



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

# Task 9.2 progress @

3rd Annual Meeting

16/04/2024

Alessandro Salmaso



# Cu Cavity production



- OFE Cu sheets bought by Piccoli srl (from Hemimex® BV)
- New dies tested with iron sheets
- Production of Cu cavity planned for May 2024



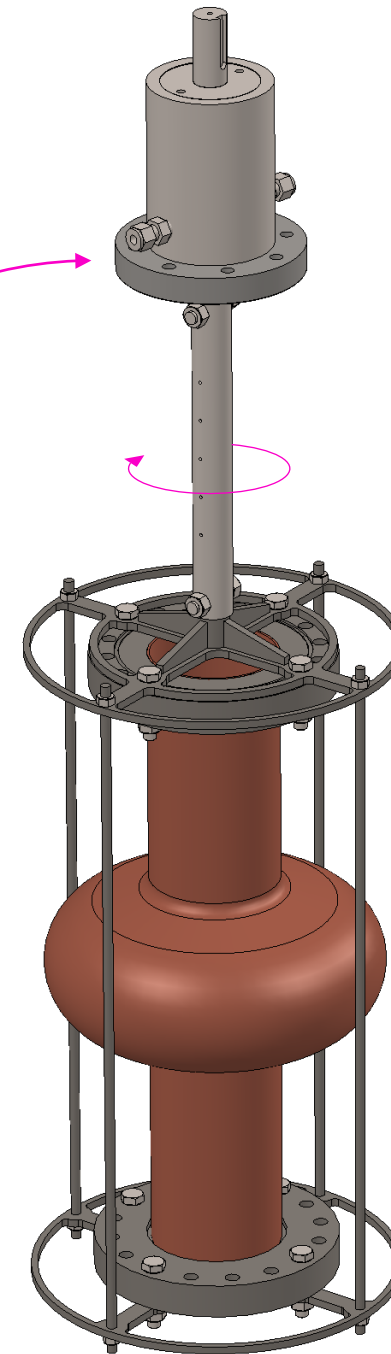
# Objective recap

- «Hybrid» coating system for 1.3GHz cavities
  - **Rectangular magnetron & rotating cavity**
  - Post magnetron configuration with Nb<sub>3</sub>Sn cylindrical target produced via dipping



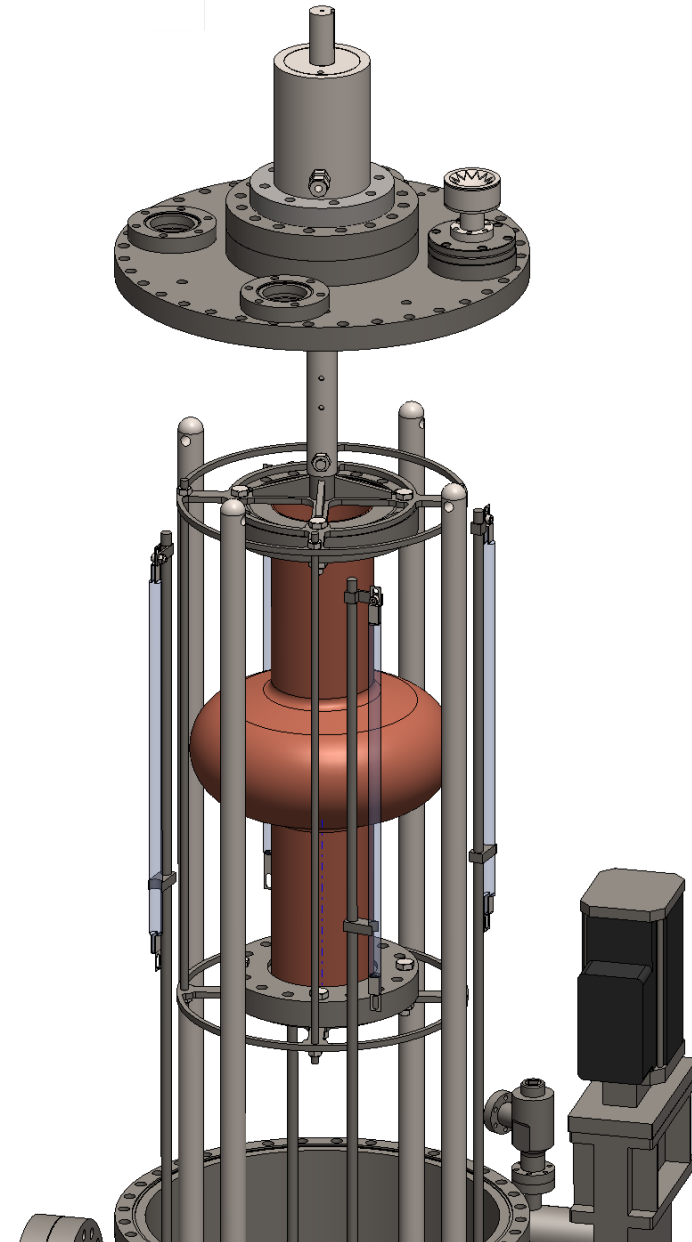
# Cavity stand design

- Cavity suspended from rotating vacuum feedtrough
- Stand designed to **align** the cavity and minimize deformation due to high temperature deposition



# Cavity stand design

- Magnetron and cavity will be aligned on the same axis by means of centering system: two rings tangent to four vertical rods with small tolerance





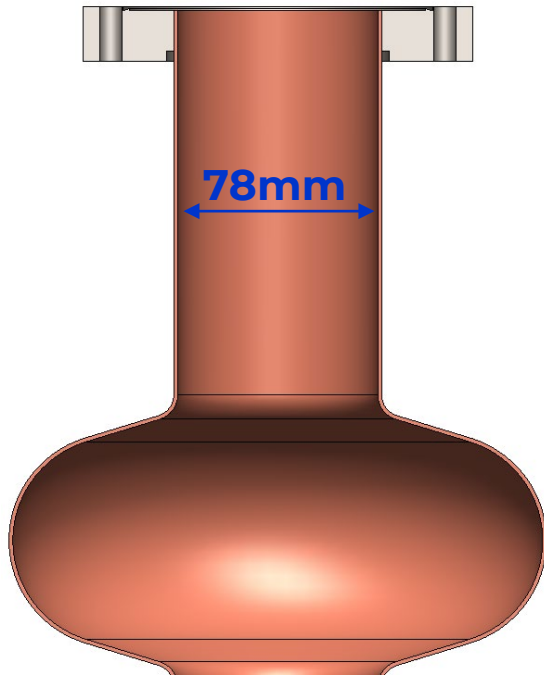
# Components production

- Previously designed components production started at the mechanical workshop @LNL

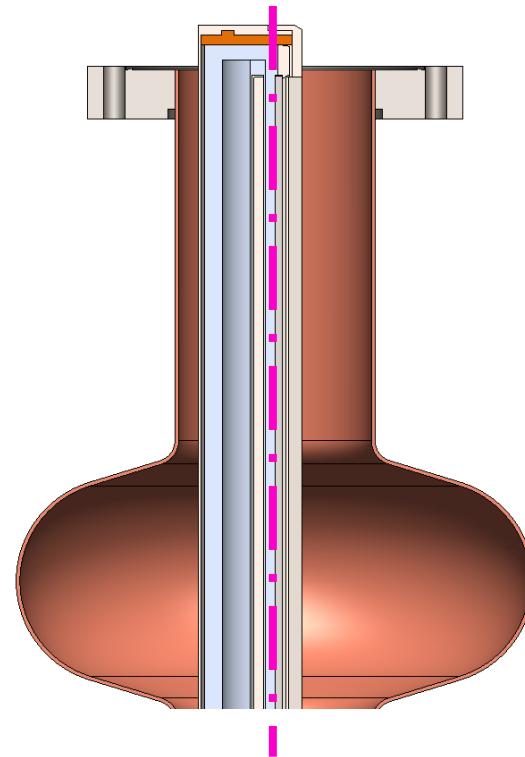


# Rectangular magnetron

- Main constrain: Cutoff diameter

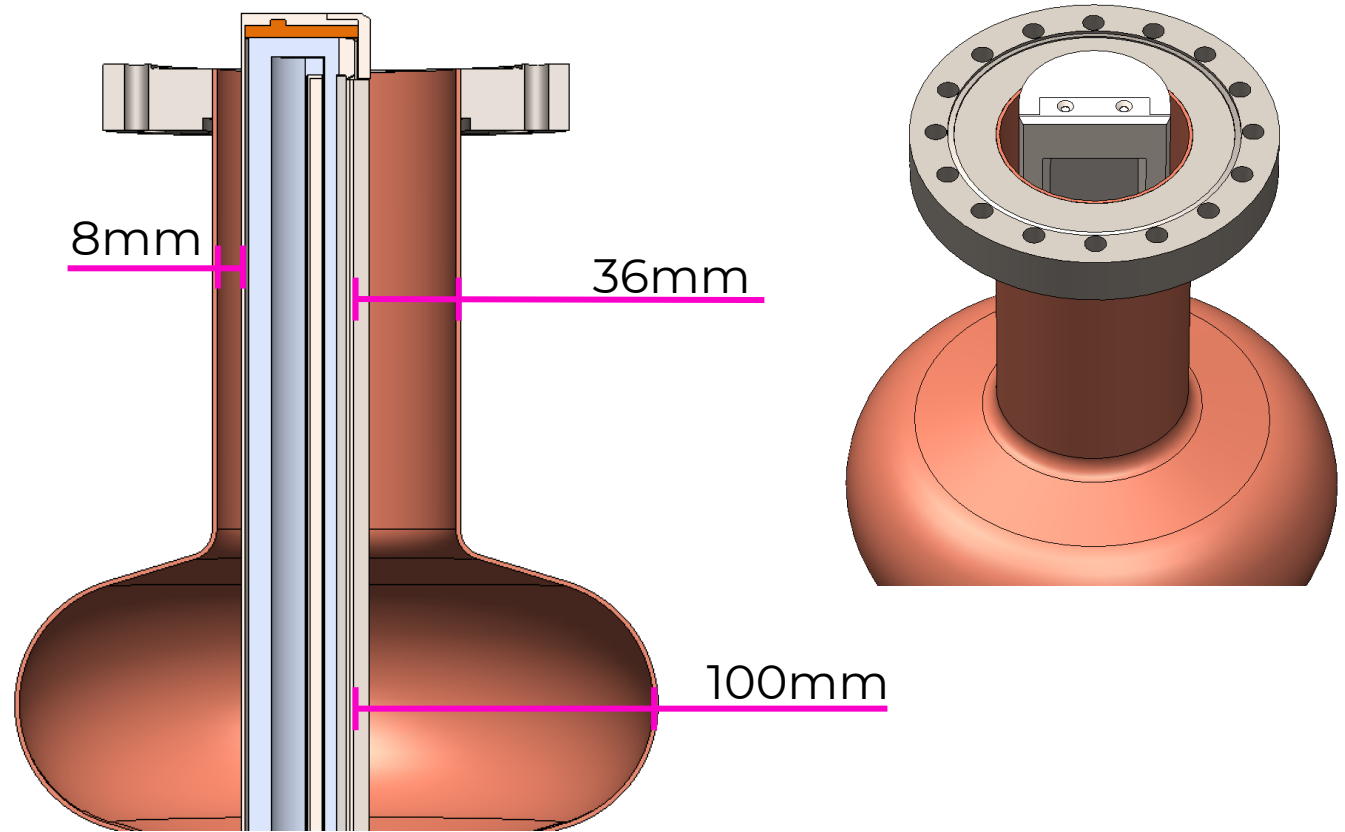


- Main requirement: alignment with cavity



# Rectangular magnetron

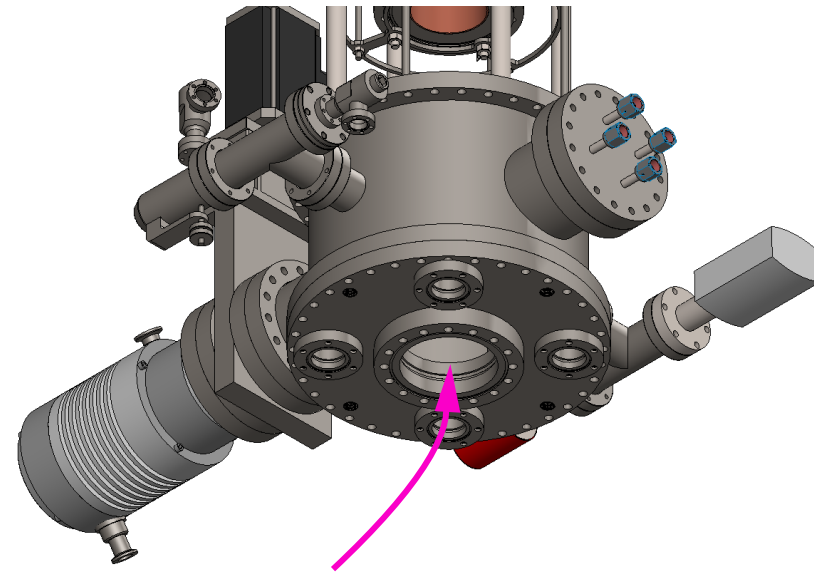
- *Safety distance*: 8mm
- TGT-Cutoff: 36mm
- TGT-Equator: 100mm





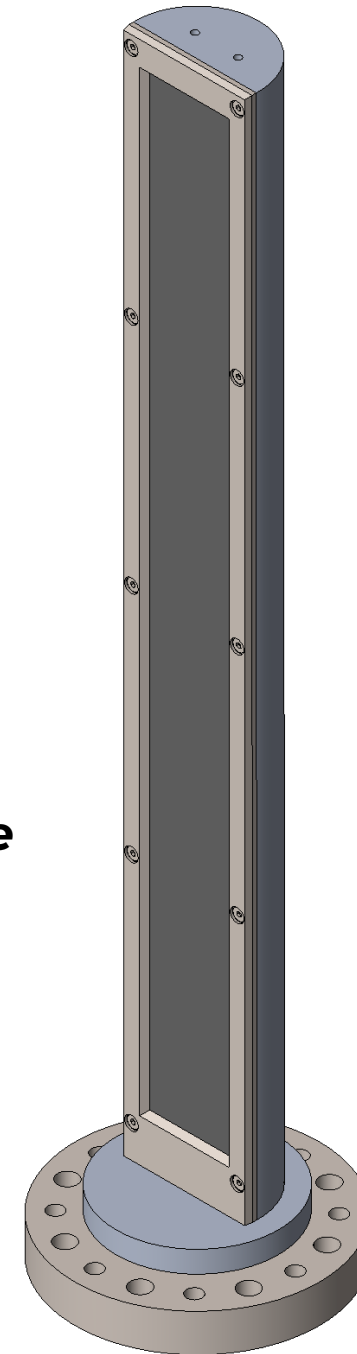
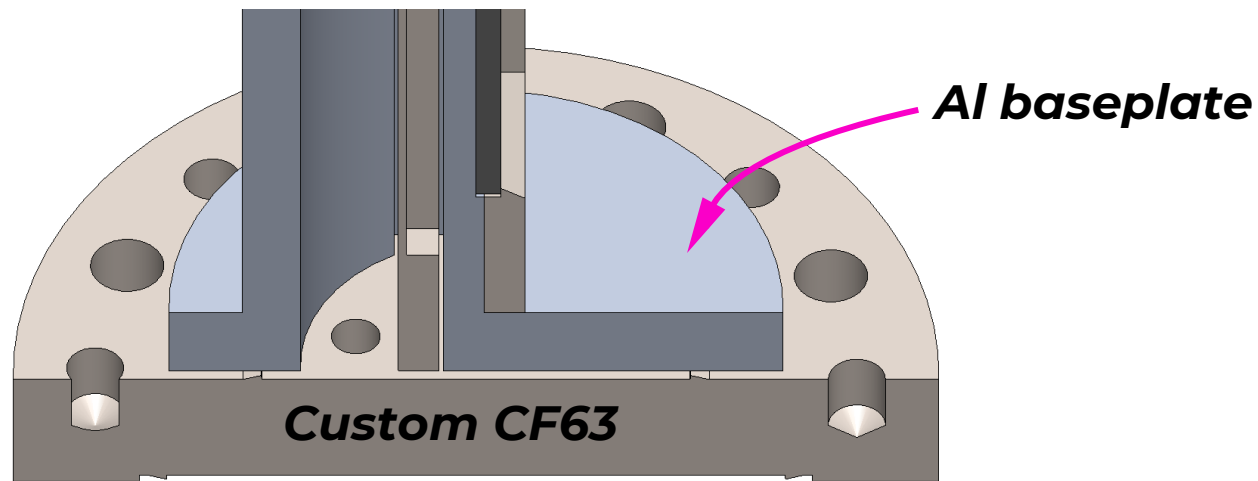
# Rectangular magnetron

- Possibility to assemble the whole magnetron outside the vacuum chamber and insert it through the lower CF100 flange
- ✓ Ease of maintenance
- ✓ No need to open the custom CF280



# Rectangular magnetron

- All metal design: NO Viton O-Rings
- By using a custom CF63 the Al baseplate will act as the UHV gasket

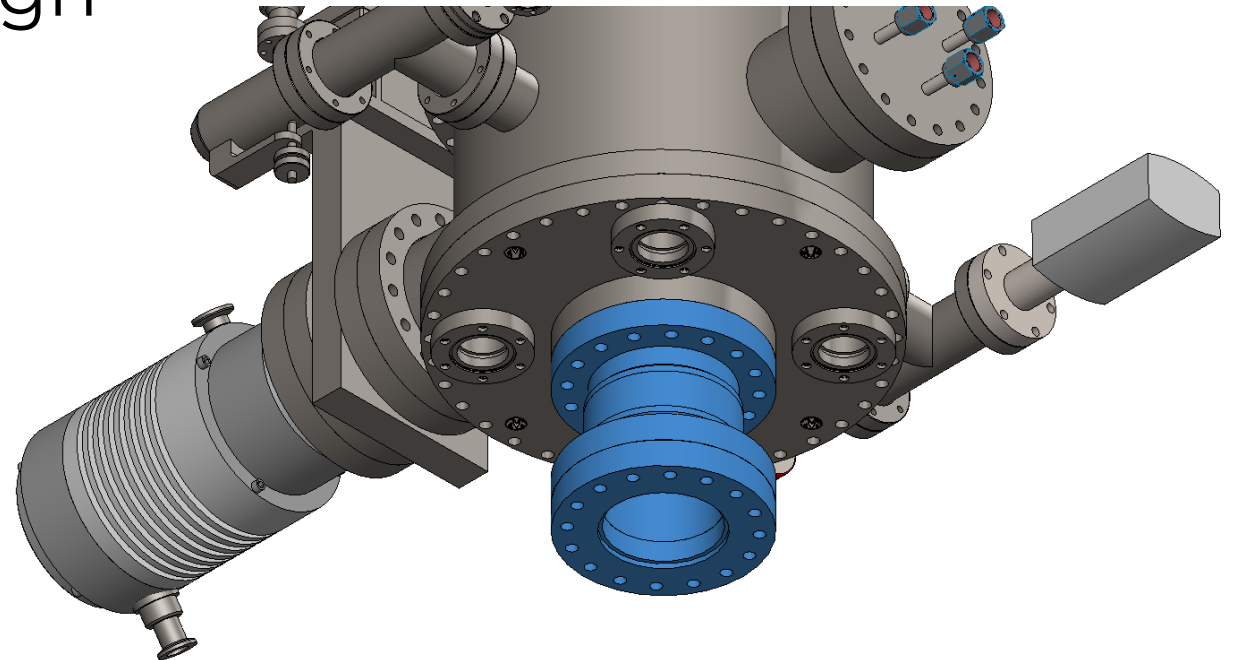


Target dimensions

Width: 40 mm  
Height: 420 mm  
Thick: 3-5 mm

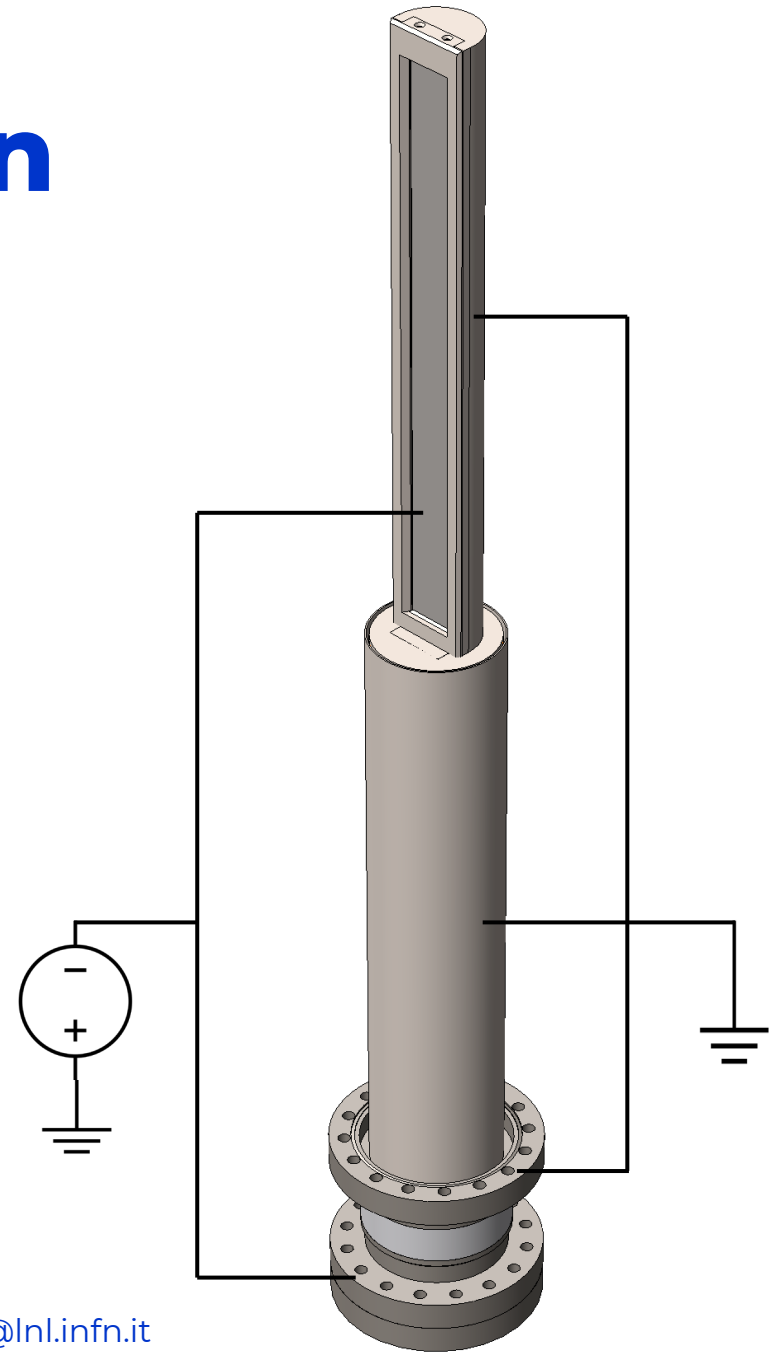
# Rectangular magnetron

- Connection to the chamber via insulated CF100 Feedthrough



# Rectangular magnetron

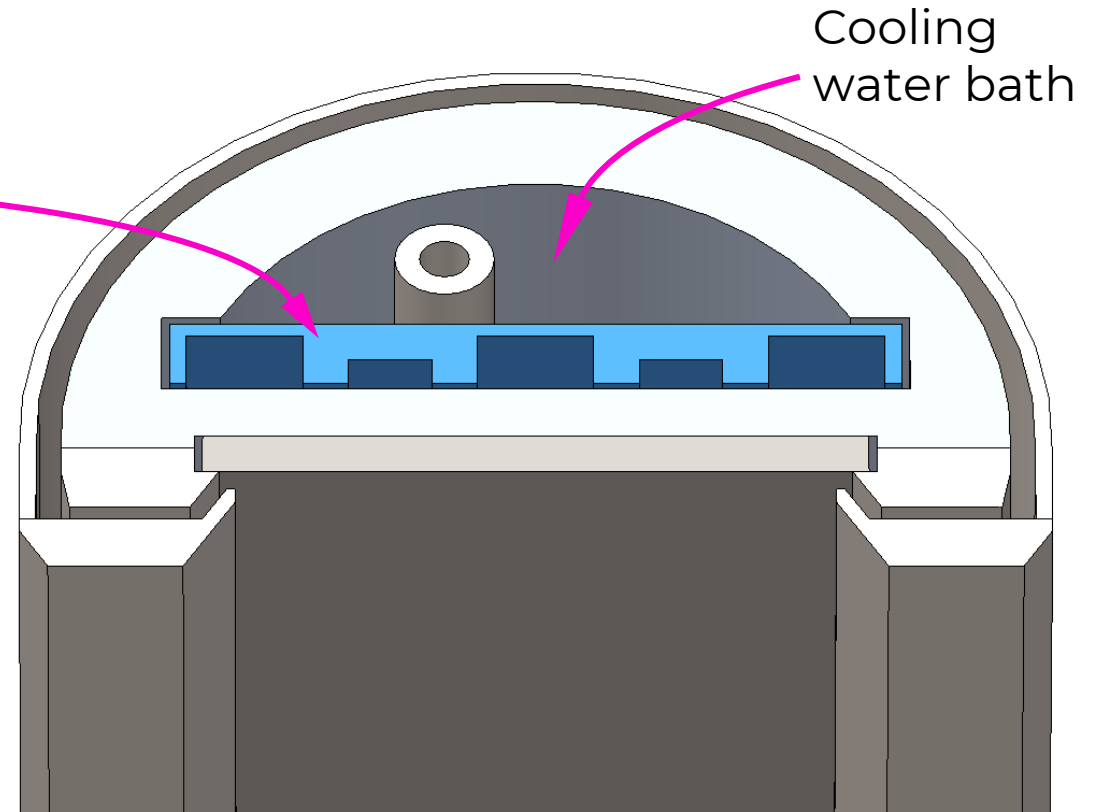
- Electrical potential applied to the feedtrough
- Grounded shielding spaced with **BN** or **sintered  $\text{Al}_2\text{O}_3$**



# Rectangular magnetron

- Permanent magnets positioned in a **cart** inserted in the baseplate
- Magnetic field behaviour to be simulated

*Thanks to Master's Student Anita Fetaj*





# Conclusions and next steps

- ✓ 1.3GHz vacuum system tested
  - ✓ Cavity stand commissioned and in production
  - ✓ Rectangular magnetron design ultimated
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- 📅 Production of OFE Cu Cavity planned on May 2024
  - 📅 Evaluation of magnetic configuration to be performed



[alessandro.salmaso@lnl.infn.it](mailto:alessandro.salmaso@lnl.infn.it)

# Thanks for your attention



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