

# PEM meeting

2019/5/7

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# Today's Report

- Conference
  - KIW6
  - JPS@山形
- Electric noise monitor
  - Problem of AC monitor circuit
  - Next design
- X-end environment with EXC cooling down

# KIW6

## 【Title】

Status of KAGRA Physical Environmental Monitors toward the O3

## 【Abstract】

Physical Environmental Monitors (PEM) play an important role of the noise identification/hunting for GW detectors. Especially, the environmental information of KAGRA will be important for the future GW detectors, because KAGRA is a underground and cryogenic experiment.

We have installed the seismometers, accelerometers, microphones and magnetometers to KAGRA site and are monitoring their behavior during the commissioning term. In this talk, we will report the current progress and future prospect of the PEM in KAGRA toward our joining the O3.

# JPS@山形

## 案1 (status talk)

- 大型低温重力波望遠鏡KAGRAにおける環境雑音モニターの現状

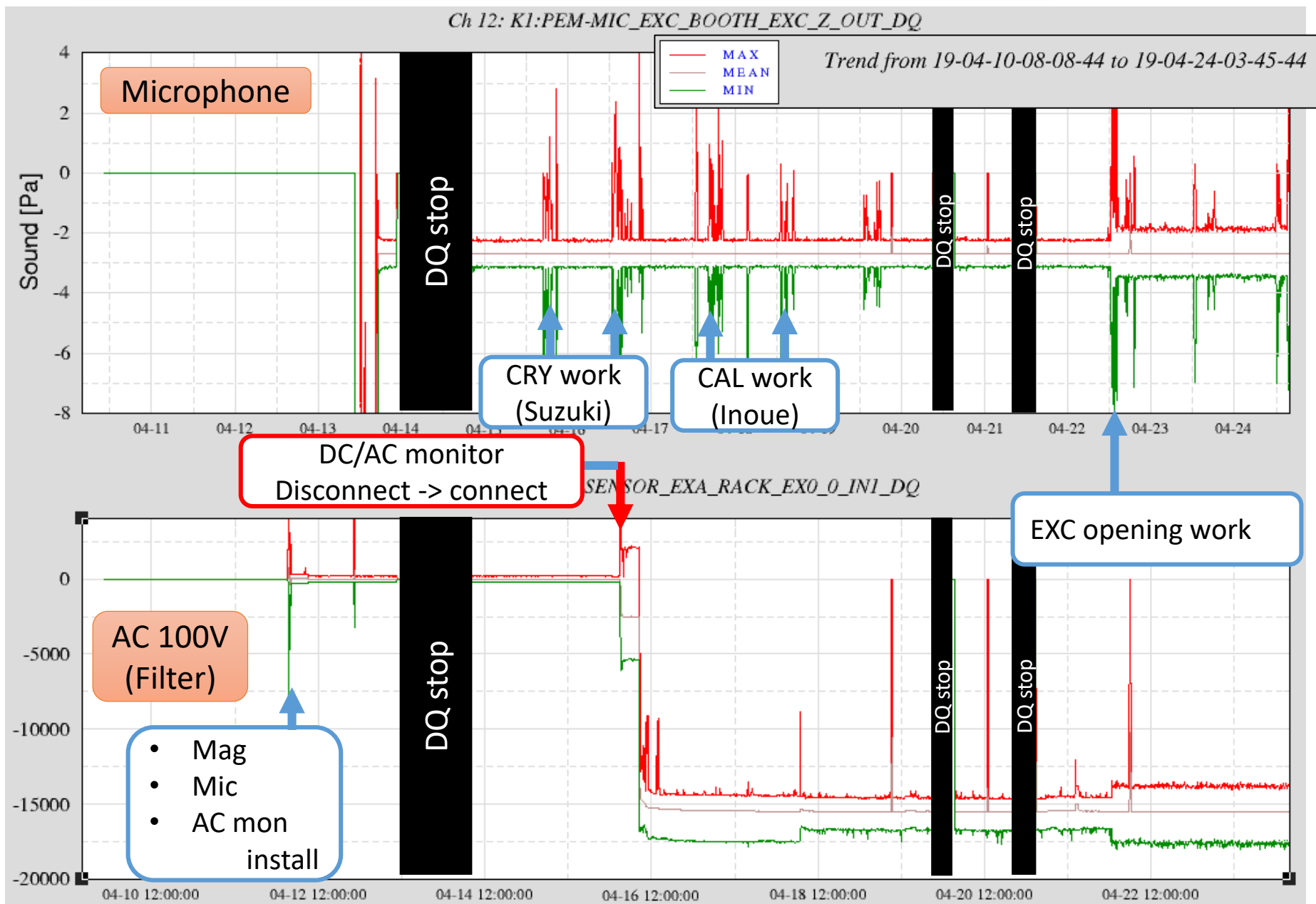
## 案2 (my topics)

- KAGRAにおける冷凍装置由来の雑音評価

## 案3 (next topics)

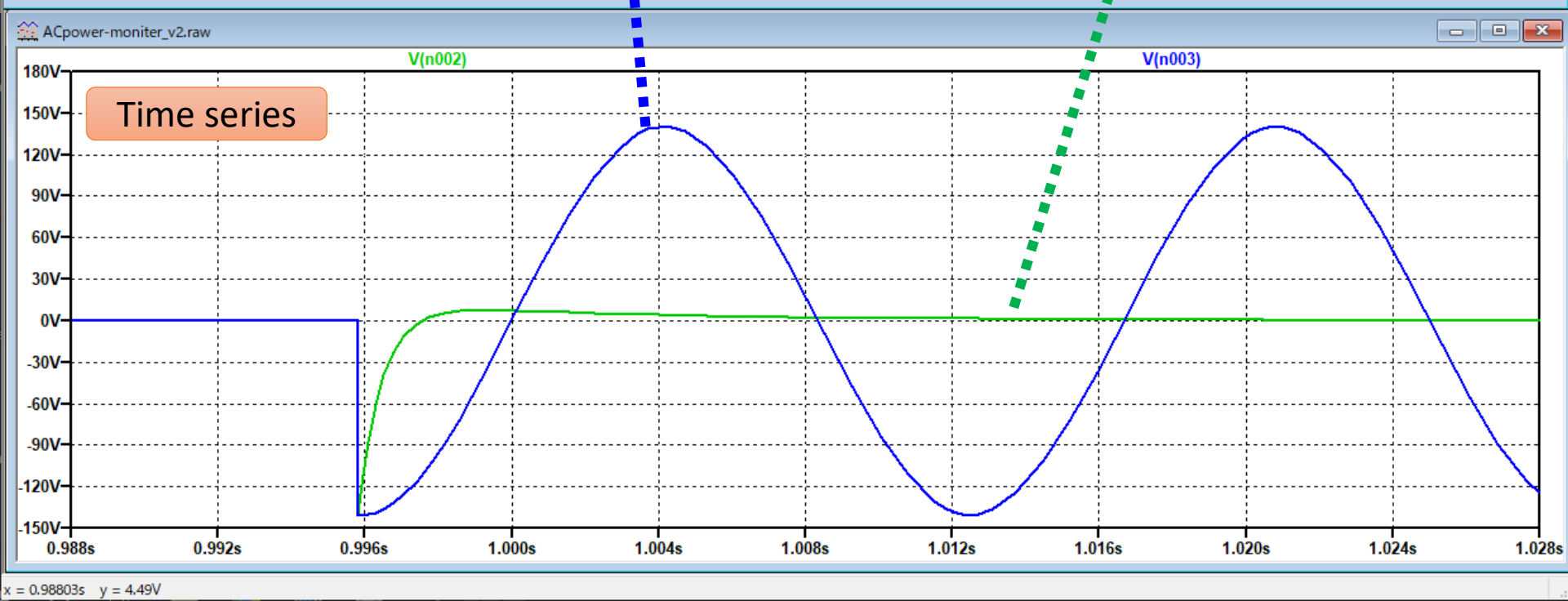
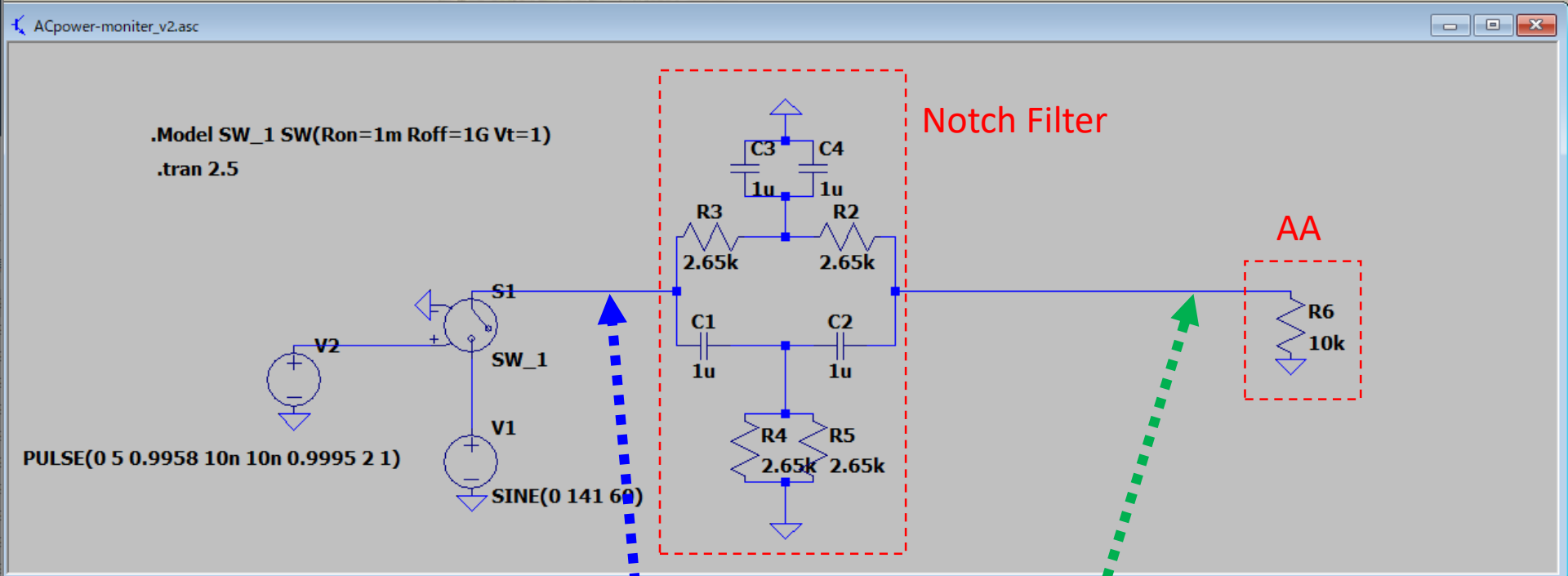
- KAGRAの重力波観測に向けた雑音注入試験の準備状況

# Problem of AC monitor circuit

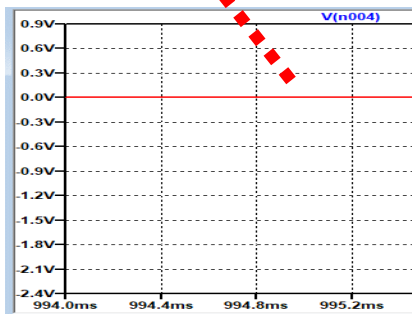
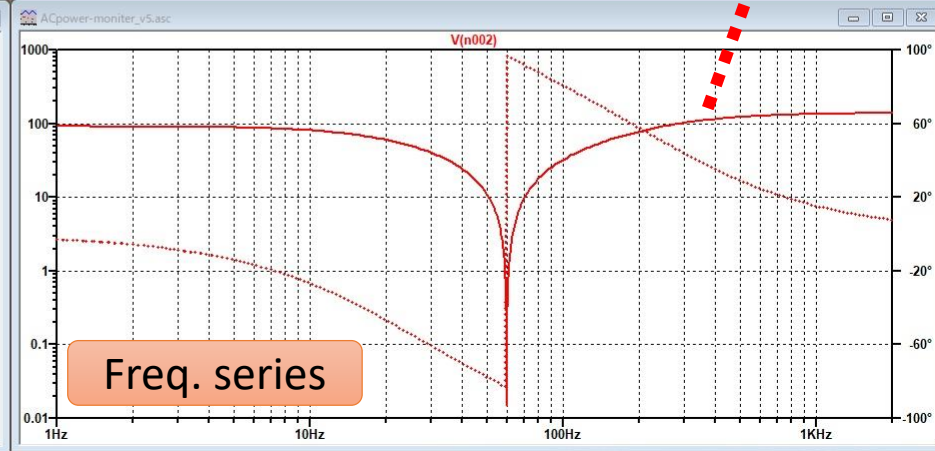
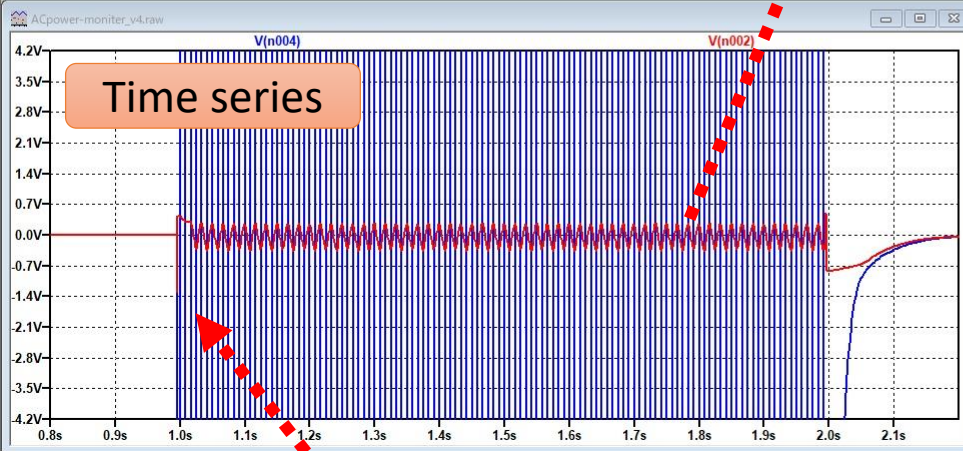
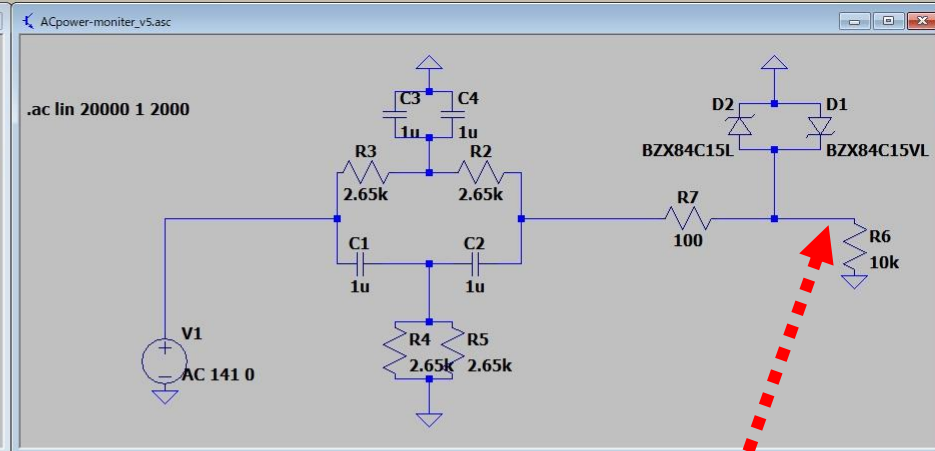
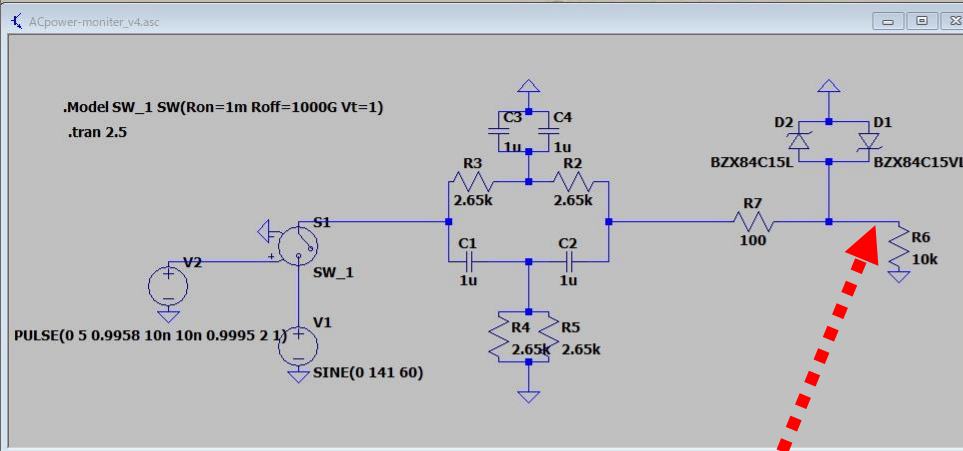


# Problem of AC monitor circuit

- ADC output of AC monitor channel has large offset ( $\sim -15000$  counts) from 4/16 work (disconnect / re-connect)
- I check it at 4/26 in the mine.
  - This offset did not disappear when I removed the circuit.
  - This offset disappears when I turned off the AA-chassis.
    - The ch.1 of this AA was damaged by my circuit.
  - I reported it to Simoda-san and commented in JGWdoc.
- LTspice simulation of the notch filter with a switch.
  - Sometimes the voltage of AA-input becomes very large when the timing of ON/OFF (depends on the phase)
  - See the next page



# Next design of AC monitor circuit

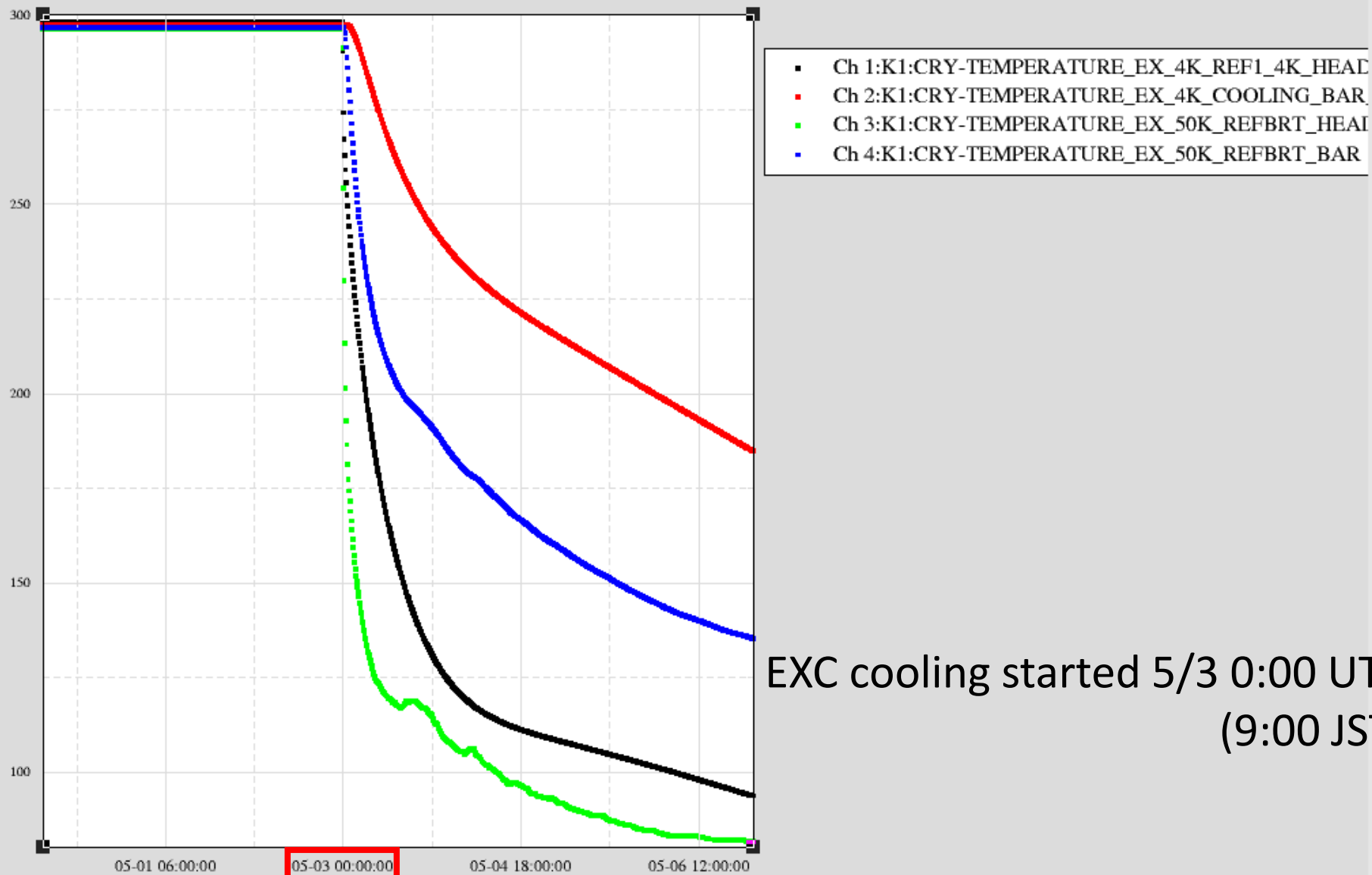


- By using Zener diodes, the voltage is well reduced.
- I will conduct this study more carefully.



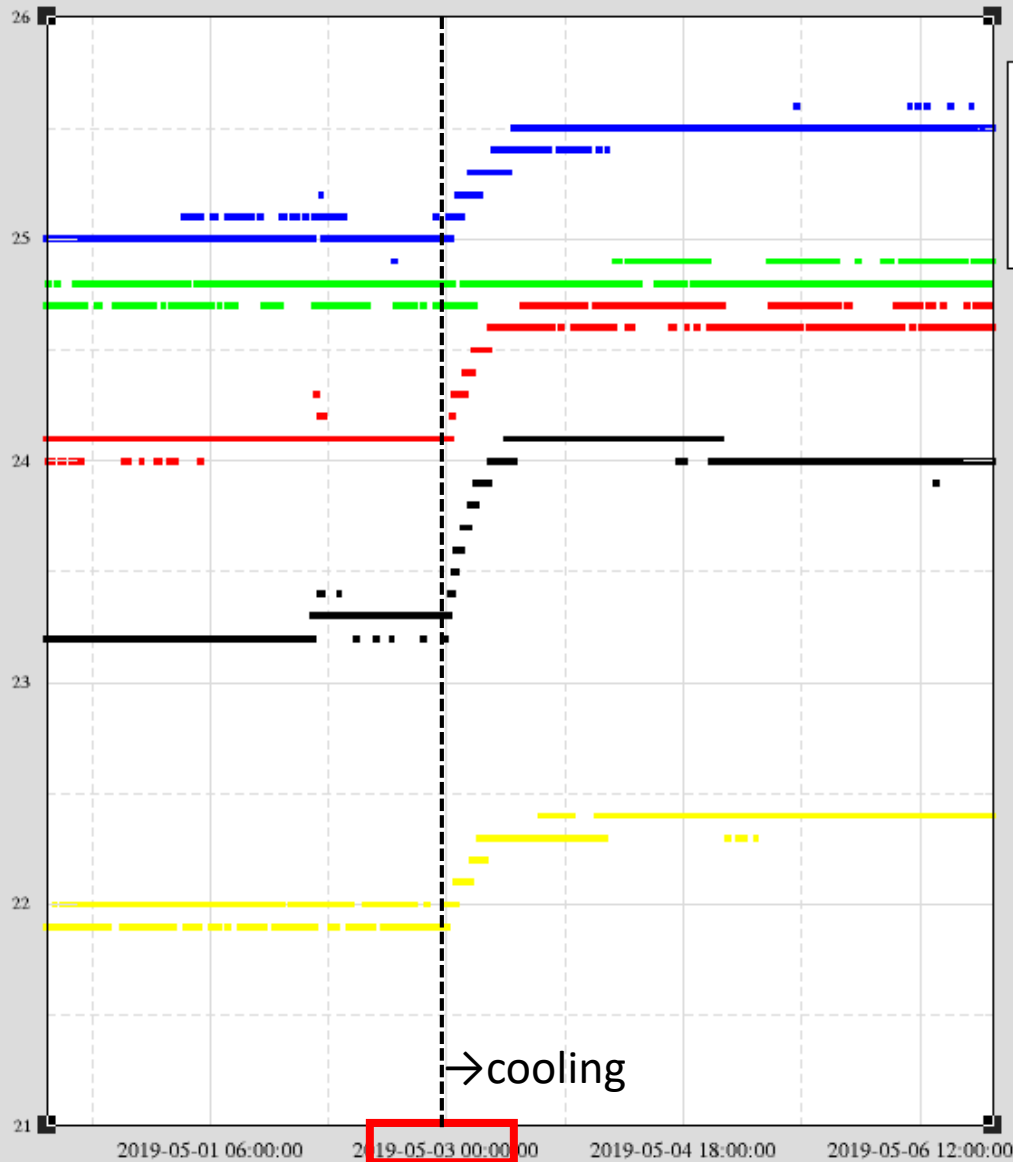
# X-end environment with EXC cooling down

play Multiple MIN Trend from 19-04-30-00-51-44 to 19-05-07-00-50-44



# X-end environment with EXC cooling down

lay Multiple MIN Trend from 19-04-30-00-51-44 to 19-05-07-00-50-44



Room Temperature

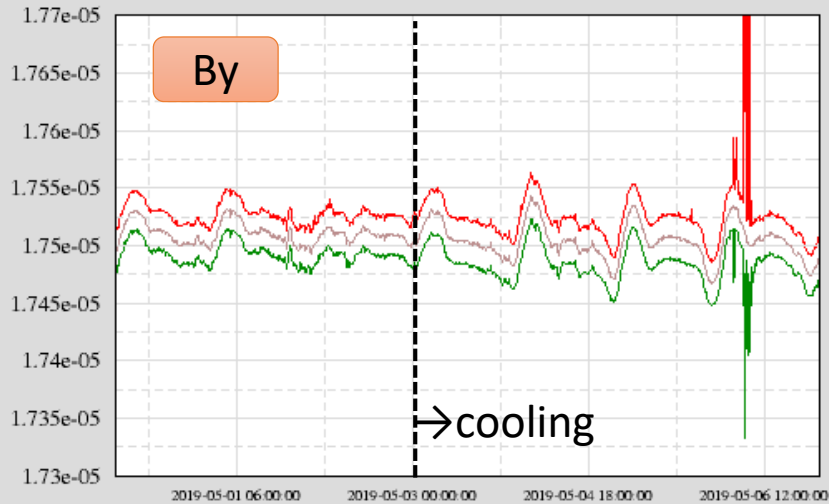
- Ch 5:K1:PEM-TEMPERATURE\_BOOTH\_EXC1F
- Ch 6:K1:PEM-TEMPERATURE\_BOOTH\_EXC2F
- Ch 7:K1:PEM-TEMPERATURE\_BOOTH\_EXV
- Ch 8:K1:PEM-TEMPERATURE\_FIELD\_EXA
- Ch 9:K1:PEM-TEMPERATURE\_FIELD\_EXAIR

# X-end environment with EXC cooling down

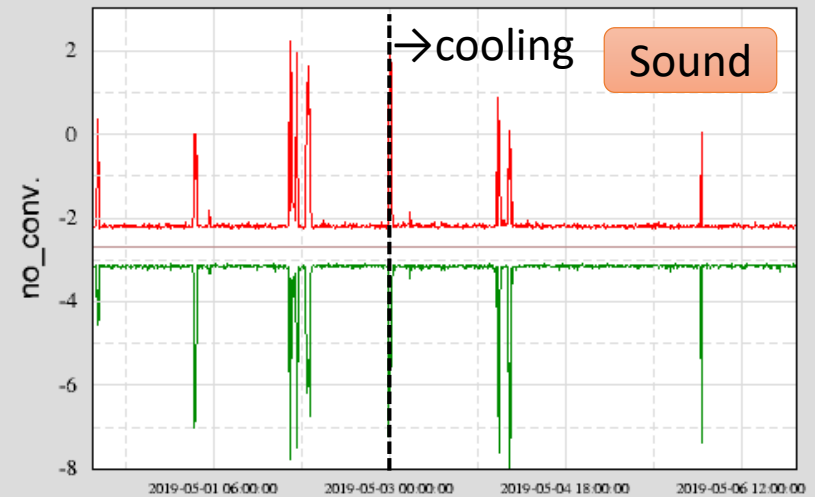


Trend from 19-04-30-00-51-44 to 19-05-07-00-51-44

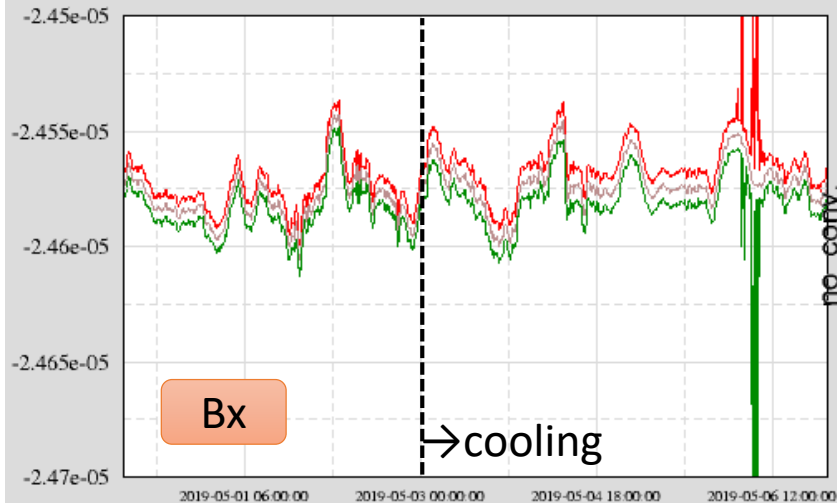
Ch 6: K1:PEM-MAG\_EXC\_BOOTH\_EXC\_Y\_OUT\_DQ



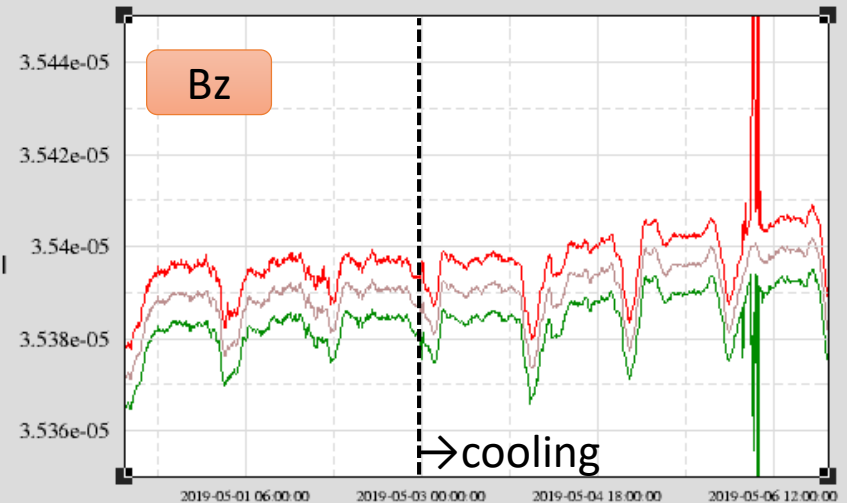
Ch 8: K1:PEM-MIC\_EXC\_BOOTH\_EXC\_Z\_OUT\_DQ



Ch 5: K1:PEM-MAG\_EXC\_BOOTH\_EXC\_X\_OUT\_DQ



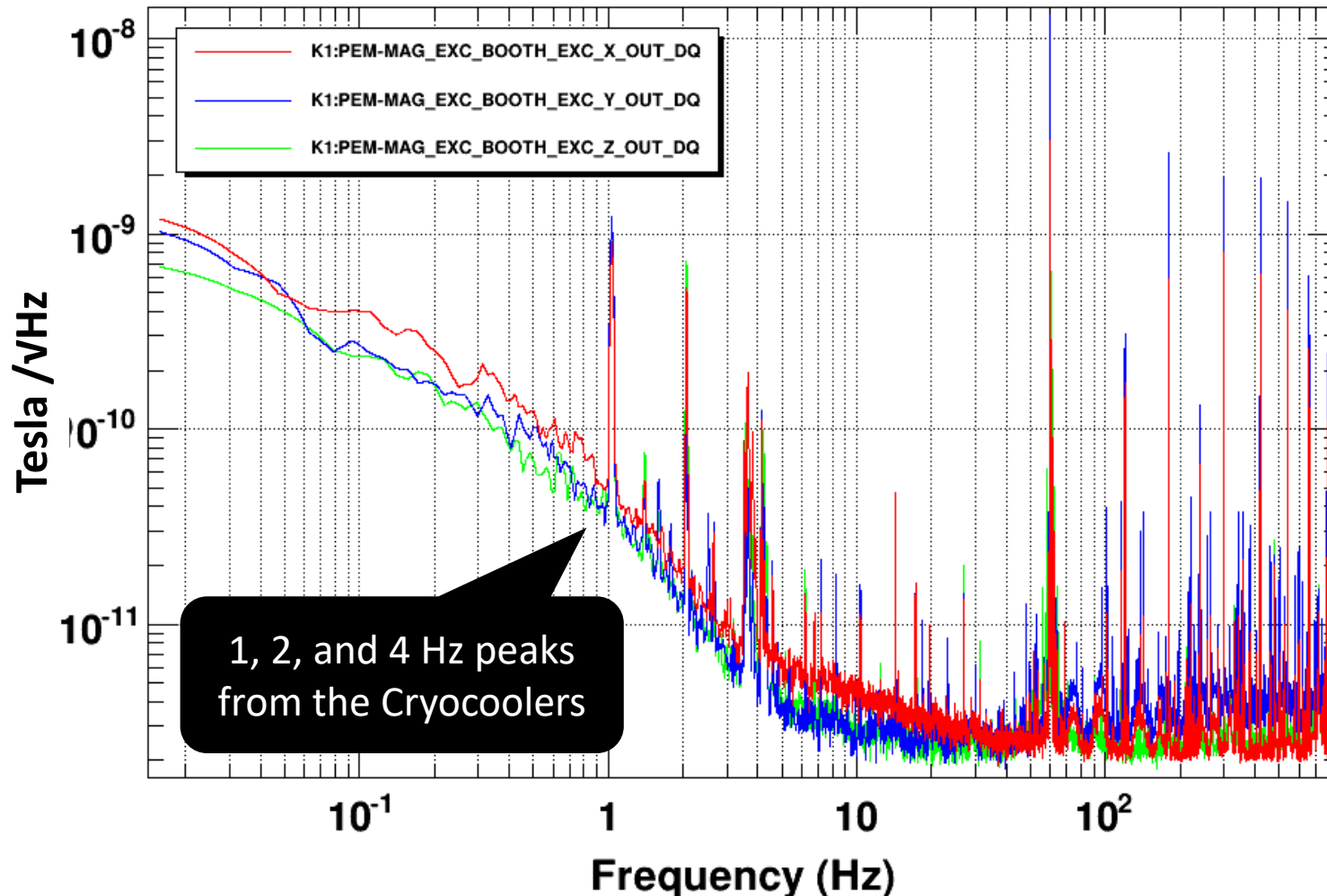
Ch 7: K1:PEM-MAG\_EXC\_BOOTH\_EXC\_Z\_OUT\_DQ



# X-end environment with EXC cooling down

Power spectrum

Magnetic Field in EXC Booth



T0=07/05/2019 00:14:43

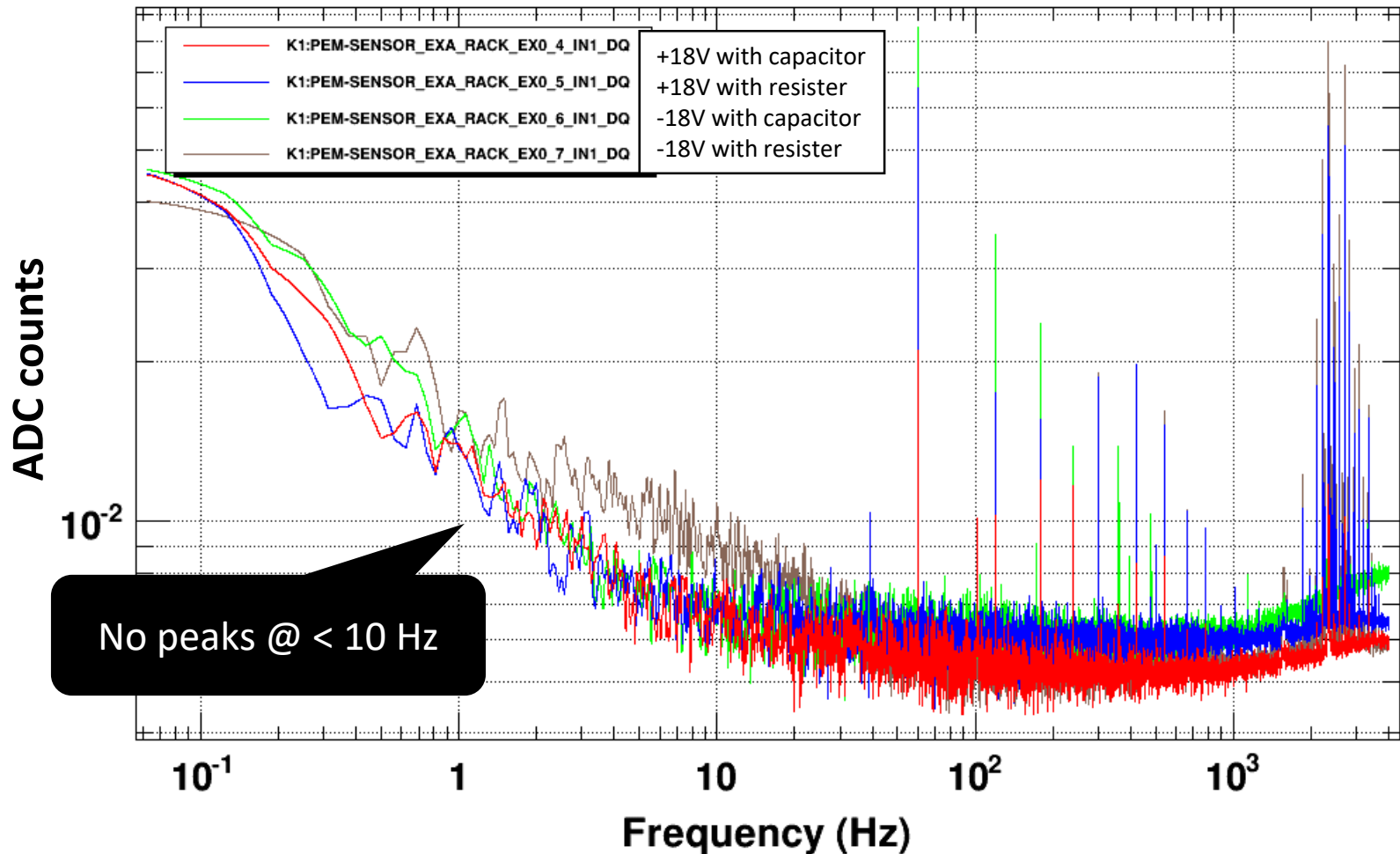
Avg=20/Bin=5L

BW=0.0234367

# X-end environment with EXC cooling down

Power spectrum

$\pm 18V$  DC monitoring



T0=07/05/2019 04:12:19

Avg=30/Bin=6L

BW=0.0937422

# X-end environment with EXC cooling down

The peaks in 1/31 measurement are not seen today...

