



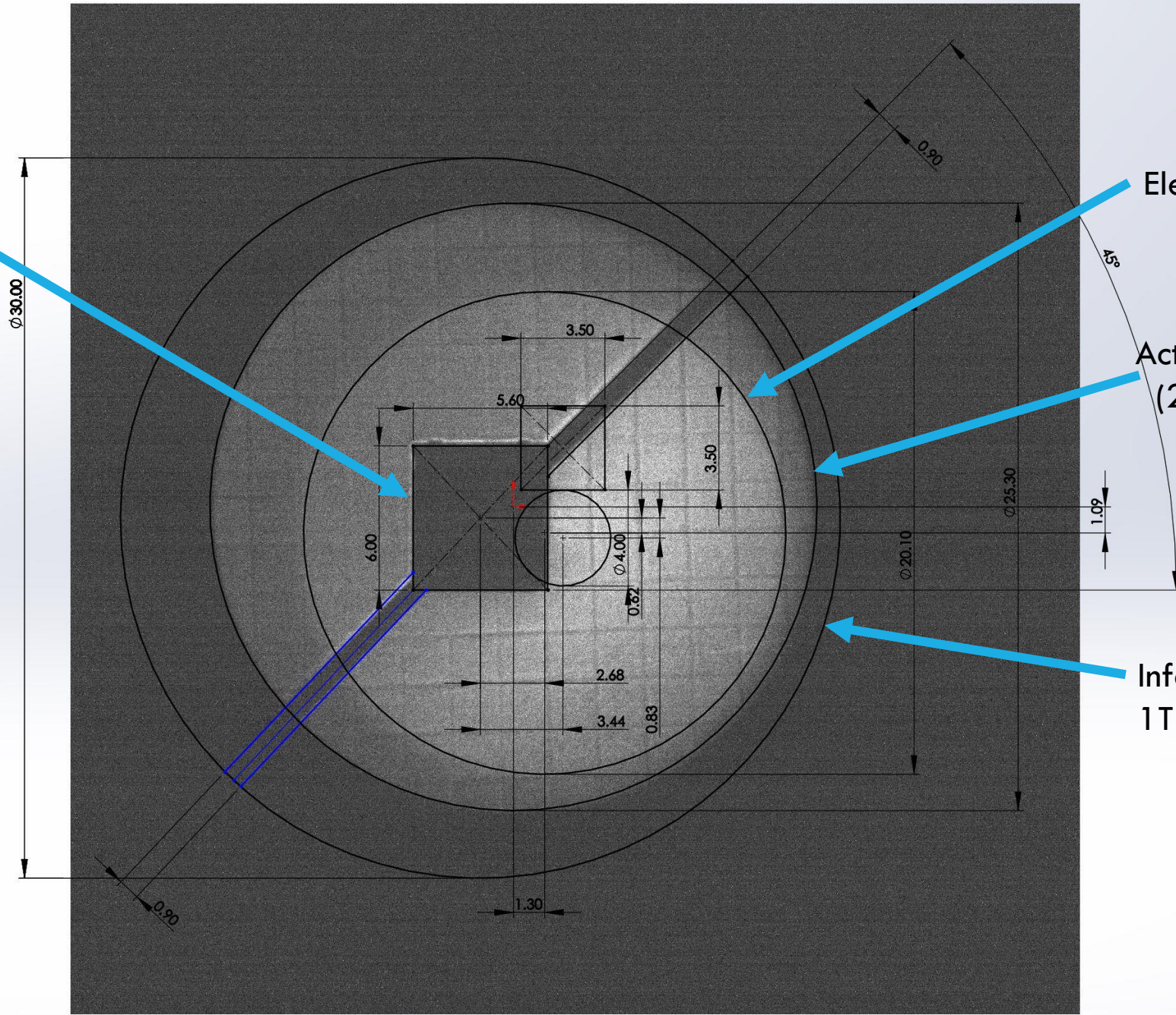
THE DOUBLE TARGET HOLDER

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DESIGN CRITERIA FOR THE NEW TARGET HOLDER

- Targets need to be much smaller
- Reflection target necessary to continue the present tests
- but the reflection target should be installed under an angle to the direction of flight,- like the 2018 target
- Transmission target for starting the tests of Ps formation in forward direction
- Minimize the steering of pbars, positrons and Laser as much as possible
ie, by moving the A0 target electrode we should shift from reflection to transmission target.
- It should be thermally isolated to keep the heat load to the magnets minimal
- apply bias voltages of a few 100V
- Facilitate maintenance, and easy changes of targets

Present target



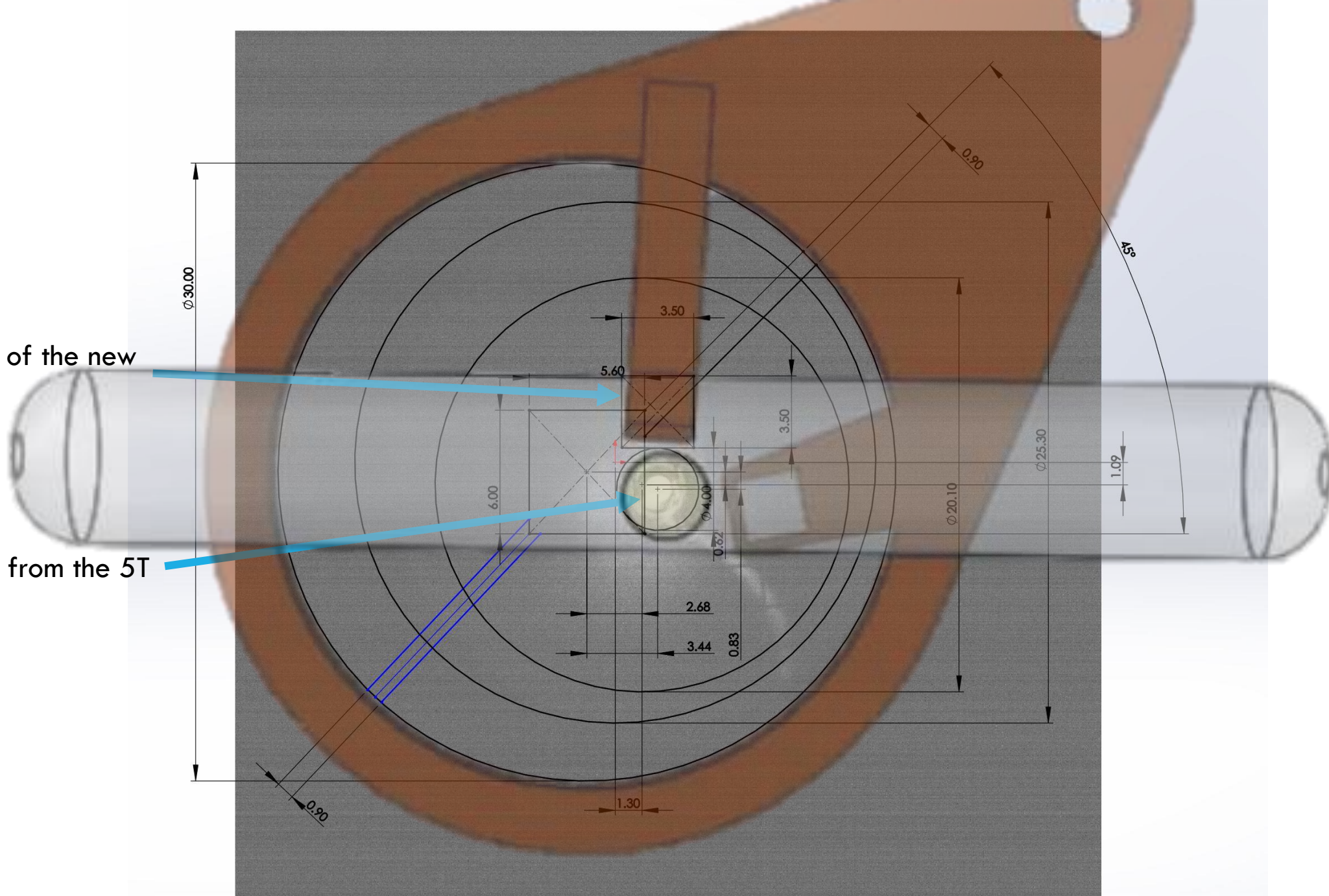
Electrons from the 5T

Active area of the 1T MCP (25mm)

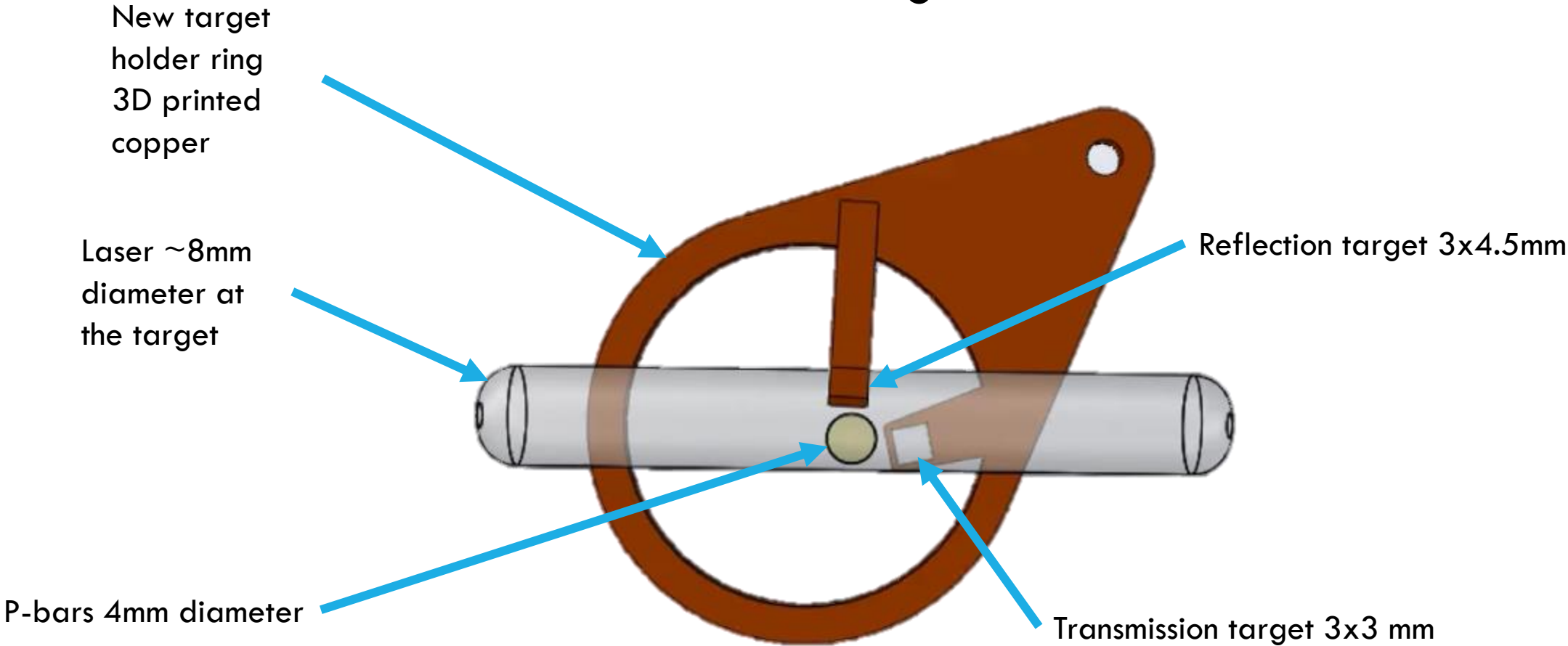
Inferred size of the 1T electrodes (30mm)

Position of the new target

P-bars from the 5T



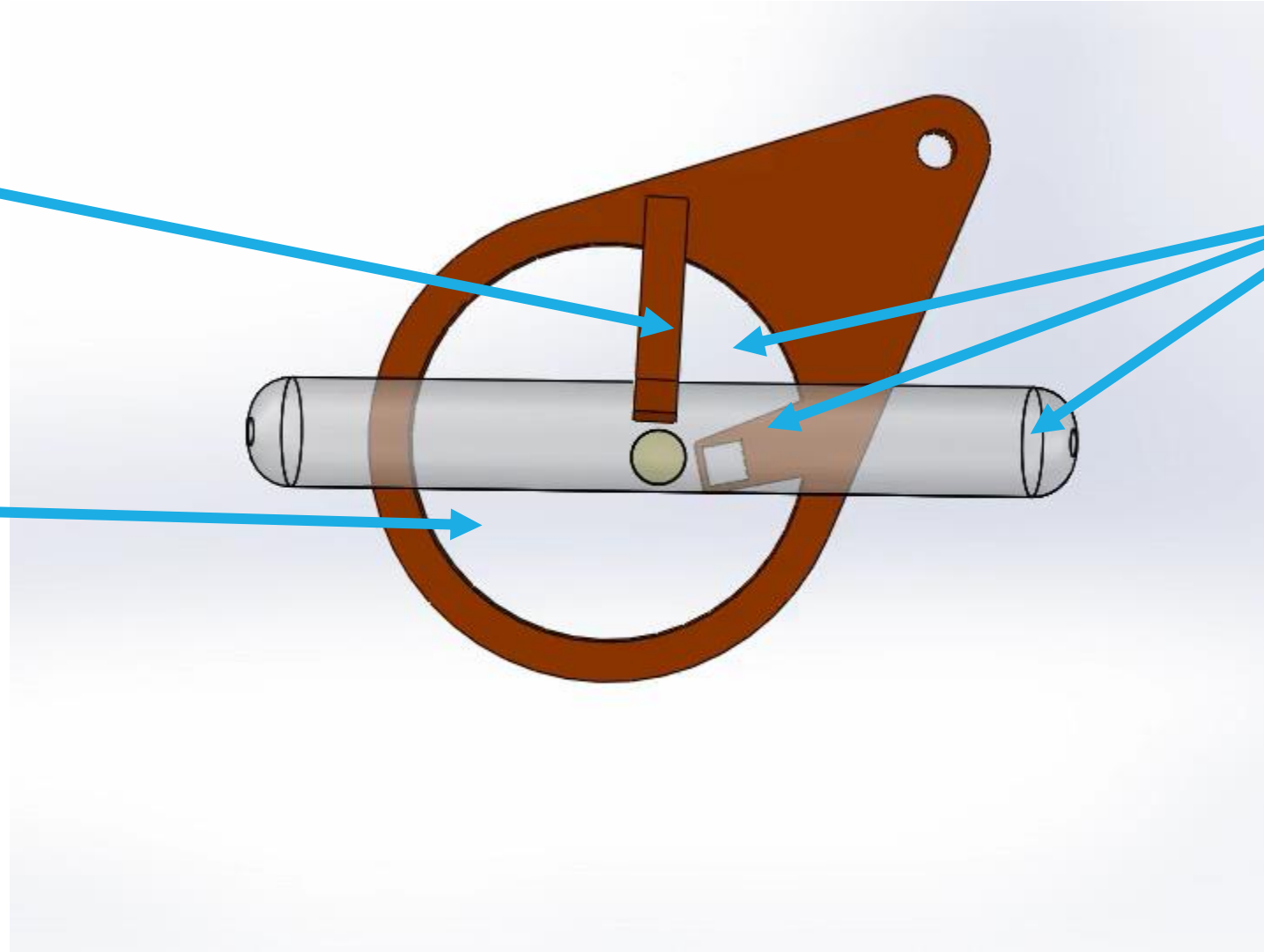
The double target holder



The double target holder

Reflection
target

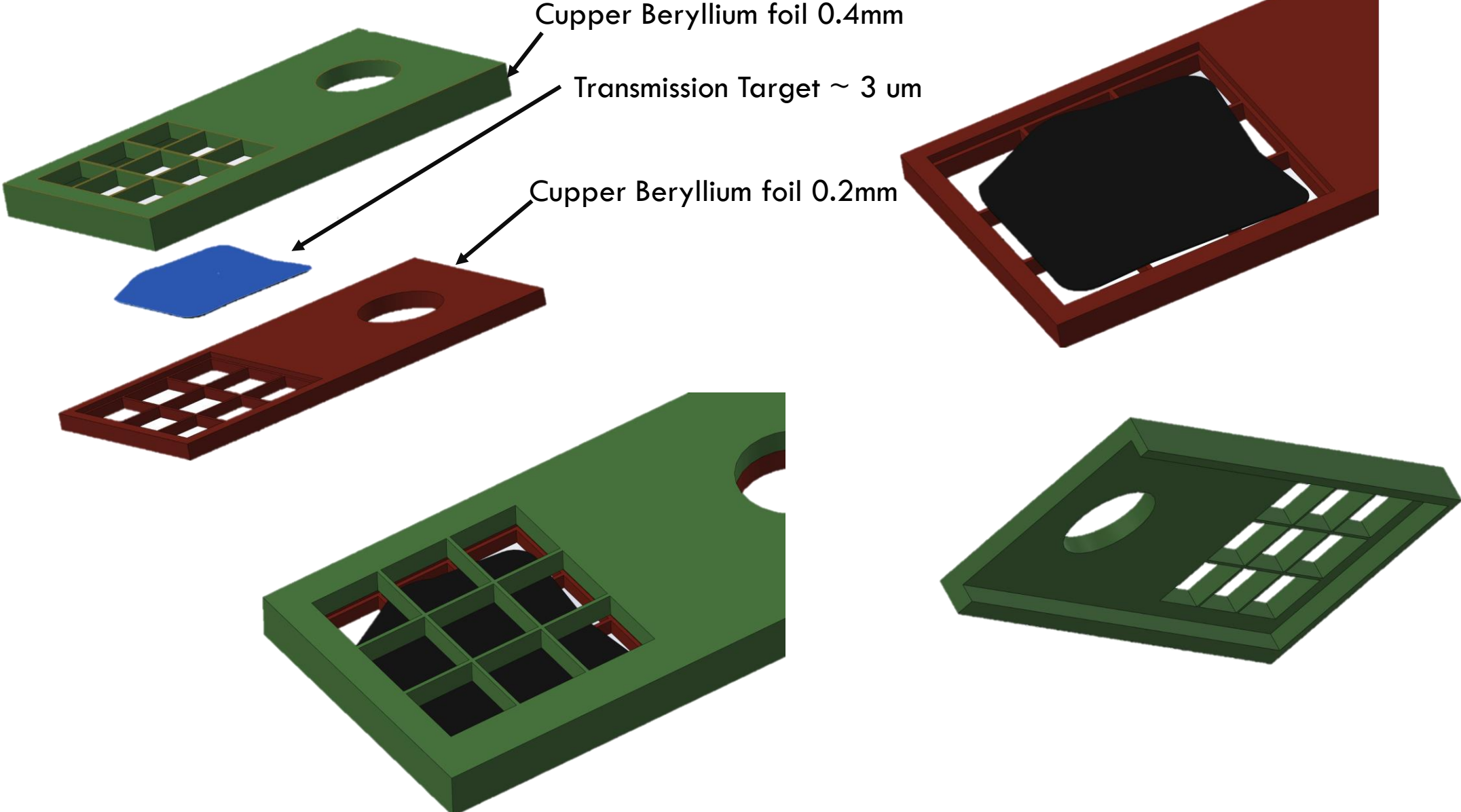
Transmission
target



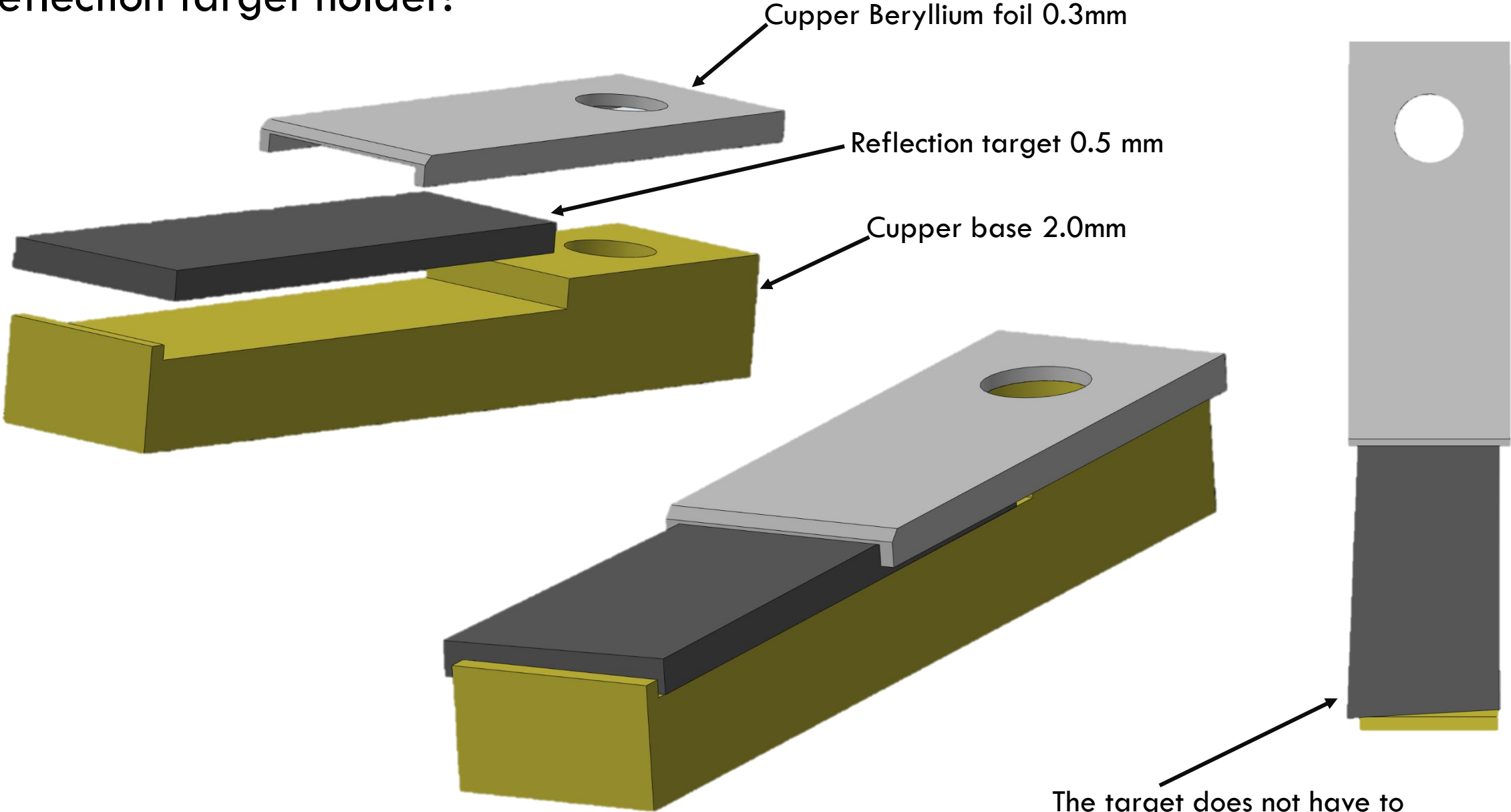
Positrons,
Pbars and
Laser
do not move when
Switching targets

A possible technical solution from the PCB lab in CERN:

(they also made our Cupper-Beryllium double-grid on the Grid-Cryo-Motor)



Reflection target holder:



Copper Beryllium foil 0.3mm

Reflection target 0.5 mm

Copper base 2.0mm

The target does not have to perfectly cut

STILL TO BE DONE

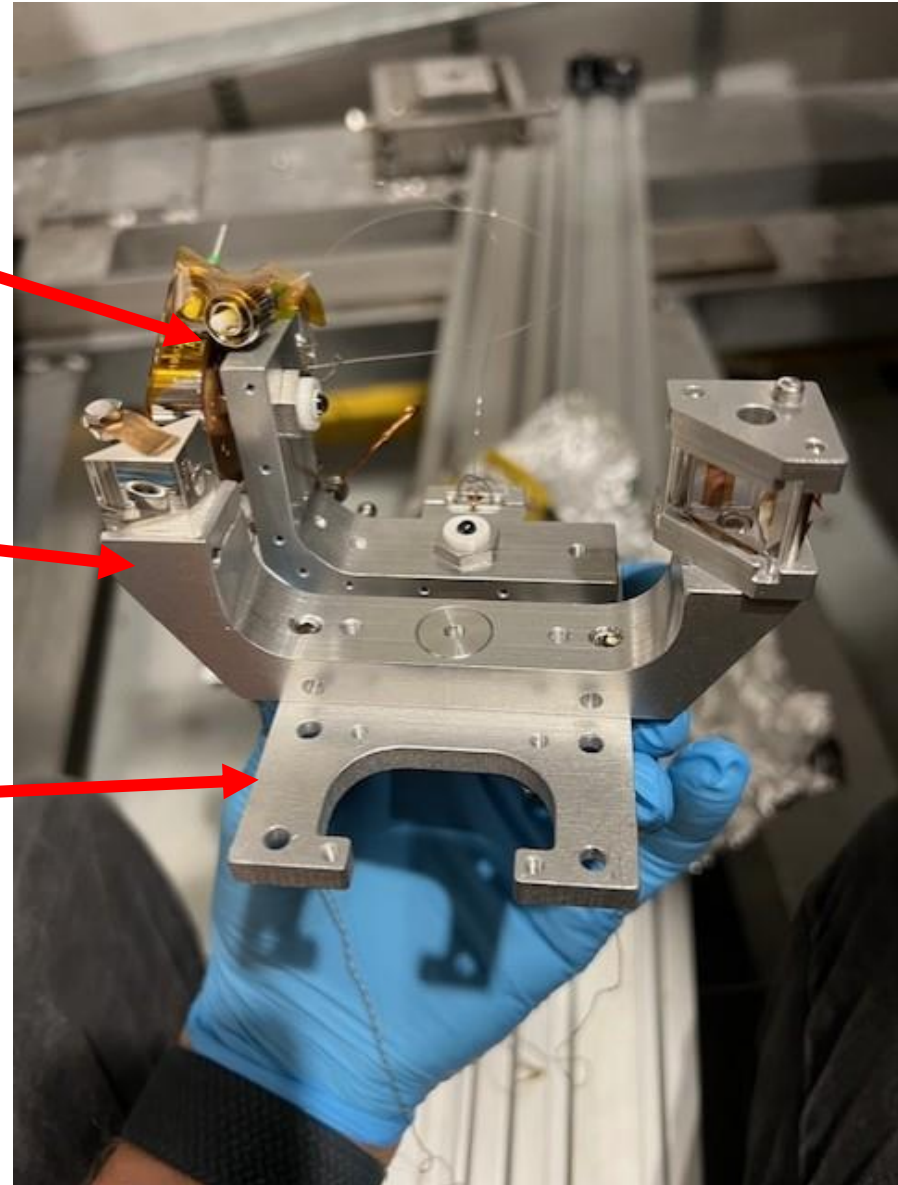
- add adequate mechanical clamps to hold the targets securely in place
 - test the transmission target holder under cryogenic conditions
- add heater and temperature sensor to the ring
- add thermal insulation in order to keep it at RT without heating the environment too much
- integrate to the existing trap infrastructure:
 - new cable management with new connectors for easier maintenance
 - shift the optical elements for the laser a few mm further downstream
- 3D print / or micro water jet cut the elements
- test the heating of the targets with an infra red camera in a vacuum setup

The modular design of the trap extension:

Alignment motor unit

Optical unit

Short support plate
(fixed with 4 screws to the trap support plate)



Target size 3x3mm in comparison



SMA HF connector