

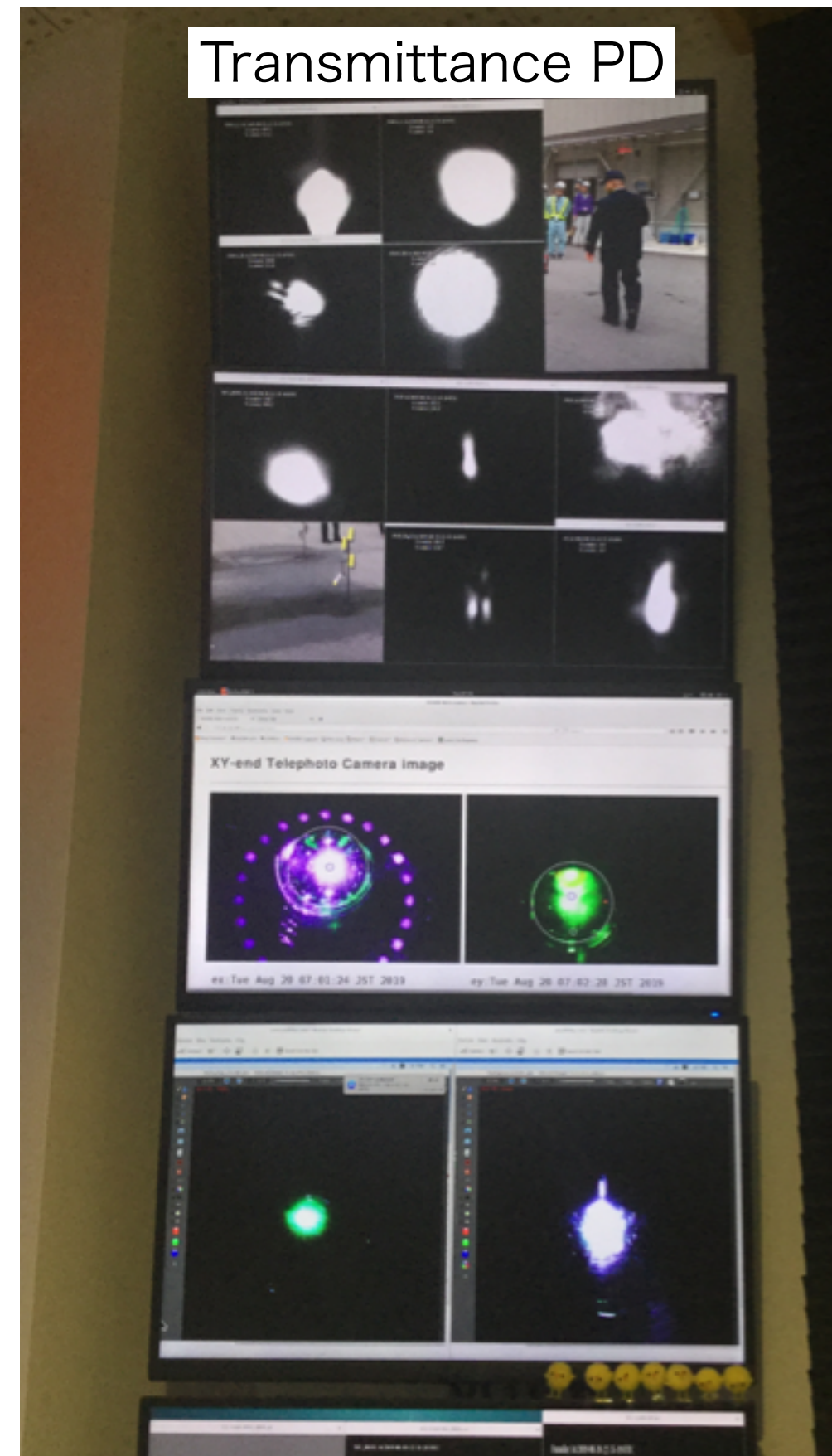
# PEM meeting brief reports

VK PEM meeting

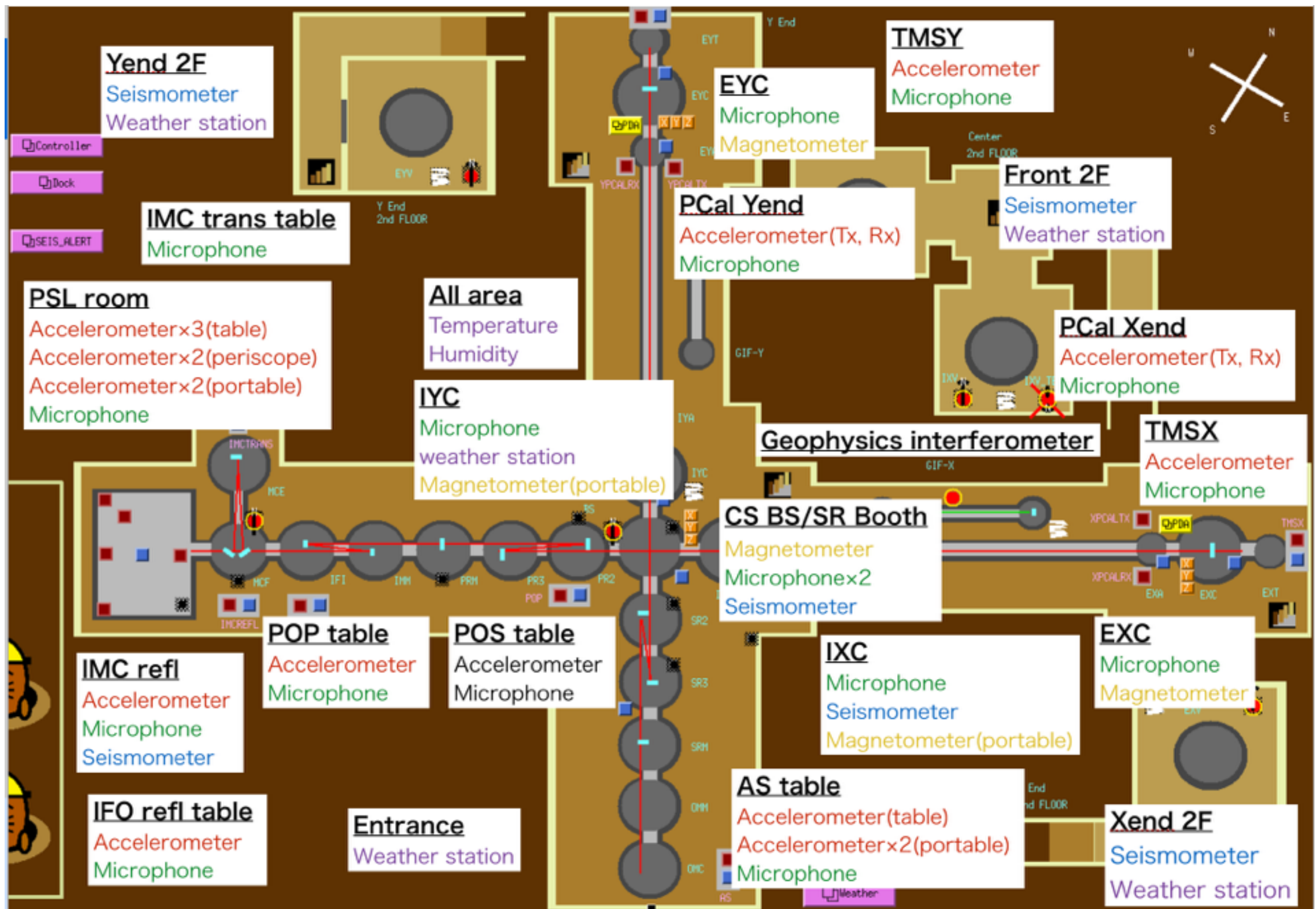
2019/08/20 T.Yokozawa

# Detector status

- We are in the commissioning phase of the Fabry-perot michelson
- Detector configuration will be determined soon
  - DRFPMI or SRFPMI or FPMI
- Discussing about following tasks and groups
  - Suspension damping
  - Length sensing
  - Alignment sensing
  - Noise hunting
  - Output mode cleaner



# PEM status

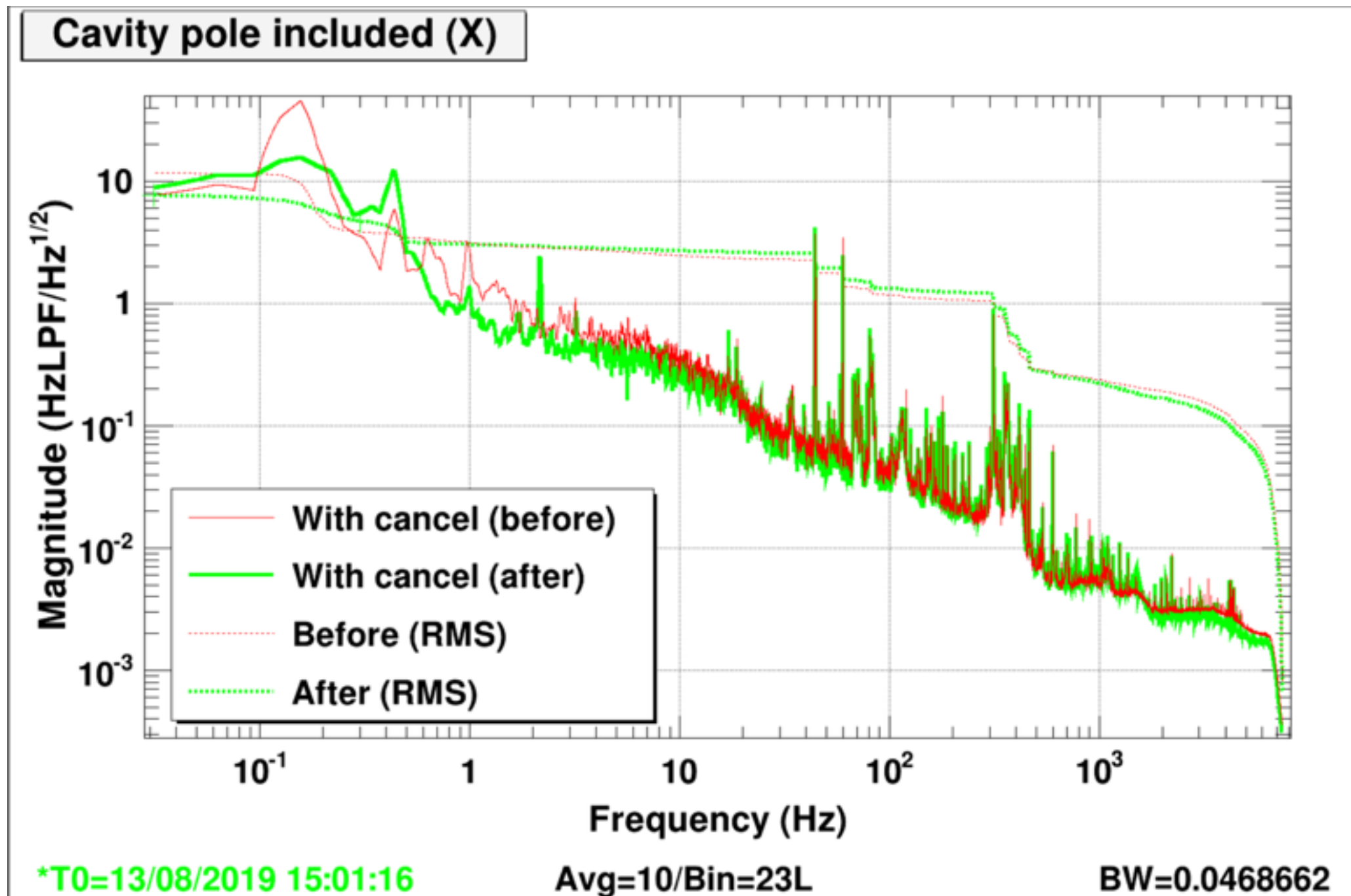


# PEM status

<http://gwwiki.icrr.u-tokyo.ac.jp/JGWwiki/KAGRA/Subgroups/PEM>

- Portable PEM project (Last month meeting)
  - Origin of the line noise search (next page)
  - Vibration characteristics (Cryo-chamber, Photon calibrator, ...)
  - Origin of the Glitch search (w/ detchar group)
  - Sound reverberation time analysis (Main topic today)
  - Seismic motion analysis
  - Lock loss analysis using PEMs
  - Preparing toward the PEM injection
- 
- Today topic
    - Virgo status and October commissioning (Irene)
    - Plan to visit Virgo (Washimi)

# Line noise



- We found some mysterious peak around 44Hz...

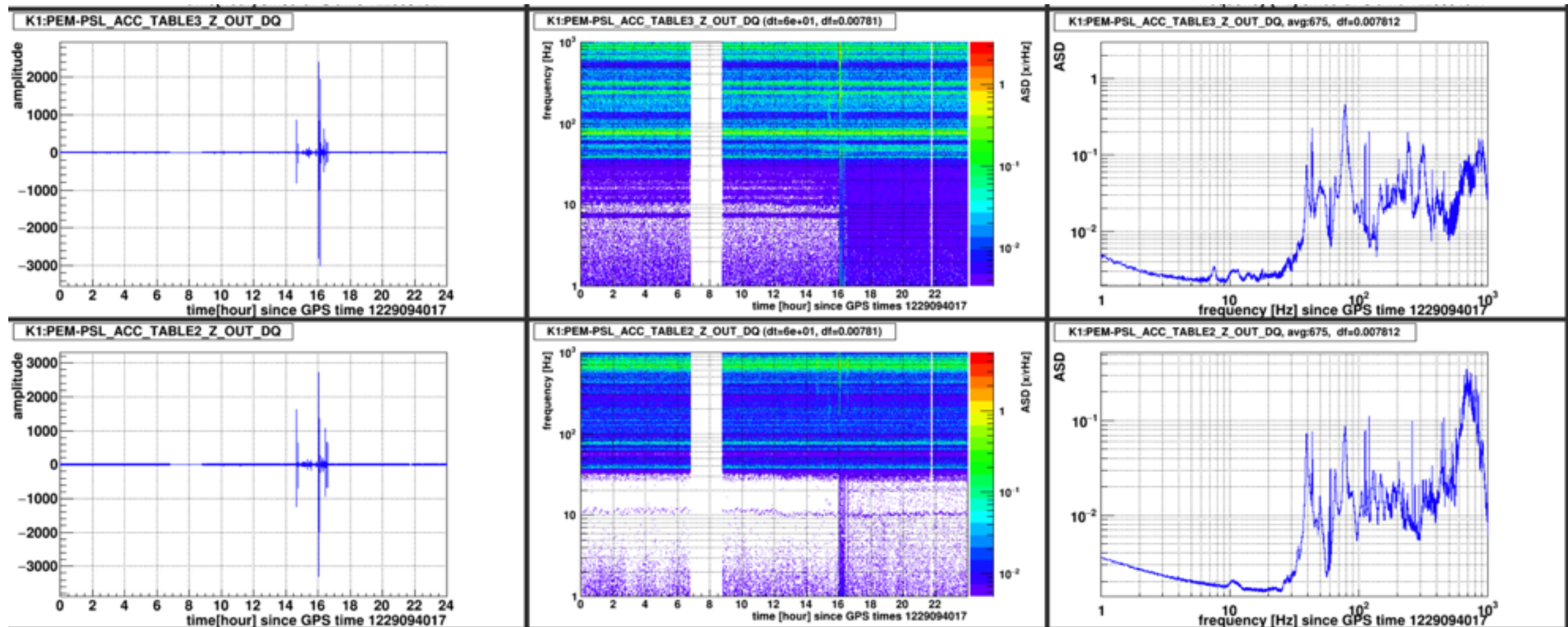


# Line noise

44.09	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (0.99)	VALVE-PRDG ARM-FREQUENCY DO (0.99)	LAS-POW-MG REFL-OUT DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (0.97)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (0.97)	PSL-ACC-TR SCHE-L-PY DO (0.96)	MC-MGL-SERV REFL-OUT DO (0.96)	MC-MGL-SERV REFL-OUT DO (0.96)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.95)	PSL-REFCAV REFL-OUT.DQ DO (0.74)	LAS-POW-FMC OUT.DQ DO (0.68)	PSL-FMC-TRANS DC-OUT DO (0.54)	MC-SERVO-SLOW DAQ-OUT DO (0.52)	
44.11	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (1.00)	VALVE-PRDG ARM-FREQUENCY DO (0.99)	LAS-POW-MG REFL-OUT DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.98)	MC-MGL-SERV REFL-OUT DO (0.98)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.95)	PSL-REFCAV REFL-OUT.DQ DO (0.82)	PSL-FMC-PYT SLOW-OUT DO (0.74)	LAS-POW-FMC OUT.DQ DO (0.72)	PSL-ACC-MGE TABLE-REFL X-OUT.DQ (0.71)	PSL-FMC-TRANS DC-OUT DO (0.71)
44.12	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (1.00)	LAS-POW-MG REFL-OUT DO (1.00)	MC-MGL-SERV REFL-OUT DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.98)	MC-MGL-SERV REFL-OUT DO (0.98)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.97)	PSL-FMC-PYT SLOW-OUT DO (0.85)	PSL-REFCAV REFL-OUT.DQ DO (0.83)	PSL-ACC-MGE TABLE-REFL X-OUT.DQ (0.82)	LAS-POW-FMC OUT.DQ DO (0.71)	PSL-FMC-TRANS DC-OUT DO (0.68)
44.14	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	LAS-POW-MG REFL-OUT DO (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.97)	PSL-ACC-TR SCHE-L-PY DO (0.97)	MC-MGL-SERV REFL-OUT DO (0.97)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.95)	PSL-FMC-PYT SLOW-OUT DO (0.92)	LAS-POW-FMC OUT.DQ DO (0.77)	PSL-REFCAV REFL-OUT.DQ DO (0.75)	PSL-FMC-TRANS DC-OUT DO (0.74)	PSL-ACC-MGE TABLE-REFL X-OUT.DQ (0.69)
44.16	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	LAS-POW-MG REFL-OUT DO (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	MC-MGL-SERV REFL-OUT DO (1.00)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (1.00)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.98)	MC-MGL-SERV REFL-OUT DO (0.98)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.97)	PSL-FMC-PYT SLOW-OUT DO (0.94)	LAS-POW-FMC OUT.DQ DO (0.89)	PSL-FMC-TRANS DC-OUT DO (0.84)	PSL-FMC-PYT HY-MON-OUT DO (0.77)	PSL-FMC-MON MON-OUT DO (0.75)
44.17	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	LAS-POW-MG REFL-OUT DO (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	MC-MGL-SERV REFL-OUT DO (1.00)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (1.00)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.98)	MC-MGL-SERV REFL-OUT DO (0.98)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.96)	PSL-FMC-PYT SLOW-OUT DO (0.87)	MC-SERVO-SLOW DAQ-OUT DO (0.85)	LAS-POW-FMC OUT.DQ DO (0.82)	PSL-FMC-PYT HY-MON-OUT DO (0.81)	PSL-FMC-TRANS DC-OUT DO (0.80)
44.19	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	LAS-POW-MG REFL-OUT DO (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	MC-MGL-SERV REFL-OUT DO (1.00)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.96)	PSL-REFCAV REFL-OUT.DQ DO (0.91)	LAS-POW-FMC OUT.DQ DO (0.88)	PSL-REFCAV REFL-OUT.DQ DO (0.88)	PSL-FMC-PYT SLOW-OUT DO (0.87)	PSL-FMC-TRANS DC-OUT DO (0.85)
44.20	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	MC-MGL-SERV REFL-OUT DO (1.00)	LAS-POW-MG REFL-OUT DO (1.00)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (1.00)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.99)	PSL-REFCAV REFL-OUT.DQ DO (0.93)	PSL-FMC-PYT SLOW-OUT DO (0.92)	LAS-POW-FMC OUT.DQ DO (0.87)	PSL-FMC-TRANS DC-OUT DO (0.85)	MC-MGL-SERV REFL-OUT DO (0.85)
44.22	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	MC-MGL-SERV REFL-OUT DO (1.00)	LAS-POW-MG REFL-OUT DO (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (1.00)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.98)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.97)	PSL-REFCAV REFL-OUT.DQ DO (0.95)	PSL-FMC-PYT SLOW-OUT DO (0.91)	LAS-POW-FMC OUT.DQ DO (0.88)	PSL-FMC-TRANS DC-OUT DO (0.87)	PSL-ACC-MGE TABLE-REFL X-OUT.DQ (0.86)
44.23	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (0.99)	LAS-POW-MG REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.98)	MC-MGL-SERV REFL-OUT DO (0.98)	MC-MGL-SERV REFL-OUT DO (0.97)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.97)	PSL-REFCAV REFL-OUT.DQ DO (0.93)	PSL-FMC-PYT SLOW-OUT DO (0.87)	PSL-ACC-MGE TABLE-REFL X-OUT.DQ (0.84)	MC-MGL-SERV REFL-OUT DO (0.87)	LAS-POW-FMC OUT.DQ DO (0.83)
44.25	PSL-ACC-PYL PORTABLE X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL1 X-OUT.DQ (1.00)	PSL-ACC-PYL TABLE-PYL2 X-OUT.DQ (1.00)	PSL-ACC-PYL PYL-PYL1 X-OUT.DQ (1.00)	VALVE-PRDG ARM-FREQUENCY DO (1.00)	LAS-POW-MG REFL-OUT DO (0.99)	PSL-ACC-PYL PYL-PYL2 X-OUT.DQ (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-ACC-TR SCHE-L-PY DO (0.99)	VALVE-PRDG ARM-DLLA CTRL-ARM DO (0.99)	MC-MGL-SERV REFL-OUT DO (0.99)	PSL-REFCAV REFL-OUT.DQ DO (0.99)	PSL-FMC-PYT SLOW-OUT DO (0.99)				

- This 44Hz noise has many coherent channels
- Large coherent channels are accelerometers in the PSL room

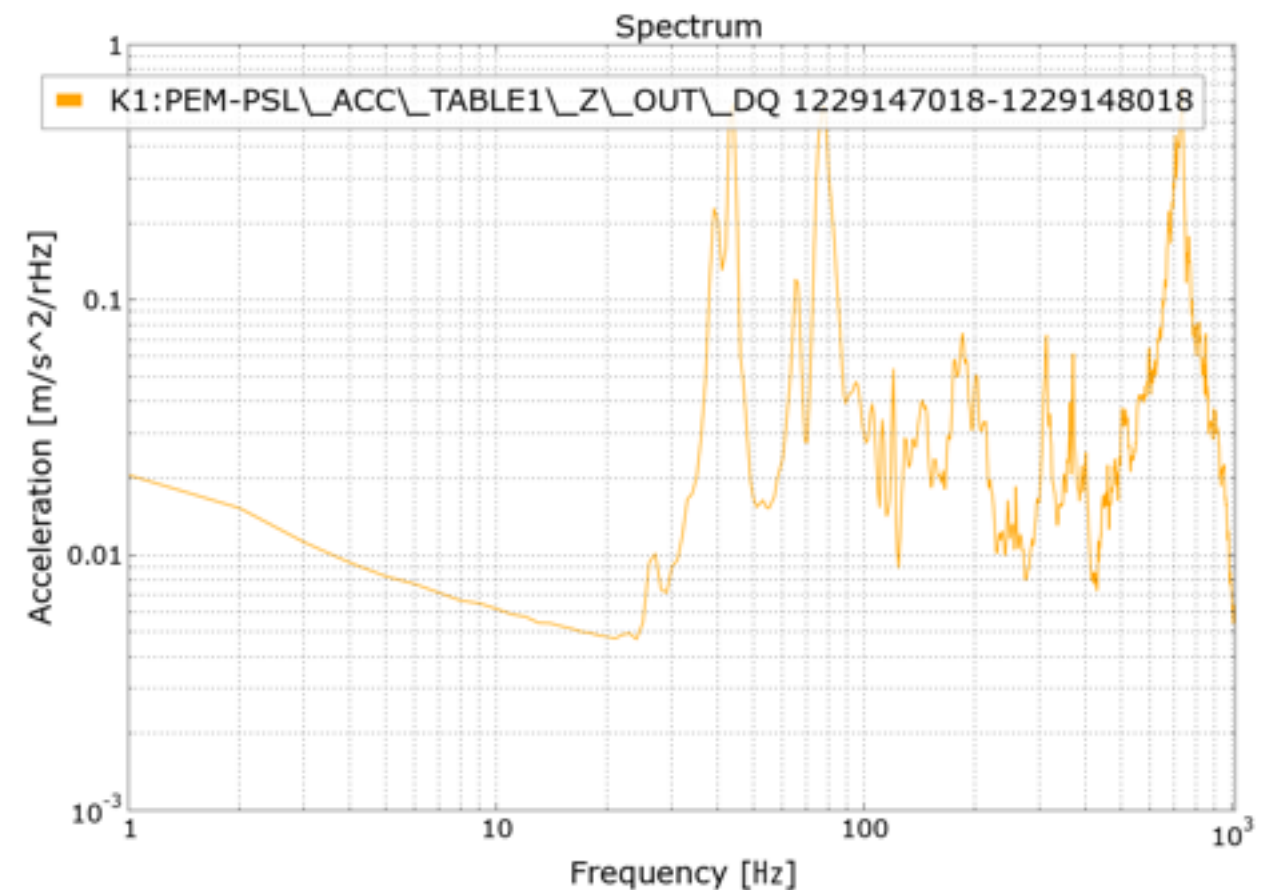
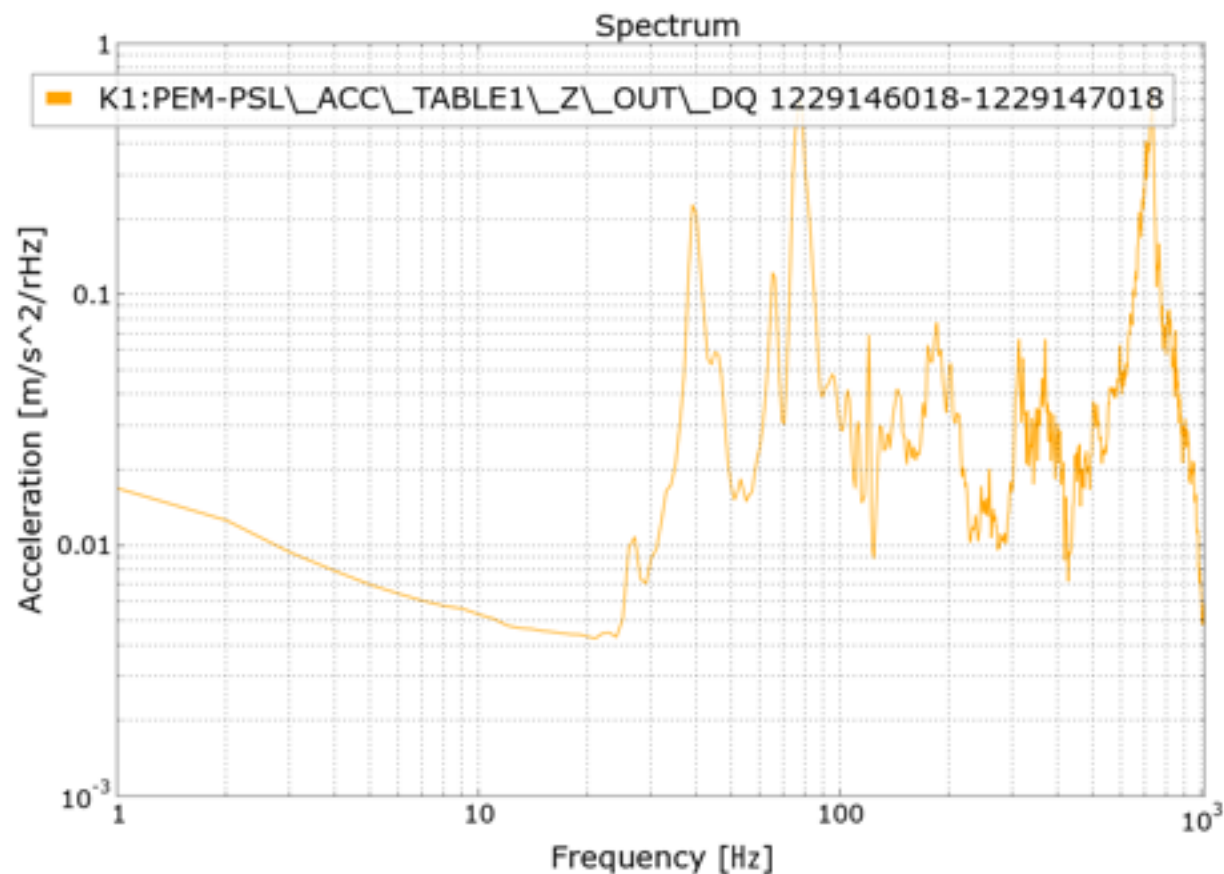
# Line noise



- We found this peak suddenly appeared at the Dec.18th, 2018
- Used Yuzu summary page [https://www.icrr.u-tokyo.ac.jp/~yuzu/bKAGRA\\_summary/html/20181218\\_PEM.html](https://www.icrr.u-tokyo.ac.jp/~yuzu/bKAGRA_summary/html/20181218_PEM.html)



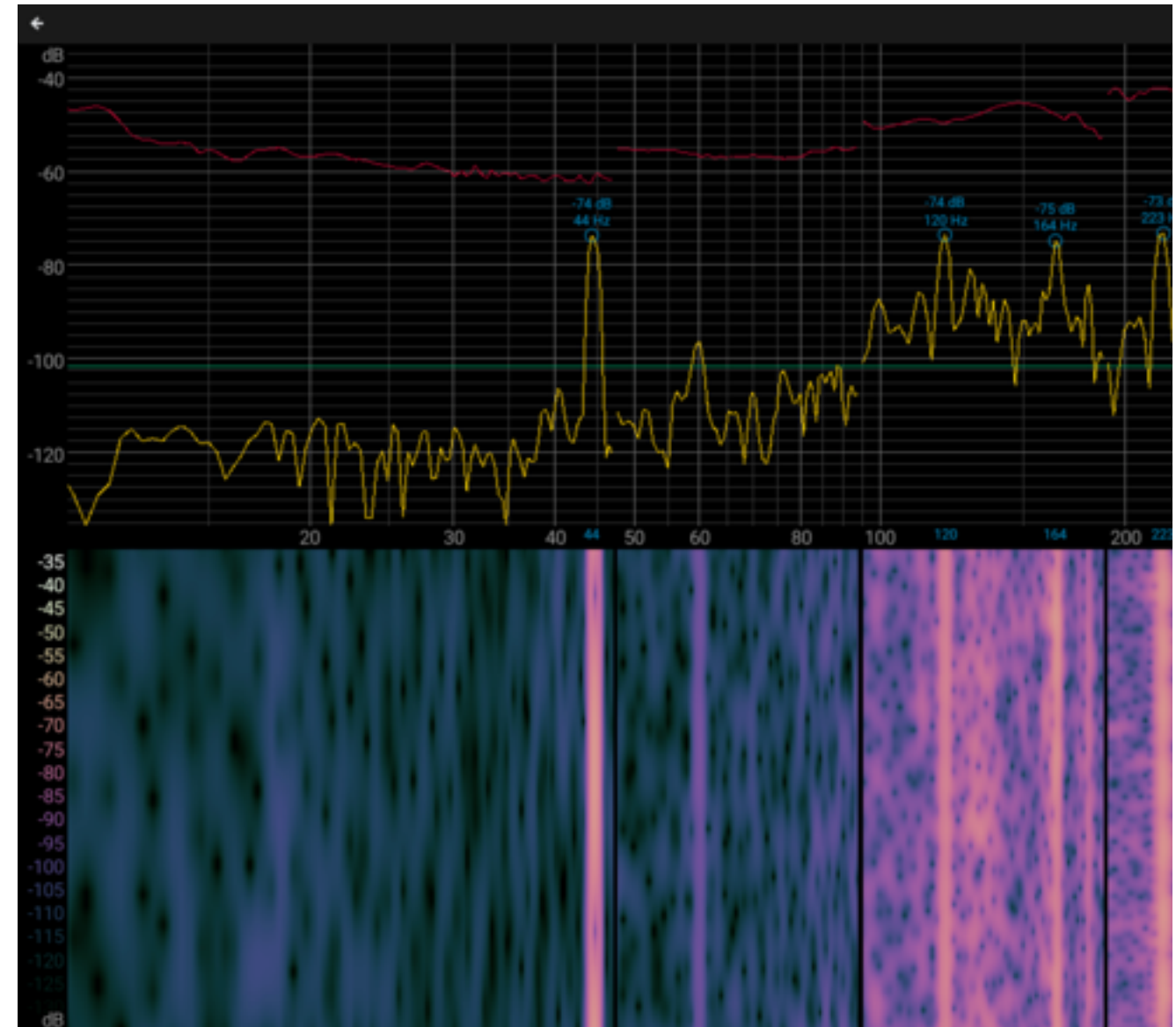
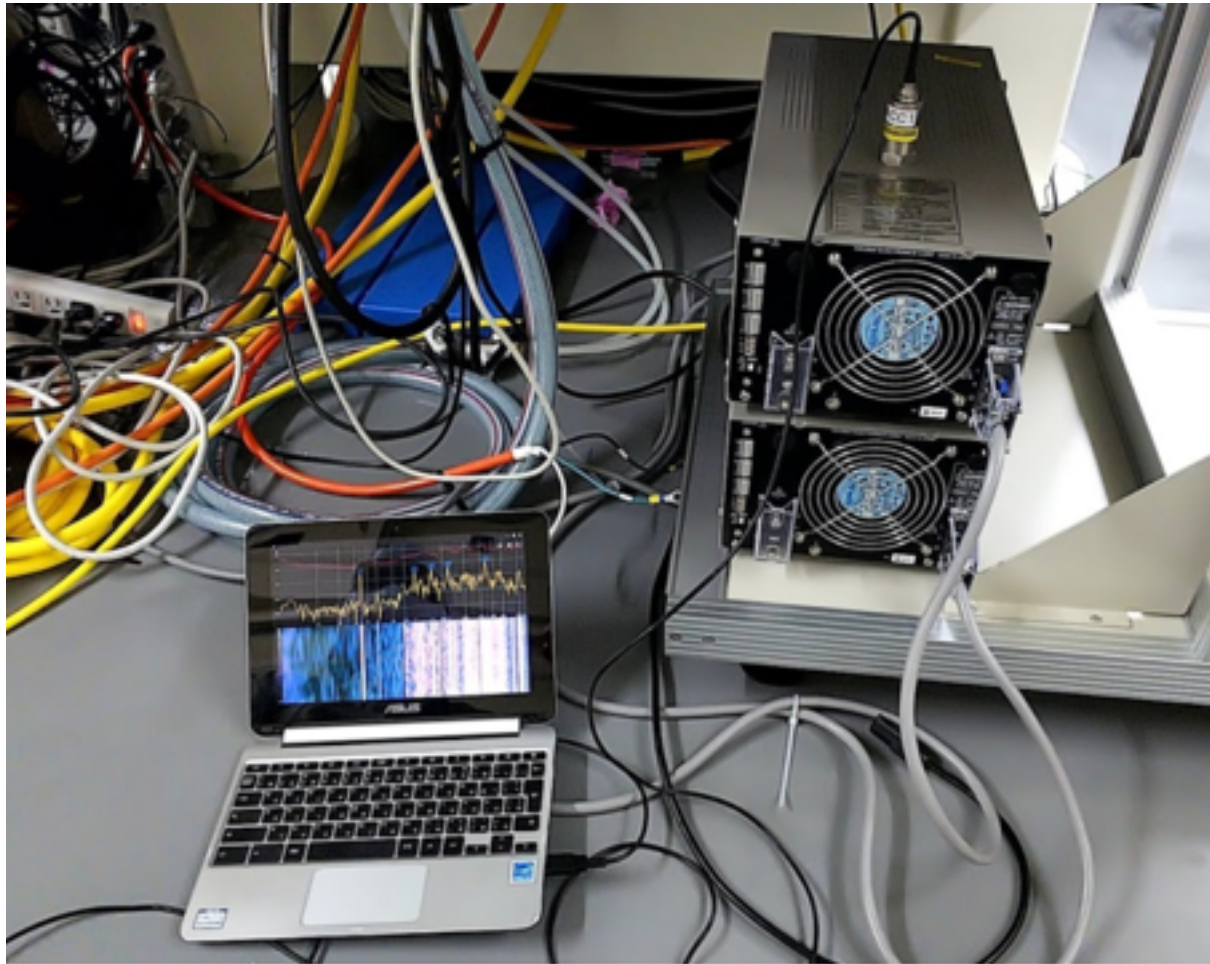
# Line noise



- I can identify this peak suddenly appeared 14:49 18th Dec. 2018
- Used Kozapy spectral
- No specific news from KAGRA klog <http://klog.icrr.u-tokyo.ac.jp/osl/>

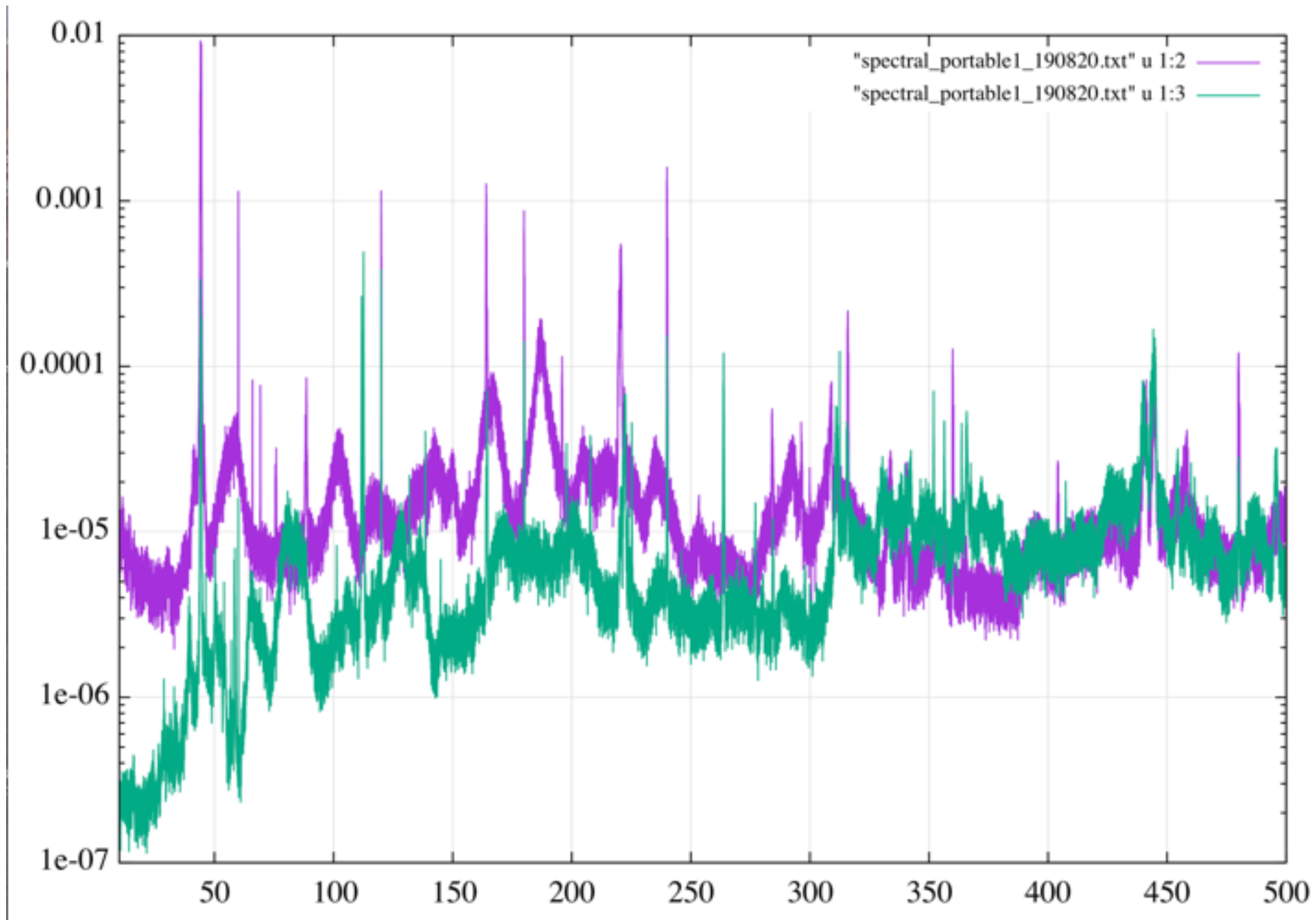


# Line noise



- We found it inside the PSL room
- There is no clear vibration path to the optical table

# Line noise



- Set a portable accelerometer and check lines now

