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SEISMOLOGICAL BULLETIN

1977

JANUARY FEBRUARY MARCH

PAŃSTWOWE WYDAWNICTWO NAUKOWE
WARSZAWA-ŁÓDŹ 1979

AGUT 1979

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The present Seismological Bulletin contains distant earthquakes recorded by seismological observatories of the Institute of Geophysics, Polish Academy of Sciences. The identification of shocks and interpretation of phases were based on the hypocenter determination given by:

NEIS - U.S. Department of the Interior (Geological Survey), National Earthquake Information Service, Boulder, USA.

EMSC - European Mediterranean Seismological Centre, Strasbourg.

Moscow - Central Seismological Station "Obninsk", Institute of the Physics of the Earth, USSR Academy of Sciences, Moscow.

Epicentral distances were calculated in geocentral coordinates with an accuracy of $\pm 0.01^\circ$. Magnitudes of earthquakes were determined from recordings of horizontal and vertical components of surface waves for epicentral distances $\Delta > 5^\circ$ and depths $h < 80$ km, using the IASPEI formula. The magnitude from body waves was determined only from the recordings of vertical component of the P waves for $\Delta > 20^\circ$ and depths $h < 80$ km, using the calibrating function given by Vanek et al. /1962/.^{*} The maximum value of A/T was determined in the interval up to 40 s from the first arrival of the P wave.

^{*} Vanek I., Zatopek A., Karnik V., Kondorskaya N.V., Riznichenko Yu.V., Savarenskiy E.F., Solovev S.L., Shebalin N.V., 1962, Standartizatsiya shkaly magnitud, Izv. AN SSSR, Ser. geofiz., 2, 153-158.

Station	Type of seismo-graph	Comp.	Ts [s]	Tg [s]	Ds	Dg	σ^2	Vo	Vm	Tm [s]	Remarks
Warszawa (WAR) $\varphi = 52^{\circ}14'30''N$ $\lambda = 21^{\circ}01'25''E$ h=110 m	GW	N-S	10.28	12.10	1.08	1.02	0.059	1500	865	4.2-9.0	
		E-W	9.68	11.10	0.99	0.98	0.058	1330	820	4.4-9.0	
		Z	7.80	11.38	0.50	0.83	0.030	900	855	5.5-9.0	
SKD	SKD	N-S	20.3	79.8	1.08	0.47	0.086	535	550	13-32	
		E-W	20.4	89.6	1.04	0.50	0.091	513	520	13-32	
		Z	21.4	86.5	1.00	0.48	0.104	603	620	14-32.6	
Kraków (KRA) $\varphi = 50^{\circ}03'22''N$ $\lambda = 19^{\circ}56'23''E$ h=223 m	Ch	N-S	1.24	0.281	0.497	1.981	0.132	10600	11420	0.17-1.0	
		E-W	1.29	0.280	0.530	1.942	0.139	10750	11300	0.15-1.0	
		Z	1.46	0.282	0.579	1.984	0.156	10780	11100	0.15-1.0	
SKM-3	SKM-3	N-S	1.273	0.580	0.515	0.487	0.0125	21800	23260	0.5-0.75	
		E-W	1.280	0.575	0.524	0.469	0.0129	22560	24470	0.5-0.75	
		Z	1.445	0.580	0.610	0.486	0.0131	22000	22700	0.5-0.75	
GW	GW	N-S	9.70	1.01	0.49	5.00	0.020	1480	1500	0.22-8.0	
		E-W	11.10	1.00	0.47	5.00	0.021	1480	1490	0.21-9.0	
		Z	10.50	1.01	0.48	5.00	0.025	1010	1020	0.22-8.5	
SKD	SKD	N-S	20.0	106.6	1.00	0.50	0.144	600	610	13.5-40	
		E-W	20.0	98.2	0.99	0.50	0.149	600	615	13.5-40	
		Z	20.0	108.8	1.00	0.50	0.193	690	705	13.5-40	



Station	Type of seismo-graph	Comp.	Ts [s]	Tg [s]	Ds	Dg	σ^2	Vo	Vm	Tm [s]	Remarks
Racibórz (RAC) $\varphi = 50^{\circ}05'00''N$ $\lambda = 18^{\circ}11'39''E$ h = 209 m	SK-58	N-S	1.22	1.06	0.50	0.73	0.013	2420	2820	0.75-1.19	
		E-W	1.23	1.07	0.57	0.50	0.013	2880	2710	0.75-1.14	
		Z	1.12	1.07	0.31	0.40	0.020	3110	5220	0.91-1.16	
Mainka (M) h = 209 m	Mainka (M)	N-S	9.0	-	0.36	-	-	87	130	6-9	
		E-W	9.0	-	0.38	-	-	86	120	6-9	
		Z	2.0	-	0.13	-	-	165	620	1.8-2.2	
Niedzica (NIE) $\varphi = 49^{\circ}25'25''N$ $\lambda = 20^{\circ}19'19''E$ h = 555 m	SK-58	N-S	1.40	0.266	0.70	3.50	0.054	25000	25100	0.1-0.9	
		E-W	1.40	0.293	0.70	3.54	0.051	25150	25280	0.1-0.9	
		Z	1.09	0.207	0.70	3.50	0.046	25000	25100	0.1-0.9	
Książ (KSP) $\varphi = 50^{\circ}50'6''N$ $\lambda = 16^{\circ}17'6''E$ h = 380 m	SU-59	N-S	1.19	0.25	0.50	1.37	0.089	87450	90000	0.15-0.60	
		E-W	1.22	0.24	0.62	1.44	0.142	108700	110800	0.15-0.60	
		Z	1.00	0.21	0.50	1.53	0.171	106300	110700	0.15-0.65	

Abbreviations

Ts - free period of seismometer

Tg - free period of galvanometer

Ds - attenuation of seismometer

Dg - attenuation of galvanometer

σ^2 - coupling coefficient

Vo - static magnification $V_0 = \frac{2A}{10} \sqrt{\frac{Ks}{Kg} \frac{Ds}{Dg} \frac{Tg}{Ts} \sigma^2}$

Vm - maximum magnification

Tm - interval of periods where magnification $V \geq 0.9 V_m$

Vo - static magnification of SKD instruments $V_0 = \frac{2A}{10} \sqrt{\frac{Ks}{Kg} \frac{Ds}{Dg} \frac{Tg}{Ts} \sigma^2}$

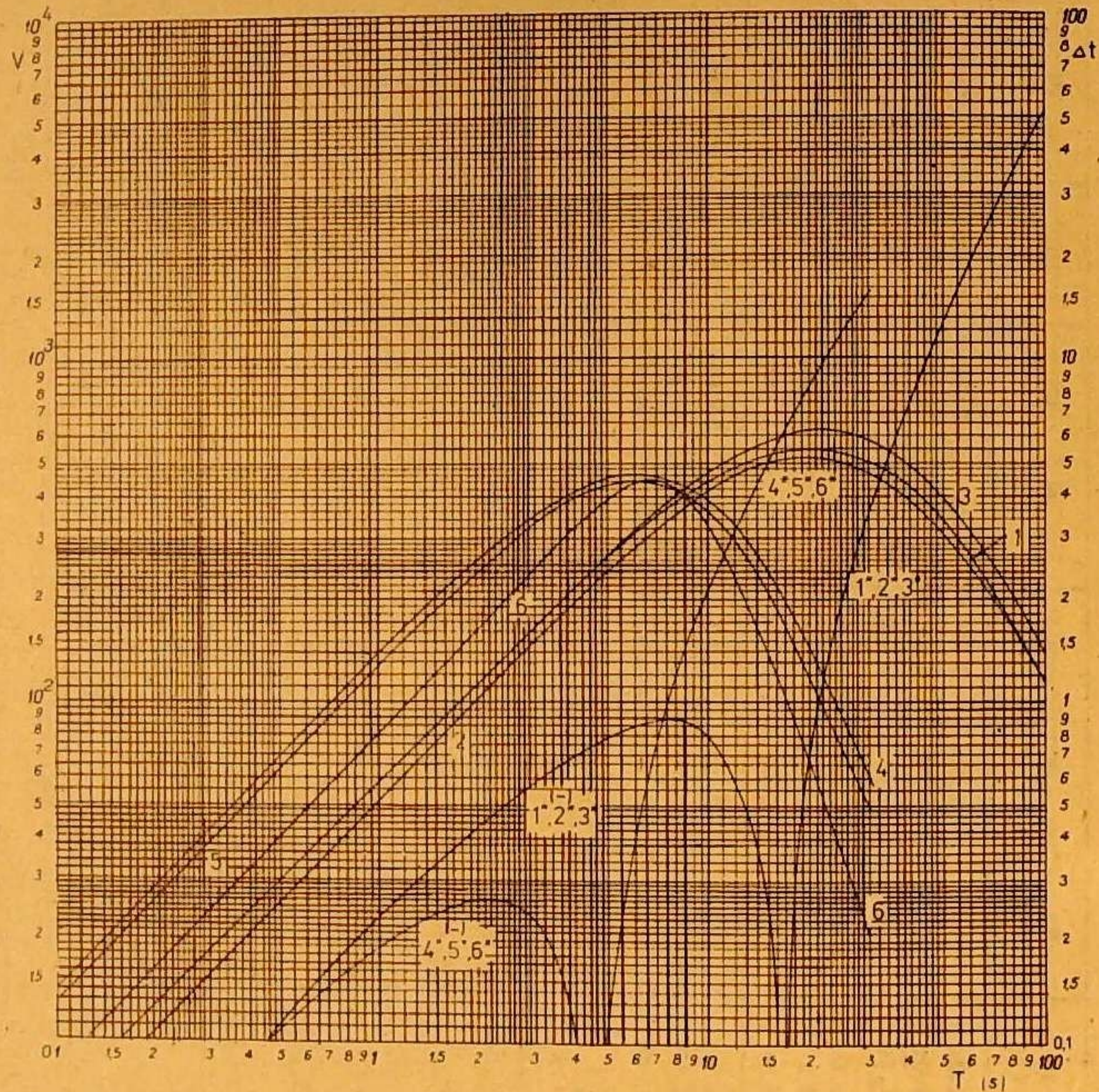


Fig. 1. Frequency responses of the instruments at Warszawa (WAR) station. Phase distortion curves marked by asterisque. SKD long-period seismographs: 1) N-S horizontal component, 2) E-W horizontal component, 3) vertical component; Galitzin-Wilip seismographs: 4) N-S horizontal component, 5) E-W horizontal component, 6) vertical component.

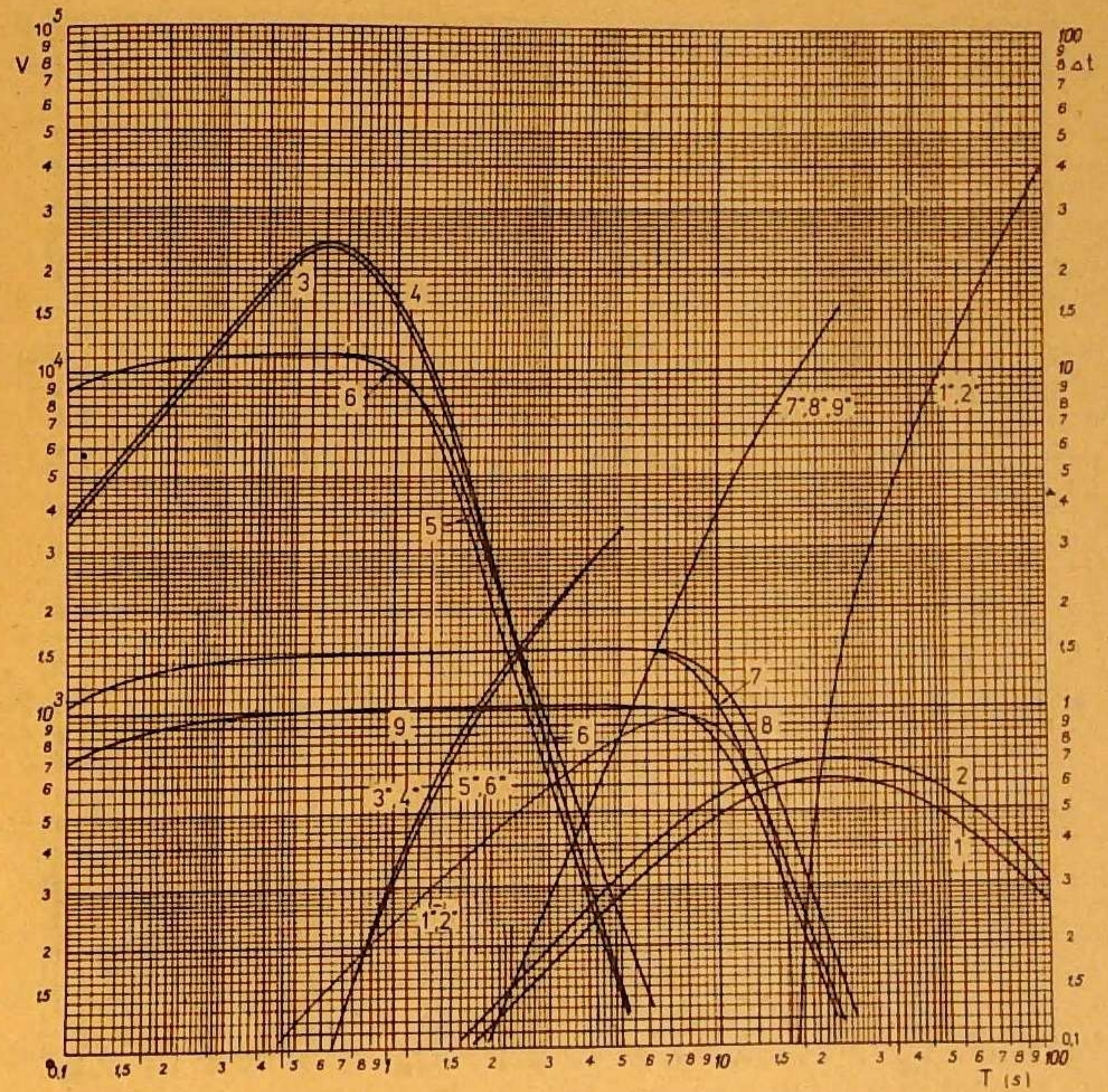


Fig. 2. Frequency responses of the instruments at Kraków (KRA) station. Phase distortion curves marked by asterisque. SKD long-period seismographs: 1) horizontal components, 2) vertical component; SKM short period seismographs; 3) N-S horizontal component and vertical component, 4) E-W horizontal component; Ch short period seismographs: 5) horizontal components, 6) vertical component; Galitzin-Wilip seismographs: 7) N-S horizontal component, 8) E-W horizontal component, 9) vertical component.

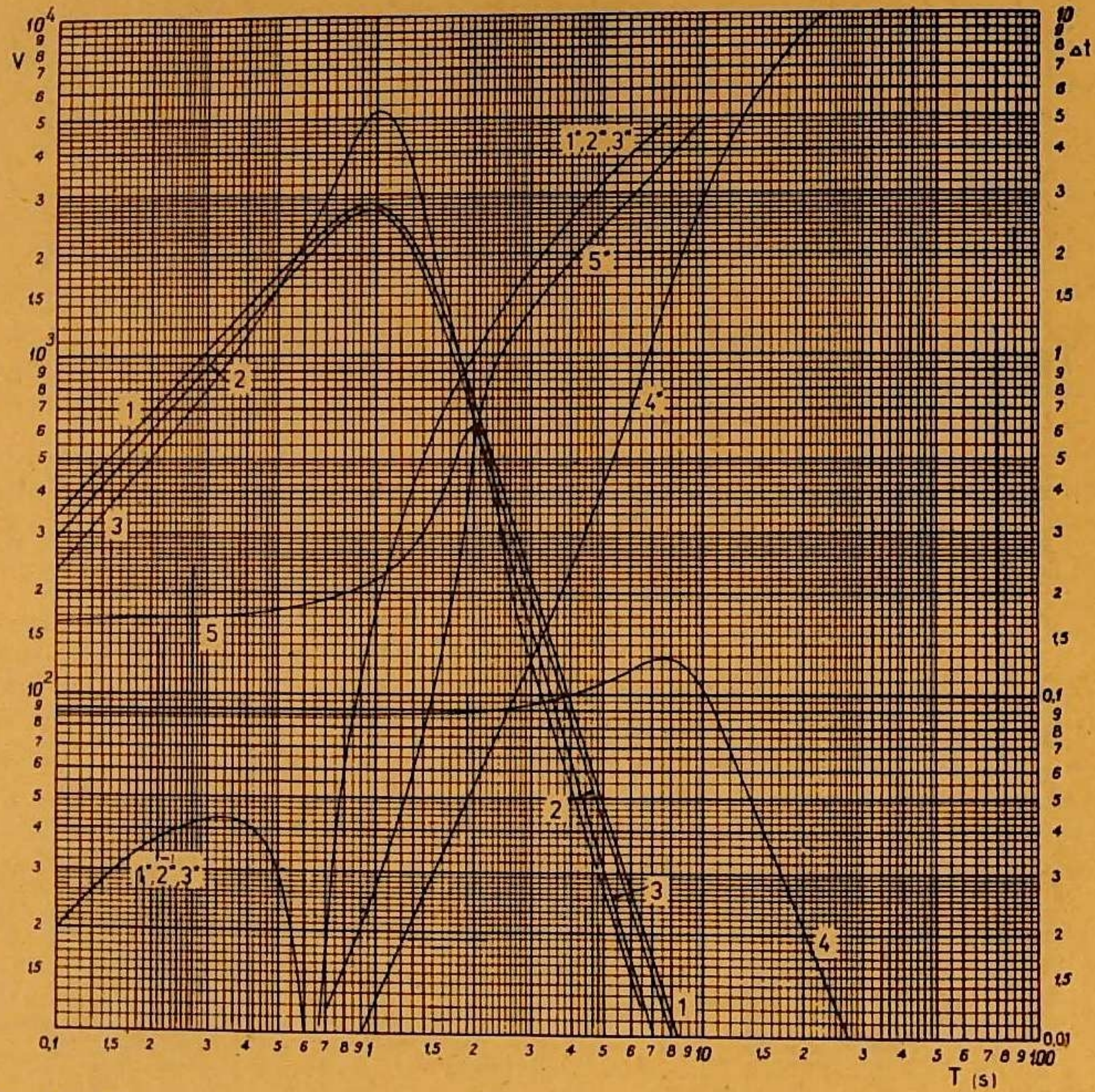


Fig. 3. Frequency response of the instruments at Racibórz (RAC) station. Phase distortion curves marked by asterisque. SK short period seismographs: 1) N-S horizontal component, 2) E-W horizontal component, 3) vertical component; Mainka seismographs: 4) horizontal components, 5) vertical component.

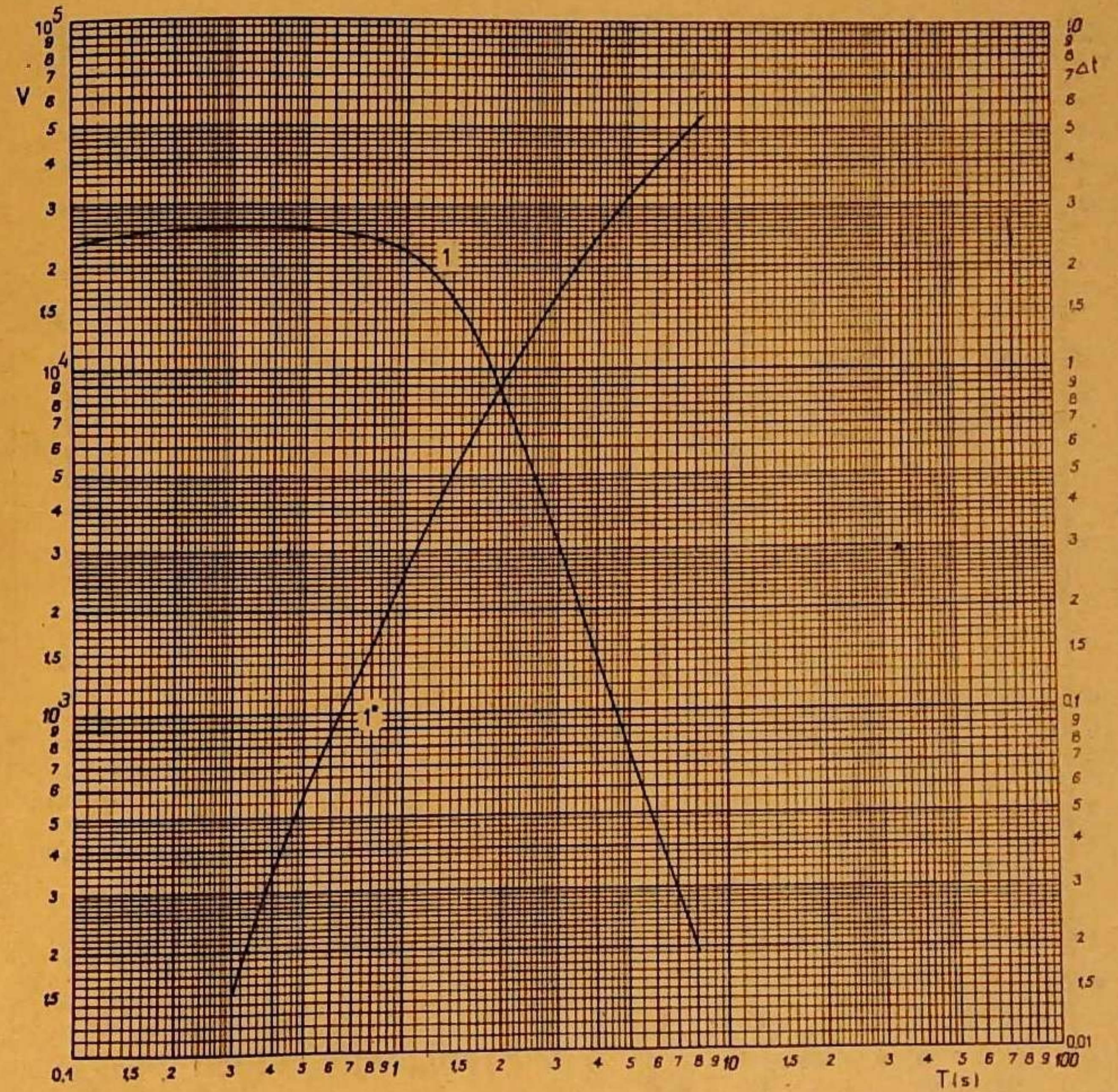


Fig. 4. Frequency responses of the instruments at Niedzica (NIE) station. SK short period seismographs. 1) magnification curve; 1*) Phase distortion curve.

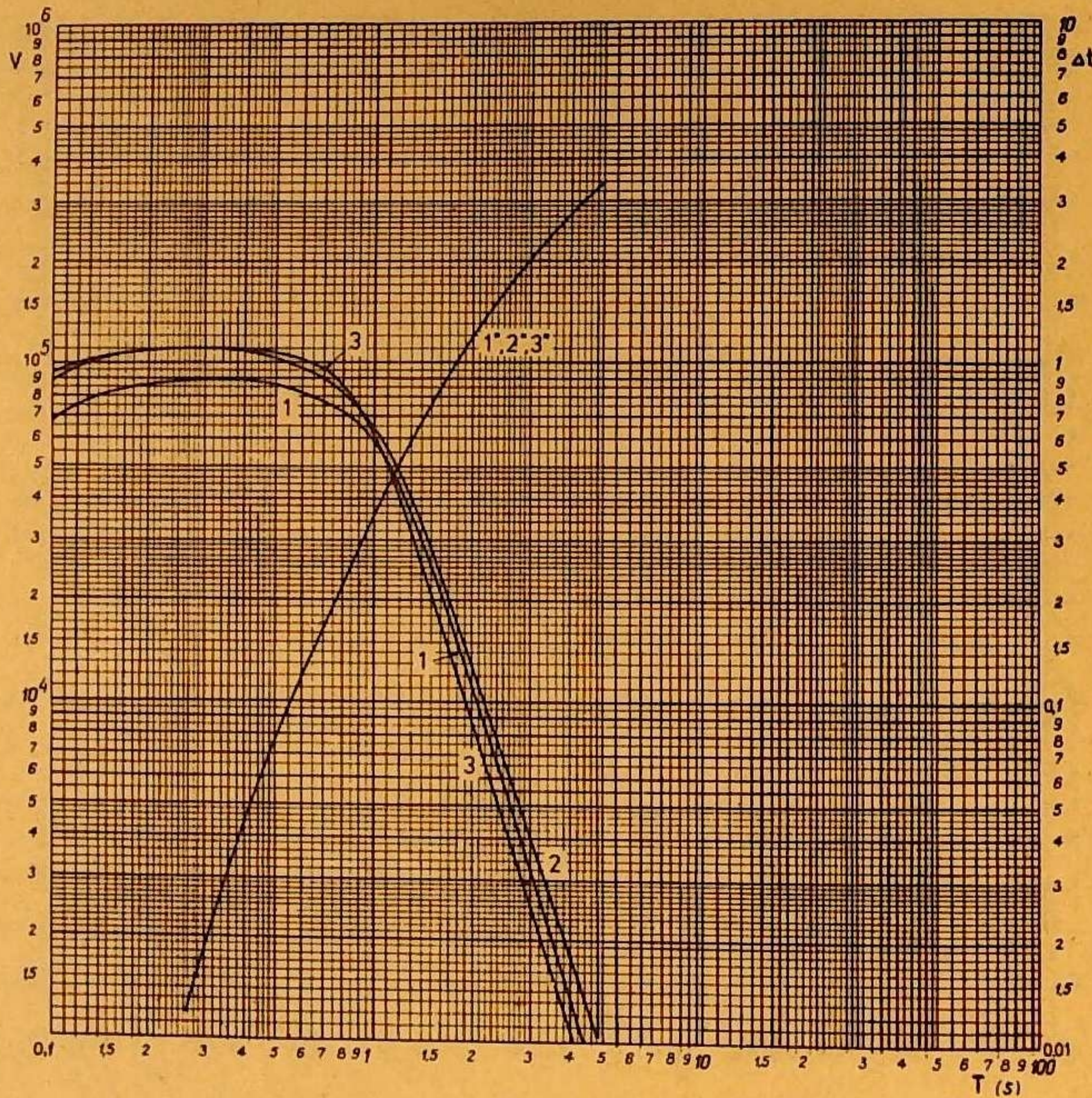
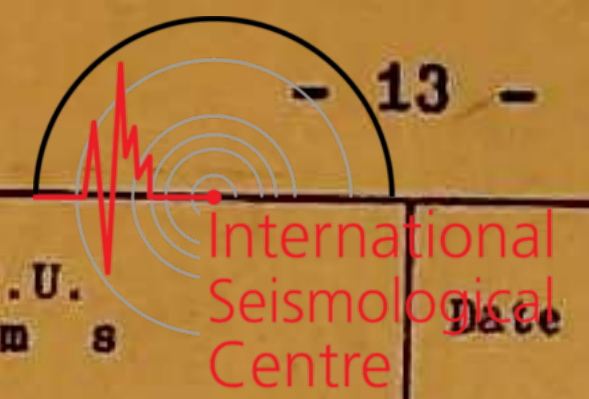


Fig. 5. Frequency responses of the instruments at Książ (KSP) station. Phase distortion curve marked by asterisque. SU short period seismographs: 1) N-S horizontal component, 2) E-W horizontal component, 3) vertical component.

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
1977				JANUARY			1977
1.I	Ryukyu Islands, NEIS: 28.135°N, 130.649°E, H=06 ^h 23 ^m 45.1 ^s , h=33 km, MB=5.1	KRA Δ=81.1° (SKM) e1P	06 35 58	1.I	WAR	Lm NE: 12 ^s ; 42μ, 20μ Lm Z: 12 ^s ; 40μ	22 08 10
1.I	Honshu, Japan, NEIS: 30.663°N, 137.060°E, H=11 ^h 33 ^m 41.6 ^s , h=476 km	KSP Δ=83.5° eP	14 45 19	KRA Δ=50.6° (SKM) eP	Pm	43.0	
1.I	KRA	(SKM) e1P	12 47 13	Z: 1.4 ^s ; 0.20μ	1pP	48.6	
1.I	Java, NEIS: 7.885°S, 109.014°E, H=17 ^h 35 ^m 54.9 ^s , h=113 km, MB=5.7	KRA Δ=95.4° (SKM) eP	17 49 02	eS	ePP	50 37	
		e1pP	52 29	Lm	eS	55 58	
1.I	Ceram Sea, NEIS: 2.532°S, 126.582°E, H=19 ^h 01 ^m 39.6 ^s , h=33 km, MB=6.0; MLV=5.7 (Kraków)	KRA Δ=102.7° (SKM) eP	19 15 36	N: 16 ^s ; 26μ	Lm	22 09.5	
		e1PP	19 52.9	Lm	Z: 22 ^s ; 11μ	11.3	
		(SKD) eL	33	KSP Δ=52.6°	e1P	21 48 55	
		Lm	53.1	e1PeP	e1PeP	50 06	
		N: 40 ^s ; 14μ		2.I	Sumba Island, NEIS: 10.170°S, 118.987°E, H=09 ^h 55 ^m 28.4 ^s , h=19 km, MB=5.8; MLH=6.4 (Kraków)	KRA Δ=103.5° (SKM) eP	10 09 30
		Lm	53.5	ePP	ePP	13 49	
		EZ: 60 ^s ; 18μ, 7.9μ		eS	eS	21 14	
WAR	Δ=101.4° (SKD) e1PP	19 19 46		Lm	Lm	11 00.9	
	e1	24 30		NEZ: 20 ^s ; 7.9μ, 11μ, 12μ			
	e1SKS	36 26		WAR Δ=102.8° (SKD) e1P	e1P	10 09 34	
	e1PS	28 50		e1SKS	e1SKS	20 09	
	e1PPS	29 46		Lm	Lm	11 00 10	
	eL	51.0		NEZ: 20 ^s , 24 ^s , 22 ^s ; 6.3μ, 12μ, 11μ			
1.I	China, NEIS: 38.146°N, 91.007°E, H=21 ^h 39 ^m 41.3 ^s , h=27 km, MB=5.9; MPV=6.0, MLH=6.3 (Kraków)	WAR Δ=93.3° (SKM) eP	15 10 01	4.I	Mexico, NEIS: 15.294°N, 94.352°W, H=14 ^h 56 ^m 46.1 ^s , h=33 km, MB=5.2	KRA Δ=93.3° (SKM) eP	15 10 01
		e1P	21 48 33				
		e1PP	50 30	4.I	Iran, NEIS: 33.094°N, 47.923°E, H=16 ^h 09 ^m 58.5 ^s , h=45 km, MB=5.1	KRA Δ=26.6° (SKM) 1P	16 15 35.2
		e1S	55 54			1pP	45.2
		e1SS	59 22				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
4.I	Tanzania, NEIS: 7.435°S, 38.518°E, H=20 ^h 44 ^m 39.4 ^s , h=33 km, MB=5.2; MPV=5.4	KRA (SKM)	Δ=59.2° e1P 20 54 42 Z: 0.8 ^s ; 0.028μ	6.I	Fiji Islands, NEIS: 17.945°S, 178.538°W, H=04 ^h 10 ^m 17.8 ^s , h=621 km, MB=4.6	KRA (SKM)	Δ=145.0° 1PKHKP 04 28 46.8 D Z: 0.6 ^s ; 0.027μ
5.I	Iran, NEIS: 27.457°N, 56.202°E, H=05 ^h 44 ^m 39.9 ^s , h=29 km, MB=5.5; MPV=5.7	KRA (SKM)	Δ=35.5° 1P 05 51 37.0 Z: 1.5 ^s ; 0.18μ			KSP	Δ=145.1° e(PKP) 04 29 07 1 08.9
		KSP	Δ=38.1° eP 05 51 58 ePP 53 30	6.I	New Guinea, NEIS: 3.630°S, 144.447°E, H=06 ^h 11 ^m 40.7 ^s , h=33 km, MB=6.0; MLH=6.9 (Kraków)	KRA (SKM)	Δ=114.5° ePKP 06 30 24 D Z: 0.6 ^s ; 0.016μ
5.I	Fiji Islands, NEIS: 23.381°S, 179.987°E, H=10 ^h 20 ^m 29.1 ^s , h=538 km, MB=5.0	KSP	Δ=149.8° e1PKP 10 39 18			(SKD)	e1PP 31 16 e1SKKS 38 16 1PS 40 48 e1SSP 47 24 Lm 07 06.5 NEZ: 45 ^s ; 39μ, 48μ, 23μ
5.I	Tonga Islands, NEIS: 16.088°S, 173.86°W, H=10 ^h 36 ^m 29.4 ^s , h=33 km, MB=5.0	KSP	Δ=144.4° ePKP 10 56 00			WAR (SKD)	Δ=112.7° e1PKP 06 30 25 e1 40 29
5.I	Fiji Islands region, NEIS: 20.813°S, 178.314°W, H=13 ^h 29 ^m 48.1 ^s , h=575 km, MB=5.2	KRA (SKM)	Δ=147.7° 1PKP 13 48 29.0 Z: 1.1 ^s ; 0.13μ	6.I	Kuril Islands, NEIS: 49.267°N, 155.547°E, H=07 ^h 55 ^m 57.5 ^s , h=33 km, MB=5.4; MPV=5.8 (Kraków)	KRA (SKM)	Δ=74.2° e1P 08 07 30 Z: 0.6 ^s ; 0.043μ
		KSP	Δ=147.9° ePKIKP 13 48 27 1PKHKP 31.2 Z: 0.8 ^s ; 0.080μ			KSP	Δ=74.3° 1P 08 07 32.5
5.I	Burma - India border region, NEIS: 25.433°N, 95.178°E, H=14 ^h 10 ^m 56.5 ^s , h=104 km, MB=4.8	KSP	Δ=63.8° e1P 14 21 20	6.I	Aleutian Islands, NEIS: 51.479°N, 175.478°W, H=16 ^h 02 ^m 07.6 ^s , h=38 km, MB=5.2	KRA (SKM)	Δ=78.2° eP 16 14 04
						e1pP	13
5.I	Volcano Islands, NEIS: 23.394°N, 143.710°E, H=22 ^h 44 ^m 59.7 ^s , h=33 km, MB=5.7; MPV=5.7 (Kraków)	KSP	Δ=92.8° eP 22 58 10			esP	18
				6.I	Lake Tanganyika region, NEIS: 2.509°S, 28.702°E, H=18 ^h 33 ^m 43.5 ^s , h=21 km, MB=5.3	KRA	Δ=52.6° eP 18 43 00
				6.I	Tibet, NEIS: 31.048°N, 88.052°E, H=21 ^h 50 ^m 08.1 ^s , h=33 km, MB=5.2; MPV=5.3 (Kraków)		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
6.I	KRA (SKM)	Δ=53.2° eP 21 59 24 Z: 0.6 ^s ; 0.016μ		8.I	Santa Cruz Islands, NEIS: 11.273°S, 166.108°E, H=07 ^h 40 ^m 41.9 ^s , h=42 km, MB=5.5; MLH=5.9 (Kraków)	KSP	Δ=133.5° ePKIKP 07 59 53
	KSP	Δ=55.4° eP 21 59 41				KRA (SKD)	Δ=132.6° eL 08 45 Lm 57.1 NEZ: 22 ^s ; 2.5μ, 1.6μ, 3.8μ
7.I	Fiji Islands, NEIS: 25.182°S, 176.958°W, H=17 ^h 14 ^m 47.3 ^s , h=76 km, MB=5.0	KRA (SKM)	Δ=152.2° ePKP ₂ 17 34 42 epPKP 48	8.I	Loyalty Islands region, NEIS: 22.241°S, 170.348°E, H=21 ^h 37 ^m 16.0 ^s , h=58 km, MB=5.1	KSP	Δ=145.0 1PKIKP 21 56 46.9 C Z: 0.8 ^s ; 0.074μ
		KSP	Δ=152.4° e1PKHKP 17 34 35 e1PKP ₂ 43				1 56.4
7.I	Taiwan, NEIS: 21.173°N, 120.276°E, H=19 ^h 36 ^m 46.9 ^s , h=33 km, MB=5.7; MPV=5.9 (Kraków, Książ), MLH=5.3 (Kraków)	KRA (SKM)	Δ=80.5° e1P 19 48 57.4 D Z: 1.2 ^s ; 0.12μ	9.I	South Atlantic Ridge, NEIS: 16.764°S, 14.191°W, H=09 ^h 26 ^m 54.3 ^s , h=3 km, MB=5.3; MPV=5.4 (Kraków)	KRA (SKM)	Δ=72.8° eP 09 38 20 Z: 1.0 ^s ; 0.030μ
		(SKD)	e1PcP 49 05 Lm 20 19.5 NE: 30 ^s ; 2.0μ, 1.0μ Lm 31.3 NEZ: 20 ^s ; 1.1μ, 1.4μ, 1.6μ			KSP	Δ=5.1° e1Pn 14 27 44 1S ^m 29 05.0
		KSP	Δ=82.2° eP 19 49 06 Z: 0.7 ^s ; 0.067μ	9.I	Italy, EMSC: 46.28°N, 13.12°E, H=14 ^h 26 ^m 29.6 ^s , h=10 km, MLH=3.8 (Skopje)	KRA (SKM)	Δ=5.6° e(Pg) 14 28 24 1(Sg) 29 42.1
7.I	Luzon, Philippine Islands, NEIS: 18.735°N, 120.805°E, H=21 ^h 31 ^m 27.3 ^s , h=52 km, MB=4.9; MPV=5.4 (Kraków)	KRA (SKM)	Δ=82.7° eP 21 43 47 C Z: 1.0 ^s ; 0.030μ			KSP	Δ=5.1° e1Pn 14 27 44 1S ^m 29 05.0
				9.I	Honshu, Japan, NEIS: 31.247°N, 141.911°E, H=20 ^h 59 ^m 22.1 ^s , h=28 km, MB=5.1	KRA (SKM)	Δ=84.3° eP 21 11 51
		KSP	Δ=84.4° eP 21 43 55				
8.I	Luzon, Philippine Islands, NEIS: 15.324°N, 121.906°E, H=06 ^h 41 ^m 04.1 ^s , h=36 km, MB=5.3; MPV=5.9 (Kraków)	KRA (SKM)	Δ=85.9° 1P 06 53 41.9 C Z: 1.1 ^s ; 0.11μ	10.I	Luzon, Philippine Islands, NEIS: 15.332°N, 121.859°E, H=03 ^h 28 ^m 54.9 ^s , h=47 km, MB=5.0; MPV=5.5 (Kraków)	KRA	Δ=85.9° e1P 03 41 28 Z: 0.9 ^s ; 0.037μ
						e1pP	43
		KSP	Δ=87.6° 1P 06 53 51.1 C Z: 0.8 ^s ; 0.023μ	10.I	Fiji Islands, NEIS: 20.717°S, 179.246°W, H=09 ^h 31 ^m 49.6 ^s , h=653 km, MB=5.5	KRA (SKM)	Δ=147.2° 1PKP 09 50 21.6 D Z: 1.0 ^s ; 0.030μ



Date	Station	Phase	T.U. h m s		Date	Station	Phase	T.U. h m s
10.I	Loyalty Islands, NEIS: 21.490°S, 168.664°E, H=23 ^h 18 ^m 07.0 ^s , h=16 km, MB=5.2				13.I	KSP	Δ=7.3° eiPn	09 20 50
	KRA Δ=142.5° ePKP 23 37 40 C Z: 1.2 ^s ; 0.047μ				14.I	USSR - Afghanistan border region, NEIS: 36.611°N, 71.407°E, H=15 ^h 46 ^m 11.1 ^s , h=149 km, MB=4.8		
11.I	Arabian Sea, NEIS: 12.935°N, 57.454°E, H=14 ^h 51 ^m 05.0 ^s , h=33 km, MB=5.1; MPV=5.3 (Kraków)					NIF Δ=38.8° eiP 15 53 24 Z: 1.0 ^s , 0.012μ		
	KRA Δ=47.9° (SKM) eP 14 59 43 Z: 1.3 ^s ; 0.036μ					KRA Δ=39.0° (SKM) 1P 15 53 24.6 Z: 1.0 ^s , 0.030μ		
12.I	Sumatra, NEIS: 1.577°N, 99.856°E, H=23 ^h 35 ^m 19.1 ^s , h=178 km, MB=5.6				14.I	Fiji Islands, NEIS: 19.800°S, 177.543°W, H=17 ^h 58 ^m 35.2 ^s , h=350 km, MB=5.2		
	WAR Δ=81.8° (SKD) eiP 23 47 21 eipP 48 01 eiS 57 10 eiPS 58 29					KSP Δ=147.2° ePKIKP 18 17 35 1PKHKP 38.3 Z: 1 ^s , 0.096μ		
	NIF Δ=81.9° 1P 23 47 21.5 C Z: 0.7 ^s ; 0.46μ ipP 48 06.4 Z: 1.3 ^s ; 0.13μ					KRA Δ=147.0° (SKM) 1PKHKP 18 17 36.5 D Z: 1.0 ^s ; 0.042μ 1 54.9		
	KRA Δ=82.3° (SKM) eiP 23 47 22 Z: 0.7 ^s ; 0.062μ ePoP 30 ipP 48 06.6 Z: 1.6 ^s ; 0.38μ (GW) iS 57 21 eiPS 58 36				15.I	Italy, EMSC: 44.85°N, 8.89°E, H=00 ^h 29 ^m 26.3 ^s , h=10 km		
13.I	Yugoslavia, EMSC: 43.57°N, 17.16°E, H=09 ^h 19 ^m 08.2 ^s , h=15 km; MLH=4.8 (Pruho-niçe)					KSP Δ=7.8° eiPn 00 31 18		
	NIF Δ=6.1° 1(Pn) 09 20 30.9 1 40.6 Z: 1.0 ^s ; 0.047μ 1P ^w 49.5				15.I	Philippine Islands, NEIS: 12.960°N, 125.960°E, H=10 ^h 49 ^m 05.8 ^s , h=33 km, MB=5.6		
	KRA Δ=6.6° (SKM) eiPn 09 20 47.9 D Z: 0.6 ^s ; 0.039μ 1 21 08.7 (W) eiSn 22 08 Lm 23 06 NE: 8 ^s ; 2.2μ, 4.0μ					KSP Δ=92.1° eP 11 02 13		
					15.I	Philippine Islands, NEIS: 12.989°N, 125.927°E, H=10 ^h 55 ^m 47.2 ^s , h=33 km, MB=5.5		
						KRA Δ=90.2° (SKM) eiP 11 08 46 eipP 57		
					17.I	Turkey, NEIS: 39.172°N, 43.518°E, H=05 ^h 19 ^m 23.7 ^s , h=33 km, MB=5.0; MPV=4.8 (Kraków)		
						KRA Δ=19.8° (SKM) eiP 05 23 55 C Z: 1.3 ^s ; 0.10μ (GW) eS 27 48 WAR Δ=20.3° (SKD) eiP 05 23 59 eiS 27 51 KSP Δ=22.3° eP 05 24 20		

Date	Station	Phase	T.U. h m s		Date	Station	Phase	T.U. h m s
17.I	Bonin Islands, NEIS: 26.677°N, 142.579°E, H=06 ^h 23 ^m 36.1 ^s , h=33 km, MB=5.6; MPV=5.5, MLH=5.9 (Kraków)				17.I	WAR	Δ=109.2° (SKD) eiPdif 21 41 47 ei 42 43 eiPP 46 23 eiSKS 53 09	
	WAR Δ=89.2° (SKD) eiP 06 36 (15) eiS 46 47 eiPS 47 51 Lm 07 17 17 Z: 16 ^s ; 10μ				17.I	Fiji Islands, NEIS: 23.767°S, 179.927°E, H=22 ^h 43 ^m 18.5 ^s , h=505 km, MB=4.9		
	KRA Δ=88.4° (SKM) eiP 06 36 25 D Z: 0.9 ^s ; 0.032μ 1(PoP) 29.4 ipP 33.0 1PP 39 51.2 (SKD) eS 46 58 Lm 07 09.6 NE: 28 ^s ; 4.3μ, 6.3μ Lm 19.4 NEZ: 18 ^s ; 8.2μ, 0μ, 11μ					KRA Δ=149.7° (SKM) eiPKP 23 02 10 Z: 0.6 ^s ; 0.019μ KSP Δ=150.1° 1PKHKP 23 02 11.9		
17.I	KRA (SKM) 1P 11 32 28.0 Z: 0.8 ^s ; 0.028μ				18.I	New Zealand, NEIS: 41.731°S, 174.250°E, H=05 41 49.6, h=50 km, MB=5.9		
17.I	KRA (SKM) 1P 12 44 20.6 Z: 0.6 ^s ; 0.027μ					KRA Δ=160.4° (SKM) ePKIKP 06 01 43 C Z: 1.4 ^s ; 0.052μ eipPKIKP 55 KSP Δ=162.3° ePKIKP 06 01 44 eiPKP ₂ 02 35		
17.I	Fiji Islands, NEIS: 14.874°S, 177.233°W, H=19 ^h 04 ^m 37.4 ^s , h=36 km, MB=5.3				18.I	Iran, NEIS: 33.157°N, 47.997°E, H=08 ^h 46 ^m 54.1 ^s , h=48 km, MB=5.2; MPV=5.6 (Kraków)		
	KRA Δ=142.5° (SKM) ePKHKP 19 24 07.2 ePKIKP 15.7 (SKD) eiPKS 28 09 Lm 20 23.3 NEZ: 25 ^s ; 3.3μ, 2.0μ, 4.3μ					KRA Δ=26.6° (SKM) 1P 08 54 30.5 D Z: 1.0 ^s ; 0.042μ 1 34.2 Z: 0.9 ^s ; 0.14μ ipP 43.2		
17.I	Chile - Argentina border region, NEIS: 24.848°S, 68.674°W, H=21 ^h 27 ^m 12.6 ^s , h=33 km, MB=6.3; MLH=6.3 (Kraków)				18.I	KRA (SKM) eiP 09 01 31 Z: 0.7 ^s ; 0.016μ KSP ei(P) 09 02 05		
	KRA Δ=107.7° (SKM) ePdif 21 41 38 Z: 1.0 ^s ; 0.030μ (GW) eiPP 46 05 1 51 38 1SKS 52 59 1PS 55 19 (SKD) Lm 22 13.6 NE: 60 ^s ; 29μ, 0μ Lm 29.1 NEZ: 50 ^s ; 0μ, 23μ, 16μ				19.I	China, NEIS: 37.022°N, 95.697°E, H=00 ^h 46 ^m 18.3 ^s , h=33 km, MB=5.9; MPV=6.1 (Kraków), MLH=6.3		
						WAR Δ=52.8° (SKD) eiP 00 55 35 eiS 01 03 03 eiScS 05 35 Lm 18 23 Z: 16 ^s ; 18μ KRA Δ=54.2°		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
19.I	KRA	e1P	00 55 42	20.I	Papua, NEIS: 6.327°S, 146.892°E, H=00 ^h 15 ^m 23.3 ^s , h=107 km, MB=5.2	KRA	Δ=118.1°
			Z: 1.8 ^s ; 0.39μ			(SKM)	ePKIKP 00 33 55
	(SKD)	1S	01 03 19	20.I	Ioeland, NEIS: 65.739°N, 16.819°W, H=04 ^h 34 ^m 37.8 ^s , h=10 km, MB=4.3	KSP	Δ=22.5°
		Lm	16.4			e1P	04 39 31
		NE: 18 ^s ; 18μ, 9.8μ		20.I	Fiji Islands, NEIS: 23.544°S, 179.910°W, H=12 ^h 33 ^m 59.2 ^s , h=546 km, MB=5.0	KRA	Δ=149.6°
		Lm	19.7			(SKM)	1PKP 12 52 46.8 D
		Z: 16 ^s ; 13μ					Z: 1.0 ^s ; 0.054μ
	KSP	Δ=56.1°				KSP	Δ=150.0°
	1P	00 55 56.6				1PKP	12 52 47.7
19.I	Philippine Islands, NEIS: 5.036°N, 126.553°E, H=13 ^h 54 ^m 04.5 ^s , h=50 km, MB=5.8; MPV=5.9 (Kraków), MLH=6.2 (Kraków)	KRA	Δ=96.8°	20.I	Taiwan, region, NEIS: 20.977°N, 120.339°E, H=20 ^h 10 ^m 09.7 ^s , h=30 km, MB=5.2; MPV=5.6 (Kraków)	KRA	Δ=80.7°
		(SKM)	eP 14 07 32			(SKM)	1P 20 22 21.1
		Pm	37				Z: 0.7 ^s ; 0.033μ
		Z: 1.3 ^s ; 0.054μ				KSP	Δ=82.4°
		epP	48			1P	20 22 29.8 D
	(SKD)	eSKS	18 09	20.I	Taiwan, NEIS: 20.970°N, 120.228°E, H=20 ^h 14 ^m 31.0 ^s , h=33 km, MB=4.6	KSP	Δ=82.4°
		e1S	59			1P	20 26 51.3
		Lm	48.1	21.I	Taiwan, NEIS: 23.756°N, 121.916°E, H=02 ^h 20 ^m 06.3 ^s , h=36 km, MB=5.3	KSP	Δ=81.2°
		NEZ: 26 ^s ; 8.0μ, 9.8μ, 5.7μ				e1P	02 32 19
	WAR	Δ=95.4°		21.I	Fiji Islands, NEIS: 18.014°S, 178.379°W, H=06 ^h 11 ^m 05.6 ^s , h=604 km, MB=5.8	KSP	Δ=145.2°
	(SKD)	e1P	14 07(35)			ePKHKP	06 29 35
		e1S	18 59			1PKIKP	39.5
		Lm	47 47			KRA	Δ=145.1°
		Z: 28 ^s ; 8.4μ				(SKM)	1PKHKP 06 29 36.5
19.I	Fiji Islands, NEIS: 20.799°S, 178.659°W, H=14 ^h 55 ^m 05.7 ^s , h=634 km, MB=5.0	KRA	Δ=147.2°				Z: 0.6 ^s ; 0.15μ
		(SKM)	e1PKP 15 13 41			1PKIKP	41.7
		Z: 0.6 ^s ; 0.019μ				1pPKP	31 37.9
		KSP	Δ=147.8°				
		1PKP	15 13 42.7				
19.I	Tunisia, NEIS: 36.585°N, 8.493°E, H=20 ^h 46 ^m 53.3 ^s , h=22 km, MB=5.1	KRA	Δ=15.6°				
		KSP	Δ=15.3°				
		1P	20 50 35.4				
		WAR	Δ=18.0°				
	(SKD)	eL	20 55.5				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
22.I	Tonga Islands, NEIS: 15.752°S, 173.112°W, H=05 ^h 30 ^m 30.9 ^s , h=33 km, MB=5.3	KSP	Δ=144.2°	27.I	Kuril Islands, NEIS: 43.319°N, 147.599°E, H=16 ^h 15 ^m 16.4 ^s , h=41 km, MB=5.0	KRA	Δ=76.6°
		e1PKP	05 50 04			(SKM)	e1P 16 27 03
23.I	New Hebride Islands, NEIS: 13.379°S, 166.511°E, H=01 ^h 38 ^m 23.5 ^s , h=39 km, MB=5.5; MLH=5.7 (Kraków)	KRA	Δ=134.6°			epP	15
		(SKM)	1PKIKP 01 57 39.2	27.I	Kuril Islands, NEIS: 43.371°N, 147.568°E, H=16 ^h 52 ^m 09.8 ^s , h=41 km, MB=5.0; MPV=5.5 (Kraków)	KRA	Δ=76.6°
		Z: 1.0 ^s ; 0.024μ				(SKM)	1P 17 03 56.7 D
		ePP	02 00 13.7				Z: 0.9 ^s ; 0.032μ
		(SKD)	Lm 56.7			1pP	04 08.0
		NEZ: 22 ^s ; 2.0μ, 0μ, 2.1μ		28.I	KRA	1P	10 30 45.7
23.I	Bonin Islands, NEIS: 26.792°N, 142.894°E, H=14 ^h 54 ^m 14.9 ^s , h=33 km, MB=5.0	KRA	Δ=88.5°		(SKM)	1P	10 30 45.7
		1(P)	15 07 15.0				Z: 1.0 ^s ; 0.042μ
24.I	Fiji Islands, NEIS: 23.771°S, 178.767°E, H=19 ^h 43 ^m 47.3 ^s , h=464 km, MB=4.9	KSP	Δ=149.8°	28.I	New Hebride Islands, NEIS: 17.437°S, 168.694°E, H=15 ^h 00 ^m 51.8 ^s , h=14 km, MB=5.4; MLH=5.9 (Kraków)	KRA	Δ=139.1°
		1PKP	20 02 43.4			(SKM)	e1PKIKP 18 20 22
25.I	Honshu, Japan, NEIS: 31.173°N, 140.891°E, H=05 ^h 20 ^m 23.2 ^s , h=33 km, MB=4.9	KSP	Δ=84.8°			(SKD)	Lm 19 20.6
		eP	05 32 57				NEZ: 20 ^s ; 2.0μ, 2.0μ, 3.8μ
25.I	Mid-Atlantic Ridge, NEIS: 7.618°N, 37.185°W, H=06 ^h 34 ^m 55.1 ^s , h=33 km, MB=5.0; MPV=5.5 (Kraków)	KRA	Δ=63.3°	29.I	Burma, NEIS: 15.239°N, 96.522°E, H=05 ^h 10 ^m 52.7 ^s , h=40 km, MB=4.9; MPV=5.6 (Kraków)	KRA	Δ=69.9°
		(SKM)	1P 06 45 24.8 D			(SKM)	e1P 05 22 01
		Z: 0.9 ^s ; 0.032μ					Z: 0.4 ^s ; 0.020μ
25.I	Santa Cruz Islands, NEIS: 10.952°S, 164.660°E, H=10 ^h 31 ^m 04.9 ^s , h=25 km, MB=5.7	KSP	Δ=132.5°			1pP	13.4
		ePKIKP	10 50 25	29.I	KRA	1P	10 33 00.0
26.I	Tonga Islands, NEIS: 18.709°S, 173.308°W, H=03 ^h 19 ^m 24.9 ^s , h=33 km, MB=4.6	KSP	Δ=147.1°		(SKM)	1P	10 33 00.0
		ePKP	03 39 09				Z: 0.9 ^s ; 0.032μ
26.I	Austria, NEIS: 46.332°N, 13.176°E, H=15 ^h 33 ^m 50.5 ^s , h=10 km	KSP	Δ=5.0°	29.I	KRA	1P	14 09 00
		e1Pg	15 35 29		1		01.8
		e1(S ^M)	36 27	30.I	Balleny Islands, region, NEIS: 62.385°S, 155.054°E, H=00 ^h 13 ^m 28.4 ^s , h=33 km, MB=4.8	KRA	Δ=152.6°
						(SKM)	ePKP ₂ 00 33 38
				30.I	Tadjik - Sinkiang border region, NEIS: 39.563°N, 73.355°E, H=10 ^h 36 ^m 06.4 ^s , h=33 km, MB=5.0; MPV=5.3 (Kraków)	NIE	Δ=38.4°
						eP	10 43 27 C
						KRA	Δ=38.6°
					(SKM)	e1P	10 43 27 C
							Z: 0.9 ^s ; 0.032μ

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
31.I	Tadzhik, USSR, NEIS: 40.040°N, 70.852°E, H=14 ^h 26 ^m 14.8 ^s , h=20 km, MB=6.1; MPV=6.3 (Kraków), MPV=6.2 (Niedzica), MLH=6.2 (Kraków)			31.I	KRA	ISS	14 41 40
						Lm	49.5
						N: 8.0 ^s ; 11μ,	
						Lm	50.5
						E: 8.0 ^s ; 10μ,	
	WAR Δ=35.8°				NIF	Δ=36.5°	
	(SKD) e1P	14 33 19			e1P	14 33 22	C
	e1PP	34 41			Fm	29	
	e1S	38 53			Z: 1.2 ^s ; 0.38μ		
	e1PoS	39 29			i	35.5	
	KRA Δ=36.7°			31.I	Tonga Islands, NEIS: 16.482°S, 175.155°W, H=20 ^h 37 ^m 20.4 ^s , h=49 km, MB=5.2		
	(SKM) eP	14 33 22	C		KRA	Δ=144.6°	
	Pm	24			ePKP	20 56 55	
	Z: 1.4 ^s ; 0.72μ				Lm	21 54.6	
	i	36.9			NEZ: 24 ^s ; 2.0μ, 2.0μ, 2.1μ		
	(GW) e1PP	34 48					
	iS	39 04					

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1.II	Kuril Islands, NEIS: 48.171°N, 154.451°E, H=13 ^h 03 ^m 03.7 ^s , h=42 km, MB=5.4; MPV=5.4 (Kraków)			2.II	Fiji Islands, NEIS: 18.174°S, 178.338°W, H=22 ^h 49 ^m 38.9 ^s , h=646 km, MB=4.9		
	NIE	Δ=75.2°			KRA	Δ=145.2°	
	e1P	13 14 45	D		(SKM) 1PKP	23 08 05.4	D
	Z: 0.8 ^s ; 0.024μ				Z: 0.7 ^s ; 0.037μ		
1.II	Bismarck Sea, NEIS: 3.356°S, 148.719°E, H=20 ^h 34 ^m 46.3 ^s , h=33 km, MB=5.0				NIE	Δ=145.6°	
	KRA	Δ=116.7°			1PKP	23 08 10.8	D
	(SKM) eP	20 52 14			Z: 0.7 ^s ; 0.050μ		
	eL	21 20		3.II	Kuril Islands, NEIS: 45.372°N, 150.439°E, H=10 ^h 38 ^m 23.4 ^s , h=33 km, MB=5.5; MPV=5.9 (Kraków), 5.7 (Niedzica)		
	Lm	35.4			KRA	Δ=76.0°	
	EZ: 36 ^s ; 1.6μ, 1.6μ				(SKM) 1P	10 50 06.5	C
	Lm	42.6			Z: 0.9 ^s ; 0.084μ		
	NEZ: 24 ^s ; 1.2μ, 2.1μ, 2.3μ				NIE	Δ=76.3°	
2.II	KRA				eP	10 50 14	
(SKM)	e1P	08 55 59	C		Z: 1.0 ^s ; 0.066μ		
	Z: 1.0 ^s ; 0.024μ				esP	27	
2.II	NIE			3.II	Loyalty Islands, NEIS: 21.521°S, 169.503°E, H=20 ^h 12 ^m 19.8 ^s , h=33 km, MB=4.7°		
	1P	14 38 31.8			KSP	Δ=144.0°	
	Z: 0.7 ^s ; 0.023μ				ePKP	20 31 50	
	KRA						
(SKM)	eP	14 38 42					
	i	39 03.7					



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
4.II	Argentina, NEIS: 24.689°S, 63.362°W, H=07 ^h 46 ^m 33.8 ^s , h=549 km, MB=6.0			6.II	Tonga Islands, NEIS: 21.821°S, 175.259°W, H=03 ^h 09 ^m 14.0 ^s , h=33 km, MB=5.6; MLV=5.6 (Kraków)		
	KSP	Δ=102.6°			KRA	Δ=149.6°	
	eP	07 59 34			(SKM) ePKP	03 28 55	
	ePP	08 03 51			1PKP ₂	29 01.3	
	KRA	Δ=104.4°			Z: 1.6 ^s ; 0.28μ		
	(SKM) 1P	07 59 43.0	D		(SKD) eL	04 20	
	Z: 0.8 ^s ; 0.032μ				Lm	28.6	
	1PP	08 04 08.4			NEZ: 28 ^s ; 1.4μ, 1.6μ, 2.3μ		
	(GW) 1S	09 27			KSP	Δ=149.7°	
	WAR	Δ=105.9°			ePKP	03 28 57	
	(SKD) e1PS	08 13 35			1PKP ₂	29 02	
4.II	Austria, NEIS: 46.188°N, 13.220°E, H=20 ^h 57 ^m 10.2 ^s , h=33 km			6.II	Philippine Islands, NEIS: 20.889°N, 120.231°E, H=05 ^h 07 ^m 27.8 ^s , h=33 km, MB=5.2		
	KSP	Δ=5.1°			KRA	Δ=80.7°	
	e1S ^m	20 59 42			(SKM) 1P	05 19 39.6	C
					Z: 0.9 ^s ; 0.032μ		
5.II	Pacific Ocean, NEIS: 66.448°S, 82.584°W, H=03 ^h 29 ^m 18.9 ^s , h=33 km, MB=6.2				e1SP	52.9	
	KRA	Δ=138.9°		6.II	India, NEIS: 24.306°N, 92.882°E, H=16 ^h 53 ^m 57.8 ^s , h=42 km, MB=4.7		
	(SKM) e1	03 48 35			KSP	Δ=63.2°	
	1PKIKP	46.5			eP	17 04 24	
	e1PP	51 35		7.II	China, NEIS: 27.406°N, 101.153°E, H=00 ^h 57 ^m 32.3 ^s , h=33 km, MB=4.9		
	1PKS	52 21			KSP	Δ=66.1°	
	eL	04 10			eP	01 08 20	
	NIE	Δ=138.6°		7.II	Honshu, Japan, Moscow: 36.1°N, 140.6°E, H=08 ^h 42 ^m 19 ^s , M=4.8		
	ePKIKP	03 48 43			KRA	Δ=79.7°	
	WAR	Δ=141.3°			(SKM) e1P	08 54 24	
	(SKD) e1PKHKP	03 48 43			KSP	Δ=61.1°	
	e1PP	51 51			eP	08 54 29	
	e1PKS	52 27		7.II	Tonga Islands, NEIS: 15.287°S, 174.091°W, H=23 ^h 28 ^m 38.6 ^s , h=132 km, MB=5.2		
	e1	04 00 47			KRA	Δ=143.7°	
5.II	Dominican Republic region, NEIS: 19.622°N, 70.181°W, H=15 ^h 42 ^m 44.3 ^s , h=33 km, MB=5.0; MPV=5.3 (Kraków), MLV=5.3 (Kraków)				(SKM) 1PKP	23 47 56.7	D
	KRA	Δ=75.3°			Z: 1.5 ^s ; 0.086μ		
	(SKM) eP	15 54 27	C		i	48 19.2	
	Z: 1.2 ^s ; 0.031μ				KSP	Δ=143.6°	
	Lm	16 23.5			ePKP	23 47 58	
	NEZ: 20 ^s ; 0.7μ, 1.1μ, 1.7μ			10.II	Loyalty Islands, NEIS: 21.876°S, 169.834°E, H=03 ^h 26 ^m 59.0 ^s , h=38 km, MB=4.9		
6.II	North Atlantic Ocean, NEIS: 17.876°N, 49.514°W, H=00 ^h 30 ^m 49.9 ^s , h=33 km, MB=5.2; MPV=5.5 (Kraków)				KRA	Δ=143.4°	
	KRA	Δ=63.3°			(SKM) 1PKP	03 46 27.7	
	(SKM) eP	00 41 18	D				
	Z: 1.4 ^s ; 0.052μ						

Date	Station	Phase	T.U. h m s
10.II	Loyalty Islands region, NEIS: 21.823°S, 169.942°E, H=07 ^h 55 ^m 56.7 ^s , h=41 km, MB=5.2	KRA (SKM) e1PKP	08 15 27 Δ=143.4°
10.II	Hungary, EMSC: 46.32°N, 17.41°E, H=10 ^h 12 ^m 33.6 ^s , h=10 km	KRA (SKM) e1SgI e	10 16 27 Δ=3.96° 45
10.II	KRA	(SKM) 1P	12 24 40.9 C Z: 0.6 ^s ; 0.027μ
10.II	South Sandwich Islands region, NEIS: 60.933°S, 23.090°W, H=22 ^h 41 ^m 06.2 ^s , h=33 km, MB=6.3; MPV=5.8 (Kraków)	KRA (SKM) ePKIKP ePP (SKD) ePS Lm	22 59 47 23 00 47 10 38 49.3 Z: 18 ^s ; 1.5μ, 2.2μ
10.II	Kermadec Islands, NEIS: 29.322°S, 177.033°W, H=23 ^h 05 ^m 11.3 ^s , h=53 km, MB=4.3	KRA (SKM) e1PKIKP ePKHKP	23 25 00 10 Δ=155.9°
10.II	Kermadec Islands, NEIS: 29.526°S, 176.993°W, H=23 ^h 20 ^m 13.6 ^s , h=51 km	KRA (SKM) ePKHKP 1PKP ₂	23 40 12 29.9 Δ=156.0°
12.II	Afghanistan - USSR border region, NEIS: 36.985°N, 71.275°E, H=04 ^h 49 ^m 16.0 ^s , h=98 km, MB=5.4	KRA (Sch) 1P Z: 0.6 ^s ; 0.085μ eipP	04 56 31.8 C 51.0 Δ=38.7°
13.II	Luzon, Philippine Islands, NEIS: 15.651°N, 119.165°E, H=04 ^h 06 ^m 46.9 ^s , h=44 km, MB=5.4; MPV=5.7 (Kraków)	KRA (SKM) e1(P) Z: 1.3 ^s ; 0.91μ (SKD) ePPS	04 19 42 04 31 06 Δ=84.0°
13.II	Luzon, Philippine Islands, NEIS: 15.679°N, 119.155°E, H=04 ^h 07 ^m 14.5 ^s , h=33 km, MB=5.7; MPV=6.0 (Niedzica)	NIE (SKM) 1P Z: 1.0 ^s ; 0.036μ eipP	13 43 26.2 35 Δ=67.7°
13.II	Molucca Sea, NEIS: 0.117°S, 125.063°E, H=13 ^h 06 ^m 51.3 ^s , h=33 km, MB=5.8; MPV=6.2 (Kraków)	KRA (Sch) eP	13 20 33 C Z: 1.1 ^s ; 0.074μ Δ=99.9°
14.II	Pakistan, NEIS: 33.595°N, 73.253°E, H=00 ^h 22 ^m 38.4 ^s , h=33 km, MB=5.2	KRA (SKM) eP	00 30 29 Δ=42.0°
14.II	Honshu, Japan, NEIS: 35.698°N, 140.060°E, H=09 ^h 08 ^m 26.1 ^s , h=79 km, MB=4.8	KRA (SKM) e1P Z: 1.0 ^s ; 0.030μ eipP	09 20 26 20 47 Δ=79.7°
15.II	Tonga Islands, NEIS: 19.428°S, 177.194°W, H=22 ^h 41 ^m 10.2 ^s , h=89 km, MB=5.2	KRA ePKP	23 00 43 Δ=146.8°
16.II	Atlantic Ocean, NEIS: 25.973°N, 26.258°W, H=00 ^h 49 ^m 31.2 ^s , h=33 km, MB=5.5	KRA (SKM) e1 Z: 1.2 ^s ; 0.079μ eipP	00 57 27 C 38 Δ=42.6°
16.II	Molucca Sea, NEIS: 0.495°N, 125.983°E, H=10 ^h 40 ^m 20.9 ^s , h=33 km, MB=6.1	KRA (SKM) e1(P) i (SKD) eS KSP eP Pm Z: 1 ^s ; 0.048μ ePP	10 54 04 07.7 11 04 40 10 54 07 12 58 26 Δ=92.2°

Date	Station	Phase	T.U. h m s
17.II	Kamchatka, NEIS: 58.917°N, 163.817°E, H=13 ^h 32 ^m 31.7 ^s , h=33 km, MB=5.2	KRA (SKM) 1P Z: 1.0 ^s ; 0.036μ eipP	13 43 26.2 35 Δ=67.7°
18.II	Fiji Islands, NEIS: 24.682°S, 175.963°W, H=01 ^h 56 ^m 47.3 ^s , h=35 km, MB=5.0	KRA (SKM) e1PKHKP Z: 1.1 ^s ; 0.035μ e1PKP ₂	02 16 40 48 Δ=152.0°
18.II	Hokkaido, Japan, NEIS: 41.409°N, 142.039°E, H=04 ^h 08 ^m 13.4 ^s , h=5 km, MB=5.5; MPV=6.1 (Kraków, Warszawa)	WAR (SKD) e1P e1PcP e1SKS e1 Lm Z: 20 ^s ; 65μ KRA (SKM) 1P Pm Z: 0.9 ^s ; 0.15μ 1PcP i (SKD) eSKS Lm NEZ: 20 ^s ; 4.2μ, 5.7μ, 7.1μ KSP eP Z: 1 ^s ; 0.080μ	04 19 51 20 07 29 47 30 54 54 23 04 19 57.2 20 05.7 08.2 20.7 30 06 56.2 04 20 04 C 04 20 04 04 20 04 C
18.II	Fiji Islands, NEIS: 24.406°S, 176.281°W, H=06 31 23.7, h=122 km, MB=5.1	KRA (SKM) e1PKHKP Z: 0.7 ^s ; 0.025μ e1 eipPKP	06 51 06 C 15 28 Δ=151.7°
18.II	Honshu, Japan, NEIS: 33.071°N, 140.817°E, H=20 ^h 51 ^m 29.8 ^s , h=42 km, MB=6.0; MPV=6.3, MLH=6.0 (Kraków), MLV=6.3 (Warszawa)	WAR Δ=80.1°	
18.II	WAR	e1P (SKD) e1PP e1S Lm NEZ: 16 ^s , 20 ^s , 18 ^s ; 7.5μ, 9.6μ, 11.5μ KRA (SKM) 1P Z: 1.5 ^s ; 0.37μ 1PcP 1pP 1sP (GW) e1 1S (SKD) Lm NEZ: 30 ^s ; 7.8μ, 8.9μ, 3.9μ KSP Δ=83.2° 1P Pm Z: 1.1 ^s ; 0.19μ e1PP NIE Δ=82.5° eP Z: 1.0 ^s ; 0.26μ i i	21 03 35 06 39 13 35 41 43 21 03 48.1 54.6 04 02.1 14.6 07 18 13 56 24.5 21 03 55.0 C 04 00 07 07 21 04 25 34 44
19.II	Honshu, Japan, NEIS: 33.084°N, 140.816°E, H=04 ^h 02 ^m 24.2 ^s , h=52 km, MB=5.2	KRA (SKM) eP KSP Δ=83.2° e1P	04 14 42 04 14 50 Δ=82.3°
19.II	Tibet - India border region, NEIS: 31.786°N, 78.417°E, H=06 ^h 15 ^m 25.0 ^s , h=40 km, MB=5.4	KRA eP	06 23 51 Δ=46.5°
19.II	KRA	(SKM) 1P Z: 0.6 ^s ; 0.012μ	10 14 24.0 D
19.II	Iran, NEIS: 27.346°N, 53.067°E, H=17 ^h 37 ^m 26.9 ^s , h=16 km, MB=4.6	KRA (SKM) 1P Z: 1.1 ^s ; 0.028μ	17 44 11.7 D Δ=33.8°

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
19.II	Aleutian Islands, NEIS: 53.566°N, 170.032°E, H=22 ^h 34 ^m 04.1 ^s , h=33 km, MB=6.2; MPV=6.6 (Kraków) 6.9 (Niedzica), MLV=7.0 (Kraków), MLH=7.0 (Warszawa)			19.II	KRA	Pm	23 52 00 Z: 1.5 ^s ; 0.086μ
	WAR	Δ=71.4°		20.II	Aleutian Islands, NEIS: 53.273°N, 170.337°E, H=08 ^h 00 ^m 58.4 ^s , h=42 km, MB=4.9		
	((SKD))	1P	22 45 22 C		KSP	Δ=74.0°	
		eIPcP	50		eP		08 12 32
		1PP	48 03	20.II	Tonga Islands, NEIS: 16.754°S, 174.790°W, H=12 ^h 57 ^m 06.2 ^s , h=219 km, MB=4.8		
		1PPP	49 51		KSP	Δ=144.9°	
		1S	54 43		eIPKP		13 16 19
		1PS	55 15	21.II	Turkey, EMSC: 40.19°N, 40.05°E, H=13 ^h 02 ^m 32.1 ^s , h=10 km, MB=4.6 (NEIS)		
	Lm		23 17 23		KSP	Δ=19.7°	
		NEZ: 20 ^s ; 69μ, 57μ, 73μ			eP		13 06 59
	KSP	Δ=73.6°		21.II	Ionian Sea, EMSC: 37.46°N, 20.58°E, H=17 ^h 44 ^m 17.3 ^s , h=49 km, MLH=4.0 (Skopje)		
		eP	22 45 35		NIE	Δ=11.7°	
		Pm	43		eP		17 47 05
		Z: 1.3 ^s ; 0.37μ			e1		23
	KRA	Δ=74.0°			KSP	Δ=13.7°	
	(SKM)	1P	22 45 37.3		eP		17 47 27
		Pm	43.8	21.II	Alaska, NEIS: 55.913°N, 161.894°W, H=20 ^h 02 ^m 06.0 ^s , h=167 km, MB=5.0		
		Z: 1.2 ^s ; 0.46μ			KRA	Δ=74.6°	
	(SKD)	1PP	48 26		(SKM)	eP	20 13 27 D
		1PPP	50 14			Z: 0.9 ^s ; 0.026μ	
		1S	55 11		NIE	Δ=75.3°	
		1PS	50		eIP		20 13 31.7
	Lm		23 18.8	22.II	North Atlantic Ridge, NEIS: 32.234°N, 40.371°W, H=19 ^h 48 ^m 35.2 ^s , h=33 km, MB=5.2; MPV=5.7 (Kraków)		
		NEZ: 22 ^s ; 70μ, 50μ, 88μ			KSP	Δ=45.1°	
	NIE	Δ=74.5°			eP		19 56 44 C
		eP	22 45 40		KRA	Δ=47.4°	
		Pm	47		(SKM)	eIP	19 57 08 C
		Z: 2.5 ^s ; 2.1 μ				Z: 2.0 ^s ; 0.15μ	
		1	46 15		(SKD)	ePS	20 04 08
19.II	Tuamotu Archipelago region, NEIS: 22.100°S, 138.762°W, H=23 ^h 29 ^m 57.9 ^s , h=0 km, MB=5.3				NIE	Δ=47.7°	
	KRA	Δ=147.7°			eIP		19 57 13
	(SKM)	1PKP	23 49 46.3 D	23.II	Tonga Islands, NEIS: 15.290°S, 173.672°W, H=00 ^h 07 ^m 18.2 ^s , h=33 km, MB=4.9		
		Z: 0.7 ^s ; 0.025μ			NIE	Δ=144.3°	
19.II	Tibet, NEIS: 34.701°N, 81.258°E, H=23 ^h 43 ^m 26.4 ^s , h=19 km, MB=5.1; MPV=5.6 (Niedzica, Kraków)				ePKP		00 26 54
	NIE	Δ=46.3°					
		eP	23 51 54				
		Pm	59				
		Z: 1.5 ^s ; 0.097μ					
	KRA	Δ=46.5					
	(SKM)	eP	23 51 54				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
23.II	Fiji Islands, NEIS: 21.986°S, 179.631°W, H=00 ^h 22 ^m 47.3 ^s , h=643 km, MB=5.2			24.II	KSP	Δ=76.0°	
	KSP	Δ=148.6°			1P		11 51 39.5 C
	1PKP		00 41 19.7			Z: 1 ^s ; 0.048μ	
		Z: 0.6 ^s ; 0.097μ			NIE	Δ=75.7°	
	KRA	Δ=148.2°			1P		11 51 43
	(SKM)	1PKP	00 41 24.7 D			Z: 0.7 ^s ; 0.046μ	
		Z: 0.5 ^s ; 0.033μ			eIPcP		58
	NIE	Δ=148.6°		24.II	Fiji Islands, NEIS: 17.640°S, 178.898°W, H=16 ^h 11 ^m 05.4 ^s , h=543 km, MB=4.9		
	eIPKP		00 41 28 D		KSP	Δ=144.7°	
	Pm		29		1PKP		16 29 40.3 D
		Z: 0.7 ^s ; 0.080μ				Z: 0.8 ^s ; 0.04μ	
23.II	KRA			24.II	Kuril Islands, NEIS: 45.677°N, 150.879°E, H=16 ^h 37 ^m 29.6 ^s , h=45 km, MB=5.1		
	(SKM)	1P	12 32 24.2 C		KRA	Δ=75.8°	
		Z: 0.7 ^s ; 0.020μ			(SKM)	1P	16 49 11.5 D
23.II	Philippine Islands, NEIS: 17.349°N, 120.182°E, H=12 ^h 37 ^m 17.6 ^s , h=67 km, MB=4.9			24.II	Turkey, EMSC: 38.63°N, 27.82°E, H=20 ^h 47 ^m 19.0 ^s , h=10 km, MLH=4.7 (Moxa)		
	KRA	Δ=83.3°			NIE	Δ=11.8°	
	(SKM)	eP	12 49 40		eP		20 50 17
23.II	Peloponnese, EMSC: 36.57°N, 21.62°E, H=20 ^h 21 ^m 10.4 ^s , h=10 km, MB=4.3 (NEIS)				KRA	Δ=12.5°	
	KSP	Δ=14.8°			(SKM)	eP	20 50 20
	eIP		20 24 43		WAR	Δ=14.4°	
		Z: 0.7 ^s ; 0.020μ			(GW)	eIP	20 50 49
24.II	Tonga Islands, NEIS: 18.546°S, 174.484°W, H=04 ^h 37 ^m 40.7 ^s , h=186 km, MB=4.8			24.II	Fiji Islands, NEIS: 20.153°S, 178.164°W, H=22 ^h 04 ^m 54.8 ^s , h=597 km, MB=4.8		
	NIE	Δ=147.2°			KSP	Δ=147.3°	
	ePKP		04 57 09		eIPKP		22 23 23
24.II	Ascension Islands, NEIS: 11.686°S, 13.622°W, H=08 ^h 51 ^m 16.6 ^s , h=33 km, MB=5.1			25.II	New Guinea region, NEIS: 6.289°S, 147.529°E, H=01 ^h 18 ^m 52.8 ^s , h=52 km, MB=5.9		
	KRA	Δ=67.9°			KRA	Δ=118.4°	
	(SKM)	1P	09 02 21.8		(SKM)	1PKP	01 37 35.6
		1pP	35.0			Z: 0.8 ^s ; 0.018μ	
	(SKD)	eS	11 18		(SKD)	ePKP	48 44
		eL	23		Lm		02 19.2
		Z: 2.0 ^s ; 0.15μ				NE: 26 ^s ; 4.1μ, 4.0μ	
24.II	Hokkaido, Japan, NEIS: 42.389°N, 142.508°E, H=11 ^h 40 ^m 00.0 ^s , h=75 km, MB=5.3; MPV=5.8 (Kraków), 5.7 (Niedzica)				Lm		31.4
	KRA	Δ=75.3°				Z: 22 ^s ; 4.0μ	
	(SKM)	1	11 51 34.9 D		NIE	Δ=118.5°	
		Z: 0.8 ^s ; 0.065μ			1PKP		01 37 41.5
	1PcP		49.9			Z: 1.0 ^s ; 0.042μ	



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
25.II	Iran, NEIS: 32.517°N, 49.428°E, H=04 ^h 37 ^m 15.9 ^s , h=66 km, MB=4.8	KSP Δ=30.4° eP	04 43 23	27.II	Tadzhik USSR, NEIS: 38.066°N, 72.688°E, H=09 ^h 21 ^m 57.2 ^s , h=112 km, MB=5.1	KRA Δ=39.0° e1P (SKM)	09 29 13 14 D
25.II	Fiji Islands, NEIS: 17.995°S, 178.345°W, H=18 ^h 21 ^m 35.2 ^s , h=605 km, MB=4.3	KSP Δ=145.2° 1PKP	18 40 07	28.II	Mindanao, Philippine Islands, NEIS: 9.125°N, 126.120°E, H=01 ^h 50 ^m 31.9 ^s , h=64 km, MB=5.7	KRA Δ=93.4° iP (SKM)	02 03 40.8 D
26.II	Tonga Islands, NEIS: 18.955°S, 174.137°W, H=20 ^h 20 ^m 30.6 ^s , h=33 km, MB=5.3	KSP Δ=147.1° e1PKP	00 40 11	28.II	Arabian Sea, NEIS: 14.878°N, 54.953°E, H=08 ^h 43 ^m 55.7 ^s , h=33 km, MB=5.1	KRA Δ=45.0° e1P (SKM)	08 52 11 D
26.II	Fiji Islands, NEIS: 17.042°S, 176.803°W, H=14 ^h 11 ^m 58.8 ^s , h=33 km, MB=4.8	KSP Δ=144.7° ePKP	14 31 31	28.II	Arabian Sea, NEIS: 14.811°N, 55.013°E, H=17 ^h 35 ^m 06.5 ^s , h=33 km, MB=5.1	KRA Δ=45.0° eP (SKM)	17 43 22 50 10
26.II	Canary Islands region, NEIS: 28.529°N, 20.835°W, H=22 ^h 43 ^m 48.9 ^s , h=10 km, MB=4.7	KRA Δ=37.4° (SKM)	22 51 05 D	28.II	Kuril Islands, NEIS: 44.629°N, 146.824°E, H=17 ^h 50 ^m 54.4 ^s , h=10 km, MB=5.3	KRA Δ=75.2° (SKM)	18 02 38
27.II	Sunda Strait, NEIS: 6.337°S, 104.866°E, H=08 ^h 30 ^m 00.6 ^s , h=59 km, MB=5.4	NIE Δ=37.5° eP	22 51 16				

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1.III	Colombia, NEIS: 6.260°N, 77.619°W, H=20 ^h 37 ^m 25.1 ^s , h=23 km, MB=4.9; MPV=5.4 (Warszawa)	KSP Δ=87.6° eP	20 50 14 D	2.III	WAR Δ=92.3° e1P e1PP 1SKS e1S Lm	10 06 30 10 15 16 55 17 40 50.0
2.III	Mindanao, Philippine Islands, NEIS: 6.772°N, 123.740°E, H=09 ^h 53 ^m 23.2 ^s , h=52 km, MB=6.1; MLV=6.4 (Warszawa), MPV=6.1 (Niedzica)	KRA Δ=90.2° (SKM)	20 50 26			

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
2.III	Kamchatka, NEIS: 54.694°N, 163.655°E, H=23 ^h 11 ^m 01.8 ^s , h=42 km, MB=5.1	KRA Δ=71.5° (SKM)	23 22 18	5.III	KRA	e1P ^M e1	00 02 33 42
4.III	NIE	eP	05 12 54	5.III	NIE	e1P	00 10 03
4.III	Roumania, EMSC: 45.80°N, 20.80°E, H=19 ^h 21 ^m 56.4 ^s , h=96 km, M=7.2	KRA Δ=4.1° (SKM)	05 12 57	5.III	NIE	eP	17 33 46
4.III	Afghanistan - USSR frontier region, NEIS: 36.823°N, 72.050°E, H=22 ^h 58 ^m 47.7 ^s , h=50 km, MB=5.0	KRA Δ=39.3° (SKM)	23 06 19	7.III	China NEIS: 39.982°N, 118.694°E, H=00 ^h 28 ^m 47.4 ^s , h=33 km, MB=5.3; MLH=6.3 (Warszawa), MPV=5.7 (Kraków)	KRA Δ=65.8° eP	00 39 26
4.III	KRA Δ=6.5° (SKM)	1Pn	00 02 22.8	7.III	West Germany, EMSC: 50.21°N, 8.05°E, H=08 ^h 18 ^m 17.7 ^s , h=34 km, M=4.1	KRA Δ=65.7° (SKM)	00 39 29
5.III	Rumania, EMSC: 45.52°N, 27.06°E, H=00 ^h 00 ^m 45.0 ^s , h=10 km, M=4.9 (Moskva)	NIE Δ=5.9° e1Pn	00 02 11.2				



Date	Station	Phase	T.U. h m s
7.III	Central Mid-Atlantic ridge, NEIS: 7.432°N, 35.987°W, H=10 ^h 39 ^m 20.9 ^s , h=33 km, MB=4.9	KRA Δ=62.7° (SKM) eIP Z: 0.8 ^s ; 0.028μ eipP	10 49 46 D
8.III	Fiji Islands, NEIS: 17.839°S, 178.712°W, H=03 ^h 02 ^m 32.8 ^s , h=571 km, MB=5.3	KSP Δ=145.0° 1PKP	03 21 07.0 D
8.III	Salomon Islands, NEIS: 8.323°S, 156.229°E, H=08 ^h 07 ^m 19.7 ^s , h=33 km, MB=5.3	KRA Δ=125.0° (SKM) ePKIKP (SKD) Lm NEZ: 24 ^s ; 2.5μ, 2.3μ, 2.8μ	08 26 12.4 09 18.3
8.III	Peru, NEIS: 11.961°S, 74.202°W, H=13 ^h 08 ^m 56.3 ^s , h=41 km, MB=5.6	KSP Δ=99.5° eP KRA Δ=101.7° (SKM) eP (SKD) Lm NEZ: 22 ^s ; 1.1μ, 1.8μ, 1.8μ	13 22 36 13 22 47.2 14 06.5
8.III	Yugoslavia, EMSC: 43.24°N, 21.02°E, H=19 ^h 18 ^m 12.7 ^s , h=10 km, MLH=4.0 (Skopje)	NIF Δ=5.9° ePn 1P ^m	19 19 44 54
		KRA Δ=6.6° (SKM) e(Pn) 1Pg	19 19 58.8 20 14.3
		KSP Δ=8.3° ePn	19 20 13
8.III	Peru, NEIS: 12.056°S, 74.031°W, H=22 ^h 46 ^m 04.8 ^s , h=14 km, MB=5.6	KSP Δ=85.7° 1P Z: 1 ^s ; 0.040μ	22 59 48.2 C
8.III	Sumatra, NEIS: 0.451°N, 100.021°E, H=23 ^h 17 ^m 28.0 ^s , h=22 km, MB=5.5; MLH=5.6, MLV=5.5 (Kraków)	NIF Δ=82.9°	

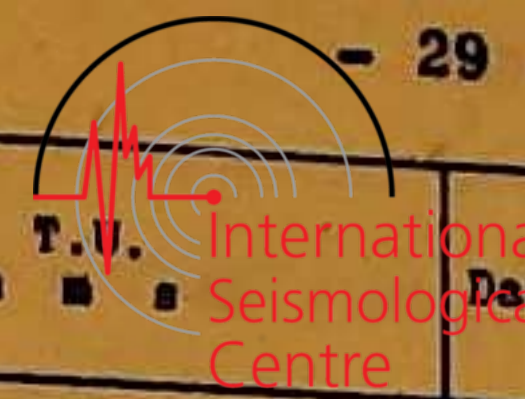
Date	Station	Phase	T.U. h m s
8.III	NIE	eP epP KRA Δ=83.2° (SKM) eP Z: 1.4 ^s ; 0.052μ i (SKD) eS Lm NB: 36 ^s ; 8.6μ, 5.6μ Lm Z: 36 ^s ; 3.3μ KSP Δ=85.7° eP	23 29 53. 30 03. 23 29 56 30 15.3 40 15 00 01 02 23 30 06
9.III	Kuril Islands, NEIS: 46.425°N, 153.868°E, H=03 ^h 59 ^m 27.2 ^s , h=30 km, MB=5.2; MPV=5.5 (Kraków, Niedzica)	KRA Δ=76.2° (SKM) eP Z: 1.1 ^s ; 0.041μ epP NIE Δ=76.6° eP Z: 1.0 ^s ; 0.042μ epP	04 11 12 D 23 04 11 15 26
9.III	Kuril Islands, NEIS: 46.083°N, 154.057°E, H=04 ^h 14 ^m 58.6 ^s , h=38 km, MB=5.5 (Niedzica)	NIE Δ=76.9° eP Z: 1.0 ^s ; 0.036μ	04 26 47
9.III	Aleutian Islands, NEIS: 52.755°N, 167.793°W, H=06 ^h 06 ^m 30.4 ^s , h=33 km, MB=4.7	KSP Δ=76.7° eP KRA Δ=77.6° (SKM) eIP	06 18 19 06 18 23
9.III	Japan Sea, NEIS: 41.207°N, 138.215°E, H=06 ^h 30 ^m 32.2 ^s , h=33 km, MB=5.0	KRA Δ=74.4° (SKM) 1P 1pP KSP Δ=75.2° eIP	06 42 07.7 16.3 06 42 13
9.III	Korea, NEIS: 41.608°N, 130.878°E, H=14 ^h 27 ^m 53.6 ^s , h=520 km, MB=5.9	WAR Δ=68.5°	

Date	Station	Phase	T.U. h m s
9.III	Korea - continuation	(SKD) 1P 1pP 1sP eIPPP i 1S 1SKS Lm Z: 16 ^s ; 22μ KRA Δ=70.7° (SKD) 1P Pm Z: 12 ^s ; 1.1μ 1pP 1sP 1S Lm NB: 18 ^s , 14μ, 9.3μ Lm Z: 20 ^s ; 15μ NIE Δ=71.0° 1P Pm Z: 1.0 ^s ; 1.9μ 1PoP KSP Δ=71.7° 1P	14 38 05 D 40 01 49 42 29 45 13 46 21 47 05 15 10.0 14 38 16.0 D 19 40 13.5 41 05.5 46 41.5 15 09.0 10.6 14 38 18.0 21 D 37 14 38 22.9
10.III	Honshu, Japan, NEIS: 33.996°N, 137.917°E, H=03 ^h 51 ^m 27.6 ^s , h=315 km, MB=4.6	KSP Δ=81.1° eP	04 03 10
10.III	Peloponnese, EMSC: 36.47°N, 21.57°E, H=17 ^h 21 ^m 52.4 ^s , h=10	KSP Δ=14.8° eP	17 25 17
10.III	Caribbean Sea, NEIS: 17.892°N, 81.946°W, H=17 ^h 37 ^m 44.8 ^s , h=33 km, MB=4.9	KSP Δ=81.4°	17 49 59
11.III	Philippine Islands, NEIS: 19.19.138°N, 121.243°E, H=06 ^h 58 ^m 02.3 ^s , h=42 km, MB=5.4	KSP Δ=84.4° 1P 1pP	07 10 31.0 42.0
11.III	NIE	1P Z: 0.6 ^s ; 0.022μ	14 53 45.2
12.III	North Atlantic Ridge, NEIS: 23.743°N, 45.174°W, H=02 ^h 57 ^m 50.6 ^s , h=33 km, MB=5.4; MLV=5.7 (Warszawa), MLH=5.5 (Kraków), MPV=5.8 (Kraków, Niedzica)	KRA Δ=56.3° (SKM) 1P Z: 1.4 ^s ; 0.12μ i (SKD) eIS Lm NEZ: 26 ^s ; 2.1μ, 5.0μ, 4.1μ NIE Δ=56.5° eP Z: 1.5 ^s ; 0.14μ esP WAR Δ=57.2° (SKD) eIP eIS Lm Z: 20 ^s ; 7.3μ	03 07 30 47.2 15 26 24.8 03 07 33 45 03 07 37 15 35 28
13.III	Peru - Brazil, border region, NEIS: 8.036°S, 74.406°W, H=21 ^h 14 ^m 32.2 ^s , h=161 km, MB=5.1	KSP Δ=96.6° eIP	21 27 43
14.III	Fiji Islands, NEIS: 20.730°S, 178.506°W, H=19 ^h 03 ^m 07.8 ^s , h=577 km, MB=5.4	KSP Δ=147.8° ePKHKP 1PKP ₂ KRA Δ=147.5° (SKM) 1PKIKP Z: 0.8 ^s ; 0.028μ 1PKHKP Z: 1.1 ^s ; 0.19μ 1PKP ₂ NIE Δ=147.9° ePKIKP Z: 0.9 ^s ; 0.043μ 1PKHKP Z: 1.1 ^s ; 0.17μ 1PKP ₂ Z: 1.1 ^s ; 0.20μ	19 21 43 53.0 19 21 44.0 C 47.0 51.5 19 21 46 C 49.4 54.2



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
14.III	Jan Mayen Islands region, NEIS: 71.965°N, 0.990°W, H=20 ^h 50 ^m 04.2 ^s , h=33 km, MB=4.5; MPV=4.8 (Kraków)	KSP	Δ=22.6° eP 20 55 03	17.III	China, NEIS: 25.797°N, 99.507°E, H=23 ^h 55 ^m 01.6 ^s , h=33 km, MB=5.1; MPV=5.8 (Niedzica)	KRA (SKM)	Δ=64.2° eP 00 05 34
		KRA (SKM)	Δ=24.2° e1P 20 55 20 Z: 1.3 ^s ; 0.036μ ePP 54			NIE	Δ=64.1° eP 00 05 35 Z: 1.4 ^s ; 0.12μ
14.III	Kermadec Islands, NEIS: 31.010°S, 179.938°E, H=20 ^h 52 ^m 38.2 ^s , h=368 km, MB=5.0	NIE	Δ=156.2° ePKP ₂ 21 12 20 Z: 0.8 ^s ; 0.034μ	18.III	Luzon, Philippine Islands, NEIS: 16.773°N, 122.327°E, H=21 ^h 43 ^m 52.4 ^s , h=37 km, MB=6.2; MLH=7.7 (Warszawa), MPV=6.9 (Kraków)	WAR	Δ=83.6° 1P 21 56 17 e1PP 59 25 e1PPPP 22 02 35 1SKS 06 35 Lm 39 29 NEZ: 16 ^s ; 177μ, 150μ, 135μ
		KSP	Δ=156.8° e1PKP ₂ 21 12 20			KRA (SKM)	Δ=85.1° 1P 21 56 25.5 C Pm 29 Z: 1.5 ^s ; 0.86μ 1pP 36.7 (SKD) 1SKS 22 06 54 1 12 14 Lm 26.2 NE: 32 ^s ; 270μ, 260μ
15.III	Ryukyu Islands, NEIS: 27.409°N, 130.601°E, H=07 ^h 22 ^m 26.2 ^s , h=8 km, MB=4.9	KRA (SKM)	Δ=81.6° 1P 07 34 46.4			NIE	Δ=86.1° 1P 21 56 26.3 C Pm 32 Z: 0.9 ^s ; 0.48μ 1pP 37.1
15.III	NIE	1P	13 09 03.4 Z: 0.6 ^s ; 0.017μ	18.III	KRA (SKM)	1P	22 17 45.2 C Z: 0.6 ^s ; 0.023μ
15.III	Salomon Islands, NEIS: 6.731°S, 154.963°E, H=19 ^h 55 ^m 42.6 ^s , h=31 km, MB=5.5	KSP	Δ=124.3° e1PKIKP 20 14 39			NIE	eP 22 17 46 Z: 0.7 ^s ; 0.027μ
		WAR (SKD)	Δ=121.0° ePP 20 16 09 e1PKKP 24 53 e1 26 05	18.III	Philippine Islands, NEIS: 19.003°N, 120.032°E, H=22 ^h 10 ^m 29.3 ^s , h=33 km, MB=4.9	NIE	Δ=82.0° e1P 22 22 57
		KRA (SKD)	Δ=123.0° ePP 20 16 17 eSS 33 13 Lm 58.6 NE: 20 ^s ; 2.0μ, 2.4μ			KRA (SKM)	Δ=82.0° 1P 22 22 56.7
15.III	Tonga Islands, NEIS: 25.456°S, 175.095°W, H=22 ^h 34 ^m 59.4 ^s , h=33 km, MB=5.0	NIE	Δ=153.5° ePKP 22 54 59 ePKP ₂ 55 14				
16.III	KRA (SKM)	eP	12 40 03 Z: 1.4 ^s ; 0.052μ				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
18.III	KRA (SKM)	1P	22 29 06.6 Z: 0.7 ^s ; 0.025μ e1 26	19.III	NIE	1	00 54 25
		NIE	eP 22 29 12	19.III	Philippine Islands, NEIS: 17.052°N, 122.415°E, H=00 ^h 51 ^m 16.9 ^s , h=58 km, MB=5.1; MPV=5.7 (Kraków)	KRA (SKM)	Δ=84.9° 1P 01 03 47.7 D Z: 0.4 ^s ; 0.025μ
18.III	Philippine Islands, NEIS: 16.812°N, 122.165°E, H=22 ^h 34 ^m 00.7 ^s , h=33 km, MB=5.2; MPV=5.8 (Kraków)	KRA (SKM)	Δ=85.1° 1P 22 46 38.1 D Z: 0.5 ^s ; 0.037μ			NIE	Δ=84.9° eP 01 03 48 Z: 0.9 ^s ; 0.026μ
		NIE	Δ=85.1° 1P 22 46 38.8 D Z: 0.9 ^s ; 0.043μ	19.III	Philippine Islands, NEIS: 17.139°N, 122.434°E, H=01 ^h 53 ^m 19.2 ^s , h=49 km, MB=5.3; MPV=6.0 (Kraków, Niedzica)	KRA (SKM)	Δ=85.0° 1P 02 05 49.8 C Z: 0.7 ^s ; 0.090μ
18.III	Philippine Islands, NEIS: 16.942°N, 122.524°E, H=22 ^h 38 ^m 00.0 ^s , h=33 km, MB=5.0; MPV=5.5 (Niedzica)	KRA (SKM)	Δ=85.1° e1P 22 50 34 Z: 0.7 ^s ; 0.020μ			NIE	Δ=85.1° 1 02 05 51 C Z: 0.9 ^s ; 0.12μ
		NIE	Δ=85.1° eP 22 50 35 Z: 0.8 ^s ; 0.029μ	19.III	Philippine Islands, NEIS: 16.802°N, 122.551°E, H=02 ^h 43 ^m 03.7 ^s , h=36 km	KRA (SKM)	Δ=85.2° 1P 02 55 38.3 D
19.III	Philippine Islands, NEIS: 16.764°N, 122.522°E, H=23 ^h 57 ^m 38.1 ^s , h=33 km, MB=5.3; MPV=6.0 (Kraków)	KRA (SKM)	Δ=85.2° 1P 00 10 12.5 Z: 0.8 ^s ; 0.092μ 1pP 24.3			NIE	Δ=85.1° eP 03 15 16.5 Z: 0.9 ^s ; 0.043μ
		NIE	Δ=85.2° e1P 00 10 13 Z: 1.1 ^s ; 0.095μ	19.III	Philippine Islands, NEIS: 16.684°N, 122.411°E, H=08 ^h 22 ^m 16.4 ^s , h=45 km, MB=4.9; MPV=5.6 (Niedzica)	KRA (SKM)	Δ=85.0° 1P 03 15 15.6 Pm 16.6 Z: 0.9 ^s ; 0.063μ e 36.1
19.III	KRA (SKM)	1P	00 12 32.3 Z: 0.8 ^s ; 0.028μ			NIE	Δ=85.1° eP 03 15 16.5 Z: 0.9 ^s ; 0.043μ
		NIE	1P 00 12 33 Z: 0.9 ^s ; 0.033μ	19.III	Philippine Islands, NEIS: 16.684°N, 122.411°E, H=08 ^h 22 ^m 16.4 ^s , h=45 km, MB=4.9; MPV=5.6 (Niedzica)	KRA (SKM)	Δ=85.2° 1P 08 34 49.6
19.III	KRA (SKM)	e1P	00 53 42.5 C Z: 1.2 ^s ; 0.095μ 1 53.6			NIE	Δ=85.3° 1P 08 34 50.8 Z: 0.7 ^s ; 0.031μ
		NIE	eP 00 53 43 C Z: 1.4 ^s ; 0.12μ				



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
19.III	Kuril Islands, NEIS: 44.200°N, 148.196°E, H=10 ^h 56 ^m 25.1 ^s , h=70 km, MB=6.0; MPV=6.6 (Niedzica), 7.0 (Kraków)			19.III	Philippine Islands, NEIS: 17.062°N, 122.354°E, H=14 ^h 30 ^m 54.8 ^s , h=33 km, MB=5.2		
	KRA (SKM)	e1P	11 08 05.3		KRA (SKM)	e1P	14 43 28 C
		Z:	1.1 ^s ; 1.3μ			Z:	0.8 ^s ; 0.028μ
		eS	17 57	19.III	Philippine Islands, NEIS: 16.814°N, 122.354°E, H=19 ^h 35 ^m 08.0 ^s , h=39 km, MB=5.6; MLV=6.1 (Warszawa), MPV=6.3 (Kraków, Niedzica), MLH=6.3 (Kraków)		
		Lm	42.8		WAR (SKD)	e1P	19 47 35
		NEZ:	24 ^s ; 2.6μ, 2.3μ, 3.3μ			e1pP	45
	NIE	Δ=76.5°				e1SKS	57 53
		1P	11 08 08.2			e1S	58 05
		Z:	1.0 ^s ; 0.54μ			Lm	20 29
		1	12.5			Z:	20 ^s ; 10μ
		1	19.8		KRA (SKM)	1P	19 47 41.5 C
19.III	Philippine Islands, NEIS: 16.605°N, 122.422°E, H=12 ^h 17 ^m 03.6 ^s , h=33 km, MB=5.4; MPV=5.9 (Kraków, Niedzica)					Z:	0.8 ^s ; 0.18μ
	KRA (SKM)	1P	12 29 38.9 D			1PcP	47.9
		Z:	1.3 ^s ; 0.14μ			ePP	51 03
	NIE	Δ=85.3°				eS	58 09
		1P	12 29 39.7 D			Lm	20 40.8
		Z:	1.0 ^s ; 0.096μ			NEZ:	13 ^s ; 11μ, 5.2μ, 4.0μ
19.III	Philippine Islands, NEIS: 16.650°N, 122.461°E, H=12 ^h 56 ^m 03.7 ^s , h=33 km, MB=5.3; MPV=5.8 (Niedzica, Kraków)				NIE	Δ=85.1°	
	NIE	Δ=85.3°				eP	19 47 42 C
		eP	13 08 38			Z:	0.9 ^s ; 0.21μ
		Z:	1.0 ^s ; 0.066μ			1	48
		1pP	47			1	48 02
	KRA (SKM)	Δ=85.3°				KSP	Δ=86.9°
		e1P	13 08 40			e1P	19 47 50
		Z:	1.2 ^s ; 0.095μ			Z:	1 ^s ; 0.11μ
19.III	Philippine Islands, NEIS: 16.743°N, 122.458°E, H=13 ^h 00 ^m 24.4 ^s , h=33 km, MB=5.5			19.III	Tuamotu Islands, NEIS: 21 932°S, 138.958°W, H=23 ^h 00 ^m 58.2 ^s , h=0 km, MB=5.9		
	KRA (SKM)	Δ=85.2°			KSP	Δ=145.3°	
		1P	13 12 59.3			1PKP	23 20 38.6
		Z:	1.2 ^s ; 0.047μ			Z:	1 ^s ; 0.31μ
19.III	Philippine Islands, NEIS: 16.698°N, 122.458°E, H=13 ^h 27 ^m 10.0 ^s , h=53 km, MB=4.7; MPV=5.5 (Kraków, Niedzica)				KRA (SKM)	Δ=147.6°	
	KRA (SKM)	Δ=85.2°				1PKP	23 20 44.1 D
		1P	13 39 45.2 C			Pm	47
		Z:	1.5 ^s ; 0.098μ			Z:	1.0 ^s ; 0.35μ
						1PKP ₂	49.6
					NIE	Δ=148.2°	
						e1PKP	23 20 45

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
19.III	NIE	continuation		21.III	WAR	Δ=36.0°	
		Pm	23 20 49			1P	21 25 53 C
		Z:	1.0 ^s ; 0.30μ			1PP	27 16
		1PKP ₂	54			1S	31 35
20.III	Philippine Islands, NEIS: 20.376°N, 122.085°E, H=01 ^h 57 ^m 09.2 ^s , h=33 km, MB=4.6					Lm	41.5
	KSP	Δ=83.9°				Z:	20 ^s ; 120μ
		eP	02 09 37		KSP	Δ=38.1°	
						eP	21 26 10
21.III	Fiji Islands, NEIS: 23.187°S, 179.582°E, H=04 ^h 04 ^m 29.3 ^s , h=574 km, MB=4.6					Z:	1 ^s ; 0.21μ
	KSP	Δ=149.5°		21.III	Iran, NEIS: 27.498°N, 56.357°E, H=21 ^h 33 ^m 18.2 ^s , h=33 km, MB=5.1, MPV=5.3 (Kraków)		
		1PKP	04 23 15.9			KRA	Δ=35.6°
		Z:	0.8 ^s ; 0.04μ			(SKM)	1P
21.III	Afghanistan - USSR frontier region, NEIS: 36.473°N, 71.369°E, H=07 ^h 35 ^m 28.0 ^s , h=123 km, MB=4.9					Z:	0.8 ^s ; 0.028μ
	NIE	Δ=38.8°				1	21
		eP	07 42 45	21.III	Iran, NEIS: 27.725°N, 56.427°E, H=21 ^h 50 ^m 48.4 ^s , h=33 km, MB=4.7; MPV=5.2 (Kraków)		
		Z:	1.1 ^s ; 0.041μ			KRA	Δ=35.5°
	KRA (SKM)	Δ=39.1°				(SKM)	1
		1P	07 42 46.1			Z:	0.5 ^s ; 0.016μ
		Z:	0.9 ^s ; 0.037μ			1	57.7
		Lm	51.7	21.III	Iran, NEIS: 27.602°N, 56.520°E, H=22 ^h 42 ^m 06.5 ^s , h=36 km, MB=5.8; MPV=6.0 (Kraków)		
		NE:	20 ^s ; 4.4μ, 4.1μ			KRA	Δ=35.6°
		Lm	08 04.5			(SKM)	1P
		Z:	18 ^s ; 4.3μ			Z:	1.2 ^s ; 0.23μ
21.III	Philippine Islands, NEIS: 16.827°N, 122.519°E, H=08 ^h 05 ^m 33.2 ^s , h=38 km, MB=4.5					1	41
	KRA (SKM)	Δ=85.3°				1S	54 38
		1P	08 18 07.8 D	22.III	Iran, NEIS: 27.526°N, 56.317°E, H=02 ^h 25 ^m 58.8 ^s , h=43 km, MB=5.2; MPV=5.5 (Kraków)		
		Z:	1.5 ^s ; 0.037μ			KRA	Δ=35.5°
21.III	Iran, NEIS: 27.609°N, 56.393°E, H=21 ^h 16 ^m 54.2 ^s , h=29 km, MB=6.2; MLV=8.5 (Warszawa), 6.7 (Kraków), MPV=7.2 (Kraków)					eP	02 32 54
	NIE	Δ=35.0°				Z:	1.8 ^s ; 0.12μ
		e1P	21 25 49 C	22.III	Kermadec Islands, NEIS: 33.604°S, 179.100°E, H=02 ^h 23 ^m 17.8 ^s , h=336 km, MB=5.6		
		Z:	1.6 ^s ; 0.33μ			KRA	Δ=157.8°
	KRA (SKM)	Δ=35.5°				(SKM)	e1PKIKP
		1P	21 25 51.3 C			Z:	1.5 ^s ; 0.11μ
		1pP	26 00.7			NIE	Δ=157.9°
		Pm	58			ePKIKP	02 42 35
		Z:	1.5 ^s ; 4.8μ			Z:	1.0 ^s ; 0.048μ
		1PP	31 28	22.III	KRA (SKM)	1P	02 43 08.8
		Lm	38.8			Z:	1.6 ^s ; 0.13μ
		E:	42 ^s ; 280μ				
		Lm	40.1				
		N:	30 ^s ; 170μ				

Date	Station	Phase	T.U. h m s	
22.III	continuation NIE			
	eP		02 43 10	D
	i		44 19.5	
22.III	KRA (SKM)	e1 P	02 44 00	
			Z: 1.2 ^s ; 0.055μ	
22.III	Iran, NEIS: 27.717°N, 56.462°E, H=02 ^h 42 ^m 10.2 ^s , h=60 km, MB=4.9; MPV=5.2 (Kraków)			
	KRA	Δ=35.5°		
	(SKM) P		02 49 04.1	
			Z: 0.6 ^s ; 0.023μ	
	i		06.1	
22.III	South Atlantic Ridge, NEIS: 12.521°S, 14.724°W, H=04 ^h 11 ^m 37.7 ^s , h=33 km, MB=5.1			
	KRA	Δ=69.1°		
	(SKM) e1P		04 22 44	
			Z: 1.4 ^s ; 0.063μ	
22.III	KRA (SKM)	e1P	07 27 15	
			Z: 0.9 ^s ; 0.032μ	
22.III	Iran, NEIS: 27.593°N, 56.554°E, H=09 ^h 14 ^m 39.7 ^s , h=33 km, MB=5.0; MPV=5.3 (Kraków)			
	KRA	Δ=35.7°		
	(SKM) i		09 21 36.3	
			Z: 0.7 ^s ; 0.029μ	
	i		59.8	
22.III	Iran, NEIS: 27.579°N, 56.465°E, H=11 ^h 57 ^m 30.9 ^s , h=39 km, MB=5.7; MPV=5.6 (Kraków), 5.8 (Ksiq2), MLH=5.7 (Kraków)			
	KRA	Δ=35.7°		
	(SKM) 1P		12 04 27.5	D
			Z: 1.0 ^s ; 0.090μ	
	1sP		05 00.5	
	1S		09 59	
	Lm		19.7	
			NEZ: 25 ^s ; 16μ, 16μ, 14μ	
	WAR	Δ=36.0°		
	(SKD) e1P		12 04 33	
			e1PoP 06 01	
	i		10 09	
	KSP	Δ=38.2°		
	1P		12 04 48.2	D
			Z: 1.5 ^s ; 0.24μ	
22.III	Iran, NEIS: 27.577°N, 56.592°E, H=12 ^h 32 ^m 57.3 ^s , h=62 km, MB=4.8			
	KRA	Δ=35.6°		
	(SKM) e1P		12 39 53	
			e1pP 40 09	
22.III	NIE			
	i		13 03 38.5	
	i		45	
22.III	Iran, NEIS: 27.713°N, 56.372°E, H=21 ^h 31 ^m 02.6 ^s , h=33 km, MB=4.8			
	KRA	Δ=35.5°		
	(SKM) e1P		21 37 59	
23.III	KRA (SKM)	e1P	00 20 49	
			Z: 1.7 ^s ; 0.12μ	
23.III	Iran, NEIS: 27.557°N, 56.382°E, H=00 ^h 17 ^m 50.8 ^s , h=33 km, MB=4.9; MPV=5.2 (Kraków)			
	KRA	Δ=35.7°		
	(SKM) e1P		00 24 48	
			Z: 1.4 ^s ; 0.052μ	
23.III	Colombia, NEIS: 6.793°N, 73.045°W, H=02 ^h 11 ^m 14.6 ^s , h=164 km, MB=5.5			
	KRA	Δ=86.8°		
	(SKM) 1P		02 23 42.2	
			Z: 1.0 ^s ; 0.074μ	
	1pP		24 23.2	
	1sP		41.7	
	NIE	Δ=87.1°		
	eP		02 23 44	
			Z: 0.9 ^s ; 0.026μ	
	epP		24 26	
23.III	Kuril Islands, NEIS: 43.361°N, 146.892°E, H=03 ^h 46 ^m 01.3 ^s , h=36 km, MB=5.3; MPV=5.9 (Kraków), 5.6 (Niedzica)			
	KRA	Δ=76.3°		
	(SKM) 1P		03 57 47.3	C
			Z: 0.8 ^s ; 0.092μ	
	1pP		57.8	
	NIE	Δ=76.6°		
	eP		03 57 50	
			Z: 1.0 ^s ; 0.054μ	
	e1pP		58 03.2	
23.III	Fiji Islands, NEIS: 14.466°S, 177.949°W, H=07 ^h 19 ^m 11.1 ^s , h=33 km, MB=5.5			
	KRA	Δ=141.9°		
	(SKM) e1PKIKP		07 38 46	

Date	Station	Phase	T.U. h m s	
23.III	continuation			
	KRA	e1	07 39 00.5	
	(GW)	e1	41 55	
23.III	Iran, NEIS: 27.651°N, 56.446°E, H=07 ^h 46 ^m 59.4 ^s , h=54 km, MB=5.0; MPV=5.2 (Kraków), MLH=5.6 (Kraków)			
	KRA	Δ=35.7°		
	(SKM) e1P		07 53 54	
			Z: 1.0 ^s ; 0.036μ	
	Lm		08 45.9	
			NEZ: 20 ^s ; 7.4μ, 6.5μ, 11μ	
23.III	Fiji Islands, NEIS: 14.427°S, 177.957°W, H=17 ^h 10 ^m 19.5 ^s , h=2 km, MB=5.6			
	KRA	Δ=141.9°		
	(SKM) ePKP		17 29 55	
	e1		30 03	
	e1		14	
	(GW) e1PKS		33 35	
	(SKD) Lm		18 25.8	
			NEZ: 25 ^s ; 4.0μ, 4.7μ, 7.1μ	
23.III	Tonga Islands, NEIS: 15.009°S, 173.248°W, H=18 ^h 57 ^m 36.6 ^s , h=33 km, MB=5.1			
	KRA	Δ=143.7°		
	(SKM) e1PKP		19 17 06	
			Z: 0.6 ^s ; 0.023μ	
23.III	Iran, NEIS: 27.520°N, 56.481°E, H=20 ^h 40 ^m 57.9 ^s , h=42 km, MB=4.9; MPV=5.3 (Kraków)			
	KRA	Δ=35.7°		
	(SKM) 1P		20 47 54.9	
			Z: 1.0 ^s ; 0.042μ	
	1sP		48 10.4	
23.III	Iran, NEIS: 27.619°N, 56.586°E, H=23 ^h 51 ^m 15.8 ^s , h=35 km, MB=5.8; MPV=6.1 (Kraków)			
	NIE	Δ=35.1°		
	eP		23 58 09	
	KRA	Δ=35.7°		
	(SKM) 1P		23 58 13.4	C
			Z: 1.2 ^s ; 0.33μ	
	e1pP		24	
	(SKD) e1sP		29	
	e1PP		59 38	
	e1S		00 03 51	
23.III	WAR	Δ=36.1°		
	(SKD) 1P		23 58 17	
			e1PP 59 45	
	e1S		00 03 53	
	e1		06 57	
24.III	Iran, NEIS: 27.575°N, 56.456°E, H=00 ^h 13 ^m 52.3 ^s , h=45 km, MB=5.1			
	KSP	Δ=38.2°		
	eP		00 21 08	
24.III	Iran, NEIS: 27.620°N, 56.626°E, H=04 ^h 42 ^m 24.3 ^s , h=32 km, MB=5.3			
	KRA	Δ=35.7°		
	(SKM) 1P		04 49 22.1	
			Z: 1.0 ^s ; 0.086μ	
	i		25.9	
	KSP	Δ=38.2°		
	e1P		04 49 42	
24.III	Iceland, NEIS: 63.572°N, 19.168°W, H=09 ^h 25 ^m 33.9 ^s , h=10 km, MB=4.6			
	KSP	Δ=22.7°		
	e1P		09 30 36	
	KRA	Δ=25.7°		
	e1P		09 31 04	
24.III	Philippine Islands, NEIS: 16.734°N, 122.562°E, H=19 ^h 33 ^m 33.0 ^s , h=33 km, MB=5.1; MPV=5.6 (Kraków, Niedzica)			
	KRA	Δ=85.3°		
	(SKM) 1P		19 46 08.1	C
			Z: 0.9 ^s ; 0.037μ	
	1PoP		12.3	
	NIE	Δ=85.3°		
	1P		19 46 08.6	
			Z: 1.0 ^s ; 0.036μ	
25.III	Turkey, EMSC: 38.45°N, 40.01°E, H=02 ^h 40 ^m 02.6 ^s , MLH=4.9 (Moxa)			
	KRA	Δ=18.3°		
	(SKM) eP		02 44 10	
			Z: 1.5 ^s ; 0.098μ	
	i		28.3	
	(SKD) eS		47 44	
26.III	Aleutian Islands, NEIS: 52.295°N, 168.257°W, H=04 ^h 36 ^m 14.7 ^s , h=38 km, MB=5.7; MPV=6.3 (Kraków, Niedzica), MLH=6.5 (Kra- ków)			
	WAR	Δ=75.5°		
	1P		04 47 57	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
26.III	continuation			26.III	NIE	1PKHKP	19 16 20
	WAR	eIS	04 57 48			Z: 0.6 ^B ; 0.052μ	
		Lm	05 26 39				
		Z:	18 ^B ; 9μ	26.III	Ascension Islands region, NEIS:		
	KSP	Δ=77.2°			0.983°S, 13.482°W, H=22 ^h 26 ^m 54.7 ^s ,		
		1P	04 48 06.0		h=33 km, MB=5.3		
		Z:	0.9 ^B ; 0.13μ				
	KRA	Δ=78.0°			NIE	Δ=57.8°	
	(SKM)	eIP	04 48 09 C			eP	22 36 47
		Z:	1.0 ^B ; 0.26μ			Z:	1.0 ^B ; 0.036μ
		1pP	25.7			e	38 07
	(GW)	eS	58 11		KRA	Δ=58.1°	
		Lm	05 32.2		(SKM)	1P	22 36 47.3 C
		NEZ:	32 ^B ; 40μ, 37μ, 9.3μ			Z:	0.7 ^B ; 0.025μ
	NIE	Δ=78.8°			(SKD)	ePP	39 01
		eIP	04 48 14 C			ePPP	40 26
		Z:	0.9 ^B ; 0.24μ			eS	44 53
		1PoP	24.8			Lm	23 00.1
		1pP	29.5			NEZ:	24 ^B ; 2.8μ, 3.9μ, 4.1μ
26.III	Turkey, EMSC: 38.57°N, 43.51°E,				WAR	Δ=60.5°	
	H=05 ^h 04 ^m 45.7 ^s , h=93 km				(SKD)	eIP	22 37 10
	NIE	Δ=19.7°				eIPPP	40 49
		eP	05 09 02			eIPPS	45 25
		Z:	1.0 ^B ; 0.036μ			eL	56.0
26.III	Tonga Islands, NEIS: 18.585°S,			27.III	Kashmir - Tibet border region, NEIS:		
	174.147°W, H=08 ^h 19 ^m 18.5 ^s , h=93 km, MB=5.6				32.706°N, 78.545°E, H=05 ^h 36 ^m 49.2 ^s ,		
	KRA	Δ=146.9°			h=26 km, MB=5.0		
		ePKIKP	08 38 49		KSP	Δ=48.3°	
		Z:	1.5 ^B ; 0.23μ			eP	05 45 31
		1PKP ₂	54	27.III	Fiji Islands, NEIS: 23.782°S,		
	KSP	Δ=146.8°			179.828°W, H=07 ^h 25 ^m 33.2 ^s , h=441 km,		
		ePKIKP	08 38 50		MB=4.5		
		Z:	1 ^B ; 0.22μ		KSP	Δ=150.2°	
		1pPKP	39 15.0			1PKHKP	07 44 31.6
		Z:	1 ^B , 0.098μ			Z:	1 ^B ; 0.048μ
	NIE	Δ=147.4°			NIE	Δ=150.1°	
		ePKIKP	08 38 52			ePKHKP	07 44 32
		Z:	1.0 ^B ; 0.15μ			Z:	0.8 ^B ; 0.029μ
		1PKP ₂	59.2	28.III	New Hebrides Islands, NEIS:		
26.III	Fiji Islands, NEIS: 24.089°S,				14.883°S, 167.103°E, H=01 ^h 15 ^m 41.8 ^s ,		
	179.239°W, H=18 ^h 57 ^m 11.7 ^s , h=396 km, MB=4.6				h=109 km, MB=5.7		
	KSP	Δ=150.7°			KRA	Δ=136.0°	
		ePKHKP	19 16 18		(SKM)	eIPKIKP	01 34 51
		Z:	0.8 ^B ; 0.080μ			eIPP	37 36
	NIE	Δ=150.6°				eIPKS	38 18
		ePKIKP	19 16 18				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
28.III	continuation			29.III	NIE	Δ=147.6°	
	NIE	Δ=136.2°				ePKP	18 02 07
		ePKIKP	01 34 52	29.III	Iran, NEIS: 27.597°N, 56.407°E,		
		Z:	1.1 ^B ; 0.041μ		H=22 ^h 29 ^m 16.8 ^s , h=35 km, MB=5.2; MPV=5.4		
28.III	Iran, NEIS: 27.588°N, 56.553°E,				(Kraków)		
	H=04 ^h 54 ^m 07.6 ^s , h=49 km, MB=4.9				NIE	Δ=35.0°	
	KRA	Δ=35.7°				eP	22 36 10
	(SKM)	eIP	05 01 04			e	29
28.III	Albania, EMSC: 41.79°N, 20.24°E,				KRA	Δ=35.5°	
	H=08 ^h 16 ^m 45.5 ^s , h=10 km, MLG=3.1 (Skopje)				(SKM)	eIP	22 36 13
	KRA	Δ=8.0°				Z:	1.0 ^B ; 0.072μ
	(SKM)	eIP	08 23 31			ei	32
		Z:	0.7 ^B ; 0.029μ		KSP	Δ=38.1°	
	NIE	Δ=7.4°				eIP	22 36 34
		1P	08 23 33.5	30.III	Honshu, Japan, NEIS: 31.455°N,		
		Z:	1.4 ^B ; 0.082μ		140.187°E, H=11 ^h 20 ^m 35.7 ^s , h=33 km,		
28.III	Turkey, EMSC: 36.78°N, 27.68°E,				MB=5.3; MPV=5.7 (Kraków)		
	H=10 ^h 50 ^m 20.3 ^s , h=27 km; MLG=4.5 (Skopje)				KRA	Δ=83.3°	
	KRA	Δ=14.2°			(SKM)	eP	11 33 01
	(SKM)	eP	10 53 35			Fm	05
	(SKD)	Lm	11 00.4			Z:	1.3 ^B ; 0.091μ
		NZ:	15.0 ^B ; 1.7μ, 1.5μ			eIP	13
		Lm	00.6			eIP	34 18
		E:	8.0 ^B ; 2.4μ			eS	43 28
29.III	Kazakh SSR, NEIS: 49.790°N,				NIE	Δ=83.5°	
	78.140°E, H=03 ^h 56 ^m 57.7 ^s , h=0 km, MB=5.4					eP	11 33 03
	KRA	Δ=36.8°		31.III	NIE		
	(SKM)	1	04 04 07			1P	13 21 39.8
		Z:	0.5 ^B ; 0.069μ			Z:	0.7 ^B ; 0.027μ
	NIE	Δ=36.8°		31.III	Iran, NEIS: 27.585°N, 56.293°E,		
		eIP	04 04 08		H=19 ^h 11 ^m 21.4 ^s , h=52 km, MB=4.7		
		Z:	0.7 ^B ; 0.11μ		KRA	Δ=35.5°	
29.III	Fiji Islands, NEIS: 20.329°S,				(SKM)	eP	19 18 15
	178.277°W, H=17 ^h 43 ^m 23.5 ^s , h=543 km, MB=5.0					Z:	1.0 ^B ; 0.036μ
	KRA	Δ=147.2°		31.III	Iran, NEIS: 27.712°N, 52.142°E,		
	(SKM)	eIPKP	18 02 06		H=19 ^h 53 ^m 15.1 ^s , h=35 km		
					NIE	Δ=32.5°	
						eP	19 59 45
						Z:	0.8 ^B ; 0.028μ

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- 3 Wyniki rejestracji sejsmologicznych w polskich obserwatoriach 1959; PWN, Łódź–Warszawa 1964.
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INTRODUCTION

The present Seismological Bulletin contains distant earthquakes recorded by seismological observatories of the Institute of Geophysics, Polish Academy of Sciences. The identification of shocks and interpretation of phases were based on the hypocenter determination given by:

NEIS - U.S. Department of the Interior (Geological Survey),
National Earthquake Information Service, Boulder, USA;

EMSC - European Mediterranean Seismological Centre, Strasbourg;

Moscow - Central Seismological Station "Obninsk", Institute of the Physics of the Earth, USSR Academy of Sciences, Moscow.

Magnitudes of earthquakes were determined from recordings of horizontal and vertical components of surface waves for epicentral distances $\Delta > 5^\circ$ and depths $h < 80$ km, using the IASPEI formula. The magnitude from body waves was determined only from the recordings of vertical component of the P waves for $\Delta > 20^\circ$ and depths $h < 80$ km, using the calibrating function given by Vanek et al. (1962)*. The maximum value of A/T was determined in the interval up to 40 s from the first arrival of the P wave.

Since April 1977 the parameters of seismograph of vertical component of Niedzica station have been changed. The frequency responses of Niedzica station are given in Figure 1. The parameters of seismographs of Warszawa, Kraków, Racibórz and Książ station remain unchanged. The frequency responses have been given in the Seismological Bulletin for the period January - March, 1977.

* Vanek J., Zatopek A., Karnik V., Kondorskaya N.V., Riznichenko Yu.V., Savarenskiy F.F., Solovev S.L., Shebalin N.V., 1962, Standartizatsiya shkaly magnitud, Izv. AN SSSR, Ser. Geofiz., 2, 153-158.

Station	Type of seismo-graph	Comp.	T _S [s]	T _G [s]	D _S	D _G	G ²	V ₀	V _m	T _m [s]
Warszawa (WAR) φ = 52°14'30"N λ = 21°01'25"E h = 110 m	GW	N-S	10.28	12.10	1.08	1.02	0.059	1500	865	4.2-9.0
		E-W	9.68	11.10	0.99	0.98	0.058	1330	820	4.4-9.0
		Z	7.80	11.38	0.50	0.83	0.030	900	855	5.5-9.0
		N-S	20.3	79.8	1.08	0.47	0.086	535	550	13-32
		E-W	20.4	89.6	1.04	0.50	0.091	513	520	13-32
Z	21.4	86.5	1.00	0.48	0.104	603	620	14-32.6		
Kraków (KRA) φ = 50°03'22"N λ = 19°56'23"E h = 223 m	Ch	N-S	1.24	0.281	0.497	1.981	0.132	10600	11420	0.17-1.0
		E-W	1.29	0.280	0.530	1.942	0.139	10750	11300	0.15-1.0
		Z	1.46	0.282	0.579	1.984	0.156	10780	11100	0.15-1.0
		N-S	1.273	0.580	0.515	0.487	0.0125	21800	23260	0.5-0.75
		E-W	1.280	0.575	0.524	0.469	0.0129	22560	24470	0.5-0.75
Z	1.445	0.580	0.610	0.486	0.0131	22000	22700	0.5-0.75		
GW	SKM-3	N-S	9.70	1.01	0.49	5.00	0.020	1480	1500	0.22-8.0
		E-W	11.10	1.00	0.47	5.00	0.021	1480	1490	0.21-9.0
		Z	10.50	1.01	0.48	5.00	0.025	1010	1020	0.22-8.5
SKD	SKD	N-S	20.0	106.6	1.00	0.50	0.144	600	610	13.5-40
		E-W	20.0	98.2	0.99	0.50	0.149	600	615	13.5-40
		Z	20.0	108.8	1.00	0.50	0.193	690	705	13.5-40

Station	Type of seismo-graph	Comp.	T _S [s]	T _G [s]	D _S	D _G	G ²	V ₀	V _m	T _m [s]
Racibórz (RAC) φ = 50°05'00"N λ = 18°11'39"E h = 209 m	SK-58	N-S	1.22	1.06	0.50	0.73	0.013	2420	2820	0.75-1.19
		E-W	1.23	1.07	0.57	0.50	0.013	2880	2710	0.75-1.17
		Z	1.12	1.07	0.31	0.40	0.020	3110	5220	0.91-1.16
		N-S	9.0	-	0.38	-	-	87	130	6-9
		E-W	9.0	-	0.38	-	-	86	120	6-9
Z	2.0	-	0.13	-	-	165	620	1.8-2.2		
Niedzica (NIE) φ = 49°25'25"N λ = 20°19'19"E h = 555 m	SK-58	N-S	1.40	0.266	0.70	3.50	0.054	25000	25100	0.10-0.85
		E-W	1.40	0.293	0.70	3.54	0.051	25150	25280	0.10-0.90
		Z	1.09	0.207	0.70	3.50	0.313	64950	73270	0.20-0.85
Książ (KSP) φ = 50°50,6"N λ = 16°17,6"E h = 380 m	SU-59	N-S	1.19	0.25	0.50	1.37	0.089	87450	90000	0.15-0.60
		E-W	1.22	0.24	0.62	1.44	0.142	108700	110800	0.15-0.60
		Z	1.00	0.21	0.50	1.53	0.171	106300	110700	0.15-0.65

Abbreviations

- T_S - free period of seismometer,
- T_G - free period of galvanometer,
- D_S - attenuation of seismometer,
- D_G - attenuation of galvanometer,
- G² - coupling coefficient,

$$V_0 - \text{static magnification } V_0 = \frac{2A}{I_0} \sqrt{\frac{K_S}{K_G} \frac{D_S}{D_G} \frac{T_G}{T_S} \sigma^2}$$

$$V_0 - \text{static magnification of SKD instruments } V_0 = \frac{2A}{I_0} \sqrt{\frac{K_S}{K_G} \frac{D_S}{D_S} \frac{T_S}{T_S} \sigma^2}$$

V_m - maximum magnification,

T_m - interval of periods for magnification range $V \geq 0.9 V_m$.

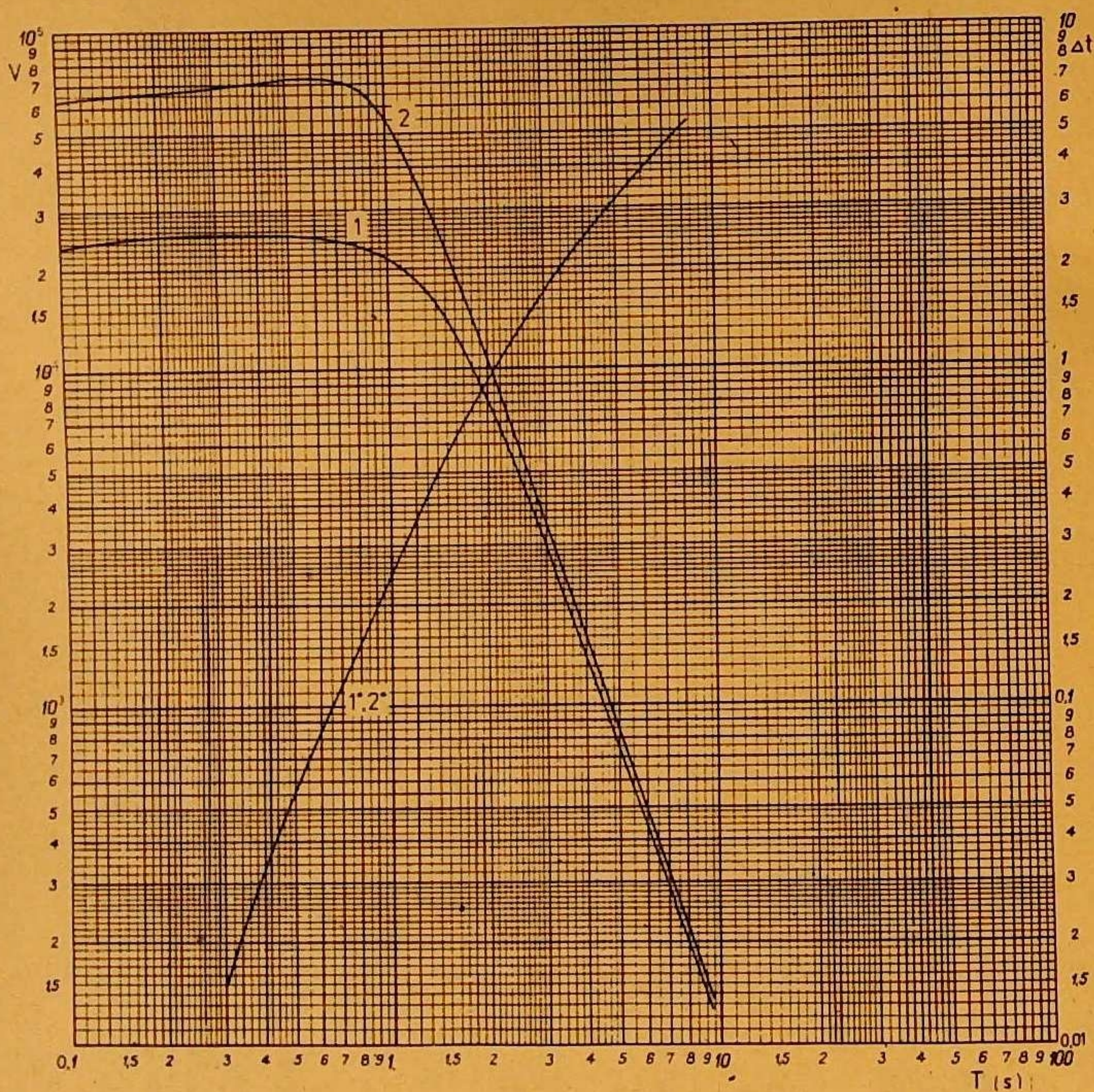
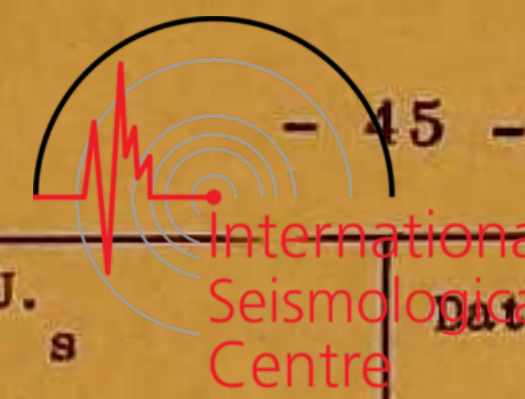


Fig. 1. Frequency responses of the instruments at Niedzica (NIE) station.

1) Magnification curve, horizontal components; 2) magnification curve, vertical component; 1*), 2*) phase distortion curve.

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
1977				A P R I L	1977		
1.IV	Iran, EMSC: 27.64°N, 56.39°E, H=13 ^h 36 ^m 30.1 ^s , h=58 km, MB=6.2 (NEIS); MPV=6.1 (Kraków), MLH=5.9 (Kraków)			2.IV	RAC Δ=145.7° (SKD) ePKP		07 35 02
	WAR Δ=36.0° (SKD) e1P		13 43 21	2.IV	KRA (SKM) 1P		08 05 42.5
	e1PP		44 41			Z: 1.4 ^s ; 0.12μ	
	e1S		49 02		i		53.2
	KRA Δ=36.5° (SKM) 1P		13 43 21.8		NIE eP		08 05 44
		Z: 1.1 ^s ; 0.32μ				Z: 1.0 ^s ; 0.031μ	
	i		29.9		i		55.5
	e1PoP		45 52.4	2.IV	Samoa Islands region, NEIS: 16.917°S, 171.921°W, H=19 ^h 54 ^m 30.8 ^s , h=33 km, MB=4.8		
	(SKD) e1S		48 53		KRA Δ=145.6° (SKM) 1PKP		20 14 07.5
	Lm		59.2			Z: 0.9 ^s ; 0.037μ	
	NEZ: 25 ^s , 15μ, 19μ, 14μ				NIE Δ=146.1° 1PKP		20 14 09.8
1.IV	Iran, EMSC: 27.67°N, 56.23°E, H=16 ^h 00 ^m 32.2 ^s , h=77 km, MB=4.9 (NEIS)					Z: 0.9 ^s ; 0.019μ	
	KRA Δ=35.5° (SKM) e1P		16 07 24		1Z		20.6
		Z: 1.0 ^s ; 0.06μ		2.IV	Mexico, NEIS: 16.880°N, 92.787°W, H=20 ^h 39 ^m 06.2 ^s , h=249 km, MB=5.3		
2.IV	Samoa Islands region, NEIS: 16.696°S, 172.095°W, H=07 ^h 15 ^m 22.7 ^s , h=33 km, MB=6.8				NIE Δ=91.5° 1P		20 51 47.5
	WAR Δ=142.9° (SKD) 1PKIKP		07 34 51	2.IV	Iran, NEIS: 32.226°N, 56.640°E, H=22 ^h 16 ^m 10.7 ^s , h=33 km, MB=4.7		
	e1pPKIKP		35 01		NIE Δ=32.0° eP		22 22 25
	e1		37 53	3.IV	Italy, EMSC: 46.25°N, 13.19°E, H=03 ^h 18 ^m 15.9 ^s , h=10 km, MLH=4.1 (Moxa)		
	Lm		08 22 30		RAC Δ=5.1° (SK) e		03 19 52
		Z: 160μ; 36s			eSn		20 44
	KRA Δ=145.3° (SKM) 1PKP		07 34 57.8		NIE Δ=5.8° ePn		03 19 42
		Z: 1.5 ^s ; 4.6μ					
	1pPKP		35 11.2				
	(SKD) i		37 19				
	Lm		08 26.3				
	NEZ: 30 ^s ; 100μ, 150μ, 145μ						
	(GW) 37.1						
	NEZ: 23 ^s ; 170μ, 130μ, 38μ						
	NIE Δ=145.8° ePKP		07 35 01				



Date	Station	Phase	T.U. h m s
3.IV	Italy - continuation		
	Pm		03 19 43
	Z:		0.9 ^S ; 0.018 μ
	1P*		47.5
	KRA	$\Delta=5.9^{\circ}$	
	(SKM) ePn		03 19 42.9
	ei		20 03.4
	i		21 26.9
3.IV	NIE		
	1P		04 19 17
	Z:		0.8 ^S ; 0.009 μ
4.IV	Rumania, EMSC: 45.67 ^o N, 26.64 ^o E, H=02 ^h 15 ^m 50.4 ^s , h=72 km		
	NIE	$\Delta=5.7^{\circ}$	
	1P		02 17 16.2 D
	Z:		0.7 ^S ; 0.010 μ
4.IV	NIE		
	1P		04 06 08.9
	Z:		0.8 ^S ; 0.012 μ
4.IV	Tonga Islands Region, NEIS: 17.296 ^o S, 172.439 ^o W, H=08 ^h 19 ^m 20.4 ^s , h=68 km, MB=4.9		
	KRA	$\Delta=145.8^{\circ}$	
	(SKM) eiPKP		08 38 54
	Z:		1.6 ^S ; 0.10 μ
4.IV	KRA		
	(SKM) eiP		15 46 56
	Z:		1.1 ^S ; 0.048 μ
4.IV	Central Mid-Atlantic Ridge, NEIS: 7.301 ^o N, 34.857 ^o W, H=17 ^h 52 ^m 19.7 ^s , h=33 km, MB=5.5; MPV=6.2 (Kraków), 6.1 (Niedzica)		
	NIE	$\Delta=62.3^{\circ}$	
	eP		18 02 40
	Pm		43.5
	Z:		2.0 ^S ; 0.40 μ
	KRA	$\Delta=62.3^{\circ}$	
	(SKM) 1P		18 02 40.6 C
	Pm		43.9
	Z:		1.5 ^S ; 0.308 μ
	i		49.1
	(SKD) eiPP		05 01.1
	eiS		11 07
	eiL		21.4

Date	Station	Phase	T.U. h m s
4.IV	WAR	$\Delta=63.8^{\circ}$	
	(SKD) eiP		18 02 50
	Lm		22 40
	Z:		32 ^S ; 12 μ
4.IV	Sumatra, NEIS: 2.766 ^o S, 102.277 ^o E, H=19 ^h 06 ^m 35.5 ^s , h=133 km, MB=5.1		
	NIE	$\Delta=87.0^{\circ}$	
	1P		19 19 07.5
	Z:		0.9 ^S ; 0.017 μ
	i		16
	KRA	$\Delta=87.2^{\circ}$	
	(SKM) 1P		19 19 08.9 D
	Z:		0.5 ^S ; 0.025 μ
5.IV	Nevada, NEIS: 37.120 ^o N, 116.062 ^o W, H=15 ^h 00 ^m 00.2 ^s , h=0 km, MB=5.6		
	KRA	$\Delta=84.9^{\circ}$	
	(SKM) eiP		15 12 37 C
	Z:		1.4 ^S ; 0.23 μ
	NIE	$\Delta=85.6^{\circ}$	
	eP		15 12 40
	Z:		1.1 ^S ; 0.082 μ
6.IV	Iran, NEIS: 31.983 ^o N, 50.683 ^o E, H=13 ^h 36 ^m 37.1 ^s , h=41 km, MB=5.5; MPV=6.3 (Kraków), MLH=5.6 (Kraków), 5.9 (Warszawa)		
	NIE	$\Delta=28.6^{\circ}$	
	eP		13 42 32
	KRA	$\Delta=29.1^{\circ}$	
	(SKM) eP		13 42 35
	Pm		43.6
	Z:		1.5 ^S ; 0.78 μ
	(SKD) eiPP		47
	1PoP		47 55
	eiL		50.0
	Lm		53.2
	N:		30 ^S ; 20.7 μ
	Lm		55.5
	EZ:		25 ^S ; 19.7 μ , 12.4 μ
	WAR	$\Delta=29.6^{\circ}$	
	(SKD) eiP		13 42 47
	eiS		47 37
	Lm		55 30
	Z:		24 ^S ; 33 μ

Date	Station	Phase	T.U. h m s
7.IV	Iran, NEIS: 27.899 ^o N, 57.055 ^o E, H=03 ^h 34 ^m 38.1 ^s , h=33 km, MB=4.9; MPV=5.6 (Kraków)		
	NIE	$\Delta=35.3^{\circ}$	
	eP		03 41 32
	KRA	$\Delta=35.8^{\circ}$	
	(SKM) 1P		03 41 36.1 D
	Z:		0.8 ^S ; 0.065 μ
7.IV	Fiji Islands Region, NEIS: 19.611 ^o S, 177.831 ^o W, H=09 ^h 34 ^m 09.8 ^s , h=617 km, MB=4.7		
	NIE	$\Delta=146.4^{\circ}$	
	eiPKP		09 52 46
	Z:		1.0 ^S ; 0.018 μ
7.IV	KRA		
	(SKM) eiP		10 28 36
	Z:		0.9 ^S ; 0.032 μ
	i		42.3
7.IV	Tonga Islands Region, NEIS: 17.485 ^o S, 172.890 ^o W, H=11 ^h 07 ^m 07.0 ^s , h=33 km, MB=4.9		
	KRA	$\Delta=145.9^{\circ}$	
	(SKM) ePKP		11 26 47
	NIE	$\Delta=146.4^{\circ}$	
	eiP		11 26 48
	Z:		0.9 ^S ; 0.010 μ
8.IV	NIE		
	eP		04 39 51
	Z:		1.0 ^S ; 0.011 μ
8.IV	Afghanistan - USSR Border Region, NEIS: 36.604 ^o N, 71.000 ^o E, H=04 ^h 46 ^m 02.6 ^s , h=243 km, MB=4.8		
	NIE	$\Delta=38.5^{\circ}$	
	eiP		04 53 04
	eipP		54
	KRA	$\Delta=38.7^{\circ}$	
	(SKM) eP		04 53 05
	Z:		1.0 ^S ; 0.042 μ
	epP		56
8.IV	Iran, NEIS: 27.454 ^o N, 56.296 ^o E, H=16 ^h 49 ^m 42.9 ^s , h=22 km, MB=4.7		
	KRA	$\Delta=35.7^{\circ}$	
	(SKM) eP		16 56 48

Date	Station	Phase	T.U. h m s
9.IV	Peru, NEIS: 10.015 ^o S, 71.181 ^o W, H=04 ^h 04 ^m 12.5 ^s , h=564 km, MB=5.5		
	KRA	$\Delta=98.3^{\circ}$	
	(SKM) 1P		04 16 52.3
	Z:		1.2 ^S ; 0.071 μ
	epP		18 54
	(SKD) eSKS		26 33
	NIE	$\Delta=98.4^{\circ}$	
	eP		04 16 53
	Z:		1.5 ^S ; 0.044 μ
9.IV	Ascension Island Region, NEIS: 5.168 ^o S, 11.485 ^o W, H=04 ^h 44 ^m 29.6 ^s , h=33 km, MB=5.0; MPV=5.6 (Kraków)		
	NIE	$\Delta=61.0^{\circ}$	
	eP		04 54 43
	KRA	$\Delta=61.4^{\circ}$	
	(SKM) eP		04 54 45
	Z:		1.6 ^S ; 0.088 μ
	i		50.7
10.IV	Kuril Islands, NEIS: 44.470 ^o N, 147.549 ^o E, H=08 ^h 31 ^m 33.4 ^s , h=84 km, MB=5.4		
	KRA	$\Delta=75.4^{\circ}$	
	(SKM) 1P		08 43 09.6 C
	Z:		0.7 ^S ; 0.070 μ
	1pP		29.1
	NIE	$\Delta=75.8^{\circ}$	
	1P		08 43 11.5 D
	Z:		1.0 ^S ; 0.096 μ
	1PoP		43 23
10.IV	Samoa Islands Region, NEIS: 16.616 ^o S, 172.317 ^o W, h=33 km, MB=4.7, H=22 ^h 44 ^m 36.7 ^s		
	KRA	$\Delta=145.2^{\circ}$	
	(SKM) eiPKP		23 04 13
	Z:		0.6 ^S ; 0.023 μ
	NIE	$\Delta=145.7^{\circ}$	
	1PKP		23 04 15.0
	Z:		0.7 ^S ; 0.011 μ
	1pPKP		23.5
11.IV	South of Australia, NEIS: 52.287 ^o S, 114.590 ^o E, H=02 ^h 15 ^m 18.1 ^s , h=33 km, MB=5.6		
	KRA	$\Delta=129.4^{\circ}$	
	(SKM) eiPKP		02 34 25
	Z:		2.0 ^S ; 0.23 μ

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
11.IV	South of Australia - continuation			11.IV	KRA	$\Delta=29.8^{\circ}$	
(GW)	e1PP		02 36 35	(SKM)	e1P		23 26 48
	e1(PKS)		37 46			Z: 1.0 ^S ; 0.036 μ	
11.IV	Lake Tanganyika Region, NEIS: 7.445 ^o S, 30.501 ^o E, H=16 ^h 12 ^m 19.4 ^s , h=33 km, MB=4.8			12.IV	Komandorskys Islands Region, NEIS: 55.754 ^o N, 164.479 ^o E, H=03 ^h 54 ^m 45.3 ^s , h=42 km, MB=5.0		
	KRA	$\Delta=58.0^{\circ}$			KRA	$\Delta=70.1^{\circ}$	
	(SKM)	eP	16 22 19		(SKM)	eP	04 06 01
11.IV	Turkey, EMSC: 36.86 ^o N, 30.88 ^o E, H=16 ^h 22 ^m 59.5 ^s , h=10 km, MB=4.6 (NEIS)				NIF	$\Delta=71.0^{\circ}$	
	NIF	$\Delta=14.7^{\circ}$			eP		04 06 06
	eP		16 26 26	12.IV	Kyushu, Japan, NEIS: 31.819 ^o N, 131.548 ^o E, H=10 ^h 38 ^m 49.8 ^s , h=44 km, MB=5.1, MPV=5.5 (Kraków)		
	i		27 30		KRA	$\Delta=78.5^{\circ}$	
11.IV	Volcano Islands Region, NEIS: 23.138 ^o N, 142.225 ^o E, H=17 ^h 15 ^m 00.7 ^s , h=33 km, MB=4.6				(SKM)	e1P	10 50 48 C
	KRA	$\Delta=91.0^{\circ}$				Z: 1.1 ^S ; 0.048 μ	
	(SKM)	e1P	17 28 02		NIF	$\Delta=78.7^{\circ}$	
	NIF	$\Delta=91.2^{\circ}$			e1P		10 50 49 C
	eP		17 28 04	13.IV	Tonga Islands, NEIS: 18.281 ^o S, 174.070 ^o W, H=00 ^h 08 ^m 15.3 ^s , h=50 km, MB=4.9		
	ei		11		KRA	$\Delta=146.4^{\circ}$	
11.IV	Volcano Islands Region, NEIS: 23.237 ^o N, 142.164 ^o E, H=19 ^h 57 ^m 44.7 ^s , h=33 km, MB=4.5				(SKM)	e1PKIKP	00 27 54
	KRA	$\Delta=90.9^{\circ}$				Z: 0.4 ^S ; 0.025 μ	
	(SKM)	eP	20 10 49		NIF	$\Delta=146.8^{\circ}$	
					ePKIKP		00 27 55
11.IV	North Atlantic Ocean, NEIS: 59.485 ^o N, 30.254 ^o W, H=22 ^h 44 ^m 42.3 ^s , h=33 km, MB=4.6			13.IV	Hindu Kush, NEIS: 36.468 ^o N, 70.907 ^o E, H=11 ^h 33 ^m 51.8 ^s , h=196 km, MB=5.3		
	KRA	$\Delta=29.8^{\circ}$			NIF	$\Delta=38.5^{\circ}$	
	(SKM)	e1P	22 50 46.6		1P		11 40 57 C
		Z: 1.0 ^S ; 0.036 μ				Z: 1.2 ^S ; 0.16 μ	
11.IV	Volcano Islands Region, NEIS: 23.183 ^o N, 142.260 ^o E, H=22 ^h 56 ^m 45.3 ^s , h=33 km, MB=5.0; MPV=5.4 (Niedzica)				-1		41 16
	KRA	$\Delta=91.0^{\circ}$			KRA	$\Delta=38.8^{\circ}$	
	(SKM)	e1P	23 09 48		(SKM)	1P	11 40 58.2 C
	NIF	$\Delta=91.2^{\circ}$				Z: 1.2 ^S ; 0.17 μ	
	eP		23 09 49		1pP		41 43.1
		Z: 1.0 ^S ; 0.022 μ			(GW)	esP	42 03
11.IV	North Atlantic Ocean, NEIS: 59.373 ^o N, 30.315 ^o W, H=23 ^h 20 ^m 42.4 ^s , h=33 km, MB=4.5; MPV=5.1 (Kraków)				e		49 36
				13.IV	Talau Islands, NEIS: 3.778 ^o N, 126.756 ^o E, H=12 ^h 45 ^m 42.0 ^s , h=43 km, MB=5.7; MPV=6.1 (Kraków)		
					NIF	$\Delta=97.7^{\circ}$	
					1P		12 59 14.7

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
13.IV	Talau Islands - continuation			16.IV	Hindu Kush, NEIS: 36.454 ^o N, 70.778 ^o E, H=00 ^h 13 ^m 04.6 ^s , h=217 km, MB=5.4		
	KRA	$\Delta=97.8^{\circ}$			WAR	$\Delta=36.1^{\circ}$	
	(SKM)	1P	12 59 14.9 C		(SKD)	e1P	00 20 06
		Z: 1.3 ^S ; 0.091 μ			e1PP		21 34
14.IV	Fiji Islands Region, NEIS: 17.665 ^o S, 178.652 ^o W, H=04 ^h 05 ^m 31.2 ^s , h=535 km, MB=5.2				ei		28 14
	KRA	$\Delta=144.4^{\circ}$			NIF	$\Delta=38.4^{\circ}$	
	(SKM)	1PKP	04 24 07.1 C		e1P		00 20 08 C
		Z: 1.2 ^S ; 0.35 μ				Z: 0.9 ^S ; 0.41 μ	
	NIF	$\Delta=144.3^{\circ}$			i		25.5
	eiPKP		04 24 09		KRA	$\Delta=38.7^{\circ}$	
		Z: 0.9 ^S ; 0.27 μ			(SKM)	1P	00 20 09.1 C
	i		15.5			Z: 0.9 ^S ; 0.378 μ	
14.IV	Algeria, EMSC: 36.35 ^o N, 5.62 ^o E, H=07 ^h 17 ^m 10.1 ^s , h=10 km, MB=4.7 (NEIS)				1PP		21 43.8
	KRA	$\Delta=17.2^{\circ}$			(SKD)	Lm	29 17
	eP		07 21 12			NEZ: 15 ^S ; 0.9 μ , 0.9 μ , 1.5 μ	
		Z: 1.3 ^S ; 0.064 μ			RAC	$\Delta=39.8^{\circ}$	
15.IV	Tonga Islands Region, NEIS: 17.347 ^o S, 172.685 ^o W, H=23 ^h 03 ^m 46.9 ^s , h=33 km, MB=5.1				(SK)	eP	00 20 20
	KRA	$\Delta=145.8^{\circ}$			epP		57
	(SKM)	ePKP	23 23 25		ePP		21 57
		Z: 1.3 ^S ; 0.064 μ		18.IV	Jan Mayen Island Region, NEIS: 70.516 ^o N, 15.184 ^o W, H=12 ^h 35 ^m 48.2 ^s , h=10 km, MB=4.6		
16.IV	Philippine Islands, NEIS: 8.861 ^o N, 123.387 ^o E, H=04 ^h 01 ^m 40.8 ^s , h=33 km, MB=5.5				KRA	$\Delta=26.2^{\circ}$	
	KRA	$\Delta=91.8^{\circ}$			(SKM)	eP	12 41 24
	(SKM)	eP	04 14 16				
		Z: 1.6 ^S ; 0.088 μ		18.IV	Mexico, NEIS: 18.608 ^o N, 101.397 ^o W, H=18 ^h 56 ^m 55.2 ^s , h=91 km, MB=5.0		
16.IV	Fiji Islands Region, NEIS: 21.492 ^o S, 179.207 ^o W, H=06 ^h 31 ^m 13.7 ^s , h=600 km, MB=5.2				KRA	$\Delta=94.3^{\circ}$	
	KRA	$\Delta=147.7^{\circ}$			(SKM)	e1P	19 10 06
	(SKM)	1PKIKP	06 49 52.7 D			Z: 1.6 ^S ; 0.088 μ	
		Z: 1.2 ^S ; 0.071 μ		19.IV	Yugoslavia, EMSC: 43.08 ^o N, 17.79 ^o E, H=02 ^h 23 ^m 41.8 ^s , h=10 km, MLG=3.0 (Skopje)		
	NIF	$\Delta=148.1^{\circ}$			NIF	$\Delta=6.6^{\circ}$	
	1PKIKP		06 49 54 D		ePn		02 25 18
		Z: 1.0 ^S ; 0.056 μ			eSn		40
17.IV	Tonga Islands, NEIS: 21.008 ^o S, 173.918 ^o W, H=02 ^h 34 ^m 43.0 ^s , h=33 km, MB=5.0			19.IV	Philippine Islands, NEIS: 15.120 ^o N, 122.719 ^o E, H=05 ^h 09 ^m 13.5 ^s , h=43 km, MB=4.7		
	NIF	$\Delta=149.5^{\circ}$			KRA	$\Delta=86.5^{\circ}$	
	e1PKIKP		02 54 30		(SKM)	eP	05 21 54
		Z: 1.0 ^S ; 0.015 μ		19.IV	Honshu, Japan, NEIS: 36.455 ^o N, 140.556 ^o E, H=06 ^h 14 ^m 59.6 ^s , h=65 km, MB=5.3		
					KRA	$\Delta=80.0^{\circ}$	
					(SKM)	1P	06 26 59.0 C
						Z: 0.8 ^S ; 0.069 μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s		
19.IV	KRA (SKM)	eP e1	22 02 37 48	20.IV	Honshu, Japan, NEIS: 30.599°N, 137.484°E, H=20 ^h 04 ^m 29.4 ^s , h=493 km, MB=5.5	KRA (SKM)	Δ=82.5° e1P Z: 0.9 ^s ; 0.262μ		
20.IV	Yugoslavia, EMSC: 44.88°N, 17.34°E, H=00 ^h 31 ^m 53.5 ^s , h=10 km, MLH=4.9 (Skopje), MLH=4.2 (Kraków)	NIE	Δ=5.0° ePn Pm Z: 0.7 ^s ; 0.108μ iP ^π	00 33 07 12.5 21.0	KRA (SKM)	Δ=82.7° iP Z: 0.9 ^s ; 0.169μ	20 16 00 20 16 02.3 06.2		
		RAC (SK)	Δ=5.2° ePn iSn	00 33 11 34 18	20.IV	Rumanie, EMSC: 44.28°N, 26.30°E, H=21 ^h 16 ^m 17.0 ^s , h=10 km, MLH=3.6 (Skopje)	NIE	Δ=6.6° ePn 1	21 17 53 18 53.5
		KRA (SKM)	Δ=5.5° iPn Z: 0.6 ^s ; 0.062μ iP ^π	00 33 13.8 23.4	20.IV	Solomon Islands, NEIS: 9.828°S, 160.323°E, H=23 ^h 13 ^m 10.4 ^s , h=33 km, MB=6.4	WAR (SKD)	Δ=126.4° e1PKIKP e1PP e1S	23 32 14 34 10 44 06
		(GW)	e1Sn Lm E: 7.0 ^s ; 3.3μ Lm NZ: 7.0 ^s ; 4.5μ, 1.5μ	34 17 35.6 35.9			KRA (SKM)	Δ=128.2° ePKIKP Z: 1.5 ^s ; 0.086μ	23 32 15 34 24.0
20.IV	Yugoslavia, EMSC: 44.81°N, 17.18°E, H=00 ^h 46 ^m 45.2 ^s , h=10 km	NIE	Δ=5.1° eP	00 48 02			NIE	Δ=128.5° ePKIKP Pm Z: 1.5 ^s ; 0.11μ 1	23 32 15 19.4 29
20.IV	Kermadec Islands, NEIS: 29.902°S, 178.301°W, H=03 ^h 14 ^m 07.7 ^s , h=138 km	NIE	Δ=155.9° ePKIKP iPKP ₂	03 33 46 34 13.5	21.IV	Solomon Islands, NEIS: 9.890°S, 160.348°E, H=23 ^h 42 ^m 50.5 ^s , h=19 km, MB=6.3; MLH=7.6 (Kraków)	KRA (SKM)	Δ=128.3° ePKIKP Z: 1.4 ^s ; 0.063μ	00 01 57
			iP eipP	04 29 16.7 27.0			(GW)	1 Lm	04 10 55.5
		KRA (SKM)	Δ=35.6° e1P Pm Z: 0.9 ^s ; 0.089μ eipP	04 29 20 23.6 29			Lm	NE: 23.0 ^s ; 120μ, 95μ 01 00 NEZ: 20.0 ^s ; 78μ, 62μ, 13μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s		
21.IV	Solomon Islands - continuation	NIE	ePKIKP Z: 1.2 ^s ; 0.026μ	00 01 58	21.IV	KRA (SKM) (GW)	e1PKIKP Z: 0.9 ^s ; 0.037μ Lm NEZ: 18.0 ^s ; 18μ, 14μ 3.5μ		
		WAR (SKD)	Δ=126.4° 1 e1PP e1PKS Lm NEZ: 24 ^s , 28 ^s , 28 ^s , 200μ, 200μ, 150μ	00 02 26 03 54 04 26 48 42		NIE	Δ=128.9° iPKIKP Z: 1.1 ^s ; 0.024μ	05 25 34 05 25 34.6	
21.IV	Solomon Islands, NEIS: 9.889°S, 159.953°E, H=01 ^h 20 ^m 32.8 ^s , h=32 km, MB=5.5	NIE	Δ=128.3° e1PKIKP	01 39 40	21.IV	Tadzhik SSR, NEIS: 40.083°N, 70.837°E, H=10 ^h 03 ^m 55.8 ^s , h=47 km, MB=5.1; MPV=5.7 (Kraków)	KRA (SKM)	Δ=36.6° iP Z: 0.7 ^s ; 0.066μ	10 10 59.4 D
21.IV	KRA (SKM)	e1P Z: 1.4 ^s ; 0.147μ 1 e1	01 58 39 54 02 02 03		21.IV	Uzbek SSR, NEIS: 40.488°N, 63.783°E, H=13 ^h 38 ^m 49.2 ^s , h=33 km, MB=4.8	KRA (SKM)	Δ=31.9° iP 13 45 13.4	C C
		NIE	e1P Z: 1.0 ^s ; 0.074μ	01 58 39 C	21.IV	Bonin Islands Region, NEIS: 26.696°N, 142.388°E, H=17 ^h 20 ^m 44.7 ^s , h=27 km, MB=5.3 (Kraków)	KRA (SKM)	Δ=88.1° iP Z: 0.6 ^s ; 0.016μ eipP	17 33 34.8 41.9 D
21.IV	Jan Mayen, NEIS: 70.887°N, 14.212°W, H=03 ^h 59 ^m 56.2 ^s , h=10 km, MB=4.9; MPV=4.8 (Niedzica), 5.0 (Kraków)	KRA (SKM)	Δ=26.1° eP Z: 1.0 ^s ; 0.036μ 1	04 05 32 37.5			NIE	Δ=88.4° e1P 17 33 36.5	
		NIE	Δ=26.8° eP Z: 1.0 ^s ; 0.018μ	04 05 40	21.IV	KRA (SKM)	e1P Z: 0.9 ^s ; 0.032μ	22 43 42	
21.IV	Solomon Islands, NEIS: 9.965°S, 160.731°E, h=33 km, MB=6.6	KRA (SKM)	Δ=128.6° e1PKIKP iPP 1	04 43 15 45 26.3 46 38		NIE	eP Z: 1.0 ^s ; 0.018μ	22 43 44	
		(GW)	1		22.IV	Kuril Islands Region, NEIS: 52.256°N, 153.817°E, H=00 ^h 52 ^m 01.6 ^s , h=390 km, MB=4.8	KRA (SKM)	Δ=70.8° iP Z: 0.9 ^s ; 0.058μ	01 02 38.0 D
		NIE	Δ=128.7° e1PKIKP 1	04 43 16 43.6			NIE	Δ=71.3° iP Z: 0.7 ^s ; 0.028μ 1	01 02 41.7 54 D
21.IV	Solomon Islands, NEIS: 10.148°S, 160.698°E, H=05 ^h 06 ^m 28.5 ^s , h=33 km, MB=5.8	KRA	Δ=128.7°						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
22.IV	Solomon Islands, NEIS: 10.168°S, 160.657°E, H=03 ^h 11 ^m 00.2 ^s , h=51 km, MB=5.6			22.IV	NIF	ePKP	23 30 26 Z: 0.8 ^s ; 0.058μ
	KRA Δ=128.7°					i	34.2
	(SKM) ePKIKP 03 30 11			22.IV	Greece, EMSC: 38.94°N, 21.02°E, H=23 ^h 57 ^m 08.6 ^s , h=65 km, MAW=4.2 (Tirana)		
	epP 32 10				NIF	Δ=10.5°	
	(SKD) ePKKP 42 03				eP	23 59 45	
	eIPS 49 31				e	56	
	Lm 04 25.8				ei	00 00 01	
	NEZ: 25.0 ^s ; 2.1μ, 4.0μ, 3.5μ			23.IV	KRA		
22.IV	Oregon Region, NEIS: 44.253°N, 129.275°W, H=08 ^h 16 ^m 04.5 ^s , h=15 km, MB=5.2			(SKM)	iP	08 18 12	
	KRA Δ=82.3°					Z: 0.7 ^s ; 0.020μ	
	(SKM) eP- 08 28 23			24.IV	New Britain Region, NEIS: 6.522°S, 150.345°E, H=00 ^h 24 ^m 26.1 ^s , h=39 km		
22.IV	KRA				NIF	Δ=120.2°	
(SKM)	eIP 06 37 22.7				eIPKP	00 43 14	
	Z: 0.9 ^s ; 0.032μ			24.IV	Turkmen SSR, NEIS: 39.823°N, 54.724°E, H=00 ^h 59 ^m 17.7 ^s , h=34 km, MB=4.8		
22.IV	China Sea, NEIS: 27.365°N, 126.668°E, H=14 ^h 07 ^m 27.8 ^s , h=33 km, MB=5.0				NIF	Δ=26.1°	
	KRA Δ=79.4°				eP	01 04 51	
	(SKM) eIP 14 19 37				epP	05 02	
	epP 45			24.IV	NIF		
22.IV	Samoa Islands, NEIS: 16.564°S, 172.521°W, H=20 ^h 46 ^m 02.5 ^s , h=33 km, MB=5.1				eIP	02 10 14	
	KRA Δ=145.1°					Z: 0.9 ^s ; 0.017μ	
	(SKM) ePKP 21 05 40				KRA		
22.IV	Eastern Sea of Japan, NEIS: 42.988°N, 139.508°E, H=22 ^h 15 ^m 44.0 ^s , h=33 km, MB=5.0; MPV=5.4 (Kraków), 5.2 (Niedzica)			(SKM)	eP	02 10 16	D
	KRA Δ=73.4°					Z: 0.7 ^s ; 0.029μ	
	(SKM) eIP 22 27 15			24.IV	Samoa Islands Region, NEIS: 16.561°S, 172.791°W, H=03 ^h 24 ^m 01.4 ^s , h=33 km, MB=4.7		
	Z: 1.0 ^s ; 0.036μ				NIF	Δ=145.5°	
	eipP 26				ePKP	03 43 42	
	NIF Δ=73.7°				i	44 01.2	
	eIP 22 27 17.6	C		24.IV	Solomon Islands, NEIS: 9.873°S, 160.070°E, H=06 ^h 28 ^m 52.3 ^s , h=29 km, MB=5.4		
	Z: 0.9 ^s ; 0.017μ				NIF	Δ=128.3°	
22.IV	Fiji Islands Region, NEIS: 17.748°S, 178.276°W, H=23 ^h 11 ^m 47.9 ^s , h=538 km, MB=5.5				ePKIKP	06 48 05	
	KRA Δ=144.6°				eipPKIKP	15	
	(SKM) eIPKP 23 30 25			24.IV	Sumatra, NEIS: 5.211°S, 102.927°E, H=16 ^h 10 ^m 05.9 ^s , h=33 km, MB=5.2; MPV=5.3 (Niedzica)		
	Z: 0.7 ^s ; 0.041μ				NIF	Δ=89.1	
	NIF Δ=145.0°						



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
24.IV	Sumatra - continuation			26.IV	Iran, NEIS: 32.656°N, 48.922°E, H=16 ^h 25 ^m 29.0 ^s , h=47 km, MB=5.4; MPV=5.7 (Kraków)		
	NIE eIP 16 23 01				NIF	Δ=27.1°	
	Z: 1.1 ^s ; 0.022μ				eIP	16 31 09	
	eipP 12				i	20.5	
24.IV	Honshu, Japan, NEIS: 40.050°N, 142.715°E, H=20 ^h 42 ^m 43.2 ^s , h=44 km, MB=5.0; MPV=5.3 (Niedzica), 5.6 (Kraków)				KRA	Δ=27.6°	
	KRA Δ=77.2°			(SKM)	iP	16 31 13.2	C
(SKM)	iP 20 54 34.0					Z: 1.4 ^s ; 0.157μ	
	Z: 0.8 ^s ; 0.046μ				ipP	23.4	
	eipP 45.6			(SKD)	eS	36 14	
	NIF Δ=77.7°			26.IV	Kuril Islands, NEIS: 43.392°N, 148.020°E, H=23 ^h 06 ^m 40.4 ^s , h=34 km, MB=5.0; MPV=5.4 (Kraków)		
	iP 20 54 36	C			KRA	Δ=76.5°	
	Z: 1.0 ^s ; 0.028μ			(SKM)	eP	23 18 29	
	eipP 49					Z: 1.0 ^s ; 0.036μ	
	i 55 02				NIF	Δ=76.9°	
24.IV	NIF				eP	23 18 31	
	eIP 21 14 49	D			Pm	35	
	Z: 0.7 ^s ; 0.011μ					Z: 0.7; 0.013μ	
25.IV	Kazakh SSR, NEIS: 49.837°N, 78.159°E, H=04 ^h 06 ^m 57.8 ^s , h=0, MB=5.1; MPV=5.4 (Kraków), 5.5 (Niedzica)				isP	47.8	
	KRA Δ=36.6°			27.IV	South Pacific Cordillera, NEIS: 55.203°S, 127.241°W, H=03 ^h 53 ^m 57.5 ^s , h=33 km, MB=5.1		
(SKM)	iP 04 14 07.6				KRA	Δ=159.5°	
	Z: 0.8 ^s ; 0.051μ				(SKM)	eIPKIKP 04 14 00	
	NIF Δ=36.6°			27.IV	Honshu, Japan, NEIS: 29.381°N, 142.023°E, H=11 ^h 58 ^m 54.1 ^s , h=25 km, MB=5.3		
	iP 04 14 09	C			KRA	Δ=85.7°	
	Z: 0.7 ^s ; 0.052μ				eIP	12 11 32	D
	ei 14				eisP	45.9	
25.IV	KRA				NIF	Δ=86.0°	
(SKM)	iP 08 23 17.6	C			eIP	12 11 34	
	Z: 0.5 ^s ; 0.057					Z: 0.7 ^s ; 0.013μ	
25.IV	Tonga Islands, NEIS: 24.379°S, 175.576°W, H=15 ^h 03 ^m 03.9 ^s , h=33 km, MB=5.3				ipP	42	
	NIF Δ=152.1°				isP	48	
	ePKIKP 15 22 58			27.IV	Nevada, NEIS: 37.095°N, 116.028°W, H=15 ^h 00 ^m 00.1 ^s , h=0 km, MB=5.4; MPV=5.3 (Kraków), 5.5 (Niedzica)		
	ipPKIKP 23 14.2				KRA	Δ=84.9°	
25.IV	Tonga Islands, NEIS: 20.810°S, 173.458°W, H=18 ^h 02 ^m 06.5 ^s , h=33 km, MB=4.6				(SKM)	iP 15 12 37.0	D
	NIF Δ=149.4					Z: 1.2 ^s ; 0.024μ	
	ePKIKP 18 21 53						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
27.IV	Nevada - continuation			30.IV	NIE	ePKP	00 19 55
	NIE	$\Delta=85.6^\circ$				epPKP	20 08
	iP		15 12 41 C	30.IV	NIE	eP	02 26 21
	Z:	0.9^S ; 0.035μ		30.IV	KRA		
28.IV	Yugoslavia, EMSC: $44.85^\circ N$, $17.34^\circ E$, $H=03^h 41^m 58.6^s$, $h=10$ km, $MLH=3.6$ (Skopje)				(SKM)	iP	12 39 00.8
	NIE	$\Delta=5.0^\circ$				Z:	1.3^S ; 0.064μ
	eIPn		03 43 15	30.IV	NIE	eP	14 42 30
	KRA	$\Delta=5.5^\circ$				eI	49
	(SKM)	ePn	03 43 20		KRA		
	eP ^x		28		(SKM)	iP	14 42 34.0 C
	iSn		44 22.3			Z:	1.3^S ; 0.082μ
29.IV	Alaska, NEIS: $59.418^\circ N$, $145.004^\circ W$, $H=08^h 15^m 11.8^s$, $h=8$ km, $MB=4.7$			30.IV	North Atlantic Ridge, NEIS: $32.427^\circ N$, $40.344^\circ W$, $H=16^h 22^m 45.3^s$, $h=33$ km, $MB=4.6$		
	KRA	$\Delta=70.2^\circ$			NIE	$\Delta=47.7^\circ$	
	(SKM)	eIP	08 25 59			eP	16 31 23
30.IV	Tonga Islands, NEIS: $17.339^\circ S$, $173.001^\circ W$, $H=00^h 00^m 14.0^s$, $h=33$ km, $MB=5.3$			30.IV	Norwegian Sea, EMSC: $68.08^\circ N$, $10.80^\circ E$, $H=23^h 32^m 43.8^s$, $h=10$ km		
	NIE	$\Delta=146.2^\circ$			NIE	$\Delta=19.4^\circ$	
						eP	23 37 08
						iPP	24.5

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1.V	NIE	eP	00 02 17	1.V	KRA	$\Delta=76.4^\circ$	
					(SKM)	eP	16 34 54
1.V	Northern Sumatra, NEIS: $2.126^\circ N$, $97.199^\circ E$, $H=00^h 57^m 11.6^s$, $h=68$ km, $MB=4.8$					Z:	1.0^S ; 0.030μ
	NIE	$\Delta=79.8^\circ$			(GW)	eL	17 04.3
	eP		01 09 15		Lm		06.6
						- NE:	16.0^S ; 3.0μ , 2.4μ
1.V	China, NEIS: $27.322^\circ N$, $101.234^\circ E$, $H=02^h 47^m 22.9^s$, $h=53$ km, $MB=4.7$			1.V	Solomon Islands, NEIS: $7.204^\circ S$, $154.394^\circ E$, $H=18^h 39^m 23.8^s$, $h=32$ km, $MB=5.6$		
	NIE	$\Delta=64.0^\circ$			NIE	$\Delta=123.0^\circ$	
	eIP		02 57 54			ePKP	18 58 19
	Pm		55.3			Pm	21.4
	Z:	1.0^S ; 0.015μ				Z:	1.0^S ; 0.020μ
	eISp		58 23	2.V	NIE		
1.V	Honshu, Japan, NEIS: $35.162^\circ N$, $132.610^\circ E$, $h=6$ km, $MB=4.5$; $MPV=5.4$ (Kraków), $MLH=5.8$ (Kraków)					eIP	02 00 01
						Pm	02
						Z:	1.1^S ; 0.013μ

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
2.V	NIE	eP	05 17 52	2.V	Donin Islands Region, NEIS: $27.375^\circ N$, $140.198^\circ E$, $H=03^h 15^m 07.6^s$, $h=312$ km, $MB=4.8$		
2.V	Fiji Islands Region, NEIS: $21.226^\circ S$, $178.827^\circ W$, $H=07^h 24^m 56.0^s$, $h=579$ km, $MB=4.9$				KRA	$\Delta=86.5^\circ$	
	NIE	$\Delta=148.0^\circ$			(SKM)	eIP	03 27 16
	iPKIKP		07 43 38			Z:	0.9^S ; 0.026μ
	Pm		36.7		NIE	$\Delta=86.7^\circ$	
	Z:	1.0^S ; 0.018μ				iP	03 27 17.5 D
	1		43.5			Z:	0.9^S ; 0.01μ
2.V	Iran, EMSC: $37.07^\circ N$, $55.26^\circ E$, $H=15^h 17^m 53.1^s$, $h=33$ km, $MPV=5.0$ (Niedzica), 5.3 (Kraków)			3.V	KRA		
	NIE	$\Delta=28.0^\circ$			(SKM)	eIP	08 18 50
	iP		15 23 41.2 C			Z:	0.7^S ; 0.020μ
	Z:	1.1^S ; 0.032μ		3.V	China, NEIS: $27.369^\circ N$, $101.052^\circ E$, $H=12^h 26^m 33.0^s$, $h=33$ km, $MB=5.0$		
	1		49.0		NIE	$\Delta=63.9^\circ$	
	KRA	$\Delta=28.4^\circ$				eP	12 37 06
	(SKM)	eIP	15 23 44	3.V	NIE		
	Z:	1.1^S ; 0.069μ				eP	17 59 11
2.V	Iran - USSR Border Region, NEIS: $39.569^\circ N$, $44.008^\circ E$, $H=18^h 55^m 01.8^s$, $h=42$ km, $MB=4.7$					Z:	1.0^S ; 0.013μ
	NIE	$\Delta=19.5^\circ$				1	29
	eIP		18 59 33	4.V	Iran, EMSC: $31.74^\circ N$, $50.87^\circ E$, $H=02^h 01^m 28.2^s$, $h=53$ km, $MPV=4.7$ (Niedzica), 5.4 (Kraków)		
	iPP		45.2		NIE	$\Delta=28.9^\circ$	
2.V	Mindanao, Philippine Islands, NEIS: $7.186^\circ N$, $123.258^\circ E$, $H=21^h 53^m 56.5^s$, $h=24$ km, $MB=5.7$; $MPV=5.9$ (Kraków)					eP	02 07 22
	WAR	$\Delta=91.8^\circ$				Z:	0.9^S ; 0.011μ
	(SKD)	eIP	22 07 03			iSP	48.2
		eIPp	10 50			iPP	08 14.5
		eIS	18 04		KRA	$\Delta=29.4^\circ$	
	KRA	$\Delta=93.0^\circ$			(SKM)	eIP	02 07 25.7
	(SKM)	eP	22 07 09			Pm	27.9
	Z:	1.8^S ; 0.12μ				Z:	1.0^S ; 0.072μ
	1		41.7			eI	46.0
	(SKD)	ePP	10 55	4.V	Afghanistan - USSR Border Region, NEIS: $36.934^\circ N$, $71.389^\circ E$, $H=02^h 37^m 44.4^s$, $h=122$ km, $MB=5.3$		
		eS	18 19		NIE	$\Delta=38.6^\circ$	
	NIE	$\Delta=92.9^\circ$				eP	02 44 57
		eP	22 07 10 D			iPP	45 22.5
	Z:	1.8^S ; 0.064μ				iSP	43

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
4.V	Afghanistan - USSR - continuation			6.V	KRA	$\Delta=75.9^\circ$	
	KRA $\Delta=38.8^\circ$			(SKM)	eIP	21 49 22	
	(SKM) eIP	02 44 58			Z: 1.3^S ; 0.045μ		
	eipP	45 23.2		NIE	$\Delta=76.3^\circ$		
	ei	43.8		eIP	21 49 25.4	D	
4.V	Iran - USSR Border Region, NEIS:				Z: 0.9^S ; 0.021μ		
	$39.287^\circ N$, $44.132^\circ E$, $H=06^h 08^m 46.0^S$,			ipP	36.6		
	$h=33$ km			6.V	Kuril Islands Region, NEIS: $46.601^\circ N$,		
	NIE $\Delta=19.7^\circ$				$154.107^\circ E$, $H=22^h 10^m 17.5^S$, $h=43$ km, $MB=4.6$		
	eP	06 13 15		NIE	$\Delta=76.3^\circ$		
	Z: 1.1^S ; 0.013μ			eIP	22 22 04		
4.V	NIE			7.V	Jan Mayen, EMSC: $71.91^\circ N$, $1.37^\circ W$,		
	eP	23 56 40			$H=02^h 13^m 30.3^S$; $MPV=5.6$ (Kraków, Niedzica).		
	Z: 1.2^S ; 0.016μ				$MLV=4.9$ (Warszawa)		
5.V	KRA			WAR	$\Delta=22.1^\circ$		
(SKM)	iP	22 26 13.0	C	(SKD)	eIP	02 18 26	
	Z: 0.7^S ; 0.066μ				eIPPP	19 04	
	ei	32.7			eIS	22 34	
	NIE				eISS	23 04	
	iP	22 26 16.2	C		Lm	25 44	
	Z: 0.9^S ; 0.043μ				Z: 24^S ; 5.9μ		
	i	28.5		RAC	$\Delta=23.6^\circ$		
5.V	Crete, EMSC: $34.81^\circ N$, $24.75^\circ E$,			(SK)	eP	02 18 42	
	$H=23^h 13^m 13.8^S$						
	NIE $\Delta=15.0^\circ$			KRA	$\Delta=23.9^\circ$		
	eP	23 16 50		(SKM)	iP	02 18 43.2	
6.V	NIE				Z: 1.4^S ; 0.28μ		
	iP	01 38 41.5	D	(GW)	eIPPP	19 19	
	Z: 0.9^S ; 0.021μ				eIS	23 09	
6.V	Kuril Islands Region, NEIS:			NIE	$\Delta=24.6^\circ$		
	$45.943^\circ N$, $152.060^\circ E$, $H=03^h 53^m 30.2^S$,			eIP	02 18 52	C	
	$h=29$ km, $MB=5.4$; $MPV=6.0$ (Kraków), 5.8			i	59.1		
	(Niedzica)			Pm	19 02.7		
	KRA $\Delta=75.7^\circ$				Z: 1.2^S ; 0.186μ		
	(SKM) iP	04 05 14.9	C	7.V	Tonga Islands Region, NEIS:		
	Z: 1.0^S ; 0.15μ				$18.198^\circ S$, $172.428^\circ W$, $H=15^h 11^m 37.2^S$,		
	NIE $\Delta=76.4^\circ$				$h=33$ km, $MB=5.0$		
	iP	04 05 18	C	KRA	$\Delta=146.7^\circ$		
	Z: 1.1^S ; 0.10μ			(SKM)	eIPKIKP	15 31 18	
	ipP	29.8			Z: 1.6^S ; 0.088μ		
6.V	Kuril Islands Region, NEIS: $46.515^\circ N$,				ei	27	
	$153.981^\circ E$, $H=21^h 37^m 38.4^S$, $h=35$ km, $MB=5.2$;			NIE	$\Delta=147.2^\circ$		
	$MPV=5.5$ (Kraków), 5.3 (Niedzica)			ePKIKP	15 31 18		
					Z: 1.2^S ; 0.016μ		



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
7.V	Kuril Islands, NEIS: $46.770^\circ N$,			8.V	NIE	$\Delta=147.6^\circ$	
	$153.825^\circ E$, $H=15^h 55^m 16.2^S$, $h=33$ km,				eIPKIKP	04 57 14	
	$MB=5.0$; $MPV=5.3$ (Niedzica)				Z: 1.0^S ; 0.011μ		
	KRA $\Delta=75.6^\circ$			8.V	Yugoslavia, EMSC: $43.23^\circ N$,		
	(SKM) eIP	16 07 00			$19.03^\circ E$, $H=10^h 02^m 43.5^S$		
	NIE $\Delta=76.0^\circ$			NIE	$\Delta=6.2^\circ$		
	eIP	16 07 07			iPn	10 04 16.5	
	Z: 1.0^S ; 0.022μ				Z: 0.4^S ; 0.014μ		
7.V	Kuril Islands, NEIS: $47.027^\circ N$,				i	05 37	
	$153.707^\circ E$, $H=16^h 34^m 27.0^S$, $h=16$ km,			8.V	North Atlantic Ridge, NEIS:		
	$MB=5.1$; $MPV=5.2$ (Niedzica)				$13.463^\circ N$, $44.907^\circ W$, $H=15^h 26^m 25.5^S$,		
	NIE $\Delta=75.8^\circ$				$h=33$ km, $MB=4.9$		
	eIP	16 46 14		KRA	$\Delta=63.7^\circ$		
	Z: 0.8^S ; 0.016μ			(SKM)	eP	15 36 56	
7.V	South of Fiji Islands, NEIS:			NIE	$\Delta=64.0^\circ$		
	$25.746^\circ S$, $179.945^\circ E$, $H=18^h 25^m 33.4^S$,				eP	15 37 01	
	$h=450$ km, $MB=5.4$				eipP	15	
	KRA $\Delta=151.2^\circ$			8.V	NIE		
	(SKM) eIPKIKP	18 44 35			iP	20 41 13.4	C
	Z: 0.7^S ; 0.029μ				Z: 0.6^S ; 0.015μ		
	eIPKP ₂	44		8.V	Jan Mayen, EMSC: $71.66^\circ N$, $13.04^\circ W$,		
	NIE $\Delta=151.5^\circ$				$H=21^h 07^m 44.7^S$		
	iPKIKP	18 44 36.5	D	KRA	$\Delta=26.3^\circ$		
	Z: 1.1^S ; 0.043μ			(SKM)	eP	21 13 19	
	eIPKP ₂	44.6		NIE	$\Delta=27.0^\circ$		
7.V	Tonga Islands Region, NEIS: $17.986^\circ S$,				eIP	21 13 25.6	C
	$172.592^\circ W$, $H=19^h 35^m 32.2^S$, $h=33$ km,				i	45	
	$MB=5.0$			9.V	Easter Island Cordillera, NEIS:		
	KRA $\Delta=146.5^\circ$				$49.806^\circ S$, $114.478^\circ W$, $H=10^h 25^m 54.2^S$,		
	(SKM) eIPKP	19 55 12			$h=33$ km, $MB=5.2$		
	Z: 1.5^S ; 0.061μ			NIE	$\Delta=151.0^\circ$		
	NIE $\Delta=146.9^\circ$				eIPKIKP	10 45 44	
	ePKP	19 55 12			Z: 0.9^S ; 0.019μ		
8.V	Samoa Islands Region, NEIS: $16.419^\circ S$,			KRA	$\Delta=151.0^\circ$		
	$172.642^\circ W$, $H=23^h 56^m 45.6^S$, $h=62$ km, $MB=4.4$			(SKM)	iPKP ₂	10 45 53.9	
	KRA $\Delta=144.9^\circ$			9.V	East China Sea, NEIS: $27.130^\circ N$,		
	(SKM) ePKP	00 16 17			$126.752^\circ E$, $H=15^h 02^m 44.6^S$, $h=109$ km,		
	NIE $\Delta=145.4^\circ$				$MB=5.4$		
	ePKP	00 16 19		KRA	$\Delta=79.6^\circ$		
8.V	Tonga Islands, NEIS: $19.647^\circ S$,			(SKM)	eP	15 14 41	
	$175.934^\circ W$, $H=04^h 37^m 31.5^S$, $h=33$ km, $MB=5.0$				eisP	15 20	
	KRA $\Delta=147.1^\circ$			NIE	$\Delta=79.7^\circ$		
	(SKM) eIPKP	04 57 12			iP	15 14 42	D
					Z: 1.1^S ; 0.028μ		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
10.V	Halmahera, NEIS: 01.111°S, 127.389°E, H=22 ^h 32 ^m 08.9 ^s , h=12 km, MB=5.2			12.V	NIR	Δ=87.5°	
	NIR Δ=101.9°				eP		08 22 39
	1P 22 46 05				i		45.4
11.V	New Britain Region, NEIS: 7.685°S, 151.203°E, H=23 ^h 53 ^m 19.6 ^s , h=25 km, MB=5.3				Pm		46.5
	NIR Δ=121.6°				Z: 0.9 ^s ; 0.042μ		
	e1FKIKP 00 12 14			12.V	KRA		
	1 38			(SKM)	eP		08 54 30
11.V	Molucca Passage, NEIS: 02.000°N, 126.682°E, H=03 ^h 22 ^m 25.2 ^s , h=77 km, MB=5.7			12.V	KRA		
	NIR Δ=99.2°			(SKM)	eP		10 24 12
	eP 03 36 07			12.V	China, NEIS: 39.266°N, 117.708°E, H=11 ^h 17 ^m 53.1 ^s , h=22 km, MB=5.8; MPV=6.4 (Kraków, Niedzica), MLH=6.4 (Kraków), MLV=6.3 (Warszawa)		
	Z: 0.9 ^s ; 0.013μ				WAR Δ=63.8°		
11.V	South of Fiji Islands, NEIS: 23.372°S, 179.961°E, H=14 ^h 00 ^m 03.9 ^s , h=545 km, MB=4.6			(SKD)	e1P		11 28 33
	KRA Δ=149.1°				e1		30 04
	(SKM) 1PKIKP 14 18 51.3 D				e1S		36 59
	Z: 0.9 ^s ; 0.037μ				Lm		52 42
11.V	Western Iran, NEIS: 33.225°N, 46.001°E, H=23 ^h 46 ^m 16.7 ^s , h=33 km, MB=4.8; MPV=5.2 (Kraków), 5.1 (Niedzica)				NE: 14 ^s , 12 ^s ; 21μ, 15μ		
	NIR Δ=26.1°				Lm		56 53
	eP 23 51 50				Z: 12 ^s , 11μ		
	Z: 0.9 ^s ; 0.037μ				KRA Δ=65.5°		
	KRA Δ=26.7°			(SKM)	1P		11 28 36.1 D
	(SKM) e1P 23 51 54				Pm		38.0
	Z: 1.0 ^s ; 0.048μ				Z: 1.1 ^s ; 0.34μ		
	1 56.4				e1S		49
12.V	KRA				e1PcP		29 05
(SKM)	eP		00 32 05		(SKD) e1S		37 21
NIR					Lm		53.9
eP			00 32 05		NFZ: 15 ^s ; 19.3μ, 11.2μ, 6.9μ		
12.V	Mindanao, Philippine Islands, NEIS: 13.032°N, 121.711°E, H=08 ^h 09 ^m 52.9 ^s , h=33 km, MB=5.4; MPV=5.6 (Niedzica), MLH=5.7 (Kraków)			NIR	Δ=65.7°		
	KRA Δ=87.5				1P		11 28 38 D
(SKM)	e1P		08 22 38		Z: 0.9 ^s ; 0.29μ		
(SKD)	eS		33 19		1PcP		29 09
Lm			57.8	12.V	Burma, NEIS: 21.747°N, 92.990°E, H=12 ^h 20 ^m 00.7 ^s , h=40 km, MB=5.4; MPV=5.7 (Niedzica), 5.5 (Kraków), MLV=5.8 (Warszawa)		
NBZ: 25.0 ^s ; 3.3μ, 0.9μ, 1.4μ					NIR Δ=62.6°		
					e1P		12 30 23 D
					Pm		25.8
					Z: 1.0 ^s ; 0.063μ		
					1P		29 09
					1PcP		29 09
					1S		41.8

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
12.V	Burma - continuation			12.V	NIR	Pm	21 48 56
	KRA Δ=62.8°				Z: 1.1 ^s ; 0.054μ		
(SKM)	e1P		12 30 24		1		49 02.5
	Z: 1.5 ^s ; 0.060μ				RAC Δ=73.5°		
	e1P		37		eP		21 48 54
(GW)	e1S		38 43	13.V	Honshu, Japan. NEIS: 38.286°N, 141.929°E, H=01 ^h 26 ^m 43.0 ^s , h=50 km, MB=4.9; MPV=5.6 (Kraków)		
	e1SKS		40 14		KRA Δ=78.3°		
WAR	Δ=62.1°			(SKM)	e1P		01 38 39 D
(SKD)	e1S		12 38 37		Z: 0.9 ^s ; 0.042μ		
	Lm		13 00 56		NIR Δ=78.6°		
	Z: 7.3μ, 20 ^s				eP		01 38 41
12.V	KRA				Pm		42
(SKM)	e1P		14 02 37		Z: 0.9 ^s ; 0.017μ		
12.V	Philippine Islands, NEIS: 16.003°N, 121.150°E, H=14 ^h 00 ^m 57.0 ^s , h=16 km, MB=5.0; MPV=5.6 (Kraków, Niedzica), MLH=5.8 (Kraków)			13.V	Philippine Islands, NEIS: 13.014°N, 121.688°E, H=02 ^h 15 ^m 55.1 ^s , h=39 km, MB=5.2		
	KRA Δ=84.9°				KRA Δ=87.5°		
(SKM)	e1P		14 13 32		(SKM) eP		02 28 38
	Z: 0.9 ^s ; 0.042μ			13.V	Bonin Islands Region, Moscow: 28.4°N, 139.5°E, H=11 ^h 13 ^m 29 ^s , h=430 km, MPV(SKM)=6.0		
	e1PcP		39		WAR Δ=83.4°		
	ePP		16 43		(SKD) 1P		11 25 13 D
(SKD)	ePPP		18 27		e1PP		27 37
	eS		23 59		e1S		34 54
	Lm		46.7		e1		37 48
	NE: 25.0 ^s ; 4.7μ, 3.4μ				NIR Δ=85.5°		
	Lm		51.5		e1P		11 25 23 D
	Z: 25.0 ^s ; 2.3μ				Z: 0.9 ^s ; 0.22μ		
NIR	Δ=84.9°				RAC Δ=86.1°		
1P			14 13 33		(SK) e1P		11 25 27
Pm			40		KRA Δ=85.3°		
Z: 1.5 ^s ; 0.075μ				(SKM)	e1P		11 25 22 D
1			55		Z: 1.4 ^s ; 0.58μ		
12.V	KRA				1		29.1
(SKM)	e1P		14 44 14		(SKD) 1P		27 02
	Z: 0.7 ^s ; 0.041μ				e1S		50
12.V	Kuril Islands, NEIS: 50.161°N, 154.987°E, H=21 ^h 37 ^m 33.4 ^s , h=126 km, MB=5.3				e1PP		28 44
	KRA Δ=73.0°				1S		35 12
(SKM)	1P		21 48 51	13.V	KRA		
	Z: 1.1 ^s ; 0.076μ			(SKM)	1P		11 29 22.6 C
1			59.7		Z: 1.2 ^s ; 0.11μ		
NIR	Δ=73.5°			(GW)	e1		38 09
e1P			21 48 53				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
13.V	KRA (SKM)	eP	11 54 05	14.V	KRA (SKM)	eP	16 05 48
		Z: 1.7 ^S ; 0.14 μ		14.V	KRA (SKM)	eP	19 53 48
13.V	Aegean Sea, EMSC: 39.12 ^o N, 23.62 ^o E, H=16 ^h 17 ^m 48.0 ^s , MLH=5.0 (Kraków), 4.9 (Warszawa)			14.V	Hokkaido, Japan, NEIS: 41.112 ^o N, 143.695 ^o E, H=21 ^h 28 ^m 33.5 ^s , h=26 km, MB=4.8; MPV=5.4 (Kraków)		
	NIE	$\Delta=10.6^{\circ}$	18 20 18.9 D		KRA	$\Delta=76.8^{\circ}$	
		Z: 0.9 ^S ; 0.040 μ			(SKM)	eIP	21 40 24
	KRA	$\Delta=11.2^{\circ}$	18 20 28			Z: 0.7 ^S ; 0.025 μ	
	(SKM)	eP	18 20 28		NIE	$\Delta=77.0^{\circ}$	21 40 27
		Z: 1.2 ^S ; 0.079 μ				eIP	21 40 27
		eI	21 15	14.V	Turkey, EMSC: 38.66 ^o N, 39.92 ^o E, H=21 ^h 43 ^m 41.5 ^s		
		Lm	27.0		KRA	$\Delta=18.2^{\circ}$	
		N: 10.0 ^S ; 2.9 μ			(SKM)	eP	21 47 52
		Lm	27.1	15.V	Kuril Islands, NEIS: 49.589 ^o N, 152.907 ^o E, H=00 ^h 20 ^m 59.6 ^s , h=221 km, MB=5.0		
		EZ: 10.0 ^S ; 3.6 μ , 0.7 μ			KRA	$\Delta=72.9^{\circ}$	
	WAR	$\Delta=13.2^{\circ}$	18 23 25		(SKM)	eIP	00 32 05
	(SKD)	eIS	18 23 25			eIP	33 00
		Lm	29 30		NIE	$\Delta=73.3^{\circ}$	00 32 08
		Z: 16 ^S ; 8 μ				eP	00 32 08
13.V	KRA		18 46 56			Pm	10.8
	(SKM)	eP	18 46 56			Z: 0.8 ^S ; 0.012 μ	
13.V	South of Fiji Islands, NEIS: 22.423 ^o S, 179.640 ^o W, H=19 ^h 42 ^m 07.8 ^s , h=627 km, MB=4.8					iPKIP	24.3
	KRA	$\Delta=148.4^{\circ}$	20 00 46	15.V	NIE		00 33 04.1
	(SKM)	ePKIKP	20 00 46			Z: 0.9 ^S ; 0.018 μ	
		Z: 1.3 ^S ; 0.059 μ				i	11.6
		ePKP ₂	51	15.V	Aleutian Islands, NEIS: 52 446 ^o N, 168.025 ^o W, H=15 ^h 50 ^m 47.1 ^s , h=33 km, MB=5.3; MPV=5.6 (Kraków), 5.5 (Niedzica)		
	NIE	$\Delta=148.8^{\circ}$	20 00 48		WAR	$\Delta=75.4^{\circ}$	
		Z: 1.1 ^S ; 0.037 μ			(SKD)	eIP	16 02 28
14.V	Yugoslavia, EMSC: 43.13 ^o N, 16.0 ^o E, H=03 ^h 39 ^m 23.7 ^s				KRA	$\Delta=77.7^{\circ}$	16 02 41
	NIE	$\Delta=7.1^{\circ}$	03 41 04		(SKM)	eP	16 02 41
		ePn	03 41 04			Z: 1.1 ^S ; 0.062 μ	
		i	42 25			i	45.9
	KRA	$\Delta=7.4^{\circ}$	03 41 17	15.V	NIE	$\Delta=78.3^{\circ}$	16 02 46
	(SKM)	eIPn	03 41 17			eP	16 02 46
		iS	42 36.1			Z: 1.2 ^S ; 0.052 μ	
14.V	KRA		06 46 55			iPKIP	58
	(SKM)	eP	06 46 55				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
15.V	NIE		18 57 07	17.V	Panama, NEIS: 7.356 ^o N, 78.034 ^o W, H=14 ^h 15 ^m 21.9 ^s , h=8 km, MB=5.1		
		eIP	18 57 07		KRA	$\Delta=89.5^{\circ}$	
15.V	KRA		22 05 46.7 D		(SKM)	iP	14 28 21.8
	(SKM)	iP	22 05 46.7 D			Z: 1.4 ^S ; 0.073 μ	
		Z: 0.7 ^S ; 0.025 μ		18.V	Philippine Islands, NEIS: 16.724 ^o N, 122.407 ^o E, H=03 ^h 53 ^m 22.9 ^s , h=33 km, MB=4.9; MPV=5.2 (Niedzica)		
	NIE		22 05 50		KRA	$\Delta=85.1^{\circ}$	
		eP	22 05 50		(SKM)	eP	04 05 57
15.V	Fiji Islands Region, NEIS: 19.131 ^o S, 177.672 ^o W, H=23 ^h 12 ^m 53.6 ^s , h=499 km, MB=5.5					i	08 07.4
	KRA	$\Delta=146.1^{\circ}$	23 31 36.4			Z: 0.8 ^S ; 0.046 μ	
	(SKM)	iPKIKP	23 31 36.4		NIE	$\Delta=85.1^{\circ}$	04 05 57
		iPKP ₂	38.1			eIP	04 05 57
		Z: 1.9 ^S ; 0.48 μ				Z: 0.6 ^S ; 0.010 μ	
	WAR	$\Delta=143.9^{\circ}$	23 31 32	18.V	Kamchatka, NEIS: 55.706 ^o N, 160.819 ^o E, H=03 ^h 57 ^m 13.4 ^s , h=158 km, MB=5.1		
	(SKD)	eIPKP	23 31 32		NIE	$\Delta=70.2^{\circ}$	
	NIE	$\Delta=146.5^{\circ}$	23 31 39.8			eIP	04 08 10
		iPKIKP	23 31 39.8			Z: 0.9 ^S ; 0.024 μ	
		Pm	42.5			iPKIP	30
		Z: 1.1 ^S ; 0.14 μ				iPKIP	50
	RAC	$\Delta=146.6^{\circ}$	23 31 40	16.V	Crete, EMSC: 35.53 ^o N, 26.56 ^o E, H=08 ^h 16 ^m 03.9 ^s		
		ePKIKP	23 31 40		NIE	$\Delta=14.6^{\circ}$	
16.V	Crete, EMSC: 35.53 ^o N, 26.56 ^o E, H=08 ^h 16 ^m 03.9 ^s					eP	08 19 32
	NIE	$\Delta=14.6^{\circ}$	08 19 32			i	35
		eP	08 19 32	16.V	KRA		11 55 13
		i	35		(SKM)	eP	11 55 13
16.V	KRA		11 55 13		(SKD)	Lm	12 35.5
	(SKM)	eP	11 55 13			NFZ: 20.0 ^S ; 1.1 μ , 0.5 μ , 1.5 μ	
	(SKD)	Lm	12 35.5	16.V	Iceland Region, EMSC: 63.97 ^o N, 22.68 ^o W, H=16 ^h 47 ^m 45.1 ^s , MLV=4.9 (Kraków)		
		NFZ: 20.0 ^S ; 1.1 μ , 0.5 μ , 1.5 μ			KRA	$\Delta=26.4^{\circ}$	
					(SKM)	eP	16 53 22
						eIPPP	17
					(SKD)	ei	58 12
						Lm	17 04.6
						NZ: 15.0 ^S ; 2.9 μ , 3.0 μ	
	NIE	$\Delta=26.6^{\circ}$	16 53 34	19.V	KRA		20 32 03
		eP	16 53 34		(SKM)	eIP	20 32 03
16.V	NIE		20 48 22	19.V	Southern Iran, NEIS: 27.124 ^o N, 55.319 ^o E, H=22 ^h 58 ^m 30.8 ^s , h=30 km, MB=5.2; MPV=5.1 (Niedzica), 5.9 (Kraków)		
		eP	20 48 22		NIE	$\Delta=34.9^{\circ}$	
						eP	23 05 21 C
						Z: 1.1 ^S ; 0.030 μ	
						i	24
					KRA	$\Delta=35.4^{\circ}$	
					(SKM)	iP	23 05 25.3 C

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
19.V	Southern Iran - continuation			20.V	NIE	$\Delta=87.9^\circ$ eP	23 04 01
	KRA	Z: 1.1 ^S ; 0.19 μ				Z: 1.4 ^S ; 0.072 μ	
	1		23 05 28.4			eipP	10.9
19.V	Iran, EMSC: 27.24 ^o N, 55.32 ^o E, H=23 ^h 04 ^m 59.9 ^s ; MPV=5.2 (Niedzica), 6.0 (Kraków)				KRA	$\Delta=88.3^\circ$ eP	23 04 03 C
	NIE	$\Delta=34.8^\circ$			(SKM)	Z: 1.7 ^S ; 0.19 μ	
	1P		23 11 42.7 C			ipP	17.0
	1	Z: 0.6 ^S ; 0.020 μ	51.5		(SKD)	eipP	07 31
	KRA	$\Delta=35.3^\circ$				e SKS	14 31
	(SKM)	1P	23 11 48.0 C			eS	44
	1	Z: 0.9 ^S ; 0.17 μ		21.V	Philippine Islands, NEIS: 15.699 ^o N, 120.820 ^o E, H=05 ^h 35 ^m 22.5 ^s , h=189 km, MB=5.7		
19.V	KRA				KRA	$\Delta=84.9^\circ$	
(SKM)	eP		23 41 07		(SKM)	1P	05 47 37.8
						Z: 0.8 ^S ; 0.35 μ	
20.V	Iran, EMSC: 27.15 ^o N, 55.22 ^o E, H=12 ^h 25 ^m 24.8 ^s				1		48 27.1
	KRA	$\Delta=35.3^\circ$			(SKD)	e1PP	50 59
	(SKM)	e1P	12 32 15			1SKS	57 44
					Lm		06 21.2
20.V	Fiji Islands Region, NEIS: 20.361 ^o S, 177.742 ^o W, h=533 km, MB=5.0				Lm		25.2
	KRA	$\Delta=147.0^\circ$				NE: 25.0 ^S ; 9.0 μ , 7.3 μ	
	(SKM)	1PKIKP	14 30 36.8			Z: 20.0 ^S ; 4.3 μ	
20.V	Philippine Islands, NEIS: 17.544 ^o N, 120.244 ^o E, H=15 ^h 10 ^m 15.9 ^s , h=76 km, MB=4.5				NIL	$\Delta=84.9^\circ$	
	KRA	$\Delta=83.2^\circ$			1P		05 47 38.5
	(SKM)	eP	15 22 36		WAR	$\Delta=83.6^\circ$	
					(SKD)	1P	05 47 39 D
20.V	Fiji Islands Region, NEIS: 23.867 ^o S, 176.556 ^o W, H=21 ^h 04 ^m 58.0 ^s , h=48 km, MB=4.6				1S		57 33
	KRA	$\Delta=150.9^\circ$		21.V	Bonin Islands Region, NEIS: 27.583 ^o N, 139.997 ^o E, H=13 ^h 40 ^m 55.0 ^s , h=340 km, MB=5.1; MPV=5.7 (Kraków)		
	(SKM)	1PKIKP	21 24 46.7 D		KRA	$\Delta=86.2^\circ$	
		Z: 0.6 ^S ; 0.050 μ			(SKM)	eP	13 52 59
	1PKP ₂		50.0			Z: 1.5 ^S ; 0.086 μ	
	NIF	$\Delta=151.3^\circ$		21.V	KRA		
	1PKHKP		21 24 47.3		(SKM)	e1P	16 41 16.5
	1	Z: 1.1 ^S ; 0.087 μ	54.6			Pm	17.2
	1PKP ₂		25 01			Z: 1.1 ^S ; 0.048 μ	
	1		10.8	22.V	Fiji Islands Region, NEIS: 19.523 ^o S, 177.250 ^o W, H=23 ^h 27 ^m 03.8 ^s , h=350 km, MB=5.2		
20.V	Sumatra, NEIS: 4.444 ^o S, 101.975 ^o E, H=22 ^h 51 ^m 13.9 ^s , h=37 km, MB=5.7; MPV=5.7 (Niedzica), 6.0 (Kraków)				KRA	$\Delta=146.6^\circ$	
					(SKM)	e1PKIKP	23 46 05 C
						Z: 0.9 ^S ; 0.053 μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
22.V	Fiji Islands - continuation			24.V	KRA	eP	13 06 05
	NIE	$\Delta=147.0^\circ$			(SKM)	Z: 1.1 ^S ; 0.055 μ	
	1PKIKP		23 46 07.5 C	25.V	Iran, EMSC: 34.85 ^o N, 52.05 ^o E, H=11 ^h 01 ^m 50.5 ^s ; MPV=5.0 (Niedzica), 5.4 (Kraków)		
	1PKIKP		11		NIF	$\Delta=27.4^\circ$	
23.V	Sumatra, NEIS: 0.665 ^o N, 98.676 ^o E, H=21 ^h 55 ^m 54.1 ^s , h=40 km, MB=5.5; MPV=5.8 (Kraków)				e1P		11 07 32
	KRA	$\Delta=82.3^\circ$			1	Z: 1.1 ^S ; 0.035 μ	51.4
	(SKM)	1P	22 08 13 C		KRA	$\Delta=27.9^\circ$	
		Z: 0.7 ^S ; 0.062 μ			(SKM)	1P	11 07 35.5
	(GW)	e1S	18 21			Z: 0.8 ^S ; 0.060 μ	
24.V	Volcano Islands Region, NEIS: 25.47 ^o N, 142.512 ^o E, H=07 ^h 46 ^m 13.5 ^s , h=9 km, MB=5.7; MPV=5.7 (Niedzica)			25.V	Fiji Islands Region, NEIS: 17.859 ^o S, 178.619 ^o W, H=12 ^h 10 ^m 01.2 ^s , h=578 km, MB=5.4		
	KRA	$\Delta=89.2^\circ$			NIE	$\Delta=145.0^\circ$	
	(SKM)	e1P	07 59 11		1PKP		12 28 35.5
	NIE	$\Delta=89.5^\circ$			Pm		37
	1P		07 59 13			Z: 0.9 ^S ; 0.055 μ	
		Z: 1.0 ^S ; 0.046 μ			1		57
	1		22.5	25.V	Sumatra, NEIS: 4.237 ^o N, 95.774 ^o E, H=14 ^h 55 ^m 45.0 ^s , h=56 km, MB=5.9; MPV=6.3 (Niedzica), 6.2 (Kraków), MLH=5.8 (Kraków)		
24.V	Mariana Islands, NEIS: 18.814 ^o N, 145.352 ^o E, H=10 ^h 23 ^m 23.4 ^s , h=207 km, MB=5.7				NIE	$\Delta=77.3^\circ$	
	KRA	$\Delta=96.2^\circ$			1P		15 07 36
	(SKM)	e1P	10 36 30		Pm		41
	epP		37 34			Z: 1.2 ^S ; 0.31 μ	
	ePP		40 05		1PoP		50
	ei		41 05	WAR	$\Delta=77.3^\circ$		
	(GW)	e1S	46 40		(SKD)	e1P	15 07 37
	Lm		11 13.6			e1S	17 17
		NE: 25.0 ^S ; 5.7 μ , 7.2 μ				e1SKS	49
		1.5 μ			KRA	$\Delta=77.7^\circ$	
	NIF	$\Delta=96.4^\circ$			(SKM)	1P	15 07 37.9
	eP		10 36 31			Z: 1.1 ^S ; 0.23 μ	
	Pm		32.2		ipP		52.5
		Z: 0.9 ^S ; 0.010 μ			(GW)	1S	17 45
	1pP		37 30		(SKD)	Lm	43.9
24.V	Iran, EMSC: 27.09 ^o N, 50.35 ^o E, H=12 ^h 43 ^m 31.5 ^s				Lm		45.4
	KRA	$\Delta=35.4^\circ$				F: 26.0 ^S ; 5.1 μ	
	(SKM)	eP	12 50 23	25.V	Nevada, NEIS: 37.094 ^o N, 116.045 ^o W, H=17 ^h 00 ^m 00.1 ^s , h=0 km, MB=5.3; MPV=5.7 (Kraków), 5.6 (Niedzica)		
24.V	Iran, EMSC: 27.21 ^o N, 55.47 ^o E, H=12 ^h 59 ^m 16.9 ^s ; MPV=5.6 (Kraków)						
	KRA	$\Delta=35.4^\circ$					



Date	Station	Phase	T.U. h m s
25.V	Nevada - continuation		
	KRA	$\Delta=84.9^\circ$	
	(SKM)	1P	17 12 37.4
		Z: 1.5^S ; 0.086μ	
	NIE	$\Delta=85.6^\circ$	
	(SKM)	1P	17 12 41
		Z: 1.2^S ; 0.052μ	
26.V	Turkey, EMSC: $38.92^\circ N$, $44.41^\circ E$, $H=01^h 35^m 18.2^s$; MPV=5.5 (Niedzica), 4.7 (Kraków), MLH=4.8 (Kraków), MLV=5.4 (Warszawa)		
	NIE	$\Delta=20.1^\circ$	
	(SKM)	e1P	01 39 47
		Z: 1.8^S ; 0.58μ	
		1	53.5
		1	40 03.8
		1	07.5
	KRA	$\Delta=20.6^\circ$	
	(SKM)	eP	01 39 50
		Z: 1.4^S ; 0.073μ	
	(GW)	e1S	43 39
	(SKD)	Lm	50.1
		NEZ: 25.0^S ; 6.9μ , 9.6μ , 12μ	
	WAR	$\Delta=21.0^\circ$	
	(SKD)	e1P	01 39 (53)
		1S	43 49
		Lm	48 41
		Z: 18^S ; 18μ	
	RAC	$\Delta=21.7^\circ$	
	(SK)	eP	01 39 55
26.V	Turkey, EMSC: $38.93^\circ N$, $44.48^\circ E$, $H=09^h 50^m 28.3^s$; MPV=4.6 (Niedzica)		
	NIE	$\Delta=20.2^\circ$	
	(SKM)	1P	09 54 57.5
		Z: 1.0^S ; 0.044μ	
		1	55 16
	KRA	$\Delta=20.6^\circ$	
	(SKM)	eP	09 54 59
26.V	Iran, EMSC: $27.64^\circ N$, $56.44^\circ E$, $H=22^h 39^m 33.6^s$		
	KRA	$\Delta=35.7^\circ$	
	(SKM)	eP	22 46 25

Date	Station	Phase	T.U. h m s
27.V	Pamir, Moscow: $38.0^\circ N$, $72.1^\circ E$, $H=02^h 32^m 27^s$, $h=100$ km; MPV(SKM)=5.1 (Moscow)		
	NIE	$\Delta=38.4^\circ$	
	(SKM)	1P	02 39 41
		Z: 0.9^S ; 0.035μ	
		e1	40 17
	KRA	$\Delta=38.6^\circ$	
	(SKM)	1P	02 39 42.0
		Z: 0.7^S ; 0.033μ	
		e1	41 17
27.V	KRA		
	(SKM)	eP	05 23 13
		Z: 1.1^S ; 0.040μ	
27.V	NIE		
	(SKM)	eP	10 24 37
		Z: 0.9^S ; 0.011μ	
27.V	Crete, EMSC: $35.27^\circ N$, $26.64^\circ E$, $H=22^h 31^m 52.4^s$		
	NIE	$\Delta=14.9^\circ$	
	(SKM)	eP	22 35 23
	KRA	$\Delta=15.6^\circ$	
	(SKM)	eP	22 35 26
		Z: 1.0^S ; 0.036μ	
		e1	58
27.V	Solomon Islands, NFIS: $9.405^\circ S$, $159.024^\circ E$, $h=33$ km, MB=5.3		
	NIE	$\Delta=127.4^\circ$	
	(SKM)	1P	23 17 18
		Z: 1.0^S ; 0.013μ	
		1	23
28.V	KRA		
	(SKM)	e1P	00 39 25
28.V	Sulawesi, NEIS: $01.732^\circ S$, $120.520^\circ E$, $H=05^h 51^m 48.1^s$, $h=54$ km, MB=5.9		
	WAR	$\Delta=97.2^\circ$	
	(SKD)	eP	06 05 27
	(GW)	e1PP	09 25
		Lm	49 52
		Z: 24^S ; 6.5μ	
	KRA	$\Delta=98.1^\circ$	
	(SKM)	eP	06 05 34
		Z: 1.8^S ; 0.12μ	
		esP	49

Date	Station	Phase	T.U. h m s
28.V	Sulawesi - continuation		
	KRA	e1PP	06 09 30
		e1PPPP	13 08
	(SKD)	Lm	49.4
		NEZ: 25.0^S ; 48μ , 39μ , 18μ	
29.V	KRA		
	(SKM)	1P	02 30 07.8
		Z: 0.8^S ; 0.023μ	
		1	24.2
29.V	Kazakh SSR, NEIS: $49.944^\circ N$, $78.846^\circ E$, $H=02^h 56^m 57.8^s$, $h=0$ km, MB=5.6; MPV=6.4 (Niedzica)		
	KRA	$\Delta=37.0^\circ$	
	(SKM)	1P	03 04 09.9
		Z: 1.0^S ; 0.048μ	
		1	42.7
	NIE	$\Delta=37.0^\circ$	
	(SKM)	1P	03 04 11
		Z: 0.9^S ; 0.44μ	
		1	30
29.V	New Zealand, Moscow: $34.5^\circ S$, $178.3^\circ E$, $H=03^h 20^m 33^s$, M=5.2		
	KRA	$\Delta=157.8^\circ$	
	(SKM)	ePKIKP	03 40 16
		Z: 1.0^S ; 0.024μ	
29.V	Izores Islands Region, EMSC: $40.39^\circ N$, $29.78^\circ W$, $H=16^h 37^m 20.4^s$		
	KRA	$\Delta=35.7^\circ$	
	(SKM)	e1P	16 44 19
		Z: 0.9^S ; 0.032μ	
		e1	24
	NIE	$\Delta=35.2^\circ$	
	(SKM)	1P	16 44 22
		Z: 1.0^S ; 0.013μ	
30.V	Honshu, Japan, NFIS: $36.689^\circ N$, $138.378^\circ E$, $H=00^h 23^m 28.7^s$, $h=7$ km, MB=5.0		
	KRA	$\Delta=78.0^\circ$	
	(SKM)	e1P	00 35 29
30.V	NIE	$\Delta=78.2^\circ$	
	(SKM)	eP	00 35 30
30.V	KRA		
	(SKM)	1P	08 39 51.8
		Z: 1.0^S ; 0.030μ	
30.V	Aleutian Islands, NEIS: $52.428^\circ N$, $169.707^\circ W$, $H=15^h 16^m 01.6^s$, $h=33$ km, MB=5.6; MPV=5.8 (Kraków), MLH=6.5 (Kraków), MLV=6.0 (Warszawa)		
	WAR	$\Delta=75.3^\circ$	
	(SKD)	e1P	15 27 41
		e1S	37 27
		Lm	16 03 32
		NEZ: 20^S ; 6.4μ , 7.7μ , 8.0μ	
	KRA	$\Delta=77.6^\circ$	
	(SKM)	e1P	15 27 55
		Z: 0.9^S ; 0.079μ	
		1	28 00.7
	(SKP)	eS	37 53
		eSS	42 55
		Lm	16 03.6
		NEZ: 15.0^S ; 6.7μ , 9.0μ	
		Lm	04.4
		E: 16.0^S ; 3.5μ	
	RAC	$\Delta=77.6^\circ$	
	(SK)	eP	15 27 55
	NIE	78.2°	
	(SKM)	1P	15 27 59.2
31.V	Hindu-Kush, NFIS: $36.242^\circ N$, $69.559^\circ E$, $H=07^h 38^m 23.5^s$, $h=139$ km, MB=4.7		
	KRA	$\Delta=38.0^\circ$	
	(SKM)	1P	07 45 30.0
		Z: 0.7^S ; 0.029μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
1977				JUNE			
1.VI Tonga Islands, NFIS: 21.193°S, 174.369°W, H=08 ^h 57 ^m 30.9 ^s , h=33 km, MB=5.2				1.VI NIF Δ=87.1° eIP 22 39 39 Z: 1.0 ^s ; 0.018μ			
WAR Δ=146.8° (SKD) eIPKIKP 09 17 13				KRA Δ=87.2° (SKM) eP 22 39 40 Z: 0.7 ^s ; 0.029μ			
NIF Δ=149.5° ePKIKP 09 17 19 Z: 1.4 ^s ; 0.040μ				ei 52			
1.VI Turkey, FMSC: 36.06°N, 31.72°E, H=12 ^h 54 ^m 42.9 ^s , MLH=5.1 (Kraków)				2.VI Tonga Islands, NFIS: 18.887°S, 174.809°W, H=11 ^h 17 ^m 20.1 ^s , h=187 km, MB=4.7			
NIF Δ=15.7° eP 12 58 24 Z: 2.1 ^s ; 1.4μ				NIF Δ=147.2° IPKIKP 11 36 38.5 Z: 0.9 ^s ; 0.011μ			
KRA Δ=16.1° (SKM) eP 12 58 32 Pm 36 (SKD) IS 13 01 32 Lm 04.5 NFZ: 24 ^s ; 9.9μ, 14μ, 7.1μ				2.VI Germany, FMSC: 53.02°N, 9.57°E, H=13 ^h 32 ^m 18.4 ^s			
RAC Δ=16.8° (SK) eIPn 12 58 49				NIF Δ=7.6° eP 13 34 18 i(S) 36 40.5			
WAR Δ=17.6° (SKD) IP 12 58 49 i(S) 13 02 11 Lm 08 53 Z: 8 ^s ; 43μ				2.VI Iceland, G3.56°N, 19.29°W, H=14 ^h 55 ^m 33.9 ^s , MPV=5.2 (Kraków), 4.7 (Niedzica), MLH=5.2 (Kraków), 5.5 (Warszawa)			
1.VI KRA (SKM) IP 13 06 54.2 Z: 1.4 ^s ; 0.14μ				WAR Δ=23.8° (SKD) eIP 15 00 45 eIS 05 04 Lm 10 28 NF: 16 ^s ; 7.5μ, 11μ			
1.VI Philippine Islands, NFIS: 13.792°N, 122.222°E, H=22 ^h 23 ^m 38.1 ^s , h=46 km, MB=4.8; MPV=5.3 (Niedzica), 5.5 (Kraków)				KRA Δ=24.9° (SKM) eIP 15 00 55 Z: 1.4 ^s ; 0.094μ			
NIE Δ=87.2° eIP 22 36 20 Z: 1.0 ^s ; 0.022μ				(GW) eS 05 38 Lm 12.8 NFZ: 15.0 ^s ; 4.1μ, 7.3μ, 1.1μ			
KRA Δ=87.5° (SKM) eP 22 36 22 Z: 1.2 ^s ; 0.047μ				NIF Δ=25.5° eP 15 01 00 Z: 1.1 ^s ; 0.022μ			
1.VI Philippine Islands, NFIS: 13.943°N, 122.262°E, H=22 ^h 26 ^m 57.8 ^s , h=56 km, MB=4.9; MPV=5.2 (Niedzica), 5.6 (Kraków)				2.VI Dodecanese Islands, FMSC: 35.32°N, 27.86°E, H=17 ^h 20 ^m 24.7 ^s			
				KRA Δ=15.9° (SKM) eP 17 24 06 Z: 1.3 ^s ; 0.045μ			

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
2.VI Dodecanese Islands, FMSC: 35.14°N, 27.75°E, H=19 ^h 08 ^m 30.3 ^s				3.VI KRA Δ=38.7° (SKM) IP 02 38 09.8 C Z: 0.9 ^s ; 0.316μ			
KRA Δ=16.0° (SKM) eP 19 12 22 e 14 58				(GW) 1 39 45 eIS 43 52			
2.VI North Atlantic Ocean, NFIS: 54.234°N, 35.177°W, H=19 ^h 36 ^m 56.4 ^s , h=33 km, MB=4.4				NAC Δ=39.8° (SK) eP 02 38 20			
NIE Δ=33.9° IP 19 43 36.5				3.VI Uzbek SSR, NFIS: 40.262°N, 63.294°E, H=04 ^h 11 ^m 10.1 ^s , h=33 km, MB=4.7; MPV=4.7 (Niedzica)			
3.VI Tadzhik SSR, NFIS: 39.874°N, 71.786°E, H=01 ^h 05 ^m 23.7 ^s , h=24 km, MB=5.1; MPV=5.6 (Niedzica), 5.4 (Kraków), MLH=5.2 (Kraków)				NIE Δ=31.4° eIP 04 17 30 Z: 0.9 ^s ; 0.011μ			
WAR Δ=36.6° (SKD) eIP 01 12 32 eIS 18 09				3.VI NIF IP 12 09 27.8 Z: 0.8 ^s ; 0.022μ 1 46			
NIW Δ=37.2° IP 01 12 34 Z: 0.9 ^s ; 0.017μ 1 44.2				KRA (SKM) eP 12 09 32 Z: 0.7 ^s ; 0.062μ 1 46.2 1 54.9			
KRA Δ=37.4° (SKM) IP 01 12 35.9 C Z: 0.8 ^s ; 0.041μ				3.VI Fiji Islands Region, NFIS: 18.940°S, 177.633°W, H=14 ^h 33 ^m 07.0 ^s , h=573 km, MB=5.3			
(GW) eIP 14 03 Lm 28.3 NF: 9.0 ^s ; 1.5μ, 1.4μ				KRA Δ=145.9° (SKM) ePKP 14 51 43 Z: 0.7 ^s ; 0.049μ 1 46.1			
3.VI Kamchatka, NFIS: 52.147°N, 159.053°E, H=02 ^h 21 ^m 36.8 ^s , h=33 km, MB=4.7; MPV=4.9 (Niedzica)				3.VI New Hebrides Islands, NFIS: 14.149°S, 166.560°S, H=15 ^h 17 ^m 25.1 ^s , h=38 km, MB=5.4			
NIF Δ=73.1° IP 02 33 02.3 Z: 0.9 ^s ; 0.010μ				KRA Δ=143.8° (SKM) ePKIKP 15 35 54 eI 38 22 (SKD) Lm 16 35.6 NZ: 25.0 ^s ; 1.3μ, 1.4μ			
3.VI Hindu Kush Region, NFIS: 36.436°N, 70.762°E, H=02 ^h 31 ^m 04.7 ^s , h=210 km, MB=5.5				3.VI NIE IP 21 06 52.8 Z: 0.9 ^s ; 0.010μ			
WAR Δ=38.1° (SKD) IP 02 38 05 C eIP 39 35 IS 43 41 eI 44 52				3.VI Honshu, Japan, NFIS: 40.524°N, 145.308°E, H=22 ^h 50 ^m 01.5 ^s , h=33 km, MB=5.0; MPV=5.7 (Kraków)			
NIF Δ=38.4° IP 02 38 07.2 C Lm 09.2 Z: 1.4 ^s ; 0.577μ 1 15 1 22.5							

Date	Station	Phase	T.U. h m s
6.VI	Fiji Islands - continuation		
	NIF $\Delta=145.2^\circ$		
	1PKP		20 10 30 C
	Z: 0.6^S ; 0.023μ		
8.VI	South of Fiji Islands, NFIS: $22.101^\circ S$, $176.954^\circ W$, $H=14^h 05^m 39.3^S$, $h=226$ km, MB=5.2		
	KRA $\Delta=149.1^\circ$		
	(SKM) e1PKIKP		14 25 02 D
	Z: 0.8^S ; 0.049μ		
	NIE $\Delta=149.5^\circ$		
	1PKIKP		14 25 03.5
	Z: 1.6^S ; 0.128μ		
	1PKP ₂		13.0
8.VI	Honshu, Japan, NFIS: $38.539^\circ N$, $141.485^\circ E$, $H=14^h 25^m 46.5^S$, $h=78$ km, MB=5.5; MPV=5.8 (Kraków), 5.4 (Niedzica)		
	KRA $\Delta=77.9^\circ$		
	(SKM) e1P		14 37 37 C
	Z: 0.6^S ; 0.043μ		
	e1pP		56
	1sP		38 02.2
	(SKD) e1S		47 22
	NIE $\Delta=78.2^\circ$		
	1P		14 37 38.7
	Z: 0.7^S ; 0.023μ		
	1PcP		50
	1pP		56
8.VI	KRA		
	(SKM) 1P		21 00 26.3
8.VI	Java Sea, NFIS: $5.882^\circ S$, $113.076^\circ E$, $H=21^h 18^m 03.2^S$, $h=636$ km, MB=5.4		
	NIE $\Delta=96.2^\circ$		
	eP		21 30 26 D
	Z: 1.1^S ; 0.022μ		
	KRA $\Delta=96.5^\circ$		
	(SKM) eP		21 30 28
	Z: 1.0^S ; 0.030μ		
	e1PP		34 31
9.VI	NIE		
	e1P		12 15 32
	Z: 0.8^S ; 0.009μ		
10.VI	China, NFIS: $39.611^\circ N$, $117.913^\circ E$, $H=00^h 41^m 00.0^S$, $h=46$ km, MB=5.1; MPV=5.4 (Kraków), 5.2 (Niedzica)		

Date	Station	Phase	T.U. h m s
12.VI	Hokkaido, Japan, NFIS: $42.351^\circ N$, $142.066^\circ E$, $H=08^h 47^m 46.2^S$, $h=108$ km, MB=5.1		
	KRA $\Delta=75.0^\circ$		
	(SKM) eP		08 59 15.2
	Pm		18.0
	Z: 0.7^S ; 0.045μ		
	e1		43
	NIE $\Delta=75.3^\circ$		
	1P		08 59 19 C
	Z: 1.0^S ; 0.033μ		
13.VI	Pakistan, NFIS: $29.838^\circ N$, $67.642^\circ E$, $H=00^h 16^m 46.2^S$, $h=33$ km, MB=4.4; MPV=5.1 (Niedzica)		
	NIE $\Delta=40.6^\circ$		
	e1P		00 24 26
	Z: 1.0^S ; 0.028μ		
13.VI	Tonga Islands, NFIS: $18.525^\circ S$, $174.057^\circ W$, $H=10^h 08^m 48.0^S$, $h=41$ km, MB=5.5		
	WAR $\Delta=144.3^\circ$		
	(SKD) e1PKIKP		10 28 20
	KRA $\Delta=146.6^\circ$		
	(SKM) 1PKHKP		10 28 25.5
	Z: 1.6^S ; 0.220μ		
	(SKD) Lm		11 27.6
	NEZ: 24^S ; 0.8μ , 1.0μ , 1.1μ		
	NIE $\Delta=147.1^\circ$		
	ePKIKP		10 28 28
	Z: 1^S ; 0.069μ		
	1		35.5
13.VI	Philippine Islands, NFIS: $13.309^\circ N$, $124.645^\circ E$, $H=11^h 47^m 41.4^S$, $h=35$ km, MB=5.6; MPV=5.3 (Kraków), 5.1 (Niedzica)		
	WAR $\Delta=87.7^\circ$		
	(GW) e1P		12 00 22
	(SKD) e1SKS		10 56
	KRA $\Delta=89.1^\circ$		
	(SKM) eP		12 00 34
	Z: 0.8^S ; 0.023μ		
	1		40.4
	NIE $\Delta=89.1^\circ$		
	eP		12 00 36
	Z: 1.1^S ; 0.015μ		
	1		42.2
	1pP		46
13.VI	Afghanistan - USSR Border Region, $36.433^\circ N$, $71.299^\circ E$, $H=13^h 40^m 50.3^S$, $h=121$ km, MB=5.0		
	NIE $\Delta=38.8^\circ$		
	1P		13 48 06.2 D
	Z: 1.3^S ; 0.063μ		
	1		27.2
	KRA $\Delta=39.0^\circ$		
	(SKM) 1P		13 48 07.0 D
	Z: 1.4^S ; 0.105μ		
	1pP		33.8
14.VI	Tonga Islands, NFIS: $15.777^\circ S$, $173.935^\circ W$, $H=02^h 00^m 58.1^S$, $h=47$ km, MB=5.0		
	NIE $\Delta=144.5^\circ$		
	ePKP		02 20 29 C
	Z: 1.0^S ; 0.015μ		
14.VI	Tonga Islands, NFIS: $18.015^\circ S$, $175.119^\circ W$, $H=06^h 37^m 09.6^S$, $h=223$ km, MB=5.0		
	KRA $\Delta=145.7^\circ$		
	(SKM) e1PKP		08 58 24
	Z: 0.7^S ; 0.029μ		
14.VI	Taiwan Region, NFIS: $21.054^\circ N$, $122.090^\circ E$, $H=10^h 30^m 41.3^S$, $h=7$ km, MB=4.9; MPV=5.6 (Kraków)		
	KRA $\Delta=81.6^\circ$		
	(SKM) 1P		10 43 01.0
	Z: 1.0^S ; 0.048μ		
	e1FcP		11
14.VI	Mediterranean Sea, NFIS: $33.864^\circ N$, $25.633^\circ E$, $H=20^h 50^m 03.1^S$, $h=33$ km, MB=5.0		
	NIE $\Delta=16.0^\circ$		
	eP		20 59 47
	KRA $\Delta=16.7^\circ$		
	(SKM) 1P		20 59 55.3
	Z: 0.9^S ; 0.032μ		
14.VI	South Atlantic Ridge, NFIS: $14.120^\circ S$, $14.433^\circ W$, $H=21^h 39^m 35.2^S$, $h=33$ km, MB=6.0; MPV=6.0 (Kraków), 5.9 (Niedzica)		
	KRA $\Delta=70.7^\circ$		
	(SKM) eP		21 50 48
	Pm		51.2
	Z: 1.6^S ; 0.250μ		
	(SKD) eS		22 00 05

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14.VI	South Atlantic Ridge- continuation		
	NIE $\Delta=70.3^\circ$	eP	21 50 49 C
			Z: 1.9^S ; 0.20μ
14.VI	North Atlantic Ridge, NEIS: $16.601^\circ N, 46.616^\circ W, H=22^h 32^m 14.4^S, h=33$ km, MB=4.6; MPV=5.5 (Kraków)		
	KRA $\Delta=62.4^\circ$	(SKM) eP	22 42 36
			Z: 1.4^S ; 0.052μ
15.VI	North Atlantic Ridge, NEIS: $16.559^\circ N, 46.555^\circ W, H=23^h 52^m 58.6^S, h=33$ km, MB=5.1		
	KRA $\Delta=62.4^\circ$	(SKM) eP	00 03 21
			Z: 0.8^S ; 0.023μ
		ePcP	04 11
		e	12 43
15.VI	North Atlantic Ridge, NEIS: $16.528^\circ N, 46.605^\circ W, H=23^h 53^m 49.9^S, h=33$ km, MB=5.3		
	NIE $\Delta=62.6^\circ$	eP	00 04 14
			Z: 1.5^S ; 0.066μ
		ei	30
15.VI	Iran, NEIS: $26.756^\circ N, 58.77^\circ E, H=03^h 22^m 53.2^S, h=33$ km, MB=4.8		
	NIE $\Delta=37.2^\circ$	eP	03 30 16 C
			Z: 0.9^S ; 0.011μ
15.VI	China, NEIS: $41.855^\circ N, 83.305^\circ E, H=03^h 23^m 12.6^S, h=39$ km, MB=4.7; MPV=5.2 (Kraków)		
	KRA $\Delta=43.6^\circ$	(SKM) eIP	03 31 15
			Z: 0.7^S ; 0.025μ
16.VI	Rumania, EMSC: $45.85^\circ N, 26.76^\circ E, H=02^h 26^m 10.8^S,$		
	NIE $\Delta=5.6^\circ$	IPn	02 27 32.5
			Z: 1.0^S ; 0.21μ
	KRA $\Delta=6.2^\circ$	(SKM) IPn	02 27 40.1 D
			Z: 0.8^S ; 0.074μ
		(GW) ei	29 08
16.VI	WAR $\Delta=7.4^\circ$	(GW) ei(P)	02 29 04
		ei	54
16.VI	Samoa Islands Region, NEIS: $15.243^\circ S, 172.798^\circ W, H=04^h 17^m 35.7^S, h=33$ km, MB=5.0		
	KRA $\Delta=143.8^\circ$	(SKM) eIPKHKP	04 37 04
		eIPKIKP	11
17.VI	Fiji Islands Region, NEIS: $19.876^\circ S, 179.098^\circ W, H=02^h 29^m 09.8^S, h=690$ km, MB=5.7		
	WAR $\Delta=144.1^\circ$	(GW) IPKHKP	02 47 31
			Z: 10^S ; 26μ
		i	50 10
	KRA $\Delta=146.3^\circ$	(SKM) eIPKIKP	02 47 34
		eIPKHKP	37
			Z: 1.5^S ; 0.64μ
		i	50 13.2
17.VI	NIE	IP	20 59 57.5 D
			Z: 0.5^S ; 0.018μ
18.VI	New Hebrides Islands, NEIS: $15.298^\circ S, 166.120^\circ E, H=01^h 48^m 48.0^S, h=37$ km, MB=5.4		
	NIE $\Delta=136.0^\circ$	ePKIKP	02 08 07
18.VI	Fiji Islands Region, NEIS: $20.288^\circ S, 177.989^\circ W, H=10^h 04^m 08.3^S, h=567$ km, MB=5.0		
	KRA $\Delta=147.0^\circ$	(SKM) IPKIKP	10 22 48.4
18.VI	NIE	IP	10 22 51 D
			Z: 1.0^S ; 0.057μ
18.VI	Hokkaido, Japan, NEIS: $41.873^\circ N, 142.278^\circ E, H=10^h 24^m 02.9^S, h=72$ km, MB=4.7; MPV=5.5 (Kraków), 5.2 (Niedzica)		
	KRA $\Delta=75.5^\circ$	(SKM) eIP	10 35 41
			Z: 1.0^S ; 0.042μ
		eIP	36 02
	NIE $\Delta=75.8^\circ$	eIP	10 35 43 C
			Z: 0.9^S ; 0.018μ



Date	Station	Phase	T.U. h m s
18.VI	Western Caucasus, NEIS: $41.974^\circ N, 43.977^\circ L, H=14^h 32^m 31.2^S, h=33$ km, MB=4.5		
	NIE $\Delta=18.1^\circ$	eP	14 36 41
			Z: 1.6^S ; 0.088μ
	KRA $\Delta=18.5^\circ$	(SKM) eIP	14 36 45
			Z: 1.6^S ; 0.088μ
	WAR $\Delta=18.6^\circ$	(GW) eIP	14 36 46
18.VI	South Atlantic Ridge, NEIS: $13.799^\circ S, 14.182^\circ W, H=18^h 40^m 18.9^S, h=33$ km, MB=4.7		
	KRA $\Delta=70.3^\circ$	(SKM) eP	18 51 30
18.VI	South Atlantic Ridge, NEIS: $13.720^\circ S, 14.606^\circ W, H=20^h 38^m 46.6^S, h=33$ km, MB=5.5		
	KRA $\Delta=70.4^\circ$	(SKM) eP	20 49 53
		eIP	04
	NIE $\Delta=70.0^\circ$	eP	20 49 58
18.VI	Solomon Islands, NEIS: $9.766^\circ S, 159.672^\circ E, H=22^h 10^m 49.6^S, h=11$ km, MB=5.6		
	KRA $\Delta=127.8^\circ$	(SKM) eIPKIKP	22 29 57
		(SKD) eIPP	32 02
		eISS	49 12
	NIE $\Delta=128.0^\circ$	eIPKIKP	22 29 57
			Z: 1.5^S ; 0.066μ
18.VI	South of Fiji Islands, NEIS: $24.206^\circ S, 179.064^\circ E, H=22^h 33^m 56.0^S, h=543$ km, MB=5.2		
	NIE $\Delta=149.8^\circ$	ePKIKP	22 52 40
		IPKHKP	45
			Z: 1.0^S ; 0.037μ
		IPKP ₂	53.8
	KRA $\Delta=149.5^\circ$	(SKM) eIPKHKP	22 52 44
			Z: 1.0^S ; 0.042μ
19.VI	NIE	eP	04 00 32
			Z: 0.7^S ; 0.008μ
		ei	43
19.VI	Samoa Islands Region, NEIS: $16.300^\circ S, 172.137^\circ W, H=07^h 22^m 13.2^S, h=33$ km, MB=4.7		
	KRA $\Delta=144.9^\circ$	(SKM) IPKP	07 41 47.7 C
			Z: 0.8^S ; 0.032μ
19.VI	Celebes Sea, NEIS: $4.652^\circ E, 124.933^\circ E, H=07^h 32^m 13.8^S, h=271$ km, MB=5.7		
	NIE $\Delta=95.9^\circ$	eP	07 45 11
			Z: 1.1^S ; 0.015μ
	KRA $\Delta=96.0^\circ$	(SKM) eIP	07 45 11 D
			Z: 1.0^S ; 0.030μ
		epP	18
	(GW) e(PP)		49 10
		e	55 19
		Lm	09 43.5
			NE: 11^S ; $1.8\mu, 1.7\mu$
19.VI	Kuril Islands, NEIS: $47.150^\circ N, 151.093^\circ E, H=11^h 47^m 23.4^S, h=149$ km, MB=5.6		
	WAR $\Delta=72.2^\circ$	(GW) IP	11 58 32 D
		eIPS	12 08 22
	KRA $\Delta=74.4^\circ$	(SKM) IP	11 58 45.8 D
			Z: 0.9^S ; 0.24μ
		i	52.1
	(GW) ePP		12 01 34
	NIE $\Delta=74.8^\circ$	IP	11 58 48.5 D
			Z: 0.9^S ; 0.22μ
19.VI	North Atlantic Ridge, NEIS: $15.475^\circ N, 46.711^\circ W, H=16^h 17^m 39.2^S, h=33$ km, MB=5.3		
	KRA $\Delta=63.3^\circ$	(SKM) eIP	18 28 07 C
			Z: 1.4^S ; 0.063μ

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
25.VI	China, NEIS: 41.980°N, 89.799°E, H=22 ^h 02 ^m 11.5 ^s , h=26 km, MB=4.9; MPV=5.1 (Niedzica)	KRA (SKM) NIE 1P Z: 0.6 ^s ; 0.011μ	22 10 47 22 10 47.4	27.VI	Fiji Islands Region, NEIS: 24.219°S, 176.883°W, H=14 ^h 11 ^m 46.4 ^s , h=33 km, MB=5.2	KRA (SKM) NIF 1PKIKP 1PKIKP	14 31 37 42.9 14 31 37.5
26.VI	Kuril Islands, NEIS: 45.457°N, 150.729°E, H=00 ^h 10 ^m 58.2 ^s , h=47 km, MB=5.2; MPV=5.5 (Kraków, Niedzica)	KRA (SKM) Z: 1.0 ^s ; 0.036μ eipP	00 22 41 56.7	27.VI	Dodecanese Islands, NEIS: 35.721°N, 27.301°E, H=22 ^h 53 ^m 44.4 ^s , h=33 km, MB=4.2	NIF 1P KRA (SKM) Z: 0.8 ^s ; 0.018μ	22 57 20 16 09 04.8 16 09 03
26.VI	Tonga Islands Region, NEIS: 22.449°S, 175.703°W, H=04 ^h 07 ^m 53.4 ^s , h=33 km, MB=4.7	KRA (SKM) NIF ePKP	04 27 42 04 27 48	27.VI	North Atlantic Ridge, NEIS: 10.630°N, 42.873°W, H=23 ^h 28 ^m 55.8 ^s , h=33 km, MB=4.8	NIF eP KRA (SKM) 1P Z: 1.1 ^s ; 0.041μ	23 39 36 23 39 34.5 40 03
26.VI	Tonga Islands Region, NEIS: 22.702°S, 175.486°W, H=05 ^h 59 ^m 21.2 ^s , h=51 km, MB=5.4	KRA (SKM) Pm Z: 0.9 ^s ; 0.037μ 1PKP ₂ NIF Δ=150.6° e1PKHKP Pm Z: 1.0 ^s ; 0.021μ 1	06 19 07.9 08.4 13.9 06 19 08 08.9 28.5	27.VI	Fiji Islands Region, NEIS: 24.093°S, 177.031°W, H=22 ^h 21 ^m 14.2 ^s , h=33 km, MB=4.5	KRA (SKM) NIF Δ=149.0° ePKIKP ePKHKP Z: 0.6 ^s ; 0.023μ	01 43 17 01 43 19 22
27.VI	Italy, FMSC: 44.34°N, 11.51°E, H=12 ^h 33 ^m 37.2 ^s	KRA (SKM) eP eIS	12 35 47 36 53				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
28.VI	Iran, NEIS: 27.605°N, 58.146°E, H=03 ^h 44 ^m 55.1 ^s , h=46 km, MB=4.9	KRA (SKM) e1P ipP	03 51 49 52 05.3	28.VI	NIE Δ=57.3° 1P Pm Z: 1.1 ^s ; 0.076μ	15 48 24.5 28.5	
28.VI	Tonga Islands, NEIS: 23.505°S, 175.294°W, H=05 ^h 43 ^m 12.5 ^s , h=47 km, MB=4.7	NIF Δ=151.4° e1PKP 1PKP ₂	06 03 03 14.3	28.VI	North Atlantic Ridge, NEIS: 22.650°N, 45.139°W, H=16 ^h 18 ^m 15.2 ^s , h=33 km, MB=5.5; MPV=5.9 (Kraków), 6.1 (Niedzica), MLV=5.5 (Warszawa)	KRA (SKM) eP Z: 1.5 ^s ; 0.15μ 1pP 1 33.3 (GW) e1PP 1S 35 59 NIF Δ=57.3° eP Z: 1.4 ^s ; 0.22μ 1sP 19 WAR Δ=57.9° (GW) e1P 16 28 06 (SKD) e1S 36 12 Lm 47 00 Z: 18 ^s ; 4.1μ	
28.VI	Sicily, FMSC: 38.58°N, 14.71°E, H=07 ^h 12 ^m 50.3 ^s	NIF Δ=11.6° e1P Z: 0.9 ^s ; 0.18μ RAC Δ=11.8° (SK) eP 07 15 30 KRA Δ=12.1° (SKM) 1P Z: 1.0 ^s ; 0.066μ (GW) 1 18 49 WAR Δ=14.3° (GW) 1P 07 16 (00) e1S 18 42	07 15 29 07 15 30 07 15 34.1 18 49 07 16 (00) 18 42	28.VI	Tonga Islands, NEIS: 23.507°S, 175.360°W, h=33 km, MB=4.8	KRA (SKM) ePKP 08 50 23	
28.VI	North Atlantic Ridge, NEIS: 22.562°N, 45.124°W, H=15 ^h 36 ^m 37.0 ^s , h=33 km, MB=5.3; MPV=6.2 (Kraków)	KRA (SKM) e1P Pm Z: 2.5 ^s ; 0.595μ eipP (GW) e1PcP (SKD) 1S 56 22 WAR Δ=57.9° (SKD) e1P 15 48 24 e1S 56 28	49 25 56 22	28.VI	North Atlantic Ridge, NEIS: 22.615°N, 45.111°W, H=19 ^h 18 ^m 35.6 ^s , h=33 km, MB=5.8; MPV=6.4 (Kraków), 7.5 (Niedzica)	KRA (SKM) eP 19 28 20 Pm 25.1 Z: 2.0 ^s ; 0.64μ 1PcP 29 19.1 (SKD) eS 36 23 NIE Δ=57.3° e1P 19 28 23 Z: 2.4 ^s ; 1.4μ 1 31 WAR Δ=57.9° (SKD) e1P 19 28 26 Lm 48 40 Z: 20 ^s ; 5.6μ	
28.VI	North Atlantic Ridge, NEIS: 22.566°N, 45.112°W, H=19 ^h 35 ^m 01.9 ^s , h=33 km, MB=4.9; MPV=5.7 (Kraków), 5.5 (Niedzica)						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
28.VI	North Atlantic Ridge - continuation			29.VI	KRA	Z: 1.1 ^S ; 0.035μ	
	KRA	Δ=57.1°			e1PKP ₂	03 31 41	
	(SKM)	eP	19 44 47		NIF	Δ=151.1°	
		Z: 1.7 ^S ; 0.10μ			ePKIKP	03 31 30	
	1		53.5		Z: 1.2 ^S ; 0.021μ		
	NIF	Δ=57.3°			1PKP ₂	43	
	1P		19 44 50	29.VI	Banda Sea, NFIS: 7.599°S,		
		Z: 1.6 ^S ; 0.053μ			127.654°E, H=07 ^h 24 ^m 24.8 ^s , h=58 km,		
	e		56		MB=6.0		
28.VI	Honshu, Japan, NEIS: 32.718°N,				WAR	Δ=105.9°	
	141.774°E, H=21 ^h 09 ^m 47.0 ^s , h=33, MB=4.9				(SKD)	e1Pd1f	07 38 32
	NIF	Δ=83.1°			e1PP	43 (00)	
	eP		21 22 13	29.VI	Tonga Islands Region, NFIS:		
28.VI	NIE				22.563°S, 175.354°W, H=21 ^h 25 ^m 13.7 ^s ,		
	1P		21 47 55.5		h=33 km, MB=4.9		
		Z: 1.0 ^S ; 0.015μ			NIE	Δ=150.5°	
	e1		48 08		1PKIKP	21 45 05	
28.VI	Molucca Sea, NEIS: 0.061°S,				Z: 1.2 ^S ; 0.021μ		
	125.058°E, H=22 ^h 02 ^m 42.5 ^s , h=33 km, MB=4.8;				ePKP ₂	09	
	MPV=6.0 (Kraków), 5.8 (Niedzica)			30.VI	Philippine Islands, NEIS:		
	KRA	Δ=99.7°			9.871°N, 125.826°E, H=00 ^h 12 ^m 20.3 ^s ,		
	(SKM)	1P	22 16 25.1		h=33 km, MB=5.2		
		Z: 0.9 ^S ; 0.042μ			NIF	Δ=92.2°	
	NIE	Δ=99.4°			e1P	00 25 30	
	e1P		22 16 25		Z: 0.9 ^S ; 0.014μ		
		Z: 1.1 ^S ; 0.032μ		30.VI	Bonin Islands Region, Moscow:		
29.VI	NIE				27.3°N, 140.1°E, H=02 ^h 50 ^m 47 ^s , h=400 km,		
	1P		03 03 13.1		KRA	Δ=86.5°	
		Z: 0.9 ^S ; 0.010μ			(CH)	e1P	03 02 47
	1		21.0		NIE	Δ=86.7°	
29.VI	Kazakh SSR, NFIS: 50.034°N,				eP	03 02 49	
	78.927°E, H=03 ^h 06 ^m 58.0 ^s , h=0 km, MB=5.3;				Z: 1.0 ^S ; 0.013μ		
	MPV=5.7 (Kraków), 6.1 (Niedzica)			30.VI	Chile, NFIS: 19.401°S, 69.527°W,		
	KRA	Δ=37.1°			H=02 ^h 46 ^m 03.8 ^s , h=106 km, MB=5.4		
	(SKM)	1P	03 14 10.7		NIF	Δ=104.4°	
		Z: 0.7 ^S ; 0.078μ			1PP	03 04 15.5	
	NIE	Δ=37.1°		30.VI	NIF		
	1P		03 14 12		1P	03 11 55.5	
		Z: 0.6 ^S ; 0.16μ			Z: 1.2 ^S ; 0.018μ		
	1		25		e1	12 08	
29.VI	Tonga Islands Region, NFIS:			30.VI	Tonga Islands Region, NFIS:		
	23.162°S, 175.199°W, H=03 ^h 11 ^m 39.8 ^s ,				23.778°S, 175.602°W, H=03 ^h 14 ^m 09.4 ^s ,		
	h=38 km, MB=5.2				h=33 km, MB=4.8		
	KRA	Δ=151.0°			KRA	Δ=151.1°	
	(SKM)	e1PKIKP	03 31 29		(CH)	e1PKHKP	03 34 02

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
30.VI	Tonga Islands Region - continuation			30.VI	Sicily, FMSC: 38.42°N, 11.93°E,		
	NIE	Δ=151.5°			H=19 ^h 28 ^m 36.1 ^s ,		
	1PKHKP		03 34 03.9		KRA	Δ=13.0°	
	Z: 1.0 ^S ; 0.017μ				(SKM)	eP	19 31 45
	1PKP ₂		08.3	30.VI	NIE		
30.VI	Tonga Islands, NFIS: 17.440°S,				e1P	21 17 12	
	173.524°W, H=08 ^h 51 ^m 26.1 ^s , h=68 km,				Z: 0.8 ^S ; 0.010		
	MB=5.3			30.VI	Honshu, Japan, NEIS: 40.692°N,		
	KRA	Δ=145.7°			143.553°E, H=22 ^h 25 ^m 47.6 ^s , h=20 km,		
	(SKM)	ePKP	09 11 00		MB=5.0; MPV=5.5 (Kraków), 4.9 (Niedzica)		
	NIE	Δ=146.2°			KRA	Δ=77.0°	
	1PKP		09 11 03.5		(SKM)	e1P	22 37 41
	Z: 0.8 ^S ; 0.013μ				Z: 0.6 ^S ; 0.023μ		
	i		09		NIE	Δ=77.3°	
30.VI	KRA				1P	22 37 43.4	
	(SKM)	eP	17 46 25		Z: 1.0 ^S ; 0.011μ		
	NIE				1PeP	55.5	
	1P		17 46 26				
	Z: 1.1 ^S ; 0.015μ						

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The present Seismological Bulletin contains distant earthquakes recorded by seismological observatories of the Institute of Geophysics, Polish Academy of Sciences. The identification of shocks and interpretation of phases were based on the hypocenter determination given by:

NEIS - U.S. Department of the Interior (Geological Survey),
National Earthquake Information Service, Boulder, USA.

EMSC - European Mediterranean Seismological Centre, Strasbourg.

Moscow - Central Seismological Station "Obninsk", Institute of the Physics of the Earth, USSR Academy of Sciences, Moscow.

Magnitudes of earthquakes were determined from recordings of horizontal and vertical components of surface waves for epicentral distances $\Delta > 5^\circ$ and depths $h < 80$ km, using the IASPEI formula. The magnitude from body waves was determined only from the recordings of vertical component of the P waves for $\Delta > 20^\circ$ and depths $h < 80$ km, using the calibrating function given by Vanek et al. (1962)*. The maximum value of A/T was determined in the interval up to 40 s from the first arrival of the P wave.

The parameters of seismographes of Warszawa, Kraków, Racibórz and Książ station remain unchanged. The frequency responses have been given in the Seismological Bulletin for the period January - March, 1977. Since April 1977 the parameters of seismograph of vertical component of Niedzica station have been changed. The frequency responses of Niedzica station are given in Figure 1 in Seismological Bulletin for the period April - June, 1977.

* Vanek J., Zatopek A., Karnik V., Kondorskaya N.V., Riznichenko Yu.V., Savarenskiy E.F., Solovev S.L., Shebalin N.V., 1962. Standartizatsiya shkaly magnitud, Izv. An SSSR, Ser. Geofiz., 2, 153-158.

Station	Type of seismo-graph	Comp.	Ts [s]	Tg [s]	Ds	Dg	σ^2	Vo	Vm	Tm [s]
Warszawa (WAR) $\varphi = 52^{\circ}14'30''$ N $\lambda = 21^{\circ}01'25''$ E h=110 m	GW	N-S	10.28	12.10	1.08	1.02	0.059	1500	865	4.2-9.0
		E-W	9.68	11.10	0.99	0.98	0.058	1330	820	4.4-9.0
		Z	7.80	11.38	0.50	0.83	0.030	900	855	5.5-9.0
SKD	SKD	N-S	20.3	79.8	1.08	0.47	0.086	535	550	13-32
		E-W	20.4	89.6	1.04	0.50	0.091	513	520	13-32
		Z	21.4	86.5	1.00	0.48	0.104	603	620	14-32.6
Kraków (KRA) $\varphi = 50^{\circ}03'22''$ N $\lambda = 19^{\circ}56'23''$ E h=223 m	Ch	N-S	1.24	0.281	0.497	1.981	0.132	10600	11420	0.17-1.0
		E-W	1.29	0.280	0.530	1.942	0.139	10750	11300	0.15-1.0
		Z	1.46	0.282	0.579	1.984	0.156	10780	11100	0.15-1.0
SKM-3	SKM-3	N-S	1.273	0.580	0.515	0.487	0.0125	21800	23260	0.5-0.75
		E-W	1.280	0.575	0.524	0.469	0.0129	22560	24470	0.5-0.75
		Z	1.445	0.580	0.610	0.486	0.0131	22000	22700	0.5-0.75
GW	GW	N-S	9.70	1.01	0.49	5.00	0.020	1480	1500	0.22-8.0
		E-W	11.10	1.00	0.47	5.00	0.021	1480	1490	0.21-9.0
		Z	10.50	1.01	0.48	5.00	0.025	1010	1020	0.22-8.5
SKD	SKD	N-S	20.0	106.6	1.00	0.50	0.144	600	610	13.5-40
		E-W	20.0	98.2	0.99	0.50	1.149	600	615	13.5-40
		Z	20.0	108.8	1.00	0.50	0.193	690	705	13.5-40

Station	Type of seismo-graph	Comp.	Ts [s]	Tg [s]	Ds	Dg	σ^2	Vo	Vm	Tm [s]
Racibórz (RAC) $\varphi = 50^{\circ}05'00''$ N $\lambda = 18^{\circ}11'39''$ E h=209 m	SK-58	N-S	1.22	1.06	0.50	0.73	0.013	2420	2820	0.75-1.19
		E-W	1.23	1.07	0.57	0.50	0.013	2880	2710	0.75-1.17
		Z	1.12	1.07	0.31	0.40	0.020	3110	5220	0.91-1.16
Mainka (M)	Mainka (M)	N-S	9.0	-	0.36	-	-	87	130	6-9
		E-W	9.0	-	0.38	-	-	86	120	6-9
		Z	2.0	-	0.13	-	-	165	620	1.8-2.2
Niedzica (NIE) $\varphi = 49^{\circ}25'25''$ N $\lambda = 20^{\circ}19'19''$ E h=555 m	SK-58	N-S	1.40	0.266	0.70	3.50	0.054	25000	25100	0.10-0.85
		E-W	1.40	0.293	0.70	3.54	0.051	25150	25280	0.10-0.90
		Z	1.09	0.207	0.70	3.50	0.313	64950	73270	0.20-0.85
Książ (KSP) $\varphi = 50^{\circ}50'6''$ N $\lambda = 16^{\circ}17'6''$ E h=380 m	SU-59	N-S	1.19	0.25	0.50	1.37	0.089	87450	90000	0.15-0.60
		E-W	1.22	0.24	0.62	1.44	0.142	108700	110800	0.15-0.60
		E	1.00	0.21	0.50	1.53	0.171	106300	110700	0.15-0.65

Abbreviations

- Ts - free period of seismometer,
- Tg - free period of galvanometer,
- Ds - attenuation of seismometer,
- Dg - attenuation of galvanometer,
- σ^2 - coupling coefficient,

$$V_0 - \text{static magnification } V_0 = \frac{2A}{10} \sqrt{\frac{K_s}{K_g}} \sqrt{\frac{D_s}{D_g}} \sqrt{\frac{T_g}{T_s}} \sigma^2 ;$$

$$V_0 - \text{static magnification of SKD instruments } V_0 = \frac{2A}{10} \sqrt{\frac{K_s}{K_g}} \sqrt{\frac{D_g}{D_s}} \sqrt{\frac{T_s}{T_g}} \sigma^2$$

Vm - maximum magnification,

Tm - interval of periods for magnification range $V \geq 0.9 V_m$.

RESULTS OF RECORDINGS

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
1977 JULY 1977							
1.VII Afghanistan - USSR Border Region, NEIS: H=14 ^h 44 ^m 10.3 ^s , 36.414°N, 71.111°E, h=257 km, MB=4.7; MPV=5.6 (Kraków, Niedzica)				3.VII Aleutian Islands, NEIS: 52.523°N, 167.479°W, H=12 ^h 55 ^m 41.4 ^s , h=33 km, MB=5.0			
NIE	Δ=38.7°			KRA	Δ=77.8°		
1P	14 51 12.0	C		(SKM)	1P	13 07 35.9	
Z:	1.0 ^s ; 0.092μ			NIE	Δ=78.2°		
1pP	52 04.5			e1P	13 07 40		
KRA	Δ=38.9°			Z:	1.2 ^s ; 0.031μ		
(SKM)	1P	14 51 12.5	C	3.VII Molucca Passage, NEIS: 1.435°N, 126.435°E, H=14 ^h 39 ^m 14.1 ^s , h=51 km, MB=5.9			
Z:	0.9 ^s ; 0.079μ			NIE	Δ=99.3°		
1.VII Kuril Islands, NEIS: H=15 ^h 32 ^m 41.2 ^s , 45.619°, 151.529°E, h=36 km, MB=5.0; MPV=5.8 (Kraków), 5.6 (Niedzica)				e1P	14 52 53		
KRA	Δ=75.9°			Pm	55.6		
(SKM)	1P	15 44 25.6	C	Z:	0.6 ^s ; 0.020μ		
Z:	0.7 ^s ; 0.062μ			1pP	53 10		
1pP	36.5			WAR	Δ=98.3°		
NIE	Δ=76.3°			(GW)	e1P	14 52 51	
e1P	15 44 28	C		e1	56 27		
Z:	0.9 ^s ; 0.047μ			e1SKS	15 03 23		
2.VII Solomon Islands, NEIS: H=00 ^h 55 ^m 09.0 ^s , 9.954°S, 160.535°E, h=16 km, MB=5.7				(SKD)	e1S	04 20	
KRA	Δ=128.5°			KRA	Δ=99.4°		
(SKM)	e1PKIKP	01 14 28		(SKM)	1P	14 52 53.2	D
(SKD)	ePP	17 06		Pm	56.2		
e	18 08			Z:	0.7 ^s ; 0.037μ		
3.VII Southern Iran, NEIS: H=06 ^h 38 ^m 41.4 ^s , 25.179°N, 60.900°E, h=33 km, MB=4.6; MPV=5.4 (Kraków)				(GW)	eSKS	15 03 30	
KRA	Δ=40.1°			4.VII Fiji Islands, NEIS: 18.106°S, 178.214°W, H=07 ^h 15 ^m 02.7 ^s , h=464 km, MB=5.0			
(SKM)	1P	06 46 16.5		KRA	Δ=145.0°		
Z:	0.6 ^s ; 0.031μ			(SKM)	e1PKP	07 33 47	
ePoP	48 30			4.VII Sea of Okhotsk, NEIS: 48.077°N, 146.524°E, H=16 ^h 33 ^m 39.9 ^s , h=457 km, MB=4.6			
				KRA	Δ=72.0°		
				(SKM)	e1P	16 44 17	
				Z:	0.7 ^s ; 0.025μ		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
4.VII Tadzhik SSR, NEIS: 37.361°N, 72.047°E, H=21 ^h 01 ^m 57.5 ^s , h=146 km, MB=5.0				8.VII KRA			
KRA	Δ=39.0°			1PKHKP	11 46 53.7		
(SKM)	e1P	21 09 15		(GW)	e1PKP	49 30	
epP	44			(SKD)	1	50 26	
1sP	10 02.4			WAR	Δ=145.4°		
5.VII Ryukyu Islands, NEIS: 28.811°N, 130.144°E, H=16 ^h 00 ^m 16.9 ^s , h=31 km, MB=5.2; MPV=5.5 (Kraków)				(SKD)	1PKP	11 47 03	
KRA	Δ=80.1°			1	49 23		
(SKM)	1P	16 12 25.9		RAC	Δ=148.2°		
Z:	0.5 ^s ; 0.020μ			(SK)	e1PKP	11 47 13	
6.VII South of Panama, NEIS: 5.278°N, 82.651°W, H=04 ^h 42 ^m 23.6 ^s , h=33 km, MB=5.4; MPV=5.6 (Kraków)				6.VII KRA			
KRA	Δ=94.0°			(SKM)	1P	12 50 09.5	
(SKM)	eP	04 55 42		Pm	10.0		
Z:	1.1 ^s ; 0.035μ			Z:	1.1 ^s ; 0.069μ		
e1pP	56 05			6.VII NIE			
e1PP	59 35			e1P	23 19 46		
(SKD)	e1SKS	05 06 19		1	48.8		
e1PS	08 08			Pm	49.2		
eSS	13 14			Z:	0.8 ^s ; 0.014μ		
Lm	30.5			7.VII Tonga Islands, NEIS: 17.096°S, 147.369°W, H=09 ^h 57 ^m 35.4 ^s , h=153 km, MB=5.1			
NEZ:	25 ^s ; 1.6μ, 3.3μ, 3.7μ			KRA	Δ=145.2°		
WAR	Δ=94.2°			(SKM)	e1PKP	10 16 56	
(SKD)	e1P	04 55 44		Z:	1.0 ^s ; 0.030μ		
6.VII Lake Tanganyika Region, NEIS: 6.181°S, 29.539°E, H=08 ^h 48 ^m 38.2 ^s , h=33 km, MB=5.1; MPV=5.1 (Niedzica)				8.VII Afghanistan - USSR Border Region, NEIS: 36.617°N, 71.151°E, H=05 ^h 25 ^m 27.4 ^s , h=212 km, MB=4.9			
NIE	Δ=56.0°			NIE	Δ=38.6°		
e1P	08 58 15	D		e1P	05 32 32	C	
Z:	1.0 ^s ; 0.017μ			Z:	1.0 ^s ; 0.12μ		
1pP	24.5			KRA	Δ=38.8°		
KRA	Δ=56.6°			(SKM)	1P	05 32 34.0	C
(SKM)	eP	08 58 19		Z:	0.9 ^s ; 0.11μ		
6.VII Fiji Islands Region, NEIS: 21.068°S, 178.574°W, H=11 ^h 28 ^m 31.5 ^s , h=594 km, MB=5.8				e1pP	33 10		
KRA	Δ=147.6°			8.VII Ethiopia, NEIS: 10.940°N, 39.629°E, H=06 ^h 23 ^m 02.4 ^s , h=38 km, MB=5.0			
(SKM)	ePKIKP	11 46 52		NIE	Δ=41.6°		
				1P	06 30 49		
				Pm	52.5		
				Z:	1.0 ^s ; 0.028μ		
				KRA	Δ=42.3°		
				(SKM)	e1P	06 30 54	
				Z:	1.1 ^s ; 0.069μ		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
8.VII	Solomon Islands, NEIS: 5.806°S, 154.579°E, H=08 ^h 48 ^m 04.7 ^s , h=127 km, MB=5.8	NIE	Δ=122.0° 1PKIKP 09 06 44.8 Z: 0.4 ^s ; 0.014μ	9.VII	NIF	Δ=150.5° 1PKIKP 17 03 55.0 1PKHKP 04 00.6 Z: 0.9 ^s ; 0.040μ	
8.VII	NIF	e1P	09 44 19 Z: 1.0 ^s ; 0.011μ	10.VII	Atlantic - Indian Rise, NEIS: 37.930°S, 49.684°E, H=00 ^h 15 ^m 58.8 ^s , h=33 km, MB=5.4; MPV=5.6 (Kraków)	RAC (SK)	Δ=150.5° ePKHKP 17 04 01
8.VII	Ryukyu Islands, NEIS: 23.916°N, 123.543°E, H=17 ^h 59 ^m 23.0 ^s , h=53 km, MB=5.3; MPV=5.6 (Kraków)	KRA (SKM)	Δ=80.2° eP 18 11 30 Z: 1.0 ^s ; 0.048μ e1pP 44 e1sP 52	10.VII	South Sandwich Islands Region, NEIS: 56.115°S, 27.558°W, H=01 ^h 42 ^m 36.5 ^s , h=122 km, MB=6.1	KRA (SKD)	Δ=91.5° e1P 00 29 02 C Z: 0.8 ^s ; 0.028μ
8.VII	East China Sea, NEIS: 28.801°N, 127.782°E, H=22 ^h 13 ^m 15.1 ^s , h=33 km, MB=5.0	KRA (SKM)	Δ=78.9° eP 22 25 09 Lm 23 03.2 NFZ: 14 ^s ; 1.4μ, 1.7μ, 3.8μ	10.VII	Fiji Islands Region, NEIS: 21.820°S, 179.287°W, H=04 ^h 20 ^m 25.5 ^s , h=582 km, MB=5.3	KRA (SKM)	Δ=112.9° ePP 02 02 05 e 11 30 Lm 36.5 FZ: 20 ^s ; 1.1μ, 1.5μ
9.VII	KRA (SKM)	1P	10 27 15.8 Z: 0.6 ^s ; 0.043μ 1 44.8	10.VII	Fiji Islands Region, NEIS: 21.820°S, 179.287°W, H=04 ^h 20 ^m 25.5 ^s , h=582 km, MB=5.3	WAR (SKD)	Δ=115.2° e1PP 02 02 10
9.VII	Banda Sea, NEIS: 7.410°S, 129.737°E, H=13 ^h 28 ^m 32.8 ^s , h=167 km, MB=5.6	KRA (SKM)	Δ=108.3° eP 13 42 43 Z: 1.1 ^s ; 0.035μ	9.VII	KRA (SKM)	Δ=148.0° 1PKP 04 39 05.8 C Pm 08.0 Z: 0.6 ^s ; 0.031μ 1 12.8 1 41 28.8	
9.VII	Tonga Islands, NEIS: 22.455°S, 175.100°W, H=16 ^h 44 ^m 09.4 ^s , h=33 km, MB=5.5	KRA (SKM)	Δ=150.0° ePKIKP 17 03 53 e1PKHKP 58 Z: 1.4 ^s ; 0.084μ 1PKP ₂ 04 04.3	10.VII	Fiji Islands Region, NEIS: 21.917°S, 179.251°W, H=05 ^h 11 ^m 40.8 ^s , h=607 km, MB=5.4	NIE	1PKP 04 39 09.0 Pm 12 Z: 1.0 ^s ; 0.037μ



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
10.VII	NIE	1P	05 32 42.5 Z: 2.0 ^s ; 0.140μ	14.VII	Dodecanese Islands, NEIS: 36.215°N, 27.707°E, H=00 ^h 39 ^m 01.4 ^s , h=33 km, MB=4.1	KRA (SKM)	Δ=14.9° eP 00 42 38
11.VII	Aleutian Islands, NEIS: 51.413°N, 176.312°E, H=09 ^h 38 ^m 32.4 ^s , h=13 km, MB=5.1; MPV=5.6 (Kraków)	KRA (SKM)	Δ=76.9° 1P 09 50 25.8 C Z: 1.0 ^s ; 0.054μ ePcP 41	14.VII	Uzbek SSR, NEIS: 40.316°N, 63.682°E, H=05 ^h 49 ^m 08.7 ^s , h=33 km, MB=5.5; MPV=6.4 (Niedziça), 6.2 (Kraków)	NIE	Δ=31.7° e1P 05 55 31 C Z: 1.5 ^s ; 0.37μ 1 37.5 1 41.5 1 49.8
11.VII	Kuril Islands, NEIS: 48.028°N, 155.749°E, H=12 ^h 35 ^m 42.1 ^s , h=33 km, MB=5.0; MPV=5.4 (Kraków)	KRA (SKM)	Δ=75.1° 1P 12 47 24.8 C Z: 1.0 ^s ; 0.030μ i 30.8	14.VII	Iceland, NEIS: 64.469°N, 17.492°W, H=07 ^h 15 ^m 37.2 ^s , h=33 km, MB=4.7; MPV=5.2 (Kraków)	KRA (SKM)	Δ=32.0° 1P 05 55 32.8 C Z: 0.8 ^s ; 0.134μ (GW) e1S 06 00 41 e1PcS 02 12 (SKD) eL 04.4 Lm 06.5 NFZ: 30 ^s ; 4.3μ, 1.7μ, 1.7μ
13.VII	Pakistan, NEIS: 29.880°N, 67.454°E, H=08 ^h 09 ^m 15.7 ^s , h=10 km, MB=5.1; MPV=5.2 (Kraków)	NIE	Δ=40.4° e1P 08 16 57	14.VII	KRA (SKM)	Δ=31.4° e1P 05 55 34 (SKD) e1 06 01 08 e1SS 02 16	
13.VII	Tonga Islands Region, NEIS: 23.242°S, 175.306°W, H=14 ^h 06 ^m 00.0 ^s , h=63 km, MB=5.0	KRA (SKM)	Δ=40.8° eP 08 17 00 Z: 2.0 ^s ; 0.061μ (GW) eS 23 10	14.VII	KRA (SKM)	Δ=24.4° e1P 07 20 53 Z: 1.8 ^s ; 0.14μ	
13.VII	NIE	e1P	15 08 45 Z: 1.2 ^s ; 0.016μ	14.VII	KRA (SKM)	e1P 09 50 26 Z: 0.8 ^s ; 0.023μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
14.VII	Southern Iran - continuation			16.VII	Philippine Islands, NEIS: 14.873°N, 120.005°E, H=15 ^h 38 ^m 00.8 ^s , h=72 km, MB=5.2; MPV=5.7 (Kraków)		
	KRA Δ=34.5°				KRA Δ=85.1°		
	(SKM) 1P 15 30 43.7				(SKM) 1P 15 50 30.8		
15.VII	Taiwan Region, NEIS: 24.051°N, 122.214°E, H=02 ^h 12 ^m 54.4 ^s , h=33 km, MB=5.5; MPV=5.9 (Kraków), MLV=5.9 (Warszawa)				Z: 0.6 ^s ; 0.031μ		
	WAR Δ=77.8°			16.VII	Kermadec Islands Region, NEIS: 27.456°S, 176.713°W, H=23 ^h 38 ^m 21.4 ^s , h=33 km, MB=5.5		
	(SKD) e1P 02 24 50				KRA Δ=154.1°		
	ei 34 40				(SKM) ePKIKP 23 59 10		
	Lm 03 02 30				1PKHKP 18.7		
	Z: 16 ^s ; 6.0μ				1PKP ₂ 24.9		
	KRA Δ=79.4°				NIE Δ=154.4°		
	(SKM) e1P 02 24 58				e1PKIKP 23 58 11		
	Z: 0.9 ^s ; 0.084μ				1PKHKP 19.8		
	e1pP 25 11				1PKP ₂ 26.0		
	(GW) eS 34 58				1 31.5		
	eSKS 35 23			17.VII	Svalbard Region, NEIS: 77.864°N, 18.328°E, H=09 ^h 22 ^m 24.5 ^s , h=10 km, MB=4.5; MPV=4.9 (Kraków)		
	Lm 03 05.2				KRA Δ=28.0°		
	NE: 14 ^s ; 1.8μ, 1.4μ,				(SKM) e1P 09 28 16		
	NIF Δ=79.4°				Z: 0.8 ^s ; 0.018μ		
	e1P 02 25 00			18.VII	Hindu Kush Region, NEIS: 35.527°N, 70.306°E, H=14 ^h 22 ^m 52.6 ^s , h=69 km, MB=5.2; MPV=5.5 (Niedzica)		
16.VII	Tonga Islands Region, NEIS: 18.663°S, 172.783°W, H=11 ^h 16 ^m 29.4 ^s , h=51 km, MB=4.9				NIE Δ=38.7°		
	KRA Δ=147.1°				1P 14 30 09.5		
	(SKM) 1PKHKP 11 36 09.2				Z: 0.5 ^s ; 0.021μ		
	Z: 1.1 ^s ; 0.041μ				1pP 25.5		
16.VII	Yugoslavia, NEIS: 46.290°N, 14.293°E, H=13 ^h 13 ^m 29.6 ^s , h=6 km, MB=4.6				1sP 34.0		
	RAC Δ=4.7°			19.VII	KRA		
	(SK) ePn 13 14 28				(SKM) e1P 06 24 55		
	e1Sn 15 45			20.VII	KRA		
	NIE Δ=5.1°				(SKM) eP 11 29 48		
	1Pn 13 14 49.5				Z: 0.8 ^s ; 0.023μ		
	1 15 10			20.VII	KRA		
	KRA Δ=5.4°				(SKM) eP 12 36 08		
	(SKM) ePn 13 14 52				Z: 0.6 ^s ; 0.023μ		
	1P* 15 05.0						
	(GW) 1S 16 26						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
20.VII	KRA			21.VII	WAR	Δ=83.6°	
	(SKM) eP 13 04 35				(SKD) 1P 13 58 20		C
	Z: 1.4 ^s ; 0.052μ				e1PPP 14 03 28		
20.VII	KRA				1S 08 39		
	(SKM) e1P 17 35 20				Lm 40 32		
	Z: 0.5 ^s ; 0.016μ				Z: 16 ^s ; 80μ, 94μ, 99μ		
21.VII	Sumatra, NEIS: 3.321°N, 96.315°E, H=02 ^h 36 ^m 02.1 ^s , h=68 km, MB=4.8				KRA Δ=85.0°		
	NIE Δ=78.4°				(SKM) 1P 13 58 28.1		C
	1P 02 47 59.1				Z: 1.1 ^s ; 0.96μ		
21.VII	Nicobar Islands, NEIS: 7.063°N, 94.394°E, H=09 ^h 31 ^m 42.5 ^s , h=33 km, MB=4.7				1PcP 33.8		
	KRA Δ=74.6°				1pP 41.3		
	(SKM) eP 09 43 11				(GW) 1SKS 14 08 55		
	e1sP 28				(SKD) Lm 11 32		
	ePcP 37				NEZ: 26 ^s ; 130.6μ, 76μ, 35μ		
21.VII	Macquarie Islands Region, NEIS: 53.863°S, 158.602°E, H=11 ^h 53 ^m 22.5 ^s , h=33 km, MB=6.4; MLV=6.7 (Warszawa)				NIE Δ=84.9°		
	KRA Δ=154.5°				1P 13 58 29.5		C
	(SKM) ePKIKP 12 13 09				Pm 31		
	1PKHKP 14.9				Z: 1.0 ^s ; 0.37μ		
	Pm 16.3			21.VII	Philippine Islands, NEIS: 17.137°N, 122.710°E, H=15 ^h 23 ^m 33.5 ^s , h=33 km, MB=4.7; MPV=5.7 (Kraków), 5.3 (Niedzica)		
	Z: 1.4 ^s ; 0.17μ				KRA Δ=85.0°		
	1PKP ₂ 22.8				(SKM) 1P 15 36 07.3		
	(GW) 1 48				Z: 0.5 ^s ; 0.029μ		
	ePP 17 08				NIE Δ=85.0°		
	NIE Δ=154.0°				1P 15 36 13.0		
	1PKHKP 12 13 11.5				Z: 0.9 ^s ; 0.019μ		
	1 16.0			21.VII	Philippine Islands, NEIS: 17.212°N, 122.432°E, H=18 ^h 55 ^m 34.6 ^s , h=46 km, MB=5.1; MPV=5.5 (Kraków), 5.2 (Niedzica)		
	Pm 16.2				KRA Δ=84.7°		
	Z: 2.0 ^s ; 0.49μ				(SKM) e1P 19 08 06		
	WAR Δ=154.7°				Z: 0.8 ^s ; 0.032μ		
	(SKD) 1PKHKP 12 13 12				1 15.0		
	Pm 16				NIE Δ=84.7°		
	Z: 10 ^s ; 15μ				1P 19 08 07.2		C
	1PKS 16 48				Z: 0.9 ^s ; 0.017μ		
	1PP 17 14			21.VII	Tibet, NEIS: 30.288°N, 94.850°E, H=23 ^h 32 ^m 12.1 ^s , h=33 km, MB=5.0		
	Lm 13 30 32				NIE Δ=57.9°		
	Z: 24 ^s ; 23μ				eP 23 42 05		
21.VII	Philippine Islands, NEIS: 16.882°N, 122.361°E, H=13 ^h 45 ^m 54.0 ^s , h=33 km, MB=6.1; MPV=6.9 (Kraków), 6.5 (Niedzica), MLH=7.2 (Kraków) MLV=7.2 (Warszawa)				Z: 1.5 ^s ; 0.031μ		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
22.VII	Kermadec Islands, NEIS: 30.842°S, 178.812°E, H=00 ^h 20 ^m 27.1 ^s , h=558 km, MB=4.8	e1PP	17 40 38	22.VII	WAR	Lm	18 45 08
						Z: 22 ^s ; 4.8μ	
	NIE Δ=155.3°				KRA Δ=158.2°		
	ePKP 00 39 19			(SKM)	ePKIKP 17 36 34		
	Z: 1.0 ^s ; 0.009μ				Z: 1.5 ^s ; 0.15μ		
22.VII	Philippine Islands, NEIS: 16.696°N, 122.154°E, H=00 ^h 45 ^m 01.4 ^s , h=85 km, MB=4.8; MPV=6.1 (Kraków)	1PKP ₂	37 09.3	(SKD)	ePP 40 42		
					Lm 18 52.5		
	KRA Δ=85.0°				NEZ: 28 ^s ; 2.1μ, 2.4μ, 3.0μ		
(SKM)	e1P 00 57 30						
	Z: 0.6 ^s ; 0.019μ			NIE Δ=158.5°	1PKIKP 17 36 35.0	C	
	NIE Δ=85.0°				Z: 1.5 ^s ; 0.15μ		
	eP 00 57 31				1pPKP 44.5		
22.VII	Greece, EMSC: 36.12°N, 24.79°E, H=01 ^h 43 ^m 18.3 ^s	1PKP ₂	37 12.0	23.VII	China, NEIS: 42.195°N, 83.391°E, H=06 ^h 57 ^m 03.7 ^s , h=33 km, MB=5.1; MPV=5.2 (Niedzica, Kraków)		
	NIE Δ=13.7°				NJE Δ=43.4°		
	1P 01 46 28				1P 07 05 05.5		
	Z: 0.9 ^s ; 0.010μ				Z: 0.8 ^s ; 0.025μ		
22.VII	Philippine Islands, NEIS: 17.347°N, 122.306°E, H=05 ^h 13 ^m 39.8 ^s , h=46 km, MB=5.1; MPV=5.7 (Kraków), 5.3 (Niedzica)	1pP	15.3		1pP 15.3		
					1sP 21		
	KRA Δ=84.6°				KRA Δ=43.5°		
(SKM)	1P 05 26 09.8			(SKM)	1P 07 05 05.6	D	
	Z: 0.5 ^s ; 0.029μ				Z: 0.8 ^s ; 0.023μ		
	1pP 23.6			23.VII	Alaska Peninsula, NEIS: 54.316°N, 162.414°W, H=13 ^h 44 ^m 54.6 ^s , h=27 km, MB=5.1; MPV=5.6 (Kraków), 6.1 (Niedzica)		
	NIE Δ=84.6°						
	1P 05 26 10				KRA Δ=76.0°		
	Z: 0.9 ^s ; 0.019μ			(SKM)	1P 13 56 40.3		
	1pP 15				Z: 0.6 ^s ; 0.031μ		
	1pP 24				NIE Δ=76.6°		
22.VII	KRA				1P 13 56 45.0		
(SKM)	1P 11 38 17.4				Z: 1.5 ^s ; 0.075μ		
	NIE			24.VII	Tonga Islands, NEIS: 15.339°S, 173.152°W, H=06 ^h 22 ^m 51.3 ^s , h=33 km, MB=6.0; MLV=6.3 (Warszawa, Kraków)		
	e1P 11 38 18						
22.VII	Kermadec Islands, NEIS: 33.797°S, 179.720°W, H=17 ^h 16 ^m 40.3 ^s , h=31 km, MB=6.0; MLV=6.1 (Warszawa)				WAR Δ=141.5°		
				(SKD)	e1PKIKP 06 42 16		
	WAR Δ=156.3°				e1PP 45 22		
(SKD)	e1PKIKP 17 36 31						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
24.VII	Tonga Islands - continuation			25.VII	KRA Δ=76.6°		
	WAR Lm 07 40 20			(SKM)	e1P 10 59 47		
	Z: 22 ^s ; 7.3μ, 7.6μ, 7.2μ				Z: 1.0 ^s ; 0.036μ		
	KRA Δ=143.8°			26.VII	Samoa Islands Region, NEIS: 16.191°S, 172.291°W, H=10 ^h 27 ^m 59.9 ^s , h=41 km, MB=4.8		
(SKM)	ePKP 06 42 22						
	Z: 1.5 ^s ; 0.11μ				KRA Δ=144.8°		
	1PKP 36.8			(SKM)	1PKP 10 47 33.4	D	
(SKD)	1PP 45 35				Z: 0.6 ^s ; 0.023μ		
	eSKSP 55 49			27.VII	Tonga Islands, NEIS: 17.066°S, 173.437°W, H=02 ^h 55 ^m 08.5 ^s , h=46 km, MB=4.8		
	eSS 07 04 19						
	Lm 43.5				KRA Δ=145.4°		
	NZ: 22 ^s ; 6.9μ, 8.9μ			(SKM)	1PKP 03 14 43.4	D	
	NIE Δ=144.3°				Z: 0.8 ^s ; 0.041μ		
	1PKP 06 42 25	C			e1pPKP 57		
	Z: 1.5 ^s ; 0.17μ				NIE Δ=145.8°		
24.VII	Mariana Islands, NEIS: 19.495°N, 144.717°E, H=19 ^h 55 ^m 36.8 ^s , h=409 km, MB=5.4				1PKP 03 14 45.1	C	
					Z: 1.0 ^s ; 0.041μ		
	KRA Δ=95.1°				e1pPKP 58		
(SKM)	1P 20 08 16.7			27.VII	Fiji Islands Region, NEIS: 20.928°S, 178.802°W, H=08 ^h 11 ^m 00.5 ^s , h=570 km, MB=5.1		
	Z: 0.8 ^s ; 0.028μ						
	e1PP 12 14				KRA Δ=147.4°		
	NIE Δ=95.6°				(SKM)	e1PKP 08 29 33	
	1P 20 08 18.8	C			Z: 0.8 ^s ; 0.023μ		
	Z: 0.8 ^s ; 0.022μ				NIE Δ=147.7°		
25.VII	Caribbean Sea, NEIS: 17.855°N, 81.659°W, H=04 ^h 51 ^m 40.6 ^s , h=33 km, MB=4.9; MPV=5.3 (Kraków)				1PKP 08 29 35.1		
					Z: 1.0 ^s ; 0.031μ		
	KRA Δ=83.7°			27.VII	Philippine Islands, NEIS: 17.063°N, 122.498°E, H=17 ^h 25 ^m 16.2 ^s , h=41 km, MB=5.4; MPV=5.9 (Niedzica), 6.1 (Kraków)		
(SKM)	e1P 05 04 08						
	Z: 0.7 ^s ; 0.020μ				NIE Δ=84.9°		
	NIE Δ=84.2°				1P 17 37 48.5	C	
	e1P 05 04 12				Z: 1.0 ^s ; 0.092μ		
	1pP 22.5				i 55		
25.VII	Kuril Islands, NEIS: 44.295°N, 149.772°E, H=10 ^h 32 ^m 44.4 ^s , h=33 km, MB=5.0; MPV=5.5 (Kraków)				e1sP 38 07		
					KRA Δ=84.9°		
	KRA Δ=76.4°			(SKM)	1P 17 37 48.5	C	
(SKM)	e1P 10 44 32	D			Z: 0.8 ^s ; 0.11μ		
	Z: 0.6 ^s ; 0.023μ			25.VII	Kuril Islands, NEIS: 44.260°N, 149.673°E, H=10 ^h 47 ^m 59.8 ^s , h=36 km, MB=4.8; MPV=5.5 (Kraków)		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s	
28.VII	Ascension Island, NEIS: 1.149°S, 14.035°W, H=01 ^h 47 ^m 32.7 ^s , h=33 km, MB=5.3; MPV=5.2 (Niedzica), 5.4 (Kraków)			29.VII	China, NEIS: 38.193°N, 75.174°E, H=09 ^h 14 ^m 08.3 ^s , h=102 km, MB=5.2			
	NIE	Δ=58.4°			WAR	Δ=39.7°		
	eP	01 57 26			(GW)	eIP	09 21 28	
	iPcP	30				eIS	22 10	
	Pm	30.4				eISS	30 32	
	Z:	1.0 ^S ; 0.022μ			NIE	Δ=40.3°		
	KRA	Δ=58.7°				iP	09 21 38	
	(SKM)	eP	01 57 29		KRA	Δ=40.5°		
		eIPcP	32		(SKM)	eIP	09 21 39 C	
		Pm	33			Pm	39.2	
		Z:	0.9 ^{Ei} ; 0.032μ			Z:	0.6 ^S ; 0.058μ	
		i	51.2			i	43.7	
	(GW)	e	58 19			(GW)	eIPP	23 15
		ePPP	02 01 05				eScS	31 42
		eS	05 39		29.VII	Solomon Islands, NEIS: 8.031°S, 155.538°E, H=11 ^h 15 ^m 45.3 ^s , h=33 km, MB=6.4; MLV=7.6 (Kraków)		
	WAR	Δ=60.8°			KRA	Δ=124.0°		
	(SKD)	eIP	01 57 46		(SKD)	eIPKIKP	11 34 41	
		eIPcS	02 02 36		(GW)	iPP	36 29	
		eIS	06 16			i	37	
28.VII	Off coast of Oregon, NEIS: 44.244°N, 128.967°W, H=15 ^h 22 ^m 18.5 ^s , h=15 km, MB=5.1; MPV=5.4 (Kraków), 5.2 (Niedzica)				(SKD)	Im	12 17.0	
	WAR	Δ=80.5°				NZ:	20 ^S ; 110μ, 150μ	
	(SKD)	eIP	15 34 40		NIE	Δ=124.3°		
		eISKS	44 42			iPKIKP	11 34 42.5	
		eL	55.0			Z:	1.0 ^S ; 0.10μ	
	KRA	Δ=82.5°				i	35 05	
	(SKM)	eIP	15 34 41	29.VII	NIE			
		Z:	1.0 ^S ; 0.036μ			iP	16 54 28.5	
		eIPcP	46			Z:	0.7 ^S ; 0.034μ	
	NIE	Δ=82.9°		29.VII	Tonga Islands, NEIS: 19.468°S, 175.036°W, H=16 ^h 51 ^m 06.0 ^s ; MB=5.1			
	iP	15 34 45.0			KRA	Δ=147.2°		
	Z:	1.3 ^S ; 0.024μ			(SKM)	ePKIKP	17 10 33	
	i	55.5				iPKIKP	35.5	
28.VII	KRA					Pm	35.9	
(SKM)	eP	16 30 20				Z:	0.8 ^S ; 0.046μ	
	Z:	0.4 ^S ; 0.020μ				iPKP ₂	37.7	
NIE					NIE	Δ=147.7°		
	iP	16 30 22.0				eIPKIKP	17 10 34	
	Z:	0.8 ^S ; 0.010μ				eIPKIKP	37	
	i	41.5				Pm	38.5	
						Z:	0.9 ^S ; 0.026μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
29.VII	Sumatra, NEIS: 2.362°S, 99.984°E, H=21 ^h 05 ^m 59.5 ^s , h=33 km, MB=5.3			30.VII	North of Ascension Island, NEIS: 3.176°S, 12.198°W, H=07 ^h 31 ^m 07.0 ^s , h=33 km, MB=5.1; MPV=5.4 (Kraków)		
	KRA	Δ=85.6°			KRA	Δ=59.8°	
	(SKM)	eP	21 18 36		(SKM)	eP	07 41 11 C
		i	56.2		Z:	1.7 ^S ; 0.053μ	
	NIE	Δ=85.1°		30.VII	KRA		
	eIP	21 18 41		(SKM)	eIP	09 47 05	
	iPcP	43		30.VII	KRA		
29.VII	Philippine Islands, NEIS: 18.646°N, 121.055°E, H=22 ^h 23 ^m 41.2 ^s , h=40 km, MB=5.2			(SKM)	eIP	10 20 23	
	KRA	Δ=82.8°			ei	21 00	
	(SKM)	iP	22 36 02.7	30.VII	Jan Mayen Island Region, NEIS: 71.876°N, 1.905°W, H=16 ^h 09 ^m 43.7 ^s , h=33 km, MB=4.4; MPV=5.1 (Kraków)		
	Z:	0.7 ^S ; 0.016μ			WAR	Δ=22.1	
	NIE	Δ=82.8°			(GW)	eIP	16 14 36
	iP	22 36 03.5				eIPP	15 10
	i	08.5				eIS	18 48
30.VII	Kazakh SSR, NEIS: 49.777°N, 78.163°E, H=01 ^h 56 ^m 58.0 ^s , h=0 km, MB=5.3				KRA	Δ=24.0°	
	KRA	Δ=36.7°			(SKM)	iP	16 15 02.7
	(SKM)	iP	02 04 07.4			Pm	03.9
		Pm	08.1		Z:	1.2 ^S ; 0.063μ	
	Z:	0.7 ^S ; 0.020μ			NIE	Δ=24.7°	
	NIE	Δ=36.7°			eP	16 15 07	
	iP	02 04 08.5 C			i	28.5	
	Z:	0.7 ^S ; 0.031μ		30.VII	Greece, FNIS: 36.85°N, 21.69°E, H=19 ^h 51 ^m 40.2 ^s		
	i	19.5			NIE	Δ=12.6°	
						iP	19 54 35
						i	44
1977 AUGUST 1977							
1.VIII	Taland Islands, NEIS: 4.062°N, 126.937°E, H=01 ^h 01 ^m 22.2 ^s , h=58 km, MB=5.2			1.VIII	KRA		
	NIE	Δ=97.6°		(SKM)	eIP	11 29 18	
	eIP	01 14 52			Z:	1.0 ^S ; 0.036μ	
	KRA	Δ=97.7°		1.VIII	New Hebrides Islands, NEIS: 20.494°S, 196.623°E, H=13 ^h 32 ^m 48.8 ^s , h=108 km, MB=5.5		
	(SKM)	eP	01 14 54		NIE	Δ=142.2°	
						eIPKIKP	13 52 05
					Z:	1.0 ^S ; 0.011μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
1.VIII	NIE	1P	13 55 36.7	3.VIII	Tibet, NEIS: 30.322°N, 94.918°E, H=01 ^h 13 ^m 06.8 ^s , h=33 km, MB=4.7	NIE	Δ=58.0°
		Z: 1.0 ^s ; 0.031μ				eP	01 22 59
		i	43			KRA	Δ=58.2°
1.VIII	Fiji Islands Region, 20.043°S, 178.208°W, H=19 ^h 11 ^m 57.4 ^s , h=599 km, MB=5.3				(SKM) eP	01 23 01	
		KRA	Δ=146.7°	3.VIII	South of Fiji Islands, NEIS: 23.041°S, 176.299°W, H=11 ^h 00 ^m 25.1 ^s , h=115 km, MB=4.8	KRA	Δ=150.2°
		(SKM) ePKP	19 30 30			(SKM) e1PKP	11 20 05
		i	33.2			Z: 1.1 ^s ; 0.055μ	
		Z: 0.6 ^s ; 0.070μ				1PKP ₂	09.1
		1PKP ₂	36.8			NIE	Δ=150.6°
		NIE	Δ=147.2°			1PKP	11 20 07
		e1PKP	19 30 32			1PKP ₂	10
		i	35.8	3.VIII	KRA		
		Z: 1.0 ^s ; 0.084μ			(SKM) e1P	18 36 56	
		1PKP ₂	40		Z: 0.7 ^s ; 0.025μ		
		RAC	Δ=147.3°		NIE		
		(SK) ePKP	19 30 35		e1P	18 37 07	
2.VIII	NIE	1P	00 34 42.0	4.VIII	South Sandwich Islands Region, NEIS: 56.013°S, 27.788°W, H=01 ^h 11 ^m 11.3 ^s	KRA	Δ=112.9°
		Z: 0.5 ^s ; 0.030μ				(SKM) ePKIKP	01 29 35
2.VIII	NIE	e1P	01 23 49			Z: 0.9 ^s ; 0.026μ	
2.VIII	Philippine Islands, NEIS: 17.400°N, 122.812°E, H=02 ^h 10 ^m 06.8 ^s , h=33 km, MB=5.1					e1	30 48
		NIE	Δ=84.8°			(SKD) ePS	40 04
		eP	02 22 30			ePKKS	41 20
		e1sP	56	4.VIII	Nevada, NEIS: 37.087°N, 116.007°W, E=16 ^h 40 ^m 00.1 ^s , h=0 km, MB=0	KRA	Δ=84.9°
		i	23 48			(SKM) e1P	16 52 37
2.VIII	Bonin Islands Region, NEIS: 27.368°N, 142.013°E, H=19 ^h 54 ^m 00.6 ^s , h=33 km, MB=5.0; MPV=5.1 (Niedzica)					Z: 1.1 ^s ; 0.062μ	
		KRA	Δ=87.7°			NIE	Δ=85.6°
		(SKM) eP	20 06 47			1P	16 52 40.5
		e1pP	53			Z: 1.3 ^s ; 0.031μ	
		NIE	Δ=87.6°	4.VIII	Rumania, NEIS: 45.684°N, 26.619°E, H=22 ^h 32 ^m 02.1 ^s , h=146 km, MB=4.7		
		1P	20 06 48.5				
		Z: 1.0 ^s ; 0.013μ					
		e1pP	55				

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
4.VIII	Rumania - continuation			6.VIII	NIE	Δ=57.9°	
		NIF	Δ=5.7°		eP	21 01 47	
		1P	22 33 25.5		epP	58	
		Z: 1.2 ^s ; 0.10μ			KRA	Δ=58.0°	
		i	35.2		(SKM) eP	21 01 50	
		KRA	Δ=6.3°	7.VIII	KRA		
		(SKM) e1P	22 33 32.3		(SKM) eP	02 06 52	
		Z: 0.6 ^s ; 0.023μ			e1	07 06	
5.VIII	Crete, NEIS: 34.268°N, 25.796°E, H=13 ^h 19 ^m 54.8 ^s , h=24 km, MB=4.4				NIE		
		NIE	Δ=15.7°		eP	02 06 54	
		eP	13 23 35	7.VIII	Panama - Costa Rica Border Region, NEIS: 8.554°N, 82.751°W, H=07 ^h 08 ^m 05.6 ^s , h=33 km, MB=5.2		
		e1PP	53			KRA	Δ=91.6°
		KRA	Δ=16.4°			(SKM) eP	07 21 11
		(SKM) eP	13 23 40			(SKD) eS	32 16
5.VIII	Solomon Islands, NEIS: 7.922°S, 155.802°E, H=21 ^h 21 ^m 13.4 ^s , h=45 km, MB=5.0					Lm	54.5
		NIE	Δ=124.4°			N: 22 ^s ; 2.5μ	
		ePKIKP	21 40 12			Lm	56.0
						E: 22 ^s ; 7.0μ	
6.VIII	South of Fiji Islands, NEIS: 22.220°S, 175.983°W, H=05 ^h 26 ^m 56.0 ^s , h=122 km, MB=5.1			7.VIII	Tonga Islands region, NEIS: 23.015°S, 175.018°W, H=16 ^h 46 ^m 24.7 ^s , h=33 km, MB=5.0		
		KRA	Δ=149.5°			KRA	Δ=150.6°
		(SKM) e1PKP	05/46 26			(SKM) ePKP	17 06 14
		e1pPKP	47 06			i	58.9
6.VIII	Solomon Islands, NEIS: 7.078°S, 155.832°E, H=11 ^h 26 ^m 12.2 ^s , h=83 km, MB=5.4					NIE	Δ=150.9°
		KRA	Δ=123.6°			1PKP	17 06 17
		(SKM) e1PKIKP	11 45 02			Z: 0.7 ^s ; 0.088μ	
		Z: 0.6 ^s ; 0.035μ				e1	29
6.VIII	KRA			8.VIII	Near West Coast of Colombia, NEIS: 6.930°N, 77.782°W, H=07 ^h 00 ^m 06.3 ^s , h=33 km, MB=5.2; MPV=5.7 (Kraków), 5.5 (Niedzica)		
	(SKM) eP	12 12 30				KRA	Δ=89.7°
		Z: 0.9 ^s ; 0.026μ				(SKM) 1P	07 13 03.6
		NIE				Z: 0.9 ^s ; 0.042μ	
		1P	12 12 32.7			NIE	Δ=90.0°
		Z: 1.0 ^s ; 0.019μ				1P	07 13 06.2
						Z: 0.6 ^s ; 0.018μ	
6.VIII	Tibet, NEIS: 30.339°N, 94.833°E, H=20 ^h 51 ^m 54.8 ^s , h=33 km, MB=4.7						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
8.VIII	West of Macquarie Island, NEIS: 55.078°S, 145.656°E, H=14 ^h 09 ^m 01.3 ^s , h=33 km, MB=5.0	KRA (SKM)	$\Delta=147.3^{\circ}$ e1PKP 14 28 50. ei 29 04	10.VIII	KRA (SKM)	$\Delta=94.7^{\circ}$ eP 07 20 45 Z: 1.0 ^s ; 0.030 μ	
8.VIII	Fiji Islands Region, NEIS: 17.808°S, 178.687°W, H=15 ^h 05 ^m 46.5 ^s , h=562 km, MB=5.1	KRA (SKM)	$\Delta=144.5^{\circ}$ 1PKP 15 24 20.3 Z: 0.4 ^s ; 0.045 μ	10.VIII	Philippine Islands, NEIS: 7.081°N, 123.565°E, H=09 ^h 33 ^m 29.2 ^s , h=54 km, MB=5.3; MPV=5.9 (Kraków), 5.5 (Niedzica)	KRA (SKM)	$\Delta=93.0^{\circ}$ e1P 09 46 30 D Z: 0.9 ^s ; 0.053 μ
8.VIII	South of Fiji Islands, NEIS: 23.806°S, 179.387°W, H=22 ^h 20 ^m 51.5 ^s , h=436 km, MB=5.2	KRA (SKM)	$\Delta=149.8^{\circ}$ e1PKP 22 39 51 Z: 1.1 ^s ; 0.055 μ ei 40 05	10.VIII	Fiji Islands Region, NEIS: 20.730°S, 178.454°W, H=18 ^h 27 ^m 09.6 ^s , h=585 km, MB=5.4	NIE (SKM)	$\Delta=93.2^{\circ}$ e1P 09 46 34 Z: 1.1 ^s ; 0.026 μ
9.VIII	KRA (SKM)	1P 11 33 08.4		10.VIII	Lake Baikal Region, NEIS: 50.923°N, 110.761°E, H=21 ^h 59 ^m 58.8 ^s , h=2 km, MB=5.2; MPV=5.3 (Niedzica), 5.5 (Kraków)	WAR (SKD)	$\Delta=145.1^{\circ}$ 1PKP 18 45 42 e1pPKP 47 56
9.VIII	Iran - USSR, NEIS 36.773°N, 60.002°E, H=21 ^h 43 ^m 00.3 ^s , h=21 km, MB=4.5; MPV=4.8 (Niedzica)	NIE (SKM)	$\Delta=31.2^{\circ}$ 1P 21 49 21.5 Z: 0.9 ^s ; 0.013 μ 1pP 27 1PP 50 23	10.VIII	Lake Baikal Region, NEIS: 50.923°N, 110.761°E, H=21 ^h 59 ^m 58.8 ^s , h=2 km, MB=5.2; MPV=5.3 (Niedzica), 5.5 (Kraków)	KRA (SKM)	$\Delta=147.3^{\circ}$ ePKP 18 45 45.5 i 49.0 Z: 0.9 ^s ; 0.12 μ
10.VIII	Java, NEIS: 8.172°S, 107.644°E, H=07 ^h 07 ^m 26.9 ^s , h=52 km, MB=5.7; MPV=5.3 (Niedzica), 5.7 (Kraków)	KRA (SKM)	$\Delta=31.6^{\circ}$ e1P 21 49 24	10.VIII	Lake Baikal Region, NEIS: 50.923°N, 110.761°E, H=21 ^h 59 ^m 58.8 ^s , h=2 km, MB=5.2; MPV=5.3 (Niedzica), 5.5 (Kraków)	NIE (SKM)	$\Delta=147.7^{\circ}$ 1PKP 18 45 46.2 Pm 52.5 Z: 1.0 ^s ; 0.158 μ e1PKP ₂ 57
				10.VIII	Lake Baikal Region, NEIS: 50.923°N, 110.761°E, H=21 ^h 59 ^m 58.8 ^s , h=2 km, MB=5.2; MPV=5.3 (Niedzica), 5.5 (Kraków)	NIE (SKM)	$\Delta=54.3^{\circ}$ 1P 22 09 30 Z: 1.0 ^s ; 0.037 μ i 34
				10.VIII	Lake Baikal Region, NEIS: 50.923°N, 110.761°E, H=21 ^h 59 ^m 58.8 ^s , h=2 km, MB=5.2; MPV=5.3 (Niedzica), 5.5 (Kraków)	KRA (SKM)	$\Delta=54.1^{\circ}$ eP 22 10 27 Z: 0.8 ^s ; 0.037 μ
				11.VIII	Tonga Islands, NEIS: 17.564°S, 174.370°W, H=01 ^h 42 ^m 47.5 ^s , h=57 km, MB=6.3		



Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
11.VIII	Tonga Islands - continuation	WAR (SKD)	$\Delta=143.3^{\circ}$ 1PKHKP 02 02 12 e1PKIKP 20 Lm 03 01 00 Z: 24 ^s ; 6.5 μ	12.VIII	KRA (SKM)	$\Delta=122.7^{\circ}$ 1PKIKP 00 26 43.2 D Z: 0.5 ^s ; 0.020 μ	
		KRA (SKM)	$\Delta=145.6^{\circ}$ ePKP 02 02 20 Z: 1.9 ^s ; 1.44 μ 1PKP ₂ 25.9 Z: 1.4 ^s ; 0.92 μ 1pPKP 35.5 (SKD) Lm 45.5 NE: 64 ^s ; 12 μ , 28 μ	12.VIII	NIE (SKM)	1P 00 36 36.8 C Z: 1.0 ^s ; 0.019 μ	
		RAC (SK)	$\Delta=146.0^{\circ}$ ePKP 02 02 22 e1PKP ₂ 28	12.VIII	KRA (SKM)	1P 00 36 37.1 Z: 0.8 ^s ; 0.023 μ	
		NIE	$\Delta=146.1^{\circ}$ e1PKP 02 02 22 Pm 30 Z: 1.0 ^s ; 0.31 μ i 33	12.VIII	Tonga Islands, NEIS: 22.493°S, 175.876°W, H=20 ^h 05 ^m 43.2 ^s , h=33 km, MB=4.0	NIE (SKM)	$\Delta=150.2^{\circ}$ 1PKP 20 25 32.5 Z: 1.2 ^s ; 0.029 μ 1PKP ₂ 43.1
11.VIII	KRA (SKM)	e1P 08 12 39 C Pm 40.4 Z: 1.0 ^s ; 0.036 μ		13.VIII	Tonga Islands, NEIS: 16.994°S, 173.456°W, H=00 ^h 39 ^m 46.0 ^s , h=33 km, MB=4.5	NIE (SKM)	$\Delta=145.8^{\circ}$ 1PKP 00 59 26 Z: 0.9 ^s ; 0.010 μ
		NIE	1P 08 12 42.5 Pm 43 Z: 1.0 ^s ; 0.022 μ	13.VIII	Tibet, NEIS: 30.322°N, 94.825°E, H=12 ^h 54 ^m 43.2 ^s , h=33 km, MB=4.6; MPV=4.9 (Niedzica)	NIE (SKM)	$\Delta=57.9^{\circ}$ eP 13 04 35 Z: 1.3 ^s ; 0.015 μ
12.VIII	Iran, EMSC: 26.82°N, 54.87°E, H=00 ^h 12 ^m 15.6 ^s , MPV=5.2 (Kraków)	KRA (SKM)	$\Delta=35.4^{\circ}$ e1P 00 19 04 Z: 0.5 ^s ; 0.016 μ	13.VIII	Hokkaido, NEIS: 43.132°N, 145.580°E, H=19 ^h 33 ^m 09.7 ^s , h=62 km, MB=4.9; MPV=5.6 (Niedzica)	KRA (SKM)	$\Delta=58.0^{\circ}$ eP 13 04 35
12.VIII	Solomon Islands, NEIS: 6.533°S, 155.011°E, H=00 ^h 07 ^m 51.8 ^s , h=58 km, MB=5.9	NIE (SKM)	$\Delta=122.8^{\circ}$ 1PKIKP 00 26 43 Z: 1.2 ^s ; 0.044 μ i 47.8	13.VIII	Hokkaido, NEIS: 43.132°N, 145.580°E, H=19 ^h 33 ^m 09.7 ^s , h=62 km, MB=4.9; MPV=5.6 (Niedzica)	KRA (SKM)	$\Delta=75.8^{\circ}$ 1P 19 44 50.4 C Z: 0.6 ^s ; 0.085 μ
		NIE	$\Delta=122.8^{\circ}$ 1PKIKP 00 26 43 Z: 1.2 ^s ; 0.044 μ i 47.8	13.VIII	Hokkaido, NEIS: 43.132°N, 145.580°E, H=19 ^h 33 ^m 09.7 ^s , h=62 km, MB=4.9; MPV=5.6 (Niedzica)	NIF (SKM)	$\Delta=76.1^{\circ}$ 1P 19 44 52.5 Z: 1.1 ^s ; 0.059 μ 1pP 45 03.5 1PoP 13.5

Date	Station	Phase	T.U. h m s
14.VIII	Windward Islands, NFIS: 10.969°N, 62.373°W, H=04 ^h 22 ^m 49.7 ^s , h=112 km, MB=4.9; MPV=5.5 (Kraków), 5.0 (Niedzica)	KRA (SKM)	$\Delta=77.0^\circ$ e1P 04 34 32 Z: 1.1 ^s ; 0.041 μ
		NIE	$\Delta=77.0^\circ$ 1P 04 34 33.5 Z: 0.9 ^s ; 0.011 μ 1pP 35 03.5
14.VIII	South Atlantic Ridge, NEIS: 22.752°S, 12.752°W, H=19 ^h 03 ^m 44.2 ^s , h=33 km, MB=4.9; MPV=5.4 (Kraków)	KRA (SKM)	$\Delta=78.1^\circ$ e1P 19 15 41 Z: 1.3 ^s ; 0.045 μ
14.VIII	South Atlantic Ridge, NEIS: 22.745°S, 12.703°W, H=19 ^h 04 ^m 20.3 ^s , h=33 km, MB=5.6; MPV=5.5 (Kraków), 5.2 (Niedzica)	NIE	$\Delta=77.6^\circ$ e1P 19 16 13 Z: 1.3 ^s ; 0.024 μ eipP 21
		KRA (SKM)	$\Delta=78.0^\circ$ e1P 19 16 16 Z: 1.2 ^s ; 0.055 μ eipP 24
14.VIII	Java, NEIS: 7.763°S, 107.567°E, H=21 ^h 38 ^m 51.5 ^s , h=33 km, MB=5.7; MPV=6.0 (Kraków)	WAR (SKD)	$\Delta=94.0^\circ$ e1P 21 52 08 e1 28 e1PP 55 52 e1S 22 03 20 Lm 34 16 Z: 24 ^s ; 4.0 μ
		NIE	$\Delta=94.0^\circ$ 1P 21 52 08.0 Z: 1.0 ^s ; 0.017 μ 1pP 20
14.VIII	KRA (SKM)	$\Delta=94.4^\circ$ eP 21 52 10 Z: 1.7 ^s ; 0.14 μ 1pP 29.7	
	(GW)	e1PP 55 57 eSKS 22 02 40	
	(SKD)	Lm 37.9 EZ: 24 ^s ; 2.4 μ , 2.1 μ Lm 38.8 N: 20 ^s ; 2.8 μ	
15.VIII	Sea of Japan, NEIS: 41.726°E, 138.572°E, H=23 ^h 49 ^m 13.4 ^s , h=33 km, MB=4.9; MPV=5.5 (Kraków), 5.1 (Niedzica)	KRA (SKM)	$\Delta=74.0^\circ$ e1P 00 00 47 Z: 1.2 ^s ; 0.047 μ 1pP 56.7
	(GW)	eS 10 21	
	NIE	$\Delta=74.3^\circ$ 1P 00 00 49.5 Z: 1.1 ^s ; 0.015 μ 1pP 59	
15.VIII	Tonga Islands, NEIS: 23.325°S, 175.382°W, H=05 ^h 41 ^m 12.1 ^s , h=33 km, MB=5.3	KRA (SKM)	$\Delta=150.7^\circ$ ePKP 06 00 56 e1 01 02 i 18.0
	NIE	$\Delta=151.1^\circ$ ePKP 06 00 57 i 01 02.9 Z: 1.5 ^s ; 0.13 μ 1PKP ₂ 08.5	
15.VIII	Italy, NEIS: 38.849°N, 16.978°E, H=21 ^h 10 ^m 32.5 ^s , h=54 km, MB=5.0	NIE	$\Delta=10.8^\circ$ e1P 21 13 08 Z: 1.1 ^s ; 0.098 μ 1PP 17
	KRA (SKM)	$\Delta=11.4^\circ$ e1P 21 13 15 Z: 1.7 ^s ; 0.17 μ	

Date	Station	Phase	T.U. h m s
15.VIII	Italy - continuation	KRA	e1PP 21 13 22 e1PPP 30
	WAR	$\Delta=13.7^\circ$	
	(SKD)	e1P 21 13 48 e1S 16 40	
15.VIII	KRA (SKM)	eP 22 32 44 Z: 0.6 ^s ; 0.019 μ	
16.VIII	New Hebrides, NEIS: 19.280°S, 167.655°E, H=06 ^h 15 ^m 16.7 ^s , h=12 km, MB=5.5	KRA (SKM)	$\Delta=140.0^\circ$ ePKIKP 06 34 43
	NIE	$\Delta=140.2^\circ$ ePKIKP 06 34 47 Pm 48.5 Z: 1.5 ^s ; 0.035 μ	
17.VIII	Tonga Islands, NEIS: 17.868°S, 172.497°W, H=03 ^h 07 ^m 29.2 ^s , h=15 km, MB=5.1	KRA (SKM)	$\Delta=146.4^\circ$ ePKP 03 27 09 Z: 1.5 ^s ; 0.123 μ
	NIE	$\Delta=146.9^\circ$ ePKP 03 27 11 Z: 0.9 ^s ; 0.011 μ 1PKP ₂ 16.5	
17.VIII	Kazakh SSR, NEIS: 49.814°N, 78.151°E, H=04 ^h 26 ^m 57.7 ^s , h=0 km, MB=5.0; MPV=5.5 (Kraków), 5.7 (Niedzica)	KRA (SKM)	$\Delta=36.6^\circ$ e1P 04 34 07 Z: 0.7 ^s ; 0.041 μ
	NIE	$\Delta=36.7^\circ$ 1P 04 34 08.5 Z: 0.8 ^s ; 0.081 μ	
17.VIII	Iran - USSR, NEIS: 36.394°N, 59.041°E, H=16 ^h 28 ^m 41.9 ^s , h=11 km, MB=4.7	KRA (SKM)	$\Delta=31.2^\circ$ e1P 16 35 00
17.VIII	Aleutian Islands, NEIS: 51.867°N, 175.432°W, H=16 ^h 48 ^m 31.3 ^s , h=57 km, MB=5.4	KRA (SKM)	$\Delta=77.6^\circ$ eP 17 00 22 esP 44
18.VIII	Crete, NEIS: 35.225°N, 23.395°E, H=09 ^h 27 ^m 40.0 ^s , h=42 km, MB=5.2	NIE	$\Delta=14.4^\circ$ 1P 09 31 02.4 Z: 1.5 ^s ; 0.16 μ 1pP 09 Z: 1.5 ^s ; 0.63 μ iPP 20
	KRA (SKM)	$\Delta=15.0^\circ$ e1P 09 31 10 Z: 1.2 ^s ; 0.095 μ iPP 17.2 Z: 1.3 ^s ; 0.29 μ	
	(GW)	1(S) 34 08 e1L 36.5 Lm 38.8 NEZ: 9 ^s ; 6.7 μ , 4.8 μ , 0.9 μ	
	RAC (SK)	$\Delta=15.3^\circ$ eP 09 31 13	
	WAR (SKD)	$\Delta=17.1^\circ$ e1P 09 31 38 (GW) e1PP 55 (SKD) e1S 34 58 Lm 40 48 Z: 18 ^s ; 13 μ	
18.VIII	Kuril Islands, NEIS: 46.632°N, 153.706°E, H=11 ^h 59 ^m 41.2 ^s , h=33 km, MB=5.7; MPV=5.2 (Niedzica), 5.4 (Kraków)	WAR (SKD)	$\Delta=73.5^\circ$ e1P 12 11 12 Lm 47 28 Z: 18 ^s ; 8.2 μ
	KRA (SKM)	$\Delta=75.7^\circ$ e1P 12 11 24 Z: 1.4 ^s ; 0.48 μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
20.VIII	Caribbean Sea - continuation			21.VIII	Siberia, NEIS: 64.223°N, 99.577°E, H=21 ^h 59 ^m 58.7 ^s , h=0 km, MB=5.0; MPV=5.3 (Kraków), 5.0 (Niedzica)		
	NIE	Δ=88.3°			KRA	Δ=42.5°	
	1P	04 04 45.0	D		(SKM) eP	22 07 57	C
	Pm	49				Z: 1.0 ^s ; 0.036μ	
		Z: 1.0 ^s ; 0.033μ			NIE	Δ=42.7°	
	1pP	55.5			1P	22 08 01.2	
20.VIII	Sumba Island, NEIS: 11.108°S, 119.127°E, H=09 ^h 21 ^m 50.3 ^s , h=33 km, MB=5.7; MLV=5.8 (Kraków)					Z: 0.8 ^s ; 0.017μ	
	KRA	Δ=104.1°			i	16	
	(SKM) e(P)	09 35 46		21.VIII	Tibet, NEIS: 30.342°N, 94.813°E, H=02 ^h 57 ^m 22.5 ^s , h=33 km, MB=4.9; MPV=5.1 (Niedzica)		
	e	36 00			NIE	Δ=57.9°	
	ePP	40 11			eP	03 07 16	D
	(SKD) Lm	10 26.0				Z: 1.5 ^s ; 0.027μ	
		NZ: 25 ^s ; 8.1μ, 3.5μ			epP	27	
	WAR	Δ=103.7°		21.VIII	Samoa Islands Region, NEIS: 14.773°S, 173.474°W, H=04 ^h 44 ^m 32.3 ^s , h=33 km, MB=4.9		
	(SKD) e(P)	09 36 08			KRA	Δ=143.2°	
	e1SKS	46 36			(SKM) e1PKP	05 04 00	
	Lm	10 24 00		21.VIII	Honshu, NEIS: 35.241°N, 141.115°E, H=05 ^h 19 ^m 34.2 ^s , h=42 km, MB=5.5; MPV=5.9 (Kraków), 5.1 (Niedzica), MLH=5.6 (Kraków)		
		Z: 28 ^s ; 5.8μ			WAR	Δ=78.4°	
20.VIII	Sumba Island, NEIS: 11.039°S, 119.135°E, H=19 ^h 16 ^m 32.7 ^s , h=33 km, MB=6.0; MLH=6.7 (Kraków)				(GW) e1P	05 31 32	
	WAR	Δ=103.6°			(SKD) e1S	41 28	
	(SKD) e1P	19 30 32			KRA	Δ=80.4°	
	e1PP	34 56			(SKM) 1P	05 31 43	C
	e1SKS	41 12				Z: 0.9 ^s ; 0.079μ	
	Lm	20 18 48			1sP	57	
		Z: 28 ^s ; 17μ			(GW) e1S	41 52	
	KRA	Δ=104.3°			Lm	06 08.5	
	(SKM) eP	19 30 35				NE: 14 ^s ; 1.4μ, 1.4μ	
		Z: 1.5 ^s ; 0.064μ			NIE	Δ=80.7°	
	e1pP	30 42			1P	05 31 45	C
	e1PP	34 58				Z: 1.0 ^s ; 0.056μ	
	(GW) e1SKS	41 20			1sP	59	
	(SKD) eL	20 02.5		21.VIII	Pacific Cordillera, NEIS: 55.021°S, 136.005°W, H=13 ^h 36 ^m 32.6 ^s , h=33 km, MB=4.8		
	Lm	16.0					
		NEZ: 25 ^s ; 25μ, 8.6μ, 9.9μ					
	NIE	1P	19 31 36.5				
			Z: 1.2 ^s ; 0.021μ				
	e1pP	43					
	i	51					

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
21.VIII	Pacific Cordillera - continuation			23.VIII	KRA	Δ=152.0°	
	NIE	Δ=164.5°			(SKM) ePKIKP	08 27 05	
	ePKIKP	13 56 33				Z: 1.0 ^s ; 0.030μ	
	KRA	Δ=164.6°			e1PKP ₂	15	
	(SKM) ePKIKP	13 56 37			NIE	Δ=153.0°	
	(SKD) eL	14 51.4			1PKIKP	08 27 06.9	
	1m	15 19.0				Z: 0.9 ^s ; 0.014μ	
		NEZ: 20 ^s ; 1.6μ, 0.8μ, 2.1μ			1PKP ₂	18.0	
21.VIII	Kermadec Islands, NEIS: 29.974°S, 177.909°W, H=19 ^h 35 ^m 05.6 ^s , h=59 km, MB=5.7			24.VIII	Ryukyu Islands, NEIS: 27.020°N, 130.017°E, H=03 ^h 44 ^m 47.8 ^s , h=33 km, MB=5.2; MPV=5.1 (Niedzica)		
	KRA	Δ=155.8°			NIE	Δ=81.6°	
	(SKM) ePKIKP	19 54 53			1P	03 57 05.0	
		Z: 1.2 ^s ; 0.039μ				Z: 1.1 ^s ; 0.015μ	
	e1PKHKP	55 03			KRA	Δ=81.5°	
22.VIII	Kuril Islands, NEIS: 44.506°N, 149.597°E, H=05 ^h 24 ^m 49.9 ^s , h=45 km, MB=4.7; MPV=4.9 (Niedzica)				(SKM) e1P	03 57 04	C
	KRA	Δ=76.1°		25.VIII	Sumba Island Region, NEIS: 10.743°S, 119.268°E, H=18 ^h 05 ^m 10.8 ^s , h=33 km, MB=6.1; MLH=6.3 (Kraków)		
	(SKM) eP	05 36 35			WAR	Δ=103.5°	
	epP	49			(SKD) e1P	18 19 10	
	NIE	Δ=76.5°			e1(PP)	23 18	
	1P	05 36 39			Lm	19 07 20	
		Z: 0.9 ^s ; 0.010μ				Z: 22 ^s ; 7.6μ	
	1pP	52			KRA	Δ=104.1°	
22.VIII	Afghanistan - USSR, NEIS: 36.689°N, 71.411°E, H=17 ^h 58 ^m 47.3 ^s , h=100 km, MB=4.9; MPV=4.8 (Niedzica), 5.2 (Kraków)				(SKM) eP	18 19 13	
	NIE	Δ=38.7°			epP	25	
	e1P	18 06 04			1SKS	29 52	
	Pm	06			1SKKS	30 31	
		Z: 1.0 ^s ; 0.013μ			(SKD) i	32 33	
	1sP	34			eL	43.4	
	KRA	Δ=39.0°			Lm	19 04.5	
	(SKM) eP	18 06 07				NEZ: 25 ^s ; 12μ, 4.1μ, 4.5μ	
		Z: 0.6 ^s ; 0.019μ			NIE	Δ=103.9°	
	epP	29			e1P	18 19 13	
	esP	35			e1pP	25	
23.VIII	Fiji Islands, NEIS: 25.602°S, 176.201°W, H=08 ^h 07 ^m 12.9 ^s , h=49 km, MB=5.4			25.VIII	NIE	eP	18 35 03
							Z: 1.6 ^s ; 0.027μ

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
26.VIII	Afghanistan - USSR, NEIS: 36.608°N, 71.326°E, H=04 ^h 51 ^m 18.2 ^s , h=186 km, MB=4.7; MPV=5.2 (Niedzica), 5.3 (Kraków)			26.VIII	Sulawesi, NEIS: 0.152°N, 123.067°E, H=22 ^h 54 ^m 44.1 ^s , h=140 km, MB=5.6		
	NIE	Δ=38.7°			NIE	Δ=98.2°	
	iP	04 58 27.5	C		iP	23 08 07	
		Z: 0.9 ^s ; 0.029μ			Pm	08	
	KRA	Δ=39.0°		27.VIII	KRA		
	(SKM)	iP	04 58 28.2		(SKM)	eP	03 55 18
		Z: 1.0 ^s ; 0.042μ				Z: 1.0 ^s ; 0.030μ	
		epP	59 09	27.VIII	KRA		
26.VIII	Sumba Island Region, NEIS: 10.667°S, 119.301°E, H=08 ^h 26 ^m 37.5 ^s , h=33 km, MB=5.6			27.VIII	(SKM)	eP	05 43 39
	KRA	Δ=104.1°				Z: 0.9 ^s ; 0.026	
	(SKM)	eP	08 40 39	27.VIII	Timor, NEIS: 8.063°S, 125.300°E, H=07 ^h 12 ^m 22.5 ^s , h=25 km, MB=6.4; MLV=6.9 (Kraków), 7.1 (Warszawa)		
	ePP	44 55			WAR	Δ=105.1°	
	(SKD)	i	50 50		(SKD)	eIPdif	07 26 30
	NIE	Δ=103.8°			(GW)	eIPP	30 52
	eP	08 40 39				ePS	40(00)
	Pm	40				Lm	08 10 00
		Z: 0.7 ^s ; 0.077μ					Z: 32 ^s ; 98μ
	eIPP	44 52			KRA	Δ=106.0°	
26.VIII	Atlantic Ocean, NEIS: 59.426°S, 20.508°W, H=19 ^h 50 ^m 01.4 ^s , h=33 km, MB=6.3; MLH=7.6 (Kraków)				(SKM)	ePdif	07 26 39
	KRA	Δ=114.0°				Z: 0.4 ^s ; 0.025μ	
	(SKD)	ePdif	20 04 52		iPP	31 03.8	
	ePKP	08 42			(SKD)	eIS	38 25
	eIPP	09 37			iPS	40 11	
	eIPPP	12 05			Lm	08 06.0	
	eSKS,	15 29				NEZ: 35 ^s , 70 ^s , 70 ^s ,	
	ePS	19 11				64μ, 220μ, 130μ	
	iPPS	20 25		28.VIII	NIE		
	i	25 23			eIP	01 50 50	
	Lm	38.0				Z: 1.3 ^s ; 0.018μ	
		NEZ: 60 ^s ; 120μ, 390μ, 50μ		28.VIII	Mediterranean Sea, NEIS: 38.210°N, 8.209°E, H=09 ^h 45 ^m 14.5 ^s , h=10 km, MB=5.1; MLH=4.9 (Kraków)		
	Lm	45.0			NIE	Δ=14.2°	
		NEZ: 40 ^s ; 140μ, 72μ, 83μ			eP	09 48 40	
	NIE	Δ=113.5°			i	47.3	
	ePKP	20 08 40				Z: 1.2 ^s ; 0.13μ	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
28.VIII	Mediterranean Sea - continuation			29.VIII	KRA	ePP	14 39 19
	KRA	Δ=14.5°			eIS	46 23	
	(SKM)	eP	09 48 43		Lm	15 11.0	
	i	50.2				NE: 14 ^s ; 16μ, 7.3μ	
		Z: 1.5 ^s ; 0.13μ			(SKD)	Lm	08.5
	(GW)	iS	51 37			NEZ: 22 ^s ; 30μ, 26μ, 13μ	
	Lm	55.5			NIE	Δ=83.2°	
		NEZ: 25 ^s ; 7.6μ, 9.8μ, 1.6μ			iP	14 36 07.5	C
	WAR	Δ=16.6°				Z: 1.1 ^s ; 0.39μ	
	(SKD)	eI(P)	09 49 12		iPP	13.8	
	(GW)	i	16		WAR	Δ=51.7°	
		eIL	55 30		(SKD)	eIP	14 36 08
	Lm	56 26			iS	46 10	
		Z: 12 ^s ; 9.1μ			eISKS	16	
28.VIII	Kermadec Islands, NEIS: 29.062°S, 177.148°W, H=14 ^h 11 ^m 30.3 ^s , h=44 km, MB=5.5				eIPS	47 10	
	KRA	Δ=155.3°			Lm	15 11 40	
	(SKM)	ePKIKP	14 31 17			Z: 14 ^s ; 27μ	
	eI	29		29.VIII	Aleutian Islands, NEIS: 51.563°N, 173.968°W, H=20 ^h 59 ^m 59.2 ^s , h=25 km, MB=5.4		
	eIPKHKP	33			KRA	Δ=78.1°	
	eIPKP ₂	46			(SKM)	eP	21 11 57
	(SKD)	eIPP	35 17		(SKD)	Lm	47.0
	Lm	15 36.0				NEZ: 21 ^s ; 3.0μ, 1.3μ, 4.0μ	
		NEZ: 25 ^s ; 2.4μ, 2.4μ, 3.1μ			NIE	Δ=78.6°	
	NIE	Δ=155.7°			iP	21 12 01	C
	ePKIKP	14 31 20				Z: 1.0 ^s ; 0.026μ	
	iPKHKP	35.3			eIP	11	
	iPKP ₂	46.7			eIS	16	
28.VIII	KRA				WAR	Δ=75.8°	
	(Sch)	eP	20 28 54		(SKD)	eISKS	21 22 08
	(SKD)	Lm	21 07.0	30.VIII	Alaska, NEIS: 63.161°N, 151.109°W, H=06 ^h 50 ^m 39.9 ^s , h=130 km, MB=5.0		
		NEZ: 25 ^s ; 5.0μ, 3.2μ, 1.4μ			NIE	Δ=67.6°	
29.VIII	Philippine Islands, NEIS: 17.441°N, 119.869°E, H=14 ^h 23 ^m 40.5 ^s , h=12 km, MB=6.0; MPV=5.5 (Niedzica), MLH=6.6 (Kraków)				eIP	07 01 24	
	KRA	Δ=83.0°				Z: 1.2 ^s ; 0.018μ	
	(Sch)	iP	14 36 06.5	30.VIII	Aleutian Islands, NEIS: 51.382°N, 173.785°W, H=15 ^h 12 ^m 27.6 ^s , h=33 km, MB=5.4; MPV=5.6 (Kraków), 5.2 (Niedzica)		
	(GW)	i	22		KRA	Δ=78.3°	
					(SKM)	eIP	15 24 25
						Z: 0.8 ^s ; 0.041μ	C

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
8.IX	Fiji Islands, NEIS: 20.764°S, 177.860°W, H=03h00m15.2s, h=505 km, MB=5.1	KRA (SKM)	Δ=147.5° ePKP 03 19 03	10.IX	KRA (SKM)	Δ=15.3° eP 06 35 16	
		NIE	Δ=147.9° 1PKP 03 19 05.2 Z: 1.2 ^s ; 0.029μ ei 10.2			i 22.9 1PP 36.1 (SKD) Lm 43.2 NZ: 20 ^s ; 4.0μ, 3.5μ	
8.IX	KRA (SKM)	1P 14 36 55.6 Z: 0.7 ^s ; 0.020μ		10.IX	Java, NEIS: 6.572°S, 107.088°E, H=13h39m01.7s, h=105 km, MB=5.9	NIE	Δ=92.8° 1P 13 52 04.4 D Z: 1.4 ^s ; 0.072μ i 39.8
9.IX	USSR - China Border Region, NEIS: 42.980°N, 131.358°E, H=02h34m59.5s, h=499 km, MB=4.9; MPV=5.7 (Kraków, Niedzica)	KRA (SKM)	Δ=69.7° 1P 02 45 19.8 D Z: 0.7 ^s ; 0.045μ	11.IX	Macquarie Islands, NEIS: 59.631°S, 150.286°E, H=05h07m29.7s, h=33 km, MB=5.4	KRA (SKM)	Δ=93.2° eiP 13 52 05 C Z: 1.5 ^s ; 0.086μ
		NIE	Δ=70.2° 1P 02 45 23.2 D Z: 1.3 ^s ; 0.091μ i 28			KRA (SKM)	Δ=150.5° ePKP 05 27 19 C Z: 1.5 ^s ; 0.061μ 1PKP ₂ 27.1
9.IX	Fiji Islands, NEIS: 20.112°S, 177.700°W, H=17h38m16.4s, h=561 km, MB=4.8	KRA (SKM)	Δ=147.0° 1PKP 17 56 57.6 Z: 0.3 ^s ; 0.049μ	11.IX	Tonga Islands, NEIS: 15.389°S, 173.214°W, H=14h08m04.6s, h=33 km, MB=5.4	KRA (SKM)	Δ=143.8° ePKHKP 14 27 32 eiPKHKP 44 ei 32 01
		NIE	Δ=147.4° 1PKP 17 56 59.5 D i 57 04 i 09.2			(SKD)	Lm 15 32.5 NZ: 25 ^s ; 1.6μ, 3.4μ
10.IX	Fiji Islands, NEIS: 22.114°S, 179.493°W, H=01h20m08.4s, h=587 km, MB=5.1	NIE	Δ=148.8° 1PKP 01 38 51.3 D Z: 0.9 ^s ; 0.032μ i 56.5	11.IX	Tonga Islands, NEIS: 15.397°S, 173.295°W, H=14h12m29.9s, h=33 km, MB=5.3	NIE	Δ=144.3° 1PKP 14 27 40 Z: 1.0 ^s ; 0.020μ i 50
10.IX	Crete, NEIS: 34.933°N, 23.015°E, H=06h31m41.8s, h=33 km, MB=4.6						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
11.IX	Tonga Islands - continuation	HAC (SK)	Δ=144.2° ePKP 14 32 04 e 12	12.IX	Crete, NEIS: 34.899°N, 23.141°E, H=02h30m44.3s, h=57 km, MB=4.0	NIE	Δ=14.7° eiP 02 34 16
11.IX	Crete, NEIS: 35.048°N, 23.029°E, H=23h19m23.7s, h=33 km, MB=5.8; MLH=5.4 (Niedzica), 5.7 (Kraków) MLV=5.8 (Warszawa)	NIE	Δ=14.5° 1P 23 22 48.0 D Z: 1.9 ^s ; 0.065μ i 56.3 1S 25 51 Lm 28.9 NF: 5.0 ^s ; 4.4μ, 6.9μ Lm 31.6 Z: 5.5 ^s ; 9.6μ	12.IX	Crete, NEIS: 34.993°N, 23.171°E, H=02h57m55.0s, h=36 km, MB=4.5	NIE	Δ=14.6° eiP 03 01 25 Z: 1.0 ^s ; 0.028μ 1PP 39
		KRA (SKM)	Δ=15.2° eiP 23 22 55.6 C Z: 1.4 ^s ; 0.17μ i 23 02.3 i(PP) 14.6 (GW) i 25 58 Lm 31.0 NEZ: 6 ^s ; 17μ, 16μ, 2.0μ	12.IX	South Atlantic Ridge, NEIS: 12.784°S, 14.693°W, H=14h16m06.6s, h=21 km, MB=5.3	NIE	Δ=69.4° eP 14 29 13 eiPP 20 i 42
		RAC (SK)	Δ=15.4° eP 23 22 58 eiPP 23 08			KRA (SKM)	Δ=69.6° eP 14 29 15 ipP 22.8 (GW) eS 38 30
		WAR (SKD)	Δ=17.2° 1P 23 23 24 D eiPP 44 ci 24 37 1S 26 37 Lm 33 10 Z: 16 ^s ; 62μ	12.IX	KRA (SKM)	eP 17 23 41 Z: 1.1 ^s ; 0.041μ	
11.IX	KRA (SKM)	eP 23 58 34 ei 55		12.IX	Eastern Sea of Japan, NEIS: 41.837°N, 138.418°E, H=23h16m50.7s, h=32 km, MB=5.2; MPV=5.9 (Kraków, 5.7 (Niedzica)	KRA (SKM)	Δ=73.8° eP 23 28 24 C Z: 0.7 ^s ; 0.070μ
12.IX	Mediterranean Sea, NEIS: 35.041°N, 22.864°E, H=00h03m40.9s, h=37 km, MB=3.9;	KRA (SKM)	Δ=15.2° eP 00 07 19			NIE	Δ=74.1° 1P 23 28 26.5 C Z: 1.0 ^s ; 0.065μ ipP 35.5
				13.IX	KRA (SKM)	eiP 00 23 05	

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
25.IX	Sumbawa Island, NEIS: 11.298°S, 117.245°E, H=18 ^h 31 ^m 39.1 ^s , h=33 km, MB=5.6	NIE	Δ=103.0° ePP 18 49 51	27.IX	NIE	Δ=150.1° 1PKIKP 17 41 54.5 C Z: 1.1 ^s ; 0.026μ eiPKP ₂ 42 07	
25.IX	Turkey, NEIS: 38.689°N, 31.050°E, H=19 ^h 56 ^m 56.7 ^s , h=18 km, MB=4.3	NIE	Δ=13.2° eP 20 00 09 eiPP 20	28.IX	Italy, NEIS: 46.185°N, 12.909°E, H=01 ^h 43 ^m 13.8 ^s , h=10 km	NIE	Δ=5.9° eiPn 01 44 44 1 45 21 iSn 51
26.IX	Maoquarie Islands, NEIS: 60.039°S, 150.585°E, H=04 ^h 56 ^m 57.1 ^s , h=33 km, MB=5.3	KRA	Δ=13.8° (SKM) eP 20 00 26 Z: 1.0 ^s ; 0.024μ	28.IX	Tonga Islands, NEIS: 21.517°S, 174.230°W, H=12 ^h 12 ^m 10.3 ^s , h=33 km, MB=5.6	KRA	Δ=6.1° (SKM) ei 01 45 10 eiS ^x 46 11
26.IX	Kamchatka, NEIS: 53.376°N, 160.745°E, H=08 ^h 21 ^m 21.7 ^s , h=43 km, MB=4.8; MPV=5.2 (Kraków)	KRA	Δ=150.7° (SKM) ePKIKP 05 16 45 Z: 1.2 ^s ; 0.031μ	29.IX	Kamchatka, NEIS: 52.619°N, 159.632°E, H=07 ^h 56 ^m 49.0 ^s , h=33 km, MB=4.7; MPV=5.1 (Niedzica)	NIE	Δ=149.4° (SKM) 1PKIKP 12 31 57.7 1PKP ₂ 32 09.2
26.IX	KRA	Δ=150.1° ePKIKP 05 16 45		29.IX	Kamchatka, NEIS: 52.619°N, 159.632°E, H=07 ^h 56 ^m 49.0 ^s , h=33 km, MB=4.7; MPV=5.1 (Niedzica)	NIE	Δ=149.8° 1PKIKP 12 31 58.7 Z: 0.8 ^s ; 0.040μ
26.IX	KRA	Δ=71.8° (SKM) eP 08 32 41 D Z: 0.8 ^s ; 0.014μ		29.IX	Kamchatka, NEIS: 52.619°N, 159.632°E, H=07 ^h 56 ^m 49.0 ^s , h=33 km, MB=4.7; MPV=5.1 (Niedzica)	NIE	Δ=72.6° eiP 08 08 14 Z: 0.9 ^s ; 0.014μ
27.IX	Nevada, NEIS: 37.151°N, 116.068°W, H=14 ^h 00 ^m 00.2 ^s , h=0 km, MB=4.8; MPV=5.4 (Kraków)	KRA	Δ=149.4° (SKM) eiP 17 41 53 Z: 1.0 ^s ; 0.030μ eiPKP ₂ 42 05	29.IX	Tonga Islands, NEIS: 18.300°S, 172.780°W, H=18 ^h 31 ^m 29.4 ^s , h=33 km, MB=5.3	KRA	Δ=149.8° 1PKIKP 12 31 58.7 Z: 0.8 ^s ; 0.040μ
27.IX	Tonga Islands, NEIS: 21.489°S, 174.285°W, H=17 ^h 22 ^m 05.8 ^s , h=33 km, MB=5.0	KRA	Δ=84.9° (SKM) eiP 14 12 37 Z: 1.2 ^s ; 0.039μ	29.IX	Tonga Islands, NEIS: 18.300°S, 172.780°W, H=18 ^h 31 ^m 29.4 ^s , h=33 km, MB=5.3	KRA	Δ=146.7° (SKM) eiPKP 18 51 10 C Z: 0.6 ^s ; 0.039μ

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
30.IX	Kazakh SSR, NEIS: 47.800°N, 48.145°E, H=06 ^h 59 ^m 55.6 ^s , h=0 km, MB=5.1	KRA	Δ=18.6° (SKM) 1P 07 04 11.8 C Z: 0.7 ^s ; 0.020μ (SKD) Lm 55.0 NEZ: 34 ^s ; 1.8μ, 2.3μ, 2.3μ	30.IX	NIE	Δ=19.8° eP 16 55 13 1PP 28	
30.IX	Utah, NEIS: 40.518°N, 110.436°W, H=10 ^h 19 ^m 21.0 ^s , h=5 km, MB=5.0; MPV=5.2 (Kraków, Niedzica)	KRA	Δ=79.8° (SKM) 1P 10 31 30.3 C Z: 1.2 ^s ; 0.024μ	30.IX	Tadzhik - Sinkiang Border Region, NEIS: 39.388°N, 73.387°E, H=19 ^h 17 ^m 08.0 ^s , h=19, MB=5.0; MPV=5.3 (Niedzica), 5.4 (Kraków)	NIE	Δ=20.2° (SKM) eP 16 55 18 ePP 30
30.IX	Tonga Islands, NEIS: 15.956°S, 173.026°W, H=11 ^h 37 ^m 46.2 ^s , h=33 km, MB=5.0	NIE	Δ=80.5° eP 10 31 34 Z: 1.0 ^s ; 0.019μ	30.IX	Tadzhik - Sinkiang Border Region, NEIS: 39.388°N, 73.387°E, H=19 ^h 17 ^m 08.0 ^s , h=19, MB=5.0; MPV=5.3 (Niedzica), 5.4 (Kraków)	NIE	Δ=38.5° eiP 19 24 30 Z: 1.1 ^s ; 0.041μ
30.IX	KRA	Δ=144.4° (SKM) eP 11 57 19 Z: 1.5 ^s ; 0.037μ		30.IX	Shmoa Islands, NEIS: 16.041°S, 172.925°W, H=21 ^h 22 ^m 57.5 ^s , h=33 km, MB=5.4	KRA	Δ=38.7° (SKM) eiP 19 24 32 Z: 1.1 ^s ; 0.055μ
30.IX	Caucasus, NEIS: 40.082°N, 44.989°E, H=16 ^h 50 ^m 37.2 ^s , h=9 km, MB=4.8	KRA	Δ=144.4° (SKM) eP 11 57 19 Z: 1.5 ^s ; 0.037μ	30.IX	Shmoa Islands, NEIS: 16.041°S, 172.925°W, H=21 ^h 22 ^m 57.5 ^s , h=33 km, MB=5.4	KRA	Δ=144.5° (SKM) 1PKP 21 42 31.0 D Z: 1.5 ^s ; 0.111μ (SKD) ePP 45 46 Lm 22 43 NEZ: 23 ^s ; 1.8μ, 1.6μ, 2.2μ
30.IX	KRA	Δ=144.4° (SKM) eP 11 57 19 Z: 1.5 ^s ; 0.037μ		30.IX	Shmoa Islands, NEIS: 16.041°S, 172.925°W, H=21 ^h 22 ^m 57.5 ^s , h=33 km, MB=5.4	NIE	Δ=145.0° eiPKP 21 42 31 Z: 1.6 ^s ; 0.11 μ
30.IX	KRA	Δ=144.4° (SKM) eP 11 57 19 Z: 1.5 ^s ; 0.037μ		30.IX	Shmoa Islands, NEIS: 16.041°S, 172.925°W, H=21 ^h 22 ^m 57.5 ^s , h=33 km, MB=5.4	NIE	Δ=145.0° eiPKP 21 42 31 Z: 1.6 ^s ; 0.11 μ

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part 4

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1977

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The present Seismological Bulletin contains distant earthquakes recorded by seismological observatories of the Institute of Geophysics, Polish Academy of Sciences. The identification of shocks and interpretation of phases were based on the hypocenter determination given by:

NEIS - U.S. Department of the Interior (Geological Survey),
National Earthquake Information Service, Boulder.

EMSC - European Mediterranean Seismological Centre, Strasbourg;

Moscow - Central Seismological Station "Obninsk", Institute of the Physics of the Earth, USSR Academy of Sciences, Moscow.

Magnitudes of earthquakes were determined from recordings of horizontal and vertical components of surface waves for epicentral distances $\Delta > 5^\circ$ and depths $h < 80$ km, using the IASPEI formula. The magnitude from body waves was determined only from the recordings of vertical component of the P waves for $\Delta > 20^\circ$ and depths $h < 80$ km, using the calibrating function given by Vanek et al. (1962)*. The maximum value of A/T was determined in the interval up to 40 s from the first arrival of the P wave.

The parameters of seismographs of Warszawa, Kraków, Racibórz and Książ station remain unchanged. The frequency responses have been given in the Seismological Bulletin for the period January - March, 1977. Since April 1977 the parameters of seismograph of vertical component of Niedzica station have been changed. The frequency responses of Niedzica station are given in Figure 1 in Seismological Bulletin for the period April-June, 1977.

* Vanek J., Zátopek A., Karnik V., Kondorskaya N.V., Riznichenko Yu.V., Savarenskiy E.F., Solovev S.L., Shebalin N.V., 1962, Standartizatsiya shkaly magnitud, Izv. AN SSSR, Ser. Geofiz., 2, 153-158.

Station	Type of seismo-graph	Comp.	Ts [s]	Tg [s]	Ds	Dg	σ^2	Vo	Vm	Tm [s]
Warszawa (WAR) $\varphi = 52^{\circ}14'30''$ N $\lambda = 21^{\circ}01'25''$ E h=110	GW	N-S	10.28	12.10	1.08	1.02	0.059	1500	865	4.2-9.0
		E-W	9.68	11.10	0.99	0.98	0.058	1330	820	4.4-9.0
		Z	7.80	11.38	0.50	0.83	0.030	900	855	5.5-9.0
SKD	SKD	N-S	20.3	79.8	1.08	0.47	0.086	535	550	13-32
		E-W	20.4	89.6	1.04	0.50	0.091	513	520	13-32
		Z	21.4	86.5	1.00	0.48	0.104	603	620	14-32.6
Kraków (KRA) $\varphi = 50^{\circ}03'22''$ N $\lambda = 19^{\circ}56'23''$ E h=223 m	Ch	N-S	1.24	0.281	0.497	1.981	0.132	10600	11420	0.17-1.0
		E-W	1.29	0.280	0.530	1.942	0.139	11300	11300	0.15-1.0
		Z	1.46	0.282	0.579	1.984	0.156	10780	11100	0.15-1.0
	SKM-3	N-S	1.273	0.580	0.515	0.487	0.0125	21800	23260	0.5-0.75
		E-W	1.280	0.575	0.524	0.469	0.0129	22560	24470	0.5-0.75
		Z	1.445	0.580	0.610	0.486	0.0131	22000	22700	0.5-0.75
	GW	N-S	9.70	1.01	0.49	5.00	0.020	1480	1500	0.22-8.0
		E-W	11.10	1.00	0.47	5.00	0.021	1480	1490	0.21-9.0
		Z	10.50	1.01	0.48	5.00	0.025	1010	1020	0.22-8.5
SKD	N-S	20.0	106.6	1.00	0.50	0.144	600	610	13.5-40	
	E-W	20.0	98.2	0.99	0.50	0.149	600	615	13.5-40	
	Z	20.0	108.8	1.00	0.50	0.193	690	705	13.5-40	

Station	Type of seismo-graph	Comp.	Ts [s]	Tg [s]	Ds	Dg	σ^2	Vo	Vm	Tm [s]
Racibórz (RAC) $\varphi = 50^{\circ}05'00''$ N $\lambda = 18^{\circ}11'39''$ E h=209 m	SK-58	N-S	1.22	1.06	0.50	0.73	0.013	2420	2820	0.75-1.19
		E-W	1.23	1.07	0.57	0.50	0.013	2880	2710	0.75-1.17
		Z	1.12	1.07	0.31	0.40	0.020	3110	5220	0.91-1.16
Mainka (M)	Mainka (M)	N-S	9.0	-	0.36	-	-	87	130	6-9
		E-W	9.0	-	0.38	-	-	86	120	6-9
		Z	2.0	-	0.13	-	-	165	620	1.8-2.2
Niedzica (NIE) $\varphi = 49^{\circ}25'25''$ N $\lambda = 20^{\circ}19'19''$ E h=555 m	SK-58	N-S	1.40	0.266	0.70	3.50	0.054	25000	25100	0.10-0.85
		E-W	1.40	0.293	0.70	3.54	0.051	25150	25280	0.10-0.90
		Z	1.09	0.207	0.70	3.50	0.313	64950	73270	0.20-0.85
Książ (KSP) $\varphi = 50^{\circ}50'6''$ N $\lambda = 16^{\circ}17'6''$ E h=380 m	SU-59	N-S	1.19	0.25	0.50	1.37	0.089	87450	90000	0.15-0.60
		E-W	1.22	0.24	0.62	1.44	0.142	108700	110800	0.15-0.60
		Z	1.00	0.21	0.50	1.53	0.171	106300	110700	0.15-0.65

A b b r e v i a t i o n s

Ts - free period of seismometer,
Tg - free period of galvanometer,
Ds - attenuation of seismometer,
Dg - attenuation of galvanometer,
 σ^2 - coupling coefficient,

Vo - static magnification $Vo = \frac{2A}{10} \sqrt{\frac{Ks}{Kg}} \frac{Ds}{Dg} \frac{Tg}{Ts} \sigma^2$

Vo - static magnification of SKD instruments $Vo = \frac{2A}{10} \sqrt{\frac{Ks}{Kg}} \frac{Dg}{Ds} \frac{Tg}{Ts} \sigma^2$

Vm - maximum magnification,

Tm - interval of periods for magnification range $V \geq 0.9 Vm$.

Date	Station	Phase	T.U. h m s		Date	Station	Phase	T.U. h m s
30.X	Fiji Islands Region - continuation				30.X	KRA	eiPcP eipP	21 05 38 49
	NIE $\Delta=147.36^\circ$ ePKIKP 06 44 06 iPKHKP 09.5 1 22.5				30.X	NIE	1P	22 01 19.0 D Z: 0.6 ^s ; 0.016 μ
30.X	New Hebrides Islands, NEIS: 14.871°S, 166.950°E, H=12 ^h 53 ^m 22.8 ^s , h=103 km, MB=5.6				30.X	Kermadec Islands Region, NEIS: 27.385°S, 176.396°W, H=22 ^h 27 ^m 01.9 ^s , h=57 km, MB=5.3		
	NIE $\Delta=136.09^\circ$ e1PKIKP 13 12 36					KRA $\Delta=154.13^\circ$ (SKM) ePKP 22 46 56		
30.X	Kermadec Islands Region, NEIS: 27.188°S, 176.724°W, H=16 ^h 25 ^m 58.0 ^s , h=47 km, MB=5.2					NIE $\Delta=154.50^\circ$ ePKP 22 46 58 ei 47 07 e1PKP ₂ 19		
	KRA $\Delta=153.83^\circ$ (SKM) e1PKIKP 16 45 53 NIE $\Delta=154.20^\circ$ ePKIKP 16 45 54 1PKP ₂ 46 14				31.X	Tonga Islands, NEIS: 20.681°S, 174.816°W, H=13 ^h 07 ^m 27.8 ^s , h=86 km, MB=4.8		
30.X	Philippine Islands Region, NEIS: 15.535°N, 123.044°E, H=20 ^h 52 ^m 56.1 ^s , h=58 km, MB=5.1; MPV=5.2 (Niedzica), 5.4 (Kraków)					KRA $\Delta=148.44^\circ$ (SKM) ePKP 13 27 03 Z: 1.8 ^s ; 0.14 μ ei 15 NIE $\Delta=148.88^\circ$ ePKP 13 27 04 Z: 1.5 ^s ; 0.089 μ ei 11 eipPKP 25		
	NIE $\Delta=86.39^\circ$ eiP 21 05 34 D Z: 1.0 ^s ; 0.020 μ cipP 48 KRA $\Delta=86.41^\circ$ (SKM) eiP 21 05 34 Z: 1.0 ^s ; 0.030 μ				31.X	NIE	eiP 22 53 55 Z: 1.1 ^s ; 0.015 μ	

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1.XI Tonga Islands Region, NEIS:
22.825°S, 174.646°W, H=08^h25^m22.1^s,
h=33 km, MB=4.9

KRA $\Delta=150.51^\circ$
(SKM) ePKP 08 45 12
ePKP₂ 23
NIE $\Delta=150.94^\circ$
e1PKP 08 45 15
Z: 0.9^s; 0.013 μ
e1PKP₂ 21

1.XI Fiji Islands Region, NEIS:
20.272°S, 174.113°W, H=21^h16^m31.3^s,
h=248 km, MB=4.8

NIE $\Delta=148.71^\circ$
e1PKP 21 35 50
Z: 0.7^s; 0.011 μ
ei 53

2.XI Taiwan, NEIS: 26.667°N, 121.926°E,
H=01^h02^m45.8^s, h=85 km, MB=4.9

Date	Station	Phase	T.U. h m s		Date	Station	Phase	T.U. h m s
2.XI	Taiwan - continuation				3.XI	RAC	$\Delta=8.93^\circ$	
	NIE $\Delta=78.76^\circ$ eiP 01 14 41 eiPcP 47				(SK)	ePn 02 25 09 eP ^N 23 eSn 26 55 eS ^N 27 24		
2.XI	Tonga Islands, NEIS: 15.391°S, 173.319°W, H=01 ^h 19 ^m 27.9 ^s , h=30 km, MB=5.3				WAR	$\Delta=10.34^\circ$ (SKD) eiPn 02 25 28 eiSn 27 28 eiSS 36 eiSg 28 24 Lm 29 20 E: 14 ^s ; 120 μ Lm 30 28 NZ: 10 ^s ; 40 μ , 28 μ		
	KRA $\Delta=143.79^\circ$ (SKM) ePKHKP 01 38 59 ePKIKP 39 05 NIE $\Delta=144.28^\circ$ e1PKIKP 01 39 04				3.XI	Yugoslavia, NEIS: 42.739°N, 20.744°E, H=09 ^h 05 ^m 15.3 ^s , h=33 km		
2.XI	Kamchatka Region, NEIS: 51.905°N, 160.132°E, H=06 ^h 30 ^m 40.3 ^s , h=33 km, MB=4.9; MPV=5.0 (Niedzica)					NIE $\Delta=6.69^\circ$ 1Pn 09 06 56.7 Z: 1.2 ^s ; 0.018 μ ei 07 16		
	NIE $\Delta=73.41^\circ$ eiP 06 42 11 Z: 0.9 ^s ; 0.010 μ				3.XI	Kuril Islands, NEIS: 44.404°N, 149.350°E, H=12 ^h 28 ^m 00.7 ^s , h=44 km, MB=4.6; MPV=5.4 (Kraków)		
2.XI	Fiji Islands Region, NEIS: 17.287°S, 179.223°W, H=23 ^h 37 ^m 03.3 ^s , h=555 km, MB=5.1					KRA $\Delta=76.12^\circ$ (SKM) eiP 12 39 47 Z: 0.7 ^s ; 0.025 μ		
	KRA $\Delta=143.85^\circ$ (SKM) e1PKHKP 23 55 35.8 C Z: 0.8 ^s ; 0.037 μ e1PKIKP 40.2				3.XI	Turkey, NEIS: 39.283°N, 43.498°E, H=19 ^h 46 ^m 15.0 ^s , h=33 km, MB=5.1		
3.XI	Bulgaria, NEIS: 42.106°N, 23.972°E, H=02 ^h 22 ^m 54.9 ^s , h=6 km, MB=5.2; MLH=5.3 (Kraków), 5.9 (Warszawa)					NIE $\Delta=19.35^\circ$ eP 19 50 40 Z: 1.5 ^s ; 0.066 μ KRA $\Delta=19.83^\circ$ (SKM) eP 19 50 46 Z: 0.6 ^s ; 0.016 μ		
	NIE $\Delta=7.75^\circ$ iPn 02 24 51.0 Pm 54 Z: 0.6 ^s ; 0.049 μ iP ^N 25 09.4 iPg 16.4				4.XI	Aleutian Islands, NEIS: 51.659°N, 175.952°W, H=09 ^h 52 ^m 55.7 ^s , h=33 km, MB=5.7; MLH=6.6, MLV=6.7 (Kraków), MLH=7.0 (Warszawa)		
	KRA $\Delta=8.43^\circ$ (SKM) ePn 02 25 01 (GW) ei 31 i 26 47 Lm 27.5 Z: 6 ^s ; 3.7 μ Lm 29.2 NE: 7 ^s ; 14 μ , 17 μ					WAR $\Delta=75.49^\circ$ (SKD) eiP 10 04 36 iP 46 ei 05 36		

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Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
22.XI	Tonga Islands Region, NEIS: 22.164°S, 173.984°W, H=13 ^h 11 ^m 05.5 ^s , h=33 km, MB=4.7			23.XI	NIE	Δ=150.37° 1PKP Z: 1.0 ^s ; 0.030μ	02 30 55.0
	KRA Δ=150.08° (SKM) ePKP 13 30 52 e1PKP ₂ 31 03			23.XI	Argentina, NEIS: 31.028°S, 67.767°W, H=09 ^h 26 ^m 24.7 ^s , h=13 km, MB=6.3; MLH=7.0, MLV=6.2 (Kraków)		
22.XI	Solomon Islands, NEIS: 10.231°S, 161.126°E, H=15 ^h 56 ^m 44.1 ^s , h=92 km, MB=5.9				KRA Δ=111.72° (SKD) eiPdif 09 41 06 C Pm 42 Z: 19 ^s ; 13.5μ		
	KRA Δ=129.00° (SKM) 1PKIKP 16 15 42.7 D Z: 1.2 ^s ; 0.055μ epPKIKP 16 04.4 eiPP 17 50.8 (GW) i 18 16 (SKD) Lm 17 07.5 NE: 30 ^s ; 6.8μ, 7.1μ Lm 07.9 Z: 30 ^s ; 8.7μ				WAR Δ=113.16° (SKD) 1Pdif 09 41 12 ei 36 i 45 36 1PS 55 26 iScSP 58 Lm 10 26 00 Z: 28 ^s ; 156μ Lm 38 00 NE: 20 ^s ; 184μ, 195μ		
	WAR Δ=127.12° (SKD) eiPP 16 17 58 ei 27 28 Lm 17 04 00 NEZ: 28 ^s , 28 ^s , 32 ^s , 7.5μ, 13μ, 11μ				NIE Δ=111.70° ePdif 09 41 07 i 46 09		
22.XI	Near Coast of California, NEIS: 39.448°N, 123.259°W, H=21 ^h 15 ^m 52.8 ^s , h=5 km, MB=5.2; MPV=5.6 (Kraków), 5.4 (Niedzica)			23.XI	RAC	eP 11 32 49	
	KRA Δ=85.17° (SKM) eP 21 28 33 C Z: 1.2 ^s ; 0.055μ				KRA (SKM) eiP 11 32 56 Z: 0.8 ^s ; 0.32μ i 33 16.5		
	NIE Δ=85.85° 1P 21 28 36.0 C Z: 1.4 ^s ; 0.043μ ei 43			23.XI	Aleutian Islands, NEIS: 52.195°N, 171.546°W, H=16 ^h 55 ^m 20.4 ^s , h=53 km, MB=5.5; MPV=5.5 (Kraków), 5.4 (Niedzica), MLH=5.6, MLV=5.3 (Kraków)		
23.XI	South of Fiji Islands, NEIS: 24.450°S, 179.856°E, H=02 ^h 12 ^m 02.5 ^s , h=523 km, MB=5.1				KRA Δ=77.66° (SKM) eP 17 07 12 C Z: 1.4 ^s ; 0.064μ		
	KRA Δ=150.04° (SKM) eiPKP 02 30 54 C Z: 0.8 ^s ; 0.028μ						

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
23.XI	KRA (SKD)	ePoP ePPS Lm NEZ: 30 ^s ; 2.0μ, 3.9μ, 2.5μ	17 07 20 08 08 36.5	26.XI	Fiji Islands Region, NEIS: 17.956°S, 178.120°W, H=05 ^h 21 ^m 40.8 ^s , h=564 km, MB=5.5		
	NIE	Δ=78.25° 1P 17 07 16.0 C Z: 1.5 ^s ; 0.044μ 1PcP 26.3 1pP 30			KRA Δ=144.85° (SKM) 1PKP 05 40 14.8 C Z: 1.0 ^s ; 0.042μ		
	WAR Δ=75.40° (SKD) ei 17 15 12 eiS 16 40 eiSKS 17 10 eL 21.0				NIE Δ=145.26° 1PKP 05 40 16.4 Z: 0.7 ^s ; 0.062μ ei 23		
24.XI	Argentina, NEIS: 31.471°S, 67.628°W, H=01 ^h 58 ^m 33.4 ^s , h=33 km, MB=5.8			26.XI	Tonga Islands, NEIS: 15.274°S, 174.400°W, H=09 ^h 14 ^m 51.2 ^s , h=133 km, MB=5.3		
	NIE Δ=111.93° eiPKIKP 02 17 11				KRA Δ=143.40° (SKM) ePKHKP 09 34 06 ePKIKP 14		
24.XI	Tuamotu Archipelago Region, NEIS: 21.894°S, 138.959°W, H=16 ^h 59 ^m 58.5 ^s , h=0 km, MB=6.0				NIE Δ=143.88° eiPKHKP 09 34 10 Z: 0.9 ^s ; 0.017μ ei 49		
	RAC Δ=146.61° (SK) ePKP 17 19 42			26.XI	NIE	1P 13 15 54.0 Z: 0.6 ^s ; 0.030μ	
	KRA Δ=147.34° (SKM) 1PKHKP 17 19 42.2 D 1PKIKP 45.8 Z: 1.0 ^s ; 0.30μ i 47.5			26.XI	Greece, NEIS: 38.487°N, 20.275°E, H=13 ^h 19 ^m 47.2 ^s , h=66 km, MB=4.6		
	NIE Δ=148.00° 1PKP 17 19 46.2 C Pm 52 Z: 1.2 ^s ; 0.37μ				NIE Δ=10.93° eP 13 22 23 Z: 0.9 ^s ; 0.011μ i 41		
24.XI	Fiji Islands Region, NEIS: 17.840°S, 178.790°W, H=20 ^h 11 ^m 48.1 ^s , h=549 km, MB=5.2			26.XI	China, NEIS: 39.465°N, 117.938°E, H=22 ^h 46 ^m 52.2 ^s , h=33 km, MB=5.1; MPV=5.6 (Kraków)		
	KRA Δ=144.51° (SKM) eiPKP 20 30 22 C Z: 0.7 ^s ; 0.025μ				KRA Δ=65.51° (SKM) 1P 22 57 33.7 C Z: 1.0 ^s ; 0.048μ i 39.8		
	NIE Δ=144.92° 1PKP 20 30 26.2 Z: 0.5 ^s ; 0.029μ ei 33			27.XI	Philippine Islands, NEIS: 11.800°N, 125.472°E, H=02 ^h 19 ^m 52.3 ^s , h=33 km, MB=5.5; MPV=6.2 (Kraków, Niedzica), MLH=5.8, MLV=5.8 (Kraków)		

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
10.XII	KRA (SKM)	e1P Z: 0.6 ^S ; 0.019 μ	11 21 29	13.XII	North Atlantic Ocean, NEIS: 17.359 ^O N, 54.848 ^O W, H=01 ^h 14 ^m 18.6 ^S , h=33 km, MB=5.7; MPV=5.9 (Kraków), 5.7 (Niedzica), MLH=6.1. MLV=6.0 (Kraków), MLV=6.4 (Warszawa)		
10.XII	KRA (SKM)	$\Delta=74.59^{\circ}$ eP Z: 1.2 ^S ; 0.047 μ	23 23 03				
11.XII	KRA (SKM)	$\Delta=82.47^{\circ}$ e1P Z: 1.1 ^S ; 0.082 ^O	16 34 31				
12.XII	KRA (SKM)	$\Delta=79.65^{\circ}$ e1P Z: 0.7 ^S ; 0.029 μ	02 56 10				
12.XII	KRA (SKM)	$\Delta=79.67^{\circ}$ 1P Z: 1.1 ^S ; 0.015 μ	02 56 10.5				
12.XII	KRA (SKM)	$\Delta=145.59^{\circ}$ e1PKP Z: 1.2 ^S ; 0.079 μ	08 57 15				
12.XII	NIE	$\Delta=146.05^{\circ}$ 1PKP Z: 1.0 ^S ; 0.020 μ	08 57 17				
			i	30			

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
13.XII	KRA (SKM)	$\Delta=146.54^{\circ}$ e1PKP Z: 0.7 ^S ; 0.025 μ	06 47 16	13.XII	Tonga Islands, NEIS: 18.309 ^O S, 173.522 ^O W, H=06 ^h 27 ^m 40.0 ^S , h=38 km, MB=5.2		
14.XII	NIE	$\Delta=89.38^{\circ}$ 1P Z: 1.4 ^S ; 0.050 μ	03 13 08.9	14.XII	South of Indian Ocean, NEIS: 33.793 ^O S, 58.035 ^O E, H=03 ^h 00 ^m 14.6 ^S , h=33 km, MB=5.6; MPV=5.5 (Niedzica), 5.7 (Kraków)		
14.XII	KRA (SKM)	$\Delta=90.05^{\circ}$ e1P Z: 1.0 ^S ; 0.059 μ	03 13 11	14.XII	Nevada, NEIS: 37.136 ^O N, 116.086 ^O W, H=15 ^h 30 ^m 00.2 ^S , h=0 km, MB=5.7; MPV=6.1 (Kraków)		
14.XII	KRA (SKM)	$\Delta=153.51^{\circ}$ ePKP Lm NEZ: 25 ^S ; 1.3 μ , 1.3 μ , 2.4 μ	05 01 17 06 04.4	14.XII	Fiji Islands Region, NEIS: 21.101 ^O S, 179.145 ^O W, H=18 ^h 52 ^m 34.9 ^S , h=659 km, MB=5.6		
14.XII	NIE	$\Delta=153.84^{\circ}$ e1PKP Z: 2.0 ^S ; 0.069 μ	05 01 17				
14.XII	KRA (SKM)	$\Delta=76.07^{\circ}$ e1P Z: 0.8 ^S ; 0.028 μ	23 37 53	14.XII	Kuril Islands, NEIS: 44.148 ^O N, 148.613 ^O E, H=23 ^h 26 ^m 10.8 ^S , h=57 km, MB=4.7; MPV=5.3 (Kraków)		
14.XII	NIE	$\Delta=92.03^{\circ}$ 1P Z: 1.1 ^S ; 0.037 μ	09 00 36.5	15.XII	KRA (SKM)	e1P Z: 0.4 ^S ; 0.020 μ	08 13 11
14.XII	KRA (SKM)	$\Delta=92.07^{\circ}$ 1P Z: 0.9 ^S ; 0.032 μ	09 00 36.4	15.XII	KRA (SKM)	1P Z: 0.3 ^S ; 0.070 μ	12 19 13.9

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
15.XII	Caucasus, NEIS: 43.241°N, 45.168°E, H=15 ^h 07 ^m 51.8 ^s , h=33 km, MB=4.9	KRA (SKM)	15 12 05 40.2	16.XII	KRA 159.460(SKM)	Δ=73.01° eP Z: 0.9 ^s ; 0.026μ	09 20 28
15.XII	Tanzania, NEIS: 4.761°S, 34.913°E, H=23 ^h 20 ^m 53.6 ^s , h=33 km, MB=4.8; MPV=5.1 (Niedzica)	NIE	23 30 31.0 37.4	16.XII	Japan, NEIS: 36.619°N, 140.989°E, H=15 ^h 10 ^m 28.0 ^s , h=46 km, MB=5.6; MPV=6.1 (Kraków)	KRA (SKM)	15 22 29.6 41.5
		KRA (SKM)	23 30 35 33 18			RAC (SK)	15 22 35
16.XII	Kuril Islands, NEIS: 43.233°N, 146.763°E, H=07 ^h 11 ^m 41.6 ^s , h=38 km, MB=5.4; MPV=5.9 (Kraków)	KRA (SKM)	07 23 27.0 37.6	17.XII	KRA (SKM)	eIP Z: 0.5 ^s ; 0.020μ	05 08 56 C
16.XII	Turkey, NEIS: 38.436°N, 27.216°E, H=07 ^h 37 ^m 30.1 ^s , h=34 km, MB=5.3; MLH=4.8 (Kraków)	NIE	07 40 22 27	17.XII	Fiji Islands Region, NEIS: 21.048°S, 178.785°W, H=16 ^h 03 ^m 00.3 ^s , h=602 km, MB=5.1	KRA (SKM)	16 21 38.1 C
		KRA (SKM)	07 40 30 39			RAC (SK)	16 21 41
		(SKD)	43.9 45.2	17.XII	Tonga Islands Region, NEIS: 23.722°S, 175.820°W, H=16 ^h 07 ^m 50.0 ^s , h=115 km, MB=5.1	KRA (SKM)	16 27 32 D
16.XII	Kamchatka, NEIS: 51.630°N, 159.460°E, H=09 ^h 08 ^m 59.7 ^s , h=33 km, MB=4.7; MPV=5.4 (Kraków)	KRA (SKM)	17 39 21 58.4			RAC (SK)	16 21 41
		(SKD)	46.9 5.4 (Niedzica)	17.XII	Aleutian Islands, NEIS: 52.210°N, 170.025°W, H=17 ^h 27 ^m 27.5 ^s , h=40 km, MB=5.3; MPV=5.6 (Kraków)	KRA (SKM)	17 39 21 D
			NE: 15 ^s ; 7.4μ, 5.0μ				Z: 0.8 ^s ; 0.041μ

Date	Station	Phase	T.U. h m s	Date	Station	Phase	T.U. h m s
17.XII	Aleutian Islands - continuation	NIE	17 39 25.0 D	19.XII	Iran, NEIS: 30.954°N, 56.473°E, H=23 ^h 34 ^m 34.2 ^s , h=31 km, MB=5.4; MPV=6.2, MLH=5.7, MLV=5.5 (Kraków)	NIE	23 41 07
		1P	32.8			KRA (SKM)	23 41 10.9 C
		1sP	39.5			(SKD)	46 37
18.XII	NIE	eIP	00 06 04			RAC	20 02 02
		1	09.8	18.XII	China, NEIS: 39.865°N, 77.334°E, H=16 ^h 47 ^m 17.1 ^s , h=33 km, MB=5.3; MPV=5.5 (Niedzica, Kraków), MLH=5.7, MLV=6.0 (Kraków)	(SK)	23 41 19
		KRA (SKM)	00 06 07 07 57			WAR (SKD)	23 46 37
							47 48
							49 45
				18.XII		NIE	16 54 57.5 C
						1P	55 08
						Z: 1.0 ^s ; 0.065μ	
						ipP	55 08
						KRA (SKM)	16 54 57.5 C
						Pm	55 04.7
						Z: 1.3 ^s ; 0.10μ	
						1	21.2
						(SKD)	17 01 19
						eS	04 15
						eSS	06.9
						eL	09.9
						Lm	7.1μ
						NEZ: 24 ^s ; 12μ, 4.1μ,	
						7.1μ	
						Lm	13.3
						NEZ: 16 ^s ; 6.3μ, 6.9μ,	
						16μ	
						WAR (SKD)	16 56 28
						eIP	17 01 09
						eIS	03 40
						eI(SS)	12 14
						Lm	13 16
						EZ: 18 ^s , 16 ^s ; 52μ, 21μ	
						N: 8 ^s ; 21μ	

Date	Station	Phase	T.U. h m s
20.XII	NIE	1P	10 06 35.0 Z: 1.0 ^S ; 0.031μ
21.XII Volcano Islands Region, NEIS: 25.510°N, 143.112°E, H=01 ^h 00 ^m 32.8 ^S , h=33 km, MB=6.2; MPV=6.4 (Kraków, Nie- dzica), MLH=6.8, MLV=6.8 (Kraków)			
WAR	(SKD)	1P	01 13 20 e1 45 i 15 49 e1SKS 23 41 e1S 59 e1PS 24 56 Lm 56 20 NEZ: 16 ^S , 18 ^S , 18 ^S , 67μ, 140μ, 75μ
KRA	(SKM)	eP	01 13 27 Z: 1.1 ^S ; 0.34μ
(SKD)		i	44.2
(SKD)		1PP	17 01
		1SKS	23 57
		e1(P _S)	25 13
		Lm	57.2 NEZ: 18 ^S ; 40μ, 20μ, 47μ
NIE		1P	01 13 28.5
		1PoP	31.0
		Pm	32.5 Z: 1.2 ^S ; 0.37μ
		1pP	38
		1sP	44
RAC	(SK)	e1P	01 13 33 e1sP 46
21.XII Kashmir - India Border Region, NEIS: 32.837°N, 76.634°E, H=02 ^h 07 ^m 10.0 ^S , h=33 km, MB=5.1; MPV=4.9 (Niedzica)			
NIE		1P	02 16 20.0 Z: 1.1 ^S ; 0.017μ
21.XII	Japan, NEIS: 30.847°N, 132.321°E, H=04 ^h 54 ^m 31.3 ^S , h=33 km, MB=5.2; MPV=5.2 (Niedzica)	KRA	Δ=79.69° (SKM) e1P 05 06 36.5 D Z: 0.8 ^S ; 0.055μ
		NIE	Δ=79.86° e1P 05 06 37.5 D Z: 1.4 ^S ; 0.032μ
		1sP	49.0
21.XII	Fiji Islands Region, NEIS: 18.175°S, 178.551°W, H=05 ^h 08 ^m 54.4 ^S , h=606 km, MB=4.9	KRA	Δ=144.90° (SKM) 1PKP 05 27 23.3 C Z: 0.7 ^S ; 0.033μ
		NIE	Δ=145.31° 1PKP 05 27 25.5 C Z: 0.6 ^S ; 0.21μ
21.XII	Kamchatka, NEIS: 52.929°N, 159.804°E, H=16 ^h 39 ^m 33.0 ^S , h=33 km, MB=5.5; MPV=5.9 (Kraków), 5.8 (Niedzica)	KRA	Δ=71.93° (SKM) eP 16 50 54 Z: 0.8 ^S ; 0.078μ
		e1pP	51 02
		NIE	Δ=72.40° e1P 16 50 57 Z: 1.0 ^S ; 0.084μ
		1pP	51 06
		1sP	13
21.XII	Hindu Kush Region, NEIS: 36.196°N, 68.667°E, H=20 ^h 17 ^m 13.6 ^S , h=53 km, MB=4.8; MPV=5.3 (Kraków)	KRA	Δ=37.49° (SKM) eP 20 25 31 Z: 0.6 ^S ; 0.023μ
21.XII	KRA	(SKM) eP	21 33 06
	NIE	e1P	21 33 07 Z: 2.0 ^S ; 0.17μ



Date	Station	Phase	T.U. h m s
22.XII	Kermadec Island Region, NEIS: 27.503°S, 178.801°W, H=02 ^h 00 ^m 41.8 ^S , h=253 km, MB=5.2	KRA	Δ=153.30° (SKM) ePKP 02 20 13
22.XII	NIE	1P	04 52 21.0 Z: 1.3 ^S ; 0.039μ
22.XII	East China Sea, NEIS: 29.553°N, 127.812°E, H=04 ^h 45 ^m 14.7 ^S , h=33 km, MB=5.5; MPV=5.6 (Niedzica), 5.8 (Kraków), MLH=6.4, MLV=6.7 (Kraków), MLH=7.0 (Warszawa), MLV=6.8 (Warszawa)	WAR	Δ=76.57° (SKD) e1P 04 56 56 e1S 05 06 48 e1SS 11 52 Lm 27 40 NE: 18 ^S ; 37μ, 67μ Lm 33 45 NEZ: 16 ^S ; 22μ, 80μ, 34μ
		KRA	Δ=78.42° (SKM) eP 04 57 13 D Pm 18.4 Z: 1.0 ^S ; 0.090μ
		(SKD)	e1pP 23 e1S 05 07 09 e1SS 12 15 eL 18.0 Lm 28.9 NEZ: 20 ^S ; 20μ, 16μ, 5.1μ Lm 34.9 Z: 15 ^S ; 29μ
		NIE	Δ=78.42° 1P 04 57 14.0 Pm 21.0 Z: 1.2 ^S ; 0.070μ i 35.0
22.XII	Atlantic - Indian Rise, NEIS: 34.419°S, 55.297°E, H=13 ^h 29 ^m 49.4 ^S , h=33 km, MB=5.7; MPV=5.9 (Niedzica, Kraków)		
22.XII	NIE		Δ=89.07° 1P 13 42 42.5 D Z: 1.5 ^S ; 0.13μ i 49.6
	KRA	(SKM) eP	Δ=89.75° 13 42 45 D Z: 0.6 ^S ; 0.046μ
	(SKD)	eSKS	53 26
		ePPS	55 26
		eL	14 13
		Lm	19.4 NEZ: 20 ^S ; 1.0μ, 1.1μ, 1.4μ
22.XII	Japan, NEIS: 39.145°N, 143.162°E, H=22 ^h 17 ^m 59.9 ^S , h=23 km, MB=5.3; MPV=5.7 MLH=5.7 (Kraków)	KRA	Δ=78.11° (SKM) e1P 22 29 59 C Z: 1.0 ^S ; 0.072μ
		e1pP	30 08.6
	(SKD)	Lm	23 07.4 NEZ: 15 ^S ; 1.7μ, 1.9μ, 2.2μ
	NIE	e1P	Δ=78.41° 22 30 00
		1pP	11.0
	RAC	(SK) eP	Δ=78.83° 22 30 04
23.XII	Jan Mayen Islands Region, NEIS: 72.023°N, 0.501°W, H=11 ^h 15 ^m 44.0 ^S , h=10 km, MB=4.8; MPV=5.7, MLH=5.0, MLV=5.1 (Kraków)	WAR	Δ=21.99° (SKD) e1P 11 20 42 e1PP 21 11 Lm 28 28 Z: 20 ^S ; 4.0μ
	KRA	(SKM) eP	Δ=23.89° 11 20 59 Pm 21 04 Z: 2.0 ^S ; 0.36μ
	(SKD)	e1	08
		1S	25 20
		Lm	30.4 NEZ: 15 ^S ; 3.4μ, 1.2μ, 4.9μ

Date	Station	Phase	T.U. h m s
23.XII	Japan, NEIS: 39.132°N, 143.162°E, H=21 ^h 02 ^m 07.5 ^s , h=19 km, MB=5.6; MPV=5.8 (Niedzica), 6.2 (Kraków), MLH=6.6 (Kra- ków), MLH=7.1 (Warszawa)	WAR (SKD)	Δ=76.04° e1P 21 13 56 e1 16 25 e1PPP 18 36 e1S 23 41 e1PS 24 21 Lm 51 44 NEZ: 16 ^s , 16 ^s , 15 ^s ; 32μ, 82μ, 33μ
		NIE	Δ=78.43° 1P 21 14 03 Pm 11 Z: 0.9 ^s ; 0.089μ 1 21.4
		KRA (SKM)	Δ=78.12° eP 21 14 07 Z: 1.0 ^s ; 0.18μ e1pP 14 1 32.3
		(SKD)	e1PP 16 58 e1PPP 18 54 e1S 24 02 Lm 51.4 NEZ: 20 ^s ; 20μ, 23μ, 26μ
		RAC (SK)	Δ=78.84° e1P 21 14 14
23.XII	Japan, NEIS: 39.140°N, 143.102°E, H=21 ^h 09 ^m 21.7 ^s , h=23 km, MB=5.4; MPV=5.5 (Niedzica), 5.8 (Kraków)	KRA (SKM)	Δ=78.09° 1P 21 21 19.9 C Z: 0.7 ^s ; 0.062μ e1pP 30 e1sP 35
		NIE	Δ=78.39° 1P 21 21 22.5 C Z: 0.8 ^s ; 0.035μ 1pP 32.5
		RAC (SK)	Δ=78.80° eP 21 21 26
23.XII	Japan, NEIS: 39.068°N, 143.047°E, H=21 ^h 14 ^m 26.7 ^s , h=41 km, MB=5.4; MPV=5.8 (Kraków), 5.5 (Niedzica), MLH=6.6, MLV=6.6 (Kraków), MLH=7.1 (Warszawa)	WAR (SKD)	Δ=76.04° e1P 21 26 13 e1 28 35 1S 35 59 Lm 22 03 55 NEZ: 16 ^s , 18 ^s , 15 ^s , 30μ, 81μ, 33μ
		RAC (SK)	Δ=78.84° eP 21 26 29
		KRA (SKM)	Δ=78.12° e1P 21 26 23 D Z: 1.0 ^s ; 0.090μ 1pP 35.4
		(SKD)	e1S 36 14 Lm 22 03.7 NEZ: 20 ^s ; 23μ, 23μ
		NIE	Δ=78.43° 1P 21 26 25.5 D Z: 0.9 ^s ; 0.040μ
23.XII	Japan, NEIS: 39.016°N, 143.407°E, H=22 ^h 10 ^m 36.4 ^s , h=32 km, MB=5.1; MPV=5.7 (Kraków), 5.1 (Niedzica)	KRA (SKM)	Δ=78.32° eP 22 22 34 Z: 1.0 ^s ; 0.066μ
		NIE	Δ=78.63° 1P 22 22 37 C Z: 1.0 ^s ; 0.016μ 1 44.4
		RAC (SK)	Δ=79.04° eP 22 22 40
23.XII	Japan, NEIS: 39.090°N, 143.462°E, H=23 ^h 07 ^m 22.8 ^s , h=14 km, MB=5.0; MPV=5.5 (Kraków), 5.4 (Niedzica)	KRA (SKM)	Δ=78.28° 1P 23 19 24.0 D Z: 0.9 ^s ; 0.037μ e1 30
		NIE	Δ=78.59° 1P 23 19 26.5 D Z: 1.0 ^s ; 0.033μ

Date	Station	Phase	T.U. h m s
24.XII	South of Fiji Islands, NEIS: 24.944°S, 176.028°W, H=15 ^h 48 ^m 32.2 ^s , h=33 km, MB=4.8	KRA (SKM)	Δ=152.03° ePKP 16 08 27
		NIE	Δ=152.43° 1PKP 16 08 28.5 Z: 0.9 ^s ; 0.017μ 1PKP ₂ 35.3
25.XII	Loyalty Islands Region, NEIS: 22.023°S, 170.906°E, H=04 ^h 25 ^m 27.7 ^s , h=76 km, MB=5.0	NIE	Δ=144.11° 1PKP 04 44 54.0 Z: 1.4 ^s ; 0.040μ 1pPKP 45 18.0
		RAC (SK)	Δ=144.72° ePKP 04 44 54
25.XII	Banda Sea, NEIS: 7.317°S, 128.674°E, H=08 ^h 23 ^m 22.8 ^s , h=106 km, MB=5.4	NIE	Δ=107.44° ePKIKP 08 41 38
		KRA (SKM)	Δ=107.58° ePKIKP 08 41 39
25.XII	Afghanistan - USSR Border Region, NEIS: 38.923°N, 70.796°E, H=16 ^h 18 ^m 54.7 ^s , h=33 km, MB=5.3; MPV=5.5 (Niedzica), 5.8 (Kraków)	NIE	Δ=37.05° eP 16 26 03 Z: 1.0 ^s ; 0.074μ e1pP 12 1PP 27 25
		KRA (SKM)	Δ=37.27° eP 16 26 04 D Z: 0.7 ^s ; 0.090μ
25.XII	Japan, NEIS: 39.130°N, 143.380°E, H=18 ^h 20 ^m 21.6 ^s , h=18 km, MB=5.0; MPV=5.5 (Kraków), 5.4 (Niedzica)	KRA (SKM)	Δ=78.21° e1P 18 32 22 D Z: 0.9 ^s ; 0.037μ
25.XII	KRA NIF	e1pP 18 32 29 Δ=78.52° 1P 18 32 24.7 Z: 1.2 ^s ; 0.039μ e1pP 30 1sP 34.2	
25.XII	Taiwan, NEIS: 24.175°N, 121.690°E, H=22 ^h 33 ^m 48.1 ^s , h=40 km, MB=5.2; MPV=5.5 (Kraków), 5.2 (Niedzica)	KRA (SKM)	Δ=78.96° e1P 22 45 49 C Z: 1.2 ^s ; 0.055μ e1pP 59.5
		NIE	Δ=79.00° e1P 22 45 50 Z: 0.7 ^s ; 0.013μ
26.XII	South of Tonga Islands, NEIS: 24.585°S, 175.903°W, H=00 ^h 57 ^m 07.4 ^s , h=33 km, MB=4.6	NIE	Δ=152.15° e1PKP 01 17 02 e1PKP ₂ 13 1 21
26.XII	Kazakh SSR, NEIS: 49.881°N, 78.141°E, H=04 ^h 02 ^m 57.7 ^s , h=0 km, MB=4.9; MPV=5.2 (Kraków)	KRA (SKM)	Δ=36.61° e1P 04 10 08 D Z: 0.7 ^s ; 0.025μ
26.XII	Philippine Islands, NEIS: 14.707°N, 123.630°E, H=09 ^h 39 ^m 26.1 ^s , h=33 km, MB=5.3; MPV=5.4 (Niedzica)	NIE	Δ=67.38° e1P 09 52 12 Z: 1.5 ^s ; 0.049μ 1pP 21.4
		KRA (SKM)	Δ=67.40° eP 09 52 12 e1pP 21
27.XII	Fiji Islands Region, NEIS: 17.970°S, 178.630°W, H=11 ^h 38 ^m 21.3 ^s , h=555 km, MB=5.3	KRA (SKM)	Δ=78.21° e1P 18 32 22 D Z: 0.9 ^s ; 0.037μ

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B. SEISMOLOGY

The following volumes, which have been published previously in years 1963–1978, have been devoted to the problems of seismology:

- 2 Droste Z., Hordejuk J., Obsługa i wyznaczanie stałych sejsmografów polskiej sieci sejsmologicznej; PWN, Łódź–Warszawa 1964.
- 3 Wyniki rejestracji sejsmologicznych w polskich obserwatoriach 1959; PWN, Łódź–Warszawa 1964.
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- 66 Résultats des enregistrements séismologiques dans les observatoires polonais 1972. Bulletin séismologique (parts 1–5); PWN, Warszawa 1973.
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- B-2 (118) Bulletin séismologique 1976 (parts 1–5); PWN, Warszawa 1977–1978.
- B-3 (122) Macroscopic intensities observed in Czechoslovakia and Poland, PWN, Warszawa–Łódź 1978.
- B-4 124 Seismological Bulletin 1977 parts 1–3; PWN, Warszawa–Łódź 1979.