Weekly Report
2019-07-16

Kim, Hanbeom

Detector Design Improvement (plan)

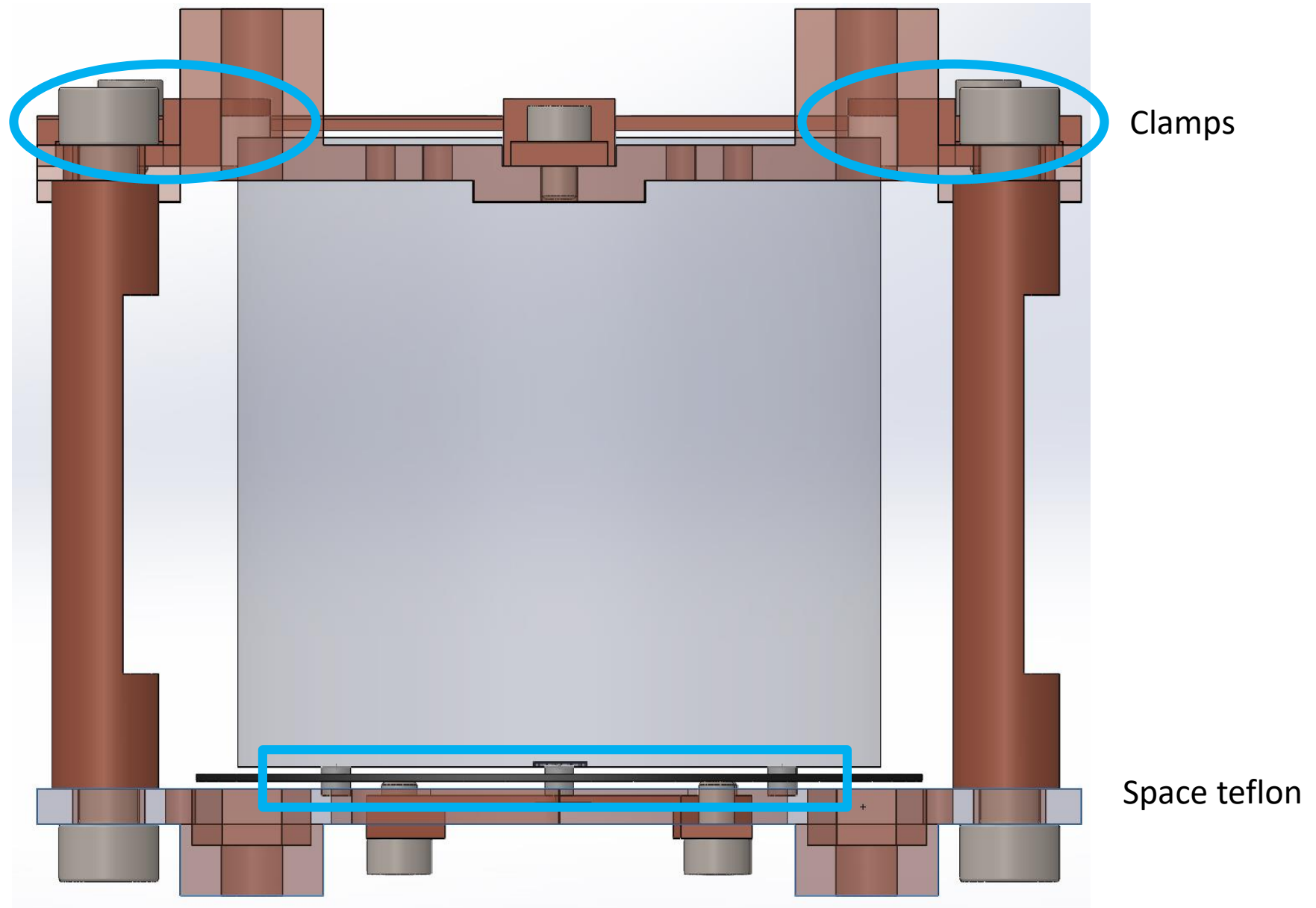- New idea:

Clamps
(force)

Crystal

Teflon

Ge wafer
Photon sensor

Get rid of this part
(minor goal: Cu
mass reduction)

- Goal: reduce photon signal noise by vibration

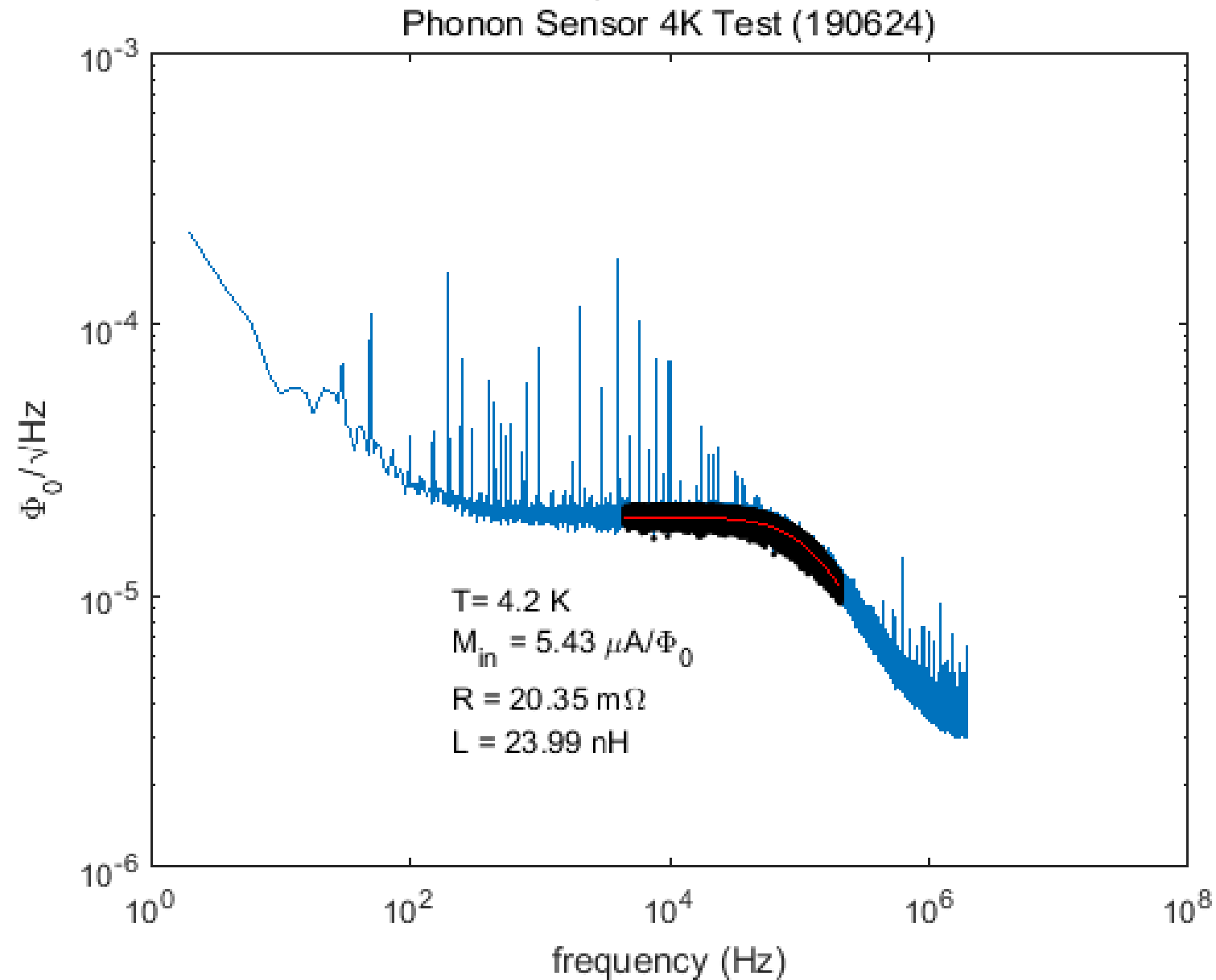# New detector module design - 190520

Clamps

Space teflon
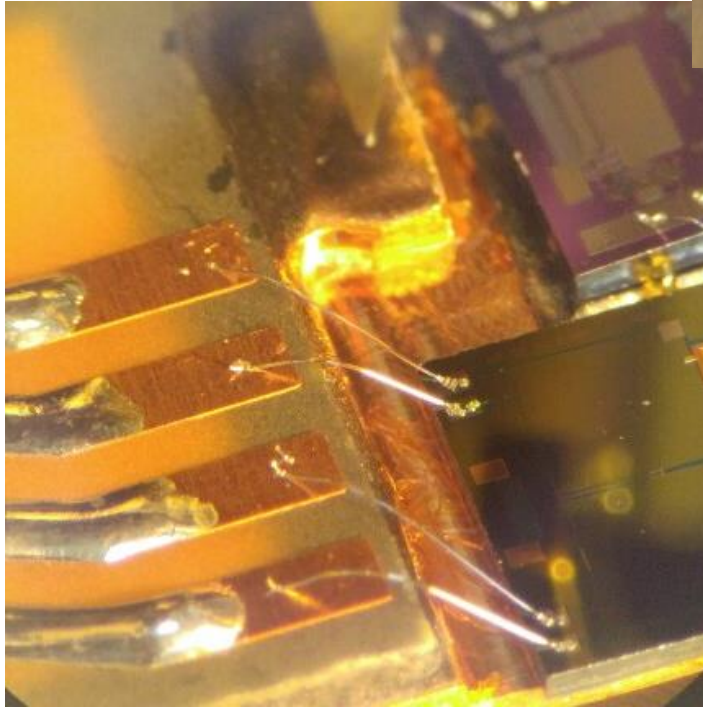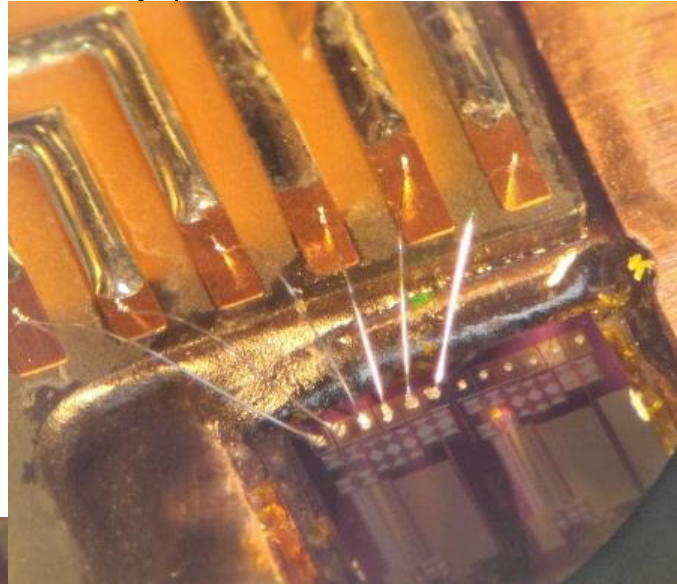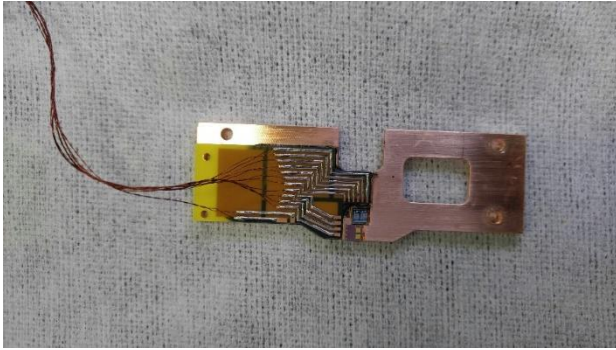
New detector module design – sensor

New detector module design – sensor

Phonon Sensor 4K Test (190624)

T= 4.2 K

M_{in} = 5.43 μA/Φ_0

R = 20.35 mΩ

L = 23.99 nH
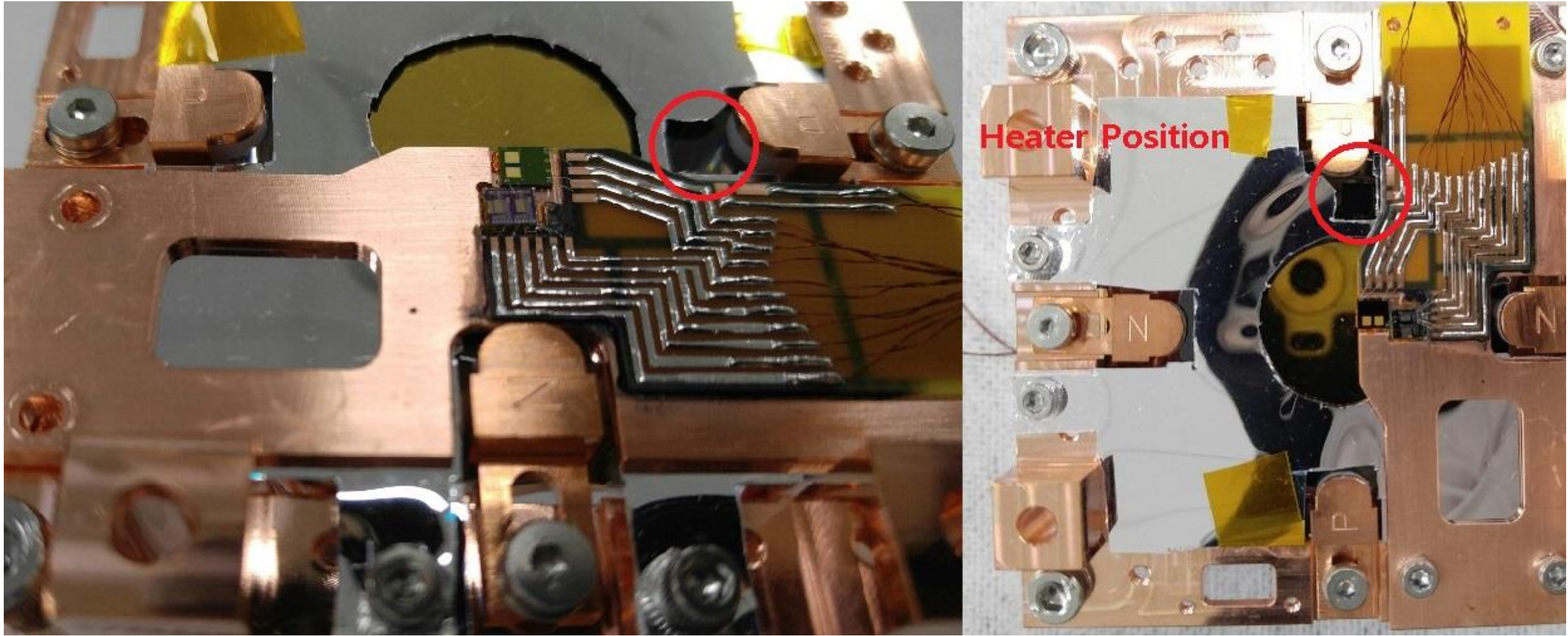
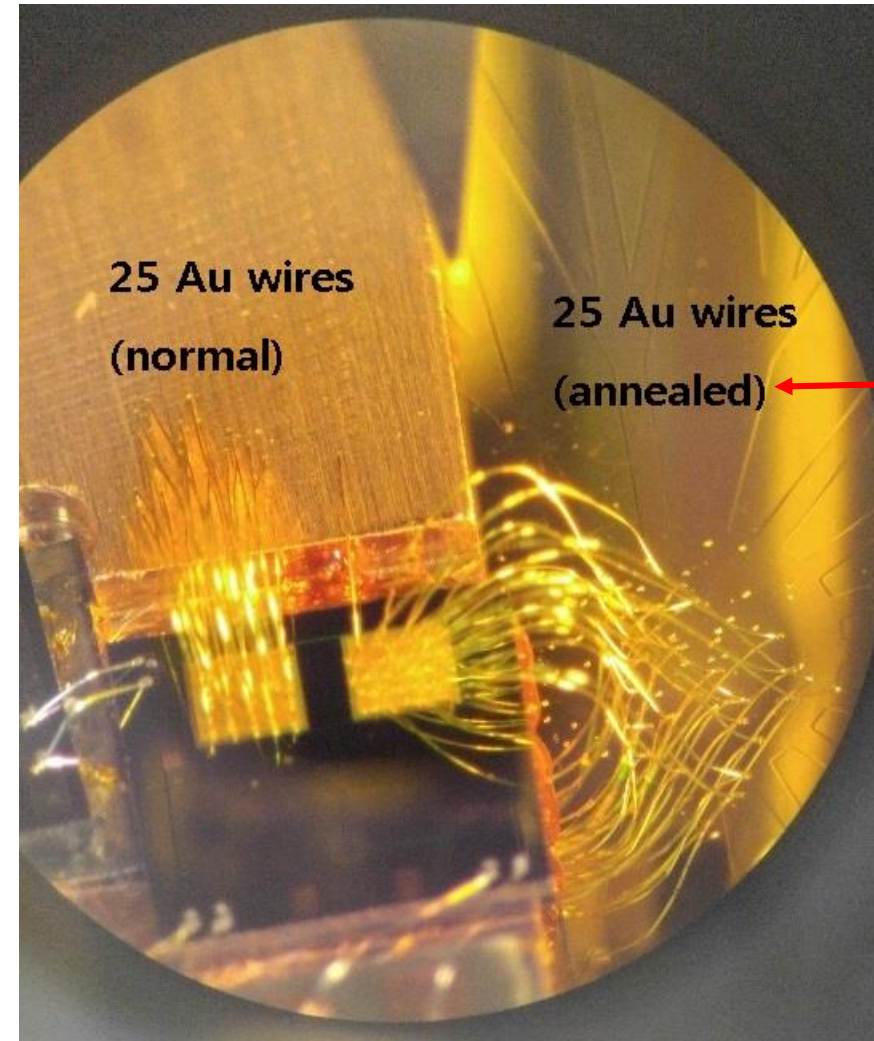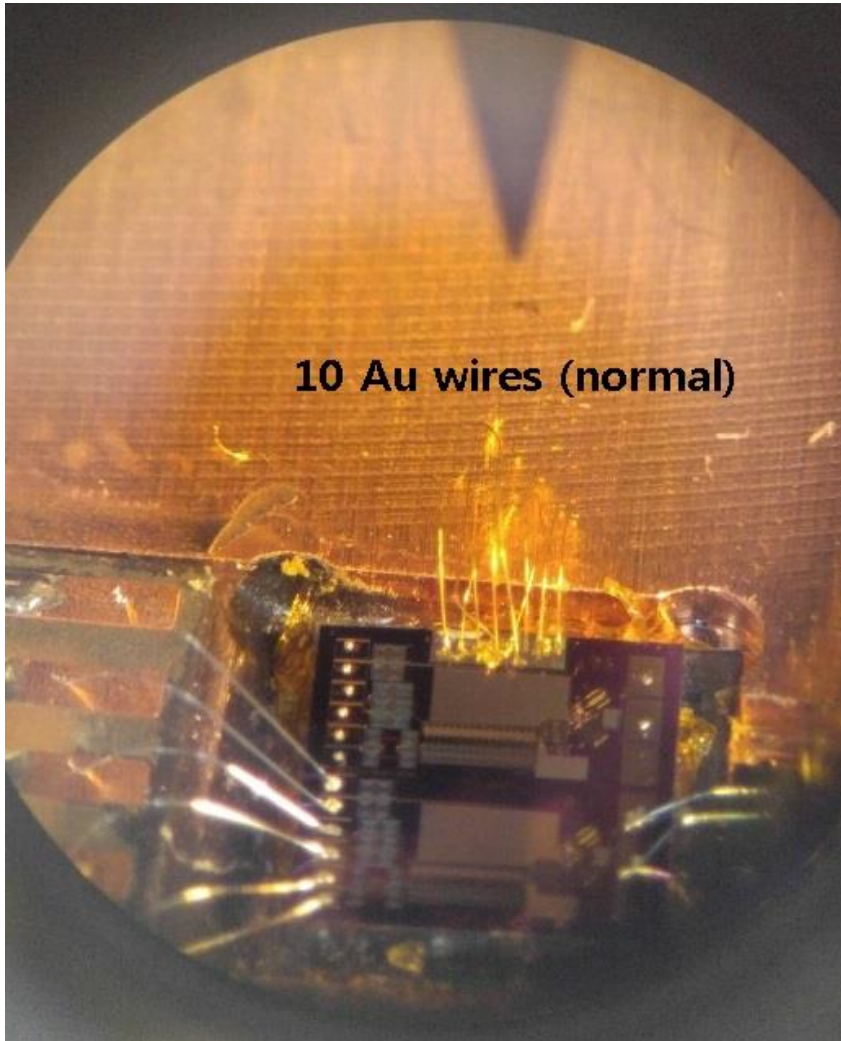# New detector module design – reflector -190624
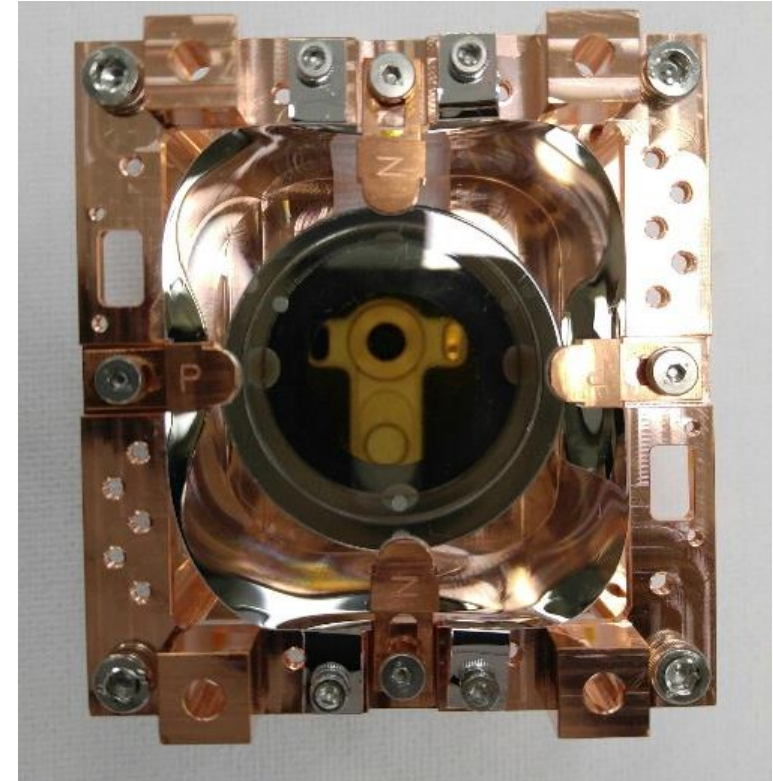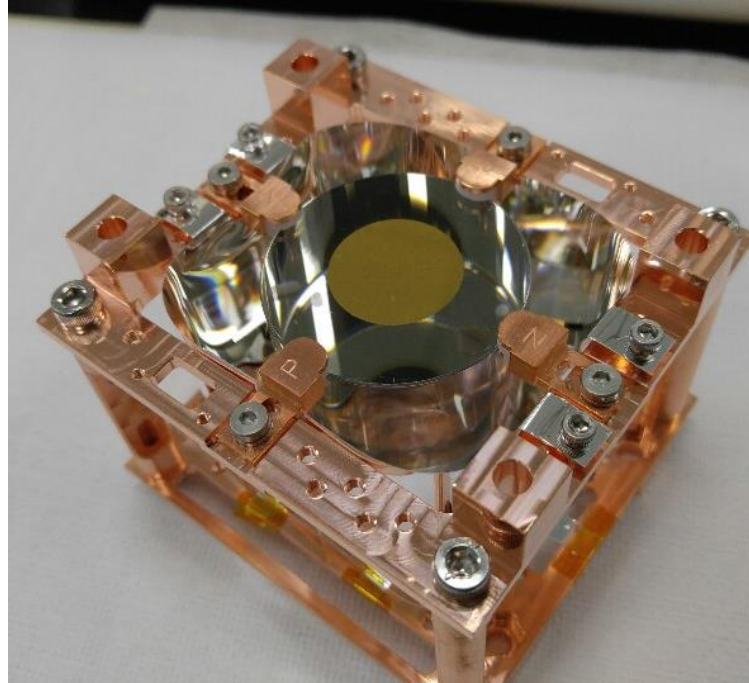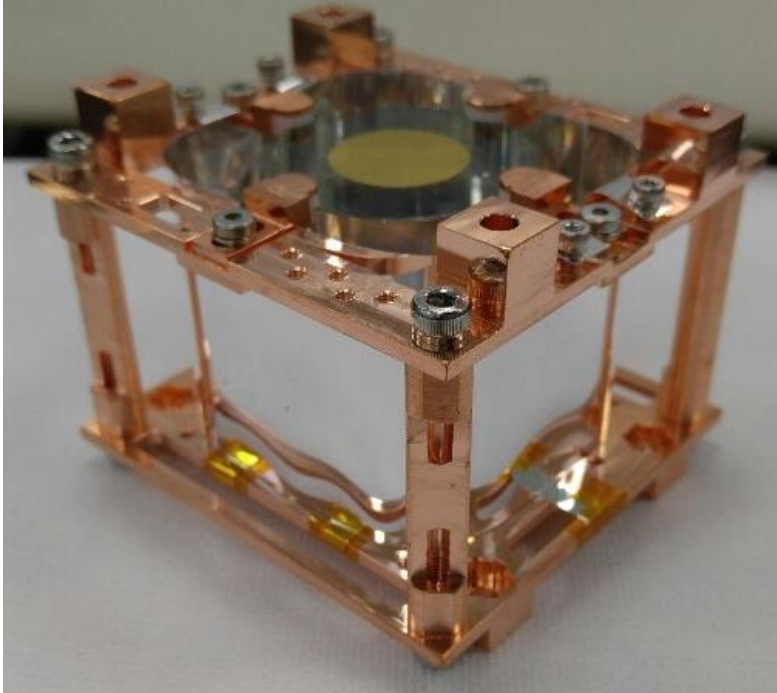
New detector module design – reflector
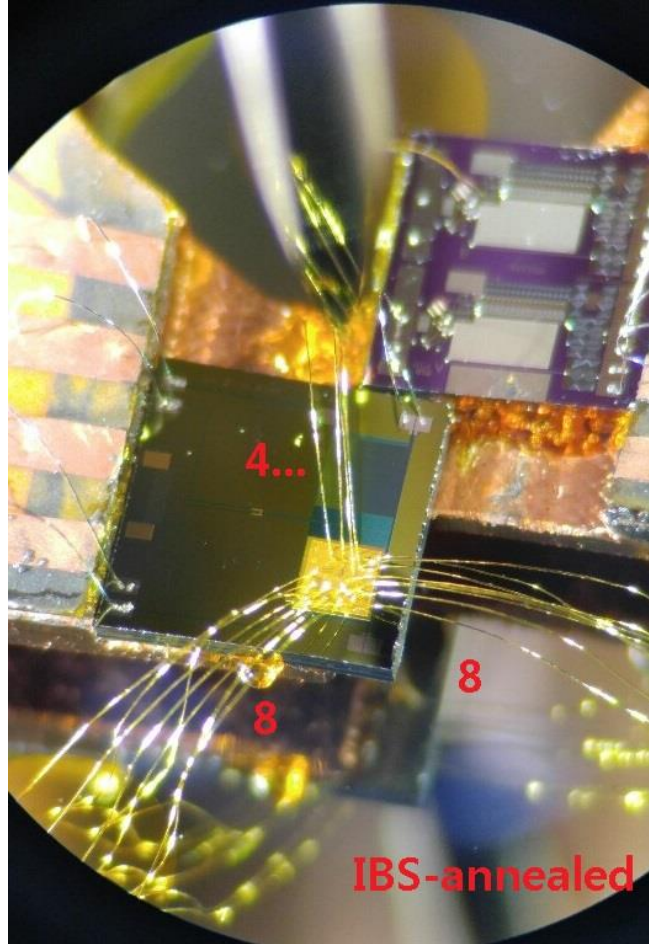

- Heater Resistance: 1119 Ω

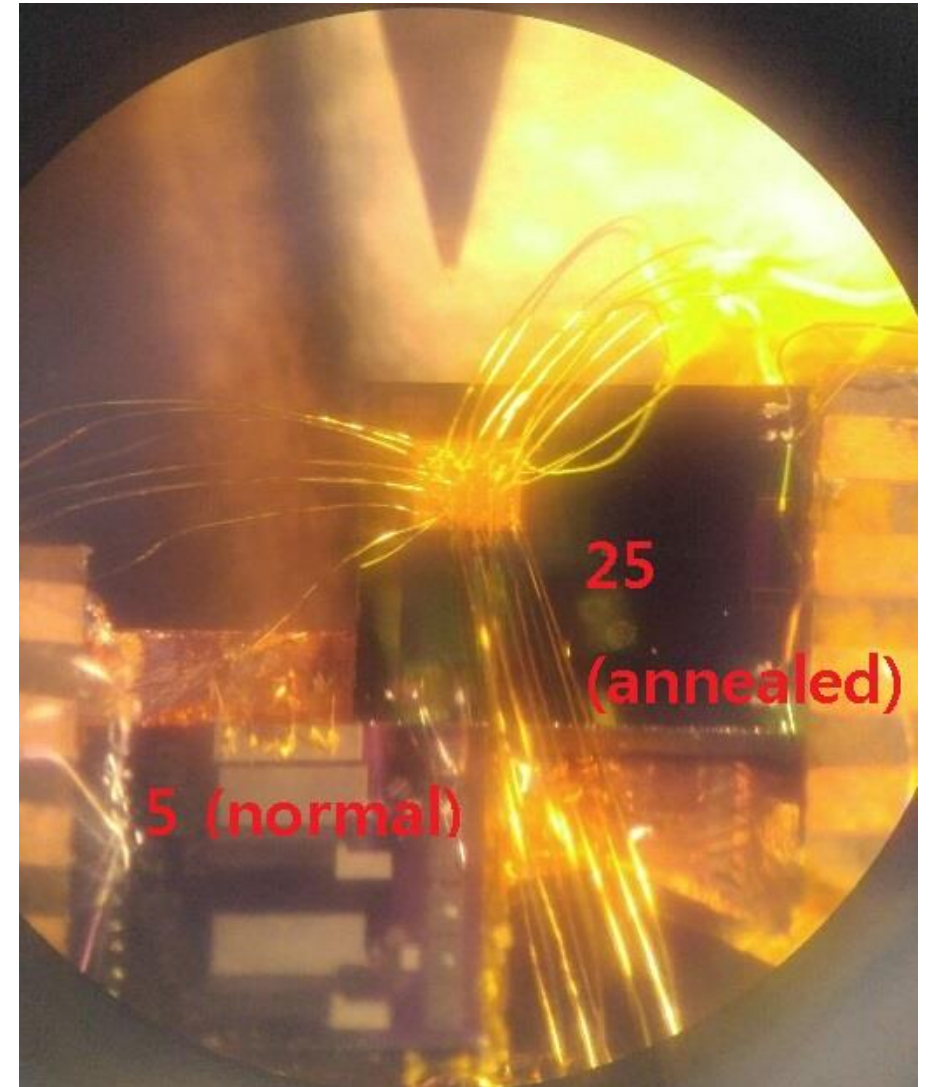# New detector module design – Au wiring

- Phonon

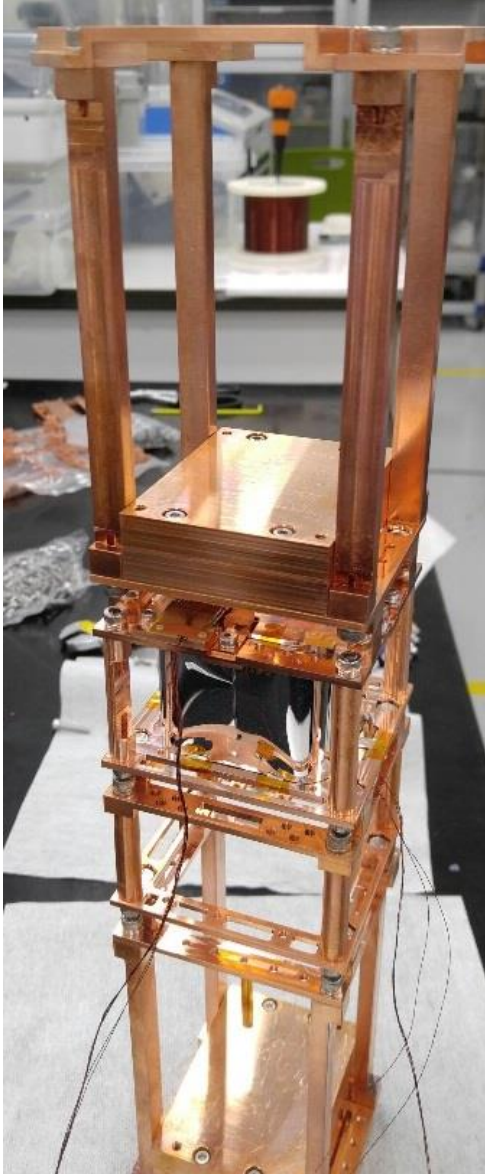# New detector module design – Au wiring

- Photon

On the photon sensor, the highly annealed wire is used, but it ran out before finishing wiring.

New detector module design – assembly

- Tower

- Some shortcomings:
  - Wire direction
  - Post height
  - Fixing method of reflector
  - …

New detector module design

➢ Attachment of MMC & SQUID + Wiring - Done
➢ 4K Test – half done - Done

➢ Assembly of detector including clamp, wafer, and crystal - Done
➢ To make reflector - Done

➢ Test on RODY (refrigerator at IBS)
   ▪ Now cooling…

New detector module design – refrigerator
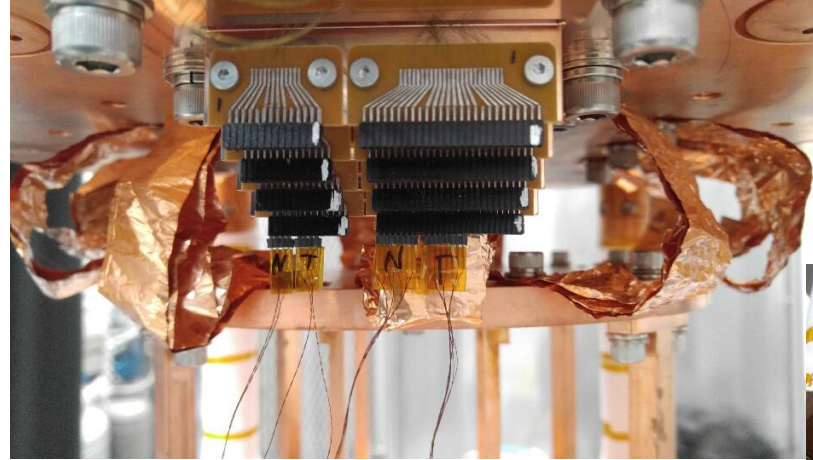
New detector module design – refrigerator

- 190705 (Friday)
  ~6 hours

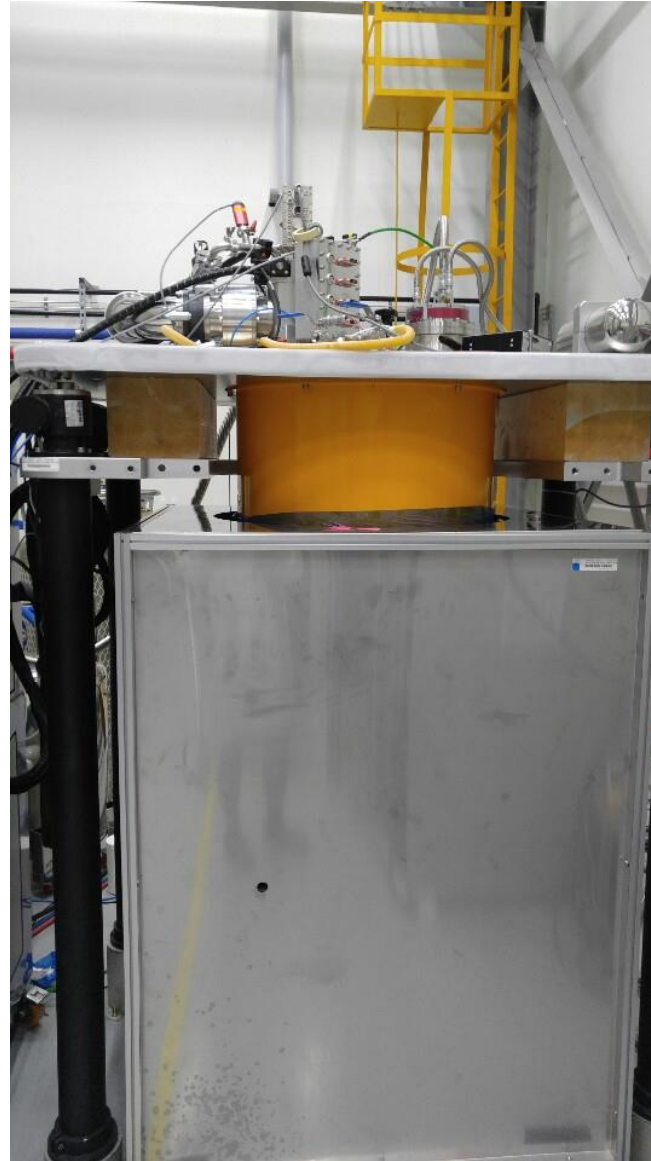# New detector module design – refrigerator cooling

1. Began pumping at 18:40, 190705

2. Compressor on 20:39

3. Liquid N_2 pre-cooling & exchange gas added

New detector module design – refrigerator cooling

1. Began pumping at 18:40, 190705

2. Compressor on 20:39

3. Liquid N_2 pre-cooling & exchange gas added

4. Monitoring (& stop pre-cooling)

190708 (Today) 9:42 a.m.

Temperature rose twice
- LN2 ran out → dewar change
(2 dewars were used.
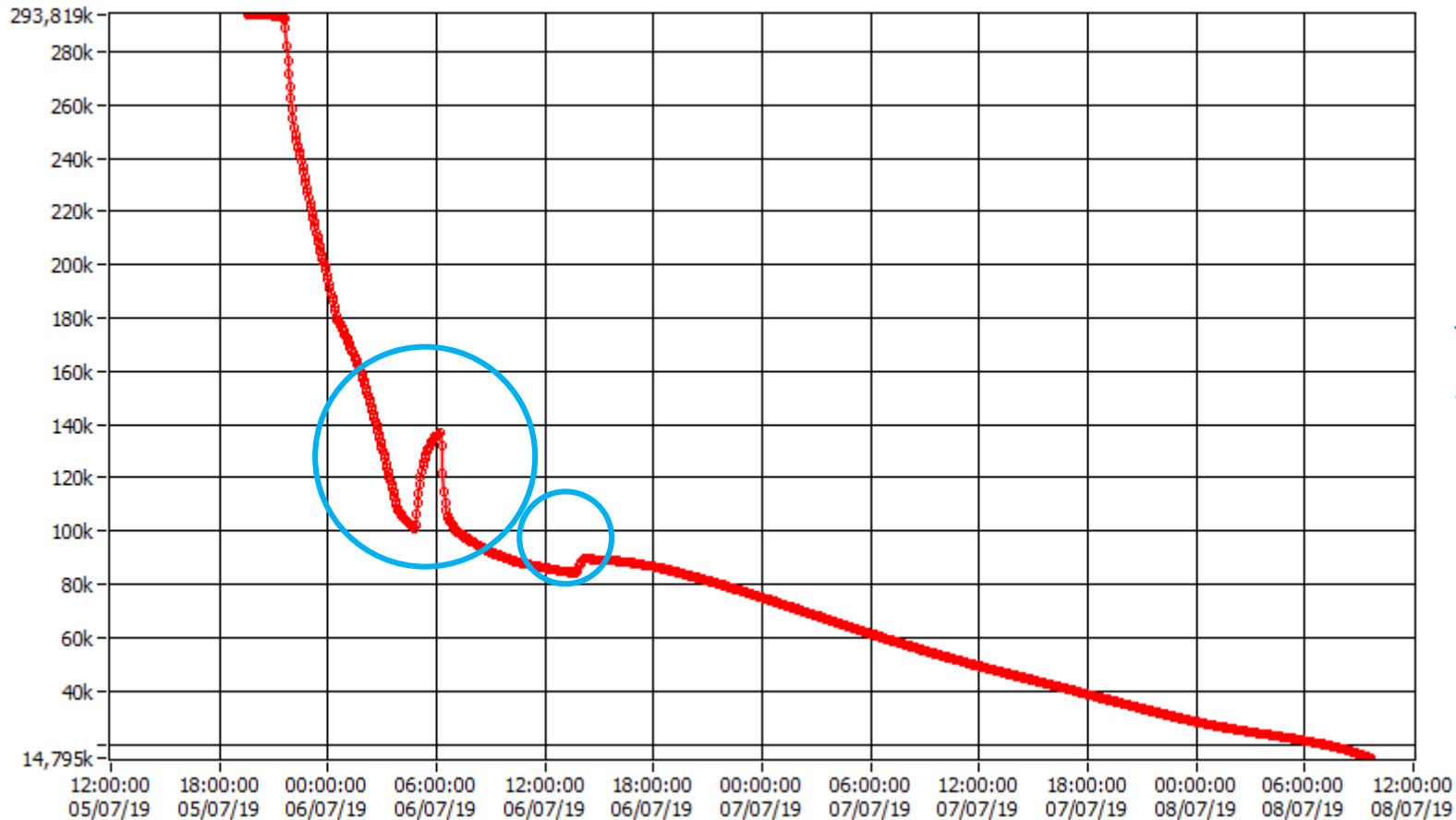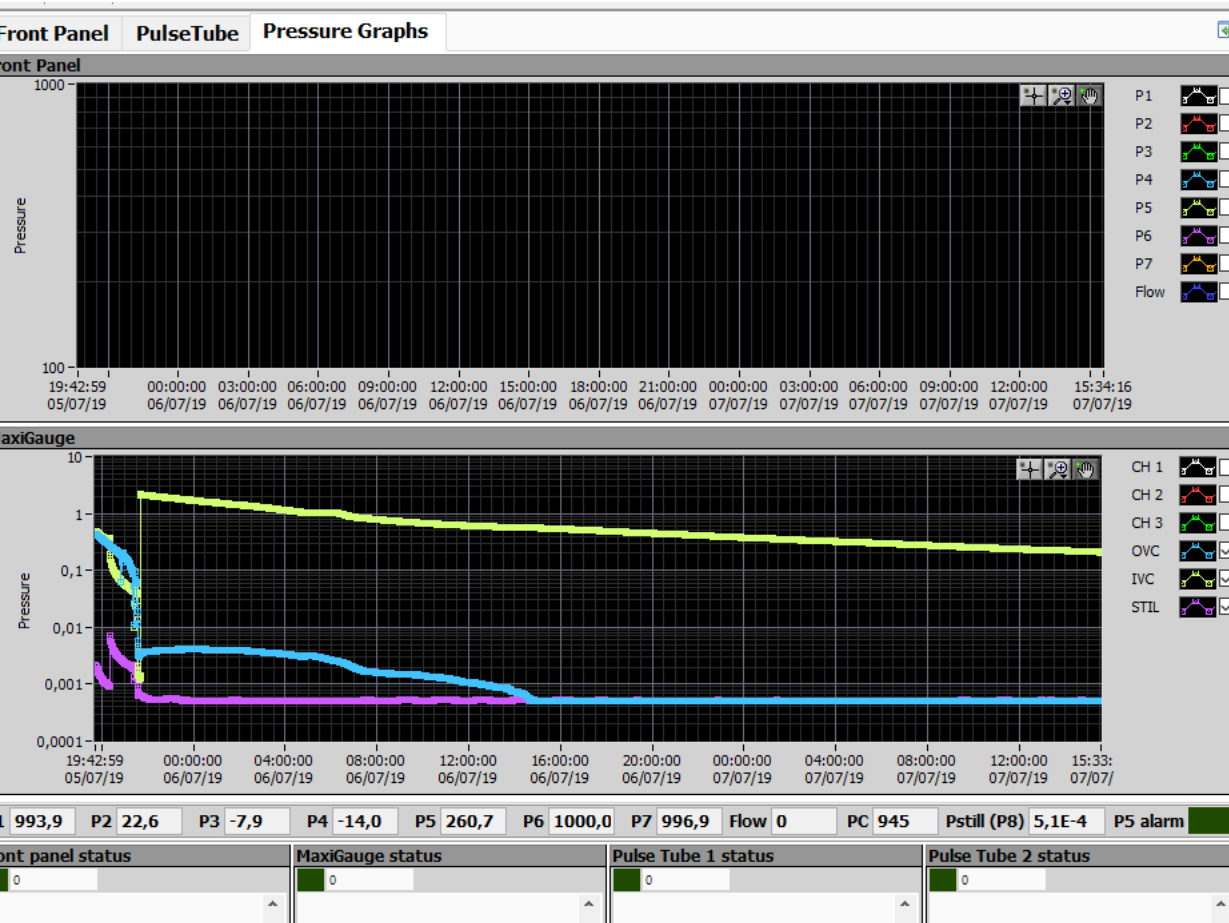Removed at 2:10 p.m. 190706)

New detector module design – refrigerator cooling

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4. monitoring

New detector module design – refrigerator cooling

1. Began pumping at 18:40, 190705

2. Compressor on 20:39

3. Liquid N_2 pre-cooling & exchange gas added

4. Monitoring (& stop pre-cooling)
   - To use heater to activate the exchange gas

5. Zero field cooling – Jul. 8th~9th

6. SQUID Tuning (@ < 5 K) - 9th

7. Condensing – 9th~10th

8. MMC field insertion – 10th

9. PID (20 mK) started & getting data signals – doing Now