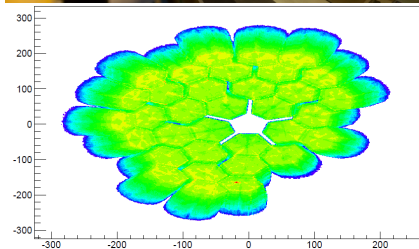


Online PSA performance

Damian Ralet

GANIL, CEA/DSM-CNRS/IN2P3, F-14076 Caen Cedex 05, France

AGATA is installed in G1 experimental cave since 2014

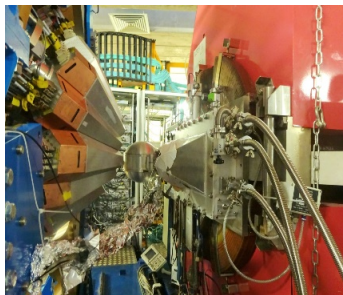


- Currently 35 AGATA crystals are operated
- 3,4(1)% efficiency in nominal position at 1.408 MeV (GEANT4 simulations 3.6%)
- Coupled to different ancillary detectors (VAMOS, NEDA+DIAMANT, MUGAST)

E. Clement et al. NIMA 885 1-12 (2017)

Total of 21 experiments from 2014 to 2018
with 3 setup:

- 2014: installation + commissioning
- 2015-2016: AGATA+VAMOS
(10 experiments)



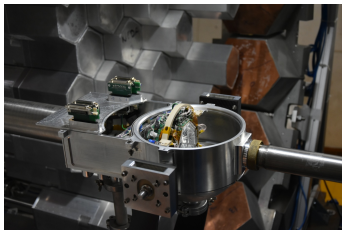
Total of 21 experiments from 2014 to 2018
with 3 setup:

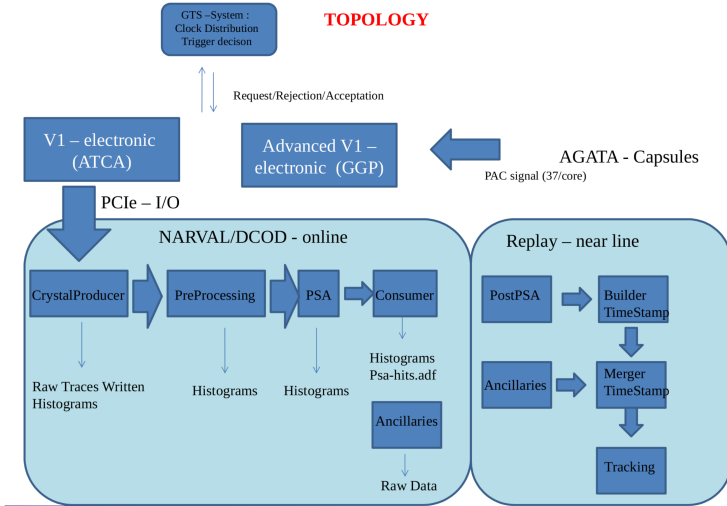
- 2014: installation + commissioning
- 2015-2016: AGATA+VAMOS
(10 experiments)
- 2017: AGATA + (VAMOS) +
(FAST-TIMING) (7 experiments)



Total of 21 experiments from 2014 to 2018
with 3 setup:

- 2014: installation + commissioning
- 2015-2016: AGATA+VAMOS
(10 experiments)
- 2017: AGATA + (VAMOS) +
(FAST-TIMING) (7 experiments)
- 2018: AGATA+NEDA+DIAMANT
(4 experiments done; 1 remaining)



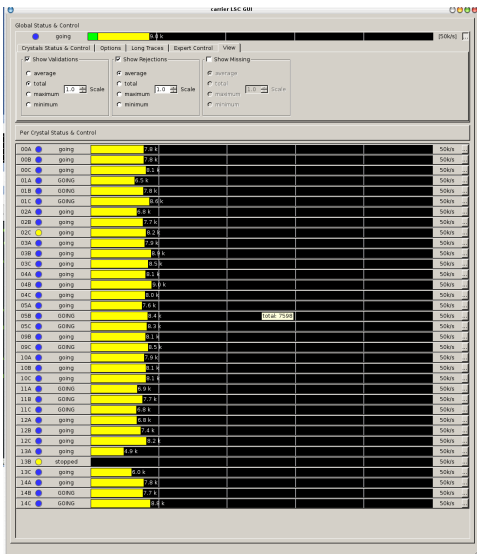


E.Clément



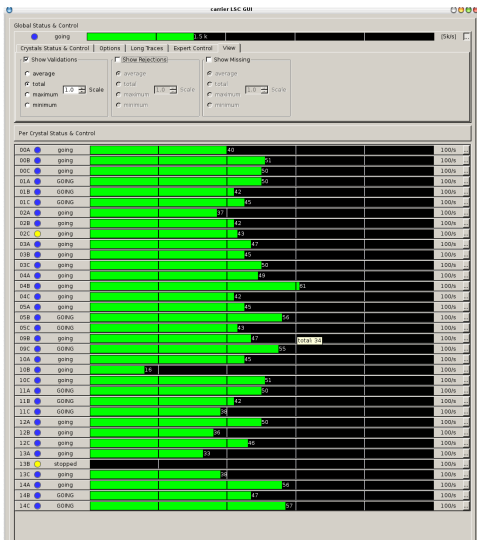
Up to 35 AGATA detectors

- VAMOS DAQ: analogue, with a common Time-stamp from the GTS system
- Max counting rate $\approx 10/20$ kHz per crystal



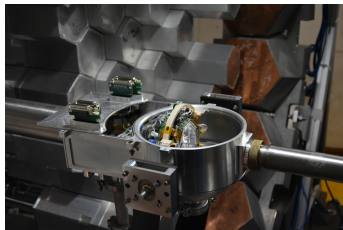
Up to 35 AGATA detectors

- VAMOS DAQ: analogue, with a common Time-stamp from the GTS system
- Max counting rate $\approx 10/20$ kHz per crystal
- Small portion validated due to the ancillary detectors (≈ 100 Hz)
- Rate is low (below the 1kHz of validation per crystal): keep the AGATA traces



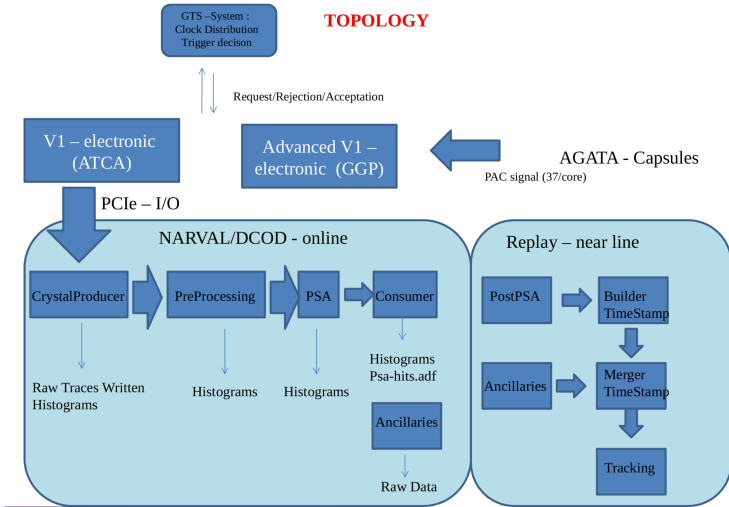
NEDA and DIAMANT have digital electronic (NUMEXO-2) that uses the GTS system

- Firmware for NEDA boards and DIAMANT boards tested
- Too many GTS leaves for the historical AGATA trigger processor → new trigger processor
- High count rate
- Data treatment: event builder and event merger



Current limitations and improvements

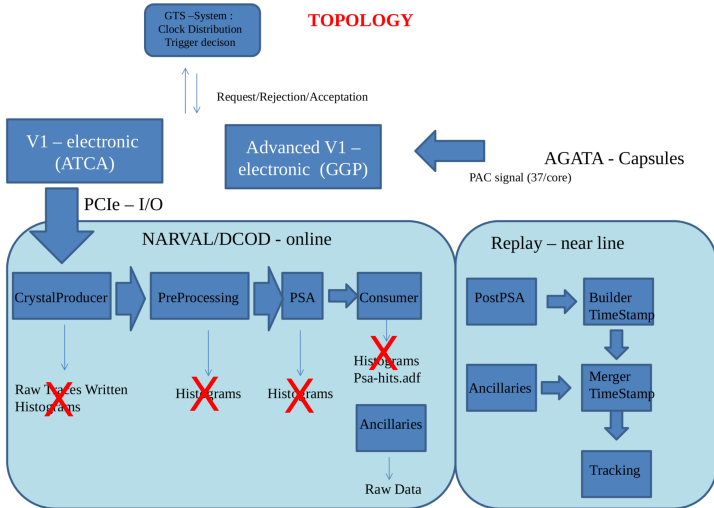
How can we increase the data taking?



E.Clément

Current limitations and improvements

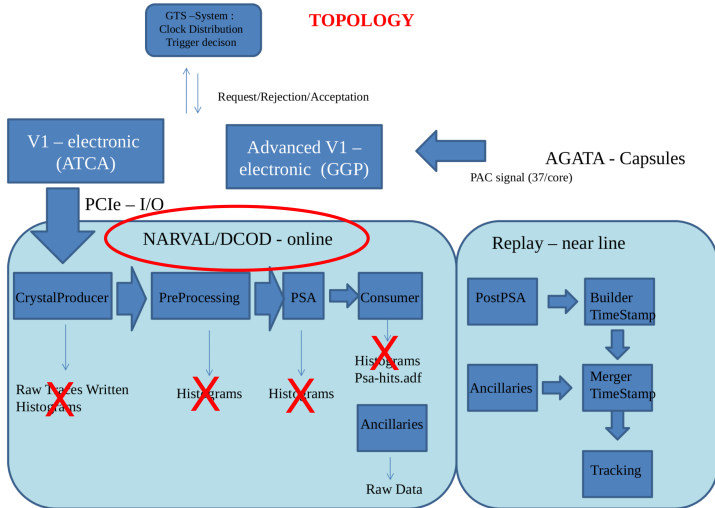
Limit disk access → no histogram, no trace



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Improvement of the buffer handling and new disks servers

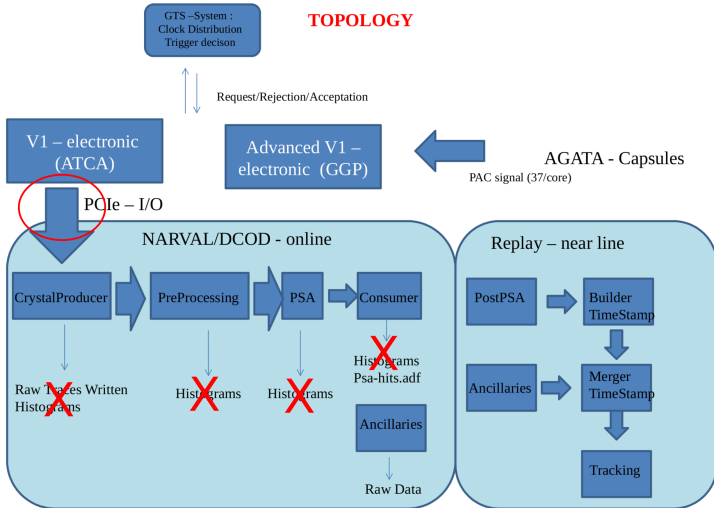


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Navigation icons

Current limitations and improvements

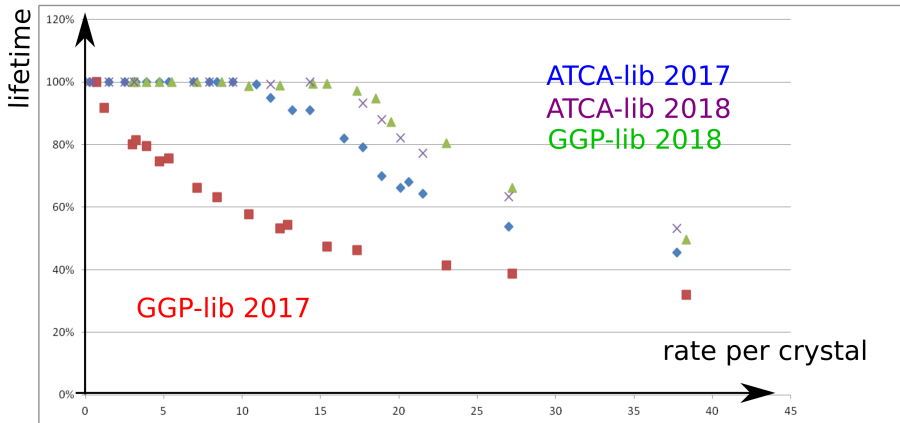
Interface between hardware-software (PCIe) investigation



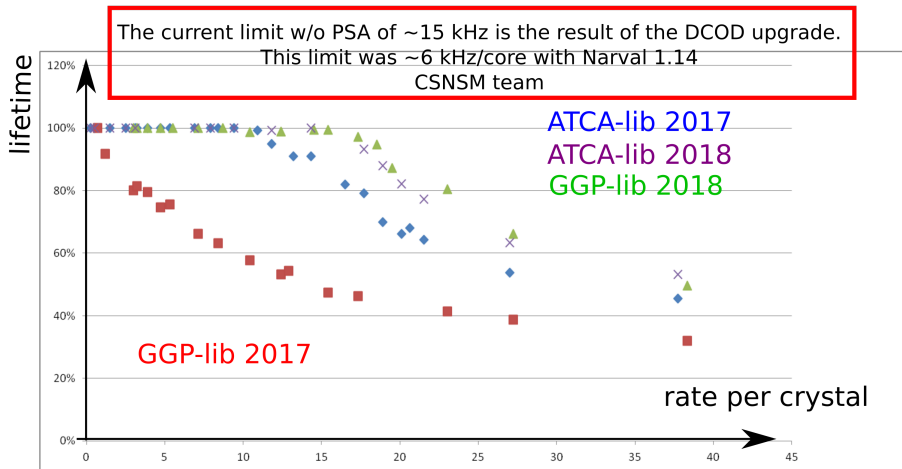
E.Clément



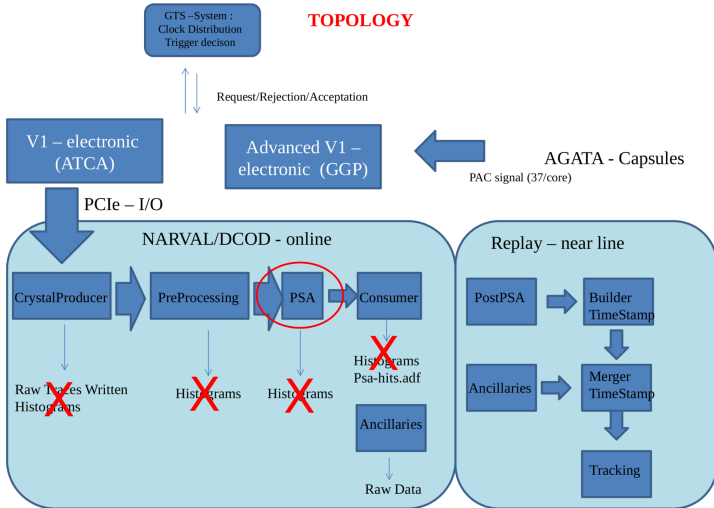
Multi-threading memory access as a solution to increase the validation rate



Multi-threading memory access as a solution to increase the validation rate



Pulse-shape-analysis:



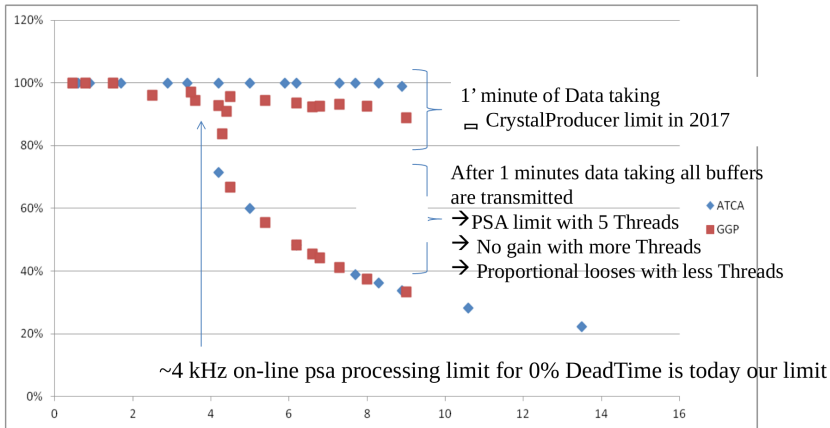
E.Clément



Current limitation

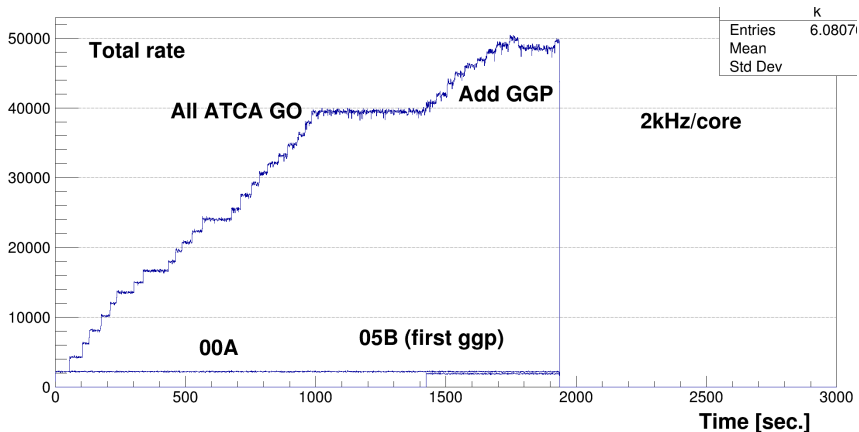
Current limitation PSA → where is the limit?

Individual Lifetime



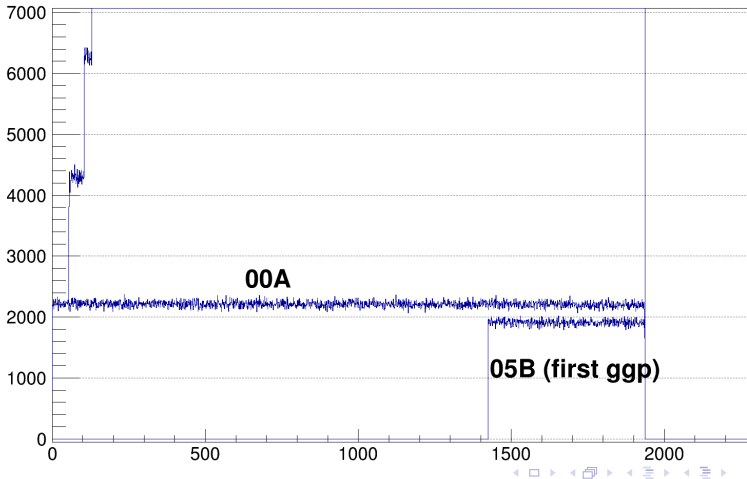
Maximum counting rate

Average count of 2kHz per crystal, gradual increase

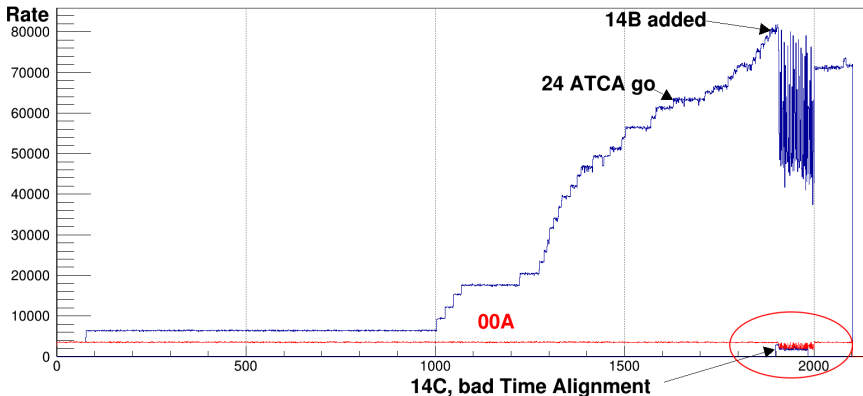


Maximum counting rate

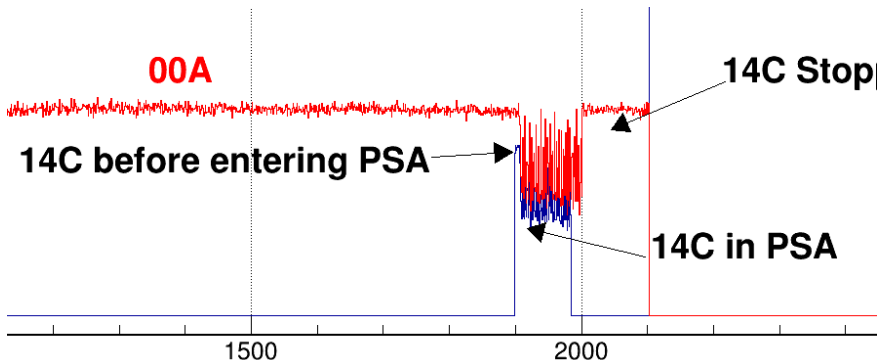
Average count of 2kHz per crystal, gradual increase
System is stable



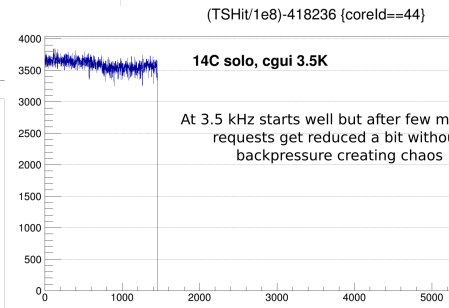
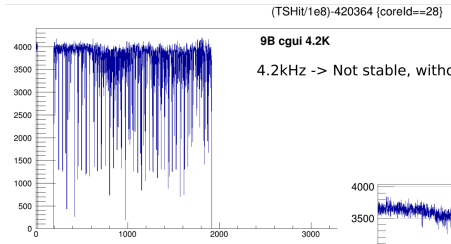
Average count of 3.8kHz per crystal, gradual increase



Average count of 3.8kHz per crystal, gradual increase
Start well then get a huge back-pressure affecting all crystals

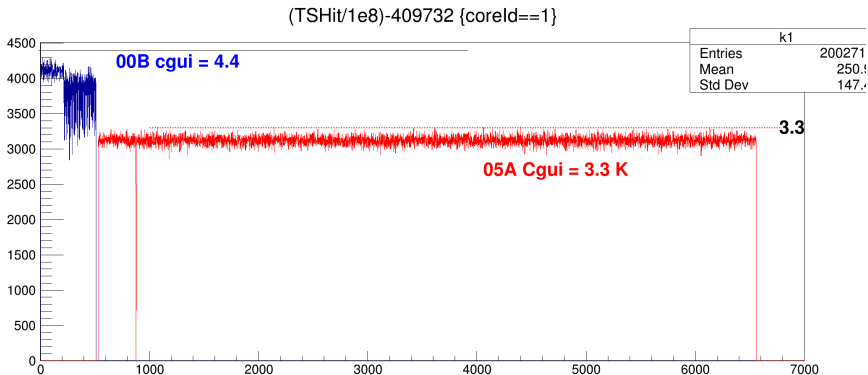


Between 3 and 4kHz: the current limitation

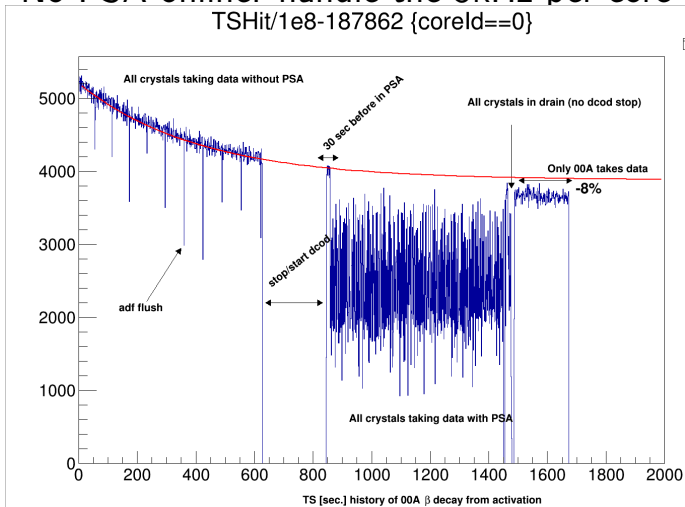


Maximum counting rate

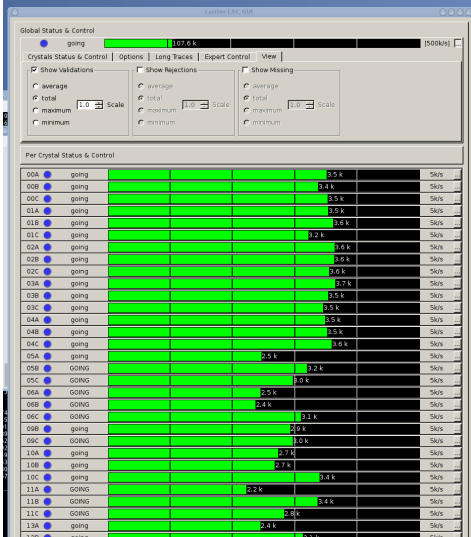
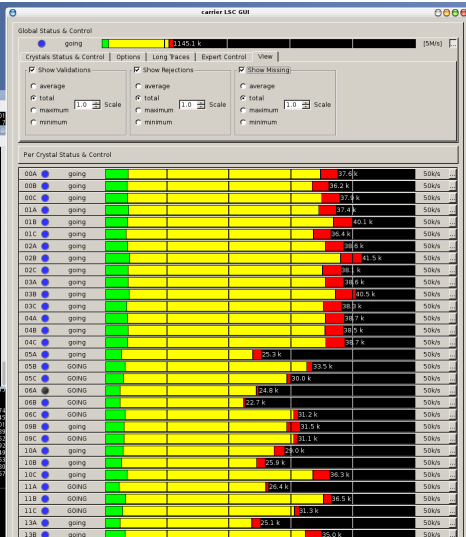
Between 3 and 4kHz: the current limitation
3.3kHz seem to be the current limit



Activation with a average counting rate of 5kHz per core
 No PSA online: handle the 5kHz per core



40/50 kHz per crystal, 3-4kHz validation



2018: huge step of the collaboration to increase the rate capability of AGATA

Many improvement of the AGATA libraries

Neutron damage correction is essential
→ up to which extend?

Next step: speed of the PSA algorithm