

中国地震台网观测报告

BULLETIN OF SEISMOLOGICAL
OBSERVATIONS OF CHINESE STATIONS

1990



国家地震局地球物理研究所编

地震出版社出版

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前 言

1.“中国地震台网观测报告”是我国地震台网对发生在全世界、特别是发生在中国和邻近地区的地震观测数据的汇编。自1979年起,本报告采用协调世界时(UTC)。为方便中国读者在目录部分也给出北京时。采用汉语拼音拼写中国地名和人名,外国地名和人名沿用英文。

2.本报告列出的震源参数是用VAX/780计算机进行计算修定的。使用的走时表是J-B表^[1]。使用的震相数据除报告中列出的24个一类台以外,还有许多国内台和部分国外台的数据。到时残差、总体标准误差和震源参数的标准误差都分别列出。震中位置,除给出经纬度外,还按Flinn、Engdahl和Hill^[2,3]划定的地震分区给出了大致的地理位置。应该强调指出,所有地震的地理区域名称仅作位置的参考,不包含任何政治意义。

3.面波震级 M_s 的测定,从1966到1982年的地震报告都采用北京台1965年的面波震级公式:

$$M_s = \log(A/T) + \sigma_{PEK}(\Delta)$$

$$\sigma_{PEK}(\Delta) = 1.66 \log(\Delta) + 3.5 \quad (1^\circ < \Delta < 130^\circ)$$

$\sigma_{PEK}(\Delta)$ 比1967年IASPEI(国际地震学与地球内部物理学联合会)推荐的,现已被国际上广泛采用的量规函数

$$\sigma_{IASPEI}(\Delta) = 1.66 \log(\Delta) + 3.3 \quad (20^\circ < \Delta < 160^\circ)$$

在 $\Delta = 20^\circ - 130^\circ$ 的范围内偏高0.2级。世界上两个最有权威的地震机构:国际地震中心(ISC,它使用全球台网资料)和美国地震情报中心(NEIC,它使用世界标准台网资料)都采用 $\sigma_{IASPEI}(\Delta)$ 测定面波震级 M_s ,故此我国测定的 M_s 比国际上系统地偏高0.2级。此外,量规函数 $\sigma_{PEK}(\Delta)$ 代表的面波衰减 $\Delta^{-1.66}$ 在近距离处($\Delta = 1^\circ - 20^\circ$)过大,使得近距离测得的 M_s 偏小,尽管如此,为使资料连续,仍给出用它测定的震级。

4.体波震级 m_B 和 m_b 采用古登堡—里克特公式测定:

$$m_B \text{ 或 } m_b = \log(A/T) + Q(\Delta, h)$$

m_B 是用宽频带中周期SK仪或长周期763仪测定, m_b 是用短周期地震仪测定。

5.为便于使用和对比,报告中还给出了NEIC测定的面波震级 M_{sz} 和短周期地震仪测定的体波震级 m_b 。

6.为避免混乱,各种震级之间一律不换算。

参 考 文 献

[1] Jeffreys, H. and Bullen, K. E., 1940. Seismological Tables, British Association, London (Re-printed, with additions, 1967).

[2] Flinn, E. A. and Engdahl, E. R., 1965. A proposed basis for geographical and seismic regionalization, Rev. Geophys., 3, 123-149.

[3] Flinn, E. A. Engdahl, E. R. and Hill, A. R., 1974. Seismic and geographical regionalization, Bull. Seism. Soc. Am., 64, 771-992.

[4] Willmore, P. L., 1979. Manual of Seismological Observatory Practice, World Data Center A for Solid Earth Geophysics, Report SE-20.

Preface

1. The "Bulletin of Seismological Observations of Chinese Stations" is a summary of the observed data of earthquakes occurring all over the globe, especially those in China and its surrounding regions. Beginning from 1979, observational time and origin time are given in UTC. The names of Chinese places and persons are spelt with Chinese phonetic alphabets while foreign names are all given in English.

2. All focal parameters are processed with a VAX / 780 computer. Jeffreys-Bullen travel time tables are used in this Bulletin^[1]. In addition to the data listed in this Bulletin the observational data used include that of many other stations inside and outside China for computer revision of earthquake parameters. Arrival time residuals, gross standard deviations and standard errors of focal parameters are all listed. The location of every earthquake is expressed by its latitude and longitude, at the same time, is given by the corresponding geographical region proposed by Flinn, Engdahl and Hill^[2,3]. It should be noted that the names used to classify seismic and geographic regions are only references to their locations and does not imply any political significance.

3. The surface wave magnitude M_s given in the Bulletin of Seismological Observations of Chinese Stations from 1966 to 1982 have all adopted the calibration function of the Beijing Station (BJI).

$$M_s = \log(A / T) + \sigma_{PEK}(\Delta) \\ \sigma_{PEK}(\Delta) = 1.66 \log(\Delta) + 3.5 \quad (1^\circ < \Delta < 130^\circ)$$

This calibration function in the range $\Delta = 20^\circ - 130^\circ$ is larger by 0.2 than $\sigma_{IASPEI}(\Delta)$ recommended by IASPEI in 1967 which has already been adopted by many nations and seismological institutions in the world.

$$\sigma_{IASPEI}(\Delta) = 1.66 \log(\Delta) + 3.3 \quad (20^\circ < \Delta < 160^\circ)$$

Both the most authoritative seismological institution in the world: ISC and NEIC have been adopting the $\sigma_{IASPEI}(\Delta)$ to determine magnitude M_s . Therefore, the magnitude M_s calculated by $\sigma_{PEK}(\Delta)$ is systematically 0.2 units larger than that determined by ISC and NEIC which possess the largest aperture seismic network. The rate of attenuation of surface wave amplitude $\Delta^{-1.66}$ in the range $\Delta = 1^\circ - 20^\circ$ characterized by $\sigma_{PEK}(\Delta)$ is so large that the M_s measured for smaller epicentral distance is too small. In spite of this, in order to maintain continuity of data, the values of M_s computed by $\sigma_{PEK}(\Delta)$ are still given.

4. Body-wave magnitudes m_B and m_b are computed by the Gutenberg-Richter formula

$$m_B \text{ or } m_b = \log(A / T) + Q(\Delta, h)$$

m_B being measured by broad-band intermediate (SK) or 763 long period seismographs and m_b measured by short period ones.

5. For convenience of use and comparison, the surface wave magnitude M_{sz} (NEIC) and body wave magnitude m_b (NEIC) measured by NEIC recorded on short period seismograph, are also listed in this Bulletin.

6. In order to avoid confusion, no conversion is made among the various magnitudes.

References

- [1] Jeffreys, H. and Bullen, K. E., 1940. Seismological Tables, British Association, London (Reprinted, with additions, 1967).
- [2] Flinn, E. A. and Engdahl, E. R., 1965. A proposed basis for geographical and seismic regionalization, *Rev. Geophys.*, 3, 123-149.
- [3] Flinn, E. A. Engdahl, E. R. and Hill, A. R., 1974. Seismic and geographical regionalization, *Bull. Seism. Soc. Am.*, 64, 771-992.
- [4] Willmore, P. L., 1979. Manual of Seismological Observatory Practice, World Data Center A for Solid Earth Geophysics, Report SE-20.

台 站 目 录

List of seismological observatories

Station name	Code	Geographic coordinates		Altitude (m)	Foundation	Instruments
		Lat N	Long E			
Baotou	BTO	40° 36' 20"	110° 01' 15"	1114	Granite gneiss	SK,64,763
Beijing	BJI	40 02 25	116 10 30	43	Gravel soil	SK,62,JD2,DK-1,763
Changchun	CN2	43 48 05	125 26 54	230	Slate	SK,DK-1,473,763
Chengdu	CD2	30 54 36	103 45 28	628	Conglomerate	SK,DD-1,763
Dalian	DL2	38 54 22	121 37 42	62	Silicilith	SK,DD-1,763
Gaotai	GTA	39 24 38	99 48 52	1341	Granite	SK,62,DD-1,763
Guangzhou	GZH	23 05 13	113 20 38	11	Sandstone	SK,DD-1,513,763
Guiyang	GYA	26 27 31	106 39 50	1162	Dolomite	SK,DD-1,763
Hohhot	HHC	40 50 58	111 33 49	1154	Rhyolite	SK,DD-1,763
Kashi	KSH	39 31 00	75 55 23	1314	Alluvial clay	SK,DD-1
Kunming	KMI	25 07 24	102 44 24	1945	Sandstone	SK,DD-1,763
Lanzhou	LZH	36 05 12	103 50 48	1550	Lehm	SK,64,513,763
Lhasa	LSA	29 42 00	91 09 00	3789	Granite	SK,VGK
Mudanjiang	MDJ	44 36 59	129 35 31	250	Granite	SK,DD-1,513,763
Nanjing	NJ2	32 03 06	118 51 16	45	Silicarenite	SK,DD-1,513,763
Quanzhou	QZH	24 56 35	118 35 30	21	Granite	SK,64,763
Qiongzong	QZN	19 01 46	109 50 36	230	Granite	DD-1,763
Shenyang	SNY	41 49 40	123 34 41	54	Granite	SK,DD-1,763
Sheshan	SSE	31 05 44	121 11 12	10	Andesite	SK,DD-1,763
Tai'an	TIA	36 12 41	117 07 28	300	Amphibole granite	SK,64,513,763
Taiyuan	TIY	37 42 47	112 26 03	850	Limestone	SK,DD-1,64,763
Urumqi	WMQ	43 48 49	87 42 17	901	Sandstone	SK,62,763
Wuhan	WHN	30 32 37	114 21 01	26	Silicarenite	SK,DD-1,763
Xi'an	XAN	34 02 22	108 55 17	630	Granite	SK,DD-1,513

仪器常数

Constants of seismograph

台站代号 Station code	仪器型号 Type of instrument	分向 Comp.	T ₁	T ₂	D ₁	D ₂	σ^2	V ₀	测定日期 Date determined	记录纸速 R _v (mm / min)	记录方式 Recorder type
BTO	SK	N-S	12.5	1.2	0.45	4.94	0.099	2.29E3	1989.6.9	30	照像纸 Photo paper
		E-W	12.4	1.2	0.45	4.86	0.098	2.35E3	1990.10.5		
		U-D	12.5	1.2	0.58	5.05	0.300	1.42E3			
		N-S	12.5	1.2	0.45	5.03	0.097	2.45E3			
		E-W	12.5	1.2	0.45	4.87	0.091	2.31E3			
		U-D	12.5	1.2	0.58	5.10	0.295	1.29E3			
	DD1	N-S	1.0		0.45			7.68E4	1989.9.20	120	墨水笔 Pen and ink
		E-W	1.0		0.45			6.29E4	1990.11.7		
		U-D	1.0		0.45			7.46E4			
		N-S	1.0		0.45			7.21E4			
		E-W	1.0		0.45			6.56E4			
		U-D	1.0		0.45			7.10E4			
BJI	SK	N-S	12.5	1.1	0.45	5.48	0.009	1.81E3	1989.9.1	30	照像纸 Photo paper
		E-W	12.5	1.1	0.45	5.34	0.083	1.61E3	1990.9.1		
		U-D	12.5	1.1	0.59	4.12	0.294	1.21E3			
		N-S	12.5	1.2	0.45	4.92	0.087	1.84E3			
		E-W	12.5	1.2	0.45	5.02	0.079	1.62E3			
		U-D	12.5	1.2	0.59	5.10	0.283	1.01E3			
	DD-2	N-S	1.0		0.60			1.61E5	1989.10.20	120	墨水笔 Pen and ink
		E-W	1.0		0.60			1.48E5			
		U-D	1.0		0.60			1.17E5			
CN2	SK	N-S	12.5	1.2	0.45	5.05	0.078	2.08E3	1990.1.20	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.06	0.073	2.15E3			
		U-D	12.5	1.2	0.60	5.09	0.329	1.36E3			
	473	N-S	1.5		0.45			1.09E5	1989.11.25	120	熏烟纸 Smoked paper
		E-W	1.5		0.45			1.17E5	1990.3.24		
		U-D	1.5		0.45			6.58E4			
		N-S	1.5		0.45			7.45E4			
		E-W	1.5		0.45			8.55E4			
U-D	1.5		0.45			1.32E5					
CD2	SK	N-S	12.5	1.2	0.45	5.0	0.016	1.40E3	1989.12.29	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.0	0.017	1.40E3			
		U-D	12.5	1.2	0.53	5.0	0.083	1.00E3			
	DD1	N-S	1.0		0.45			9.13E4	1989.12.20	120	墨水笔 Pen and ink
		E-W	1.0		0.45			9.80E4	1990.6.16		
		U-D	1.0		0.45			9.86E4			
		N-S	1.0		0.45			7.26E4			
		E-W	1.0		0.45			6.69E4			
		U-D	1.0		0.45			6.70E4			
DL2	SK	N-S	12.5	1.2	0.45	4.99	0.091	1.70E3	1989.10.31	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.06	0.100	1.70E3	1990.10.26		
		U-D	12.5	1.2	0.58	4.91	0.247	1.34E3			
		N-S	12.5	1.2	0.45	4.96	0.102	1.70E3			
		E-W	12.5	1.2	0.45	5.07	0.100	1.70E3			
		U-D	12.5	1.2	0.59	5.01	0.241	1.31E3			

续表

台站代号 Station code	仪器型号 Type of instrument	分向 Comp.	T ₁	T ₂	D ₁	D ₂	σ^2	V ₀	测定日期 Date determined	记录纸速 R _v (mm/min)	记录方式 Recorder type
DL2	DD1	N-S	1.0		0.45			2.38E4	1990.4.13	120	墨水笔 Pen and ink
		E-W	1.0		0.45			1.78E4			
		U-D	1.0		0.45			2.21E4			
		N-S	1.0		0.45			2.62E4			
		E-W	1.0		0.45			1.96E4			
		U-D	1.0		0.45			.983E4			
GTA	SK	N-S	12.5	1.2	0.45	5.02	0.080	2.25E3	1989.11.7	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.90	0.071	2.23E3			
		U-D	12.5	1.2	0.53	4.96	0.284	1.11E3			
		N-S	12.5	1.2	0.45	5.03	0.075	1.91E3			
		E-W	12.5	1.2	0.45	4.95	0.070	1.69E3			
		U-D	12.5	1.2	0.53	4.96	0.286	1.13E3			
	DD2	N-S	1.0		0.45			2.32E5	1990.3.30	120	墨水笔 Pen and ink
		E-W	1.0		0.45			3.39E5			
		U-D	1.0		0.45			5.44E5			
	DD1	N-S	1.0		0.45			2.04E5	1990.9.26	120	照相纸 Photo paper
		E-W	1.0		0.45			1.93E5			
		U-D	1.0		0.45			1.26E5			
GZH	SK	N-S	12.5	1.2	0.45	4.96	0.064	1.88E3	1989.3.10	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.10	0.063	1.93E3			
		U-D	12.5	1.2	0.56	4.95	0.244	1.24E3			
		N-S	12.5	1.2	0.45	5.09	0.069	1.88E3			
		E-W	12.5	1.2	0.45	5.09	0.065	1.94E3			
		U-D	12.5	1.2	0.56	5.07	0.258	1.13E3			
	DD1	N-S	1.0		0.45			6.53E4	1990.2.19	120	墨水笔 Pen and ink
		E-W	1.0		0.45			5.31E4			
		U-D	1.0		0.45			6.49E4			
		N-S	1.0		0.45			5.69E4			
		E-W	1.0		0.45			5.13E4			
		U-D	1.0		0.45			7.51E4			
GYA	SK	N-S	12.5	1.2	0.45	5.04	0.089	1.42E3	1989.7.10	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.99	0.070	1.32E3			
		U-D	12.5	1.2	0.56	4.99	0.280	.901E3			
		N-S	12.5	1.2	0.45	4.99	0.090	1.54E3			
		E-W	12.5	1.2	0.45	5.02	0.070	1.38E3			
		U-D	12.5	1.2	0.56	5.10	0.311	1.03E3			
	DD1	N-S	1.0		0.45			7.71E4	1989.7.13	120	墨水笔 Pen and ink
		E-W	1.0		0.45			7.08E4			
		U-D	1.0		0.45			8.44E4			
		N-S	1.0		0.45			7.82E4			
		E-W	1.0		0.45			6.88E4			
		U-D	1.0		0.45			7.99E4			
HHC	SK	N-S	12.5	1.2	0.45	5.0	0.1	2.84E3	1989.7.4	30	照相纸 Photo paper
		E-W	12.5	1.2	0.45	4.9	0.1	2.99E3			
		U-D	12.5	1.2	0.60	5.1	0.3	1.38E3			

续表

台站代号 Station code	仪器型号 Type of instruments	分向 Comp.	T ₁	T ₂	D ₁	D ₂	σ^2	V ₀	测定日期 Date determined	记录纸速 R _v (mm / min)	记录方式 Recorder type
HHC	SK	N-S	12.5	1.2	0.45	5.0	0.10	2.90E3	1990.7.4	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.9	0.10	2.97E3			
		U-D	12.5	1.2	0.61	5.1	0.30	1.33E3			
	DD1	N-S	1.0		0.45			6.31E4	1989.7.9	120	墨水笔 Pen and ink
		E-W	1.0		0.45			7.57E4			
		U-D	1.0		0.45			8.47E4			
		N-S	1.0		0.45			6.80E4			
E-W		1.0		0.45			7.67E4				
U-D		1.0		0.45			7.96E4				
KSH	SK	N-S	12.5	1.2	0.45	4.94	0.040	1.74E3	1989.11.26	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.01	0.042	1.94E3			
		U-D	12.5	1.2	0.59	4.99	0.302	1.29E3			
		N-S	12.5	1.2	0.45	5.01	0.064	2.06E3			
		E-W	12.5	1.2	0.45	4.93	0.078	1.58E3			
		U-D	12.5	1.2	0.50	5.03	0.254	1.26E3			
		KMI	SK	N-S	12.5	1.2	0.45	5.0	0.093		
E-W	12.5			1.2	0.45	5.0	0.092	2.40E3			
U-D	12.5			1.2	0.65	5.0	0.367	1.50E3			
62	N-S		2.6	0.101	0.50	5.0	0.079	3.19E4	1989.12.20	60	照像纸 Photo paper
	E-W		2.6	0.238	0.50	5.0	0.147	2.95E4			
	U-D		2.6	0.106	0.40	4.0	0.079	3.34E4			
LZH	SK		N-S	12.5	1.2	0.45	4.96	0.083	2.12E3	1989.10.14	30
		E-W	12.5	1.2	0.45	5.05	0.086	2.13E3			
		U-D	12.5	1.2	0.59	5.05	0.351	1.17E3			
		N-S	12.5	1.2	0.45	5.06	0.084	2.05E3			
		E-W	12.5	1.2	0.45	5.08	0.086	2.25E3			
		U-D	12.5	1.2	0.59	5.02	0.346	1.25E3			
	64	N-S	2.5	0.087	0.50	6.0	0.25	2.81E4	1989.6.14	60	照像纸 Photo paper
		E-W	2.5	0.094	0.50	6.0	0.25	2.53E4			
		U-D	2.5	0.092	0.50	6.0	0.25	3.54E4			
		N-S	2.5	0.089	0.50	6.0	0.25	2.73E4			
		E-W	2.5	0.091	0.50	6.0	0.25	2.57E4			
		U-D	2.5	0.091	0.50	6.0	0.25	4.44E4			
LSA	SK	N-S	12.5	1.2	0.45	4.99	0.085	1.65E3	1989.6.15	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.00	0.110	2.19E3			
		U-D	12.5	1.2	0.56	5.00	0.264	.899E3			
		N-S	12.5	1.2	0.45	4.95	0.065	1.71E3			
		E-W	12.5	1.2	0.45	4.98	0.090	2.15E3			
		U-D	12.5	1.2	0.53	4.92	0.257	1.02E3			
		MDJ	SK	N-S	12.4	1.2	0.45	5.0	0.076		
E-W	12.4			1.2	0.45	4.9	0.062	1.99E3			
U-D	12.5			1.2	0.59	5.0	0.248	1.28E3			
N-S	12.4			1.2	0.45	5.1	0.070	2.25E3			
E-W	12.4			1.2	0.45	5.0	0.063	1.80E3			
U-D	12.5			1.2	0.59	5.0	0.249	1.15E3			

续表

台站代号 Station code	仪器型号 Type of instrument	分向 Comp.	T ₁	T ₂	D ₁	D ₂	σ^2	V ₀	测定日期 Date determined	记录纸速 R _v (mm / min)	记录方式 Recorder type
MDJ	DD1	N-S E-W U-D	1.0 1.0 1.0		0.45 0.45 0.45			6.70E4 6.53E4 7.20E4	1989.12.20	120	墨水笔 Pen and ink
NJ2	SK	N-S	12.5	1.2	0.45	5.0	0.084	2.36E3	1990.1.1	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.0	0.092	2.49E3			
		U-D	12.5	1.2	0.60	5.0	0.267	1.57E3			
	DD1	N-S	1.0		0.45			5.39E4	1990.5.15	120	墨水笔 Pen and ink
		E-W	1.0		0.45			6.11E4			
		U-D	1.0		0.45			5.43E4	1990.9.25		
		N-S	1.0		0.45			3.11E4			
E-W	1.0		0.45			3.56E4					
U-D	1.0		0.45			5.18E4					
QZH	SK	N-S	12.5	1.2	0.45	5.09	0.082	2.19E3	1989.11.12	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.95	0.076	2.08E3			
		U-D	12.5	1.2	0.61	4.95	0.075	1.05E3			
	473	N-S	1.5		0.45			2.30E4	1989.10.30	120	熏烟纸 Smoked paper
E-W		1.5		0.45			2.63E4				
U-D		1.5		0.45			2.24E4				
QZN	SK	N-S	12.5	1.2	0.45	4.93	0.038	1.71E3	1989.12.15	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.92	0.038	1.61E3			
		U-D	12.5	1.2	0.59	4.95	0.283	1.24E3	1989.12.8		
		N-S	12.5	1.2	0.45	4.98	0.040	1.70E3			
		E-W	12.5	1.2	0.45	4.97	0.038	1.63E3			
		U-D	12.5	1.2	0.59	4.93	0.288	1.28E3			
	DD1	N-S	0.7		0.40			1.46E5	1989.12.13	120	墨水笔 Pen and ink
		E-W	0.7		0.40			1.71E5			
		U-D	0.7		0.40			1.24E5			
SNY	SK	N-S	12.5	1.2	0.45	5.09	0.083	2.22E3	1989.3.30	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	5.03	0.095	2.42E3			
		U-D	12.5	1.2	0.60	4.93	0.315	1.23E3	1990.3.28		
		N-S	12.5	1.2	0.45	5.10	0.080	2.16E3			
		E-W	12.5	1.2	0.45	4.94	0.094	2.18E3			
		U-D	12.5	1.2	0.61	5.06	0.315	1.13E3			
	DD1	N-S	1.0		0.45			6.81E4	1989.11.30	120	墨水笔 Pen and ink
		E-W	1.0		0.45			7.31E4			
		U-D	1.0		0.45			5.79E4	1990.5.30		
		N-S	1.0		0.45			6.23E4			
		E-W	1.0		0.45			7.22E4			
		U-D	1.0		0.45			5.73E4			
SSE	SK	N-S	12.5	1.2	0.45	4.94	0.076	2.49E3	1989.12.28	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.98	0.079	2.85E3			
		U-D	12.5	1.2	0.54	5.03	0.241	1.10E3			
	DD1	N-S	1.0		0.45			5.74E4	1989.12.8	120	墨水笔 Pen and ink
		E-W	1.0		0.45			6.62E4			
		U-D	1.0		0.45			4.50E4			

续表

台站代号 Station code	仪器型号 Type of instrument	分向 Comp.	T ₁	T ₂	D ₁	D ₂	σ ²	V ₀	测定日期 Date determined	记录纸速 R _v (mm / min)	记录方式 Recorder type
SSE	DD1	N-S E-W U-D	1.0 1.0 1.0		0.45 0.45 0.45			4.94E4 5.49E4 5.04E4	1990.11.22	120	墨水笔 Pen and ink
TIA	SK	N-S	12.5	1.2	0.45	5.0	0.081	2.30E3	1989.10.22	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.9	0.086	2.35E3	1990.10.13		
		U-D	12.5	1.2	0.53	5.0	0.219	.823E3			
		N-S	12.5	1.2	0.45	5.1	0.081	2.27E3			
		E-W	12.5	1.2	0.45	5.0	0.084	2.39E3			
		U-D	12.5	1.2	0.53	5.0	0.211	.802E3			
	473	N-S	1.5		0.45			1.09E5	1990.4.19	120	熏烟纸 Smoked paper
		E-W	1.5		0.45			2.19E5	1990.10.21		
		U-D	1.5		0.45			1.24E5			
		N-S	1.5		0.45			9.60E4			
		E-W	1.5		0.45			1.93E5			
		U-D	1.5		0.45			1.24E5			
TIY	SK	N-S	12.5	1.2	0.45	5.08	0.084	1.58E3	1989.2.17	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.91	0.082	1.63E3	1990.2.9		
		U-D	12.5	1.2	0.59	5.04	0.308	.895E3			
		N-S	12.5	1.2	0.45	5.07	0.085	1.65E3			
		E-W	12.5	1.2	0.45	5.06	0.082	1.69E3			
		U-D	12.5	1.2	0.59	5.05	0.309	.832E3			
	DD1	N-S	1.0		0.45			1.23E4	1990.3.23	120	墨水笔 Pen and ink
		E-W	1.0		0.45			1.79E4	1990.9.15		
		U-D	1.0		0.45			5.84E4			
		N-S	1.0		0.45			3.05E4			
		E-W	1.0		0.45			4.13E4			
		U-D	1.0		0.45			5.24E4			
WHN	SK	N-S	12.5	1.2	0.45	5.00	0.111	2.19E3	1989.5.10	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.96	0.100	2.38E3	1990.5.1		
		U-D	12.5	1.2	0.62	4.92	0.378	1.28E3			
		N-S	12.5	1.2	0.45	4.90	0.085	2.04E3			
		E-W	12.5	1.2	0.45	5.00	0.098	2.32E3			
		U-D	12.5	1.2	0.62	4.95	0.361	1.56E3			
	DD1	N-S	1.0		0.45			2.90E4	1989.5.1	120	墨水笔 Pen and ink
		E-W	1.0		0.45			2.78E4	1990.5.1		
		U-D	1.0		0.45			5.08E4			
		N-S	1.0		0.45			3.01E4			
		E-W	1.0		0.45			2.68E4			
		U-D	1.0		0.45			4.93E4			
WMQ	SK	N-S	12.5	1.2	0.45	5.00	0.092	2.99E3	1989.10.2	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.99	0.093	2.17E3	1990.9.7		
		U-D	12.5	1.2	0.57	5.00	0.289	0.93E3			
		N-S	12.5	1.2	0.45	4.99	0.093	2.25E3			
		E-W	12.5	1.2	0.45	4.99	0.094	1.54E3			
		U-D	12.5	1.2	0.57	5.00	0.316	0.85E3			

续表

台站代号 Station code	仪器型号 Type of instrument	分向 Comp.	T ₁	T ₂	D ₁	D ₂	σ ²	V ₀	测定日期 Date determined	记录纸速 R _v (mm / min)	记录方式 Recorder type
WMQ	DD1	N-S	1.0		0.45			1.38E5	1990.9.1	60	照相纸 Photo paper
		E-W	1.0		0.45			1.13E5			
		U-D	1.0		0.45			1.63E5			
XAN	SK	N-S	12.5	1.2	0.45	4.97	0.094	2.25E3	1989.10.21	30	照像纸 Photo paper
		E-W	12.5	1.2	0.45	4.95	0.094	2.27E3	1990.11.13		
		U-D	12.5	1.2	0.62	4.96	0.318	1.30E3			
		N-S	12.5	1.2	0.45	4.98	0.094	2.23E3			
		E-W	12.5	1.2	0.45	4.96	0.094	2.24E3			
		U-D	12.5	1.2	0.62	5.01	0.316	1.33E3			
	DD1	N-S	1.0		0.45			1.85E5	1989.10.1	120	墨水笔 Pen and ink
		E-W	1.0		0.45			2.04E5	1990.5.31		
		U-D	1.0		0.45			1.72E5			
		N-S	1.0		0.45			2.41E5			
		E-W	1.0		0.45			1.77E5			
		U-D	1.0		0.45			1.43E6			

62 : Type 62 seismograph with galvanometer recording

64 : Type 64 seismograph with galvanometer recording or with electronic amplifier and pen recorder

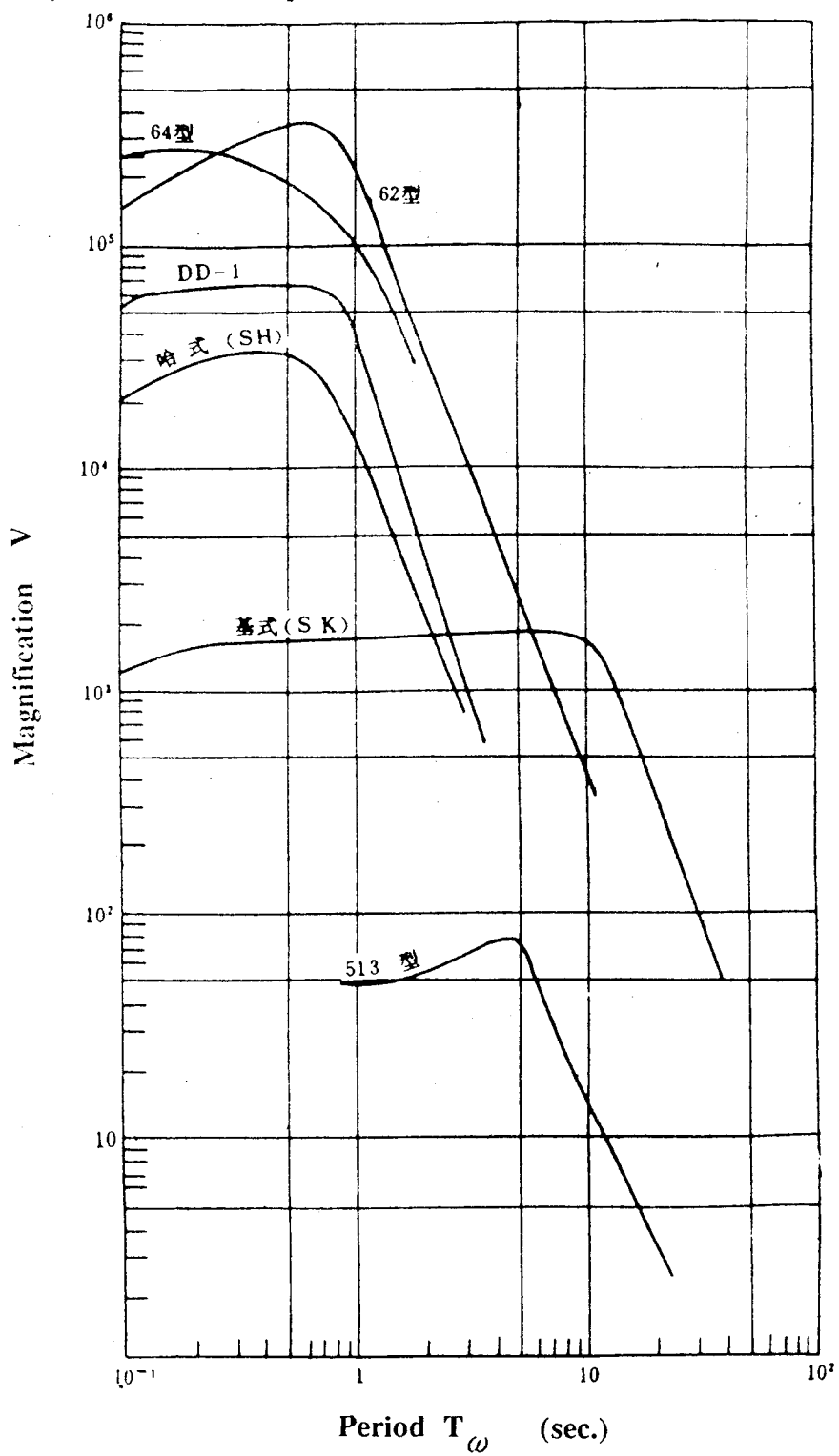
SK : Type SK (Kirnos) seismograph with galvanometer recording

DD-1 : Type DD-1 seismograph with electronic amplifier and pen recorder

 T_1 : Seismometer period in sec. T_2 : Galvanometer period in sec. D_1 : Damping coefficient of Seismometer D_2 : Damping coefficient of galvanometer σ^2 : Coupling coefficient V_0 : Static magnification, asterisk indicates magnification at T_1 R_v : Paper speed in mm / min

仪器放大倍率曲线

Response Curves of Instruments



1990 年 地 震 目 录
Catalogue of earthquakes of 1990

