International Seismological Centre

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NOTICE ON THE MEGASEISMS

Earthquake on Tibetan Border on March 7*.

Tatsienlu (打箭鑪), Hsikang province, March 7.—According to local reports, Tatsienlu and its vicinity were shaken by a series of violent earthquakes, at about 5:30 a.m.. Houses were damaged and hundreds of people were killed and injured. This earthquake was recorded at our station (See page 12).

Mid-China Earthquake on April 6*.

The earthquake which took place on the 6th of April, was moderately recorded at Chiufeng. The max. displacement is about 40μ. The first tremor condenses on the side of N-S component, but what was recorded in the Observatoire de Zi-Ka-Wei, Shanghai, condenses on the side of E-W component; that means the epicentre lies West of Shanghai and South of Peking. By listing S-P time difference** of our station, that of Zi-Ka-Wei (1′ 5″), and that of Tsingtao (1′ 15″), the epicentre was located by means of stereographic projection to be at 115°−116°E, 31°−32°N. The district, Macheng (麻城), has been much damaged, corresponding to the IXth degree in the Rossi-Forel scale.

The cause of this earthquake is evidently tectonic. The Tungpei (桐柏) mountain range, which runs in Northwestern direction until at Huoshan (霍山) and Chienshan (潛山) where the trend turns to Northeast, making an angle of nearly 90 degrees. There seems to be two foldings which meet perpendicularly to each other. In history earthquakes were frequently known near this place. From the year 1265 to the year 1917 there occurred more than six destructive earthquakes. The recent earthquake may have some connexion with the origin of the foregoing earthquakes. The following is a preliminary map (see p. 2) showing isoseismal lines constructed with the reports from the districts where the earthquake was felt.

Macheng (麻城), Hupeh, April 6.—The local government reports that severe earthquakes took place at about 3:? p.m. until 7 of the next morning. Many native houses collapsed and persons were killed and injured.

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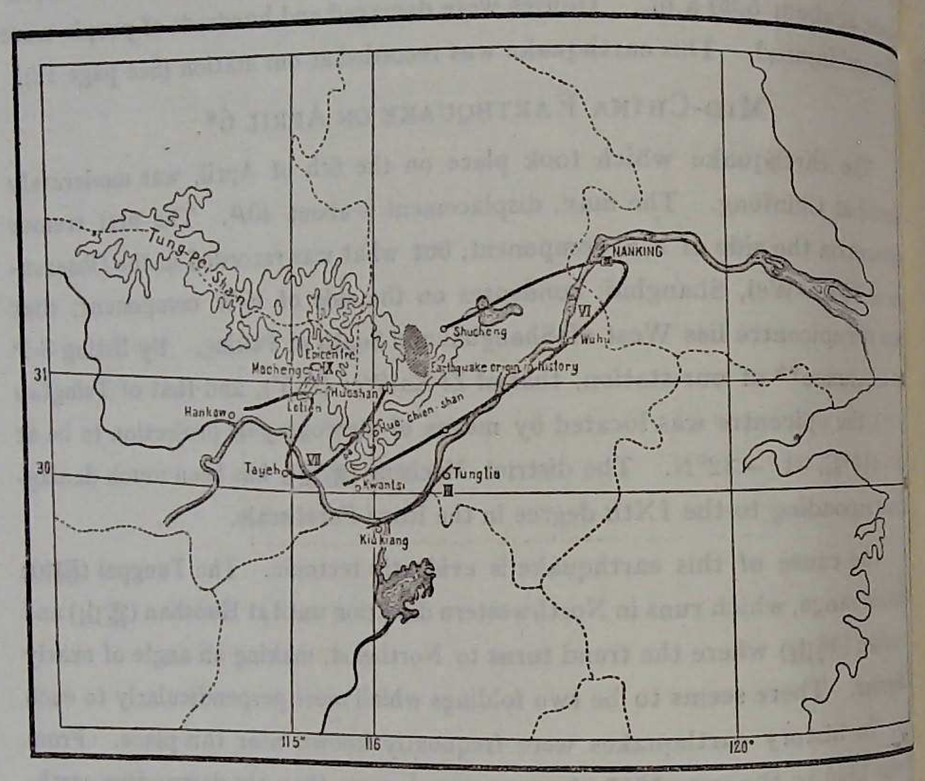
*Times given are local.

**Thanks are due to Father E. Gherzi, Directeur seismologique, Observatoire de Zi-Ka-Wei, who lent me his seismograms; and to Dr. Tsiang, Director of Tsingtao Observatory, for the time interval of the first tremor recorded at his Observatory.

Hankow (漢口), April 6.—Press reports that an earthquake was felt about 5:20 p.m. Window-glasses were broken by the shock, and people could not stand at their own places. No damage was caused.

Nanking (南京), April 6.—Press reports that an earthquake was felt about 5:15 p.m. Furnitures were shifted to and fro, everything seems to be aboard. No damage was caused.



Questionaries have been sent out to the districts affected; from which we have received the following reports (see table).

Place		Time*	Scale (R.F.)	Motion	Sound (Davison's scale)
Prov. Hupeh	Kiukiang (九江)	5:15 p.m.	III	Waving	——
	Kwangtsi (廣濟)	5:10 p.m.	III-IV	Horizontal	II, (moving car)
	Tayeh (大冶)	4:50 p.m.	VI	Impulse	V, (heavy car passing)
	Lotien (羅田)	4:20 p.m.	VII	Horizontal	V, (distant thunder)
Prov. Anhui	Shucheng (舒城)	——	V-VI	Impulse	V, (heavy car passing)
	Huoshan (霍山)	3:40 p.m.	VII	Horizontal	V, (heavy car passing)
	Tungliu (東流)	4:10 p.m.	II-III		——

*Times given are local.

DETERMINATION OF CONSTANTS (Wiechert)

due January 1932

PERMANENT CONSTANTS

(a) of Horizontal Component

M (Steady mass) 200 kg.

H (Height of c. g. of the steady mass above the turning point) 96 cm.

(b) of Vertical Component

M (Steady mass) 80 kg.

h (Distance of c. g. of the steady mass from the turning point) 54 cm.

h' (Distance of the adding weight from the turning point) 60 cm.

(1) T_0 in sec. & V

Trial	$3\text{-}T_0E$	$3\text{-}T_0N$	$3\text{-}T_0Z$	Mean
1	$17\frac{3}{5}$	$17\frac{1}{5}$	$13\frac{4}{5}$	$T_0E=5.9$
2	$17\frac{4}{5}$	$17\frac{1}{5}$	14	$T_0N=5.7$
3	18	17	$13\frac{4}{5}$	$T_0Z=4.6$

V (Separately determined) $= 3840\left(\frac{a}{mT_0^2}\right)$ (points apart 20 cm.)

V (Simultaneously determined) $= 5430\left(\frac{a}{mT_0^2}\right)$

V (Vertical) $= 288\left(\frac{a}{m'T_0^2}\right)$

	m = 20 g.								m' = 2 g.		
Trial	a_E		V_E		a_N		V_N		a_Z	V_Z	Mean
	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.			$V_E=97.9$
1	17.6	12.6	97	98.4	15.75	11.5	93	96.1	11.5	78.3	$V_N=94.8$
2	17.4	12.8	96	99.4	15.75	11.7	93	97.7	11.5	78.3	$V_Z=78.5$
3	17.6	12.8	97	99.4	15.8	11.4	93.3	95	11.6	78.9	

(2) r in mm.

$$r=\frac{\sum_{1}^{n-1} l-\varepsilon_0 \sum_{2}^{n} l}{2(n-1)(1+\varepsilon_0)} \qquad \varepsilon_0=\frac{l_1-l_{n-1}}{l_2-l_n}$$

Trial		l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}	l_{12}
E	1	45.75	39.6	34.3	29.5	25.25	21.2	17.6	14	11	8.4	6	4
	2	57.75	50.2	43.7	37	32	27	22.7	19.1	16.25	13.2	10.3	7
	3	56.7	49.25	42.6	36.3	31	26.3	22	18.5	16	13.4	11	8
N	1	31.3	28.5	25.5	22.75	20.5	18	16	13.8	12	10.2	8.6	7
	2	43.2	39.3	35.5	32	29	26.2	23.3	20.8	18.4	16.2	14.2	12
	3	39.3	35.5	32	29	26	23.2	20.8	19.25	17.3	15.8	14.3	12
z	1	16.7	14.5	12.8	11	9.4	7.7	6.25	4.8	3.7	2.5	1.5	1
	2	27	24.25	21.7	19.3	17.2	15	13.2	11.6	10	8.25	7	5
	3	34.7	31	27.4	24.5	22.6	20.5	18.2	16	14.2	12.25	10.5	9

l_{13}	l_{14}	l_{15}	l_{16}	l_{17}	l_{18}	l_{19}	l_{20}	$\sum_{1}^{n} l$	ε_0	r	Mean
2.7	1.1							260.65	1.1	.24	
5.75	3.75	2						348.45	1.1	.35	$r_E=.31$
6.3	4.2	2.4	1					345.45	1.1	.33	
5.5	4	2.8	1.2					227.65	1.08	.23	
10.5	8.7	7	5.5	4.4	2.7	2	1.6	352.8	1.09	.17	$r_N=.18$
10.7	9	7.5	5.8	5	3.5	2	1.25	329.5	1.09	.15	
4.5	3.4	2.4	1.6					91.6	1.1	.18	
6	6.2	5	3.8	2.8	1.9	1.3		193	1.09	.17	$r_Z=.16$
								269.45	1.08	.19	

(3) ε

$$\varepsilon=\frac{Y_1-r}{Y_2+r}$$

	E			N			Z			Mean
Trial	Y_1	Y_2	ε	Y_1	Y_2	ε	Y_1	Y_2	ε	
1	6,2	1.4	3.3	8.75	2.5	3.2	9.25	2.5	3.4	$\varepsilon_E=3.5$
2	6.7	1.4	3.6	9	2.6	3.2	7.5	2	3.4	$\varepsilon_N=3.2$
3	6.5	1.3	3.7	7.25	2	3.2	10.3	2.9	3.3	$\varepsilon_Z=3.4$

(4) R in mg,

R (Horizontal) $=800000.\frac{r}{T_0^2 V^2}$

R (Vertical) $=320000.\frac{r}{T_0^2 V^2}$

$R_E=.74$ $R_N=.493$ $R_Z=.44$

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due January	N-S	94.8	5.7	3.2	.0055
	E-W	97.9	5.9	3.5	.0089
	Z	78.5	4.6	3.4	.0085

Apparatus: I. 200kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
133 3/1	E	eP?	7 54 40					
,, ,,	E	F	8 16					
134 9/1	Z	iP	10 31 3	6		−	5911	
,, ,,	Z	m	,, ,, 6			+		
,, ,,	E	iP	,, ,, 3			+		
,, ,,	N	iP	,, ,, ,,			−		
,, ,,	E	PP	,, 33 13					
,, ,,	N	PP	,, ,, ,,					
,, ,,	Z	PP	,, ,, 14					
,, ,,	Z	S	,, 38 31					
,, ,,	E	S	,, ,, 32					
,, ,,	N	iS	,, ,, ,,			+		
,, ,,	N	F	11 35					
135 18/1	N	eP?	20 31 29				2500	
,, ,,	E	eP?	,, ,, ,,					
,, ,,	E	iS	,, 35 26			+		
,, ,,	N	iS	,, ,, 27			−		

S. P. Lee, Seismologist.
L. H. Chia, Assistant.

N. B. We are using the table of "Laufzeitkurve", published by Rev. Fr. J. B. Macelwane (St. Louis Univ., 1927).

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due January	N-S	94.8	5.7	3.2	.0055
	E-W	97.9	5.9	3.5	.0089
	Z	78.5	4.6	3.4	.0085

Apparatus: I. 20 kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
135 18/I	N	F	20 56					
,, ,,	E	F	,, 57					
136 29/I	N	eP	13 51 9				6589	
,, ,,	E	eP	,, ,, ,,					
,, ,,	Z	eP	,, ,, ,,				6622	
,, ,,	N	S	,, 59 17					
,, ,,	E	S	,, ,, ,,					
,, ,,	Z	S	,, ,, 19					
,, ,,	N	F	16 54					
,, ,,	E	F	,, 57					
137 3/II	N	eP	6 41 58					
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	e	7 39 26					
,, ,,	N	F	8 20					
,, ,,	E	F	,, ,, ,,					
138 5/II	N	eP	13 48 34				5511	
,, ,,	E	eP	,, ,, ,,					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due January	N-S	94.8	5.7	3.2	.0055
	E-W	97.9	5.9	3.5	.0089
	Z	78.5	4.6	3.4	.0085

Apparatus: I. 200kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
138 5/II	N	S	13 55 35					
,, ,,	E	S	,, ,, ,,					
,, ,,	N	i	,, 59 45			+		
,, ,,	E	i	,, ,, ,,			−		
,, ,,	N	F	14 24					

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DETERMINATION OF CONSTANTS (Wiechert)

due March, 1932.

PERMANENT CONSTANTS

(a) of Horizontal Component

M (Steady mass) 200 kg.

H (Height of c. g. of the steady mass above the turning point) 96 cm.

(b) of Vertical Component

M (Steady mass) 80 kg.

h (Distance of c. g. of the steady mass from the turning point) 54 cm.

h′ (Distance of the adding weight from the turning point) 60 cm.

(1) T_0 in sec. & V

Trial	3-T_0E	3-T_0N	3-T_0Z	Mean
1	18	$17\frac{3}{5}$	14	$T_0E=5.98$
2	18	$17\frac{3}{5}$	$13\frac{4}{5}$	$T_0N=5.86$
3	$17\frac{4}{5}$	$17\frac{1}{2}$	14	$T_0Z=4.64$

V (Separately determined) $= 3840\left(\frac{a}{mT_0^2}\right)$ (points apart 20 cm.)

V (Simultaneously determined) $= 5430\left(\frac{a}{mT_0^2}\right)$

V (Vertical) $= 288\left(\frac{a}{m'T_0^2}\right)$

	m = 20 g.								m′ = 2 g.		
Trial	aE		VE		aN		VN		aZ	VZ	Mean
	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.			VE=97.6
1	17.8	13	95.6	98.8	16.1	11.6	89.9	91.8	11.2	74.9	VN=90.9
2	18	12.8	96.7	97.1	15.8	11.8	88.3	92.3	11.4	76.3	VZ=75.8
3	18	13.2	96.7	100.5	16.2	11.8	90.6	92.3	11.4	76.3	

(2) r in mm.

$$r=\frac{\sum_{1}^{n-1}l-\varepsilon_0\sum_{2}^{n}l}{2(n-1)(1+\varepsilon_0)} \qquad \varepsilon_0=\frac{l_1-l_{n-1}}{l_2-l_n}$$

Trial		l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}	l_{12}
E	1	30.5	26.7	23.7	21	18.4	15.8	13.7	11.6	9.8	8	6.6	5.4
	2	27	23.6	20.8	18	15	12.7	11.5	9.8	8.6	6.5	5	4.2
	3	22.6	19.2	16.5	14	11.5	9.3	7.4	5.5	4	2.8	1.7	.8
N	1	24.2	21.8	20.5	18	16	14.7	12	10.2	8.7	7.1	5.7	4.5
	2	37.2	33.5	29.8	26.5	23.4	20.5	18	15.5	13.2	11.2	9.3	7.5
	3	40.6	36.7	32.8	29.6	26.3	23.5	20.5	18	15.8	13.7	11.7	9.8
Z	1	22.3	19.8	17.5	15.3	13.5	12	10	8.6	7.2	5.8	4.8	3.7
	2	34.3	30	26.5	23.3	20.4	18	15.5	13.3	11.3	9.3	7.6	6
	3	26	23.3	20.8	18.6	16.5	14.7	13.3	11.8	10.4	9	7.7	6.3

l_{13}	l_{14}	l_{15}	l_{16}	l_{17}	l_{18}	l_{19}	l_{20}	$\sum_{1}^{n}l$	ε_0	r	Mean
4.5	3.4	2.3	1.1					202.5	1.1	.20	
2.8	1.7	.9						168.2	1.1	.20	$r_E=.19$
								115.3	1.1	.18	
3.4	2.3	1.5	.8					171.4	1.08	.18	
6.2	4.8	3.9	2.8	2	1.1	.6		267	1.1	.18	$r_N=.18$
8.2	7	5.8	4.3	3.4	2.5	1.7	1	312.9	1.09	.19	
2.7	1.9	1						151.5	1.08	.19	
4.5	3.2	2	.9					226.1	1.1	.23	$r_Z=.19$
5.4	4.5	3.5	2.5					197.9	1.08	.16	

(3) ε

$$\varepsilon=\frac{Y_1-r}{Y_2+r}$$

	E			N			Z			Mean
Trial	Y_1	Y_2	ε	Y_1	Y_2	ε	Y_1	Y_2	ε	
1	4	.9	3.5	11.2	3	3.5	8	2	3.6	$\varepsilon_E=3.6$
2	7.2	1.8	3.5	7.5	1.8	3.7	9.4	2.5	3.4	$\varepsilon_N=3.6$
3	6.4	1.5	3.7	9.3	2.5	3.6	12	3.2	3.5	$\varepsilon_Z=3.5$

(4) R in mg.

R (Horizontal) $=800000.\frac{r}{T_0^2V^2}$

R (Vertical) $=320000.\frac{r}{T_0^2V^2}$

$R_E=.446$ $R_N=.504$ $R_Z=.493$

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due March	N-S	90.9	5.86	3.6	.0052
	E-W	97.6	5.98	3.6	.0053
	Z	75.8	4.64	3.5	.0088

Apparatus: I. 200kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
139 6/III	N	eP	21 47 37				3800	Earthquake of western Szechuan. The city, Tatsienlu, has suffered up to the degree IX, (R.F.).
,, ,,	E	eP	,, ,, ,,					
,, ,,	Z	eP	,, ,, ,,					
,, ,,	N	eS	,, 53 0					
,, ,,	E	eS	,, ,, ,,					
,, ,,	E	i	,, 55 53			–		
,, ,,	N	i	,, 56 6			–		
,, ,,	N	F	22 18					
,, ,,	E	F	,, ,,					
140 15/III	N	eP	4 39 38				4233	
,, ,,	E	eP	,, ,, 39					
,, ,,	Z	eP	,, ,, ,,					
,, ,,	N	eS	,, 45 28					
,, ,,	E	eS	,, ,, ,,					
,, ,,	N	F	5 24					
,, ,,	E	F	,, ,,					
141 19/III	E	eP	11 6 47				4000	Vertical component invisible.

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ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
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	E-W	97.6	5.98	3.6	.0053
	Z	75.8	4.64	3.5	.0088

Apparatus: I. 200kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
141 19/III	N	eP	11 6 52				3922	
,, ,,	N	S	,, 12 23	5				
,, ,,	E	eS?	,, ,, ,,					
,, ,,	N	F	12 9					
142 24/III	N	eP	16 14 18					
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	F	,, 42					
,, ,,	E	F	,, 43					
143 26/III	E	eP	0 8 13				6233	
,, ,,	N	eP	,, ,, ,					
,, ,,	Z	eP	,, ,, 14					
,, ,,	Z	eS	,, 15 59					
,, ,,	E	eS	,, ,, ,,					
,, ,,	E	m	,, 16 6	7		+		
,, ,,	N	eS	,, 15 59					
,, ,,	N	m	,, 16 6	7		–		
,, ,,	E	eL	,, 24 54					

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	E-W	97.6	5.98	3.6	.0053
	Z	75.8	4.64	3.5	.0088

Apparatus: I. 200kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
143 26/III	N	eL	0 24 54					
,, ,,	N	M_1	,, 29 39	12		−		
,, ,,	E	M_1	,, ,, ,,	12		+		
,, ,,	E	M_2	,, 30 25	10		−		
,, ,,	E	M_3	,, 31 51	14		+		
,, ,,	Z	i	,, 32 59	12		+		
,, ,,	N	i	,, 33 4	12		+		
,, ,,	N	F	1 42					
144 ,,	N	eP	10 0 45				5522	When I rebalance the instrument the phase, S, is tracing, so the time of its arrival is questionable.
,, ,,	E	eP	,, ,, 46					
,, ,,	Z	eP	,, ,, ,,					
,, ,,	N	S?	,, 7 51					
,, ,,	E	S?	,, ,, 52					
,, ,,	E	F	11 19					
145 28/III	N	eP	0 43 10					
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	F	2 0					

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	E-W	97.6	5.98	3.6	.0053
	Z	75.8	4.64	3.5	.0088

Apparatus: I. 200kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
146 4/IV	N	P	19 20 47				1111	
,, ,,	E	P	,, ,, ,,					
,, ,,	N	S	,, 22 41					
,, ,,	N	m	,, ,, 46			−		
,, ,,	E	iS	,, ,, 41			−		
,, ,,	E	m	,, ,, 46	6		+		
,, ,,	N	L?	,, 24 15					
,, ,,	E	L	,, ,, 16					
,, ,,	N	F	20 3					
,, ,,	E	F	,, 5					
147 6/IV	N	eP	9 13 24				1000	Mid China earthquake, see notice above (p. 1.).
,, ,,	E	eP	,, ,, 26					
,, ,,	Z	eP	,, ,, ,,					
,, ,,	Z	eS?	,, 15 12					
,, ,,	N	eS	,, ,, 14					
,, ,,	E	eS?	,, ,, 15					
,, ,,	N	eL	,, 16 22					

S. P. Lee, Seismologist.
L. H. Chia, Assistant.

N. B. We are using the table of "Laufzeitkurve", published by Rev. Fr. J. B. Macelwane (St. Louis Univ., 1927).

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V_1	T_0	ε	$r/T_0{}^2$
Constants (Wiechert) due March	N-S	90.9	5.86	3.6	.0052
	E-W	97.6	5.98	3.6	.0053
	Z	75.8	4.64	3.5	.0088

Apparatus: I. 200kg Horizontal Wiechert; II. 80kg Vertical Wiechert

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
147 6/IV	E	eL	9 16 24					
,, ,,	N	i	,, ,, 57			+		
,, ,,	E	i	,, ,, ,,	4		+		
,, ,,	Z	i	,, ,, ,,			+		
,, ,,	N	F	,, 52					

S. P. Lee, Seismologist.
L. H. Chia, Assistant.

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SPECIAL NOTICE

BY S. P. LEE

Recently, we set up a vertical component of Galitzin-Wilip seismograph, which was constructed by Hugo Masing, in Estonia. The constants were not accurately determined until August 14, however, the seismograph has been working interruptedly since the end of May. The presupposed values: l, T_1, R_a, etc. originally given by Prof. J. Wilip were checked personally; and the temperature compensation was also adjusted to such a degree that the migration of zero position of the pendulum will not be over $\frac{1}{3}$ of a division, under a fluctuation of room temperature of 0°.5 C.

THE TAPPING TEST OF CONSTANTS (Galitzin-Wilip vertical)

due—August 14

Presupposed:

Reduced pendulum length.....l : 14,676 cm.
Undamped period of galvanometre.....T_1 : 11,06 sec.
n_1 0,5686

Distances:

Galvanometre mirror to drum.....A : 120 cm.
Galvanometre mirror to scale.....D_1 : 100 cm.
Pendulum mirror to scale.....D : 500 cm.

Readings:

m_1 : Amplitude of first throw of galvanometre
m_2 : Amplitude of second throw of galvanometre
m : Throw of pendulum
t_0 : Time of deflection of galvanometre

Ratios:

$$\alpha=\frac{m_1-\triangle m_1}{m_2-\triangle m_2};\ \alpha'=\frac{m_1-\triangle m_1}{m};\ \alpha''=\frac{m_2-\triangle m_2}{m}.$$

(where $\triangle$m is the corresponding correction to arc)

Formulae for computation:

Damping constants— $\mu^2=2.886-1.258\alpha$

Undamped period of pendulum— $T=T_1(\frac{2}{3}n_1 \text{ to} -1+\frac{1}{10}\mu^2)$

Transmission factor of galvanometre— $k=n_1\frac{D}{D_1}\alpha'\ (2.817+0.018\mu^2)$
$=n_1\frac{D}{D_1}\alpha''\ (6.461-2.196\mu^2)$

Synchronous magnification— $V=\frac{1}{4}(\frac{k\,A\,T}{\pi\,l})=\frac{1}{4}C'$

Data:

Trial	m	$M_1-\triangle m_1$	$m_2-\triangle m_2$	t_0	α	α'	α''
1	3	74.9	33	5.27	2.270	24.967	11.000
2	3	68.9	30	5.30	2.297	22.967	10.000
3	3	66.9	29	5.27	2.307	22.300	9.667
4	4	86.8	37	5.31	2.346	21.700	9.250
5	3.5	80.8	36	5.27	2.244	23.090	10.290
6	2.5	63.9	28	5.27	2.282	25.560	11.200
mean				5.28	2.291	23.431	10.235

Constants obtained:

μ^2:0.001; T:11.09; k:187.73; V:1357
(C':5428)

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DETERMINATION OF CONSTANTS (Wiechert)

due May 1

PERMANENT CONSTANTS

(a) of Horizontal Component
M (Steady mass) 200 kg.
H (Height of c. g. of the steady mass above the turning point) 96 cm.

(b) of Vertical Component
M (Steady mass) 80 kg.
h (Distance of c. g. of the steady mass from the turning point) 54 cm.
h' (Distance of the adding weight from the turning point) 60 cm.

(1) T_0 in sec. & V

Trial	3-T_{0E}	3-T_{0N}	3-T_{0Z}	Mean
1	$18\frac{3}{5}$	$17\frac{1}{2}$	14	T_{0E}=6.18
2	$18\frac{1}{2}$	$17\frac{1}{2}$	14	T_{0N}=5.84
3	$18\frac{1}{2}$	$17\frac{3}{5}$	$14\frac{1}{5}$	T_{0Z}=4.7

V (Separately determined) $=3840\left(\frac{a}{mT_0^2}\right)$
(points apart 20 cm.)

V (Simultaneously determined) $=5430\left(\frac{a}{mT_0^2}\right)$

V (Vertical) $=288\left(\frac{a}{m'T_0^2}\right)$

	m = 20 g.								m' = 2 g.		
Trial	a_E		V_E		a_N		V_N		a_Z	V_Z	Mean
	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.			V_E=97.7
1	19.5	13.8	97.9	98.3	17.3	12.4	97.5	98.8	12.2	79.5	V_N=97.7
2	19.3	13.8	97.2	98.3	17.5	12.2	98.5	97.2	12	78.2	V_Z=78.6
3	19.2	13.8	96.4	98.3	17.2	12.2	96.8	97.2	12	78.2	

(2) r in mm.

$$r=\frac{\sum_{1}^{n-1} l-\varepsilon_0 \sum_{2}^{n} l}{2(n-1)(1+\varepsilon_0)} \qquad \varepsilon_0=\frac{l_1-l_{n-1}}{l_2-l_n}$$

Trial		l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}	l_{12}
E	1	27	22.8	18.8	15.7	13.2	10.2	7.7	5.2	3.2	1.5	.7	
	2	30.5	26.2	22.2	18.5	15	12.5	9.7	7.3	4.8	2.6	1.6	
	3	28.7	24.5	20.6	17.2	14	11	8.6	6.4	4.3	3.2		
N	1	15.5	13.6	11.8	10	8.7	7.2	6	4.6	3.5	2.3	1.7	1.3
	2	25.3	22.4	20	17.8	15.5	13.6	12	10.2	8.7	7.3	6.2	5.9
	3	24.3	21.8	19.3	17.2	15.2	13.2	11.5	9.8	8.5	7	5.6	4.5
Z	1	25.7	23	20.6	18.4	16.3	14.3	12.7	11.2	9.7	8.2	7	5.8
	2	34	29.2	25.6	22.7	20.2	17.8	15.7	13.5	11.6	9.8	8.2	6.5
	3	25.8	23.2	20.8	18.5	16.4	14.4	12.6	11	9.2	7.8	6.4	5

l_{13}	l_{14}	l_{15}	l_{16}	l_{17}	l_{18}	l_{19}	l_{20}	$\sum_{1}^{n} l$	ε_0	r	Mean
								126	1.15	.27	
								150.9	1.13	.31	$r_E=.32$
								138.5	1.1	.38	
.7								86.9	1.1	.15	
3.8	2.8	1.9	.8					174.2	1.08	.20	$r_N=.18$
3.5	2.5	1.8	1					166.7	1.08	.19	
4.7	3.7	2.8	2	1.2	.7			188	1.1	.12	
5	3.7	2.5	1.4	.5				227.9	1.1	.21	$r_Z=.18$
3.8	2.8	1.8	.9					180.5	1.08	.21	

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(3) ε

$$\varepsilon=\frac{Y_1-r}{Y_2+r}$$

	E			N			Z			Mean
Trial	Y_1	Y_2	ε	Y_1	Y_2	ε	Y_1	Y_2	ε	
1	6.7	1.2	3.2	6	1.7	3.1	7.5	2.3	2.9	$\varepsilon_E=3.6$
2	7	1.6	3.5	8	1.8	3.9	6.2	1.7	3.2	$\varepsilon_N=3.8$
3	6.3	1.1	4.2	7.5	1.5	4.3	5.6	1.5	3.2	$\varepsilon_Z=3.1$

(4) R in mg.

R (Horizontal) $=800000.\frac{r}{T_0^2 V^2}$

R (Vertical) $=320000.\frac{r}{T_0^2 V^2}$

$R_E=.702$ $R_N=.442$ $R_Z=.432$

(2) r in mm.

$$r=\frac{\sum_{1}^{n-1}l-\varepsilon_0\sum_{2}^{n}l}{2\,(n-1)\,(1+\varepsilon_0)} \qquad \varepsilon_0=\frac{l_1-l_{n-1}}{l_2-l_n}$$

Trial		l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}	l_{12}
E	1	36.7	32.2	28	24.3	21	18.2	15.3	13	10.8	8.8	7	5.5
	2	37	31.8	27.5	23.5	20	17.2	14.6	12.2	10.2	8.3	6.8	5.2
	3	28.8	24.5	22.2	17.4	15.5	13	10.3	8.2	6.6	4.8	3.8	2.5
N	1	20	18	16.4	14.7	12.5	10.8	9.8	8.6	7.4	6.2	5.5	4.3
	2	18.1	16.6	14.3	12.3	10.8	9.5	8.4	7.1	6.2	5	4.3	3.2
	3	24.3	22.4	21	19.1	18	16.1	14.6	12.8	11.5	10	8.9	7.7
Z	1	22.2	19.7	17.2	14.8	13.2	11.5	9.8	8.3	7.1	6.2	5.8	3.5
	2	23.5	20.8	18.6	16.6	14.7	13	11.2	8.7	8	6.8	5.3	4.6
	3	20	17.8	15.7	13.8	12.5	10.6	9.2	7.6	6.2	4.8	3.5	2.3

l_{13}	l_{14}	l_{15}	l_{16}	l_{17}	l_{18}	l_{19}	l_{20}	$\sum_{1}^{n}l$	ε_0	r	Mean
4	2.9	1.7	1					230.4	1.12	.20	$r_E=.28$
4	2.8	2	1.1					224.2	1.14	.31	
1.6	.8							160.2	1.15	.33	
3.4	2.6	1.8						142	1.07	.17	$r_N=.17$
2.4	1.8							120	1.06	.19	
6.6	5.5	4.5	3.6	2.9	1.8	1.3		212.6	1.07	.14	
2.2	1.2							142.7	1.08	.21	$r_Z=.21$
3	1.8	.9						157.5	1.09	.18	
1.2								125.2	1.07	.23	

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

Constants (Wiechert) due May 14		V	T_0	ε	r/T_0^2
	N-S	93.7	5.9	3.1	.0049
	E-W	98.3	6.16	3.4	.0074
	Z	81	4.67	3.2	.0096

Constants T = 11.09 secs.
(Galitzin) μ^2 = 0.00
due Aug. 14 $\frac{k\,AT}{\pi\,l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
148 14/V	N	eP	13 18 42				4400	
,, ,,	N	m	,, ,, 58	6	115	−		
,, ,,	E	eP	,, ,, 42				4411	
,, ,,	Z	P	,, ,, 44				4378	
,, ,,	N	i_1	,, 01 28	7	81	+		
,, ,,	N	i_2	,, 19 41	5	90	+		
,, ,,	N	PP	,, 20 00					
,, ,,	Z	i_1	,, ,, 59	6	65	+		
,, ,,	E	PPP	,, 21 37					
,, ,,	Z	i_2	,, 22 30			−		
,, ,,	N	iPS	,, 24 43					
,, ,,	Z	S	,, ,, ,,					
,, ,,	E	PS	,, ,, 44					
,, ,,	E	iS	,, ,, 52					
,, ,,	E	m	,, 25 03	7	164	−		
,, ,,	N	iS	,, 24 57					
,, ,,	E	i_1	,, 25 39	9	92	−		

S. P. Lee, Seismologist.
L. H. Chia, Assistant.

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		V	T_0	ε	r/T_0
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	E-W	98.3	6.16	3.4	.0074
	Z	81	4.67	3.2	.0096

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due Aug. 14 $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip*

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
148 14/V	N	i	13 25 55	6		+		
,, ,,	E	i_2	,, 26 49	8	65	−		
,, ,,	N	SS?	,, 27 19					
,, ,,	E	SS	,, ,, 25					
,, ,,	N	L_1	,, ,, 47					
,, ,,	E	L_1	,, ,, ,,					
,, ,,	Z	L	,, 31 45					
,, ,,	N	L_2	,, ,, ,,					
,, ,,	E	i	,, 39 24	16	8	+		
,, ,,	N	i	,, 41 44	14	13	+		
,, ,,	N	F	16 00					
149 21/V	Zg	P	10 28 55				12711	Phases were marked by Fr. E. Gherzi S. J. of Zi-Ka-Wei obv.
,, ,,	,,	iP_2	,, 30 43					
,, ,,	,,	P'	,, 32 57					
,, ,,	,,	PR_1?	,, 33 59					Destructive in San Salvador, Central America.
,, ,,	,,	PR_2	,, 36 53					
,, ,,	,,	PR_3?	,, 38 33					

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* Records from the Galitzin-Wilip are indicated by Zg.

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0
Constants (Wiechert) due May 1	N-S	97.7	5.84	3.8	.0053
	E-W	97.7	6.18	3.6	.0084
	Z	78.6	4.7	3.1	.0081

Constants (Galitzin) T = 11.09 secs., μ^2 = 0.00
due Aug. 14 $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
149 21/V	Zg	$\overline{ScPcS}$	10 39 39					
,, ,,	,,	PR_4	,, 40 3					
,, ,,	,,	$\overline{ScPcPcS}$	,, ,, 29					
,, ,,	,,	$\overline{PcPcPcP}$	,, 43 10					
,, ,,	,,	PS	,, ,, 32					
,, ,,	,,	$\overline{PScPcS}$	,, 44 12					
,, ,,	,,	PPS	,, ,, 47					
,, ,,	,,	PPPS	,, 45 29					
,, ,,	,,	SR_1	,, 50 1					
,, ,,	,,	SPS	,, ,, 11					
,, ,,	,,	PPSS	,, ,, 27					
,, ,,	,,	$\overline{ScPcPcS'c}$	,, 51 49					
,, ,,	,,	PR'2	,, 52 13					
,, ,,	,,	PSSS	,, 54 47					
,, ,,	,,	SR_2	,, 55 15					
,, ,,	,,	PR'3	,, ,, 27					
,, ,,	,,	PR'4	,, 58 1					

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		V	T_0	ε	r/T_0^2
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	E-W	97.7	6.18	3.6	.0084
	Z	78.6	4.7	3.1	.0081

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due Aug. 14 $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
149 21/V	Zg	SR_3	10 58 55					
,, ,,	,,	L	11 9 9					
,, ,,	,,	M_1	,, 19 37	28		−		
,, ,,	,,	M_2	,, 20 50	27		+		
,, ,,	,,	M_3	,, 22 1	28		−		
,, ,,	,,	M_4	,, 25 21	24		+		
,, ,,	,,	M_5	,, 27 13	20		+		
,, ,,	,,	M_6	,, 30 27	20		+		
,, ,,	,,	M_7	,, 32 57	20		+		
,, ,,	,,	W_2	12 22 35	28				
,, ,,	,,	F	13 00					
150 26/V	N	eP	5 21 9				1556	
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	eS?	,, 23 50					
,, ,,	N	F	6 15					
151 ,,	N	eP	16 21 28				8367	
,, ,,	E	eP	,, ,, ,,					

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ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

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	E-W	97.7	6.18	3.6	.0084
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Constants (Galitzin) T = 11.09 secs. μ^2 = 0.00
dne Aug. 14 $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
151 26/V	Zg	iP	16 21 28				8367	Light source weak on Galitzin.
,, ,,	N	iP_2	,, ,, 39	4		+		
,, ,,	E	iP_2	,, ,, ,,	4		−		
,, ,,	Zg	i	,, 23 39					
,, ,,	N	i	,, ,, 41					
,, ,,	E	i	,, ,, ,,					
,, ,,	Zg	iPP	,, 24 45					
,, ,,	E	PPP?	,, 25 46					
,, ,,	N	PS	,, 31 3					
,, ,,	E	PS	,, ,, ,,					
,, ,,	Zg	PS?	,, ,, 15					
,, ,,	N	iS	,, ,, 39					
,, ,,	E	S	,, ,, ,,					
,, ,,	Zg	iS?	,, ,, 48					
,, ,,	N	F	18 19					
152 28/V	N	eP	2 24 32				2633	
,, ,,	E	eP	,, ,, ,,					

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	E-W	97.7	6.18	3.6	.0084
	Z	78.6	4.7	3.1	.0081

Constants (Galitzin) due Aug. 14: T = 11.09 secs., μ^2 = 0.00, $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
152 28/V	N	PP?	2 25 14					Time mark bad.
,, ,,	E	PP?	,, ,, ,,					
,, ,,	Zg	iP	,, ,, 22	6		+		
,, ,,	,,	m	,, ,, 34	6		+		
,, ,,	,,	i	,, 27 48					
,, ,,	N	eS?	,, 28 39					
,, ,,	E	eS?	,, ,, ,,					
,, ,,	Zg	iS	,, ,, 40			+		
,, ,,	N	L	,, 30 4					
,, ,,	Zg	iL	,, ,, 10			−		
,, ,,	N	M_1	,, 32 6	12		+		
,, ,,	E	M_1	,, ,, 24			+		
,, ,,	Zg	M_1	,, ,, ,,			+		
,, ,,	N	M_2	,, 33 57	13		−		
,, ,,	E	M_2	,, 34 7	13		−		
,, ,,	Zg	M_2	,, ,, 14	13				
,, ,,	,,	M_2	,, 35 52	13				
,, ,,	E	F	3 41					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

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	E-W	97.7	6.18	3.6	.0084
	Z	78.6	4.7	3.1	.0081

Constants (Galitzin) due Aug. 14: T = 11.09 secs., μ^2 = 0.00, $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
153 2/V1	N	eP	19 50 25					
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	P_2	,, ,, 47					
,, ,,	N	m	,, 51 1	3		+		
,, ,,	E	iP_2	,, 50 49					
,, ,,	N	F	20 22					
154 3/VI	E	eP	10 51 46				10733	
,, ,,	N	eP	,, ,, ,,					
,, ,,	E	e	,, 55 56					
,, ,,	E	ePP?	,, 56 21					
,, ,,	N	ePP?	,, ,, ,,					
,, ,,	N	eS?	11 3 12					
,, ,,	E	eS?	,, ,, ,,					
,, ,,	E	i_1	,, 6 20					
,, ,,	N	i_1	,, ,, 23					
,, ,,	E	i_2?	,, 12 21					
,, ,,	N	i_2	,, ,, 30					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due May 1	N-S	97.7	5.84	3.8	.0053
	E-W	97.7	6.18	3.6	.0084
	Z	78.6	4.7	3.1	.0081

Constants (Galitzin) due Aug. 14 T = 11.09 secs. μ^2 = 0.00 $\frac{k}{\pi}\frac{AT}{l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
154 3/VI	E	eL?	11 22 59					
,, ,,	N	eL?	,, 23 51					
,, ,,	E	M_1?	,, 36 9	22		+		
,, ,,	N	M_1?	,, 37 38	22		−		
,, ,,	E	M_2	,, 49 10	16	12	−		
,, ,,	E	M_3	,, 50 43	15	11	−		
,, ,,	N	M_2	,, 54 10	16	6	−		
,, ,,	E	M_4	,, ,, 16	14		−		
,, ,,	N	M_3	,, 55 49	15		−		
,, ,,	E	M_5	,, 57 41	14		−		
,, ,,	N	F	14 00					
155 ,,	N	eP	17 35 36				517	
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	eS?	,, 36 23					
,, ,,	E	eS?	,, ,, ,,					
,, ,,	N	F	,, 56					
,, ,,	E	F	,, 56					

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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
156 8/VI	Zg	P	6 17 35	6			1900	
,, ,,	N	eP	,, ,, ,,					
,, ,,	E	eP	,, ,, ,,					
,, ,,	Zg	S	,, 20 47	8				
,, ,,	,,	L	,, 22 ,,					
,, ,,	,,	M	,, 24 23	14				
,, ,,	,,	F	,, 42					
157 ,,	,,	P	8 2 20					A very sharp beginning followed by a very faint end until "e"
,, ,,	,,	e	,, 23 3					
,, ,,	,,	i	,, 24 31					
,, ,,	,,	M?	,, 27 7					
,, ,,	,,	F	9 00					
158 ,,	,,	P	10 57 39				1800	
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	eS	11 0 43					
,, ,,	,,	eL	,, 2 41					

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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
158 8/VI	Zg	M?	11 4 26	16		+		
,, ,,	,,	F	,, 24					
159 ,,	,,	eP	15 1 16				3600	A series of short waves.
,, ,,	,,	i	,, ,, 59	2				
,, ,,	,,	eS?	,, 6 27					
,, ,,	,,	F	,, 41					
160 10/VI	,,	iP	20 28 16	5		+	4056	
,, ,,	N	eP	,, ,, 17				4045	
,, ,,	E	eP	,, ,, ,,					
,, ,,	Zg	iS	,, 33 56	6		−		
,, ,,	N	S	,, ,, ,,					
,, ,,	E	iS	,, ,, ,,					
,, ,,	Zg	iSR_1	,, 36 16	6.5		+		
,, ,,	,,	eL?	,, 38 28					
,, ,,	N	i	,, ,, 31					
,, ,,	E	i	,, ,, 32					
,, ,,	N	F	21 12					

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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
161 11/VI	Zg	P	10 45 4				2811	
,, ,,	,,	eS?	,, 49 23					
,, ,,	,,	eL?	,, 54 18					
,, ,,	,,	M	,, 56 39	14				
,, ,,	,,	F	11 24					
162 ,,	N	eP	17 7 3					
,, ,,	E	eP	,, ,, ,,					
,, ,,	Zg	iP	,, ,, ,,	6		−	4056	
,, ,,	,,	PP	,, 8 29					
,, ,,	,,	iS	,, 12 43	8		+		
,, ,,	,,	eL	,, 18 5					
,, ,,	,,	F	,, 57					
163 13/VI	N	eP	22 2 30				2644	
,, ,,	E	eP	,, ,, 33					
,, ,,	N	eS	,, 6 38					
,, ,,	E	eS	,, ,, ,,					
,, ,,	N	F	23 00					

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(Galitzin) μ^2 = 0.00
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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
164 14/VI	Z	iP	6 4 28				2578	
,, ,,	N	P	,, ,, 29				2522	
,, ,,	E	P	,, ,, ,,				2533	
,, ,,	Z	i_1	,, ,, 48			−		
,, ,,	Z	i_2	,, 5 7			−		
,, ,,	N	S	,, 8 28					
,, ,,	E	S	,, ,, 29					
,, ,,	Z	eS	,, ,, 31					
,, ,,	N	F	,, 55					
165 ,,	N	eP	12 25 12				2700	
,, ,,	E	eP	,, ,, ,,					
,, ,,	Zg	P	,, ,, ,,					
,, ,,	N	eS?	,, 29 23					
,, ,,	E	eS?	,, ,, ,,					
,, ,,	Zg	iS	,, ,, ,,			+		
,, ,,	,,	L?	,, 33 39					
,, ,,	,,	M_1?	,, 34 49	12				

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(Galitzin) μ^2 = 0.00
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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
165 14/VI	Zg	M_2	12 35 35	11				
,, ,,	,,	M_3	,, 36 24	13				
,, ,,	,,	M_4	,, 37 3	13				
,, ,,	,,	M_5	,, ,, 41	11				
,, ,,	,,	M_6	,, 38 18	10				
,, ,,	,,	M_7	,, 39 37	12				
,, ,,	,,	M_8	,, 40 23					
,, ,,	,,	M_9	,, 41 8					
,, ,,	,,	M_{10}	,, 42 33					
,, ,,	,,	F	13 6					
166 16/VI	N	iP	1 26 22				3578	
,, ,,	E	iP	,, ,, ,,					
,, ,,	N	eS?	,, 31 31					
,, ,,	E	eS?	,, ,, ,,					
,, ,,	N	F	2 00					
167 18/VI	N	eP	1 34 59				3156	
,, ,,	E	eP	,, ,, ,,					

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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
167 18/VI	N	eS	1 39 42					
,, ,,	E	eS	,, ,, ,,					
,, ,,	N	F	,, 53					
168 ,,	Zg	P	10 27 3				12401	Destructive in Tuchitlan, Mexico.
,, ,,	,,	m	,, ,, 21	12				
,, ,,	N	eP	,, 27 5?					
,, ,,	E	eP	,, ,, ,,					
,, ,,	Zg	i_1	,, 30 11	6		−		A series of short period waves
,, ,,	,,	P′	,, ,, 39					
,, ,,	,,	iPP	,, 31 40	12		+		
,, ,,	,,	m	,, ,, 57	12		−		
,, ,,	N	PP	,, 31 44					
,, ,,	E	PP	,, ,, ,,					
,, ,,	Zg	i_1	,, 32 ,,			+		
,, ,,	,,	i_2	,, 34 17			+		
,, ,,	,,	$\overline{ScPcS}$	,, 37 29					
,, ,,	,,	i	,, 39 44					

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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
168 18/VI	Zg	iPS	10 40 53					
,, ,,	N	eS	,, 41 9					
,, ,,	E	eS	,, ,, ,,					
,, ,,	Zg	SS?	,, 43 47					
,, ,,	N	i	,, 47 39					
,, ,,	E	i	,, ,, 50					
,, ,,	Zg	PPP?	,, 49 51					> 180°
,, ,,	E	L?	,, 59 41					
,, ,,	N	M_1?	11 14 4	20		−		Main phase out of scale on Galitzin
,, ,,	E	M_1?	,, ,, 58	20		−		
,, ,,	N	M_2?	,, 15 6	21		−		
,, ,,	E	M_2	,, 18 29	20		−		
,, ,,	N	M_3	,, ,, 31	20		−		
,, ,,	N	M_4	,, 22 57	18		+		
,, ,,	E	M_3	,, 23 33	17		−		
,, ,,	E	M_4	,, 25 4	17		−		
,, ,,	N	M_5	,, ,, 16	20		−		

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	E-W	97.7	6.18	3.6	.0084
	Z	78.6	4.7	3.1	.0081

Constants (Galitzin) due Aug. 14 $T = 11.00$ secs. $\mu^2 = 0.00$ $\frac{kAT}{\pi l} = 5428$

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
164 18/VI	E	M_6	11 26 20	18		−		
,, ,,	N	M_6	,, ,, 31	18		+		
,, ,,	N	M_7	,, 30 17	16		+		
,, ,,	N	M_8	,, 32 44	16		+		
,, ,,	N	F	13 35					
169 20/VI	Zg	P	14 21 6					
,, ,,	,,	F	,, 54					
170 21/VI	,,	iP	23 4 57				2367	Time mark bad on Galitzin
,, ,,	N	eP?	,, ,, ,,					
,, ,,	E	eP?	,, ,, ,,					
,, ,,	Zg	eS	,, 8 46					
,, ,,	N	eS?	,, ,, ,,					
,, ,,	E	eS	,, ,, ,,					
,, ,,	Zg	eL	,, 11 38					
,, ,,	,,	M	,, 13 52	12		+		
,, ,,	N	F	,, 50					
171 22/VI	Zg	P	0 40 34				2289	

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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
171 22/VI	N	eP	0 40 34					
,, ,,	E	eP	,, ,, ,,					
,, ,,	Zg	iS	,, 44 16	8		+		
,, ,,	N	eS	,, ,, ,,					
,, ,,	E	eS	,, ,, ,,					
,, ,,	Zg	eL?	,, 46 39					
,, ,,	E	F	1 50					
172 ,,	Zg	eP	13 14 3				11972	
,, ,,	N	eP	,, ,, 4					
,, ,,	E	eP	,, ,, ,,					
,, ,,	Zg	PP	,, 18 43					
,, ,,	,,	iPS?	,, 27 55					
,, ,,	,,	eL?	,, 54 41					
,, ,,	,,	M_1?	14 3 54	22		−		
,, ,,	,,	M_2	,, 14 14	16		+		
,, ,,	,,	M_3	,, 15 58	20		−		
,, ,,	,,	M_4	,, 16 46	20		−		

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No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
172 22/V1	Zg	M_5	14 17 55	18		−		
,, ,,	,,	M_6	,, 18 53	18		+		
,, ,,	,,	M_7	,, 20 25	16		−		
,, ,,	,,	M_8	,, 21 33	16		+		
,, ,,	,,	M_9	,, 23 47	15		−		
,, ,,	,,	M_{10}	,, 27 58	14		−		
,, ,,	,,	F	15 50					
173 26/V1	N	eP?	19 21 4					
,, ,,	E	eP?	,, ,, ,,					
,, ,,	N	F	20 15					

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DETERMINATION OF CONSTANTS (Wiechert)

due July 1

PERMANENT CONSTANTS

(a) of Horizontal Component

M (Steady mass) 200 kg.

H (Height of c. g. of the steady mass above the turning point) 96 cm.

(b) of Vertical Component

M (Steady mass) 80 kg.

h (Distance of c. g. of the steady mass from the turning point) 54 cm.

h' (Distance of the adding weight from the turning point) 60 cm.

(1) T_0 in sec. & V

Trial	3-T_{0E}	3-T_{0N}	3-T_{0Z}	Mean
1	$18\frac{4}{5}$	$17\frac{4}{5}$	14	T_{0E}=6.34
2	$18\frac{4}{5}$	18	$13\frac{4}{5}$	T_{0N}=5.96
3	$18\frac{3}{5}$	$17\frac{4}{5}$	$13\frac{4}{5}$	T_{0Z}=4.62

V (Separately determined) $= 3840\left(\frac{a}{mT_0^2}\right)$ (points apart 20 cm.)

V (Simultaneously determined) $= 5430\left(\frac{a}{mT_0^2}\right)$

V (Vertical) $= 288\left(\frac{a}{m'T_0^2}\right)$

	m = 20 g.								m′ = 2 g.		
Trial	a_E		V_E		a_N		V_N		a_Z	V_Z	Mean
	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.	Sep.	Simul.			V_E=95.6
1	19.9	14.3	95	96.6	17.4	12.5	94.3	95.6	11.4	76.9	V_N=95.1
2	19.8	14.2	94.6	95.9	17.5	12.5	94.7	95.6	11.4	76.9	V_Z=76.9
3	19.8	14.4	94.6	97.2	17.5	12.5	94.7	95.6	11.4	76.9	

(2) r in mm.

$$r=\frac{\sum_{1}^{n-1} l-\varepsilon_0 \sum_{2}^{n} l}{2(n-1)(1+\varepsilon_0)} \qquad \varepsilon_0=\frac{l_1-l_{n-1}}{l_2-l_n}$$

Trial		l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}	l_{12}
E	1	30.8	26.8	23	20	17.4	15.7	13.5	10.7	9.2	7.5	5.5	4.2
	2	27.4	24	21	18.2	15.7	13.5	11.5	9.7	8.2	6.8	5.6	4.5
	3	22	19	16.7	14.4	12.3	10.2	8.5	7.2	6	4.7	3.5	2.5
N	1	29	26	23	20.5	18	15.9	13.8	11.5	9.8	8.5	7.3	6
	2	29.6	26.5	23.3	20.7	18.2	15.7	13.7	11.6	10.2	8.6	6.8	5
	3	26	23	20.4	17.9	16.4	14.3	11.6	9.7	8.2	6.5	5	3.6
Z	1	26.8	23.7	20.7	18.2	15.8	13.8	12.2	10.5	9	7.7	6.5	5.2
	2	22.5	19.5	17.2	15	13.2	11.5	10	8.8	7.2	6	4.7	4
	3	18.3	16	14	12	10.5	9	8	7	6	5.2	4.5	3.5

l_{13}	l_{14}	l_{15}	l_{16}	l_{17}	l_{18}	l_{19}	l_{20}	$\sum_{1}^{n} l$	ε_0	r	Mean
3.2	2.2	1.4	.7					191.8	1.13	.14	
3.5	2.5	1.7	.8					174.6	1.1	.19	$r_E=.17$
1.5								128.5	1.1	.19	
4.9	3.7	2.5	1.5					201.9	1.08	.22	
3.6	2.3	1.1						196.9	1.07	.29	$r_N=.24$
2.3	1.2							166.1	1.09	.22	
4.7	3.9	2.8	2.2	1.5	.8			186	1.1	.14	
3	2	1						145.6	1.1	.16	$r_Z=.14$
2.6	1.7							118.3	1.1	.12	

(3) ε

$$\varepsilon=\frac{Y_1-r}{Y_2+r}$$

	E			N			Z			Mean
Trial	Y_1	Y_2	ε	Y_1	Y_2	ε	Y_1	Y_2	ε	
1	6.8	1.5	4.0	6.7	1.5	3.7	6	1.5	3.6	$\varepsilon_E=3.7$
2	6.4	1.6	3.5	9.7	2.5	3.5	7.2	1.9	3.5	$\varepsilon_N=3.6$
3	6.9	1.7	3.6	8.3	2	3.6	6	1.5	3.6	$\varepsilon_Z=3.6$

(4) R in mg.

$$R\text{ (Horizontal)}=800000.\frac{r}{T_0^2 V^2}$$

$$R\text{ (Vertical)}=320000.\frac{r}{T_0^2 V^2}$$

$R_E=.370$ $R_N=.598$ $R_Z=.358$

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due July 1	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

Constants (Galitzin) T = 11.09 secs., μ^2 = 0.00
due Aug. 14 $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
174 9/VII	N	eP	11 16 19					
,, ,,	E	eP	,, ,, ,,					
,, ,,	N	i	,, 17 22					
,, ,,	N	m	,, ,, 29	5		+		
,, ,,	E	i_1	,, ,, 22					
,, ,,	E	i_2	,, 18 7					
,, ,,	N	F	,, 36					
175 ,,	N	eP?	23 55 57					
,, 10/VII	N	F	0 19					
176 ,,	N	eP	7 50 12				2711	
,, ,,	E	eP	,, ,, ,,					
,, ,,	Z	eP	,, ,, ,,					
,, ,,	N	i	,, 54 14					
,, ,,	E	i	,, ,, 15					
,, ,,	N	eS	,, ,, 24					
,, ,,	E	eS	,, ,, 24					
,, ,,	Z	eS	,, ,, ,,					
,, ,,	E	F	8 40					

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S. P. Lee, Seismologist.
L. H. Chia, Assistant.

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due July 1	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

Constants (Galitzin) T = 11.09 secs., μ^2 = 0.00
due Aug. 14 $\frac{kAT}{\pi l}$ = 5428

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
177 12/VII	E	eP	20 9 57					
,, ,,	E	F	21 14					
178 16/VII	Zg	P	20 14 29					
,, ,,	,,	F	21 12					
179 21/VII	N	eP	12 48 23				5256	
,, ,,	N	eS?	,, 55 14					
,, ,,	E	eS?	,, ,, ,,					
,, ,,	E	F	13 25					
180 25/VII	E	eP	8 28 11				1556	
,, ,,	N	eP	,, ,, ,,					
,, ,,	E	S	,, 30 53					
,, ,,	N	S	,, ,, ,,					
,, ,,	N	F	11 7					
181 2/VIII	E	eP	4 33 4					
,, ,,	E	F	5 5					
182 12/VIII	E	eP	3 29 5?				8189	Time signal missed; the mentioned time being not correct in second.
,, ,,	N	eP	,, ,, ,,					

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S.P. Lee, Seismologist.
L.H. Chia, Assistant.

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due July 1	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

		V	E	N
Constant	T_1	11.06		
(Galitzin)	T	11.091		
due	μ^2	0.0017		
Aug. 14	k	187.73		

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	$\triangle$ km	Remark
182 12/VIII	Z	eP	3 29 5?					Time signal missed
,, ,,	E	eS?	,, 38 52					
,, ,,	N	eS?	,, ,, ,,					
,, ,,	Z	eS?	,, ,, ,,					
,, ,,	N	M_1?	,, 50 8	20				
,, ,,	Z	M_1?	,, 52 2	20				
,, ,,	N	M_2	,, 53 42	17		–		
,, ,,	Z	M_2	,, ,, 55	17		–		
,, ,,	Z	F	4 37					
183 14/VIII		iP	4 40 26				2467	Time signal missed
,, ,,	Z	m	,, ,, 29	3		–		
,, ,,	E	eP	,, ,, 26					
,, ,,	E	iP	,, ,, 31					
,, ,,	N	eP	,, ,, 26					
,, ,,	N	iP	,, ,, 31					
,, ,,	Z	iPP	,, ,, 47					
,, ,,	N	iPP	,, ,, 53					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due July 1	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

		V	E	N
Constant	T_1	11.06		
(Galitzin)	T	11.091		
due	μ^2	0.0017		
Aug. 14	k	187.73		

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	$\triangle$ km	Remark
183 14/VIII	E	iPP	4 40 53					
,, ,,	E	iPPP	,, 41 3					
,, ,,	N	iPPP	,, ,, ,,					
,, ,,	E	eS?	,, 44 21					
,, ,,	N	eS?	,, ,, ,,					
,, ,,	Z	eS?	,, ,, ,,					
,, ,,	E	iS	,, ,, 31					
,, ,,	N	iS	,, ,, ,,					
,, ,,	Z	iS	,, ,, ,,					
,, ,,	Z	iSS	,, 45 3					
,, ,,	E	iSS	,, ,, 11					
,, ,,	N	iSS	,, ,, ,,					
,, ,,	N	iSSS	,, ,, 31					
,, ,,	Z	F	5 52					
184 21/VIII	Zg	iP	4 19 33	8		–	2022	Time signal missed
,, ,,	N	P	,, ,, ,,					
,, ,,	Zg	iPP	,, ,, 47	8	16	–		

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due July 1	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

		V	E	N
Constant (Galitzin) due Aug. 14	T_1	11.06		
	T	11.091		
	μ^2	0.0017		
	k	187.73		

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
184 21/VIII	Zg	iS	4 22 56	12				
,, ,,	,,	iL	,, 24 36					
,, ,,	,,	M_1	,, 27 8	16	63	−		
,, ,,	,,	M_2	,, 28 34	16	26	+		
,, ,,	,,	M_3	,, 30 59	14	18	+		
,, ,,	,,	F	6 11					
185 22/VIII	E	eP	11 6 9				700	Felt in Tsingtao, ca. 4th degree of Rossi-Forel scale.
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	eP	,, ,, ,,					
,, ,,	,,	i	,, ,, 25					
,, ,,	,,	S	,, 7 20					
,, ,,	,,	iL	,, ,, 58					
,, ,,	E	iL	,, ,, 58					
,, ,,	N	iL	,, 8 6					
,, ,,	Zg	M_1?	,, 9 6	10	76	+		
,, ,,	,,	M_2	,, 10 59	10	40	−		
,, ,,	,,	M_3	,, 11 39	10	34	−		
,, ,,	,,	F	12 40					

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International Seismological Centre

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due July 1	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

		V	E	N
Constant (Galitzin) due Aug. 14	T_1	11.06		
	T	11.091		
	μ^2	0.0017		
	k	187.73		

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
186 24/VIII	E	eP	12 7 45				2878	
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	P	,, ,, ,,					
,, ,,	,,	iS	,, 12 9					
,, ,,	,,	eL	,, 16 33					
,, ,,	,,	F	13 20					

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International Seismological Centre

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Aug. 30	N-S	100.8	5.4	3.3	.0072
	E-W	97.4	5.48	3.7	.0040
	Z	75.5	4.63	3.3	.0056

Constants (Galitzin) due Sept. 14 $T_1 = 11.05$, $T = 10.88$, $\mu^2 = -0.17$, $K = 165.6$

Apparatus: I. 200kg Horizontal Wiechert II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h	m	s	Period s	Amplitude μ	Direction	$\triangle$ km	Remark
187 3, IX	Z	eP	12	3	30					Galitzin off.
,, ,,	E		,,	,,	31				2267	
,, ,,	N	eP	,,	,,	,,					
,, ,,	Z	iP	,,	,,	39					
,, ,,	E	iPP?	,,	,,	41					
,, ,,	N	PP?	,,	,,	48					
,, ,,	Z	i	,,	4	6	3		+		
,, ,,	E	eS	,,	7	14					
,, ,,	N	eS	,,	,,	,,					
,, ,,	Z	F	,,	58						
188 9, IX	Zg	P	6	54	27			+	4756	
,, ,,	,,	eS?	7	00	49					
,, ,,	,,	F	8	04						
189 9, IX	E	eP	13	47	17					
,, ,,	N	eP	,,	,,	,,					
,, ,,	Zg	P	,,	,,	,,			+	5978	
,, ,,	,,	i	,,	,,	54	4		−		

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 12	N-S	99.5	5.48	3.4	.0076
	E-W	96.4	5.51	3.2	.0072
	Z	78.2	4.54	3.3	.0087

Constants (Galitzin) due Sept. 14: T_1=11.05, T=10.88, μ^2=−0.17, K=165.6

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
189 9, IX	Zg	PP	13 49 51					
,, ,,	,,	S	,, 54 49					
,, ,,	,,	L	14 4 43					
,, ,,	,,	F	15 12					
190 11, IX	Zg	P	2 7 48				389	At minute eclipse
,, ,,	,,	S?	,, 8 28					
,, ,,	,,	F	,, 25					
191 11, IX	Zg	P	4 21 12				1922	
,, ,,	,,	eS?	,, 24 27					
,, ,,	,,	eL?	,, 26 22					
,, ,,	,,	M	,, 28 44					
,, ,,	,,	F	,, 57					
192 11, IX	N	eP	14 18 25					
,, ,,	Zg	P	,, ,, ,,			+	2911	
,, ,,	,,	i	,, ,, 34	3		+		
,, ,,	,,	eS	,, 22 51					
,, ,,	,,	i	,, 26 22	4		+		
,, ,,	,,	m	,, ,, 35	6	6	+		

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 12	N-S	99.5	5.48	3.4	.0076
	E-W	96.4	5.51	3.2	.0072
	Z	78.2	4.54	3.3	.0087

Constants (Galitzin) due Sept. 14: T_1=11.05, T=10.88, μ^2=−0.17, K=165.6

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
192 11, IX	Zg	i	14 27 05			−		
,, ,,	,,	eL?	,, ,, 41					
,, ,,	,,	M	,, 29 29	12	10	−		
,, ,,	,,	F	15 39					
193 15, IX	Zg	P	11 20 3			−	4600	
,, ,,	,,	m	,, ,, 7	4		−		
,, ,,	E	eP	,, ,, 6					
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	iPP	,, 21 23			−		
,, ,,	,,	eS	,, 26 16					
,, ,,	,,	eL	,, 31 32					
,, ,,	,,	M	,, 35 20	16	10	−		
,, ,,	,,	F	13 2					A small jump, immediately died out.
194 15, IX	,,	e	13 56 45					
,, ,,	Zg	eP	14 7 30				10,000	At minute eclipse.
,, ,,	,,	ePP	,, 11 13					
,, ,,	,,	ePPP	,, 13 28					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 20	N-S	98.4	5.48	3.5	.0067
	E-W	99.6	5.46	3.3	.0064
	Z	76.2	4.56	3.5	.0072

Constants (Galitzin) due Sept. 14 T_1=11.05, T = 10.88, μ^2=−0.17, K = 165.6

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
194 15, IX	Zg	ScPcS	14 17 33					
,, ,,	,,	ePS	,, 18 18					
,, ,,	,,	eSS?	,, 23 00					
,, ,,	,,	eL_1	,, 33 37					
,, ,,	,,	eL_2	,, 38 32					
,, ,,	,,	M	,, 45 47	24	26	−		
,, ,,	,,	W_{21}	16 24 50					
,, ,,	,,	W_{22}	,, 30 20					
,, ,,	,,	F	17 34					
195 20, IX	Zg	iP	15 50 41	8		−	4411	
,, ,,	,,	iPP	,, 52 11	10		−		
,, ,,	,,	eS	,, 56 43					
,, ,,	,,	eSS?	,, 59 22					
,, ,,	,,	M	16 6 57	13		−		
,, ,,	,,	F	19 56					
196 23, IX	E	eP	22 25 49				1833	
,, ,,	N	eP	,, ,, ,,					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 20	N-S	98.4	5.48	3.5	.0067
	E-W	99.6	5.46	3.3	.0064
	Z	76.2	4.56	3.5	.0072

Constants (Galitzin) due Sept. 24 T_1=11.05, T = 10.32, μ^2= .068, K = 167.1

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
196 23, IX	Zg	iP	22 25 50			−	1900	Galitzin strongly recorded but very faint on account of weak light.
,, ,,	E	iPP	,, 26 00	3	44	+		
,, ,,	,,	i	,, ,, 40	3		+		
,, ,,	N	i	,, ,, ,,	3		+		
,, ,,	E	iS	,, 28 58	3		+		
,, ,,	N	iS	,, ,, ,,	5	70	−		
,, ,,	Zg	iS	,, 29 3?					
,, ,,	E	iSS	,, ,, 16					
,, ,,	,,	F	15 56					
197 25, IX	Zg	P	9 2 6			−		
,, ,,	,,	F	,, 24					
198 25, IX	Zg	P	22 7 57			+	3689	
,, ,,	,,	ePP	,, 9 13					
,, ,,	,,	eS	,, 13 14					
,, ,,	,,	eL_2?	,, 19 15					
,, ,,	,,	M_1?	,, 20 52	18				

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 20	N-S	98.4	5.48	3.5	.0067
	E-W	99.6	5.46	3.3	.0064
	Z	76.2	4.56	3.5	.0072

Constants (Galitzin) due Sept. 24: T_1=11.05, T=10.32, μ^2=.068, K=167.1

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
198 25, IX	Zg	M_2	22 22 00	17				
,, ,,	,,	F	23 16					
199 26, IX	E	eP	0 52 34				444	
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	eP_1	,, ,, ,,					
,, ,,	,,	iP_2	,, ,, 41					
,, ,,	,,	eS?	,, 53 19					
,, ,,	,,	i	,, 55 12	7		−		
,, ,,	E	F	7 15					
200 26, IX	Zg	iP	19 31 44?	6		−	7656	Time mark dying out; the first arrival time probable (± sec.). Destructive in Chalcidice, Greece.
,, ,,	,,	m	,, ,, 54	8		−		
,, ,,	,,	iPP	,, 34 21	10		−		
,, ,,	,,	iPPP	,, 35 57	6		−		
,, ,,	,,	iS	,, 40 55	14		−		
,, ,,	,,	eSS?	,, 45 20					
,, ,,	,,	iSSS?	,, 48 26	16		−		
,, ,,	,,	eL_1?	,, 52 32					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0		r/T_0^2
Constants (Wiechert) due Sept. 20	N-S	98.4	5.48	3.5	.0067
	E-W	99.6	5.46	3.3	.0064
	Z	76.2	4.56	3.5	.0072

Constants (Galitzin) due Sept. 27: T_1=11.05, T=10.27, μ^2=.098, K=186

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
200 26, IX	Zg	eL_2	19 54 9					
,, ,,	,,	M_1	20 1 40	16	38	+		
,, ,,	,,	M_2	,, 2 46	10	26	−		
,, ,,	,,	M_3	,, 3 ,,	13	31	+		
,, ,,	,,	M_4	,, 4 18	13	80	−		Out of paper toward + side.
,, ,,	,,	M_5	,, 5 10	13	54	+		
,, ,,	,,	M_6	,, ,, 40	12	14	+		
,, ,,	,,	F	23 36					
201 28, IX	Zg	e_1	17 3 5					e_1 and e_2, small jumps; i followed by continuous waving. Time signal missed, the first arrival time of No. 201 to 203, probable.
,, ,,	,,	e_2	,, 12 3					
,, ,,	,,	i	,, 23 33					
,, ,,	,,	F	18 20					
202 29, IX	Zg	iP	4 8 18			−	7344	
,, ,,	E	eP	,, ,, 19					
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	eS?	,, 17 11					
,, ,,	,,	eL?	,, 29 37					

S. P. Lee, Seismologist.
L. H. Chia, Assistant.

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International Seismological Centre

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 30	N-S	99.2	5.44	3.5	.0081
	E-W	96.3	5.43	3.5	.0075
	Z	75.3	4.57	3.4	.0096

Constants (Galitzin) due Sept. 29: T_1=11.05, T = 11.04, μ^2=−0.02, K = 196

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
202 29, IX	Zg	M	4 38 49	11	6	−		
,, ,,	,,	F	6 6					
203 29, IX	Zg	eP	17 52 19	/			3256	
,, ,,	,,	iP	,, ,, 21	6	3	+		
,, ,,	,,	m	,, ,, 27	8	11	+		
,, ,,	E	eP	,, ,, 21					
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	PP	,, 53 4					
,, ,,	,,	eS	,, 57 8					
,, ,,	,,	M_1?	18 2 51	18	16	−		
,, ,,	,,	M_2	,, 3 57	16	31	+		
,, ,,	,,	M_3	,, 4 48	16	33	−		
,, ,,	,,	F	21 16					
204 1, X	Zg	e	8 18 23					
,, ,,	,,	F	9 ,,					
205 1, X	Zg	eP	15 12 28				1267	Superposed by short period (ca. 2 sec.) waves, while Micro-Seism small.
,, ,,	,,	S	,, 14 40					
,, ,,	,,	F	,, 56					

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International Seismological Centre

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 30	N-S	99.2	5.44	3.5	.0081
	E-W	96.3	5.43	3.5	.0075
	Z	75.3	4.57	3.4	.0096

Constants (Galitzin) due Oct. 8: T_1=11.05, T = 10.93, μ^2=0.01, K = 190

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
206 2, X	E	e_1	3 18 10					More than one earthquake superposed each other.
,, ,,	Zg	e_1	,, ,, ,,					
,, ,,	,,	e_2	,, 19 54					
,, ,,	,,	e_3	,, 26 52					
,, ,,	,,	e_4	,, 29 19					
,, ,,	,,	e_5	,, 30 46					
,, ,,	,,	e_6	,, 35 11	10		+		
,, ,,	,,	eL?	,, 39 16					
,, ,,	,,	M_1	,, 43 4	7	11	−		
,, ,,	,,	M_2	,, ,, 57	7	11	+		
,, ,,	,,	eL	,, 59 2					After eL the seismogram shows very distant quake.
,, ,,	,,	m	4 9 25	30				
,, ,,	,,	M_1	,, 16 28	20	17			
,, ,,	,,	M_2	,, 18 38	20	24	−		
,, ,,	,,	F	5 58					
207 9, X	E	eP	12 53 42				1944	
,, ,,	N	eP	,, ,, ,,					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Sept. 30	N-S	99.2	5.44	3.5	.0081
	E-W	96.3	5.43	3.5	.0075
	Z	75.3	4.57	3.4	.0096

Constants (Galitzin) due Oct. 8 T_1=11.05 T=10.93 μ^2=−0.01 K= 190

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
207 9, X	Zg	iP	12 53 42	8	+2 −6	+		
,, ,,	,,	ePP	,, ,, 57					
,, ,,	,,	eS	,, 56 59					
,, ,,	E	eS	,, ,, ,,					
,, ,,	N	eS	,, ,, ,,					
,, ,,	Zg	L?	,, 58 35					
,, ,,	,,	M	13 1 10	13	34	+		
,, ,,	,,	F	14 15					
208 9, X	Zg	e_1	19 30 17					
,, ,,	,,	e_2	,, 31 15					
,, ,,	,,	e_3	,, 33 42					
,, ,,	,,	F	,, 56					
209 12, X	Zg	P	19 52 35			+	3189	
,, ,,	,,	m	,, ,, 41	7		+		
,, ,,	,,	i	,, 43 17					
,, ,,	,,	eS?	,, 47 20					
,, ,,	,,	eL_2?	,, 52 36					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Oct. 10	N-S	96.1	5.53	3.0	.0068
	E-W	100.1	5.41	3.1	.0096
	Z	79.3	4.54	3.7	.0150

Constants (Galitzin) due Oct. 13 T_1=11.05 T=10.49 μ^2=.151 K= 187

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
209 12, X	Zg	M	19 54 11	16		−		
,, ,,	,,	F	20 49					
210 16, X	Zg	iP	12 17 38	6	+5 −7	+	6233	
,, ,,	,,	i	,, 18 33					
,, ,,	,,	i	,, 20 22					
,, ,,	,,	i	,, ,, 58					
,, ,,	,,	iS	,, 25 25	8		−		
,, ,,	,,	m	,, ,, 44	9	4	+		
,, ,,	,,	eL_1	,, 30 15	20				
,, ,,	,,	eL_2	,, 34 13					
,, ,,	,,	M_1	,, 42 3	20	22	−		
,, ,,	,,	M_2	,, 44 ,,	18	47	+		
,, ,,	,,	F	15 20					
211 17, X	Zg	i	13 35 27			−		At minute eclipse.
,, ,,	,,	eL_2?	,, 52 00					
,, ,,	,,	M	14 1 3	18		+		
,, ,,	,,	F	15 10					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Oct. 20	N-S	101.5	5.4	3.0	.0065
	E-W	98	5.4	2.8	.0099
	Z	79.9	4.43	3.5	.019

Constants (Galitzin) due Oct. 21: T_1=11.05, T=10.98, μ^2=.084, K=183.4

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
212 18, X	Zg	i	4 17 10			+	800	
,, ,,	,,	e	,, 40 31					
,, ,,	,,	eS?	,, 41 58					
,, ,,	,,	eL	,, 42 20					
,, ,,	,,	M	,, 43 10	9	2	+		
,, ,,	,,	F	5 6					
213 23, X	Zg	iP	21 31 44	6	+3 −8	+	1933	
,, ,,	,,	iPP	,, ,, 53					
,, ,,	,,	iS	,, 35 00	9	+2 −5	−		
,, ,,	,,	i	,, ,, 48	7		+		
,, ,,	,,	iL_2?	,, 37 12					
,, ,,	,,	M	,, 39 16	9	31	−		
,, ,,	,,	F	22 49					
214 25, X	E	P	17 6 31				2144	
,, ,,	N	P	,, ,, ,,					
,, ,,	Zg	iP	,, ,, ,,	5	−4 +6	−		
,, ,,	,,	i	,, 8 18			−		

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Oct. 20	N-S	101.5	5.4	3.0	.0065
	E-W	98	5.4	2.8	.0099
	Z	79.9	4.43	3.5	.019

Constants (Galitzin) due Oct. 21: T_1=11.05, T=10.89, μ^2=.084, K=183.4

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
214 25, X	E	eS	17 10 4					
,, ,,	N	S	,, ,, ,,					
,, ,,	Zg	iS	,, ,, ,,			−		
,, ,,	,,	eSS	,, 11 39					
,, ,,	,,	i	,, 12 27			+		
,, ,,	,,	F	,, 45					
215 29, X	E	e	11 15 28					
,, ,,	N	e	,, ,, ,,					
,, ,,	Zg	eP	,, ,, ,,				5333	
,, ,,	,,	eS?	,, 22 23					
,, ,,	,,	eL?	,, 26 17					
,, ,,	,,	M	,, 30 42	11	13	+		
,, ,,	,,	F	12 36					
216 30, X	E	eP	20 56 31				6211	
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	iP	,, ,, ,,	6	+3 −4	+		
,, ,,	,,	i	,, 58 35	6		+		

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Oct. 20	N-S	101.5	5.4	3.0	.0065
	E-W	98	5.4	2.8	.0099
	Z	79.9	4.33	3.5	.019

Constants (Galitzin) due Oct. 29 T_1=11.05 T=10.65 μ^2=.028 K=193.9

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
216 30, X	Zg	PP	20 59 8	6		−		
,, ,,	,,	eS	21 4 17	7		−		
,, ,,	,,	eL	,, 14 56					
,, ,,	,,	M_1	,, 20 45	20	+15 −17	+		
,, ,,	,,	M_2	,, 22 44	17	+18 −19	−		
,, ,,	,,	F	23 12					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Oct. 30	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

Constants (Galitzin) due Oct. 29 T_1=11.05 T=10.65 μ^2=.028 K=193.3

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
217 2, XI	Zg	eP	11 22 43					
,, ,,	,,	i	,, 25 21					At minute eclipse
,, ,,	,,	ePP?	,, 27 50					
,, ,,	,,	F	13 26					
218 3, XI	E	eP	19 49 26					
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	P	,, ,, ,,			−	3578	
,, ,,	,,	iPP?	,, 50 21	6	1	+		
,, ,,	,,	i	,, ,, 49			−		
,, ,,	,,	m	,, ,, 58	7	+6 −5	+		
,, ,,	,,	eS	,, 54 35					
,, ,,	,,	eL?	,, 57 16					
,, ,,	,,	F	21 00					
,, ,,	E	e	18 35 28				2994	
219 9, XI	N	e	,, ,, ,,					Galitzin; light source burnt out.
,, ,,	N	eS	,, 39 56					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Nov. 14	N-S	95.1	5.96	3.6	.007
	E-W	95.6	6.34	3.7	.0042
	Z	76.9	4.62	3.6	.0066

Constants (Galitzin) due Nov. 8: $T_1=11.05$, $T=10.68$, $\mu^2=-.122$, $K=187.9$

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
219 9, XI	E	eS	18 39 57					
,, ,,	E	eL	,, 43 36					
,, ,,	N	eL	,, ,, ,,					
,, ,,	N	F	19 14					
220 10, XI	Zg	e	11 1 23					
,, ,,	,,	eL?	,, 9 55					
,, ,,	,,	F	,, 34					
221 13, XI	E	iP	4 50 22	4	+26 −18	+	1622	
,, ,,	N	iP	,, ,, ,,	4	7	+		
,, ,,	Zg	iP	,, ,, ,,	4	45	−		
,, ,,	,,	i_1	,, 51 5			−		
,, ,,	,,	i_2	,, ,, 45			+		
,, ,,	E	i	,, ,, 49	4	18	+		
,, ,,	E	iS	,, 53 10	4	18	−		
,, ,,	N	iS	,, ,, ,,	6	−47 +72	−		

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Nov. 14	N-S	100.3	5.37	3.0	.008
	E-W	99.1	5.4	2.4	.0099
	Z	79.6	4.4	3.4	.015

Constants (Galitzin) due Nov. 16: $T_1=11.05$, $T=10.65$, $\mu^2=-0.03$, $K=192$

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
221 13, IX	Zg	iS	4 53 10	6	+44 −69	+		
,, ,,	,,	M	,, 54 44	8?	+66 +64	+		
,, ,,	,,	F	5 46					
222 13, IX	Zg							initial phase confused by microseism
,, ,,	,,	eL	15 17 17					
,, ,,	,,	F	,, 44					
223 17, XI	Zg							initial phase confused by microseism
,, ,,	,,	eL	7 14 6					
,, ,,	,,	F	,, 42					
224 18, IX	Zg	iP	13 54 11	6	+2 −3	+	3744	
,, ,,	,,	i	,, 55 3					
,, ,,	,,	PP?	,, ,, 39					
,, ,,	,,	eS?	,, 59 31					
,, ,,	,,	F	14 36					
225 22, IX	Zg	iP	14 59 50	2	4	+	1200	
,, ,,	,,	eS	15 1 41					
,, ,,	,,	F	,, 37					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Nov. 20	N-S	99	5.4	3.2	.0086
	E-W	101	5.36	3.2	.01
	Z	75.1	4.46	2.9	.018

Constants (Galitzin) due Nov. 14 $T_1=11.05$ $T=10.65$ $\mu^2=-.03$ $K=192$

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
226 25, IX	Zg	P	11 2 48					
,, ,,	,,	F	,, 11					
227 26, IX	Zg	P	4 28 25			–	2211	
,, ,,	E	eP	,, ,, 26				2222	
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	iPP	,, ,, 43			–		
,, ,,	,,	iS	,, 32 3	7	−10 +14	–		
,, ,,	E	S	,, 5					
,, ,,	N	eS	,,					
,, ,,	Zg	iSS	,, 43					at minute eclipse
,, ,,	,,	L	,, 34 25					
,, ,,	,,	M	,, 36 40	13	+24 −35	+		
,, ,,	,,	F	6 12					
228 27, IX	Zg	P	3 42 43				2911	
,, ,,	,,	eS	,, 47 9					
,, ,,	,,	eL	,, 50 38					
,, ,,	,,	M	,, 53 22	15	+11 −10	+		
,, ,,	,,	F	4 48					

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ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Nov. 20	N-S	99	5.4	3.2	.0086
	E-W	101	5.36	3.2	.01
	Z	75.1	4.46	2.9	.018

Constants (Galitzin) due Nov. 16 $T_1=11.05$ $T=10.65$ $\mu^2=-0.03$ $K=192$

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
229 27, XI	Zg	eP	9 31 26			–	950	
,, ,,	,,	eS?	,, 32 59					
,, ,,	,,	eL?	,, 33 39					
,, ,,	,,	F	,, 53					
230 28, XI	Zg	eL	21 42 38					
,, ,,	,,	M	,, 45 25					
,, ,,		F	22 00					
231 29, XI	N	iP	1 58 54			–	7882	
,, ,,	,,	eL	2 21 59					
,, ,,	,,	F	,, 38					
232 29, XI	Zg	P	11 31 3			–	14440	
,, ,,	,,	P'?	,, 34 2					
,, ,,	,,	iPP	,, 36 8			–		
,, ,,	,,	PPP	,, 37 21					
,, ,,	,,	$\overline{ScPcS}$	,, 43 9					
,, ,,	,,	Sn	,, ,, 29					
,, ,,	,,	PS	,, 44 7					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 1	N-S	98.2	5.48	2.8	.008
	E-W	100.2	5.41	3.4	.011
	Z	76.6	4.46	3.6	.014

Constants (Galitzin) due Nov. 16: T_1=11.05, T=10.65, μ^2=−0.03, K= 192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
232 29, XI	Zg	L?	12 44 39					L comes too late.
,, ,,	,,	F	13 36					
233 29, XI	Zg	eP?	15 35 17				944	Prausible earthquake waves preceded.
,, ,,	,,	eS	,, 36 49					
,, ,,	,,	F	,, 59					
234 30, XI	Zg	e	3 45 37					
,, ,,	,,	F	4 5					
235 3, XII	Zg	iP	6 32 29			+	2000	
,, ,,	,,	S?	,, 35 50					
,, ,,	,,	F	7 43					
236 4, XII	E	eP	8 18 31					Azimuth: N-E, up. The moving confinded quite on N-S Component.
,, ,,	N	eP	,, ,, ,,					
,, ,,	Zg	iP	,, ,, ,,			+	4289	
,, ,,	N	iPP	,, 20 24					
,, ,,	Zg	iPP?	,, ,, 25	8	−18 +22	−		
,, ,,	E	eS	,, 24 24					
,, ,,	N	eS	,, ,, ,,					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 1	N-S	98.2	5.48	2.8	.008
	E-W	100.2	5.41	3.4	.011
	Z	76.6	4.46	3.6	.014

Constants (Galitzin) due Dec. 16: T_1=11.05, T=10.65, μ^2=−0.03, K= 192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
236 4, XII	Zg	iS	8 24 25			−		
,, ,,	,,	iSS	,, 27 3			+		
,, ,,	,,	m	,, ,, 33					
,, ,,	,,	L	,, 30 1					
,, ,,	,,	M_1	,, 32 25	23	201	+		
,, ,,	,,	M_2	,, 34 5	20	+105 −141	+		
,, ,,	,,	M_3	,, 35 37	17	+78 −83	−		
,, ,,	,,	M_4	,, 37 16	16	−66 +69	+		
,, ,,	N	F	9 25					
237 4, XII	E	e	10 40 15				4178	
,, ,,	N	e	,, ,, ,,					
,, ,,	Zg	iP	,, ,, ,,			+		After shock of the above.
,, ,,	,,	PP?	,, 41 48					
,, ,,	,,	eS	,, 45 47					
,, ,,	E	eS	,, ,, 59					
,, ,,	N	eS	,, ,, ,,					
,, ,,	Zg	eL	,, 48 30					

S. P. Lee, Seismologist.
L. H. Chia, Assistant.

N. B. We are using the table of "Laufzeitkurve", published by Rev. Fr. J. B. Macelwane (St. Louis Univ., 1927).

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 1	N-S	9.82	5.48	2.8	.008
	E-W	100.2	5.41	3.4	.011
	Z	76.6	4.46	3.6	.014

Constants (Galitzin) due Nov. 16: T_1=11.05, T = 10.65, μ^2 = −.03, K = 129

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
237 4, XII	Zg	F	12 00					
238 5, XII	Zg	P	0 23 8			−		
,, ,,	,,	i	,, 26 22					
,, ,,	,,	F	,, 37					
239 5, XII	Zg	eL	23 00 25					
,, ,,	,,	F	,, 16					
240 7, XII	Zg	P	16 36 42				12440	At minute eclippe
,, ,,	,,	P′	,, 40 5					
,, ,,	,,	iPP	,, 41 18			+		
,, ,,	,,	S	,, 50 17					
,, ,,	,,	PS	,, 51 14					
,, ,,	,,	i	,, 58 4			+		
,, ,,	,,	eL_1	17 18 53					
,, ,,	,,	eL_2	,, 28 6					
,, ,,	,,	M	,, 35 34	16	+20 −24	+		
,, ,,	,,	F	19 00					
241 8, XII	E	e	15 21 42				2400	

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0		r/T_0^2
Constants (Wiechert) due Dec. 1	N-S	98.2	5.48	2.8	.008
	E-W	100.2	5.41	5.4	.011
	Z	76.6	4.46	3.6	.014

Constants (Galitzin) due Nov. 16: T_1=11.05, T = 10.65, μ^2 = −0.03, K = 192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
241 8, XII	N	e	15 21 42					
,, ,,	Zg	eP	,, ,, ,,					
,, ,,	,	P	,, ,, 44			+		
,, ,,	,,	iS	, 25 37	7	−2 +2	−		
,, ,,	,,	eL	,, 28 54					
,, ,,	,,	M	,, 30 53	11	−7 +8	+		
,, ,,	,,	F	,, 58					
242 10, XII	Zg	e	4 9 55					
,, ,,	,,	i	,, 10 28			+		
,, ,,	,,	F	5 00					
243 10, XII	Zg	iP	10 27 53			+		Between iP-eL moving quite flat.
,, ,,	,,	eL	,, 25 46					
,, ,,	,,	F	11 32					
244 15, XII	E	eP	19 38 5				2122	
,, ,,	N	eP	,, ,, ,,					
,, ,,	E	eS	,, 41 36					
,, ,,	N	eS	,, ,, ,,					
,, ,,	N	F	20 16					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 11	N-S	98	5.43	2.9	.010
	E-W	100	5.46	2.7	.008
	Z	74.3	4.41	3.5	.016

Constants (Galitzin) due Nov. 16: T_1=11.05, T=10.65, μ^2=−0.03, K=192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
245 16, XII	Zg	e	7 20 56					
,, ,,	,,	F	8 7					
246 20, XII	Zg	iP	10 36 47			+	2867	
,, ,,	,,	eS	,, 41 10					
,, ,,	,,	eL	,, 43 31					
,, ,,	,,	M	,, 45 23	16	−5 +6	−		
,, ,,	,,	F	13 00					
247 21, XII	E	e	6 22 52					
,, ,,	N	e	,, ,, ,,					
,, ,,	Zg	eP	,, ,, ,,				12210	
,, ,,	,,	iP	,, 23 02	6	+3 −5	+		
,, ,,	,,	P′	,, 26 26					
,, ,,	,,	PP	,, 27 22					
,, ,,	,,	$\overline{\text{ScPcS}}$	,, 33 28					
,, ,,	,,	i	,, 34 3					
,, ,,	,,	$\overline{\text{ScPcPcS}}$	,, ,, 25					
,, ,,	,,	Sn?	,, 35 7					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 21	N-S	99.5	5.38	2.8	.010
	E-W	95.5	5.5	2.9	.008
	Z	74.6	4.48	2.8	.015

Constants (Galitzin) due Nov. 16: T_1=11.05, T=10.65, μ^2=−0.03, K=192

Apparatus: I. 200kg Horizontal Wiechert II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
247 21, XII	Zg	PS	6 35 36					
,, ,,	,,	i	,, 36 54					
,, ,,	,,	i	,, 38 34					
,, ,,	,,	SS?	,, 42 4					
,, ,,	,,	L_1	,, 49 18					
,, ,,	,,	L_2	,, 52 58					
,, ,,	,,	M_1	,, 57 12	24	+38 −39	+		
,, ,,	,,	M_2	7 00 40	24	−48 +46	−		
,, ,,	,,	F	10 00					
248 24, XII	Zg	P	4 32 34			+	810	
,, ,,	,,	S?	,, 33 54				1020	
,, ,,	,,	F	,, 53					
249 24, XII	Zg	eP	5 27 47					
,, ,,	,,	eS	,, 29 27					
,, ,,	,,	M	,, 31 18	9	−1 +2	−		
,, ,,	,,	F	,, 44					
250 24, XII	E	E	6 39 39				5477	

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International Seismological Centre

SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 27	N-S	99.1	5.37	2.0	.008
	E-W	100.9	5.43	3.5	.006
	Z	9.2	4.47	3.6	.015

Constants (Galitzin) due Nov. 16: $T_1=11.05$, $T=10.65$, $\mu^2=-0.03$, $K=192$

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
250 24, XII	N	e	6 39 39					
,, ,,	Zg	iP	,, ,, ,,	4	+1 −1	+		
,, ,,	,,	i	,, 40 12	7	2	−		
,, ,,	,,	PR	,, 41 40					
,, ,,	,,	iS	,, 46 58	12	+4 −5	+		
,, ,,	,,	SR?	,, 51 33					
,, ,,	,,	L	,, 54 40					
,, ,,	,,	M	,, 57 10	22	+38 −35	+		
,, ,,	,,	F	8 32					
251 25, XII	Zg	iP	2 7 58	11	29	+	1756 (16°)	Out of limit. Azimuth: S 86° E; probable epi.: 98° E, 39.°5 N. Destructive in Coatai and Suchau, Kansu.
,, ,,	E	iP	,, ,, ,,	6	15	+		
,, ,,	N	iP	,, ,, ,,			+		
,, ,,	Z	i	,, 8 9	5	+69 −29	−		
,, ,,	,,	iPP	,, ,, 19	5	+65 −66	+		
,, ,,	N	iPP	,, ,, 26			−		
,, ,,	E	iPP	,, ,, 28	5	+76 −80	+		
,, ,,	,,	iS	,, 10 59	4	−28	+		

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 27	N-S	99.1	5.37	2.9	.008
	E-W	100.9	5.43	3.5	.006
	Z	79.2	4.47	3.7	.015

Constants (Galitzin) due Nov. 16: $T_1=11.05$, $T=10.65$, $\mu^2=-0.03$, $K=192$

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
251 25, XII	N	iS	2 10 59			+		Galitzin out shortly after P; Wiechert out of limit in L and M.
,, ,,	Z	iS	,, ,, ,,	4	−27 +12	−		
,, ,,	E	iSS	,, 11 15	6	−158 +171	−		
,, ,,	N	iSS	,, ,, 19	7	+198 −71	−		
,, ,,	Z	iL	,, 12 24			+		
,, ,,	E	iL	,, ,, ,,			−		
,, ,,	N	iL	,, ,, ,,			+		
252 25, XII	E	P	3 6 51			−	843	
,, ,,	N	P	,, ,, ,,			−		
,, ,,	Zg	iP	,, ,, ,,			+		
,, ,,	,,	iS	,, 8 14			+		
253 25, XII	Zg	P	6 15 36			+	726	
,, ,,	,,	i	,, 16 15	6	−2 +2	−		
,, ,,	,,	S(L)?	,, ,, 48					
,, ,,	,,	F	,, 52					
254 25, XII	Zg	P	7 46 2			+	566	
,, ,,	,,	S(L)?	,, ,, 59					
,, ,,	,,	F	8 00					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 27	N-S	99.1	5.37	2.9	.008
	E-W	100.9	5.43	3.5	.006
	Z	79.2	4.47	3.7	.015

Constants (Galitzin) due Nov. 16: T_1=11.05, T=10.65, μ^2=−0.03, K=192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
255 25, XII	Zg	eP	8 5 34				726	
,, ,,	,,	iS?	,, 6 46			+		
,, ,,	,,	iL?	,, 7 00					
,, ,,	,,	F	,, 31					
256 25, XII	Zg	eP	11 14 44				621	
,, ,,	,,	eS(L)?	,, 15 46					
,, ,,	,,	F	,, 22					
257 25, XII	Zg	P	11 25 49			−	588	
,, ,,	,,	S	,, 26 48					
,, ,,	,,	iL?	,, 27 13					
,, ,,	,,	F	,, 45					
258 25, XII	Zg	P	12 29 38			−	1667	
,, ,,	,,	iS	,, 32 30	8	+1 −1	+		
,, ,,	,,	iL	,, 33 49	6	2	−		
,, ,,	,,	L?	,, 34 3					
,, ,,	,,	M	,, 35 22	10	+9 −8	+		
,, ,,	,,	F	,, ?					

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SEISMIC DATA

ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 27	N-S	99.1	5.39	2.9	.008
	E-W	100.9	5.43	3.5	.006
	Z	79.2	4.47	3.7	.015

Constants (Galitzin) due Nov. 16: T_1=11.05, T=10.65, μ^2=−0.03, K=192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
259 25, XII	Zg	eP	12 47 28				898	At minute eclipse
,, ,,	,,	S (L)?	,, 48 56	7	−1 +1	−		
,, ,,	,,	F	13 00					
260 25, XII	Zg	eP	14 9 24?				736	Light spot diverging
,, ,,	,,	S	,, 10 37					
,, ,,	,,	F	,, 24					
261 25, XII	Zg	eP	14 56 53				799	
,, ,,	,,	S (L)	,, 58 12					
,, ,,	,,	F	15 4					
262 25, XII	Zg	P	23 25 35			+	706	
,, ,,	,,	S (L)	,, 26 45					
,, ,,	,,	F	,, 34					
263 26, XII	Zg	eP_1	7 48 39				938	
,, ,,	,,	iP_2	,, ,, 54	4		+		
,, ,,	,,	S (L)	,, 50 11					
,, ,,	,,	F	8 00					
264 26, XII	Zg	e	17 7 43					

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		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 27	N-S	99.1	5.37	2.9	.008
	E-W	100.9	5.43	3.5	.006
	Z	79.2	4.47	3.7	.015

Constants (Galitzin) due Nov. 16: T_1=11.05, T=10.65, μ^2=−0.03, K= 192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
264 26, XII	Zg	i	17 8 15	4		−		
,, ,,	,,	F	,, 17					
265 26, XII	Zg	eP	19 49 25				958	At minute eclipse
,, ,,	E	e	,, ,, ,,					
,, ,,	N	e	,, ,, ,,					
,, ,,	Zg	i	,, ,, 55	5	−1 +1	−		
,, ,,	,,	i	,, 50 39	4	−1	+		
,, ,,	,,	S (L)	,, ,, 59					
,, ,,	,,	F	20 7					
266 26, XII	Zg	iP	21 18 14	6	−15 +30	−	1700	iP stronger than all others.
,, ,,	E	iP	,, ,, ,,	4	+4 −13	+		
,, ,,	N	iP	,, ,, ,,	4	−8 +20	−		
,, ,,	Zg	iPP	,, ,, 39	6	−5 +6	−		
,, ,,	,,	iS	,, 21 10	10	+3 −10	+		
,, ,,	E	S	,, ,, 11					
,, ,,	N	S	,, ,, ,,					
,, ,,	Zg	F	22 10					

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		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 27	N-S	99.1	5.37	2.9	.008
	E-W	100.9	5.43	3.5	.006
	Z	79.2	4.47	3.7	.015

Constants (Galitzin) due Nov. 16: T_1=11.05, T=10.65, μ^2=−.03, K= 192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
267 26, XII	Zg	iP	22 36 41			+	2944	
,, ,,	,,	S?	,, 41 10					
,, ,,	,,	F	,, 57					
268 28, XII	Zg	P	0 39 55				821	Confused by next line.
,, ,,	,,	S(L)?	,, 41 16					
269 28, XII	Zg	eP	8 28 31				1878	
,, ,,	,,	P	,, ,, 49			+		
,, ,,	,,	iS	,, 31 44	8	+1 −1	+		
,, ,,	,,	L	,, 33 3					
,, ,,	,,	M	,, 34 35	8	+6 −7	+		
,, ,,	,,	F	9 11					
270 29, XII	E	e	10 36 30					
,, ,,	N	e	,, ,, ,,					
,, ,,	Zg	eP	,, ,, ,,				1600	
,, ,,	,,	eS	,, 39 17					

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ϕ 40° 3′ 55″ λ 116° 5′ 46″ h 155 M. Granite-foundation

		V	T_0	ε	r/T_0^2
Constants (Wiechert) due Dec. 27	N-S	99.1	5.37	2.9	.008
	E-W	100.9	5.43	3.5	.006
	Z	79.2	4.47	3.7	.015

Constants (Galitzin) due Nov. 16 T_1=11.05 T=11.65 μ^2=−0.03 K= 192

Apparatus: I. 200kg Horizontal Wiechert, II. 80kg Vertical Wiechert, III. Galitzin-Wilip

No. & Date	Component	Phase	Time (Greenwich) h m s	Period s	Amplitude μ	Direction	△ km	Remark
270 29, XII	Zg	L	10 40 30					
,, ,,	,,	M	,, 42 4	10	+4 −4	+		
,, ,,	,,	F	,, 58					
271 30, XII	Zg	P	0 28 8			−	726	
,, ,,	,,	S(L)	,, 29 20					
,, ,,	,,	F	,, 41					
272 30, XII	Zg	eL	19 37 44					
,, ,,	,,	F	,, 50					
273 30, XII	Zg	P	21 35 12			+	821	
,, ,,	,,	S(L)?	,, 36 33					
,, ,,	,,	F	,, 55					
274 31, XII	Zg	P	1 42 39			+		
,, ,,	,,	F	,, 51					
275 31, XII	Zg	eL	7 23 38					
,, ,,	,,	M	,, 29 37	20	+½ −5	+		
,, ,,	,,	F	8 28					
276 31, XII	Zg	e	17 11 57					
,, ,,	,,	F	,, 19					

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FOREWORD

Seismographic data at Chiufeng Station up to December, 1932 had been published in the Seismological Bulletin. Since January, 1933, these data were regularly distributed at the end of every month in mimeographic reports to the more important stations of the world. From this issue the Seismological Bulletin will contain chiefly special articles on more significant quakes, while the regular monthly mimeographic reports will be continued and supplied to any station who wishes to have them.