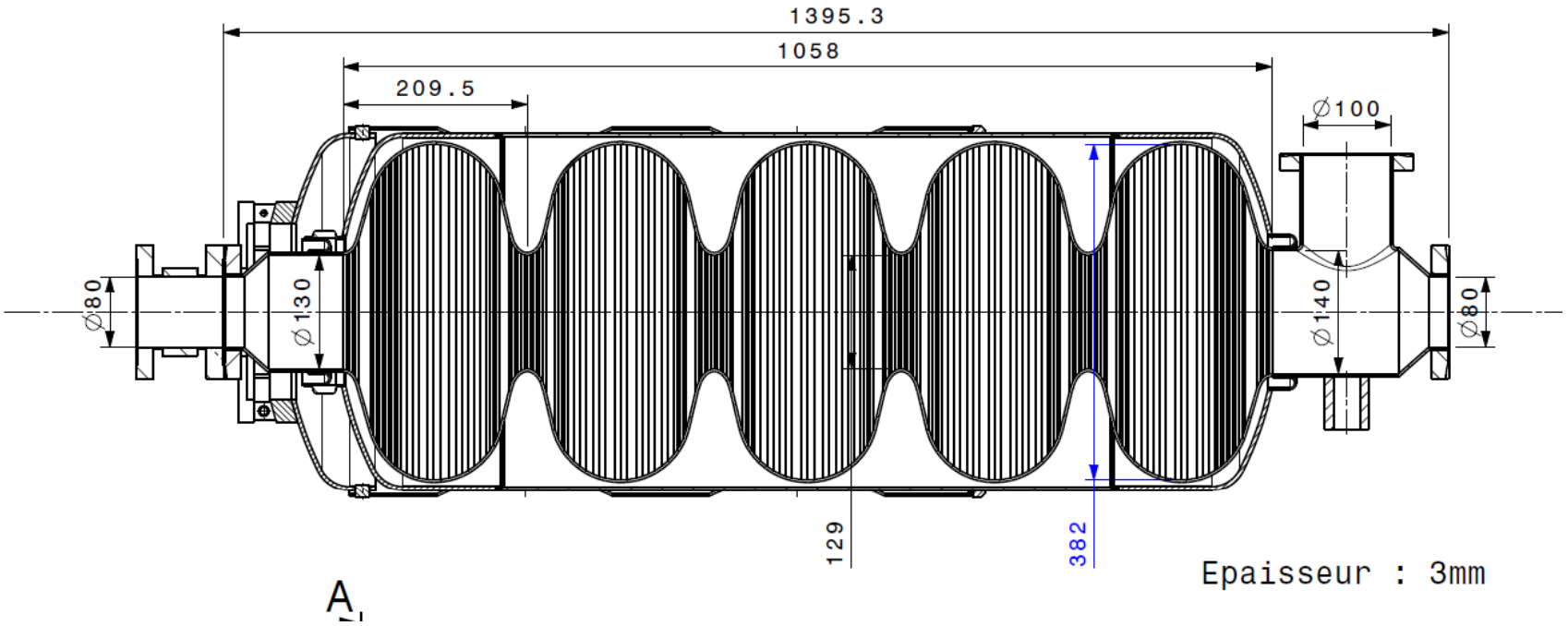
Open points

Ofelia Capatina

« Closed points »



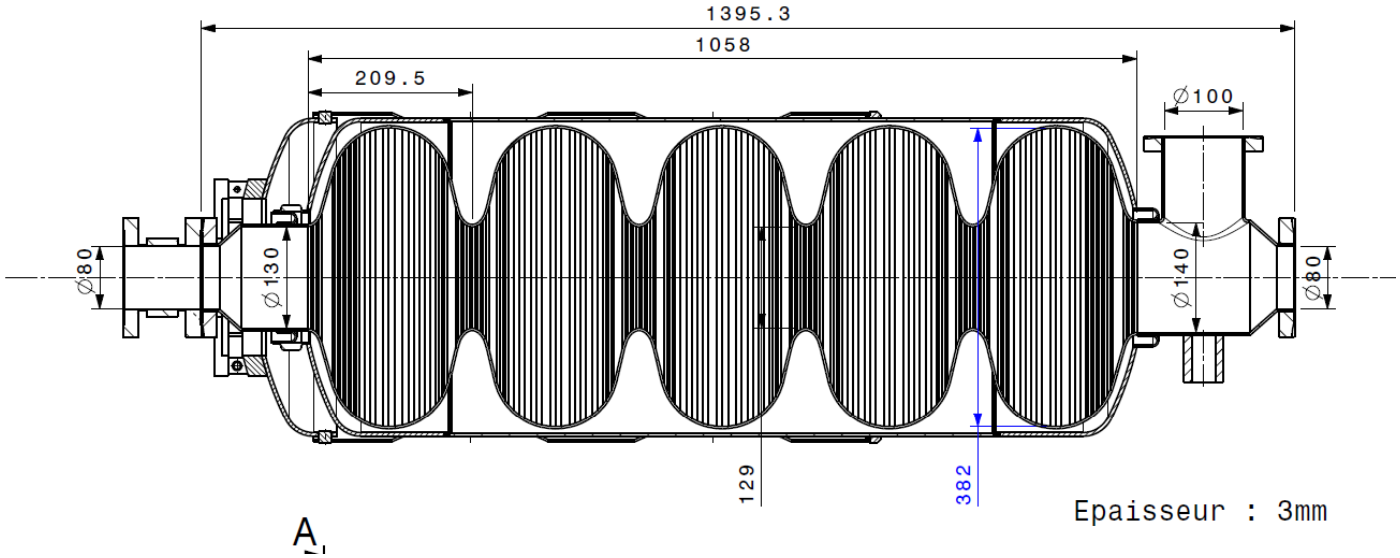
- Cavity material: Nb bulk
- Cooled by saturated HeII (at ~2K) inside a helium tank
- No HOM couplers

« Open points »

- Cavity material requirements (Nb)
  - Material requirements similar to DESY specification?
  - Annealing
    - Is annealing needed ?
    - Which temperature (depending on material choices)
    - “Q disease”
      - Annealing
      - Fast cool-down not required?

« Open points »

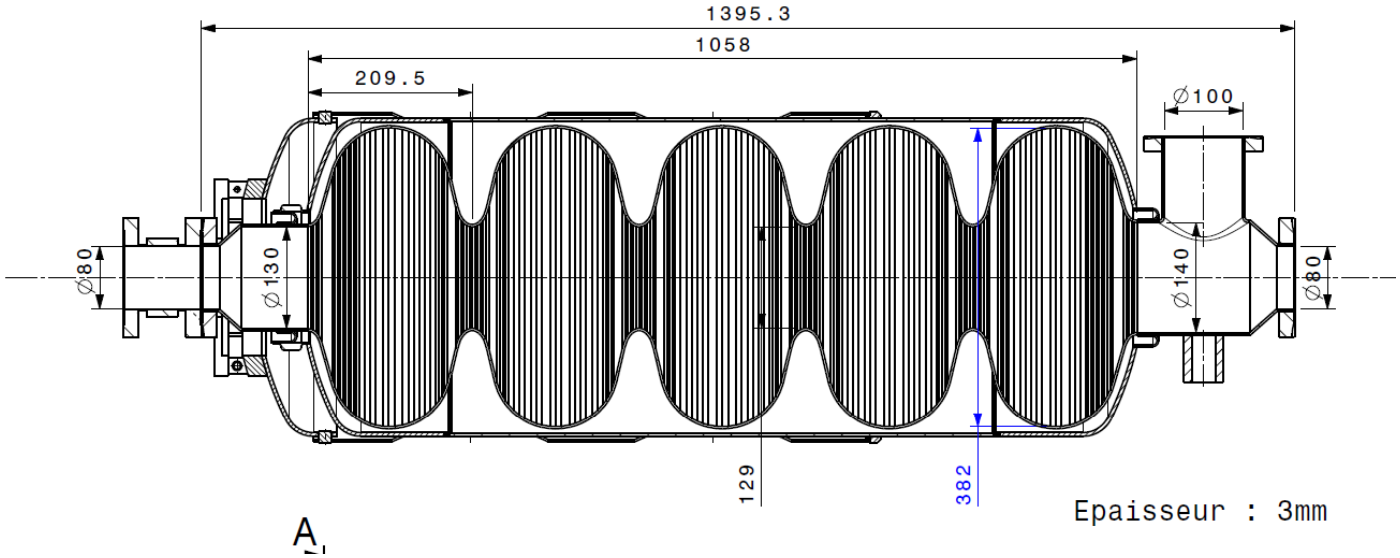
- Cavity RF and mechanical design open points



  - Cavity thickness / reinforcement rings vs lorentz force detuning (ongoing at Saclay)
  - Design pressure of helium inside helium tank
  - Pressure stability requirements during operation
  - Mechanical stability requirements during operation
  - Openings for HOM still to be considered ?

« Open points »

- Cavity RF and mechanical design open points



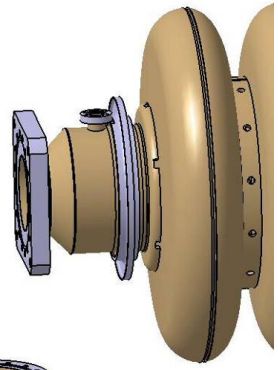
  - Helium tank material
  - Flanges material; coupler interface material
  - Mechanical stiffness
  - Which tuner (depends on material choice)
  - + list given by S. Chel during SPL WG1

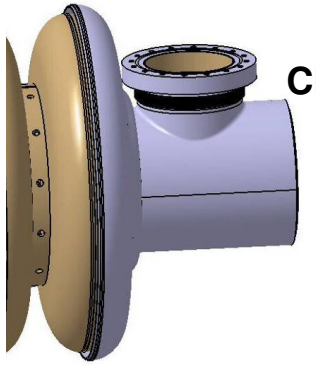
704 MHz Elliptical Cavity: design (2)

Options/Interfaces:

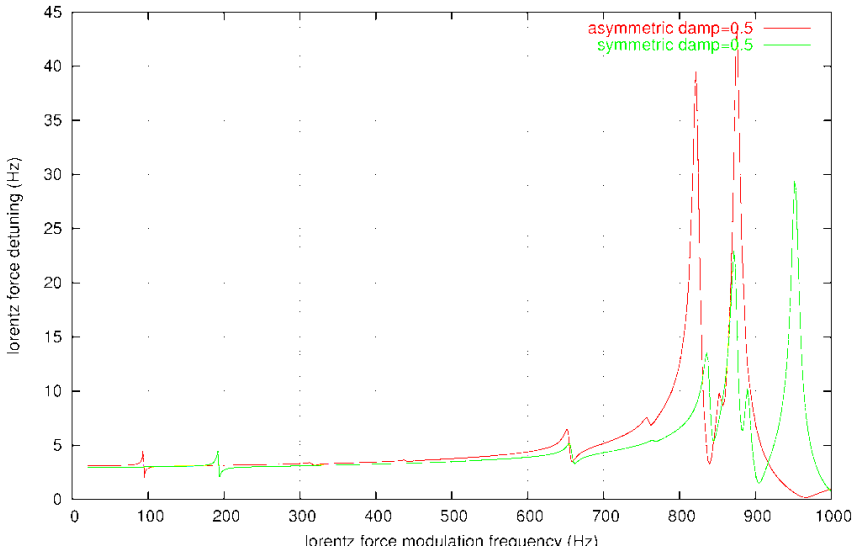
-which gaskets? same for both IE and HE cavities?
-max. diameter of the flanges?
-is the conical part of the tube necessary?
-do we keep a LHe cooled end-tube on the coupler side?
-symmetrical end-tubes?
-how many HOM couplers? which type?
-material (SS, Ti) for the LHe tank?

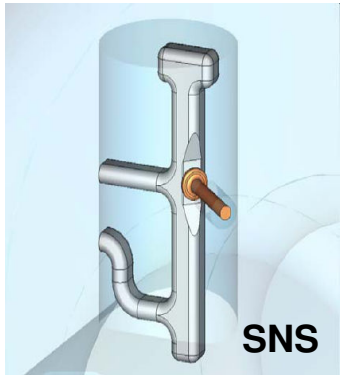
… to be addressed in the WG2



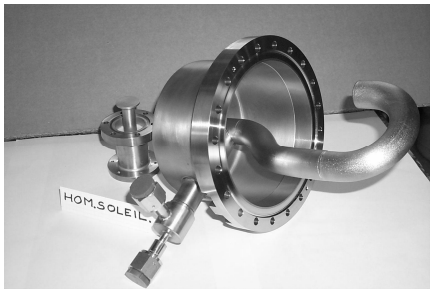


CEA_HIPPI cavity



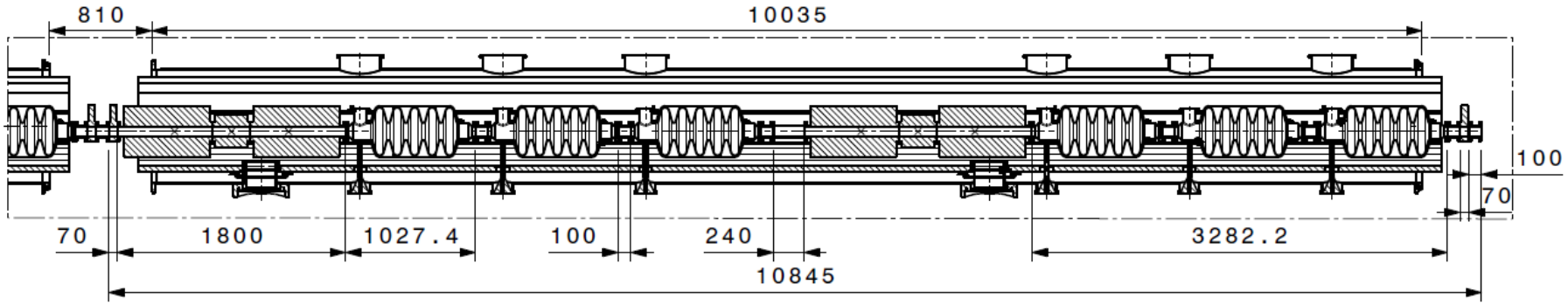


SNS



« Open points »

- Cavity design with respect to integration into cryostat



  - Joints
  - Bellows
  - RF absorbing coating
  - Interface to cryogenic piping
    - Bi-metallic transitions if needed
    - Flanged?
  - Magnetic shielding
  - Alignement references

« Open points »

- Cavity manufacturing
  - Deep-drawing ?
  - Spinning?
  - Other technologies ?
  - Manufacturing, assembly sequence
  - Tolerances requirements during manufacturing

« Open points »

- Cavity manufacturing, assembly and treatment sequence
  - Depends on material choice

704 MHz Elliptical Cavity: preparation & test (1)

For HE cavities, accelerating field in operation = 25 MV/m

⇨ **Eacc in vertical test ≥ 27 MV/m**

Requires a preparation recipe identical to XFEL

Need EP !

+

= vertical EP set-up for multicell cavities to be developed at Saclay within the EuCARD program

Cavity Preparation:

1) EP 150 microns
1 bis) surface endoscopy
2) UHV annealing at 800°C
3) field flatness checking
4) flash BCP 10 microns
or 4) final EP 30 microns
5) alcohol rinsing
6) drying in class 10
7) UHV baking at 120°C
8) HPR at 100 bars (6 times)
9) drying in class 10

how to share the preparation between participants?
➡WG2