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PAKISTAN METEOROLOGICAL SERVICE

GEOPHYSICAL INSTITUTE

QUETTA

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Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11'·3 N	66° 57'·0 E	1719 meters	Cretaeocus Limestone
Lahore	Lh	31° 33'·0 N	74° 20'·0 E	210 "	Alluvium
Karachi	Kr	24° 49'·8 N	67° 02'·2 E	30 "	Alluvium
Chittagong	Ch	22° 21'·5 N	91° 49'·0 E	15 "	Alluvium
Warsak	Wr	34° 09'·0 N	71° 25'·0 E	343 "	River Terrace

(b) Instruments

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Quetta (Central Station)				
Sprengnether	Z	1·9 sec.	Critical	5,500
"	N	1·95 "	"	4,500
"	E	1·95 "	"	5,800
"	N	15·8 "	"	15,000
"	E	16·5 "	"	16,000

(Contd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N & E	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Milne-Shaw	E	12.0 sec.	20:1	250
Sprengnether Pen recorder	E	1.0 "	—	—
Lahore Sprengnether	Z	1.8 "	Critical	4,900
"	N	1.7 "	"	4,200
"	E	1.6 "	"	4,100
Karachi Sprengnether	Z	1.8 sec.	Critical	5,890
"	N	1.6 "	"	4,700
"	E	1.4 "	"	4,700
Chittagong Sprengnether	Z	1.7 "	Critical	5,200
"	N	1.8 "	"	5,700
"	E	1.5 "	"	3,600
"	N	7.0 "	"	6,600
Willmore	Z	{ Seismo = 1 sec. Galvo = 1/4 "	—	—
Warsak Sprengnether	N	2.0 sec.	Critical	4,000
Willmore (with Sprengnether galvo. & recorder)	Z	1.0 "	—	—

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Qt	ePZ	00	07	01			Mu			
		USCGS H 23 56 23						PZ	0.2		1.3
		10 S 119 E						$\Delta = 82^\circ.5$			
		Soemba Island						USCGS H 04 29 30			
1	Wr	ePN	08	09	40			51 1/2 N 173 1/2 W			
	Lh	ePZ			40			Andreanof Islands			
	Qt	ePZ			10 12			Aleutian Islands			
		iXZ			18			Mag 6.0 (Qt)			
		ePcPZE			32	2	Qt	ePKPZ	09	17	49 c
		eSEN*			19 17			ePKP ₂ Z			57
		eLRN*			31.4		Wr	ePKP ₂ Z			18 03
		USCGS H 07 58 58						USCGS H 08 58 05			
		56 N 165 E						45 1/2 S 73 1/2 W			
		Komandorskie Islands						Southern Chile			
1	Qt	ePZ	08	38	34	2	Qt	ePZ	10	36	49
1	Qt	ePZ	17	52	03	2	Qt	ePKPZ	12	14	27
		epPZ			29			ePPZ			15 31
		USCGS H 17 40 38						eXZ			17 51
		11 1/2 N 142 1/2 E						eSKSNE			21 11
		Mariana Islands						eSKKSN*			22 29
		depth about 60 km						eXN*			23 27
								eSSN*			31 41
2	Ch	ePZ	04	41	18		Lh	ePKPZ	14	35	
		ePcPZ			31			USCGS H 11 55 41			
		ePPZ			44 10			56 S 27 W			
		ePPPZ			45 54			Sandwich Islands			
	Lh	ePZ			41 30	2	Qt	ePZ	12	52	50d
	Qt	ePZ			56 c			epPZ			54 33
		ePcPZN			42 03			eSNE			59 39
		ePPZ			45 04			USCGS H 12 44 21			
		eSNE			52 17			41 N 131 1/2 E			
		eScSN*			25			Sea of Japan			
								depth about 550 km			

* indicates long period seismographs, Sprengnether or Milne-Shaw.
 c=compression, d=dilatation, X=unidentified phase.
 Mu=Actual ground motion of the indicated phase in microns.
 Se =Period of the indicated phase in seconds.
 (Pas), (Berk), (Up), (Ki) stand for seismological observatories Pasadena (U.S.A.),
 Berkley (U.S.A.), Uppsala (Sweden) and Kiruna (Sweden) respectively.
 All times are in Greenwich Mean Time.

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
2	Lh	ePZ	22	05	14	3	Ch	iPZN*	20	32	25 d
	Qt	ePZ		41	c			iPcPZN*		38	
		USCGS H 21 53 22						ePPZ		35	12
		51½ N 175½ W						ePPPZ		36	57
		Andreanof Islands						eSZN*		41	58
		Aleutian Islands						eSKSZN*		42	29
3	Ch	ePZN*	03	31	04			eScSZN*		32	
		ePcPZ		19				ePPSZN*		46	
		ePPZ		33	56			eSSN*		46	44
	Lh	ePZ		31	19		Wr	iPN		32	38
	Qt	ePZ		45	c		Lh	ePZ		41	d
		ePcPNE		52				eSN		42	34
		eSNE		42	03			Mu Sec			
		USCGS H 03 19 19					PZ	1.8 1.6			
		52 N 174 W					Qt	iPZ		33	09 d
		Andreanof Islands						iPcPZN		15	
		Aleutian Islands						ePPZN		36	15
3	Ch	ePZ	05	27	53			ePPPZ		38	07
	Qt	ePZ		28	34 c			iSNN*		43	24
		ePcPNE		40				eSSN*		48	42
		USCGS H 05 16 08						eLQN*		55.1	
		52 N 173 W						eLRN*		59.0	
		Andreanof Islands						ePKPPKPZ		59	37
		Aleutian Islands						Mu Sec			
3	Ch	ePZ	07	28	00		PZ	1.5 1.5			
	Lh	ePZ		15			PN	0.6 1.3			
	Qt	ePZ		41	c		PE	0.7 1.4			
		ePcPN		47			PPZ	1.1 2.5			
		eSN		38	57		SN	2.6 4.0			
		USCGS H 07 16 14					SE	3.4 3.6			
		52 N 173½ W						Δ = 82			
		Andreanof Islands						USCGS H 20 20 46			
		Aleutian Islands						50½ N 177 W			
								Andreanof Islands			
								Aleutian Islands			
								Mag 6½ (Berk), 6.9 (Qt)			

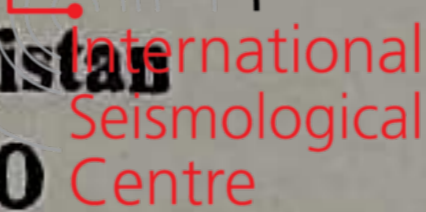


Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s	
3	Ch	ePZ	23	04	03		Qt	ePZ	42	12	c	
		ePcPZ		19				ePPN*	46	07		
		ePPZ		06	50			eSKSNEN*	52	49		
	Lh	ePZ		04	19			eSKKSN	53	15		
	Qt	ePZ		47	d			eSNE		35		
		ePcPN		54				eSSN*	05	00	22	
		ePPZN		07	52			eLN†	08.7			
		eSN*		15	00			Mu Sec				
		eScSE		16				PZ 0.4 2.0				
		USCGS H 22 52 24						Δ = 98°				
		50½ N 177 W						USCGS H 04 28 33				
		Andreanof Islands						52 N 131½ W				
		Aleutian Islands						Queen Charlotte Islands				
4	Wr	ePN	01	24	15			Mag 6½-6¾ (Pas),				
		iSN		47				6½ (Berk), 6.8 (Qt)				
	Lh	ePZ		55								
		eSN		25	57		4	Qt	ePZ	11	48	35
	Qt	ePZ		15	c		4	Qt	ePZ	14	02	10
		eSNE		26	34			Wr	ePN	18	29	41
		H 01 23 32							iSN	30	29	
		36¼ N 71 E							ePZ		46	
		Hindukush							eSNE		32	14
		depth about 200 km							H 18 28 50			
4	Wr	iPnN	01	47	59				Northern Afghanistan			
		iSnN		48	25							
	Qt	ePnZ		26			4	Qt	ePKPZ	21	49	05
		ePgZ		41					ePKP₂Z		14	
		H 01 47 24						Wr	ePKP₂N		27	
		Eastern Afghanistan						Lh	ePKPZ		19±	
4	Qt	ePZ	03	46	39				USCGS H 21 29 20			
	Wr	ePN		47	36				43 S 73 W			
4	Qt	ePZ	04	19	36				Southern Chile			
4	Wr	ePN	04	41	50		5	Qt	ePZ	03	06	35
									eSNE		08	05

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
9	Ch	ePZ	00	49	27			ePPN*	14	57	
	Lh	ePZ		50	48			ePcPZ	15	06	
	Wr	ePN		51	02			eSNE	19	27	
	Qt	ePZ			38 d			eLNE	22	7	
		eXZ			45			USCGS H 00 05 18			
		ePPZ			30			0 98 E			
		eSN*			58 53			Off west coast of			
		eScSN*	01	01	29			Sumatra			
		USCGS H 00 42 29				10	Qt	ePZ	13	52	24
		25½ N 125½ E						eSNEN*	54	40	
		Ryukyu Islands						eSSN*		54	
9	Qt	ePZ	02	24	44			eLN*	55	6	
9	Qt	ePZ	03	36	23		Wr	ePN	53	27	
9	Qt	ePZ	07	37	37		Lh	ePZ	49	±	
9	Qt	ePZ	10	50	26			H 13 49 29			
9	Qt	ePZ	11	25	28			Southern coast of Iran			
9	Wr	ePN	17	30	29	10	Qt	ePZ	20	35	47
		iSN			31 08			USCGS H 20 22 51			
	Lh	ePZ			05			53½ S 134 E			
		eSNE			32 12			South of Australia			
	Qt	ePZ			31 35	10	Qt	ePZ	22	59	13
		eSNE			33 36			eSNE	23	01	28
		H 17 29 36						H 22 56 18			
		Afghanistan-Tadzhik						Southern coast of Iran			
		border				11	Qt	ePKPZ	07	18	13
10	Ch	iPZN*	00	10	25			USCGS H 06 58 28			
		ePPZN*			56			38 S 75 W			
		ePPPZN*			11 05			Off coast of Chile			
		iXN*			50	11	Qt	ePZ	09	19	34
		eSZN*			14 32			eSNE	20	56	
	Lh	ePZ			12 43 c			H 09 17 46			
	Wr	ePN			13 13			Hindukush region			
	Qt	ePZN*			14	11	Qt	ePZ	10	47	58



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
11	Ch	ePZ	12	05	59	13	Qt	ePZ	13	08	11
	Lh	ePZ			06 19 c			ePPZ			09 35
	Qt	ePZ			45 c			eSNE			13 54
		USCGS H 11 54 16						eLN*			16.7
		51½ N 173 W					Wr	ePN			08 35
		Andreanof Islands						USCGS H 13 01 00			
		Aleutian Islands						41 N 23½ E			
		Greece									
11	Qt	ePKPZ	12	14	14 d	13	Qt	ePZ	13	49	06
		eSSN*			33 09	13	Qt	ePKPZ	16	42	54
		USCGS H 11 55 10						epPKPZ			43 28
		16 S 172 W						USCGS H 16 23 56			
		Tonga Islands region						17 N 94½ W			
		Mag 6 (Pas),						Oaxaca, Mexico			
		6¼-6½ (Berk)						depth about 150 km			
11	Qt	ePZ	12	15	01	13	Qt	ePZ	17	21	54
12	Qt	ePZ	17	10	38	13	Qt	ePZ	20	37	59
		USCGS H 17 00 25						USCGS H 20 27 46			
		41 N 142 E						34 N 139 E			
		Off coast of northern						Off coast of			
		Honshu, Japan						Honshu, Japan			
13	Qt	ePZ	02	40	33	14	Qt	ePZ	02	16	20
		USCGS H 02 30 18						eSN*			23 34
		42½ N 143 E						USCGS H 02 07 21			
		Near south coast of						25 N 124½ E			
		Hokkaido, Japan						Ryukyu Islands			
13	Qt	eXZ	08	13	07			depth about 200 km			
		eSKSN*			20 27						
		USCGS H 07 55 54				14	Qt	ePZ	08	11	06
		53½ S 1½ E						eSNE			13 00
		Bouvet Islands						ePN*			10 34 21
		Mag 6.0 (Pas)				14	Ch	ePPN*			35 51
13	Qt	ePZ	10	27	42			ePPPZN*			36 15
		USCGS H 10 20 25						eSN*			40 15
		Greece									

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
		eLN*	43.2	14	Wr	iPN	22 11 44
	Lh	ePZ	36 45 c			iSN	12 10
		eSNE	44 28		Lh	ePZ	30
	Wr	ePN	37 07			esPZ	55
		eSN	45 08			iSNE	13 33
	Qt	ePZ	37 26		Qt	iPZ	12 39 c
		ePPZE	39 33			esPZ	13 13
		iSNEN*	45 46			iSNE	48
		USCGS H 10 26 58				Mu Sec	
		5 N 127½ E				PZ 0.7 0.8	
		Molucca Passage				$\Delta = 6^\circ.1$	
14	Qt	ePKPZ	11 02 53		Kr	eXE	13 48
		USCGS H 10 45 02				eSE	15 42
		23½ S 180			Ch	ePZN*	16 10
		South of Fiji Islands				epPZN*	34
		depth about 600 km				ePPN*	49
14	Ch	ePZ	15 28 39			eSN*	20 14
	Qt	ePZ	31 39			esSN*	53
		USCGS H 15 21 41				eSSN*	21 17
		1 N 120½ E				H 22 11 10	
		Celebes				35¾ N 70 E	
14	Qt	ePZ	18 46 33			Hindukush	
		eSN*	52 12			depth about 150 km	
	Wr	ePN	47 19			Mag 6.0 (Qt)	
		USCGS H 18 39 34				USCGS H 22 11 06	
		7 N 38½ E				36 N 70 E	
		Ethiopia				Hindukush	
14	Lh	ePZ	20 28 24			depth about 100 km	
	Qt	ePZ	29 02	15	Qt	ePZ	03 04 41
		USCGS H 20 18 45		15	Qt	ePZ	05 10 38
		0 123 E				ePcPZ	12 12
		Celebes				eSN*	17 27

				Major Shocks			
Date	Station	Phase	h m s	Date	Station	Phase	h m s
		eSSN*	20 49	16	Qt	ePZ	22 14 44
	Wr	ePN	11 15			USCGS H 22 02 53	
	Ch	ePZ	12 08			65½ N 167½ W	
		USCGS H 05 02 05				Seward Peninsula	
		12 S 45½ E				Alaska	
		Off northeast coast of		17	Qt	ePZ	02 25 00
		Madagascar				USCGS H 02 15 07	
						12 N 125½ E	
16	Qt	ePZ	00 22 26			Samar, Philippine	
		ePPZNE	45			Islands	
		eSNN*	26 06	17	Qt	ePZ	04 45 18
	Wr	ePN	23 24	17	Wr	ePN	05 15 33
		H 00 17 49			Lh	ePZ	16 19 ±
		Arabian Sea			Qt	ePZ	27
16	Qt	ePKPZ	05 03 50			iSNEN*	17 53
		USCGS H 04 44 34			Ch	ePN*	20 04 ±
		21½ S 67 W				eSN*	24 13
		Southern Bolivia				H 05 14 32	
		depth about 150 km				37¼ N 69 E	
16	Qt	ePZ	15 08 37			Afghanistan-Tadzhik	
		eSNE	10 18			border	
16	Lh	ePZ	17 27 31 c			USCGS H 05 14 56	
	Wr	ePN	47			36 N 69 E	
	Qt	ePZ	28 16 c			Hindukush	
		USCGS H 17 17 44				depth about 200 km	
		21½ N 143 E		17	Wr	ePN	05 31 29
		Mariana Islands region			Qt	ePZ	32 22
		depth about 300 km				eSNE	33 44
16	Lh	ePZ	21 31 04			H 05 30 34	
	Qt	ePZ	27			Afghanistan	
		USCGS H 21 19 37		17	Qt	ePZ	19 55 25 c
		65½ N 167½ W				eSN*	20 06 06
		Seward Peninsula				USCGS H 19 42 38	
		Alaska				10 S 13 W	
						Ascension Islands region	

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
18	Lh	ePZ	01	00	19						
	Qt	ePZ			47						
		eLN*			08.2						
	Wr	ePN			00 48						
		USCGS H 00 53 54									
		Nicobar Islands									
18	Lh	ePZ	01	21	33±						
	Qt	ePZE			22 07						
		USCGS H 01 15 07									
		Nicobar Islands									
18	Lh	ePZ	01	50	19						
	Qt	ePZ			48						
		eSN*			56 17						
	Wr	ePN			50 49						
		H 01 43 55									
		Nicobar Islands									
18	Qt	ePZ	01	56	05						
		epPZ			58						
		USCGS H 01 43 29									
		4½ S 151 E									
		New Britain region									
		depth about 200 km									
18	Ch	ePN*	04	47	30						
	Qt	ePZE			48 30						
		USCGS H 04 40 54									
		56 N 111 E									
		Lake Baikal U.S.S.R.									
18	Wr	ePN	09	44	37						
	Qt	ePZ			45 15						
18	Wr	ePN	16	52	38±						
	Lh	ePZ			53 21±						
	Qt	ePZ			29						
		eSNEN*			54 51						



Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Qt	ePZ	41	42	d						
		ePcPZ			42 06						
		ePPZ			44 11						
		iSNEN*			50 44						
		eLN*			59.1						
		Mu Sec									
		PZ 09			2.2						
		Δ = 68°·6									
		USCGS H 09 30 38									
		49 N 157½ E									
		Kurile Islands region									
		Mag 6.6 (Qt)									
20	Wr	ePN	15	21	23						
	Lh	ePZ			22 07						
		esPZ			30						
	Qt	ePZ			17 d						
		esPZE			43						
		eSNE			23 36						
		H 15 20 35									
		36¾ N 69½ E									
		Hindukush									
		depth about 100 km									
20	Ch	ePZ	21	11	57						
		epPZ			12 53						
		ePPZ			15 34						
		ePPPZ			17 34						
		eSN*			22 25						
		ePSN*			24 07						
		USCGS H 20 59 25									
		20½ S 169 E									
		New Hebrides Islands									
		depth about 200 km									
20	Qt	ePKPZ	21	58	06						
		ePPZNE			22 01 42						
	Wr	ePKP ₂ N	21	58	20±						
	Lh	ePKPZ			14						
		USCGS H 21 38 20									
		Southern Chile									
21	Qt	ePZ	04	21	13						
21	Qt	ePZ	08	30	12						
		eXZ			28						
21	Kr	ePnZ	08	33	27						
		eSnZ			58						
	Qt	ePnZ			57						
		ePgZE			34 15						
		iSnNEN*			50						
		H 08 32 47									
		Mekran Range									
21	Ch	ePZ	20	59	35						
	Qt	ePZ	21	02	03						
		USCGS H 20 51 20									
		27 N 142½ E									
		Bonin Islands									
22	Qt	ePZ	06	46	58						
22	Qt	ePZ	19	28	42						
22	Wr	ePN	20	04	32						
		eSN			05 05						
	Qt	ePZ			28 d						
		eSNE			06 45						
		H 20 03 47									
		Northern Afghanistan									
22	Qt	ePZ	21	40	51						
23	Lh	ePZ	00	14	00						
	Wr	ePN			24						
	Qt	ePZ			32						
23	Qt	ePKPZ	07	49	27						

Date	Station	Phase	h	m	s
	USCGS H 07 31 38				
	21½ S 179½ W				
	Fiji Islands				
	depth about 600 km				
23	Qt	ePZ	17	13	57
24	Wr	ePN	01	55	43
		eSN		56	20
	Qt	ePZ			46
		eSZNE		58	14
	H 01 54 51				
	Northern Afghanistan				
24	Ch	ePZ	02	38	25
		ePcPZ			40
		ePPZ		41	12
		ePPPZ		42	56
	Qt	ePZ		39	07 d
	USCGS H 02 26 45				
	50½ N 177½ W				
	Andreanof Islands				
24	Ch	ePZN*	09	59	02
		ePcPZ			49
		ePPZ		10	01 14
		eSN*		07	10
	Qt	ePZ		00	04
		eSNEN*		09	09
	USCGS H 09 48 56				
	56 N 164 E				
	Near coast of Kamchatka				
24	Qt	ePZ	10	57	13
24	Kr	ePnZ	20	46	51
		eSgZ		47	27
	Qt	ePnZ		13	c
		eP*ZN		19	

Date	Station	Phase	h	m	s
	Lh	ePZ	22	03	d
		epPZ			30
		eSN		30	13
	Wr	ePN		22	12
	Qt	ePZ			44 d
		epPZNE		23	07
		ePPZE		25	09
		ePPPZ		26	55
		eSNE		31	29
		esSNE		32	02
		eSSE		35	44
		ePKPPKPZ		51	09
		Mu			Sec
	PZ	5.2			2.2
		Δ = 68°			
	Kr	ePZ	11	23	13
		USCGS H 11 12 00			
		54 N 159 E			
		Kamchatka			
		depth about 100 km			
		Mag 6½ (Berk),			
		7 (Pas), 7 (Qt)			
25	Ch	ePZN*	15	40	15
		epPZ			53
		ePcPZ		42	14
		ePPZ			27
		ePPPZN*		43	51
		eSN*		48	02
		esSN*			
	Qt	ePZ		41	21
		USCGS H 15 30 36.6			
		53.4 N 159.4 E			
		Near coast of Kamchatka			
		depth about 152 km			
25	Qt	ePZ	21	13	58
		ePPZN		14	10
		e!PPPE			23
		eSN*		15	50
		eLN*			16.3
	Ch	ePZ			18 23
		USCGS H 21 11 36			
		32 N 56½ E			
		Iran			
25	Ch	ePZ	21	46	52
	Qt	ePZ		49	22 c
		ePcPZE			26
		ePPZE		52	38
		USCGS H 21 36 46			
		3 S 148 E			
		Bismarck Sea			
25	Qt	ePZ	22	49	57
26	Qt	ePZ	04	06	29
		USCGS H 03 55 54			
		40½ N 144½ E			
		Off east coast of			
		Hokkaido, Japan			
26	Qt	ePZ	12	41	53
		ePPZN		42	34
		ePPPNE			46
		e(S)N*		46	34
		eLN*			48.3
		USCGS H 12 36 20			
		40½ N 37 E			
		Turkey			
26	Wr	ePN	20	05	02

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Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Lh	eSN			43			eSKSPN*	38	27	
	Lh	ePZ			34			eSSN*	47	24	
		eSNE	06	38		Wr		ePKP ² N	24	59	
	Qt	ePZ		06	d	Lh		ePKPZ		46	
		iSNE	07	36				USCGS H 10 04 53.0			
		H 20 04 08						44.7 S 75.1 W			
		37½ N 73½ E						Near coast of southern			
		Northern Afghanistan						Chile			
27	Qt	ePZ	02	00	07			depth about 25 km			
27	Qt	ePKPZ	04	16	09			Mag 6¼-6½ (Pas),			
		USCGS H 03 57 26.4						6 (Berk)			
		59.4 S 25.1 W				27	Wr	ePnN	15	30	01
		Sandwich Islands						iSnN		27	
		depth about 65 km					Lh	eSZ	31	39	
27	Lh	ePZ	09	04	43		Qt	ePZ		19	
	Qt	ePZ		05	13 c			eSNE	32	38	
		epPZE			38			H 15 29 35			
		ePPZE	06	51				35½ N 71½ E			
		ePPPZE	07	42				Afghanistan-Pakistan			
		USCGS H 09 56 22.9						border			
		5.6 S 103.6 E				28	Qt	ePZ	17	02	03
		Near coast of Sumatra						eXZE		33	
		depth about 93 km						e(S)NE	03	46	
27	Qt	ePKPZ	10	24	37 d	29	Qt	ePKPZ	00	42	38 ±
		ePKP ₂ ZNE			43			ePPZ	43	19	
		iXZ			56			ePPPZ	45	42	
		ePKSZE	28	07				USCGS H 00 24 06			
		ePPPNE	31	33				19½ S 170½ E			
		eSKSEN*			51			Loyalty Islands			
		eSKKSN*	34	59				Mag 6½-6¾ (Pas),			
								6¼-6½ (Berk)			



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Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
29	Lh	ePZ	10	46	11			USCGS H 16 45 49.3			
		eSZNE		48	46			28.0 N 54.6 E			
	Wr	ePN		46	58			Southern Iran			
	Qt	ePZ		47	29 c			depth about 159 km			
		e(S)NN*		51	04	29	Qt	ePZ	16	55	25 d
		e(S)E		12				eSZNE		51	
		USCGS H 10 42 44.6						Eastern Afghanistan			
		26.9 N 90.3 E						aftershock			
		India				29	Ch	iPZN*	17	40	02 c
		depth about 11 km						ePPZN*		41	55
29	Qt	iPZ	14	34	11 d			iSN*		46	41
	Wr	iPN			49			isSZN		47	00
	Lh	ePZ		35	13 c		Lh	ePZ		41	05 c
		esPZ			37			iSNE		48	42
		eSNE		36	21		Wr	iPN		41	12
	Kr	iPZ		35	23 d		Qt	ePZ		48	0
	Ch	ePZ		38	50			eSNEN*		50	02
		H 14 33 45						ePKPPKPZ 18 11 10			
		31½ N 67 E						Mu Sec			
		Eastern Afghanistan						PZ 1.3 1.2			
		depth about 60 km						Δ=61°			
		USCGS H 11 33 46.1					Kr	ePZ		17	42 04 ±
		31.7 N 67.0 E						USCGS H 17 31 39.5			
		Eastern Afghanistan						40.1 N 142.3 E			
		depth about 64 km						Honshu, Japan			
		Felt Quetta						depth about 50 km			
29	Qt	ePZ	15	54	54 d			Mag 6¾ (Pas), 6¾-7 (Berk)			
		eSNE			55 20			6.9 (Qt)			
		Eastern Afghanistan									
		aftershock				30	Wr	ePN		09	54 31
29	Qt	ePZ	16	48	21 c			iSN		55	00

Major Shocks



Minor Shocks

Date	Station	Phase	h	m	s
	Qt	ePZ			37
		eSZNE		56	57
		H 09 53 51			
		Hindukush			
30	Qt	ePZ	12	39	27
		e(S)N*		41	49
30	Wr	ePN		40	36
	Qt	ePZ	14	23	43
		USCGS H 14 12 35.5			
		56.3 N 163.9 E			
		Near coast of Kamchatka			
		depth about 21 km			
31	Ch	ePZ	03	06	17
		eSN*		14	45
	Lh	ePZ		07	58
		ePcPZ		08	05
	Wr	ePN		28	±
	Qt	ePZ		35	
		ePPNE		11	58
		eXZ		12	12
		eSKSNE		18	59
		eSNN*		19	12
		eScSNE		17	
		ePSNE		20	12
		ePKPPKPZ		34	27
		USCGS H 02 55 46.2			
		5.6 S 150.0 E			
		New Britain			
		depth about 25 km			
		Mag 6 $\frac{3}{4}$ (Pas), 6-6 $\frac{1}{4}$ (Berk)			
31	Ch	ePZ	09	26	28
	Lh	ePZ		28	33
	Qt	ePZ		29	07
		USCGS H 09 17 57.4			
		65 S 129.6 E			
		Banda Sea			
		depth about 83 km			
31	Qt	ePKP ₁ Z	15	14	39 d
		ePKP ₂ ZNE			49
		e!XNE		17	45
		e(PP)Z		18	04
	Wr	ePKP ₂ Z		15	05

Date	Station	Phase	h	m	s
		USCGS H 14 55 03.3			
		43.6 S 74.3 W			
		Near coast of central Chile			
		depth about 97 km			
31	Wr	iPN	16	28	08
		eN			38
	Lh	ePZ			54
		eSN		29	59
	Qt	ePZ		28	57 d
		esPZ		29	37
		eSZN		30	05
		H 16 27 29			
		35.6 N 69.3 E			
		Hindukush			
		depth about 150 km			
31	Lh	ePZ	18	58	18 c
	Qt	ePZ			47 c
		ePcPZ			51
		USCGS H 18 46 13.9			
		2.8 S 148.2 E			
		Bismarck Sea			
		depth about 13 km			
31	Qt	ePZ	22	29	37 c
		ePPZ			50
		esPZN		30	08
		eSNE		31	35
	Wr	ePZ		30	40
	Lh	ePZ		31	02 c
		USCGS H 22 27 01			
		27.9 N 54.6 E			
		Southern Iran			
		depth about 127 km			
31	Qt	ePZ	23	56	00
		eSNE		58	04
		Southern Iran			

Date	Phase	h	m	s
	Quetta.			
1	ePgZ	01	12	58.7
	eSgNE		13	05.8
1	ePZ	03	26	07
	eSNE			33
1	eXZ	05	51	34
1	ePZ	18	55	41
1	iPgZ	22	53	42.0d
	iSgZNE			46.4
	iXE			56.4
2	eXZ	03	18	24
2	ePZ	15	29	15
2	ePZ	15	35	28.9
2	ePgZ	17	12	45
	eSgE			54
2	ePgZ	17	36	01.0
	eSgN			10.1
2	ePZ	23	23	30
	eSZNE			55
3	eXE	05	01	.3
4	ePgE	02	05	17.0
	iSgE			27.5
4	ePZ	04	09	12.4
	eSNE			28.9
4	ePZ	07	22	22
4	ePZ	09	50	48
4	ePZ	10	59	08.6
	eSZN			34.0
4	ePZ	15	08	55
	eSZN			09 26

Date	Phase	h	m	s
4	ePZ	15	39	08
	eSN			47
4	ePgZE	20	16	02.3 o
	iSgZNE			05.2
5	ePZ	01	41	31d
5	ePZ	02	07	31.5
	eXE			42.3
	iSNE			48.2
5	ePZ	09	09	16.5
5	ePZ	15	17	15.0
5	ePZ	20	00	21
	eSE			37
6	eXZ	00	11	.0
6	ePZ	01	39	47
6	ePZ	05	37	08
6	eXZ	06	35	.2
6	ePZ	07	18	09
6	eXZ	14	19	20
6	ePgZ	15	00	25.9
	eSgZ			31.0
6	ePZ	16	42	23
	iSN			46
6	eXZ	17	21	03
6	ePgZ	22	48	46.5
	eSgNE			49 02
6	ePZ	23	56	26
7	iPZ	02	00	31
	eSN			56
7	eXZ	05	29	.5
7	ePE	14	20	25



Date	Phase	h m s	Date	Phase	h m s	Date	Phase	h m s	Date	Phase	h m s
	eSNE	55	11	ePZ	02 56 15		eSgZNE	54 13.5		eSgZE	50 02.3
7	eXZ	17 06 54	11	ePZ	08 00 53	14	ePZE	22 26 09	17	ePgE	21 03 10
7	ePZ	18 20 32		ePZNE	02 02		iSE	27 23		eSgE	20
7	ePE	22 50 44	11	ePZ	19 15 17	15	ePZ	10 57 43	17	ePZ	21 06 58
	eSE	51 05	12	eXZ	06 15.3	16	ePgZ	02 29 11.3	17	eXE	23 32 44
8	ePgE	00 05 27.6	12	ePZ	07 52 55		iSgZNE	18.4	18	ePE	00 22 46
	eSgE	42.1		eSN	53 16	16	ePgZ	02 32 21.8		eSZE	23 03
8	ePgE	00 06 38.0	12	ePE	11 21 04		iSgNEN*	28.9	18	ePE	06 13 14 ±
	iSgE	48.6		eSEN	29	16	ePgZ	02 41 14.6d	18	eXE	06 33 28
8	iPgZ	07 43 22.7	12	ePgZ	14 31 37.6		eSgNE	21.3	18	ePZ	15 08 11
	iSgZNE	30.4		eSgZE	52.3	16	ePgZ	02 53 07.1d		eSNE	46
8	eXZ	08 17 37	12	ePZ	16 12 54		iSgNE	14.4	18	ePZ	20 12 56
8	ePZ	16 26 00		eSNE	14 28	16	eXZ	03 48 06	18	ePZ	20 58 53
8	ePZ	17 57 09	12	ePgE	19 35 43	16	eXZ	04 18 01	19	ePgZ	00 00 22.5
8	ePZ	19 41 01		eSgNE	57	16	eXNE	07 55 22.0		iSgNE	30.3
8	ePZ	20 51 57	13	eXZ	11 29 12	16	ePgZ	07 55 47.0	19	ePgZ	02 31 38.4
	eSNE	52 23	13	ePgZ	13 39 43		eSgNE	54.4		iSgE	42.0
9	ePZ	06 25 16		eSgZN	50	16	ePZ	09 08 01	19	eXE	02 32 21.6
9	ePZ	07 26 40	13	ePgZ	16 09 02.8	16	ePZ	12 17 11	19	ePgZ	03 15 20.7
9	ePZ	08 09 27		eSgZ	14.4	16	eXZ	12 21 59		eSgZNE	35.0
	eSNE	47	13	eXZ	16 49 21	16	ePZ	16 12 24	19	eXN	07 43
10	ePZ	02 46 38	13	eXZ	17 02 57	17	ePgZ	01 53 04.1		ePgZ	09 27 51.4
10	eXE	06 12.6	13	ePZ	19 23 05		eSgNE	13.2	19	eSgNE	58.2
10	ePgZ	09 04 03.8		iSN	24 22	17	ePZ	05 40 04		ePZ	09 31 26
	eSgNE	20.0	13	ePZ	20 32 17	17	eSNE	41 33	19	eSNE	32 51
10	ePZ	21 47 00	13	ePgZ	20 48 06	17	eXZ	11 49 21		eXZ	16 23 00
	eSNE	34		eSgNE	19	17	ePZE	15 09 24	19	ePgZ	18 05 10.8
10	eXZ	23 28 33	13	ePgZ	21 36 37.9	17	eXE	16 21 08	19	eSgNE	18.0
11	ePgZ	00 41 01		eSgNE	51.6	17	ePgE	20 49 55.1			
	iSgZNE	14	13	ePgZ	23 53 57.5						

Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
19	eXZ	18 58 45		eSN	46
19	ePgZ	19 56 07.7	24	eXZ	10 50 53
	eSgN	16.6		ePZ	57 01
19	ePgZ	21 44 39.5	24	ePZ	12 18 01
	eSgEN	49.4		eSN	25
20	iPgZ	04 40 53.3 d	24	ePZ	13 57 12±
	iSgNE	55.7		e(S)N	59 42
20	ePZ	16 41 25	24	eXZ	14 44 49
	iSE	42 04	24	eXZ	15 15.0
20	ePZ	20 52 20	24	eXZ	16 22 47
	eSNE	50	24	ePZ	23 34 10
20	ePZ	21 44 16	25	ePZ	00 00 36.4
	eSNE	39	25	ePZ	08 18 21
20	ePgZ	21 57 37		eSNE	38
	eSgE	48.7	25	ePZ	08 48 55
21	eXZ	01 10.0		eSNE	49 12
21	ePZ	19 34 06	25	ePZ	11 15 45
	eSE	35 06		eSN	16 07
22	ePZE	07 44 49	25	ePgZ	15 25 45.6
22	ePZ	10 34 16		eSgNE	26 00.7
23	ePgZ	07 53 44.8	25	ePZ	16 53 28
	eSgN	50.7	25	ePZ	16 57 39
23	ePgZ	08 15 10.1	25	ePZ	17 27 05
	eSgN	23.2		iSNE	29
23	eXZ	09 23.5	25	ePZ	20 06 30
24	ePZ	06 07 49	26	ePZ	01 48 50
	eSZN	09 27		eSN	49 31
24	ePZ	10 17 17	26	ePgZ	03 26 41.9
	eSNE	18 03		iSgNE	55.6
24	ePZ	10 43 07	26	eXZ	07.24



Minor Shocks

Date	Phase	h m s	Date	Phase	h m s
26	eXZ	09 14.8		eSN	38 21
26	iXE	09 27 47	30	ePZ	06 23 05
26	ePZ	11 56 00	30	ePZ	06 48 06
26	ePgZ	21 28 18.5	30	ePZ	07 14 52
	iSgNE	20.0		eSN	15 19
26	iPgN	23 40 45.1	30	ePZ	13 30 51
	iSgN	49.0	30	eXZ	14 17 38
27	ePgZ	00 03 37.6	30	eXZ	10 52 10
	eSgE	51.6	30	ePZ	15 07 10
27	ePZ	12 14 33		eSN	34
27	eXZ	12 38 31	30	ePZ	16 49 57
27	ePgZ	14 39 52.7		eSNE	50 22
	eSgN	56.7	31	eXZ	03 34 27
27	ePgZ	22 47 28.0	31	ePZ	18 22 36
	iSgNE	29.6		eSN	57
27	ePgZ	23 57 13.3		Warsak	
	eSgE	15.6	2	ePgN	02 01 12
28	ePgZ	14 35 49		iSgN	27
	eSgNE	36 04	2	ePN	13 53 20
29	ePZ	08 47 22		iSN	39
	eSNE	48 09	3	ePN	16 56 08
29	ePZ	15 08 59	4	ePN	15 39 15
	eSN	09 25	4	ePN	19 42 50
29	ePZ	16 34 32		iSN	43 01
29	ePZ	18 01 27	7	ePN	22 48 48
	eSZ	52		eSN	49 14
29	ePZ	18 07 22	8	ePN	16 55 54
29	ePZ	19 54 22	10	ePN	13 01 55
	eSN	48		eSN	02 06
29	ePZ	20 37 55	10	ePN	23 26 46



Date	Phase	h	m	s	Date	Phase	h	m	s
11	ePN	04	29	34	19	ePN	09	30	21
	eSN			51		eSN			55
11	ePN	07	59	43	19	ePN	18	57	49
	eSN	08	00	14		eSN			58 31
11	ePN	09	18	41	20	ePN	07	43	33
13	ePN	19	22	10	21	ePN	08	36	53
	iSN			43	22	ePN	13	59	53
14	ePN	17	22	16	23	ePN	11	01	41
14	ePN	17	54	46	23	ePN	11	25	10
	eSN			55 06	24	ePN	10	17	28
14	ePN	21	03	41	24	ePN	10	43	22
14	ePN	22	25	06	24	ePN	12	18	11
	iSN			33	24	ePN	15	26	02
15	ePN	10	56	40	24	ePN	16	20	16
	eSN			57 20		eSN			43
16	ePN	09	05	46	24	ePN	23	29	24
	eSN			06 15	25	ePN	07	16	52
16	ePN	14	38	21	26	ePN	01	38	02
17	ePN	02	32	05	26	ePN	04	10	21
17	ePN	05	39	11	26	ePN	05	23	11
	eSN			51	27	ePN	09	05	22
17	ePN	15	08	31	27	ePN	12	34	36
	eSN			09 11		eSN			35 18
17	ePN	16	20	08	29	ePN	02	42	04
	eSN			49	29	ePN	08	46	46
18	ePN	06	30	47		iSN			47 07
18	ePN	20	27	50	29	ePN	15	56	14
18	ePN	23	25	21	29	ePN	16	56	18
19	ePN	02	31	14		iSN			57 15
	eSN			32 04	31	ePN	06	16	31

Date	Phase	h	m	s	Date	Phase	h	m	s
	Lahore					Chittagong			
2	eXZN	12	59	40	1	eXN	08	10	40
4	eXZ	01	48	54	1	ePZ	17	49	44 ±
5	ePN	03	07	13	2	eXN	12	52	32
11	eXZ	09	20	21	4	eXN	04	43	26
12	eXZ	17	10	03	5	eXZ	08	26	26
12	eXZ	19	30	16	6	ePZ	14	49	46 ±
13	ePZ	00	47	31	6	ePZ	18	34	54
14	ePZ	22	26	42	7	eXZ	22	20	23
17	ePZ	00	11	48	8	eXZ	15	39	36
	eSN			12 16	9	eXN	08	04	57
17	ePZ	05	40	19 ±	9	eXN	09	25	51
19	eXZ	18	58	55	10	ePZ	16	09	04
22	ePZ	20	05	14	10	eXN	23	43	53
25	ePZ	03	51	43	12	eXN	17	09	36
25	eXZ	04	25	43	13	eXN	04	54	08
26	eXZ	04	06	36	14	eXN	02	25	13
27	ePZ	12	37	31	14	eXZ	18	49	17
28	eXZ	08	11	00	16	eXN	17	31	04
29	eXNE	02	40	52	18	eXN	00	19	06
29	eXZ	08	47	48	18	eXN	16	57	33
29	eXZ	15	03	22	18	eXN	18	58	27
29	eXZ	15	29	09	23	eXZ	07	47	34
30	eXZ	09	55	34	25	eXN	10	42	32
	eXZ			56 24	26	ePZ	02	06	33
30	eXZ	16	50	27	26	eXZ	04	04	18
31	eXZ	15	14	39	27	eXN	09	03	08
	Karachi				27	eXN	21	19	00
14	eXE	22	13	48	28	eXZ	10	21	16
	iSE			15 42	29	ePZ	01	06	00
17	eSE	05	19	49	29	eXN	10	46	26
					30	eXZ	10	24	48