



AGATA AMB Phone conference 16th May 2025

Sujet : AGATA AMB May 2025 – EXTENDED

Apologies: B. Million, K; Wimmer

LNL Status (A. Goasduff)

The EXOTIC test was performed. 11C is operational. The Ca beam time at the tandem was cancelled. Test with the GTS TP is scheduled from the 7th to 9th of June. Next Pre PAC is 10-11 of July.

Detector status :

ATC19 : V2 test

ATC01 : FET to be changed

ATC12 : cryostat maintenance

The IJClab intervention on the CEPH went OK. New NFS and analysis machine operational. A new FW has been released to get a gamma multiplicity using the fast trigger output of the DIGOPT12.

A mini GTS tree is set for V2 test (ROOT-FIFO-AGAVA-V2)

Heat exchanger OK; New LVPS not yet installed.

ASC Report / ASC Matters (M. Gorska)

Mid term review went well. The ASC/AMB prepared an amendment based on the procurement of 135 capsules by 2030. Each ASC members has to go back to its funding agency to get the document signed.

P. Reiter with the help of Gilbert is preparing an agreement for the D-AGATA detector from TU-Darmstadt. AGATA will use OC to bring the cluster to life at the latest standard and it will be available to collaboration for experiment.

ACC Report / ACC Matters (S. Leoni)

J.J. Valiente Dobon will be introduce as new chair of the ACC at the ACC meeting during the next AGATA week in GSI. The ACC session at the AW has been prepared and call for abstract opened. See the indico !

GSI Status (K. Wimmer)

General funding review in GSI. AGATA was shown.

GANIL Status (E. Clement)

Workshop organized at GANIL 11-13th of June. See for physics and infra/DAQ/FEBEE at <https://indico.in2p3.fr/event/34661/>

REPORTS FROM THE WORKING GROUPS

Detector Module (H. Hess)

39 capsules located at LNL.

21 capsules in IKP

10 in MIRION.

1 in Salamanca

Marie Hélène presents the detector data base. So far in EXCEL, to be incorporated at some point into the on-line data base.

A005 failed in Salamanca.

6 ATC empty at LNL

Herbert will travel to LNL to bring 6-9 detector and get 6-9 back to IKP

CTT has started the assembly of the GANIL ATC

The DEGAS detector is working at IKP

Infrastructure (B. Million)

- Heat Exchanger for Digitisers installed early 2025. Situation for electronics positive, it became more stable.

- EMC: NK planning to make test at LNL within the summer with a HV decoupler lent by CAEN, with Alain Goasduff and Rosa Perez.

- GANIL.2: meeting on May, 27th 14:00, with GANIL and Orsay for both Mechanics and Infrastructure aspects for AGATA setup at GANIL.2 (2029-2030) and integration of GRIT

- DB: Detector group is proceeding in collecting all information on Detectors. Soon will come back to DB team to verify if it is possible and how it should be done to make it available to the involved teams.

Resource Management:

- mass production of V2 electronics started : PACE, all TRENZ boards, back planes/PSU/mechanics, DIGIOPT12, being purchased

- 4 ATC (Salamanca, IRFU, 2 INFN) being ordered to CTT

Front End Electronics (A. Gadea)

Coordination: last Electronics W.G. VC was on April 2nd, 2025,
next Electronics W.G. VC meeting on Monday May 19th 2025 10:00 CET, 9:00 U.K.

Meeting on the status and debugging of the GTS implementation in the AGATA
Phase 2 Electronics took place on April 29th 10:00 AM.

Management:

Agnese Giaz will work as co-teamleader with Alain Goasduff in the ancillary
intergration team.

Maintenance:

2 x phase 1 PSUs were sent to Valencia for repair. A problem was repaired on the fan.
The other produces correct voltages. Problem is probably temperature-related
(overheating causing shut down and intermittent working). Fans have 80k hour
lifetime but potentially reduced by dust? Conclusion is that intermitted PSU problems
are likely to be related to the fans, not DC-DC converters.

DIGIOPT12 (A.Pullia):

Small run of v3.7.1 cards have been completed (7 segment, 8 core) for delivering to
INFN. 1 core, 3 segment tested by Alberto and proved OK. These are the first cards
with remote control of fast reset preamp reset implementation for segment. Core cards
already have this function. One more component is needed in BOM to implement this
(no PCB change is needed). In principle this component can be added to existing
cards if required. This more easily done before initial mounting of the cards.

A.Pullia discussed with EOS the work and they have given the availability to do it.
A.Gadea requested EOS a quotation for the patch work and the delivery times. We
have to consider a batch modification to allow for the integration testing to proceed.
The costs of the modification will be 55€ (VAT excluded) per board and around 80
boards can be modify per month. Quotation already existing.

The cards purchased by UK are still in Milan (not sent to LNL). Most of the 3.7 cards
are still in Milan. Some 3.7 cards are in Valencia, possibly a few in Orsay too.

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

PACE Production-

flying probe tests done and some repairs are being made to repair short circuits and
then to mount the final connectors. The goal is to have substantial number of boards
to start factory and customer acceptance tests.

First a couple of boards were sent to Valencia for testing. On these boards 1 resistor
was mounted that should not have been (will be removed from all cards) and SFP
cover not fitted.

On April an May Teydisa completed the delivery of the IFIC Order, we have now 15
boards in Valencia.

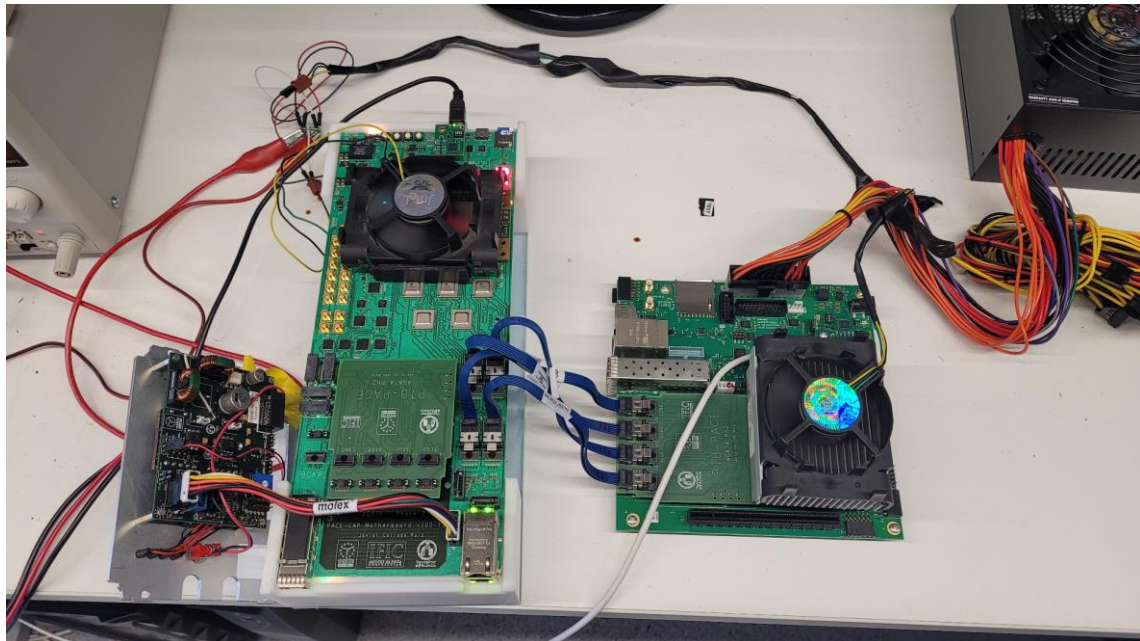
SOM will be mounted and the full PACE plus SOM to be tested and delivered. 67 SOMs with the original PLL which was modified 1 year ago to replace an obsolete component. 2 of these updated cards and 5 which also have upgraded memory. Total 74 SOMs delivered; 25 TE0808 INFN 2024 order delayed only placed in May 8th. Order now confirmed by Trenz, but the delivery time is mid November 2025.

PACE Firmware Status –

Base firmware still has ADF formatting problems. Problems identified in building ADF buffer.

STARE V19 firmware used in LNL but has been updated several times since then so there is a discussion with Orsay about using PACE/STARE from Orsay which is more up to date and could be used for ADF testing.

First step in maintenance contract with Zeptonova for test setup firmware has been completed. The issues with PLL versions have delay the delivery substantially because part of the point 3 of the contract had to be done in order to use all the available SoMs .



Test set-up without enclosure

GTS firmware integration

Now working on the GTS integration testing, expected from mid April but finally started late April 2025 to be complete in May now. Meeting on the status and debugging of the GTS implementation in the AGATA Phase 2 Electronics took place on April 29th (see notes of the meeting attached to this report).

In the meeting were defined a number of actions on Javier Collado, Matthieu Bezar, Alain Goasduff and Abderrahman Boujrad, Sebastien Coudert Luc Legeard and Frederic Saillant that are partially fulfilled.

A.Goasduff has recovered the work done integrating the Petalinux in the TE0808 SoM processor. He is now checking the differences between the GGP and NUMEXO2 integration.

One relevant aspect is the investigation of the clock use for the GTS, unfortunately we need a new PACE deliver to LNL in order to proceed and they were under test. We expect to be able to deliver as soon as one PSU is available. X. Lafay and N. Karkour delivered a new version STARE to LNL for this test.

PACE Firmware Maintenance Contract

Status and schedule:

1. Maintenance of the test setup, **100% completed**.
Had to completed within March 2025, but finally was completed mid May due to the PLL issues. The setup has been built in Valencia and tested. The setup is already able to identify the TE0808 version and upload the configuration file for the replaced PLL in the version This will allow to proceed with the Factory and AGATA acceptance test of the PACE boards.
2. Maintenance of the AGATA Ph2 Trigger Firmware for GTS integration, SMART integration, Trigger system control, Trigger system architecture and Trigger Match IP block.
Started on April 29th2025. The contract also allows integration of SMART leaf into PACE if the leaf IP exists. G.Witter confirms that he has full protocol definitions and documentation plus 1 page of example Verilog code.
3. Maintenance of the monitoring firmware and update of the control system to consider new versions of PACE SoM. Initially scheduled for May 2025, probably to be delayed to June 2025.
4. Update of the documentation, update of the programming platform and preparation of the firmware for future energy algorithms development. To be scheduled for June 2025 or latter.

PSU and Mechanics: (V.Gonzalez)

Status of the cooling block production now 20 sets completed, but 60 DIGIOPT12 sets, 78 STARE coolers and 59 Heat exchangers available.

Proceeding with the Alodine passivation of 59 heat exchangers. Expected to be ready by May 19th.

PSU under production of 50 units, but still to be delivered.

STARE production and Firmware Status (N. Karkour, X. Lafay)

Production

There is 63 STARE mounted with SOMs ; 15 more SOMs arrived at Orsay, but there is also a lack of SFP transceivers (optical and copper) ; Nabil asked to Emanuel to order them.

The problem with PLL that didn't locked has been solved by changing the reset procedure at power up : tested on 1 card at Orsay, the 3 others are still at the manufacturer, I asked them to test with this new firmware.

There is still one non-working STARE. So we are at 59 working STARE + 3 probably working at manufacturer place.

Firmware and Software testing

On firmware we had two main tasks done: the reset procedure at powerup mentioned above

and the writing data into RAM emulator via IPbus ; we had some glitches but now it is fixed (we can sent by IPbus an event and replay it at any rate)

The test setup with 12 link bay now has 5 STARES installed, one with PACE test bench

Works at 80Gbits/sec (8 links to 1 server with 8 inputs (4 x 2 10Gbit input)). These are connected through a switch and transfer through switch for several days but from time to time there are glitches causing crashes. Work under way between Lyon and Orsay teams to increase reliability.

Behaviour of the Topology manager and STARE emulator are being compared to Topology manager and STARE card.

New Energy Processing Firmware (M. Kogimtzis)

Code block sent to J.Collado. Meeting on March 25th with J.Collado, M.Kogimtzis, A.Gadea and I.Lazarus). Waiting for feedback.

Triggering: CFD retained on all channels (including segments) with core able to trigger all segments to get trace data with pre/post trigger data.

Code processes pileup by default- M.Kogimtzis will add software control to disable this and mark pileup instead as we do now with MWD.

Traces- need to confirm that the traces come from J.Collado code, not new M.Kogimtzis code.

SMART (G. Wittwer, E.Clement)

AMC boards received at start of 2025 for up to 14 routers for AGATA (and more for GANIL). Hardware tested and ready to use. Plan is to have a test experiment this year with SMART trigger and synchronisation. Software work under way

SMART MCH for AGATA- 20 layer PCB is ready and files will go to company next week with prototype due before summer. Firmware for FPGA s is ready. SMART MCH should be ready summer. (Hiway SOM used in MCH rather than the Trenz on the AMC).

Procurement and Schedule

Nowadays the status of the hardware parts production is as follows:

- DIGIOPT12: 55 v3.6.1 core boards and 129 v3.6.1 segment boards delivered within 2023. Then it was necessary a major update of the hardware changing the ADC and several other components. This new version is called DIGIOPT12 v3.7. Presently 35 v3.7 core boards and 141 v3.7 segment boards have been delivered or are in production. The total number of DIGIOPT12 boards produced for the phase 2 electronics is 90 core boards and 270 segment boards, allowing to instrument 90 channels.

- PACE: the production of 90 PACE motherboards is ongoing. Expected completion March 2025, but delayed due to errors found in flight probe. Now the Factory acceptance test and the AGATA acceptance test will be performed. Expected delivery in May 2025. Electronic components have been purchased for the full 135 boards production to avoid obsolescence issues.
- STARE: the production of the STARE motherboards was completed late 2024. Presently the boards are being delivered as soon as the corresponding SoM's are available with a lead time of 3 to 4 weeks. Presently 63 complete STARE boards and 15 SoMs have been received.
- Regarding the mechanics, enclosures are purchased for 66 units and cooling plates for 140 units are under production. Signal and Power Backplanes are available in quantities of 50 and 60 units respectively and towards mid 2025 we expect to number on 75 and 85 respectively. 50 Power supply units should be delivered within May 2025

The schedule for the integration testing should be as follows:

- Hardware mostly ready mid 2025
- Test immediately standalone with 1 ATC as soon as GTS integrated into the firmware (June 2025)
- 2nd half 2025 for testing full system with more channels and V1 synchronisation

AGATA Electronics PACE GTS Experts meeting 29/04/2025 10:00 CET

Notes

Participants: Alain Goasduff, Abderrahman Boujrad, Matthieu Bezard, Javier Collado, Sebastien Coudert Luc Legeard, Frederic Saillant, Emmanuel Clement, Andres Gadea

The meeting starts with the presentation of the short report prepared by Javier on the status and implementation of GTS in the PACE. The GTS implementation is summarized in the next figure.

- Mathieu mention that additionally you need to have the right value in the right register when running the slow control. He has available a script setting the values of the GTS registers as it is done in the alignment EPICS procedure. This allows to go step by step checking that the right value is in the right register.
- Alain mentions that presently he is using the EPICS GTS server from the GGP that seems not to be acting on the proper registers to configure the LEAF for the “coma” detection. He would need the NUMEXO2 GTS server and the EPICS layer for the NUMEXO2 GTS.

ACTIONS:

- 1) **Javier to check the clock used in the GTS LEAF IP, it is compulsory that is the same clock that is provided by the GTS Tree.**
- 2) **Matthieu to provide the script to program the GTS LEAF registers in order to check that the register have the correct value and that it is possible to the alignment of the GTS LEAF**
- 3) **Abderrahman to provide the screenshots with the GTS signals of NUMEXO2, to be compared with the new ones after correction s in the clock and configuration.**
- 4) **Javier to configure the proper encoding 7b/8b when sending the coma to the GTS Tree.**
- 5) **Frederic and Sebastien to provide Alain with the correct NUMEXO2 EPICS version with the GTS EPICS layer.**

SCHEDULE:

Javier is available on May to work on the project. If he receives all the due items, he will be able to do the corrections and test the first week of May. We should expect the next meeting around mid May.

Personal : A. Giaz is appointed as co-leaded of the Ancillary team

Data Processing (O. Stézowski)

Iam-indigo agata is operational. It will replace the VOM system as identifier for the virtual organisation and access to the GRID data.

With the visit of Patrick, the CEPH has double. New upgrade of the CEPH OS to be scheduled. Guillaume is working on the analysis cluster.

RUDP : it is essential to clarify the need for the RUDP. The Orsay test benches between the STARE setup and the mini daq box is putting a high priority on that.

PSA and Tracking R&D (A. Boston)

Communication by Fraser on the 2 interaction PSA.

Dan communicated on the A601 qualification before neutron irradiation. Spec OK.

Measurement by July and results to be communicated during the AW.

On tracking, IJClab has a new student for a NN study. The goal is the re-ordering of the hit to refuse/accept bad/good clusters using GRETINA data. Then the plan is to apply to AGATA data with a promising +17% in the peak area.

Working on-going at Padova on the pair production in OFT with a better efficiency at the highest energies.

Performance and Simulation (M. Labiche)

Status on the analysis of the high energy gamma beam test.

→ **IMPORTANT ACTION** On the GAIN stability which seems to be correlated to the LN2 refill. Why ?

Personal : S. Bottoni is appointed as co-leaded of the Commissioning team

Financial Reports (B. Million)

No report

Dissemination (I. Kuti)

No publication

AOB : → Have a look to the AGATA week indico web page

<https://indico.in2p3.fr/event/35264/>

And fill the doodle for the July meeting

<https://evento.renater.fr/survey/amb-july-2025-s4t5bgrh>