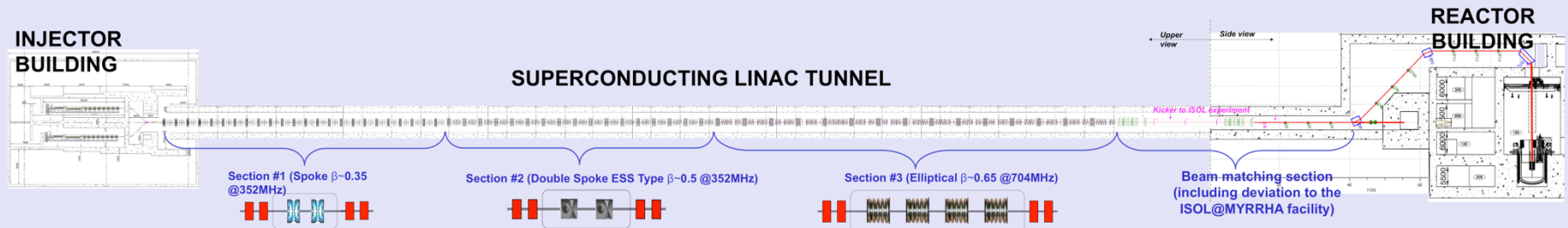


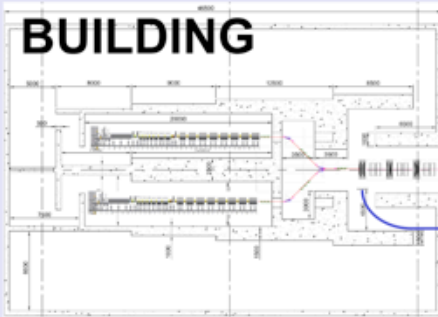
Status of MYRRHA



Dirk Vandeplassche, Jorik Belmans, Wouter De Cock
SCK•CEN

- MYRRHA: ADS project 100 MW_{th}, 600 MeV CW linac
- phased approach
 1. 100 MeV
 2. 600 MeV
 3. Pb-Bi cooled reactor
- 100 MeV subdivision = teams
 - accelerator: prototyping → construction
 - target: design
 - buildings: functional descriptions, initial integration

INJECTOR BUILDING



SUPERCONDUCTING LINAC

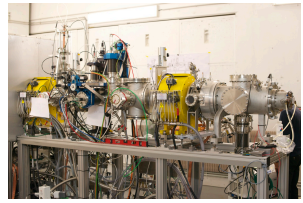
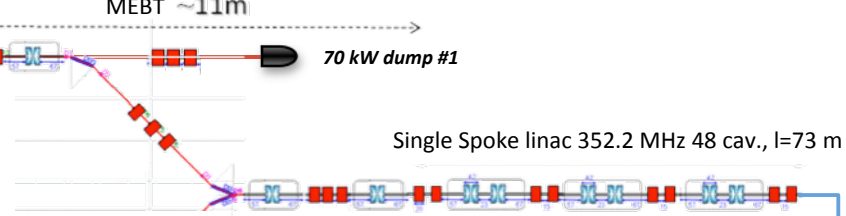
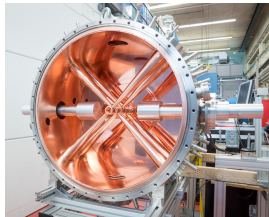
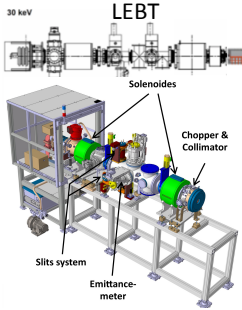
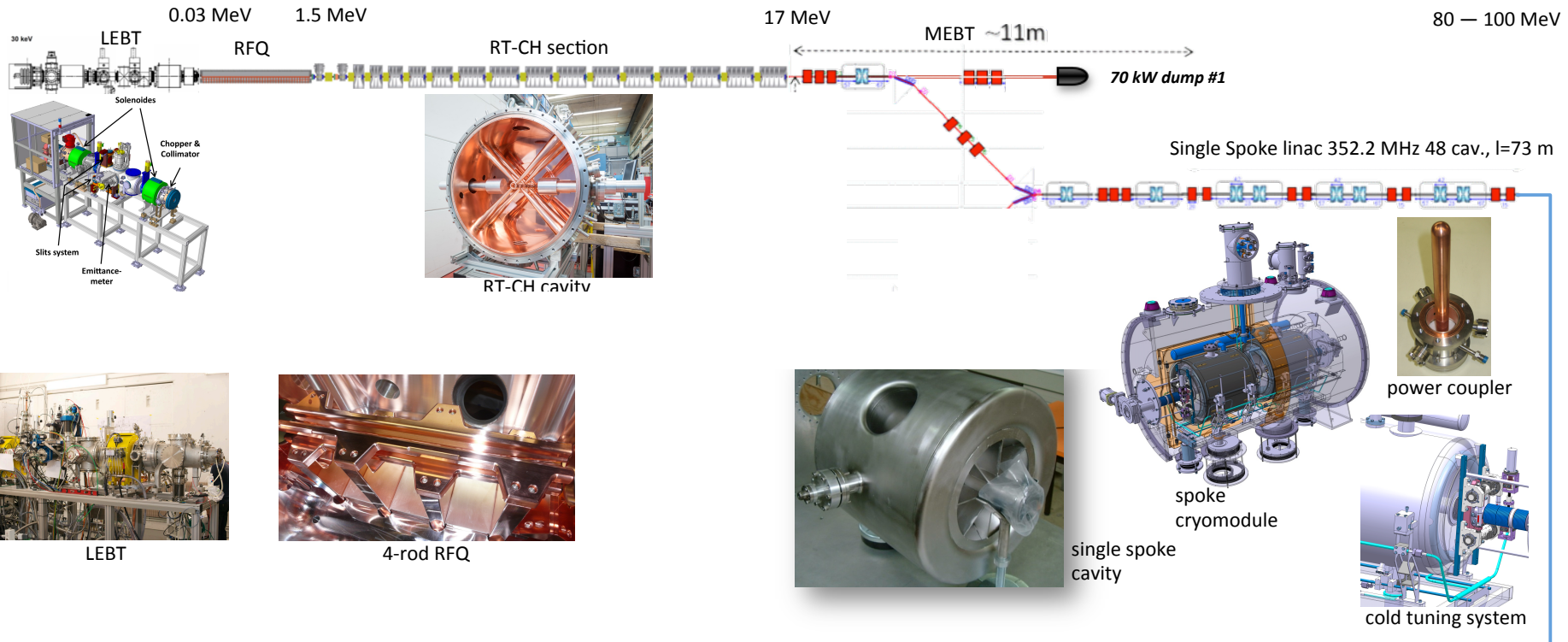
Section #1 (Spoke $\beta \sim 0.35$
@352MHz)



Section #2 (Double Spoke ESS Type $\beta \sim 0.5$ @352MHz)



100 MeV layout



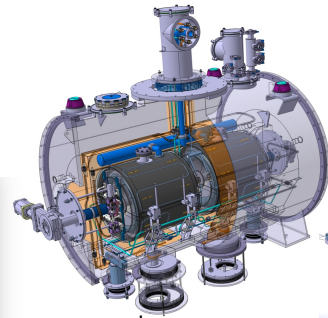
LEBT



4-rod RFQ



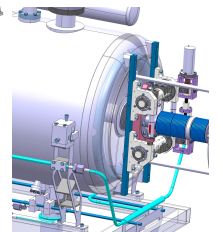
single spoke cavity



spoke cryomodule



power coupler



cold tuning system

accelerator building

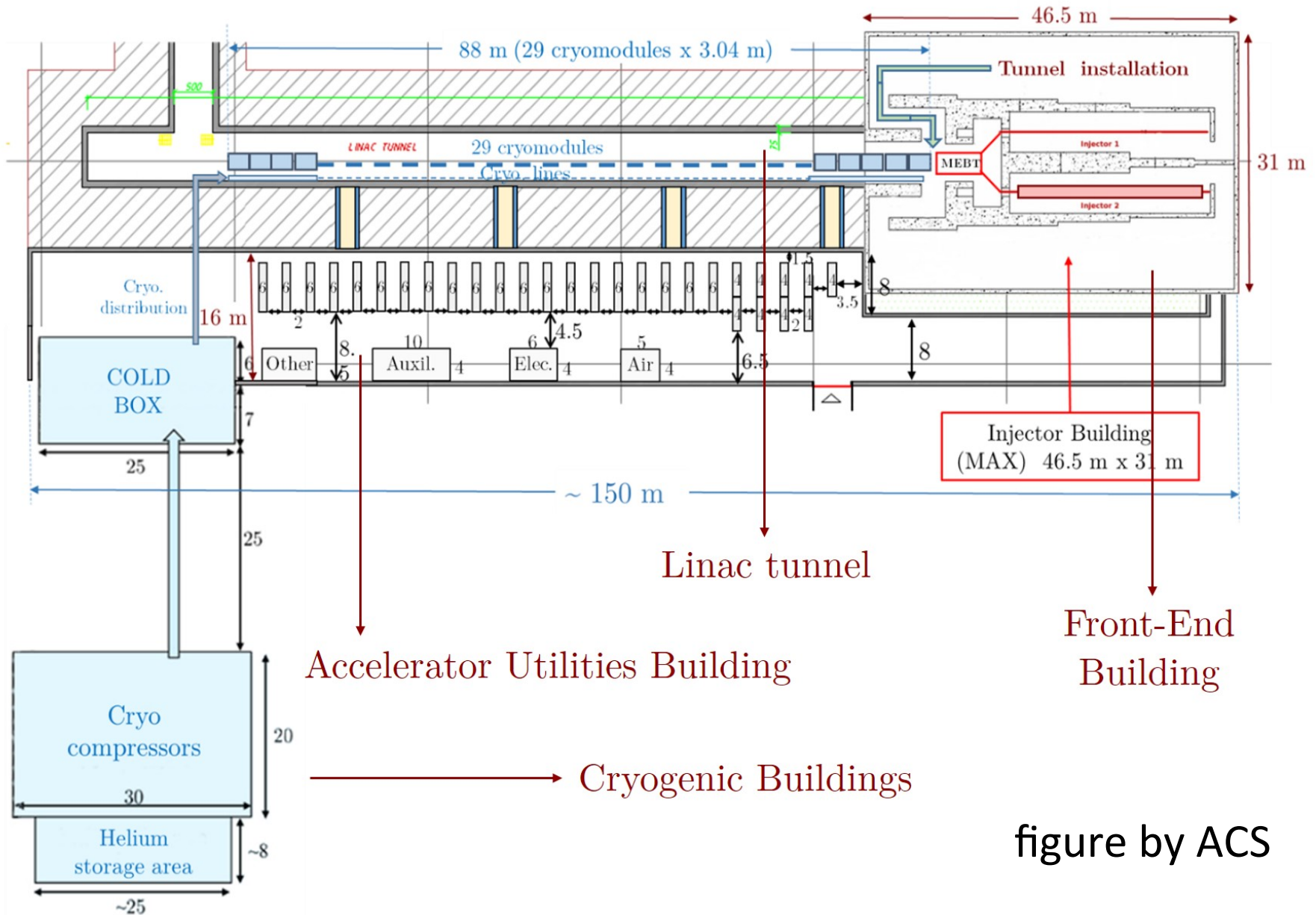
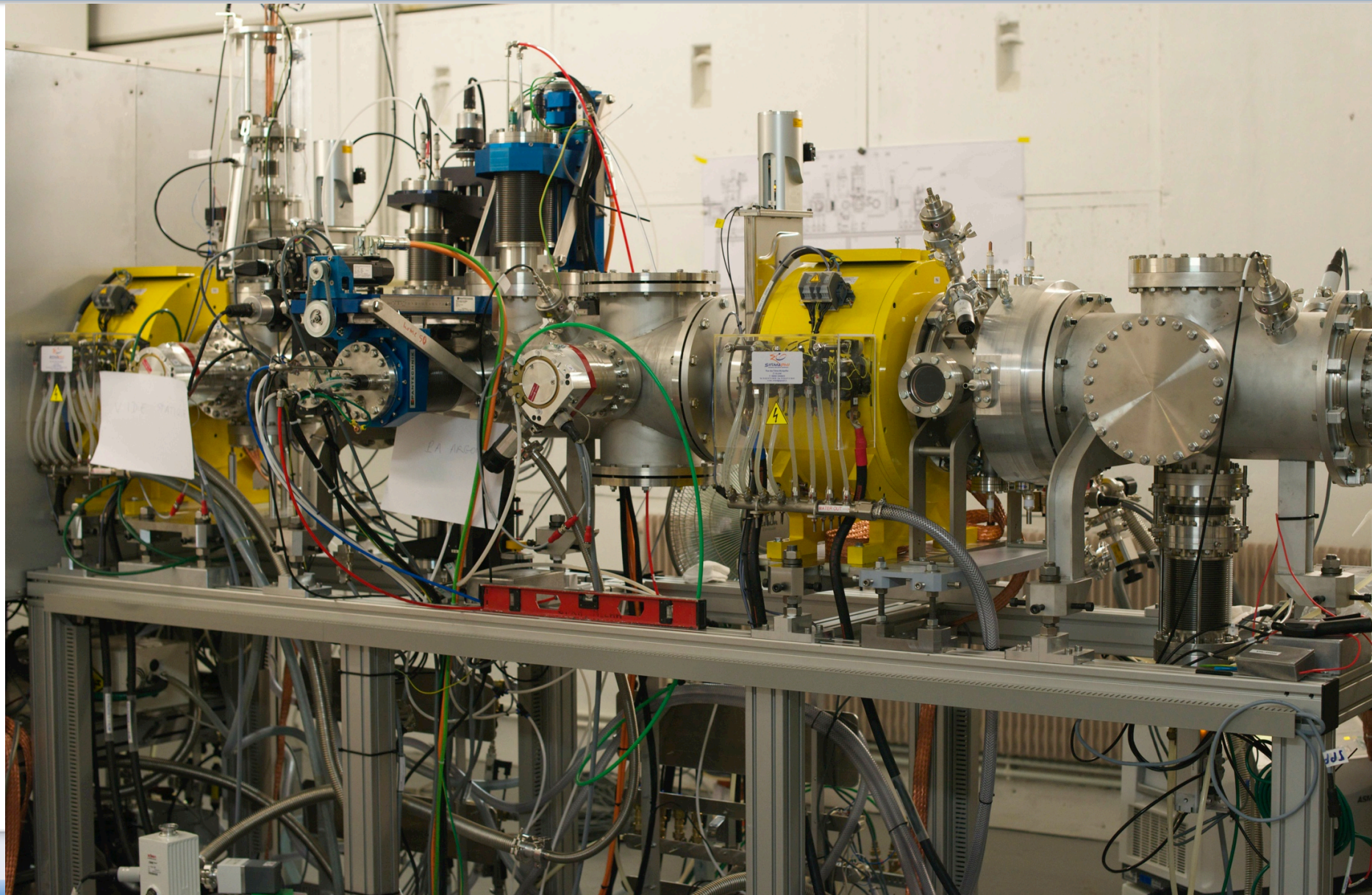


figure by ACS

- goal and schedule
 - decisional hold point 2024 after 2y commissioning
 - construction ready 2022
 - financial milestone end of 2017
 - prototyping & construction in parallel 5y
- frameworks
 - H2020: MYRTE: historical partners
 - collaboration agreements with defined financial scenario: IN2P3, U. Frankfurt/IAP, UCL/CRC
 - industrial contracts: Bevatech, ACS, (Cosylab)

- WPs
 - ECR ion source + LEBT + chopper
 - existing
 - LPSC Grenoble
 - cfr. Frédéric Bouly's talk



100 MeV accelerator program

- WPs
 - ECR ion source + LEBT + choppe
 - existing
 - LPSC Grenoble
 - cfr. Frédéric Bouly's talk
 - MYRTE: RFQ 4-rod, CW, 1.5 MeV
 - cavity 4 m (NTG + IAP)
 - SS amplifier 160 kW (IBA)
 - LLRF μ TCA-based (IPNO)
 - EPICS (Cosylab)



- **WPs**
 - **MEBT1 + diagnostic bench**
 - inspired by Spiral2 bench
 - goal: beam characterisation + diagnostic test platform
 - bench being designed (LPSC, IRFU, IPNO, IPHC, IAP, ...)
 - to be installed after MEBT1 (Bevatech)

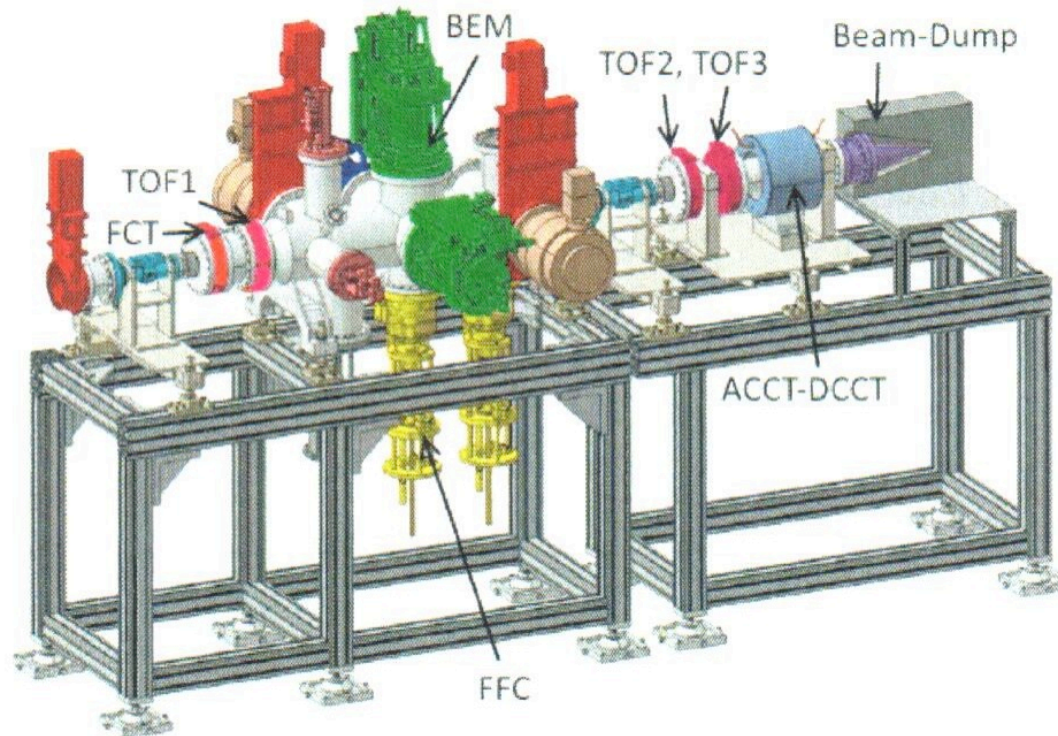


Figure 2: View of the Intermediate Test Bench

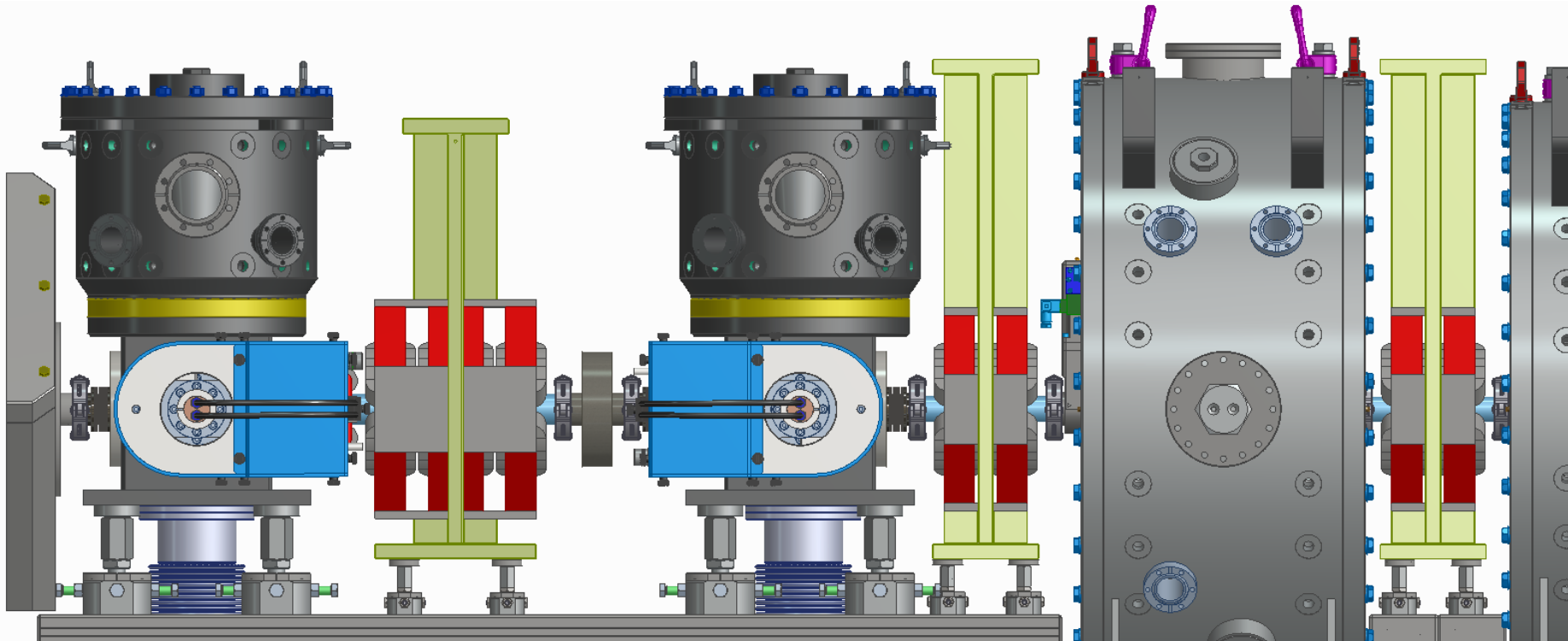
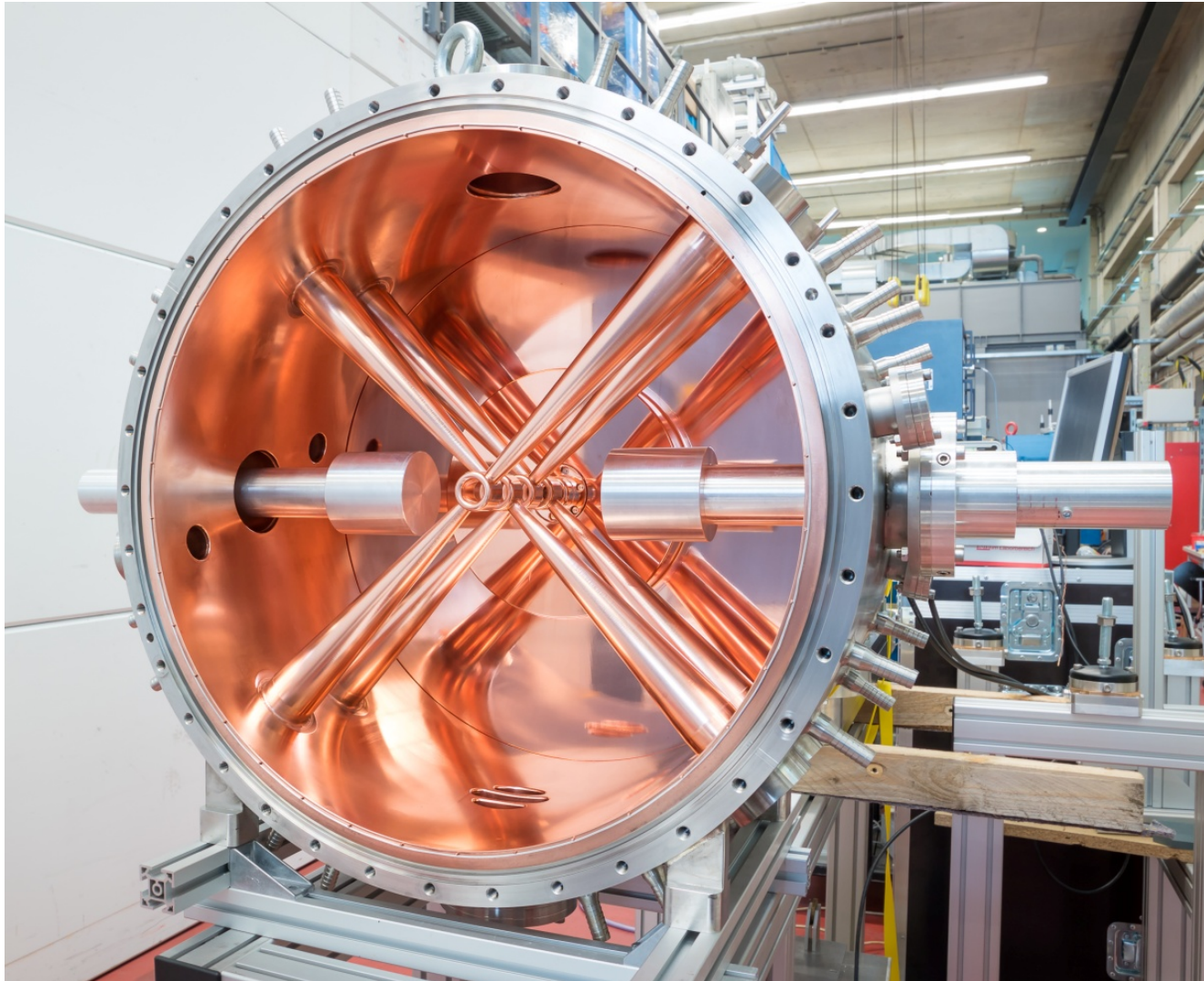


figure by Bevatech

- WPs
 - MEBT1 + diagnostic bench
 - inspired by Spiral2 bench
 - goal: beam characterisation + diagnostic test platform
 - bench being designed (LPSC, IRFU, IPNO, IPHC, IAP, ...)
 - to be installed after MEBT1 (Bevatech)
 - CH section
 - 7 cav. (5.9 MeV) + MEBT2 + 8 cav. (16.6 MeV): detailed concept design by IAP, engineering design by Bevatech
 - magnets: quadrupoles, steerers
 - 176 MHz RF

IAP: CH cavity 175 MHz



5.9 MeV by Bevatech

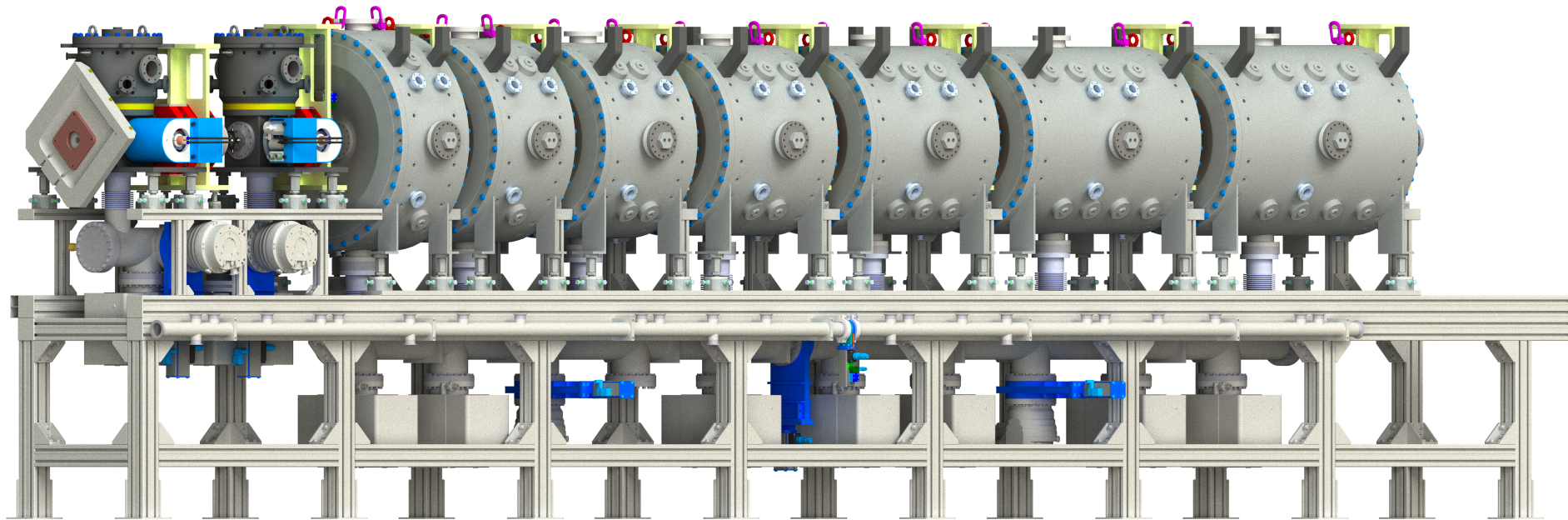
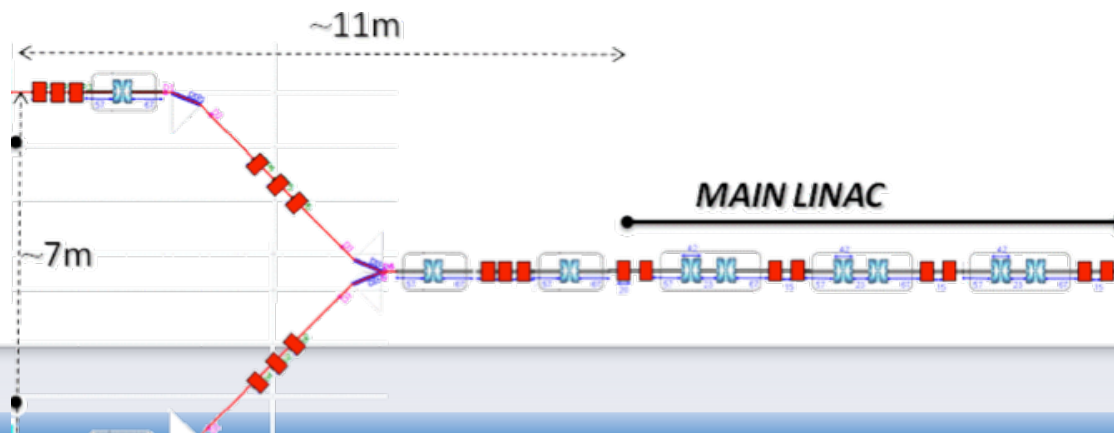


figure by Bevatech

- WPs
 - MEBT3 @ 17 MeV: strategic for fault recovery
 - fast switching dipoles, quadrupoles, SC rebunchers
 - selection dipole
 - diagnostics, scrapers
 - beam dump(s)
 - to be designed (IPHC)



- WPs

- spoke section: IPNO, LPSC, LAL

- cryomodule: designed

- valve box

- power couplers

- warm section

- 352 MHz RF

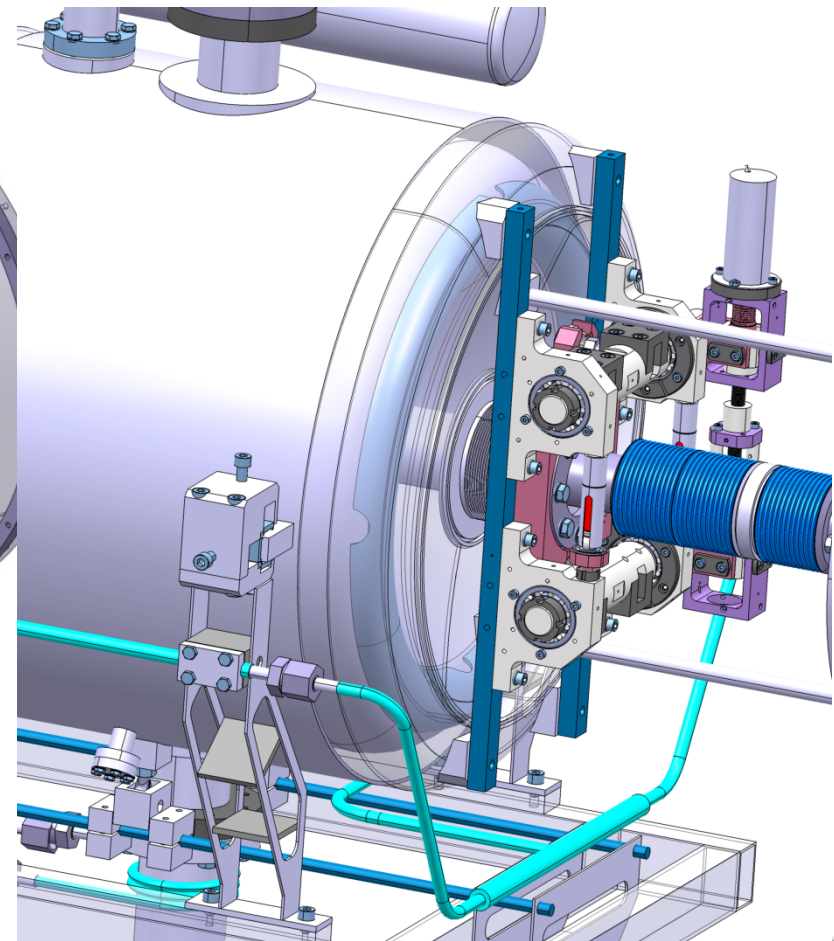
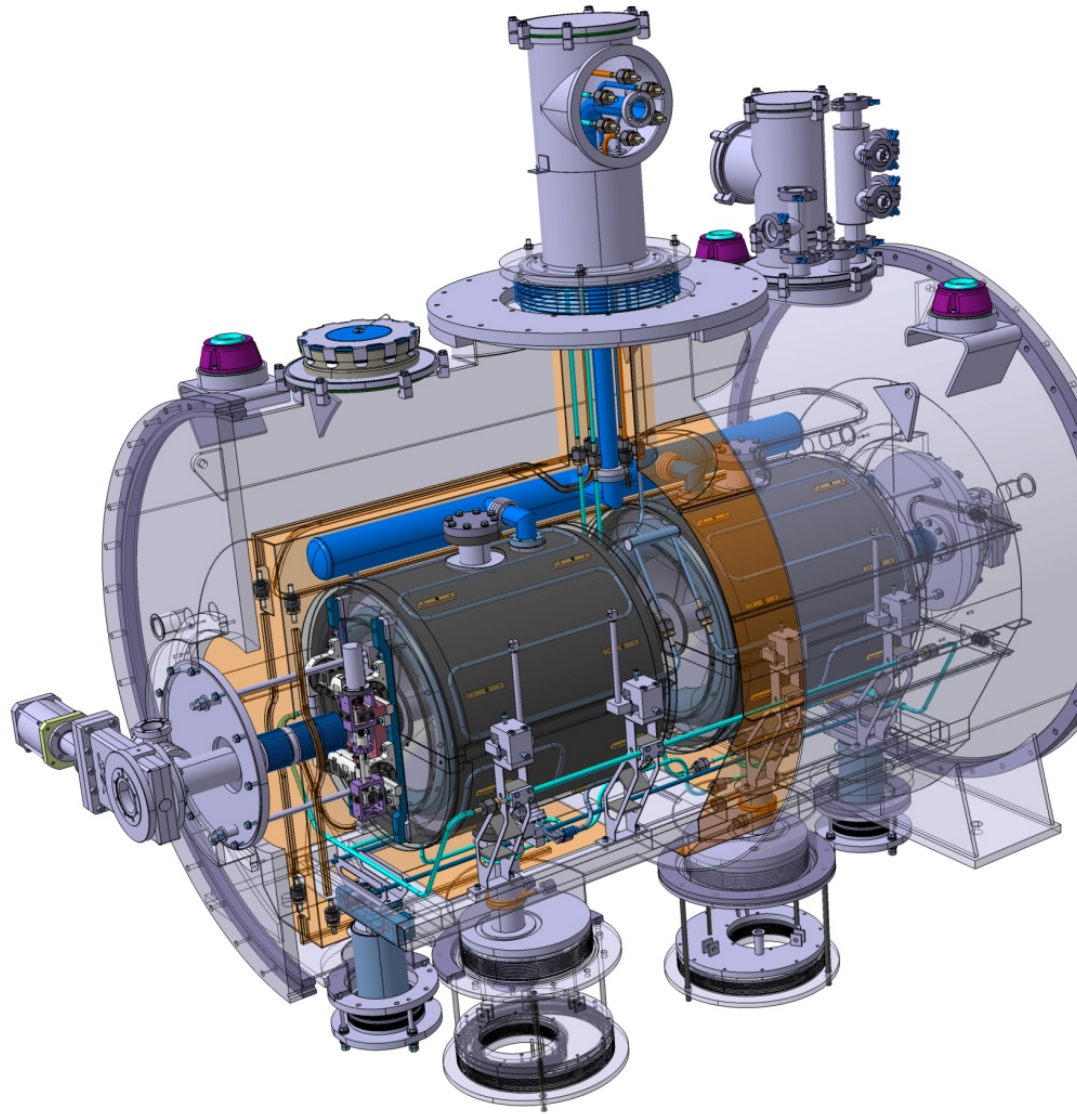
- industrialisation for series of 25–29 cryomodules

} prototyping (2 cavities will be ordered soon)

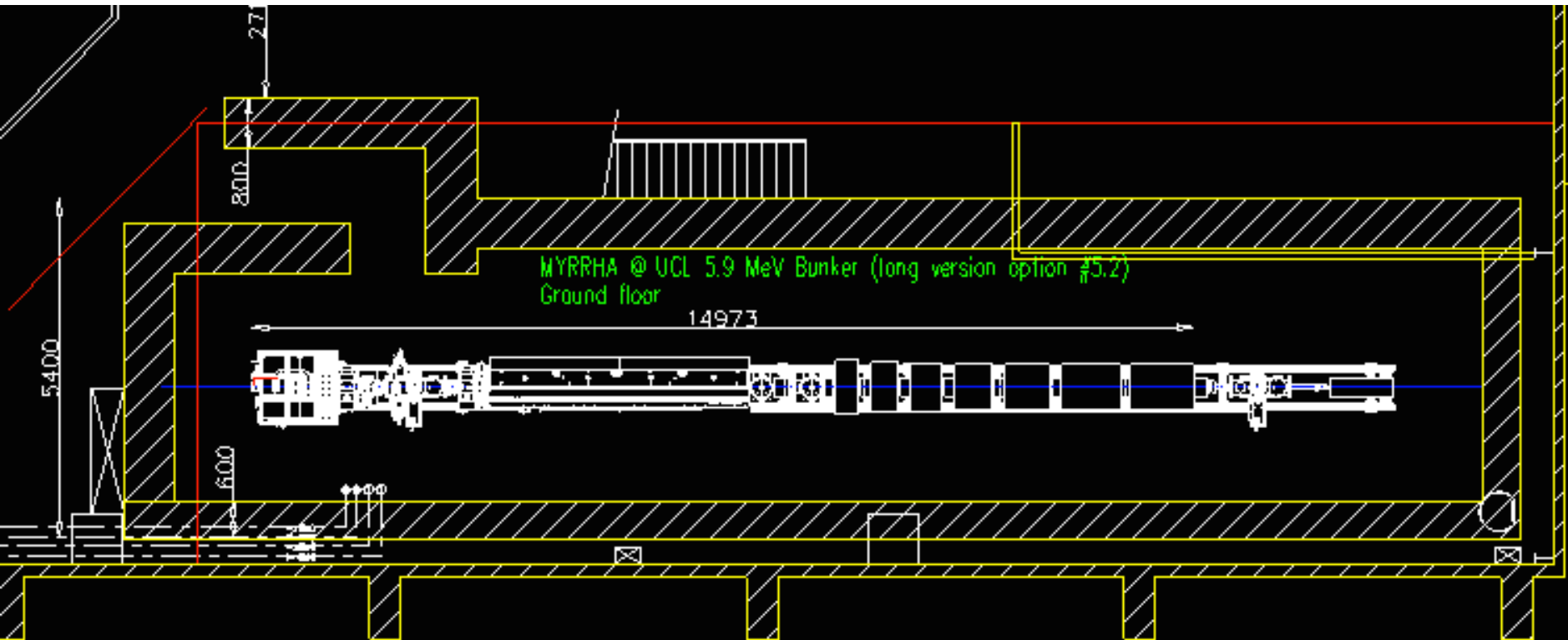
- cryogenics: ACS → industry

single spoke cryomodule

figure by IPNO



- purpose: installation of 5.9 MeV injector with diagnostic bench and beam dump
 - new bunker 24m



– near milestones

- August '17: start construction of bunker
- September '17: arrival of ECR-IS + LEBT
- December '17: arrival of RFQ + RF amplifier
- Q2 '18: first characterisation of RFQ beam with dipole

– manpower increase

- mechanical engineer
- beam dynamics physicist
- RF engineer
- technician
- control system engineer
- program manager
- integration engineer
- documentation manager

- dark sides ?
- highlights
 - hardware at LLN: show, learn, test, attract ...
 - significant prototyping program
 - ambitious construction program
 - internal organisation
 - collaborations
 - MYRRHA Accelerator TDR being finalized