

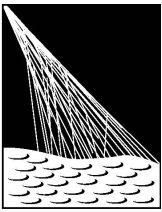
Action items



Tiina Suomijärvi
for the Trigger and UUB commissioning task

AugerPrime SDEU F2F meeting
3 - 5 June 2024

Noise

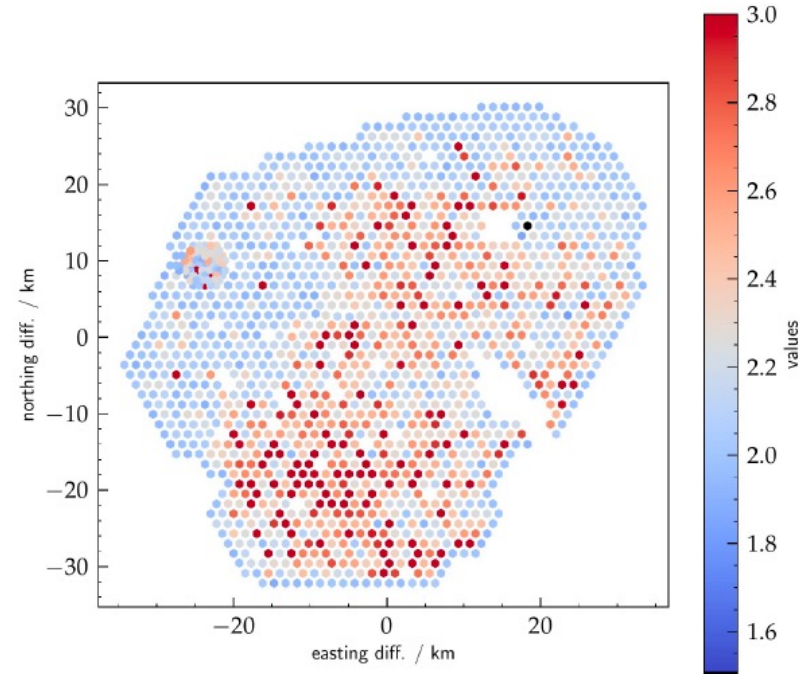


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Some noise issues were observed in the field possibly related to bad cabling, bad grounding, lightning, TPCB, and open connectors. Some of them have already been mitigated: TPCB modification, 50 Ohm caps, and better cabling. These actions are in progress in the field.

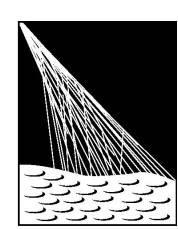
Other actions:

- Study the effect of modified TPCB
- Study if better grounding is possible. Select a few tanks in the wet area (Martin will provide a list) and go to see them in the field.
- Understand why April and September are worse than other periods, and check the correlation with rainfall
- Study noise in RD data over the array
- Continue monitoring the hexagon number
- Check the noise on the border where SSD is not installed



SSD noise by Martin.

- Study consequences of noise in high-level analysis



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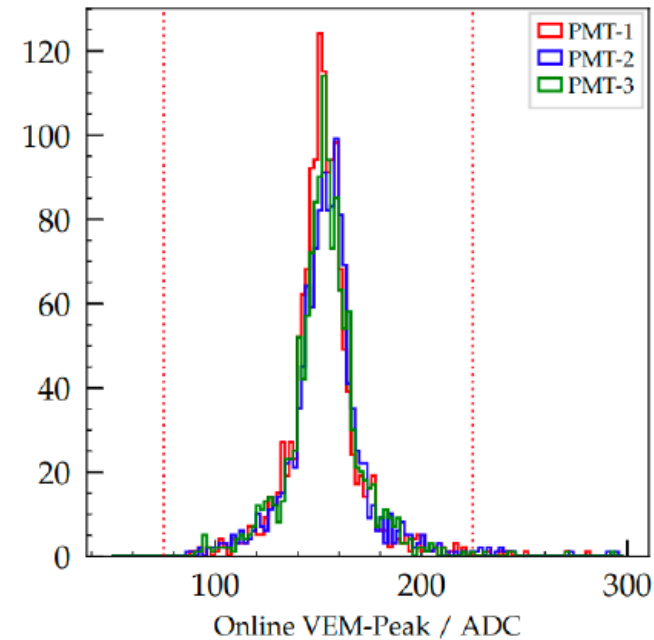
Calibration

Actions

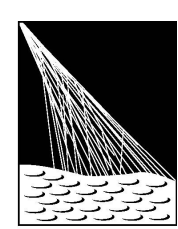
- Provide SSD online calibration of the MIP peak (in progress). This can be used for SSD monitoring and later for SSD triggers.
- Muon charge online exists, needs to be checked. The error was mitigated, new data exist (David Schmidt).

Other remarks

- SPMT calibration OK, need to have LPMT quality cuts



Timing



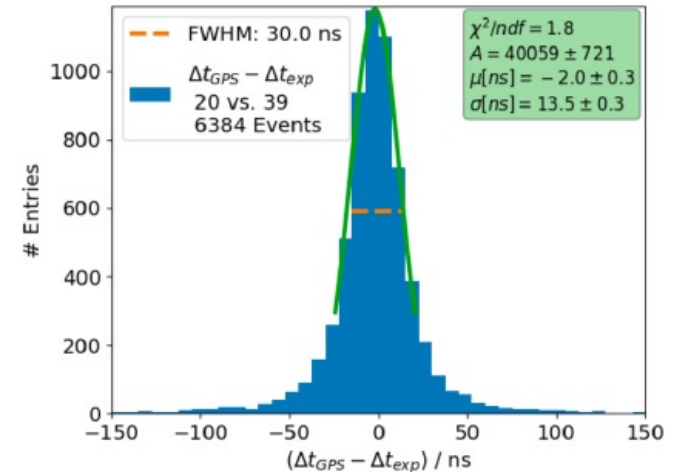
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Actions

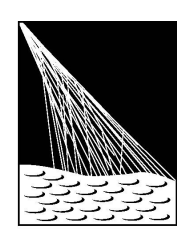
- Confirm relative offsets measured in laboratory (CWRU): about 5 ns, probably negligible
- Confirm the time difference between SSD and WCD by measuring the different transit time in SSD PMT and LPMT (Juan-Pablo). This was done for SPMT (32 ns). Transit time is longer for LPTS than for smaller PMTs, it also depends on the HV.
- **Take muon data and analyze the SSD-WCD time difference for some detector stations to get dispersion**
- Confirm the 70ns time difference between UUB and UB. Data is in Lyon.
- There is approximately a 125 ns delay induced by the trace cleaner, this value should be confirmed (Dave).

Other remarks

- WCD and FD time difference measured (Fabio and Francesco, 260324), problem with Co.



Measured timing resolution on showers using 2 nearby stations. Single station resolution is $13.5/\sqrt{2} = 9.5$ ns.

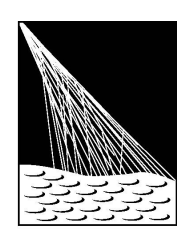


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Control and monitoring

Actions

- Check the Monitoring UUB table, not all validated yet
- Correct all values in the MonitCalib table
- Define a better link of alarms to maintenance, adjust priority/severity
- Finalize SSD HV check that is being developed.
- SPMT monitoring: no alarms for the moment, need to be finalized
- Finalize small shower monitoring (SPMT)
- Add SPMT Imon/Vmon for monitoring data
- Alarm selection is proposed, but needs validation with a new run of monitoring.
- Check the mean T dependence of the VEM peak (for the quality cut purposes)
- **Prepare bad PMT files**
- Check PMT mask
- **Get LPMT quality information from SPMT calibration**



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DAQ and CDAS

The DAQ version V128R0B0P26 is running in the test array. The version V128R0B0P20 is currently running in the array.

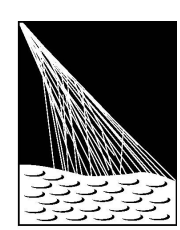
The modifications in V26 are in the repository in the "dev" branch. The main modifications are related to the trigger settings and the possibility to change them through the configuration parameters. For more information, see Ricardo's email on 5 June.

Actions

- DAQ V128R0B0P26 running in the test array should be checked.
- Request a small array (regular spacing) with 1 BSU for test array (out of the regular data taking) for CDAS and new trigger tests etc. (email sent to the management by Dave and Tiina)

Other remarks

- A trigger committee will be formed.
- **We cannot raise the threshold for the T2 thr trigger** since we would lose horizontal showers. We should check if this loss could be compensated by DL trigger (see new triggers).



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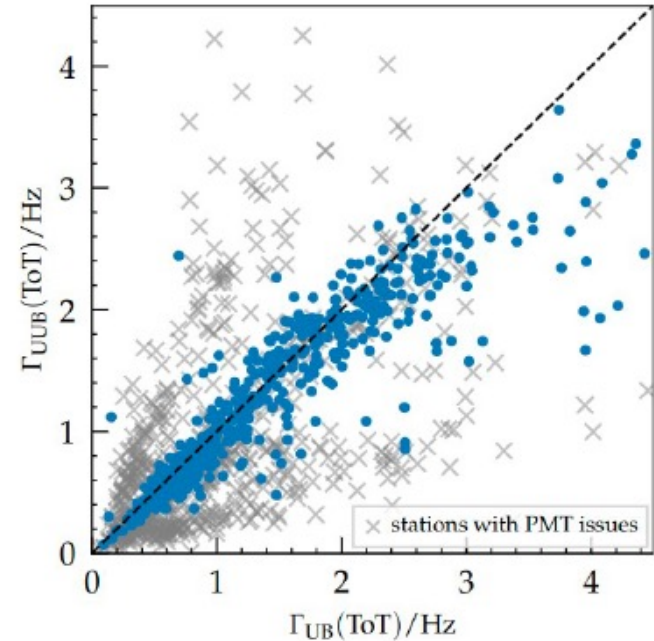
Trigger

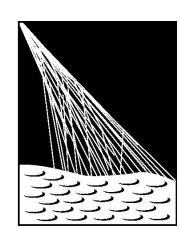
Actions

- The ToT trigger rate seems to be quite low. We should check the efficiency of the ToT rate including efficiency for 2 PMTs (see Martin's presentation).

Actions for MoPS and ToTD

- Test in the single stations (TanquitoJr and Fetche) for trace cleaning using a minimally aggressive algorithm.
- Determine the delay in the final version of trace cleaning.





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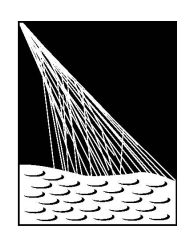
RD trigger and new triggers

RD trigger

- The T2 is now reduced by RD trigger inhibit but the T3 rate is still too high in the test stations
- We should try to implement double buffering in the RD FPGA to reduce the 5% deadtime.

New triggers

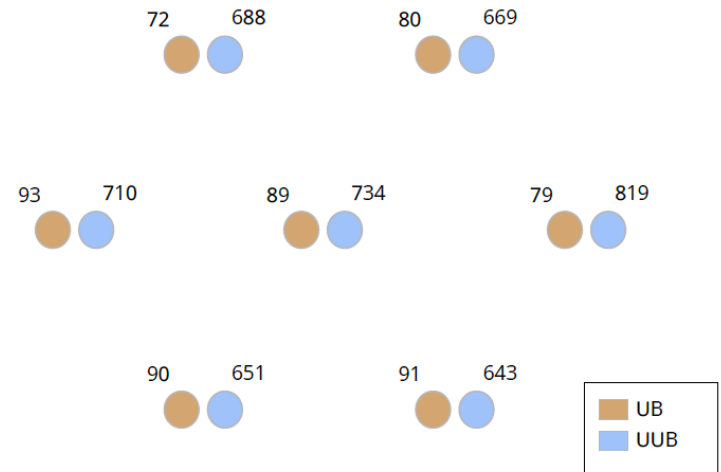
- DL, EM and EMInt (see Dave's presentation)



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UB – UUB comparison

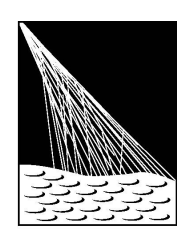
The UB-UUB compatibility has been verified by using the UUB-UB hexagon array (Allan Peyras, GAP 2023-033).



UUB-UB hexagon array

Actions

- Perform the studies of Allan with better statistics.
- Plan for paper: Phase II – Phase I performance comparison?



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Timeline

We plan to install new Software/Firmware in the field for stable data taking starting in September. The goal is to use this data for a preliminary AugerPrime spectrum.

The DAQ V128R0B0P26 (now running in the test array), Dave's latest code, and RD V17 will be installed mid-August.

The following points are noted:

- Improvement of the RD digitizer code is in progress and could be installed later.
- The MIP peak online calculation would not be available but since this is mostly used for monitoring, it would not impact too much the data.