

RMSMonreport

2015/9/8 Tuesday @DetChar meeting, Yuzurihara

o Today's topic

- What is RMSMon
- Toward detchar daily web page

What is RMSMon?

RMSMon = RMS monitor tool

[[Classical and Quantum Gravity, Volume 21, Number 5](#)]

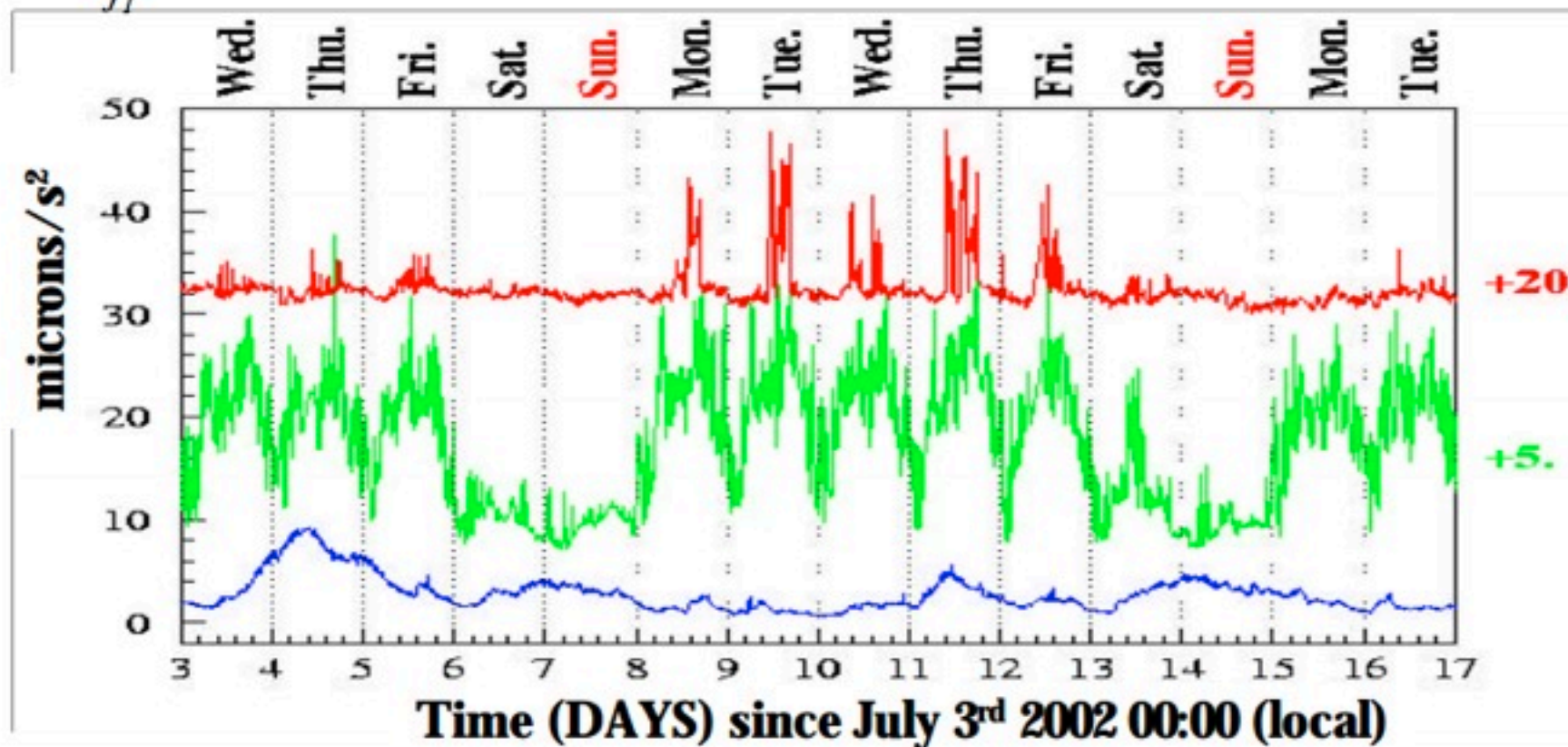
http://labcit.ligo.caltech.edu/LIGO_web/amaldi5/pdf/fiori.pdf



Monitor of RMS Seismic Motion

(Irene Fiori's slide)

$$RMS = \left(\int_{f_1}^{f_2} |\tilde{a}(f)|^2 df \right)^{1/2} \text{ in 3 frequency bands: } 0.2\text{-}1 \text{ Hz ; } 1\text{-}4 \text{ Hz ; } 4\text{-}10 \text{ Hz}$$



- 0.2 - 1 Hz: slow motion → correlated with wind & sea-waves ?
- 1 - 4 Hz: day-night-weekend variations → local traffic ?
- 4 - 10 Hz: spikes between 10AM-6PM → human activities on-site.

What is RMSMon?

[[Classical and Quantum Gravity](#), Volume 21, Number 5]

$$\text{RMS} = \left(\int_{f_1}^{f_2} |\tilde{s}(f)|^2 df \right)^{1/2},$$

$s(t)$

↓ FFT

$S(f)$

↓ sum up

$$\int_{f_1}^{f_2} S(f)$$

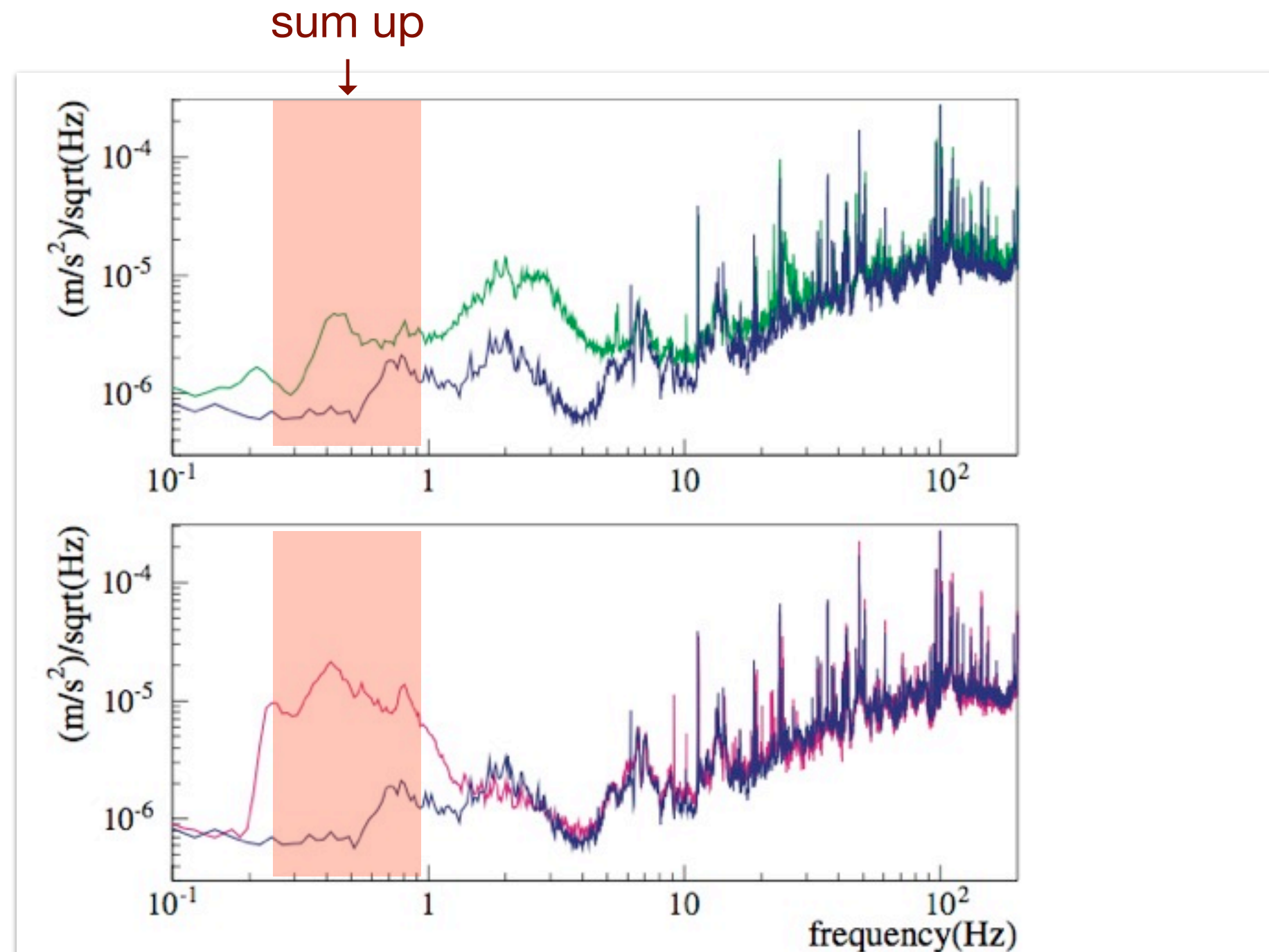


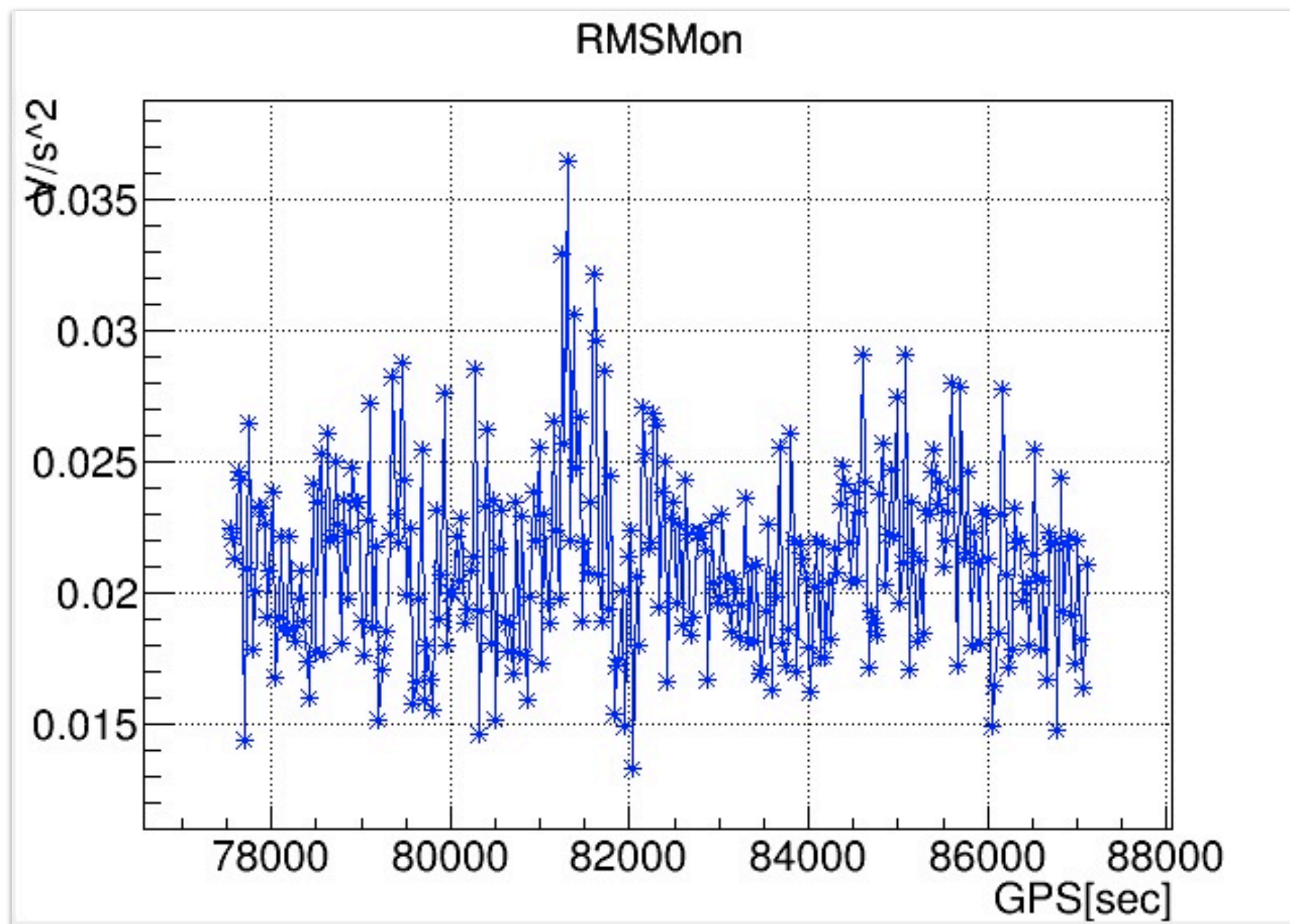
Figure 1. Top: acceleration amplitude spectra for (dark line) a workday period (around 10 am local time) and (light-grey line) a night-time period (around 2 am local time). No request on weather conditions was made. Bottom: the same night-time spectrum is compared with one recorded during a night of particularly bad weather (grey line). Each spectrum (0.01 Hz resolution) is obtained with 1 hour of data.

Toward detchar daily web page

- o RMSMon monitors selected channel.
Ask commissioner which channel is useful to monitor?
i.e. Virgo monitor **seismic activity** by RMSMon
- o How many seismometers KAGRA have?
One seismometer output one daily figure.
- o Virgo's RMSMon monitors several frequency bands (0.2-1Hz, 1-4Hz, 4-10Hz)
Which frequency bands KAGRA choose?
It depends on data and detector condition.

RMSMon on HasKAL

- o Now We can RMSMon on HasKAL, but still development version.
<https://github.com/gw-analysis/detector-characterization/tree/master/attic/testRMSMon>



Measure time to be needed for calculation

measured time

- 32sec x 10chunk : 1~2sec needed
 - 32sec x 100chunk : 9~10sec needed
 - 32sec x 300chunk : ~28sec needed
 - 64sec x 150chunk : ~28sec needed
 - 128sec x 75chunk : ~28sec needed
- (Unexpectedly short)

not measured time, just expect

- 24hour data needs ~252sec?

