Electronic Supplement

The OBS noise due to deep ocean currents

Carlos Corela[1], Afonso Loureiro[1], José Luis Duarte[1], Luis Matias[1], Tiago Rebelo[2], Tiago Bartolomeu[2]

[1]Instituto Dom Luiz, Faculdade de Ciências, Universidade de Lisboa, 1749-016 Lisboa, Portugal

[2]CEIIA, Av. D. Afonso Henriques, 1825, 4450-017 Matosinhos, Portugal

(ccorela@fc.ul.pt, jlduarte@fc.ul.pt, maloureiro@fc.ul.pt, lmmatias@fc.ul.pt, tiago.rebelo@ceiia.com, tiago.bartolomeu@ceiia.com)

Contents

This electronic supplement contains a tide table from Sines (Portugal) from 10 September 2007 until 28 September 2007 showing a complete tide cycle from spring to neap tide and finish in a spring tide to shown that the ocean bottom has a flow regime that may have two contributions, the permanent low frequency bottom current and the tidal current. The recorded noise displays the balance between these two currents along the full tidal cycle, between neap and spring tides. We show, for each day of the tide cycle, the day-plot of the OBS data record with ObsPy software, the normalized spectrograms with GMT (Wessel et al., 2013) and the probabilistic power spectral densities with ObsPy (Krischer et al., 2015). The normalized spectrogram have a tide cycle of that day represented as a black curve.

Table S1 – Tide from Sines (Portugal) between 10/09/2007 and 28/09/2007.
(Source: Instituto Hidrográfico, Marinha - Portugal, Instituto Hidrográfico (hidrografico.pt))

Date	Time	Tide(m)	Phenomenon	Tide range(m)
10/09/2007	02:39	3.1	High Tide	2.3
10/09/2007	08:46	0.9	Low tide	2.2
10/09/2007	14:52	3.4	High Tide	2.5
10/09/2007	21:05	0.7	Low Tide	2.7
11/09/2007	03:12	3.2	High Tide	2.5
11/09/2007	09:09	0.8	Low Tide	2.4
11/09/2007	13:44	-	New Moon	
11/09/2007	15:25	3.4	High Tide	2.6
11/09/2007	21:35	0.6	Low Tide	2.8
12/09/2007	03:43	3.2	High Tide	2.6
12/09/2007	09:40	0.7	Low Tide	2.5
12/09/2007	15:56	3.4	High Tide	2.7
12/09/2007	22:04	0.7	Low Tide	2.7
13/09/2007	04:13	3.2	High Tide	2.5
13/09/2007	10:10	0.7	Low Tide	2.5
13/09/2007	16:26	3.4	High Tide	2.7
13/09/2007	22:32	0.7	Low Tide	2.7
14/09/2007	04:42	3.2	High Tide	2.5
14/09/2007	10:40	0.8	Low Tide	2.4
14/09/2007	16:55	3.3	High Tide	2.5
14/09/2007	22:59	0.8	Low Tide	2.5
15/09/2007	05:11	3.1	High Tide	2.3
15/09/2007	11:10	0.9	Low Tide	2.2
15/09/2007	17:25	3.1	High Tide	2.2
15/09/2007	23:27	1.0	Low Tide	2.1
16/09/2007	05:40	3.0	High Tide	2.0
16/09/2007	11:41	1.0	Low Tide	2.0
16/09/2007	17:56	2.9	High Tide	1.9
16/09/2007	23:57	1.1	Low Tide	1.8
17/09/2007	06:13	2.9	High Tide	1.8
17/09/2007	12:16	1.2	Low Tide	1.7
17/09/2007	18:30	2.7	High Tide	1.5
18/09/2007	00:30	1.3	Low Tide	1.4
18/09/2007	06:51	2.7	High Tide	1.4
18/09/2007	12:58	1.4	Low Tide	1.3
18/09/2007	19:13	2.5	High Tide	1.1
19/09/2007	01:12	1.5	Low Tide	1.0
19/09/2007	07:43	2.6	High Tide	1.1
19/09/2007	13:59	1.5	Low Tide	1.1
19/09/2007	17:48		First quarter	
19/09/2007	20:19	2.4	High Tide	0.9
20/09/2007	02:21	1.6	Low Tide	0.8

20/09/2007	09:04	2.5	High Tide	0.9
20/09/2007	15:45	1.6	Low Tide	0.9
20/09/2007	22:05	2.3	High Tide	0.7
21/09/2007	04:19	1.7	Low Tide	0.6
21/09/2007	10:46	2.5	High Tide	1.0
21/09/2007	17:32	1.5	Low Tide	0.9
21/09/2007	23:43	2.4	High Tide	0.9
22/09/2007	05:48	1.5	Low Tide	0.9
22/09/2007	12:01	2.7	High Tide	1.2
22/09/2007	18:33	1.3	Low Tide	1.4
23/09/2007	00:41	2.6	High Tide	1.3
23/09/2007	06:42	1.3	Low Tide	1.3
23/09/2007	12:53	3.0	High Tide	1.7
23/09/2007	19:17	1.0	Low Tide	2.0
24/09/2007	01:25	2.9	High Tide	1.9
24/09/2007	07:25	1.0	Low Tide	1.9
24/09/2007	13:35	3.2	High Tide	2.2
24/09/2007	19:55	0.7	Low Tide	2.5
25/09/2007	02:03	3.2	High Tide	2.5
25/09/2007	08:03	0.8	Low Tide	2.4
25/09/2007	14:15	3.5	High Tide	2.7
25/09/2007	20:31	0.5	Low Tide	3.0
26/07/2007	02:41	3.4	High Tide	2,9
26/07/2007	08:42	0.6	Low Tide	3.1
26/07/2007	14:55	3.7	High Tide	3.1
26/07/2007	20:45		Full Moon	
26/07/2007	21:08	0.4	Low Tide	3.3
27/07/2007	03:19	3.5	High Tide	3.1
27/07/2007	09:20	0.4	Low Tide	3.1
27/07/2007	15:36	3.8	High Tide	3.4
27/07/2007	21:46	0.3	Low Tide	3.5
28/07/2007	03:58	3.6	High Tide	3.3
28/07/2007	10:01	0.3	Low Tide	3.3
28/07/2007	16:17	3.8	High Tide	3.5
28/07/2007	22:25	0.4	Low Tide	3.4

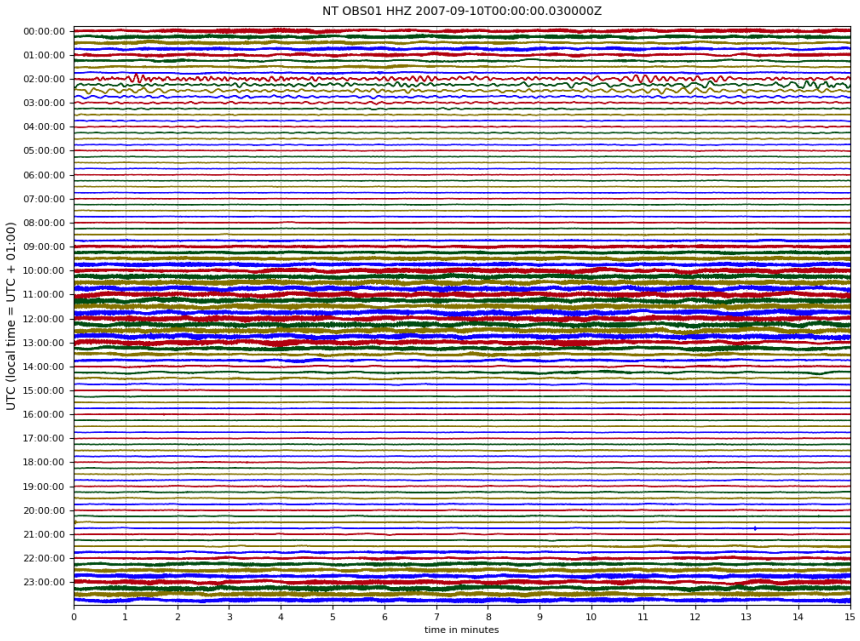
Tide range – Difference between the amplitude of High Tide and Low Tide

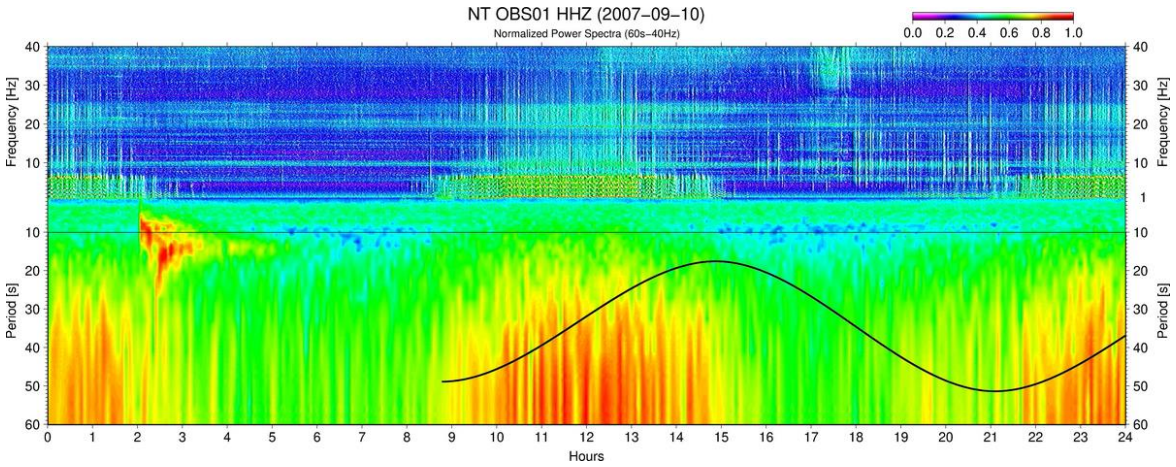
Yellow – face of the moon

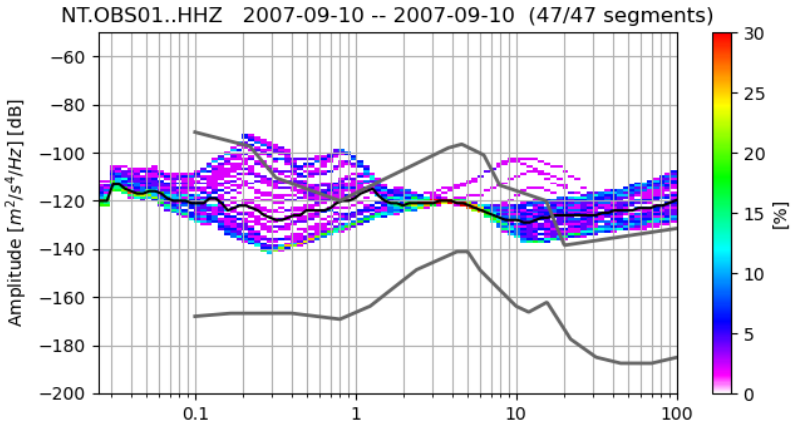
Green – Spring Tide

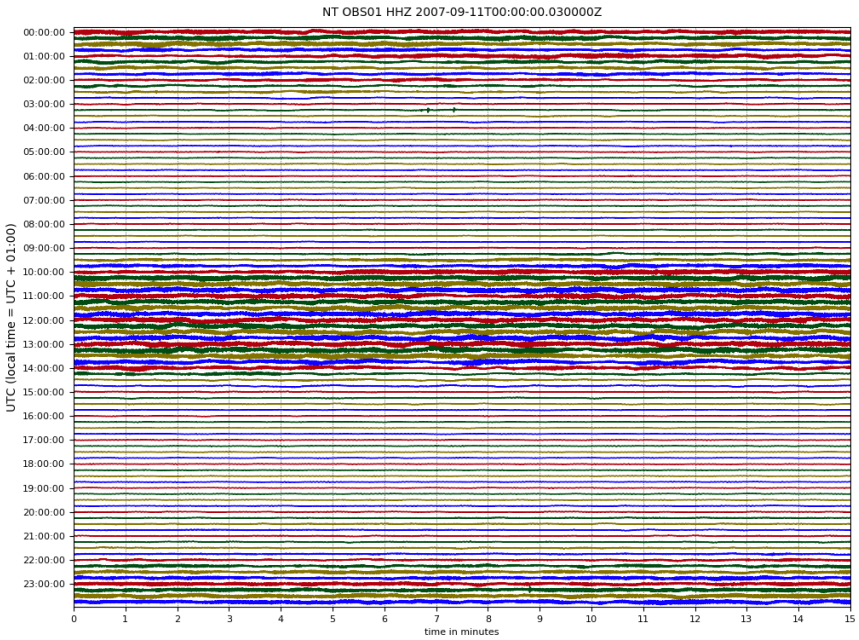
Blue – Neap Tide

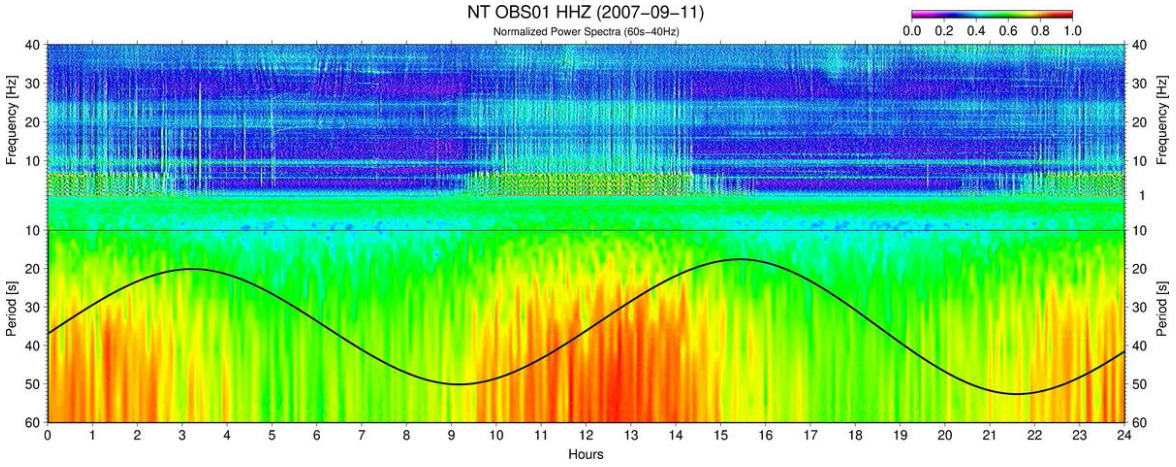
Sequence from spring tide to neap tide and back to spring tide (2007-09-10 to 2007-09-28)

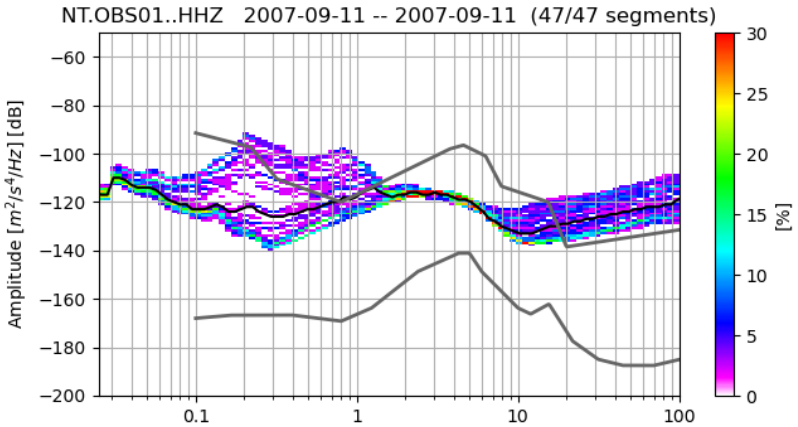


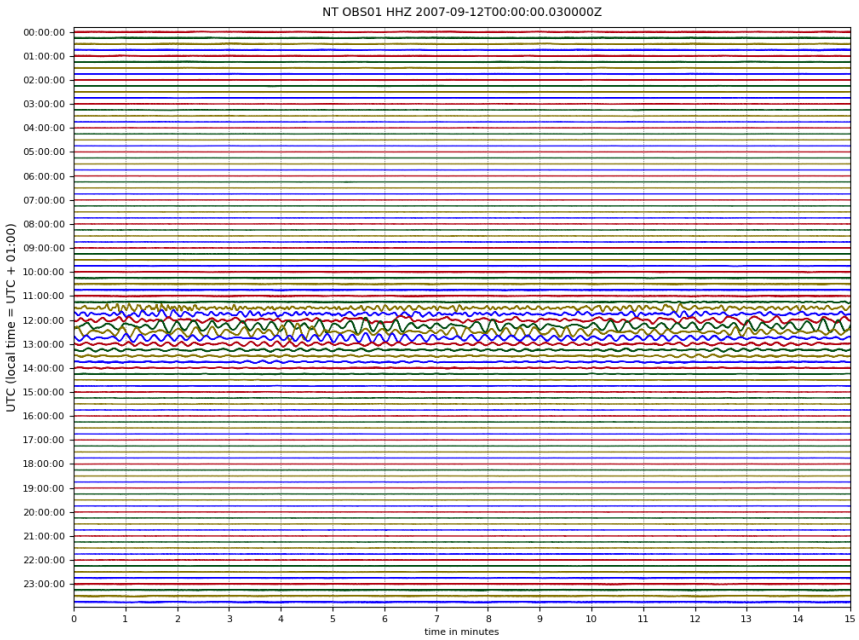


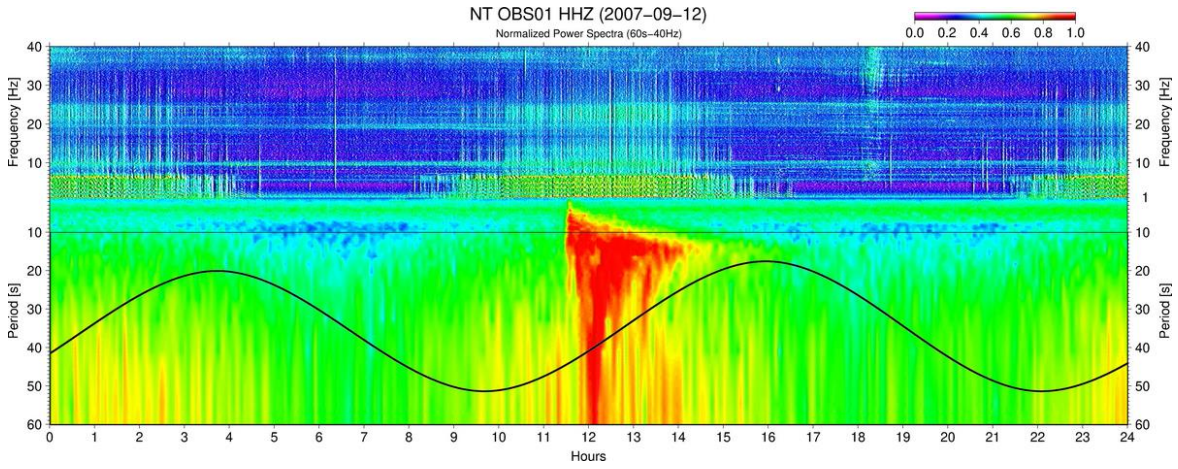


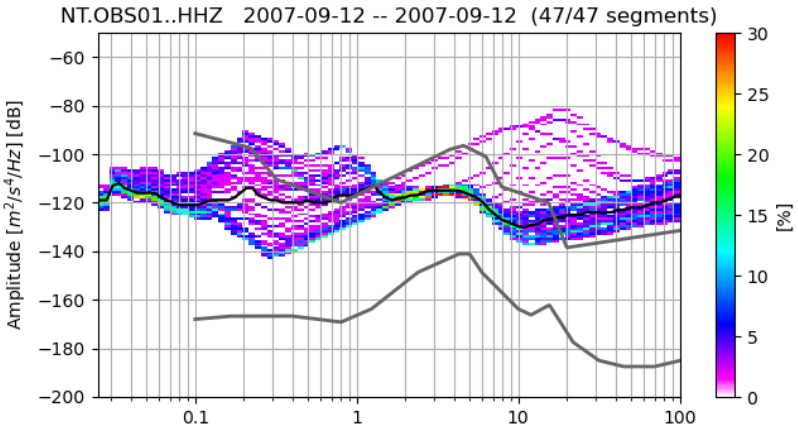

NT OBS01 HHZ 2007-09-11T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

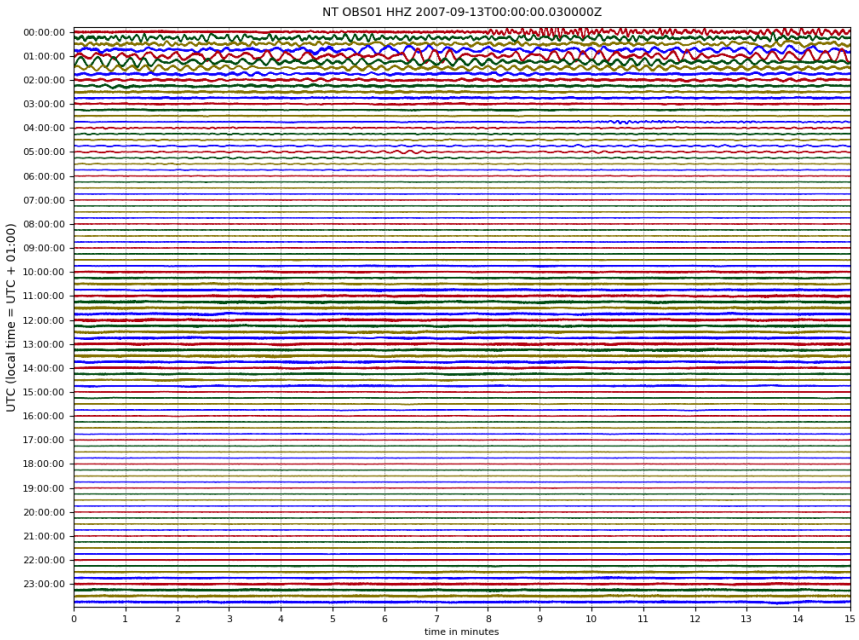

NT OBS01 HHZ (2007–09–11)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

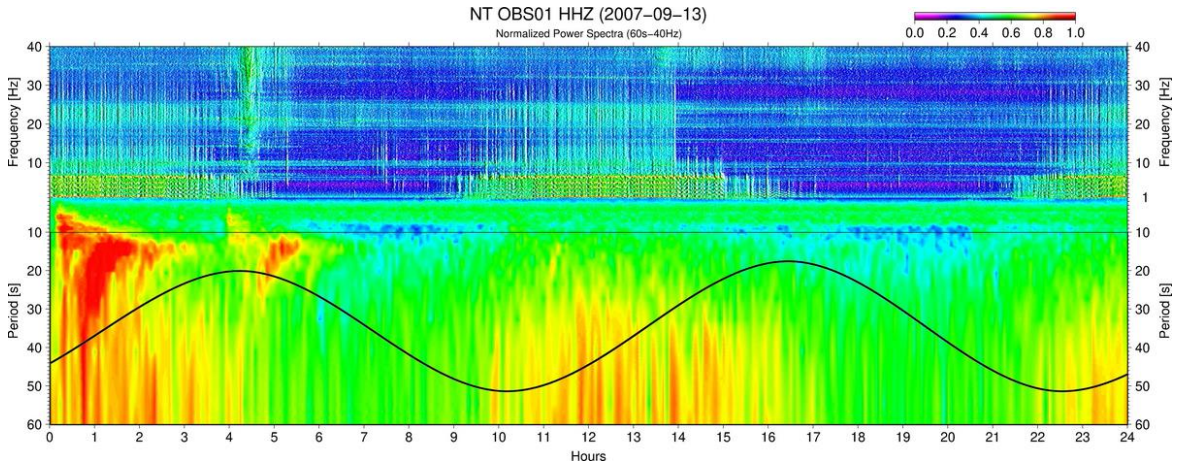

NT.OBS01..HHZ 2007-09-11 -- 2007-09-11 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

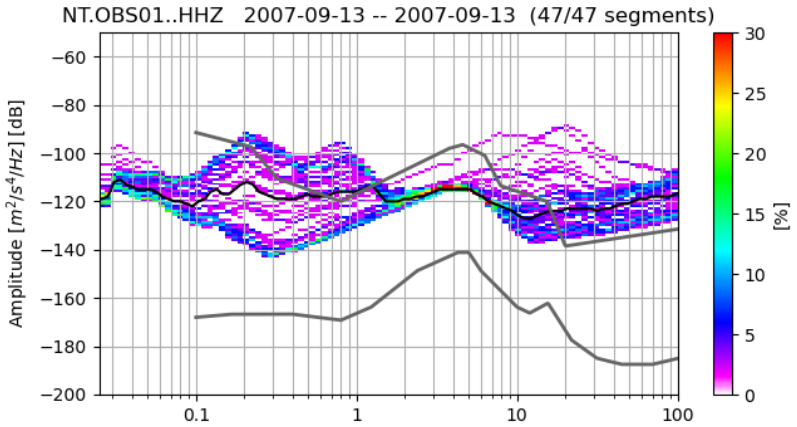

NT OBS01 HHZ 2007-09-12T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

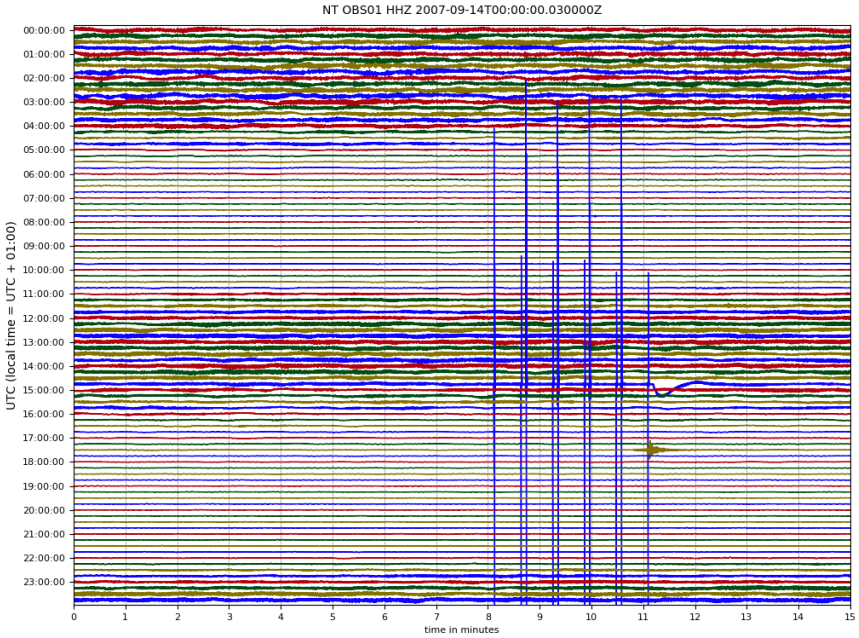

NT OBS01 HHZ (2007–09–12)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

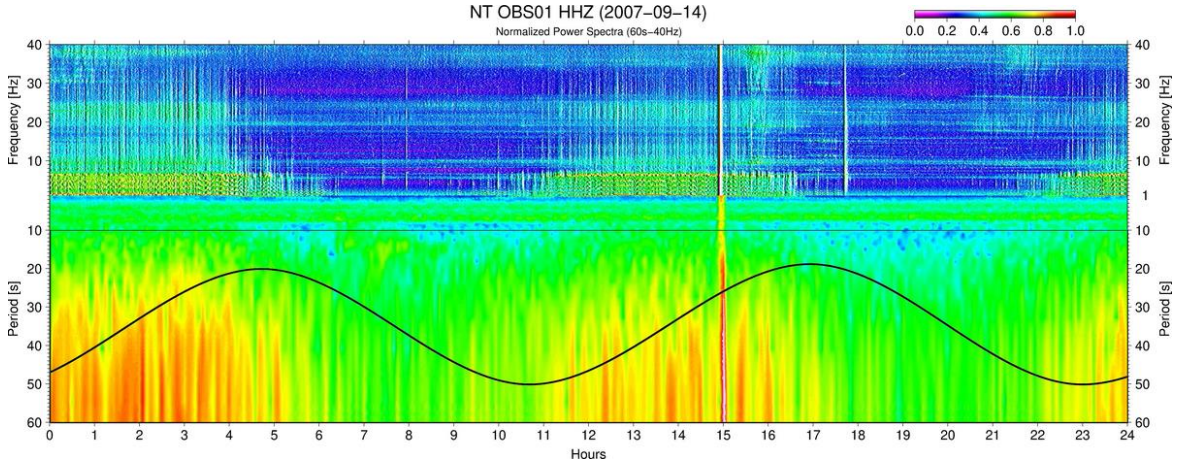

NT.OBS01..HHZ 2007-09-12 -- 2007-09-12 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

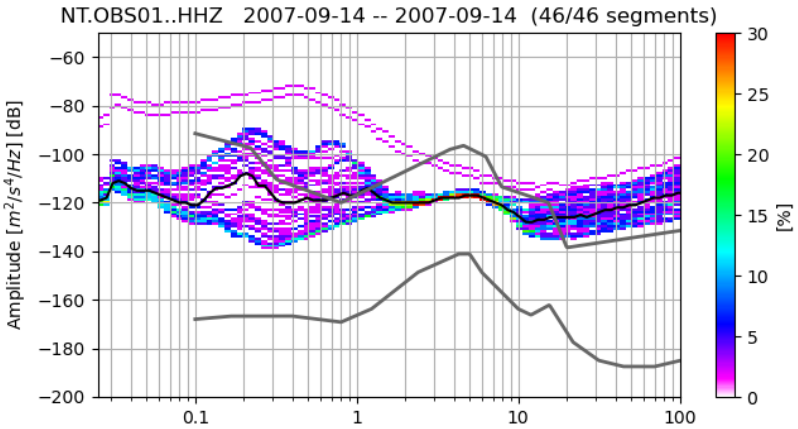

NT OBS01 HHZ 2007-09-13T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

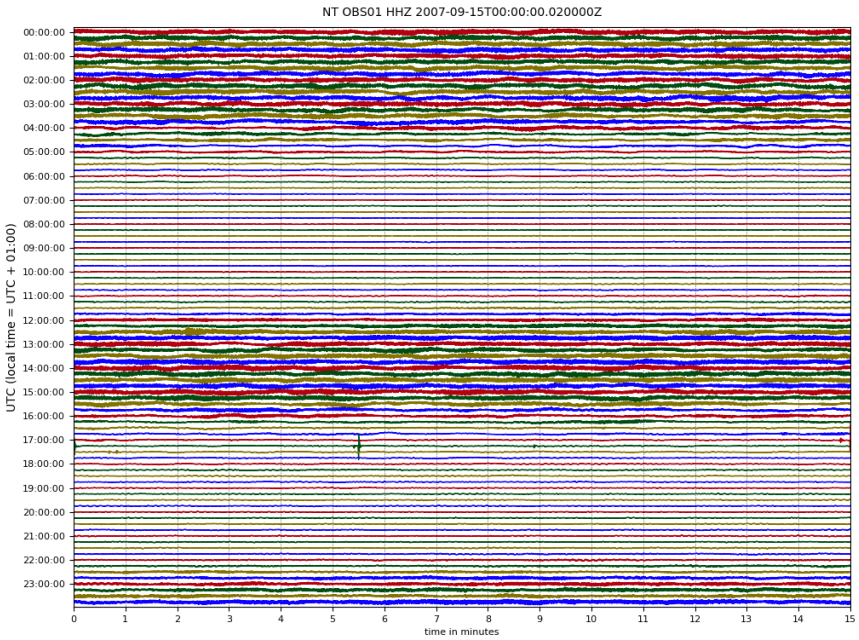

NT OBS01 HHZ (2007–09–13)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

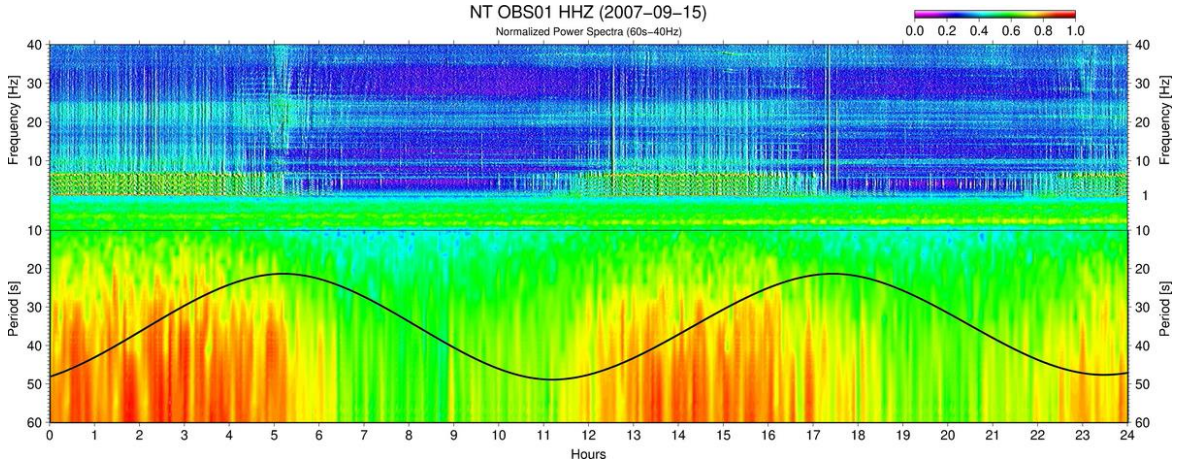

NT.OBS01..HHZ 2007-09-13 -- 2007-09-13 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

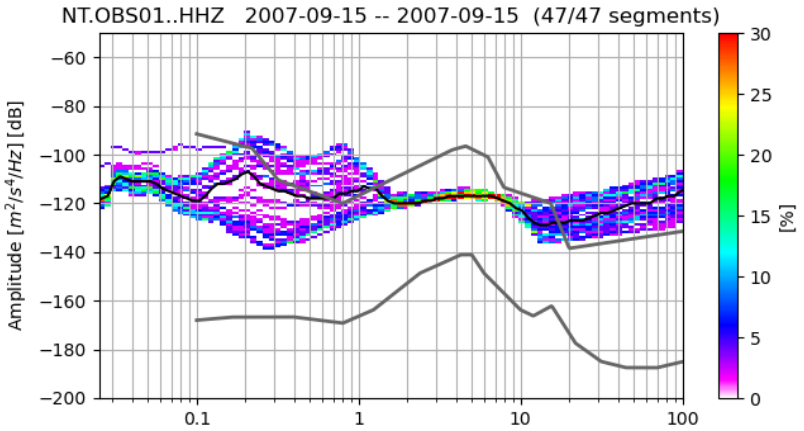

NT OBS01 HHZ 2007-09-14T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

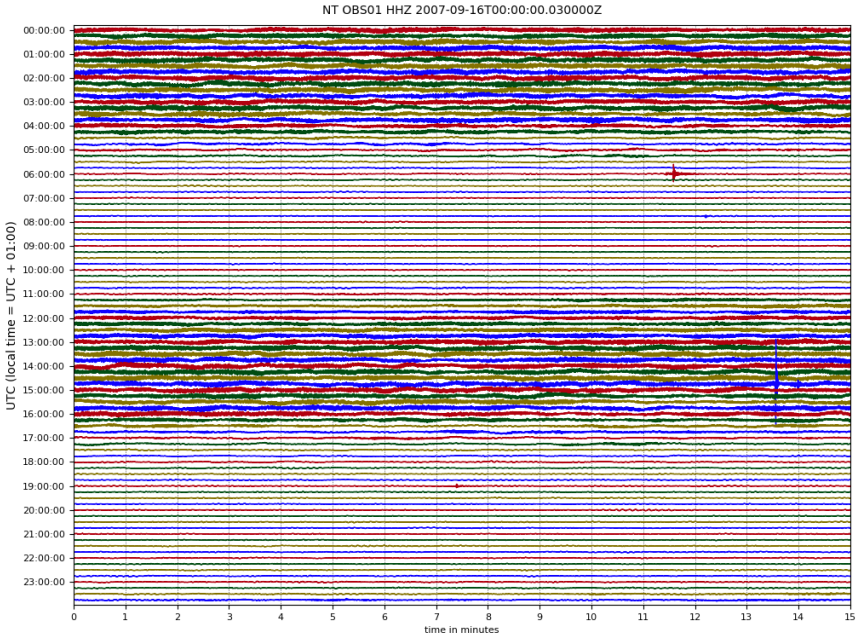

NT OBS01 HHZ (2007–09–14)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

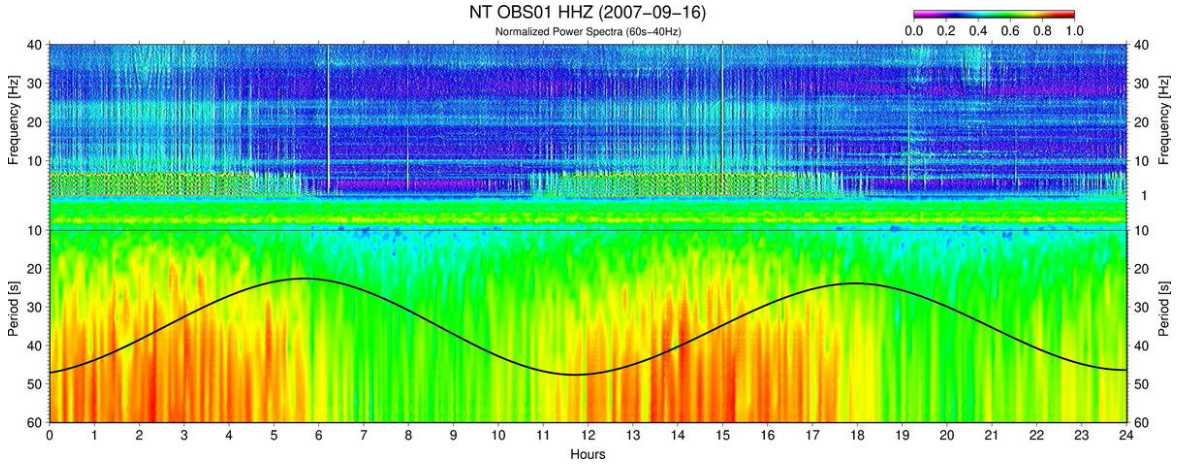

NT.OBS01..HHZ 2007-09-14 -- 2007-09-14 (46/46 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

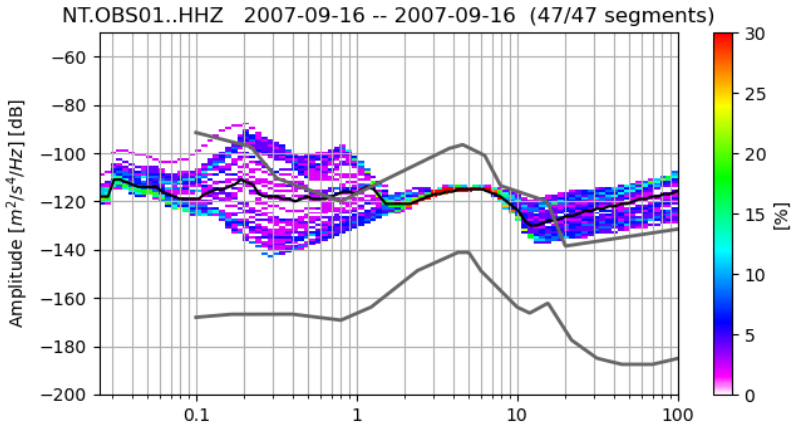

NT OBS01 HHZ 2007-09-15T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

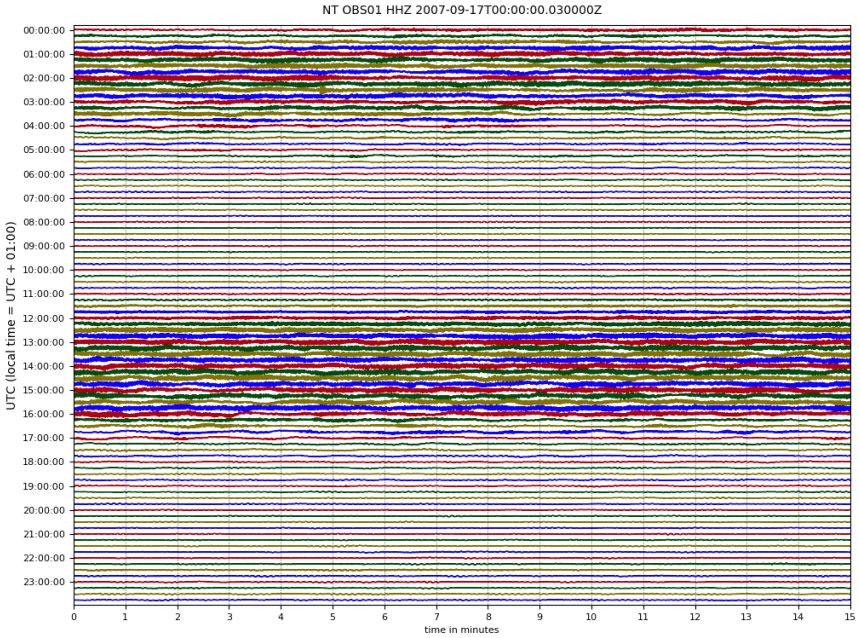

NT OBS01 HHZ (2007–09–15)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

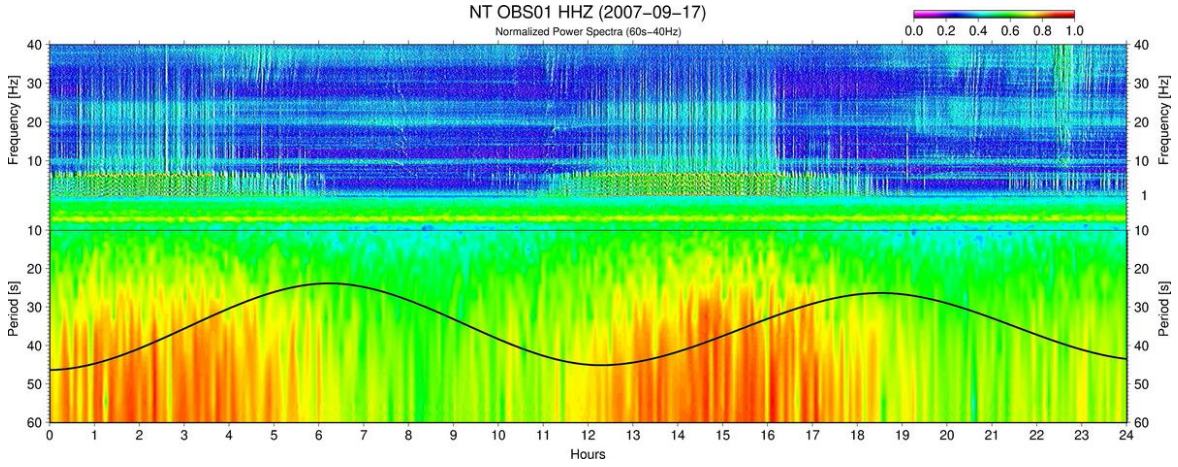

NT.OBS01..HHZ 2007-09-15 -- 2007-09-15 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

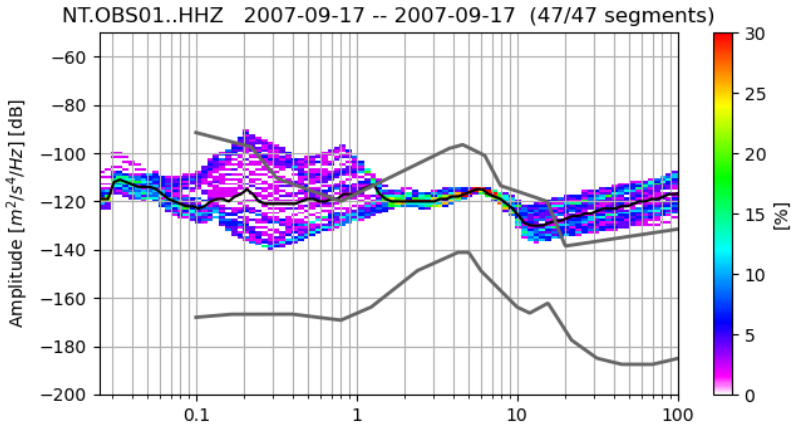

NT OBS01 HHZ 2007-09-16T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

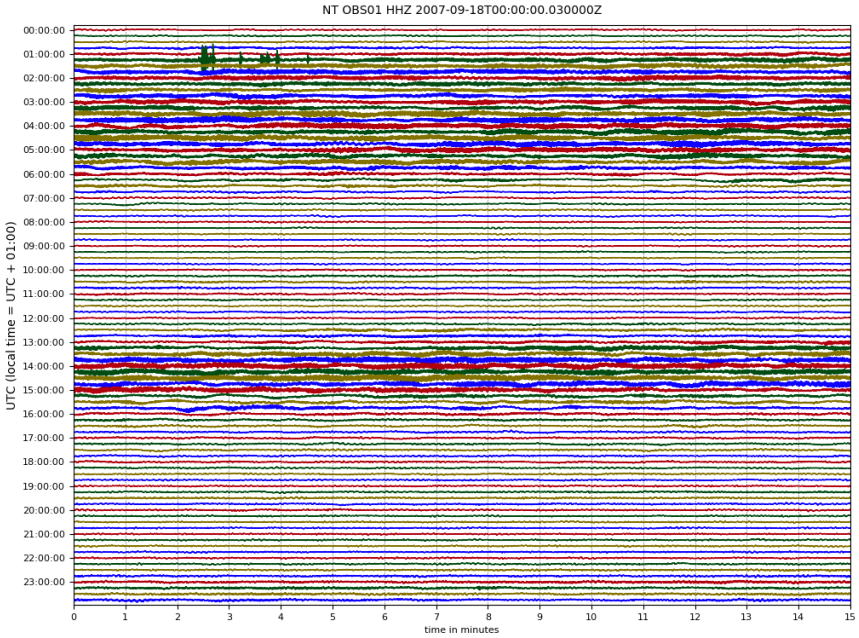

NT OBS01 HHZ (2007–09–16)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

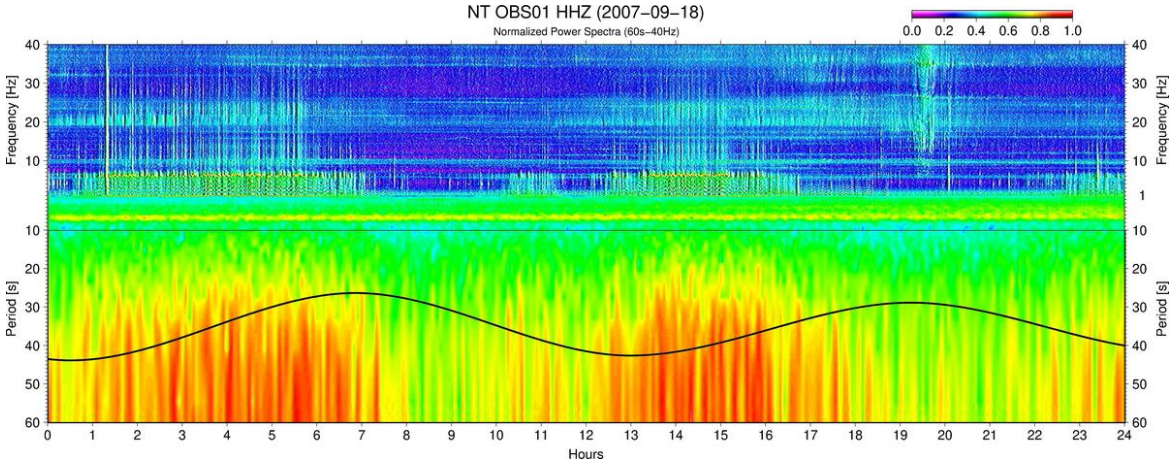

NT.OBS01..HHZ 2007-09-16 -- 2007-09-16 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

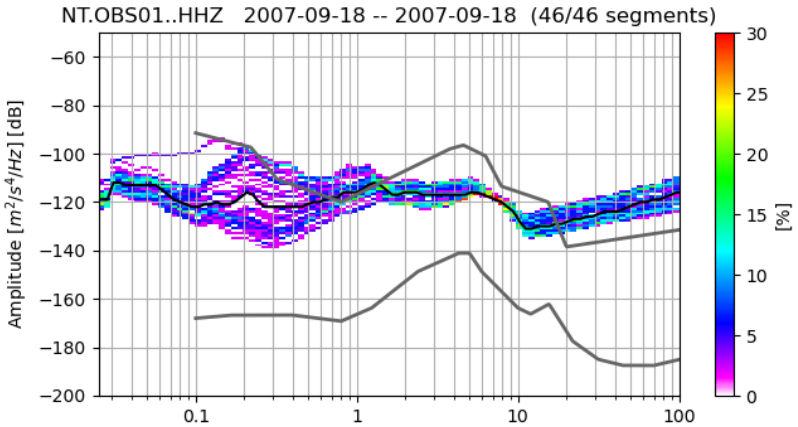

NT OBS01 HHZ 2007-09-17T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

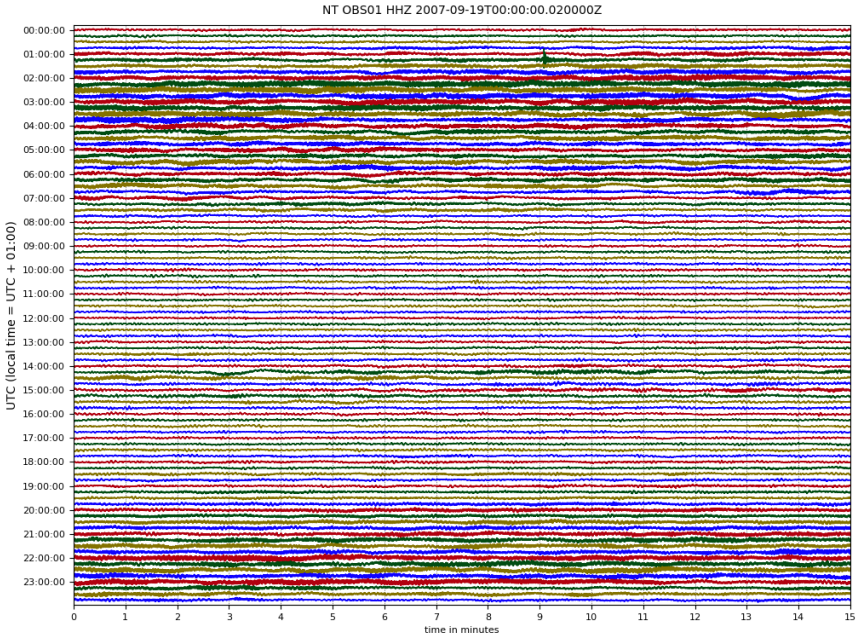

NT OBS01 HHZ (2007–09–17)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

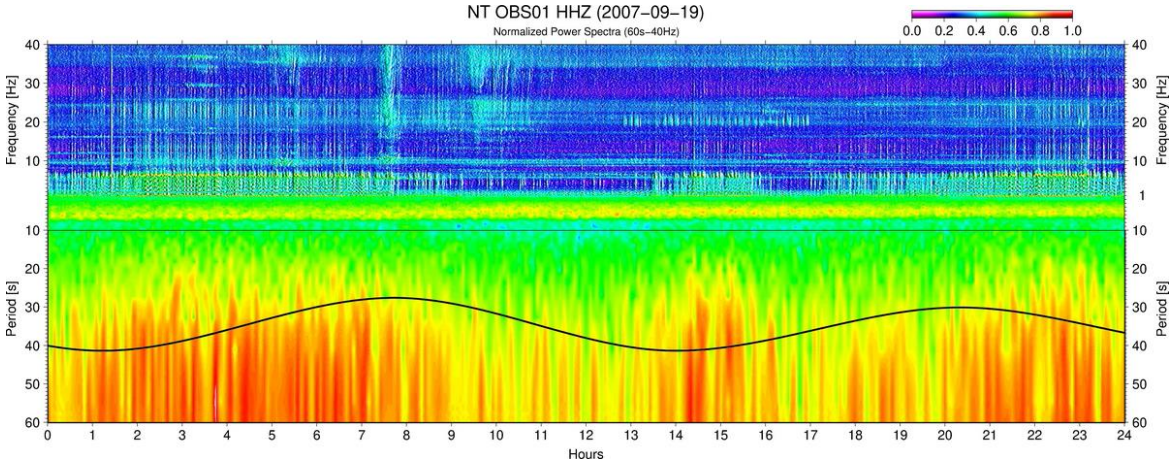

NT.OBS01..HHZ 2007-09-17 -- 2007-09-17 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

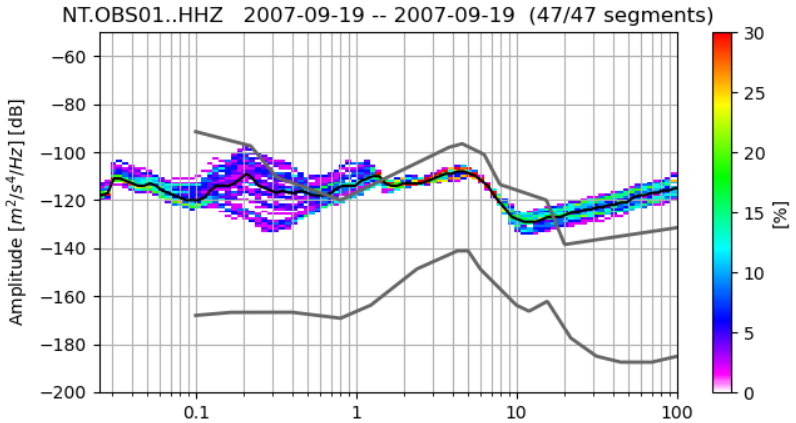

NT OBS01 HHZ 2007-09-18T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

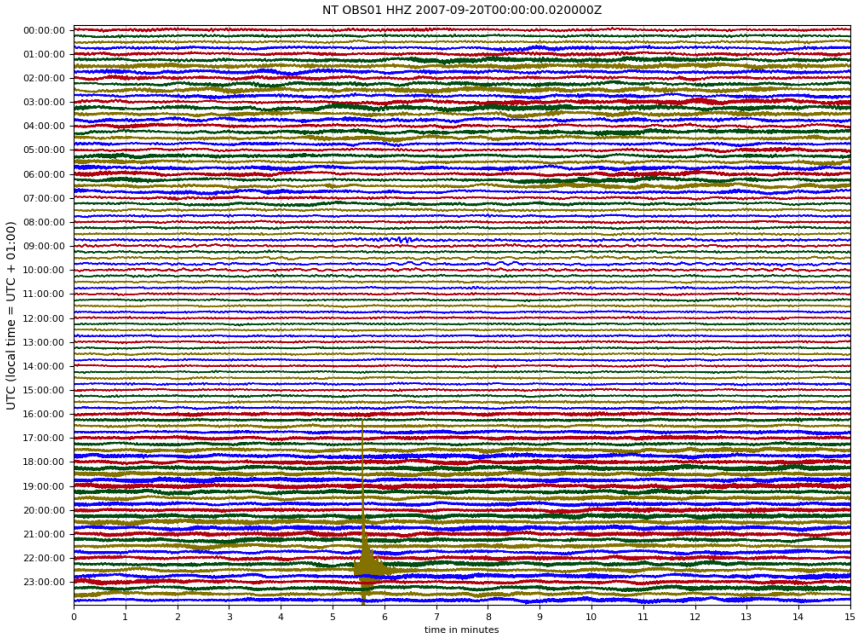

NT OBS01 HHZ (2007–09–18)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

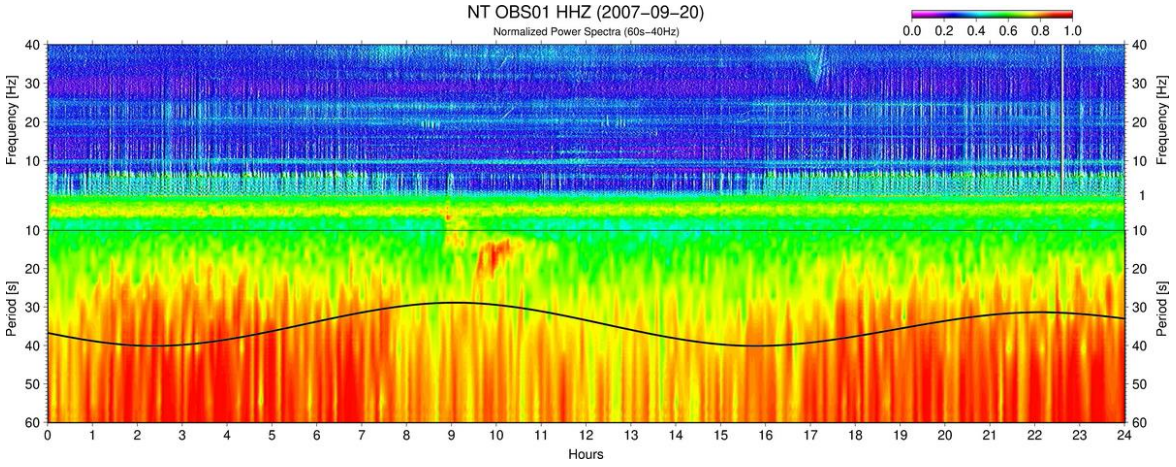

NT.OBS01..HHZ 2007-09-18 -- 2007-09-18 (46/46 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

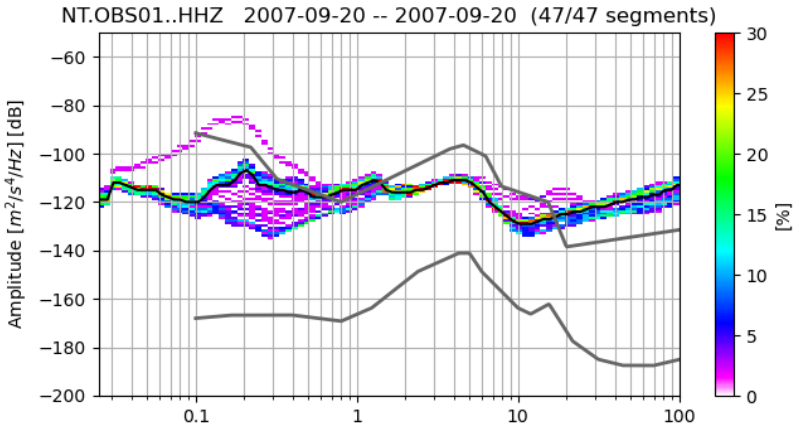

NT OBS01 HHZ 2007-09-19T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

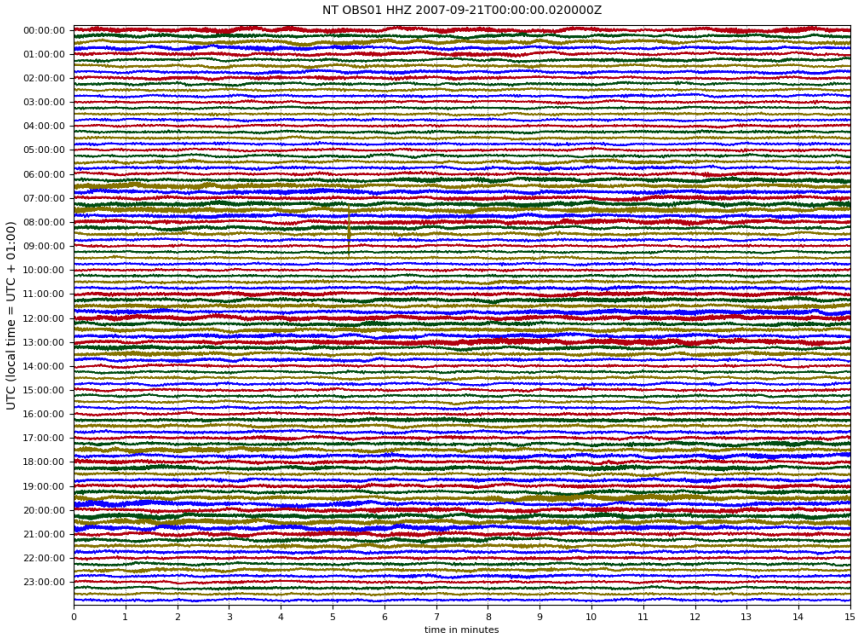

NT OBS01 HHZ (2007–09–19)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

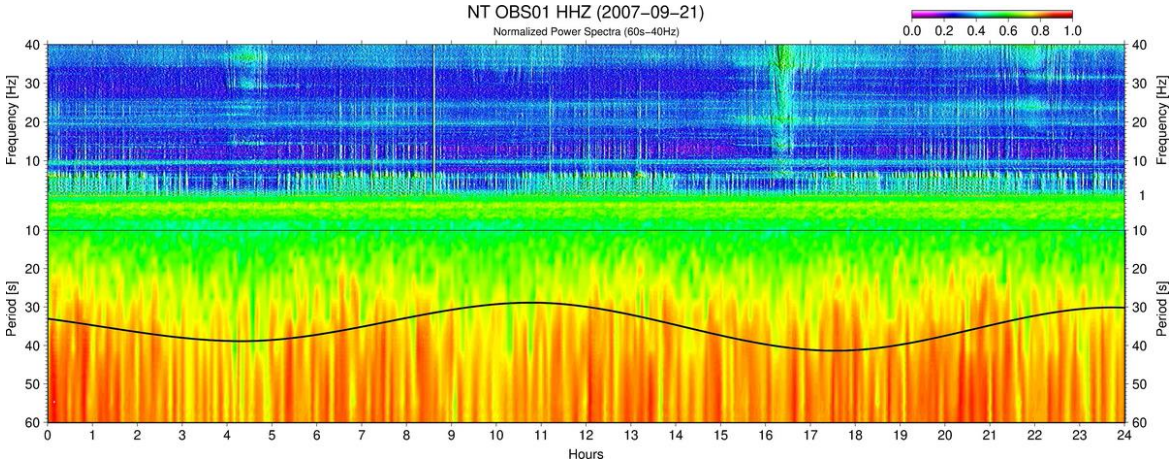

NT.OBS01..HHZ 2007-09-19 -- 2007-09-19 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

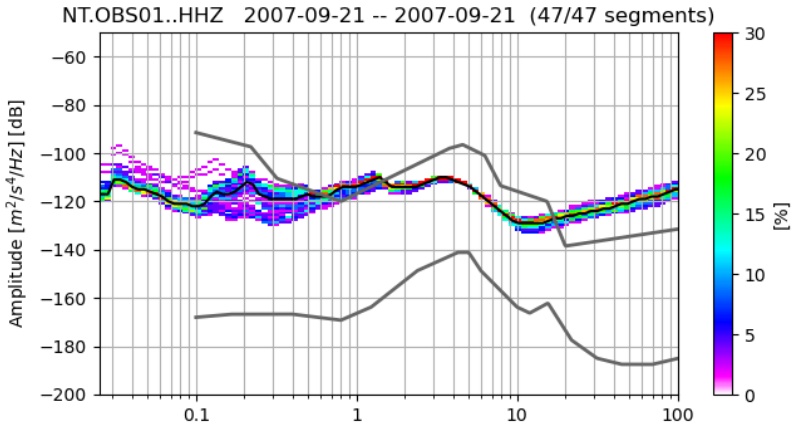

NT OBS01 HHZ 2007-09-20T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

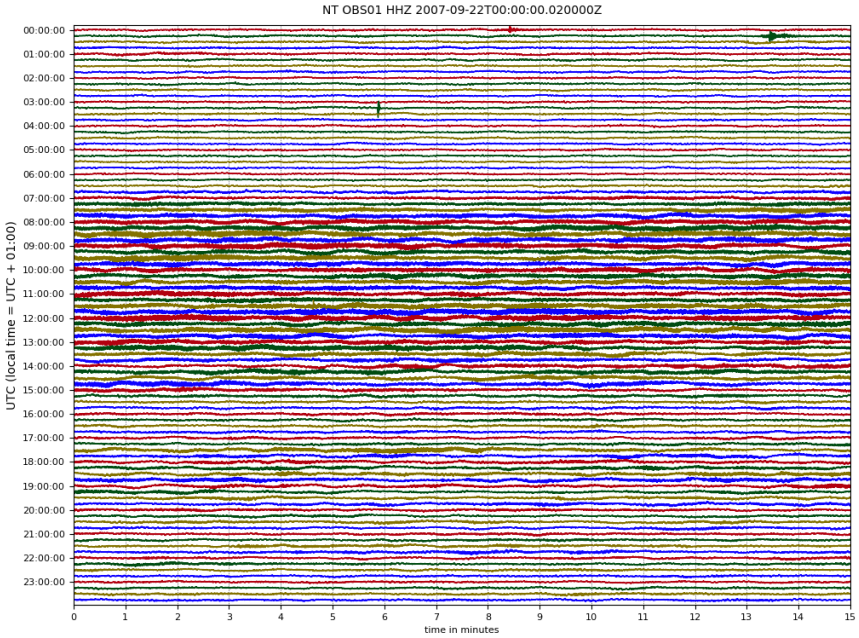

NT OBS01 HHZ (2007–09–20)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

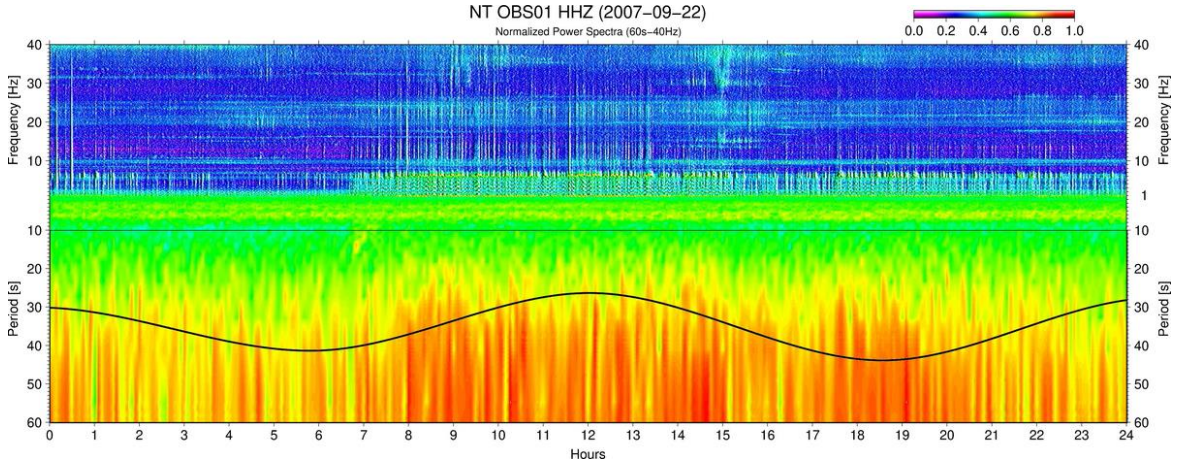

NT.OBS01..HHZ 2007-09-20 -- 2007-09-20 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

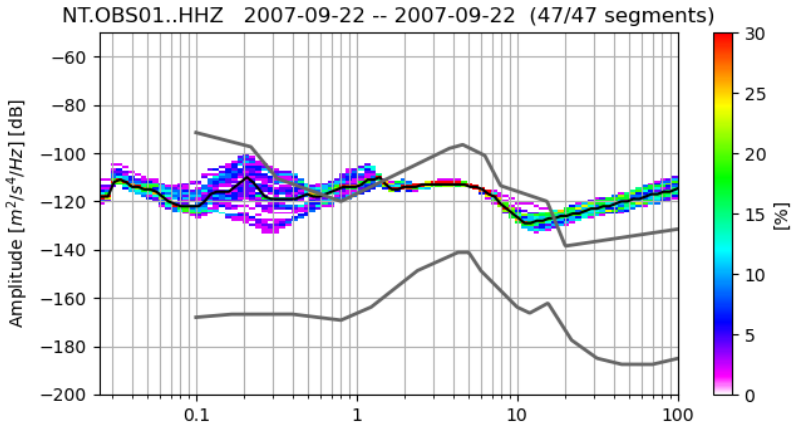

NT OBS01 HHZ 2007-09-21T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

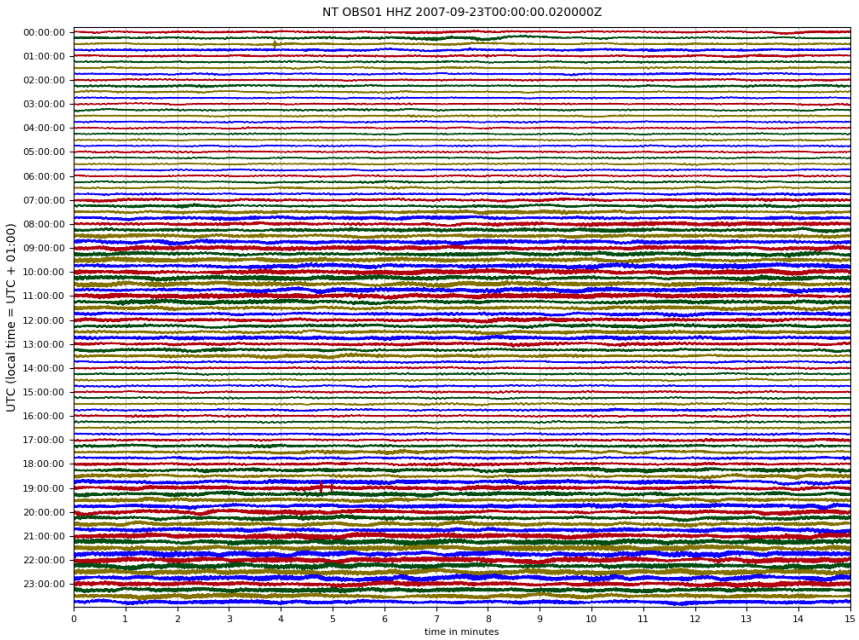

NT OBS01 HHZ (2007–09–21)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

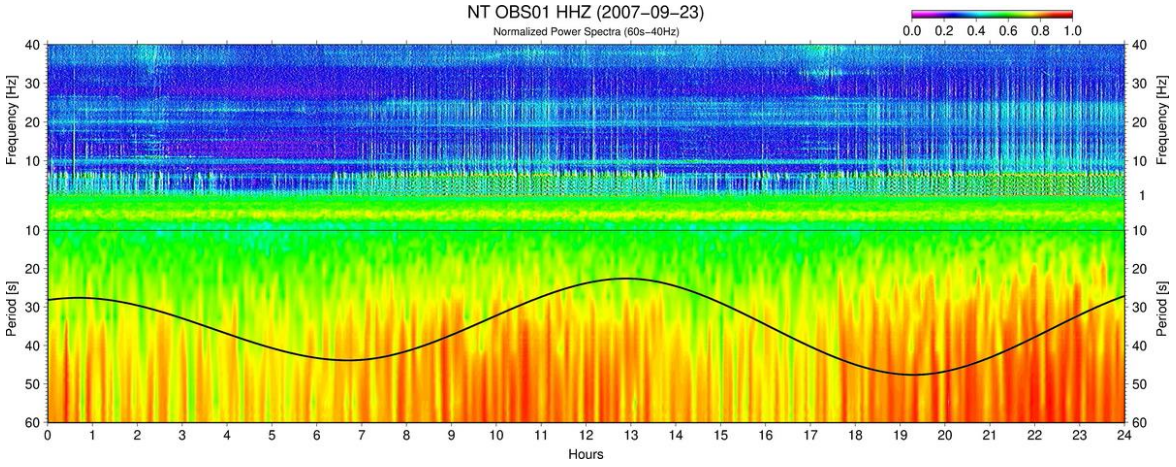

NT.OBS01..HHZ 2007-09-21 -- 2007-09-21 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

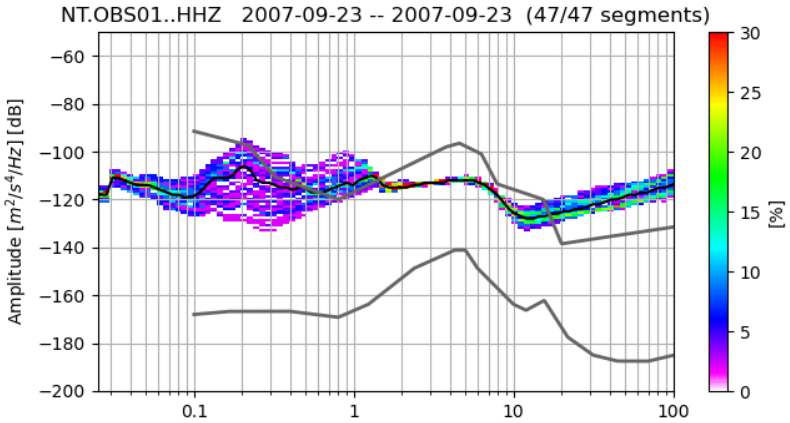

NT OBS01 HHZ 2007-09-22T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

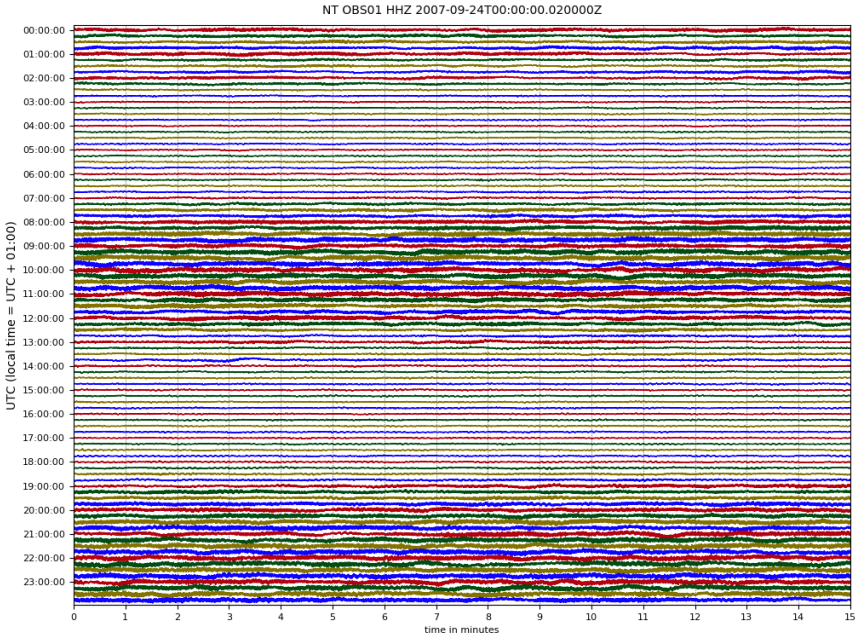

NT OBS01 HHZ (2007–09–22)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

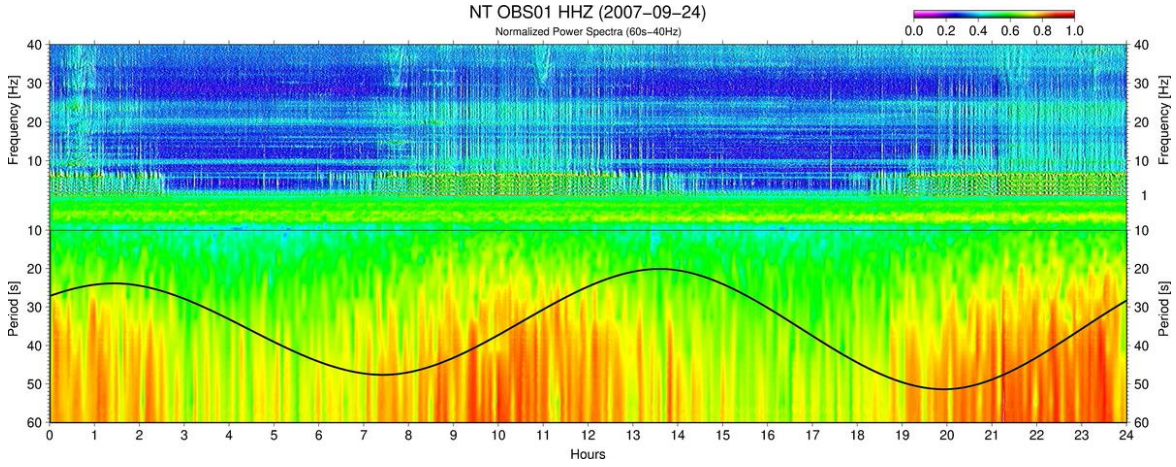

NT.OBS01..HHZ 2007-09-22 -- 2007-09-22 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

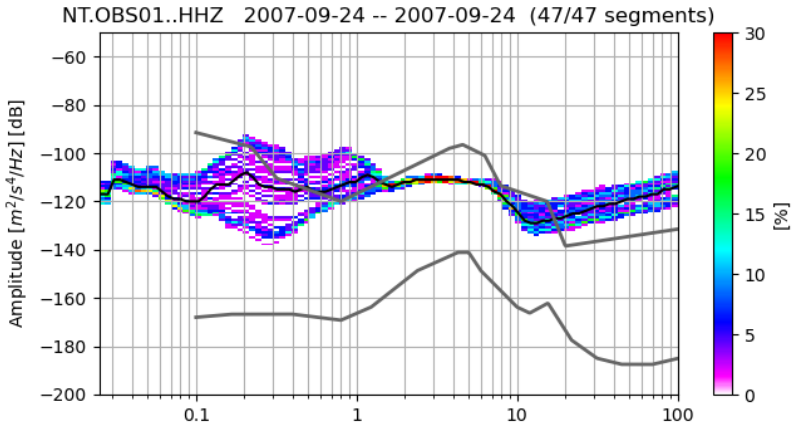

NT OBS01 HHZ 2007-09-23T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

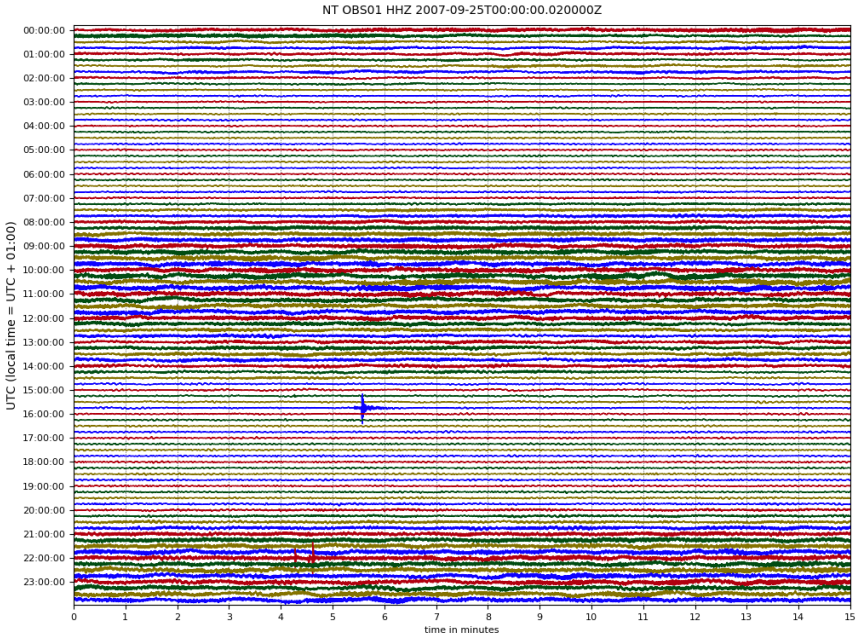

NT OBS01 HHZ (2007–09–23)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

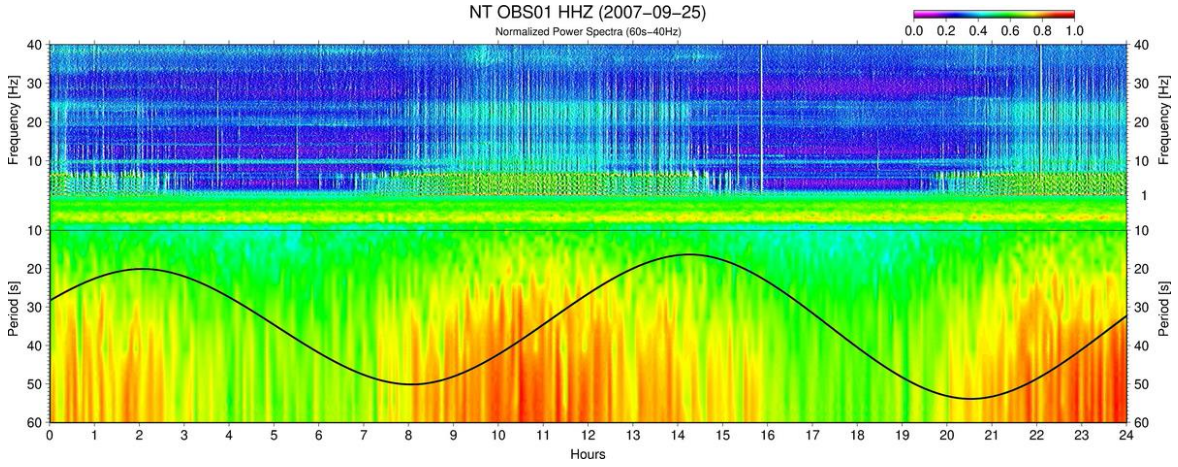

NT.OBS01..HHZ 2007-09-23 -- 2007-09-23 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

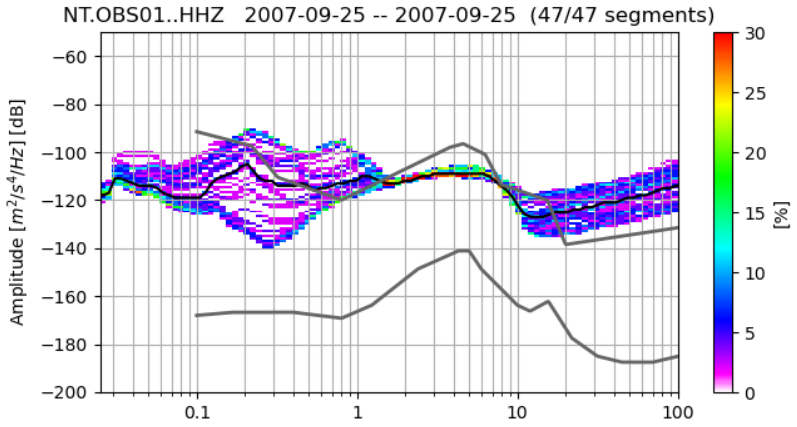

NT OBS01 HHZ 2007-09-24T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

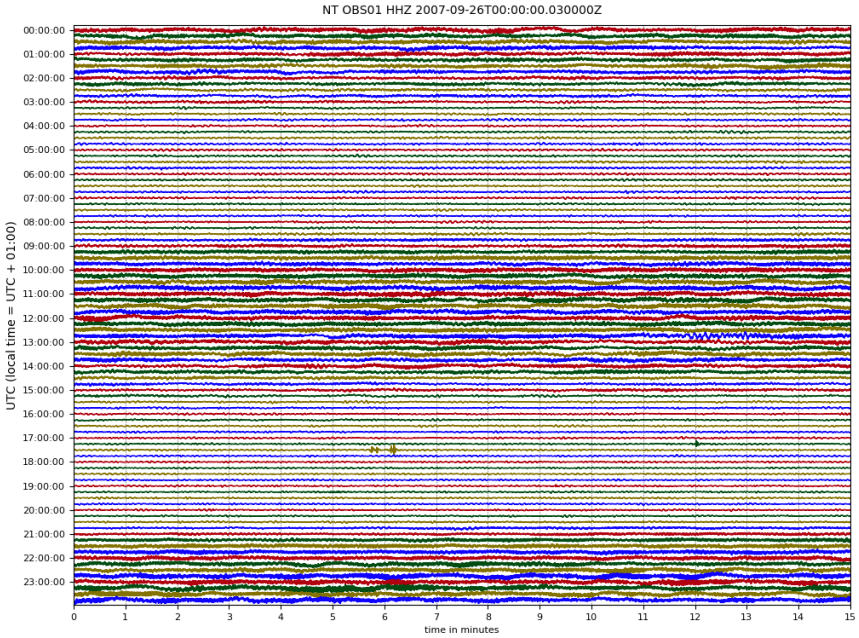

NT OBS01 HHZ (2007–09–24)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

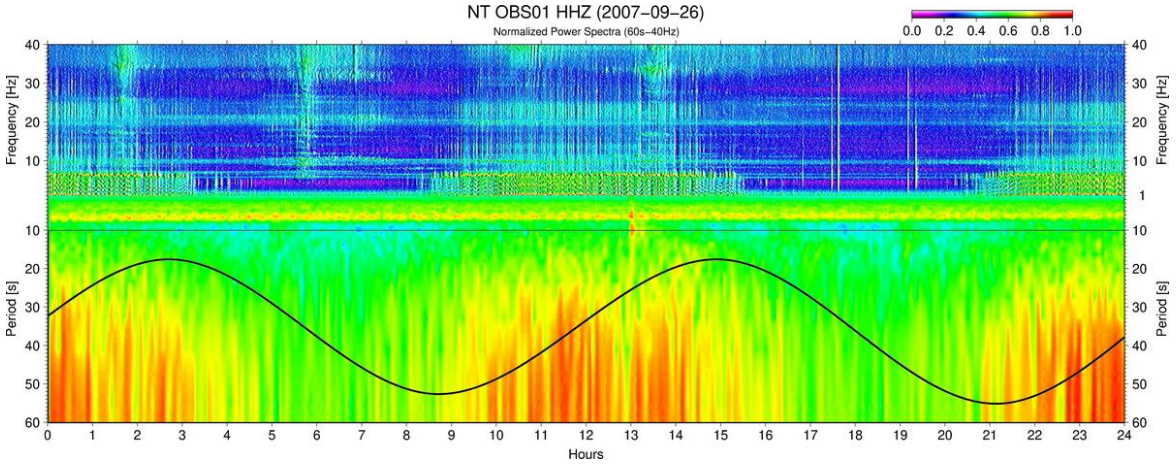

NT.OBS01..HHZ 2007-09-24 -- 2007-09-24 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

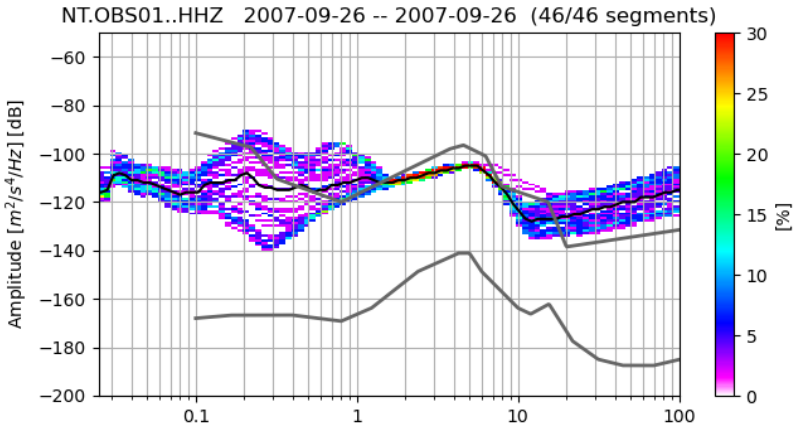

NT OBS01 HHZ 2007-09-25T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes

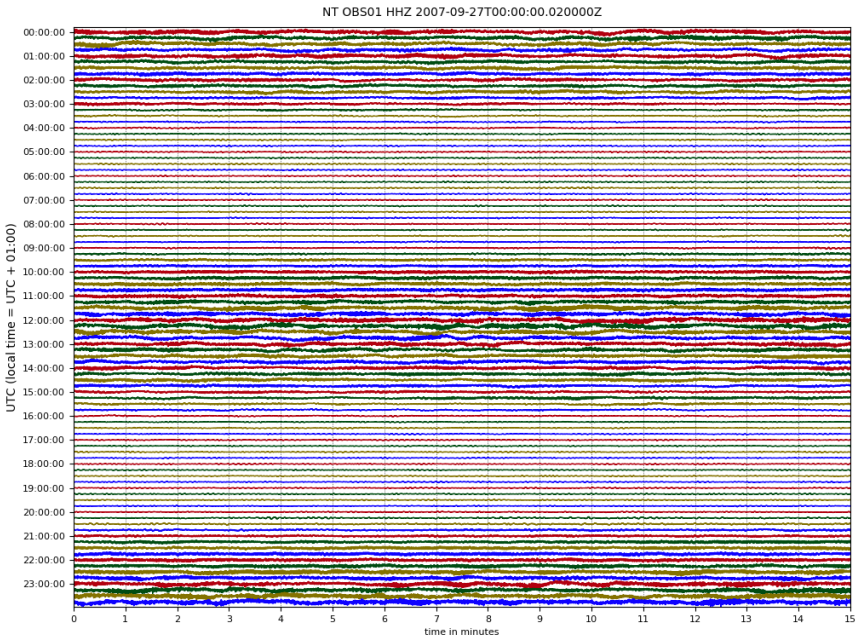

NT OBS01 HHZ (2007–09–25)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

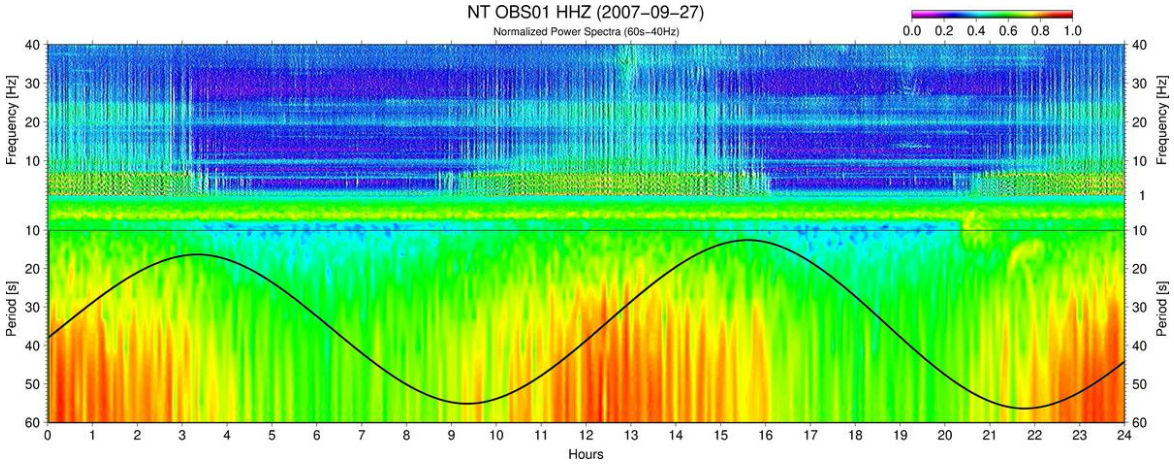

NT.OBS01..HHZ 2007-09-25 -- 2007-09-25 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

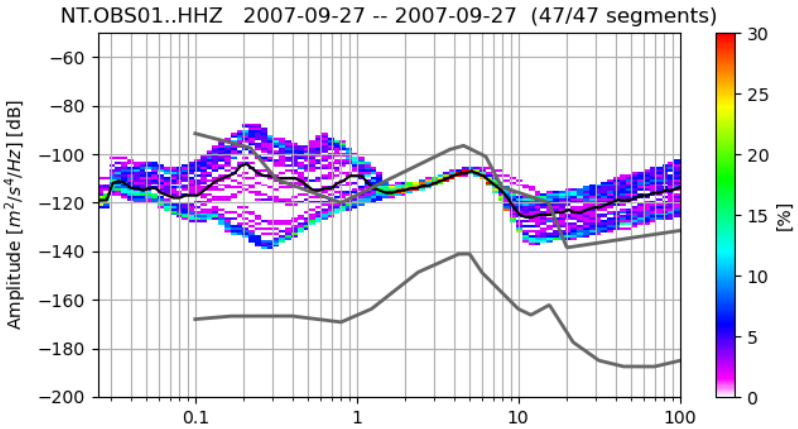

NT OBS01 HHZ 2007-09-26T00:00:00.030000Z
UTC (local time = UTC + 01:00)
time in minutes

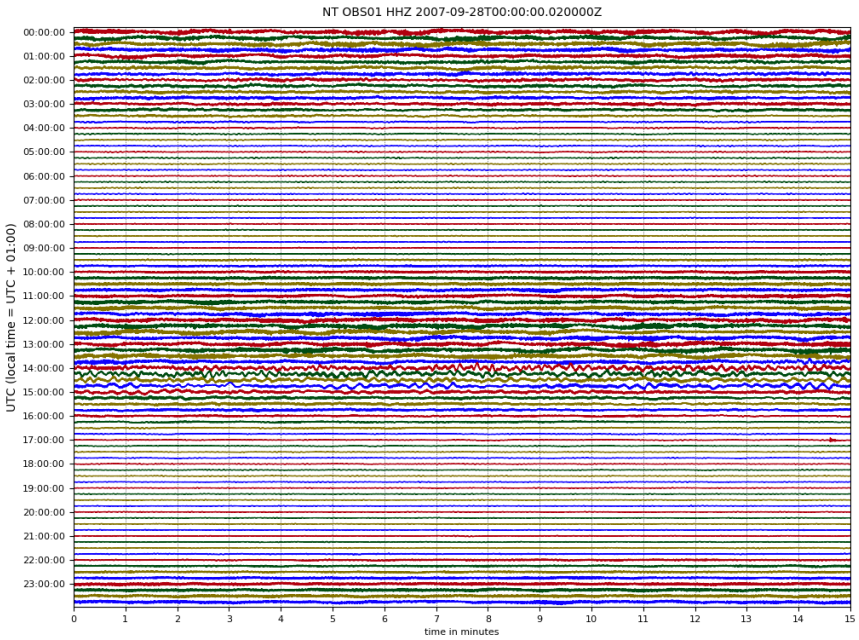

NT OBS01 HHZ (2007–09–26)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours

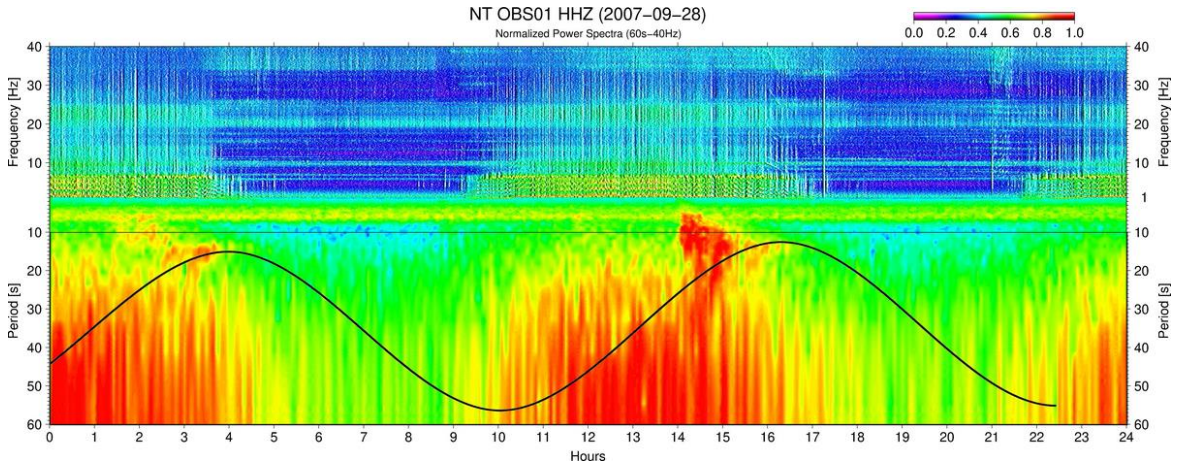

NT.OBS01..HHZ 2007-09-26 -- 2007-09-26 (46/46 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]

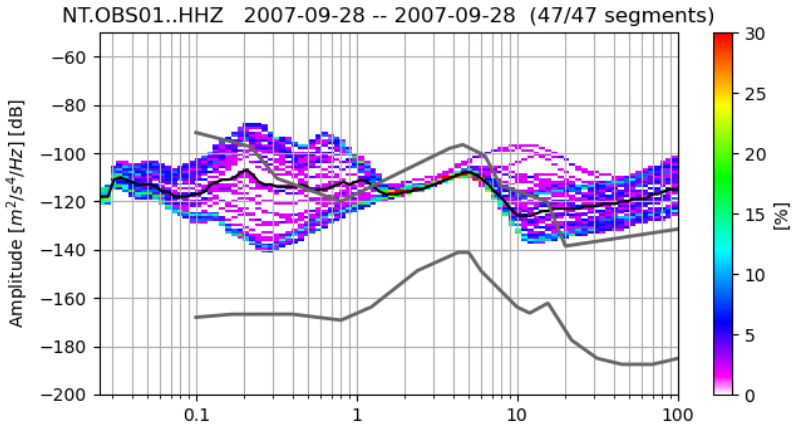

NT OBS01 HHZ 2007-09-27T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes


NT OBS01 HHZ (2007–09–27)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours


NT.OBS01..HHZ 2007-09-27 -- 2007-09-27 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]


NT OBS01 HHZ 2007-09-28T00:00:00.020000Z
UTC (local time = UTC + 01:00)
time in minutes


NT OBS01 HHZ (2007–09–28)
Normalized Power Spectra (60s–40Hz)
Frequency [Hz]
Period [s]
Hours


NT.OBS01..HHZ 2007-09-28 -- 2007-09-28 (47/47 segments)
Amplitude [m²/s⁴/Hz] [dB]
[%]