

OBSERVATÓRIO NACIONAL DO RIO DE JANEIRO

SEISMOGRAPH INTERPRETATIONS
for January, February and March, 1949

North-South Component

East-West Component

JANUARY 9

eP = 10^h 39^m 14^s
 sP? = 40 21
 S = 43 00
 e = 44 10
 e = 44 25
 e = 45 30
 i = 45 40
 ScP = 46 30
 F = 11 12 \cancel{z}

iP = 10^h 39^m 13^s
 e = 39 24
 pP = 39 45
 sP? = 40 20
 iS = 43 00
 e = 44 23
 e = 45 39
 ScP = 46 28
 F = 11 12 \cancel{z}

Small amplitudes

JANUARY 21

eL? = 16^h 48^m 20^s
 F = 17 15 \cancel{z}

e = 16^h 45^m 19^s
 eL = 48 05
 F = 17 15 \cancel{z}

Weak waves

JANUARY 23

e = 06 53 30
 e = 07 08 40
 e = 28 15
 e = 29 47
 F = 09 02 \cancel{z}

e = 06 53 20^s
 e = 07 08 40
 e = 28 20
 e = 29 40
 F = 09 02 \cancel{z}

JANUARY 24

PR₁ = 09^h 35^m 20^s
 SKS = 41 00
 PS = 45 00
 F = 10 49 \cancel{z}

PR₁ = 09^h 35^m 30^s
 SKS = 41 00
 PS = 45 00
 F = 10 49 \cancel{z}

JANUARY 26

eL? = 23^h 55^m 00^s
 F = 24 05 \cancel{z}

eL = 23^h 55^m 10^s
 F = 24 05 \cancel{z}

Weak waves

JANUARY 27

e = 08 36 35
 F = 09 24 \cancel{z}

e = 08^h 43^m 40^s ?
 F = 09 24 \cancel{z}

Weak waves

North-South Component

East-West Component

F E B R U A R Y 1

e = 19^h 00^m 00^s
eL? = 36 42
F = 20 32 ζ

e = 19^h 00^m 12^s
eL = 36 40
F = 20 32 ζ

Weak waves

F E B R U A R Y 2

e = 19^h 31^m 10^s
F = 48 ζ

e = 19^h 31^m 12^s
F = 48 ζ

Weak waves

F E B R U A R Y 11

e = 07^h 51^m 46^s
e = 52 37
e = 54 10
e = 55 12
F = 08 14 ζ

e = 07^h 52^m 00^s ?
e = 52 30
e = 54 10
e = 55 00
F = 08 14 ζ

beginning doubtful
small amplitude

F E B R U A R Y 14

e = 18^h 28^m 30^s
e = 37 08
e = 43 07
F = 20 42 ζ

e = 18^h 28^m 37^s
e = 37 05
e = 43 20
F = 20 42 ζ

Weak waves

F E B R U A R Y 21

eL = 11^h 55^m 00^s
F = 12 23 ζ

beginning undefined

S = 11^h 51^m 10^s
SR₁ = 52 23
SR₂ = 52 44
L = 54 57
F = 12 23 ζ

beginning undefined

F E B R U A R Y 23

PR₁ = 16^h 29^m 50^s
PKS = 31 00
e = 41 42
SR₁? = 47 40
e = 17 11 30
F = 18 32 ζ

Poorly defined record

PR₁ = 16^h 29^m 55^s
PKS = 31 01
e = 48 19
e = 17 12 35
F = 18 32 ζ

Small amplitudes



North-South Component

East-West Component

F E B R U A R Y 28

Record unreadable
owing to defective
illumination

eP	=	00	20	02 ^s
iS	=		25	18
PcS	=		26	11
SR ₂	=		27	12
eL	=		29	45
F	=	02	12	z

M A R C H 5

e	=	01	51	14 ^s
e	=		58	10
e	=		22	00
F	=	03	43	z

e	=	01	51	20 ^s
e	=		58	00
e	=		22	02
F	=	03	43	z

weak waves

PR ₁	=	10	39	31 ^s
e	=		40	29
e	=		41	07
SKS	=		44	39
e	=		46	10
SKKS ?	=		46	21
e	=		47	23
PS ?	=		49	10
e	=		50	31
PPS	=		51	00
e	=		52	29
e	=		53	13
SR ₁	=		55	50
SR ₂	=	11	00	27
F	=	13	16	z

PR ₁	=	10	39	14 ^s
e	=		39	39
e	=		40	20
e	=		41	08
SKS	=		44	40
e	=		46	07
PS ?	=		48	55
e	=		50	11
PPS	=		50	51
e	=		51	46
e	=		53	00
e	=	11	00	00
SR ₂	=		00	34
F	=	13	16	z

beginning undefined

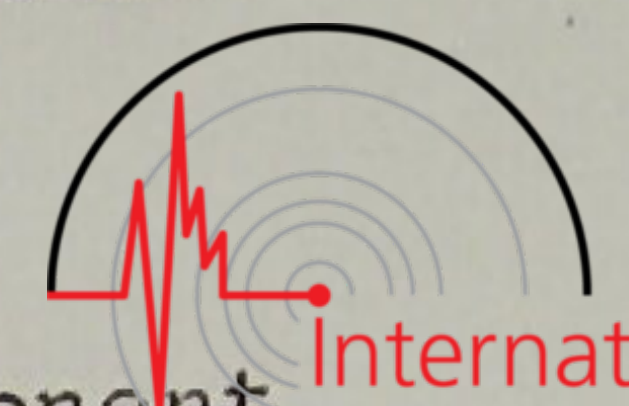
M A R C H 13

eP	=	18	48	07 ^s
PR ₁	=		48	35
PR ₂	=		49	16
eS	=		52	03
SR ₁	=		53	06
SR ₂	=		53	18
eL ?	=		54	50
e	=		55	37
e	=		56	02
e	=		56	18
i	=		58	00
e	=		58	40
ScS	=		59	19
e	=	19	00	10
F	=		58	z

iP	=	18	48	02 ^s
PR ₁	=		48	34
PR ₂	=		49	15
PR ₅ ?	=		49	30
e	=		49	44
e	=		50	43
iS	=		52	06
SR ₁	=		53	05
SR ₂	=		53	20
eL ?	=		54	50
e	=		56	14
i	=		58	09
ScS	=		59	17
i	=	19	00	25
F	=		58	z

João de Sousa
DIRECTOR

MINISTÉRIO DA EDUCAÇÃO E SAÚDE



International
Seismological
Centre

North-South Component

East-West Component

MARCH 14

eL ? = 17^h 00^m 15^s
F = 27 $\frac{t}{-}$

eL ? = 17^h 00^m 20^s
F = 27 $\frac{t}{-}$

Weak waves

MARCH 16

e = 22^h 35^m 00^s
e = 49 03
e = 23 00 20
F = 24 28 $\frac{t}{-}$

e = 22^h 35^m 01^s
F = 24 28 $\frac{t}{-}$

Phases poorly defined

MARCH 17

e = 23^h 48^m 05^s
e = 54 06
F = 01 10 $\frac{t}{-}$

e = 23^h 47^m 49^s
e = 54 42
F = 01 10 $\frac{t}{-}$
Very poor record

Weak waves

MARCH 23

e = 23^h 49^m 32^s
eL = 55 12
F = 24 12 $\frac{t}{-}$

e = 23^h 49^m 27^s
eL = 55 08
F = 24 12 $\frac{t}{-}$

Weak waves

MARCH 24

e = 19^h 38^m 09^s
F = (disturbed)

e = 19^h 38^m 14^s
F = (disturbed)

Strong microseismic disturbance

MARCH 27

P'2 = 06^h 54^m 40^s
PR1 = 58 20
e = 59 00
PR2 = 07 02 04
SKKS = 05 20
SKKKS ? = 06 10
SKKS = 08 30
SKSP = 08 45 ?
SR1 = 18 32
SR2 = 19 12
e = 21 38
F = 09 29 $\frac{t}{-}$

P'2 = 06^h 54^m 30^s
PR1 = 58 18
PR2 = 07 02 03
SKKS = 05 14
SKKKS ? = 06 00
SKSP = 09 01
SR1 = 18 23
SR2 = 19 18
e = 21 34
F = 09 29 $\frac{t}{-}$

OBSERVATÓRIO NACIONAL DO RIO DE JANEIRO

SEISMOGRAPH INTERPRETATIONS

for April, May and June

North-South Component

East-West Component

A P R I L 13

PR₁ = 20^h13^m35^s
 SKS = 20 00
 PS = 22 38
 PPS = 23 18
 SR₂ = 28 20
 e = 36 11
 e = 41 38
 e = 44 40
 F = 22 07 ±

PR₁ = 20^h13^m34^s
 SKS = 19 55
 PS = 22 35
 e = 22 50
 PPS = 23 15
 SR₁ = 27 55
 SR₂ = 28 20
 e = 36 37
 e = 41 50 ?
 e = 43 35 ?
 F = 22 07 ±

A P R I L 17

eP = 00^h47^m33^s
 PcP = 51 34
 eS = 51 50
 SR₁ = 52 10
 PcS = 54 50
 e = 55 17
 e = 55 36
 e = 57 20
 F = 01 25 ±

eP = 00^h47^m34^s
 PR₁ = 47 50
 eS = 51 52
 SR₁ = 52 18
 PcS = 54 50
 e = 55 20
 e = 55 37
 e = 57 30
 F = 01 25 ±

A P R I L 18

eP = 00^h41^m37^s
 e = 45 44
 L = 48 08
 PcS = 49 16
 F = 01 18 ±

eP = 00^h41^m39^s
 eS = 45 50
 SR₁ = 46 30
 L? = 48 12
 PcS = 49 18
 F = 01 18 ±

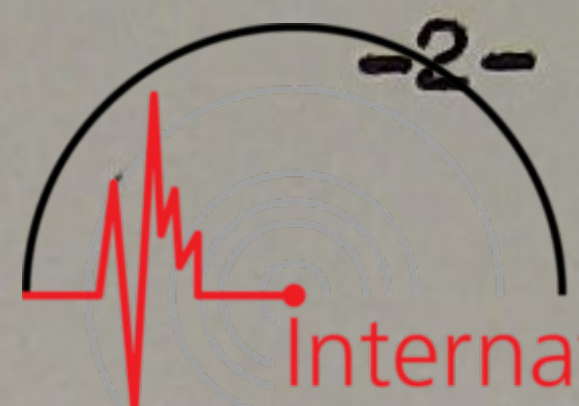
Small amplitudes.
 Record poor.

Small amplitudes.

A P R I L 20

1P = 03^h35^m05^s
 PR₁ = 35 23
 PR₂ = 35 45
 PR₃ = 35 51
 PR₄? = 36 00
 e = 36 57
 e = 37 46
 PcP = 38 33
 1S = 39 53
 e = 40 20
 SR₂ = 41 36
 PcS = 42 13
 e = 42 33
 L = 43 50
 M = 45 12
 F = 06 31 ±

1P = 03^h35^m04^s
 PR₁ = 35 25
 PR₂ = 35 38
 PR₃ = 35 50
 PR₄? = 36 05
 e = 36 37
 e = 37 45
 PcP = 38 30
 1S = 39 51
 e = 40 20
 SR₂ = 41 30
 SR₃? = 41 53
 e = 42 32
 L = 43 50
 e = 44 22
 M = 45 10
 F = 06 31 ±



North-South Component

East-West Component

A P R I L 22

e = 17^h 05^m 52^s
 e = 42 40
 e = 46 39
 F = 18 58 ±

e = 17^h 05^m 50^s
 e = 42 46
 e = 46 40
 F = 18 58 ±

Small amplitudes

A P R I L 24

e = 04^h 47^m 38^s
 e = 05 17 40
 F = 06 17 ±

e = 04^h 47^m 35^s
 e = 05 18 00
 F = 06 17 ±

Beginnings badly defined - Weak waves.

April 25

No record

Record of disturbance
 interrupted by replacement
 of photographic paper

1P = 14^h 00^m 15^s
 pP ? = 00 40
 PR₁ = 00 50
 PR₃ = 01 30
 e = 02 06
 e = 03 02
 PcP = 04 07
 1S = 04 30
 SR₁ = 05 00
 SR₂ = 06 00
 e = 06 45
 L? = 07 29
 M = 10 34
 F = 16 06 ±

A P R I L 30

e = 01^h 44^m 11^s
 PR₁ = 47 49
 e = 48 40
 PR₂ = 51 30
 SKKS = 54 32
 PKKS = 55 23
 SKSP = 58 14
 e = 02 00 07
 PPS = 01 20
 e = 02 50
 SSP = 08 51
 e = 11 48
 e = 15 07
 e = 22 11
 SR₂ ? = 22 54
 F = 03 39 ±

e = 01^h 44^m 10^s
 e = 47 05
 PR₁ = 47 50
 PKKS = 55 18
 SKSP = 58 15
 e = 02 00 06
 PPS = 01 15
 e = 02 48
 e = 03 25
 SSP = 08 50
 e = 11 43
 SR₂ = 14 05
 e = 15 20
 e = 22 10
 SR₂ ? = 22 53
 F = 03 39 ±



North-South Component

East-West Component

M A Y 7

eP	=	13 ^h 06 ^m 38 ^s
PR2	=	07 40
PcP	=	10 18
eS	=	11 20
e	=	11 42
SR2	=	13 00
SR3?	=	13 11
PcS	=	13 48
F	=	53 ±

1P	=	13 ^h 06 ^m 38 ^s
PR	=	07 44
PcP	=	10 16
eS	=	11 10
e	=	11 40
SR2	=	13 00
SR3	=	13 20
F	=	53 ±

M A Y 8

e	=	21 ^h 29 ^m ?
eS	=	33 41 ^s
SR2	=	34 40
e	=	36 07
e	=	36 13
e	=	36 46
PcS	=	37 18
e	=	38 20
e	=	39 10
F	=	22 23 ±

1P	=	21 ^h 29 ^m 38 ^s
pP	=	30 07
PR1	=	30 16
PR2	=	30 30
PR3	=	30 55
e	=	31 14
eS	=	33 45
SR1	=	34 29
SR2	=	34 43
PcS	=	37 15
e	=	38 00
e	=	38 20
e	=	38 50
e	=	39 47
F	=	22 23 ±

M A Y 9

e	=	14 ^h 40 ^m 30 ^s
F	=	End of disturbance was list

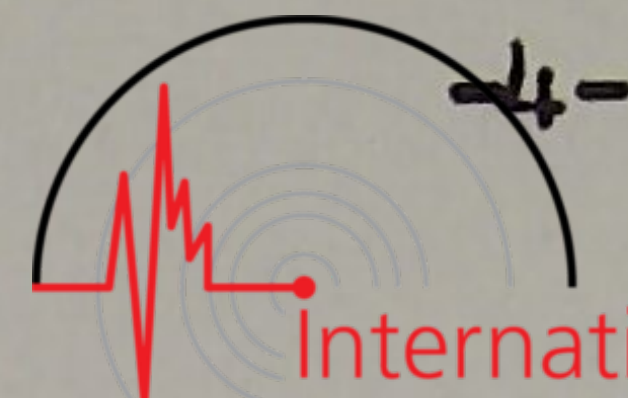
e	=	14 ^h 40 ^m 30 ^s
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in replacement of photographic paper.

M A Y 30

eP	=	01 ^h 38 ^m 15 ^s
PR1	=	38 45
eS	=	42 10
SR2	=	43 10
SR3	=	43 27
SR n	=	43 43
e	=	44 06
e	=	45 19
PcS	=	46 14
i	=	46 50
e	=	47 23
e	=	47 48
e	=	48 37
ScS	=	50 00
F	=	02 44 ±

No record



North-South Component

East-West Component

J U N E 12

		h	m	s	?
eP	=	17	56	20	
sP ?	=		58	29	
eS	=		59	10	
e	=		59	54	
e	=	18	02	18	
e	=		02	36	
e	=		04	37	
e	=		05	16	
e	=		06	15	
F	=		27	±	

		h	m	s	
iP	=	17	56	11	
sP ?	=		58	30	
iS	=		59	10	
PcP	=	18	00	03	
e	=		01	15	
e	=		01	50	
e	=		02	38	
e	=		04	00	?
e	=		05	29	
ScS ?	=		06	34	
F	=		27	±	

Beginning disturbed by microseisms.

FEB 6 1950



MINISTÉRIO DA EDUCAÇÃO E SAÚDE
OBSERVATÓRIO NACIONAL

Rio de Janeiro-Brazil-January 20, 1950

The Director
U.S. Coast and Geodetic Survey
Washington 25. U.S.A.

I am sending you enclosed herewith our seismograph interpretations for the months of July, August and September, in sequence to data supplied with our previous letter dated October 26. Although frequently defective these are the best results we can furnish while steps are being taken to improve working conditions of our seismographs.

Very truly yours

Sodre da Gama

Director

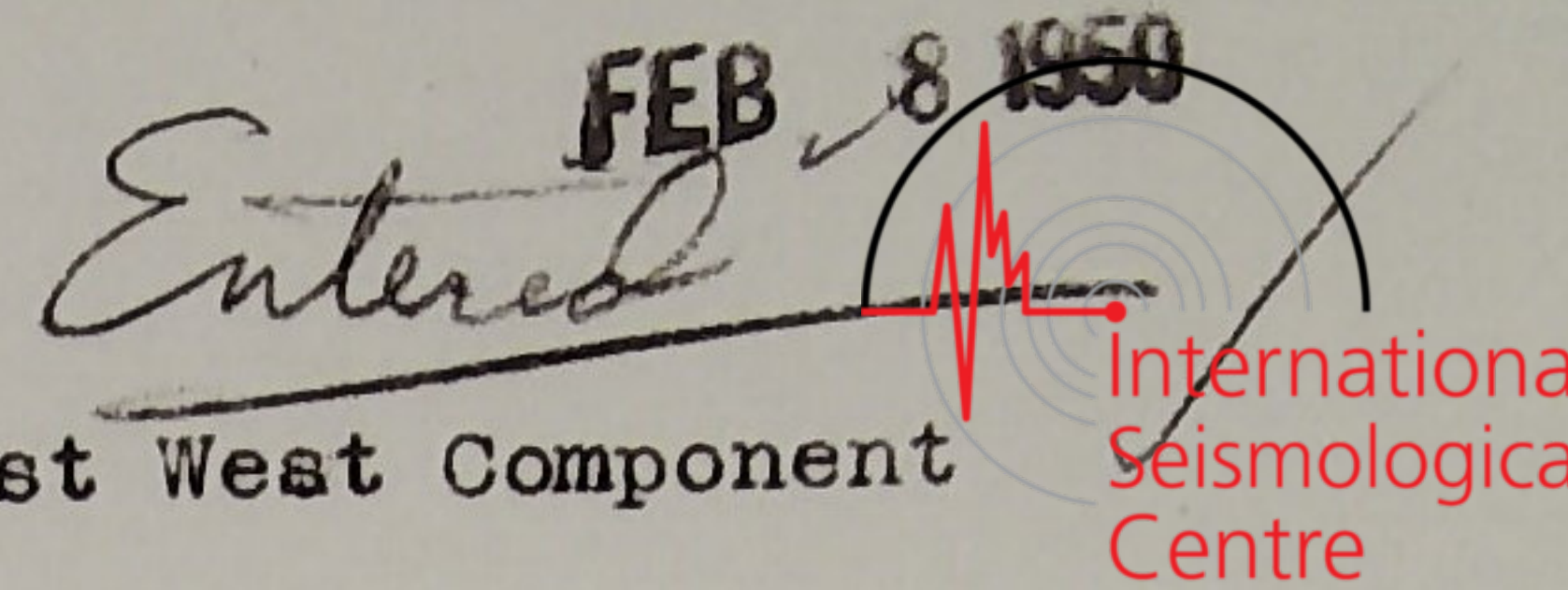
North South Component

J U L Y 2

No record

East West Component

PR₂ = 20^h 26^m 37^s ?
 pPR₂ = 26 48
 SKKS₂ = 29 00
 e = 29 10
 SKKS ? = 31 00
 e = 31 22
 ScSP'₂ = 33 11
 e = 33 42
 PSKS ? = 34 20
 F = 22 07 ±



Beginning doubtful owing to micros
 Small amplitudes.

J U L Y 10

PR₁ = 04^h 14^m 15^s
 e₁ = 14 50
 SKS = 19 40
 SKKS = 21 10
 PKKS = 26 20
 SR₁ = 31 00
 SR₂ = 35 20
 e = 50 10
 L = 52 15
 e = 56 03
 e = 05 02 07
 F = 06 25 ±

PR₁ = 04^h 14^m 13^s
 e = 15 02
 SKS = 19 38
 e = 20 18
 SKKS = 21 16
 PKKS = 26 29
 SR₁ = 31 04
 e = 33 20
 e = 34 18
 SR₂ = 35 22
 e = 49 48
 L = 52 12
 e = 56 18
 e = 05 02 03
 F = 06 25 ±

Beginning uncertain and reading difficult due to micro
 disturbance.

J U L Y 21

eP = 08^h 07^m 36^s
 PR₁ = 08 31
 eS = 12 29 ?
 ScS = 18 09
 e = 18 34
 e = 19 14
 e = 20 13
 F = 31 ±

P = 08^h 07^m 30^s
 PR₁ = 08 25
 S = 12 12
 ScS = 18 17
 e = 18 32
 e = 19 04
 e = 20 21
 F = 31 ±

J U L Y 23

No record

e = 22^h 27^m 29^s
 e = 28 41
 e = 41 08
 e = 47 20
 e = 50 15
 F = 23 28 ±

Record poor



North South Component

J U L Y 25

East West Component

e = 11^h54^m08^s
 e = 54 30
 e = 56 00
 e = 56 51
 e = 57 18
 F = 12 22 ±

e = 11^h54^m05^s
 e = 54 38
 e = 56 05
 e = 56 40
 e = 57 19
 F = 12 22 ±

Readable part of beginning presents sine waves of longer period. Small amplitudes.

J U L Y 27

e = 15^h40^m05^s
 e = 40 32
 e = 16 05 10
 F = 51 ±

e = 16^h05^m09^s
 F = 51 ±

Beginning lost in changing photographic paper

Weak waves

A U G U S T 5

P = 19^h16^m31^s
 e = 17 10
 PR₁ = 18 11
 iS₁ = 22 38
 e = 23 40
 e = 25 10
 SR₁ = 25 40
 SR₂ = 26 05
 s₁s₂ = 26 42
 e = 27 04
 e = 28 10
 L = 28 22
 M = 29.6
 F = 22 06 ±

iP = 19^h16^m30^s
 e = 17 08
 PR₁ = 18 04
 iS₁ = 22 37
 e = 23 38
 e = 25 00
 SR₁ = 25 43
 SR₂ = 26 04
 s₁s₂ = 26 39
 e = 27 06
 e = 28 00
 L = 28 34
 M = 29.6
 F = 22 06 ±

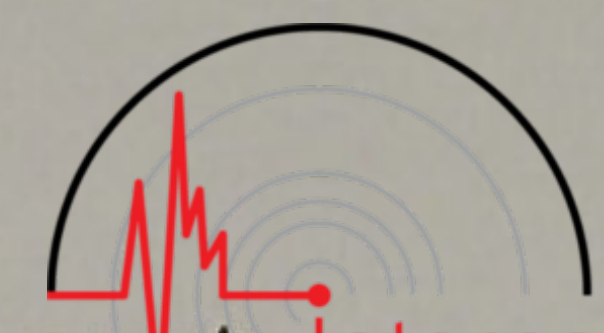
Record poor in its main phase

A U G U S T 6

PR₁ = 00^h55^m26^s
 SKS₁ = 01 01 00
 e = 01 40
 SKKS = 02 20
 SKSP = 05 21
 PPS ? = 06 10
 SKKKS = 15 32
 SR₂ = 16 10
 F = 02 57 ±

PR₁ = 00^h55^m25^s
 SKS₁ = 01 01 04
 e = 01 40
 SKKS = 02 21
 SKSP = 05 18
 e = 05 33
 PPS ? = 06 10
 SKKKS = 15 30
 SR₂ = 16 00
 e = 33 08
 F = 02 57 ±

Small amplitudes



North South Component

AUGUST 8

East West Component

e = 19^h24^m30^s
 e = 25 26
 e = 26 04
 e = 28 06
 e = 28 50
 F = 52 ±

e = 19^h24^m35^s
 e = 25 24
 e = 26 00
 e = 27 40
 e = 28 05
 e = 28 36 ?
 F = 52 ±

Beginning doubtful. Small amplitudes

AUGUST 17

No record

SKS = 19^h08^m40^s
 SKKS = 09 03
 ScS = 09 40
 e = 13 30 Beginning
 SSP = 16 31 undefined.
 e = 20 33
 F = 21 19 ±

AUGUST 18

No record

e = 13 49 23
 e = 53 20
 e = 59 48
 e = 14 00 26
 e = 01 22
 e = 02 04
 e = 02 40
 e = 04 05 Small
 e = 05 37 amplitudes
 e = 07 48
 F = 43 ±

AUGUST 22

PR₁ = 04^h20^m10^s
 e₁ = 20 24
 e = 20 35
 e = 20 50
 PR₂ = 22 05
 e₂ = 24 35
 SKS = 26 38
 PS = 29 20
 i = 29 36
 PPS = 30 20
 PKKP ? = 31 35
 e = 33 40
 SR₁ = 35 26
 SKKS₁ = 38 10
 SR₂ = 39 40
 e₂ = 40 30
 e = 49 50
 e = 51 30
 L = 52 31
 M = 05 01.3
 F = 08 45 ±

PR₁ = 04^h20^m10^s
 e₁ = 20 22
 e = 20 50
 e = 24 38
 SKS ? = 26 23
 i = 27 00
 e = 27 43
 e = 28 41
 i = 29 39
 PPS = 30 25
 e = 31 06
 PKKP ? = 31 37
 e = 32 15
 e = 33 03
 SR₁ = 35 30
 e = 38 37
 SR₂ = 39 40
 e₂ = 40 32
 e = 50 36 ?
 L = 52 20
 M = 05 01.3
 F = 08 45 ±

North South Component

East West Component

AUGUST 23

e = 15^h 24^m 40^s
 e = 29 30
 e = 29 55
 e = 30 12
 e = 32 14
 F = lost in changing
 grams.

AUGUST 23

Record poor

e = 20^h 58^m 48^s
 e = 21 17 41
 F = 47 ±

Weak waves

AUGUST 24

e = 09^h 54^m 40^s
 F = 10 14 ±

eL ? = 09^h 56^m 40^s
 F = 10 14 ±

Beginning undefined. Readings
 doubtful.

Beginning disturbed by micros

Weak waves

SEPTEMBER

14

PR₂ = 20^h 18^m 11^s
 e = 20 40
 e = 21 12
 L ? = 21 07 15
 F = 22 03 ±

P'₂ = 20^h 10^m 50^s
 PR₂ = 18 00
 PKKP = 18 40
 e = 21 10
 SKKS = 21 20
 PKKS = 21 36
 SKKKS ? = 22 18
 L ? = 21 07 20
 e = 09 21
 F = 22 03 ±

Small amplitudes

SEPTEMBER

19

e = 21^h 57^m 00^s
 e = 22 03 10
 F = 26 ±

No record

Weak waves

SEPTEMBER

20

e = 12^h 49^m 15^s
 F = 13 11 ±
 Weak waves

No record

SEPTEMBER

21

eP = 13^h 05^m 44^s

eP = 13^h 05^m 40^s

North South Component

PcP = 06 25
 1S = 14 18
 e = 15 00 ?
 PKKP ? = 26 38
 e = 27 06
 F = 57 ±

East West Component

PcP = 06 27
 S = 14 16
 PKKP ? = 26 45
 e = 27 09
 F = 57 ±



International
 Seismological
 Centre

S E P T E M B E R

27

e = 15^h 56^m 39^s
 e = 16 07 00
 e = 29 20
 F = 18 31 ±

No record

Beginning disturber by micros
 Weak waves.