Cryogenic accelerometer and sphere without DLC in Toshiba

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Cryogenic meeting 12th Dec. 2012

Out line

<1>Cryogenic accelerometer

(1)Adaptor for new cryogenic cooler

(2)Vacuum test

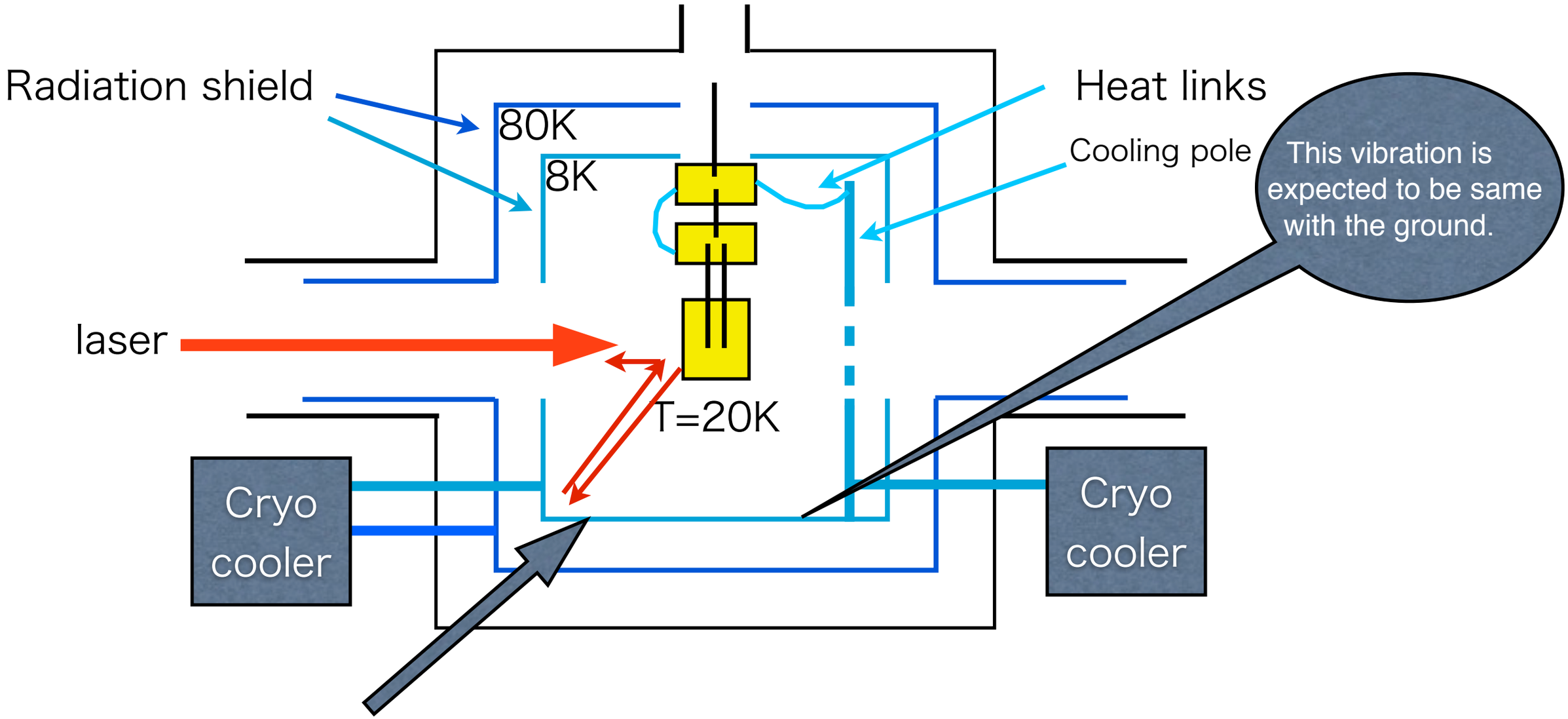
(3)The tilt of the radiation shield

<2>The cooling test of a sphere without DLC in TOSHIBA

(1)Suspending in the radiation shield

Purpose

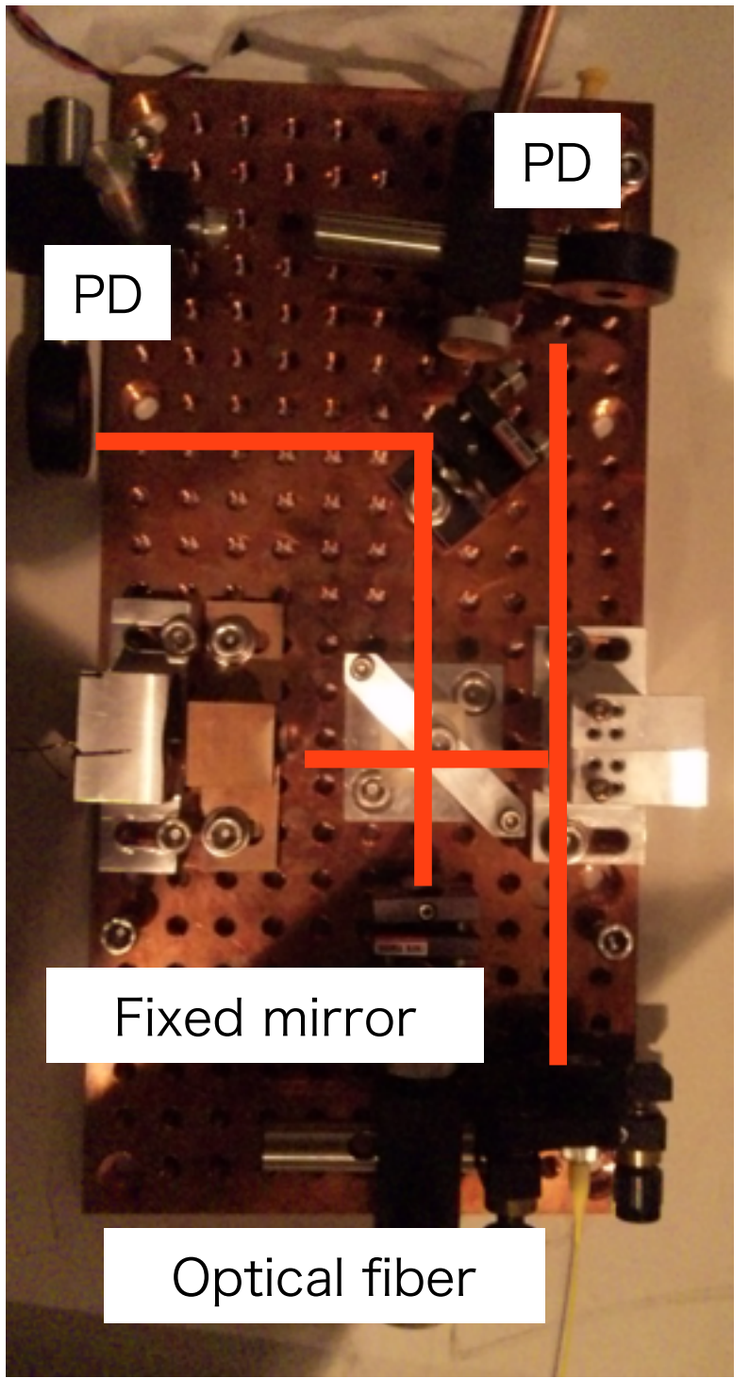
Measurement of the vibration on the radiation shield.



The vibration of the radiation shield may swing the test mass through the heat links.
The scattering laser may be reflected by the shield and recombine into main laser.

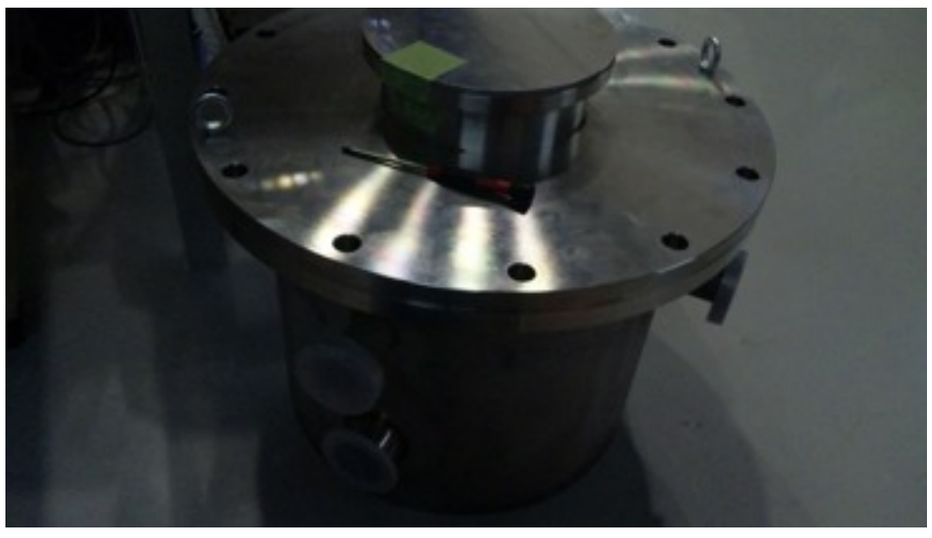
We will measure the vibration on this radiation shield with cryocooler ON.
The real measurement will be run in Toshiba(Yokohama-city) in December.

Accelerometer



We will have a cooling test of this accelerometer.

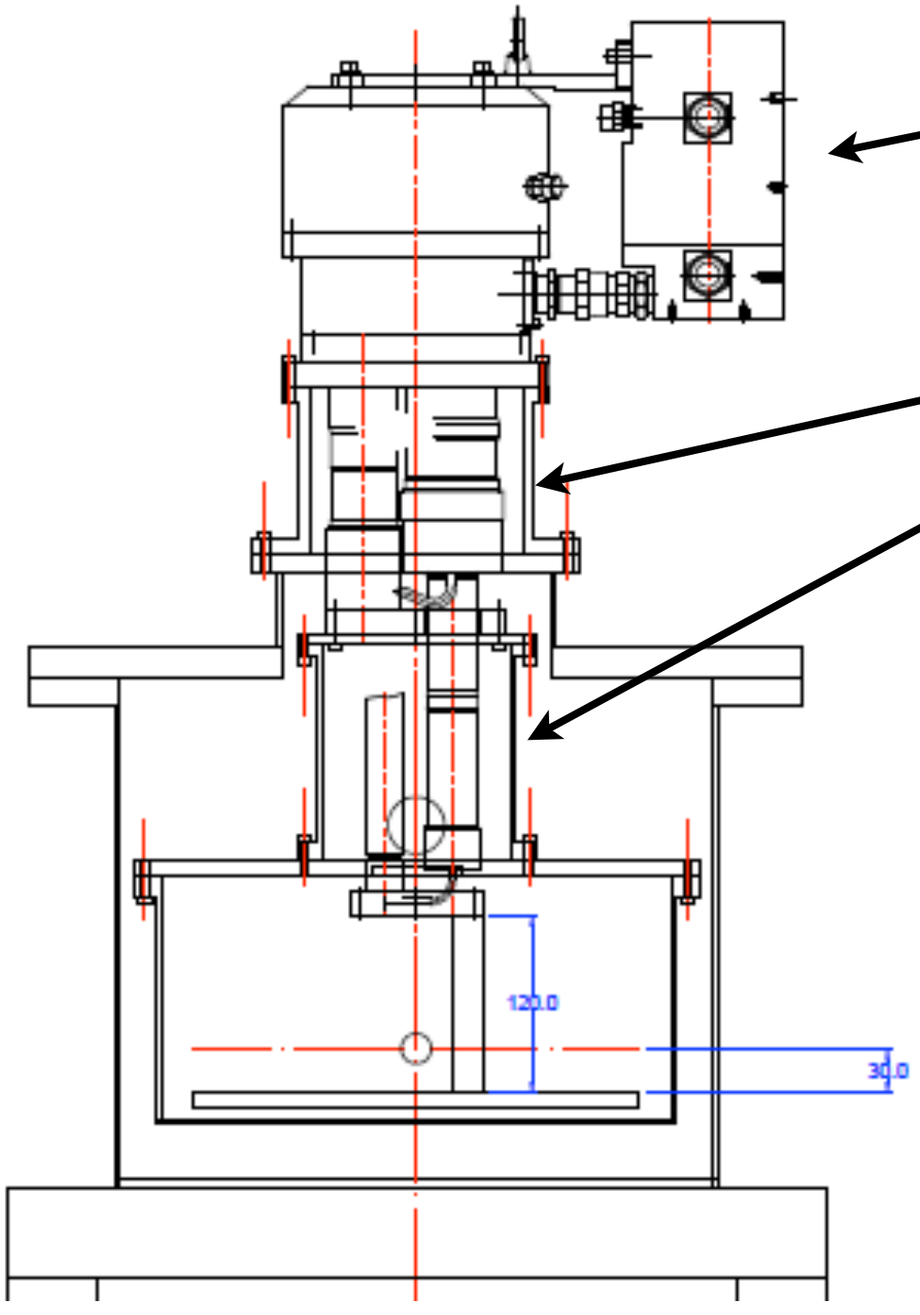
Chamber



Cooler

New one

Adaptor for new cooler



The design is almost done.
I will check the size.

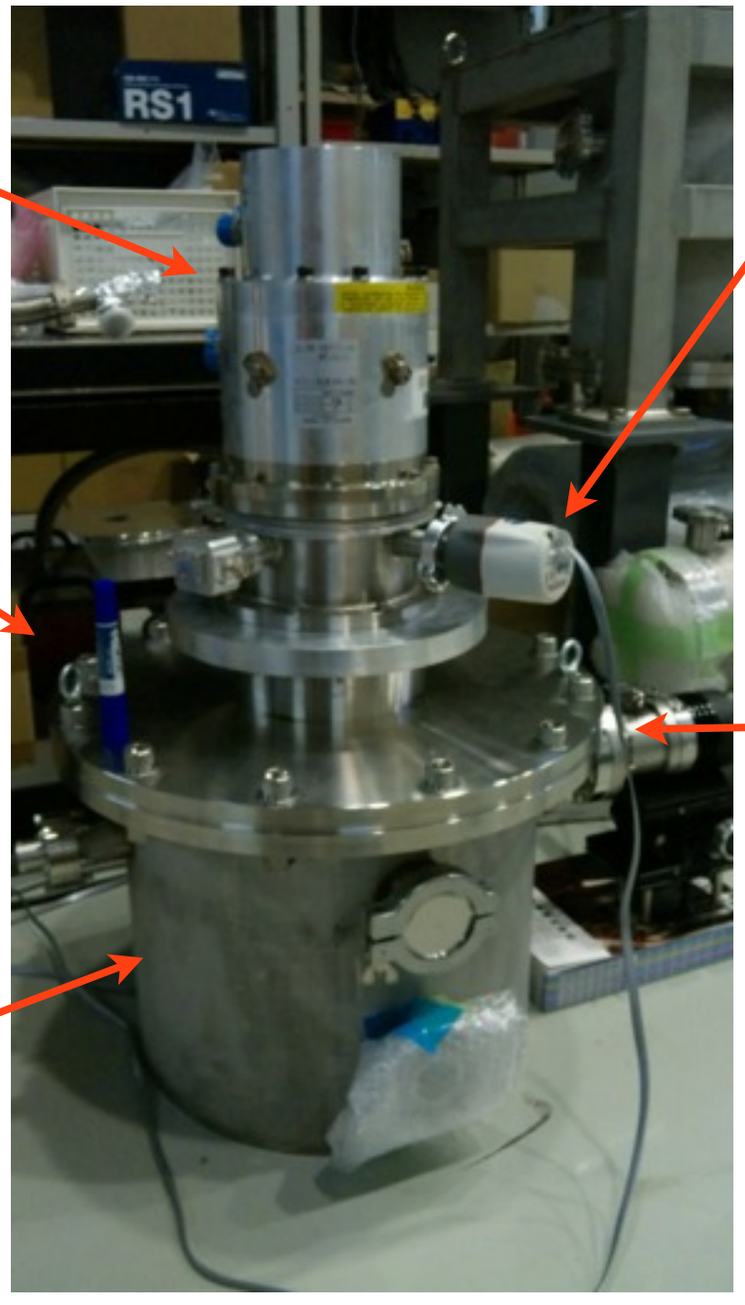
Tokoku-san

Vacuum test of the chamber

Cooler

Diaphragm pump
(ダイアフロムポンプ)

Chamber



Vacuum gauge

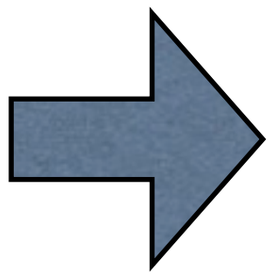
Turbo pump

Vacuum test of the chamber

The pressure which we can switch on the cryo-cooler: $10^{-4}[\mathrm{mbar}]$

The time to reach the above pressure: ~ 1 night

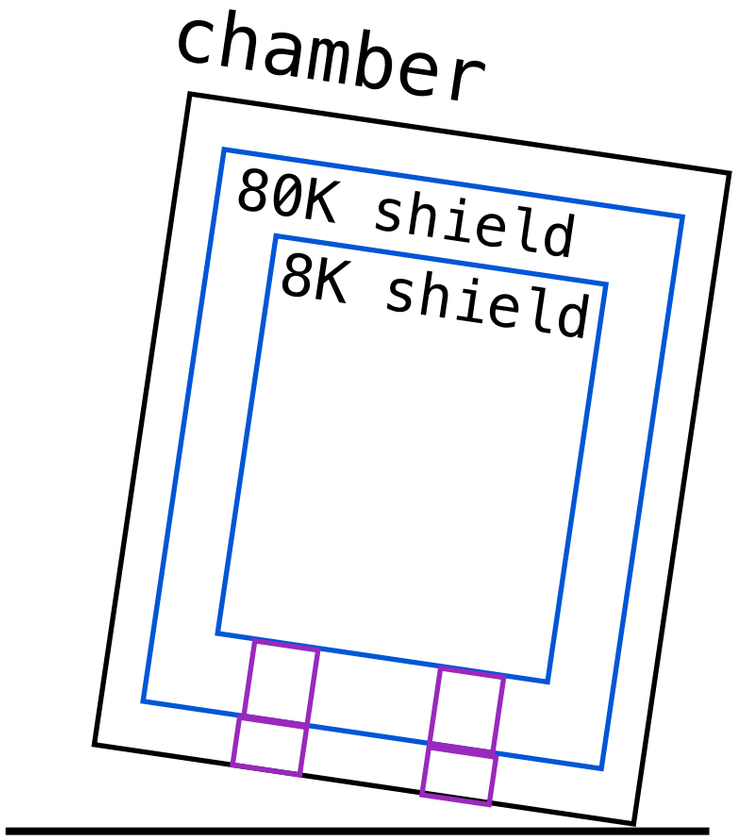
The minimum pressure: $10^{-6}[\mathrm{mbar}]$



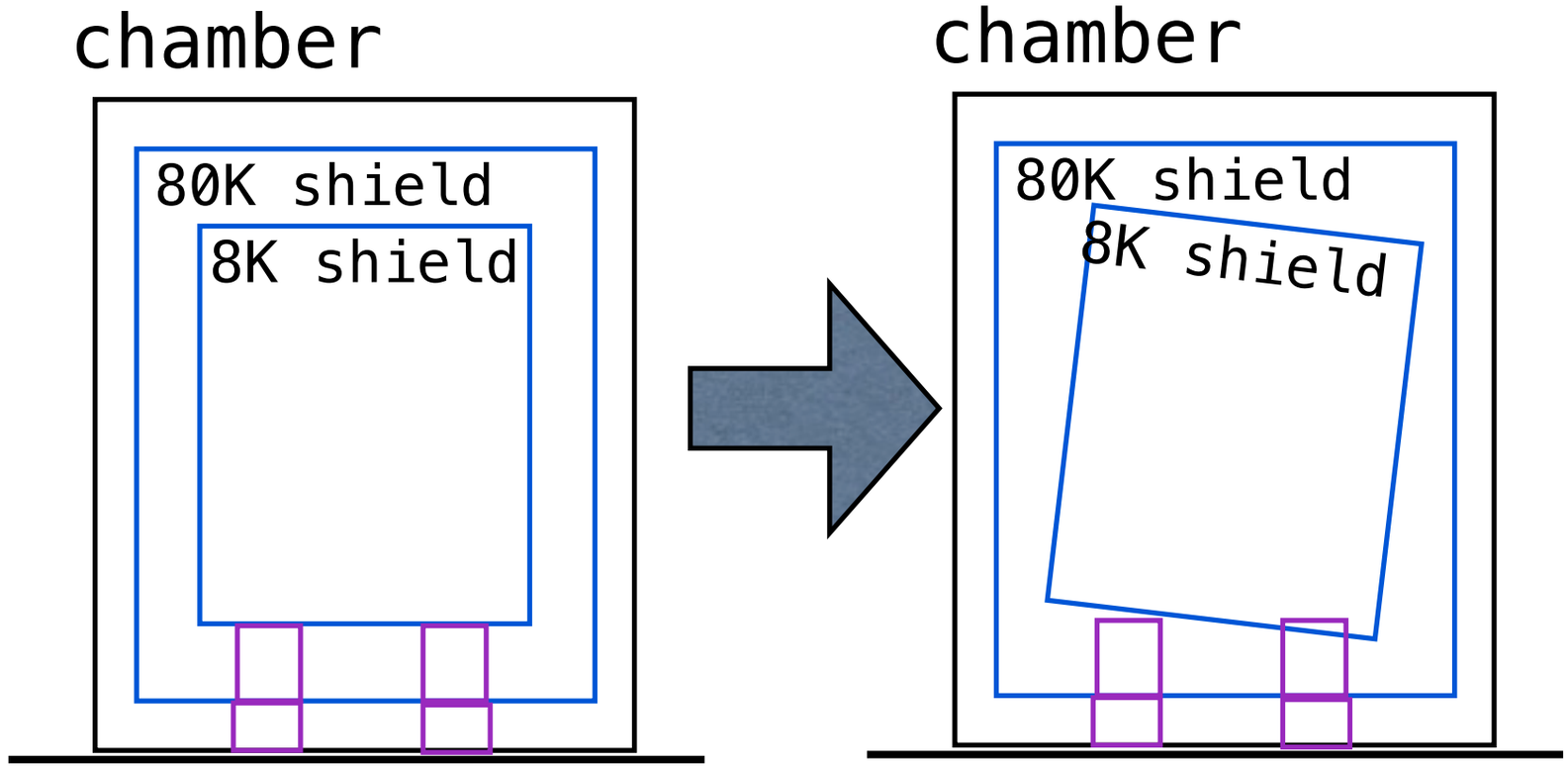
No problem

The tilt of the radiation shield

The radiation shield can have initial tilt angle.
And the angle can change during the cooling test of the cryostat.



Initial tilt



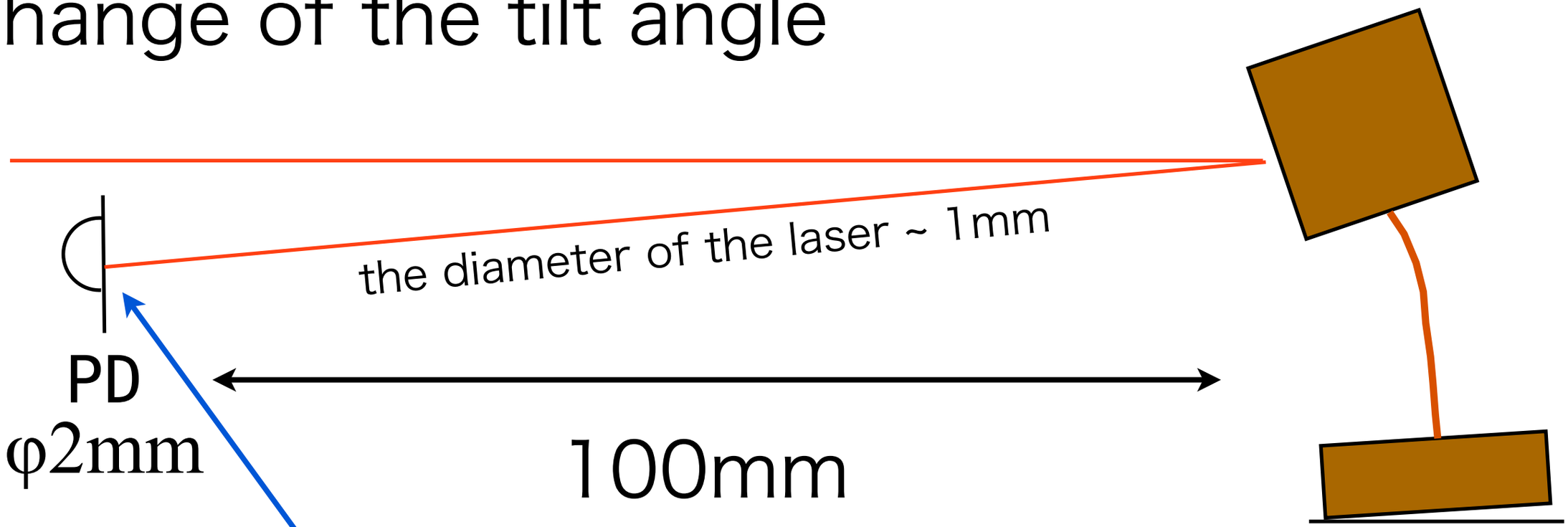
Change because of the temperature change

Can our accelerometer work?

The tilt of the radiation shield

The initial tilt is OK because we can adjust the alignments at the room temperature.

Change of the tilt angle

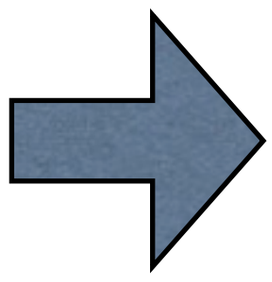


The requirement from our accelerometers is 6mrad(~0.34degree).

The tilt of the radiation shield

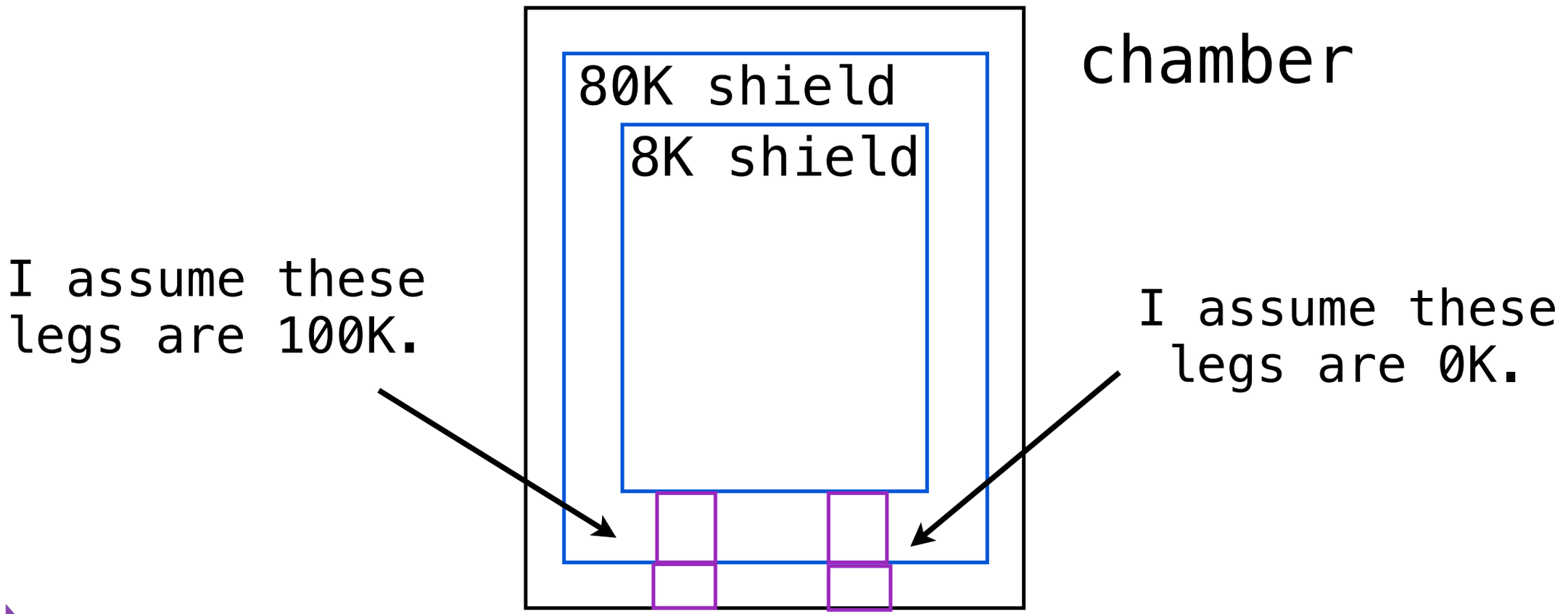
The requirement from our accelerometers is 6mrad(~0.34degree).

The requirement from Luca’s accelerometers is ~10mrad(~0.57degree).



The requirement value is 6mrad.

How much can the radiation shield tilt? (at the worst)

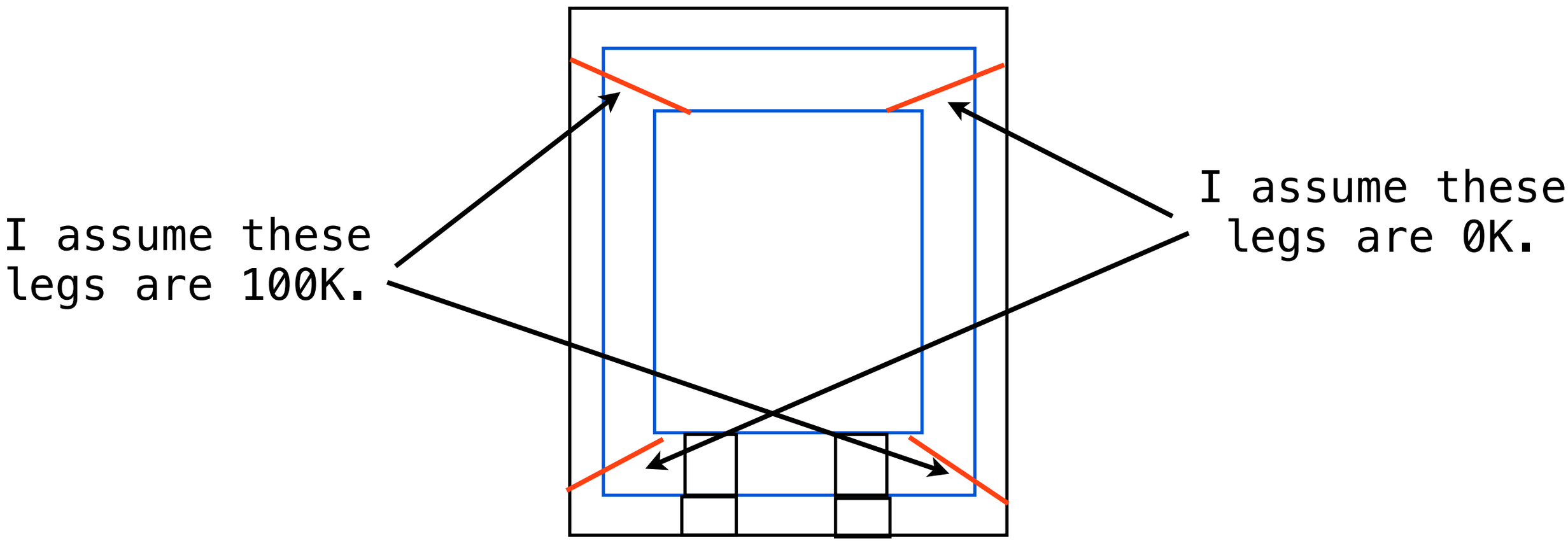


The tilt angler of the radiation shield is 1.4mrad(~0.08degree).

No problem

How much can the radiation shield tilt? (at the worst)

There are supports attached on the radiation shield.

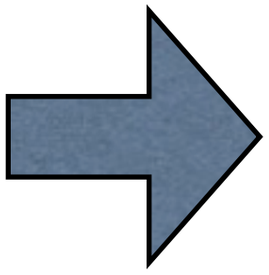


The tilt angler of the radiation shield is 1.4mrad(~0.08degree).

No problem

The cooling test of a sphere without DLC in TOSHIBA

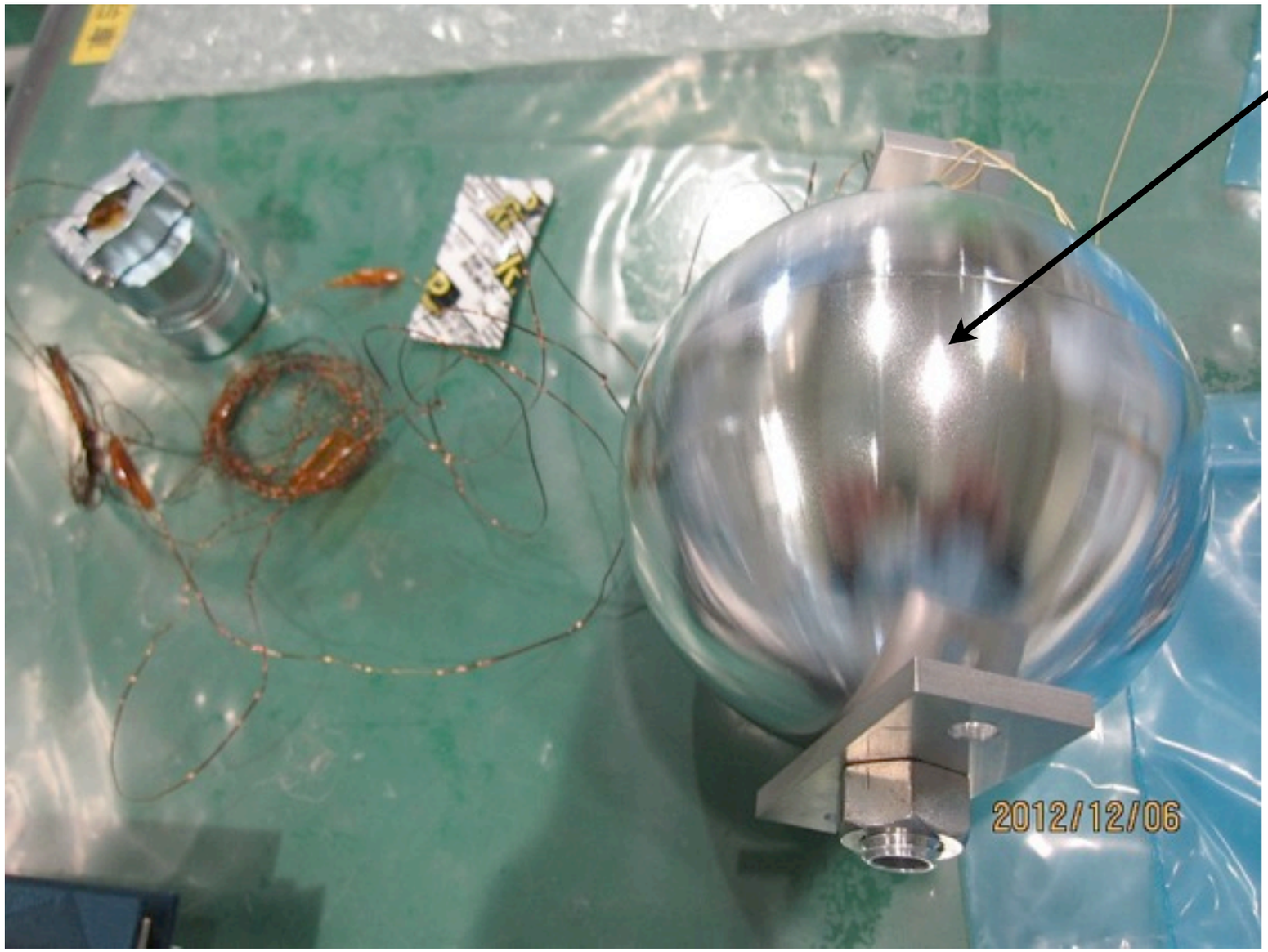
We are going to measure the temperature change of a sphere(without DLC and with DLC) in the cryostat.



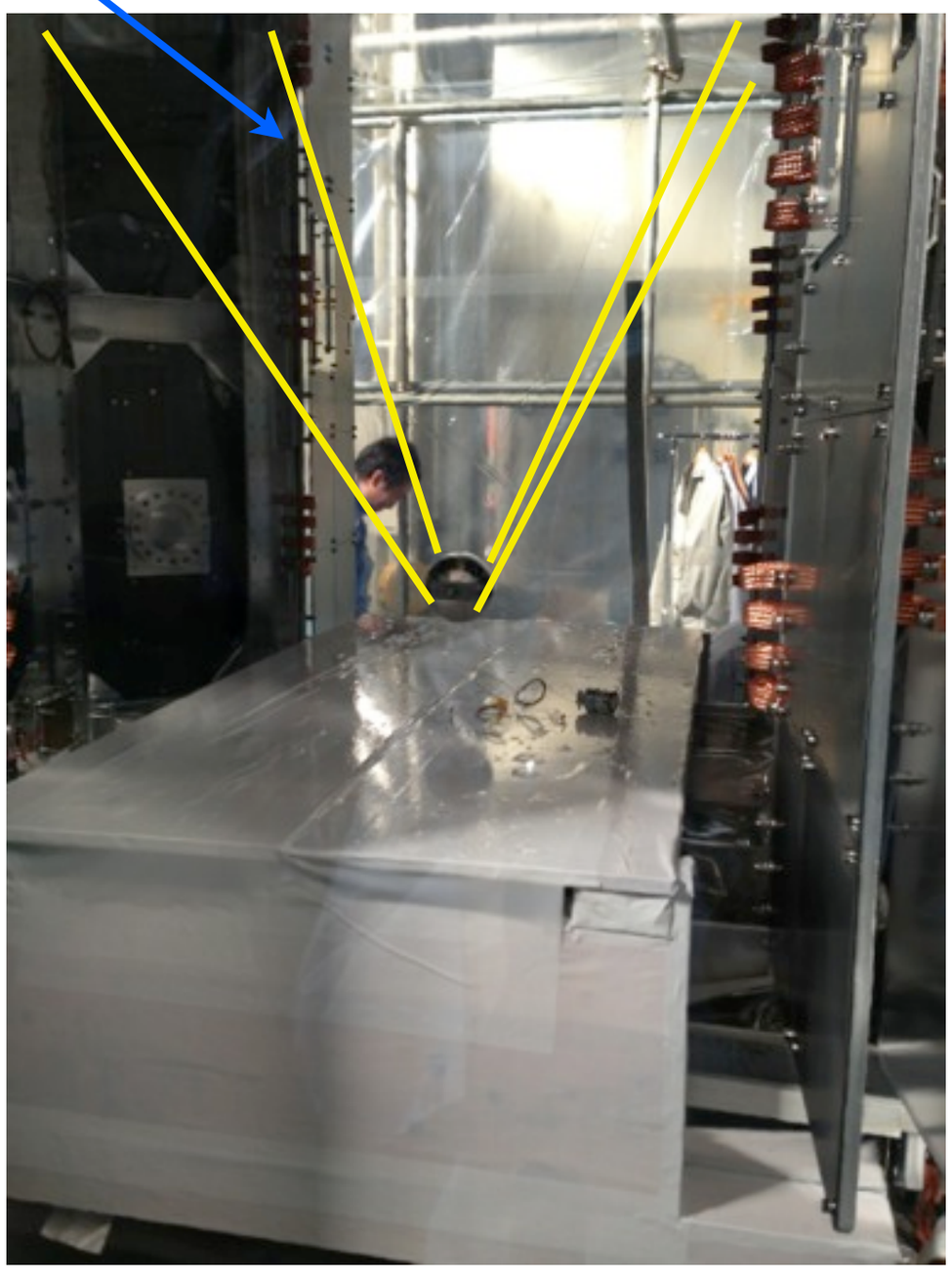
To confirm the scale law of the experiment of Sakakibara-kun

Last week, we suspended a sphere without DLC in the cryostat.

The cooling test of a sphere without DLC in TOSHIBA



The cooling test of a sphere without DLC in TOSHIBA



The impression in the radiation shield

Although the chamber is not so big inside,
3 or 4 person can work in the chamber.

2 person can work in the radiation shield.
(using some footing)
Because the roof is not so high, you have
to bend in the radiation shield.

I am the first person of KAGRA who enter the KAGRA radiation shield!

end