

中国地震台网观测报告

BULLETIN OF SEISMOLOGICAL
OBSERVATIONS OF CHINESE STATIONS

1967



国家地震局地球物理研究所编

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前 言

自 1966 年至 1970 年期间的中国地震台网观测读数, 没有汇编成用于国际交流的地震台网观测通报。1985 年决定补编这段时期的资料, 有关补编的宗旨和作法已在 1987 年《国际地震动态》第 9 期作了介绍⁽⁴⁾。

本通报列出的地震参数, 没有重新修定。国内及边境地区地震, 一般给出两组数, 第一组引自中国地震目录⁽³⁾, 第二组引自 BISC⁽²⁾, 以资对比。国外远震仅一组数, 为 BISC 的结果; 还有少部分地震列出了三组数, 第一组引自文献⁽³⁾, 第二组为区域台网测定结果 (例如云南省区域台网), 第三组为 BISC 测定结果。使用的时间为世界时 (UT 或 GMT), 地震走时表为 J-B 表⁽¹⁾。

关于震级, 凡大于 5 小于 6 者, 为北京 (BJI), 拉萨 (LSA), 和乌鲁木齐 (WMQ) 三台的平均值或某一台的测定结果。测定震级的公式如下:

$$M_b = 1.59M - 3.97$$

$$m = \log\left(\frac{A}{T}\right) + Q(\Delta, h)$$

$$M_s = \log\left(\frac{A}{T}\right)_{\max} + \sigma(\Delta)$$

$$\sigma(\Delta) = 1.66\log\Delta + 3.5$$

报告中的震相符号参考了国际地震电报符号。请注意对照表: $PG = \bar{P}$ 或 Pg ; $SG = \bar{S}$ 或 Sg ; $CG = \pi g$; $PB = P^*$; $SB = S^*$; $AP = pP$; $APKP = pPKP$; $XP = sP$; $XP KP = sPKP$; $XS = sS$; $XSKS = sSKS$ 。Sr 为 20° 间断面以下的折射波震相, p 后无到时读数, 而后接地动位移和相应周期, 表示 p 的初始前半个周期的振幅和相应周期。Pm, PPm, Sm 分别为 P 波, PP 波和 S 波的最大振幅。Qm 和 Rm 分别为勒夫波和瑞利波的最大振幅。Lm 为面波在水平向的最大振幅, 不能分辨为勒夫波或瑞利波。

本汇编的最后部分“附录”, 给出了北京台、乌鲁木齐台、拉萨等台站读数的震相数据, 其中不包括已有定位的震相数据。

在工作中得到各省市自治区地震局资料室和地震台站以及国家地震局科技监测司的协助和支持; 得到本所资料室的帮助。在此, 对以上各有关机构的同志们表示感谢。

参加地震通报分析、汇编工作的有国家地震局地球物理研究所九室、二室、昌黎, 广州、长春、南京、沈阳和分析预报中心共 17 人。

编 者

1988 年 10 月

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Preface

The seismological data observed at Chinese stations during 1966–1970 had not been compiled into "Bulletin of Seismological Observations of Chinese Stations" for exchange. A decision had been made in 1985 to compile these Bulletins. The aim and method of compilation are presented in "Recent Developments in World Seismology" in 1987⁽⁴⁾.

All of focal parameters in this Bulletin are not revised. Two sets of parameters are given for the earthquakes occurred in China and its surrounding regions. The first one comes from "The Catalogue of the Chinese Earthquakes"⁽³⁾ while the second is quoted from BISC⁽²⁾, for mutual comparison. There is only a set of data for the distant earthquakes outside China, which is the result of BISC. Three sets of parameters are given for a few of earthquakes: the first one is quoted from reference⁽³⁾, the second is the result obtained by local network (such as seismic network in Yunnan province) and the third is the result of BISC. The observational time and origin time are given in universal time (UT or GMT). The travel time tables used in the Bulletin are Jeffreys and Bullen's⁽¹⁾.

The magnitude for such earthquakes $5 < M < 6$ is an average over three stations of BJI, LSA and WMQ, or a measurement at one station only. The surface wave magnitude M_s and body wave magnitude M_b are determined according to the following formulas

$$M_b = 1.59M - 3.97$$

$$m = \log\left(\frac{A}{T}\right) + Q(\Delta, h)$$

$$M_s = \log\left(\frac{A}{T}\right)_{\max} + \sigma(\Delta)$$

$$\sigma(\Delta) = 1.66 * \log \Delta + 3.5$$

The phases in the Bulletin refer to international earthquake telegraphic symbols, shortly as follows: $PG = \bar{P}$ or P_g ; $SG = \bar{S}$ or S_g ; $CG = \pi g$; $PB = P^*$; $SB = S^*$; $AP = pP$; $APKP = pPKP$; $XP = sP$; $XPKP = sPKP$; $XS = sS$; $XSKS = sSKS$. S_r is a refraction phase under 20° discontinuity. The ground displacement and its period listed after the P phase without P arrival time represent onset amplitude and its period. PM, PPM and Sm are the maximum amplitude of P, PP and S wave, respectively. Qm and Rm are the maximum amplitude of Love and Rayleigh surface wave, respectively. Lm is the maximum amplitude of surface wave on horizontal component, disregarding either Love or Rayleigh waves.

The appendix in the last part of the Bulletin is phase data of some stations, such as BJI, WMQ, LSA etc, excluding the data which have been used to locate earthquake.

The authors wish to express their sincere thank to the Department of Scientific Programming and Earthquake Monitoring, SSB, every Provincial Sismological Bureau in China and Reference room of Institute of Geophysics for their constant support and assistance.

17 colleagues, from the 9th and the 2nd departments, Inst. of geophysics, SSB, from Guangzhou, Changli, Changchun, Nanjing and Shenyang cities, as well as from prediction center, SSB have taken part in the computation work.

Author in Oct., 1988

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LIST OF SEISMOLOGICAL OBSERVATIONES

STATION	CODE	LAT(N)	LON(E)	ALTITUDE H(m)	INSTRUMENT
Beijing (Peking)	BJI 北京	40 02 25	116 10 30	43	SH, 513, SK
Baotou (Baotow)	BTO 包头	40 35 54	110 01 06	1120	SK
Chengdu (Chengtú)	CDU 成都	30 39 37	104 00 40	506	SK
Changchun	CNH 长春	43 49 45	125 18 48	236	SK, 513
Dallan (Dairen)	DRA 大连	38 54	121 38	94	SK
Guangzhou (Ganton)	GZH 广州	23 05 13	113 20 38	11	SK, SH
Guiyang	GYA 贵阳	26 27 31	106 39 50	1162	SK
Kunming	KMI 昆明	25 07 24	102 44 24	1945	SK
Kashi	KSH 喀什	39 27 19	75 58 48	1286	SK
Lhasa	LSA 拉萨	29 38 10	91 02 11	3658	SK, SH
Lanzhou (Lanchow)	LZH 兰州	36 05 12	103 50 40	1560	513, SK, SH
Nanjing (Nanking)	LJI 南京	32 03 48	118 47 00	10	SK, SW(1)
Sheshan (Zose)	SSH 佘山	31 05 48	121 11 11	90	SK, SW(2)
Taian	TIA 泰安	36 12 41	117 07 28	300	SK
Wuhan (Wuchang)	WHM.N 武汉	30 32 37	114 21 01	26	SK
Urumqi (Urumchi)	WMQ 乌鲁木齐	43 49 16	87 41 42	970	62, SK
Xian (Sian)	XAN 西安	34 02 22	108 55 17	630	SK

CONSTANTS OF SEISMOGRAPHS

types of Instruments	comp	T1	T2	D1	D2	σ	r1	V0	Rv
62	H	2.0	0.5	0.5	1.5-1.7	0.05		3E5	120
	Z	2.0	0.5	0.5	1.5-1.7	0.08		(2-3)E5	120
513	H	4-5		0.2-0.4			0.1-0.2	30-50	30
SK	H	12.5	1-1.2	0.45-0.60	5-6	0.08		(1-2)E3	30
	Z	12.5	1-1.2	0.45-0.65	5-6	0.30		(1-2)E3	30
SH	H	0.8-1.2	0.4-1	0.6-0.8	1.0	0.35		(2-3)E3	60
	Z	0.8-1	0.5-1	0.6-0.8	1.0	0.35		3E3	60
SW(1)	H	1.4		0.43				1.3E3	30
SW(2)	H	5.0-6.0					0.01-0.45	200	30

62 type62 galvanometric seismographs

513 type513 low magnification, mechanical registration, horizontal seismographs

SK Kirnos type galvanometric seismographs

SH Harins type galvanometric seismographs

SW(1) Wiechert(1) type mechanical registration horizontal seismographs
(17,000kg)

SW(2) Wiechert(2) type mechanical registration horizontal seismographs (1,200kg)

T1 Pendulum period

T2 Galvanometer period

D1 Damping factor of pendulum

D2 Damping factor of galvanometer

σ Coupling coefficient

r1 Amplitude of solid friction

V0 Static magnification

Rv The recording paper speed, mm / min

INS	TYPE	COMP	T1	D1	T2	D2	σ_2	V0 X10 ³	R(mm/min)	DATE OF MEASUREMENT
SSE	SK	N	12.6	0.45	1.19	5.00	0.070	1.51	30	1965.10.30
		E	12.5	0.45	1.20	5.09	0.073	1.59		1965.10.30
		Z	12.5	0.60	1.20	4.97	0.230	0.89		1965.5
		N	12.5	0.45	1.20	5.06	0.072	1.70		1969.4.20
		E	12.5	0.45	1.20	4.95	0.076	1.79		1969.4.20
		Z	12.5	0.60	1.20	4.90	0.249	0.91		1965.10.3
DLI	SK	N	12.5	0.45	1.20	5.0	0.087	1.62	30	1966.12.10
		E	12.5	0.45	1.20	5.0	0.082	1.55		
		Z	12.5	0.50	1.20	5.0	0.28	0.81		
		N	12.5	0.45	1.2	5.0	0.082	1.56		1967.8.15
		E	12.5	0.45	1.2	5.0	0.086	1.52		
		Z	12.5	0.50	1.2	5.0	0.339	0.78		
BJI	SH	N	0.766	0.7	0.40	2.0	0.25	300	60	1967.11.9
		E	0.783	0.7	0.40	2.0	0.25	272		
		Z	0.807	0.7	0.40	2.0	0.25	266		
	SK	N	12.5	0.45	1.10	5.55	0.092	1.65	30	
		E	12.5	0.45	1.10	5.55	0.083	1.52		1966.10.26
		Z	12.5	0.59	1.10	5.53	0.313	0.90		
		N	12.5	0.45	1.09	5.55	0.095	1.73		1967.3.14
		E	12.4	0.45	1.10	5.58	0.088	1.61		
		Z	12.4	0.59	1.10	5.57	0.317	0.92		
		N	12.4	0.45	1.09	5.59	0.095	1.68		1968.12.13
		E	12.4	0.45	1.10	5.59	0.087	1.67		
		Z	12.4	0.59	1.11	5.59	0.314	0.86		
	581	E	1.30	0.197				11.1	120	1966.11.22
NJI	SK	N	12.5	0.45	1.20	5.00	0.071	1.62	30	1966.5.10
		E	12.5	0.45	1.20	5.00	0.068	1.48		
		Z	12.5	0.56	1.20	5.01	0.257	1.00		

INS	TYPE	COMP	T1	D1	T2	D2	σ_2	V0 X10 ³	R(mm/min)	DATE OF MEASUREMENT
		N	12.5	0.45	1.20	4.87	0.070	1.71		1970.9.23
		E	12.5	0.45	1.20	4.99	0.067	1.51		
		Z	12.5	0.56	1.20	4.84	0.246	1.05		
CNH	SK	N	12.5	0.45	1.2	5.0	0.088	1.47	30	1966.12.31
		E	12.5	0.45	1.2	5.0	0.088	1.61		
		Z	12.5	0.60	1.2	5.0	0.314	1.02		
		N	12.5	0.45	1.2	5.0	0.086	1.44		1967.7.14
		E	12.5	0.45	1.2	5.0	0.083	1.62		
		Z	12.5	0.60	1.2	5.0	0.302	1.01		
		N	12.5	0.45	1.2	5.0	0.077	1.41		1968.5.16
		E	12.5	0.45	1.2	5.0	0.087	1.65		
		Z	12.5	0.60	1.2	5.0	0.315	1.14		
XAN	SK	N	12.5	0.45	1.2	4.98	0.087	1.59	30	1966.12.25
		E	12.5	0.45	1.2	5.01	0.103	1.75		
		Z	12.5	0.55	1.2	5.03	0.26	1.02		
		N	12.5	0.45	1.2	4.90	0.088	1.70		1967.11.8
		E	12.5	0.45	1.2	5.01	0.094	1.86		1967.11.8
		Z	12.5	0.59	1.2	5.08	0.303	0.86		
LZH	SH	N	1.2	0.6	1.2	1.0	0.35	29.6	60	1966.7.4
		N	1.2	0.6	1.2	1.0	0.35	31.5		1968.9.7
		E	1.2	0.6	1.2	1.0	0.35	30.0		
		Z	1.2	0.6	1.2	1.0	0.35	32.3		
	SK	N	12.5	0.45	1.2	4.98	0.101	1.61	30	1966.11.15
		E	12.5	0.45	1.2	4.99	0.097	1.61		
		Z	12.5	0.59	1.2	5.01	0.348	0.88		
		N	12.5	0.45	1.2	4.99	0.100	1.70		1969.8.15
		E	12.5	0.45	1.2	4.99	0.079	1.55		
		Z	12.5	0.59	1.2	4.99	0.388	0.86		

INS	TYPE	COMP	T1	D1	T2	D2	σ_2	V0 X10 ³	R(mm/min)	DATE OF MEASUREMENT
BTO	SK	N	12.5	0.45	1.2	5.04	0.104	1.59	30	1966.10.27
		E	12.5	0.45	1.2	5.09	0.097	1.67		
		Z	12.5	0.61	1.2	5.09	0.338	1.00		
		N	12.5	0.45	1.2	5.02	0.104	1.56		1967.10.23
		E	12.5	0.45	1.2	5.12	0.095	1.63		
		Z	12.5	0.61	1.2	5.12	0.343	0.97		
		N	12.5	0.45	1.2	5.10	0.110	1.68		1969.12.14
		E	12.5	0.45	1.2	5.20	0.101	1.66		
		Z	12.5	0.61	1.2	5.26	0.408	1.16		
GZH	SH	N	0.8	0.5	0.4	1.5	0.2	171	60	1965.9.9
		E	0.8	0.5	0.4	1.5	0.2	174		
		Z	0.8	0.5	0.4	1.5	0.2	157		
		N	0.8	0.5	0.4	1.5	0.2	171		1969.12.7
		E	0.8	0.56	0.4	1.6	0.48	303		
		Z	0.8	0.65	0.4	2.0	0.47	319		
	SK	N	12.5	0.45	1.2	5.08	0.074	1.54	30	1966.12.20
		E	12.5	0.45	1.2	5.03	0.065	1.44		
		Z	12.5	0.56	1.2	5.07	0.286	1.00		
		N	12.5	0.45	1.2	4.99	0.074	1.52		1969.12.6
		E	12.5	0.45	1.2	5.00	0.063	1.37		
		Z	12.5	0.56	1.2	5.03	0.289	1.01		
KMI	SK	N	12.5	0.45	1.1	5.5	0.091	1.46	30	1966.12.8
		E	12.5	0.45	1.1	5.5	0.081	1.46		
		Z	12.5	0.62	1.1	5.6	0.33	0.96		
		N	12.5	0.45	1.1	5.6	0.090	1.50		1967.8.18
		E	12.5	0.45	1.1	5.5	0.081	1.41		
		Z	12.5	0.63	1.1	5.6	0.33	0.93		
CDU	SK	N	12.5	0.45	1.1	5.54	0.075	1.43	30	1966.5.30

INS	TYPE	COMP	T1	D1	T2	D2	σ_2	V0 X10 ³	R(mm / min)	DATE OF MEASUREMENT
		E	12.5	0.45	1.1	5.48	0.078	1.49		
		Z	12.5	0.56	1.1	5.54	0.272	0.82		
		N	12.5	0.45	1.1	5.57	0.077	1.46		1967.11.23
		E	12.5	0.45	1.1	5.48	0.082	1.55		
		Z	12.5	0.56	1.1	5.59	0.278	0.82		
		N	12.5	0.45	1.1	5.56	0.078	1.47		1968.4.7
		E	12.5	0.45	1.1	5.45	0.086	1.57		
		Z	12.5	0.56	1.1	5.60	0.278	0.78		
LSA	SK	N	12.5	0.45	1.1	5.47	0.083	1.34	30	1965.6.18
		E	12.5	0.45	1.1	5.49	0.078	1.35		
		Z	12.5	0.58	1.1	5.49	0.287	0.85		
		N	128.6	0.45	1.2	5.46	0.726	3.07		1969.5.19
		E	12.6	0.45	1.2	6.16	0.078	3.07		
		Z	12.6	0.45	1.1	5.49	0.367	1.01		
WHN	SK	N	12.5	0.45	1.2	5.09	0.091	1.75	30	1966.11.17
		E	12.5	0.45	1.2	5.02	0.087	1.57		
		Z	12.5	0.56	1.2	5.06	0.312	0.98		
		N	12.5	0.45	1.2	5.08	0.108	1.87		1969.12.30
		E	12.5	0.45	1.2	5.00	0.089	1.45		
		Z	12.5	0.56	1.2	5.07	0.312	0.88		
WMQ 62		N	2.0	0.50	0.5	1.542	0.054	64.7	120	1966.8.28
		E								
		Z	2.0	0.50	0.5	1.615	0.077	66.7		
		N	2.0	0.50	0.5	1.530	0.056	69.8		1967.7.27
		E	2.0	0.50	0.5	1.680	0.059	65.8		
		Z	2.0	0.50	0.5	1.530	0.077	62.4		
		N	2.0	0.50	0.5	1.573	0.060	72.0		1968.1.22
		E	2.0	0.50	0.5	0.638	0.058	68.7		

INS	TYPE	COMP	T1	D1	T2	D2	σ_2	V0 X10 ³	R(mm / min)	DATE OF MEASUREMENT
		Z	2.0	0.50	0.5	1.638	0.059	6.4		
	SK	N	12.5	0.45	1.2	5.02	0.082	1.92	30	1966.12.25
		E	12.5	0.45	1.2	5.10	0.091	1.56		
		Z	12.5	0.61	1.2	5.07	0.366	1.05		
		N	12.5	0.45	1.20	5.05	0.078	1.89		1967.7.13
		E	12.5	0.45	1.20	5.05	0.088	1.49		
		Z	12.5	0.62	1.20	5.01	0.348	1.00		
		N	12.5	0.45	1.20	5.01	0.081	2.05		1968.1.10
		E	12.5	0.45	1.20		0.093	1.60		
		Z	12.5	0.62	1.20	4.99	0.361	1.06		
GYA	SK	N	12.4	0.45	1.2	4.92	0.067	1.42	30	1966.9.14
		E	12.4	0.45	1.2	4.97	0.067	1.39		
		Z	12.4	0.56	1.1	4.97	0.249	0.90		
		N	12.5	0.45	1.2	4.99	0.070	1.56		1967.10.16
		E	12.5	0.45	1.2	4.90	0.666	1.39 ₈₈		
		Z	12.5	0.56	1.1	4.93	0.261	0.99		
		N	12.5	0.45	1.2	4.95	0.072	1.57		1969.8.18
		E	12.5	0.45	1.2	4.96	0.064	1.52		
		Z	12.5	0.56	1.2	5.04	0.268	0.68		
KSH	SK	N	12.5	0.45	1.20	5.00	0.099	3.52	30	1966.10
		E	12.5	0.45	1.20	5.00	0.055	3.16		
		Z	12.5	0.53	1.20	5.00	0.287	0.90		
		N	12.5	0.45	1.20	5.00	0.095	3.40		1969.8
		E	12.5	0.45	1.20	5.01	0.083	3.05		
		Z	12.5	0.56	1.20	5.03	0.263	0.96		
TIA	SK	N	12.5	0.45	1.2	5.0	0.068	2.90	30	1967.4.8
		E	12.5	0.45	1.2	5.0	0.055	2.75		
		Z	12.5	0.45	1.2	5.0	0.324	0.93		

INS	TYPE	COMP	T	D	V0	r1	R(mm/min)	DATE OF MEASUREMENT
SSE	SW2	N	6.05	1.10	195	0.0045	15	1962.4.6
		E	5.95	1.09	200	0.0016		
		N	6.0	1.05	243	0.0059		1965.6.30
		E	6.0	1.05	221	0.0045		
		N	5.96	1.15	124	0.213		1974.7.10
		E	6.0	1.09	156	0.438		
BJI	513	N	5.0	0.29	45		30	1966.11.4
		E	5.0	0.33	48			
LZH	513	N	5.0	0.33	43	0.17	30	1966.4.26
		E	5.0	0.33	46	0.15		
		N	5.0	0.33	45	0.10		1971.10.23
		E	5.0	0.33	50	0.16		