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PAKISTAN METEOROLOGICAL SERVICE

GEOPHYSICAL INSTITUTE

QUETTA.

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CONTENTS

	Page
1. Particulars of Stations and Instruments ...	1
2. Major shocks ...	3
3. Local and Minor shocks ...	16

Particulars of Stations and Instruments

(a) Stations

Station	Symbol	Latitude	Longitude	Height (a.s.l.)	Ground
Quetta	Qt	30° 11' N	66° 57' E	1721 meters	Cretaceous Limestone
Lahore	Lh	31° 33' N	74° 20' E	210 "	Alluvium
Karachi	Kr	24° 50' N	67° 02' E	30 "	Alluvium
Chittagong	Ch	22° 21' N	91° 49' E	35 "	Alluvium
Warsak	Wr	34° 09' N	71° 25' 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	19.5 "	"	16,000

(Contd.)

Instruments	Components	Period Seismo. & Galvo.	Damping	Max. Magnification
Willmore	Z, N, & E	Seismo = 1 sec. Galvo = 1/4 "	—	—
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 "	—	—

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

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
1	Ch	e(PP)Z	00	58	15			eXZ		05	43
		eSKSE	01	04	22			Russian Atomic Test			
		e(SKKS)E		05	07			USCGS H 07 59 58.5			
	Wr	ePKPZ	00	58	51			49.9 N 78.2 E			
	Qt	ePKPZ			57			Kazakh S S R			
		epPKPZ		59	08			depth about 0 km			
		e(SKKS)N*	01	07	47	2	Wr	iPgZ	12	11	13 d
		USCGS H 00 39 54.6					Lh	iSgN			23
		31.7 S 177.3 W					Lh	ePZ	12	05	±
		Kermadec Islands						eSN			54
		depth about 30 km					Qt	ePZ	12	17	
1	Qt	ePZ	20	39	47			eSNE	13	19	
		eXZ			58			USCGS H 12 10 57			
2	Qt	ePZ	03	58	19			34 1/4 N 70 1/2 E			
		e(S)NE	04	00	22			Pakistan Afghanistan border			
	Wr	ePZ	03	59	24	2	Ch	ePZ	17	29	10
2	Wr	ePZ	05	47	12d			ePPZ			31 01
		iSN			41		Lh	ePZ	30	04	
	Lh	eSZ	48	50			Wr	ePZ			09
	Qt	iPZ	48	00			Qt	ePZ			45
		eSZE	49	10				eSE	39	19	
		USCGS H 05 46 35						USCGS H 17 20 11.1			
		34.5 N 71.0 E						43.7 N 148.5 E			
		Pakistan Afghanistan border						Kurile Islands			
		depth about 300 km						depth about 49 km			
2	Kr	ePnZ	06	02	41.3	3	Ch	iPZ	00	40	55 e
		ePgZ			48.8			ipPZ			47 02
		eSgN	03	19	3			ePcPZ	48	16	
	Qt	ePnZ	03	01				ePPZ			53
		ePgZN			13			ePcSZE	52	09	
2	Wr	ePZ	08	03	48			eSNE	54	05	
		eXZ			54			eScSN	56	44	
		eXN	07	03				e(SS)E	57	29	
	Lh	ePZ	04	17							
	Qt	ePZ			47		Lh	ePZ	48	55	

Date	Station	Phase	h m s	Date	Station	Phase	h m s
	Wr	iPZ	49 15			Celebes	
		eSN	58 30			depth about 89 km	
	Kr	ePZ	49 23	4	Qt	ePZ	03 34 17
		epPE	33	4	Wr	ePZ	04 47 23
	Qt	ePZ	33 c		Lh	iSZ	48 20
		epPZ	39			ePZ	47 41
		iSNEN*	59 05			eSNE	48 51
	Mu Sec				Qt	ePZ	48 36
	PZ 1.0 1.7					eSNE	50 28
	Δ 74°.0					USCGS H 104 46 11.1	
	USCGS H 00 37 53.6					38.0 N 75.5 E	
	1.2 S 137.8 E					Tadzhik Sinkiang border	
	North of New Guinea			4	Wr	iPZ	11 27 46
	depth about 17 km					iSZ	28 43
	Mag 6 - 6½ (Pas), 6.6 (Qt)				Lh	ePZ	28 05
3	Qt	ePZ	11 44 51			eSNE	29 12
		eSN*	51 41			ePZ	28 58
	Wr	ePZ	45 21		Qt	eSNE	30 51
						H 11 26 33	
						38.0 N 75.5 E	
						Tadzhik Sinkiang border	
						depth about 150 km	
4	Ch	ePZ	03 01 54	4	Wr	iPZ	13 15 24
		epPZ	02 19			iSZ	55
		e(PP)Z	03 14		Qt	ePZ	16 18
		ePcPZ	04 10			eSNE	17 35
		eSN	07 45			USCGS H 13 14 37	
	Wr	ePZ	04 36			Hindukush	
	Qt	ePZ	45	4	Qt	ePZ	21 42 27
		eXN*	08 57			eSN	53 09
		esSN*	13 26		Wr	ePZ	42 43
						ePPZ	46 20
						USCGS H 21 29 33.2	
						0.5 S 20.2 W	



Date	Station	Phase	h m s	Date	Station	Phase	h m s
						South Atlantic Ocean	
						depth about 17 km	
5	Ch	iPZ	23 03 40 e	8	Lh	ePZ	12 00 35
		ipPZ	04 22		Wr	iPZ	51 c
		ePcPZ	05 24			eSN	10 29
		eSNE	09 54		Qt	ePZ	01 07
		eScS	13 26			eSN*	11 03
	Lh	ePZ	04 22			USCGS H 11 49 13.9	
	Wr	iPZ	05 08			3.2 S 141.3 E	
	Qt	ePZ	05 43 c			depth about 87 km	
		eXZ	54	8	Lh	ePZ	19 47 48
		eSNEN*	13 44			iSNE	53 38
		esSN*	14 36		Wr	ePZ	48 16
	Kr	ePZ	05 56			eSN	54 27
		ePcPZ	06 31			ePZ	48 19
		epPZ	43			eSN*	54 35
						USCGS H 19 40 28	
						0.7 N 98.6 E	
						Sumatra	
						depth about 43 km	
				8	Qt	ePZ	20 13 49
						eXE	16 05
					Wr	ePZ	14 31
					Lh	ePZ	59
						eXNE	18 57
				8	Qt	ePZ	23 02 04
				9	Ch	ePZ	20 47 53
					Qt	ePZ	50 20
				9	Ch	ePZ	21 58 34
						epPZ	49
						espZ	58
						ePPZ	22 00 08
						ePcPZ	36
						eSN	04 18
						eSSN	46
						eScSNE	08 30

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
								eSE	03	09	28
	Lh	ePZ	22	00	51			USCGS H 02 42 36.1			
	Wr	ePZ	01	13				29.6 N 139.0 E			
		eSZ	09	16				South of Honshu, Japan			
	Qt	ePZ	01	32				Mag 6½ (Pas)			
		eSE	09	50				depth about 400 km			
		USCGS H 21 51 13.2				11	Wr	ePZ	10	13	39
		0.6 N 123.9 E					Qt	ePZ			55
		Celebes						USCGS H 10 01 24.8			
		depth about 50 km						52.0 N, 168.0 W			
10	Qt	ePZ	18	06	10			Fox Islands, Aleutian Islands			
		eXZ			15			depth about 50 km			
	Wr	ePZ			27						
10	Qt	ePKPZ	20	05	30	11	Kr	ePZ	11	12	10
		USCGS H 19 46 11.0						epPZ			16
		33.1 S 69.0 W					Qt	ePZ			13 01
		Mendoza Province Argentina						eSN*			18 07
		depth about 171 km					Wr	ePZ			13 37
11	Ch	epPZ	02	51	20			USCGS H 11 06 44.3			
		ePcPZ			41			0.9 S 67.2 E			
		ePPZ			49			Maldiv Islands region			
		eSPZ			52 08			depth about 25 km			
		ePcSN			55 31						
		eSNE			53	11	Ch	iPZ	19	06	10 c
		esSE			58 20			epPZ			32
		eScS			59 14			iPcPZ			36
	Lh	ePZ			51 30			esPZ			45
		eSN			58 41			ePPN			08 37
	Wr	ePZ			51 41			ePcSN			32
		eSZ			59 06			eSNE			14 53
	Qt	ePZ			52 14			ePSNE			15 29
		eSNE	03	00	03			esSNE			35
		eScSN*			01 24			eScSNE			56
		esSN*			02 38			eSSE			19 07
	Kr	ePZ			52 30			ePKPPKP			35 08

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Wr	iPZ	08	02		13	Wr	ePZ	00	57	40
		eSN	18	26			Qt	ePZ			47
	Kr	ePZ	08	14				epPZ			53
		epPZ			37			USCGS H 00 46 16.3			
		e(sS)E	19	19				54.1 N 35.1 W			
	Qt	ePZ	08	19	c			North Atlantic Ocean			
		eSN*	19	00		13	Ch	ePZ	02	32	00
		e(sS)NE			24			USCGS H 02 22 15.2			
		USCGS H 18 55 32.0						49.0 N 156.2 E			
		4.5 S 153.5 E						Kurile Islands			
		New Ireland region						depth about 45 km			
		depth about 100 km				13	Ch	ePZ	07	45	15
		Mag 6 (Berk)						eSE			47 10
12	Ch	ePZ	06	52	30		Wr	ePZ			46 57
		epPZ			55		Qt	ePZ			47 42
	Qt	ePZ			55 23			USCGS H 07 42 46.0			
		USCGS H 06 45 00.4						China - Tibet border			
		2.0 N 128.1 E				13	Lh	ePZ	20	43	16
		Halmahera					Wr	ePZ			20
		depth about 169 km					Qt	ePZ			57
12	Ch	ePZ	13	55	19			USCGS H 20 33 42.6			
	Qt	ePZ			57 28			42.7 N 145.3 E			
		USCGS H 13 44 40.0						Near coast of Hokkaido, Japan			
		4.4 S 153.5 E						depth about 105 km			
		New Ireland region				14	Qt	ePZ	02	06	18
		depth about 121 km						USCGS H 01 53 33.9			
12	Ch	ePZ	23	32	58			4.3 S 153.5 E			
	Wr	ePZ			34 46			New Ireland region			
	Qt	ePZ			35 18			depth about 119 km			
		USCGS H 23 24 55.2				14	Ch	ePZ	02	55	20
		26.4 N 140.9 E					Qt	ePZ			57 44 ±
		Bonin Islands region					Wr	ePZ			58 02
		depth about 168 km						USCGS H 02 47 30.7			
								0.1 N 123.8 E			

Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
14	Kr	ePKPZ	06	55	35 c	14	Qt	ePKP ₂ Z	08	31	38
		ePKP ₂ Z			38		Wr	ePKP ₂ Z			50
		ipPKP ₂ Z			52			USCGS H	08	11	59.3
		ePPZ			58 56			38.1 S 73.7 W			
	Qt	ePKPZ			55 40 c			Near coast of Chile			
		ePKP ₂ Z			45			depth about 40 km			
		epPKP ₂ Z			56 00	14	Kr	ePKPZ	08	48	32
		ePPZ			59 06		Qt	ePKP ₂ Z			38
	Wr	ePKPZ			55 48		Wr	ePKPZ			50
	Lh	ePKPZ			54 ±		Lh	ePKPZ			54
		ePPZ			07 00 16			USCGS H	08	29	00.1
	Ch	ePKPZ			06 55 58 c			38.2 S 73.1 W			
		ipPKP			56 15			Near coast of Chile			
		ipPKP ₂ Z			54			depth about 40 km			
		epPKP ₂ Z			57.06	14	Ch	ePZ	11	50	35 c
		esPKP ₂ Z			12			epPZ			51 08
		ePPZ			07 00 25			ePPZ			52 07
		ePPPZ			04 01			ePcPN			56
		eSKSPNE			10 22			eScSN			56 30
		USCGS H	06	36	01.3		Lh	ePZ			52 55
		38.1 S 73.1 W					Wr	iPZ			53 15 c
		Near coast of Chile					Qt	ePZ			34
		depth about 44 km						USCGS H	11	43	35.1
		Mag 7¼ (Pas), 7½ (Berk)						5.7 N 126.0 E			
								Near coast of Mindanao			
								Phillippine Islands			
								depth about 147 km			
14	Kr	ePKP ₂ Z	07	27	51	15	Wr	ePZ	08	09	57
	Qt	ePKP ₂ Z			58		Qt	ePZ			10 39
	Wr	ePKP ₂ Z			28 10			eXZ			44
	Lh	ePKP ₂ Z			15			ePKPZ	09	23	18
		USCGS H	07	08	21.1			USCGS H	09	03	38.6
		38.2 S 73.7 W						37.9 S 74.1 W			
		Near coast of Chile						Near coast of Chile			
		depth about 40 km						depth about 40 km			



Major Shocks

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
15	Qt	ePZ	10	08	36	16	Ch	ePZ	16	04	19
		USCGS H	09	56	01.0			epPZ			33
		49.4 S 32.1 E						ePPZ			06 30
		Prince Edward Island region					Wr	ePZ			04 53
		depth about 25 km					Qt	ePZ			05 29
15	Lh	ePZ	15	38	00			USCGS H	15	54	32.3
	Wr	iPZ			03 c			49.4 N 156.0 E			
	Qt	ePZ			15			Kurile Islands			
		eSN*			49 00			depth about 24 km			
		USCGS H	15	25	29.5	16	Qt	ePZ	19	29	55
		4.4 S, 153.8 E						ePZ			08 45 50
		New Ireland region						ePZ			11 15 19
		depth about 109 km						epPZ			35
15	Qt	ePZ	17	22	50			eSN			21 57
		eXZ			23 00			esSN			22 26
15	Qt	ePZ	17	39	16		Wr	ePZ	17	50	
15	Qt	ePKP ₁ Z	20	48	24		Qt	ePZ	18	05	
		ePKP ₂ Z			25			USCGS H	11	07	01.6
	Wr	iPKP ₂ Z			37 d			2.7 S 130.2 E			
	Lh	ePKP ₂ Z			41			Ceram			
		USCGS H	20	28	47.1			depth about 54 km			
		38.1 S 73.2 W						ePKPZ	18	35	45
		Near coast of Chile						ePKPZ			59
		depth about 40 km						ePKPZ			36 56
15	Lh	ePZ	23	49	38			USCGS H	18	16	06.2
	Wr	iPZ			46 d			38.08 S 73.5 5 W			
	Qt	ePZ			50 20			Near coast of Chile			
		USCGS H	23	40	39.4			depth about 40 km			
		31.9 N 137.9 E						ePZ	22	11	38 c
		South of Honshu, Japan						epPZ			52
		depth about 257 km						ePZ			12 13 ±
16	Qt	ePKPZ	03	14	45		Qt	ePZ			43
	Wr	ePKPZ			57			epPZ			55
		USCGS H	02	55	07.0						
		38.1 S 73.1 W									

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
								epPKPZ			40
		USCGS H 22 01 51.1						e(PP)Z			46 38
		49.2 N 156.0 E					Ch	ePKPZ			44 56
		Kurile Islands						epPKPZ			45 09
		depth about 23 km						USCGS H 17 25 17.3			
17	Ch	ePZ	22	40	26 c			8.1 N 74.6 W			
	Qt	ePZ			59			Northern Columbia			
		USCGS H 22 28 22.8						depth about 70 km			
		52.7 N 169.7 W				18	Wr	ePKPZ	23	44	49
		Fox Islands, Aleutian Islands					Qt	ePKPZ			53
		depth about 29 km					Kr	ePKPZ			45 04
18	Ch	ePZ	01	38	18			USCGS H 23 25 20.1			
		epPZ			36			Galapagos Islands			
		ePPN			40 26			depth about 43 km			
	Wr	ePZ			38 53	19	Ch	iPZ	11	11	49
	Qt	ePZ			39 30			iSNE			12 14
		epPZ			44		Wr	ePZ			16 15
		USCGS H 01 28 34.9					Qt	ePZ			57
		49.2 N 156.6 E						ePZ			09 19 36
		Kurile Islands					20	Ch	ePZ		
		depth about 46 km						i(S)NE			22 20
18	Qt	ePZ	07	08	49		Lh	ePNE			07
18	Ch	ePZ	10	50	55		Kr	ePZ			11
	Wr	ePZ			52 04		Wr	iPZ			37
	Qt	ePZ			41		Qt	ePZ			38
		USCGS H 10 42 32.8						eSN*			28 02
		41.5 N 142.4 E						USCGS H 09 15 55.1			
		Near coast of Hokkaido, Japan						6.8 N 92.5 E			
		depth about 40 km						Nicobar Islands			
18	Wr	ePKPZ	17	44	06	20	Ch	ePKPZ	10	23	52 c
	Qt	ePKPZ			17		Wr	ePKPZ			24 59
		epPKPZ			32		Qt	ePKPZ			25 06
		e(PP)Z			46 13			USCGS H 10 07 26.6			
	Lh	e(PKP)Z			44 25			25.9 S 178.4 E			
	Kr	ePKPZ			25			South of Fiji Islands region			
								depth about 655 km			



Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
20	Ch	iPZ	16	14	23			Northern Burma			
		iXIZ			35			depth about 30 km			
		ePcPZ			15 51			USCGS H 22 02 38			
		iPPZ			16 16			26.1 N 96.8 E			
		eSN			21 17			Northern Burma			
		ePKPPKPZ			45 30			depth about 25 km			
	Lh	ePNE			15 18	21	Qt	ePKPZ	00	24	58
		eXNE			37			USCGS H 00 06 02.4			
		eSNE			23 02			24.8 S 177.1 W			
	Wr	ePZ			15 22 c			Tonga Islands region			
		eSN			23 09			depth about 38 km			
	Qt	ePZ			15 59 c	21	Wr	ePKPZ	17	40	54
		eSEN*			24 19		Qt	ePKPZ			58
		ePKPPKPZ			45 16			esPPZ			44 02
		△ 61°.4						USCGS H 17 21 57			
		Mu Sec						16.3 N 93.0 W			
	PZ	1.1 2.0						Chiapas Mexico			
	Kr	ePZ	16	16	16			depth about 80 km			
		H 16 05 39				22	Qt	ePZ	10	44	38
		Hokkaido, Japan					Wr	ePZ			45 03
		Mag 6.7 (Qt)						USCGS H 10 35 01.4			
20	Ch	ePZ	22	04	07			25.6 S 69.8 E			
		isP			17			Indian Ocean			
		iSN			05 16			depth about 25 km			
	Lh	ePZ			07 19	22	Qt	ePZ	13	30	02
	Wr	iPZ			47 c		Wr	ePZ			31 06
		iSN			11 59	22	Wr	ePZ	16	47	02
	Qt	ePZ			08 19		Qt	ePZ			34
		iSN*			12 52			USCGS H 16 38 01.4			
		isSN			13 16			29.4 N 131.1 E			
	Kr	ePZ			08 22			Ryukyu Islands			
		csSNE			13 30			depth about 25 km			
		H 22 02 40				22	Qt	ePZ	22	05	06
		26.0 N 96.5 E					Wr	ePZ			31

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
	Ch	ePZ			45		Qt	ePZ			08
		elpPZ	46	09				esPZ			38
		ePPZ			21			eSNE			23 20
		eSNE	49	32			H	09 20 35			
		esSNE	50	15				35 $\frac{3}{4}$ N 70 $\frac{1}{2}$ E			
		eXZ			26			Hindukush			
		H	05	40	53			depth about 130 km			
		36.5 N 71.0 E						USCGS H 09 20 36.0			
		Hindukush						35.7 N 79.5 E			
		depth about 100 km						Pakistan Afghanistan border			
		USCGS H 05 40 53						depth about 122 km			
		36.6 N 71.4 E									
		Hindukush									
		depth about 100 km									
27	Ch	ePZ	06	37	24	27	Kr	ePKPZ	13	00	17
		esPZ			35			eXZ			02 50
		eXZ			44		Qt	ePPZ			03 26
		eSNE	39	20				ePKPZ			00 23
		eLE	39.9					ePKP ₂ ZE			27
	Lh	ePZ	40	11				epPKPZ			38
	Wr	ePZ			33			eXE			01 39
	Qt	ePZ	41	07				ePPZNE			03 44
		epPZ			19		Wr	ePKSNE			04 03
		eXE			32		Lh	eXN*			10 49
		ePPZN	42	01			Ch	ePKPZ			00 31
		eSN*	46	12				ePKPZ			36
		eLN*	48.6					ePKPZ			46
		USCGS H 06 34 55.4						epPKPZ			01 03
		27.7 N 101.9 E						eXZ			03 23
		Szechwan China						ePPZ			05 00
		depth about 40 km						USCGS H 12 40 48.9			
27	Wr	iPZ	09	21	07 d			37.4 S 73.2 W			
		iSN			31			Near coast of central Chile			
	Lh	ePZ			52	27	Wr	depth about 40 km			
		eSN	22	49			Qt	Mag 6 $\frac{1}{4}$ - 6 $\frac{1}{2}$ (Pas), 6 (Berk)			14 32 09
								ePZ			23
								ePZ			

Date	Station	Phase	h	m	s	Date	Station	Phase	h	m	s
		USCGS H	14	21	24.5						
		2.7 S 130.1 E									
		Ceram Sea									
		depth about 40 km									
27	Qt	ePZ	21	40	54						
	Wr	ePZ			41 00						
		USCGS H	21	34	11.8						
		46.1 N 26.3 E									
		Romania									
		depth about 115 km									
28	Wr	ePZ	05	31	36						
	Qt	ePZ			54						
		USCGS H	05	19	54.1						
		2.5 S 140.5 E									
		Near north coast of									
		New Guinea									
		depth about 25 km									
28	Lh	ePZ	07	29	19						
	Wr	ePZ			26						
	Qt	ePZ			30 01						
		USCGS H	07	19	44.5						
		31.4 N 139.2 E									
		South of Honshu, Japan									
		depth about 62 km									
28	Ch	ePZ	20	53	47						
		eXZ			55 10						
	Qt	eXZ			57 44						
		USCGS H	20	44	22.4						
		2.9 S 140.7 E									
		Near coast of New Guinea									
		depth about 25 km									
						15					



Date	Phase	h m s	Date	Phase	h m s
	Quetta		8	ePZ	03 28 72
				eSE	43
1	ePZ	20 39 47	8	ePE	04 27 29
1	ePZ	21 40 30		e(S)E	29 14
	eSZE	50	8	ePZ	03 07 59
1	ePgE	23 16 40		eSE	08 16
	eSgE	52	8	eXZ	08 45.0
3	ePEZ	15 10 06 ±	8	ePE	10 03 54
3	ePZ	20 26 41		eSZE	04 14
4	ePZ	05 12 43	8	ePE	10 08 27
4	e(P)Z	05 57 34		eSE	46
4	eXZ	06 20 34	8	eXZ	10 18.0
4	ePgZ	09 09 53	8	ePgZ	10 50 36
	eSgZ	10 01		eSgE	40
5	ePZ	02 36 03	8	ePZ	11 20 46
5	ePgZ	14 57 11		eSE	21 03
	eSgE	18	8	ePZ	11 41 01
5	eXE	18 40.3		eSNE	16
5	ePZ	19 37 09	8	ePZ	16 46 36
5	ePZ	21 01 38		eSNE	47 00
	e(S)N	02 21	9	ePgZ	00 50 17
6	eXZ	03 42 55		eSgE	33
6	ePZ	07 00 05	9	ePgZ	01 04 10
	eSE	01 21		eSgZE	25
6	eXZ	16 40 28	9	ePgZ	01 41 27
6	ePgZ	19 42 14		eSgE	42
	e(S)gZ	25	9	ePgZ	05 53 18
7	eXZ	02 14.7		eSgZ	29
7	eXZ	07 40.0	9	ePZE	09 09 57
7	eXZ	08 15.0		eSE	11 16
7	ePZ	11 07 10	10	ePgZ	02 58 55
	eSZ	27		eSgE	59 10
7	eXE	16 51.0	10	ePZ	11 12 20
7	ePZ	19 04 55 ±		eSZ	39
	eSZN	06 13	10	eXZ	19 48.0
8	ePZ	00 13 17			

Date	Phase	h m s	Date	Phase	h m s
10	ePgZ	20 06 51	16	eXZ	02 01.0
	eSgN	07 06		eXZ	07 24.0
10	ePZ	22 52 20	16	eXZ	09 45.0
11	ePgZ	05 44 35	16	ePE	19 08 39
	eSgN	37		eSE	10 18
11	ePgZ	05 45 09	16	ePZ	20 22 56
	eSgN	11	17	eXZ	00 34.0
11	ePgZ	07 06 44	17	ePE	01 44 23
	eSgN	48		eSE	45 52
11	ePZ	19 06 22 ±	17	ePZ	23 11 55
12	ePZ	01 40 57 ±	18	eXZ	05 16.0
12	eXZ	08 04 07	18	ePZ	05 16 27
12	ePZ	22 16 36		eSNE	52
13	e(P)Z	00 42 11	18	ePZ	05 27 18
13	eXZ	01 15.0		eSNE	42
13	e(P)Z	04 44 28	18	ePN	11 32 55
13	ePZ	05 16 16		eSN	33 23
	eSE	40	19	ePgZ	01 47 56
13	ePZ	12 29 26		eSgZ	48 00
	iSNE	46	19	eXE	15 19.8
13	ePZ	20 29 34 ±	19	eXE	21 47.0
13	eXZ	23 45 24	20	eXZ	16 45 16
14	ePZ	07 54 28	20	ePZ	20 38 03
14	ePZ	08 23 44		eSN	30
	eXZ	09 05 56	21	eXZ	06 59 56
14	ePgZ	10 03 34	22	ePgZ	03 55 05
	eSgNE	47		eSgNE	15
14	ePZ	20 57 57 ±	22	eXZ	06 02 14
14	ePgZ	22 53 14 ±	22	ePgZ	12 02 19
	eSgZ	26		e(Sg)NE	30
15	eXZ	06 11.0	23	ePZ	17 36 36
15	ePE	19 46 50		eSZ	45
	eSE	48 12	23	e(P)Z	17 45 16
15	ePZ	22 58 20	23	ePgZ	17 45 32
	e(S)N	59 50		iSgNEN*	45

Date	Phase	h m s	Date	Phase	h m s
24	eXE	05 24.5	1	ePZ	15 33 22
24	eXE	08 46.0		eSZ	34 13
24	eXE	09 24.0	1	ePZ	15 34 52
24	eXE	09 58.0	1	iPZ	21 39 24
24	ePgE	12 24 18		iSZ	55
	iSgNE	29	2	iPZ	11 22 06
25	ePZ	07 11 38		iSN	37
	eSNE	13 22	3	ePZ	15 09 37
26	ePgE	16 52 06		iSZ	10 08
	eSgE	19	3	ePZ	21 44 01
26	ePZ	17 25 37		eSZ	34
	eSE	26 02	4	ePZ	16 46 44
26	eXN	23 45.0		eSZ	47 08
27	eXN	01 01.9	5	ePZ	02 15 30
27	eXN	01 46.0		iSZ	59
27	ePgZ	04 31 46	5	ePZ	10 17 43
	eSgN	47		eSN	12 19
27	ePZ	04 33 11	6	ePZ	12 33 27
	eSN	29	7	ePZ	14 49 53
27	ePZ	07 36 34	7	ePZ	16 50 24
27	eXZ	15 05.0		eSZ	52 20
27	ePgZ	15 45 20	7	iPZ	19 03 55
	eSgZ	29		iSZ	04 28
27	eXZ	20 21.0	7	ePZ	19 42 22
28	ePZ	05 28 49	8	ePZ	00 23 37
	e(S)N	29 45	8	ePZ	04 26 31
28	ePZ	23 11 30	8	ePZ	07 43 44
	Warsak			eSZ	44 54
	ePZ	02 19 40	8	ePZ	16 47 15
	iSZ	20 20	9	eSN	54 27
	ePZ	06 18 20		ePZ	09 08 52
	eSZ	52	9	iSZ	09 27
	ePZ	08 16 19		ePZ	16 41 45
				eSZ	42 02

Date	Phase	h m s	Date	Phase	h m s
10	ePZ	00 28 15		iSZ	44 01
	eSZ	43	17	ePZ	20 13 03
10	ePZ	02 59 58		eSZ	37
10	ePZ	06 27 36	18	iPZ	02 48 13
	eSZ	28 08		iSN	42
10	iPZ	19 47 22	18	ePZ	03 15 44
	iSZ	56	18	ePZ	06 00 37
10	ePZ	21 58 26	18	ePZ	11 21 29
	eSZ	59 59		eSZ	22 17
11	ePZ	19 03 48	18	ePZ	17 27 53
	eSZ	04 49		eSZ	28 15
12	ePZ	08 05 42	19	ePZ	13 26 11
	eSN	06 13	19	ePZ	16 50 15
13	ePZ	00 40 21		eSZ	44
	eSN	41 44	19	ePZ	16 50 15
13	ePZ	13 01 44		eSZ	44
	eSZ	02 16	19	iPZ	19 29 48 e
13	iPZ	20 27 02		iSZ	30 30
	iSZ	40	20	iPZ	14 31 08 e
14	ePZ	05 49 12	21	ePZ	14 58 47
	iSZ	50 08		iSZ	59 19
14	ePZ	07 07 49	21	ePZ	23 11 09
	iSZ	08 12	22	ePZ	05 06 30
14	ePZ	20 55 44		eSN	07 00
	eSZ	56 15	22	ePZ	15 56 56
15	iPZ	06 09 03		iSZ	57 29
	iSN	29	22	ePZ	16 43 32
15	ePZ	14 26 10		eSZ	58
	eSZ	40	22	ePZ	23 41 36
15	ePZ	19 45 46		iSZ	53
	iSZ	46 19	23	ePZ	05 06 00
16	ePZ	22 56 54		eSZ	08 01
	iSZ	57 18	23	ePZ	15 53 08
17	ePZ	00 34 43	23	ePZ	17 46 51
17	ePZ	01 43 29	23	ePZ	18 18 03

Date	Phase	h m s	Date	Phase	h m s
24	ePZ	05 23 32	15	ePZ	08 16 39
	eSZ	24 02		eSZ	55
25	ePZ	07 10 29	15	ePZ	22 57 34
	eSZ	11 15		eSE	58 19
25	ePZ	23 21 22	20	ePZ	20 38 25
	eSZ	54		eSZ	39 15
26	ePZ	13 17 17	28	ePZ	05 28 38
	eSZ	45		eSE	29 24
26	ePZ	13 22 31		Chittagong	
	eSZ	23 35	5	eXNE	14 57.3
27	ePZ	17 04 23	6	eXZ	07 13.0
	eSZ	53	8	iXNE	00 49 14
	Lahore		11	eXZ	11 13 24
8	ePZ	04 26 05	12	eXZ	05 07 50
	eSNE	52	13	ePNZ	06 28 38 d
10	ePZ	19 48 04	13	eSNZNE	29 06
	eSN	49 11		ePZN	06 57 12
10	ePZ	20 05 46	13	eSNE	33
13	ePZ	20 27 38	13	eXNE	17 23 11
18	ePZ	10 51 59	13	ePgZN	17 36 31
18	ePZ	23 28 05		iSgNE	32
20	ePE	10 30 44	13	ePZ	23 35 37
	Karachi			eSNE	36 00
2	ePZ	00 49 23	14	eXZ	08 55 06
	eSE	33	14	ePZ	09 20 11
5	ePZ	21 01 39	16	eXE	02 33.1
	eSE	02 20	16	ePZ	08 23 22
6	ePZ	06 59 02 ±		eSNE	30
	eSE	46	16	eXE	09 32 50
8	eXZ	12 01 00	16	eXE	09 44.4
10	ePZ	23 07 24	16	eXE	11 13 01
	eSE	08 16	16	eXZNE	11 52 09
			16	ePNE	23 18 00
				eSNE	10

Date	Phase	h m s	Date	Phase	h m s
18	iPZ	14 02 09			
18	ePZ	22 38 36			
19	eXN	10 26 35			
19	iPZNE	11 11 49 c			
	iSZNE	12 14			
19	iXNE	19 01 20			
20	eXNE	11 47 51			
21	eXE	07 15.0			
21	eXNE	10 30.7			
21	ePZ	13 26 04			
	eSZN	54			
22	eXZ	16 45 00			
22	eXZ	21 38 26			
23	eXNE	10 31.4			
23	eXZ	12 20 26			
25	eXNE	09 34 55			
27	ePZ	17 20 02			
	e(S)E	42			