AGATA AMB Phone conference 17th December 2024

Sujet : AGATA AMB Dec 2024 – Extended to Team Leaders

Apologies:

LNL Status (J.J. Valiente-Dobon – A. Goasduff)
Minutes status AGATA@LNL 17/12/2024

- PAC report:
    - 26 days of back-log from the previous beam time (mostly Ca beam + Fahlander)
    - 19 experiments proposed for a total of 154 days of beam time in total. For AGATA, 13 proposals for a total 126 days (80% of the request). 3 experiments are requesting EXOTIC beam.
    - Taking into the available beam time, we expect about a 50% rejection factor from the PAC.
- Status of the campaign:
    - EXOTIC Beam transport on AGATA, lower intensity than expected due to misalignment, and smaller beam pipe to accommodate the AGATA shell.
    - Last long measurement done → ~30 TB in 1 week of signals for the self-calibration. We had to switch to the ancillary disks to finish the data taking since the CEPH started to re-balance the data.
    - We had issue with the pumping system of AGATA, it was temporarily repaired but we will need to invest in new pumps new year (two big turbos + one small one)
- Status of the detectors:
    - 12 ATCs mounted, 32 capsules taking data. 1 capsule with trip issue.
    - ATC replacement foreseen for the period of the 15/01-17/01. Laser tracker should be available starting from the 16/01
- Status of the DAQ box:
    - Copy of all data on site will be done before the last week of January to allow for the safe installation of the new CEPH disks in the box.

Installation of the new analysis machines will be done at the same time.

- On-site test and near-line replay using the docker swarm developed by the Lyon team will be postponed to the next beam time break (foreseen in end of march-beginning of April).

- Test of the idle to fill the buffers of the DAQ and avoid the data loss at low rate is on-going in Lyon. Data files with idle-events written have been generated and sent to Olivier.

- Status of the electronics:

  - Control card FW delivered to LNL, we will start to reprogram the board as soon as possible. We hope to recover 3 channels for the crystals 05A, 07C and 08C.

  - Mechanical modification will be made on the GALILEO digitizers to better maintain the connection of the power supply back plane.

  - We are looking for gold plated connectors to replace the Nickel one we have at the moment.

  - Stability of the system has been greatly improved adjusting the 5V DC/DC of the GGPs. We observed that more than 70% of the ggp anodes have not been rebooted for more than 160 days. Which might not be a very good point. With the local DAQ team, we are foreseeing to have periodical reboot (frequency to be decided). For example, the scgw3 (gts alignment, topology manager) was not rebooted for more than 453 days …

  - No dedicated proposal for the electronic V2 has been submitted. The commissioning will done as parasitic beam time on the experiments. With progressive integration in the GTS Tree.

- Infrastructure:

  - Heat exchanger installation started on the 17/12

  - New LVPS modules will be installed on the 15-16 of January

  - HV maintenance and replacement with the AGATA boards will be done in parallel to the installation of the detectors.

  - DB team was contacted to register all the HV boards / mainframe and LVPS module in the database

ASC Report / ASC Matters (M. Gorska)

- Go for a light review in 2025,ie no external referees.
- Need to reshuffle the 3p discussion
- Draft of the document expected in February 2025 from AMB to ASC

ACC Report / ACC Matters (S. Leoni)

Nothing specific;
Agata.org : proposition to look for Polish colleagues. Magda Z. to contact HIL and Silvia Cracow for first contacts. Wait for feedback to make the official letter.

GSI Status (K. Wimmer)

Nothing specific
New director appointed
A005 scan on-going → ip2i-Lyon to be in touch

REPORTS FROM THE WORKING GROUPS

Detector Module (H. Hess)

A021→ repair under warranty
A00X, A011 ready for annealing → go to CEA OC
In November, CTT assembled the GSI cryostat. Detector OK
Oscillation observed; to be solved at the next iteration
At LNL, 3ATC in the lab (2 working and 1 with oscillation)
On-going work on the data base for detector; very appreciated by AMB

Infrastructure (B. Million)

No specific meeting since last AMB

- GRIT meeting on the 10th of January
- Starting the CAD for GANIL phase
- Updated on data base activity

Front End Electronics (A. Gadea)

Coordination: last Electronics W.G. VC was on December 9th 2024,
next Electronics W.G. VC meeting on Monday, January 20th, 2025 10:00 CET, 9:00 U.K.

Actions:
-Meeting with J.Collado, GANIL, LNL and Padova Colleagues: brainstor on GTS alignment protocol pending on the maintenance contract.

-Completed the action of sending the Control Card Firmware to the LNL colleagues

Status of the electronics at LNL (A.Goasduff et al.):
Reported in LNL status contribution
Summary:
32 channels with capsules working.

3 AGATA Digitizers in the lab. Control card to be reprogrammed
1 AGATA Power Supply Unit replaced. Failing one to be sent to ETSE.
1 GALILEO Digitizer used in AGATA with problems in the Power Backplane

Fast Reset setting status:
GGP-server updated (slow control) ok on GALILEO Digitizers , AGATA Digitizers to be checked.

DIGIOPT12 (A.Pullia):

Regarding the production status: reported that- 5 core (v3.7) DIGIOPT12 boards and 22 segment (v 3.7) DIGIOPT12 boards are still to be tested.

A.Pullia indicates that from now on the version of the DIGIOPT12 boards will be 3.7.1

PACE Status (J.Collado, reported by A.Gadea and V.Gonzalez)

Hardware production:

Production of boards (assembly) has been launched at the company- 15 boards every 2 weeks are

Expected after production ready. GANIL order is not yet received (because it is a tender), but they will start with the 15 boards ordered by Valencia.

Parts exist for 90 boards; orders for mounting 70 cards have been made or are being made by IFIC and GANIL. ETSE has new money to pay for the manufacture of the last 20 to make 90 in total.

To avoid issues with obsolescence, components up to 140 cards (3□+some spares) have been ordered. They are already in IFIC or due by February 2025.

Firmware status:

Javier Collado has been working on firmware simulation of the alignment problem that intermittently

corrupts ADF data blocks going to STARE. The ADF key and data size fields are corrupted. Keywords, segment ID and segment data size are not ok.

Javier Collado found a problem in the simulation but the problem still persists in the FPGA outputs in the real hardware.

Olivier Stezowsky and Guillaume Baulieu have provided code to speed up testing by analysing PACE ADF blocks instantly as they arrive and provides diagnostic information immediately rather than waiting for offline analysis.

Message ID: 18	Entry time: Fri Dec 6 16:08:44 2024 In reply to: 15 Reply to this: 25
Author:	stezowski, stezow@ipnl.in2p3.fr
Type:	V2
Category:	Hardware
Status:	Dataset 2801
Subject:	Re: Captured Run 2800 and Run 2801

This run also has misalignement in signals. I have changed a bit the program to check (new version joined). Here is the output for the first file of run2801

One can see all the sequences Tracelength/ID are not correct

```
./SQMScan 3 /Volumes/OSDev/Data/AGATA/TestV2/Run_2801 0 1
*** Scanning *** /Volumes/OSDev/Data/AGATA/TestV2/Run_2801/Event_0.dat
*** DoingUDP ***
First event has udp id 200,512 with sub_id 0
Previous UDP id was 645 and we now have 647 [offset in file 1107000] : we missed 1 udp paquet
Previous UDP id was 671 and we now have 673 [offset in file 1320200] : we missed 1 udp paquet
... and more
10000 total number of udp packet
 -> 118 udp paquet has never been received by SQM, marked as void
 -> 9882 udp paquets with sub_id size 1
*** DoingADF ***
First ADF key is [8088,fa010101,23656843192458,30191392]
Bad ADF key @ offset 1107000
Bad ADF key @ offset 1320200
Bad ADF key @ offset 1943400
... and more
ADF content of the checked 9882 udp packets amongst 10000
-> 7191 adf key found in UDP paquets and 2691 UDP paquets have not a good adf key
-> In the good adf header : 0 back in TS and 0 back in Event Number
  -> 6 frame found with status ba51
  -> 7184 frame found with status da10
  -> 1 frame found with status fa10
  -> Bad SegmentID: 0 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184
7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184 7184
  -> Bad Segment Length: 0 7184 6947 7184 6955 7184 6951 7184 6929 7184 6965 7184 6982 7184 6961 7184 6962 7184 6981 7184 6938 7184
6982 7184 6980 7184 6993 7184 6964 7184 6875 7184 6986 7184 6912 7184
  -> Bad CoreID: 0 0
  -> Bad Core Length: 0 0
```

On view of the persisting issue and with the information from the SQMScan, Javier Collado has analyzed the ADF file and found events full of 0’s and with a wrong footer in the middle

of the file. Actions taken to have a current version SQM in the userelec account and to check the production of faulty buffers by the PACE FPGA during this week.

PACE Firmware Maintenance Contract

In order to made usable, maintain and improve the PACE firmware, keeping the help of Javier Collado, we are proceeding with a tendering for a contract with the Zeptonova, the spin-off of KU-Leuven where Javier Collado works.
Now the tendering for the contract is published and Zeptonova is preparing the documentation to participate. Deadline has been set for 30th December.

A meeting with the management of Zeptonova is taking place on Thursday morning to discuss the tendering conditions and how to start the work.

PSU and Mechanics: (V.Gonzalez)

Mechanics production is proceeding normally the status as of 9th December

- 12 PACE cooling blocks
- 78 STARE cooling blocks (+12)
- 240 Digitopt12 cooling blocks (+23)
- 59 Heat exchangers

Front panel: Aluminum panel prepared for production
Rear panel: Steel and aluminum prototypes produced

The heat exchangers will be treated for passivation with the Alodine process.

Signal backplane in assembly company, delayed again (missing components)

PACE thermal test

- Setup 4 servers (thanks to Nicolas Dos me)
- Three running ok, one seems to not work (under investigation)
- Running three output links from STARE. Power consumption: 2 A (not Linux running)

PSU schematic and layout modifications finished. Added some additional components for DC/DC stability and filtering and updated component availability for production

STARE Status (N.Karkour, X.Lafay)

38 boards received at Orsay, 9 had problems at the assembly company, mostly voltage measurements slightly out of spec but still working OK when tested in Orsay.
Only 2 cards have real problems (testbench firmware works, but not production firmware on one and the other is a resistor change for DC-DC converter). This means there are presently 36 functioning production STARE cards plus 15 prototype and preseries.
Presently burning tests are on-going.

10 more production cards will be fitted with 10 new GSI SOMs when they arrive.

STARES under test connected to the servers through switches have caused network problem. The real PACE-STARE board is being integrated in the test.

Specific configurations being done to integrate the boards in the Topology manager is combining different types of STARE cards (emulated, test bench alone, test bench with PACE) to perform extended test with software and hardware.

New processing firmware (Moschos Kogimtzis)

Now Integrating the energy block to the format that Javier needs and also software simulation to make histograms in Matlab (Expect to send block to Javier Collado in new Year).
CFD integration (see 14/11/24) is still not clear- need input from Javier Collado (will ask him during brainstorming meeting about PACE firmware issues)

News on Testing and Production of phase 2 electronics:

STARE Trenz SOMs- some 2023 orders were never received (remained in GSI) and some parts behave differently because of changes by Trenz (new sub-versions)- At least 3 different sub-versions exist (change of chip and change of PCB routing).
N.Karkour reported that IJC lab has looked at alternatives- there are none- the STARE boards are already made so we need the SOMs and our quantities are so low that Trenz won't make any special allowance for us.
Resistor change, DC-DC converter change and improved routing are all changes made by Trenz to fix problems on SOMs and they result in new sub-versions. Plans have been made with the software team are to identify the SOM (using EPROM) and customize the programming of the FPGA according to the SOM revision level. The SOM used in the PACE has not changed so much- just a new PLL to replace an obsolete part and the same with DRAM. The TE0841 used in the STARE cards has changes to mechanics, and size of board too. The latest version of the SOM for STARE has different component heights (bigger) so we need to check mechanical clearance to the heat sinks and cooling.

In conclusion, we should minimize the problems with managing STARE SOM version variation by buying the full batch of SOMs as top priority. Need to do something similar for PACE.

Present Schedule:

DIGIOPT12: 80 Digitizer sets existing or being delivered.
Integration: PACE DIGIOPT12 Configuration file for the new V3.7X boards to be done

STARE: 36 boards already delivered 10 will be delivered soon, The delivery will continue as soon as TE0841 SoMs are delivered by Trenz.
Firmware: UDP production firmware existing, checking the necessity of RUDP version.

PACE: on production. Delivery expected starting in January with FAT and CAT.
Firmware: Packager under revision for faulty ADF formatting.
Integration of the GTS block to be done starting from February 2025.

Data Processing (O. Stézowski)

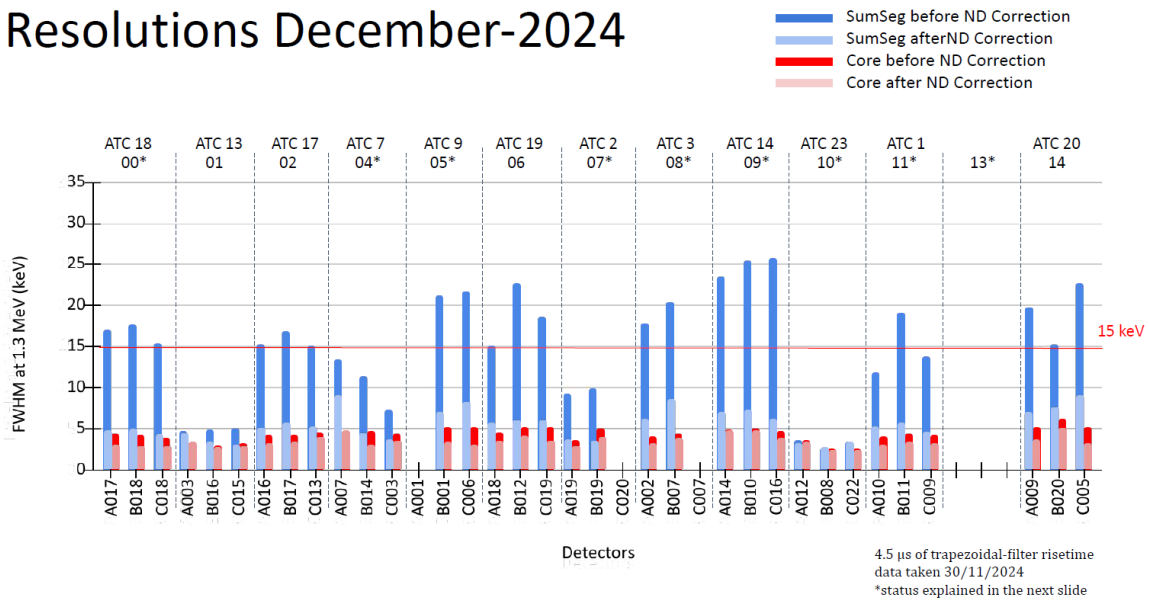
Next analysis school in Lyon 13th- 17th of January. A bit less participants than expected. Most likely because most of the PhD analysing are from Italy where the knowledge is well distributed.
Updates on the A005 ML analysis and its impact on the A-type capsules analysis of the 98Zr reference run. There is a question mark on the rise time of the core signal which seems very different between the two data set.
CEPH upgrade in January → LNL visit
There is a current action on the handbook updates.
The VOMS server is about to be shut down and the admin was Johan. This gives access to our GRID resources. It was decided to move to the iam-indigo server with Jérémie D. the manager.

PSA and Tracking R&D (A. Boston)

Fraser is working on the reduction of the memory footprint of the 2 interactions algo.
Self-Calibration data (25To) collected. Chen in charge.
It was discussed the opportunity of a webinar on the present PSA data analysis in the collaboration. Goal: sharing the info's.
For the mid-term, it is proposed to use the IPHC scanning table with a B, C and another A-type capsules.

Performance and Simulation (M. Labiche)

- Simulation : tomography results from IPHC to be included in the geometry; how ?
- Performances (see Rosa's report and chart below); next cluster to changed ar ATC14, ATC09, ATC19
- High energy run analysis on-going;
- Analysis of the cross talk after heavy neutron damage; seems more and more difficult; Probably a second loop after cal and correction needs to be done on the cross talk coefficients.



Financial Reports (B. Million)

Short overview on the OC

Dissemination (J. Nyberg) : no news.

AOB :

AGATA week. Either week of the 8th or 15th of September. It is proposed to go to GSI and in 2026 in Poland.