

NTA-ILC

SHAMASH

1) Nb₃Sn cavità 6 GHz -> forno a induzione

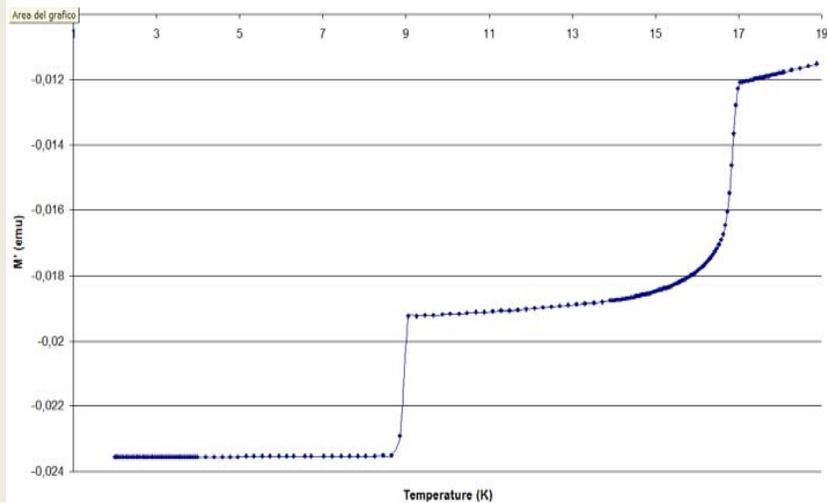
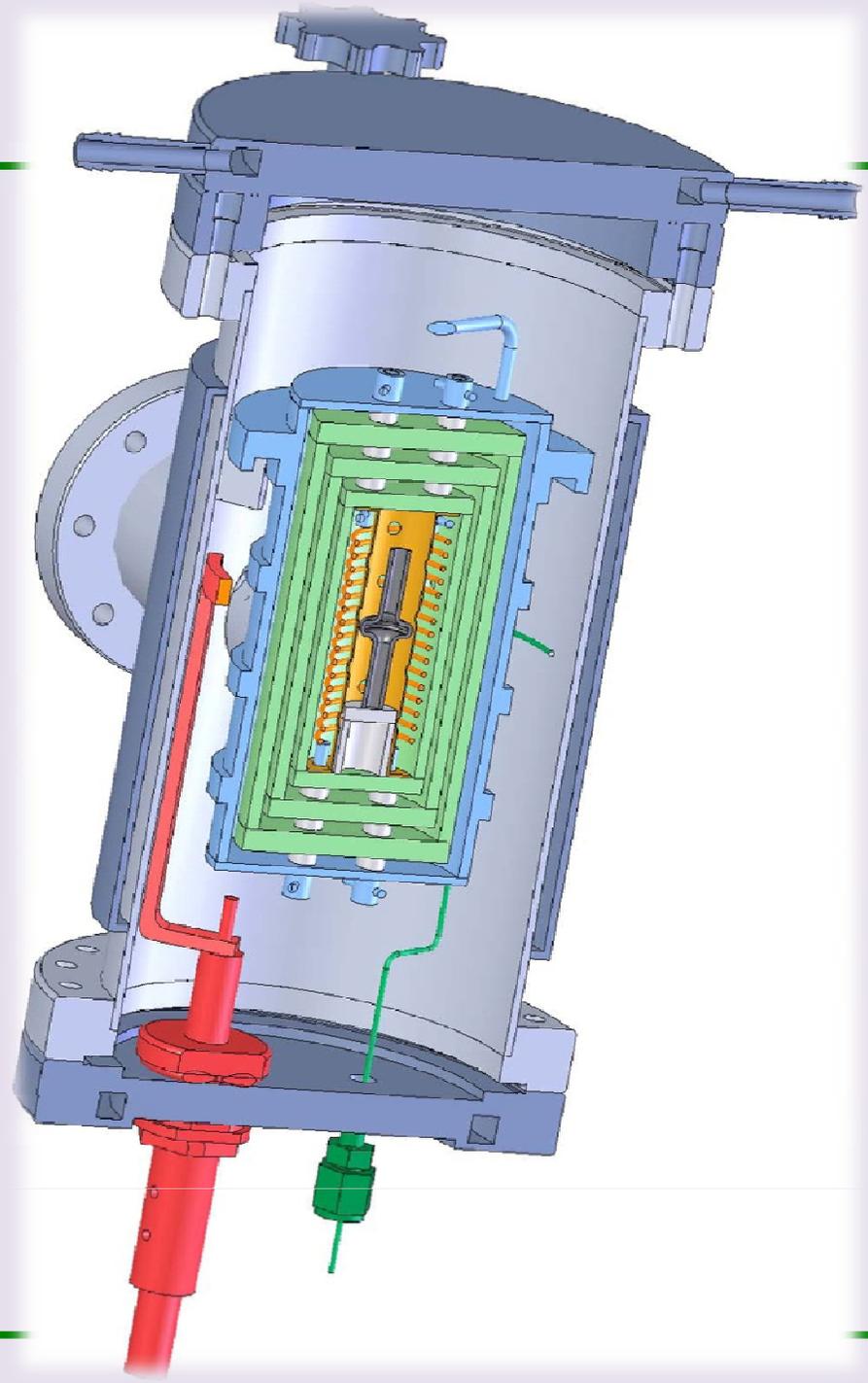
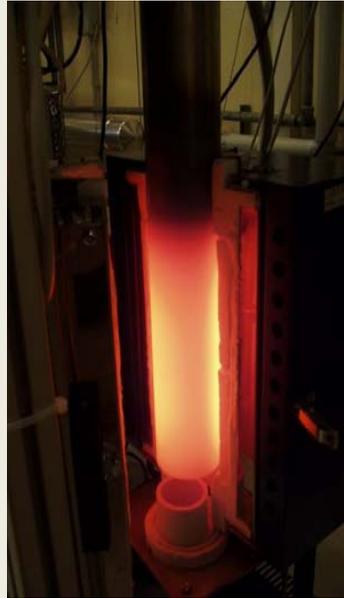
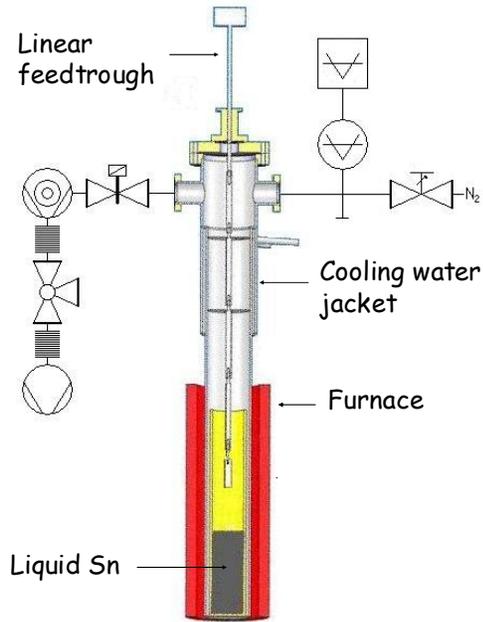
2) Magnetron Sputtering x QWRs di ISOLDE

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3) Recupero Tecnologia Arco Catodico x Niobio
da Roma2



Nb₃Sn by Liquid Diffusion



Samples ready for dipping



Sample 1:
standard



Sample 2:
standard +
BCP



Sample 3:
standard +
BCP +
Glow

Discharge

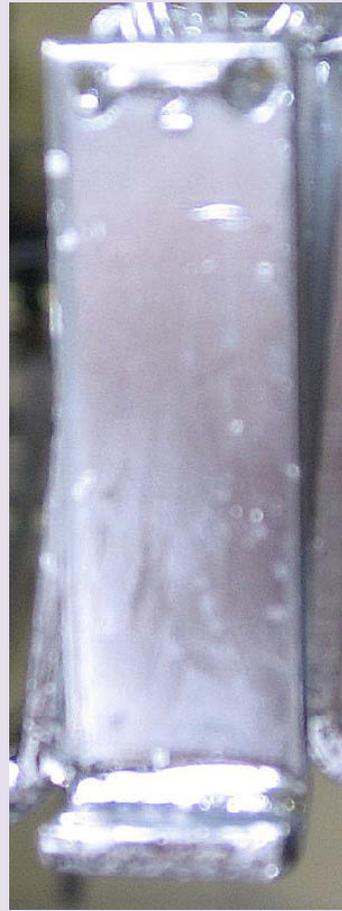


Sample 4:
standard +
Glow
Discharge

Samples after dipping (before annealing)



Sample 1:
standard



Sample 2:
standard +
BCP



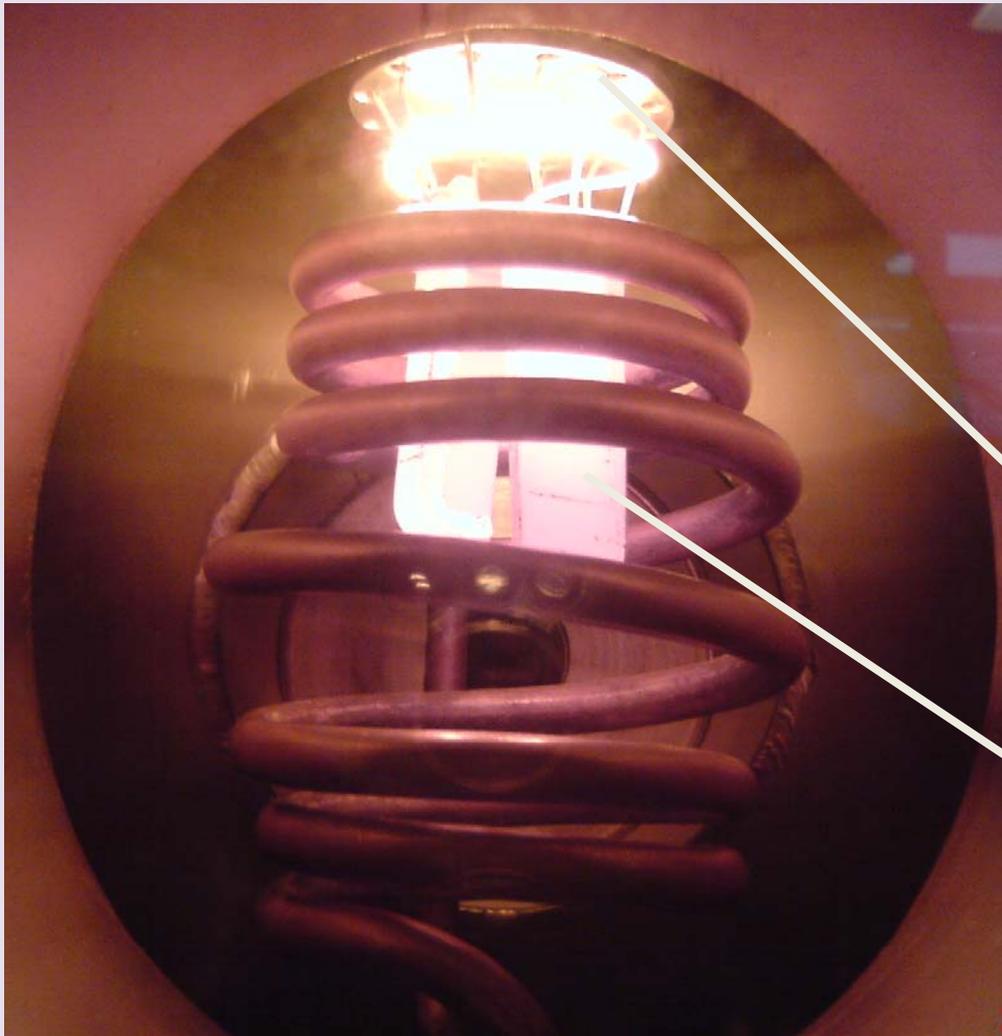
Sample 3:
standard +
BCP +
Glow

Discharge



Sample 4:
standard +
Glow
Discharge

High – temperature annealing



- process pressure: $3 \cdot 10^{-6}$ mBar;
- time of treatment: 5 min
- maximum rf - power: 5 kW
- process temperature: 1500°C

feedthrough
(Nb)

samples

sample after
annealing



Resistive

annealing at 1000°C
for 4 hours

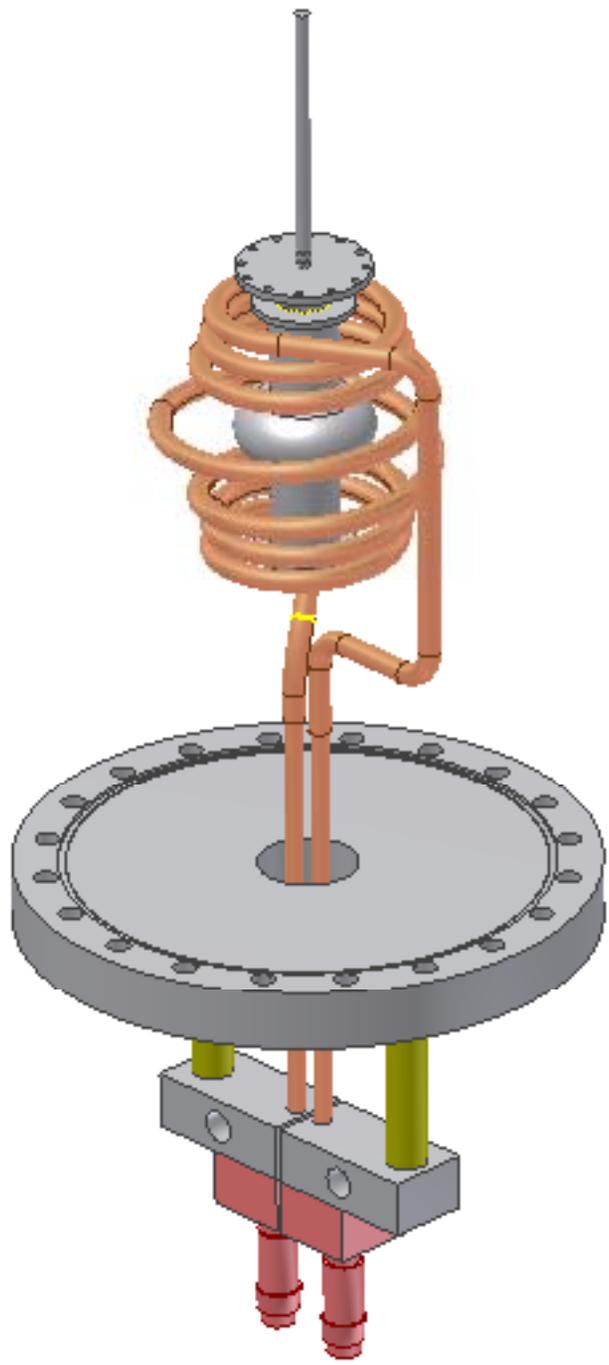


Induction

annealing at 1300°C
for 5 minutes



Just BSP anodization etching glow discharge



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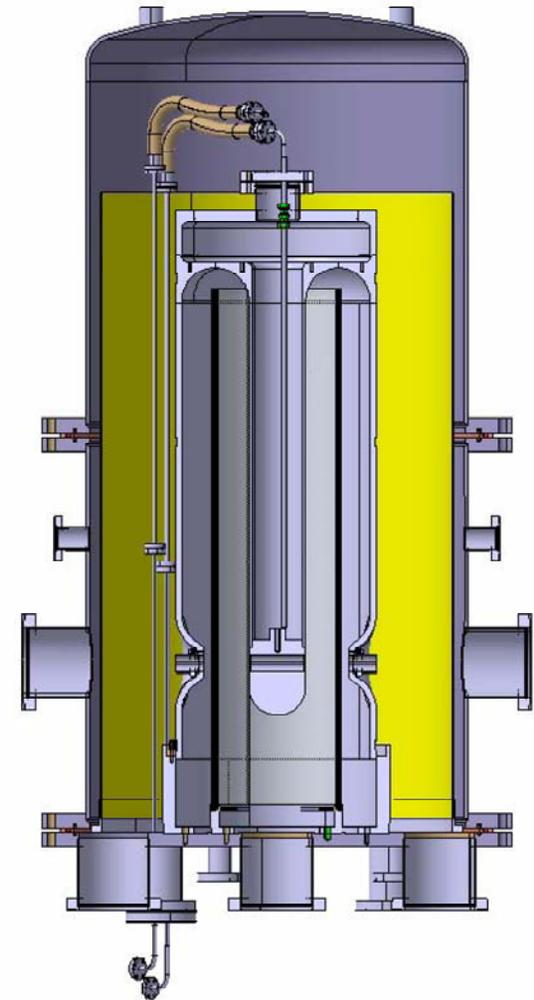
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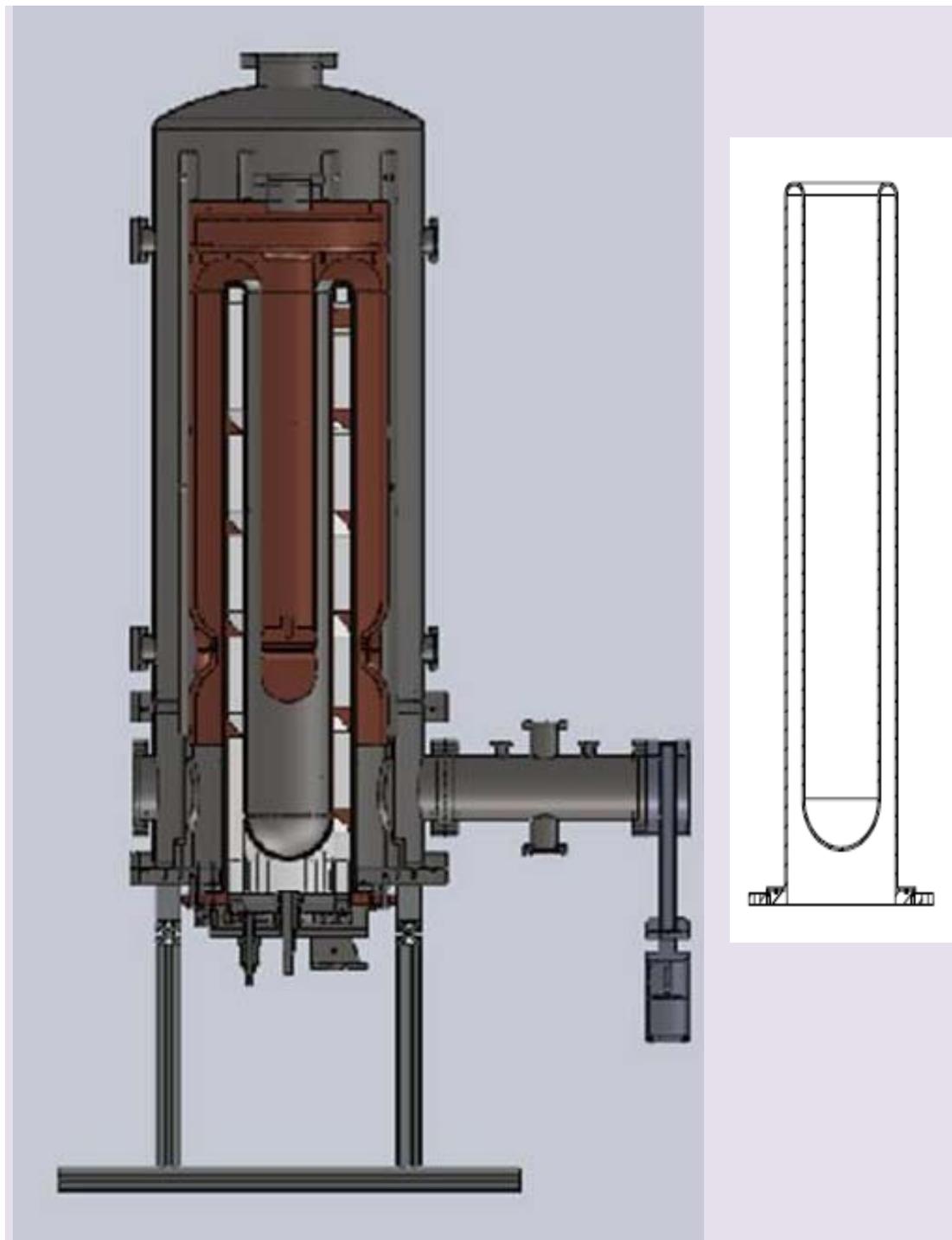
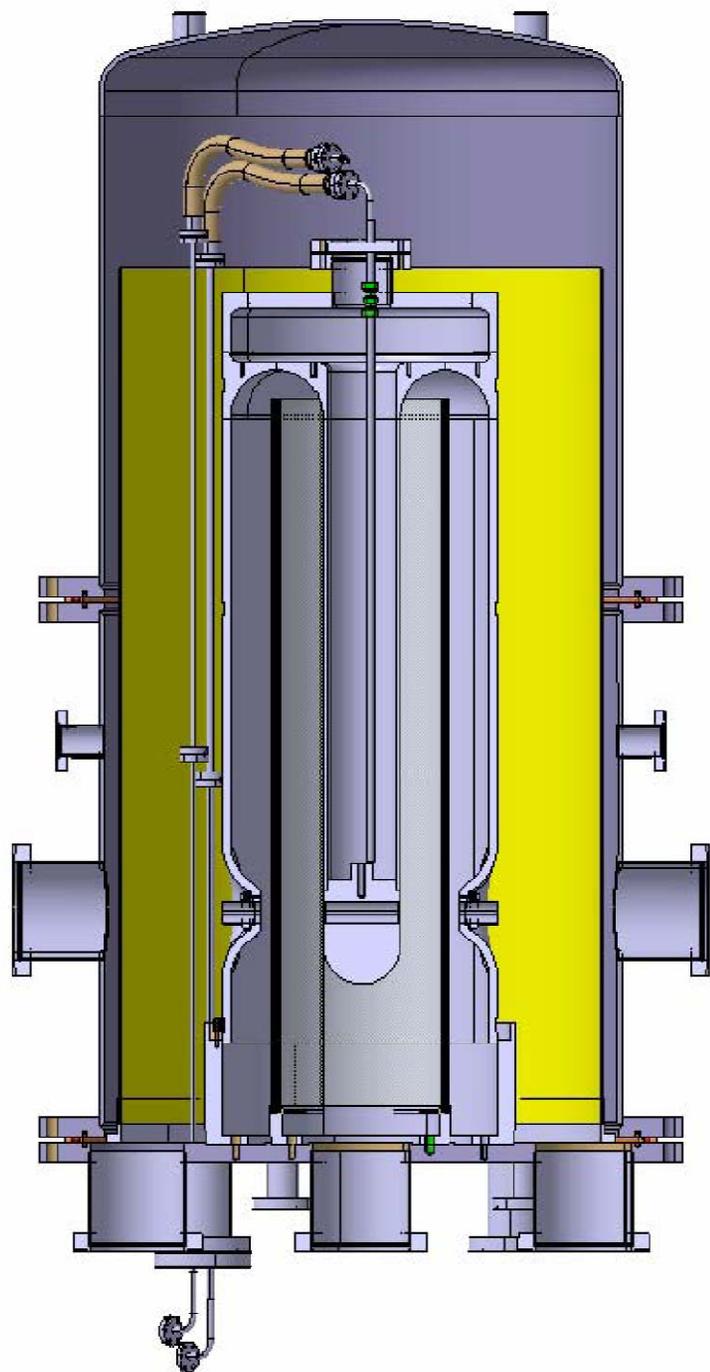
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3) Recupero Tecnologia Arco Catodico x Niobio
da Roma2

QWRs in Nb/Cu per Isolde

- ISOLDE ha bisogno di cavità QWR
- Le QWR in Niobio Sputterato sono più economiche e più stabili
- Il ns gruppo ha costruito 50 cavità di ALPI con Sputtering **DIODO**
- Il CERN ci ha chiesto di sviluppare lo sputtering **MAGNETRON** delle QWR per ISOLDE







Richiesta (qualora possibile):

1 K€ missioni interne

NTA-ILC

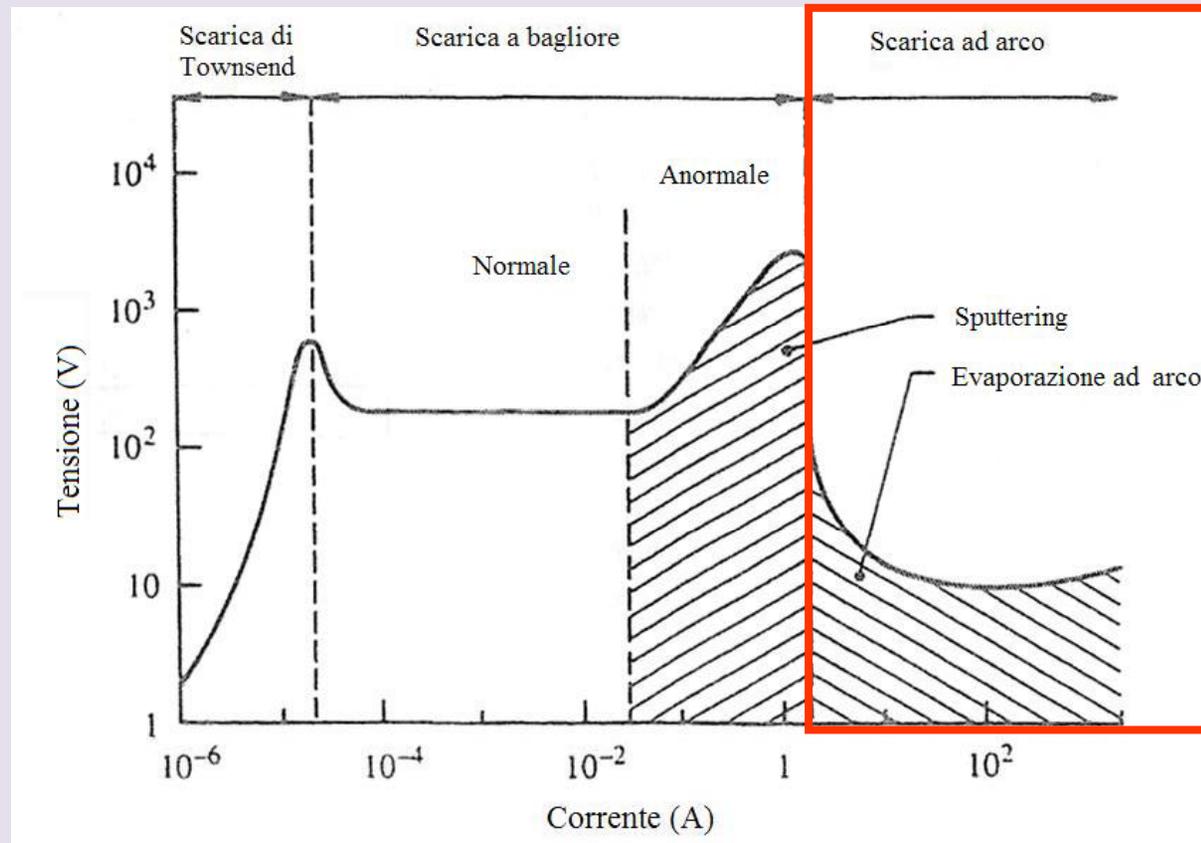
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2) Magnetron Sputtering x QWRs di ISOLDE

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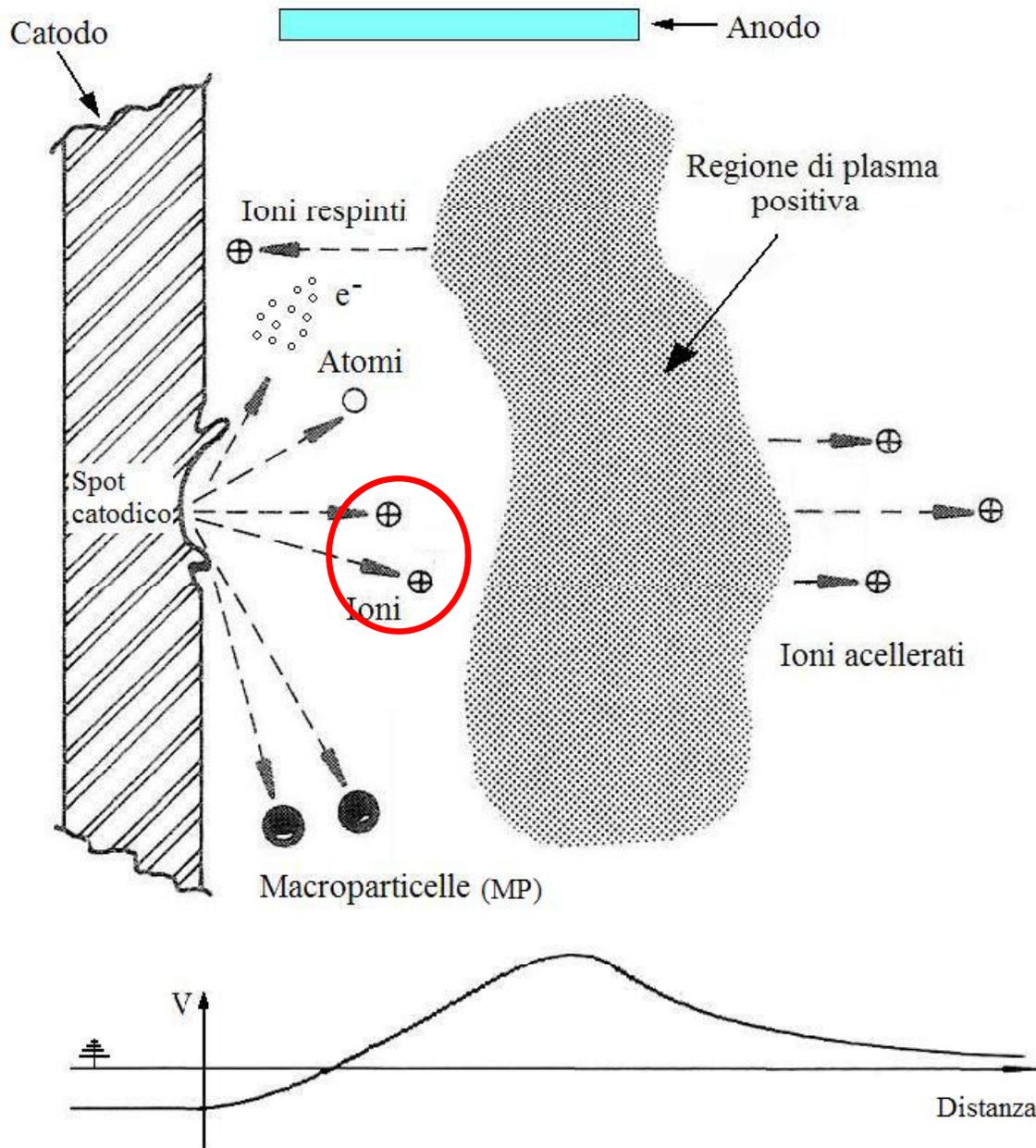
3) Recupero Tecnologia Arco Catodico x Niobio
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DEPOSIZIONE PER ARCO CATODICO (CVA)



L'arco catodico in vuoto è una scarica elettrica sostenuta da materiale proveniente da regioni del catodo chiamate CATHODE SPOTS (CS), in un ambiente che altrimenti sarebbe davvero in vuoto.

CARATTERISTICHE D'EMISSIONE DEI CS



- Ioni: - Fino al 90% degli atomi emessi sono ionizzati;
- energie di emissione fino a 100 eV (*potential hump*).
- e⁻: - Energie minori di 10 eV;
- determinano la corrente d'arco.
- attirati dall'anodo.
- MP: - Frammenti solido o liquidi con dimensione tra 30 nm e 5 μm ;
- emesse a basso angolo.

Results from G. Keppel, M. Musiani, N. Patron, V. Palmieri, D. Tonini, G. Torzo

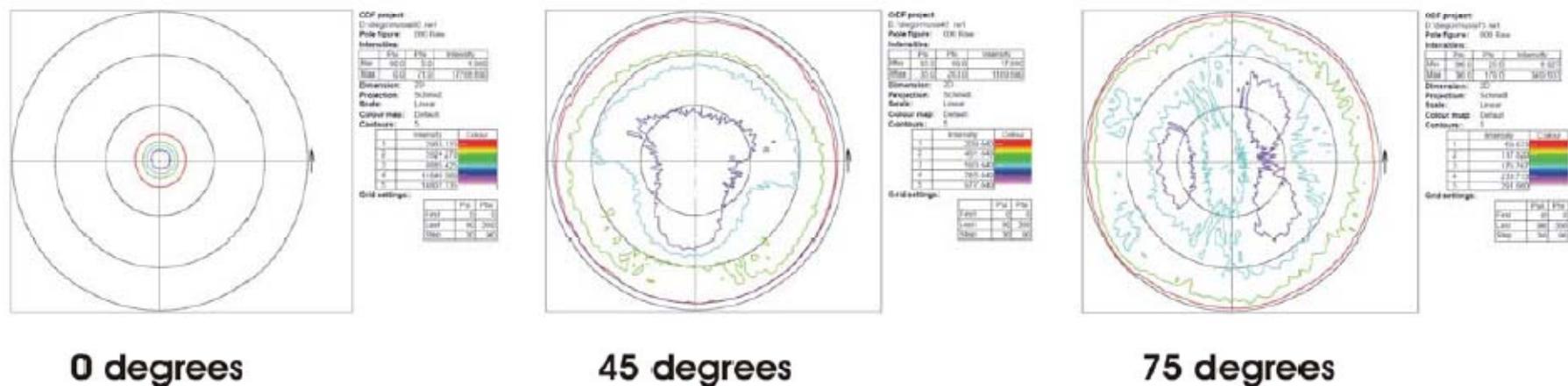


FIG. 9 Pole figure of texture respect to 110 XRD peak in sputtered films

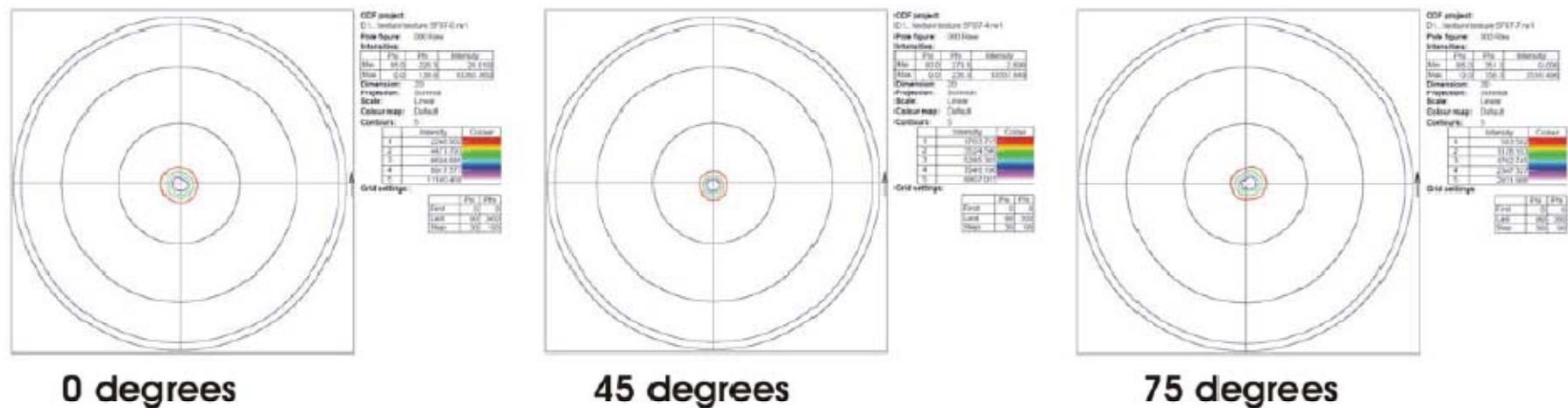


FIG. 10 Pole figure of texture respect to 110 XRD peak in arc deposited films

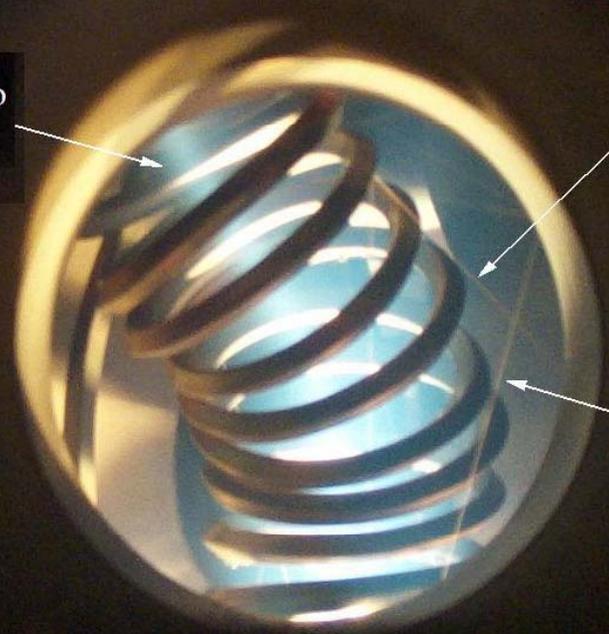
• Gli ioni v

Posizione indicativa dello schermo



filtro.

Plasma trasportato dal filtro



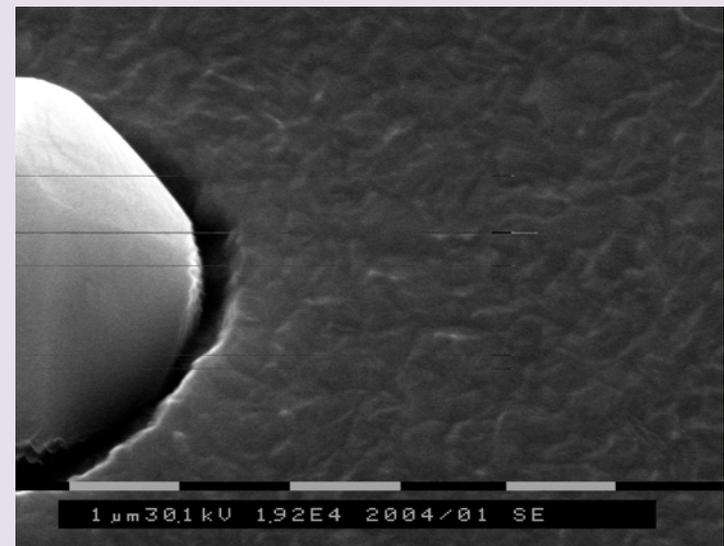
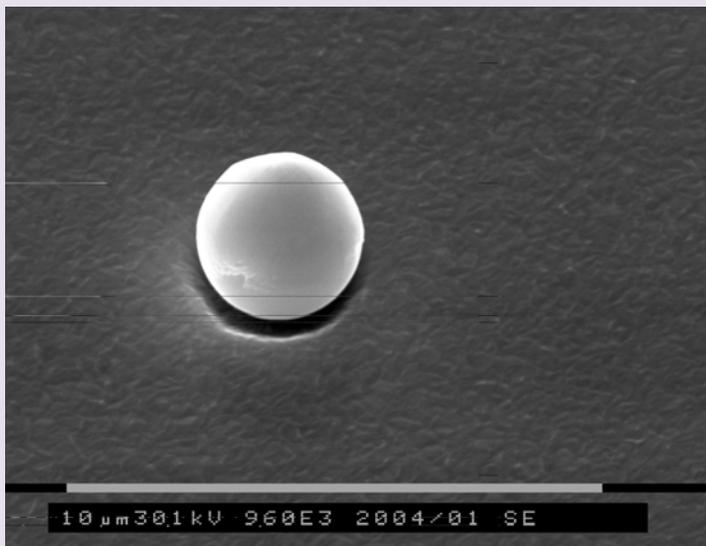
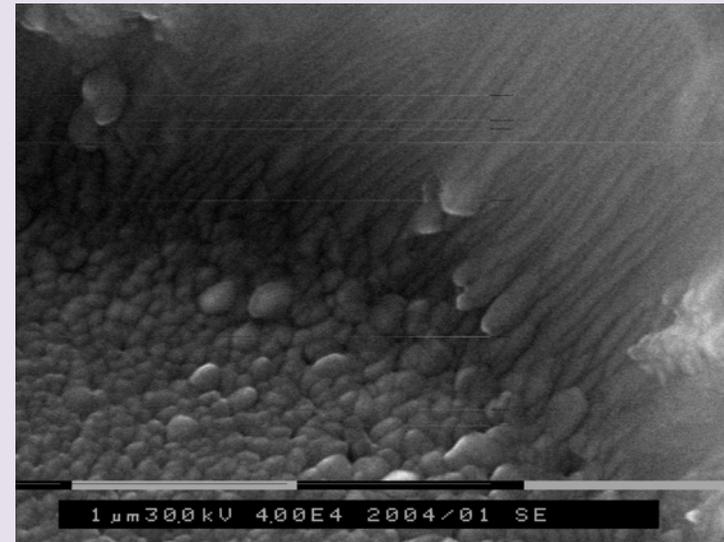
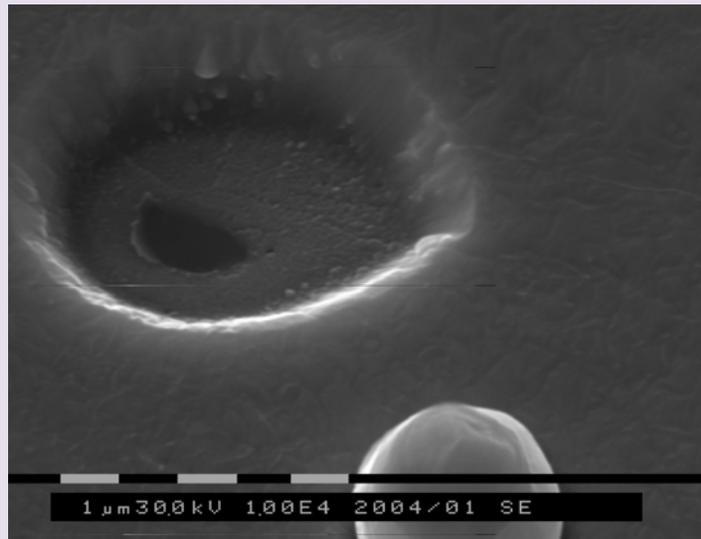
MP respinta dalla spira del filtro

MP non trasportata dal filtro

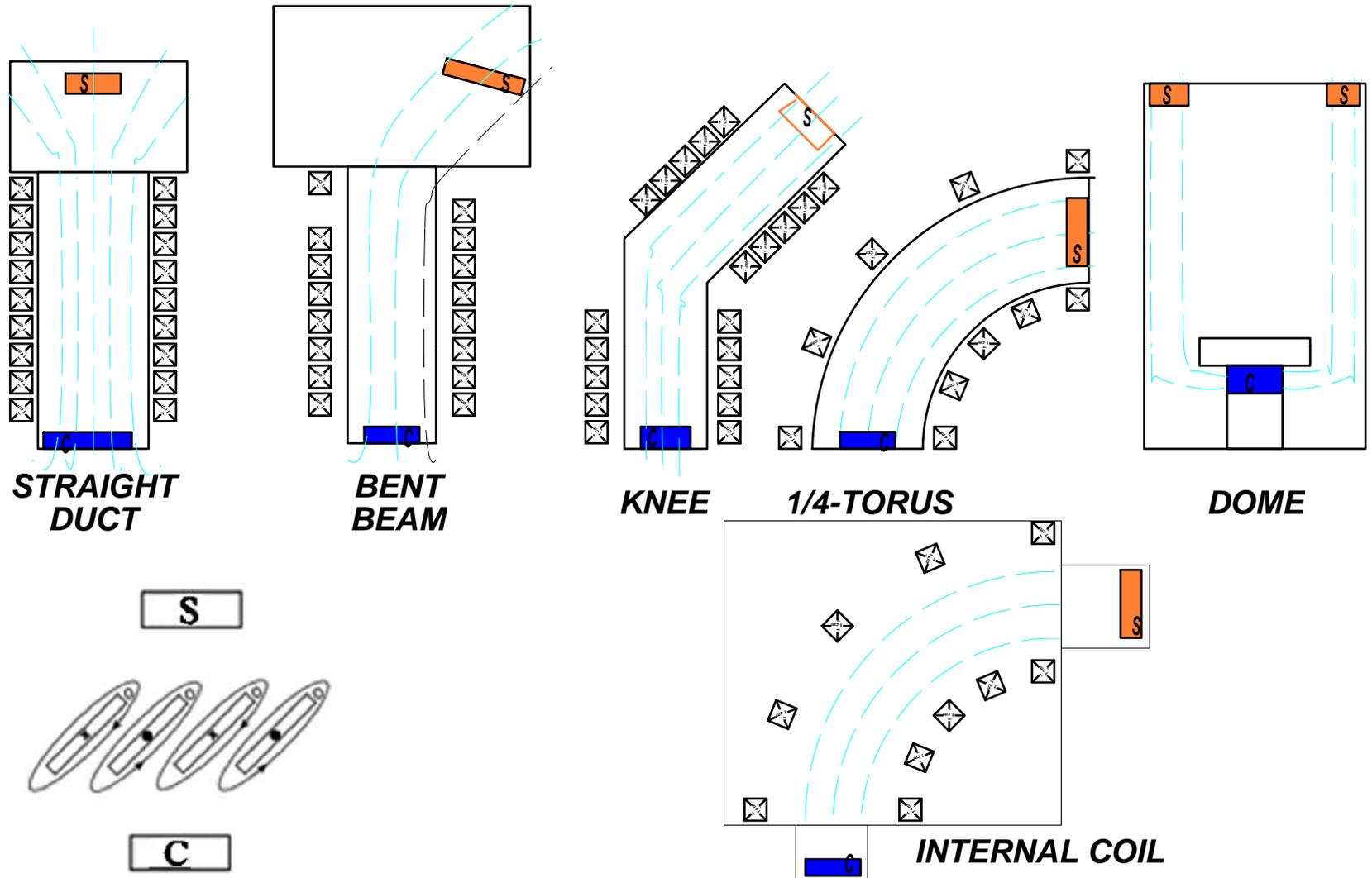
• Le macro
dallo sche

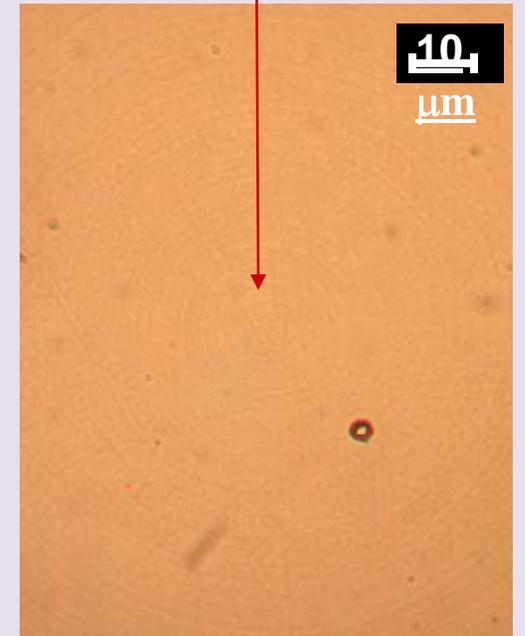
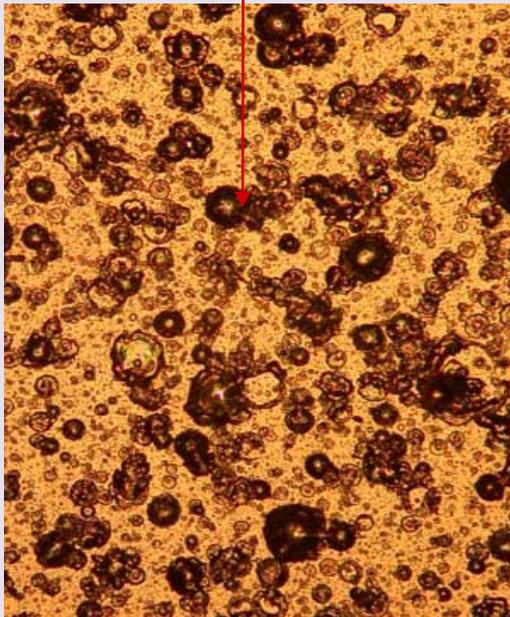
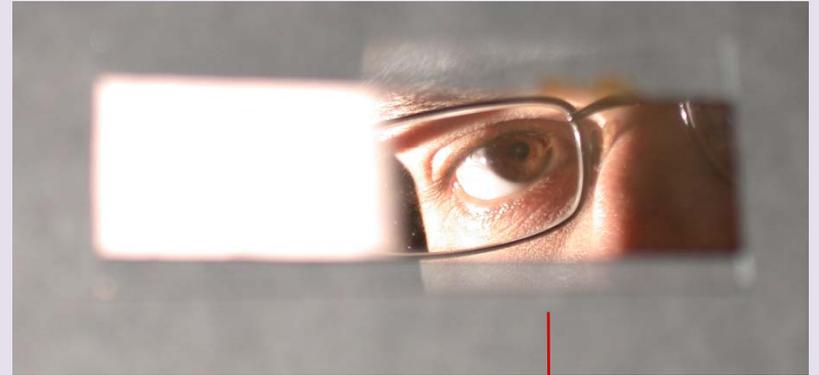
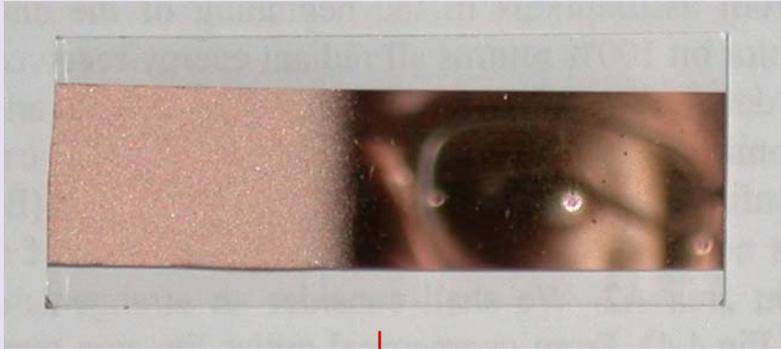
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Macroparticles on Niobium films II



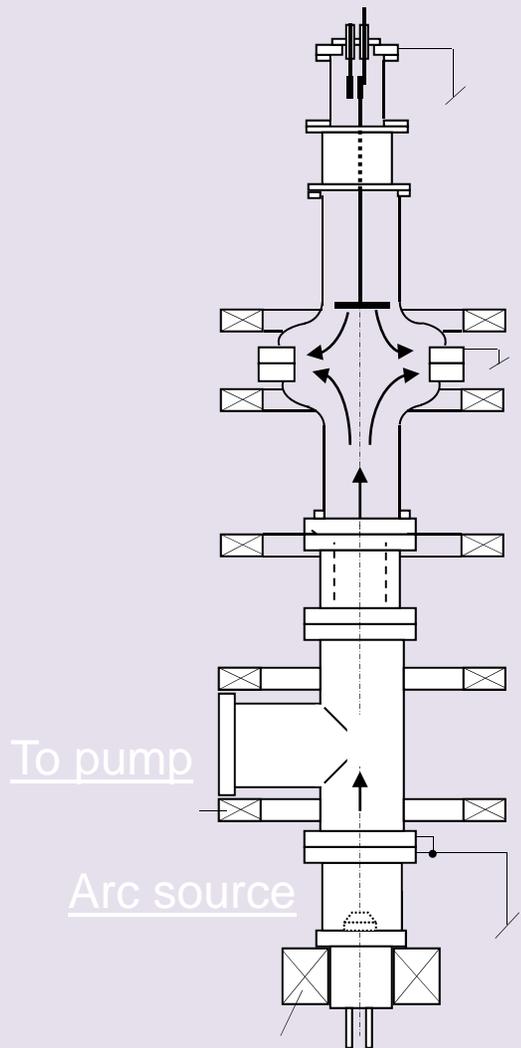
FILTERED SOURCE DESIGNS



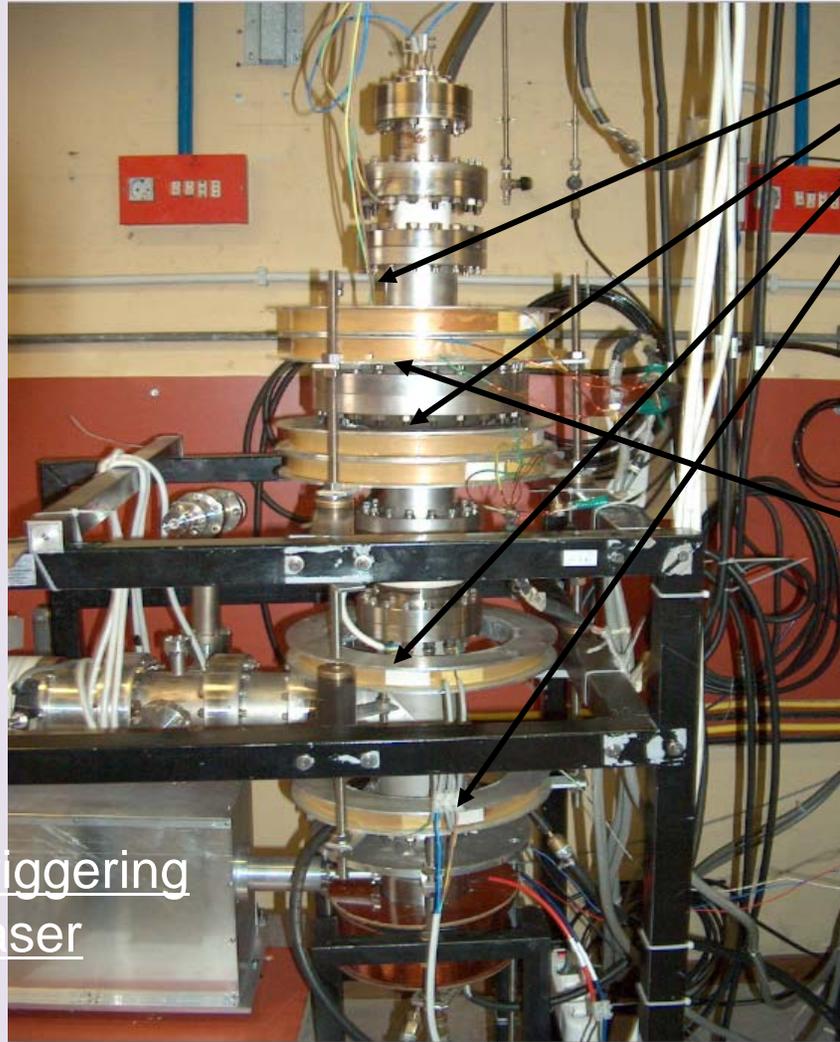


Films Applied To Superconducting
RF

Unfiltered planar arc system for single-cell cavity coating



Triggering laser

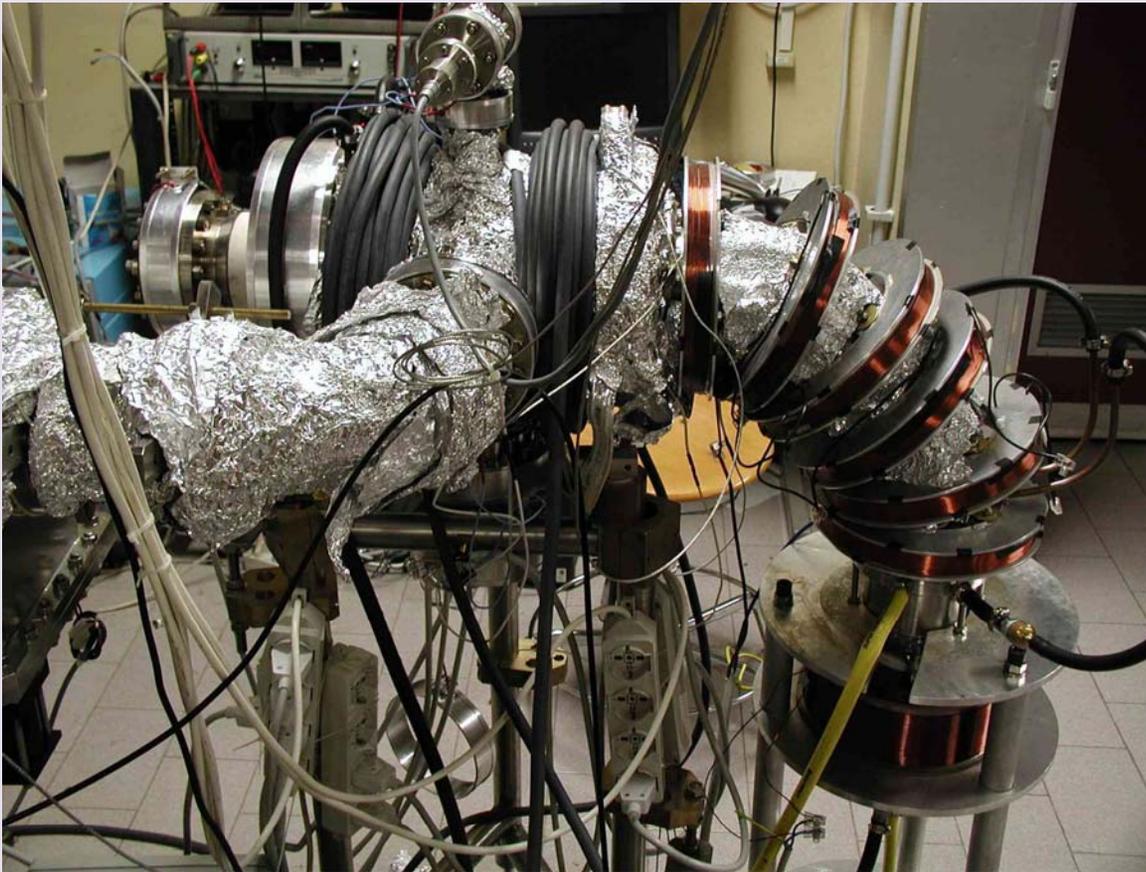


Guiding field coils

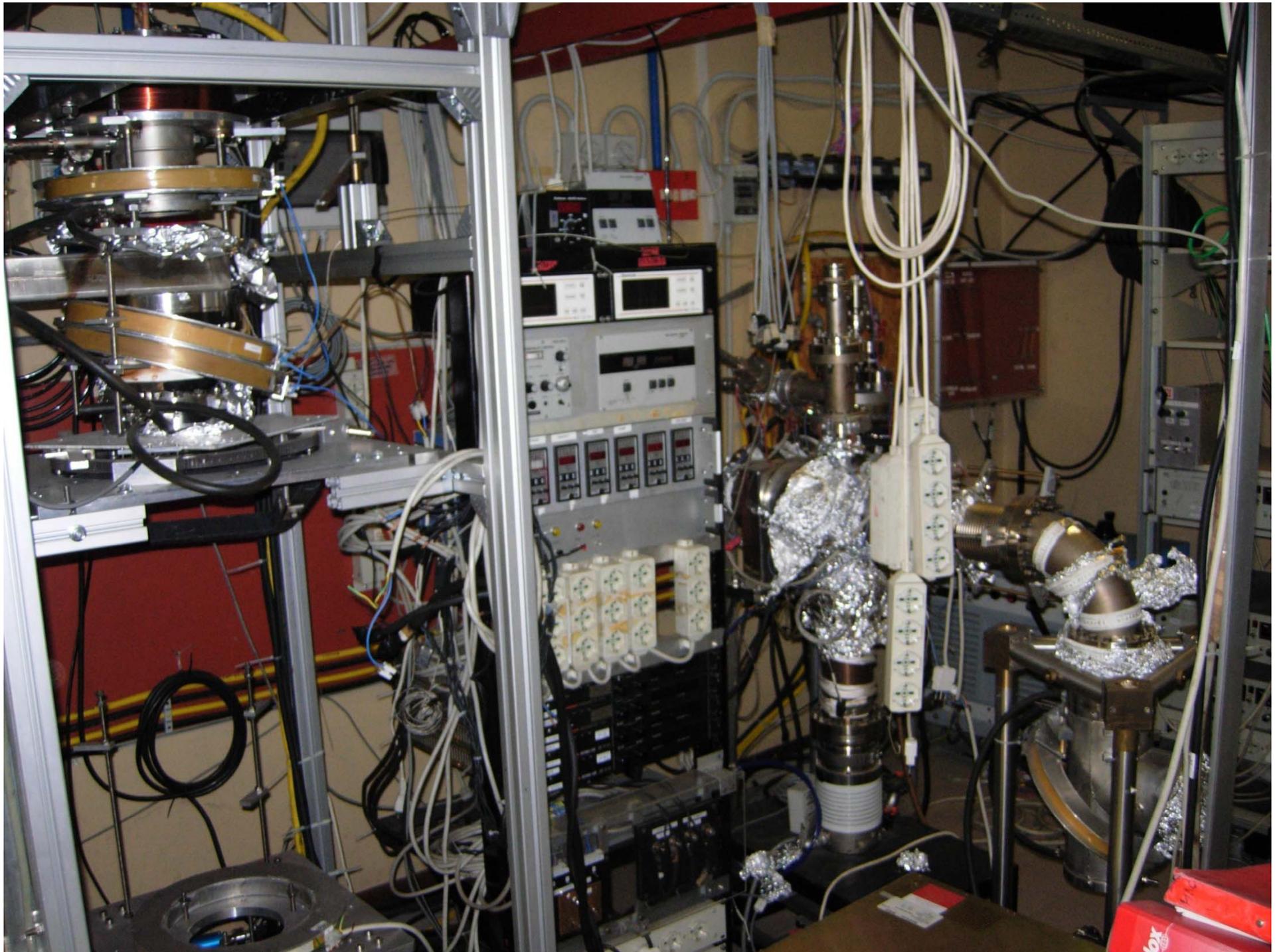
Split cavity-like SS chamber

The first UHV filtered system

We commissioned a classic quarter torus type filter



- Main Vacuum Chamber and filter vacuum chamber are water cooled
- The electrons are magnetized and the magnetic field lines guides the electrons through the curved chamber.
- Ions mainly follows electrons:
- Macroparticle stop on the chamber walls



The first single-cavity taken of the real accelerator unit, after its preparation, has been coated without micro-droplet filtering.



The coated single-cell has been cut along its symmetry axis in order to perform an analysis of the inner surfaces.