



PRE-RUN PREPARATIONS 2024

S.HAIDER

-
- Upgrades and repairs
 - Cooling down
 - First observations

OVERVIEW

UPGRADES AND REPAIRS

- Install the new SUN and repair the leak from 2023

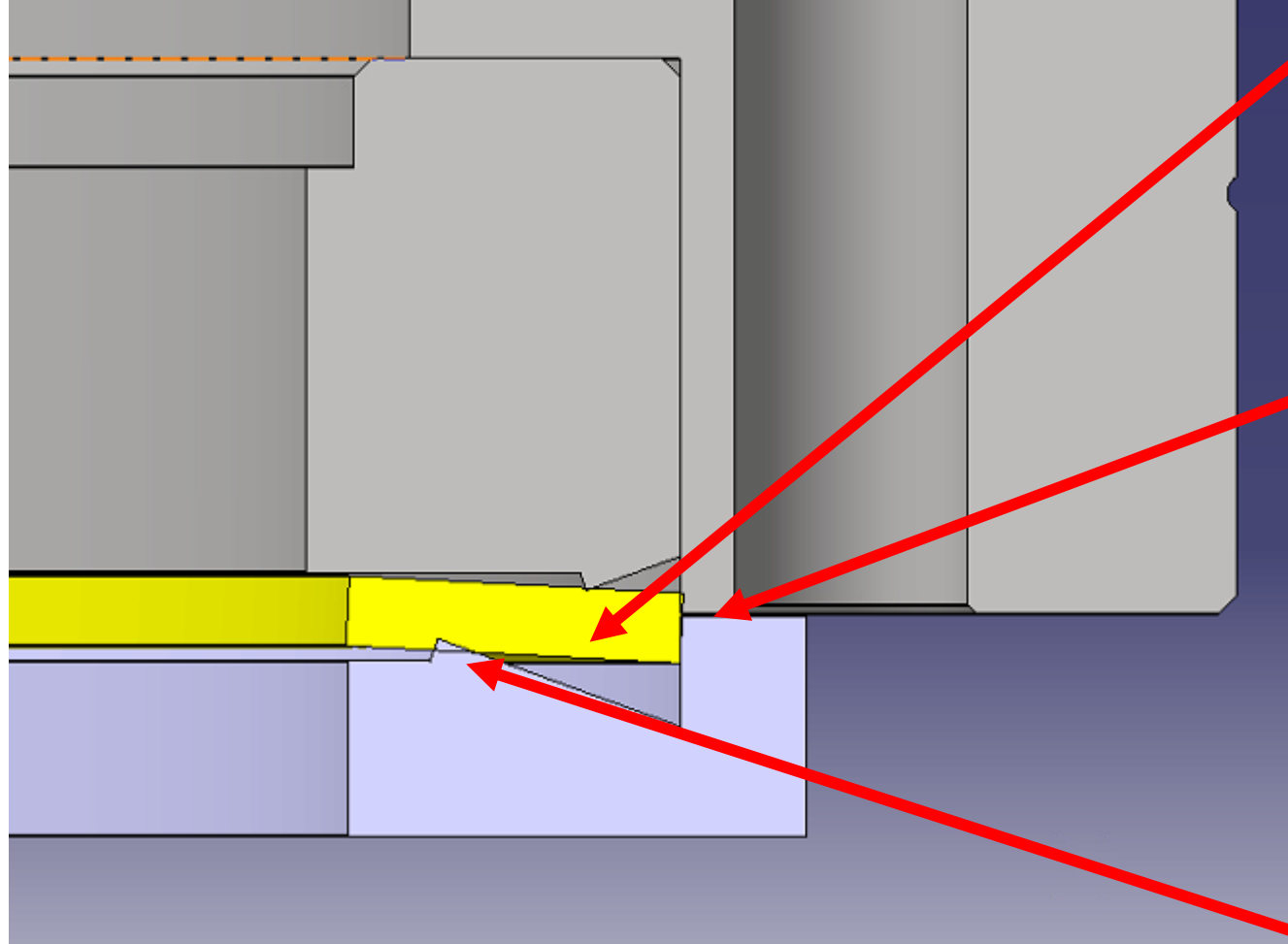
A 3D cutaway diagram of a cryostat entrance assembly. The diagram shows a grey SUN rotatable flange with two circular holes on its top surface. Below the flange is a yellow copper gasket. At the bottom, a light blue bellows-assembly is connected to a UHV flange. Red arrows point from the text labels on the right to the corresponding parts in the diagram.

SUN rotatable flange

Copper gasket

Bellows-assembly
UHV flange at the
Entrance of the
Cryostat. (bellow not shown)

The knife-edges of the two flanges are not on top of each other!!!!



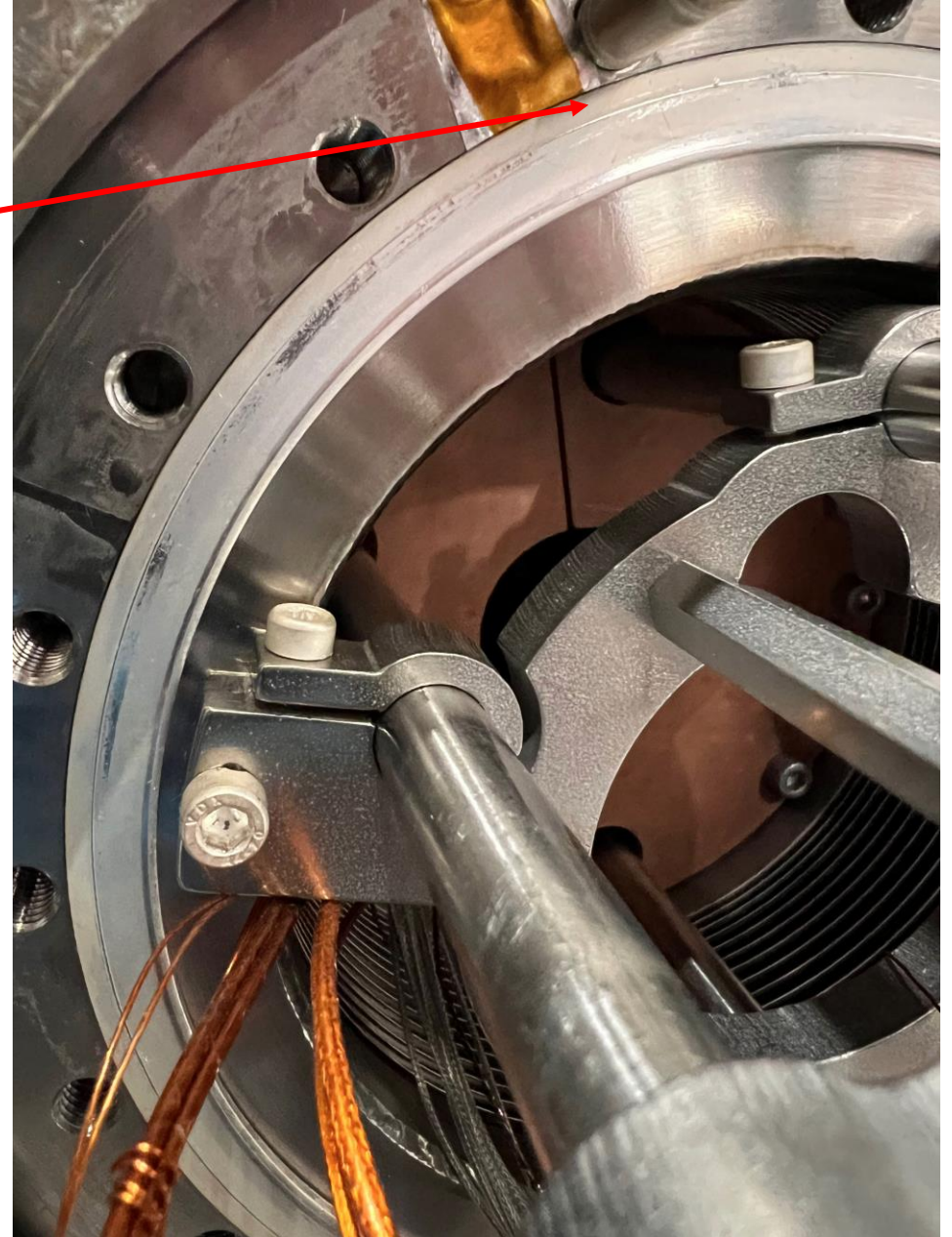
The gasket was distorted because the knife-edge on the SUN did not have anything to press against.

Both flanges were “steel-on-steel” due to the enormous pressure of the screws

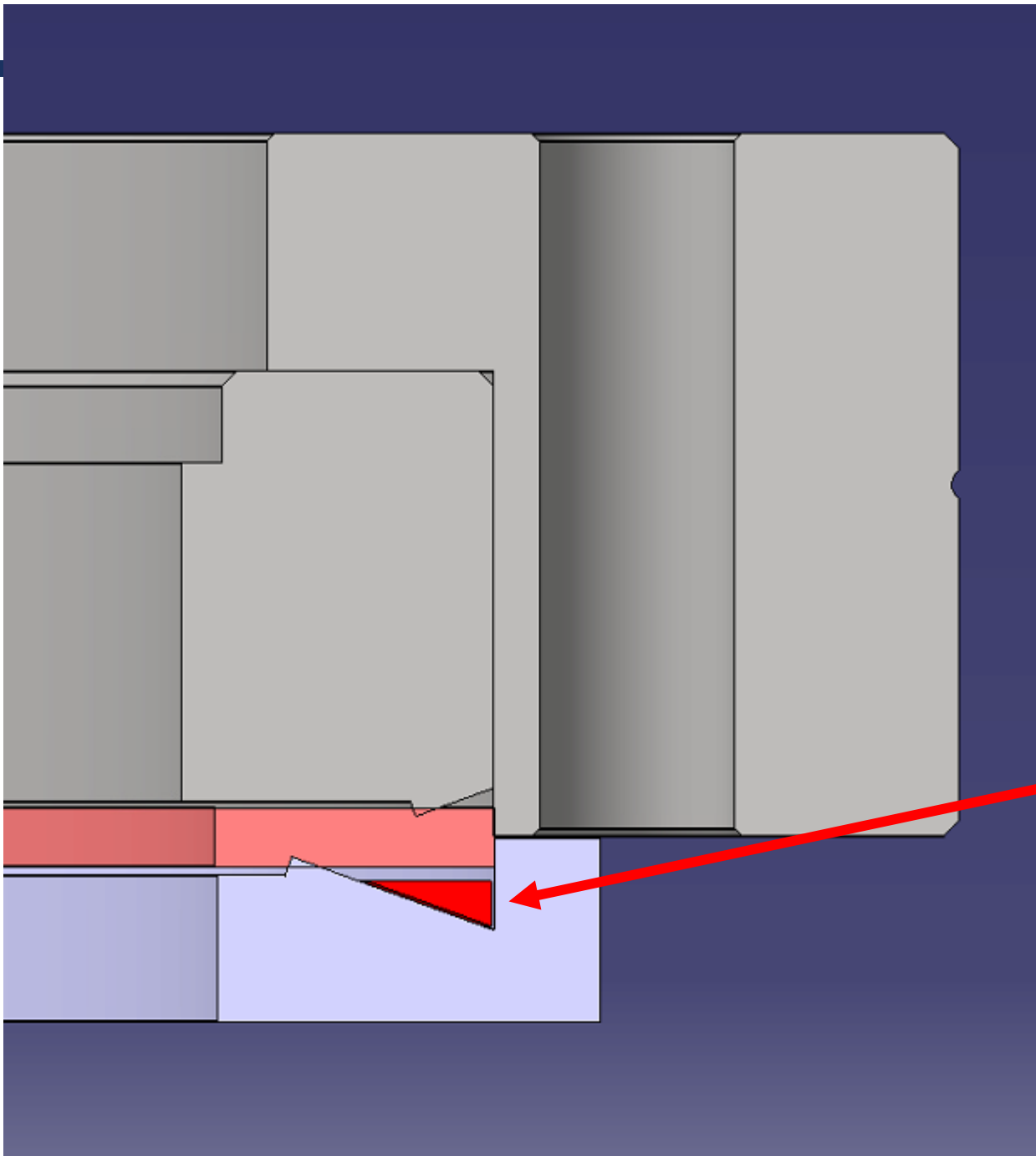
Only the lower knife edge was pressed into the gasket



The copper gasket
was deformed into a
“Cone” !



Solution:

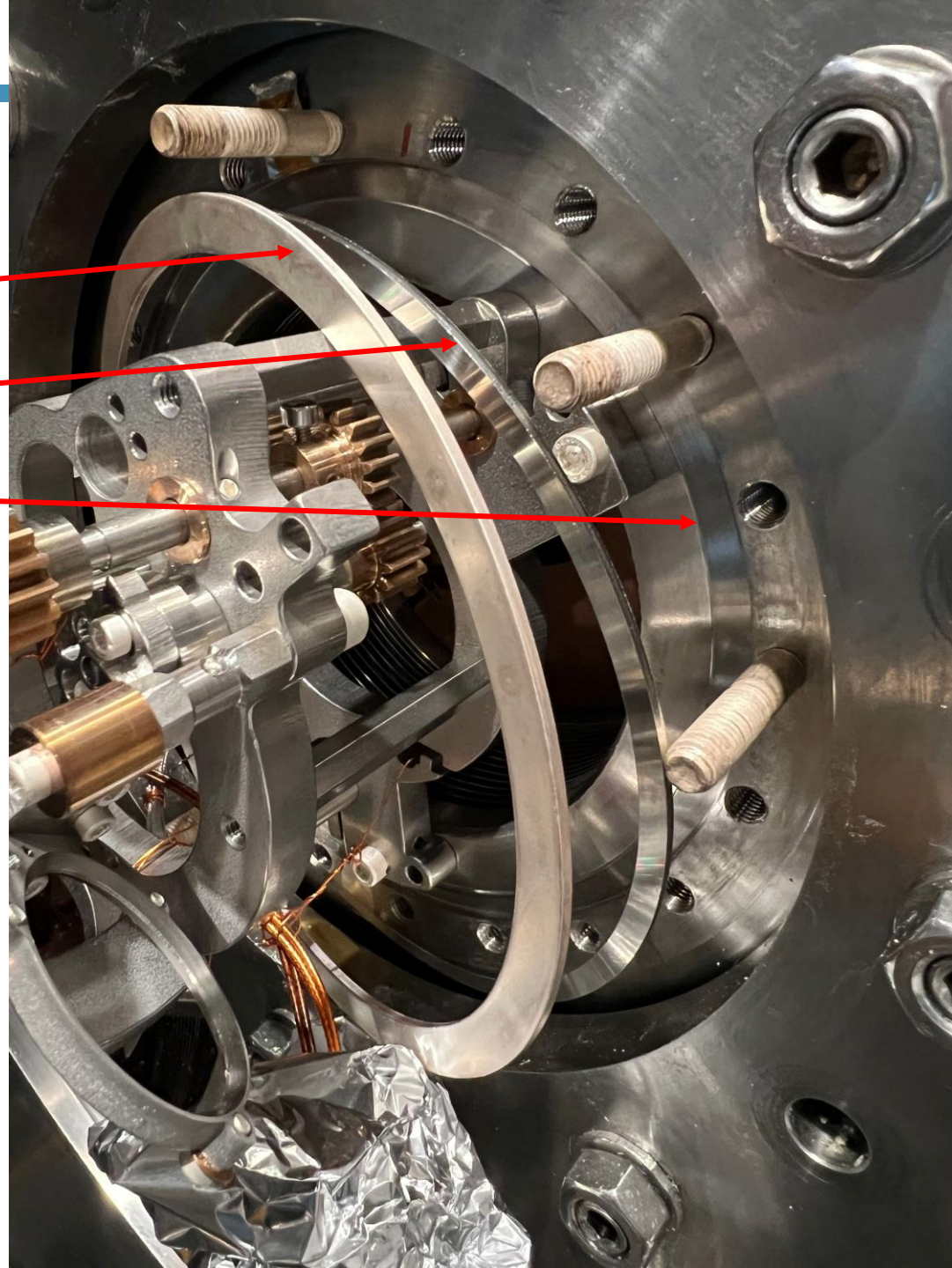


We fill the gap between flange and copper gasket, in order to keep the form of the gasket intact.
Such both knife-edges can cut into the copper.

Copper gasket

Stainless Steel ring for gasket support

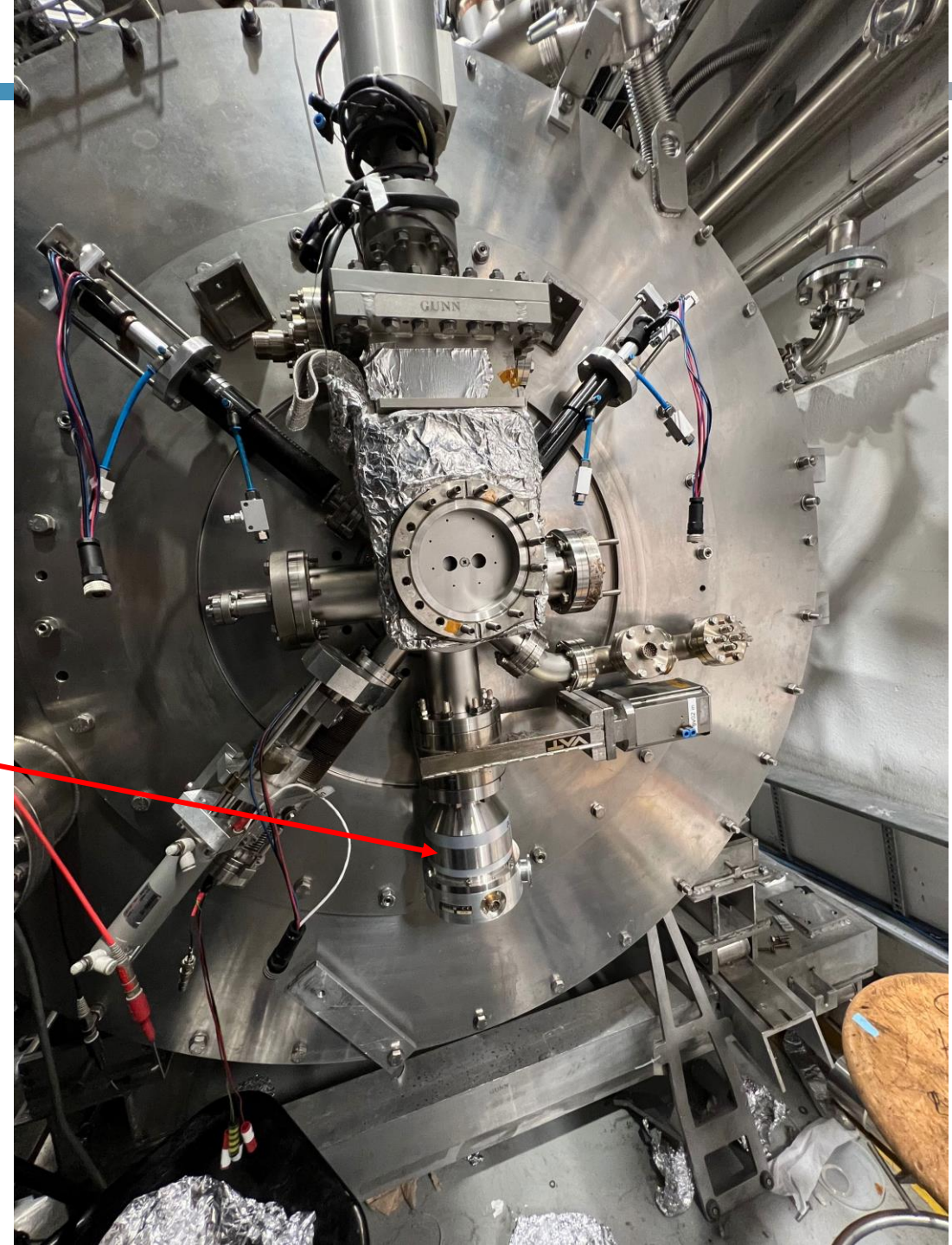
CFI50 with "wrong" knife edge



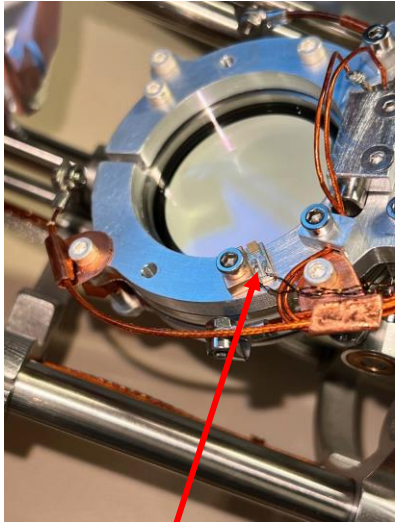
End January vacuum test with the new SUN in place. All actuators Adjusted and verified.

No leaks found with the Helium leak detector

We have again a Turbo2 on the SUN!
Hence, we can pump the SUN without the HedgeHog chamber

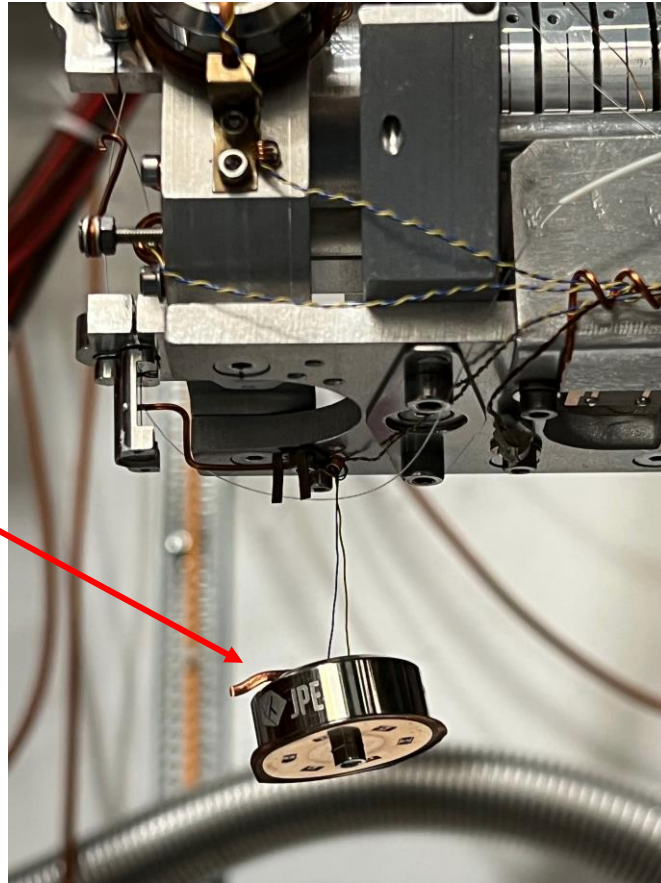


Repairs:



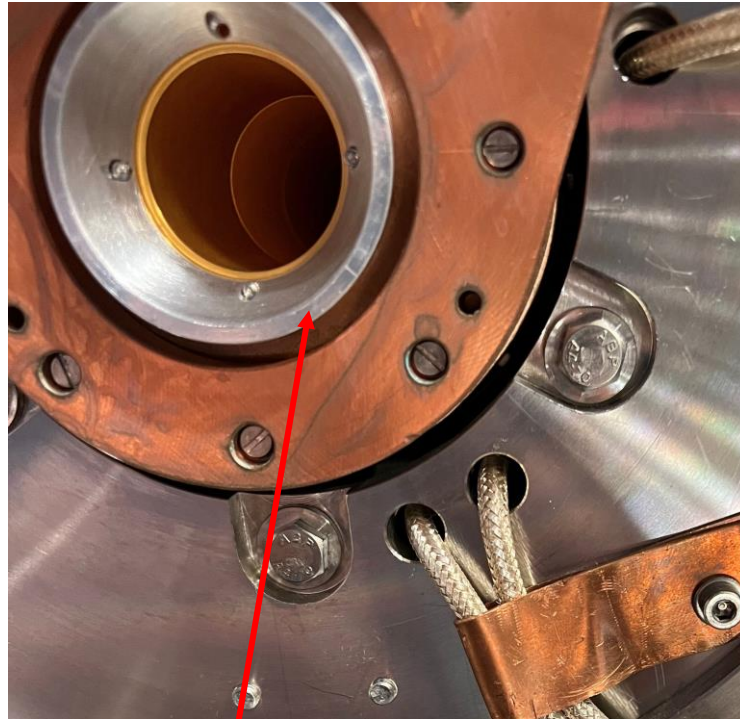
5T MCP temperature Sensor was repaired

One of the IT opening sequences, a cable got tangled-up on the Y-axis alignment motor of the IT trap, and snapped its ceramic axis.

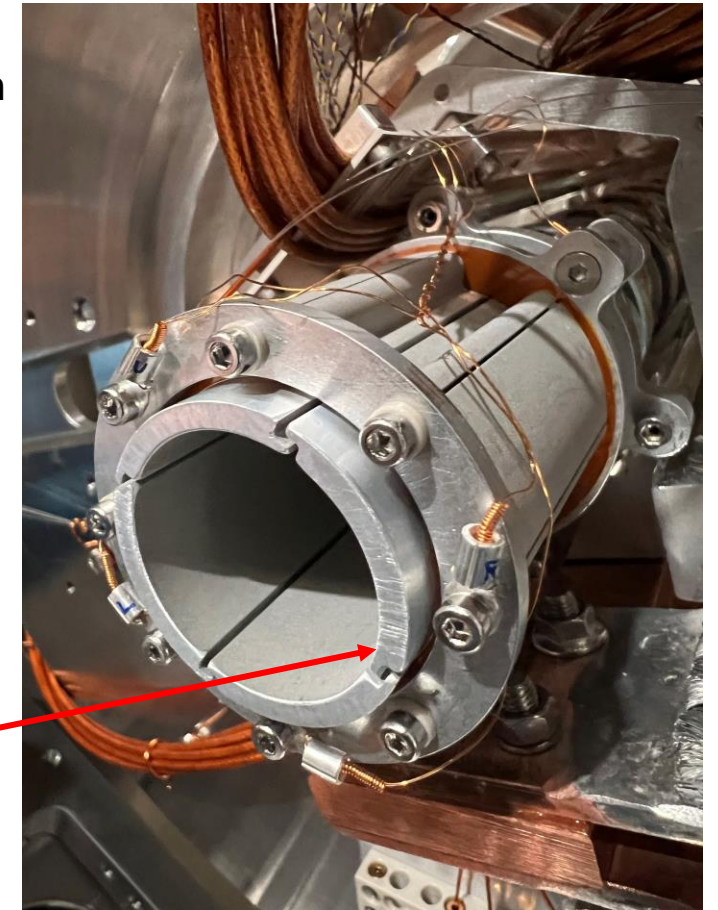


Repairs:

The end of the 5T trap has a cone attached to trap electrode T6. (which is on no 3D drawing!!)



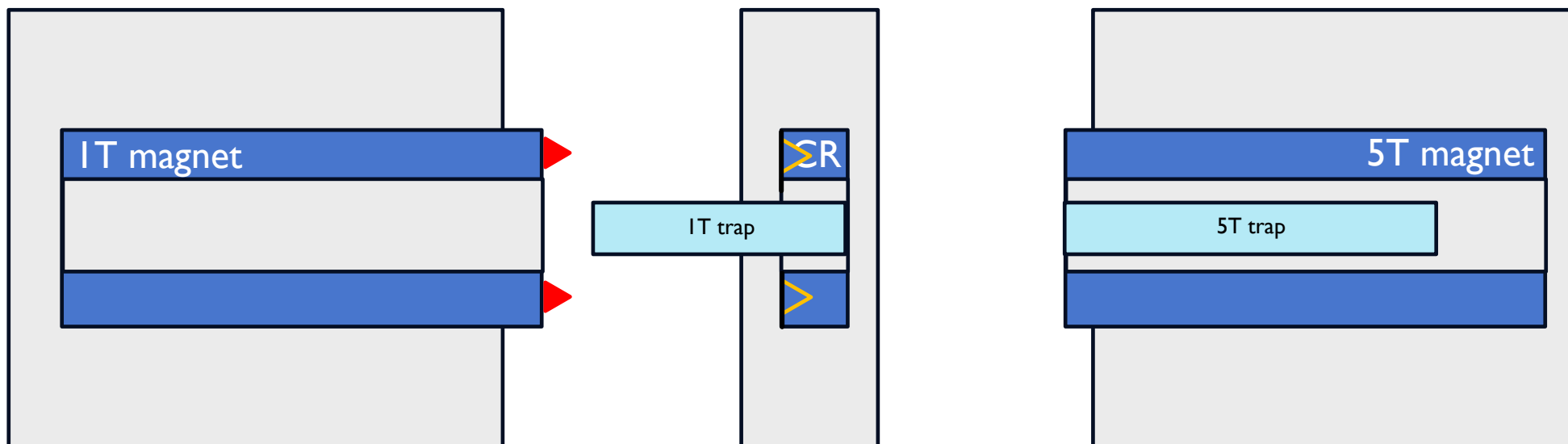
Split electrode of the IT trap in the CR. I.e. the first electrode on the IT trap



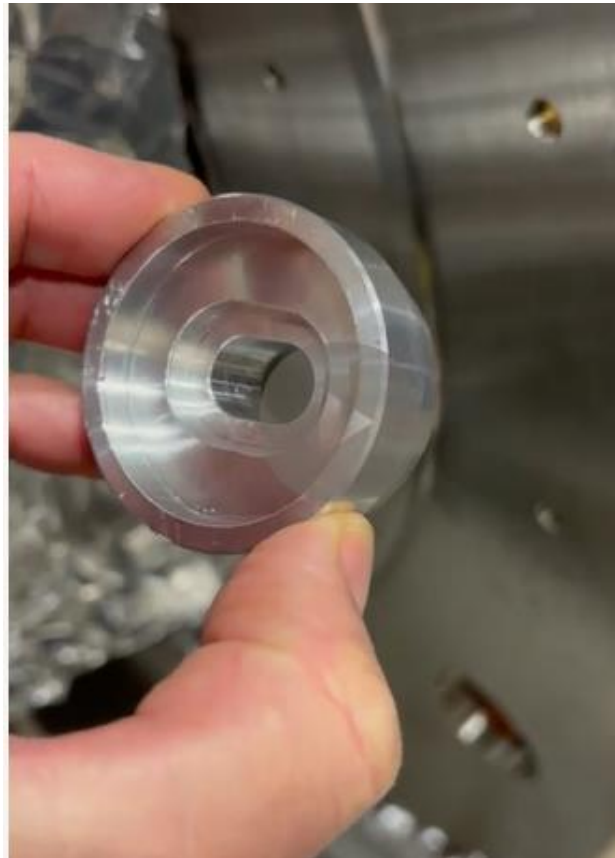
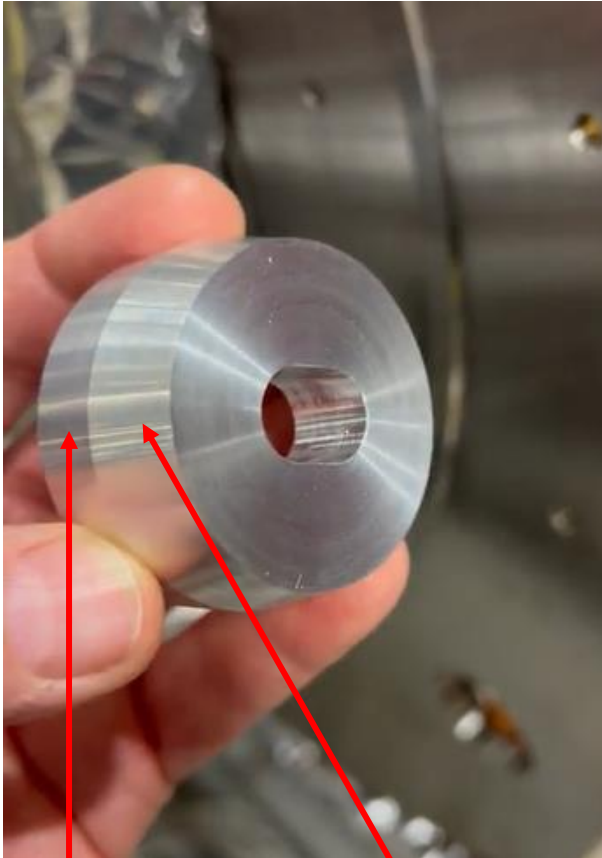
These two electrodes were colliding by $\sim 1.5\text{mm}$ when the experiment was fully assembled. We never realized this because also the cable to T6 was broken. Only electron test showed that something was wrong in this area.

The “coned” electrode of the 5T trap was shorted by a few mm and the cable to T6 was repaired.

Alignment of the major part of the experiment:



Technical solution to the alignment of the IT magnet cryostat to the central region flange:

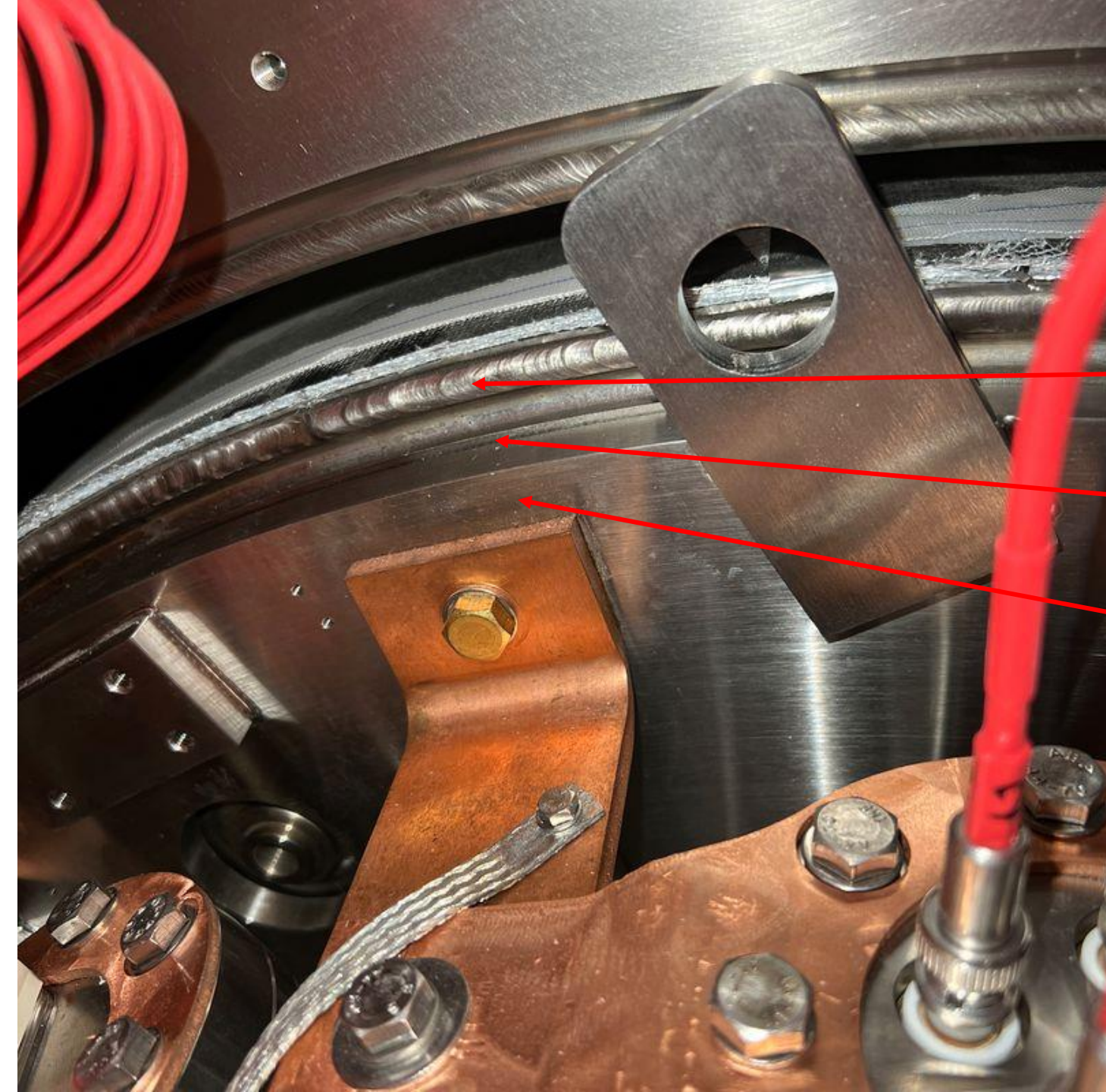


Cylindrical and a cone part:

- Cylinder takes the pressure of the weight
- The cone helps for the alignment of the two flanges.

Existing hole

~250um fitting tolerance



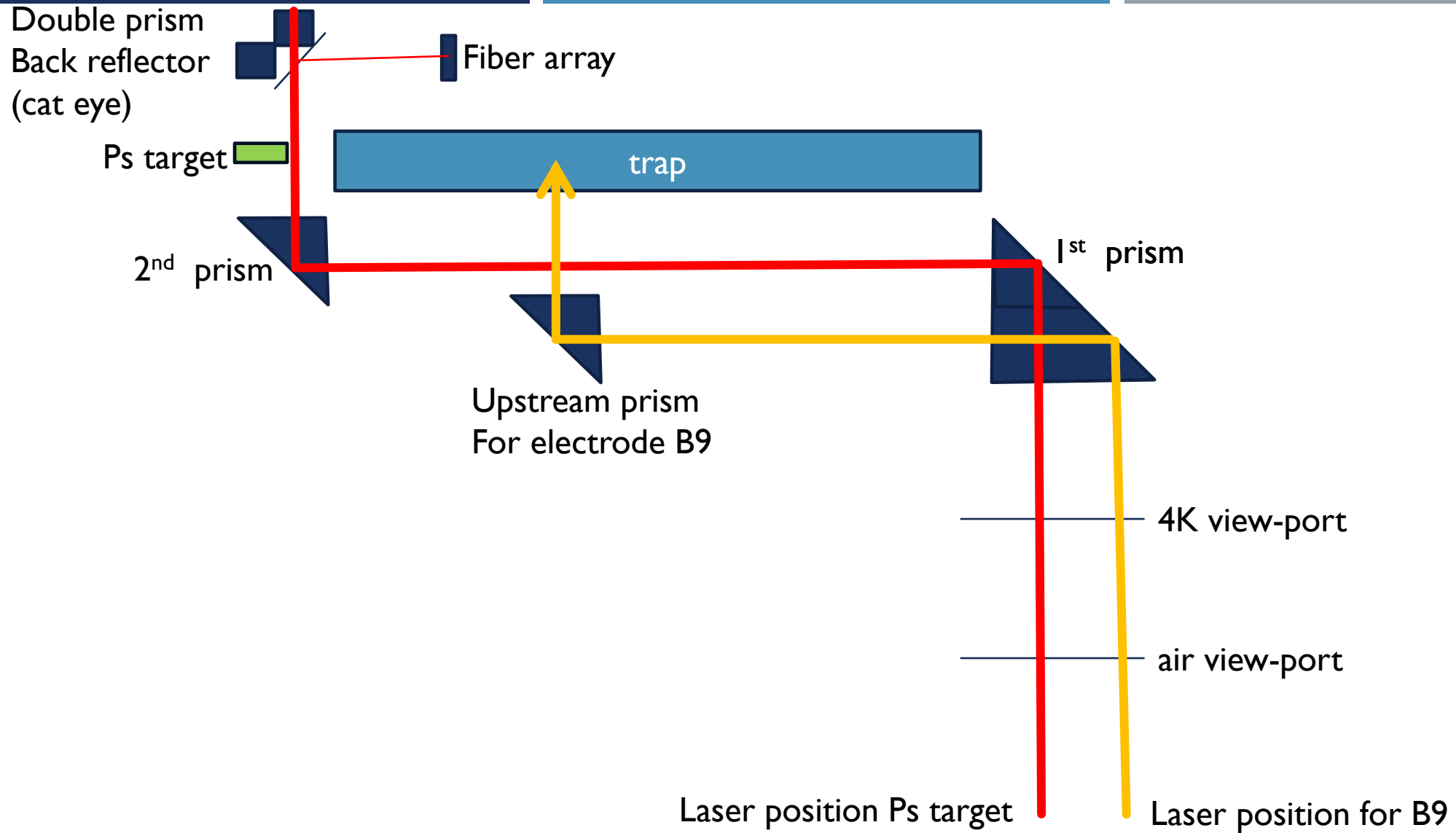
View from the open 5T-CR-part

IT magnet cryostat

Zero gap between the flanges!!!!

CR flange

Installed prism for B9 electrode:



View from the air flange
(focus target):

- Target electrode A0
- Target holder brackets (no target installed)
- Fiber bundle, illuminated from outside
- Hole for electrode B9

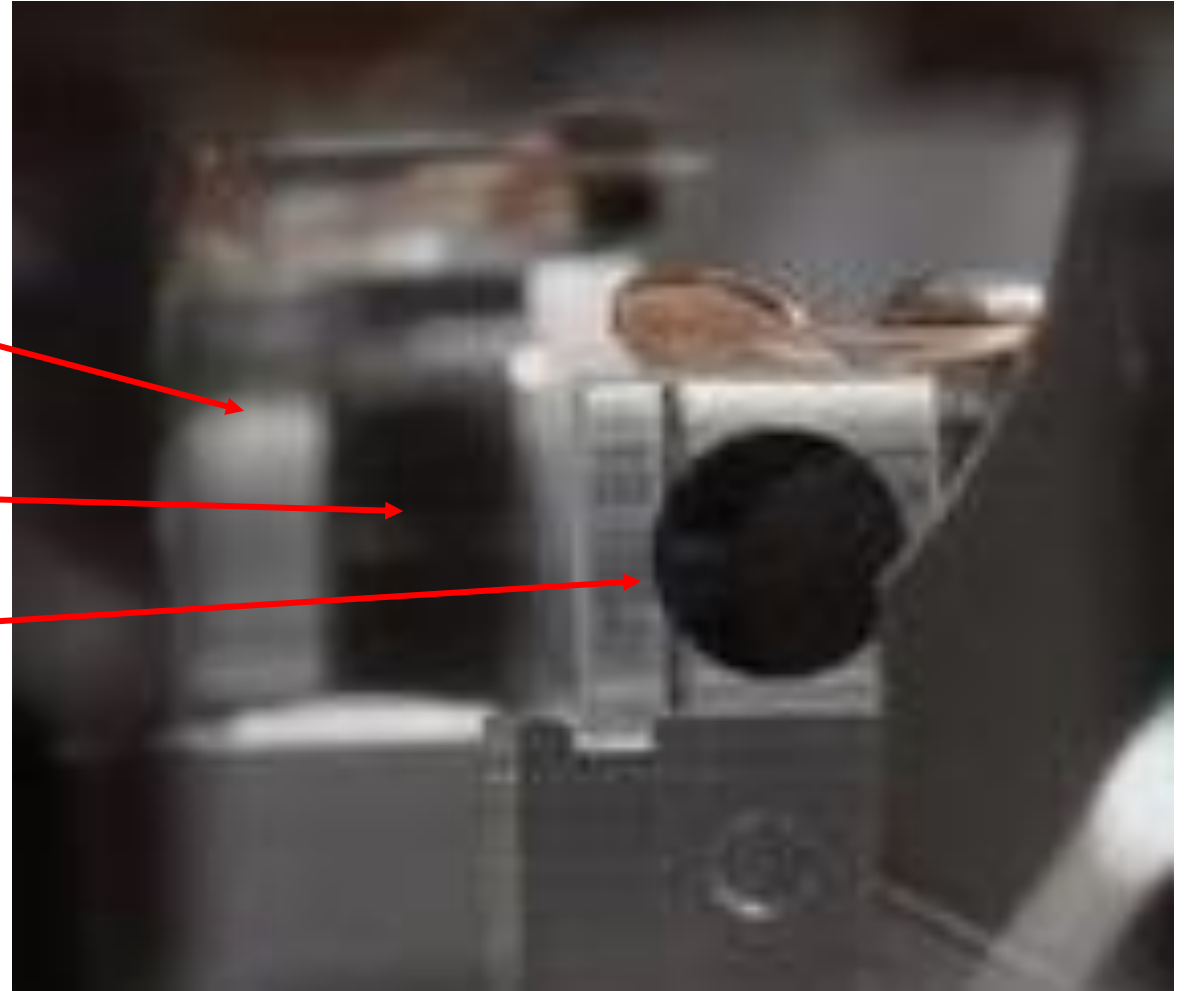


View from the air flange
(focus B9):

Target electrode A0

Fiber bundle, NOT illuminated
from outside

Hole for electrode B9

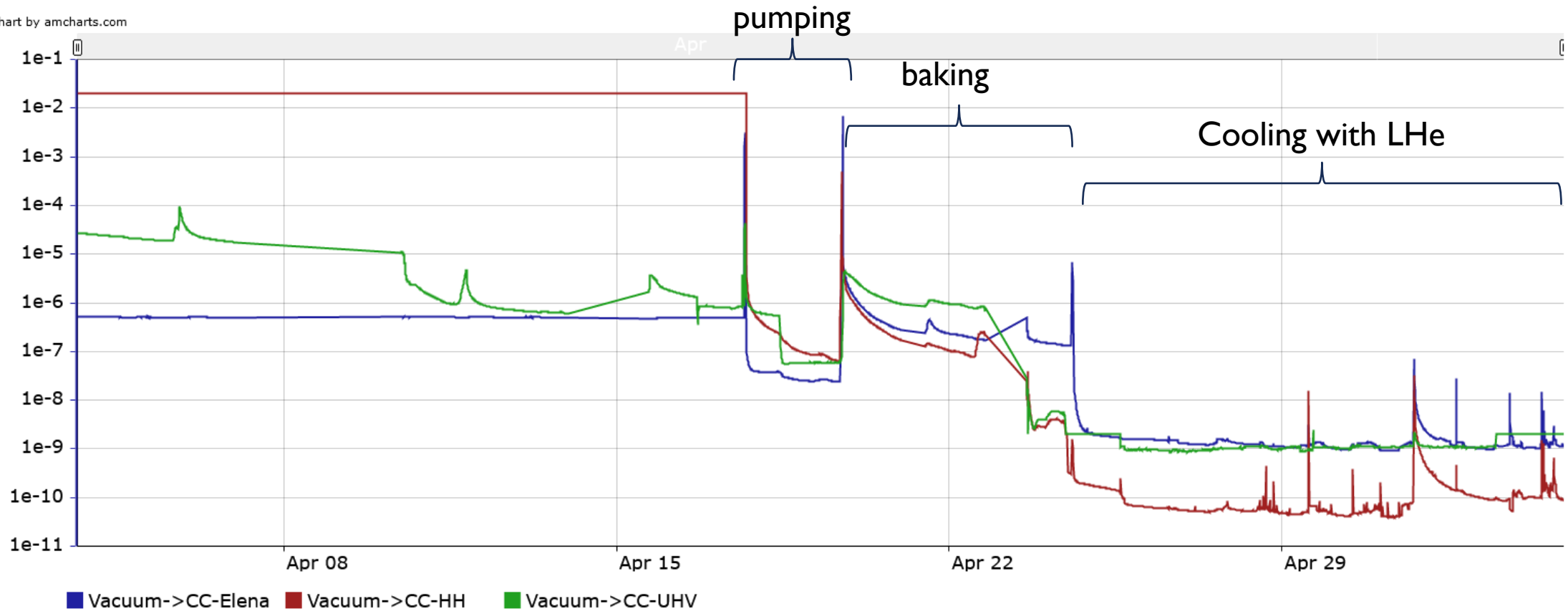


Preparation for cool down:

- Test closure March 25th with small indium pieces to show correct alignment
- March 27th Benji produces a new target
 - Which was installed immediately
 - Closing sequence followed
 - After 100 minutes, we switched on the pumps!
- **The target-on-air-time was reduced from ~ 3 weeks to 2 hours!!**

- The target was kept at room temperature during the entire cool down in order to compare the first shots with positrons with an identical target in the Bread-Box
- We installed a new ion pump in the HH-chamber
- Normal cooling down with LN2 first and subsequent LHe for the magnets
- Vacuum turned out to be good!! 😊

chart by amcharts.com



HH pressure around 1.0^{-10} mbar !!



THANK YOU