	57	-44	225	55	-138	-0.2493	0.3312	0.3932	-0.4272	-0.6585	-0.9174	URH HSS	
406																						

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	Mo(Nm)	Varied	Region name	Sir1	Dip1	Rak1	Sir2	Dip2	Rak2	Mxx	Mxy	Mxz	Myy	Myz	Mzz	used Stations
421	1999/09/05/03:19	37.4	139.0	6	3.7	3.75e14	75.61	mid Niigata pref	15	59	88	200	31	94	-0.0875	0.2472	0.1009	-0.8019	-0.4537	0.8895	SBT YMZ TTO
422	1999/09/06/13:16	38.3	141.9	50	4.1	1.83e15	87.90	E off Miyagi pref	20	69	90	200	21	90	0.0047	0.2658	0.2512	-0.6258	-0.5975	0.6211	SBT YMZ TTO
423	1999/09/07/09:06	41.7	144.3	17	4.3	2.97e15	61.60	SE off Tokachi	27	49	-100	222	42	-79	0.0024	0.0066	0.0006	-0.6786	-0.1573	-0.8811	URH TMR HSS
424	1999/09/07/11:33	44.2	148.6	59	4.6	8.40e15	71.81	SE off Etorofu	231	89	-97	134	7	-8	0.1375	-0.0110	0.7752	-0.1055	-0.0321	-0.0321	NMR
425	1999/09/08/01:47	26.9	128.4	42	4.2	2.09e15	79.10	near Okinawajima island	47	66	98	210	25	74	-0.1375	0.4504	0.5069	-0.4407	-0.4138	-0.7032	AMM
426	1999/09/08/03:03	43.6	147.4	50	4.3	3.12e15	69.60	E off Hokkaido	144	79	24	49	66	168	0.8290	0.1996	0.4364	-0.8932	-0.1855	-0.0642	URH
427	1999/09/08/07:36	27.0	128.7	8	3.5	1.80e14	82.13	near Okinawajima island	284	68	-122	163	38	-37	0.3056	0.5527	0.6584	0.2816	-0.5871	-0.5871	AMM
428	1999/09/08/13:54	33.9	141.6	5	3.8	9.44e14	80.95	far SE off Boso pen	351	62	97	157	78	78	-0.0641	-0.2212	0.0318	-0.7677	-0.5542	0.8318	FUJ
429	1999/09/09/09:56	36.4	137.9	5	3.8	4.93e14	91.27	central Nagano pref	66	60	142	177	58	36	0.0572	0.6123	0.5090	-0.5706	0.2825	0.5134	SGN
430	1999/09/10/05:36	43.4	147.7	35	4.4	4.16e15	81.24	E off Hokkaido	278	82	77	157	15	148	-0.2217	-0.2628	-0.9283	-0.1212	0.2500	-0.2500	TTO
431	1999/09/12/07:39	40.2	143.5	8	4.0	1.10e15	57.87	far E off Sanriku	6	83	85	220	9	123	0.0194	0.1144	0.0907	-0.2525	-0.9695	0.2331	GJM
432	1999/09/12/20:32	40.9	141.3	8	4.0	1.26e15	91.99	Shimokita	194	57	68	32	35	106	-0.0673	0.2989	0.1189	-0.6592	-0.8417	-0.7385	HSS
433	1999/09/12/22:56	35.6	140.2	65	5.3	1.08e17	88.16	central Chiba pref	27	57	109	152	37	63	0.2166	-0.1712	0.1145	-0.0098	-0.9632	-0.7452	SBT
434	1999/09/14/02:14	35.7	137.4	280	4.3	6.72e15	95.98	SE off Gifu pref	33	89	-91	279	1	-24	0.1111	0.0928	-0.5431	0.0148	0.8382	-0.0870	NAA
435	1999/09/14/07:32	35.0	140.1	380	3.8	6.49e15	64.83	SE off Boso peninsula	65	81	-145	329	56	-11	0.7092	0.4441	-0.4544	-0.5916	-0.2065	-0.2065	TTO
436	1999/09/14/11:08	36.4	141.0	35	3.7	4.33e14	71.33	E off Ibaraki pref	30	76	117	146	30	29	0.1951	-0.0959	0.7086	-0.4561	0.4609	-0.4609	URH
437	1999/09/14/14:55	43.4	147.5	47	4.0	1.13e15	67.04	E off Hokkaido	81	71	116	205	31	85	-0.4603	0.5186	0.5186	-0.0497	-0.0445	-0.0445	SBT
438	1999/09/15/19:38	44.4	149.8	29	4.9	2.21e16	87.55	SE off Etorofu	47	53	94	221	37	85	-0.4570	0.5283	0.5283	-0.4767	-0.1536	-0.1536	URH
439	1999/09/16/14:18	43.9	148.4	41	4.6	9.67e15	82.38	SE off Etorofu	45	76	117	160	30	29	0.2270	0.1959	0.6435	-0.6430	0.4160	-0.4160	URH
440	1999/09/16/23:21	44.2	146.4	104	4.4	4.98e15	66.20	near Kunashiri island	6	84	136	101	46	8	0.1290	-0.6865	0.1938	-0.2424	-0.6720	-0.6720	URH
441	1999/09/19/06:46	26.4	128.9	8	4.7	1.10e16	79.83	near Okinawajima island	11	76	91	189	14	88	0.0367	0.0918	0.1699	-0.4718	-0.8709	-0.4351	AMM
442	1999/09/20/01:59	40.2	142.4	50	4.0	1.31e15	83.90	NE off Iwate pref	23	75	95	183	16	71	0.0176	0.1336	0.3512	-0.5025	-0.7869	-0.4849	HSS
443	1999/09/20/04:18	43.4	147.0	44	4.0	1.21e15	91.50	E off Hokkaido	140	73	-22	236	69	-162	0.10125	0.2518	-0.0153	-0.7366	-0.3561	-0.2760	URH
444	1999/09/21/01:59	26.3	126.0	8	4.5	6.11e15	84.92	NW off Okinawajima is	256	63	-98	93	28	-75	0.8194	0.0529	0.5529	-0.0308	-0.1992	-0.7886	AMM
445	1999/09/21/06:18	37.5	142.4	23	4.0	1.21e15	82.45	E off Fukushima pref	346	55	57	214	47	127	0.1263	0.2000	-0.3962	-0.9328	-0.2005	-0.8065	SBT
446	1999/09/21/08:26	26.3	126.0	5	4.6	8.77e15	90.87	NW off Okinawajima is	253	58	-84	63	33	-99	0.7905	-0.3324	0.4191	0.0951	-0.0762	-0.8856	AMM
447	1999/09/21/11:49	44.8	150.1	26	5.3	1.16e17	70.54	SE off Etorofu	62	86	-107	319	18	-14	0.3592	0.1020	-0.8274	-0.2270	-0.4563	-0.1921	NMR
448	1999/09/21/14:21	33.1	141.5	5	4.7	1.49e16	90.55	E off Hachiojima island	60	76	113	170	27	32	0.0097	-0.1758	0.1341	-0.7673	-0.6111	-0.7576	FUJ
449	1999/09/22/07:18	43.3	146.8	53	4.2	2.51e15	91.40	E off Hokkaido	50	76	113	170	27	32	0.1114	0.2434	0.7081	-0.5576	-0.4241	-0.4462	URH
450	1999/09/22/17:36	45.5	142.8	50	5.0	3.17e16	91.29	NE off Hokkaido	334	76	-55	83	38	-158	0.1571	0.4763	0.1650	-0.1460	-0.3710	-0.3710	URH
451	1999/09/24/05:33	34.7	137.1	11	3.7	3.47e14	75.30	Mikawa bay region	318	73	119	318	33	32	0.2457	-0.1934	-0.3724	-0.7236	0.6442	0.4779	NAA
452	1999/09/24/10:43	33.9	135.4	3.6	3.6	3.43e14	80.34	central Wakayama pref	207	80	-104	181	17	-37	0.0367	0.2387	0.7513	-0.3497	-0.5094	-0.3426	ISI
453	1999/09/24/18:05	36.8	141.6	35	4.4	4.80e15	94.00	E off Fukushima pref	211	89	-104	116	14	-5	0.2790	-0.0573	0.4578	-0.1922	-0.8568	-0.0868	SGN
454	1999/09/25/14:25	35.6	140.2	74	3.6	2.71e15	66.79	central Chiba pref	47	83	201	24	106	-0.1498	0.1354	-0.0236	-0.6392	-0.6849	0.7881	SGN	
455	1999/09/25/15:51	42.4	144.1	53	3.5	1.74e14	86.24	SE off Tokachi	195	89	-71	287	19	-177	-0.1152	0.2912	0.2687	-0.1608	-0.9111	-0.0456	URH
456	1999/09/26/23:38	44.2	148.3	65	5.1	4.69e16	76.28	SE off Etorofu	47	76	86	241	14	104	0.2901	0.2983	0.6382	-0.1282	-0.4183	-0.4183	URH
457	1999/09/27/05:33	44.1	148.1	62	5.1	4.26e16	73.12	SE off Etorofu	47	82	88	240	8	103	-0.1676	0.2082	0.7017	-0.0699	-0.6527	-0.2375	URH
458	1999/09/27/05:43	41.5	142.3	32	3.7	4.63e14	75.51	E off Amori pref	333	49	105	130	43	73	-0.3615	-0.5086	0.0895	-0.5910	-0.1970	0.9525	TMR
459	1999/09/28/19:28	37.1	141.6	74	3.6	2.87e14	71.56	E off Fukushima pref	192	69	-75	334	26	-125	-0.1818	0.0819	0.1955	-0.7763	-0.5946	-0.5946	KZK
460	1999/09/29/17:28	32.3	140.7	59	4.0	1.06e15	84.25	E off Hachiojima island	168	47	-93	353	44	-86	-0.0267	0.1804	-0.0484	0.9993	-0.6477	-0.9727	JIZ
461	1999/09/30/09:48	33.1	142.0	14	4.3	3.04e15	63.14	far E off Izu Islands	120	88	-89	282	2	-108	0.0710	0.0461	-0.8633	-0.0109	-0.4973	-0.0601	JIZ
462	1999/09/30/10:19	34.9	137.9	23	3.2	6.87e13	63.32	SW Shizuoka pref	302	76	165	36	75	14	-0.9367	0.3676	-0.0782	0.7996	-0.3089	0.1373	FUJ
463	1999/10/01/03:47	37.7	139.1	168	4.5	5.08e15	72.86	NE Niigata pref	193	86	62	96	29	172	-0.1730	0.4745	-0.2159	0.0977	-0.3059	0.1053	KZK
464	1999/10/01/06:07	44.2	148.3	68	4.2	2.57e15	74.06	SE off Etorofu	37	87	138	130	48	4	0.0829	-0.1733	0.4302	-0.7685	-0.5102	-0.0755	URH
465	1999/10/02/21:09	40.2	143.2	23	5.6	2.71e17	88.07	far E off Sanriku	28	70	95	193	20	76	0.0023	0.2724	0.3769	-0.5632	-0.6736	0.5808	TMR
466	1999/10/03/04:06	36.7	136.2	380	4.0	7.91e15	50.46	northern Kyoto pref	171	77	61	38	32	154	-0.0159	0.3972	0.3771	-0.4170	-0.7480	-0.4329	ABU
467	1999/10/03/08:53	37.0	140.3	39	4.1	1.50e15	70.26	near Amami-Oshima island	135	83	-87	292	27	-113	0.1521	0.1403	-0.6889	0.0527	-0.6869	-0.2048	AMM
468	1999/10/03/16:37	35.1	141.0	29	3.3	6.05e14	81.33	E off Hachiojima island	351	68	75	90	25	116	0.1132	-0.0860	-0.2734	-0.7860	-0.6520	-0.6407	SGN
469	1999/10/04/07:42	42.4	146.0	29	3.5	6.87e14	80.42	off Nemuro peninsula	32	60	74	242	24	116	-0.4465	0.4797	0.1292	-0.3850	-0.4855	0.8315	URH
470	1999/10/04/18:47	29.3	129.9	53	3.9	6.87e14	80.42	near Amami-Oshima island	275	79	-110	163	28	-24	0.1595	0.3980	-0.8626	-0.2373	-0.1595	-0.3928	FUK
471	1999/10/04/21:09	41.4	142.3	29	4.2	2.44e15	78.69	E off Amori pref	310	75	92	123	15	83	-0.3499	-0.1242	-0.6506	-0.2432	-0.5601	0.5931	TMR
472	1999/10/05/00:39	37.4	142.5	53	5.0	3.43e16	91.42	SE off Miyagi pref	58	78	109	179	22	33	0.0157	0.2796	0.7797	-0.4182	-0.3846	0.4025	YJM
473	1999/10/05/13:36	36.0	140.1	68	3.8	5.18e14	90.59	southern Ibaraki pref	3	65	86	193	26	99	0.0699	0.1148	0.0078	-0.8032	-0.6300	0.7332	YJM
474	1999/10/07/03:43	41.1	143.4	44	4.2	2.23e15	55.01	E off Amori pref	20	50	72	227	43	111	-0.1669	0.6041	-0.0674	-0.6869	-0.2010	-0.8538	TMR
475	1999/10/07/08:57	44.0	148.3	59	4.2	2.09e15	60.46	SE off Etorofu	40	60	-99	246	31	-74	0.8015	-0.4477	-0.3156	0.2299	0.3834	-0.8314	NMR
476	1999/10/09/07:58	40.0	143.0	23	3.9	8.14e14	90.10	far E off Sanriku	53	78</											

Table 5: Estimated moment tensors (continued).

No.	Origin time (UT)	Lat(N)	Lon(E)	D(km)	Mw	Mo(Nm)	Varied	Region name	S1r	Dip1	Rak1	S1r2	Dip2	Rak2	Mxx	Mxy	Mxz	Myy	Myz	Mzz	used Stations
491	1999/10/13 21:43	31.9	138.2	400	4.3	3.68e15	86.91	near Iorishima is	190	77	77	55	18	134	-0.0908	0.2719	-0.1069	-0.3342	0.8738	KIS	JIZ
492	1999/10/16 08:14	36.5	141.5	5	3.5	3.20e16	80.44	E off Ibaraki pref	59	68	131	173	45	32	0.1293	0.6205	-0.0615	-0.0615	0.5322	SGN	KZK
493	1999/10/17 09:28	36.6	139.4	8	3.0	2.17e16	81.24	Techigi Gunma border	348	69	56	231	39	146	0.2642	0.3736	-0.2337	-0.7976	0.5334	YUZ	TTO
494	1999/10/17 20:01	34.8	137.7	14	3.2	7.46e13	73.49	Hamanako lake region	209	88	-16	300	74	-178	-0.7709	0.4810	0.1295	0.8924	-0.1214	FUJ	TKA
495	1999/10/17 21:01	29.3	130.4	5	5.2	6.49e16	69.41	near Amami-Oshima island	52	75	116	169	30	31	0.1708	0.4054	0.6203	-0.5729	0.4112	AMM	GJM
496	1999/10/18 00:24	40.2	130.4	11	4.3	1.88e16	73.56	far E off Saikiu	27	56	100	190	36	75	0.0633	0.3789	0.2169	-0.8946	0.8313	TMR	GJM
497	1999/10/18 00:47	29.2	143.9	17	4.3	2.72e15	82.94	near Amami-Oshima island	66	69	-145	322	58	-25	0.5220	0.3682	-0.2718	-0.4906	0.5427	AMM	
498	1999/10/18 03:32	26.4	127.4	47	3.8	4.69e14	59.89	near Okinawa-jima island	257	71	109	30	26	47	0.4509	0.4431	-0.3774	-0.0882	0.1170	SGN	SGN
499	1999/10/19 05:39	33.2	140.9	56	4.4	4.99e15	87.39	E off Hachiojima island	324	74	309	222	25	159	0.5959	0.0732	-0.4655	-0.9461	0.3502	JIZ	SGN
500	1999/10/19 13:16	36.4	141.5	5	4.6	9.22e15	92.93	E off Ibaraki pref	16	73	72	243	25	134	-0.1959	0.3944	-0.4784	-0.3471	0.5429	YUZ	SGN
501	1999/10/19 16:42	43.8	148.4	11	3.9	2.05e15	61.87	SE off Etorofu	325	67	30	223	63	154	0.6298	0.1179	-0.4784	-0.0847	0.3549	NMR	URH
502	1999/10/20 02:18	42.9	145.5	41	3.2	8.16e15	63.40	off Nemuro peninsula	47	70	103	193	33	89	0.1199	0.3323	-0.3641	-0.8565	0.6187	URH	URH
503	1999/10/20 05:59	42.0	142.3	35	3.7	4.37e14	68.65	E off Aomori pref	109	48	74	312	20	107	-0.2111	0.2921	-0.1826	-0.4300	0.6442	HSS	URH
504	1999/10/21 13:41	41.1	142.9	41	4.8	2.00e16	79.55	E off Aomori pref	103	74	53	325	22	139	0.1331	0.3854	-0.3977	-0.2924	1.0055	TMR	HSS
505	1999/10/22 09:48	42.1	142.9	32	3.4	4.29e14	60.62	E off Tokachi	36	70	83	237	51	109	-0.3549	0.2913	-0.4060	-0.3055	0.5263	TMR	HSS
506	1999/10/22 09:48	42.1	144.0	41	4.2	2.12e15	79.27	SE off Tokachi	309	64	30	201	58	167	0.4321	0.3907	-0.4782	-0.0916	0.6624	URH	TMR
507	1999/10/23 10:00	33.5	140.8	62	4.6	8.89e15	96.92	E off Hachiojima island	309	64	30	201	58	167	0.4321	0.3907	-0.4782	-0.0916	0.6624	URH	TMR
508	1999/10/23 18:06	37.1	142.1	23	3.6	2.70e14	71.98	E off Fukushima pref	13	67	107	169	28	65	0.7032	0.3009	-0.2970	-0.4999	0.5031	YUZ	SGN
509	1999/10/24 04:21	44.7	149.9	41	6.0	1.05e18	91.77	SE off Etorofu	41	67	103	193	33	89	0.1199	0.3323	-0.3641	-0.8565	0.6187	URH	URH
510	1999/10/26 10:57	36.9	141.8	26	3.7	4.42e14	85.09	E off Fukushima pref	31	72	87	220	18	99	-0.1072	0.3698	-0.4630	-0.6237	0.7308	NMR	URH
511	1999/10/26 11:11	34.7	136.8	320	4.0	1.28e15	80.44	Ise bay region	166	84	81	40	11	144	-0.1096	0.1429	-0.1976	-0.1976	0.3071	NAA	ABU
512	1999/10/26 12:58	41.7	144.3	17	3.8	6.45e14	63.12	SE off Tokachi	196	54	72	45	40	113	-0.0799	0.5686	-0.0361	-0.7449	0.8248	URH	TMR
513	1999/10/26 22:38	43.2	147.8	29	4.1	1.78e15	78.90	E off Hokkaido	58	67	119	183	36	41	-0.0458	0.4845	-0.5774	-0.1794	0.6233	URH	URH
514	1999/10/26 20:49	29.3	130.7	74	4.3	2.77e15	66.02	near Amami-Oshima island	45	90	-39	135	51	-180	-0.7677	-0.0204	-0.4116	-0.7946	-0.0270	AMM	TKD
515	1999/10/26 22:49	45.6	142.4	320	4.6	8.21e15	85.06	NE off Hokkaido	317	88	-84	67	7	-159	0.1804	0.6594	-0.0477	-0.7385	-0.1327	TNK	HSS
516	1999/10/27 13:14	44.1	148.1	68	3.9	8.26e14	54.91	SE off Etorofu	53	78	89	236	12	93	0.2688	0.2128	-0.7317	-0.1224	0.3911	URH	URH
517	1999/10/27 15:03	41.6	142.1	53	4.0	1.32e15	75.36	E off Aomori pref	26	69	100	180	23	66	0.0592	0.1171	0.3900	-0.6423	0.7015	HSS	URH
518	1999/10/27 15:50	41.6	142.0	56	4.3	2.73e15	73.56	E off Aomori pref	25	69	106	167	26	66	0.0227	0.0549	-0.4066	-0.7057	0.6830	HSS	URH
519	1999/10/28 06:59	39.5	144.8	8	5.1	4.32e16	56.84	far E off north Honshu	195	62	-100	35	28	-73	0.2135	-0.2882	-0.6541	-0.8676	-0.8676	TMR	URH
520	1999/10/28 12:00	33.3	139.4	5	3.7	1.45e15	86.97	near Hachiojima island	298	83	-96	132	28	-78	0.5337	0.3136	-0.5425	-0.3290	0.2161	JIZ	SGN
521	1999/10/28 18:29	33.9	135.4	53	3.5	2.00e14	71.40	central Wakayama pref	308	69	-98	150	23	-70	0.2682	0.4482	-0.5897	-0.3426	0.6108	ABU	NAA
522	1999/10/29 04:36	37.1	140.8	77	3.6	2.48e14	61.69	eastern Fukushima pref	228	69	12	217	62	111	0.1373	0.1133	-0.4360	-0.2634	0.7807	SGN	SGN
523	1999/10/29 05:59	36.6	138.2	5	4.2	2.11e15	85.79	near Maushiro	318	67	52	214	54	151	0.9555	0.0791	-0.4384	-0.1091	0.3634	KZK	TTO
524	1999/10/29 08:12	37.4	141.9	50	3.5	1.87e14	53.36	E off Fukushima pref	270	87	138	354	44	37	0.1213	0.5335	-0.5429	-0.1675	0.5668	YUZ	TTO
525	1999/10/29 12:25	34.1	133.5	17	4.5	6.77e15	92.42	Huchinada Setonaikai	277	87	163	346	75	34	0.4612	0.8620	-0.2449	-0.4907	0.1023	TKD	FUK
526	1999/10/31 00:34	31.3	130.7	101	4.1	1.44e15	90.21	Satsuna peninsula region	263	67	128	21	44	34	0.4643	0.6282	-0.5603	-0.0924	0.1631	ABU	KIS
527	1999/10/31 11:51	26.6	130.1	8	3.1	1.43e15	78.27	near Amami-Daitojima is	262	58	-125	26	40	-134	0.0776	-0.6877	-0.3164	-0.1867	0.6943	AMM	ABU
528	1999/10/31 12:50	37.0	141.8	17	3.3	1.05e14	69.42	E off Fukushima pref	199	87	-86	340	7	-129	0.5775	0.0264	-0.3224	-0.9306	-0.1506	YUZ	SGN
529	1999/10/31 16:52	33.8	135.5	62	3.6	4.91e14	65.91	southern Wakayama pref	199	87	-86	340	7	-129	0.5775	0.0264	-0.3224	-0.9306	-0.1506	YUZ	SGN
530	1999/10/31 17:23	40.8	145.7	53	3.7	4.07e14	82.99	far SE off Hokkaido	102	82	-118	356	29	-18	0.0738	0.4821	-0.8376	-0.1752	0.2490	ABU	TMR
531	1999/10/31 21:15	36.8	139.4	8	3.9	8.90e14	88.51	Techigi Gunma border	259	80	-158	161	70	-22	0.6005	0.7838	-0.1818	-0.2850	0.3155	YUZ	KZK
532	1999/11/01 01:37	38.2	138.3	32	3.9	7.56e14	69.11	Sadogashima is reg	156	77	-78	291	18	-134	0.2043	0.3125	-0.3217	-0.2025	-0.4067	KZK	TTO
533	1999/11/01 05:12	43.2	146.9	32	4.1	1.69e15	71.17	E off Hokkaido	251	89	88	148	2	167	-0.1459	0.1057	-0.9522	-0.2732	-0.1273	NMR	URH
534	1999/11/01 15:01	31.8	129.1	17	3.7	3.97e14	66.63	SW off Kyushu	17	78	162	111	73	13	0.5969	-0.7183	0.3984	-0.5150	0.0819	FUK	SGN
535	1999/11/03 03:54	34.2	135.2	5	3.7	3.97e14	89.94	NW Wakayama pref	211	58	103	7	34	70	-0.0461	0.3107	-0.3205	-0.8197	0.3010	ISU	KIS
536	1999/11/03 07:14	35.8	139.3	150	4.1	1.78e15	94.93	Tokyo pref	317	62	142	68	57	34	0.9868	-0.3391	0.0203	-0.4448	0.5421	FUJ	JIZ
537	1999/11/03 14:33	40.7	142.6	32	3.6	2.51e14	75.58	E off Aomori pref	24	54	119	161	45	56	0.2318	0.0634	-0.3114	-0.4080	0.8055	TMR	SGN
538	1999/11/04 14:31	33.8	132.4	44	3.8	5.21e14	85.27	Iyonada Setonaikai	189	72	-54	302	39	-151	-0.1327	0.4485	-0.3179	-0.6090	-0.4763	TKD	SGN
539	1999/11/05 08:13	33.5	138.8	5	3.7	4.37e14	91.19	near Hachiojima island	298	85	136	33	47	7	0.7064	0.3501	-0.5781	-0.3494	0.1376	JIZ	SGN
540	1999/11/06 06:26	35.2	140.2	47	3.5	2.35e14	84.35	southern Boso peninsula	200	86	-162	108	72	-4	0.6772	-0.7594	0.1146	-0.4746	-0.2026	JIZ	SGN
541	1999/11/06 15:56	43.0	141.7	160	4.0	1.13e15	79.45	Ishikaji depression	225	82	75	108	16	152	0.3560	0.2113	-0.6649	0.1505	0.2055	URH	TMR
542	1999/11/06 18:34	36.1	135.8	14	4.7	1.23e16	82.11	NW off Kinki District	320	79	17	236	74	169	0.8112	0.3966	-0.3069	-0.8874	0.6556	ABU	NAA
543	1999/11/07 00:10	31.8	128.8	11	3.8	5.06e14	83.31	SW off Kyushu	292	62	-44	46	53	-144	0.1040	-0.2864	0.2213	-0.4487	0.1390	FUK	SGN
544	1999/11/07 12:53	37.4	140.5	74	4.5	0.00e15	72.50	east off Fukushima pref	263	55	56	134	47	128	-0.8306	-0.3573	0.2616	-0.0460	0.3712	KZK	SGN
545	1999/11/08 01:23	43.1	148.2	7	4.2	2.06e16	68.23	SE off Fukushima pref	89	135	132	45	1	1	0.6868	-0.0880	0.4784	-0.7110	0.0242	URH	URH
546	1999/11/08 05:38	43.1	148.2	7	4.2	2.06e16	68.23	SE off Fukushima pref	89	135	132	45	1	1	0.6868	-0.0880	0.4784	-0.7110	0.0242	URH	URH
547	1999/11/09 12:30	36.6	137.7	155	3.3	2.98e15	94.02	near Kago-shima city	178	78	-88	244	12	-101	0.34						

Table 5: Estimated moment tensors (continued).

No.	Origin Time(UT)	Lat(N)	Lon(E)	D(km)	Mw	Mor(Nm)	Varied	Region name	Strl	Dip1	Rak1	Sir2	Dip2	Rak2	Mxx	Mxy	Mxz	Myy	Myz	Mzz	used Stations
561	1999/11/20/01:32	43.9	146.9	77	4.3	2.71e15	93.27	near Kunashiri island	65	52	122	199	48	56	-0.3367	0.6239	0.2924	-0.4639	0.1836	0.8006	URH
562	1999/11/21/21:27	35.1	141.5	35	4.0	1.07e15	62.82	E off Boso peninsula	311	87	48	218	42	175	-0.5998	-0.1898	-0.5069	-0.7121	-0.5335	0.1122	SGN
563	1999/11/22/00:18	42.4	145.1	41	3.6	2.42e14	74.05	E off Nemuro peninsula	53	71	37	240	20	97	0.0985	0.2988	0.6096	-0.1846	-0.4849	0.6200	URH
564	1999/11/22/14:43	38.3	141.7	74	3.7	3.95e14	55.60	Kinkasan region	22	78	115	135	28	26	-0.4355	-0.1881	0.4068	-0.5835	-0.7350	0.3613	SGN
565	1999/11/22/20:20	36.2	140.6	74	4.2	2.12e15	77.66	northern Ibaraki pref	232	88	-57	325	38	-177	-0.3956	-0.1910	0.6383	0.5424	-0.0469	0.7336	SGN
566	1999/11/22/20:26	42.1	142.5	65	3.4	1.44e14	76.86	S off Utsunomiya	110	60	-65	337	36	131	-0.3781	-0.5027	-0.1891	-0.3547	-0.0106	-0.7604	URH
567	1999/11/23/05:15	36.2	138.8	165	3.9	9.37e14	94.25	SE Gunma pref	139	60	-64	275	60	-127	0.7081	0.4837	0.1495	0.0523	-0.4546	0.2366	SGN
568	1999/11/26/19:46	44.9	149.9	53	4.4	5.00e15	73.53	SE off Etorofu	183	74	32	83	60	162	-0.0756	0.8144	0.2546	-0.1610	0.4834	0.2366	SGN
569	1999/11/27/03:57	30.6	131.3	56	4.3	3.11e15	53.56	near Tanegashima island	325	84	146	60	57	8	-0.7591	-0.3003	-0.1263	0.7458	-0.5998	0.0132	AMM
570	1999/11/27/12:47	34.2	140.7	53	4.3	3.74e15	91.70	far S off Boso peninsula	198	57	111	342	38	60	0.0467	-0.0067	-0.3379	-0.9137	0.3074	0.8670	JIZ
571	1999/11/28/08:00	37.4	139.0	5	3.4	1.34e14	63.09	mid Niigata pref	352	87	-62	88	28	-173	0.1110	0.4620	0.1015	-0.0187	0.8762	-0.0923	SGN
572	1999/11/28/12:02	25.9	126.7	17	3.6	2.55e14	78.12	near Okinawa island	324	87	-62	88	28	-173	0.1110	0.4620	0.1015	-0.0187	0.8762	-0.0923	SGN
573	1999/11/28/13:43	43.9	144.9	38	4.1	1.36e15	86.32	Shiretoko peninsula reg	160	62	-39	271	56	-146	0.4741	0.6347	0.2771	0.0243	-0.5125	-0.4985	AMM
574	1999/11/28/22:16	32.6	132.0	38	3.9	0.96e14	60.58	Hyuganada region	186	60	-96	293	6	-5	0.0235	-0.1044	0.1828	-0.0093	-0.9855	-0.0145	TKD
575	1999/11/30/01:12	26.1	127.0	41	4.1	1.50e15	60.92	central Aichi pref	178	78	127	283	14	134	-0.7682	-0.2463	0.2892	0.4894	0.9403	0.2798	ABU
576	1999/11/30/01:12	26.1	127.0	41	4.1	1.50e15	60.92	near Aichi pref	229	78	127	283	14	134	-0.7682	-0.2463	0.2892	0.4894	0.9403	0.2798	ABU
577	1999/12/01/11:34	37.9	142.5	32	4.6	3.52e15	57.73	SE off Nagasaki pref	255	61	-55	196	28	-98	-0.0703	0.2827	-0.2617	0.7440	-0.8440	-0.4339	AMM
578	1999/12/03/17:38	43.8	141.7	18	4.0	1.36e15	83.46	SE off Nagasaki pref	179	66	87	342	28	74	-0.0703	0.2827	-0.2617	0.7440	-0.8440	-0.4339	AMM
579	1999/12/07/17:52	43.8	141.7	18	4.0	1.36e15	83.46	SE off Nagasaki pref	179	66	87	342	28	74	-0.0703	0.2827	-0.2617	0.7440	-0.8440	-0.4339	AMM
580	1999/12/07/21:25	36.7	140.7	47	4.0	1.36e15	86.60	near Choshi city	171	76	84	113	15	113	0.0476	0.0341	0.3983	-0.4903	0.7752	0.4445	HSS
581	1999/12/08/18:28	35.9	140.5	35	4.3	3.56e15	88.13	southern Ibaraki pref	74	64	93	247	27	83	-0.7666	0.3212	0.5818	0.0500	-0.1519	0.7166	FUJ
582	1999/12/08/18:28	35.9	140.5	35	4.3	3.56e15	88.13	southern Ibaraki pref	74	64	93	247	27	83	-0.7666	0.3212	0.5818	0.0500	-0.1519	0.7166	FUJ
583	1999/12/04/05:06	35.9	140.7	92	4.8	1.94e16	88.48	southern Ibaraki pref	170	88	-94	52	5	-28	0.1045	-0.0885	-0.1904	0.0386	-0.9740	-0.1431	SGN
584	1999/12/04/14:50	37.1	142.3	23	3.7	3.77e14	78.46	E off Fukushima pref	2	63	88	186	27	93	0.0308	0.0632	0.0101	-0.8282	-0.5771	0.7975	SGN
585	1999/12/05/05:56	43.3	146.0	50	3.8	5.19e14	76.83	off Nemuro peninsula	17	58	75	223	35	112	-0.1528	0.4565	0.0033	-0.6977	-0.4235	0.8505	URH
586	1999/12/05/07:28	42.5	139.2	220	4.7	1.41e16	85.53	SW off Hokkaido	187	80	92	356	10	79	-0.1532	-0.0188	-0.1254	-0.2570	0.9318	0.4102	HSS
587	1999/12/05/18:33	28.9	129.9	41	4.1	1.59e15	86.92	near Amami-Oshima island	26	81	82	249	12	132	-0.1767	0.1977	0.3855	-0.1329	-0.8615	0.3096	AMM
588	1999/12/05/22:58	36.7	141.2	32	4.2	1.90e15	83.48	E off Ibaraki pref	209	66	-82	10	25	-107	0.1471	-0.1854	0.6514	0.0514	-0.5395	-0.7985	SGN
589	1999/12/06/18:51	27.4	128.3	53	4.0	1.17e15	90.15	near Okinawa island	139	79	109	258	22	31	-0.4737	-0.1962	0.5238	0.1096	-0.7136	0.3641	AMM
590	1999/12/09/03:30	31.6	128.8	8	3.5	2.32e14	60.34	SW off Kyushu	5	86	-173	274	83	-4	0.2706	-0.9806	0.0178	-0.0222	-0.1001	-0.2483	FUK
591	1999/12/10/01:55	36.1	140.1	107	4.0	1.19e15	88.16	southern Ibaraki pref	345	61	-142	234	57	-35	-0.3212	-0.4715	0.4159	-0.8563	0.2101	-0.5350	FUJ
592	1999/12/10/16:04	34.9	139.3	17	3.3	1.12e14	61.38	E off Izu peninsula	120	83	173	211	83	7	-0.9122	0.4833	0.0414	0.8090	0.1491	0.1032	SGN
593	1999/12/11/03:45	42.0	142.3	35	4.1	1.42e15	83.97	S off Utsunomiya	86	85	128	183	38	9	-0.0438	0.6031	0.7842	-0.1014	0.0508	0.1451	HSS
594	1999/12/14/16:22	36.2	142.0	14	4.0	1.07e15	80.64	far E off Ibaraki pref	27	74	-151	216	20	98	-0.0631	0.3843	0.3332	-0.9833	-0.6992	0.5453	SGN
595	1999/12/14/16:55	37.2	127.2	95	4.4	4.82e15	73.95	Bungo channel	145	57	46	62	18	-70	-0.7029	-0.5514	-0.3372	0.9833	-0.2902	0.2302	TKD
596	1999/12/16/13:28	36.6	139.4	8	4.1	4.26e15	71.07	NW off Okinawa island	295	76	38	195	53	163	0.3917	-0.5514	-0.6415	-0.6571	0.0050	0.2333	AMM
597	1999/12/16/13:47	36.6	139.4	8	4.1	4.26e15	71.07	Tochigi Gunma border	352	72	45	244	48	155	0.2167	0.5960	-0.2250	-0.6571	-0.5205	0.4403	YMK
598	1999/12/17/17:45	41.6	142.3	47	3.7	4.20e14	85.34	Tochigi Gunma border	77	62	57	245	55	146	-0.0813	0.5845	-0.0878	-0.5094	-0.5907	0.5907	SGN
599	1999/12/17/21:26	43.4	146.9	32	3.7	4.60e14	82.05	E off Amori pref	49	76	103	183	19	46	-0.0416	0.4965	0.2801	0.2618	-0.4354	0.5286	URH
600	1999/12/18/06:49	34.0	138.8	8	4.0	1.31e15	89.78	E off Hokkaido	137	81	-169	46	79	-10	-0.9174	-0.0517	-0.2204	1.0212	-0.5144	-0.1038	JIZ
601	1999/12/18/10:56	36.9	135.4	8	3.5	2.14e14	75.64	NW off Hokkaido District	128	67	-52	245	43	-146	0.8682	0.1167	-0.2591	-0.3021	-0.5855	-0.5661	TTO
602	1999/12/18/13:31	43.0	143.7	98	4.4	4.35e15	80.54	Tokachi region	87	85	90	263	5	85	-0.2003	0.0189	0.9816	0.0325	-0.0478	0.1678	HSS
603	1999/12/20/08:33	33.3	131.5	5	3.5	1.88e14	61.92	northern Oita pref	247	89	163	337	73	1	0.8053	0.6546	-0.3195	-0.5895	-0.0004	-0.2158	TKD
604	1999/12/21/01:01	34.4	139.2	11	4.3	3.56e15	92.52	near Niijima island	21	86	-5	111	85	-176	-0.6324	0.7425	-0.0970	0.6896	0.0552	-0.0572	JIZ
605	1999/12/21/14:19	42.8	144.6	50	4.2	2.50e15	92.16	off Nemuro peninsula	42	74	99	192	19	61	-0.0226	0.3699	0.5679	-0.4259	-0.6116	0.4485	URH
606	1999/12/22/02:56	43.1	146.8	32	3.7	3.64e14	76.01	E off Hokkaido	48	83	132	147	42	11	0.5532	0.1341	0.6478	0.7291	-0.3686	0.1759	URH
607	1999/12/22/11:17	32.0	132.0	29	4.9	2.16e16	84.45	Hyuganada region	193	59	-81	357	32	-104	-0.0258	-0.0829	0.4617	-0.8820	-0.4471	-0.8362	FUK
608	1999/12/22/15:24	31.2	131.5	35	4.5	7.19e15	62.16	SE off Osumi pen	30	74	110	157	26	41	0.1740	0.0624	0.4617	-0.8711	-0.6472	-0.4971	TKD
609	1999/12/25/08:41	40.3	142.6	50	3.8	6.14e14	87.88	NE off Iwate pref	16	75	91	193	15	87	0.0763	0.1641	0.2354	-0.5103	-0.8370	0.4340	TMR
610	1999/12/25/18:33	43.4	138.5	270	4.7	1.27e16	94.80	eastern sea of Japan	135	67	135	247	50	32	-0.9047	-0.2512	0.1403	0.3884	0.5514	0.3884	HSS
611	1999/12/25/22:52	43.3	146.9	74	4.5	6.37e15	83.80	E off Hokkaido	24	83	78	265	14	150	-0.1336	0.2705	0.3842	-0.0608	-0.8689	0.1945	URH
612	1999/12/26/01:21	26.8	129.8	11	4.2	1.93e15	84.91	near Okinawa island	161	80	-106	41	19	-31	-0.0900	-0.1446	-0.3567	0.4307	-0.8355	-0.3407	AMM
613	1999/12/26/03:50	30.5	130.3	5	3.9	7.22e14	77.11	near Tanegashima island	21	80	-94	219	11	-72	0.0855	-0.1617	-0.3191	0.2702	0.8761	-0.3557	TKD
614	1999/12/26/15:06	36.2	139.9	50	4.2	2.13e15	93.42	SW Ibaraki pref	78	64	111	217	33	54	-0.5586	0.4093	0.6036	-0.2009	0.0654	0.7594	SGN
615	1999/12/27/14:04	41.9	144.4	29	3.7	3.67e14	59.31	SE off Tokachi	34	58	103	191	34	71	-0.0918	0.3372	0.3365	-0.7756	-0.3037	0.8674	URH
616	1999/12/28/08:39	34.4	131.6	14	3.9	1.59e14	60.25	Yamaguchi pref	220	76	1										

Jan 01, 1999 - Jan 31, 1999 (UT)

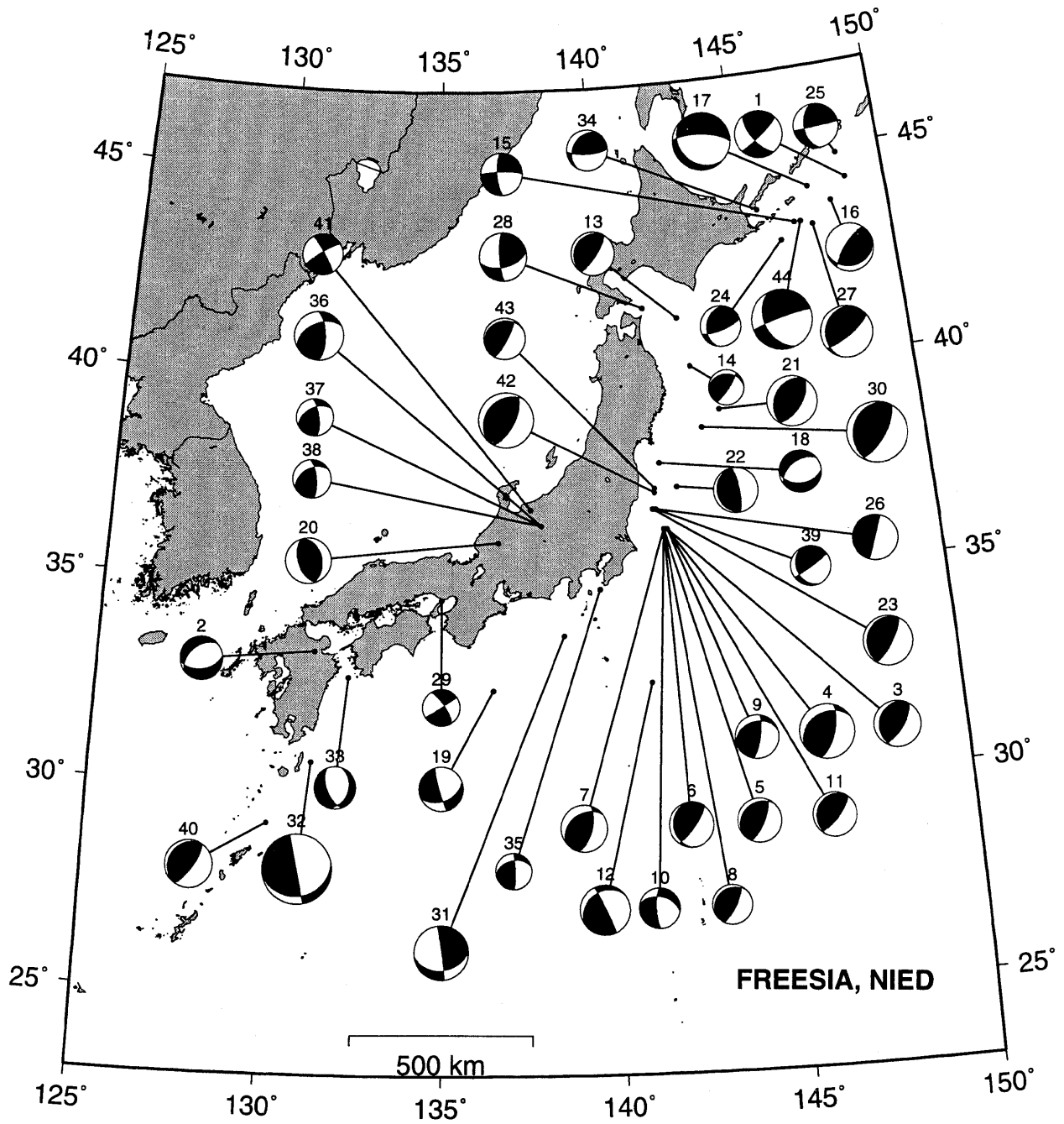


Fig. 2: Estimated focal mechanisms plotted with epicentral locations.

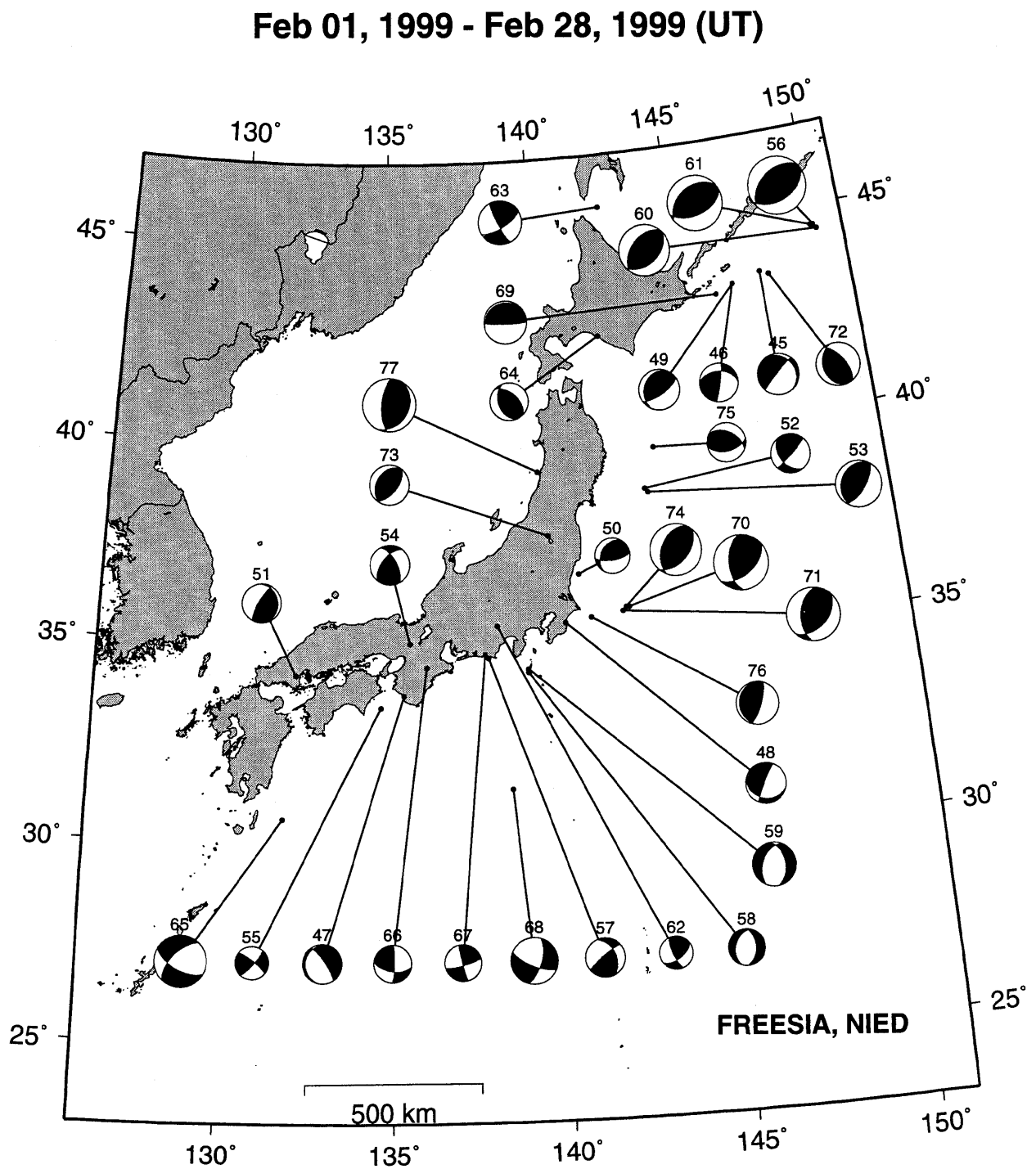


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Mar 01, 1999 - Mar 14, 1999 (UT)

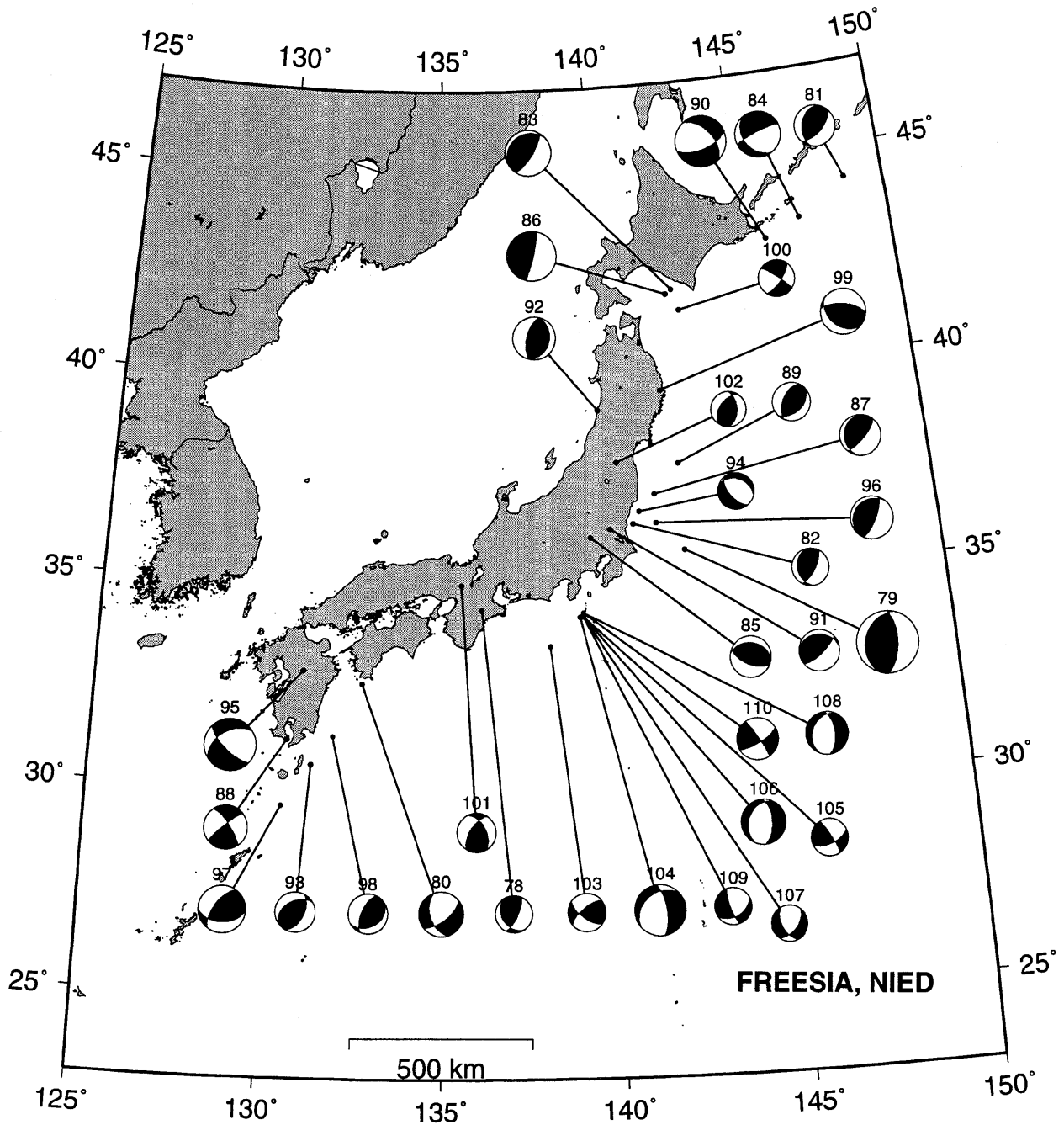


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

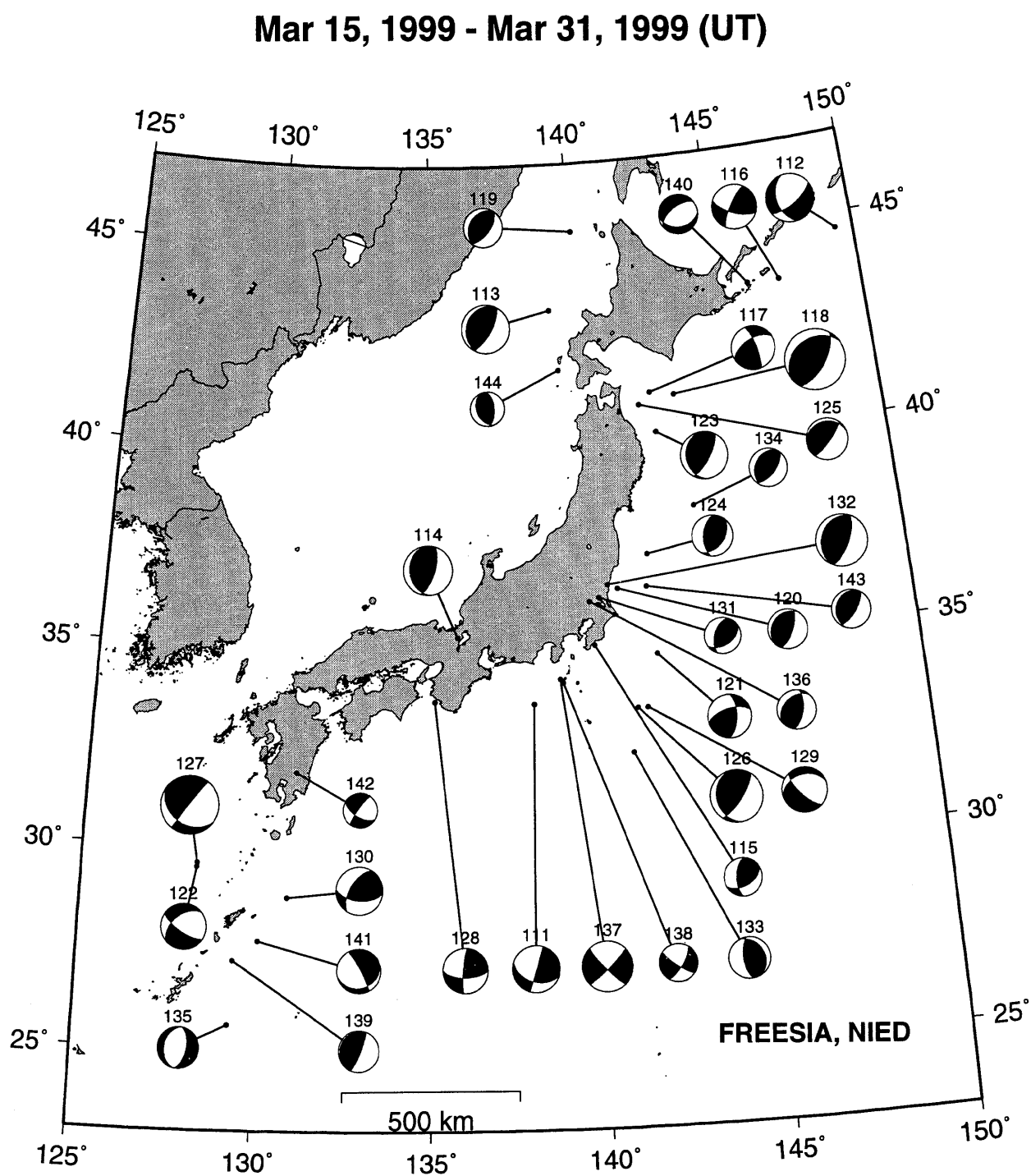


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Apr 01, 1999 - Apr 30, 1999 (UT)

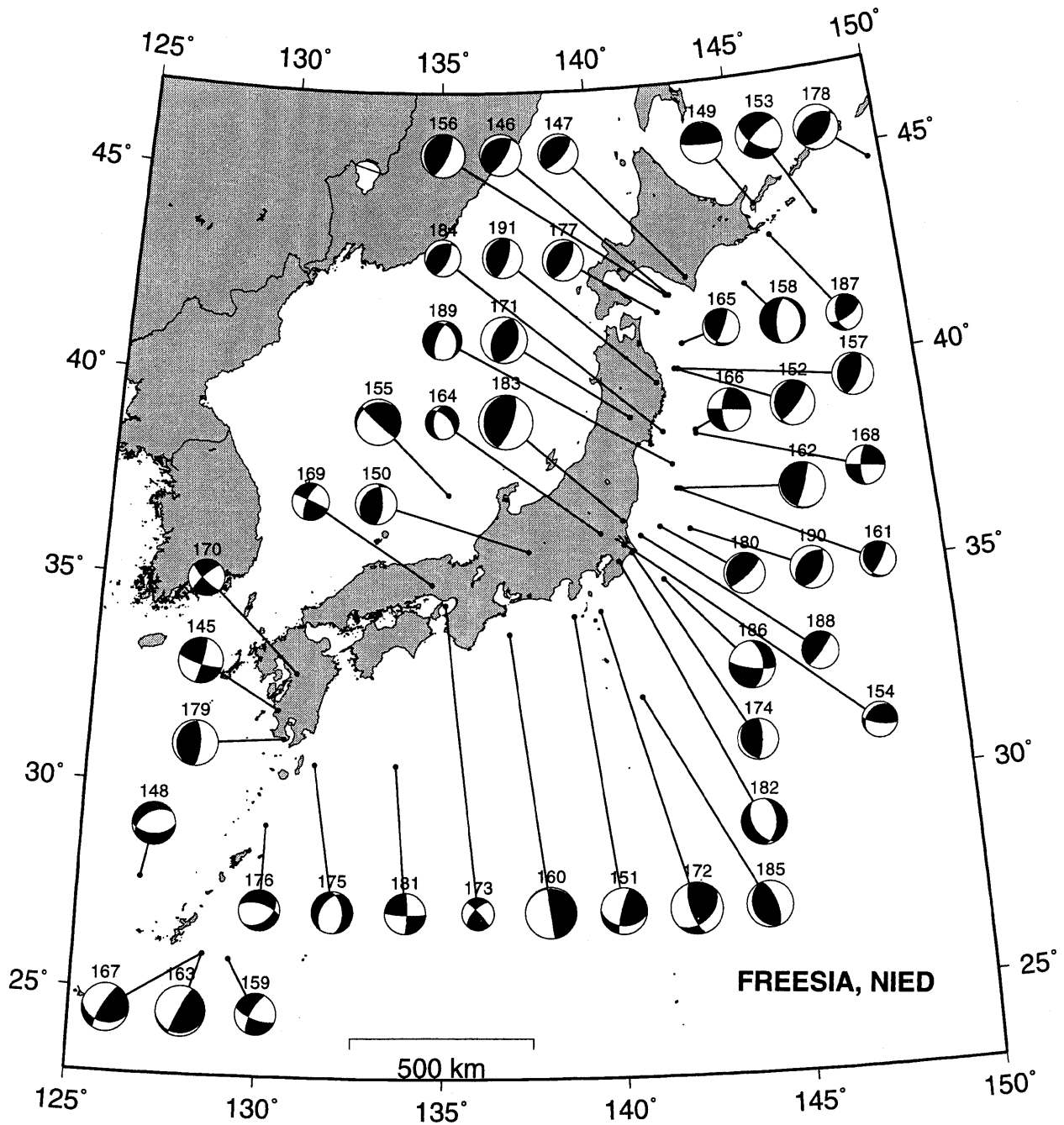


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

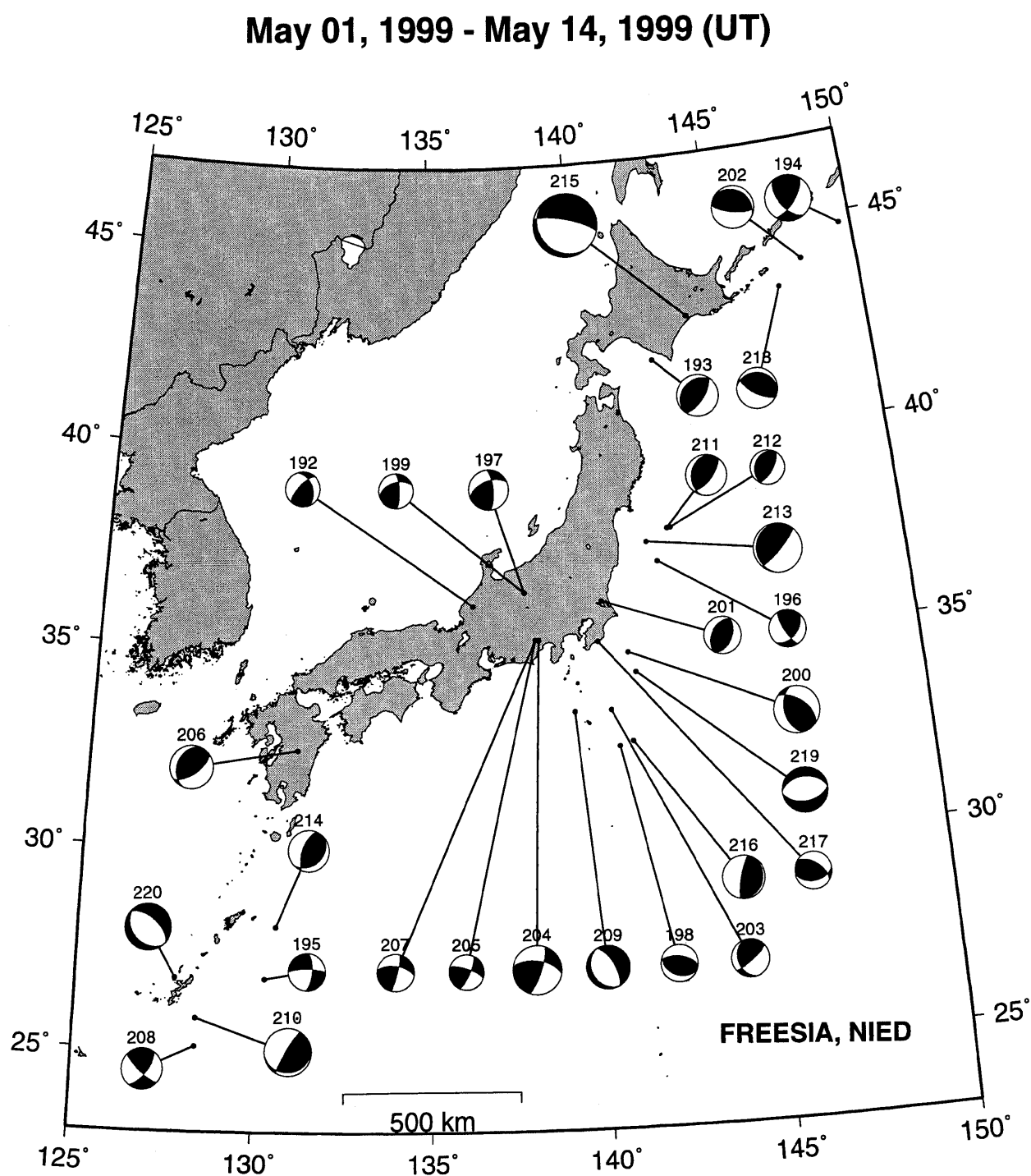


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

May 15, 1999 - May 31, 1999 (UT)

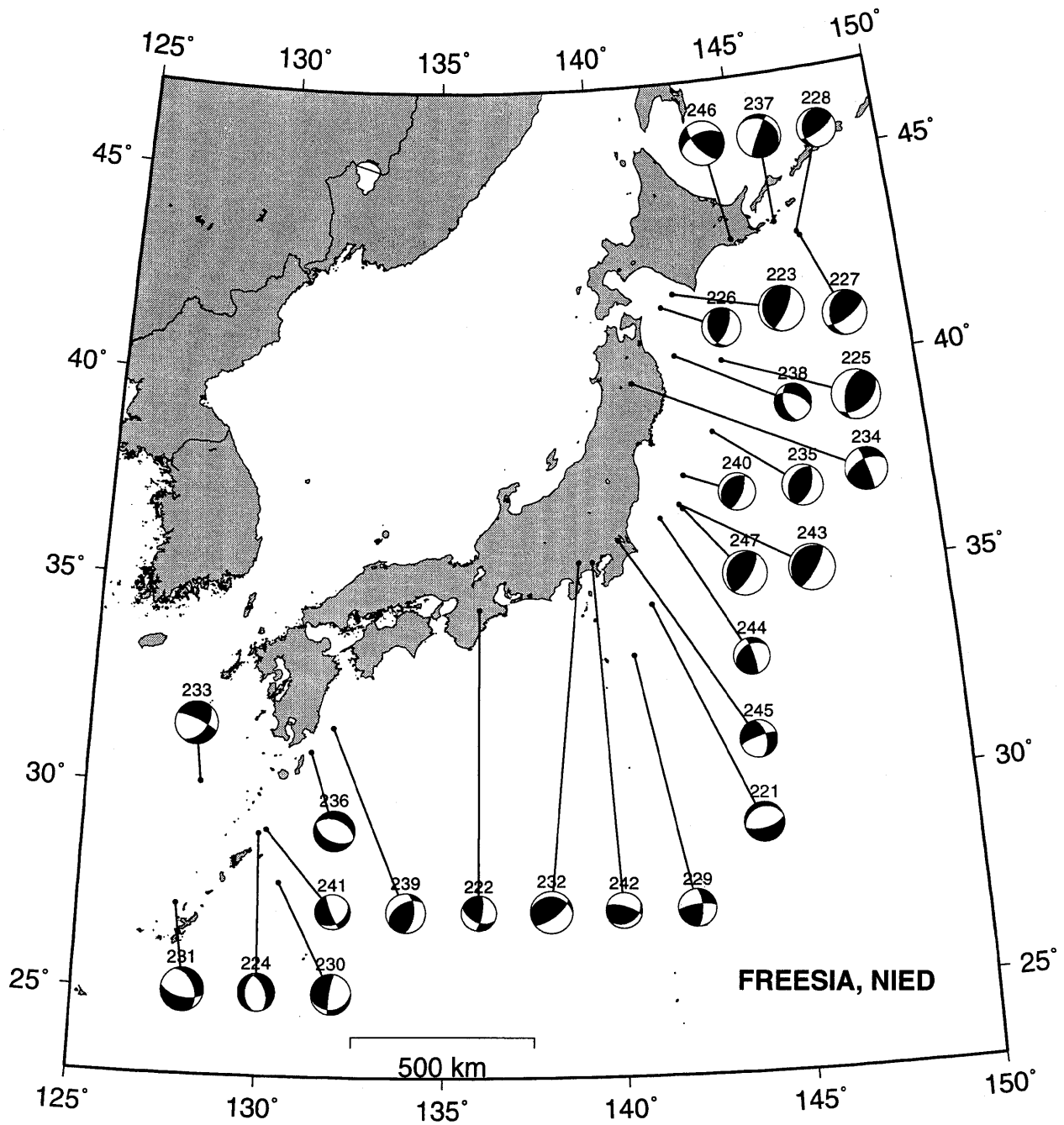


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Jun 01, 1999 - Jun 12, 1999 (UT)

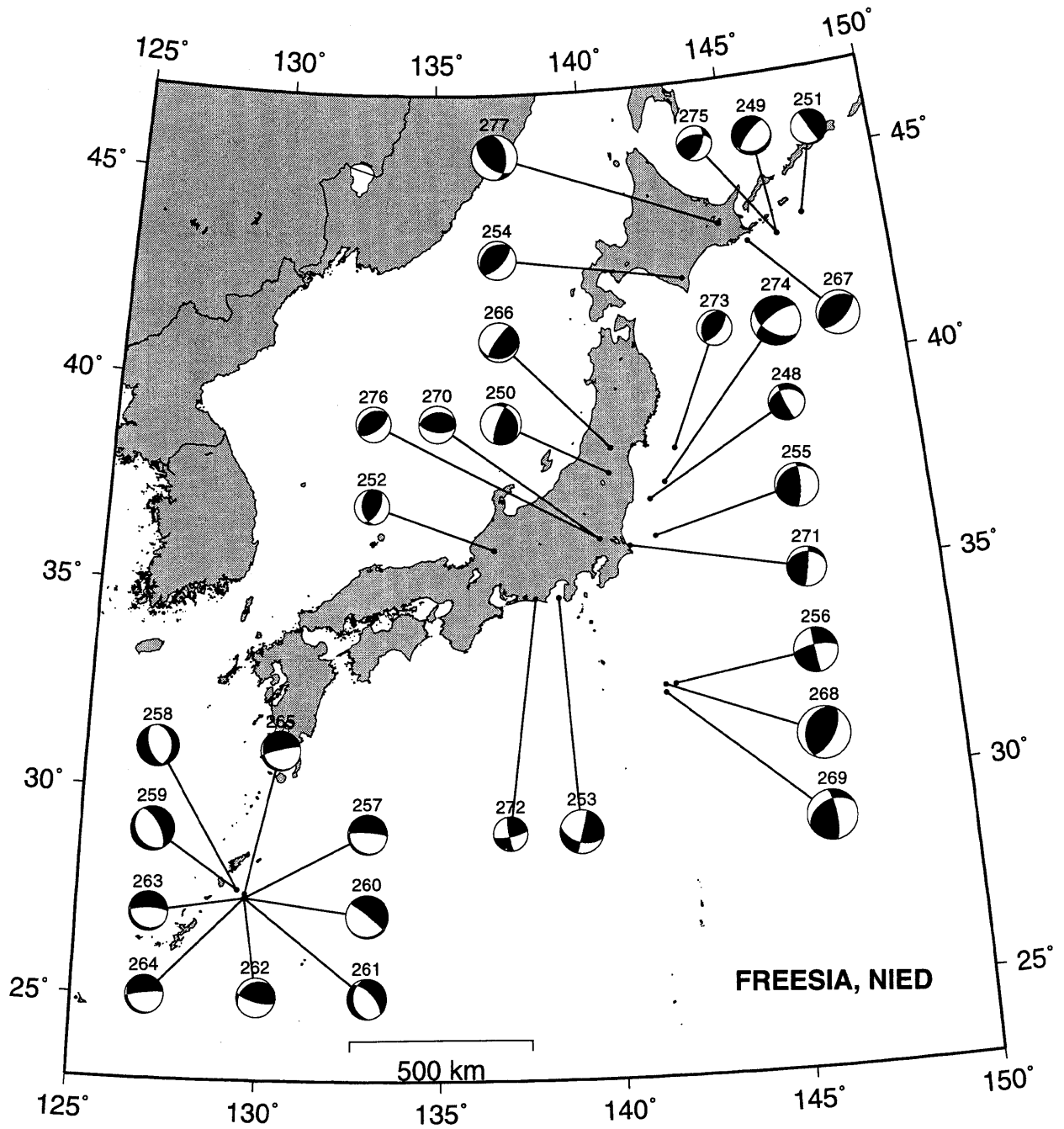


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Jun 13, 1999 - Jun 30, 1999 (UT)

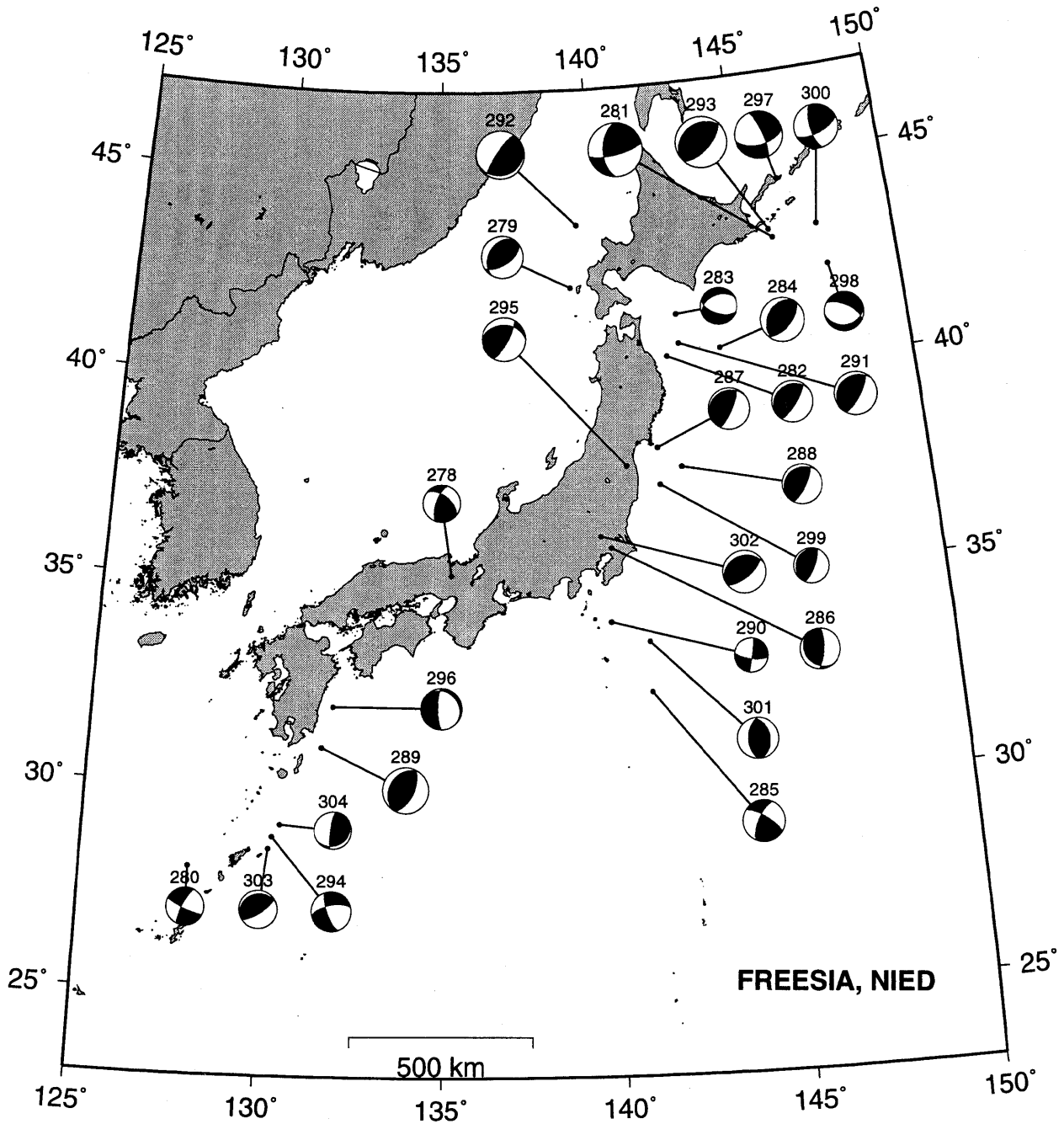


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Jul 01, 1999 - Jul 17, 1999 (UT)

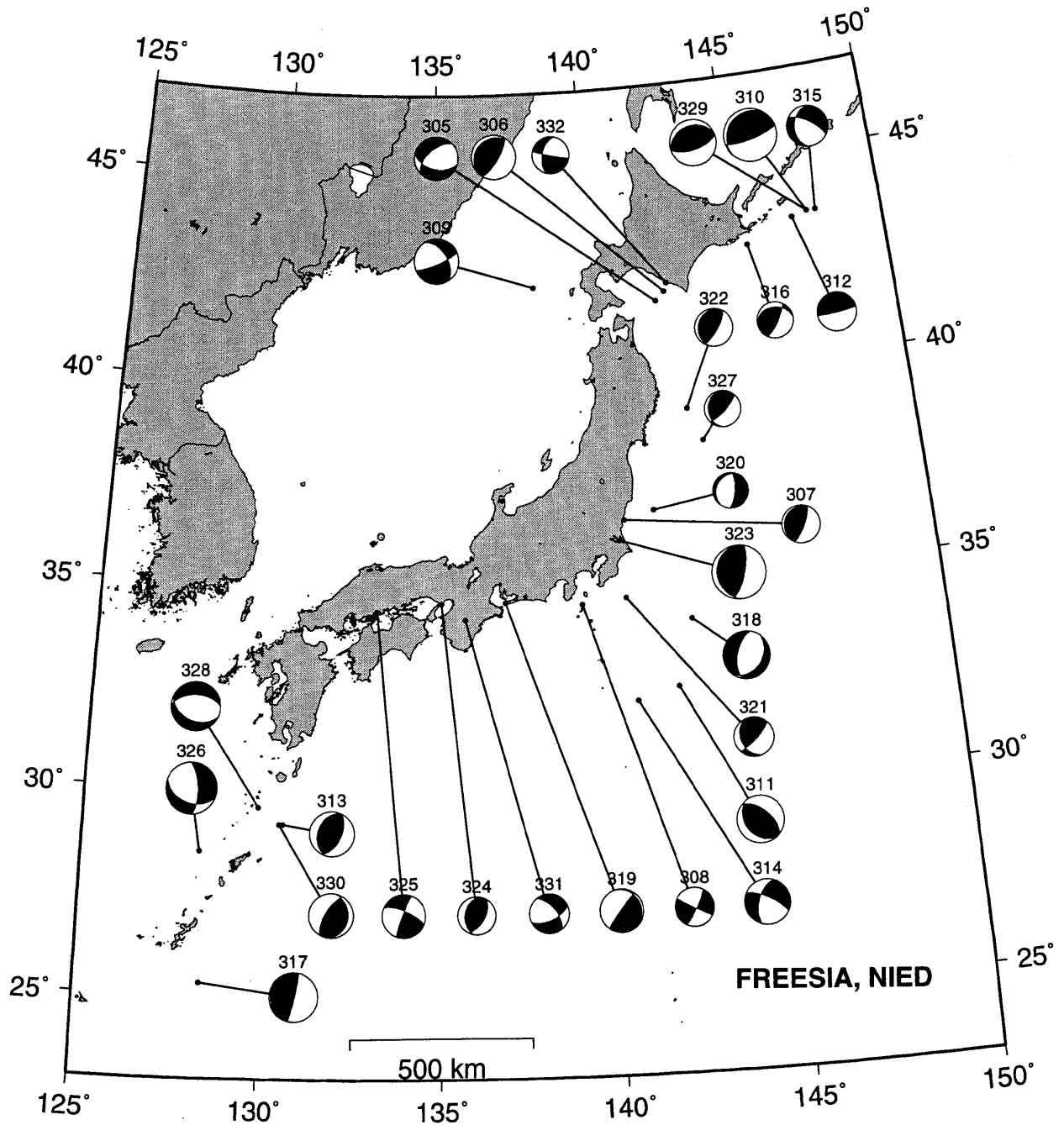


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Jul 18, 1999 - Jul 31, 1999 (UT)

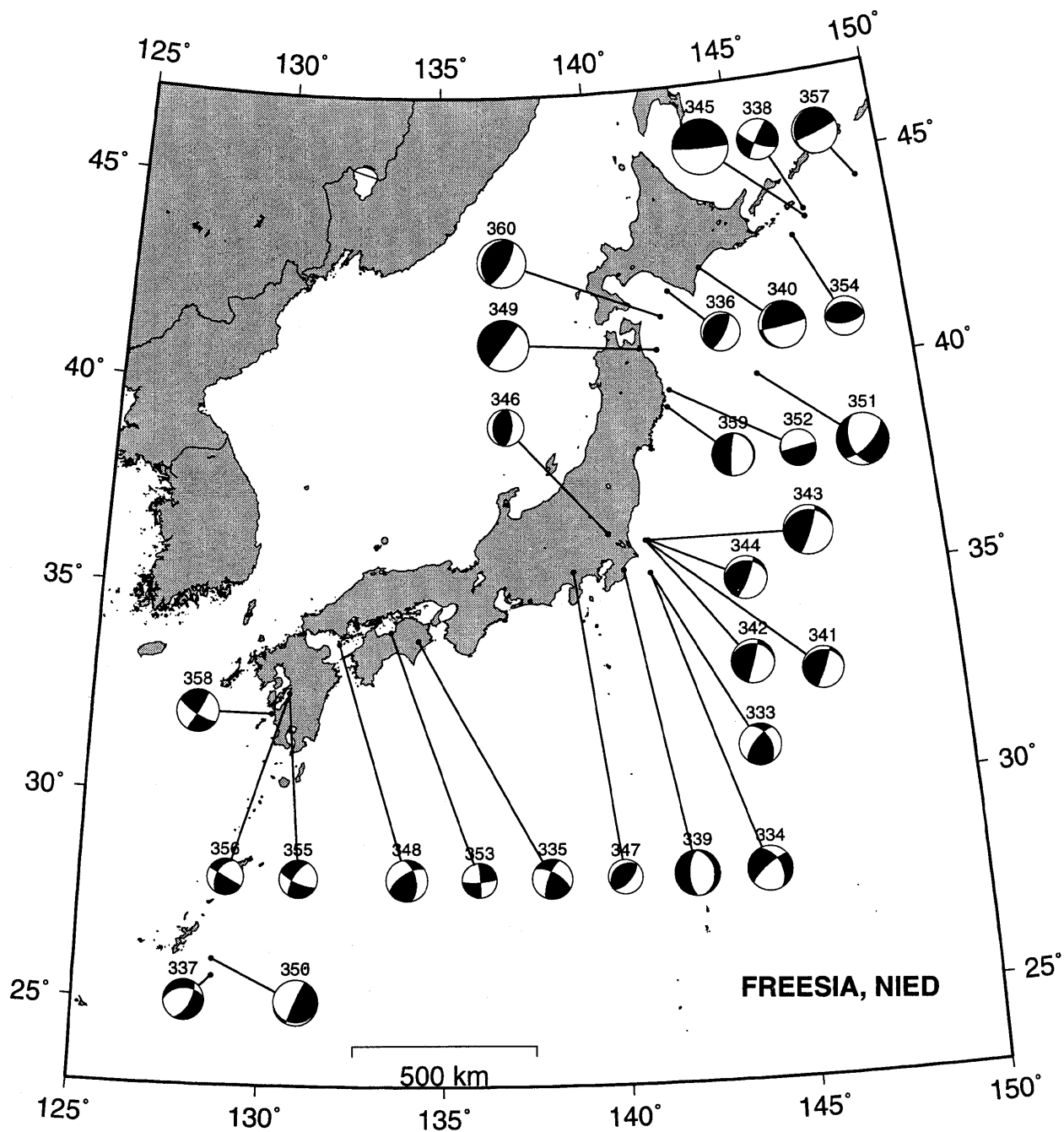


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

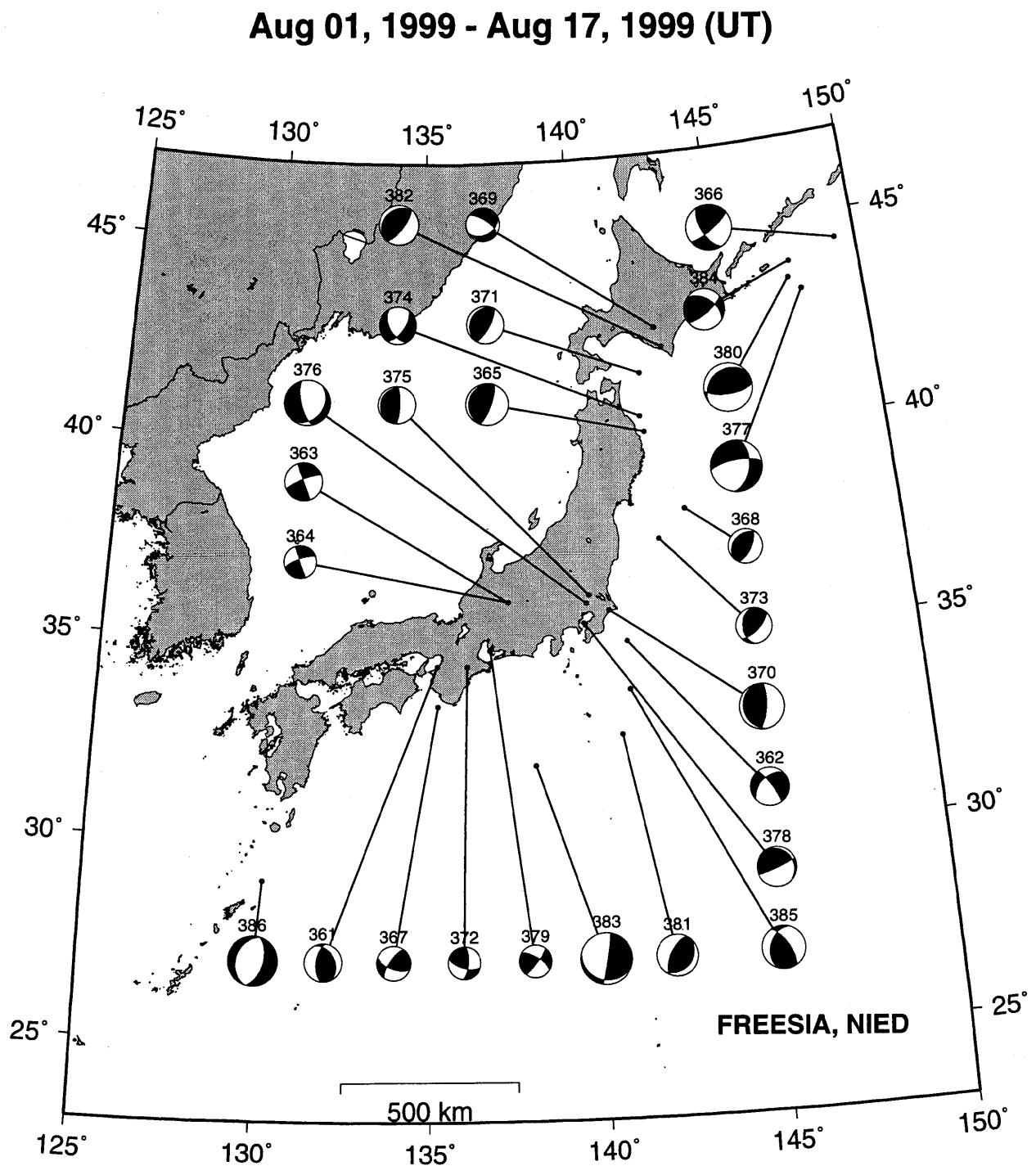


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Aug 18, 1999 - Aug 31, 1999 (UT)

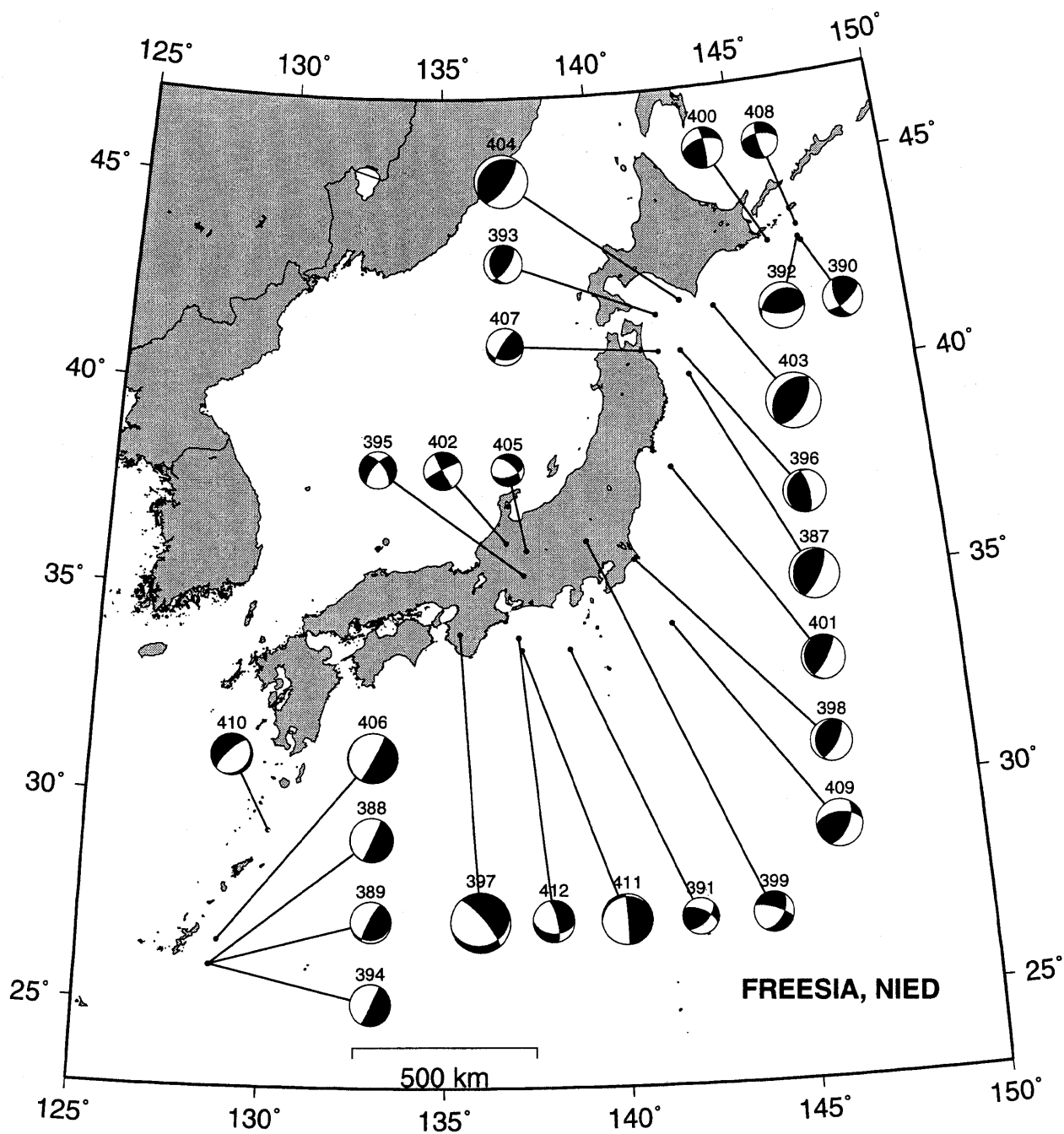


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

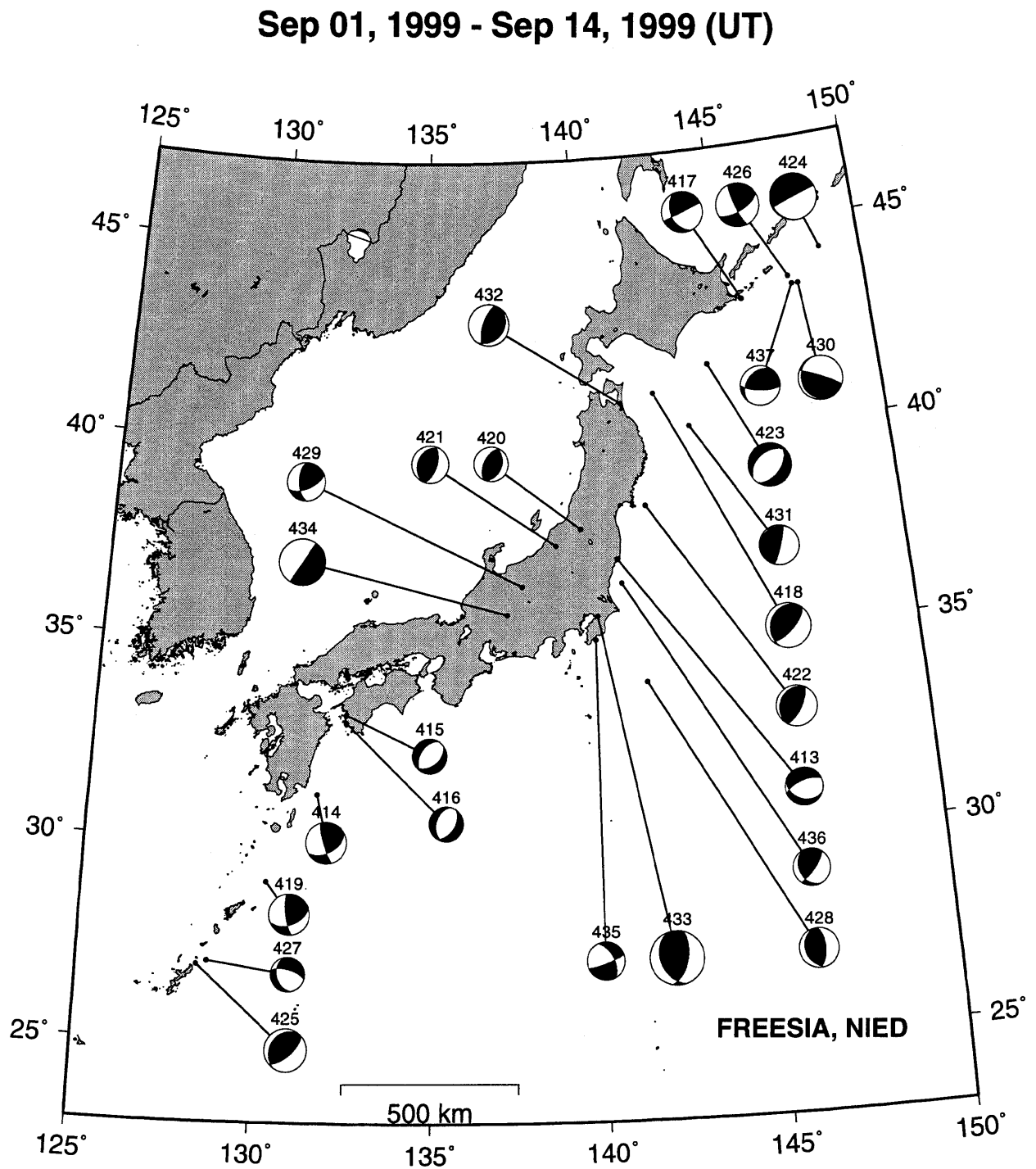


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Sep 15, 1999 - Sep 30, 1999 (UT)

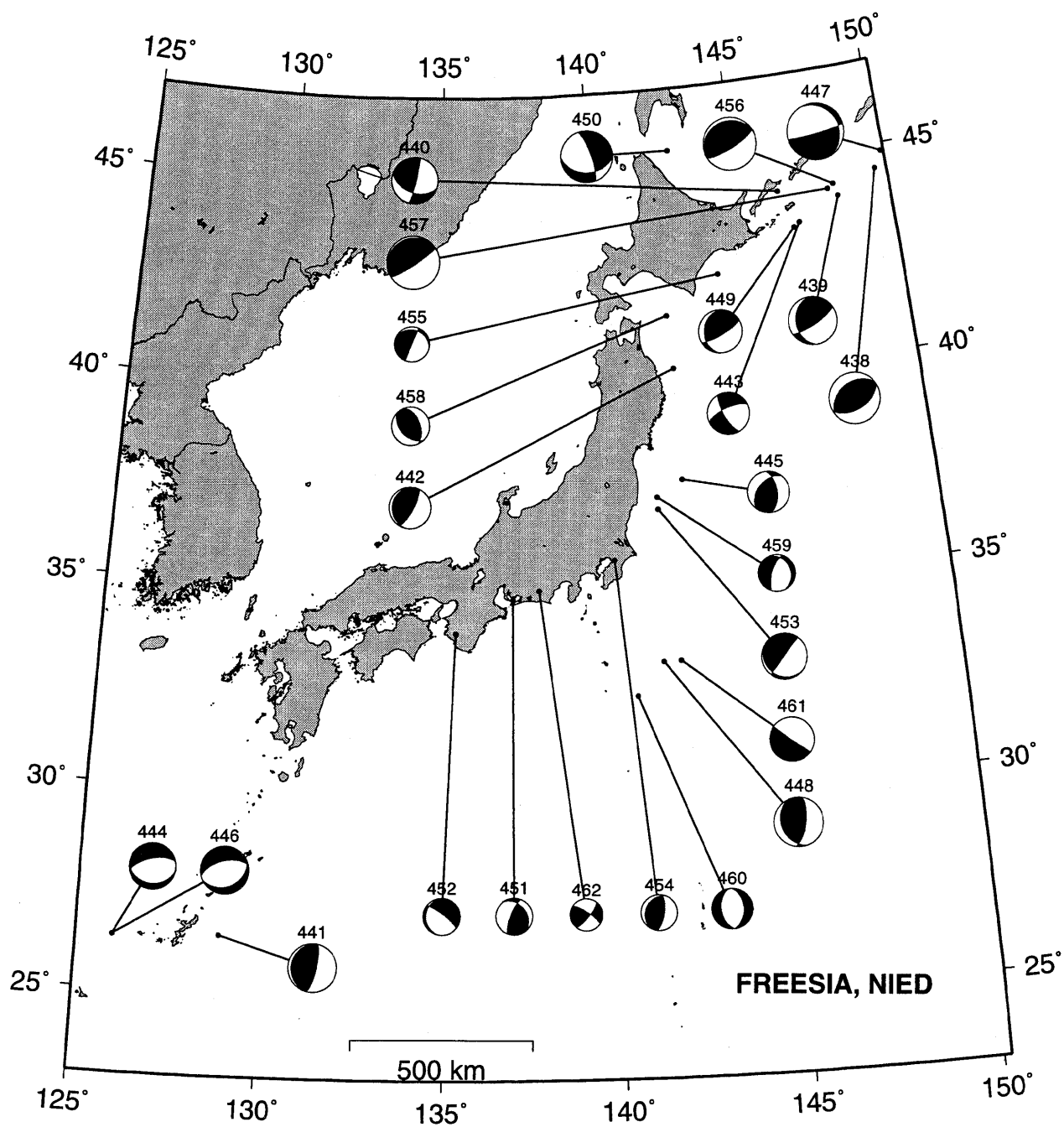


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Oct 01, 1999 - Oct 17, 1999 (UT)

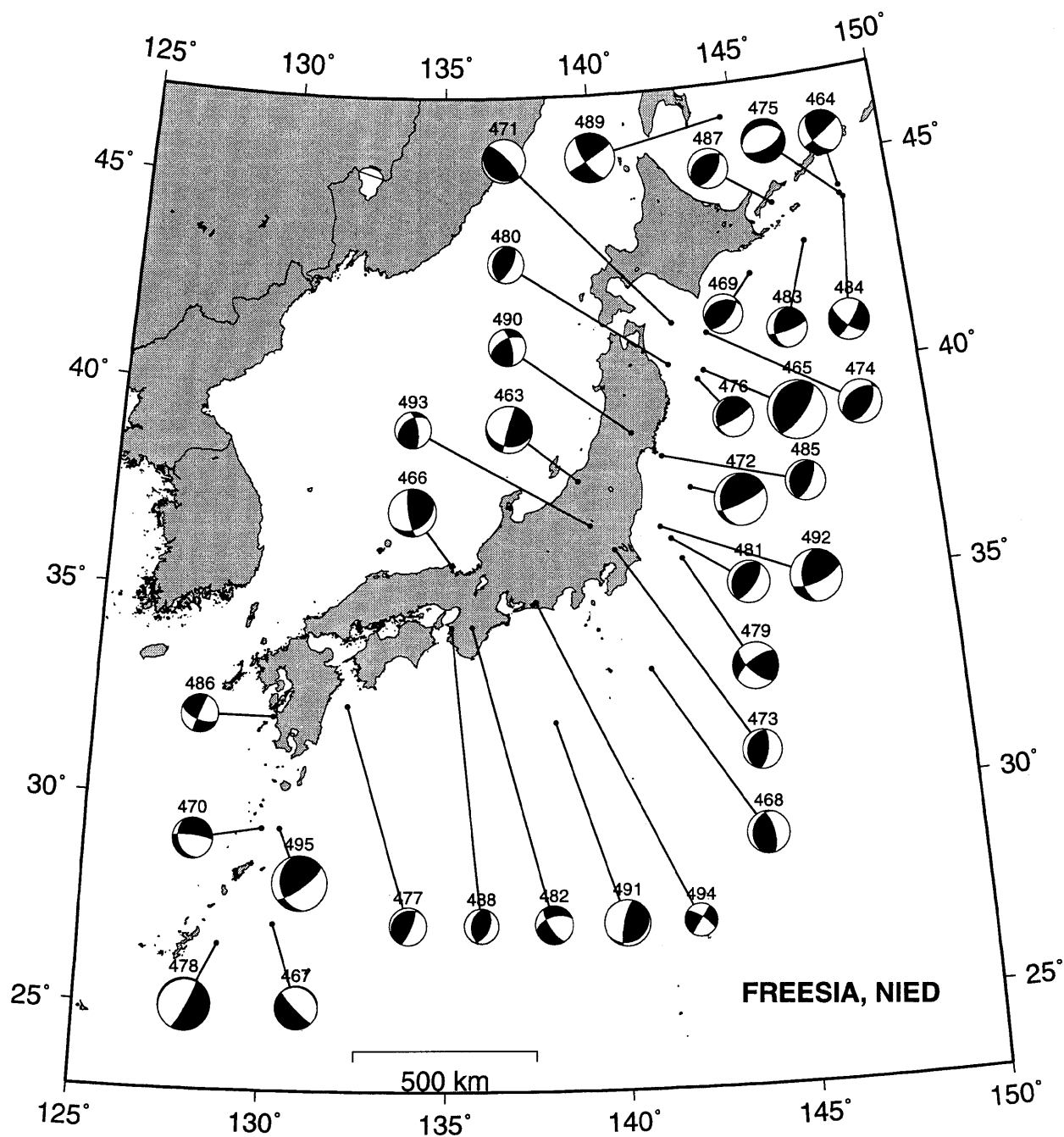


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Oct 18, 1999 - Oct 31, 1999 (UT)

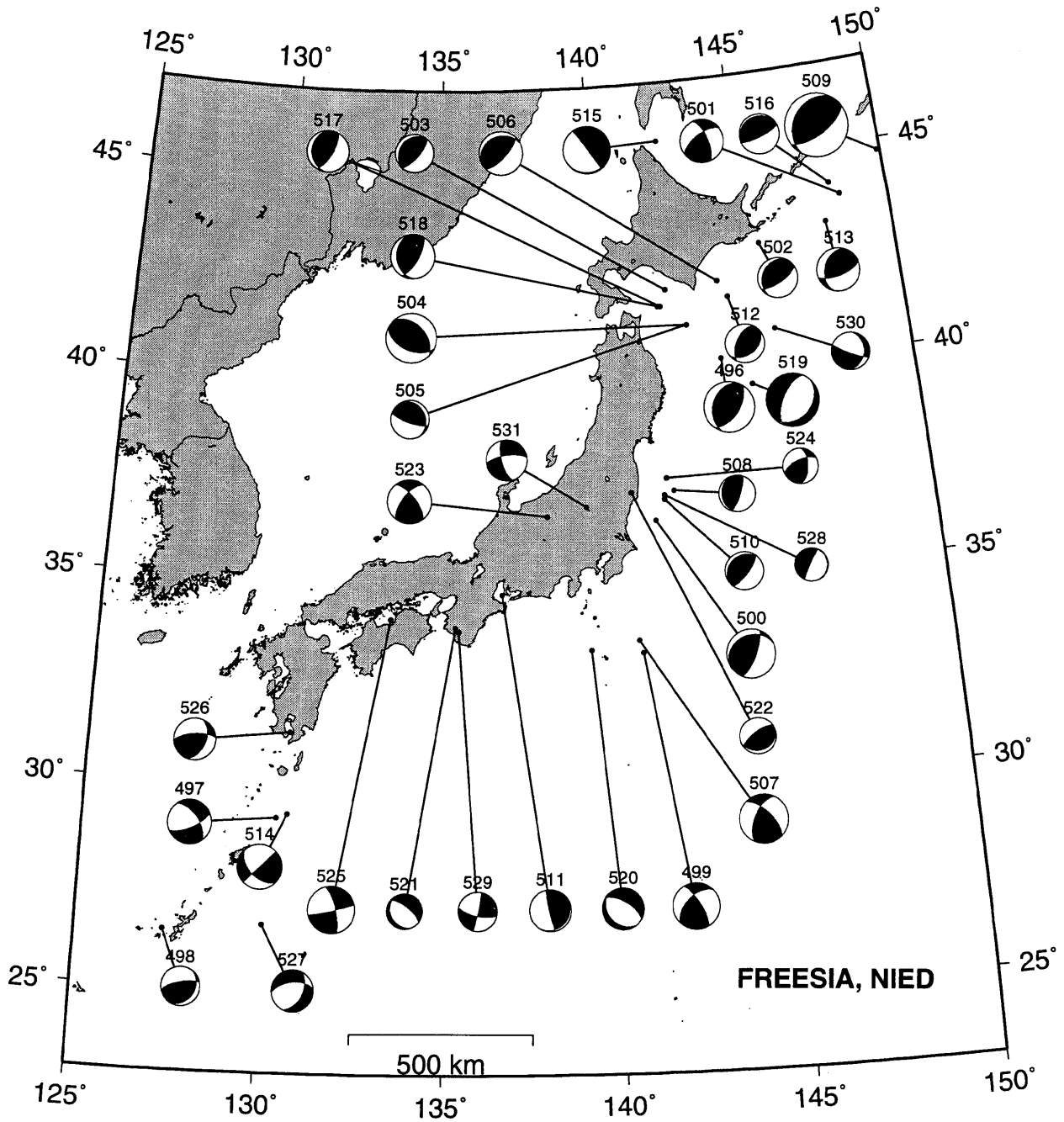


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Nov 01, 1999 - Nov 30, 1999 (UT)

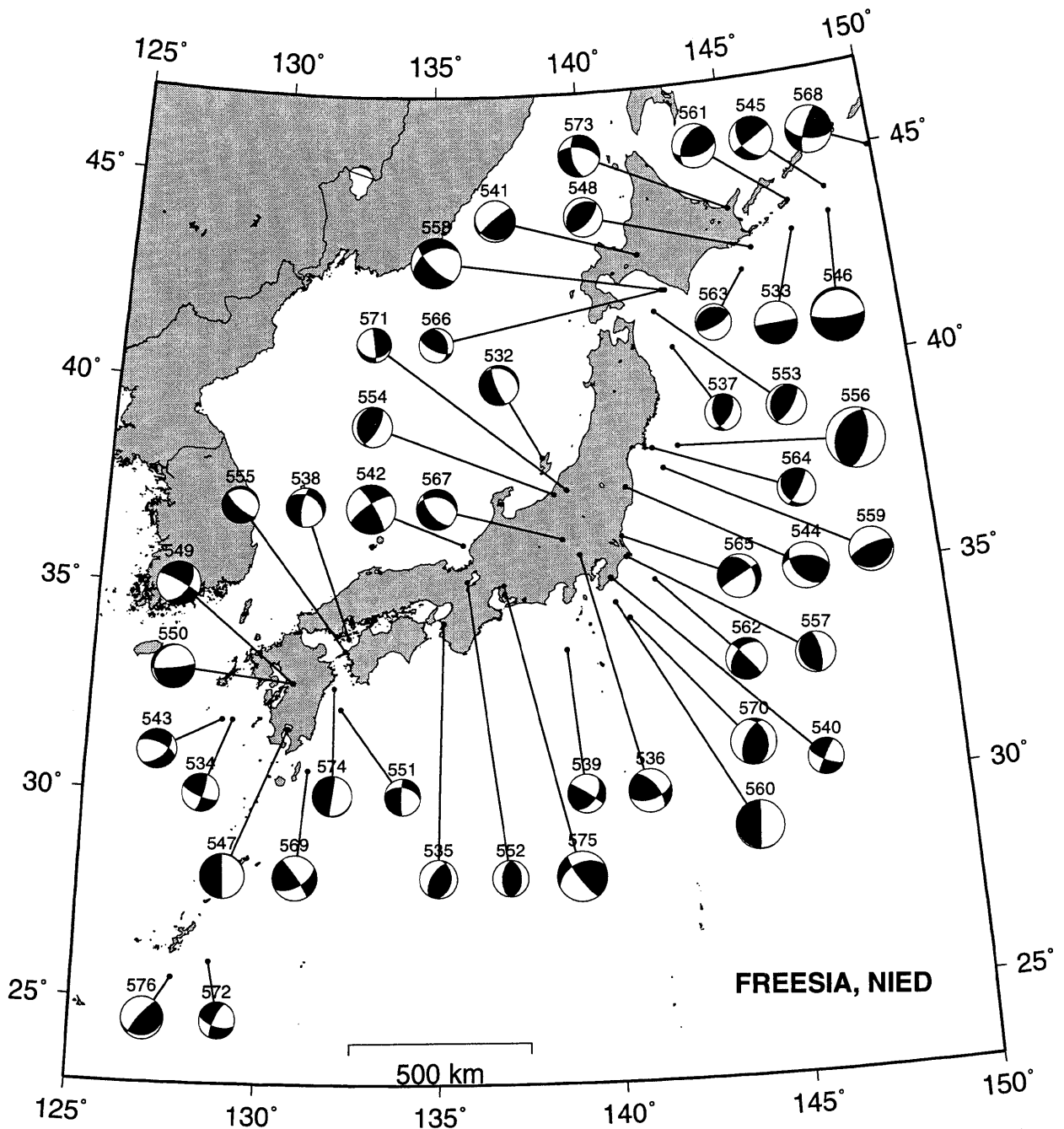


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

Dec 01, 1999 - Dec 31, 1999 (UT)

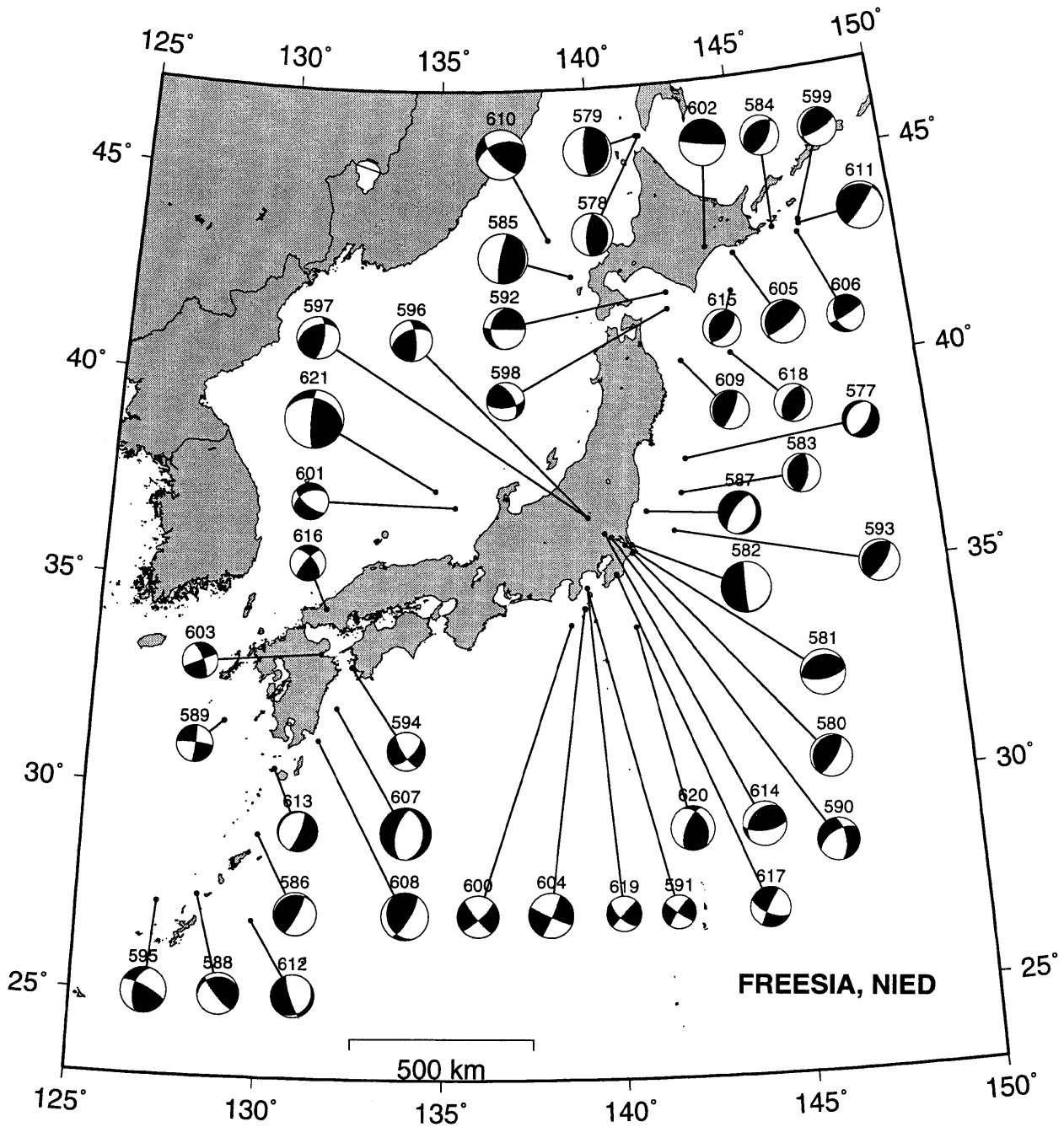


Fig. 2: Estimated focal mechanisms plotted with epicentral locations (continued).

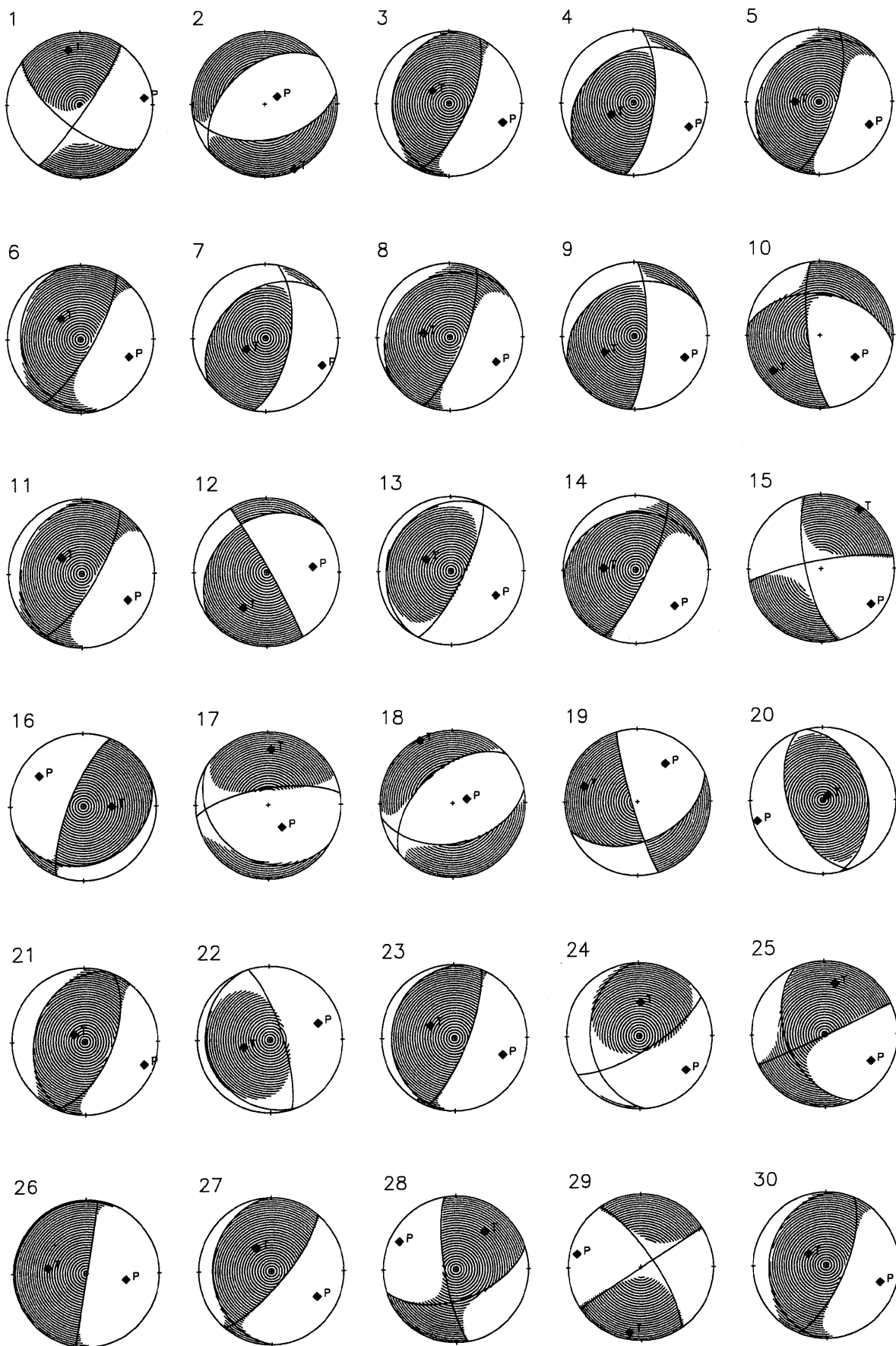


Fig. 3: Estimated moment tensors plotted in the lower hemisphere. P- and T- axes are also plotted.

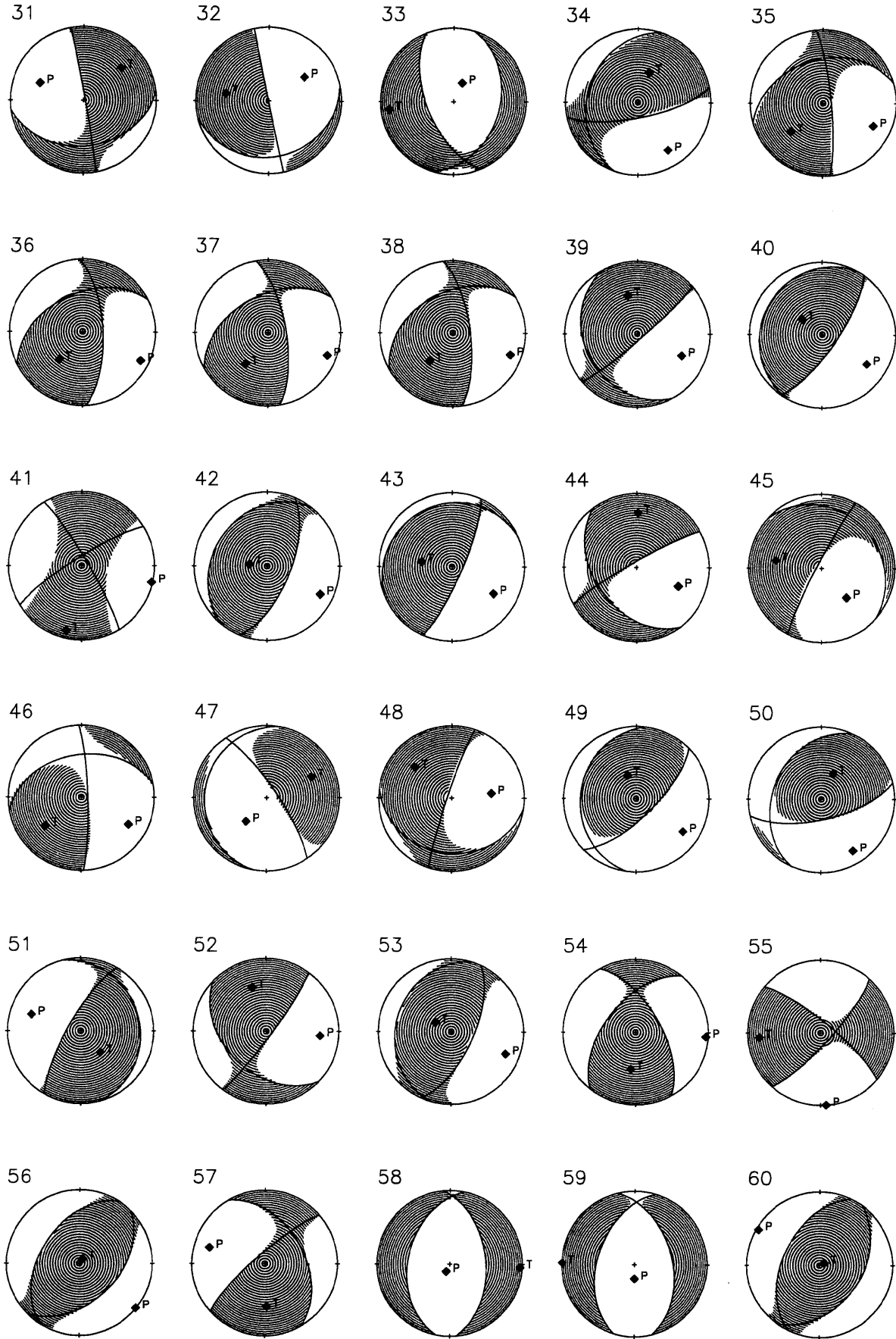


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

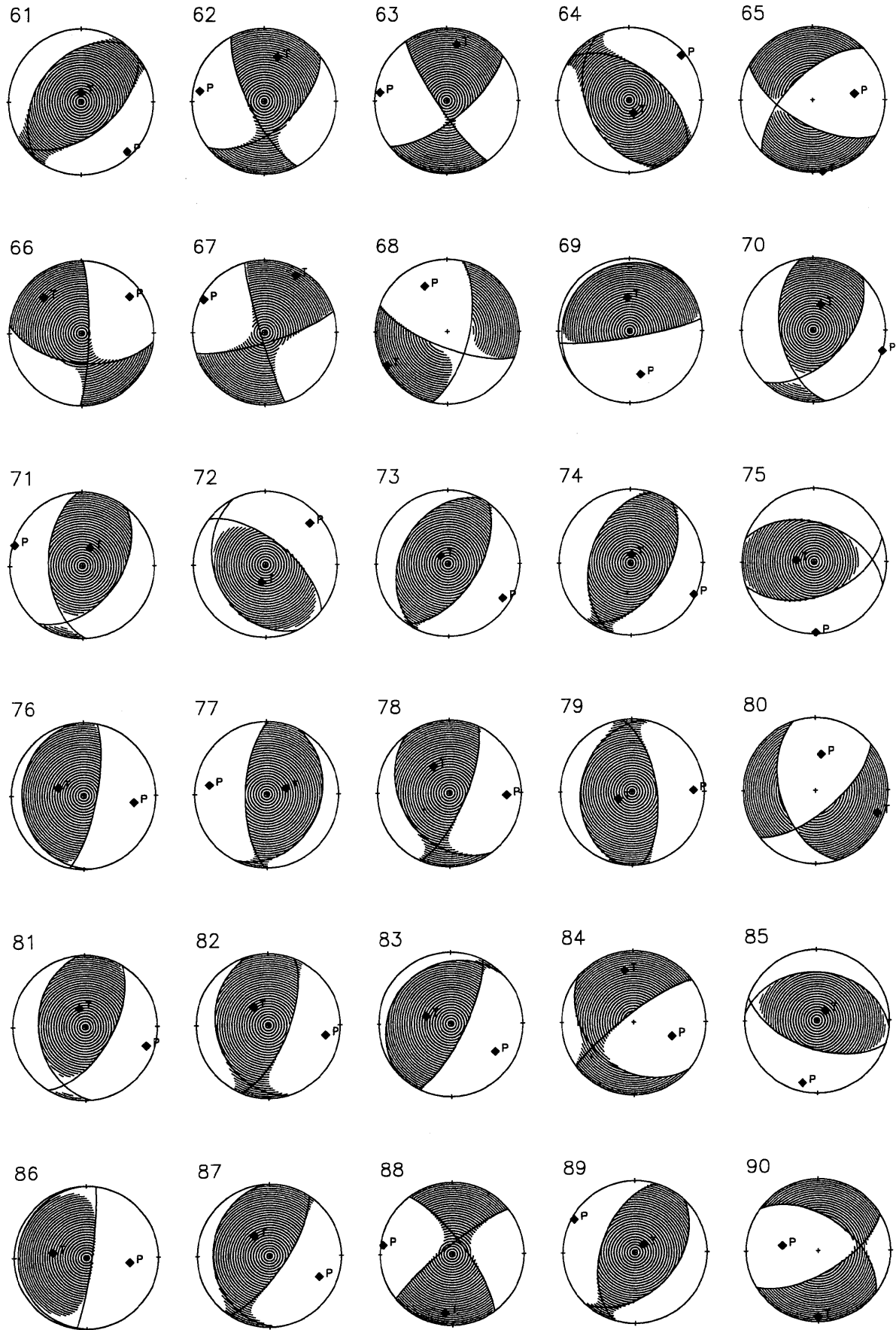


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

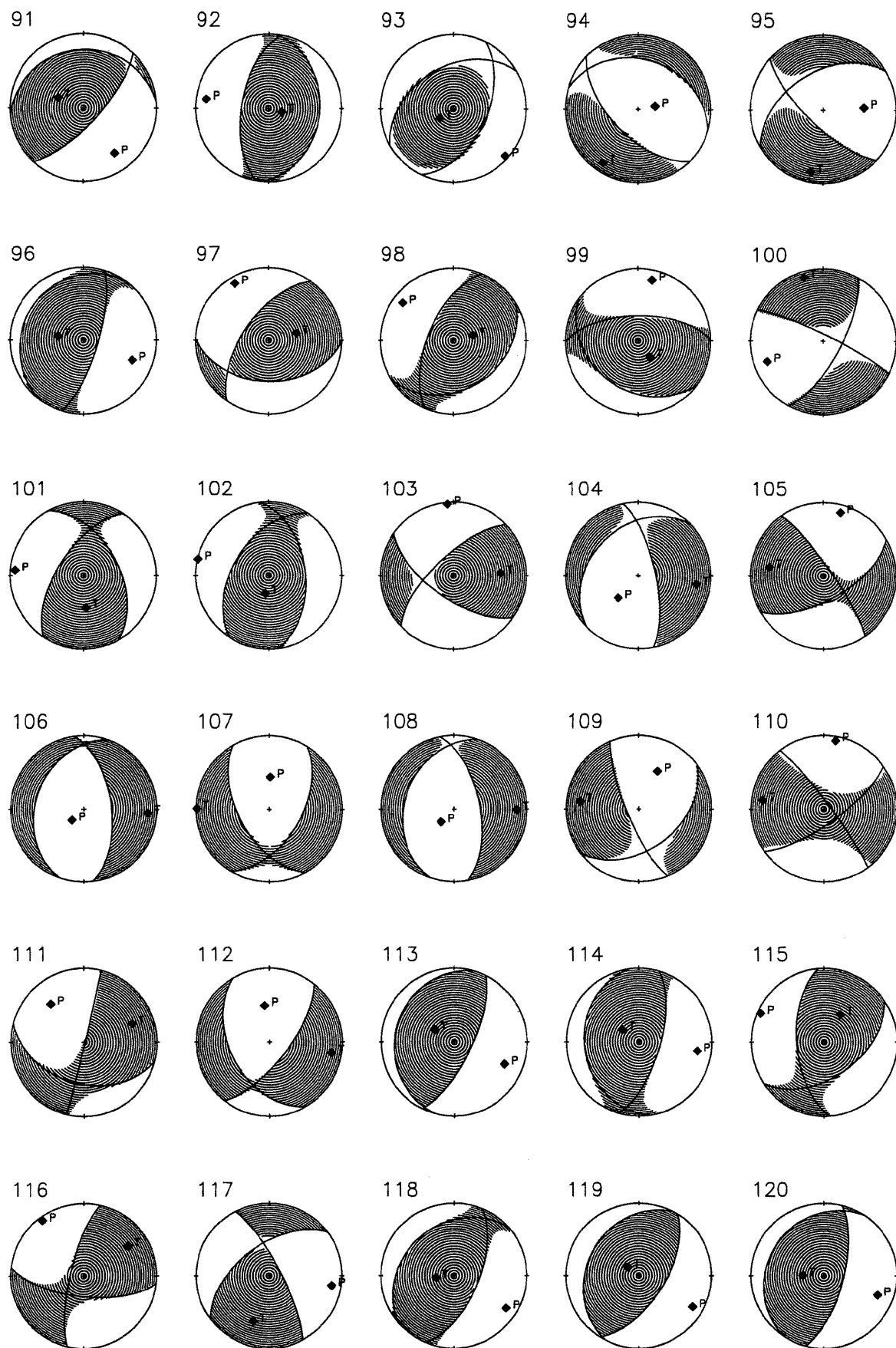


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

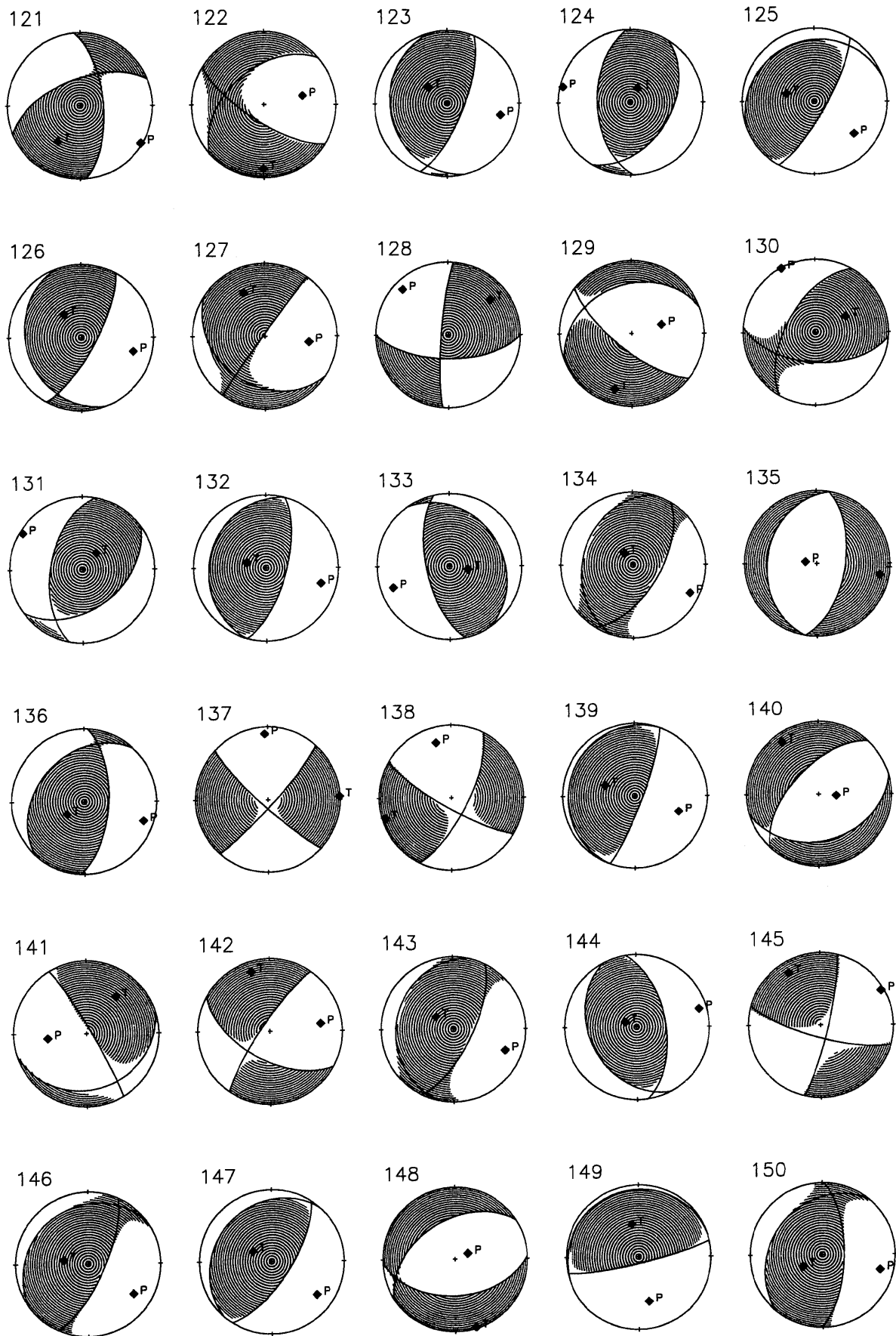


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

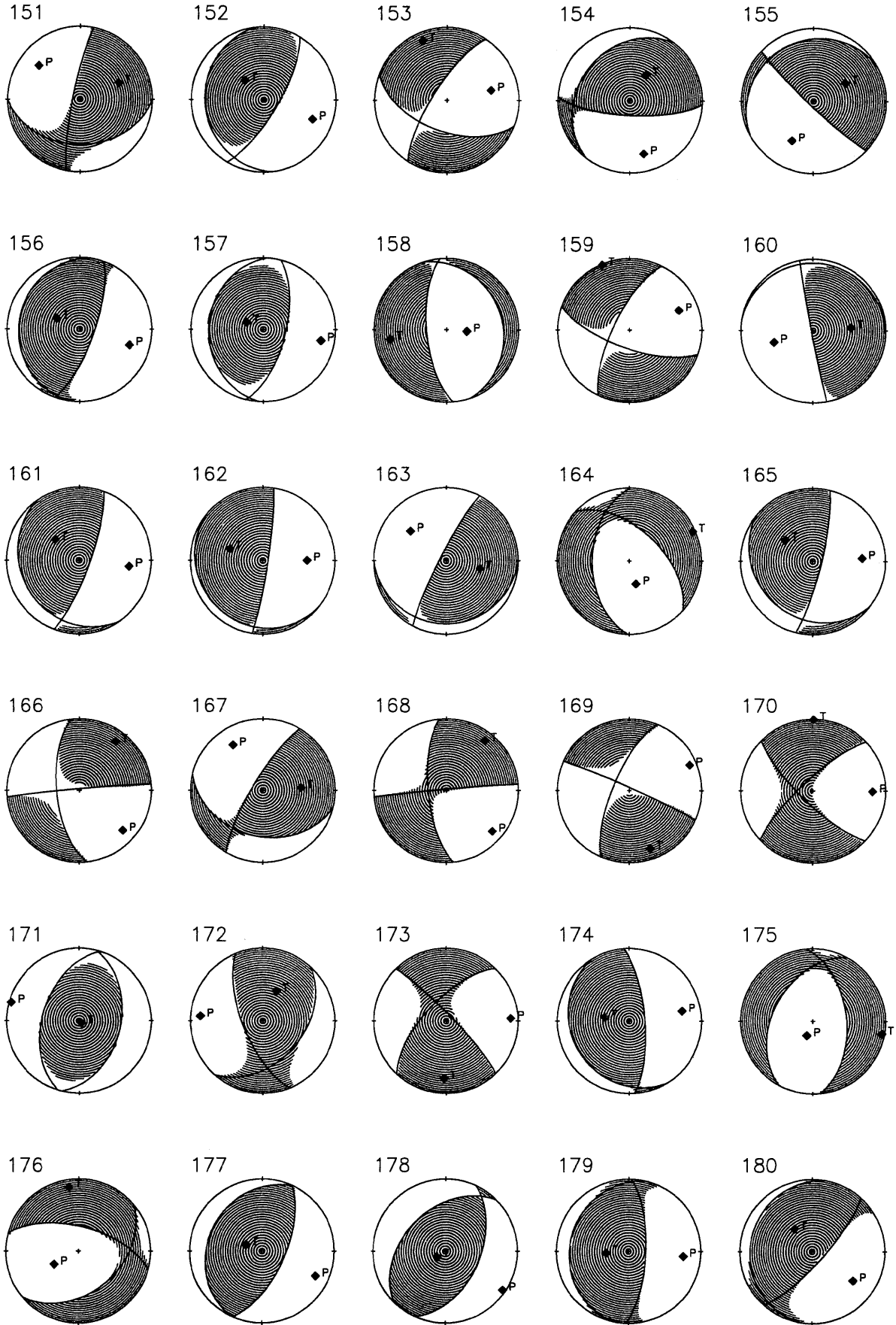


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

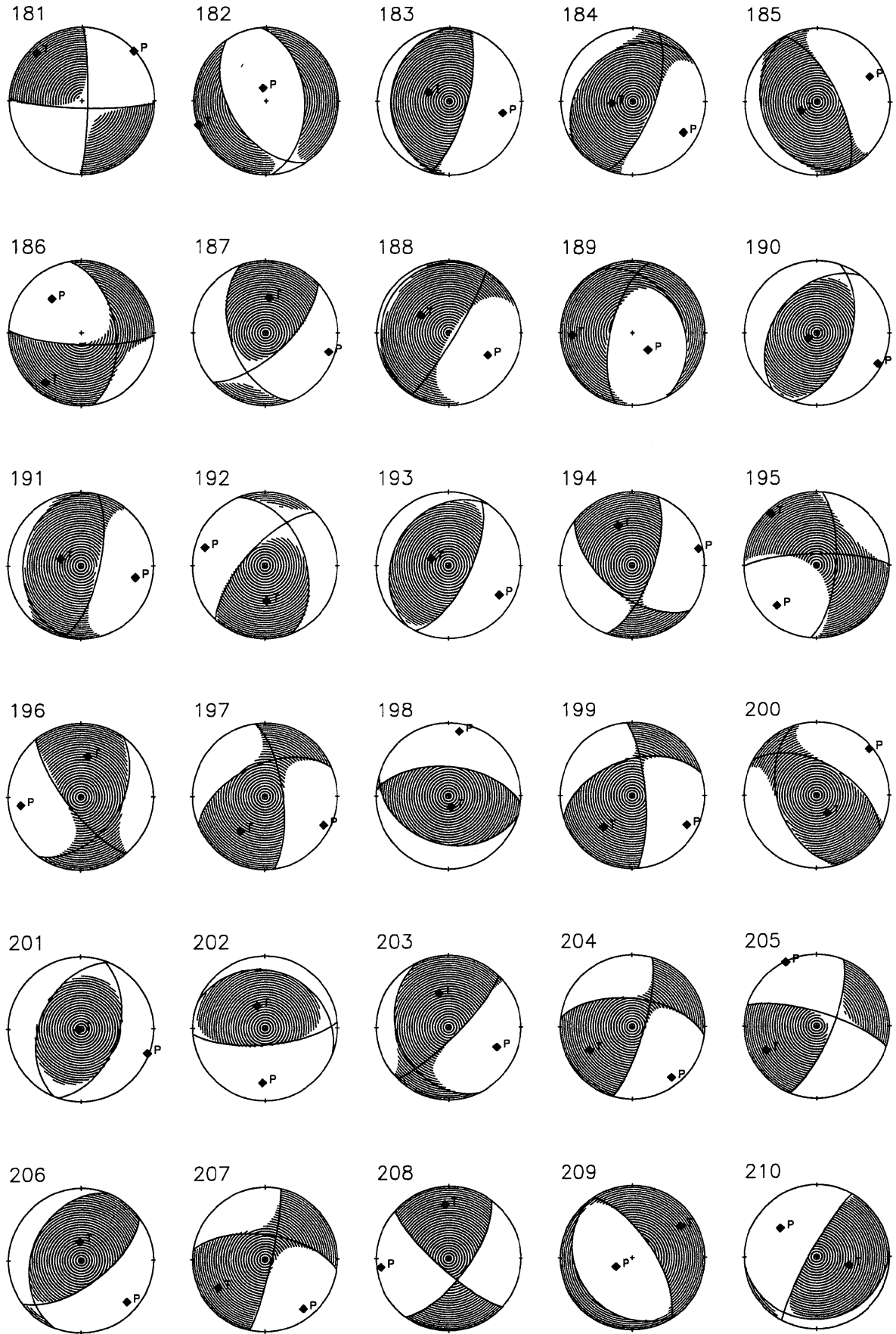


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

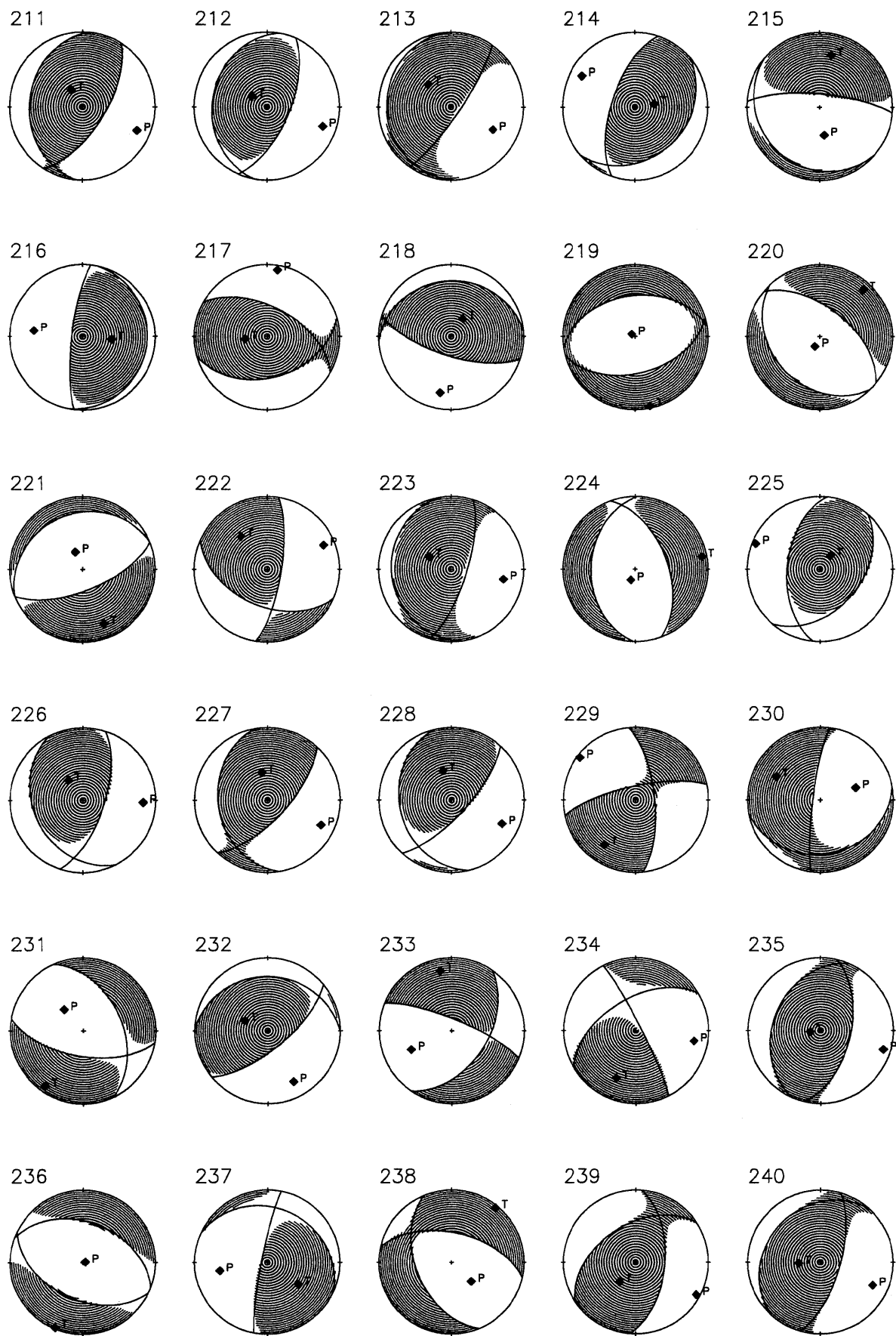


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

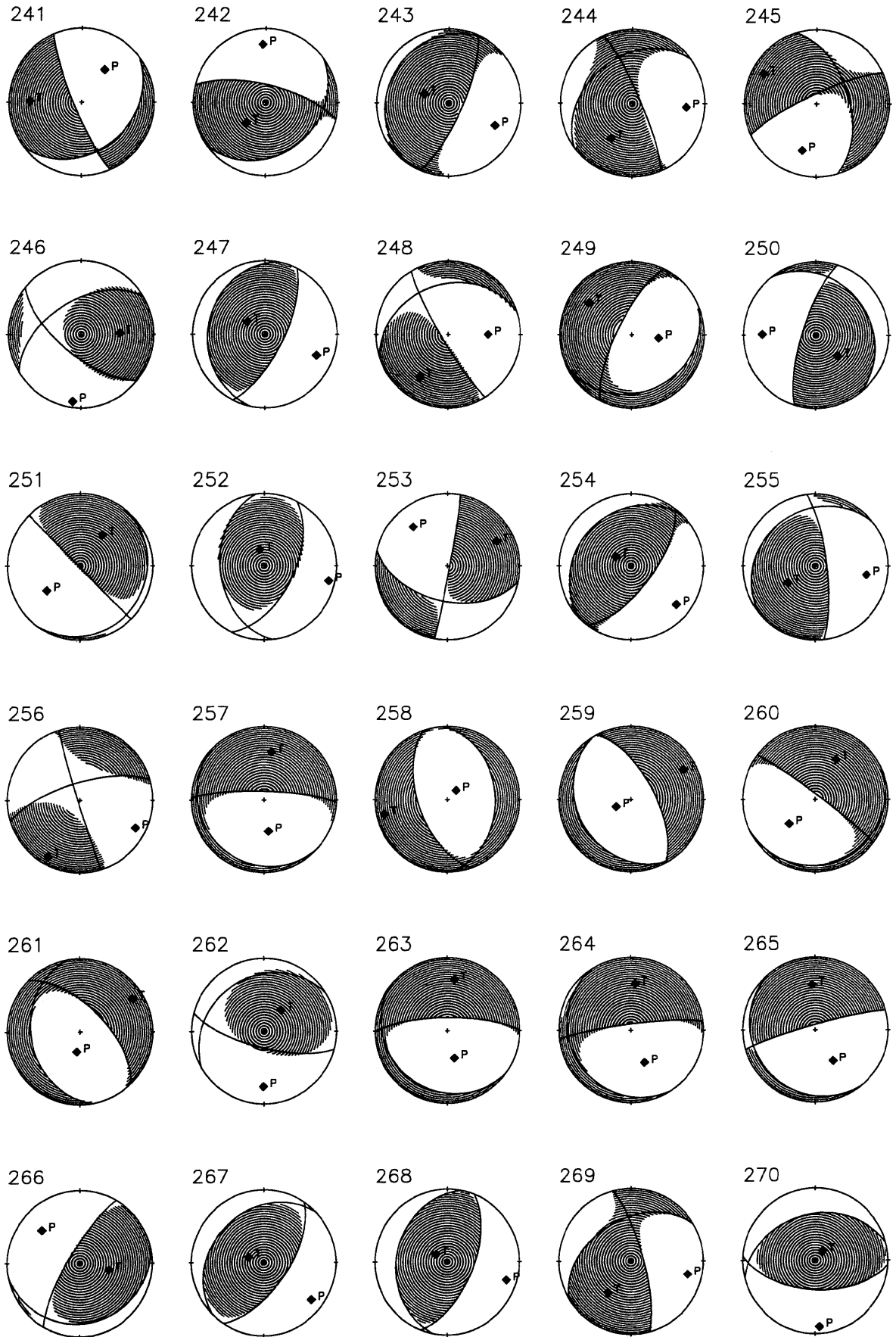


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

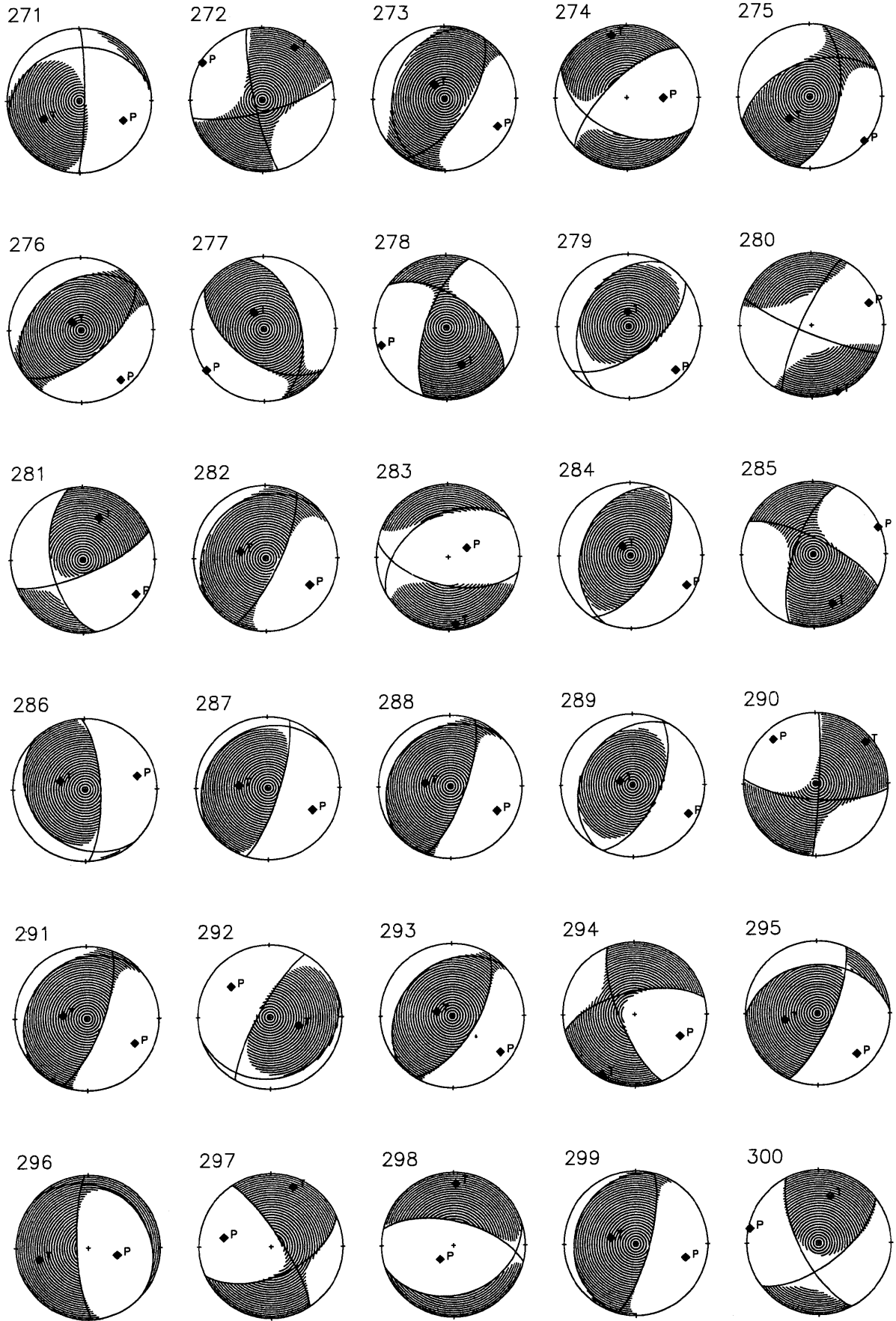


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

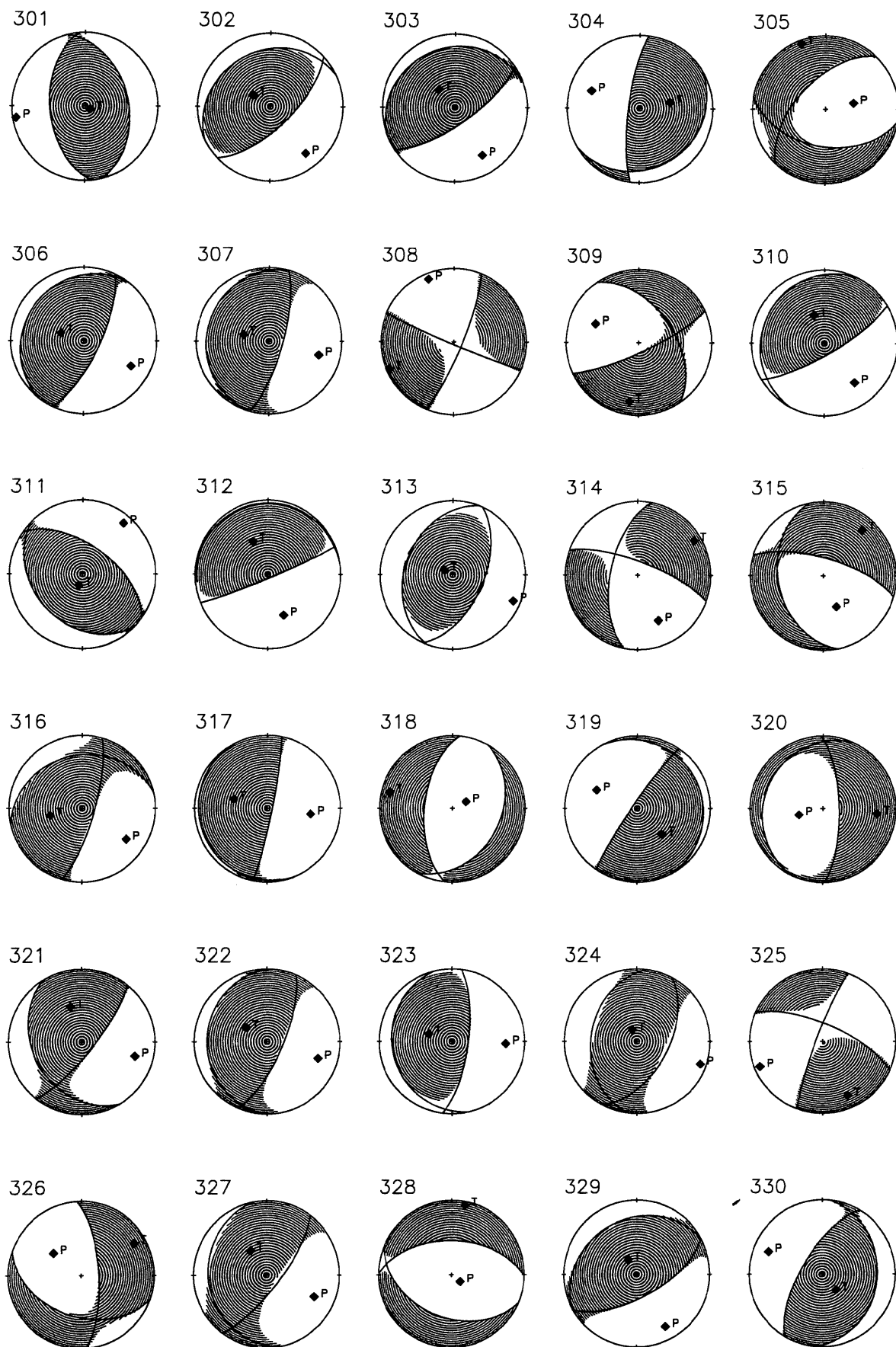


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

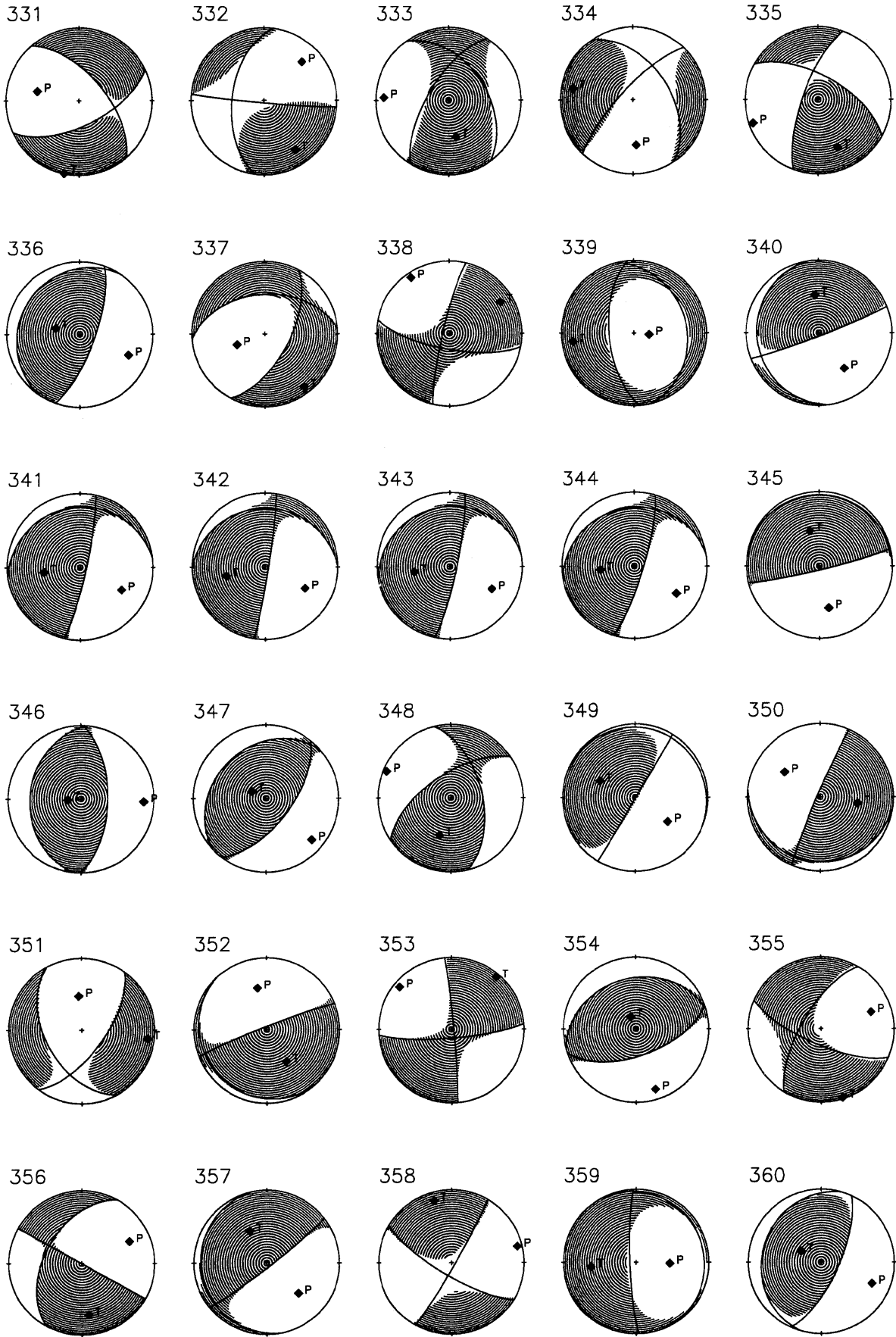


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

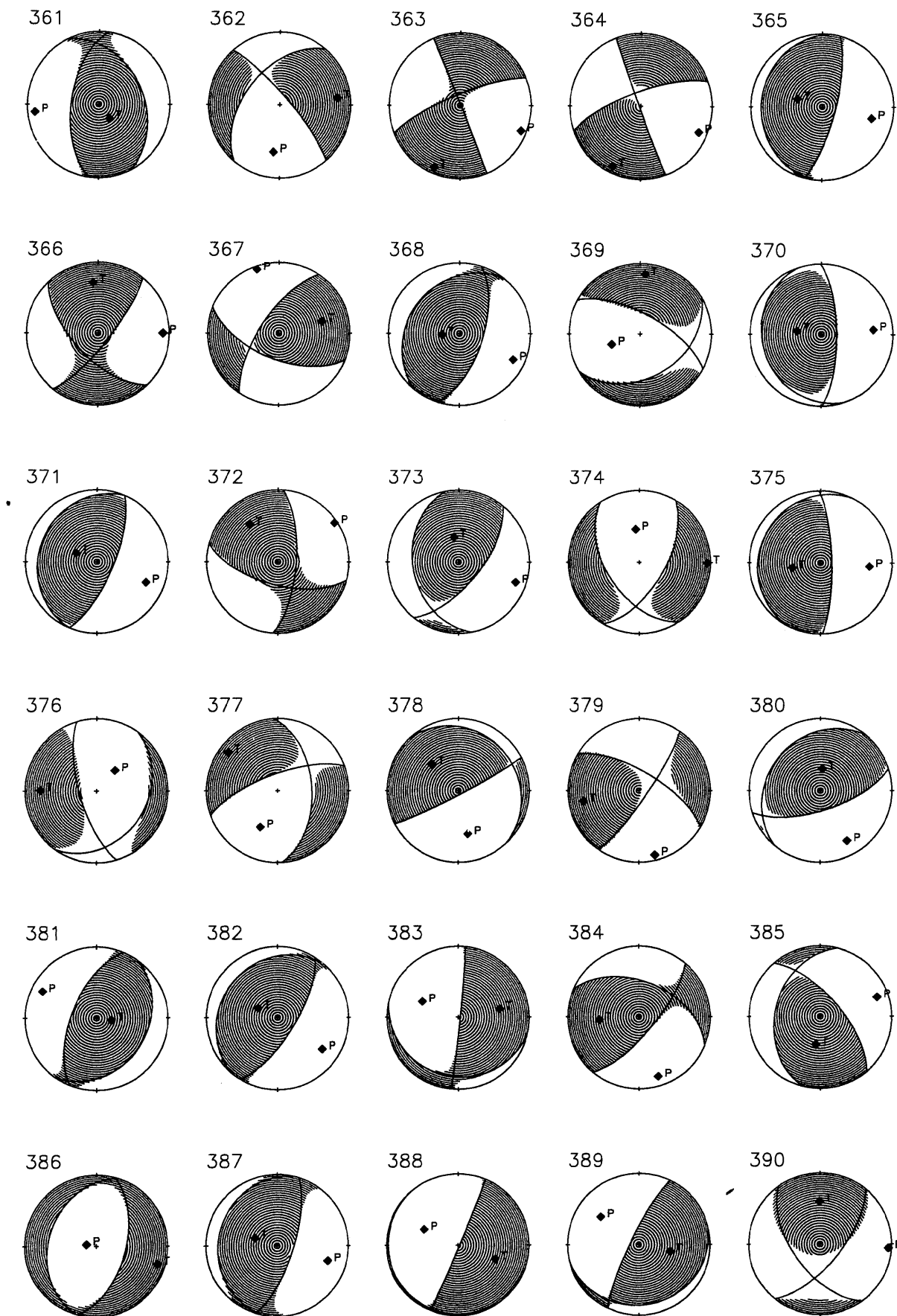


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

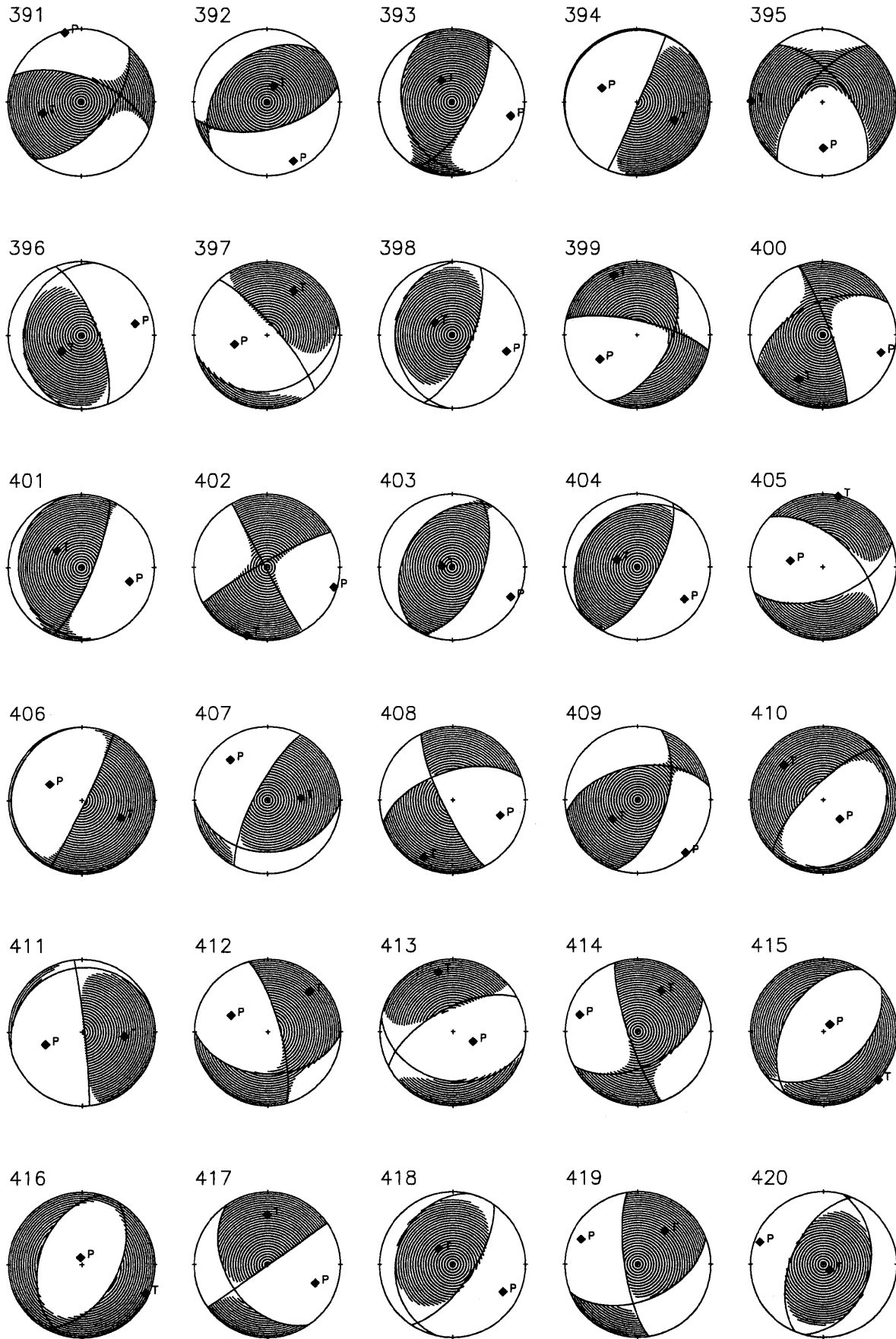


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

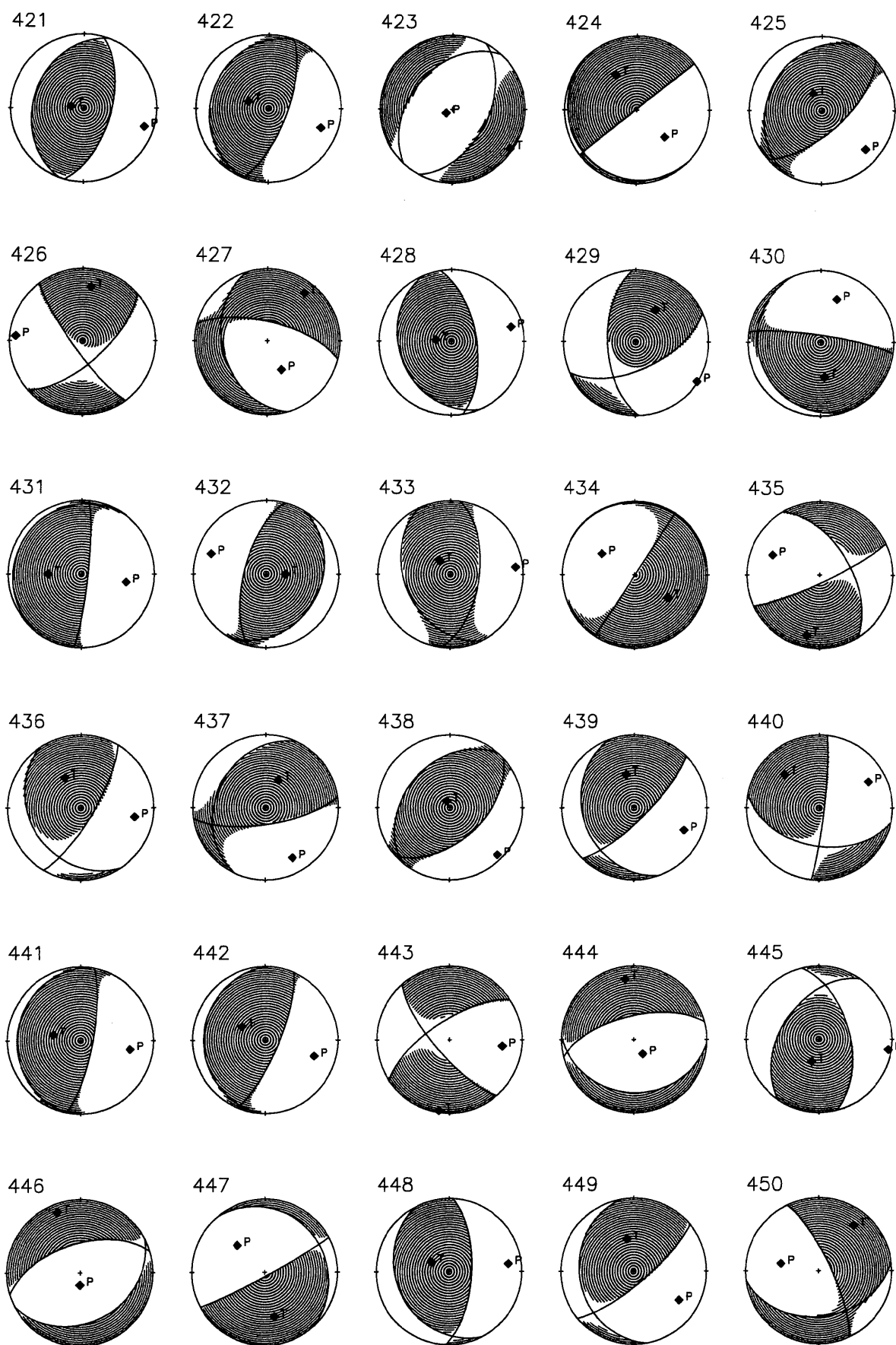


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

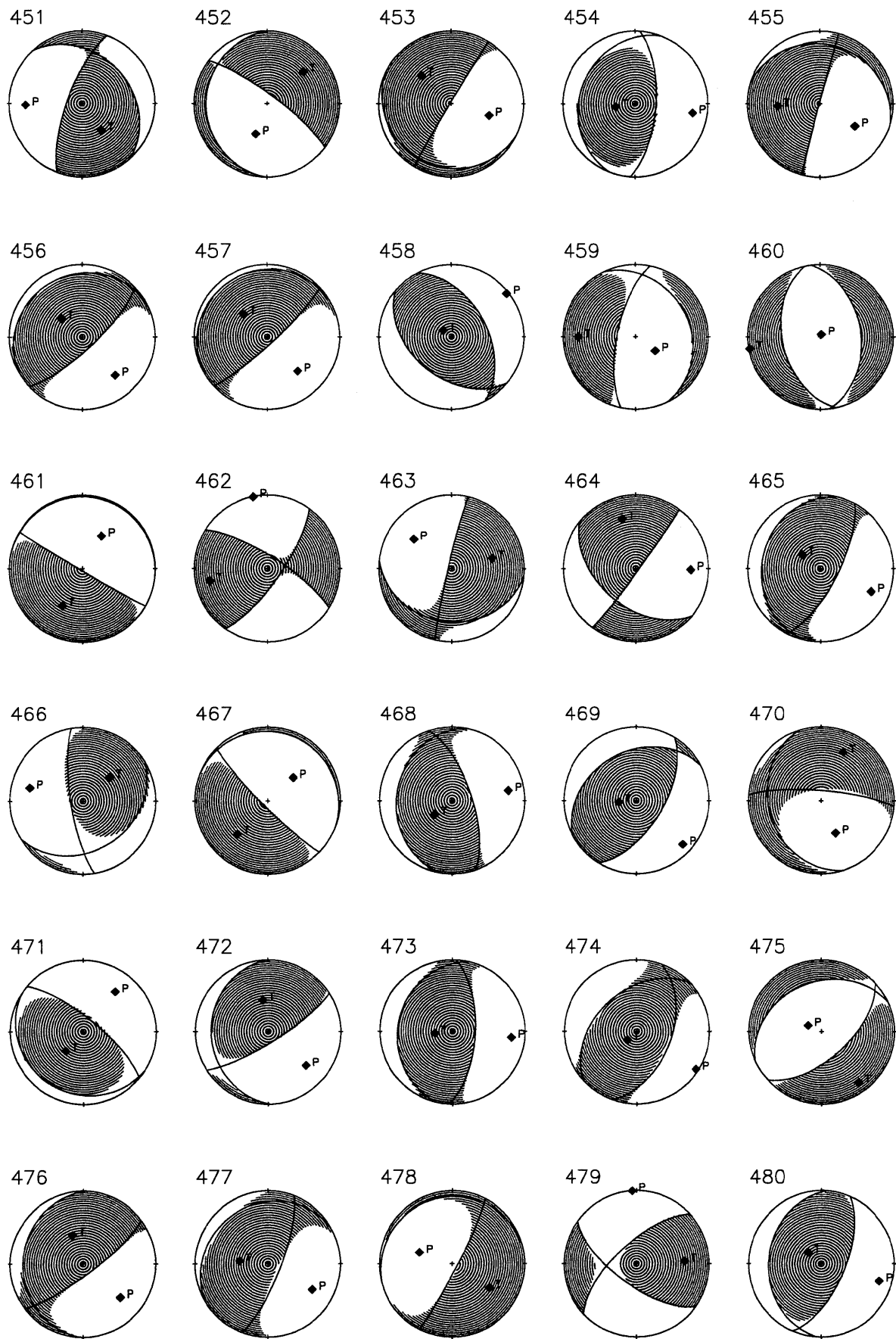


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

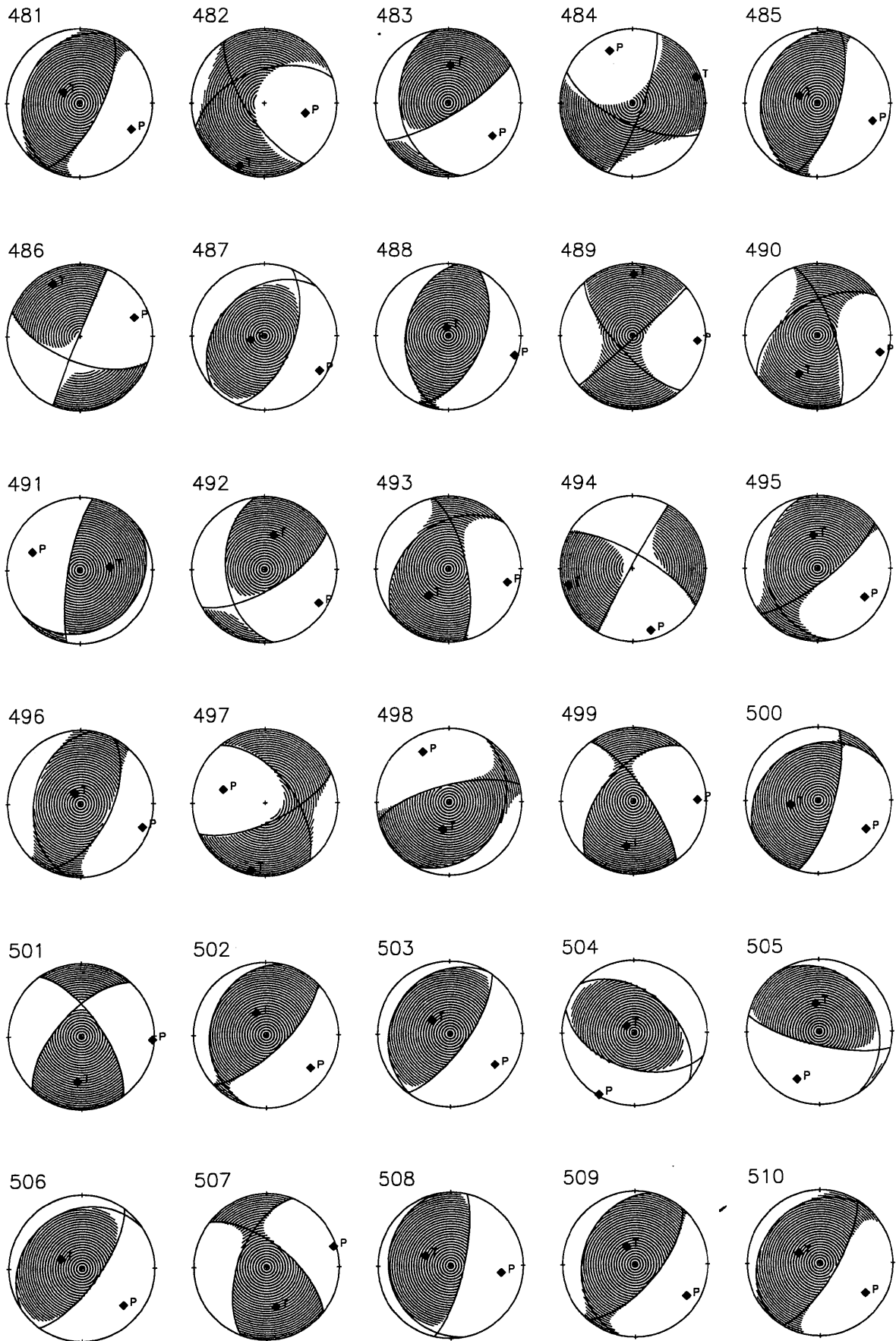


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

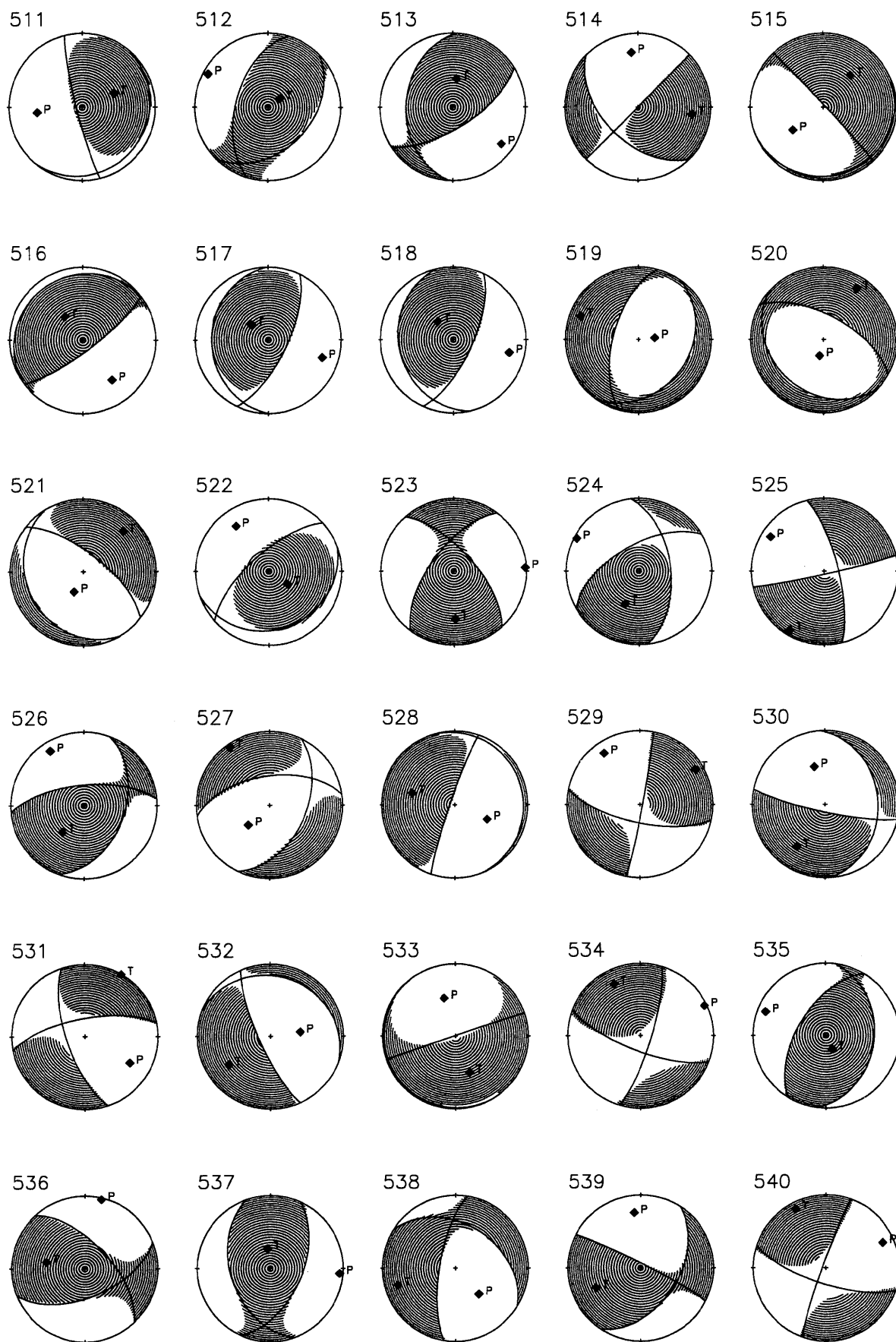


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

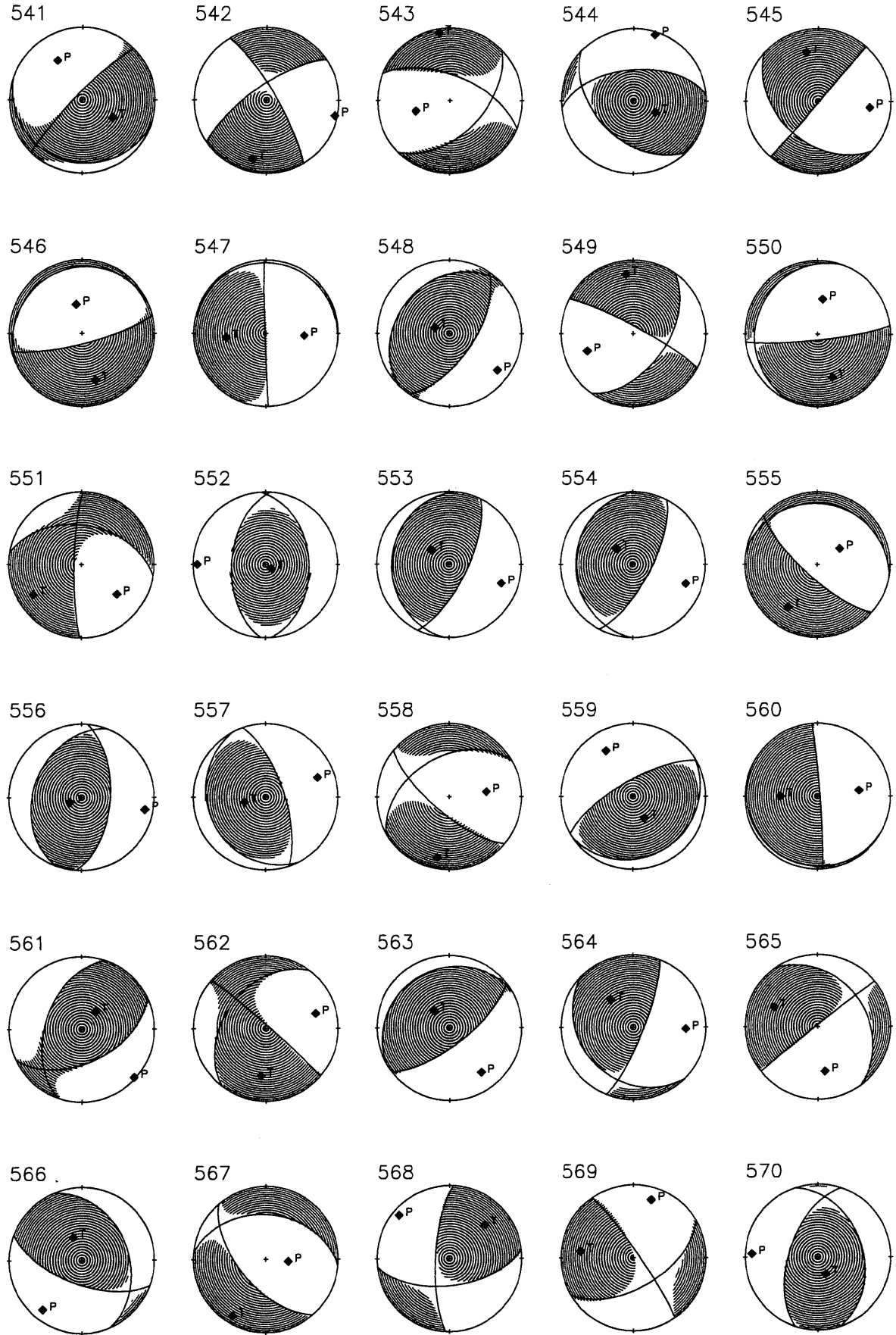


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

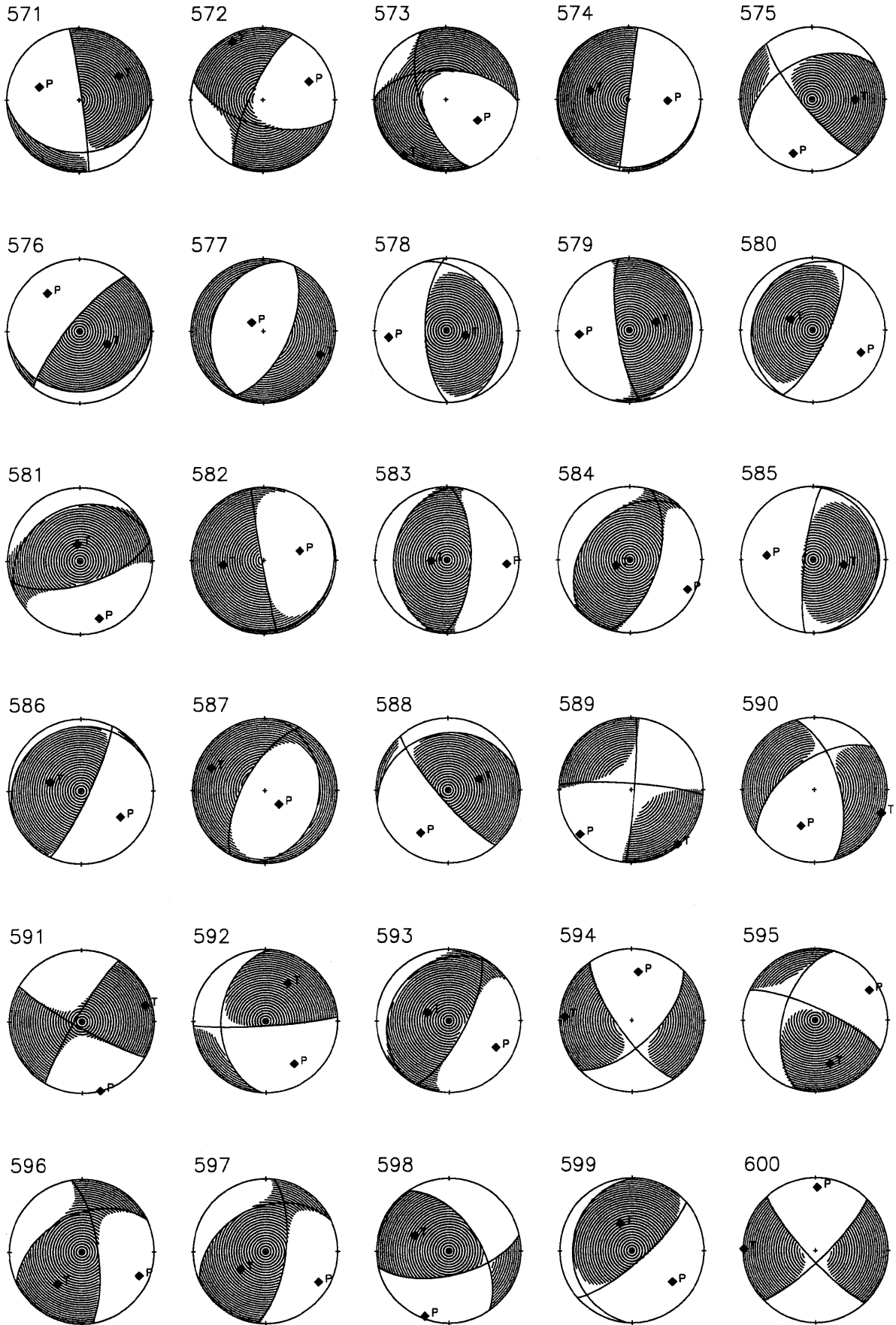


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).

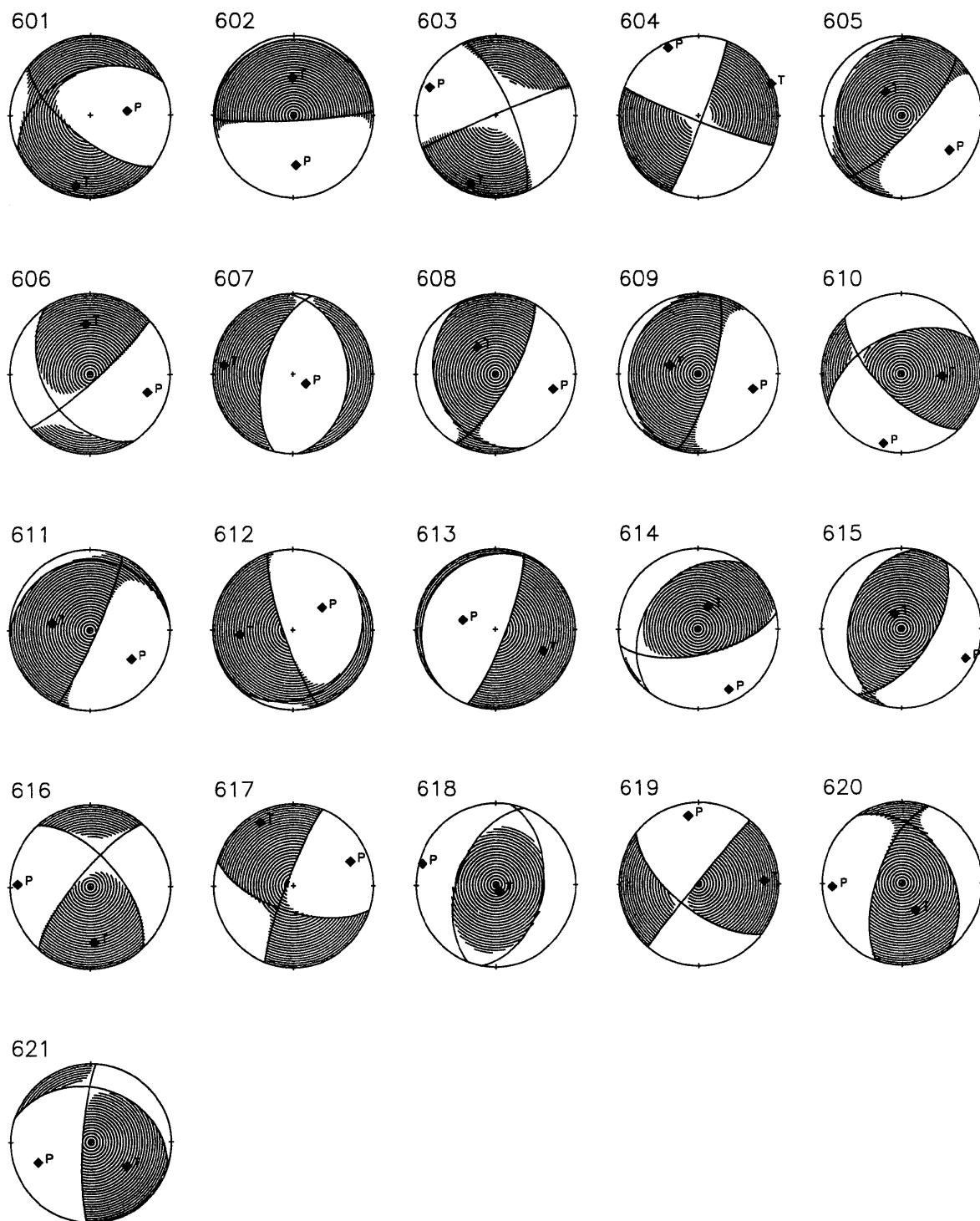


Fig. 3: Estimated moment tensors plotted to the lower hemisphere (continued).