The Infrastructure Team

Roberto Menegazzo
INFN – Sezione di Padova

Highlights

- The experimental campaign closed end of July and the detectors were kept cold during the summer pause
- No major infrastructure related issues
- The 6.5 V module will be removed in the LVPS
- Instability of LN_2 level measurement in several detectors: patch box refurbishment is needed
- **Infrastructure sufficient for AGATA 1π (45 capsules)**

- **Preliminary work toward AGATA 4π**

Toward AGATA 4π

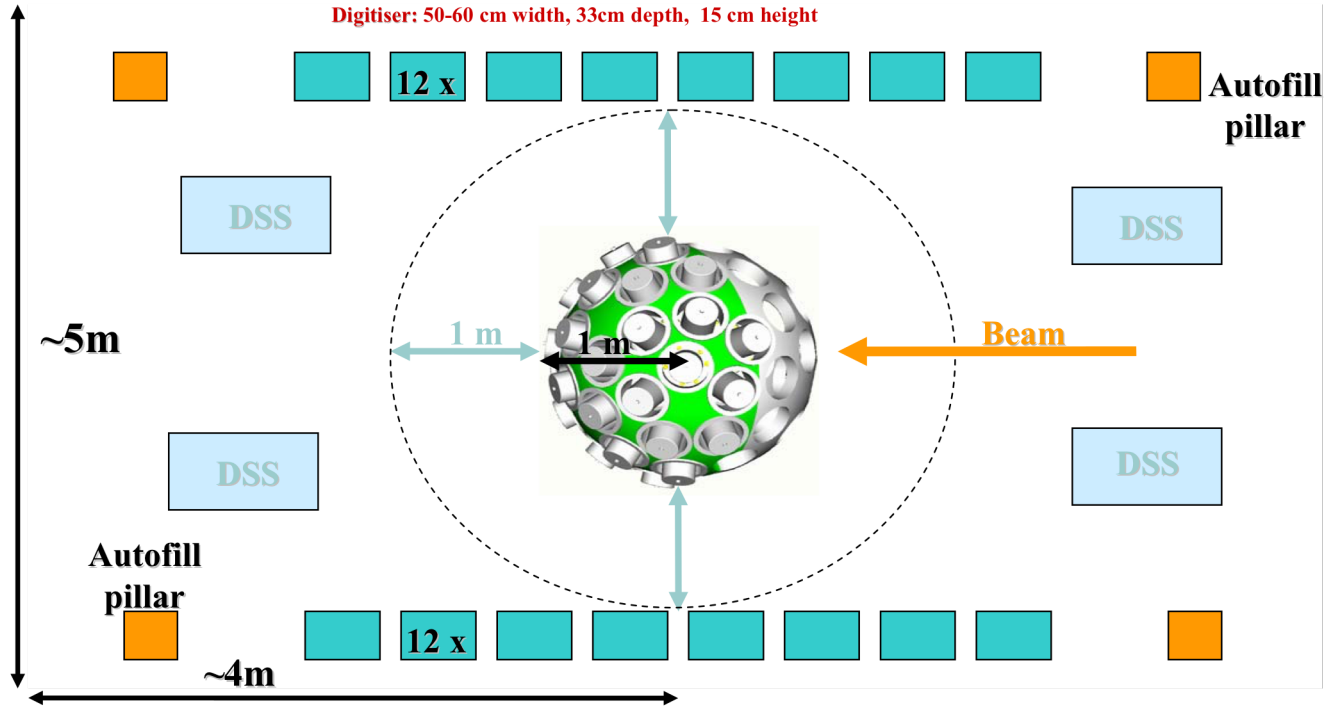
- Document with array specifications and requirements for the host laboratory based on LNL, GSI and GANIL experience (present MoU with 20 ATC): *Basic infrastructure for the AGATA array. Checked by the AMB*
- Updated list of Infrastructure components: WIP
- New Project Definition Document (in progress) for the full array. Can be used to ask for funds already in 2019
- No real work is foreseen before 2019, but paper work (global design study and cost estimation) must be done in 2018 to adjust the project to the number of detectors specified in next MoU and to new mechanics and electronics specifications

Toward AGATA 4π

- Characteristics and specific requirements of candidate AGATA sites after the GANIL campaign: GANIL/SPIRAL, GSI/NUSTAR, HIE-ISOLDE, JYFL and LNL/SPES
  - We expect changed conditions and constraints also in ”old” sites. Future projects must comply with host laboratory standards and regulations (security, communication protocols, ...)
  - A representative of each laboratory has been contacted/appointed to investigate specific technical issues
  - AGATA Infrastructure and Future Host Laboratories VC 20171219: Jyväskylä, GSI, LNL, GANIL, ISOLDE
- Common mechanics and infrastructure solutions, independent from the host laboratory. Checked the compatibility with AGATA characteristics
  - Meeting at Saclay 20180404 with members of the Detector and Electronics Teams: requirements and characteristics of the new LVPS and Autofill systems
  - AGATA Infrastructure and Future Host Laboratories VC 20180712: proposed solutions for the new LVPS and Autofill systems
- New production of existing components (replica): LV Patch Box, cables, LN_2 parts, …
- Major changes for some subsystems (new development): LN_2 and LVPS but also HV and mechanics
- *Present infrastructure not ready to accomplish the present MoU specifications (2020 is very close)*

The argument is not new

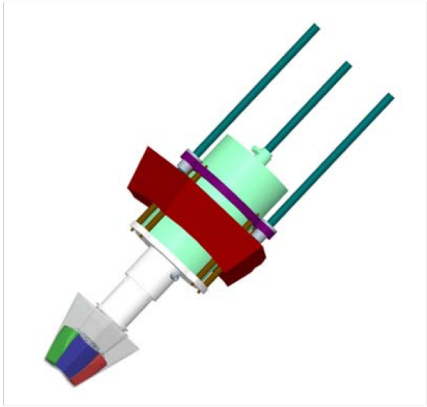
AGATA Array : Site Constraints
(60 TC's without ancillaries)



Only small refinements

AGATA Detector Systems

- Triple Cluster : 45Kg (crane)
- LN_2 cooled (~~3x daily~~) 4x daily
- LV supply (preamps)
- HV supply (~~bias integrated~~) external PS
- Monitoring (2 PT100, LN_2 level)



- LV supply = 111 preamps (70W / TC) ⟶ 4.2KW
- HV supply = 3x minimal
- LN2 supply = 20l/day ⟶ ~~1200l / day~~ ~ 1300 l/day

- Cabling : 3x7 signals + LV/HV supply & monitoring 250m ⟶ 15km
- LN_2 plumbing

- Special care

Autofill

Present

The LN_2 system is ready for 24 detectors:

- 3 Valve Control Crates + 3 Profibus Crates, PLC
- 1 external LN_2 tank + 3 buffer tanks, LN_2 manifolds, valves, PT100, …

2nd PT100 (close to the crystals) monitored with a Siemens PLC module, without interfering with the PBC/VCC hardware

Future

The draft for a new autofill system (1 PT100 reading and 16 detectors) has been prepared by Saclay and presented to the AMB in 2013. The project has recently been updated to include state of the art technical solutions in a configuration that meets the requests of the collaboration (easy to maintain, small footprint, …) **see Magda's contribution for more details**

Aim: define a solution for 30 detectors, that could be extended to 60 detectors and find a nearly common cryogenic installation for the different host labs in order to minimize the changes in the PLC

LVPS

Present

The LVPS system is ready for 15 detectors (+3 units in other laboratories):

- ± 6 and ± 12 V PS for detectors and 48 V for Digitizers
- profibus communication protocol
- V1 Digitizers: ~ 300W/capsule; V2 Digitizers: ~70W/capsule
- 48 V PS not regulated



Future

- Backward compatibility ?
- Strong space constraints
- Regulated and stabilized 48 V PS

Several configurations have been considered → **see Magda's contribution for more details**

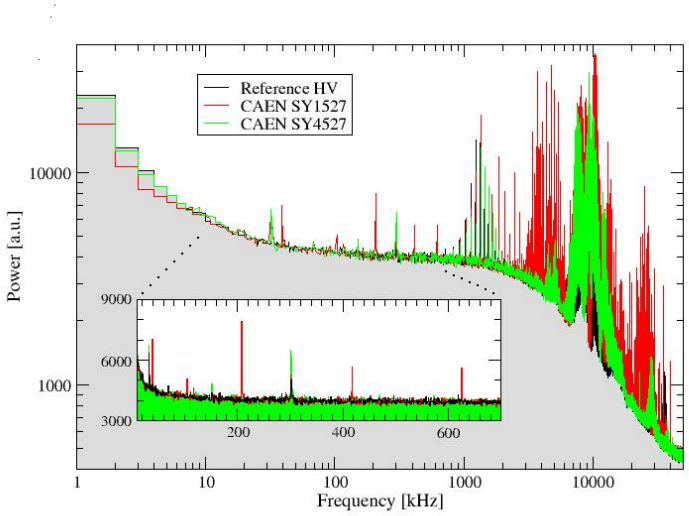
HV

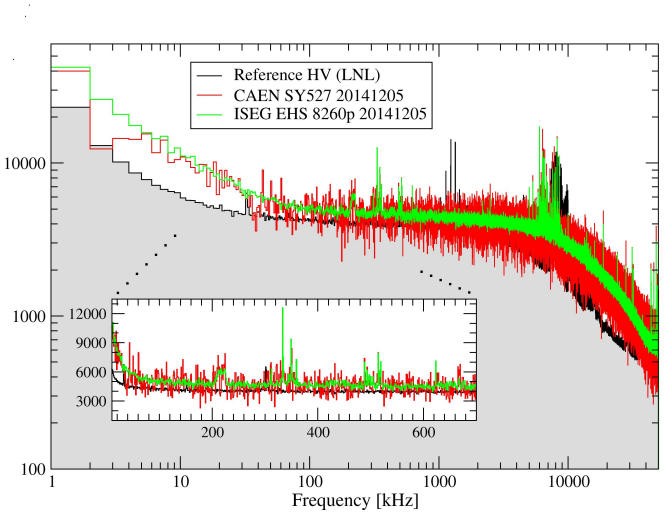
Present

We have 2 CAEN SY527 mainframes + 12 HV boards on loan from the Gammapool. In the current configuration, only 1 mainframe is required

Future

We have investigated the characteristics and performances of possible replacements. The systems considered (CAEN SY4527 mainframe + A1560H HV boards and ISEG crate + EHS 8260P HV boards) have similar performances and are both excellent solutions for HPGe detectors



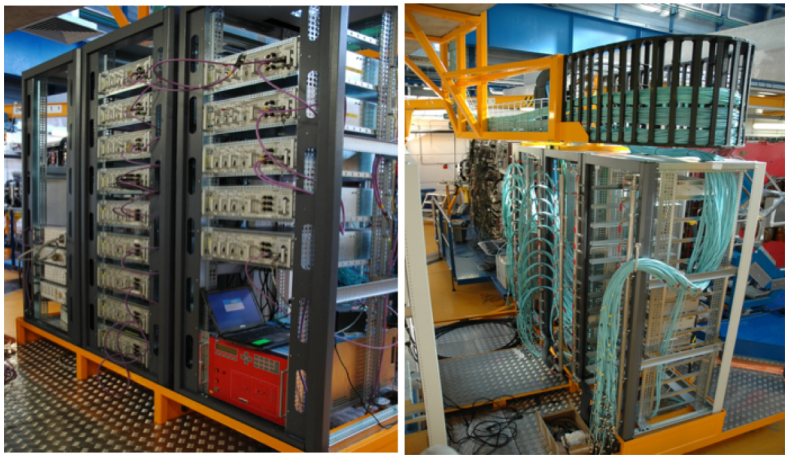


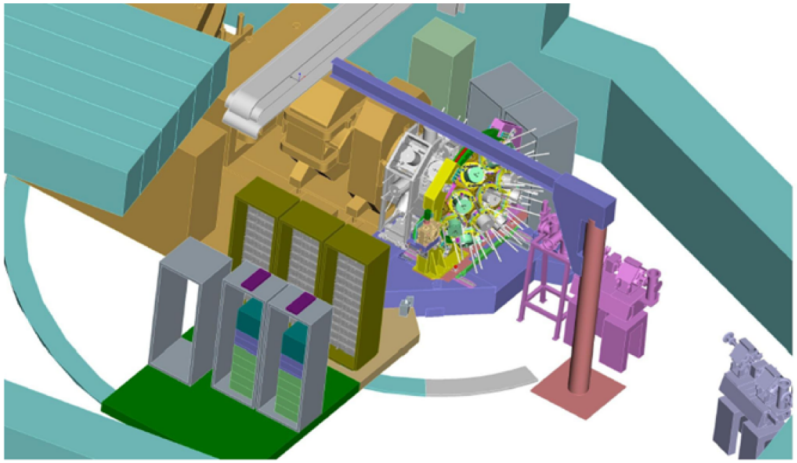
Space requirements

Could we squeeze AGATA 4π infrastructure in 3 racks ? No way with present electronics (3 racks necessary for 20 ATC)

DSS space requirement for 20 ATC

- 2 racks for 24 V1 digitizer boxes (8 ATC = 24 capsules),
- 1 rack for 12 V2 digitizer boxes (12 ATC),
- 3 racks hosting low-voltage and high-voltage power supplies, the detector control and support system and the Ge cooling system for twenty dewars





Team Activities

High Voltage

Alarms

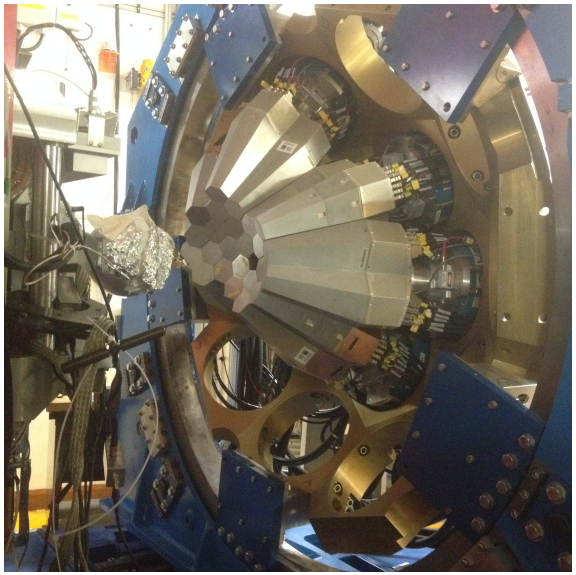
Autofill

PBC + VCC

PLC

GUI

Detector Support System



Low Voltage

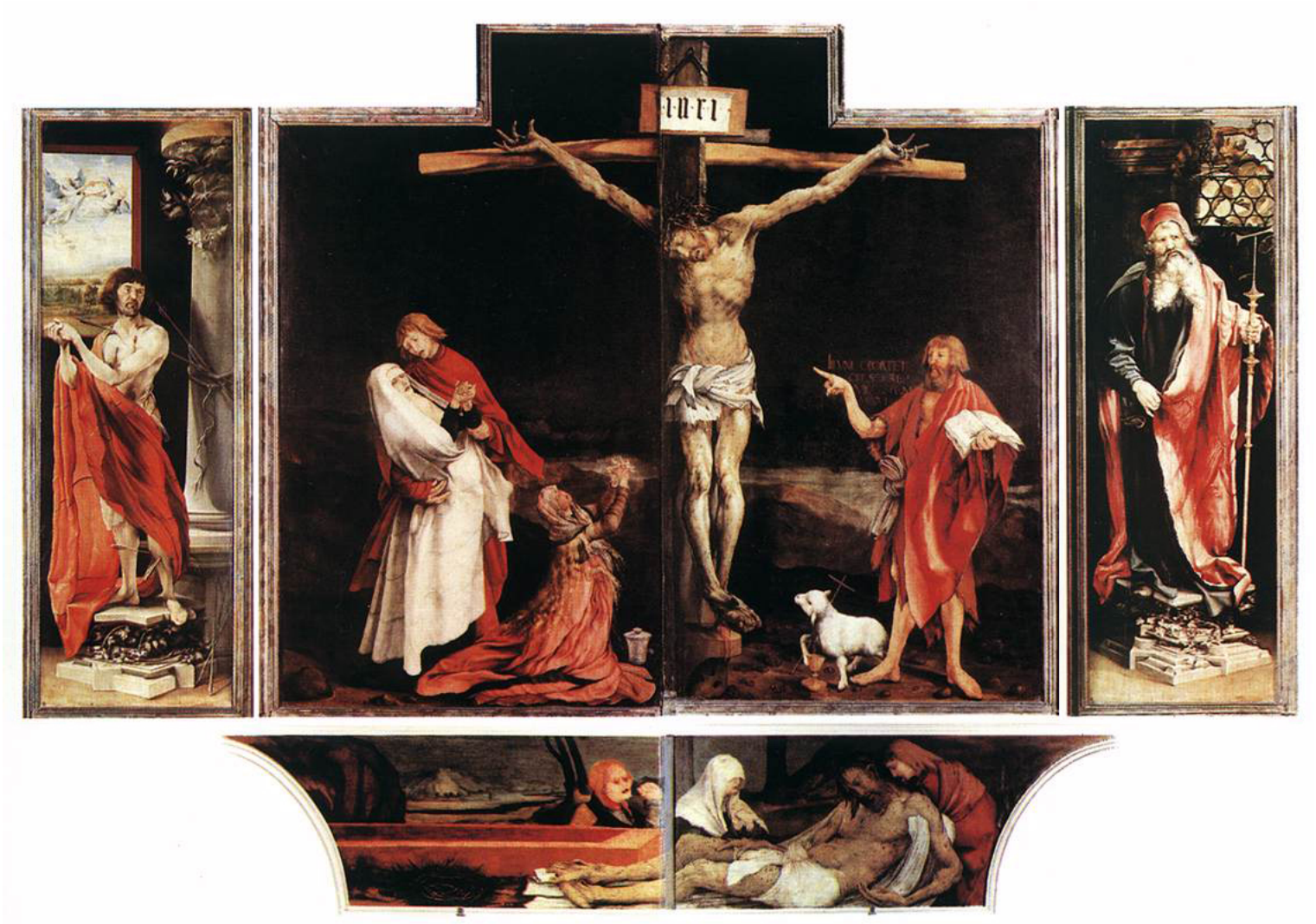
Patch Box: LV filter, BSD, LN2

Cables

Database

Grounding

We are sitting in the meeting room dedicated to …



Mathis Gothart Nithart (Grünewald, ~1475 – 1528): The altarpiece of Issenheim, Musée Unterlinden, Colmar