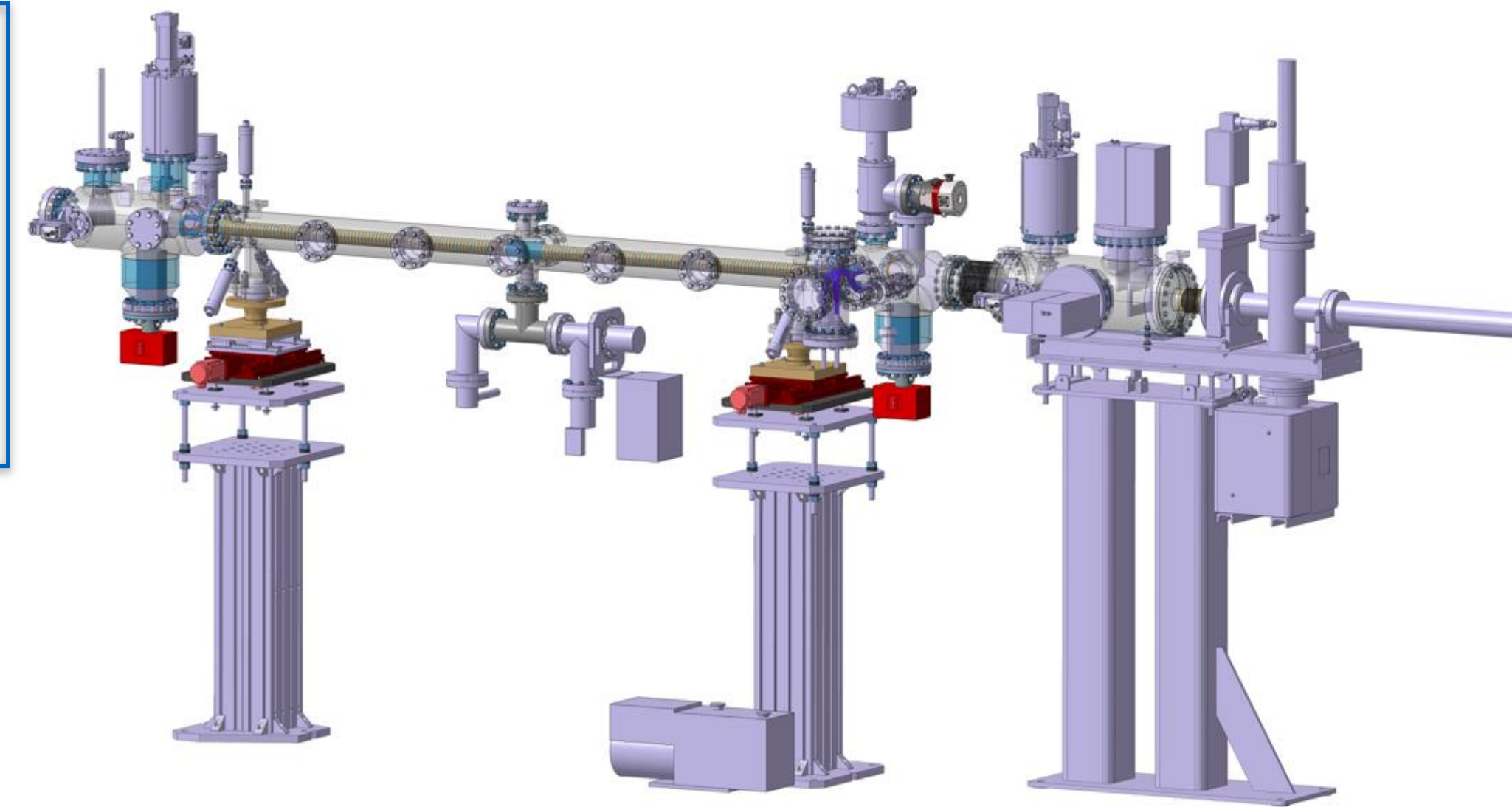
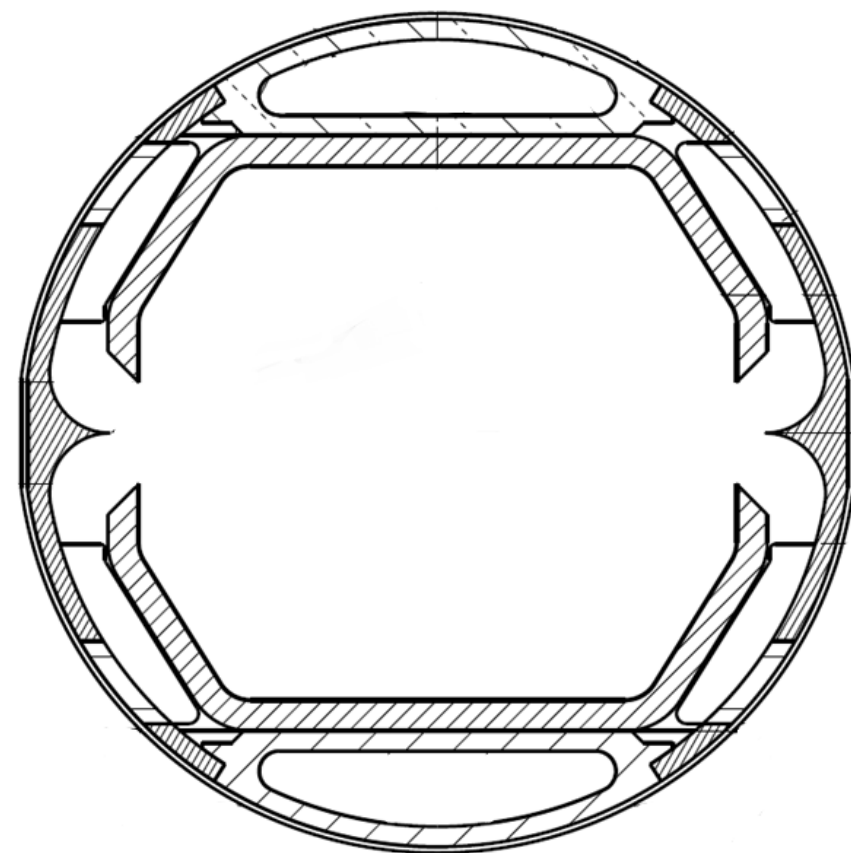


Test of FCC-hh Beam Screen at the ANKA Beamline.

L.A. Gonzalez,^{1, 2} M. Gil Costa,^{3, 2} P. Chiggiato,² V. Baglin,² C. Garion,² R. Kersevan,² S. Casalbuoni,⁴ E. Huttel,⁴
A. Gutierrez², J. Cortes², A. Grau⁴, D. Saez de Juaregui⁴, I. Bellafont^{2,5} and F. Perez⁵



Outline

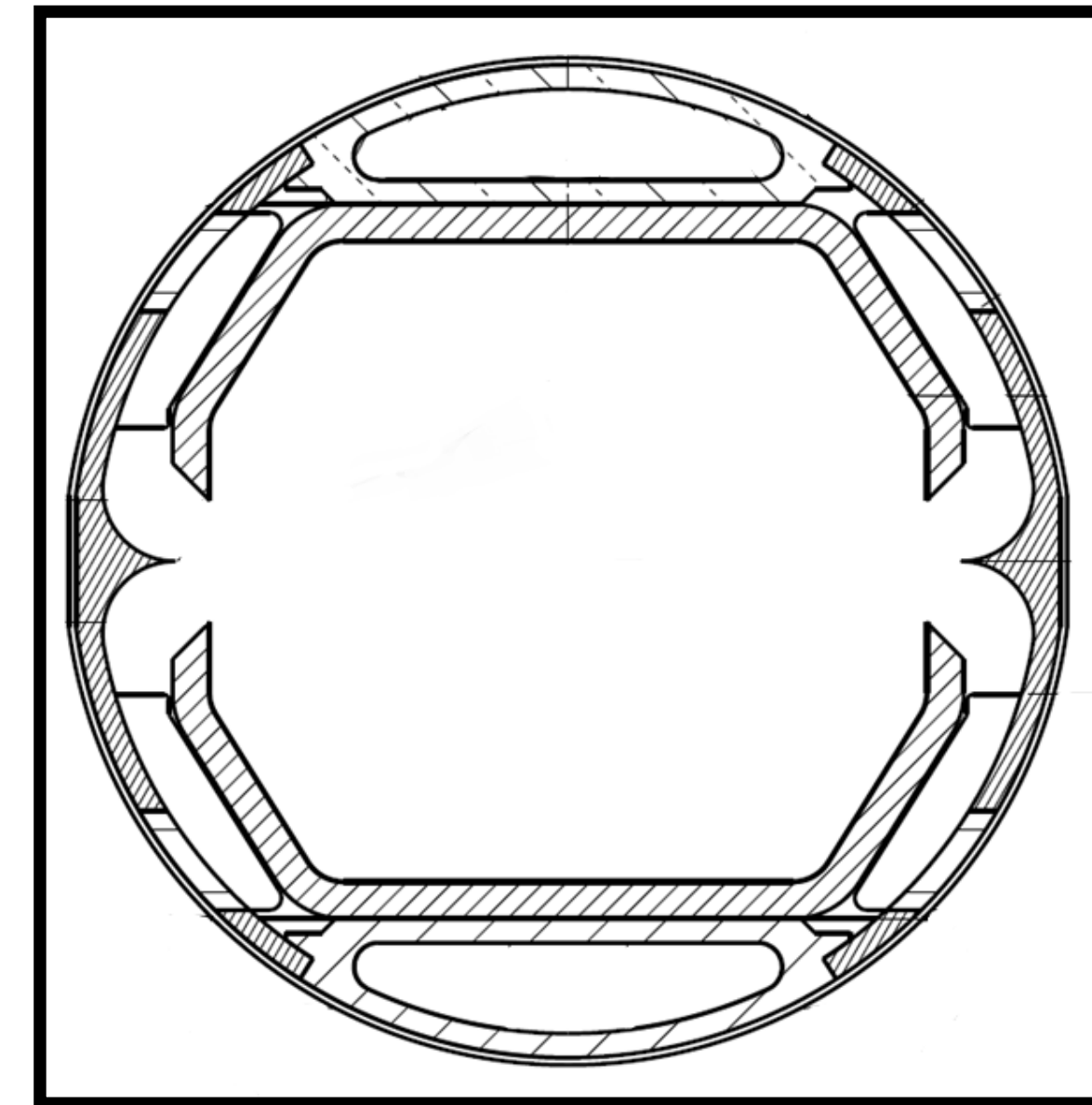
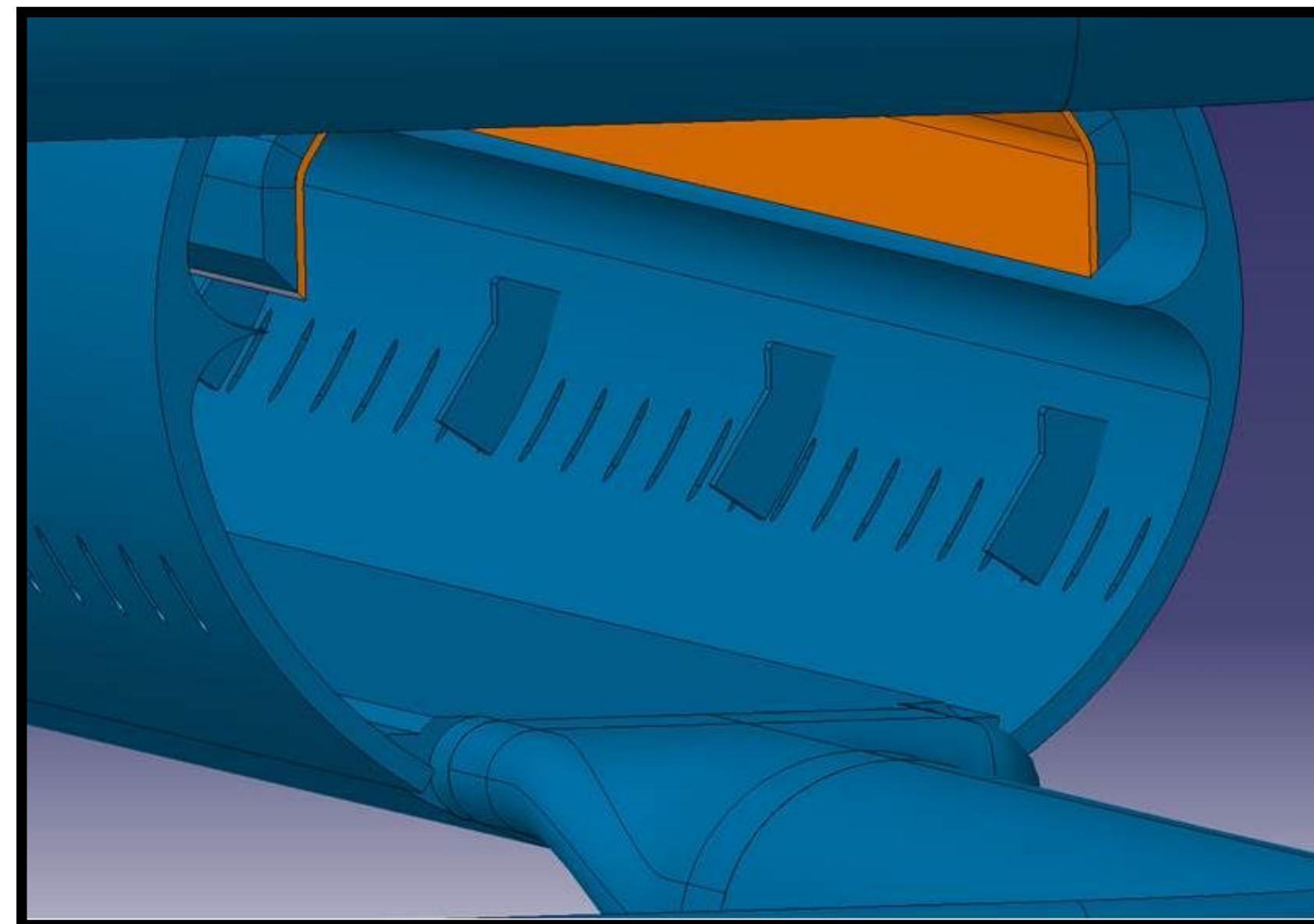
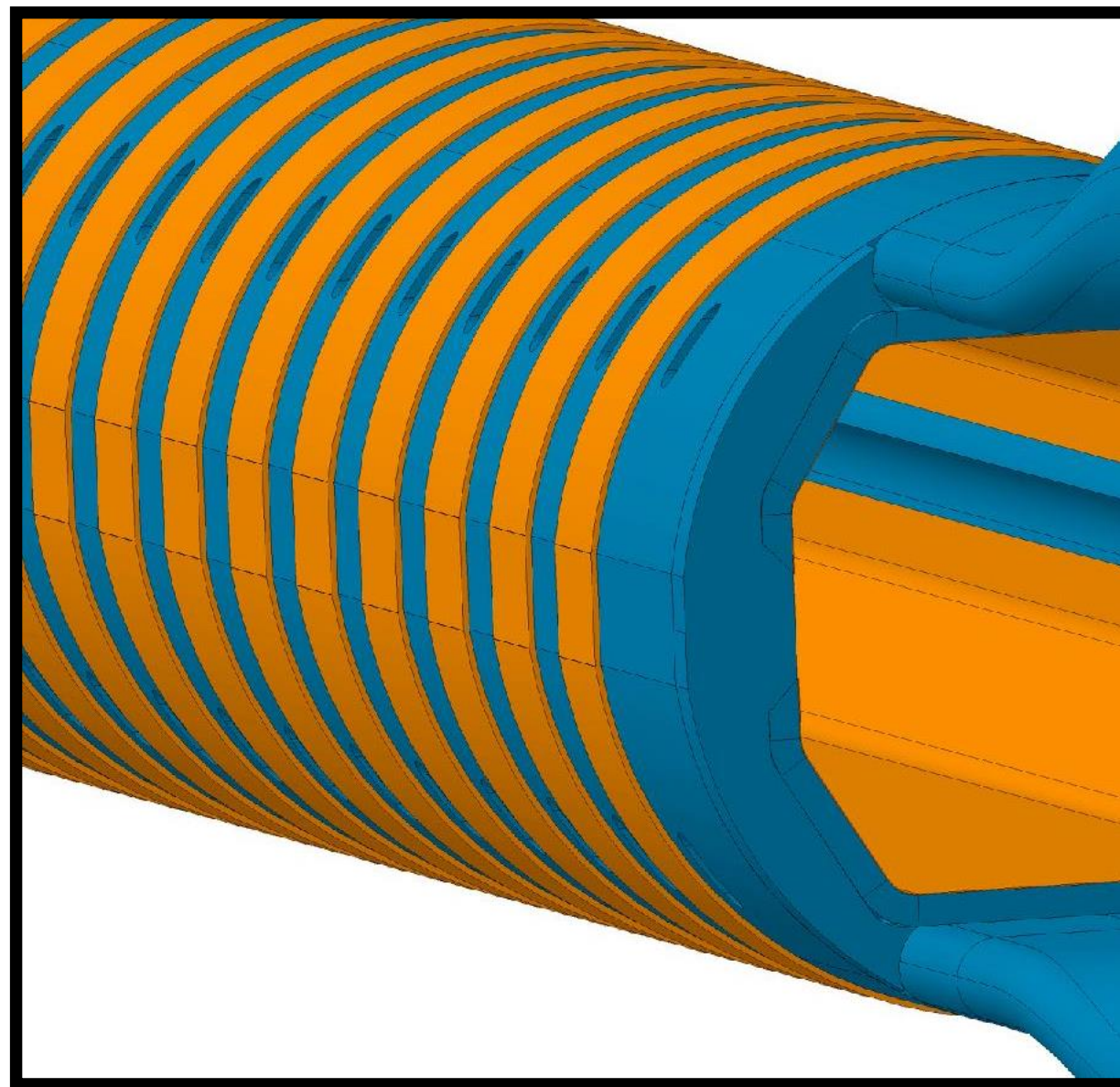
- Remedies SR Induced Effects
- Test at ANKA
 - Scientific Objectives
 - The Samples
 - The Setup
- Conditioning Results
- Installation procedure

SR induced Effects Remedies

	LHC - 0.58A 7TeV	FCC-hh - 0.5A 50TeV
SR power [W/m]	0,2	35,2
Flux* ph/m/s	$4,2 \cdot 10^{16}$	$1,5 \cdot 10^{17}$
Critical Energy	44,2eV	4,3 KeV

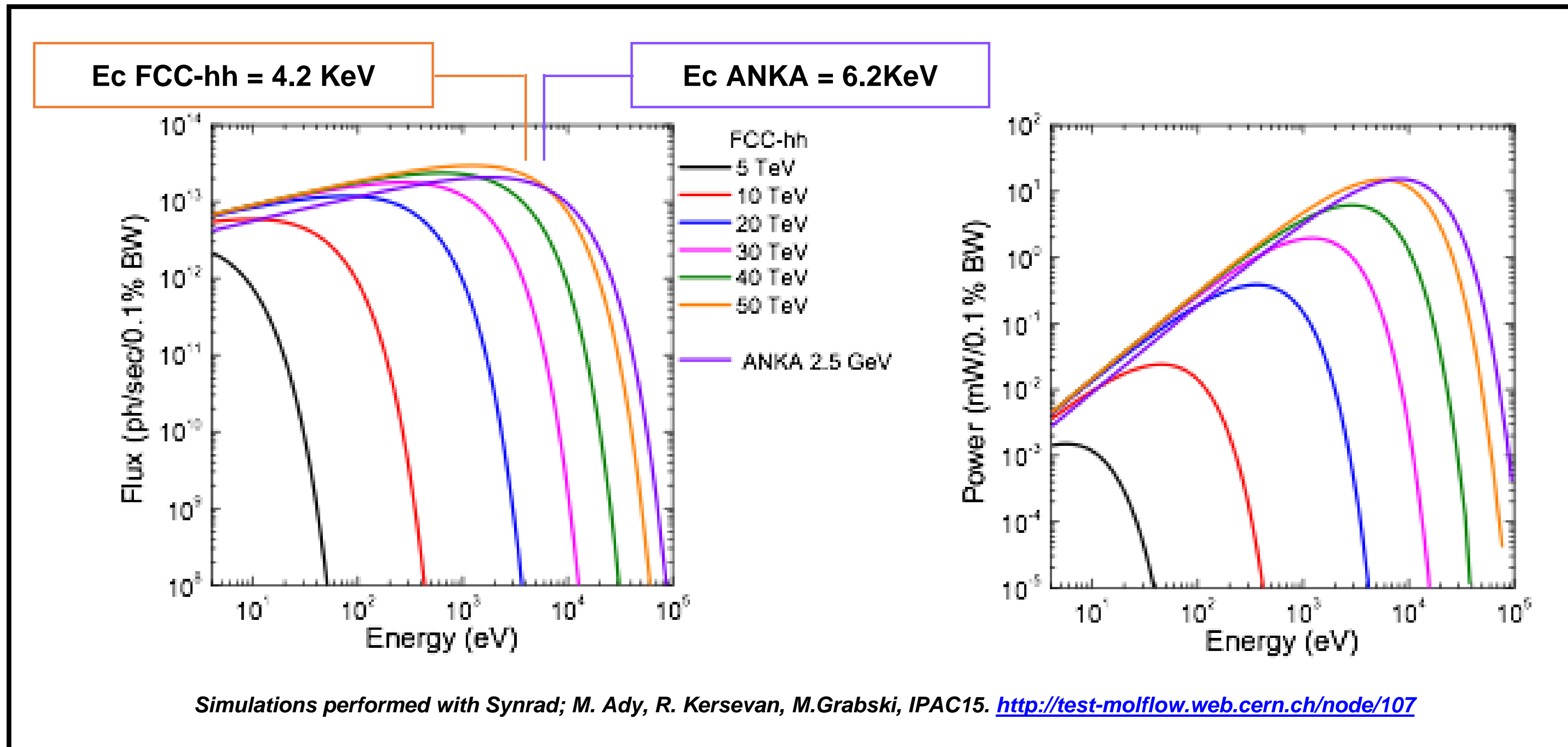
*Photon energy above 4eV

R.Kersevan; Beam Dynamics meets Vacuum, Collimations, and Surfaces Workshop. KIT, Karlsruhe. March 2017



FCC-hh

Test at ANKA



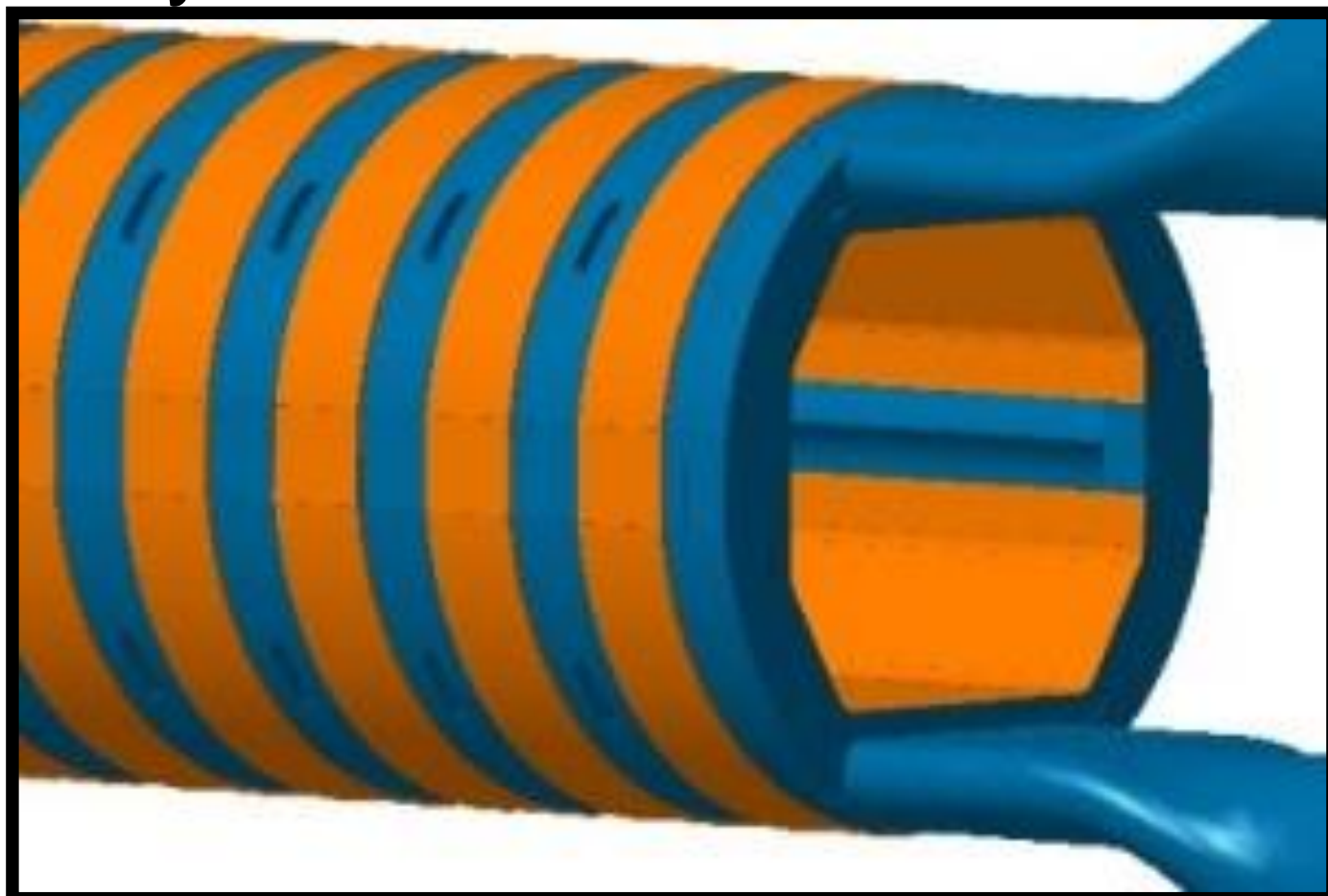
Scientific Objectives

- Define PSD
- Define Heat load distribution
- Define photoelectron generation
- Define reflectivity

ANKA reasonably resembles FCC-hh's spectrum and linear power, and even at nominal beam energy (2.5 GeV) ANKA's spectrum is a close match of that of FCC-hh.

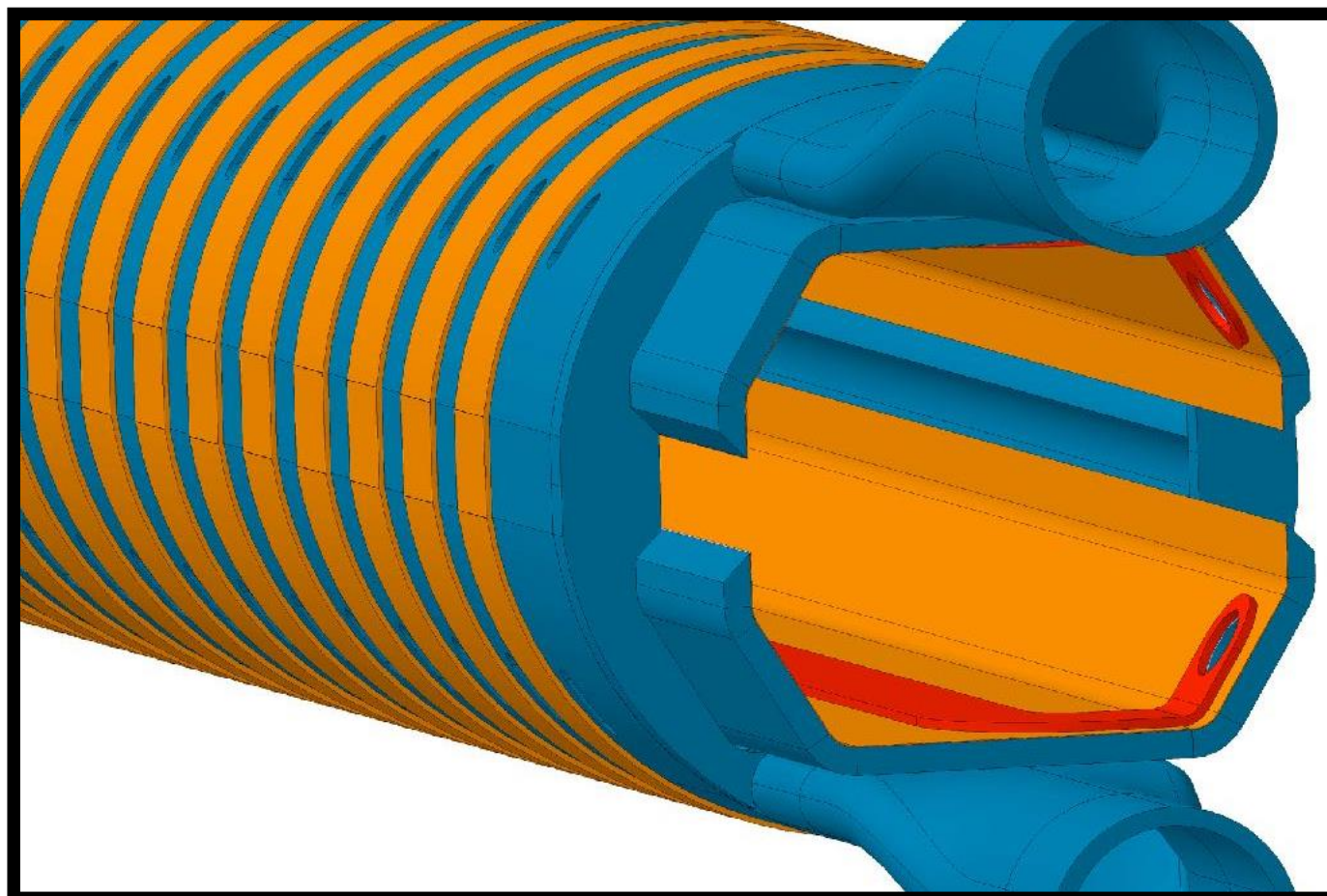
Test at ANKA.

May`17-October`17



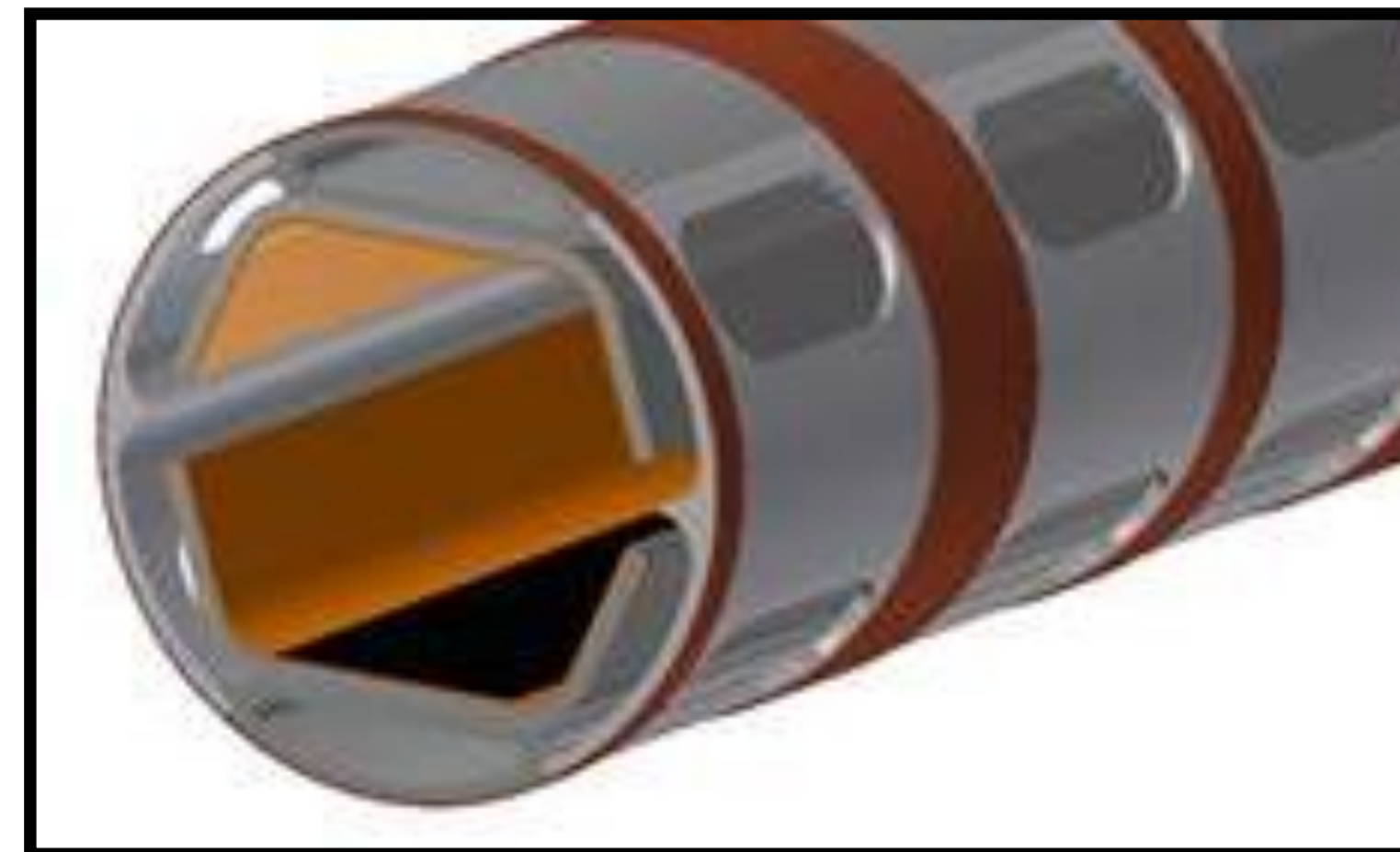
#1 for validation of temperature profile and validity of photon reflector

October`17-March`18

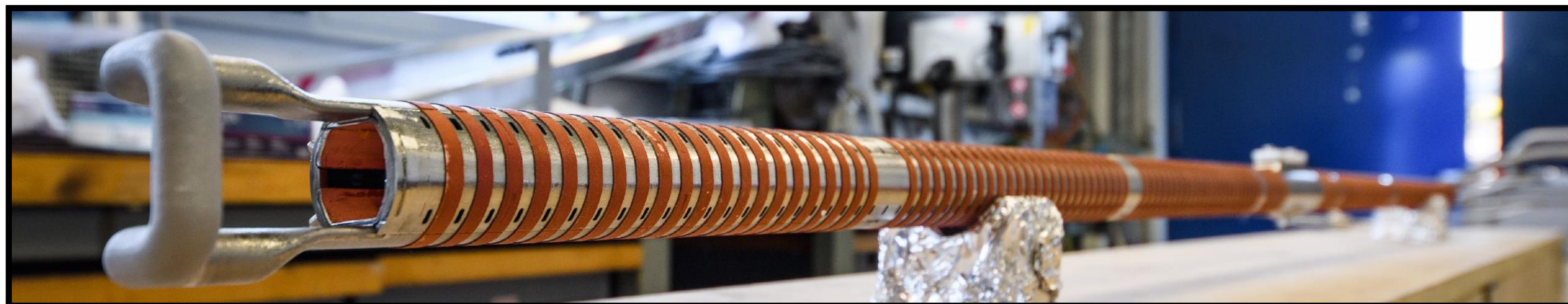


#2:#1 + electrodes for photoelectron current measurements

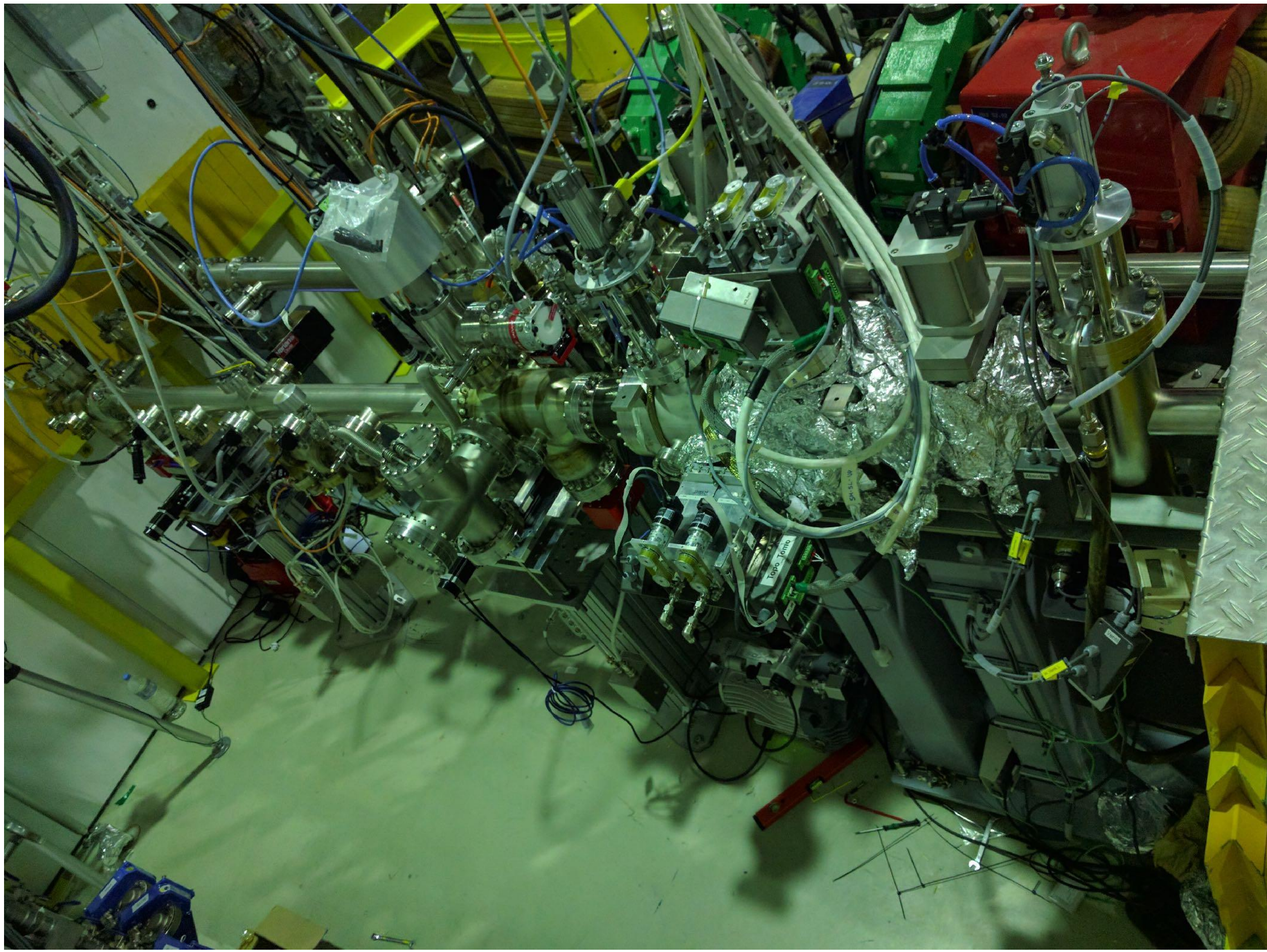
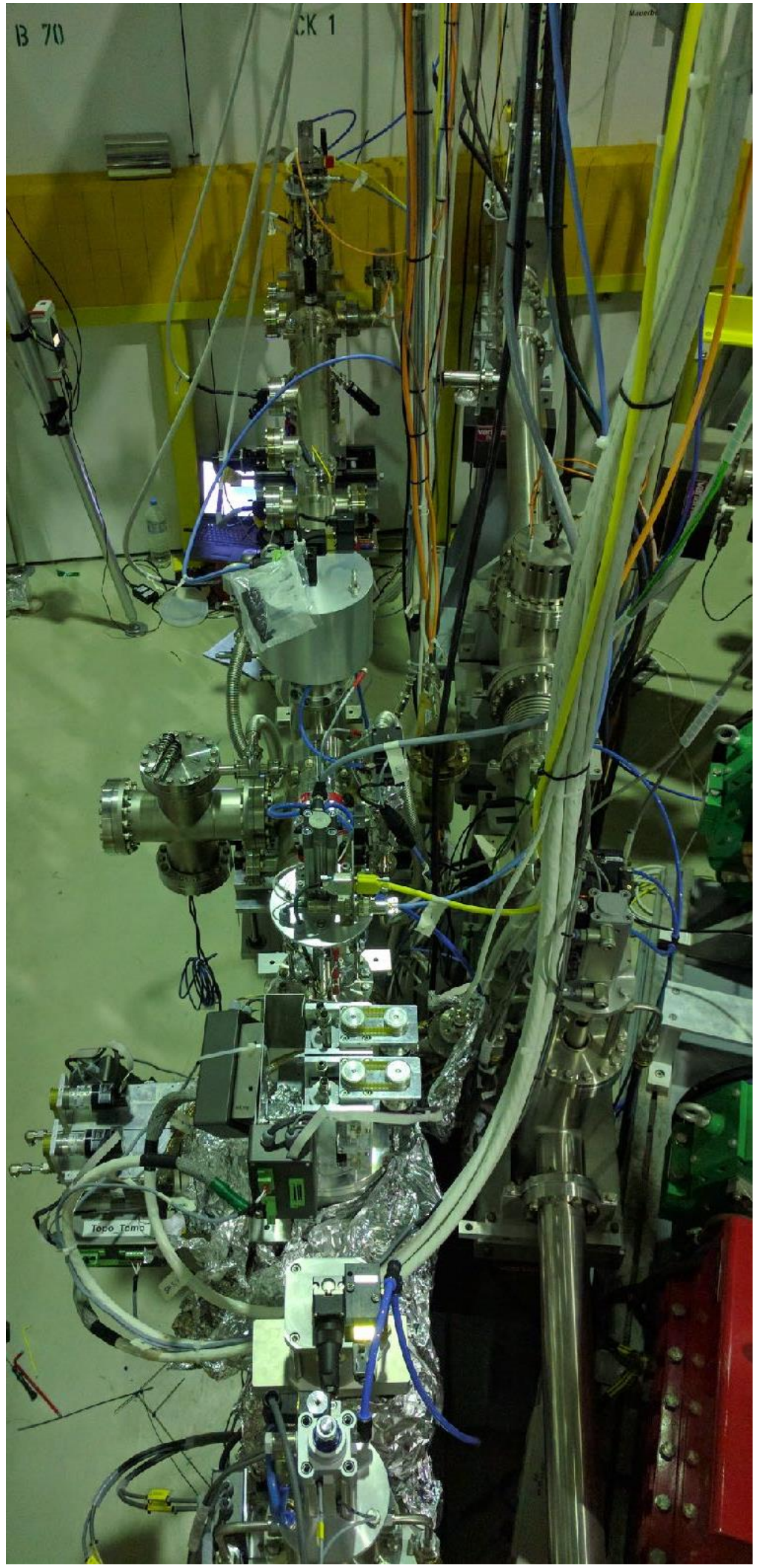
March`18-June`18



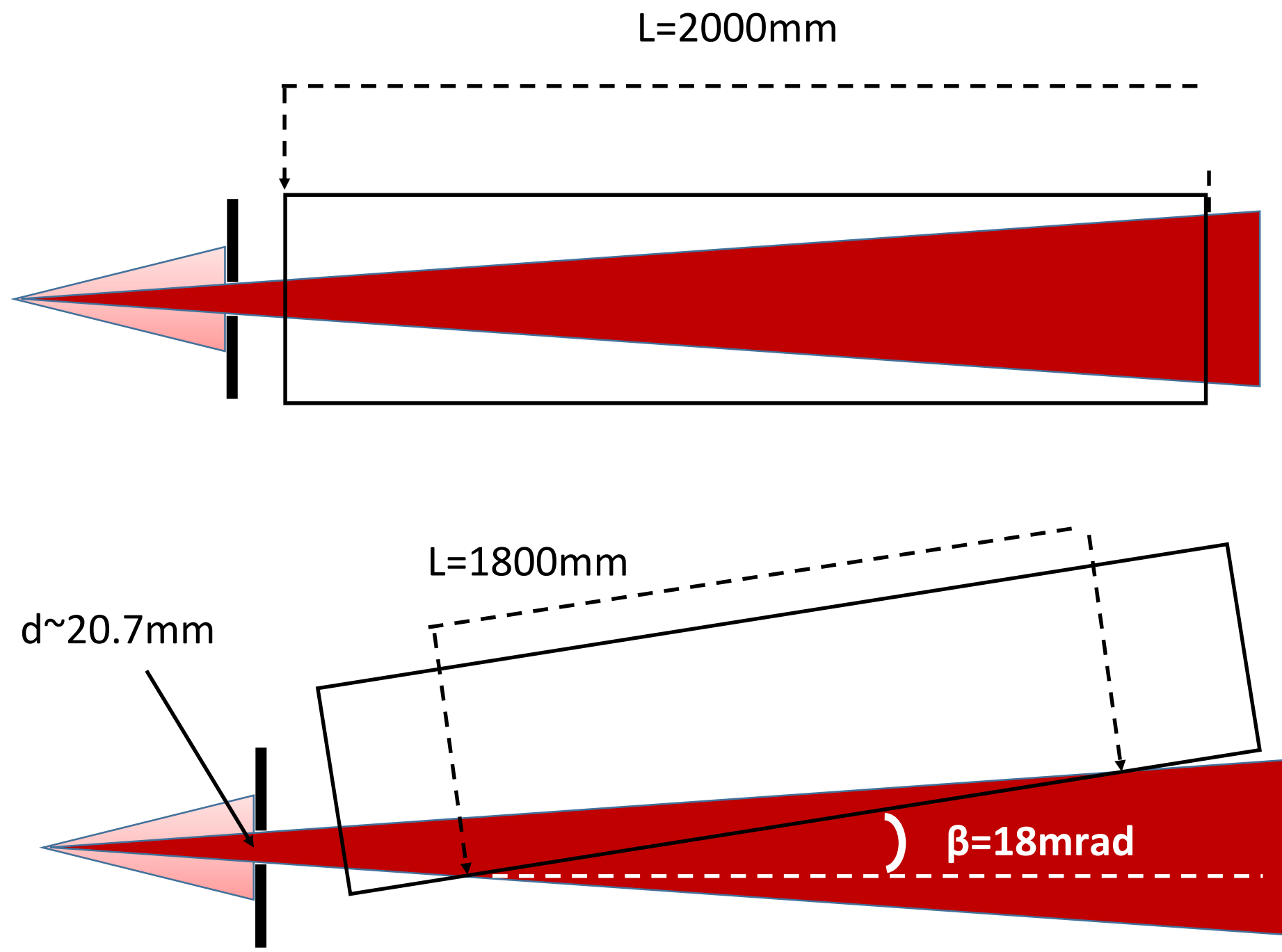
#3: Surface treatments as for baseline, updated internal screen and pumping slots, desorption yield measurement and pressure profile



Test at ANKA.



Test at ANKA.



Slits Apperture 1.2x20.7mm

83% of flux cropped \longrightarrow $8,83\text{E}16\text{Ph/sec}$
 69% of power cropped \longrightarrow 57w

Average Angle 18mrad

Irradiated Length 1800mm \longrightarrow **32W/m -**
Power per meter at FCC-hh Dipole

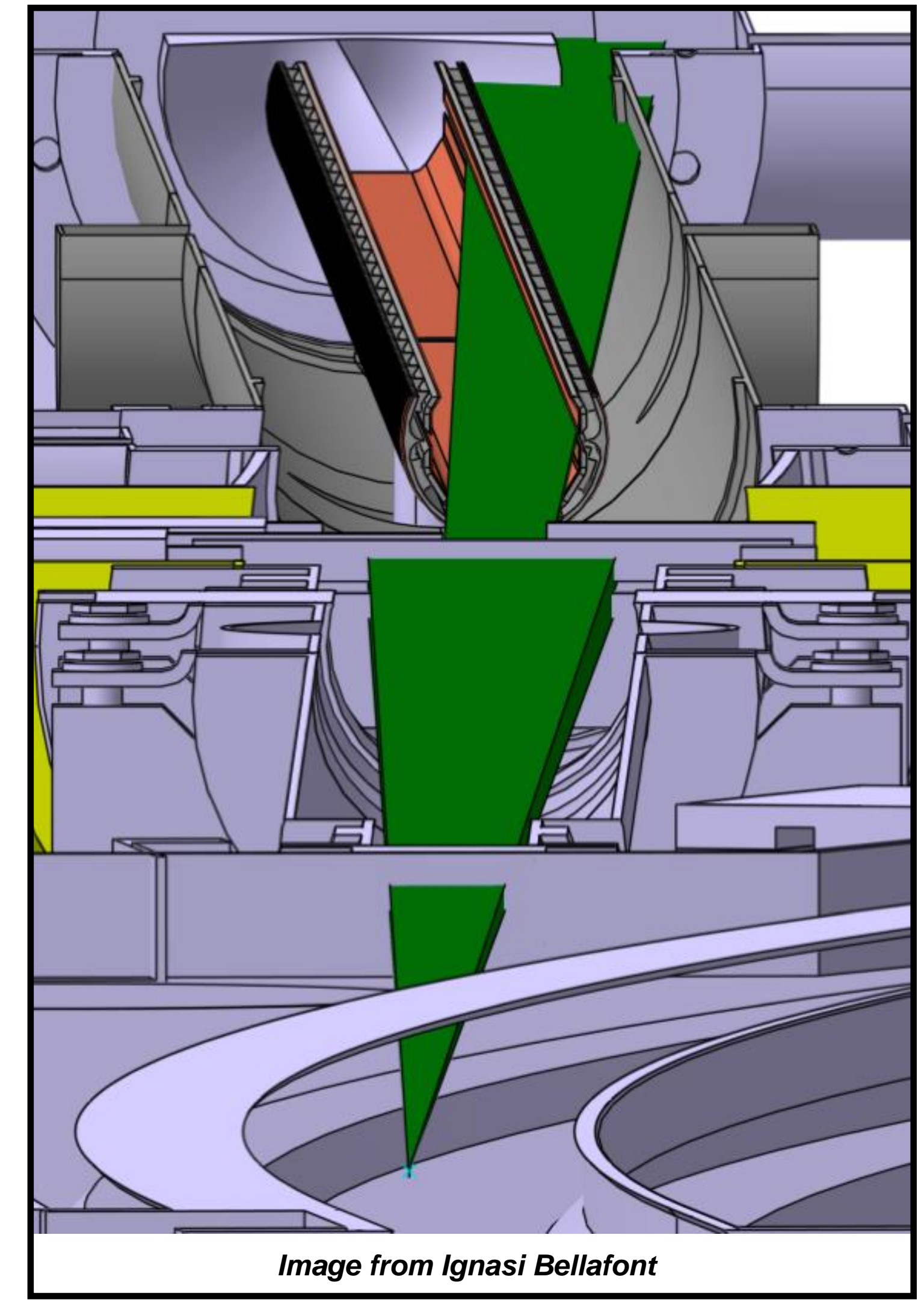
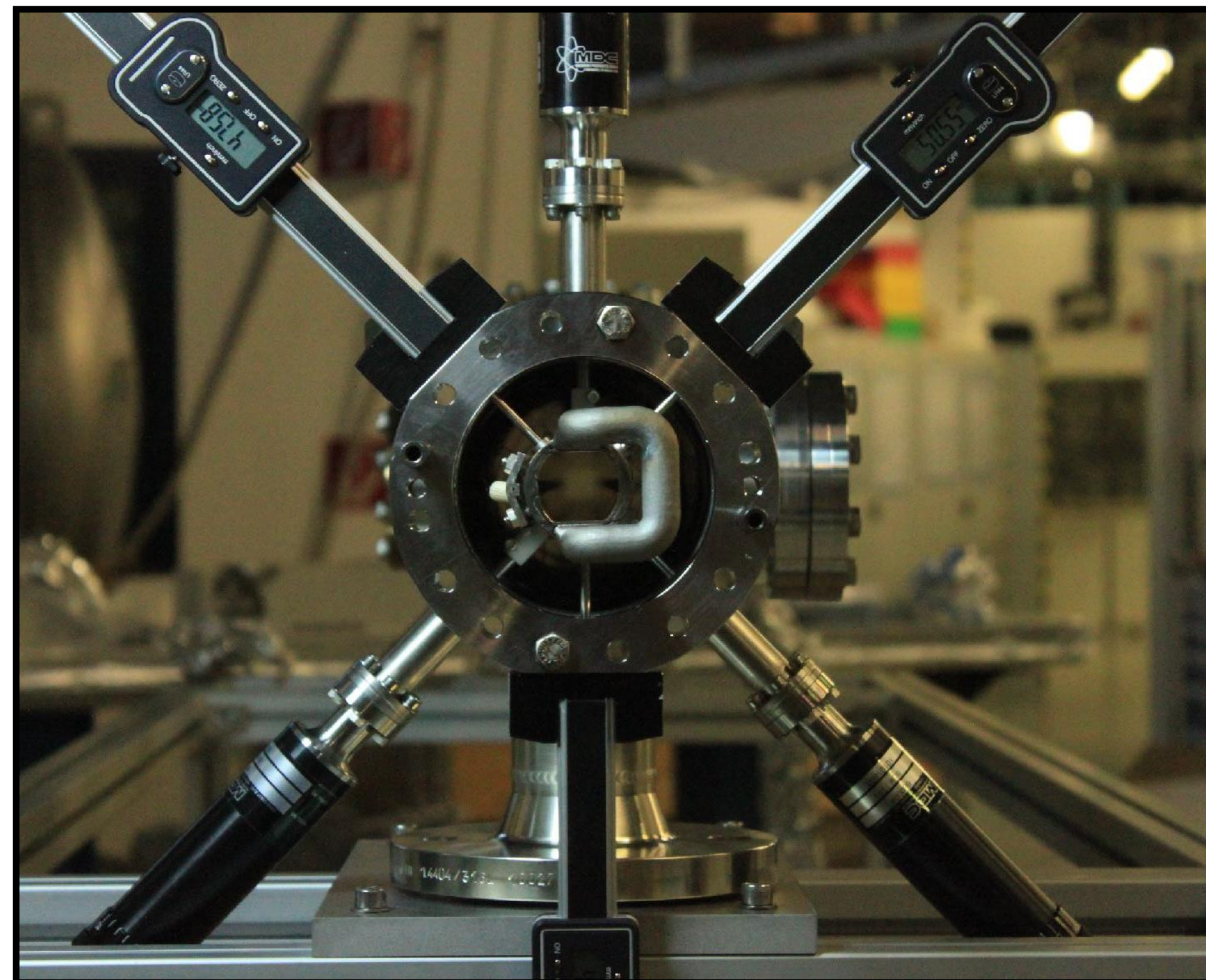
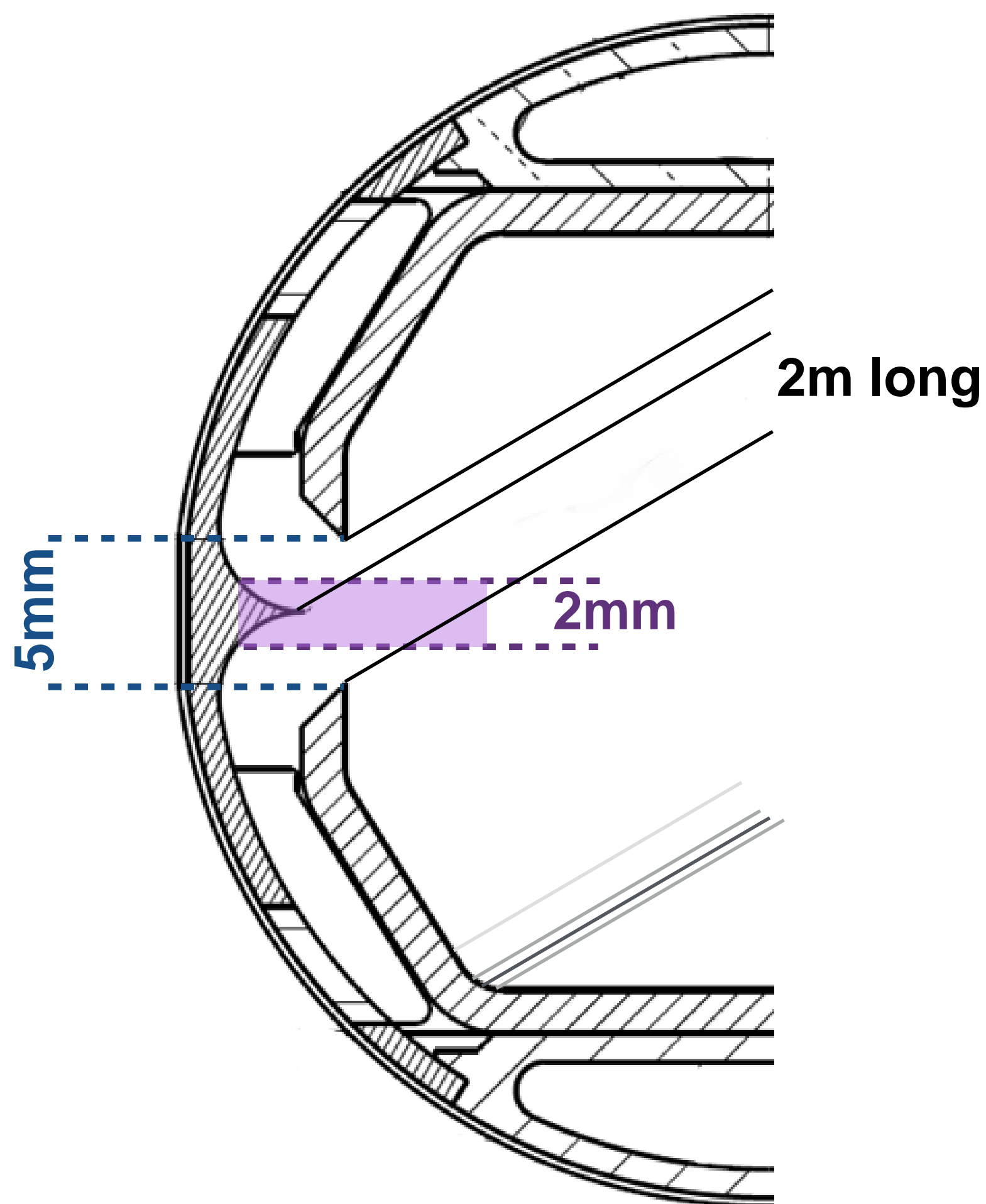


Image from Ignasi Bellafont

Test at ANKA.



Manufacturing
Reflector Position < 0.500mm

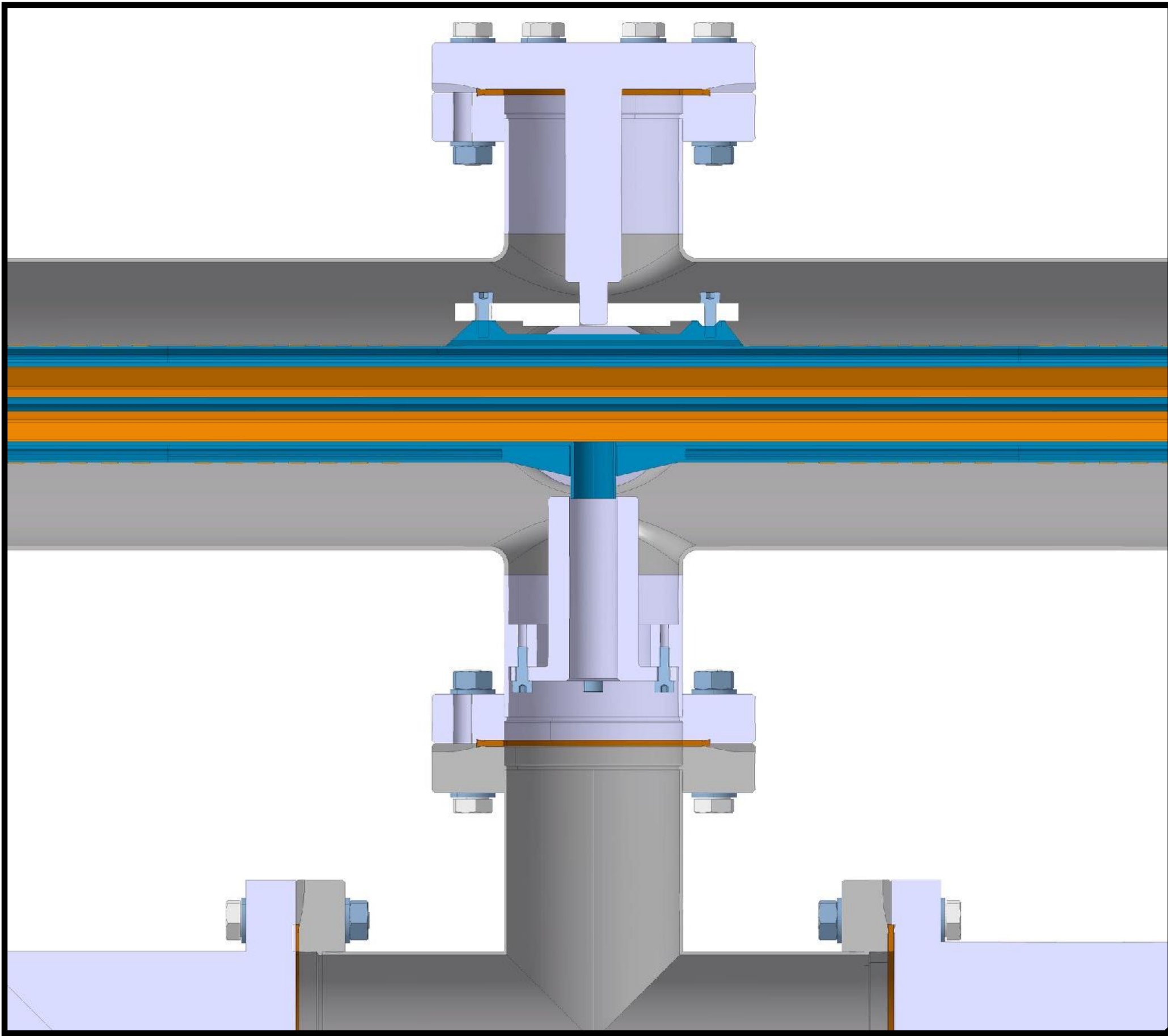
Sample Position
Repeatability < 0.050mm

Laser Tracker alignment BS
Accuracy < 0.200mm

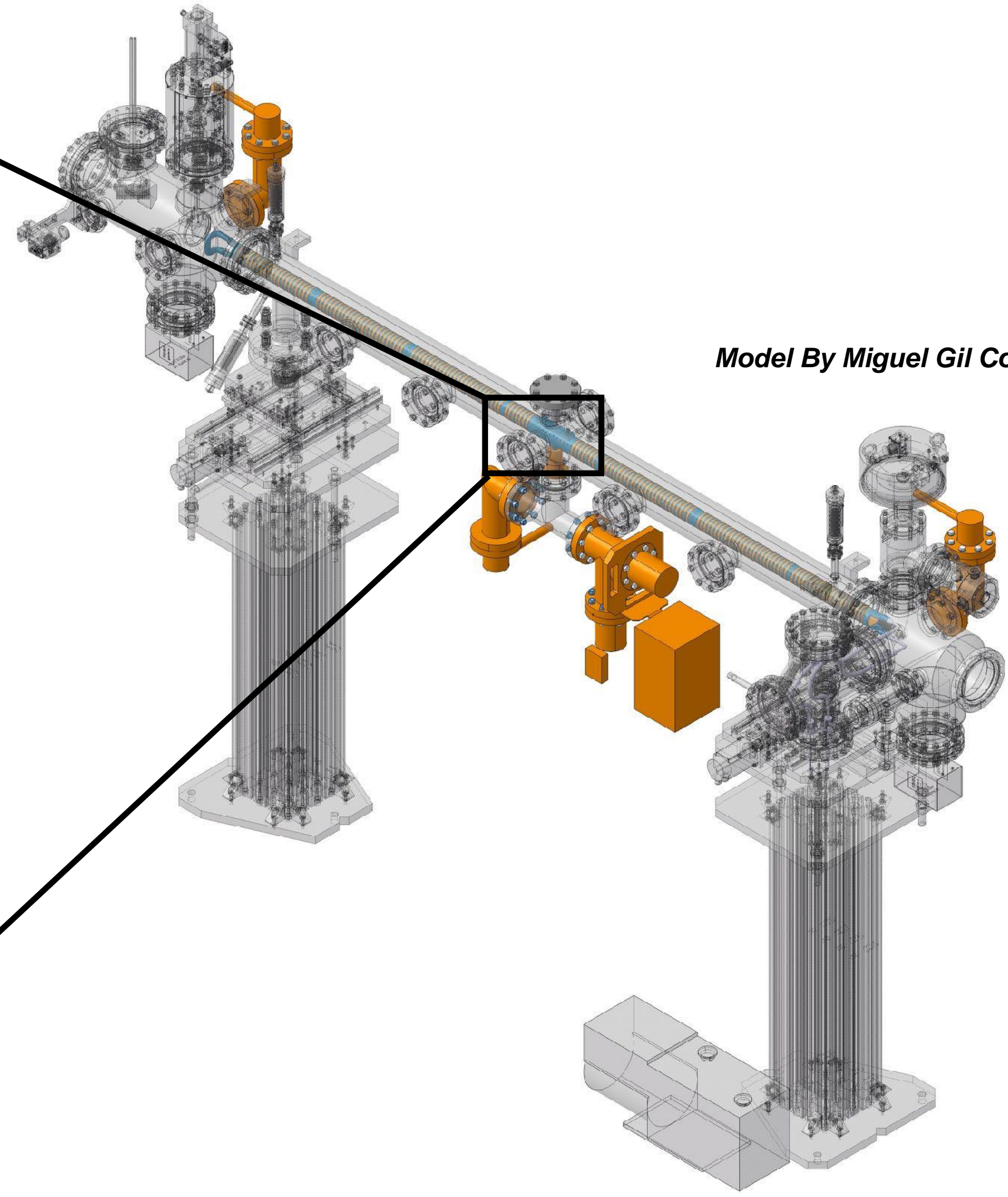
Laser Tracker alignment Slits-
Accuracy < 0.200mm

$\Delta < 0.700$ mm

Test at ANKA.

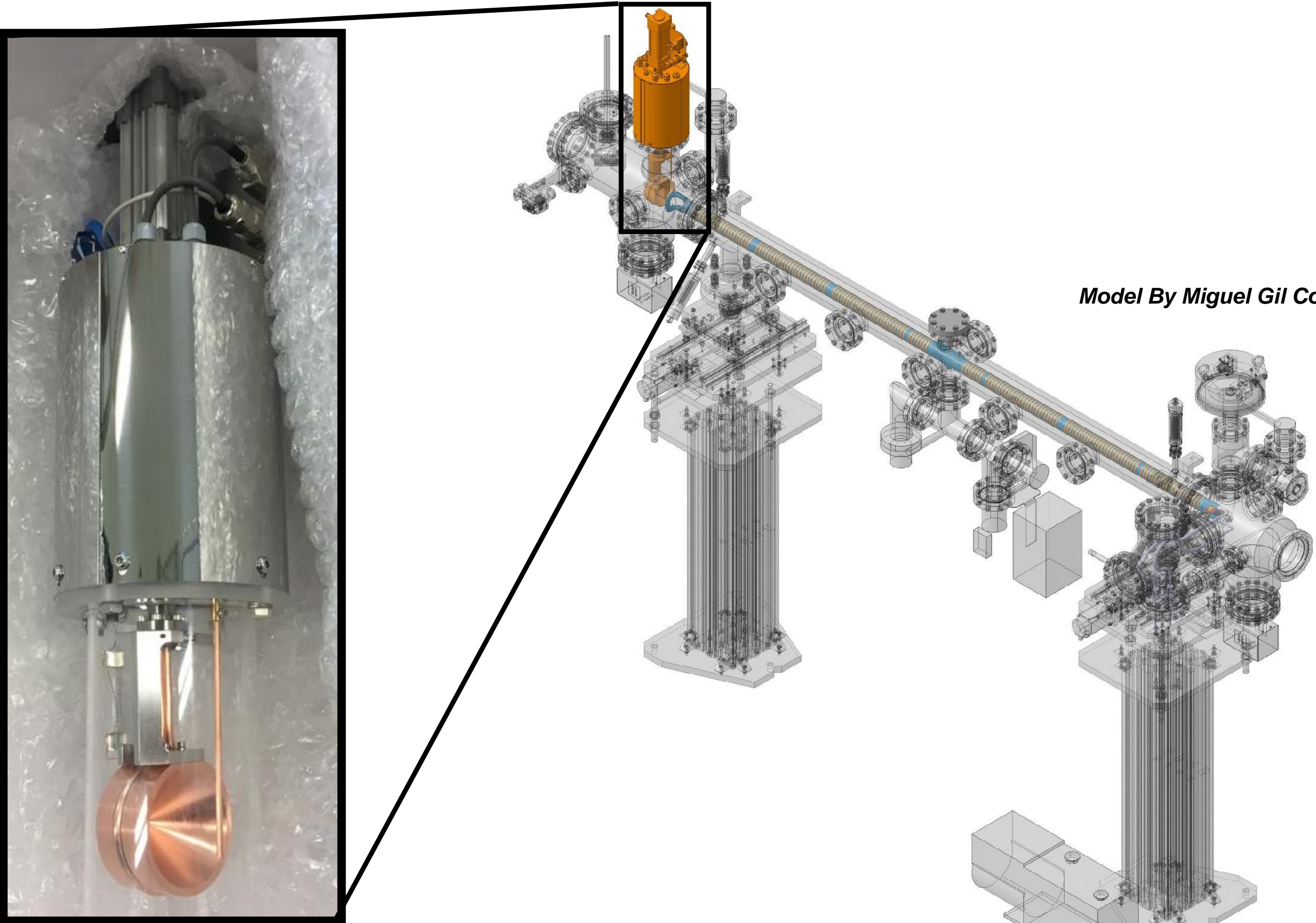
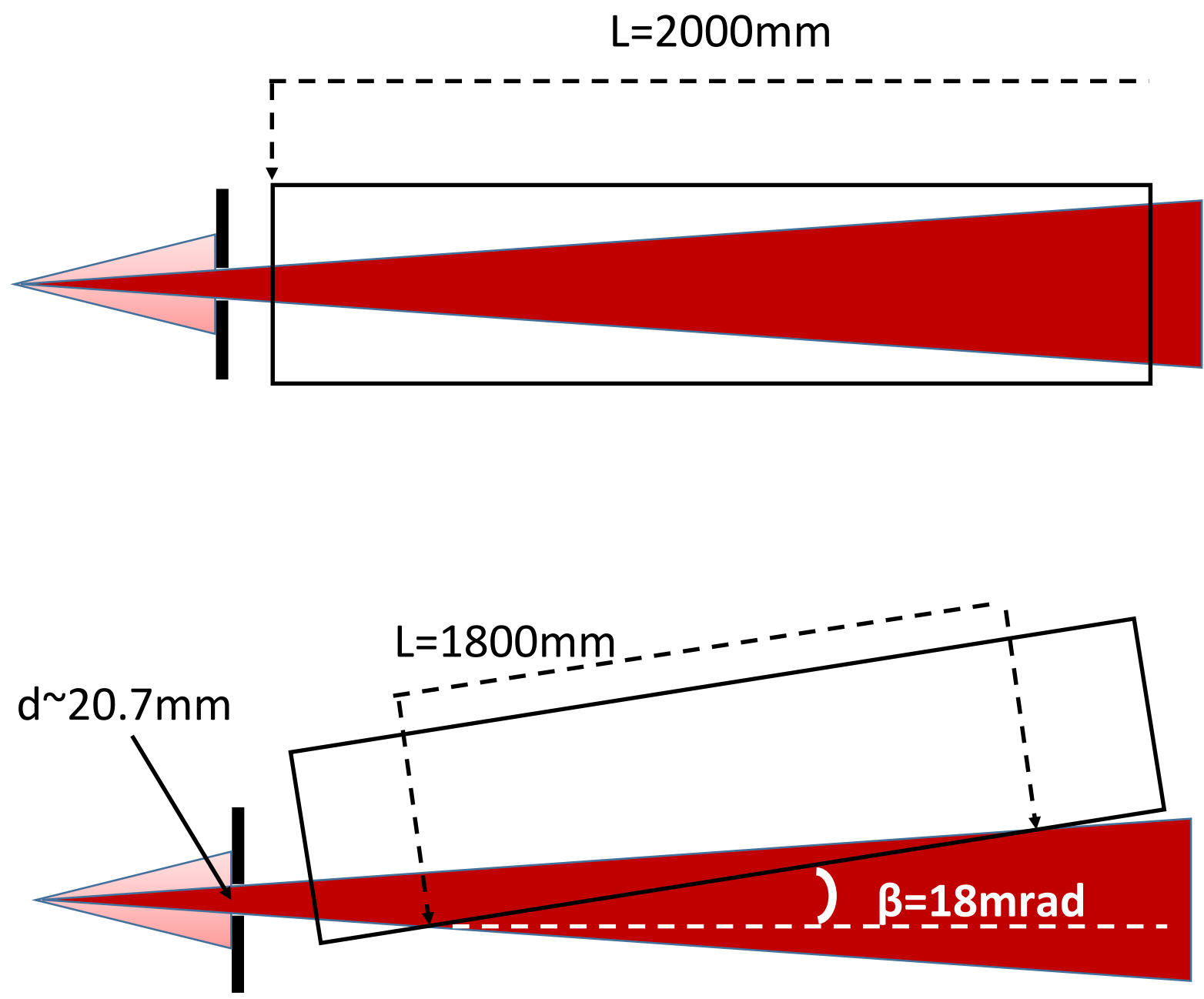


Chimney Connexion



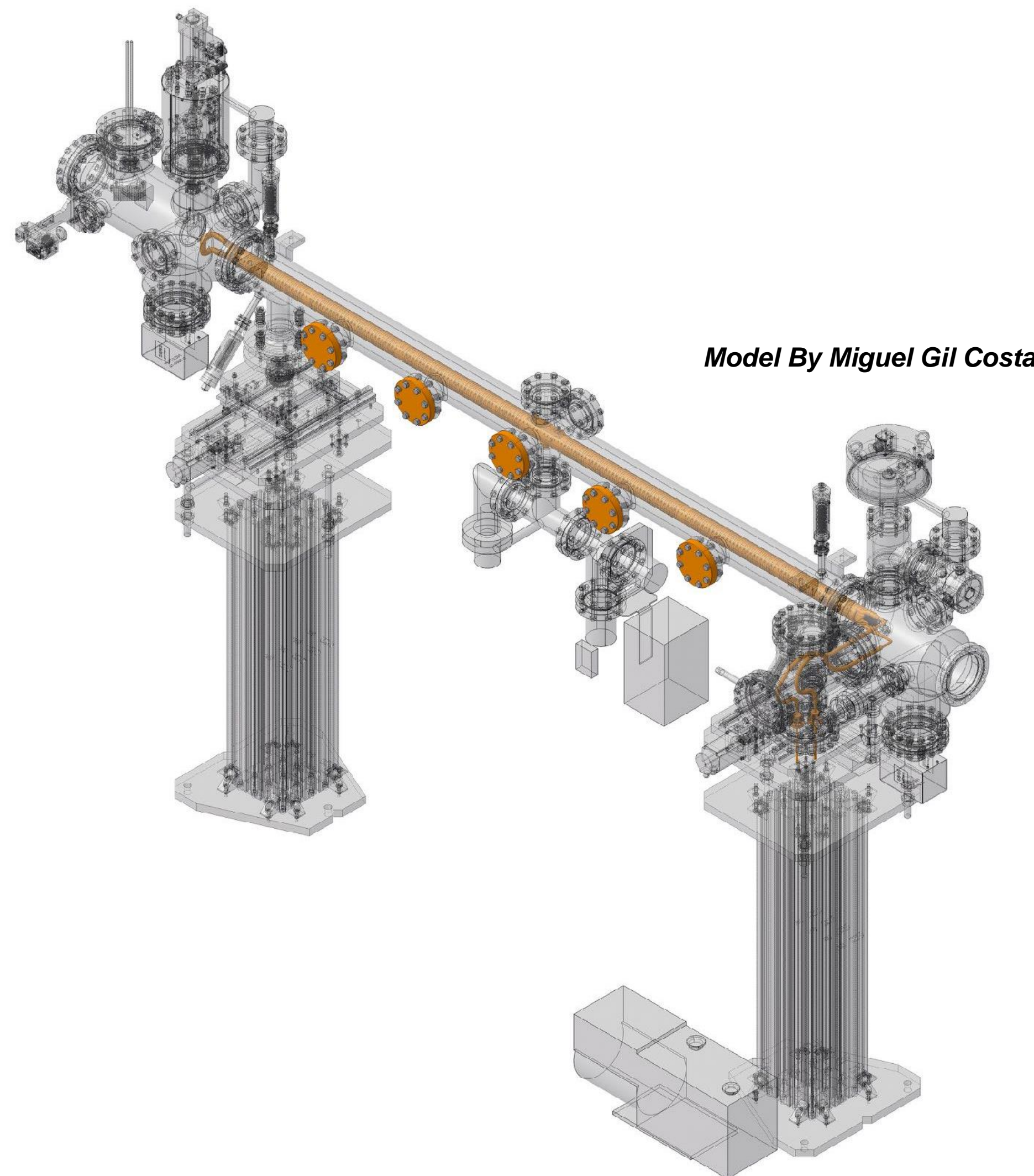
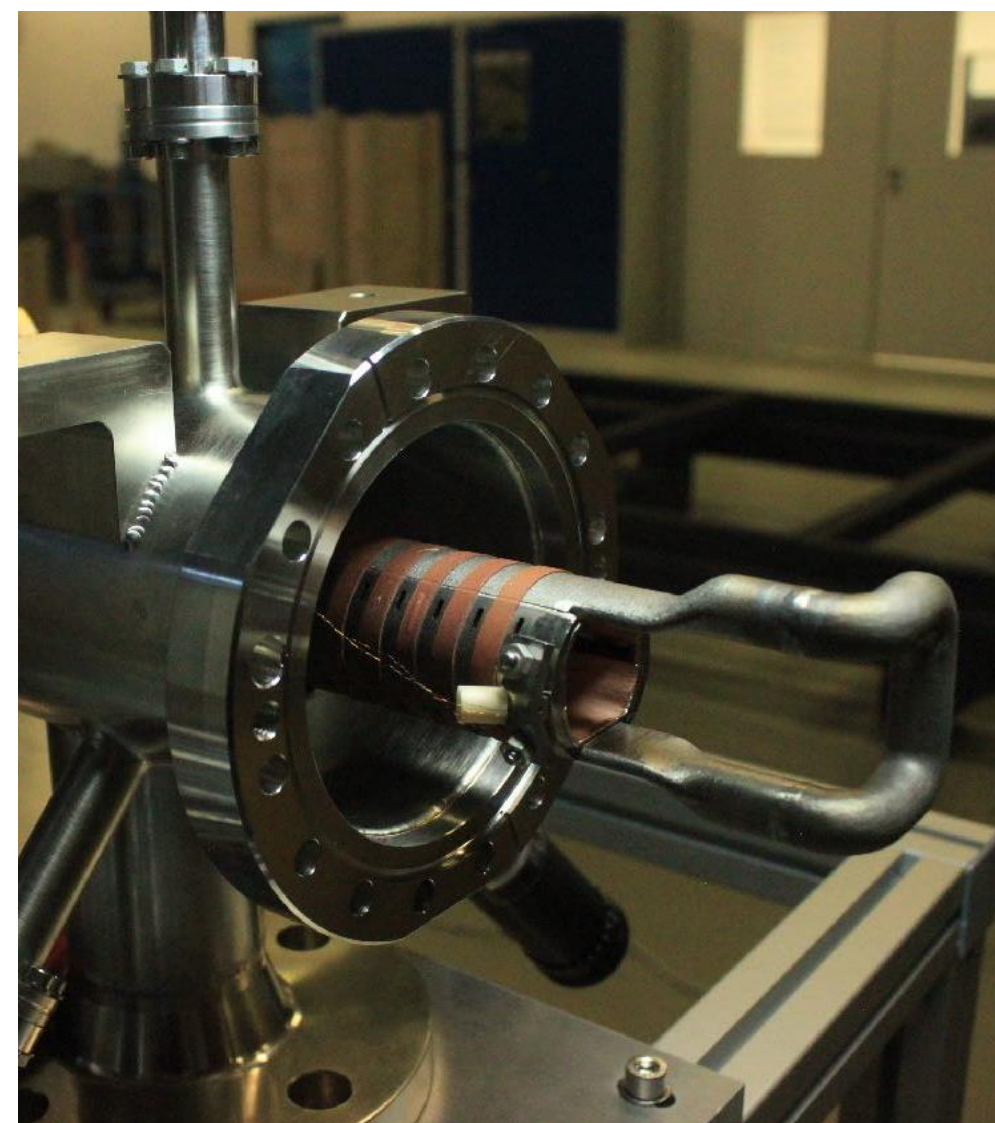
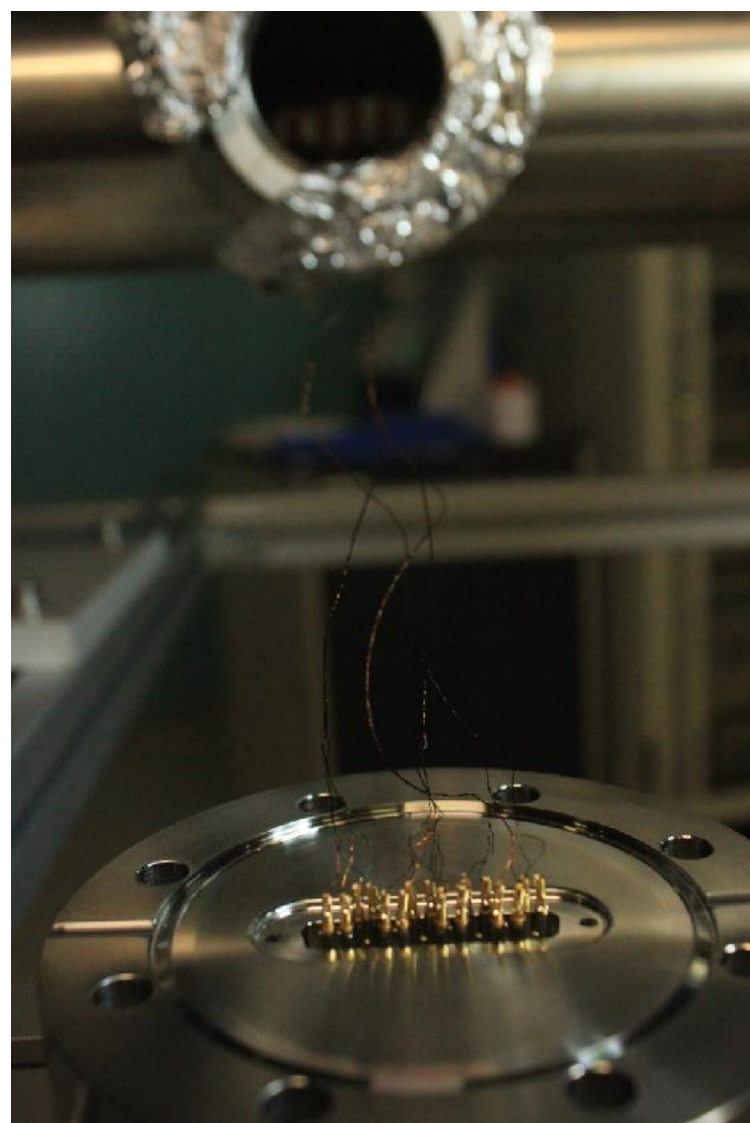
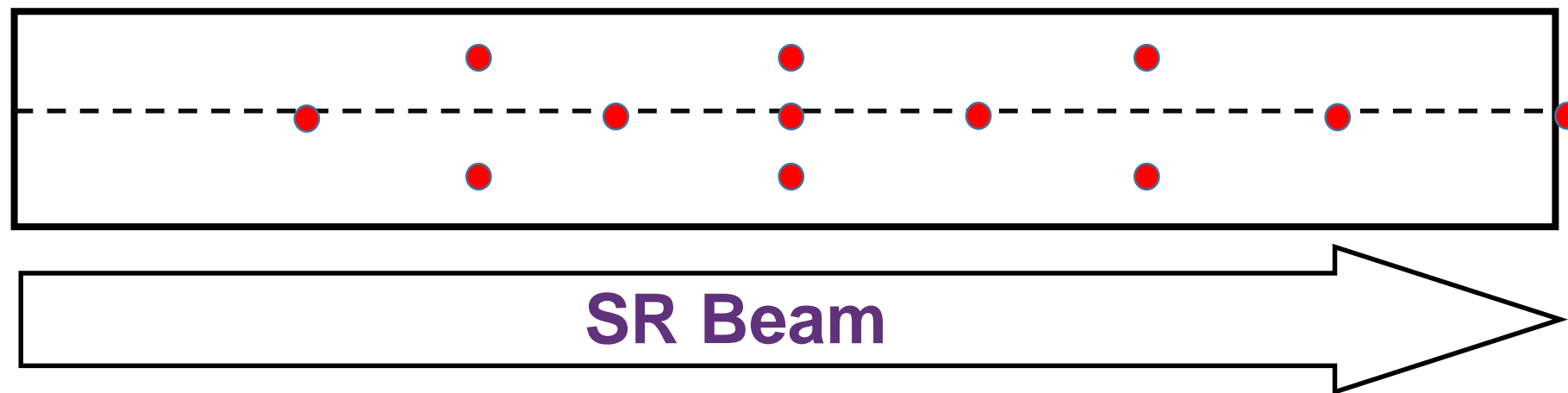
Model By Miguel Gil Costa

Test at ANKA.

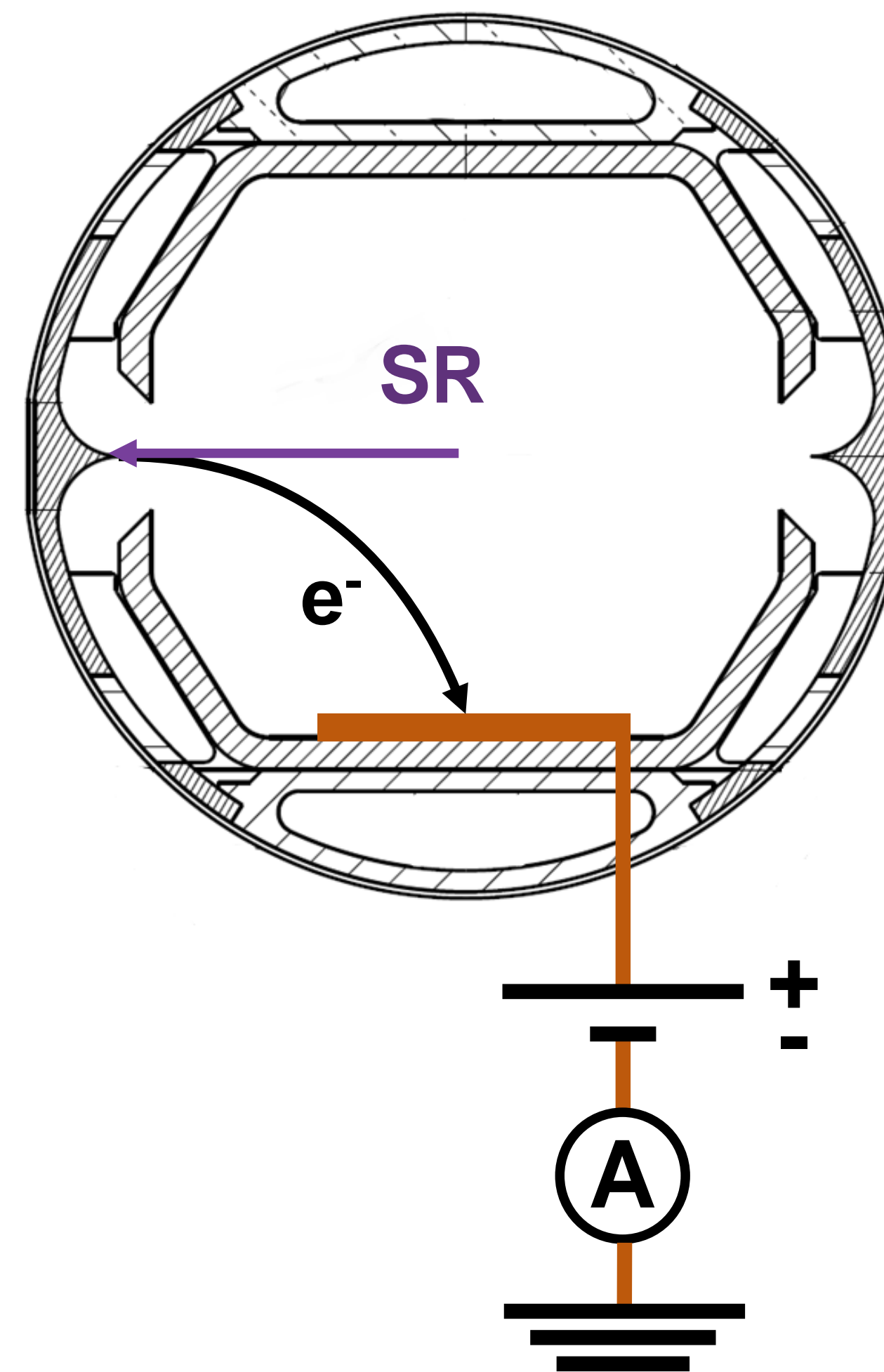


Photon Collector

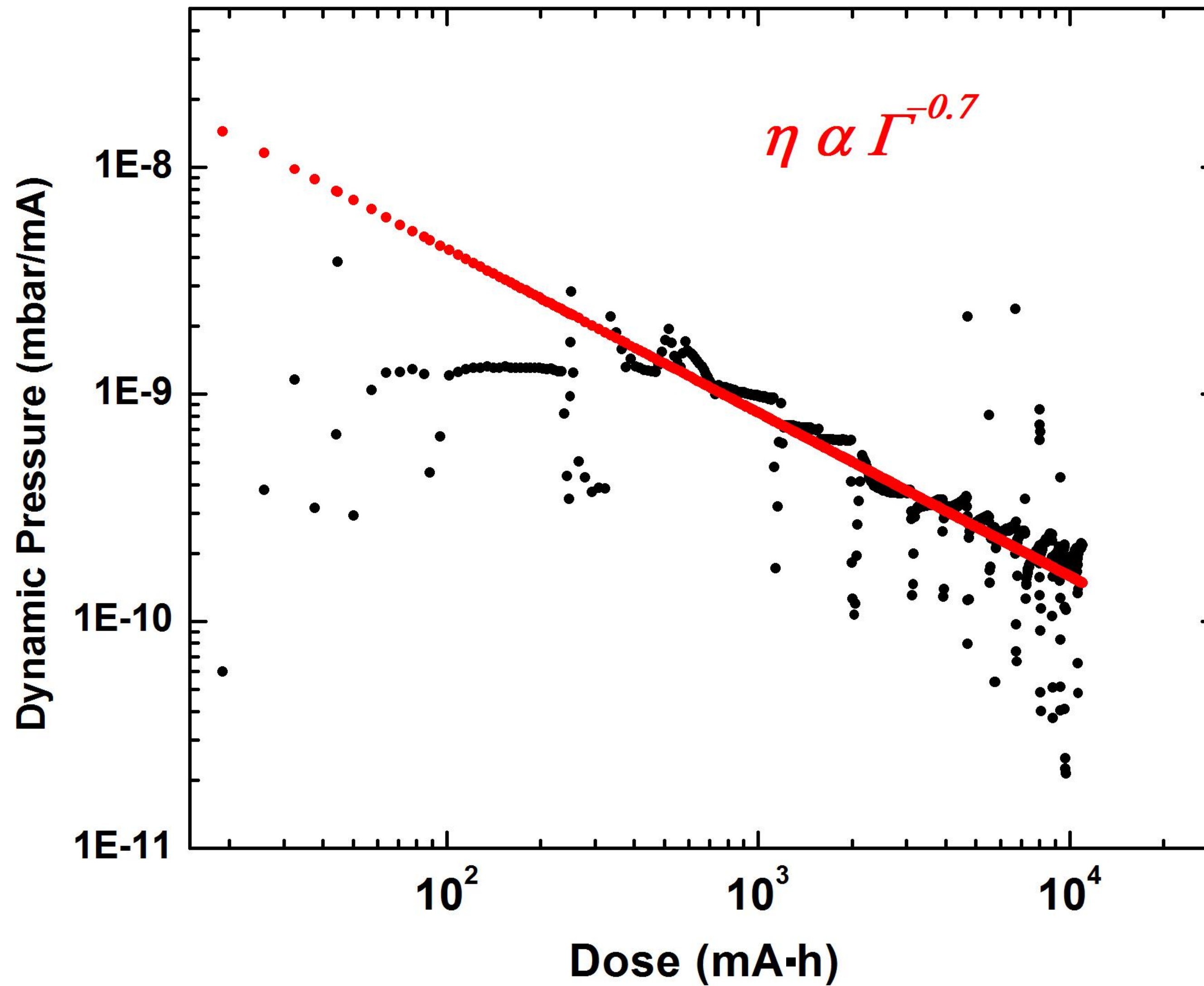
Test at ANKA.



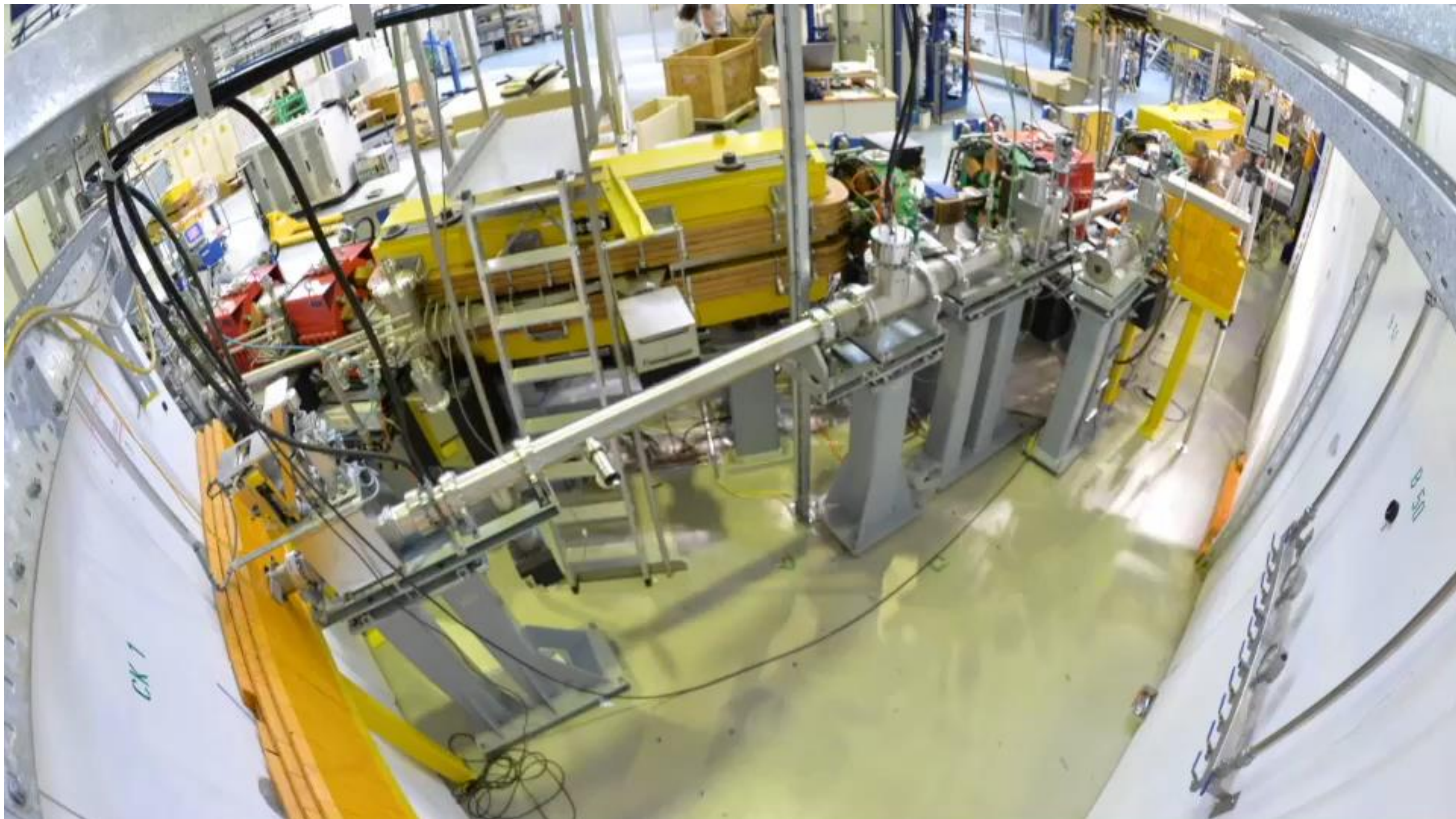
Test at ANKA.



Conditioning Slits



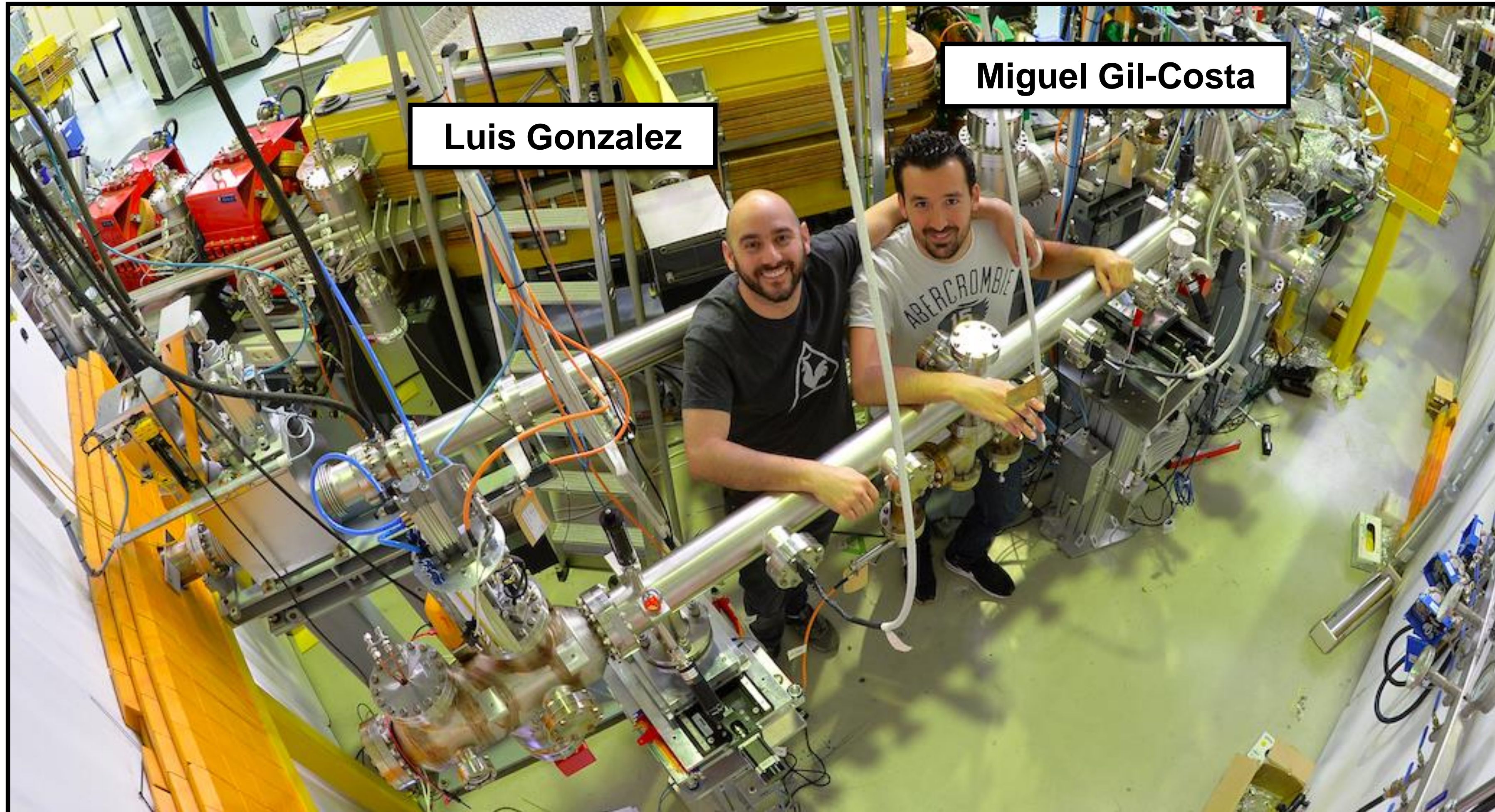
Setup Installation



Conclusions

- Installation was performed
- Test with beam will start in the next weeks with the first prototype

Thank You



Luis Gonzalez

Miguel Gil-Costa