



HELWAN OBSERVATORY



SEISMOLOGICAL REPORT FOR THE YEAR 1949

Published under the Direction of

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Director of Helwan Observatory

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SEISMOLOGICAL REPORT
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Seismological Bulletin

Constants of the Station:

$\phi=29^{\circ} 51'N.$ $\lambda=31^{\circ} 20'E.$ $h=115$ m.

NATURE OF STRATA: Limestone rock.

INSTRUMENTS: Galitzin Wilip Aperiodic Seismograph, Photo Galvanometric Registration, Vertical Component
Milne-Shaw Seismographs, Photographic Registration, two Horizontal Components.

Component	Date from which Constants apply	Pendulum Free Period T	Galvanometer Free Period T ₁	Damping Constant	Transmission Coefficient K	Static Magnification V
		sec.	sec.			
N	Monthly	12.0				250
E	"	12.0				250
Z	9-6-1938	11.16	11.13	+0.05	175	1000

The Seismological station at Helwan is superintended by Assis. Professor Azouz Ismaïl who carried out the measurements contained in this volume.

N.B. All dilatations should be taken as Compression,
and Compressions as dilatations

** Confused with the succeeded earthquake.

** Lost in changing the paper.

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
	1949			H	M.	S.	Sec.	μ	μ	μ	Kms.	
1	January 2	Z Z Z Z Z N E	P PcP pP PP PPP S M F	4	54 55	54 06 18 34 14 48					7780	Preceded by microseisms h = 100 km.
2	2	Z Z NE N N	P e e e e F	9	02 06 13 14	51 53 09 54 38						Confused with microseisms Very Weak
3	2	Z Z Z N N N N N	iP PP PPP eS i i i M F	12 13	56 57 01 02 03 09	30 22 37 22 36 22 06 54	12	+28			3220	Compression
4	2	Z Z ENZ N	Pn e Sn S* F	18	03 04	23 06 34 56					677	(Not felt)
5	4	Z Z Z Z	P e e e	2	33 34 35 37	28 36 20 50						Very Weak
6	4	Z Z Z NZ Z	Pn e P* Sn S* F	19	48 49	25 30 37 33 56					667	(Not felt)
7	6	Z Z N	Pn e i F	2	18 19	45 57 20						
8	10	Z	e F	8 8.9	48	25						Very weak
9	13	Z Z Z Z Z Z Z E Z Z	iP i i pP e PP i S e e F	9	06 08 09 10 15 16 20	08 15 27 40 42 55 11 48 15 08					9780	Dilatation h = 800 km.
10	14	Z N NE Z NE N N N	(eP) (PPP) (S) i e e e e F	15 16	56 58 59 00 01 04	21 38 24 00 06 32 30					1210	Confused with microseisms
11	18	NZ Z Z	e i i F	4 4.4	15 16	42 08 24						Very near

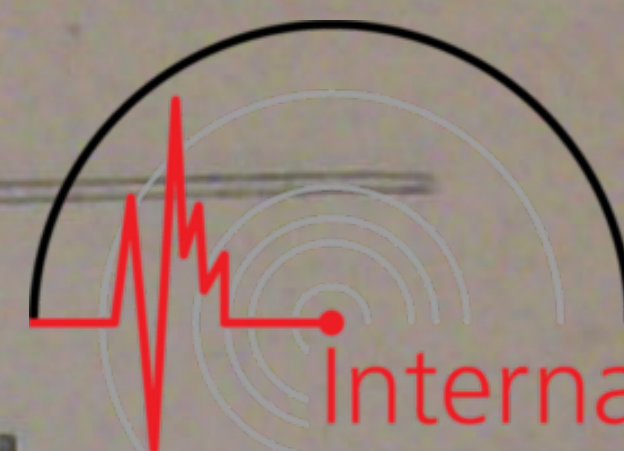
No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks	
								A _N	A _E	A _Z			
				H.	M.	S.	Sec.	μ	μ	μ	Kms.		
12	19	Z Z Z Z N N E Z	(P) i e e e (SKS) (S) e i F	15 16.3	12 13 14 17 22 23	10 30 05 05 17 12 24 11 43					8890	Confused with microseisms	
13	20	Z	eP F	13 14.4	37	23							Very "weak"
14	20	N	e F	22 22.6	31	12							" "
15	21	Z Z	e e	15	42 43	45 35							" "
16	22	Z NE	e M F	3 4 4.3	58 10	23							" "
17	23	Z ZN N	P i e	1	19 24 29	12 33 48							" "
18	23	Z N	e M F	4 6 6.4	58 02	09							" "
19	23	Z ENZ Z Z Z Z Z EN EN E N E	P i PcP e e PP PPP e S PS PPS SS M F	6 7 9.5	42 56 14	26 33 45 23 21 06 52 06 48 23 39 23 18	18	+52		8000	Preceded by microseisms		
20	23	N N	e i	10	15 21	51 06							Very weak
21	24	Z Z Z Z Z Z Z Z Z Z N	eP e e e pP e PP S e sS e SS F	9 11.5	35 36 37 39 46 47 48 49 50	30 38 55 30 58 56 27 09 58 48 40 18				10555	h = 400 Kms.		
22	27	Z Z Z N	eP e e e F	11 12.2	12 13 23	40 52 02 08							Confused with microseisms
23	27	Z N Z Z	e e e e F	17 17.5	04 05 10 11	04 00 36 23							" " "
24	28	Z Z	eP e F	8 9.2	28 32	43 55							Very "weak"

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
	February			H.	M.	S.	Sec.	μ	μ	μ	Kms.	
25	1	Z Z Z E N E	eP e e e e e F	18	33	10 30 20 45 10 24						Preceded by microseisms
				21.0								
26	2	Z Z Z Z Z Z Z NE N N N	eP pP sP PP e ipPP i i SKKS S e e F	17	54 55 58 59	30 25 45 24 00 12 24 57 48 26 16 46					10555	h = 200 Kms.
				18	00							
				19.0								
27	3	Z Z Z	e e e F	16	49	38 48 06						Confused with microseisms
				18.6								
28	5	ZN Z ZN Z N	i i e e e F	00	30	44 52 34 51 46						" " "
				1.1								
29	5	NZ Z Z N	eP e e e F	15	28 29	54 10 34 48						Very "weak"
				15.9	39							
30	9	Z Z	e e F	13	36 40	12 25						" "
				13.9								
31	10/11	Z Z Z Z Z Z Z N	PKP e PKKP e SKP PP i SS F	22	16	33 42 54 47 06 39 12 12					16165	
				21.5	40							
32	11	Z Z Z	PKP i i F	7	43	30 52 02						Very weak
				9.0	44							
33	13	Z Z Z Z Z ZN E E E E	iPKP e PKKP e PP e e SKKS e M F	18	44 45	10 02 39 36 12 39 15 57 27					17465	Compression
				19	45							
				21.5								
												Very weak
34	14	Z Z Z	P e e	16	43 47	46 10 30						
35	14	Z Z Z NE N	iP PP e S i F	18	54 57 58	39 46 30					9000	Compression
				19	04 05	47 14						
				20.2								
36	16	N	i F	15	15	34						Confused with microseisms
				15.5								

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A_n	A_e	A_z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
37	17	Z Z Z ZN	eP e PPP S F	21 21.8	05 06 10	55 19 45 15					2745	Confused with microseisms
38	18	NE	M F	22 22.3	07							" " "
39	19	Z Z	eP i	1	14 17	58 33						" " "
40	21	Z Z N	eP e e F	2 2.7	30 31	45 04 42						" weak "
41	22	Z N N N N	eP e e e e F	00 1.1	54 55 57	30 54 22 45 32						Confused with microseisms
42	23	Z Z Z Z NE N	ePn e e e Sn Sg F	15 15.9	30 31	00 09 21 36 11 48					677	
43	23	Z N N N N N NN N N N N	iP e e PP PcP PPP i e e iS i F	16 20.1	16 17 18 20 21 22 26	15 58 20 58 03 32 58 48 27 44 06					4835	Compression
44	24	Z Z Z Z E Z E	eP e PP e eS e M F	23 24.0	08 10 11 14 16 24	53 00 30 54 48 15 21	15		+25		4220	
45	26	N Z Z N N	(eP) e e e e F	00 1.1	38 40 41 42 43	06 42 22 16 00						Confused with microseisms/
46	26	Z NE	eP e F	4 5.4	18 25	00 14						" " "
47	28	Z Z NE N E E	P PP S PS e M F	00 1 3.0	26 30 38 39 40 06	57 54 44 27 08					10555	" " " h = 100 Km.
48	March 2	Z Z Z Z Z NZ	e i PP i PPP S F	7	01 02 03 04 09	27 56 06 50 45 38					7720	Preceded by Microseisms Lost in changing the paper

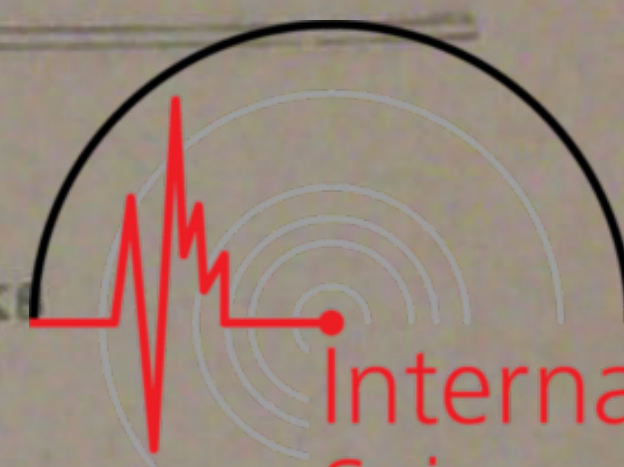
No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A_n	A_e	A_z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
49	4	Z Z Z Z NE N	iP e e PP iS PS F	1 4'0	28 29 30 31 38 39	39 29 10 30 20 00					8420	Compression
50	4	NEZ E E E E N	iP e e PP PPP iS F	10 14'2	25 26 27 30	47 22 33 46 00 52					3445	Compression (Very strong) h = 200 Km.
51	6	Z Z Z Z NE Z	iP PPP e e eS SS F	16 17'2	40 41 42 44	57 22 15 12 27 50					2110	Dilatation
52	9	Z Z Z Z	e e e e F	15 15'9	15 18 19	13 26 57 42						Confused with microseisms
53	13	N	(i)	12	58	24						
54	13	E Z	e e F	19 20'1	07 12	52 00						Very weak
55	16/17	Z Z Z EZ Z Z E E E	PKP e e PP e PPP e SKKS PS F	22 1'5	33 34 35 37 38 41 42 45	58 03 42 20 35 00 12 17 15					13380	Confused with microseisms
56	17	Z Z Z E	iP e e eS F	21 24'0	25 26 35	18 32 13 21					8890	Compression
57	18	Z Z	e e F	13 13'6	28 29	00 51						Very weak
58	19	ZE Z Z Z Z NE N	iP pP PP pPP e S sS F	18 19 19'2	31 32 34 35 36 41 42	29 20 42 36 33 26 42					9220	Compression h = 200 Km.
59	19	Z	iP F	19 19'2	01	17						Confused with the succeeding earthquake Dilatation Very weak
60	22	Z Z	e e F	2 2'7	14 16	17 06						Confused with microseisms
61	23	Z N Z Z	e e e i F	5 6'0	47 48	32 36 00 34						Preceded by microseisms
62	24	Z Z Z Z E	e e e e M F	19 20 21'0	38 48 49 07	04 17 25 14						Very weak

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
63	24	Z N N	e e e F	21 24.0	15 21 24	54 48 46						Very weak
64	26	Z Z Z	e i i F	00 0.3	11 12	57 15 24						" "
65	27	Z Z Z Z ZE ZN E E E	iP i PP i SKS S PS PPS SS F	6 7 10.0	47 51 52 57 58 00 05	18 32 15 15 52 36 00 42 12				10720	Compression	
66	27	Z Z Z	P e e F	20 22.0	47 51	19 41 07						Very weak
67	28	Z Z NE N	eP e e e F	13 14.0	03 13	00 17 14 58						Confused with microseisms
68	30	Z Z Z N	eP e e e F	15 17.5	07 08 11	40 54 08 33						" " "
	April											
69	1	Z Z	e e F	17 17.3	09	32 42						Very weak
70	3	Z Z E	eP e e F	6 8.0	48 51 59	56 10 45						Confused with microseisms
71	3	N NE	e M F	19 19.7	22 18	16						Very weak
72	5	Z Z ZE Z ZNE NE Z Z N	iP pP sP PP S i SP i SS F	9 11.1	38 40 41 47 49 52	05 05 09 (25) 07 23 54 10 26				8665	Confused with microseisms h = 600 Km.	
73	6	Z N E N	iP e (SKKS) (S) F	15 16.5	36 57 48	42 36 44 06				10890	Compression Very weak	
74	7	Z Z Z E Z Z Z	Pg e Sn e S* Sg e F	4 4.8	33 34 35	27 00 12 23 37 57 22				755	Confused with microseisms	
75	9	Z Z Z	e e e	21 22	55 58 01	45 06 42						Very weak



No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
76	10	Z N	e e F	00 0.3	10 06	51 24						Very weak
77	11	Z Z Z Z Z Z E Z	ePKP e iPKKP i PP SKS PSKS e F	00 2.2	08 09 12 15 22 24	15 28 44 09 18 12 45 00					17465	Preceded by microseisms
78	11	ZE E Z Z	ePn i i e F	15 15.8	44 45 46	48 51 12 24						Preceded by microseisms
79	13	Z Z	e e F	4 5.2	21 23	15 14						" " "
80	13	Z NE	(eP) M F	9 10.0	30 40	30						" " "
81	13	Z Z Z Z	eP i e e F	15 16.3	24 26 31	08 16 44 02 45						" weak "
82	13	Z Z Z Z N N	P e e PPP iSKS S F	20	09 11 15 19 20	24 12 09 15 58 30					10335	Confused with the succeeding shock Confused with the preceding shock
83	13	Z Z	(eP) e F	20 23.1	33 34	45 36						Very weak
84	14	Z Z Z	eP e e	7	46 47	51 19 39						" "
85	14	Z Z Z	e e e	16	06 07	20 52 26						Confused with microseisms
86	14	Z Z Z E	eP e iPP eSKS F	17 19.5	22 23 26 33	51 31 36 27					10335	Confused with microseisms
87	18	Z Z N N	eP i e (S) F	00 1.9	51 58	12 20 36 48						Very " weak "
88	18	Z Z Z Z Z Z Z E	PKP PKKP pPKP sPKP PP pPP i e F	21 22 22.8	54 55 56 58	36 54 24 00 23 44 58 20					6665	h = 180 km.
89	19	Z Z Z N EN N	P i e e SKS S F	15 16.8	31 32 33 42 43	58 14 18 22 32 54					11665	Preceded by microseisms

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A_N	A_E	A_Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
90	20	Z Z Z Z Z NE NE E N N N	P e i PP PPP i SKS SKKS i i PPS F	3 7.0	44 47 48 51 54 55 57 58 59	27 54 03 48 15 40 06 56 24 46 03	20		+103		12010	
91	22	Z	eP F	1 3.0	22	30						Very weak
92	22	Z Z Z Z Z Z Z	PKP PKKP (pPKKP) e e (PP) e F	17 19.8	37 38 39 40 41 42	00 46 25 16 42 10 25					17500	h = 150 Km.
93	22	Z Z Z	e e e F	21 21.2	04 06 07	20 24 24						Very weak
94	23	Z Z Z Z E Z Z Z E	P i i PP e SKS PS PPS M F	11 12 14.0	28 29 32 40 42 13	42 12 12 31 00 20 15 45 34	20		+34		1445	Preceded by microseisms
95	23	ENZ E Z	Pg (Sg) e F	21 21.2	10 11	54 07 18					111	Local (not felt)
96	24	EZ Z NZ N	iP PP iS M F	4 6.7	27 31 36	07 39 18 00	(14)	587			2610	Compression
97	24	NZ Z Z	e e i F	13 14.0	48 49	00 24 57						Very weak
98	25	Z Z Z Z	eP i e i F	00 0.3	09 10	05 18 04 27						Very weak
99	25	Z Z Z N	eP e e M F	5 6.1	14 15 17 43	54 30 52						" "
100	25	Z Z Z Z Z Z EN EN Z Z E E E	(eP) (pP) e (PP) (pPP) i i iSKS iS e e e M F	14 14 15 16.9	09 13 14 19 20 21 22 23 28 01	18 44 12 38 02 20 46 48 38 29 55 54 06 33	18		+102		10945	(h = 100 Km).

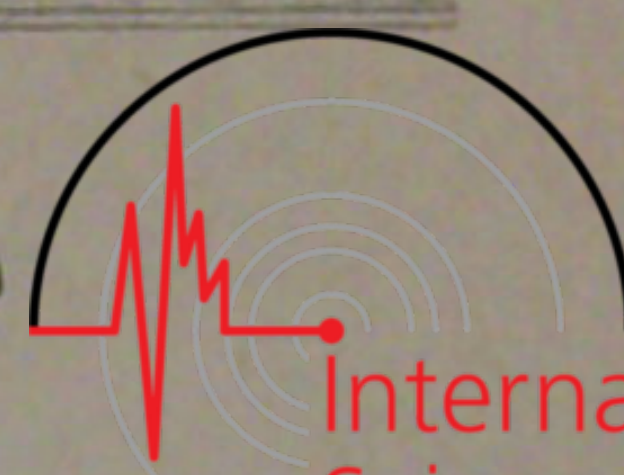




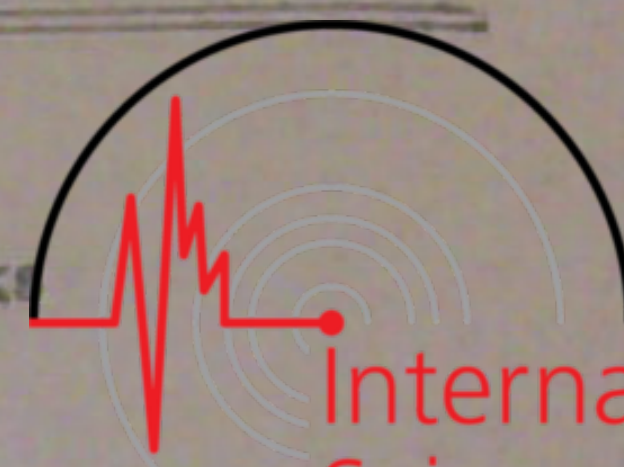
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No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms	
101	25	Z Z E E E	iP PP e (S) (PcP) F	23	11 12 14 15	47 09 30 39 55					2335	Dilatation
102	30	Z Z Z Z NE NF NE N N N	iP i i PP SKS S PS i i M F	1 2 5.0	36 37 39 46 47 48 49 54 15	21 58 17 53 44 06 06 23 00 30	20	—46			9835	Compression
103	May 2	Z NE	iP e	5	47 56	03 36						Dilatation Very weak
104	2	Z Z Z Z Z	eP e e e e F	21 21.9	43 44 45	24 36 52 39 08						Near earthquake
105	3	NEZ Z Z Z Z Z Z Z NE E	iP pP e e e e PP pPP S eS F	6 7.0	09 10 11 12 13 19 20	13 52 02 44 02 11 38 13 24 28					9445	Dilatation h = 150 km.
106	3	Z	i F	6 7.0	38	20						Confused with the preceding Shock
107	5	Z	ePKP F	21 23.0	27							Relay out of order
108	6	Z Z Z Z N	iP e e e (iS) F	14 15.6	40 42 48	21 29 49 27 38					9165	Dilatation very weak
109	8	Z Z Z Z Z Z	eP (PPP) e e (S) (SS) F	15 16.1	49 50 52 53	29 56 33 54 06 36					2165	Preceded by microseisms
110	8	Z Z Z Z E E Z E	ePKP pPKP PP e e e M F	21 22 22.7	42 43 44 49 50 57 30	45 12 12 15 15 00					13335	h = " 100 km. "
111	9	Z Z Z E E	iP PP PPP S M F	13 14 16.0	47 49 51 55 14	(06) (33) (06) (51)					(7280)	Compression Relay out of order
112	12	Z NE	(eP) M F	10 11.2	29 56	25						Very weak

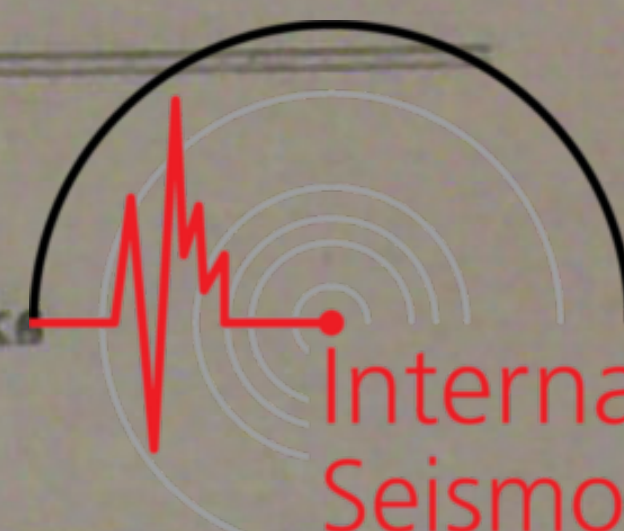
No	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
				H.	M.	S.		A _N	A _E	A _Z		
							Sec.	μ	μ	μ	Kms.	
113	13	N Z N Z Z N	eP e S i i PcP F	5	12 13 15 16	24 17 50 07 24 48					2110	Preceded by microseisms
114	13	Z Z	e e F	8	53 54	50 04						Very weak
115	13	Z Z Z N NE	eP e e (S) (SSS) F	20	16 17 18 19	43 33 45 20 48					1780	Preceded by microseisms
116	16	Z Z NE NZ Z	eP e eS PS PPS F	4	45 56 58	39 54 54 12 51					10555	Very "weak" "
117	17	Z Z N NE	iP e eSKS eS F		42 52 53	35 49 58 12					9665	Compression Very weak
118	20	Z Z Z	e i e	8	32 33	15 30 21						Very weak
119	21	Z Z	e e F	8	03	17 28						" "
120	21	Z Z Z EZ Z Z	e e e e e F	10	15 16 18 19	08 47 06 15 56 37						Near earthquake
121	22	NE NEZ	Sg Pg	13	02	03 05					22	Felt at Maadi
122	21/22	EZ Z ZE N NZ	iP e (iPP) SKS S F	21 22 02	52 54 56 03	48 04 15 21 39					10000	Compression
123	23	Z Z Z Z	PKP e e (PP) F	4	37 38 40	19 42 12 06						Very weak
124	23	Z Z	e e F	6	12 14	27 00						Confused with the succeeding Shock Very weak
125	23	Z Z	e e	23	11 12	00 06						" "
126	24	Z Z Z	e e e F	2	48 50	02 45 09						" "
127	25	Z Z Z Z E NE N	iP e pP i PP iS SS	8	31 32 33 38 41	51 06 24 20 38 20 44					5080	Compression h = 150 Km.



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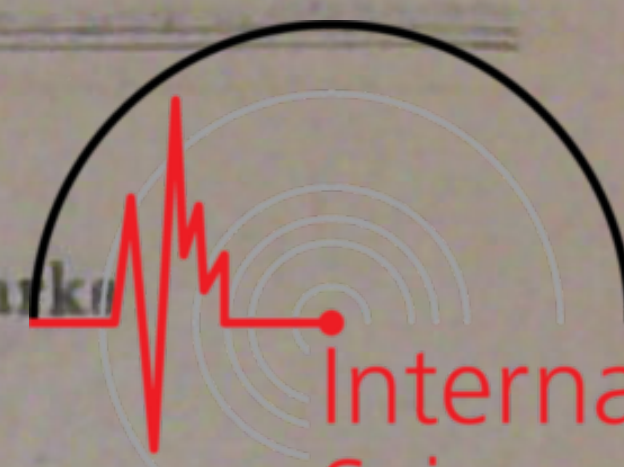


No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms	
127	(Cont.)	E	M F	10.0	55							Very weak
128	26	Z Z	e e F	2	18	00 28						
129	30	Z Z Z Z Z Z NE NE Z EZ E	P pP e e PP pPP i i S sS M F	1	51	05 33 03 51 18 39 36 30 55 50 37					9000	Preceded by microseisms h = 125 Km.
130	June 9	Z Z Z Z	PKP i e e	21	38	29 41 36 15						Very weak
131	11	Z N	e e F	14	27	06 18						" "
132	12	Z Z Z NE Z Z Z E	e e i e e e i e F	18	10	03 22 06 24 36 28 00 07						" "
133	14	Z Z N E	eP e e M F	00	31	43 18 48						" "
134	16	Z Z Z E Z N N	iP e PPP eS i i SS F	18	02	51 11 29 57 00 06 40					2535	Dilatation
135	17	Z Z NE	iPn P* iSn F	4	22	16 26 12					533	Compression (Felt in Cairo)
136	18	E NE	e M F	14	43	27 47						Very weak
137	19	Z Z Z Z	e e e e F	9	06	34 00 25 49						" "
138	22	Z Z Z NEZ N N	eP e e (S) i (SS) F	1	53	51 30 45 48 08 27					2420	
139	23	Z Z Z Z Z Z	pPKP e PP SKP (pPP) (iPPP)	22	47	08 21 12 38 51 04					15000	h = 180 Km.

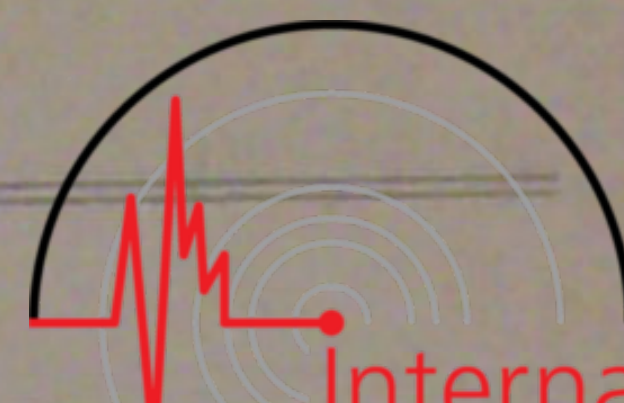


No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.		μ	μ	μ	Kms.	
139	(Cont.)	E N	e e F	23 24 ⁰	55 08	47 24						
140	24/25	Z Z E Z N N NE	iP e ePP e S SKS PS F	22 23 1 ⁰	50 53 55 00 01	50 50 54 27 46 06 24				8720	Compression	
141	25	Z Z Z Z	e e e e	19	37	08 28 51 13						Very weak
142	26	Z Z Z	e e e	5	48	06 50 39						" "
143	26	Z Z Z Z Z N	iP e e e e PP PPS F	8 9 10 ⁵	54 55 56 58 07	33 45 30 34 18 29				10335	Compression	
	July											
144	1	E E	e e	4	23	02 05						Local tremor
145	4	Z Z	eP e	14	07	27 57						Very weak
146	5	Z Z Z NEZ N	eP e e (S) e	2	35 37 39 42	02 06 36 12 38				2610		
147	6/7	Z Z	e i F	23 0 ¹	54 56	23 48						" "
148	7	Z NZ	iP e F	12 12 ⁸	22 24	51 06						Compression
149	7	EZ Z	e e F	22 22 ⁸	33	06 43						Very weak
150	8	Z Z Z N E	eP e PP S M F	8 8 ⁸	09 10 14 27	00 53 09 24				3780		
151	9	Z Z Z	e e e	15	18 19 22	51 09 21						
152		Z Z Z	iP e e	18	57	16 26 50						Compression
153	10	Z N N N	iP PP S M F	4 8 ²	00 01 05 15	18 36 48	(12)	390			3865	"
154	10	Z	e F	11 11 ⁵	04	14						Very weak
155	10	Z	e F	12 12 ⁵	04	39						" "

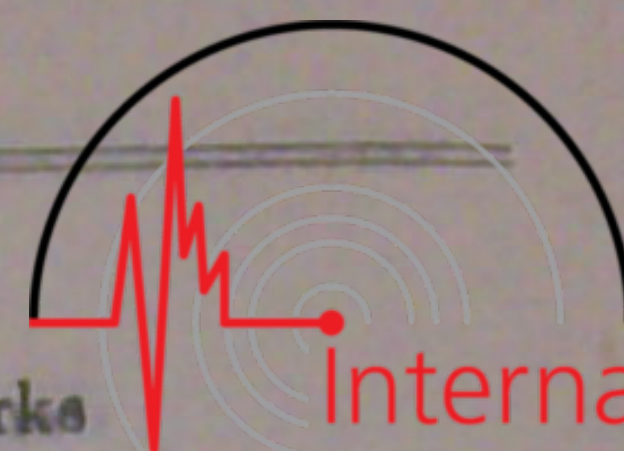
No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A_N	A_E	A_Z		
				H	M	S.	Sec.	μ	μ	μ	Kms.	
156	10	Z Z	i e F	14 15.0	20 25	10 36						Very weak
157	10	EZ E E	iP e e F	15	25 31 33	42 20 45						Compression
158	10	Z Z Z ENZ N N N	P i PP iS i i M F	15 16	56 57 01 03 10 12	00 30 14 24 58 28 30	12	-55			3835	Confused with the succeeding earthquake Confused with the preceding earthquake
159	10	ENZ Z Z Z N N N	iP i i PP e S M F	16 20.0	30 31 33 36 47	43 12 36 58 28 12	12	126			3835	Confused with the succeeding earthquake Compression
160	11	Z Z NE	P i S F	16	23 33	07 19 15					9000	Very weak
161	11	Z Z Z Z	e e e e F	16 17.8	45 47 53 54	18 15 27 11						Confused with the succeeding earthquake
162	13	Z	e F	10 10.8	20	45						Very weak
163	14	Z Z N	(P) i (S) F	20 21.6	47 56	09 18 22					7835	" "
164	18	Z Z N	e e e F	20 2.0	46 49 57	07 54 08						" "
165	19	Z E Z E	iP e i M F	17 18 18.7	48 54 08	56 27 45						Compression
166	20	Z Z Z Z NE Z	eP PeP pP PP S SP F	22 24.0	32 35 42	08 15 33 18 00 48					8945	Preceded by microseisms h = 100 Km.
167	21	Z Z NZ	eP PP iS F	21 22.0	31 32 35	33 10 44					2610	Preceded by microseisms
168	23	Z Z Z Z N	iPKP pPKP SKP PKS (SS) F	10 11 13.0	45 46 49 07	51 45 18 36 00					15555	Dilatation h = 200 Km.
169	23	NEZ NE N	iP iS M F	15 17.6	05 07 16	49 36 12	14	+176			1054	Dilatation
170	25	Z Z	Pn e	11	18	29 43						Very weak



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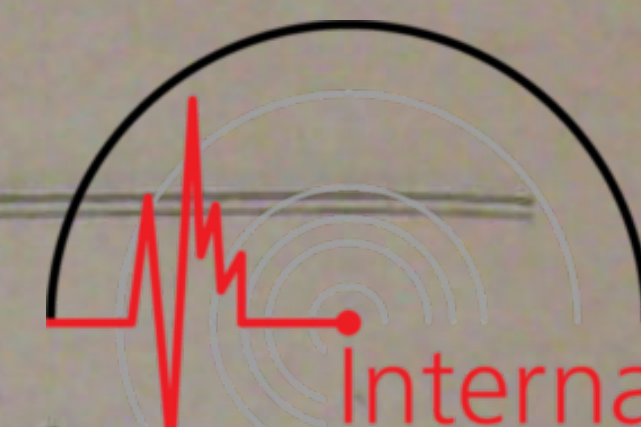


No.	Date	Comp.	Phase	G.M.T			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
171	25	(Cont.)			19	00						
		Z	e			29						
		Z	e		20	03						
		Z	e									
		Z	e	11	41	11						
		Z	iPKP		44	15						Very weak
		Z	e		45	31						
		Z	e		46	15						
		Z	e			36						
		Z	e			57						
172	27			13'3								
		Z	e	11	19	12						
		Z	e		21	12						" "
		NE	M		59							
173	27		F	12'4								
		Z	PKP	15	31	33					17435	
		Z	PKKP		32	00						
		Z	e		33	17						
		Z	SKP		35	09						
		Z	PP			37						
		Z	e		36	45						
		N	e		56	30						
174	30		F	18'0								
		Z	i	15	14	15						
		Z	i		15	09						
175	30		F	15'5								
		Z	iP	17	49	30						Dilatation
		Z	i		51	15						
		Z	e		52	28						
		Z	e		54	42						
176	30		F	18'3								
		Z	e	20	43	51						Very weak
		Z	e		44	27						
177	August 1											
		Z	iP	7	46	56					4110	Comperssion
		Z	e		47	24						
		Z	e		49	30						
		N	(S)		52	42						
		N	e		58	18						
178	1		F	8'3								
		Z	eP	15	03	16						Very weak
		Z	e		32	00						
		Z	e			46						
179	3		F	15'9								
		Z	iP	20	36	10					9220	Compression
		Z	e		37	13						
		Z	PP		39	22						
		N	eS		46	36						
180	5		M	21	12							
		Z	F	21'8								
		Z	eP	00	27	24						Preceded by microseisms
181	5		e		28	09						
			F	1'7								
		Z	e	7	19	40						
		Z	e		20	02						
		Z	e			30						
		Z	e		23	52						
		N	e		24	43						
182	5		e		25	05						Lost in changing the paper
		Z	F									
		Z	eP	19	23	15					11855	
		Z	e		26	46						
		Z	PP		27	34						
		Z	e		29	44						
		Z	e		30	09						
		E	S		35	18						
		E	PS		36	48						
			F	22'0								
183	5											
		Z	e	22	38	00						Very weak
		Z	i			10						
		Z	e		40	33						
		Z	e		41	20						



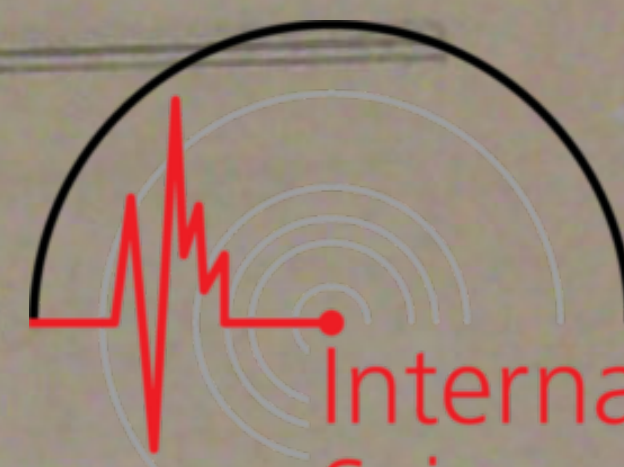
No.	Date	Comp.	Phase	G.M.T.			Period Sec.	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	μ	μ	μ	μ	Kms.	
183	(Cont.)	Z Z E	e e e F	23.9	42 44 48	28 08 45						
184	6	Z Z Z Z Z Z E E E	iPKP PKKP i SKS PP SKS SKKS i PSKS F	00 1 4.0	55 56 58 59 02 06 09	22 46 14 54 21 15 04 41 39					17310	Dilatation
185	8	Z Z Z	e e e F	7 9.0	19 20 21	06 39 48						Very weak
186	9	Z Z Z Z Z Z	e e e e e e F	4 4.2	03 04 05	10 46 06 36 11 45						" "
187	10	E NZ EZ	Pn e e	3	21	06 09 23						Local not felt
188	11	Z Z Z NE	e e e e F	14 15.4	49 50 51 56	18 32 13 27						Very weak
189	12	Z Z Z Z	e e i i	23	34 38 39	57 05 18 12						" "
190	13	Z Z Z E ZE	e e iPP SKS PS F	18 21.1	41 44 50 53	18 45 10 09 42					12555	Preceded by microseisms
191	14	Z Z E	e e M F	18 19 19.8	43 12	40 51						Very weak
192	16	Z Z Z N NE	(eP) e e e M F	11 12 12.5	55 56 02 10	32 57 42 18						" "
193	17	Z Z NE NE	iP PPP i S F	18	46 47 49	42 02 06 33					1700	Compression
194	17	Z Z Z N	eP e PPP eS F	20 23.0	48 51	20 30 40 18					1700	Confused with the succeeding earthquake Replica
195	30	Z N N N NE N	iP PP i e S M	4	14 18 20 25 36 55	42 30 00 24 04 00	30	1000			10665	Compression

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
196	22	Z Z Z Z Z N	iP e e e PP eS F	9	03	35 48 13 39 42 48					9110	Compression
				10.7								
197	22	Z N	e e F	14 15 16.1	53 11	45 58						Very weak
198	22	Z Z	e e F	20 21.2	36	32 45						" "
199	23	Z Z Z Z Z	iP (PP) (S) i i F	13	43 44 47 53	39 02 31 00 51					2355	Dilatation
				14.1								
200	23	Z Z Z N NE	iP e e e M F	15 16 17.0	32 34 37 40 19	33 42 03 33						Compression Very weak
201	23	Z Z Z Z Z Z N N N N	iP e e e PP PPP SKS S PS e F	20	38 39 40 41 44 48 49 50 51	06 06 39 22 54 00 42 30 40 40					10645	Dilatation
												Confused with the succeeding earthquake
202	23	Z Z	eP e F	22 23.7	10 12	38 40						Confused with the preceding earthquake
203	24	Z Z Z	e e e F	9	44 45 49	15 20 33						Very weak
				11.0								
204	25/26	Z Z Z Z E N	P e e e PP SPS eS F	23	39 42 43 50	30 11 42 27 00 54					10780	
				1.0								
205	30	NZ E	i e F	16 17.2	53 56	48 39						Very weak
206	31	Z Z Z Z	e e e e F	23 23.6	18 19 20	54 12 36 06						
207	September 2	Z Z Z Z Z	P PPP S e iPeP F	1 2.1	50 51 53 54 55	50 08 33 00 06					1610	Preceded by microseisms
208	4	Z Z Z Z	e e e e	15	15 16 18	28 51 18 57						Very weak
209	5	Z Z	P e	3	06	37 51						" "

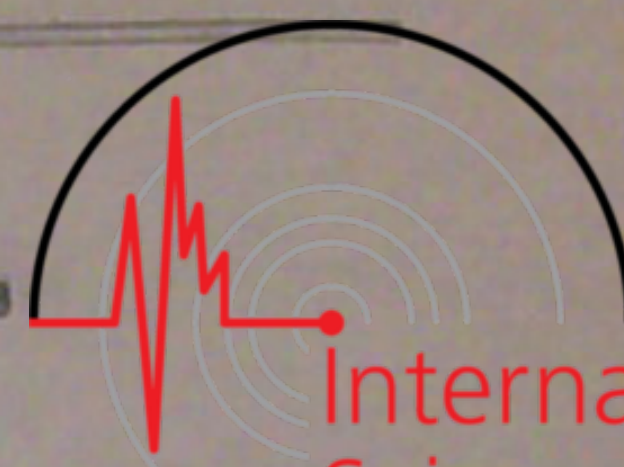


No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
209	(Cont.)	Z Z Z N	e e e e F**		07 14 16	00 51 33 50						
210	5	Z Z Z Z	iP e e e F	3	30 31 33	31 03 39 38						Compression
				4.7								
211	14	Z EZ Z E E	iP e PP SKS S F	20	03 04 07 14	36 09 15 05 37					10210	Compression
				23.5								
212	16	Z Z Z Z	P e e e	19	24 25 28 32	25 00 14 38						Very weak
213	16	Z	e	19	49	48						" "
214	17/18	Z Z Z Z Z Z Z Z Z Z EN	P i (pP) e (sP) e e e e (ePKP) M F	23	06 07 08 09	06 15 44 51 02 14 30 00 10 45					13335	(h = 150 km)
				00 1.0	09							
215	19	ENZ	M F	19 19.5	19							Very weak
216	19	Z Z Z Z E N E	op e e e eS ePS M F	21	55 56 57 06 07 34	09 24 24 13 12 18 00					10220	
				23.3								
217	20	Z Z Z Z Z Z Z Z Z Z Z	iP e e PKP e PP SKS SKKS e e e e F	12	15 16 18 19 20 25 27 28 29 31	13 52 50 25 06 17 28 14 09 45 28 53					14165	Compression
				14.2								
218	20	Z N Z N Z	eP e e e e F	18	02 03 04	45 06 02 20 50						Very weak
				18.2								
219	21	Z Z Z Z Z ZE	(eP) e e e e (S) F	13	13 14 15 18 19 23	02 15 58 32 33 15 33						" "
				14.6								
220	21	Z Z Z	e e e	18	39 40	55 12 27						" "

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
	(cont.)	Z	e		41	54						
		Z	e		43	30						
		Z	e		44	12						
			F	20.8								
221	22	Z	iP	15	50	45						Compression
		Z	i		51	11						
		Z	e		54	02						
222	24	Z	eP	4	38	14						Preceded by microseisms
		Z	e			51						
		Z	e		39	15						
		Z	e			48						
		Z	e		41	00						
		Z	e		46	00						
		Z	e		54	54						
		Z	F	7.2								
223	25	Z	e	15	35	45						Very weak
		Z	e			51						
		Z	e		39	12						
		N	e		43	24						
			F	17.1								
224	26	Z	e	22	52	27						" "
		Z	e	23	00	42						
225	27	Z	e	12	11	09						" "
		Z	e			38						
			F	13.0								
226	27	Z	iP	15	43	45					9890	Compression
		Z	e			59						
		Z	e		44	50						
		Z	e		46	21						
		Z	PP		47	16						
		Z	e		48	45						
		N	SKS		54	12						
		N	S			33						
		E	e		55	30						
		N	PPS		56	06						
			F	19.1								
227	30	Z	iPKP	4	18	45					16380	Dilatation
		Z	e		19	12						
		Z	e			32						
		Z	e			48						
		Z	e		20	00						
		Z	PP		22	14						
		Z	e		27	12						
		Z	e		30	03						
		Z	PPS		34	09						
			F	7.0								
228	30	Z	e	15	37	00						Very weak
		Z	i		38	44						
		Z	e		40	06						
229	30	Z	ePKP	18	39	30					17335	" "
		Z	PKKP			57						
		Z	e		40	39						
		Z	PP		43	30						
		Z	e		44	06						
		Z	e		50	05						
230	30/1	Z	ePKP	22	26	48					17300	" "
		Z	PKKP		27	12						
		Z	e		30	18						
		Z	PP			45						
		Z	e		31	09						
231	October 1	Z	(P)	18	08	00						
232	1	Z	(eP)	18	17	54						
		N	e		19	48						
		N	e		20	35						
		N	e			57						
		N	e		21	10						
		N	e			30						
		N	e		22	23						
		N	e			42						
			F	19.0								



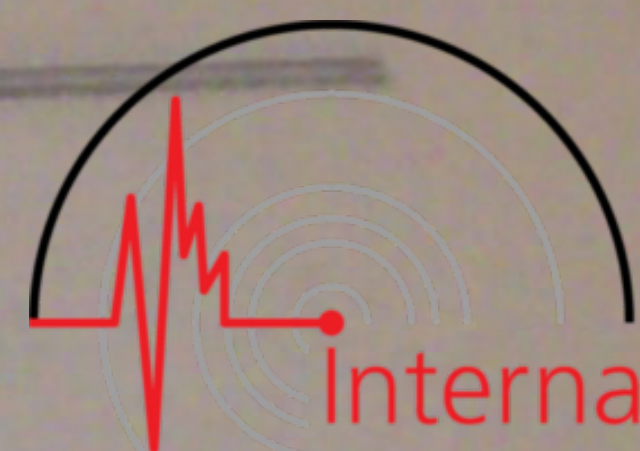
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No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A_N	A_E	A_Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
233	4	Z Z Z NEZ N N N	iP e e iS e e M F	10 13'0	30 32 33 38 40 45 52	27 28 54 33 16 00 42	14	+42			6555	Compression
234	7	Z N N NZ NE NE	iP e PP PPP S e F	12 15'5	13 15 16 17 22	24 30 00 48 22 48					7890	Dilatation h = 100 Km
235	7	Z Z Z N	eP e e e F	22 24 0	47 50 56	02 15 03 06						Very weak
236	8	Z N NE	eP eS e F	3 4'0	12 14 15	15 42 20					1445	Weak
237	8	Z Z	e e	18	44	07 50						Very weak
238	8	NZ Z	i e F	20 21'0	46	33 59						" "
239	13	Z Z Z Z Z Z E	e e e e e e F	3 4 5'8	55 56 59 00 06	31 48 27 54 20 24 15						Confused with microseisms
240	13	Z Z Z N N N	iP e e PcP S SS F	10 10'8	29 30 31 33 34	39 36 42 22 56 45					2690	Compression
241	16	Z Z Z	e e e F	18 18'4	09 10 12	36 00 03						Very weak
242	19	Z Z EZ Z Z Z Z Z N N N N N N EN EN N	e e (PKP) e e e e e e e e (S) e e e F	21 24'0	19 20 21 22 23 28 29 30 31 32 33 35	30 53 36 06 21 48 21 30 10 06 30 36 24 54 40 40					Confused with microseisms	
243	20	Z Z Z Z Z Z N N	e e e e e e e	13	04 05 06 07 10 13	12 40 18 43 03 42 49 06 48						" " "

No	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
243	25	Z Z N	e e F		15 16	10 48 40						
				14.1								
244	26	Z Z	e e F	00	13 15	45 03						Very weak
				1.0								
245	29	EN	M F	7 8.0	24							" "
	November											
246	1	Z Z Z N Z Z N	P e PP S PS e M F	13	13 14 15 20 22 37	20 47 17 36 45 23					5665	Confused with microseisms
				13.9								
247	2	Z Z Z Z E	e e e e e F	2	50 51 52 01	00 26 20 20 33						(Very "weak") "
				5.1								
248	3	ENZ Z Z Z Z Z EN EN	iP pP PP e e e e iS iPS F	1	24 25 28 29 30 31 35 36	59 36 23 59 40 56 45 08 20					9335	Compression h = 150 Km.
				2.8								
249	5	Z N N N N Z	P e e e e e F	15	10 14 17 18 19	24 30 24 48 06 30 18						Preceded by microseisms
				15.7								
250	5	Z Z Z Z Z Z	Pp P* e e Sn i i F	23	48 49 51	06 12 26 44 47 28 45					378	(Not felt) "
				23.9								
251	7	Z Z Z Z Z E E E	PKP pPKP PP SKP PSK e e e F	6	19 21 22 35 37 40	00 27 50 25 36 40 40 27					15165	h = 100 Km.
				9.1								
252	8	Z Z N	P e e F	8 9 9.8	57 08	30 39 24						Very weak
253	11	Z N	P e F	15 16 16.9	56 06	40 26						" "
254	12	N N N N	e e e e F	7	35 36 44 45	21 27 42 48						" "
				10.3								

No.	Date	Comp.	Phase	G.M.T.			Period	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	Sec.	μ	μ	μ	Kms.	
255	22	NE E N N E N	PKP PKKP pPKKP e e PPS F	1 4.0	11 12 15 22 27	27 51 18 32 26 24					16890	(h = 100 Km).
256	22	E N N E E	(eP) e (iS) e e F	15 16.1	26 27 30 32 34	20 20 24 20 26						
257	23	Z	i	16	55	02					17335	Compression
258	27	Z E Z ZE NZ E	iPKP PKKP SKP iPP SKKS PSKS F	9 11.7	02 05 06 13 16	10 35 42 10 00 27						
259	December 1	EN EN EZ	Pn P* Pg	10	32	26 28 30					189	Very weak
260	7	Z Z Z EN N E	ePn e P* Sn i S* F	16 16.5	15 16 17	30 38 48 50 54 15					778	
261	9	N N N	e e e F	23 23.2	06 07	45 07 17						" "
262	10	Z Z	e e	19	35 38	24 25						" "
263	16	N N N	e e e F	23 23.7	32 35	30 12 44						" "
264	17	N N N	e e e F	1 1.6	22 26	32 00 30						" "
265	17	N N N N N N N E E N EN N	ePP e e e SKS SKKS PS PPS e e M F	7 8 11.4	14 17 18 19 21 23 24 26 29 06	00 52 12 00 44 00 50 56 30 45 18	20	195			13110	
266	17	N N N N EN N N N N N E E	ePP SKP e e SKKS e e PS PPS e e M F	15 16 19.7	28 29 30 34 35 36 37 38 39 42 43 30	06 40 30 06 12 05 05 00 12 15 15 30	20		385		13335	
267		EN	e	14	01	21						Local tremor





No.	Date	Comp.	Phase	G.M.T.			Por.	Amplitude			Δ	Remarks
								A _N	A _E	A _Z		
				H.	M.	S.	S.	μ	μ	μ	Km.	
268	20	N N N E N	eP PP S SS M F	00	42 44 45 50	16 27 50 06 33	14	+32			1510	Confused with microseisms
269	21	Z Z N N EN N N	eP PP e e S e SS F	19	50 53 55 00 01 04	33 25 48 50 00 06 40					8110	Very "weak" "
270	22	Z Z N E	eP e i e F	9	05 25 55 95	06 30 12 14						" "
271	25/26	Z Z Z N	P e PP S	23	30 33 40	11 40 29 42					9445	Preceded by microseisms
272	25/26	Z Z N	P PP eS F	23	37 40 48	33 52 09					9445	
273	28	Z Z Z N N NZ	eP PP PPP e SKKS PS F	00	11 15 17 21 22 24	05 00 15 28 06 03					11000	Confused with microseisms
274	29	Z EN EZ ENZ F	iP e S PS PPS F	3	16 26 27	07 18 33 24 48					9335	Compression
275	29	Z		17	(02)							Relay out of order
276	29	Z Z N	iP e i F	22	18 20 26	12 18 48						Dilatation Very weak
277	31	Z Z	P e	9	01	26 46						" "

Tremors were also recorded at:

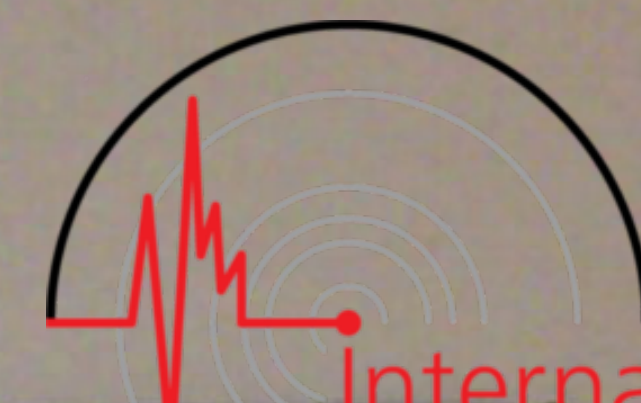
	D	H	D	H	D	H	D	
January	7	10, 18, 9	9	11	14	20	2	8
February	6	11	21	12	—	—	—	—
March	8	9	9	23	11	21, 23.	23	23
	27	5	29	4, 12, 5.				
April	—	—	—	—	—	—	—	—
May	3	3, 8, 19.	7	15	19	6	21	18
	27	18						
June	10	14	15	10	17	12	28	00
July	9	2	14	4	24	19	25	10
	29	9, 11.						
August	1	23	8	20	13	2	15	22
	18	14	26	18				
September	7	5	8	17	29	9	—	—
October	3	10	5	17	10	14	31	1, 2, 19.
November	4	13	13	5	17	20	—	—
December	2	20	17	14	18	6	30	2

MICROSEISMS (Z)



Day	Hour	0	6	12	18	Day	Hour	0	6	12	48
1949		μ	μ	μ	μ			μ	μ	μ	μ
JANUARY											
1		0.5	0.4	0.4	0.4	17		1.0	1.0	0.9	0.7
2		0.5	0.5	0.4	0.4	18		0.5	0.4	0.7	0.9
3		0.4	0.4	0.4	0.4	19		0.8	0.9	0.5	0.4
4		0.4	0.4	0.4	0.4	20		0.5	0.5	0.4	0.5
5		0.4	0.4	0.4	0.3	21		0.4	0.4	0.4	0.3
6		0.4	0.4	0.4	0.4	22		0.4	0.3	0.4	0.4
7		0.4	0.5	0.5	0.3	23		0.4	0.3	0.4	0.3
8		0.4	0.4	0.3	0.2	24		0.8	0.6	0.6	0.6
9		0.2	0.3	0.4	0.2	25		0.5	0.7	0.5	0.5
10		0.4	0.4	0.4	0.4	26		0.5	0.6	0.8	0.5
11		0.4	0.4	0.5	0.4	27		0.5	0.5	—	0.5
12		0.4	0.3	0.4	0.2	28		0.4	0.4	0.4	0.4
13		0.3	0.4	0.4	0.9	29		0.4	0.4	0.5	0.4
14		1.0	—	0.8	0.8	30		0.4	0.4	0.5	0.6
15		0.7	0.6	0.9	0.6	31		0.8	—	—	—
16		0.6	0.6	0.6	0.6						
FEBRUARY											
1		0.4	0.4	0.3	0.3	15		0.3	0.4	0.5	0.7
2		0.4	0.4	0.5	—	16		0.9	0.9	1.0	0.6
3		0.4	0.6	0.6	0.6	17		0.5	0.5	0.4	0.3
4		0.6	0.8	1.0	0.8	18		0.2	0.4	0.7	0.6
5		0.6	0.6	0.4	0.4	19		1.0	0.6	0.5	0.4
6		0.5	0.6	0.5	0.4	20		0.4	0.4	0.4	0.4
7		0.4	0.4	1.0	0.7	21		0.4	0.3	0.4	0.3
8		1.2	1.6	1.3	1.1	22		0.4	0.4	0.4	0.3
9		0.9	0.9	0.8	0.5	23		0.3	0.4	0.4	—
10		0.4	0.4	0.4	0.3	24		0.3	0.3	0.3	0.3
11		—	0.3	0.3	0.3	25		0.4	0.4	0.5	0.4
12		0.3	0.4	0.3	0.3	26		0.4	0.4	0.4	0.4
13		0.4	0.4	0.4	0.3	27		0.4	0.5	0.6	0.5
14		0.4	—	0.3	0.2	28		0.5	0.4	0.4	0.4
MARCH											
1		0.4	0.4	0.4	0.4	17		—	0.4	0.4	0.4
2		0.4	0.4	0.4	0.5	18		0.4	0.4	0.4	0.3
3		0.4	0.5	0.5	0.5	19		0.3	0.3	0.3	0.3
4		0.5	0.5	—	0.4	20		0.3	0.3	0.4	0.3
5		0.4	0.5	0.4	0.4	21		0.3	0.4	0.4	0.4
6		0.4	0.4	0.5	0.4	22		0.4	0.4	0.4	0.3
7		0.4	0.4	0.4	0.3	23		0.4	0.4	0.4	0.4
8		0.4	0.4	0.5	0.4	24		0.4	0.4	0.5	0.3
9		0.5	0.6	0.6	0.9	25		0.4	0.4	0.4	0.4
10		—	—	0.7	0.5	26		0.4	0.4	0.4	0.3
11		0.5	0.6	0.6	0.5	27		0.3	0.4	0.5	0.4
12		0.4	0.4	0.5	0.4	28		0.5	0.4	0.8	0.7
13		0.4	0.4	0.4	0.4	29		0.6	0.4	0.4	0.3
14		0.4	0.4	0.5	0.5	30		0.3	0.4	0.4	0.3
15		0.5	0.6	0.5	0.6	31		0.4	0.3	0.4	0.3
16		0.5	0.6	0.6	0.6						
APRIL											
1		0.4	0.4	0.4	0.3	16		0.4	0.4	0.4	0.3
2		0.4	0.4	0.3	0.3	17		0.4	0.3	0.4	0.3
3		0.4	0.4	0.5	0.2	18		0.4	0.4	0.4	0.3
4		0.4	0.5	0.5	0.4	19		0.4	0.5	0.6	0.6
5		0.5	0.5	0.5	0.4	20		0.6	—	0.6	0.4
6		0.8	0.6	0.5	0.4	21		0.6	0.4	0.4	0.4
7		0.5	0.4	0.4	0.3	22		0.4	0.4	0.4	—
8		0.4	0.4	0.5	0.3	23		0.4	0.4	—	0.4
9		0.4	0.4	0.4	0.2	24		0.4	—	0.4	0.4
10		0.4	0.4	0.4	0.3	25		0.5	—	0.4	0.3
11		0.4	0.5	0.4	0.3	26		0.4	0.4	0.4	0.3
12		0.4	0.6	0.6	0.5	27		0.4	0.4	0.4	0.4
13		0.6	0.5	0.5	0.4	28		0.4	0.4	0.4	0.3
14		0.4	0.4	0.4	0.3	29		0.4	0.4	0.4	0.3
15		0.3	0.3	0.4	0.2	30		0.4	0.3	0.4	0.2

MICROSEISMS (Z)

International
Seismological
Centre

Day	Hour	0	6	12	18	Day	Hour	0	6	12	18
1949		μ	μ	μ	μ			μ	μ	μ	μ
MAY											
1		0.3	0.3	0.4	0.2	17		0.4	0.5	0.4	0.2
2		0.3	—	0.4	0.2	18		0.4	0.4	0.4	0.2
3		0.3	0.3	0.2	0.2	19		0.2	—	0.3	0.2
4		0.3	0.4	0.3	0.2	20		0.3	0.3	0.4	0.2
5		0.3	0.2	0.4	0.3	21		0.2	0.3	0.3	0.3
6		0.2	0.2	0.4	0.2	22		—	0.2	0.3	0.3
7		0.3	0.2	0.4	0.2	23		0.3	—	0.3	0.2
8		0.2	0.3	0.4	0.2	24		0.3	0.3	0.4	0.2
9		0.3	0.4	0.4	0.3	25		0.3	0.3	0.4	0.3
10		0.3	0.4	0.4	0.2	26		0.4	0.4	0.3	0.3
11		0.4	0.4	0.4	0.2	27		0.3	0.3	0.3	0.2
12		—	0.3	0.4	0.3	28		0.3	0.2	0.3	0.2
13		0.4	0.4	0.4	0.2	29		0.4	0.3	0.3	0.2
14		0.3	0.3	0.4	0.3	30		0.3	0.3	0.3	0.3
15		0.3	0.3	0.4	0.3	31		0.3	0.4	0.4	0.4
16		0.4	—	0.4	0.3						
JUNE											
1		0.4	0.3	—	—	16		0.2	0.2	0.2	0.2
2		—	—	0.4	0.4	17		0.2	0.2	0.3	0.3
3		0.3	0.3	0.3	0.3	18		0.3	0.3	0.5	0.2
4		0.3	0.3	0.2	0.2	19		0.3	0.2	0.3	0.3
5		0.2	0.2	0.2	0.2	20		0.3	0.3	0.3	0.3
6		0.2	0.2	0.2	0.2	21		0.3	0.3	0.3	0.3
7		0.2	0.3	0.3	0.3	22		0.3	0.3	0.3	0.3
8		0.2	0.2	0.2	0.2	23		0.3	0.3	0.3	0.3
9		0.3	0.3	0.3	0.2	24		0.3	0.3	0.3	0.3
10		0.2	0.2	0.2	0.2	25		—	0.3	0.3	0.4
11		0.2	0.2	0.2	0.2	26		0.3	—	0.3	0.2
12		0.2	0.2	0.2	0.2	27		0.3	0.2	0.2	0.2
13		0.2	0.2	0.3	0.3	28		—	0.3	—	—
14		0.3	0.3	0.2	0.2	29		—	—	—	—
15		0.2	0.2	0.2	0.2	30		—	—	0.3	0.2
JULY											
1		—	—	—	—	17		0.3	0.3	0.3	0.3
2		—	—	—	—	18		0.3	0.3	0.3	0.3
3		—	—	0.3	0.3	19		0.5	0.3	0.3	—
4		0.3	0.3	0.3	0.3	20		0.3	0.3	0.3	0.3
5		0.3	0.3	0.3	0.3	21		0.3	0.3	0.3	0.3
6		0.3	0.3	0.3	0.3	22		0.3	0.3	0.4	0.4
7		—	0.3	0.3	0.3	23		0.4	0.4	—	0.3
8		0.3	0.3	0.3	0.3	24		0.3	0.3	0.3	0.3
9		0.3	0.3	0.3	0.3	25		0.3	0.3	—	0.2
10		0.3	—	0.3	—	26		0.2	0.3	0.2	0.2
11		0.3	0.3	0.3	0.3	27		0.2	0.2	—	—
12		0.3	0.3	0.3	0.3	28		0.3	0.3	0.3	0.3
13		0.3	0.3	0.3	—	29		0.3	0.3	0.3	0.3
14		—	—	0.3	0.3	30		0.3	0.3	0.3	—
15		0.3	0.3	0.3	0.3	31		0.3	0.3	0.3	0.3
16		0.3	0.3	0.3	0.3						
AUGUST											
1		0.3	0.3	0.3	0.3	17		—	—	0.2	0.2
2		0.3	0.3	0.3	0.3	18		0.3	0.3	0.3	0.3
3		0.3	0.3	0.3	0.3	19		0.3	0.3	0.3	0.2
4		0.3	0.3	0.3	0.3	20		0.2	0.3	0.3	0.3
5		0.3	0.3	0.3	0.3	21		0.3	0.3	0.4	0.4
6		—	0.3	0.3	0.3	22		0.4	—	0.4	0.4
7		0.4	0.4	0.4	0.3	23		0.4	0.4	0.4	0.4
8		0.4	0.4	0.4	0.4	24		0.4	0.3	0.3	0.3
9		0.4	0.4	0.4	0.4	25		0.3	0.3	0.3	0.3
10		0.4	0.4	0.4	0.3	26		—	0.2	0.2	0.2
11		0.4	0.4	0.3	0.2	27		0.2	0.2	0.3	0.3
12		0.3	0.3	0.2	0.2	28		0.3	0.4	0.4	0.4
13		—	0.2	0.2	0.2	29		0.4	0.4	0.4	0.4
14		0.2	0.2	0.2	0.2	30		0.4	0.4	0.4	0.4
15		0.2	0.2	0.2	0.2	31		0.4	0.4	0.3	0.3
16		0.2	0.2	—	0.2						

MICROSEISMS (Z)

Day	Hour	0	6	12	18	Date	Hour	0	6	12	18
1949		μ	μ	μ	μ			μ	μ	μ	μ
SEPTEMBER											
1		0.2	0.2	0.2	0.2	16		0.3	0.3	—	0.3
2		0.2	0.2	0.2	0.2	17		0.3	0.3	0.3	0.3
3		0.2	0.2	0.2	0.2	18		0.3	0.3	0.3	0.2
4		0.2	0.2	0.2	0.2	19		0.2	0.3	0.2	0.3
5		0.2	0.2	0.3	0.3	20		0.3	0.3	0.3	0.3
6		0.3	0.3	0.3	0.2	21		0.3	0.3	0.3	0.3
7		0.2	0.2	0.3	0.3	22		0.3	0.3	0.3	0.3
8		0.3	0.3	0.3	0.2	23		0.3	—	0.3	0.3
9		0.2	0.3	0.3	0.2	24		0.3	0.3	0.3	0.3
10		0.3	0.3	0.2	0.2	25		0.3	0.3	0.3	0.4
11		0.3	0.3	—	0.3	26		0.3	0.3	0.3	0.3
12		0.3	0.3	—	0.3	27		0.3	0.3	0.3	—
13		0.3	0.3	0.4	0.4	28		0.3	0.3	0.3	0.2
14		0.4	—	—	—	29		0.2	0.3	0.3	0.3
15		0.4	0.4	0.4	—	30		0.3	—	0.3	0.3
OCTOBER											
1		—	0.3	0.3	0.2	17		0.4	0.4	0.3	0.3
2		0.3	0.3	0.3	0.3	18		0.3	0.3	0.3	0.3
3		0.3	0.4	0.3	0.3	19		0.3	0.3	0.4	0.4
4		0.3	0.3	—	0.3	20		—	0.4	0.4	0.4
5		0.3	0.3	0.3	0.3	21		0.4	0.4	0.3	0.3
6		0.3	0.3	0.2	0.2	22		0.3	0.3	0.3	0.3
7		0.2	0.2	0.2	0.2	23		0.3	0.3	0.3	0.3
8		0.2	0.2	0.3	0.3	24		0.3	0.3	0.3	0.3
9		0.3	0.3	0.3	0.3	25		0.3	0.3	0.3	0.4
10		0.3	0.3	0.3	0.3	26		0.4	0.3	0.3	0.3
11		0.3	0.3	0.4	0.4	27		0.3	0.3	0.3	0.3
12		0.3	0.3	0.3	0.3	28		0.4	0.4	0.3	0.3
13		0.3	—	0.3	0.3	29		0.4	0.3	0.3	0.3
14		0.3	0.3	0.3	0.3	30		0.3	0.3	0.3	0.3
15		0.3	0.3	0.3	0.3	31		0.3	0.3	0.3	0.3
16		0.3	0.3	0.4	0.4						
NOVEMBER											
1		—	—	0.4	0.3	16		0.5	0.5	0.5	0.5
2		0.3	0.4	0.5	0.4	17		0.4	0.4	—	—
3		0.5	0.4	0.4	0.4	18		—	—	—	—
4		0.3	0.3	0.3	0.3	19		—	—	—	—
5		0.3	0.3	0.5	0.3	20		—	—	—	—
6		—	0.4	0.4	0.4	21		—	—	—	—
7		0.4	0.4	0.3	0.3	22		—	—	—	—
8		0.3	0.3	0.3	0.4	23		—	—	—	0.3
9		0.4	0.4	0.5	0.5	24		0.4	0.4	0.4	0.4
10		0.5	0.5	0.4	0.4	25		0.4	0.3	0.3	0.3
11		0.5	0.5	0.5	0.5	26		0.3	0.3	0.4	0.4
12		0.4	0.3	0.3	0.3	27		0.3	0.3	0.3	0.3
13		0.3	—	0.3	0.3	28		0.3	0.3	0.3	0.3
14		0.3	0.3	0.3	0.3	29		0.3	0.3	0.3	0.3
15		0.4	0.4	0.4	0.5	30		0.4	0.4	0.4	0.4
DECEMBER											
1		0.3	0.4	0.4	0.3	16		0.4	0.4	0.4	0.4
2		0.4	0.4	0.4	0.4	17		—	—	0.4	—
3		0.4	0.4	0.4	0.4	18		—	1.3	1.3	0.8
4		0.5	0.5	0.5	0.4	19		1.2	1.8	1.8	1.3
5		0.4	0.4	0.4	0.4	20		1.8	1.3	1.0	1.0
6		0.3	0.3	0.3	0.3	21		0.8	0.6	0.6	0.5
7		0.3	0.3	0.3	0.3	22		0.5	0.4	0.4	0.7
8		0.3	0.3	0.4	0.4	23		0.7	0.6	0.5	0.5
9		0.3	0.3	0.3	0.3	24		0.4	0.4	0.4	0.4
10		0.3	0.3	0.3	0.3	25		0.4	0.4	—	0.6
11		0.3	0.3	0.3	0.3	26		0.6	0.6	—	—
12		0.3	0.3	0.3	0.3	27		—	—	0.9	0.9
13		0.3	0.3	0.3	0.3	28		0.8	0.8	0.8	0.6
14		0.3	0.3	0.3	0.3	29		0.6	—	0.5	—
15		0.3	0.3	0.4	0.4	30		0.5	0.5	0.5	0.5
						31		0.5	0.5	0.5	0.5

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