The GANIL campaign technical preparation

Caterina Ciampi

26th AGATA Week and ACC meeting
Warsaw, 7-11 September 2026

An overview on the technical aspects

Mechanical integration in the G1 hall:

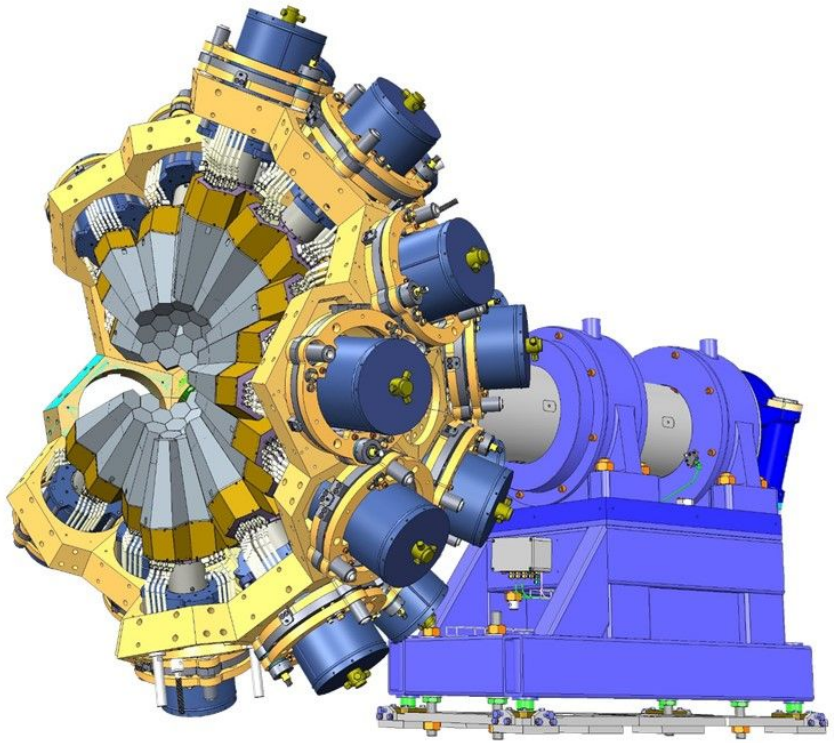
- New diagnostic box
- Beam pipe
- Vacuum chamber
- Target access
- Placement of FEE and DSS racks

Infrastructure:

- LN_2 manifold, cable management and routing
- Electronics cooling
- LN_2 autofill
- Preprocessing room
- Detector preparation and repository areas

The VAMOS-GRIT-AGATA campaign:

- Host agreement
- Data management plan
- A tentative timeline



VAMOS-GRIT-AGATA: Mechanical integration

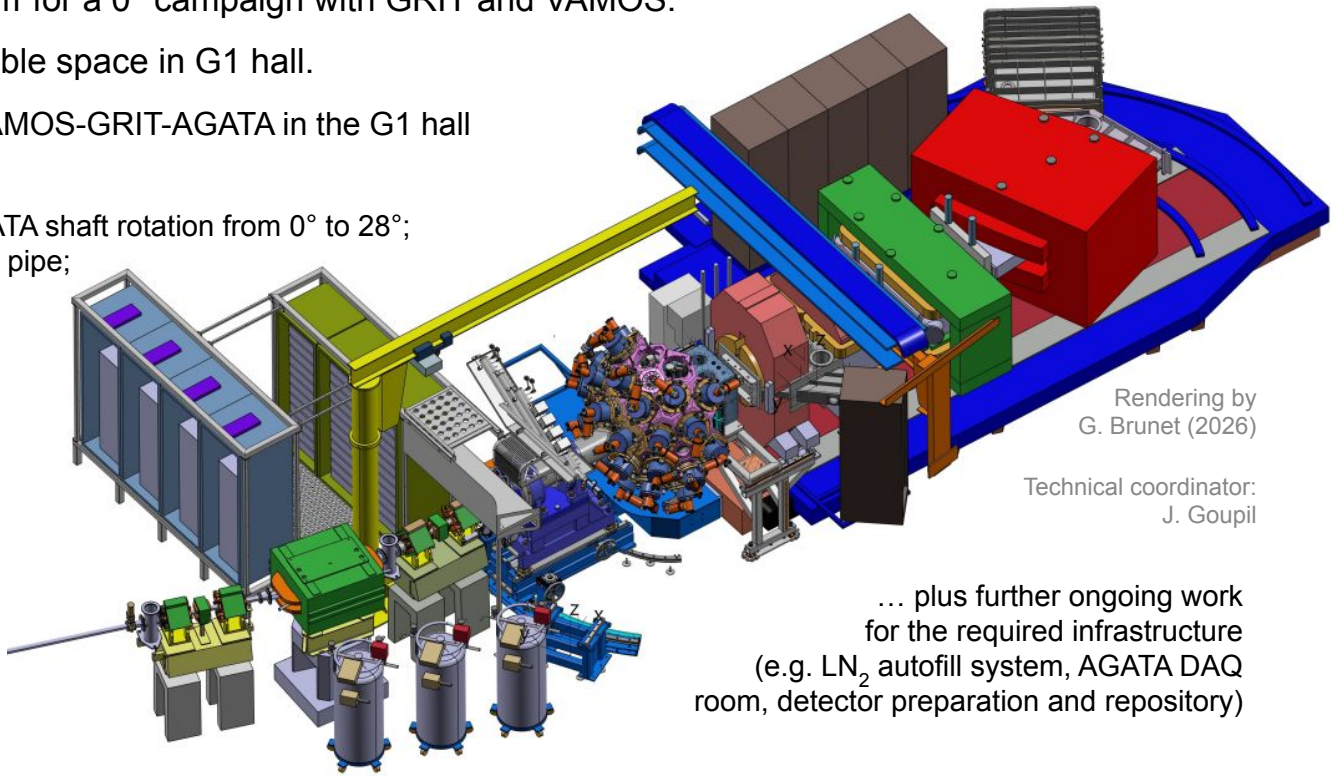
Objective: mounting AGATA 2π for a 0° campaign with GRIT and VAMOS.

Challenge: Very limited available space in G1 hall.

The mechanical integration of VAMOS-GRIT-AGATA in the G1 hall requires new tailored designs:

- Installation of two rails for AGATA shaft rotation from 0° to 28°;
- New diagnostic box and beam pipe;
- Cable management and LN_2 manifold structure;
- Redesigned rack platform placement in G1;
- Integration of cryogenic ^{3}He target;

Let's see that in detail, moving along the beam line…



Rendering by G. Brunet (2026)

Technical coordinator: J. Goupil

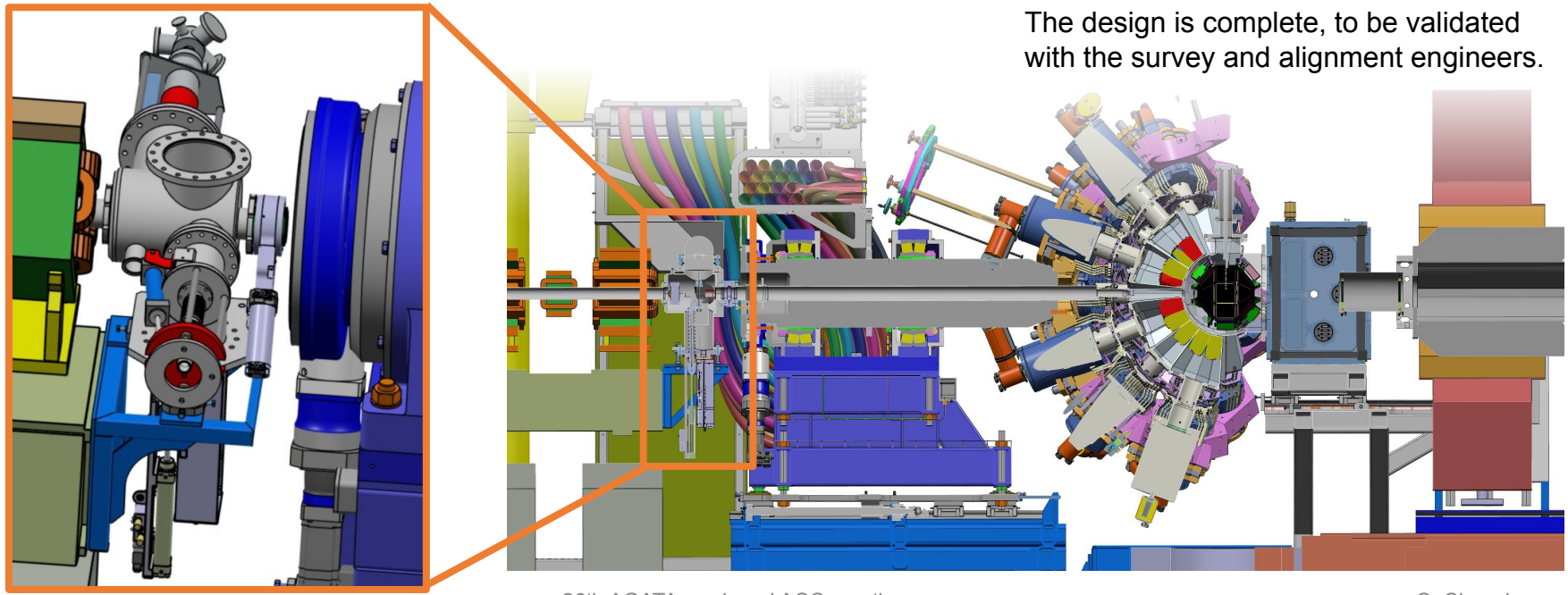
… plus further ongoing work for the required infrastructure (e.g. LN_2 autofill system, AGATA DAQ room, detector preparation and repository)

Mechanics: Diagnostic box

Newly designed diagnostic box, fitting within the tight geometric constraint (~375 mm):

- Includes profilers, FC, turbo pump + additional flange for tracking detector;
- Closed by isolating valve, connected with a bellow on the AGATA side.

The design is complete, to be validated with the survey and alignment engineers.



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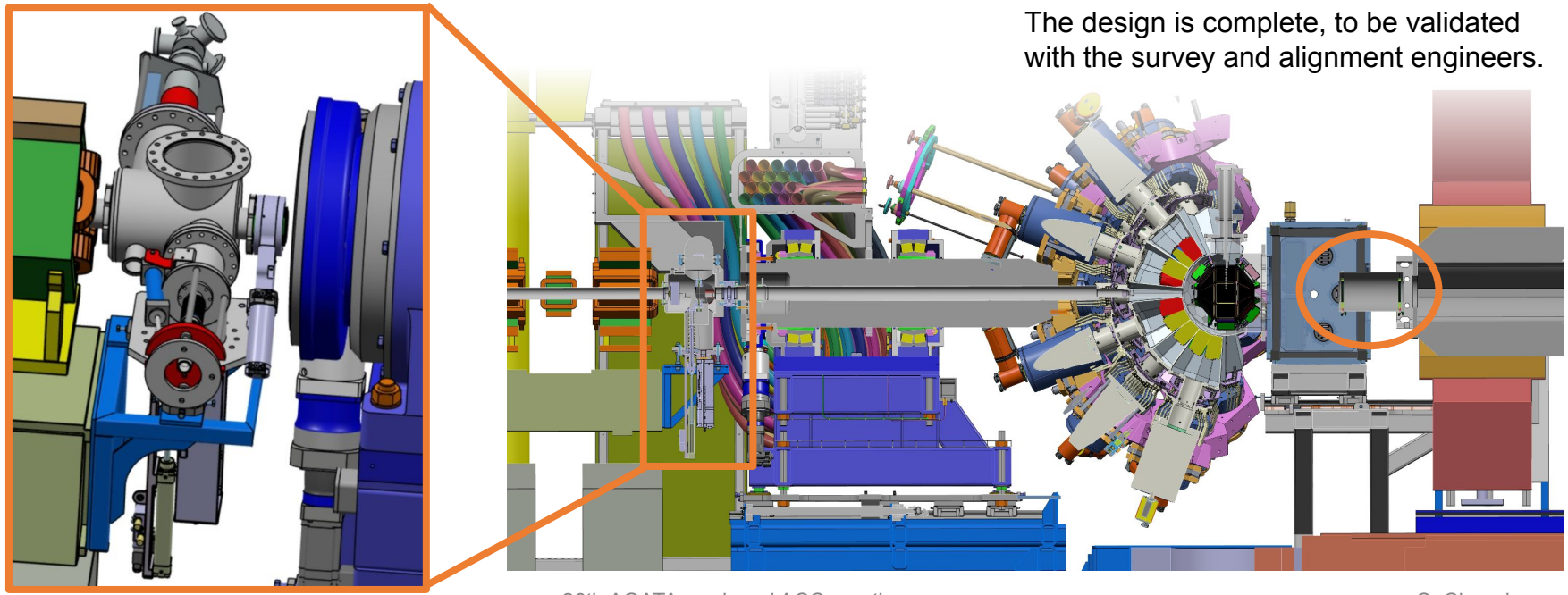
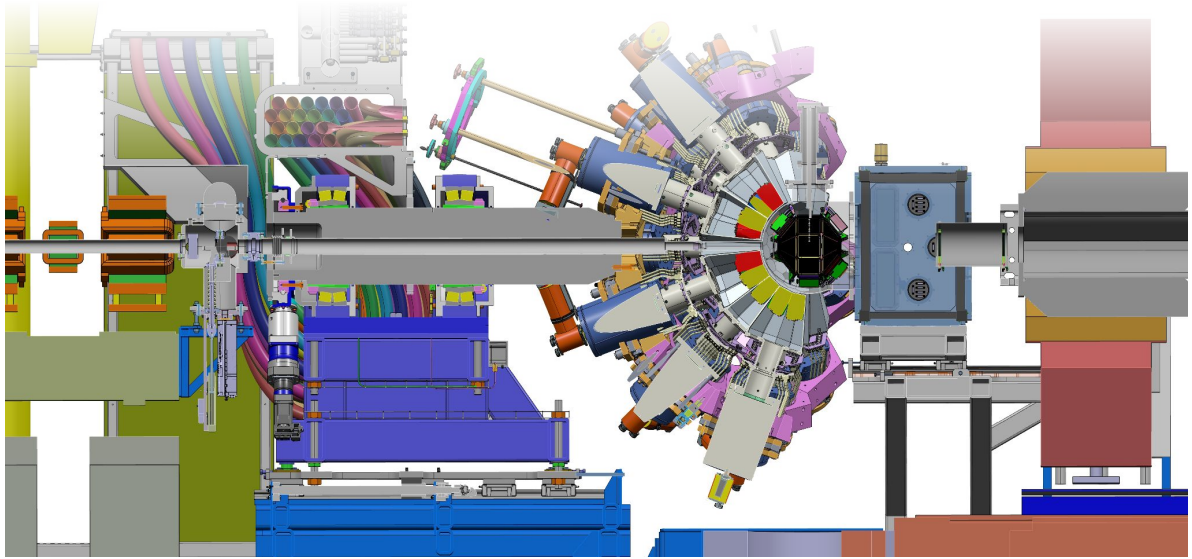


Mechanics: Beam pipe

For the 0° configuration, a 2.58m beam pipe passes through the AGATA shaft.
⇨ Manual access only from the diagnostic box side for vacuum sealing.

New clamp mechanism (designed by P. Gangnant, manufacturing launched at the end of 1st semester 2026):



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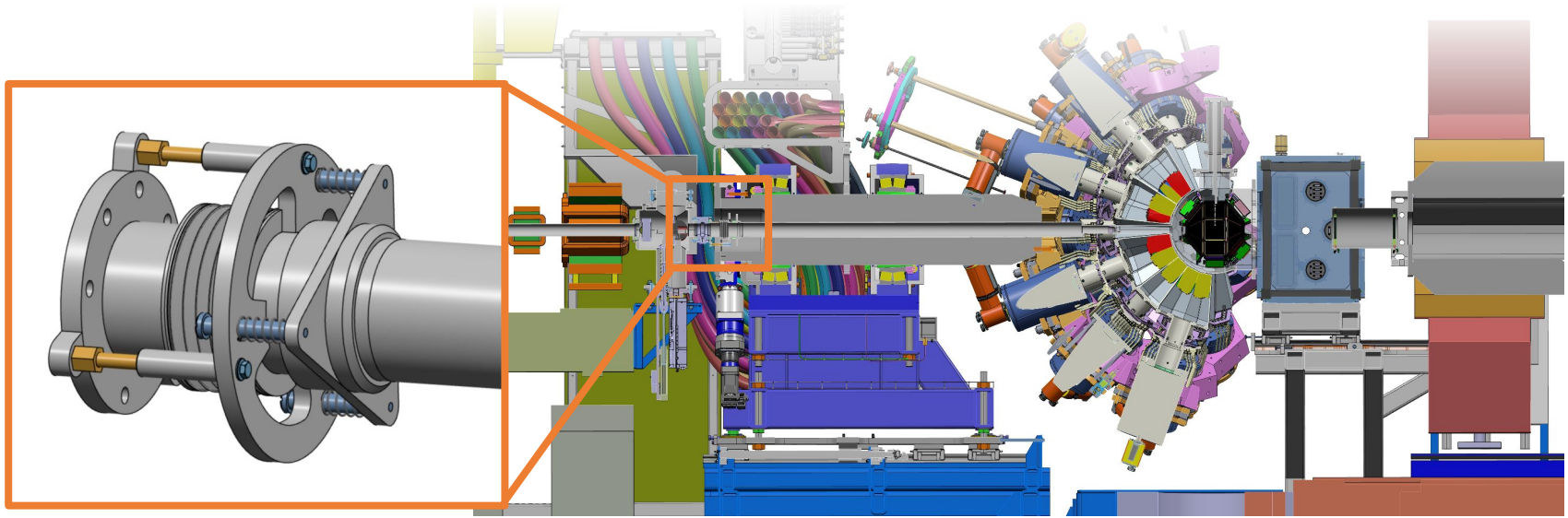

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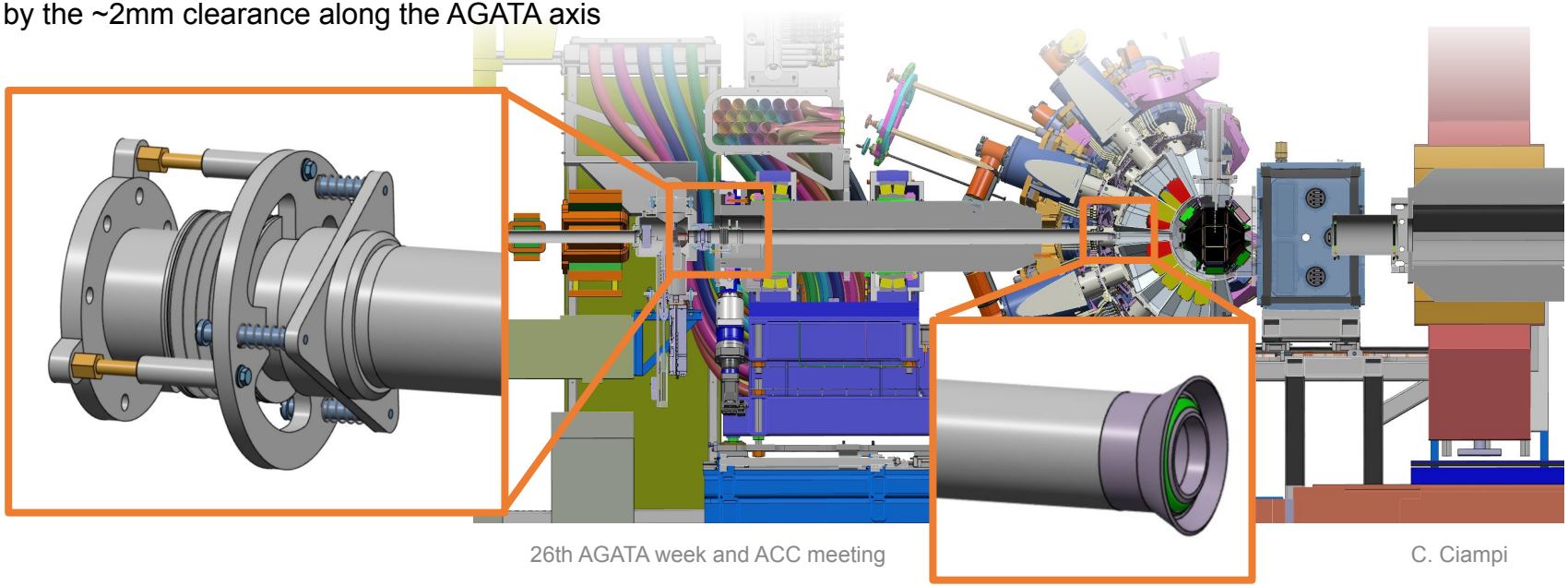
- Diagnostic box side: three brass lead screws push the pipe towards the scattering chamber
- Scattering chamber side: the O-ring is compressed ensuring vacuum sealing, guided by the ~2mm clearance along the AGATA axis



Mechanics: Vacuum chamber and targets

Vacuum chamber(s) design by GRIT collaboration:

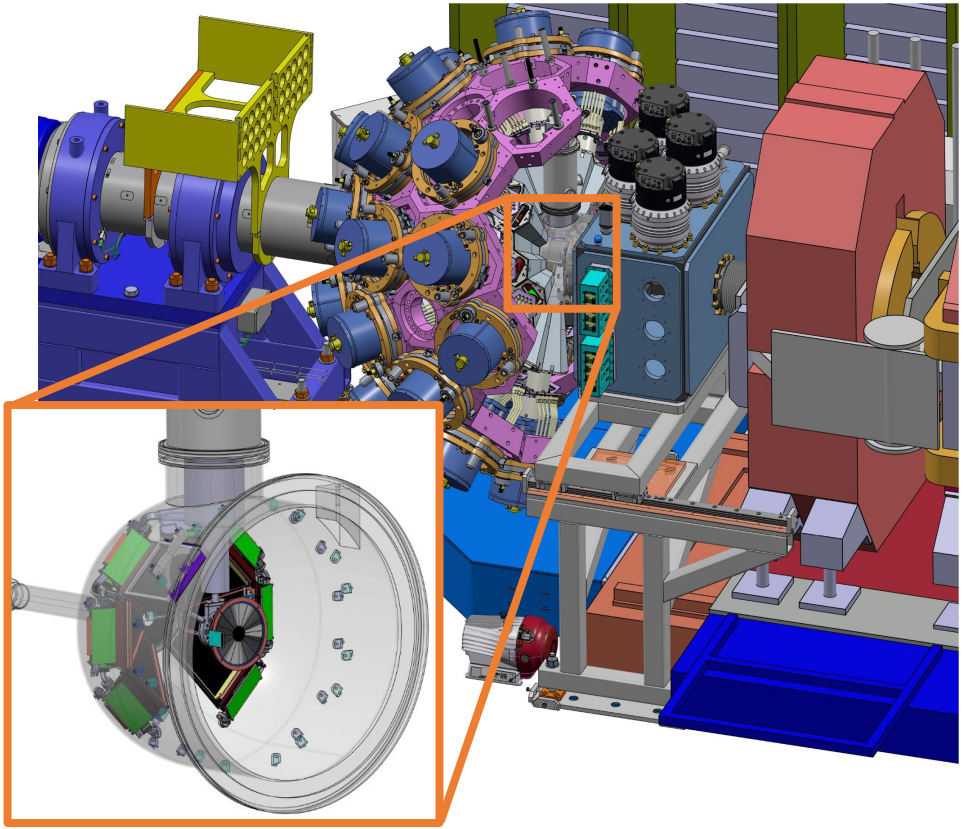
- Main reaction chamber with GRIT
  (to be delivered to GANIL with GRIT pre-installed)
  - BWD: 1 annular + 6 trapezoidal det.
  - 90deg: 1 square det. (normalization)
  - FWD: 1 annular det.
- Second chamber with all utilities

Target integration:

- Access from top of main chamber
  ⇨ 2 ATC moved to the side
- Integration of cryogenic ^{3}He target ATRACT

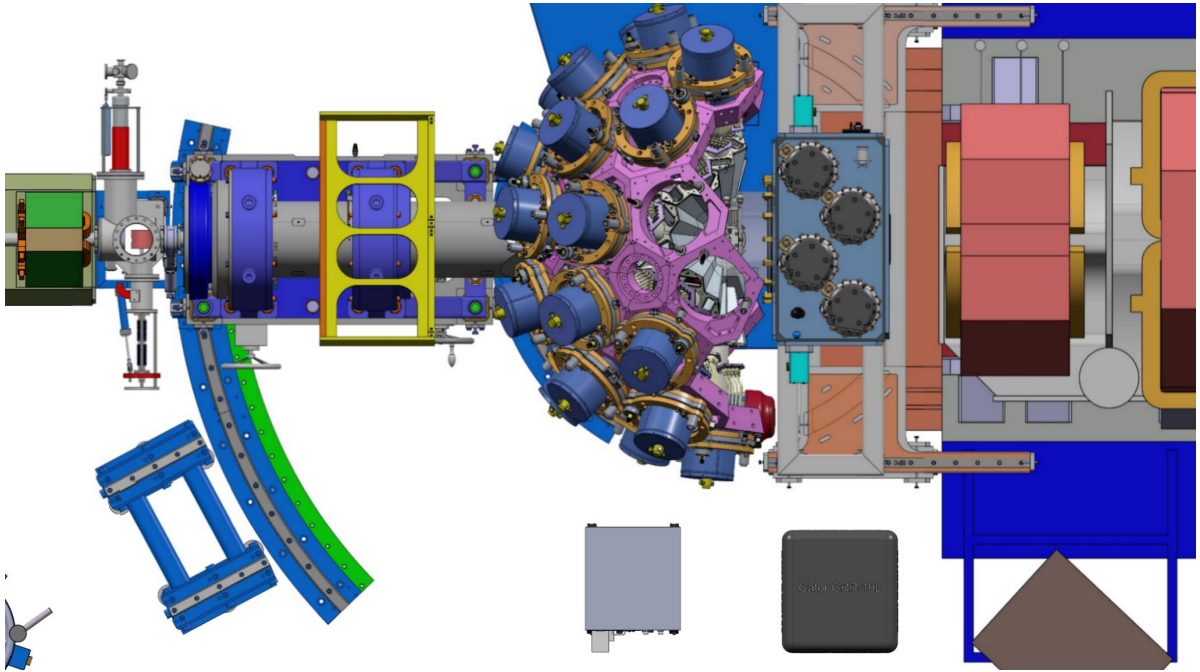
Target handling:

- Exploit G1 crane + step ladder placed on GRIT chamber support structure
- Centered via DN100 flange
- Angular alignment via ~1mm groove
- Motorized vertical alignment



Mechanics: accessing the target area

Accessing the target area:

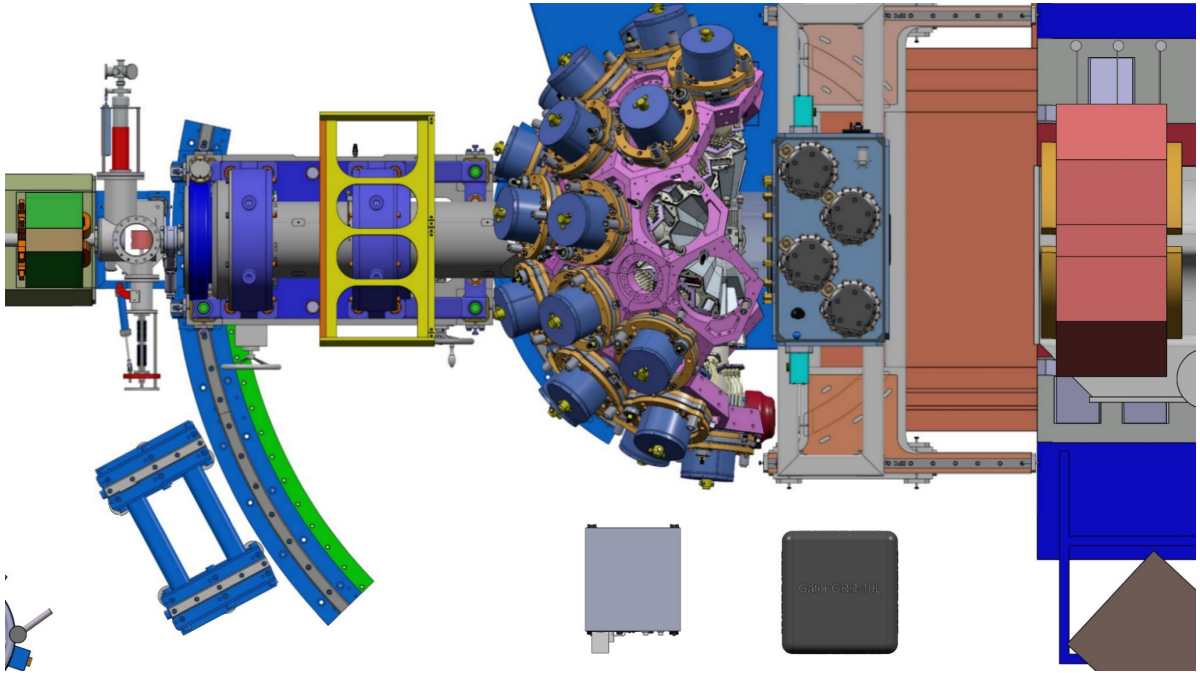


Adapted from M. Assié

Mechanics: accessing the target area

Accessing the target area:

- Retract VAMOS by ~1100mm



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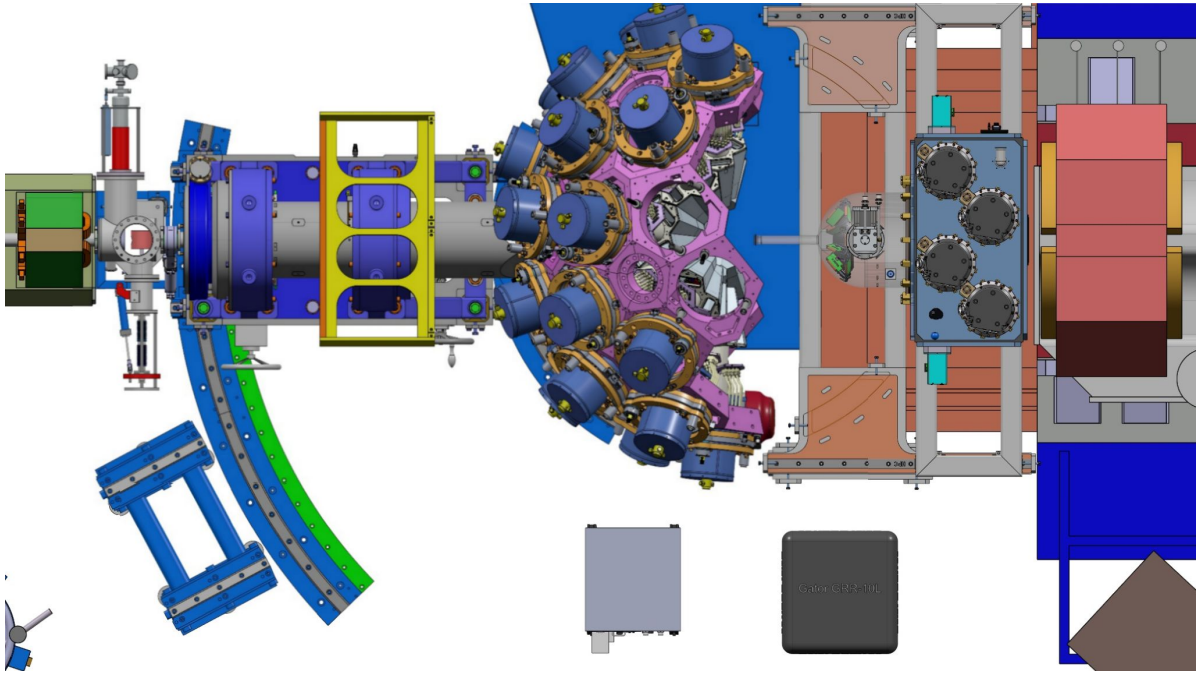
Mechanics: accessing the target area

Accessing the target area:

- Retract VAMOS by ~1100mm
- Retract GRIT chamber by ~650mm
  ⇨ target holder is accessible



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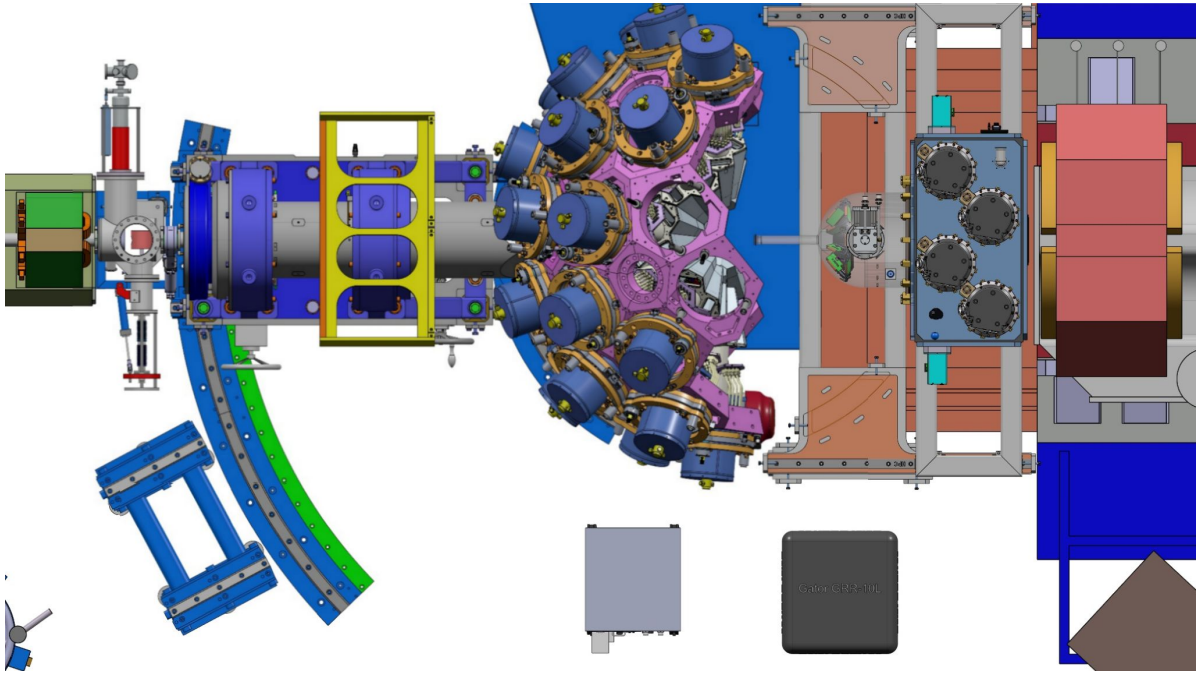
Turning AGATA:



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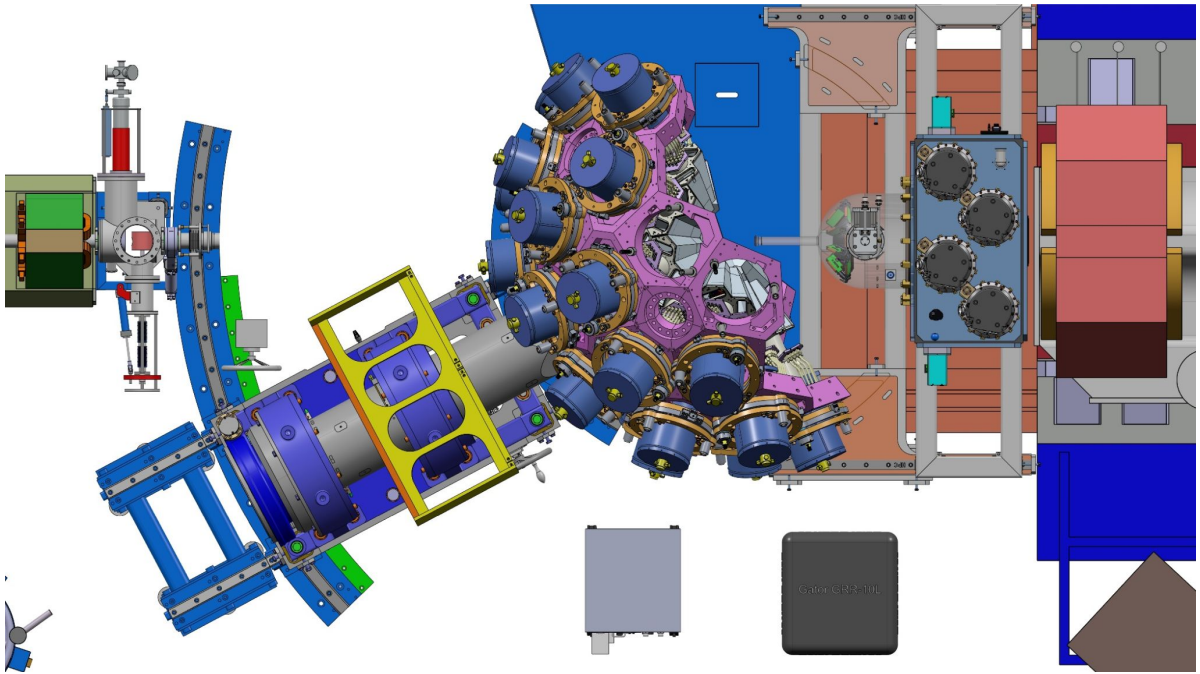
Turning AGATA:

- Disconnect beam pipe
- Turn AGATA at 28°



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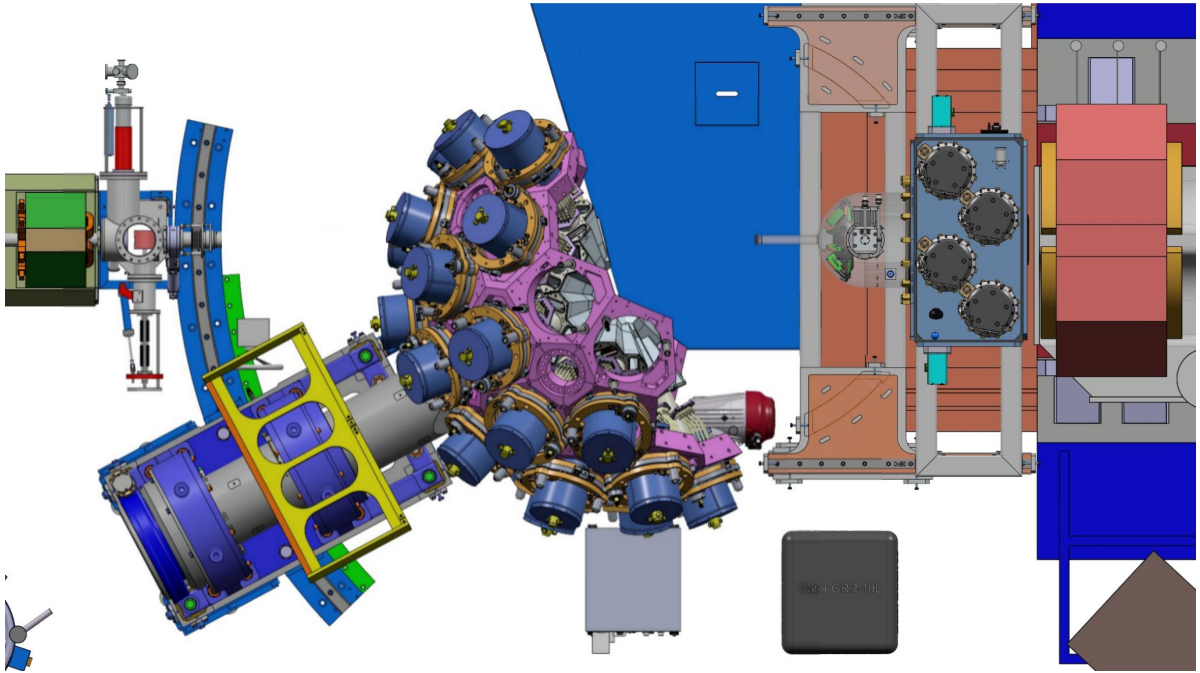
Turning AGATA:

- Disconnect beam pipe
- Turn AGATA at 28°
- Retract AGATA shaft (~550mm clearance)



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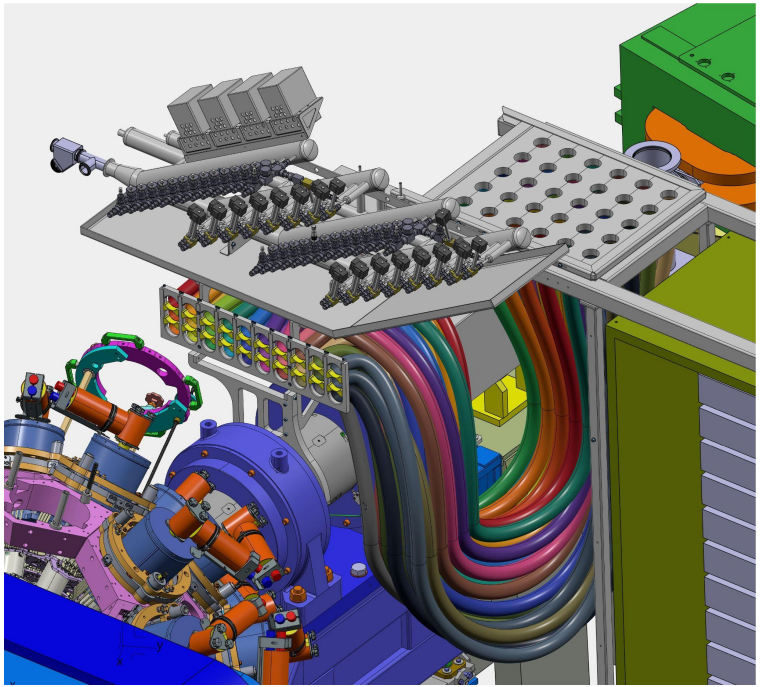
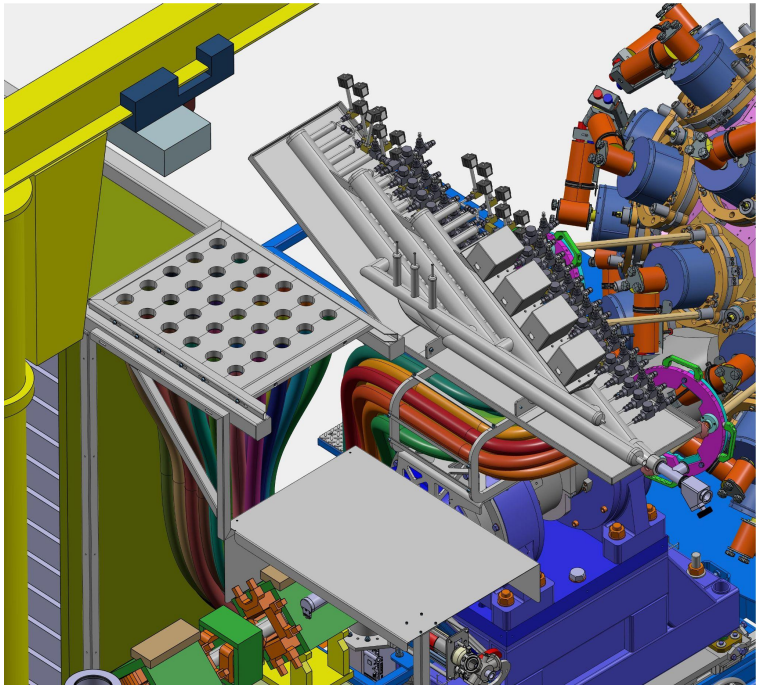
Mechanics: LN_2 manifold and cable management

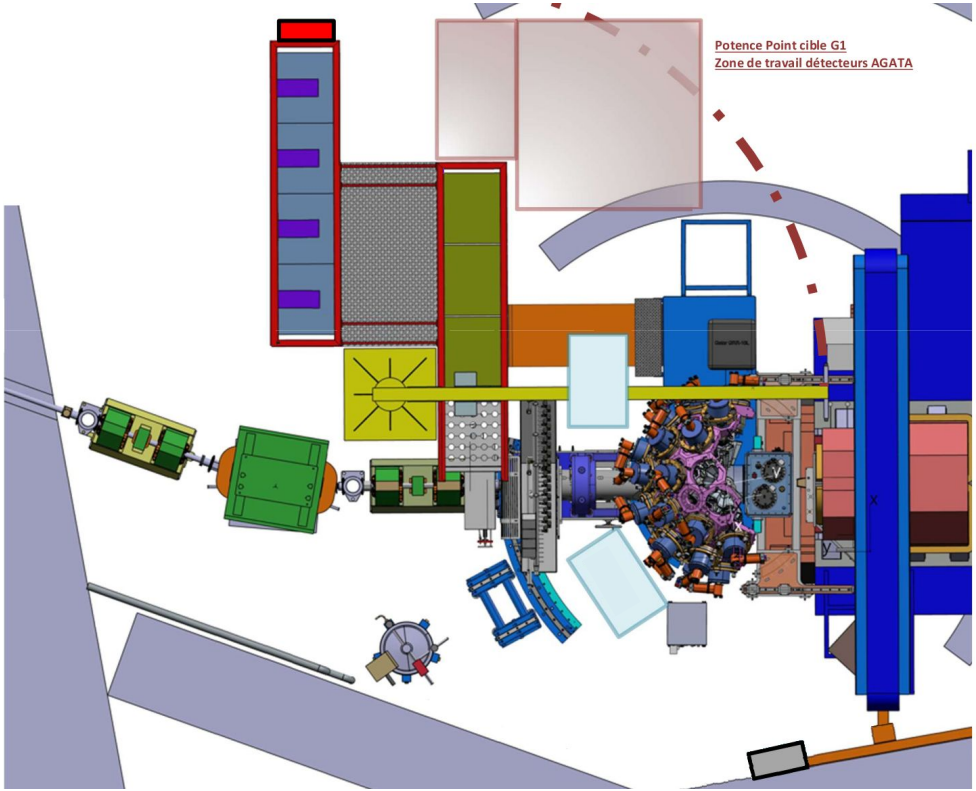
The LN_2 manifold is placed on top of the cable management structure, at variance with the present LNL configuration.

Mechanical evaluation is ongoing, design validation by 1st semester 2026, manufacturing by end 2027.





Infrastructure: Electronics platform placement



Redesigned racks platform placement in G1

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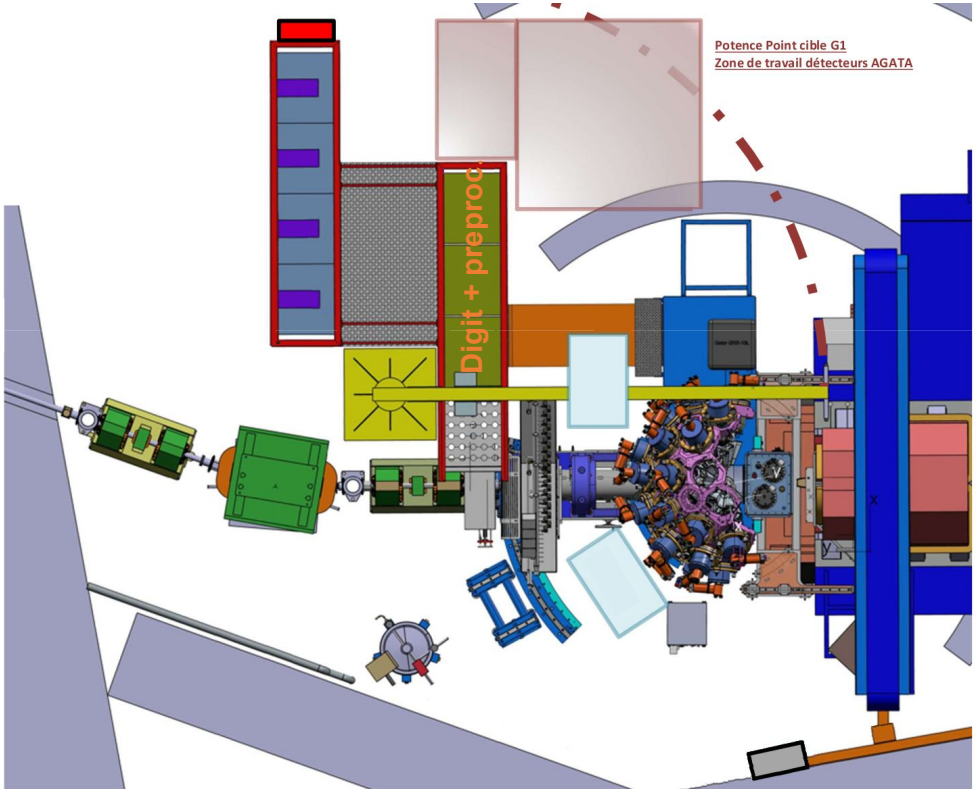

Redesigned racks platform placement in G1

Front-end electronics:

- 3 racks for digitizers (from 1st campaign)
- ✅ position OK for 10m-long MDR cables, with optimized ATC - digitizer mapping.

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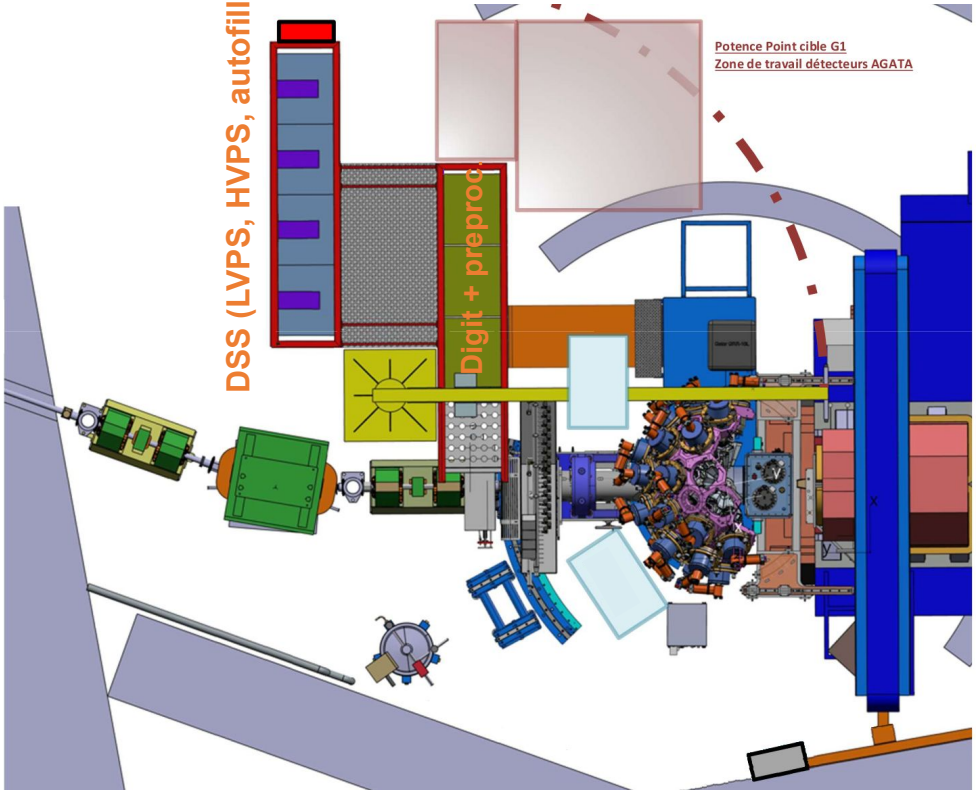

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- 2 racks for LVPS modules
- 1 rack for LN2 Autofill system
- 1 rack for (new) HVPS modules

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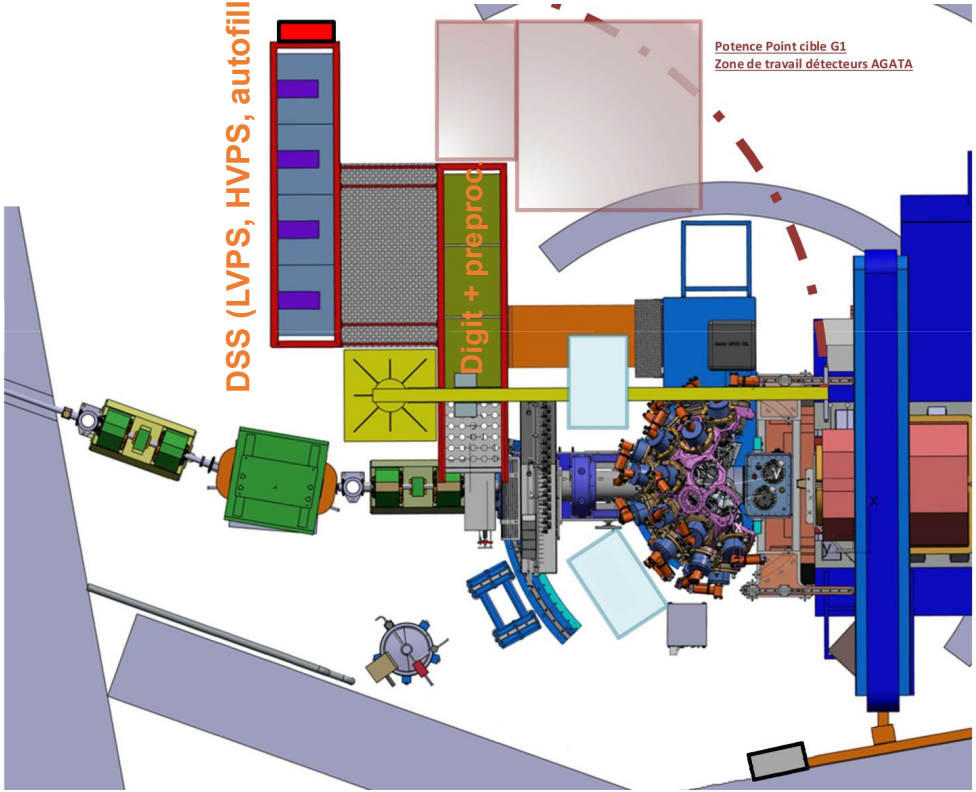

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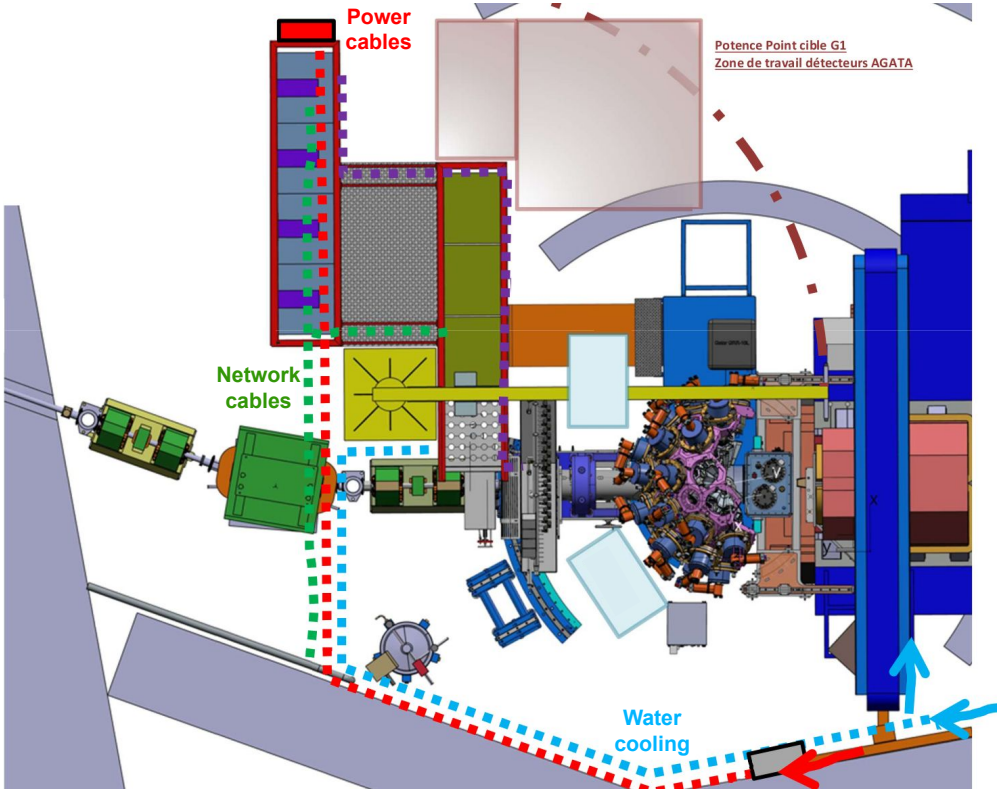
⇨ Racks on fixed platform (~30 cm above ground), allowing cable routing underneath

⇨ Overall increase of available working area

⇨ EMC: reuse of copper link between electronics platform and VAMOS, copper surface under AGATA rails

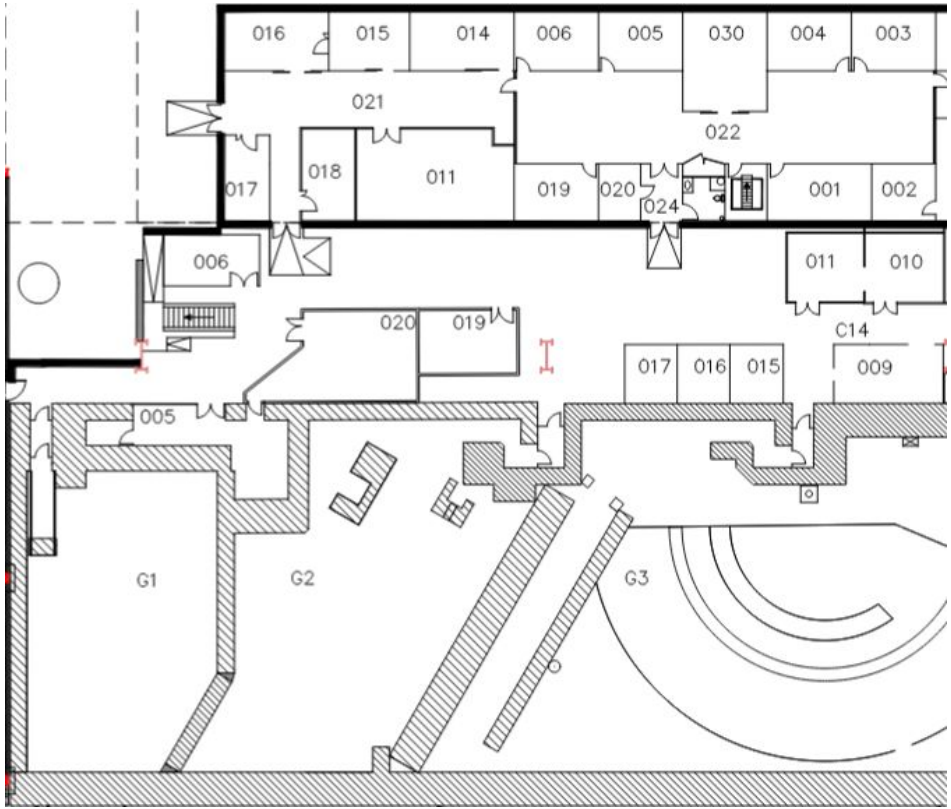
Infrastructure: Cable routing



- Water cooling for digitizers:
  2×3 branch lines (in/out), 3 flow valves for the 3 racks. To be mounted on the floor.
- Network cables: to be implemented overhead (~2.3 m above racks).
- Power cables: overhead cable routing.
  Electrical protection & distribution cabinet:
  Includes UPS backup for Autofill system.
- LVPS cables: routed under racks

Infrastructure: Water cooling

Water cooling system reused from 1st campaign
(operating conditions ~ 10 - 20 °C, ~ 4.5 bar)



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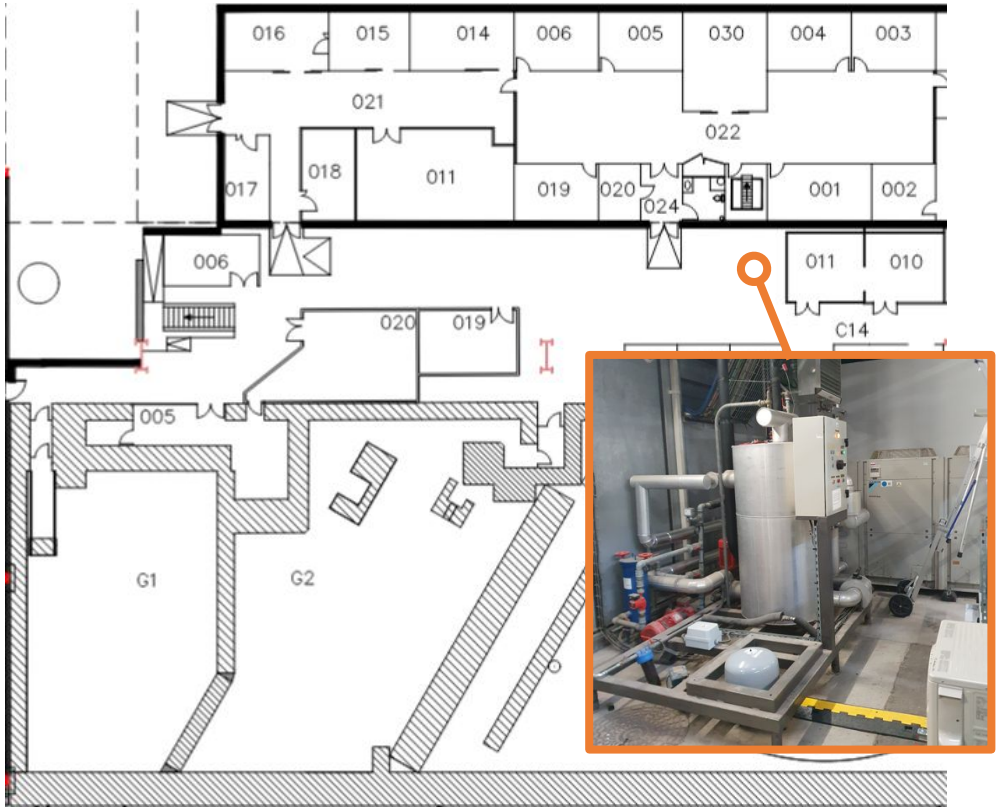
- Chiller currently used by VAMOS
  (BAE nord, **C14** aisle)
  System update and validation required for new campaign.



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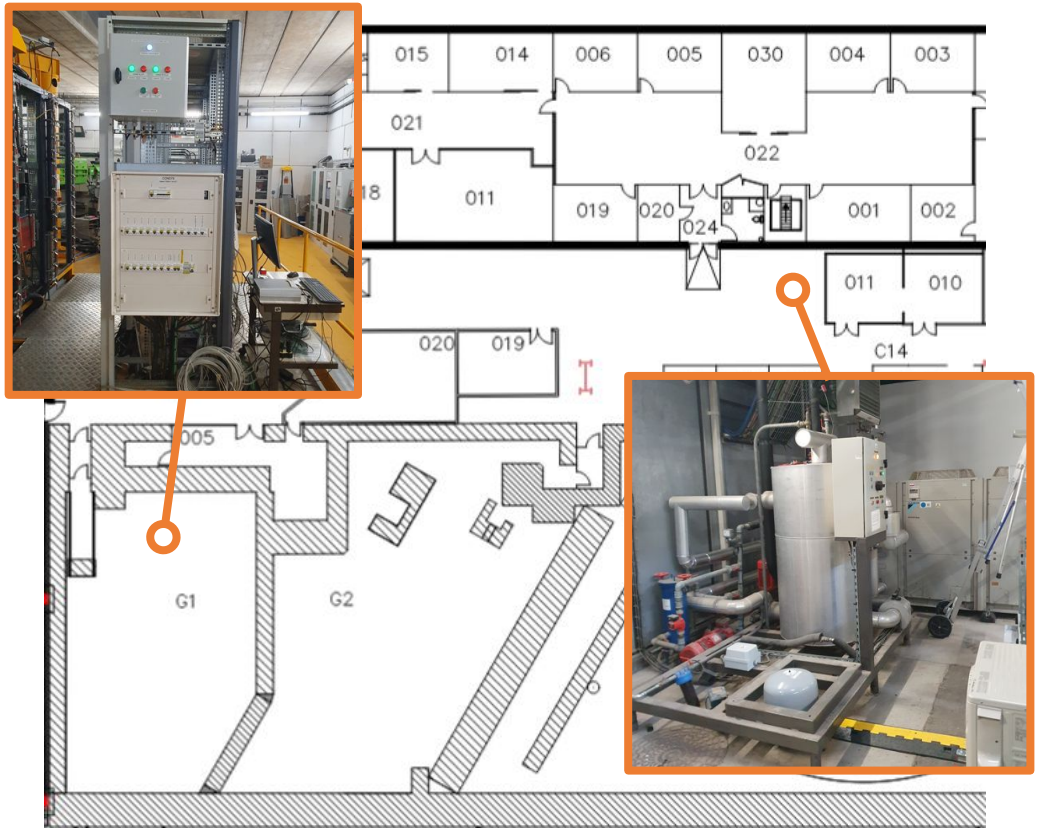
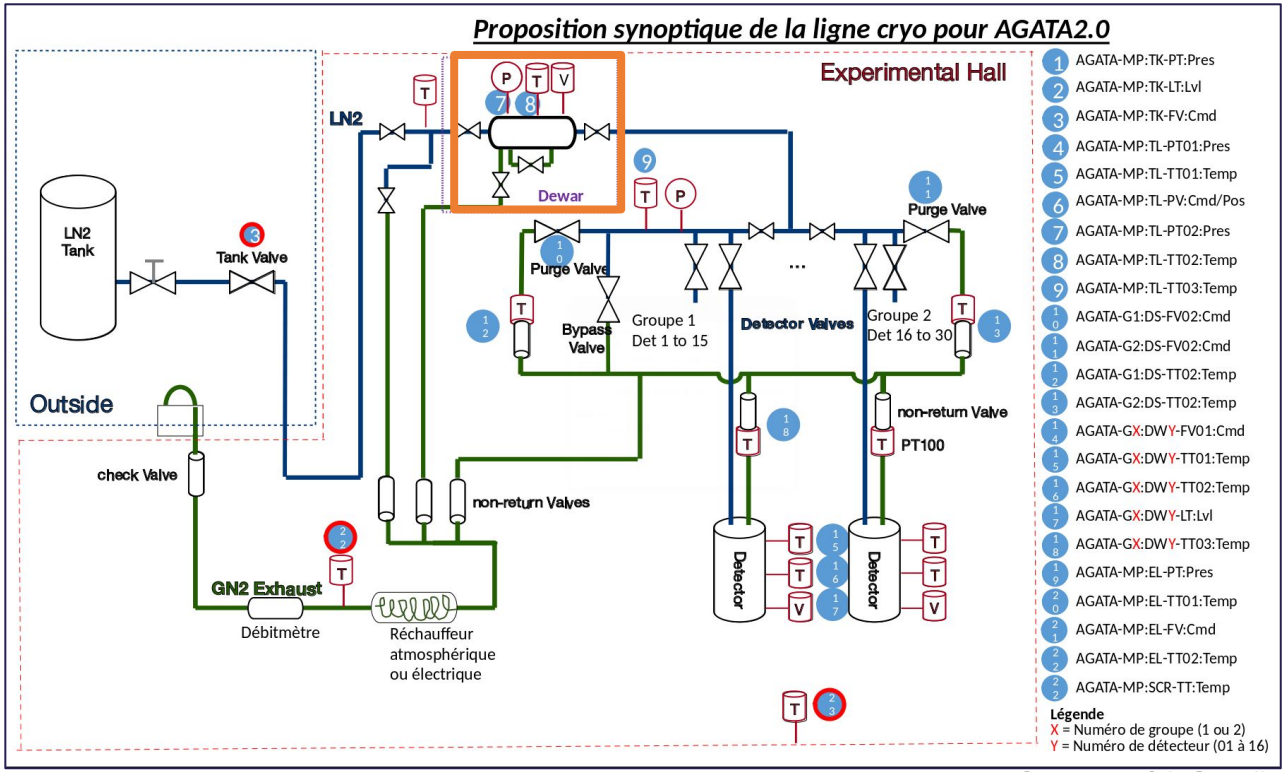
- TraceTek water leak monitoring system:
  automatic valve shut-off + manual reset.



Infrastructure: LN_2 autofill

Proposed cryogenic configuration:

- **Single 200l Dewar** retained as phase separator
- Dewar control to be implemented in the *automate*



Courtesy of J. Goupil

Infrastructure: LN_2 autofill

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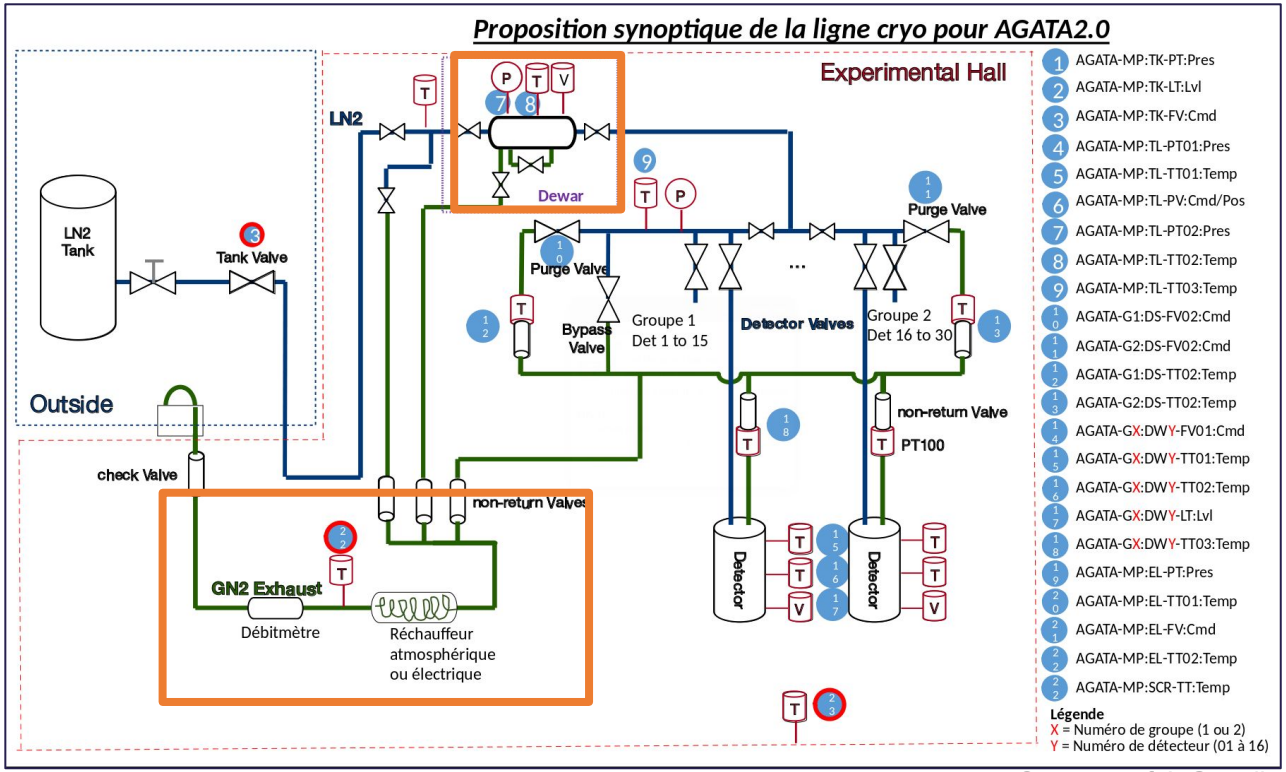
- New system for gas evacuation designed and provided by GANIL (gas heating + exhaust line)



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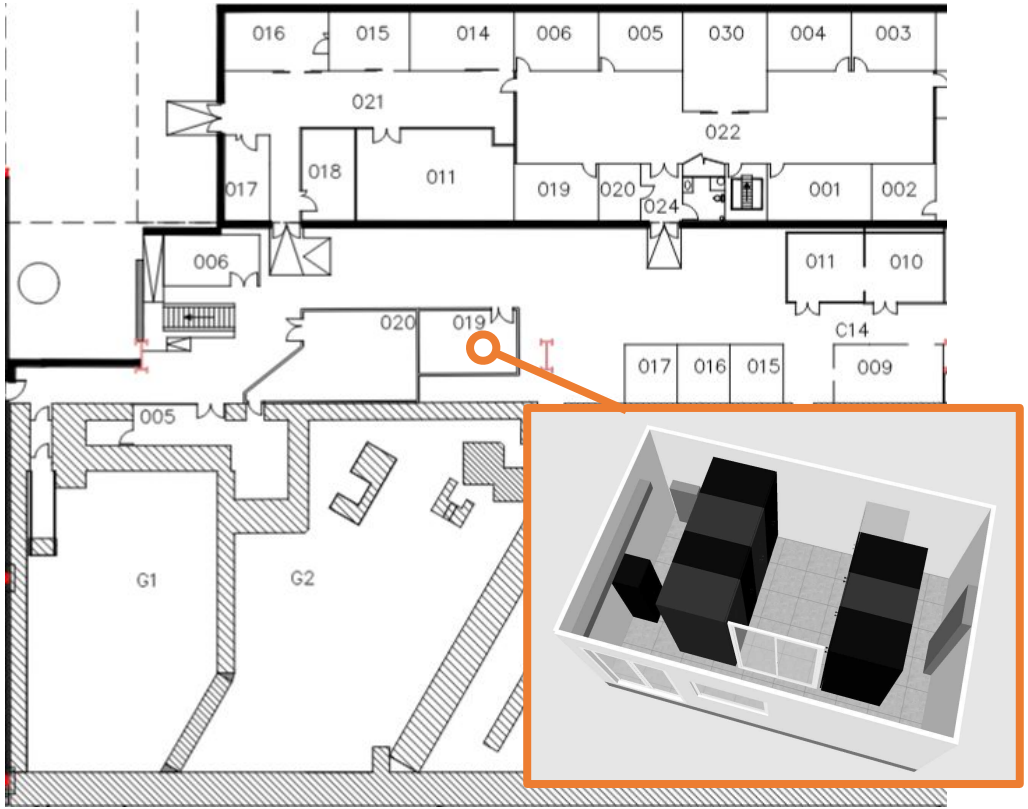
Infrastructure: DAQ room

HTC farm (15kW) + storage (~5kW) ⇨ room **019**



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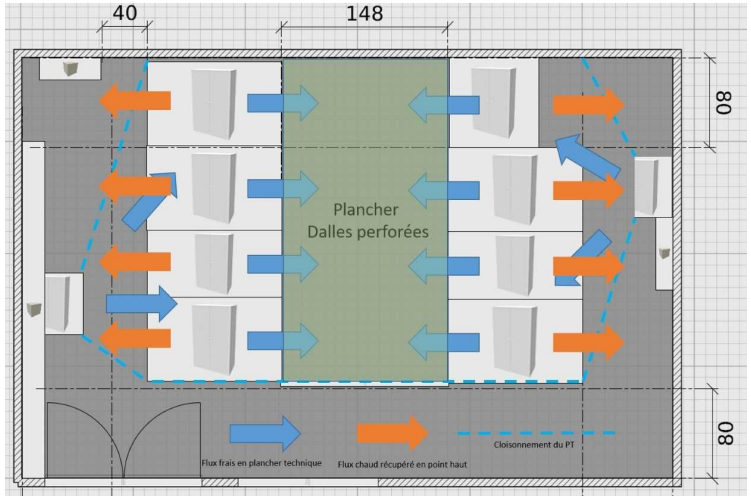
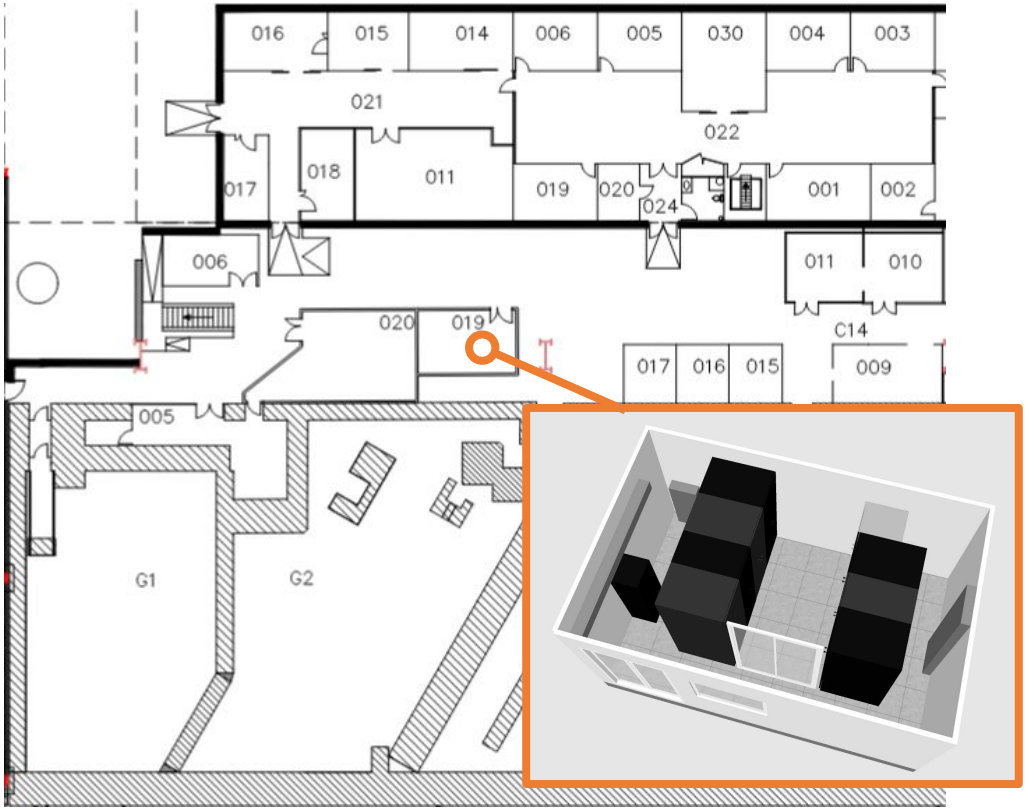
- Cold aisle layout between two rack rows
- Configurations under discussion:
  - 2x 15kW AC units vs





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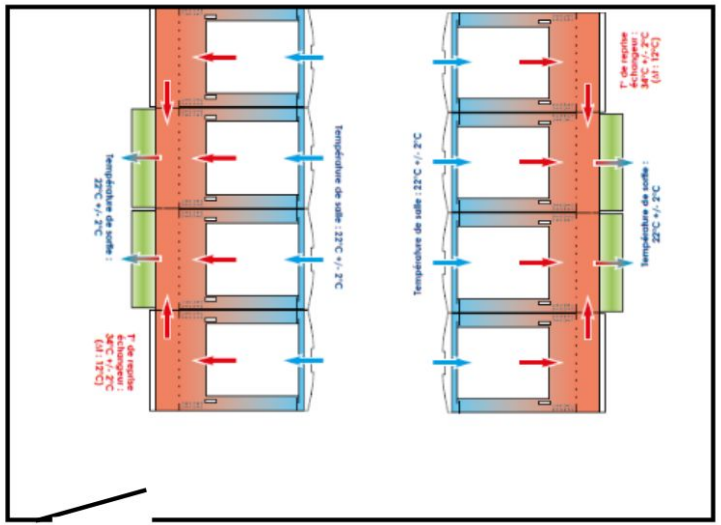
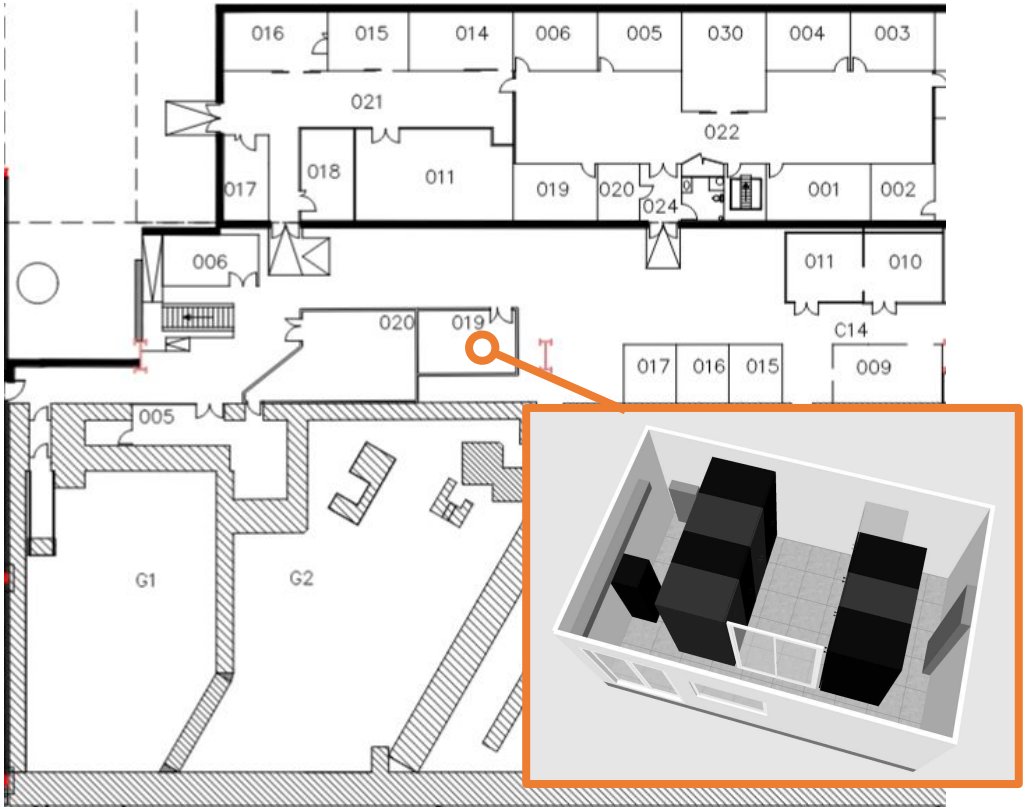
  - *Active Cold Doors* installed on racks

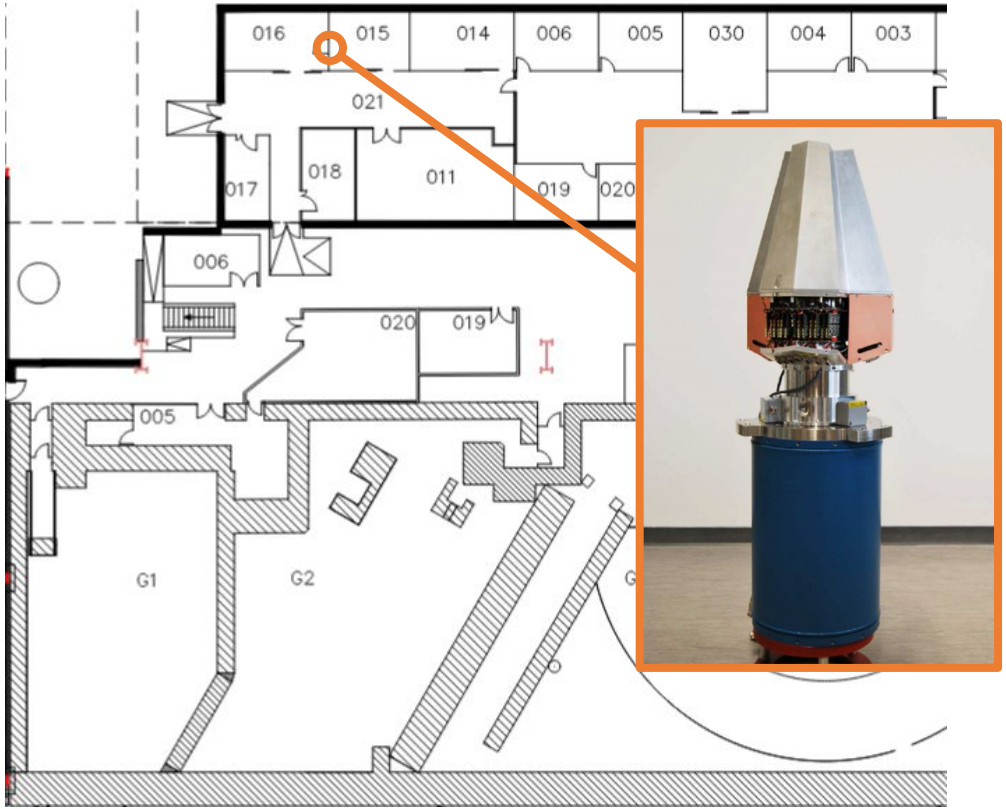




Infrastructure: ATC preparation/repository area

Detector preparation room:

- Rooms 015-016:
  LN_2 infrastructure already available.
  Update of the utilities to be done.



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Repository area:

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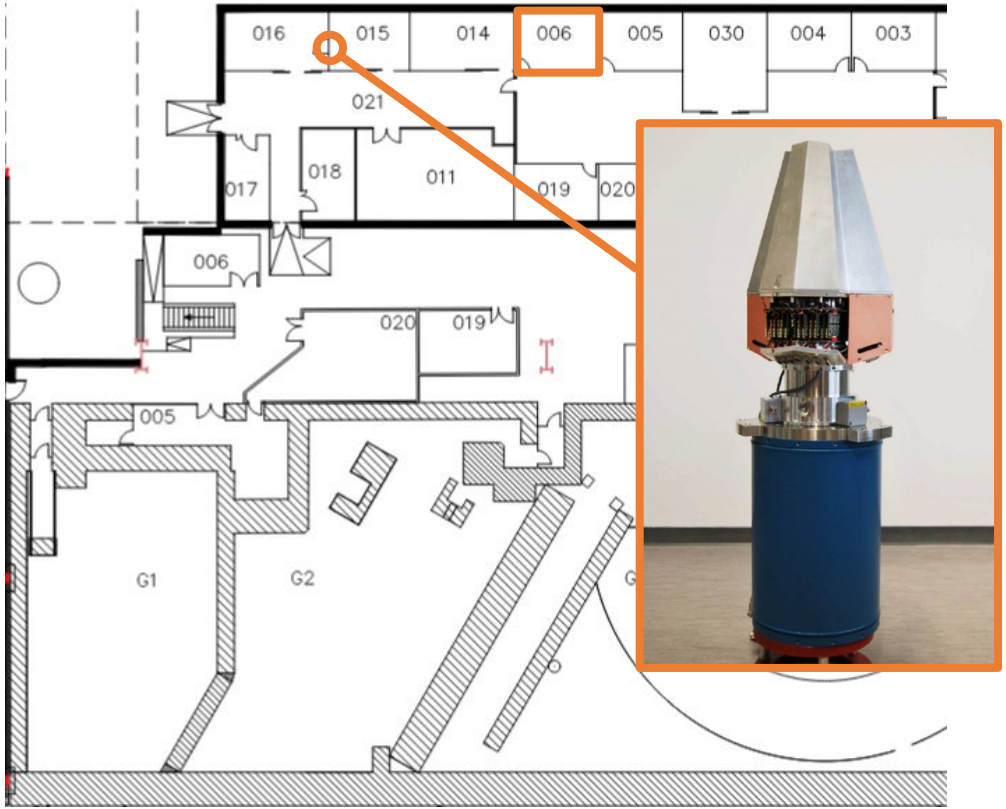

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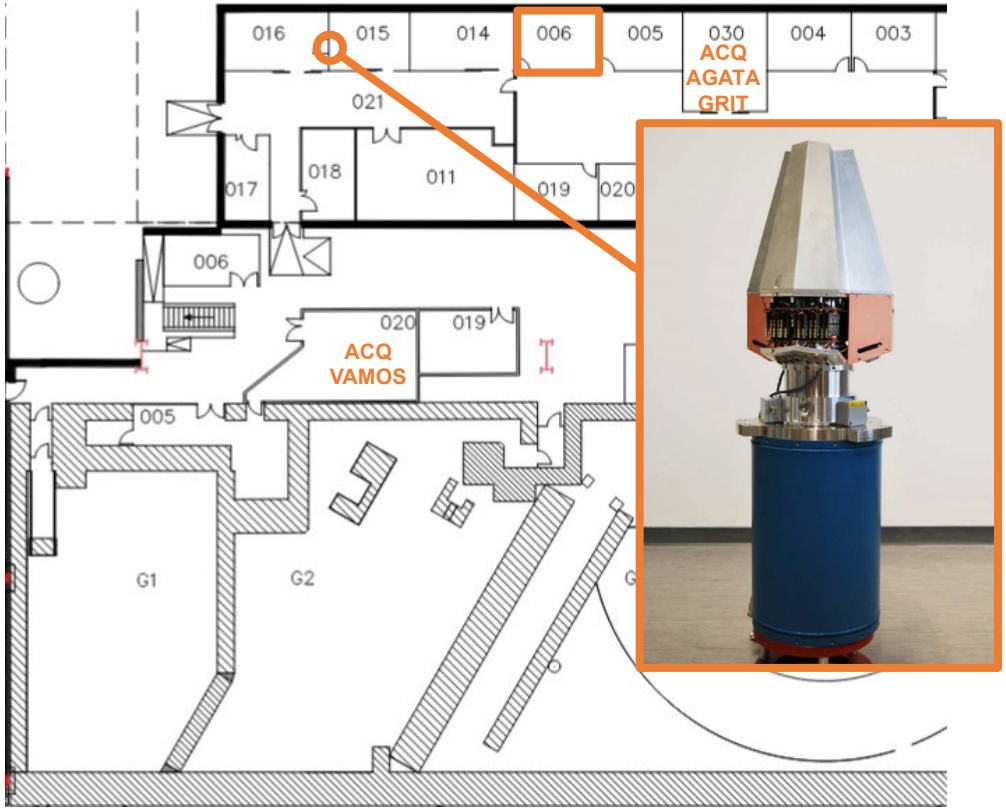
Acquisition rooms:

- Room 020 for VAMOS
- Room 030 for AGATA/GRIT
  (the area will be fully refurbished in 2027)



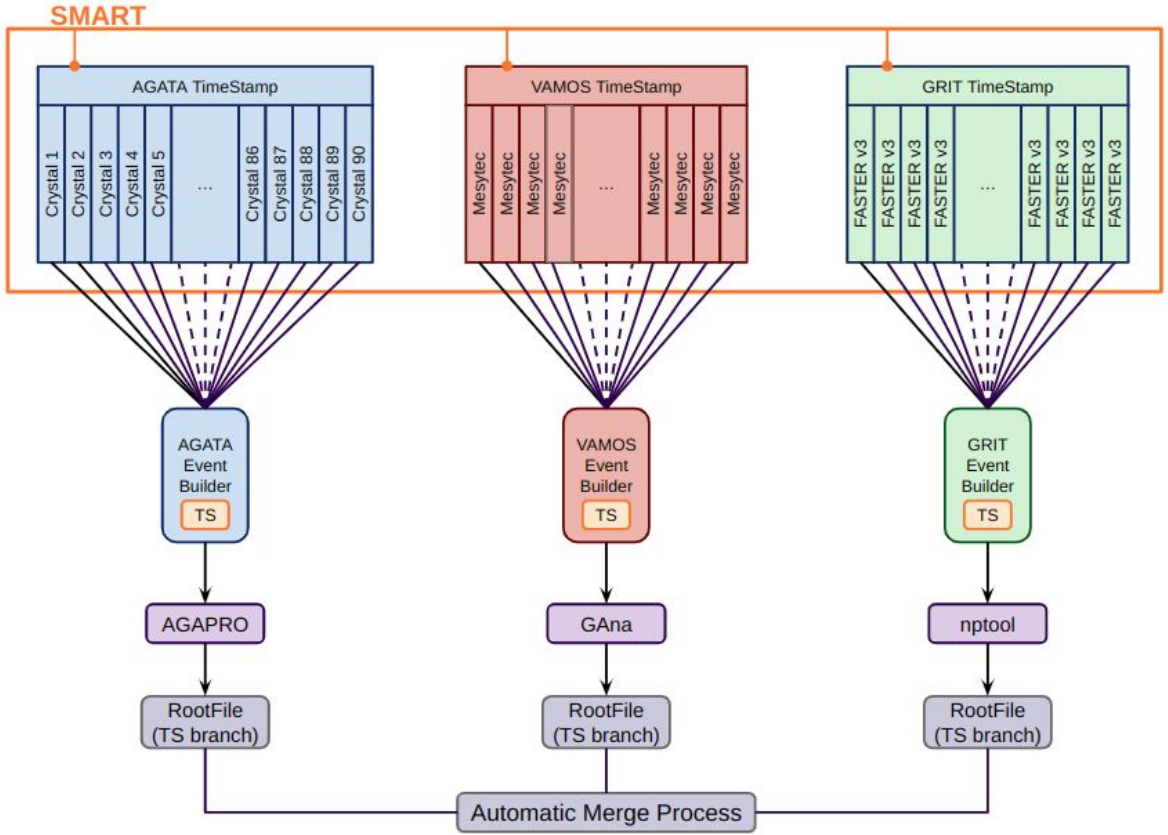
VAMOS-GRIT-AGATA: Data Flow and Analysis

Global Run Control: provided by GANIL, based on ssh scripts to the subsystems.

Synchronization via SMART.

Data flow: each sub-system uses its dedicated software suites for detector control, calibration, simulation, and physics analysis. Global event merge done at the reconstructed data level.

Common Data Management Plan: defined by the DM responsibles of the three collaborations
(A. Lemasson, A. Matta, J. Dudouet)
focus on the reproducibility of the analysis, ensured by unified metadata, well-documented open source software, clear workflow.



The campaign: Host Laboratory Agreement

Draft of the Host Laboratory Agreement for the VAMOS-GRIT-AGATA campaign at GANIL.

- Definition of the budget sharing among collaborations, including the allocation of the GANIL Hosting Lab installation funds for both AGATA and GRIT, as well as of the respective operational costs
- Beam time: - 2 weeks for in-beam commissioning
  - 50% CYCLO beam time (~ 100 UT/y), subject to PAC approval and non-commercial users rules
- Common VAMOS-GRIT-AGATA Data Management Plan drafted

⇨ Draft of the Host Agreement currently discussed within the ASC and within the GANIL management.

Roadmap to the 2029 campaign (again)

An overall timeline until the start of the campaign:

- Mechanical designs are complete and are being validated. Manufacturing by the end of 2027.
- 1 Autofill + 2 LVPS racks (Saclay) delivered in May 2028, installed by June 2028.
- Last G1 experiments in spring 2028, followed by installation starting in June-July 2028.
- Commissioning of the setup is planned for late 2028 / early 2029
- The campaign is expected to start in 2029

VGA implementation	**2026**				**2027**				**2028**				**2029**				…
	1 trim.	2 trim.	3 trim.	4 trim.	1 trim.	2 trim.	3 trim.	4 trim.	1 trim.	2 trim.	3 trim.	4 trim.	1 trim.	2 trim.	3 trim.	4 trim.	
Design + manufacture																	
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Pre-PAC meeting to be organized in 2027 for a more detailed evaluation of the campaign.
Local teams are available for further information and discussions on possible technical adjustments to fulfill the experimental requirements.

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GANIL

Merci pour votre attention

Backup slides

Zoom on the final preparation timeline

A proposed timeline from the Host Laboratory Agreement:

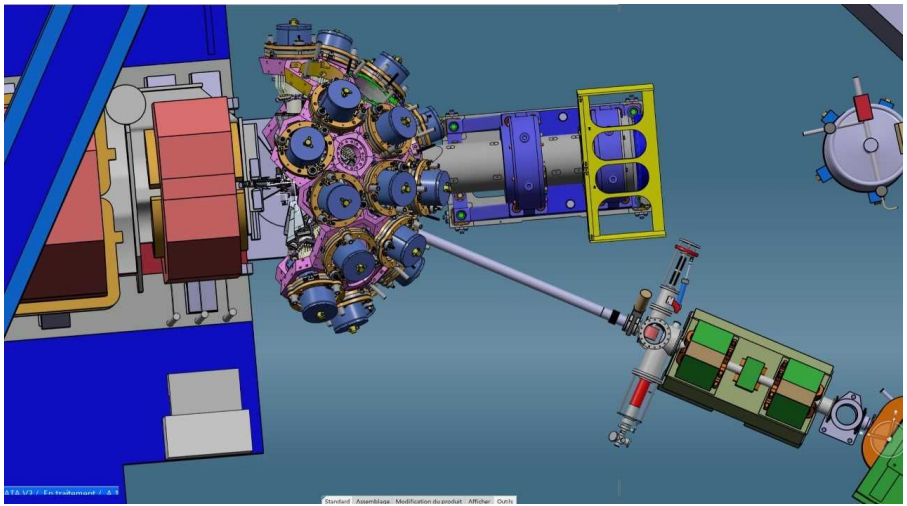
- Transfer of AGATA items from LNL by end of June 2028
- Transfer of the GRIT items by end of June 2028
- Mechanical installation completed by end of July 2028
- Electronic installation and test completed by end of September 2028
- Cooling of the detectors in November 2028
- Source tests completed by November 2028
- In-beam commissioning in December 2028 if possible with respect to the GANIL director plans.

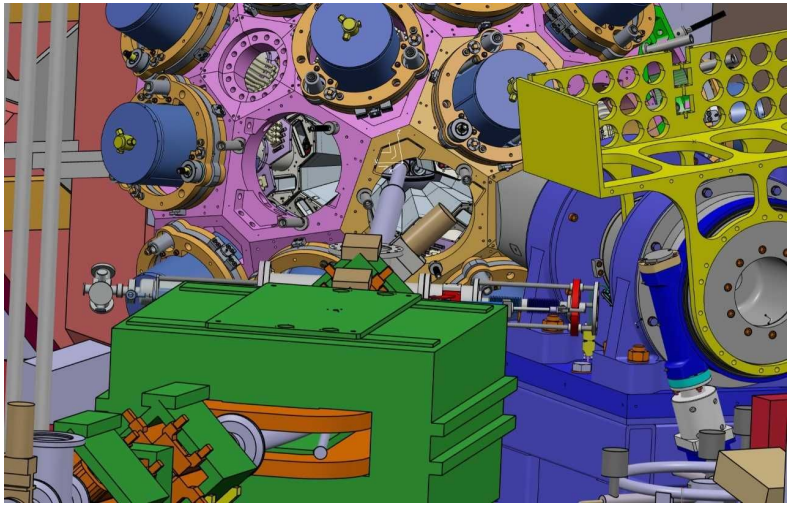
VGA implementation	**2028**									**2029**					
	…	M	J	J	A	S	O	N	D	J	F	M	A	…	
Transfer of AGATA + Installation				*m*		*e*									
Detector cooling and source tests															
In-beam commissioning															
Exploitation															

Mechanics: 28° configuration

Test of the configuration with VAMOS-AGATA at 28°

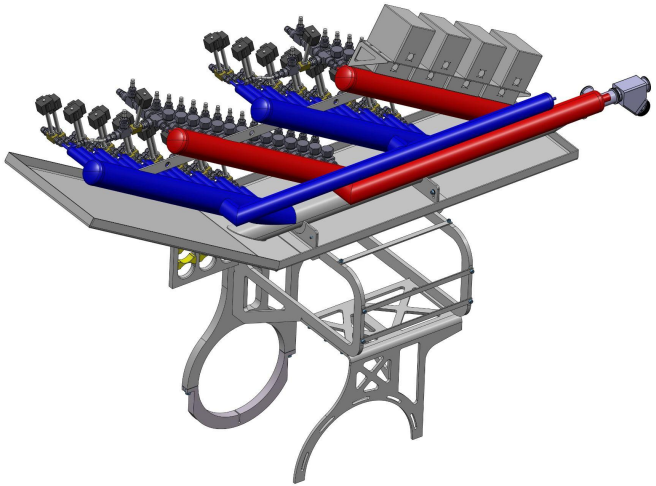
Beam pipe through the first flange on the left of AGATA support, no problem on the mechanics.

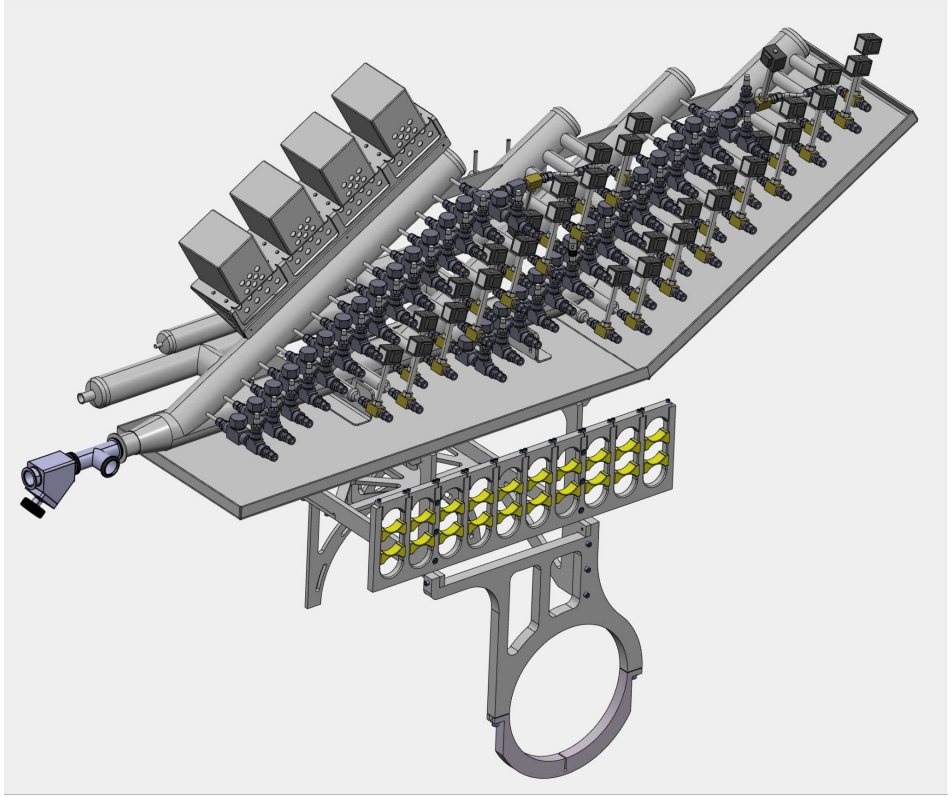




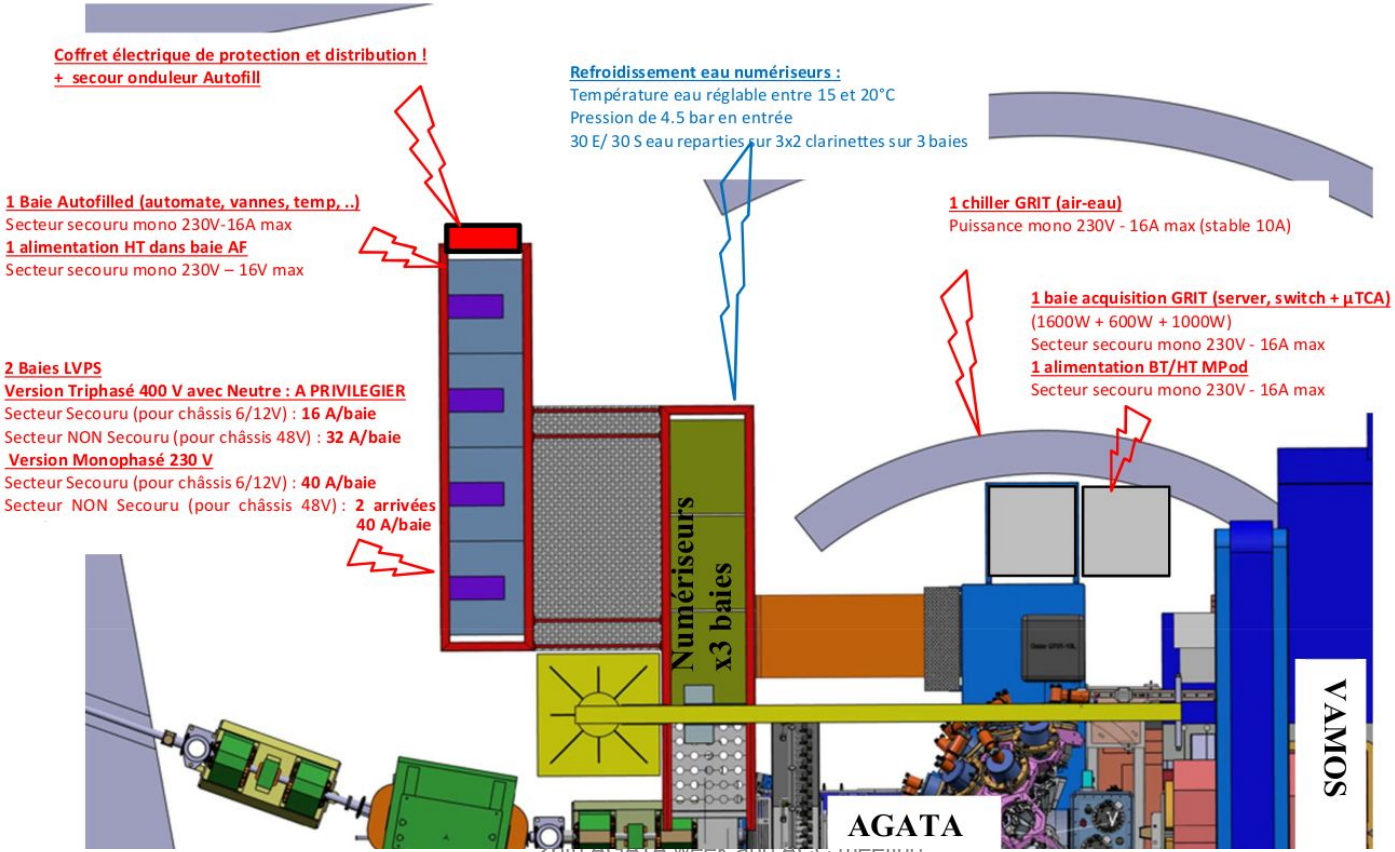
Mechanics: LN_2 manifold and cable management

Detail of the new mechanical design for the LN2 distribution system, rigidly connected with the cable management system, all positioned behind AGATA, on top of its supporting shaft.





Electronic and hydraulic requirements I



Electronic and hydraulic requirements II