SRF activities at CERN

EURISOL-NET (ENSAR/NA03) WG
CERN JUNE 27-28 2011

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Contents

- SRF CERN infrastructures
- Nb/Cu experience
- Bulk Nb cavities
- HIE-ISOLDE QW Resonators
- Status and summary

SRF infrastructures

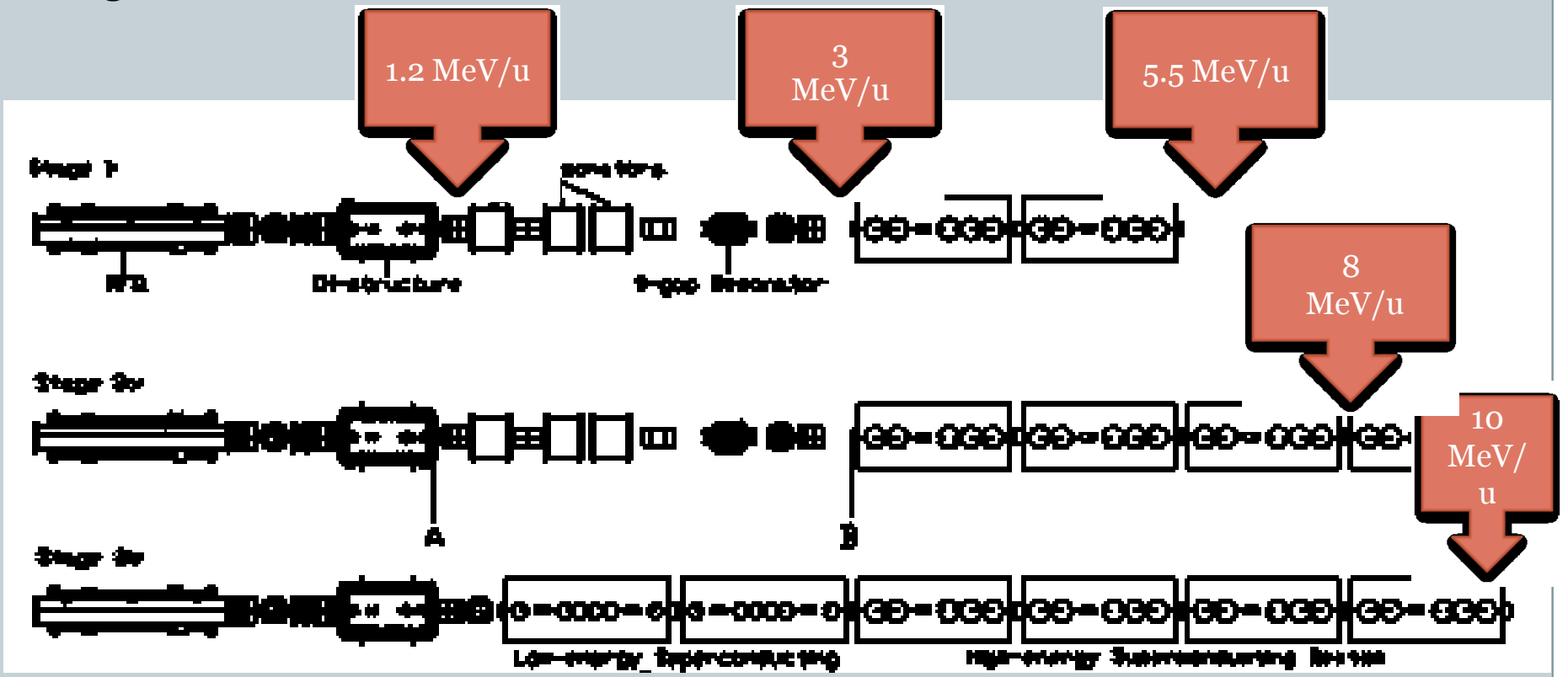
- HPWR, LPWR, EP, CP available on site with particle counting meter
- 15 m long clean room class 100 are available, there is a plan to go to class 10 (sLHC-Project-Note-0026)
- 5 vertical cryostat are available (4 bath cryostat and 1 vacuum cryostat) and 2 horizontal bunkers
- RF infrastructure available for tests from 100 MHz up to 1.3 GHz
- Cryogenics at 1.9K and 4.5K (new optimized cryo distribution line will be available next year)

On going activites

- SPL study
  - Cavity development
  - Cavity diagnostics: OSD, Thermometry
- Basic SRF research
  - Quadrupolar resonators
- Cavity production and testing
  - LHC spare cavities
  - HIE-ISOLDE QWRs
- New projects
  - Crab cavities?

HIE-ISOLDE project

3 stages installation



QWR cavities

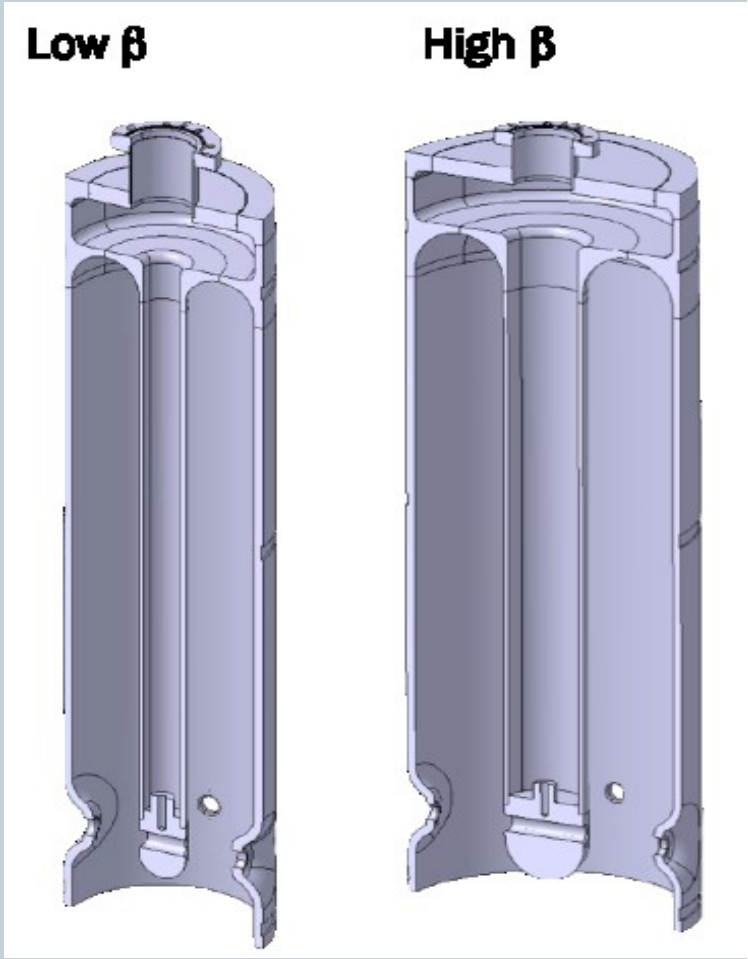
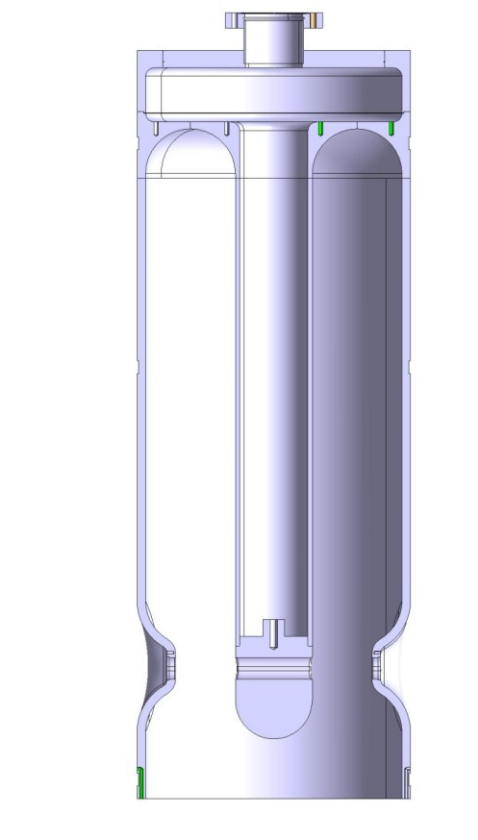


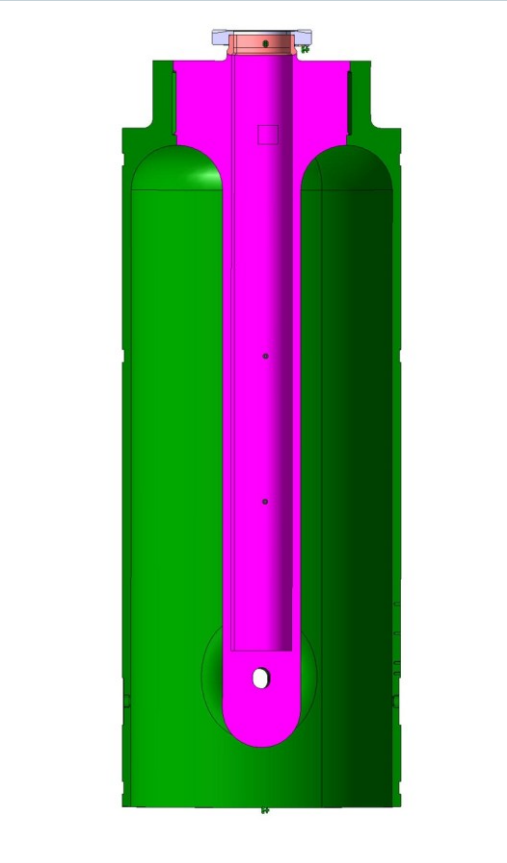
Table 1: Cavity design parameters

Cavity	**Low β**	**highβ**
No. of Cells	2	2
f (MHz)	101.28	101.28
β_0 (%)	6.3	10.3
Design gradient E_{acc}(MV/m)	6	6
Active length (mm)	195	300
Inner conductor diameter (mm)	50	90
Mechanical length (mm)	215	320
Gap length (mm)	50	85
Beam aperture diameter (mm)	20	20
$U/E_{acc}{}^2$ (mJ/(MV/m)^2	73	207
E_{pk}/E_{acc}	5.4	5.6
H_{pk}/E_{acc} (Oe/MV/m)	80	100.7
R_{sh}/Q (Ω)	564	548
$\Gamma = R_s \cdot Q_0$ (Ω)	23	30.6
Q_0 for 6MV/m at 7W	$3.2 \cdot 10^8$	$5 \cdot 10^8$
TTF max	0.85	0.9
No. of cavities	12	20

New mechanical design

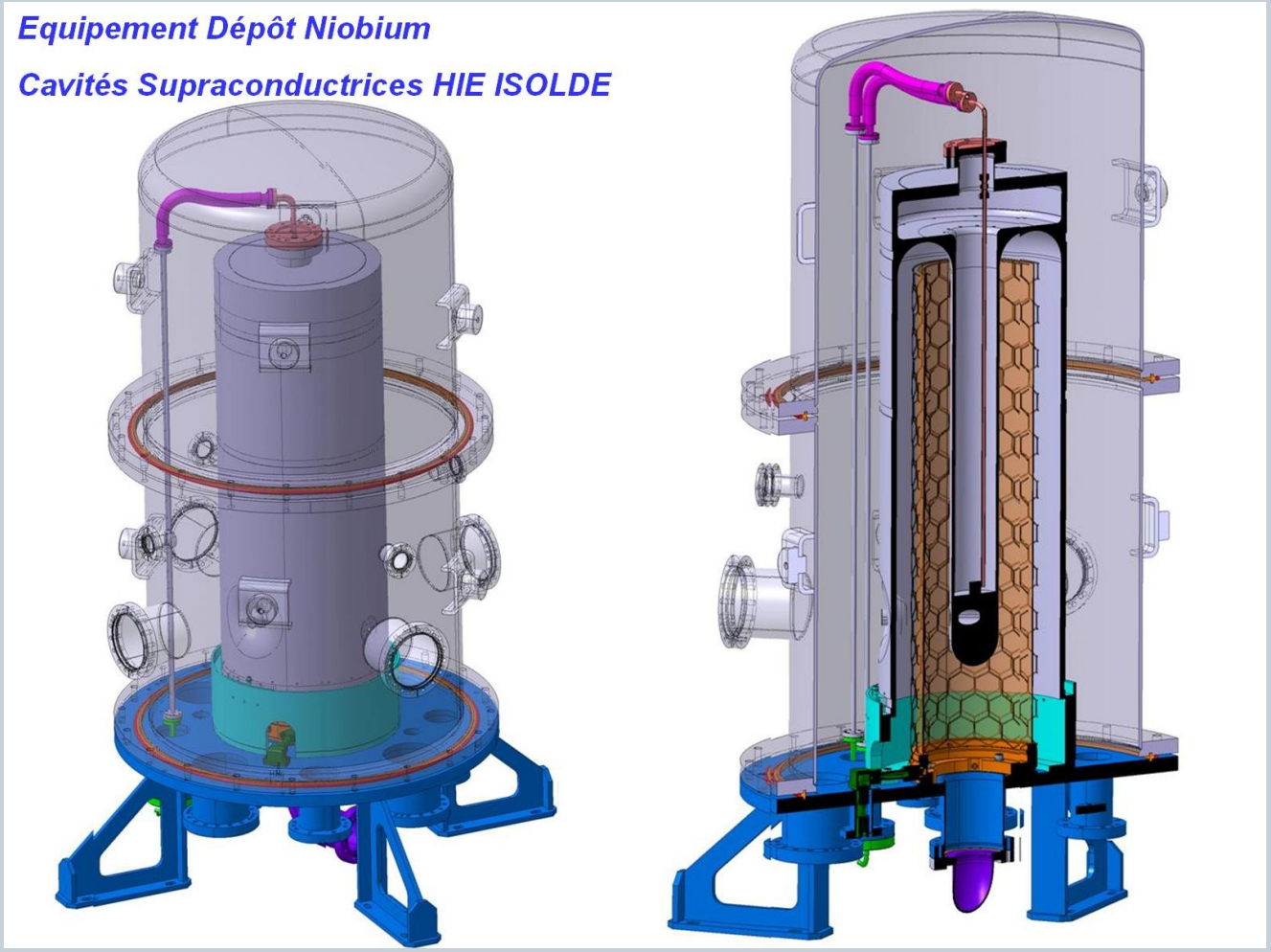


Cavity prototype



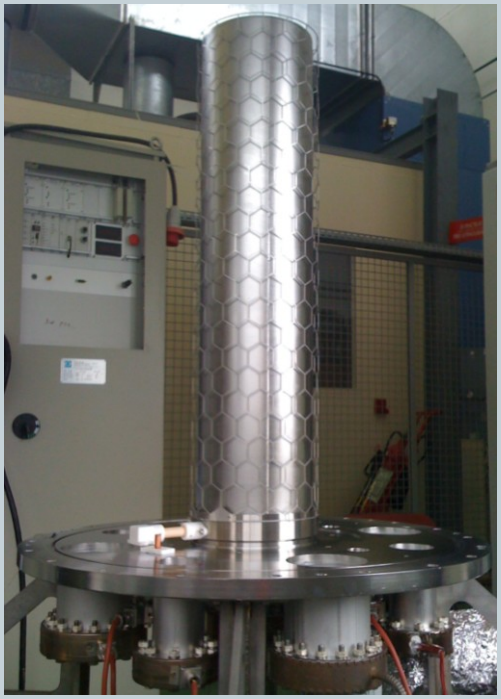
Pre-series

Nb Sputtering



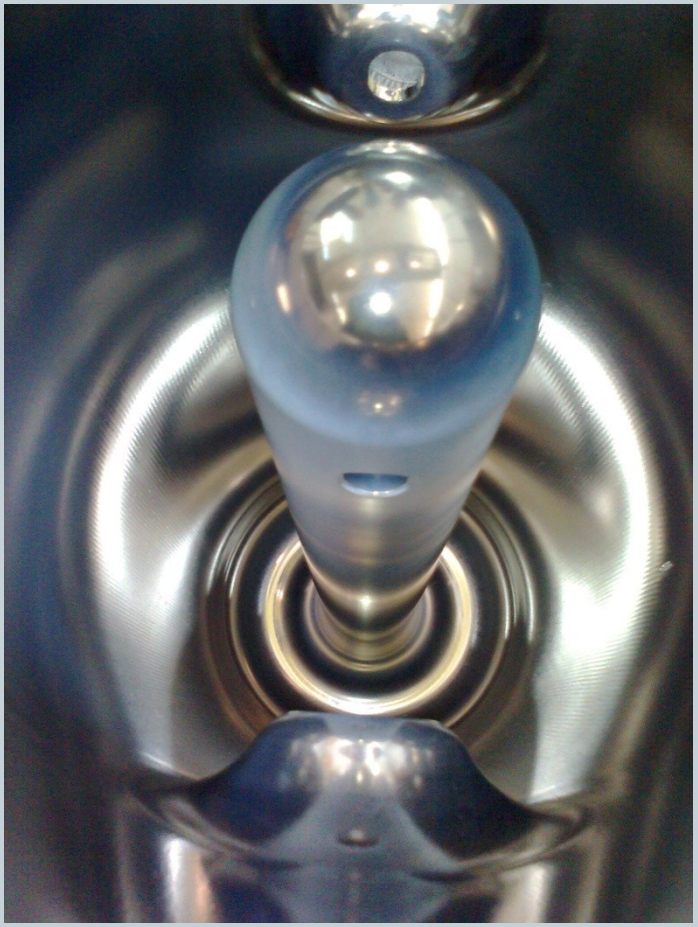
Bias and Magnetron sputtering

Bias Diode Sputtering

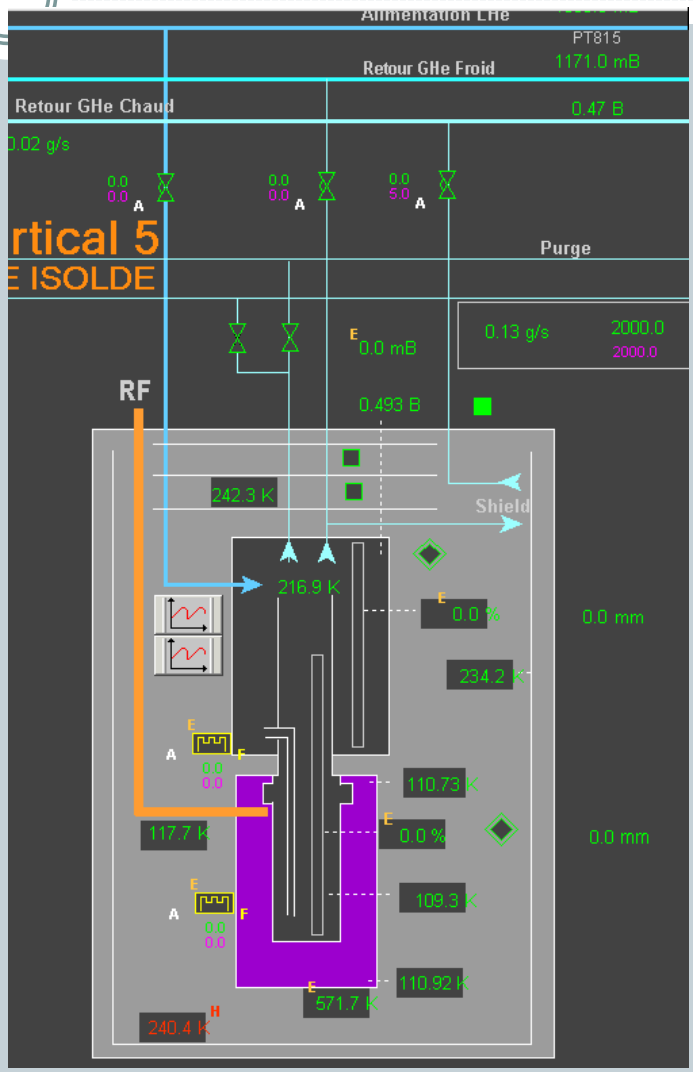


Magnetron Sputtering

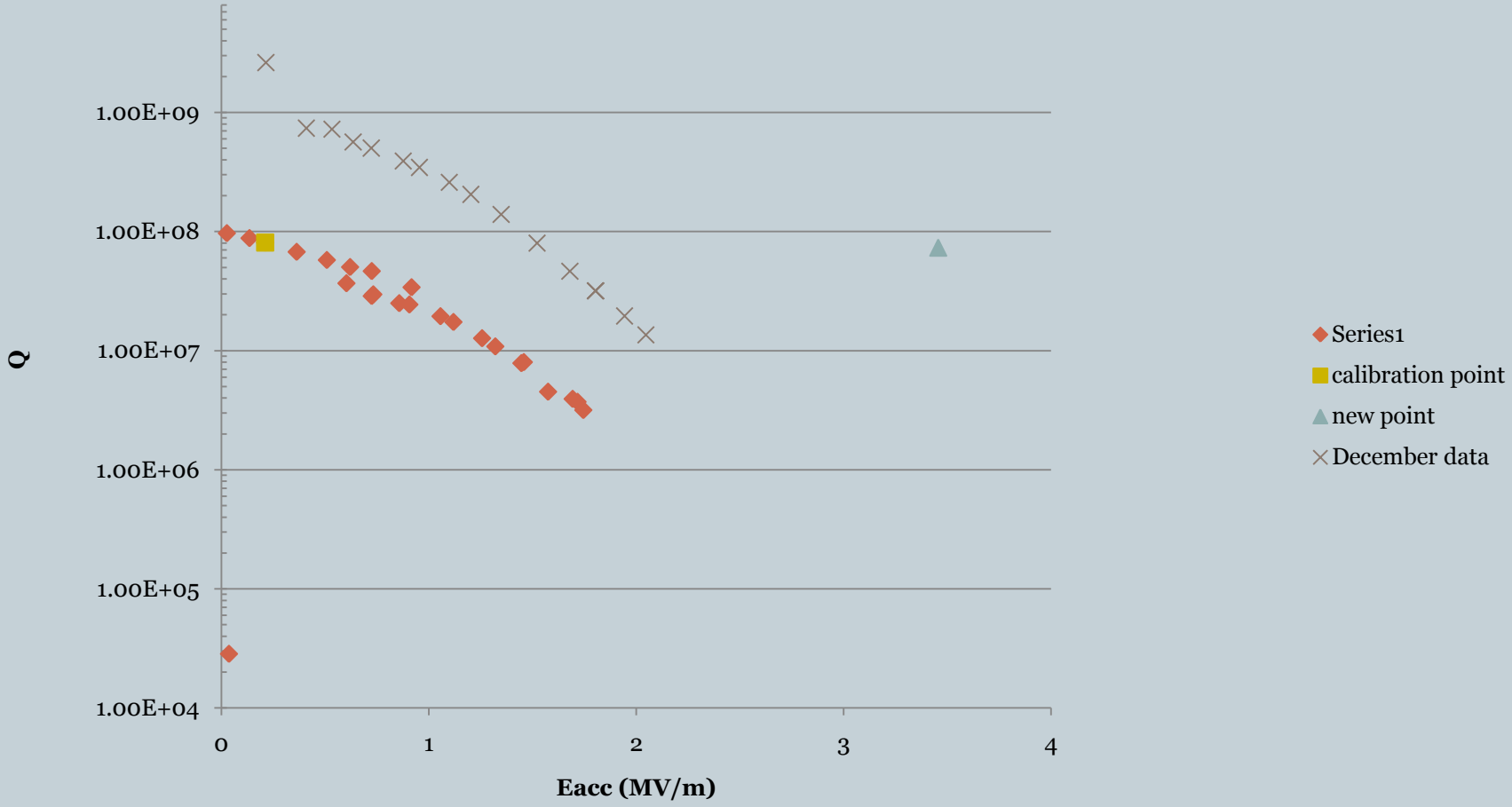
Prototype cavity



Test Cryostat



Test results



Summary

- 2 prototypes cavities are ready to be measured (Bias and Magnetron)
- All the infrastructure is in place to continue the development on the sputtering technique
- Unfortunately we had a problem (cold leak) with the test cryostat which cost us nearly 4 months of time. We have made a repair and we are getting ready to eventually replace it with a second one.